



# **EtherCAT and CANopen Reference Manual**

## **CDHD2 Servo Drive**

Revision: 1.2

Firmware Version 2.15.x



## Revision History

| Doc. Rev. | Date      | Remarks                                                                          |
|-----------|-----------|----------------------------------------------------------------------------------|
| 1.2       | Oct. 2018 | Connection wiring diagrams updated<br>Updated objects: 204D, 221Ah ,60B8h, 60C0h |
| 1.1       | June 2018 | New and updated objects.                                                         |
| 1.0       | Dec. 2017 | CDHD2 – General Release. Firmware 2.15.x                                         |

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# 1 Introduction

## 1.1 About This Manual

Drive functionality is configured using various commands and variables, which are communicated over the serial port or over a fieldbus.

This manual describes the implementation of CANopen and CANopen over EtherCAT (CoE) communication in the CDHD2 servo drives.

This manual is not meant to replace the CANopen specifications, or to reproduce them.

This manual is intended for skilled personnel who have been trained to work with the equipment described.

## 1.2 Manual Format – Object Dictionary

The CAN objects are presented and described in the following format:

### nnnnh – Object Name

#### Object Description

|             |                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------|
| Index       | <i>nnnn</i>                                                                                        |
| Description | <a href="#">VarCom equivalent</a> , where applicable.<br>Description of the object.                |
| Object Code | Variable   Array   Record                                                                          |
| Data Type   | INTEGER8   INTEGER16   INTEGER32<br>UNSIGNED8   UNSIGNED16   UNSIGNED32<br>REAL32   VISIBLE_STRING |

#### Entry Description for Variable and Record Objects

|               |                                                                            |                                     |
|---------------|----------------------------------------------------------------------------|-------------------------------------|
| Access        | Read/Write                                                                 | Read and write access               |
|               | Read Only                                                                  | Read only                           |
|               | Constant                                                                   | Read only access, value is constant |
| PDO Mapping   | Yes   No                                                                   |                                     |
| Default Value | The object's default value.                                                |                                     |
| Lower Limit   | The object's minimum value.                                                |                                     |
| Upper Limit   | The object's maximum value.                                                |                                     |
| Units         | When the object value implies units of measure, these units are specified. |                                     |

**Entry Description for Array Objects**

|                       |                                                                                                                              |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Sub-Index</b>      | <i>nnn</i>                                                                                                                   |
| <b>Description</b>    | Description of the sub-index                                                                                                 |
| <b>Entry Category</b> | Optional   Mandatory                                                                                                         |
| <b>Data Type</b>      | Integer8   Integer16   Integer32<br>Unsigned8   Unsigned16<br>Unsigned32   Real32   Visible_String                           |
| <b>Access</b>         | Read/Write      Read and write access<br>Read Only        Read only<br>Constant          Read only access, value is constant |
| <b>PDO Mapping</b>    | Yes   No                                                                                                                     |
| <b>Default Value</b>  | The object's default value.                                                                                                  |
| <b>Lower Limit</b>    | The object's minimum value.                                                                                                  |
| <b>Upper Limit</b>    | The object's maximum value.                                                                                                  |
| <b>Unit</b>           | When the object value implies units of measure, these units are specified.                                                   |

## 2 Fieldbus Wiring and Setup

### 2.1 Fieldbus Wiring – Examples

#### 2.1.1 CDHD2 – EtherCAT Configuration – softMC 7 Controller – Example

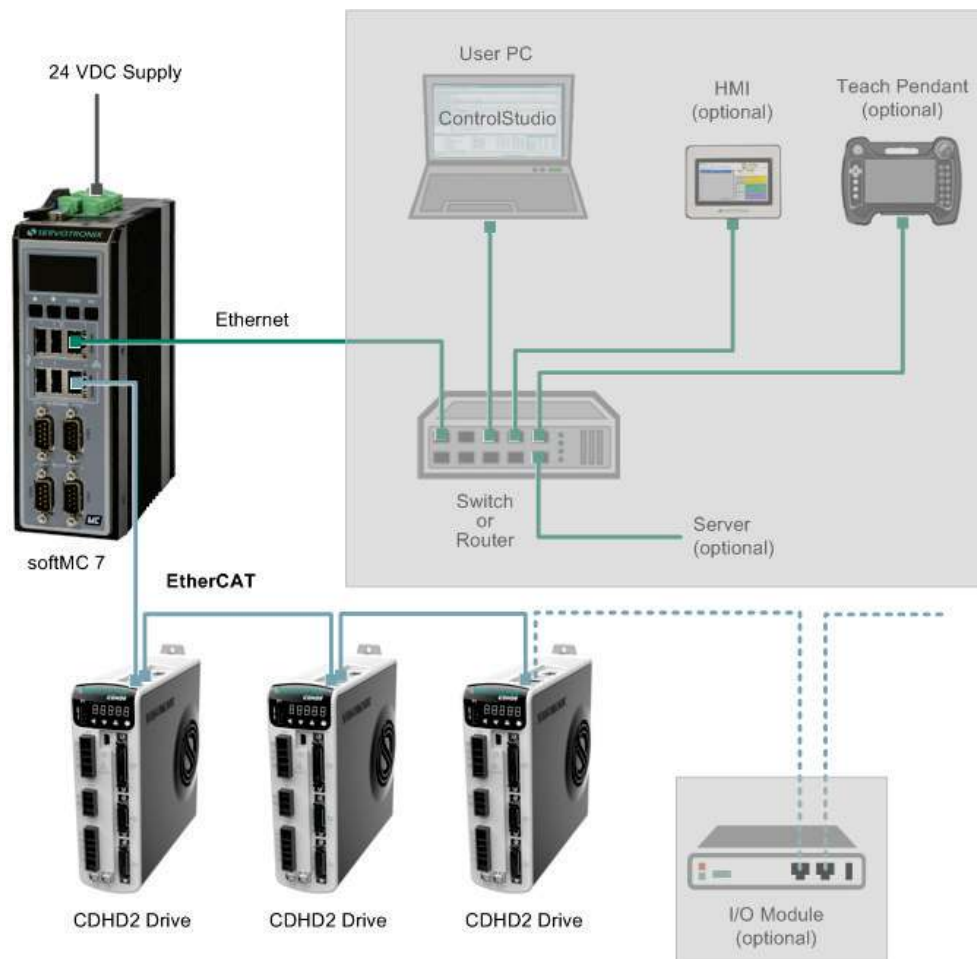


Figure 2-1. CDHD2 – EtherCAT Configuration – softMC 7 Controller – Example

## 2.1.2 CDHD2 – EtherCAT Configuration – Beckhoff Controller – Example

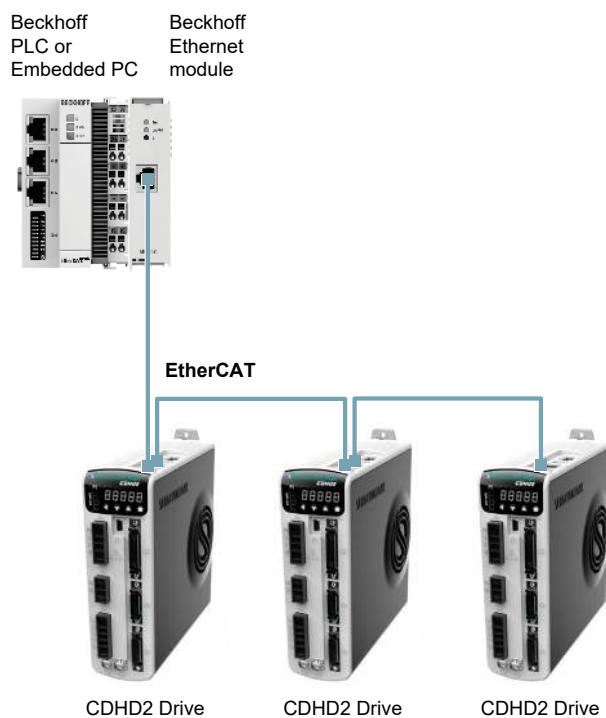


Figure 2-2. CDHD2 – EtherCAT Configuration – Beckhoff Controller – Example

### 2.1.3 CDHD2 – CAN Configuration – softMC 7 Controller – Example

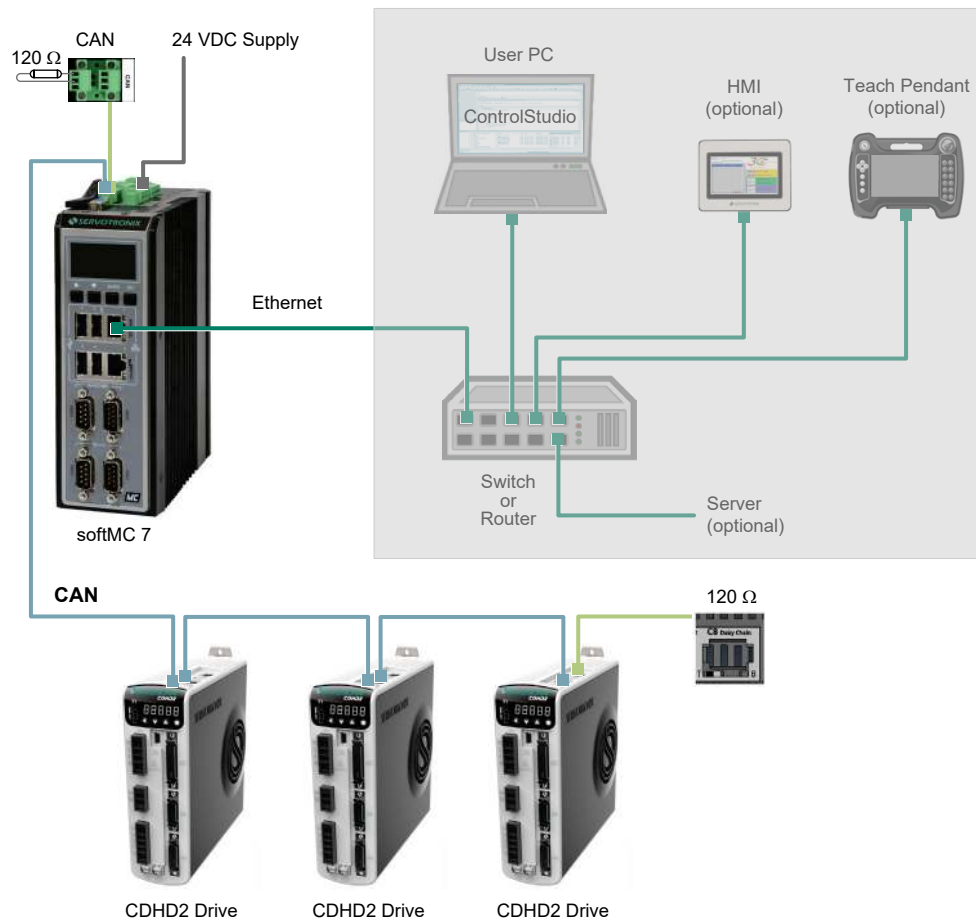


Figure 2-3. CDHD2 – CAN Configuration – softMC 7 Controller – Example

## 2.1.4 CDHD2 – CAN Configuration – Beckhoff Controller – Example

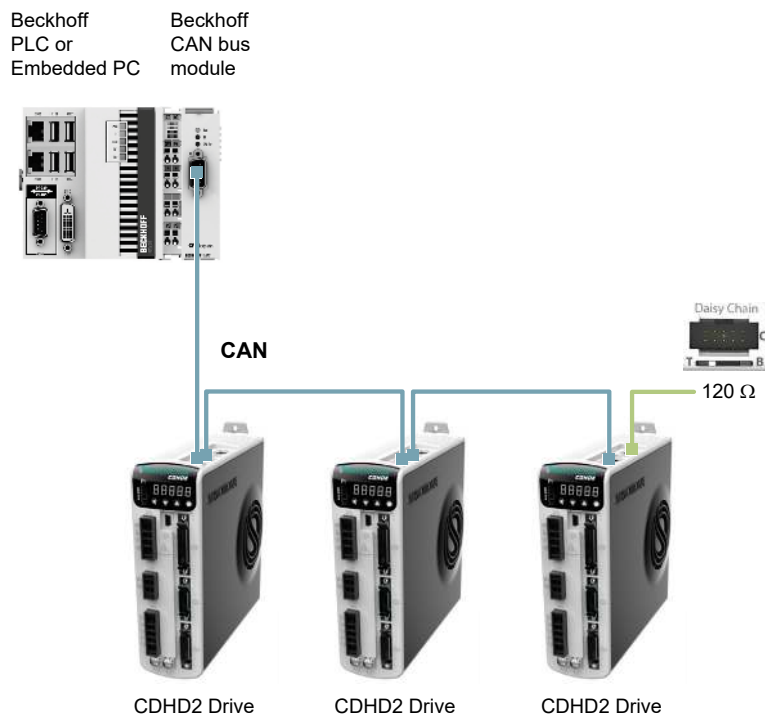


Figure 2-4. CDHD2 – CAN Configuration – Beckhoff Controller – Example

## 2.2 Node Address

### 2.2.1 Node Address in CANopen Network

Within a CANopen network, a unique node address (identification number) must be allocated to each individual CANopen device.

If only one drive is connected to the host computer, the drive address is set to 0 by default and does not need to be defined.

If two or more drives are connected to the network, address 0 cannot be used. Only a singular drive may have the address 0.

Two drives in the same CANopen network cannot have the same address.

If the drive has a rotary address switch on the front panel, use it to set the drive communication address.

If the drive does not have a rotary address switch, set the drive address using operator panel parameter **P000**. Alternately use VarCom variable ADDR. Then enter SAVE and power-cycle the drive.

**Note** | The new address will take effect only after SAVE and power-cycle of the drive.

## 2.2.2 Node Address in EtherCAT Network

Within an EtherCAT network, a physical node address (identification number) does not have to be specifically allocated to a device; the EtherCAT controller will assign the address.

Two or more drives connected in the EtherCAT network can be set at the same physical address; the EtherCAT controller will automatically set the slave IDs.

## 2.3 Termination Resistor Switch

### 2.3.1 Termination Resistor Switch in CANopen Network

The CDHD2 has a Termination Resistor switch located on the top of the drive next to the daisy chain connector (C8).



Figure 2-5. Terminator Resistor Switch (T) on Interface C8

Using a small screwdriver or similar tool, set the switch to the correct position:

- Towards T (default): 120Ω termination resistor not in use.
- Away from T: Used when the drive is the last drive in a chain. The drive provides the 120Ω termination resistor between CAN high and CAN low.

**Note** A 120Ω termination resistor is also required at the beginning of the chain, on either the CAN bus module, or the D9 to RJ45 adapter.

### 2.3.2 Termination Resistor Switch in EtherCAT Network

The terminator resistor switch is not required for EtherCAT drives.

## 2.4 Command Interface Mode

Certain parameters, such as the command interface mode, are factory-defined in the drive's firmware, and can only be modified by means of the ServoStudio software. Note that ServoStudio requires a serial (USB or RS232) connection between the host computer and the drive.

The drive is factory-configured for the fieldbus (CANopen/Ethernet) command interface, which is defined by the drive parameter `COMMODE=1`.

If necessary, you can enable the CANopen/EtherCAT command interface mode through the ServoStudio **Terminal** screen. Enter the command **COMMODE 1** and then issue the serial command **SAVE**.

Alternately, you can select the **Interface Mode** in the ServoStudio **Drive Information** screen.

|                     |                                                                                                                              |           |
|---------------------|------------------------------------------------------------------------------------------------------------------------------|-----------|
| EtherCAT/CANopen    | SERVO ON (ACTIVE) and motion commands are transmitted via an EtherCAT/CANopen interface. Not applicable for CDHD2 AP models. | COMMODE 1 |
| Serial/Pulse/Analog | SERVO ON (ACTIVE) and motion commands are transmitted via a serial, pulse or analog interface.                               | COMMODE 0 |

### 2.4.1 Communication in CANopen Network

When using **CANopen** communication, be sure the required **EDS file** is installed in the PLC controller or host computer. You can download the file from the Servotronics website or contact Technical Support.

Using any RJ45 cables:

- Connect the host to the drive on interface **C5**.
- Connect the next node to interface **C6**.

Interfaces C5 and C6 (on **AF** model) share a LED that indicates the fieldbus status when communicating on a CANopen network.

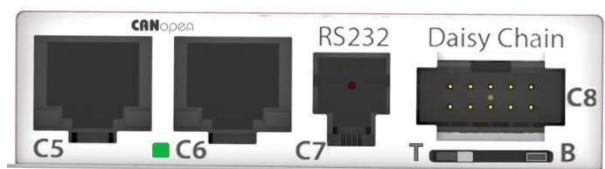


Figure 2-6. Top Panel Interfaces and LEDs on CANopen models

|         |                                                                                                 |
|---------|-------------------------------------------------------------------------------------------------|
| Green   | Steadily lit – Operational (OP) state                                                           |
|         | Fast flashing – Pre-Operational (PREOP) state                                                   |
|         | Slow flashing – Stopped state                                                                   |
| Red     | Flashing – Error                                                                                |
| Not Lit | Drive is not set to EtherCAT/CANopen command interface mode. (Refer to Command Interface Mode.) |

### 2.4.2 Communication in EtherCAT Network

When using **EtherCAT** communication, be sure the required **XML file** is installed in the PLC controller or host computer. You can download the file from the Servotronics website or contact Technical Support.

Using any RJ45 cables:

- Connect the host to the drive on interface **C5**.
- Connect the next node to interface **C6**.

Connectors C5 and C6 function as transmitter (Tx) and receiver (Rx), respectively.

Interfaces C5 and C6 (on **EB** and **EC** models) each have two LEDs that indicate the fieldbus status when communicating on an EtherCAT network:

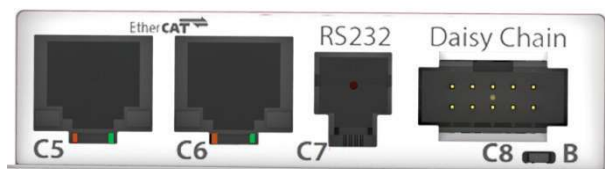


Figure 2-7. LEDs on Interfaces C5 and C6

|        |                                               |
|--------|-----------------------------------------------|
| Green  | Flashing – Communication activity             |
|        | Not lit – No communication activity           |
| Orange | Steadily lit – Operational (OP) state         |
|        | Slow flashing – Safe-Operation (SAFEOP) state |
|        | Fast flashing – Pre-Operational (PREOP) state |
|        | Very fast flashing – Bootstrap (BOOT) state   |
|        | Not lit – Initial (INIT) state                |

## 2.5 CAN Bus Bit Rate

The drive is factory-configured for a communication bus rate of 500 kbps, which is defined by the drive parameter CANBITRATE=3.

If necessary, you can manually set the value of CANBITRATE through the ServoStudio **Terminal** screen. After setting the CANBITRATE value, you must issue the serial command **SAVE**, and then power cycle the drive.

CANBITRATE can be set to one of the following values:

- 1 for 125 kbps
- 2 for 250 kbps
- 3 for 500 kbps (default)
- 4 for 1000 kbps (1 megabit)

## 2.6 Interpolation Time (Cyclic Synchronous)

The drive parameters FBITPRD and FBITIDX define, respectively, the interpolation time period and time index used for calculating fieldbus cyclic sync time in Cyclic Synchronous modes of operation.

The following equation defines the relationship of these parameters:

$$\text{FBITPRD} \times 10^{\text{FBITIDX}} = \text{Fieldbus cyclic synchronous time, in seconds.}$$

It is possible to set these parameters through object 60C2h sub-indices 1 and 2.

During INIT state, the host controller must set the values of the indexes to the equivalent cycle time as the controller.

If necessary, you can manually set the value of FBITPRD and FBITIDX through the ServoStudio **Terminal** screen. After setting FBITPRD and FBITIDX, you must issue the serial command **SAVE**.

### 3 **Configuring softMC Controller for CDHD2 EtherCAT**

Information on configuring the softMC controller for use with CDHD2 can be found in the softMC documentation wiki:

The articles should be accessed and read in the following order:

1. [http://softmc.servotronix.com/wiki/Category:EtherCAT:EC\\_SETUP](http://softmc.servotronix.com/wiki/Category:EtherCAT:EC_SETUP)
2. [http://softmc.servotronix.com/wiki/EtherCAT:EC\\_INSTALL\\_STX\\_CDHD](http://softmc.servotronix.com/wiki/EtherCAT:EC_INSTALL_STX_CDHD)

To login to the softMC wiki:

- Username: softMC
- Password: documentation

For additional assistance with the installation and configuration, contact Servotronix Technical Support.

## 4 Configuring Beckhoff Controller for CDHD2 EtherCAT

This chapter explains how to configure the Beckhoff controller for communication and operation with the CDHD2 EC models.

The application system consists of the following elements:

- CDHD2 EC Ethernet servo drive, servo motor, and ServoStudio software.
- Beckhoff controller with EtherCAT communication module, and TwinCAT software.

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Notes</b> | <ul style="list-style-type: none"><li>• Beckhoff controller refers to TwinCAT NC PTP (point-to-point axis positioning software).</li><li>• TwinCAT NC PTP includes axis positioning software (set value generation, position control), an integrated software PLC with NC interface, operating program for commissioning and an I/O connection to the axes through various fieldbuses. TwinCAT NC PTP replaces conventional positioning modules and NC controllers. The controllers that are simulated by the PC cyclically exchange data with drives and measuring systems via the fieldbus.</li><li>• Beckhoff controllers are programmed in accordance with the IEC 61131-3 programming standard.</li></ul> |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 4.1 CDHD2 Hardware and Software Settings

Make sure all hardware settings are in accordance with the instructions in the following sections.

- Fieldbus Wiring
- Node Address
- Termination Resistor Switch
- Command Interface Mode
- CAN Bus Bit Rate
- Interpolation Time

Before activating the TwinCAT System Manager, make sure the correct \*.xml file (according to the firmware version) resides at C:\TwinCAT\Io\EtherCAT.

### 4.2 Communication between Controller and PC

Using TwinCAT software, establish communication between the controller and the PC by performing the following steps.

1. Activate TwinCAT software.

2. In the navigation pane, select **SYSTEM – Configuration**.  
Then, in the **Version (Local)** tab, click **Choose Target**.

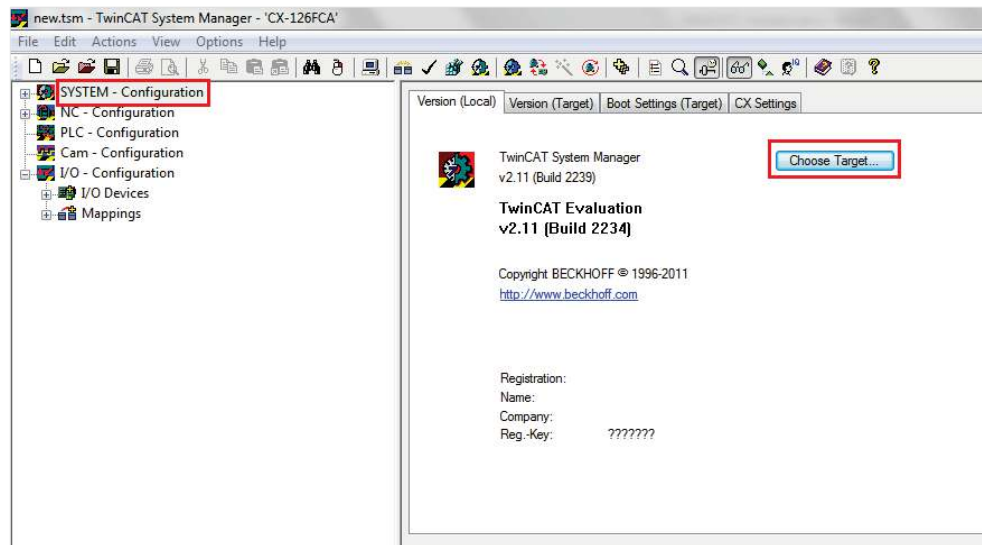


Figure 4-1.

3. Click **Search (Ethernet)** to search for the controller in the network.

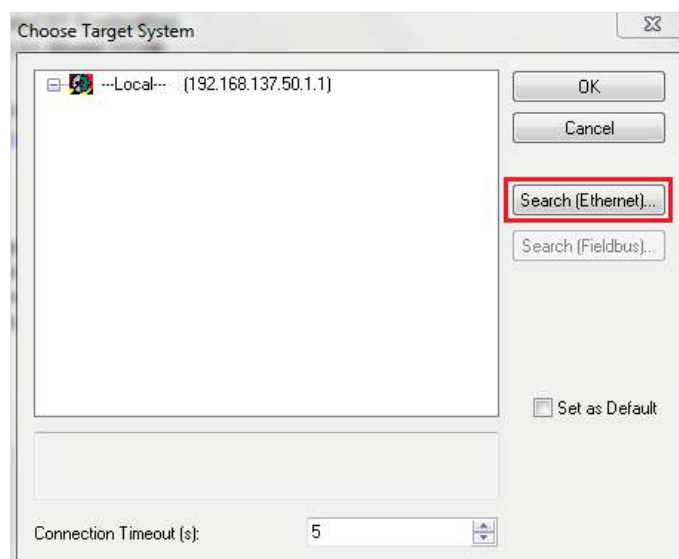


Figure 4-2.

4. Enable the option **IP Address**, and click **Broadcast Search**.  
Wait for the controller name (in the format CX-xxx) to appear.

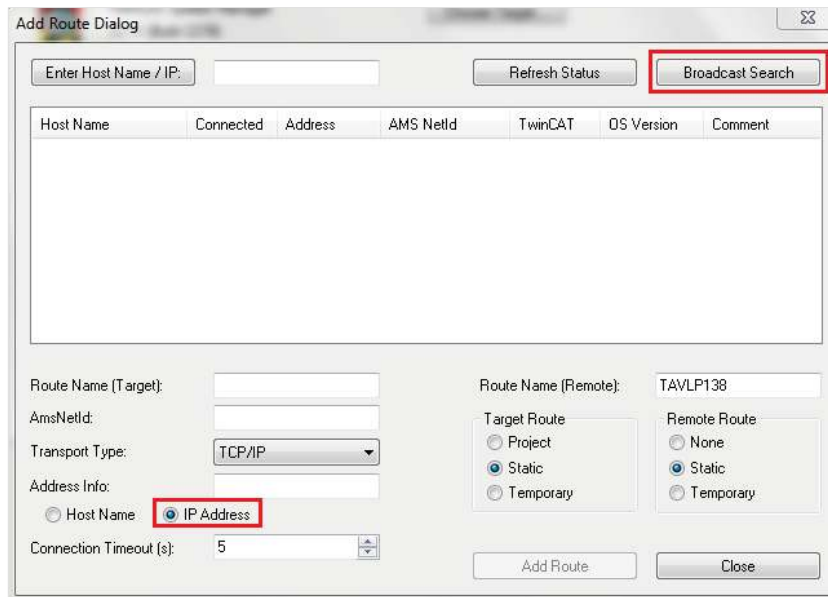


Figure 4-3.

5. After the controller appears, the option **Add Route** is displayed.  
Click Add Route
6. In the Logon dialog box, enter the following:  
User Name: **Administrator**  
Password: 1  
Click OK.



Figure 4-4.

7. In the Add Route dialog box, be sure an X appears next to the controller name. This means the controller is properly connected to the PC.  
Close this dialog box.

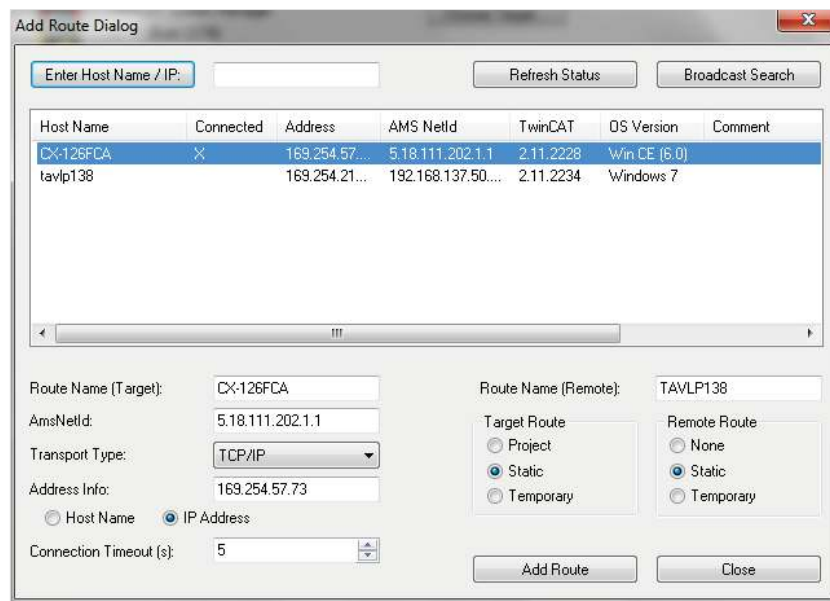


Figure 4-5.

8. In the Choose Target System dialog box, click on the controller, and click **OK**.

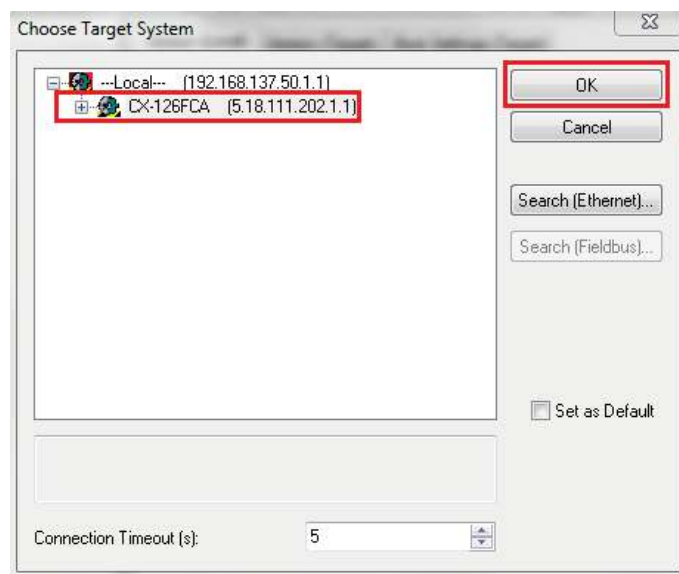


Figure 4-6.

9. Open the TwinCAT System Manager, and make sure it is in **Config Mode**.



Figure 4-7.

### 4.3 Communication between Controller and Drive

Using TwinCAT software, establish communication between the controller and the drive by performing the following steps.

1. In the navigation pane, expand **I/O–Configuration**, and then right-click on **I/O Devices**.
2. Select **Scan Devices**.  
At the prompt, click **OK**.

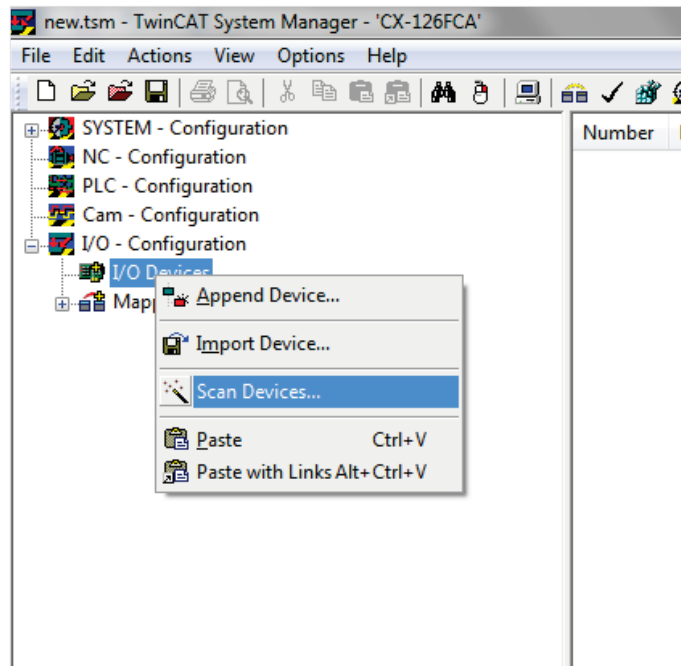


Figure 4-8.

3. After the scanning, detected devices are displayed.  
CDHD2 is identified as **Device 1 (EtherCAT)**.

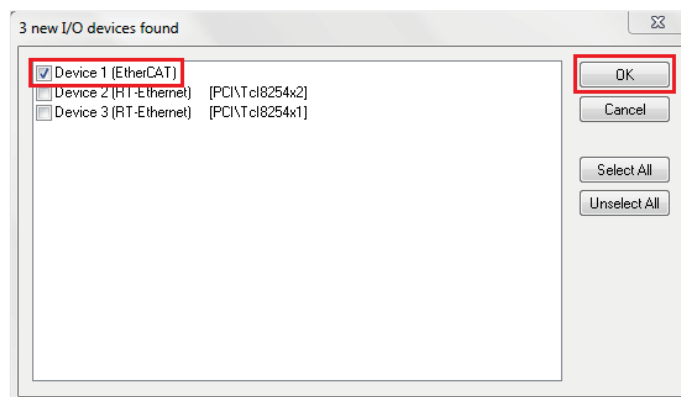


Figure 4-9.

4. Enable the option **Device 1 (EtherCAT)**, and click **OK**.
5. At the prompt to scan for boxes (slaves), click **Yes**.



Figure 4-10.

6. At the prompt to append the linked axis to the NC configuration, click **Yes**.

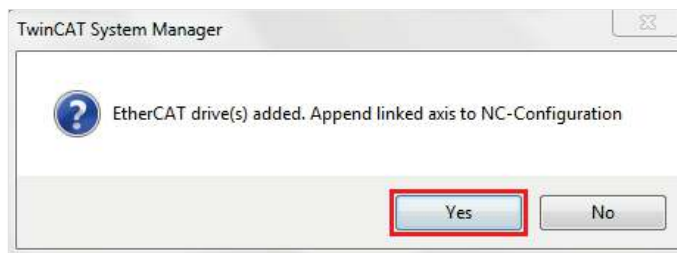


Figure 4-11.

7. At the prompt to activate FreeRun, click **No**.



Figure 4-12.

8. At the end of this procedure, **Device 1 (EtherCAT)** is displayed in the navigation pane, with all components (TPDO and RPDO) listed and automatically linked to **NC-Configuration>Axis 1**.

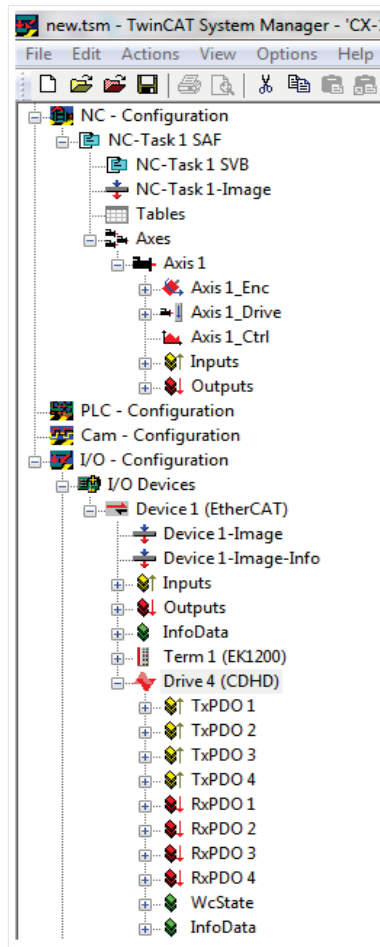


Figure 4-13.

## 4.4 Generating Motion

### 4.4.1 Setup for Motion

1. Open the TwinCAT System Manager, and make sure it is in **Config Mode**.



Figure 4-14.

2. In the navigation pane, expand **SYSTEM-Configuration**, and select **Real Time Settings**.
  - In the **Settings** tab, select Base Time = 1 ms.

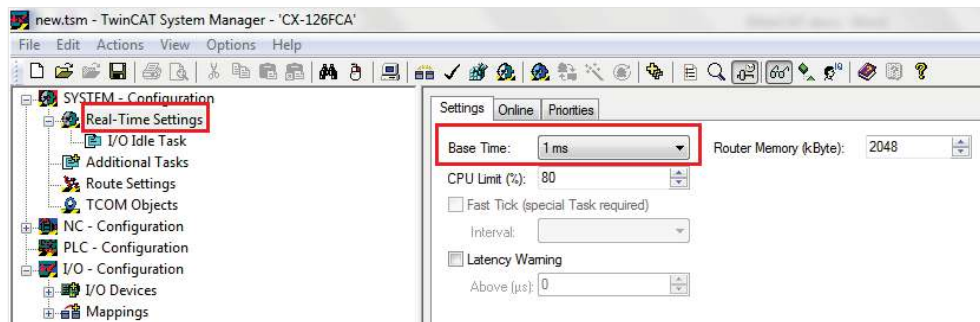


Figure 4-15.

- In the Priorities tab, enable Automatic Priority Management.

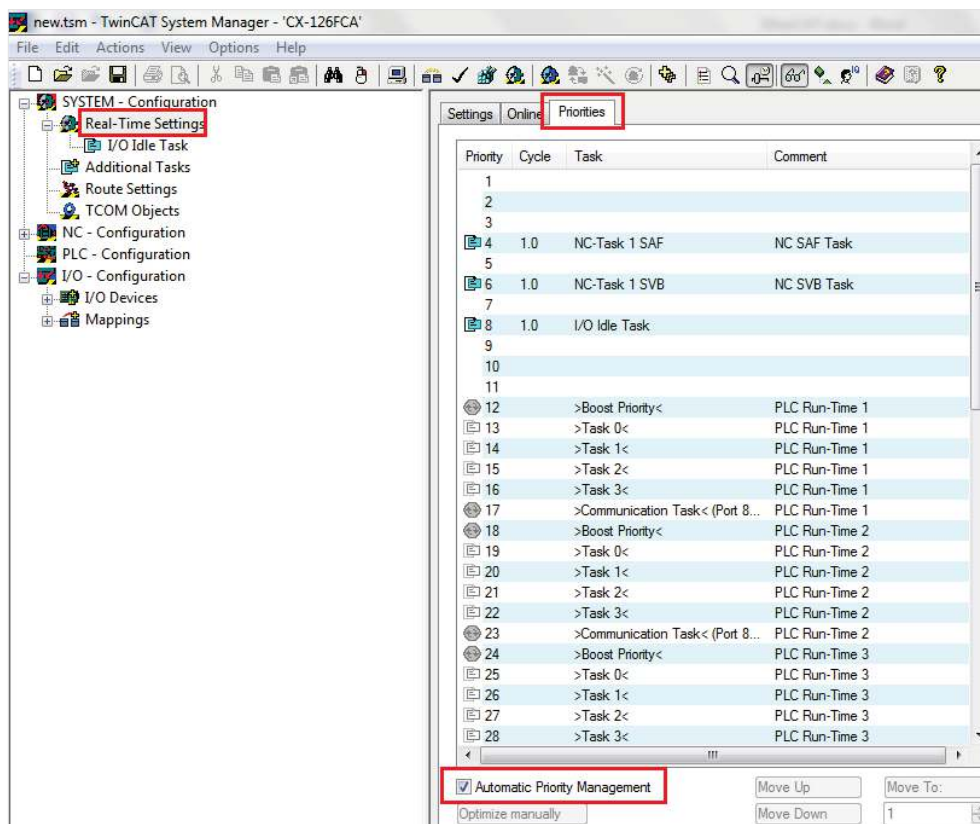


Figure 4-16.

- Expand **SYSTEM–Configuration**, and select **Real Time Settings > I/O Idle Task**.  
In the **Task** tab, select **Cycle ticks = 1 ms**.

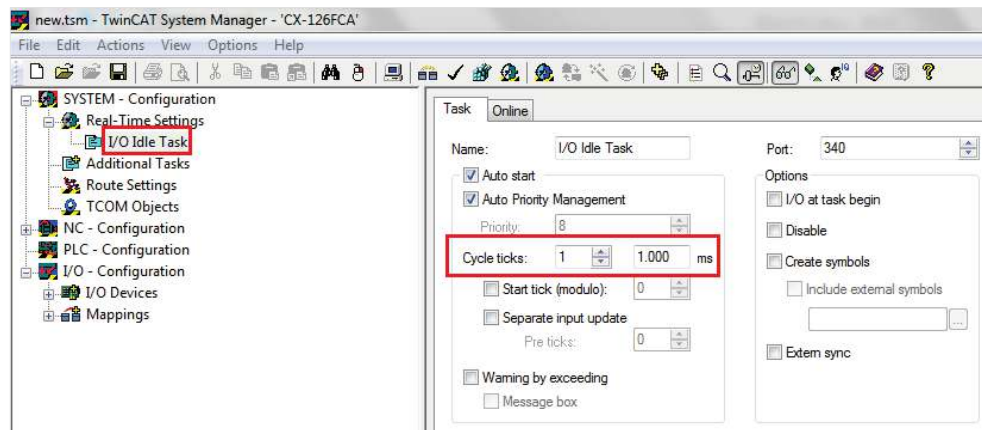


Figure 4-17.

4. In the navigation pane, expand **NC-Configuration**, and select **NC-Task1SAF**.
  - In the **Task** tab, select Cycle ticks = 1 ms.

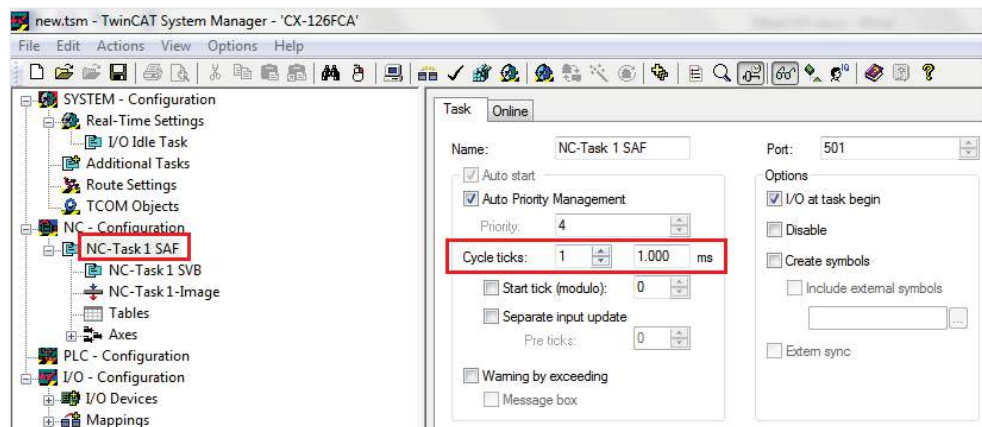


Figure 4-18.

5. Expand **NCT-Task1SAF**, and select **NC-Task1SVB**.
  - In the **Task** tab, select Cycle ticks = 1 ms.
  - Be sure the priority of NC-Task1 SVB has a higher value than the priority of NC-Task1 SAF.

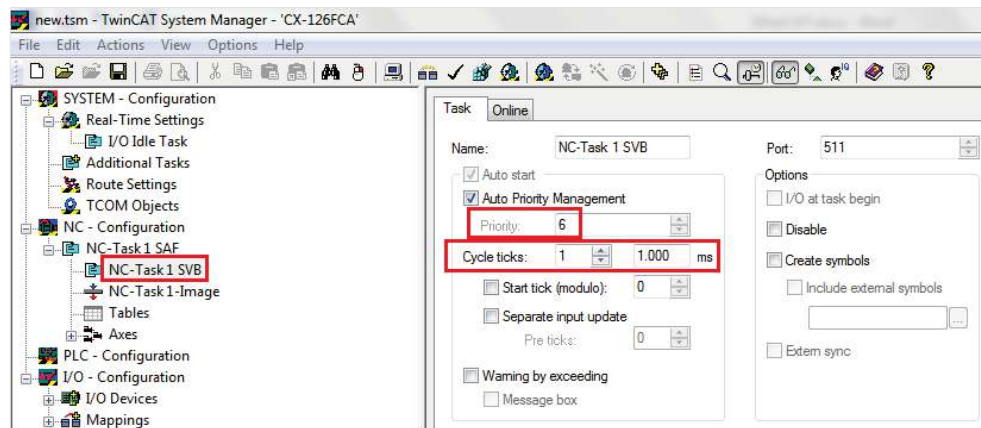


Figure 4-19.

6. Expand NC-Configuration > Axes > Axis 1 > Axis 1\_Enc.

In the **Parameter** tab, do the following:

- Encoder Evaluation > Scaling Factor = 1.  
Click Download.

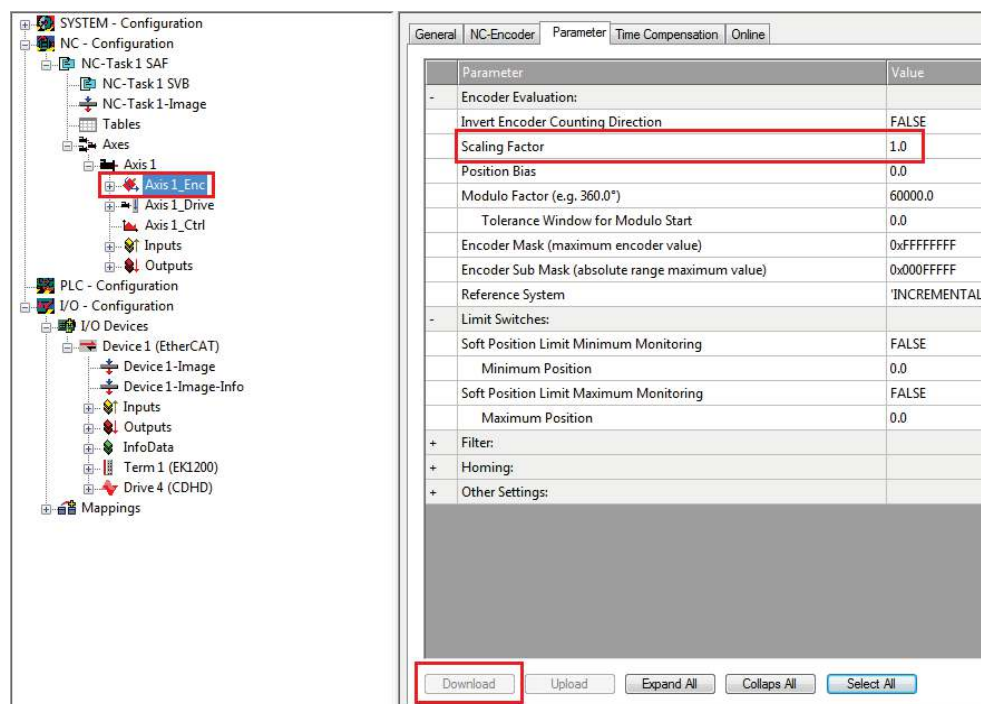


Figure 4-20.

- Encoder Evaluation > Modulo Factor = PNUM value.  
Click Download.

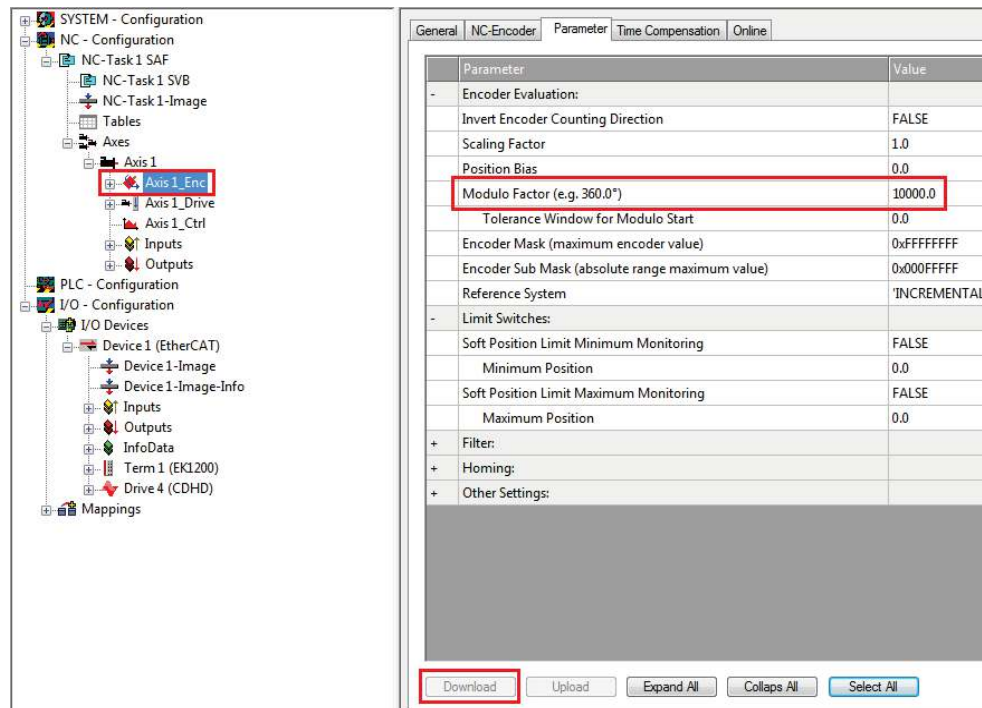


Figure 4-21.

7. Expand **NC-Configuration > Axes > Axis 1 > Axis 1\_Ctrl.**

In the **Parameter** tab, do the following:

- **Monitoring > Position Lag Monitoring = FALSE**

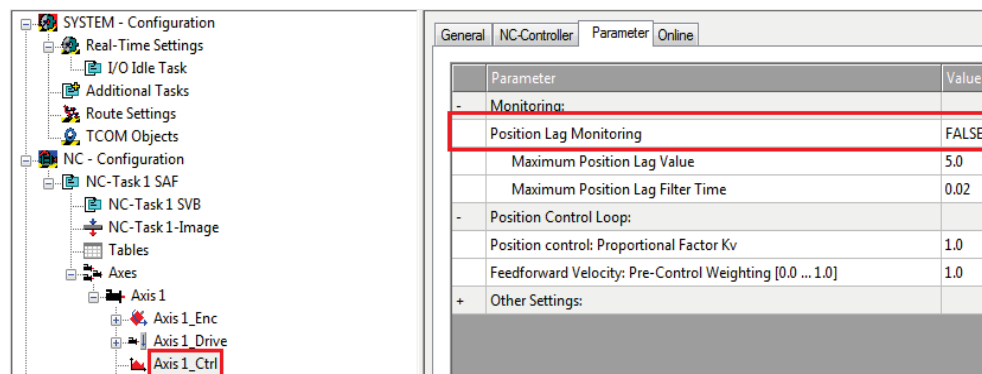


Figure 4-22.

8. Expand **IO-Configuration > I/O Devices > Device (EtherCAT)**, and select the drive indicated by the red icon.

- In the **DC** tab, select Operation Mode = **DC-Synchronous**

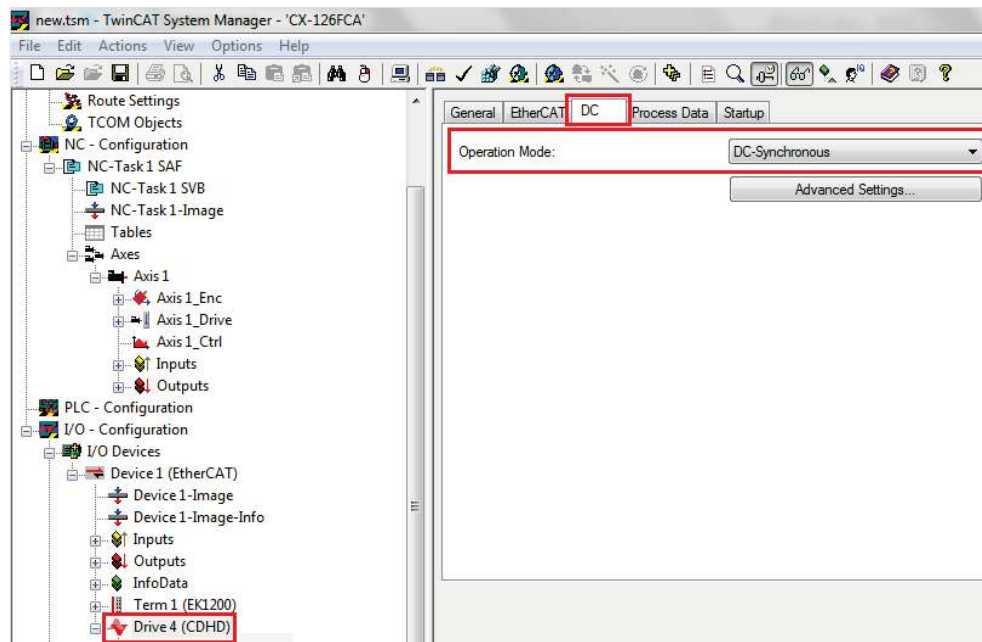


Figure 4-23.

9. Press the **Run Mode** button in the toolbar.



Figure 4-24.

Additional tabs are now available.

10. Go to the **CoE Online** tab.

The CoE Online tab shows only the SDO objects (CDHD2 EtherCAT parameters) that the drive manages.

Be sure the values of the objects 6060h and 60C2h are as follows:

- Object 6060h = 8

The drive is set to Cyclic Synchronous Position mode, OPMODE 8, through protocol object 6060h.

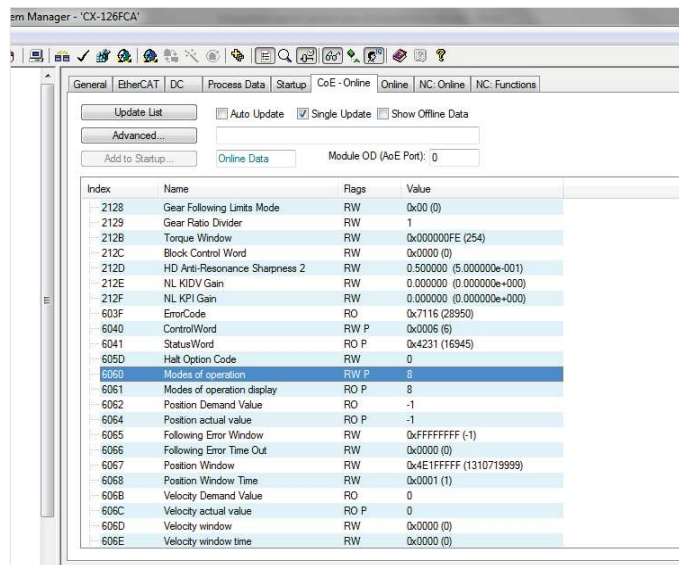


Figure 4-25.

- Object 60C2h:  
Sub-index 01 (60C2:01) = 1  
Sub-index 02 (60C2:02) = -3

The interpolation time for the Cyclic Synchronous operation modes is set through object 60C2h (sub-index 01 and sub-index 02).

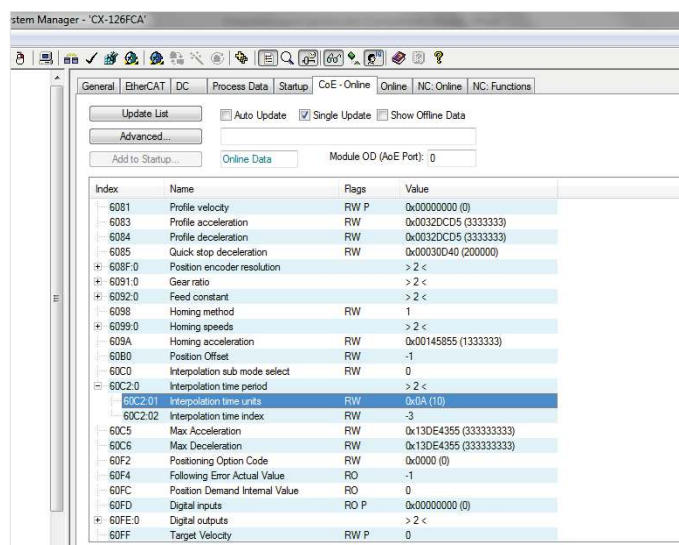


Figure 4-26.

**Note** The interpolation time must be configured with the same value of cycle ticks as configured in I/O Idle Task, in NC-Task 1 SAF, and in NC-Task 1 SVB.

11. Now activate **Run Mode** by pressing the following two buttons in the toolbar:

- Generate Mappings
- Check Configuration



Figure 4-27.

In Run mode, motion can be generated. The NC PTP communicates with the drive and receives all the values of the variables contained in each of the PDO objects (which were automatically mapped by the controller).

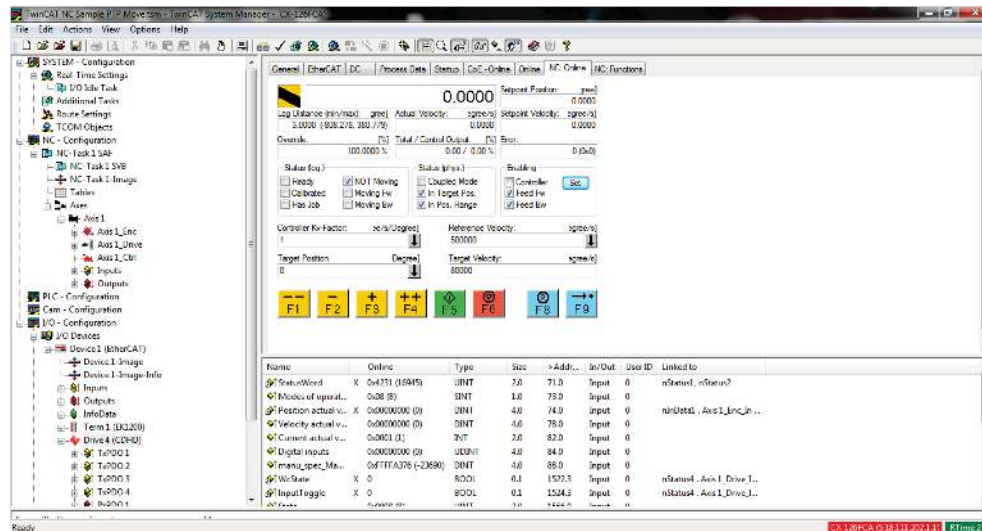


Figure 4-28.

## 12. In the NC-Online tab, test communication with the drive:

Take hold of the motor shaft, and turn it manually; check whether the position feedback value changes.

Refer to the following figure, which shows the various functions.

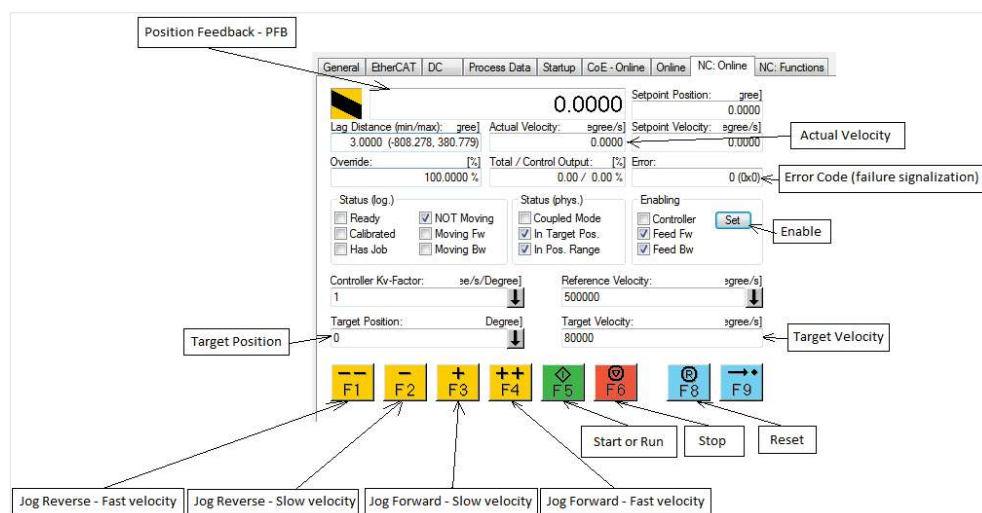


Figure 4-29.

#### 4.4.2 Generating Motion in Cyclic Synchronous Position Mode

The following steps demonstrate how to generate a motion in Cyclic Synchronous Position mode. In the **NC-Online** tab, you will send a target position with a velocity to the drive. The controller will execute a motion profile.

1. Enable the drive:
  - a. NC-Online Screen > **Enabling** > **Set**
  - b. Enable the options: **Controller**, **Feed Fw** and **Feed Bw**, or select **All**
  - c. **OK**

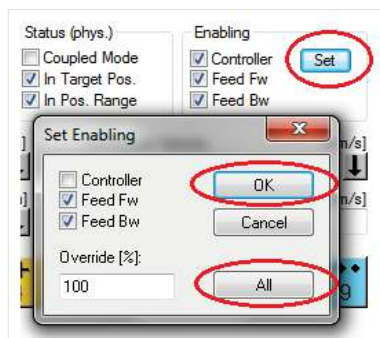


Figure 4-30.

**Note** To disable the drive:  
NC-Online Screen > **Enabling** > Clear the option **Controller** > **OK**

2. Use the motion buttons – F1, F2, F3 and F4 to generate the following motion profiles.  
Configure the velocity in the controller using **NC-Configuration** > **NC-Task1 SAF** > **Axes** > **Axis1** > **Parameters** > **Manual Velocity** (Slow and Fast), as shown in the following figure.

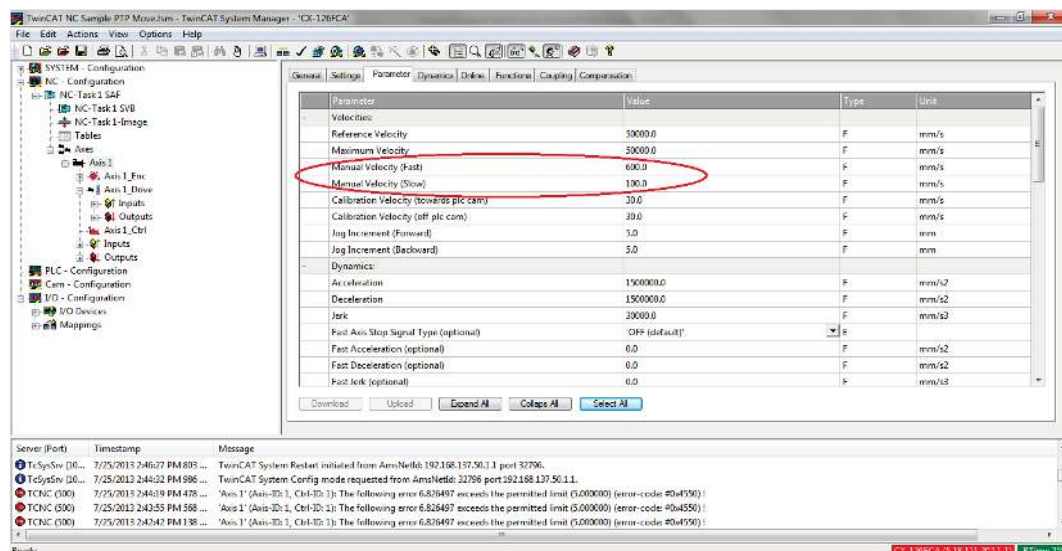


Figure 4-31.

- F1: Sends a jog command in the negative direction (CCW) with a fast velocity.
  - F2: Sends a jog command in the negative direction (CCW) with slow velocity.
  - F3: Sends a jog command in the positive direction (CW) with slow velocity.
  - F4: Sends a jog command in the positive direction (CW) with fast velocity.
3. Set values for **Target Position** and **Target Velocity** as shown in the following figure.

The screenshot shows the Beckhoff motion control software interface. The top tabs include General, EtherCAT, DC, Process Data, Startup, CoE - Online, Online, and NC: Online. The main display area shows the following parameters:

- Position:** 49999.0000 mm (Setpoint Position: 50000.0000 mm)
- Velocity:** 0.0000 mm/s (Setpoint Velocity: 0.0000 mm/s)
- Override:** 100.0000 % (Total / Control Output: 0.00 / 0.00 %)
- Error:** 0 (0x0)
- Status (log.):** Ready, Calibrated, Has Job, NOT Moving, Moving Fw, Moving Bw.
- Status (phys.):** Coupled Mode, In Target Pos., In Pos. Range.
- Enabling:** Controller, Feed Fw, Feed Bw.
- Controller Kv-Factor:** 1 mm/s/mm
- Reference Velocity:** 50000 mm/s
- Target Position:** 50000 mm
- Target Velocity:** 30000 mm/s

At the bottom, there are several function buttons: F1 (yellow), F2 (yellow), F3 (yellow), F4 (yellow), F5 (green), F6 (red), F8 (blue), and F9 (blue).

Figure 4-32.

4. Press F5 (green button) to start the motion profile in Synchronous Position mode.
- Press F6 (red button) to stop the motion.
  - Press F8 (blue button) to clear any faults.

The graph in the following figure reflects the motion performed:

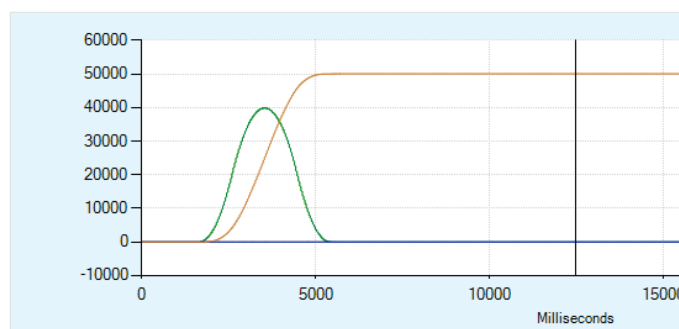


Figure 4-33.

- Brown line = Position feedback – PFB
- Green line = Point to point generator velocity command – PTPVCMD
- Blue line = Position error – PE

- X axis = milliseconds, Y axis = counts

### 4.4.3 Generating Absolute and Relative Motion

To generate absolute or relative motion in Position Profile mode, refer to the following two figures, and do the following:

1. Go to the **Functions** tab.
2. Configure the target position, the target velocity, the acceleration and deceleration, and the jerk of the motion.

The screenshot shows the 'Functions' tab of the Beckhoff Position Profile mode configuration window. The window has a tabbed interface with 'General', 'Settings', 'Parameter', 'Dynamics', 'Online', 'Functions', 'Coupling', and 'Compensation'. The 'Functions' tab is active, displaying a large numerical display showing '28571.0000'. To the right of this display, there is a 'Setpoint Position: [degree]' field with the value '28492.5000'. Below the main display, there are several sections for configuring motion parameters:

- Extended Start:**
  - Start Mode: Absolute (dropdown menu)
  - Start: (button)
  - Target Position: 0 [Degree] (input field)
  - Target Velocity: 5000 [Degree/s] (input field)
  - Acceleration: 1000 [Degree/s<sup>2</sup>] (input field, checked checkbox)
  - Deceleration: 5000 [Degree/s<sup>2</sup>] (input field, checked checkbox)
  - Jerk: 8000 [Degree/s<sup>3</sup>] (input field, checked checkbox)
  - Last Time: 33.78000 [s] (input field)
- Raw Drive Output:**
  - Output Mode: Percent (dropdown menu)
  - Change: (button)
  - Output Value: 10 [%] (input field)
  - Stop: (button)
- Set Actual Position:**
  - Mode: Absolute (dropdown menu)
  - Value: 0 (input field)
  - Set: (button)
- Set Target Position:**
  - Mode: Absolute (dropdown menu)
  - Value: 0 (input field)
  - Set: (button)

Figure 4-34.

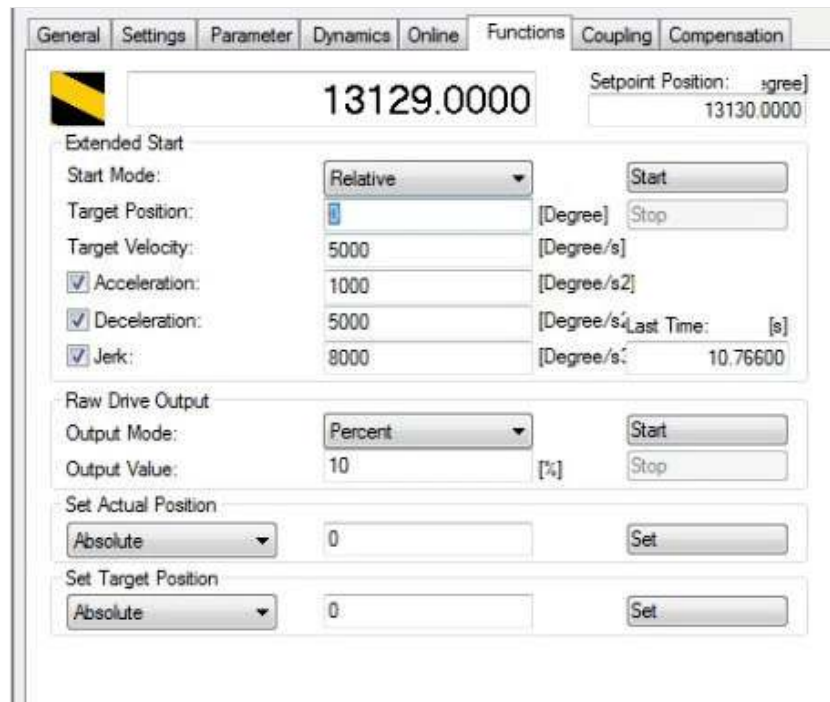


Figure 4-35.

#### 4.4.4 Generating a Step Motion

To generate a step sequence in the Velocity profile, refer to the following two figures, and do the following:

1. Go to the **Functions** tab.
2. Configure the target velocity, and a time (duration) for the step.

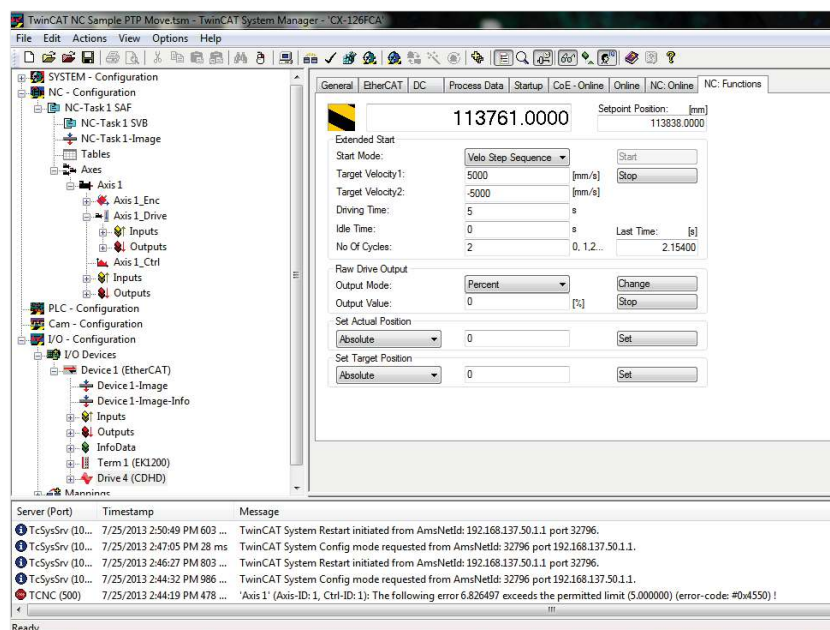


Figure 4-36.

The graph in the following figure reflects the motion performed:

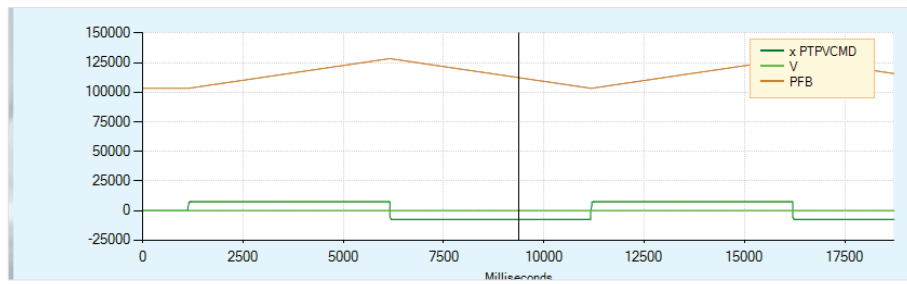


Figure 4-37.

- Brown line = Position feedback – PFB
- Dark green line = Point to point generator velocity command – PTPVCMD
- Light green line = Velocity – V
- X axis = milliseconds, Y axis = counts

## 5 Configuring Keba Controller for CDHD2 EtherCAT

To configure the Keba motion controller for use with CDHD2 EtherCAT drive, a customized set of files need to be installed on the PC.

To obtain these files, and for assistance with the installation and configuration, contact Servotronics Technical Support.

- **CustomDrivesIO**

Extract all the files to the folder:

C:\Kemro\KeStudioV2.3\Targets\KeMotion\_CP24xCP25x\_02.60\io\  
CustomDrives\Flexy2.0\_EtherCatDrive

- **McCustomDriveLibrary**

Extract the file to the library folder, and overwrite the existing file:

C:\Kemro\KeStudio V2.3\Targets\KeMotion\_CP24xCP25x\_02.60\lib

**Note** | The folder *KeMotion\_CP24xCP25x\_02.60* may be named differently, depending on the software installation.

Once these files have been put in place, the PLC configuration can be performed.

When prompted for the drive type, select CDHD2.

## 6 CANopen Operation

### 6.1 Device Communication

The CDHD2 communication interface conforms to the following standards:

- CiA 301: CANopen Application Layer and Communication Profile
- IEC 61800-7-1: Interface Definition; (previously CiA 402-1: General Definitions)
- IEC 61800-7-201: Profile Type 1 (CiA 402); (previously CiA 402-2: Operation Modes and Application Data)
- IEC 61800-7-301: Mapping of Profile Type 1; (previously CiA 402-3: PDO Mapping)

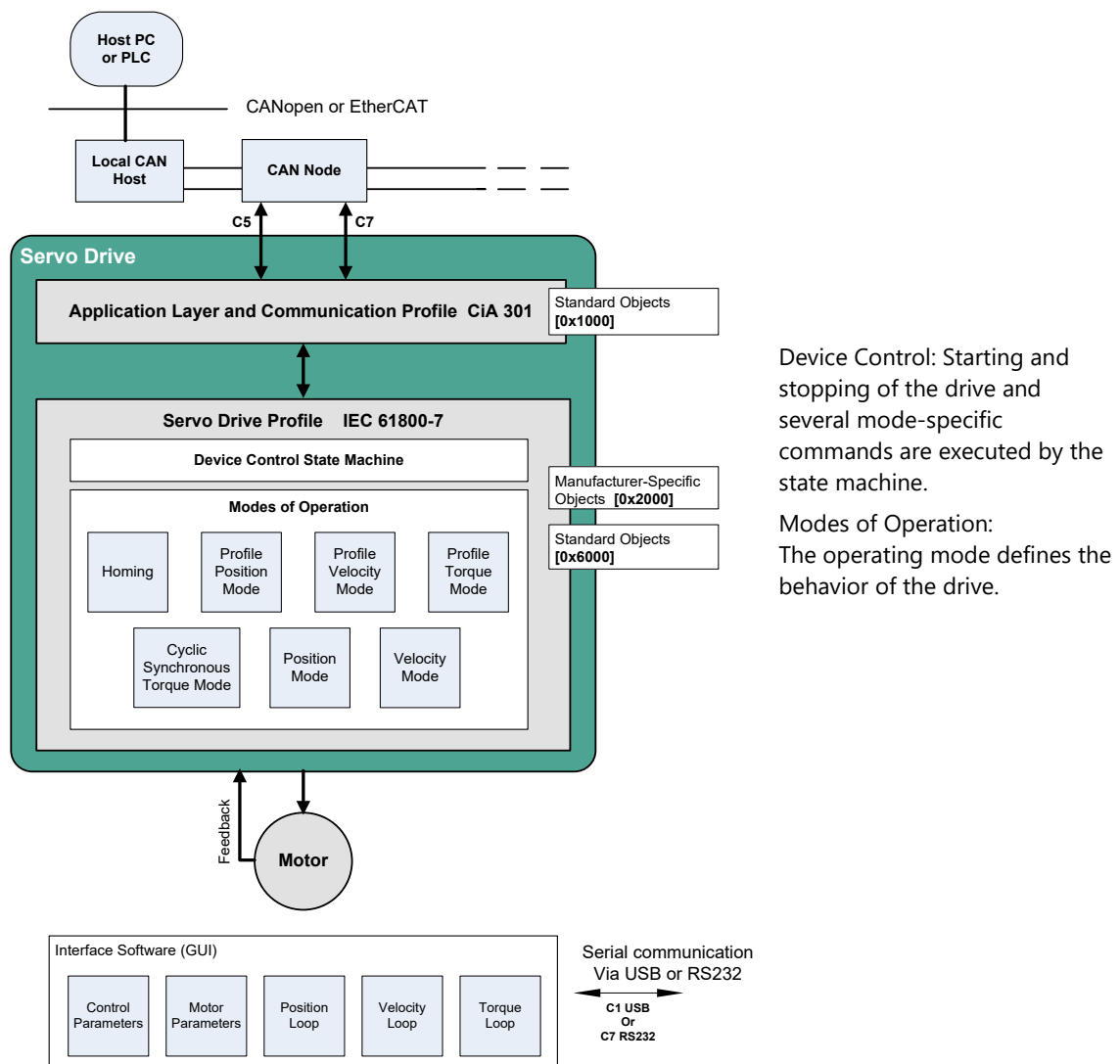


Figure 6-1. Communication Architecture

## 6.2 Communication Objects

Communication objects are used for exchanging process and service data, for process or system time synchronization, for error state supervision, and for control and monitoring of node states. These objects are defined by their structure, transmission types and their CAN identifier.

### 6.2.1 Service Data Communication

Service data objects (SDOs) provide direct access to object entries in the CANopen device object dictionary. As these object entries contain data of arbitrary size and data type, the SDOs are used to transfer multiple data sets (each containing an arbitrary large block of data) from a client to a server and vice versa. The client controls, via a multiplexer (index and sub-index of the object dictionary), which data set is transferred. The content of the data set is defined within the object dictionary.

In general, an SDO is transferred as a sequence of segments. Prior to transferring the segments there is an initialization phase in which client and server prepare for transferring the segments. For SDOs, it is also possible to transfer a data set of up to four bytes during the initialization phase. This mechanism is called SDO expedited transfer.

The client always initiates an SDO transfer for any type of transfer. The owner of the accessed object dictionary is the server of the SDO. Either the client or the server can take the initiative to abort the transfer of an SDO.

By means of an SDO, a peer-to-peer communication channel between two CANopen devices is established. A CANopen device supports more than one SDO. One supported Server-SDO is the default case (Default SDO).

### 6.2.2 Process Data Communication

Process data objects (PDOs) perform real-time data transfer. The transfer of PDOs is performed without any protocol overhead.

The PDOs correspond to objects in the object dictionary and provide the interface to the application objects. Data type and mapping of application objects into a PDO is determined by a corresponding default PDO mapping structure within the object dictionary. CDHD2 supports variable PDO mapping; therefore, the number of PDOs and the mapping of application objects into a PDO may be transmitted to a CANopen device during the configuration process, by applying the SDO services to the corresponding objects of the object dictionary.

PDOs are used for both data transmission and data reception – termed Transmit-PDO (TPDO) and Receive-PDO (RPDO), respectively. CANopen devices supporting TPDO are PDO producers, and CANopen devices supporting RPDO are called PDO consumers. CDHD2 supports both. The PDO communication parameter describes the communication capabilities of the PDO. The PDO mapping parameter contains information about the contents of the PDO.

For each PDO, a pair of communication and mapping parameters is mandatory.

The CDHD2 has a limit of 20 transmit PDO (TPDO) and receive PDO (RPDO). If more than 20 TPDOs and RPDOs are used, the drive might not have enough computing resources, which would result in a realtime overload fault.

By default 4 TPDOs and 4 RPDOs are implemented in the CDHD2:

TPDO1

- Statusword (6041h), 16 bits
- Modes of operation display (6061h)
- Torque actual value (6077h), 16 bits

TPDO2

- Position actual value (6064h), 32 bits

TPDO3

- Torque demand command (6074h), 16 bits
- Analog input 1 (20F2h), 16 bits

TPDO4

- Digital inputs (60FDh), 32 bits
- Position external command (20b6h), 32 bits
- Following error actual value (60F4h), 32 bits

RPDO1

- Control word (6040h), 16 bits
- Mode of operation (6060h), 8 bits

RPDO2

- Target position (607Ah), 32 bits
- Profile velocity (6081h), 32 bits

RPDO3

- Target velocity (60FFh), 32 bits

RPDO4

- Target torque (6071h), 16 bits
- Digital outputs (60FEh), 32 bits
- Torque offset (60B2h), 16 bits

## 6.3 Device Control and State Machine

The power drive system finite-state automaton (PDS FSA) is a mathematical model that defines the behavior of the power drive system. Because a power drive system is required to provide local control even when the communication network is not functioning properly, the communication FSA and the PDS FSA are only loosely coupled. Figure shows how the power drive system operates remotely via the network, or locally.

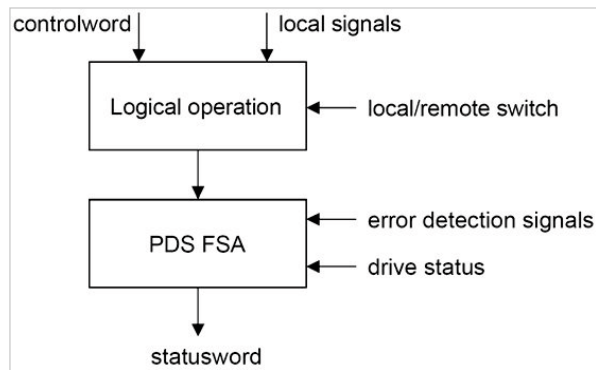


Figure 6-2. Remote and Local Control

The power drive system is operated by the Controlword sent by the control device via the network. The state of the power drive system is reported by the Statusword produced by the drive device. The FSA is also controlled by error detection signals.

The PDS FSA defines the power drive system status and the possible control sequence of the power drive system. A single state represents a special internal or external behavior. The state of the power drive system also determines which commands are accepted. For example, it is only possible to start a point-to-point move when the drive is in the operation enabled state.

## 6.4 Indicating the Operating State

After switching on, and when an operating mode is started, the power drive system goes through a number of operating states. The operating states are internally monitored and influenced by monitoring functions

Figure 6-3 illustrates the PDS FSA behavior. It takes into consideration the control of the power electronics, in accordance with user commands and internal drive faults.

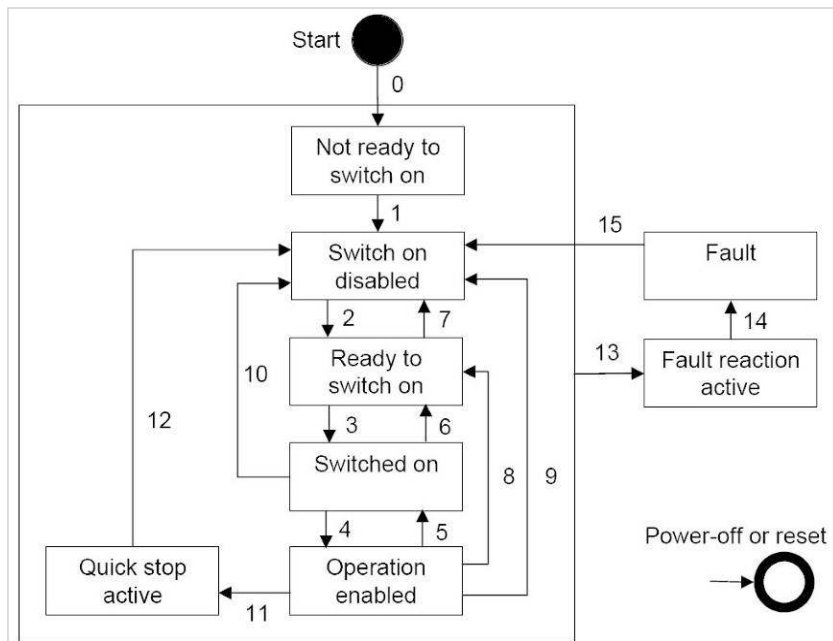


Figure 6-3. Power Drive System State Diagram

### Notes:

|                        |                                                                                                                            |
|------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Not Ready to Switch On | "Not ready to operate" received from the controller.                                                                       |
| Switch On Disabled     | Ready to operate. Can read and write parameters. Motion functionality cannot be executed.                                  |
| Ready to Switch On     | Ready to operate. Can read and write parameters. Motion functionality cannot be executed. Bus voltage must be switched on. |
| Operation Enabled      | Drive power stage is enabled. No fault is present. Motion functionality can be executed.                                   |
| Quick Stop Active      | Drive was stopped using controlled stop. Power stage is enabled. Motion functionality cannot be executed.                  |
| Fault Reaction Active  | A fault has occurred. Drive is in the process of ramping down to 0 velocity (Active Disable process).                      |
| Fault                  | A fault has occurred. Power stage is disabled.                                                                             |

Bits 0, 1, 2, 3, 5 and 6 of the parameter Statusword provide information on the operating state.

|   | Operating State        | Bit 6:<br>Switch On<br>Disabled | Bit 5:<br>Quick<br>Stop | Bit 3:<br>Fault | Bit 2:<br>Operation<br>Enabled | Bit 1:<br>Switch<br>On | Bit 0:<br>Ready to<br>Switch<br>On |
|---|------------------------|---------------------------------|-------------------------|-----------------|--------------------------------|------------------------|------------------------------------|
| 2 | Not Ready To Switch On | 0                               | X                       | 0               | 0                              | 0                      | 0                                  |
| 3 | Switch On Disabled     | 1                               | X                       | 0               | 0                              | 0                      | 0                                  |
| 4 | Ready To Switch On     | 0                               | 1                       | 0               | 0                              | 0                      | 1                                  |
| 5 | Switched On            | 0                               | 1                       | 0               | 0                              | 1                      | 1                                  |
| 6 | Operation Enabled      | 0                               | 1                       | 0               | 1                              | 1                      | 1                                  |
| 7 | Quick Stop Active      | 0                               | 0                       | 0               | 1                              | 1                      | 1                                  |
| 8 | Fault Reaction Active  | 0                               | X                       | 1               | 1                              | 1                      | 1                                  |
| 9 | Fault                  | 0                               | X                       | 1               | 0                              | 0                      | 0                                  |

| Parameter Name    | Bit Assignments                                                                                                                                                                                                                                                                                                                                  | Data Type<br>R/W        |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>Statusword</b> | Bits 0–3 = Status bits<br>Bit 4 = Voltage enabled<br>Bits 5–6 = Status bits<br>Bit 7 = Warning<br>Bit 8 = Reserved<br>Bit 9 = Remote<br>Bit 10 = Target reached<br>Bit 11 = Internal limit is active<br>Bit 12 = Operating mode-specific<br>Bit 13 = Operating mode-specific<br>Bit 14 = Manufacturer-specific<br>Bit 15 = Manufacturer-specific | Unsigned16<br>Read Only |

## Notes:

- Bit 4      Bit 4=1 indicates whether the DC bus voltage is correct. If the voltage is missing or is too low, the device does not transition from operating state 3 to operating state 4.
- Bit 7      If bit 7 (warning) of the status word is 1, it indicates the presence of a warning condition. Warning is not an error or fault (e.g., temperature limit exceeded, job refused). The status of the PDS FSA does not change. The cause of the warning may be given in the fault code parameter object (603Fh).
- Bit 9      If bit 9 is set, the device carries out commands via the fieldbus. If Bit 9 is reset, the device is controlled via a different interface. In such a case, it is still possible to read or write parameters via the fieldbus.
- Bit 10     Bit 10 is used for monitoring the current operating mode.
- Bit 12     Bit 12 is used for monitoring the current operating mode.
- Bit 13     Bit 13 only becomes 1 if an error needs to be resolved prior to further processing.

## 6.5 Changing the Operating State

The parameter Controlword can be used to switch between operating states.

| Parameter Name | Bit Assignments                                                                                                                                                                                                                                                                    | Data Type R/W           |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Controlword    | Bit 0 = Switch On<br>Bit 1 = Enable Voltage<br>Bit 2 = Quick Stop<br>Bit 3 = Enable Operation<br>Bits 4–6 = Operating Mode specific<br>Bit 7 = Fault Reset<br>Bit 8 = Halt<br>Bit 9 = Reserved<br>Bits 10–15 = Reserved (must be 0)<br>Changed settings become active immediately. | Unsigned16<br>Read Only |

Bits 0, 1, 2, 3 and 7 of the parameter Controlword allow you to switch between the operating states.

| Fieldbus Command  | State Transitions | State Transition To                             | Bit 7: Fault Reset | Bit 3: Enable Operate | Bit 2: Quick Stop | Bit 1: Enable Voltage | Bit 0: Switch On |
|-------------------|-------------------|-------------------------------------------------|--------------------|-----------------------|-------------------|-----------------------|------------------|
| Shutdown          | T2, T6, T8        | 4 – Ready To Switch On                          | X                  | X                     | 1                 | 1                     | 0                |
| Switch On         | T3                | 5 – Switched On                                 | X                  | X                     | 1                 | 1                     | 1                |
| Disable Voltage   | T7, T9, T10, T12  | 3 – Switch On Disabled                          | X                  | X                     | X                 | 0                     | X                |
| Quick Stop        | T7, T10, T11      | 3 – Switch On Disabled<br>7 – Quick Stop Active | X                  | X                     | 0                 | 1                     | X                |
| Disable Operation | T5                | 5 – Switched On                                 | X                  | 0                     | 1                 | 1                     | 1                |
| Enable Operation  | T4, T16           | 6 – Operation Enabled                           | X                  | 1                     | 1                 | 1                     | 1                |
| Fault Reset       | T15               | 3 – Switch On Disabled                          | 0 » 1              | X                     | X                 | X                     | X                |

### Notes:

- Bit 4—6 Bits 4 to 6 are used for the operating mode-specific settings.
- Bit 8 A Halt can be triggered with bit 8=1.
- Bit 9–15 Reserved.

## 6.6 Starting and Changing an Operating Mode

The Mode of Operation parameter (6060h) is used to set the desired operating mode.

| Parameter Name    | Description                                 | Data Type R/W          |
|-------------------|---------------------------------------------|------------------------|
| Mode of operation | Operating mode                              | Integer8<br>Read/Write |
|                   | 1 Profile Position                          |                        |
|                   | 3 Profile Velocity                          |                        |
|                   | 4 Profile Torque                            |                        |
|                   | 6 Homing                                    |                        |
|                   | 7 Interpolated Position                     |                        |
|                   | 8 Cyclic Synchronous Position               |                        |
|                   | 9 Cyclic Synchronous Velocity               |                        |
|                   | 10 Cyclic Synchronous Torque                |                        |
|                   | Changed settings become active immediately. |                        |

The Mode of Operation Display (6061h) can be used to read the current operating mode.

| Parameter Name    | Description                                 | Data Type R/W          |
|-------------------|---------------------------------------------|------------------------|
| Mode of operation | Operating mode                              | Integer8<br>Read/Write |
|                   | 1 Profile Position                          |                        |
|                   | 3 Profile Velocity                          |                        |
|                   | 4 Profile Torque                            |                        |
|                   | 6 Homing                                    |                        |
|                   | 7 Interpolated Position                     |                        |
|                   | 8 Cyclic Synchronous Position               |                        |
|                   | 9 Cyclic Synchronous Velocity               |                        |
|                   | 10 Cyclic Synchronous Torque                |                        |
|                   | Changed settings become active immediately. |                        |

## 6.7 Profile Position Mode

### Description

In the Profile Position operating mode, the motor executes a movement according to a target position, acceleration and velocity values sent from the master controller.

### Procedure

- Set [Mode of operation (6060h)] to operating mode Profile position (1).
- Set [Target position (607Ah)] to the target position (unit = pulse).
- Set [Profile velocity (6081h)] to profile velocity (unit = pulses per second).
- Set [Controlword (6040h)] to activate the operating mode and enable movement.
- Query [Position actual value (6064h)] to get the actual position of the motor.
- Query [Statusword (6041h)] to get the current status of following error, set-point acknowledge and target reached.

### Optional

Additional information on the operating mode Profile Position:

- Query [Position demand value (6062h)] to get the internal reference value (unit = pulse).
- Query [Position actual value (6063h)] to get the actual position value (unit = increments).

Following error:

- Set [Following error window (6065h)] to the permissible following error (unit = pulse).
- Query [Following error actual value (60F4h)] to get the current following error (unit = pulse).

Standstill window:

- Set [Position window (6067h)] to the value for the standstill window. If the difference between the target position and the current motor position remains in the standstill window for the time Position window time (6065h), the target position is considered to have been reached (unit = pulse).
- Set [Position window time (6068h)] to the value for the standstill window. If the difference between the target position and the current motor position remains in the standstill window for the time Position window time (6065h), the target position is considered to have been reached (unit = pulse).

### Associated Objects

| Index | Sub-index | Object                     | PDO   | Data Type  | Takes Effect |
|-------|-----------|----------------------------|-------|------------|--------------|
| 6040h | 0         | Controlword                | R_PDO | Unsigned16 | Immediately  |
| 6041h | 0         | Statusword                 | T_PDO | Unsigned16 | -            |
| 6060h | 0         | Modes of operation         | No    | Integer8   | Immediately  |
| 6061h | 0         | Modes of operation display | No    | Integer8   | -            |
| 6062h | 0         | Position demand value      | No    | Integer32  | -            |

| Index          | Sub-index | Object                              | PDO   | Data Type  | Takes Effect  |
|----------------|-----------|-------------------------------------|-------|------------|---------------|
| 6063h          | 0         | Position actual value               | No    | Integer32  | -             |
| 6064h          | 0         | Position actual value               | T_PDO | Integer32  | -             |
| 6065h          | 0         | Following error window              | No    | Unsigned32 | -             |
| 6067h          | 0         | Position window                     | No    | Unsigned32 | -             |
| 6068h          | 0         | Position window time                | No    | Unsigned16 | Immediately   |
| 6081h          | 0         | Profile velocity                    | R_PDO | Unsigned32 | Next movement |
| 6091h<br>6092h | 1         | Numerator<br>(Position factor)      | R_PDO | Unsigned32 | Immediately   |
| 6091h<br>6092h | 2         | Speed constant<br>(Position factor) | R_PDO | Unsigned32 | Immediately   |
| 60F2h          | 0         | Position option code                | No    | Unsigned16 | Next movement |
| 60F4h          | 0         | Following error actual value        | No    | Integer32  | -             |
| 60FCh          | 0         | Position demand value               | No    | Integer32  | -             |

## Profile Position – Example

### Setting the Operating Mode

The operating mode is set in the Mode of Operation parameter (6060h). Writing the parameter value activates the operating mode.

### Generating Movement

Use the Controlword according to the CANopen state machine to enable the drive and execute the movement.

### Controlword

Bits 4–6 and bit 8 in the Controlword (6040h) start a movement.

| Bit 5:<br>Change Set<br>Point Immediately | Bit 4:<br>New Target<br>Value | Meaning                                                                                                                                                                                                          |
|-------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0                                         | 0 » 1                         | Starts a movement to a target position.<br>Target values transmitted during a movement become immediately effective and are executed at the target. The movement is stopped at the current target position.*     |
| 1                                         | 0 » 1                         | Starts a movement to a target position.<br>Target values transmitted during a movement become immediately effective and are executed at the target. The movement is not stopped at the current target position.* |

| Parameter Value             | Meaning                                      |
|-----------------------------|----------------------------------------------|
| Bit 6 = Absolute / relative | 0: Absolute movement<br>1: Relative movement |
| Bit 8 = Halt                | Stop movement with Halt                      |

### Statusword

Information on the current movement is available via bits 10 and 12–15 in the Statusword (6041h).

| Parameter Value                   | Meaning                                                        |
|-----------------------------------|----------------------------------------------------------------|
| Bit 10 = Target reached           | 0 = Target position not reached<br>1 = Target position reached |
| Bit 12 = Target value acknowledge | 0 = New position possible<br>1 = New target position accepted  |
| Bit 13 = Following error bit      | 0 = No following error<br>1 = Following error                  |
| Bit 14 = Manufacturer-specific    |                                                                |
| Bit 15 = Manufacturer-specific    |                                                                |

### Example Node Address 1

| Work Step                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------|
| COB ID / Data                                                                                                              |
| » Set target velocity to 4000<br>601 / 23 7A 60 00 A0 0F 00 00                                                             |
| « 581 / 60 7A 60 00 00 00 00 00                                                                                            |
| » NMT Start remote node<br>0 / 01 00                                                                                       |
| « T_PDO2 with Statusword<br>281 / 31 66 00 00 00 00 00                                                                     |
| » Enable power stage with R_PDO1<br>201 / 00 00 00 00 00 00 00<br>201 / 06 00 00 00 00 00 00<br>201 / 0F 00 00 00 00 00 00 |
| « T_PDO1 (operating state: 6 Operation Enabled)<br>181 / 37 42 00 00 00 00 00                                              |
| » Starting the operating mode<br>601 / 2F 60 60 00 01 00 00 00<br>581 / 60 60 60 00 00 00 00 00                            |
| » Check operating mode*                                                                                                    |
| 601 / 40 61 60 00 00 00 00 00                                                                                              |
| « Operating mode active<br>581 / 4F 61 60 00 01 61 08 00                                                                   |
| » Issue a move command<br>601 / 23 40 60 00 00 00 00 1F                                                                    |
| « 581 / 60 40 60 00 00 00 00 00                                                                                            |

## 6.8 Homing Mode

### Description

In the Homing operating mode, the motor executes a movement until it reaches the home position, also called reference point or zero point.

### Procedure

- Set [Mode of operation (6060h)] to operating mode Homing (6).
- Set [Home offset (607Ch)].
- Set [Home method (6098h)], the value range is 1 to 35 and specifies the different homing methods.
- Set [Home speeds (6099h sub-index 1)] to the value for velocity for the search for the limit switches (unit = min-1).
- Set [Home speeds (6099h sub-index 2)] to the value for velocity for the search for the index pulse (unit = min-1).
- Set [Home acceleration (6099h sub-index 2)] to the value for the acceleration ramp (unit = milliseconds form 0 to 3000 min-1).
- Set [Controlword (6040h)] to activate the operating mode and enable movement.
- Start Homing.
- Query [Statusword (6041h)] to get the device status.

### Associated Objects

| Index | Sub-index | Object                         | PDO   | Data Type  | Takes Effect  |
|-------|-----------|--------------------------------|-------|------------|---------------|
| 6040h | 0         | Controlword                    | R_PDO | Unsigned16 | Immediately   |
| 6041h | 0         | Statusword                     | T_PDO | Unsigned16 | -             |
| 6060h | 0         | Modes of operation             | No    | Integer8   | Immediately   |
| 6061h | 0         | Modes of operation display     | No    | Integer8   | -             |
| 607Ch | 0         | Home offset                    | No    | Integer32  | Next movement |
| 6098h | 0         | Homing method                  | No    | Integer8   | Next movement |
| 6099h | 1         | Speed during search for switch | No    | Unsigned32 | Next movement |
| 6099h | 2         | Speed during search for zero   | No    | Unsigned32 | Next movement |
| 609Ah | 0         | Homing acceleration            | No    | Unsigned32 | Next movement |

### Homing – Example

#### Setting the Operating Mode

The operating mode is set in the Mode of Operation parameter (6060h). Writing the parameter value activates the operating mode.

#### Generating Movement

Use the Controlword according to the CANopen state machine to enable the drive and execute the movement.

### Controlword

Bits 4 in the Controlword (6040h) starts a movement, bit 8 terminates the movement.

| Parameter Value                | Meaning                              |
|--------------------------------|--------------------------------------|
| Bit 4 = Homing operation start | Start Homing                         |
| Bit 5 = Reserved               | Not relevant for this operating mode |
| Bit 6 = Reserved               | Not relevant for this operating mode |
| Bit 8 = Halt                   | Stop movement with Halt              |

### Statusword

Information on the current movement is available via bits 10 and 12–15 in the Statusword (6041h).

| Parameter Value                | Meaning                                          |
|--------------------------------|--------------------------------------------------|
| Bit 10 = Target reached        | 0 = Homing not completed<br>1 = Homing completed |
| Bit 12 = Homing attained       | 1 = Homing successfully completed                |
| Bit 13 = Homing error          | 1 = Homing error                                 |
| Bit 14 = Manufacturer-specific |                                                  |
| Bit 15 = Manufacturer-specific |                                                  |

### Example Node Address 1

| Work Step                                                                         |
|-----------------------------------------------------------------------------------|
| COB ID / Data                                                                     |
| » Velocity for searching the limit switch to 100<br>601 / 23 99 60 01 64 00 00 00 |
| « 581 / 60 99 60 01 00 00 00 00                                                   |
| » Velocity for moving away from switch to 10<br>601 / 23 99 60 02 0A 00 00 00     |
| « 581 / 60 99 60 02 00 00 00 00                                                   |
| » NMT Start remote node<br>0 / 01 00                                              |
| « T_PDO1 with Statusword<br>181 / 31 62                                           |
| » Enable power stage with R_PDO1<br>201 / 00 00<br>201 / 06 00<br>201 / 0F 00     |
| « T_PDO1 (operating state: 6 operation enabled)<br>181 / 37 42                    |
| » Starting the operating mode<br>601 / 2F 60 60 00 06 00 00 00                    |
| « 581 / 60 60 60 00 00 00 00 00                                                   |
| » Check operating mode *                                                          |
| 601 / 40 61 60 00 00 00 00 00                                                     |
| « Operating mode active<br>581 / 4F 61 60 00 06 61 01 00                          |

| Work Step     |                                                                  |
|---------------|------------------------------------------------------------------|
| COB ID / Data |                                                                  |
| »             | Select method 17<br>601 / 2F 98 60 00 11 00 00 00                |
| «             | 581 / 60 98 60 00 00 00 00 00                                    |
| »             | Start reference movement (Homing operation start)<br>201 / 1F 00 |
| «             | T_PDO1 reference movement active<br>181 / 37 02                  |
| «             | T_PDO1 reference movement terminated<br>181 / 37 D6              |

## 6.9 Profile Velocity Mode

### Description

In the Profile Velocity operating mode, the motor executes a movement according to a target velocity and acceleration values sent from the master controller.

### Procedure

- Set [Mode of operation (6060h)] to operating mode Profile Velocity (3).
- Set [Controlword (6040h)] to activate the operating mode and enable movement.
- Set [Target velocity (60FFh)] to the target velocity. If the power stage is enabled, the new target velocity will become active immediately and the movement will start. The value is reset to zero if the operating mode is changed, the power stage is disabled or a Quick Stop is triggered.
- Query [Statusword (6041h)] to get the device status.

### Optional

- Query [Velocity demand value (606Bh)] to get the reference velocity.
- Query [Velocity actual value (60C3h)] to get the actual velocity.
- Set [Velocity window (606Dh)] to the value of the velocity window.
- Set [Velocity window time (606Eh)] to the duration in the velocity window required to consider the velocity to have been reached unit = milliseconds).
- Query [Velocity threshold (60F4h)] to set the standstill window.

### Associated Objects

| Index | Sub-index | Object                     | PDO   | Data Type  | Takes Effect |
|-------|-----------|----------------------------|-------|------------|--------------|
| 6040h | 0         | Controlword                | R_PDO | Unsigned16 | Immediately  |
| 6041h | 0         | Statusword                 | T_PDO | Unsigned16 | -            |
| 6060h | 0         | Modes of Operation         | No    | Integer8   | Immediately  |
| 6061h | 0         | Modes of Operation Display | No    | Integer8   | -            |
| 606Bh | 0         | Velocity Demand Value      | No    | Integer32  | -            |
| 606Ch | 0         | Velocity Actual Value      | No    | Integer32  | -            |
| 606Dh | 0         | Velocity Window            | No    | Unsigned16 | Immediately  |
| 606Eh | 0         | Velocity Window Time       | No    | Unsigned16 | Immediately  |
| 606Fh | 0         | Velocity Threshold         | No    | Unsigned16 | Immediately  |
| 60FFh | 0         | Target Velocity            | No    | Integer32  | Immediately  |

### Profile Velocity – Example

#### Setting the Operating Mode

The operating mode is set in the Mode of Operation parameter (6060h). Writing the parameter value activates the operating mode.

## Generating Movement

Use the Controlword according to the CANopen state machine to enable the drive and execute the movement.

## Controlword

Bit 8 in parameter Controlword (6040h) is used to stop a movement with Halt.

| Parameter Value             | Meaning                              |
|-----------------------------|--------------------------------------|
| Bit 4 = Reserved            | Not relevant for this operating mode |
| Bit 5 = Reserved            | Not relevant for this operating mode |
| Bit 6 = Reserved            | Not relevant for this operating mode |
| Bit 8 = Halt                | Stop movement with Halt              |
| Bit 9 = Change on set point | Not relevant for this operating mode |

## Statusword

Information on the current movement is available via bits 10 and 12 in the Statusword (6041h).

| Parameter Value                | Meaning                                                        |
|--------------------------------|----------------------------------------------------------------|
| Bit 10 = Target reached        | 0 = Target velocity not reached<br>1 = Target velocity reached |
| Bit 12 = Velocity              | 0 = Velocity > 0<br>1 = Velocity = 0                           |
| Bit 14 = Manufacturer-specific |                                                                |
| Bit 15 = Manufacturer-specific |                                                                |

## Example Node Address 1

| Work Step                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------|
| COB ID / Data                                                                                                     |
| » NMT Start remote node<br>0 / 01 00                                                                              |
| « T_PDO3 with Statusword<br>381 / 31 66 00 00 00 00                                                               |
| » Enable power stage with R_PDO3<br>201 / 00 00 00 00 00 00<br>201 / 06 00 00 00 00 00<br>201 / 0F 00 00 00 00 00 |
| « T_PDO3 (operating state: 6 Operation Enabled)<br>181 / 37 46 00 00 00 00                                        |
| » Starting the operating mode<br>601 / 2F 60 60 00 03 00 00 00                                                    |
| « 581 / 60 60 60 00 00 00 00 00                                                                                   |

| Work Step     |                                                                                 |
|---------------|---------------------------------------------------------------------------------|
| COB ID / Data |                                                                                 |
| »             | Check operating mode *<br>601 / 40 61 60 00 00 00 00 00                         |
| «             | Operating mode active<br>581 / 4F 61 60 00 00 00 00 00                          |
| »             | R_PDO3: Specification of target velocity 1000<br>301 / E8 03 00 00              |
| «             | T_PDO2 with Statusword and velocity actual value<br>381 / 37 02 00 00 00 00 00  |
| «             | Target velocity reached<br>381 / 37 06 E8 03 00 00                              |
| »             | Terminate operating mode with Quick Stop with R_PDO3<br>401 / 0B 00 00 00 00 00 |
| «             | T_PDO3 with Statusword<br>381 / 17 66 00 00 00 00                               |
| »             | Clear Quick Stop with R_PDO3<br>401 / 0F 00 00 00 00 00                         |
| «             | T_PDO3 with Statusword<br>381 / 37 46 00 00 00 00                               |

## 6.10 Profile Torque Mode

### Description

In the Profile Torque operating mode, the motor executes a movement according to a target torque value sent from the master controller.

### Procedure

- Set [Mode of operation (6060 )] to operating mode Profile Torque (4).
- Set [Controlword (6040h)] to activate the operating mode and enable movement.  
When the operating mode is started, the target torque is set to zero.
- Set [Motor rated current (6075)] to a value according to motor specifications (unit = mA).
- Set [Target torque (6071h)] to the value for the target torque (unit = 0.1% of nominal torque. The value is reset to zero if the operating mode is changed, the power stage is disabled or a Quick Stop is triggered).

### Optional

- Query [Torque rated current (6075h)] to get the nominal current depending on the motor and the drive (unit = multiples of mA).
- Query [Current actual value (6078h)] to get the actual current (unit = increments of 0.1 % of the nominal current).

### Associated Objects

| Index | Sub-index | Object                     | PDO   | Data Type  | Takes Effect |
|-------|-----------|----------------------------|-------|------------|--------------|
| 6040h | 0         | Controlword                | R_PDO | Unsigned16 | Immediately  |
| 6041h | 0         | Statusword                 | T_PDO | Unsigned16 | -            |
| 6060h | 0         | Modes of Operation         | No    | Integer8   | Immediately  |
| 6061h | 0         | Modes of Operation Display | No    | Integer8   | -            |
| 6071h | 0         | Target Torque              | R_PDO | Integer16  | Immediately  |
| 6074h | 0         | Torque demand value        | No    | Integer16  | -            |
| 6075h | 0         | Motor rated current        | No    | Unsigned32 | -            |
| 6087h | 0         | Torque slope               | R_PDO | Unsigned32 | Immediately  |

### Profile Torque – Example

#### Setting the Operating Mode

The operating mode is set in the Mode of Operation parameter (6060h). Writing the parameter value activates the operating mode.

#### Generating Movement

Use the Controlword according to the CANopen state machine to enable the drive and execute the movement.

### Controlword

Bit 8 in the Controlword (6040h) is used to stop a movement with Halt.

| Parameter Value            | Meaning                              |
|----------------------------|--------------------------------------|
| Bit 4 = Reserved           | Not relevant for this operating mode |
| Bit 5 = Reserved           | Not relevant for this operating mode |
| Bit 6 = Reserved           | Not relevant for this operating mode |
| Bit 8 = Halt               | Stop movement with Halt              |
| Bit 9 = Change on setpoint | Not relevant for this operating mode |

### Statusword

Information on the movement is available via bit 10 in the Statusword (6041h).

| Parameter Value         | Meaning                                                    |
|-------------------------|------------------------------------------------------------|
| Bit 10 = Target reached | 0 = Target torque not reached<br>1 = Target torque reached |

### Example Node Address 1

| Work Step                                              |                                           |
|--------------------------------------------------------|-------------------------------------------|
| COB ID / Data                                          |                                           |
| » NMT Start remote node                                | 0 / 01 00                                 |
| « T_PDO1 with Statusword                               | 181 / 31 62                               |
| » Enable power stage with R_PDO1                       | 201 / 00 00<br>201 / 06 00<br>201 / 0F 00 |
| « T_PDO1 (operating state: 6 Operation Enabled)        | 181 / 37 62                               |
| » Starting the operating mode                          | 601 / 2F 60 60 00 04 00 00 00             |
| «                                                      | 581 / 60 60 60 00 00 00 00 00             |
| » Check operating mode*                                | 601 / 40 61 60 00 00 00 00 00             |
| « Operating mode active                                | 581 / 4F 61 60 00 02 00 00 00             |
| » Target torque set to 100 (10.0%)                     | 601 / 2B 71 60 00 64 00 00 00             |
| «                                                      | 581 / 60 71 60 00 00 00 00 00             |
| « Target torque reached                                | 181 / 37 06                               |
| » Terminate operating mode with Quick Stop with R_PDO1 | 201 / 0B 00                               |
| « T_PDO1 with Statusword                               | 181 / 17 66                               |

| Work Step     |                                             |
|---------------|---------------------------------------------|
| COB ID / Data |                                             |
| »             | Clear Quick Stop with R_PDO1<br>201 / 0F 00 |
| «             | T_PDO1 with Statusword<br>181 / 37 46       |

## 6.11 Interpolated Position Mode

### Description

The Interpolated Position operating mode is used to control multiple coordinated axes or a single axis with the need for time-interpolation of set-point data. The interpolated position mode normally uses time synchronization mechanisms for a time coordination of the related drive units.

This mode uses a buffer of position commands. The buffer size is always 1, thus it is not possible to give a list of target position commands in advance.

### Procedure

- Set [Mode of operation (6060h)] to operating mode Interpolated Position (7).
- Set [Target position (60C1h)] to the target position (unit = pulse).
- Set [Controlword (6040h)] to activate the operating mode and enable movement.
- Query [Position actual value (6064h)] to get the actual position of the motor.
- Query [Statusword (6041h)] to get the current status of following error, set-point acknowledge and target reached.

### Optional

- Additional information on the operating mode Profile Position:
- Query [Position demand value (6062h)] to get the internal reference value (unit = pulse).
- Query [Position actual value (6063h)] to get the actual position value (unit = increments).

Following error:

- Set [Following error window (6065h)] to the permissible following error (unit = pulse).
- Query [Following error actual value (60F4h)] to get the current following error (unit = pulse).

### Associated Objects

| Index | Sub-index | Object                     | PDO   | Data Type  | Takes Effect |
|-------|-----------|----------------------------|-------|------------|--------------|
| 6040h | 0         | Controlword                | R_PDO | Unsigned16 | Immediately  |
| 6041h | 0         | Statusword                 | T_PDO | Unsigned16 | -            |
| 6060h | 0         | Modes of operation         | R_PDO | Integer8   | Immediately  |
| 6061h | 0         | Modes of operation display | T_PDO | Integer8   | -            |
| 6062h | 0         | Position demand value      | No    | Integer32  | -            |
| 6063h | 0         | Position actual value      | No    | Integer32  | -            |
| 6064h | 0         | Position actual value      | T_PDO | Integer32  | -            |
| 6065h | 0         | Following error window     | No    | Unsigned32 | -            |
| 6067h | 0         | Position window            | No    | Unsigned32 | -            |
| 6068h | 0         | Position window time       | No    | Unsigned16 | Immediately  |
| 6091h | 1&2       | Gear (Position factor)     | No    | Unsigned32 | Immediately  |

| Index | Sub-index | Object                                         | PDO   | Data Type  | Takes Effect  |
|-------|-----------|------------------------------------------------|-------|------------|---------------|
| 6092h | 1&2       | Feedback constant<br>(Units resolution factor) | No    | Unsigned32 | Immediately   |
| 60F2h | 0         | Position option code                           | No    | Unsigned16 | Next movement |
| 60F4h | 0         | Following error actual value                   | T_PDO | Integer32  | -             |
| 60FCh | 0         | Position demand internal value                 | No    | Integer32  | -             |

## Interpolated Position Profile – Example

### Setting the Operating Mode

The operating mode is set in the Mode of Operation parameter (6060h). Writing the parameter value activates the operating mode.

### Generating Movement

Use the Controlword according to the CANopen state machine to enable the drive and execute the movement.

### Controlword

Bit 4 in the Controlword (6040h) is used to start a movement.

| Bit 4:<br>New Target Value | Meaning                                                                                                                                                                                                  |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 » 1                      | Starts a movement to a target position.<br>Target values transmitted during a movement every tick times according to the synchronous time value. The movement is stopped at the desired target position. |

### Statusword

Information on the current movement is available via bits 10 and 12–15 in the Statusword (6041h).

| Parameter Value                   | Meaning                                                        |
|-----------------------------------|----------------------------------------------------------------|
| Bit 10 = Target reached           | 0 = Target position not reached<br>1 = Target position reached |
| Bit 12 = Target value acknowledge | 0 = New position possible<br>1 = New target position accepted  |
| Bit 13 = Following error bit      | 0 = No following error<br>1 = Following error                  |
| Bit 14 = Manufacturer-specific    |                                                                |
| Bit 15 = Manufacturer-specific    |                                                                |

**Example Node Address 1**

| <b>Work Step</b>                       |  |
|----------------------------------------|--|
| <b>OB ID / Data</b>                    |  |
| » Set opmode 7 interpolated position   |  |
| 601 : sD : 2f 60 60 00 07 00 00 00     |  |
| « 581 : sD : 60 60 60 00 00 00 00 00   |  |
| » Check state is 8 sync position*      |  |
| 601 : sD : 40 61 60 00 00 00 00 00     |  |
| « 581 : sD : 4f 61 60 00 07 00 00 00   |  |
| » Move to OP mode                      |  |
| 000 : sD : 01 00                       |  |
| » Set to enable                        |  |
| 601 : sD : 2b 40 60 00 80 00 00 00     |  |
| 581 : sD : 60 40 60 00 00 00 00 00     |  |
| 601 : sD : 2b 40 60 00 06 00 00 00     |  |
| 581 : sD : 60 40 60 00 00 00 00 00     |  |
| 601 : sD : 2b 40 60 00 0f 00 00 00     |  |
| 581 : sD : 60 40 60 00 00 00 00 00     |  |
| » Set target position via PDO          |  |
| 769/301 : sD : 24 c7 2d 00 00 00 00 00 |  |

## 6.12 Cyclic Synchronous Position Mode

### Description

In the Cyclic Synchronous Position operating mode, the master controller provides a target position to the drive at each EtherCAT/CAN cycle, and the drive performs position control, velocity control and torque control.

### Procedure

- Set [Mode of operation (6060h)] to operating mode Cyclic Synchronous Position Profile (8).
- Set [Target position (607Ah)] to the target position (unit = pulse).
- Set [Controlword (6040h)] to activate the operating mode and enable movement.
- Query [Position actual value (6064h)] to get the actual position of the motor.
- Query [Statusword (6041h)] to get the current status of following error, set-point acknowledge and target reached.

### Optional

Additional information on the operating mode Profile Position:

- Query [Position demand value (6062h)] to get the internal reference value (unit = pulse).
- Query [Position actual value (6063h)] to get the actual position value (unit = increments).

Following error:

- Set [Following error window (6065h)] to the permissible following error (unit = pulse).
- Query [Following error actual value (60F4h)] to get the current following error (unit = pulse).

### Associated Objects

| Index | Sub-index | Object                                         | PDO   | Data Type  | Takes Effect  |
|-------|-----------|------------------------------------------------|-------|------------|---------------|
| 6040h | 0         | Controlword                                    | R_PDO | Unsigned16 | Immediately   |
| 6041h | 0         | Statusword                                     | T_PDO | Unsigned16 | -             |
| 6060h | 0         | Modes of operation                             | R_PDO | Integer8   | Immediately   |
| 6061h | 0         | Modes of operation display                     | T_PDO | Integer8   | -             |
| 6062h | 0         | Position demand value                          | No    | Integer32  | -             |
| 6063h | 0         | Position actual value                          | No    | Integer32  | -             |
| 6064h | 0         | Position actual value                          | T_PDO | Integer32  | -             |
| 6065h | 0         | Following error window                         | No    | Unsigned32 | -             |
| 6067h | 0         | Position window                                | No    | Unsigned32 | -             |
| 6068h | 0         | Position window time                           | No    | Unsigned16 | Immediately   |
| 6091h | 1&2       | Gear (Position factor)                         | No    | Unsigned32 | Immediately   |
| 6092h | 1&2       | Feedback constant<br>(Units resolution factor) | No    | Unsigned32 | Immediately   |
| 60F2h | 0         | Position option code                           | No    | Unsigned16 | Next movement |

| Index | Sub-index | Object                         | PDO   | Data Type | Takes Effect |
|-------|-----------|--------------------------------|-------|-----------|--------------|
| 60F4h | 0         | Following error actual value   | T_PDO | Integer32 | -            |
| 60FCh | 0         | Position demand internal value | No    | Integer32 | -            |

## Cyclic Synchronous Position Profile – Example

### Setting the Operating Mode

The operating mode is set in the Mode of Operation parameter (6060h). Writing the parameter value activates the operating mode.

### Generating Movement

Use the Controlword according to the CANopen state machine to enable the drive and execute the movement.

### Controlword

Bit 8 in the Controlword (6040h) is used to stop a movement with Halt.

| Parameter Value            | Meaning                              |
|----------------------------|--------------------------------------|
| Bit 4 = Reserved           | Not relevant for this operating mode |
| Bit 5 = Reserved           | Not relevant for this operating mode |
| Bit 6 = Reserved           | Not relevant for this operating mode |
| Bit 8 = Halt               | Stop movement with Halt              |
| Bit 9 = Change on setpoint | Not relevant for this operating mode |

### Statusword

Statusword changes according to the CANopen state machine.

### Example Node Address 1

| Work Step                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COB ID / Data                                                                                                                                                                                                                                       |
| » Set opmode 8 sync position<br>601 : sD : 2f 60 60 00 08 00 00 00                                                                                                                                                                                  |
| « 581 : sD : 60 60 60 00 00 00 00 00                                                                                                                                                                                                                |
| » Check state is 8 sync position*<br>601 : sD : 40 61 60 00 00 00 00 00                                                                                                                                                                             |
| « 581 : sD : 4f 61 60 00 08 00 00 00                                                                                                                                                                                                                |
| » Move to OP mode<br>000 : sD : 01 00                                                                                                                                                                                                               |
| » Set to enable<br>601 : sD : 2b 40 60 00 80 00 00 00<br>581 : sD : 60 40 60 00 00 00 00 00<br>601 : sD : 2b 40 60 00 06 00 00 00<br>581 : sD : 60 40 60 00 00 00 00 00<br>601 : sD : 2b 40 60 00 0f 00 00 00<br>581 : sD : 60 40 60 00 00 00 00 00 |

| Work Step                                                               |
|-------------------------------------------------------------------------|
| COB ID / Data                                                           |
| » Set target position via PDO<br>769/301 : sD : 24 c7 2d 00 00 00 00 00 |

## 6.13 Cyclic Synchronous Velocity Mode

### Description

In the Cyclic Synchronous Velocity operating mode, the master controller provides a target velocity to the drive at each EtherCAT/CAN cycle, and the drive performs velocity control and torque control.

### Procedure

- Set [Mode of operation (6060h)] to operating mode Cyclic Synchronous Velocity Profile (9).
- Set [Target velocity (60FFh)] to the target velocity. If the power stage is enabled, the new target velocity will become active immediately and the movement will start.
- Set [Controlword (6040h)] to activate the operating mode and enable movement.
- Query [Statusword (6041h)] to get the current status of following error, set-point acknowledge and target reached.

### Optional

Additional information on the operating mode cyclic synchronous velocity:

- Query [Velocity demand value (606Bh)] to get the reference velocity.
- Query [Velocity actual value (60C3h)] to get the actual velocity.
- Set [Velocity window (606Dh)] to the value of the velocity window.
- Set [Velocity window time (606Eh)] to the duration required in the velocity window to consider the velocity has been reached (unit = milliseconds).
- Query [Velocity threshold (60F4h)] to set the standstill window.

### Associated Objects

| Index | Sub-index | Object                     | PDO   | Data Type  | Takes Effect |
|-------|-----------|----------------------------|-------|------------|--------------|
| 6040h | 0         | Controlword                | R_PDO | Unsigned16 | Immediately  |
| 6041h | 0         | Statusword                 | T_PDO | Unsigned16 | -            |
| 6060h | 0         | Modes of Operation         | R_PDO | Integer8   | Immediately  |
| 6061h | 0         | Modes of Operation Display | T_PDO | Integer8   | -            |
| 606Bh | 0         | Velocity Demand Value      | No    | Integer32  | -            |
| 606Ch | 0         | Velocity Actual Value      | T_PDO | Integer32  | -            |
| 606Dh | 0         | Velocity Window            | No    | Unsigned16 | Immediately  |
| 606Eh | 0         | Velocity Window Time       | No    | Unsigned16 | Immediately  |
| 606Fh | 0         | Velocity Threshold         | No    | Unsigned16 | Immediately  |
| 60FFh | 0         | Target Velocity            | R_PDO | Integer32  | Immediately  |

## Cyclic Synchronous Velocity – Example

### Setting the Operating Mode

The operating mode is set in the Mode of Operation parameter (6060h). Writing the parameter value activates the operating mode.

### Generating Movement

Use the Controlword according to the CANopen state machine to enable the drive and execute the movement.

### Controlword

Bit 8 in the Controlword (6040h) is used to stop a movement with Halt.

| Parameter Value            | Meaning                              |
|----------------------------|--------------------------------------|
| Bit 4 = Reserved           | Not relevant for this operating mode |
| Bit 5 = Reserved           | Not relevant for this operating mode |
| Bit 6 = Reserved           | Not relevant for this operating mode |
| Bit 8 = Halt               | Stop movement with Halt              |
| Bit 9 = Change on setpoint | Not relevant for this operating mode |

### Statusword

Statusword changes according to the CANopen state machine.

### Example Node Address 1

| Work Step                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COB ID / Data                                                                                                                                                                                                                                       |
| » Set opmode 9 sync velocity<br>601 : sD : 2f 60 60 00 09 00 00 00                                                                                                                                                                                  |
| « 581 : sD : 60 60 60 00 00 00 00 00                                                                                                                                                                                                                |
| » Check state is 9 sync velocity*<br>601 : sD : 40 61 60 00 00 00 00 00                                                                                                                                                                             |
| « 581 : sD : 4f 61 60 00 09 00 00 00                                                                                                                                                                                                                |
| » Move to OP mode<br>000 : sD : 01 00                                                                                                                                                                                                               |
| » Set to enable<br>601 : sD : 2b 40 60 00 80 00 00 00<br>581 : sD : 60 40 60 00 00 00 00 00<br>601 : sD : 2b 40 60 00 06 00 00 00<br>581 : sD : 60 40 60 00 00 00 00 00<br>601 : sD : 2b 40 60 00 0f 00 00 00<br>581 : sD : 60 40 60 00 00 00 00 00 |
| » Set target velocity via PDO<br>401 : sD : 64 00 00 00                                                                                                                                                                                             |

## 6.14 Cyclic Synchronous Torque Mode

### Description

In the Cyclic Synchronous Torque operating mode, the master controller provides a target torque to the drive at each EtherCAT/CAN cycle, and the drive performs torque control.

### Procedure

- Set [Mode of operation (6060h)] to operating mode Cyclic Synchronous Torque (10).
- Set [Target torque (6071h)] to the target torque. If the power stage is enabled, the new target torque will become active immediately and the movement will start.
- Set [Controlword (6040h)] to activate the operating mode and enable movement.
- Query [Statusword (6041h)] to get the current status of following error, set-point acknowledge and target reached.

### Optional

Additional information on the operating mode cyclic synchronous velocity:

- Query [Torque rated current (6075h)] to get the nominal current depending on the motor and the drive (unit = multiples of mA).
- Query [Current actual value (6078h)] to get the actual current (unit = increments of 0.1% of the nominal current)

### Associated Objects

| Index | Sub-index | Object                     | PDO   | Data Type  | Takes Effect |
|-------|-----------|----------------------------|-------|------------|--------------|
| 6040h | 0         | Controlword                | R_PDO | Unsigned16 | Immediately  |
| 6041h | 0         | Statusword                 | T_PDO | Unsigned16 | -            |
| 6060h | 0         | Modes of Operation         | R_PDO | Integer8   | Immediately  |
| 6061h | 0         | Modes of Operation Display | T_PDO | Integer8   | -            |
| 6071h | 0         | Target Torque              | R_PDO | Integer16  | Immediately  |
| 6074h | 0         | Torque demand value        | T_PDO | Integer16  | -            |
| 6075h | 0         | Motor rated current        | No    | Unsigned32 | -            |
| 6087h | 0         | Torque slope               | No    | Unsigned32 |              |

### Cyclic Synchronous Torque – Example

#### Setting the Operating Mode

The operating mode is set in the Mode of Operation parameter (6060h).

Writing the parameter value activates the operating mode.

#### Generating Movement

Use the Controlword according to the CANopen state machine to enable the drive and execute the movement.

## Controlword

Bit 8 in the Controlword (6040h) is used to stop a movement with Halt.

| Parameter Value            | Meaning                              |
|----------------------------|--------------------------------------|
| Bit 4 = Reserved           | Not relevant for this operating mode |
| Bit 5 = Reserved           | Not relevant for this operating mode |
| Bit 6 = Reserved           | Not relevant for this operating mode |
| Bit 8 = Halt               | Stop movement with Halt              |
| Bit 9 = Change on setpoint | Not relevant for this operating mode |

## Statusword

Statusword changes according to the CANopen state machine.

### Example Node Address 1

| Work Step                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COB ID / Data                                                                                                                                                                                                                                       |
| » Set opmode 10 sync torque<br>601 : sD : 2f 60 60 00 0A 00 00 00                                                                                                                                                                                   |
| « 581 : sD : 60 60 60 00 00 00 00 00                                                                                                                                                                                                                |
| » Check state is 10 sync torque*                                                                                                                                                                                                                    |
| 601 : sD : 40 61 60 00 00 00 00 00                                                                                                                                                                                                                  |
| « 581 : sD : 4f 61 60 00 0A 00 00 00                                                                                                                                                                                                                |
| » Move to OP mode<br>000 : sD : 01 00                                                                                                                                                                                                               |
| » Set to enable<br>601 : sD : 2b 40 60 00 80 00 00 00<br>581 : sD : 60 40 60 00 00 00 00 00<br>601 : sD : 2b 40 60 00 06 00 00 00<br>581 : sD : 60 40 60 00 00 00 00 00<br>601 : sD : 2b 40 60 00 0f 00 00 00<br>581 : sD : 60 40 60 00 00 00 00 00 |
| » Set target torque via PDO<br>501 : sD : 64 00 00 00                                                                                                                                                                                               |

## 6.15 Digital Output Operation

The following procedure describes how to control a CDHD2 digital output.

1. Enable the digital outputs to be controlled manually:
  - Set object 60FEh sub-index 2 to FFFFFFFFh

This gives you permission to write to all digital outputs.

2. Define the mode of a specific output as idle to give you (and not drive logic) manual control of the output.

For example, define digital output 3 as idle:

- Set object 209Ch sub-index 1 to value 3
- Set object 209Ch sub-index 2 to value 0

3. Set the output state by writing to the object.

Digital input 3 is represented by bit 18 in object 60FE; therefore:

- Set object 60FE sub-index 1 to 40000h (218=262144).

# 7 Units

## 7.1 Units Overview

CiA and ETG standards provide two objects for setting the gear ratio and the feed constant conversion factors, each of which has two sub-indices.

These objects have four equivalent (VarCom) drive parameters, as shown in the following table.

| CAN Object         | VarCom   ServoStudio                              | Description                                                                                                                                                     |
|--------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6092h, sub-index 1 | PNUM: Feed Constant (Unit Conversion) Numerator   | Conversion factors of the user-defined unit. Used to multiply the motor revolution (rotary motors) or the motor pitch (linear motors), according to motor type. |
| 6092h, sub-index 2 | PDEN: Feed Constant (Unit Conversion) Denominator |                                                                                                                                                                 |
| 6091h, sub-index 1 | FBGMS: Fieldbus Gear Ratio – Motor Shaft Scaling  | The conversion factor of the fieldbus device's motor shaft revolution.                                                                                          |
| 6091h, sub-index 2 | FBGDS: Fieldbus Gear Ratio – Drive Shaft Scaling  | The conversion factor of the fieldbus device's drive shaft revolution.                                                                                          |

You can modify the values by writing directly to the objects.

Alternately, you can use the **CANopen Units** pane in the ServoStudio **Motion Units** screen:

The screenshot shows a window titled "CANopen Units". Inside, there are four rows, each with a label and a text input field:

- Feed Constant Scaling Numerator: 360
- Feed Constant Scaling Denominator: 1
- Fieldbus Gear Driving Shaft Scaling: 1
- Fieldbus Gear Motor Shaft Scaling: 1

Figure 7-1. ServoStudio Motion Units | CANopen Units

## 7.2 Position Units

Position units are expressed by the following equation:

$$\frac{0x6091 \text{ sub-index } 1}{0x6091 \text{ sub-index } 2} \times \frac{0x6092 \text{ sub-index } 1}{0x6092 \text{ sub-index } 2} = 1 \text{ motor revolution}$$

For example:

$$6091h \text{ sub-index } 1 = 1048576$$

$$6091h \text{ sub-index } 2 = 1$$

$$6092h \text{ sub-index } 1 = 1$$

6092h sub-index 2 = 1

Therefore:

$$\frac{1048576}{1} \times \frac{1}{1} = 1048576$$

That is, 1048576 position units = 1 motor revolution.

### 7.2.1 Position Resolution - Examples

Position resolution should be as high as possible; it must certainly be no less than the encoder resolution.

When the drive is operating in Synchronous Position mode, the controller sends the drive one position command per cycle.

#### Low Resolution

| CAN Object         | Parameter                                          | Value |
|--------------------|----------------------------------------------------|-------|
| 6092h, sub-index 1 | PNUM - Feed Constant (Unit Conversion) Numerator   | 360   |
| 6092h, sub-index 2 | PDEN - Feed Constant (Unit Conversion) Denominator | 1     |

Let's assume the controller intends to move the motor at a slow speed of 60 rpm; that is, 1 revolution per second, or **360 degrees per second**.

A typical EtherCAT cycle time is 1 ms; thus, the controller divides 360 degrees by 1000, and sends a command every 1 ms. Since EtherCAT supports integers only, and 0.36 (360/1000) is not an integer, the following will result:

| Cycle                                                  | 1    | 2    | 3    | 4    | 5   | 6    | .. | .. | n                     |
|--------------------------------------------------------|------|------|------|------|-----|------|----|----|-----------------------|
| Profile generator in controller                        | 0.36 | 0.72 | 1.08 | 1.44 | 1.8 | 2.16 | .. | .. |                       |
| EtherCAT position command                              | 0    | 0    | 1    | 0    | 0   | 2    | .. | .. | INT(n×0.36)           |
| Position command in drive in units of 10000 counts/rev | 0    | 0    | 27   | 0    | 0   | 55   | .. | .. | INT(n×0.36)×10000/360 |

From the table, it can be seen that the command will be updated, on average, only once every three cycles. As a result, the motor will move 27 encoder counts in one cycle and be stopped for two cycles, producing significant acoustic noise. Should the speed be lowered, the noise will become even more severe.

#### High Resolution

| CAN Object         | Parameter                                          | Value |
|--------------------|----------------------------------------------------|-------|
| 6092h, sub-index 1 | PNUM - Feed Constant (Unit Conversion) Numerator   | 1     |
| 6092h, sub-index 2 | PDEN - Feed Constant (Unit Conversion) Denominator | 1     |

Let's assume the controller intends to move the motor at a slow speed of 60 rpm; that is, 1 revolution per second, or **360000 counts per second**.

A typical EtherCAT cycle time is 1 ms; thus, the controller divides 360000 counts by 1000, and sends a command every 1 ms. Since 360000/1000 equals the integer 360, the following will result:

| Cycle #                                                | 1   | 2   | 3    | 4    | 5    | 6    | .. | .. | n                       |
|--------------------------------------------------------|-----|-----|------|------|------|------|----|----|-------------------------|
| Profile generator in controller                        | 360 | 720 | 1080 | 1440 | 1800 | 2160 | .. | .. |                         |
| EtherCAT position command                              | 360 | 720 | 1080 | 1440 | 1800 | 2160 | .. | .. | INT(n×360)              |
| Position command in drive in units of 10000 counts/rev | 10  | 20  | 30   | 40   | 50   | 60   | .. | .. | INT(n×360)×10000/360000 |

From the table, it can be seen that the command will be consistently updated at each cycle. Speed will remain constant and there will be no acoustic noise.

Position commands sent over EtherCAT have the advantage of being highly accurate, thereby improving system performance.

## 7.3 Velocity Units

Velocity units are expressed by the following equation:

$$\frac{0x6091 \text{ sub-index } 1}{0x6091 \text{ sub-index } 2} \times \frac{0x6092 \text{ sub-index } 1}{0x6092 \text{ sub-index } 2} = 1 \text{ rps}$$

For example:

6091h sub-index 1 = 1048576

6091h sub-index 2 = 1

6092h sub-index 1 = 1

6092h sub-index 2 = 1

Therefore:

$$\frac{1048576}{1} \times \frac{1}{1} = 1048576$$

That is, 1048576 velocity units = 1 rps

## 7.4 Acceleration/Deceleration Units

Acceleration/deceleration units are expressed by the following equation:

$$\frac{0x6091 \text{ sub-index } 1}{0x6091 \text{ sub-index } 2} \times \frac{0x6092 \text{ sub-index } 1}{0x6092 \text{ sub-index } 2} = 1 \text{ rps/s}$$

For example:

6091h sub-index 1 = 1,048,576

6091h sub-index 2 = 1

6092h sub-index 1 = 1

6092h sub-index 2 = 1

Therefore:

$$\frac{1048576}{1} \times \frac{1}{1} = 10000$$

That is, 1,048,576 acc/dec units = **1 rps/s**

## 7.5 Current Units

Current units are derived from object 6075h (Motor Rated Current), which is defined in mA.

After setting a value for 6075h, all other current-related objects must receive values defined in 1/1000 (one-thousandth) of 6075h.

For example: Assuming 6075h has a value of 20000 mA, then to set a value of 40000 mA for object 6073h (Max Current), write 2000 for object 6073h.

The calculation is:  $(2000 \div 1000) \times 20000 = 40000$  mA

## 7.6 Torque Units

Torque units are derived from object 6076h (Motor Rated Torque), which is defined in mNm.

After setting a value for 6076h, all other torque-related objects must receive values defined in 1/1000 (one thousandth) of 6076h.

For example: Assuming 6076h has a value of 500 mNm, then to set a value of 100 mNm for object 6074h (Torque Demand ), write 200 for object 6074h.

The calculation is:  $(200 \div 1000) \times 500 = 100$  mNm

## 7.7 Rotary Motor Units – Examples

### Setting Units to Represent Revolutions

Position = rev

Velocity = rev/sec

Acceleration = rev/sec<sup>2</sup>

| CAN Object         | Parameter                                          | Value |
|--------------------|----------------------------------------------------|-------|
| 6092h, sub-index 1 | PNUM - Feed Constant (Unit Conversion) Numerator   | 1     |
| 6092h, sub-index 2 | PDEN - Feed Constant (Unit Conversion) Denominator | 1     |
| 6091h, sub-index 1 | FBGMS - Fieldbus Gear Ratio – Motor Shaft Scaling  | 1     |
| 6091h, sub-index 2 | FBGDS - Fieldbus Gear Ratio – Drive Shaft Scaling  | 1     |

### Operating Mode: Profile Position

1. Set Mode of Operation (6060h) to Profile Position mode (1).
2. Set the Target Position (607Ah) value (unit = **revolutions**).  
If object 607Ah is 1, the motor shaft will rotate one revolution.
3. Set the Profile Velocity (6081h) value (unit = **revolutions per second**).  
If object 6081h is 1, the motor shaft speed will be 1 rev/sec.

4. Set Controlword (6040h) to start the movement.

### Operating Mode: Profile Velocity

1. Set Mode of Operation (6060h) to Profile Velocity mode (3).
2. Set Controlword (6040h) to start the operating mode.
3. Set the Target Velocity (60FFh) value.

If object 6081h is 1, the motor shaft speed will be 1 rev/sec.

If the power stage is enabled, the new target velocity will become active immediately and the movement will start. The value is reset to zero if the operating mode is changed, the power stage is disabled, or a quick stop is triggered.

### Setting Units to Represent Degrees

Position = deg

Velocity = deg/sec

Acceleration = deg/sec<sup>2</sup>

| CAN Object         | Parameter                                          | Value |
|--------------------|----------------------------------------------------|-------|
| 6092h, sub-index 1 | PNUM - Feed Constant (Unit Conversion) Numerator   | 360   |
| 6092h, sub-index 2 | PDEN - Feed Constant (Unit Conversion) Denominator | 1     |
| 6091h, sub-index 1 | FBGMS - Fieldbus Gear Ratio – Motor Shaft Scaling  | 1     |
| 6091h, sub-index 2 | FBGDS - Fieldbus Gear Ratio – Drive Shaft Scaling  | 1     |

### Operating Mode: Profile Position

1. Set Mode of Operation (6060h) to Profile Position mode (1).
2. Set the Target Position (607Ah) value (unit = **degrees**).  
If object 607Ah is **360**, the motor shaft will rotate one revolution.
3. Set the Profile Velocity (6081h) value (unit = **degrees** per second).  
If object 6081h is **360**, the motor shaft speed will be 1 rev/sec.
4. Set Controlword (6040h) to start the movement.

### Operating Mode: Profile Velocity

1. Set Mode of Operation (6060h) to Profile Velocity mode (3).
2. Set Controlword (6040h) to start the operating mode.
3. Set the Target Velocity (60FFh) value.  
If object 6081h is **360**, the motor shaft speed will be 360 deg/sec (one revolution per second).

If the power stage is enabled, the new target velocity will become active immediately and the movement will start. The value is reset to zero if the operating mode is changed, the power stage is disabled, or a quick stop is triggered.

## Setting Units to Represent Feedback Counts

Position = counts

Velocity = counts/sec

Acceleration = counts/sec<sup>2</sup>

| CAN Object         | Parameter                                          | Value                   |
|--------------------|----------------------------------------------------|-------------------------|
| 6092h, sub-index 1 | PNUM - Feed Constant (Unit Conversion) Numerator   | <i>Motor_Resolution</i> |
| 6092h, sub-index 2 | PDEN - Feed Constant (Unit Conversion) Denominator | 1                       |
| 6091h, sub-index 1 | FBGMS - Fieldbus Gear Ratio – Motor Shaft Scaling  | 1                       |
| 6091h, sub-index 2 | FBGDS - Fieldbus Gear Ratio – Drive Shaft Scaling  | 1                       |

This example assumes that the feedback device (i.e., encoder) produces 10,000 counts per 1 motor revolution.

The *Motor\_Resolution* parameter (MENCRES) defines the resolution of the motor encoder, in number of lines per revolution of the motor for a rotary motor, and in number of lines per pitch for a linear motor.

When an incremental encoder is used, the number of encoder counts per revolution or pitch is obtained by multiplying *Motor\_Resolution* by 4.

Get the value of *Motor\_Resolution*, multiple by 4, and then enter the number as the value of object 6092, sub-index 1.

### Operating Mode: Profile Position

1. Set Mode of Operation (6060h) to Profile Position mode (1).
2. Set the Target Position (607Ah) value (unit = **counts**).  
If object 607Ah is **10,000**, the motor shaft will rotate 10,000 counts, which equals one revolution.
3. Set the Profile Velocity (6081h) value (unit = **counts** per second).  
If object 6081h is **10,000**, the motor shaft speed will be 10,000 counts/sec (one revolution per second).
4. Set Controlword (6040h) to start the movement.

### Operating Mode: Profile Velocity

1. Set Mode of Operation (6060h) to Profile Velocity mode (3).
2. Set Controlword (6040h) to start the operating mode.
3. Set the Target Velocity (60FFh) value.  
If object 6081h is **10,000**, the motor shaft speed will be 10,000 counts/sec (one revolution per second).

If the power stage is enabled, the new target velocity will become active immediately and the movement will start. The value is reset to zero if the operating mode is changed, the power stage is disabled, or a quick stop is triggered.

## 7.8 Linear Motor Units - Examples

The fundamental parameter of linear motor is the motor pitch – the distance between two successive magnetic poles of the motor. Pitch data is expressed in millimeters.

To read the pitch distance, query object 207Dh, sub-index 0.

In a linear motor, the feedback resolution is defined as the number of encoder counts per the motor pitch distance.

### Setting Units to Represent Motor Pitch

Position = pitch

Velocity = pitch/sec

Acceleration = pitch/sec<sup>2</sup>

| CAN Object         | Parameter                                          | Value |
|--------------------|----------------------------------------------------|-------|
| 6092h, sub-index 1 | PNUM - Feed Constant (Unit Conversion) Numerator   | 1     |
| 6092h, sub-index 2 | PDEN - Feed Constant (Unit Conversion) Denominator | 1     |
| 6091h, sub-index 1 | FBGMS - Fieldbus Gear Ratio – Motor Shaft Scaling  | 1     |
| 6091h, sub-index 2 | FBGDS - Fieldbus Gear Ratio – Drive Shaft Scaling  | 1     |

### Operating Mode: Profile Position

1. Set Mode of Operation (6060h) to Profile Position mode (1).
2. Set the Target Position (607Ah) value (unit = **motor pitch**).  
If object 607Ah is 1, the motor shaft will move a distance of 1 pitch.
3. Set the Profile Velocity (6081h) value (unit = **counts** per second).  
If object 6081h is 1, the motor speed will be 1 pitch/sec (one pitch per second).
4. Set Controlword (6040h) to start the movement.

### Operating Mode: Profile Velocity

1. Set Mode of Operation (6060h) to Profile Velocity mode (3).
2. Set Controlword (6040h) to start the operating mode.
3. Set the Target Velocity (60FFh) value.

If object 6081h is 1, the motor speed will be 1 pitch/sec.

If the power stage is enabled, the new target velocity will become active immediately and the movement will start. The value is reset to zero if the operating mode is changed, the power stage is disabled, or a quick stop is triggered.

### Setting Units to Represent Millimeters

Position = mm

Velocity = mm/sec

Acceleration = mm/sec<sup>2</sup>

| CAN Object         | Parameter                                          | Value                            |
|--------------------|----------------------------------------------------|----------------------------------|
| 6092h, sub-index 1 | PNUM - Feed Constant (Unit Conversion) Numerator   | <i>Motor Pitch Distance [mm]</i> |
| 6092h, sub-index 2 | PDEN - Feed Constant (Unit Conversion) Denominator | 1                                |
| 6091h, sub-index 1 | FBGMS - Fieldbus Gear Ratio – Motor Shaft Scaling  | 1                                |
| 6091h, sub-index 2 | FBGDS - Fieldbus Gear Ratio – Drive Shaft Scaling  | 1                                |

This example assumes that the pitch value is 32.

### Operating Mode: Profile Position

1. Set Mode of Operation (6060h) to Profile Position mode (1).
2. Set the Target position (607Ah) value (unit = **mm**).  
If object 607Ah is 32, the motor will move a distance of 1 **mm**
3. Set the Profile Velocity (6081h) value (unit = **mm** per second).  
If object 6081h is 32, the motor speed will be 1 **mm/sec**
4. Set Controlword (6040h) to start the operating mode.

### Operating Mode: Profile Velocity

1. Set Mode of Operation (6060h) to Profile Velocity mode (3).
2. Set Controlword (6040h) to start the operating mode.
3. Set the Target Velocity (60FFh) value.  
If object 6081h is 32, the motor speed will be 1 **mm/sec** (one millimeter per second).

If the power stage is enabled, the new target velocity will become active immediately and the movement will start. The value is reset to zero if the operating mode is changed, the power stage is disabled, or a quick stop is triggered.

### Setting Units to Represent Feedback Counts

Position = counts

Velocity = counts/sec

Acceleration = counts/sec<sup>2</sup>

| CAN Object         | Parameter                                          | Value                   |
|--------------------|----------------------------------------------------|-------------------------|
| 6092h, sub-index 1 | PNUM - Feed Constant (Unit Conversion) Numerator   | <i>Motor_Resolution</i> |
| 6092h, sub-index 2 | PDEN - Feed Constant (Unit Conversion) Denominator | 1                       |
| 6091h, sub-index 1 | FBGMS - Fieldbus Gear Ratio – Motor Shaft Scaling  | 1                       |
| 6091h, sub-index 2 | FBGDS - Fieldbus Gear Ratio – Drive Shaft Scaling  | 1                       |

The *Motor\_Resolution* parameter (MENCRES) defines the resolution of the encoder, in number of lines per revolution of the motor for a rotary motor, and number of lines per pitch for a linear motor.

When an incremental encoder is used, the number of encoder counts per motor pitch distance is obtained by multiplying *Motor\_Resolution* by 4

#### **Operating Mode: Profile Position**

1. Set Mode of Operation (6060h) to Profile Position mode (1).
2. Set the Target Position (607Ah) value (unit = **counts**).
3. If object 607Ah is 1, the motor will move a distance of one count.
4. Set the Profile Velocity (6081h) value (unit = **counts** per second).  
If object 6081h is 1, the motor speed will be 1 counts/sec (one count per second).
5. Set Controlword (6040h) to start the movement.

#### **Operating Mode: Profile Velocity**

1. Set Mode of Operation (6060h) to Profile Velocity mode (3).
2. Set Controlword (6040h) to start the operating mode.
3. Set the Target Velocity (60FFh) value.  
If object 6081h is 1, the motor speed will be 1 counts/sec (one count per second).

If the power stage is enabled, the new target velocity will become active immediately and the movement will start. The value is reset to zero if the operating mode is changed, the power stage is disabled, or a quick stop is triggered.

## 8 Communication Objects

The following communication objects have been implemented in the CDHD2 servo drives.  
For more information, refer to the specific CAN documentation.

### 1000h: Device Type

#### Object Description

|             |                                                                                                                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1000                                                                                                                                                                                                                                            |
| Description | Contains information about the device type and functionality. It is comprised of a 16 bit field that describes the device profile used, and a second 16 bit field that gives additional information about optional functionality of the device. |
| Object Code | Variable                                                                                                                                                                                                                                        |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                      |

#### Entry Description

|               |            |
|---------------|------------|
| Access        | Constant   |
| PDO Mapping   | No         |
| Default Value | 0x00420192 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 1001h: Error Register

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1001                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Description | <p>The error register is a field of 8 bits, each for a certain error type.</p> <p>If an error occurs the bit will be set.</p> <p>The bits have the following meaning:</p> <p>bit 0: Generic error</p> <p>bit 1: Current</p> <p>bit 2: Voltage</p> <p>bit 3: Temperature</p> <p>bit 4: Communication error (overflow, error state)</p> <p>bit 5: Device profile specific</p> <p>bit 6: Reserved</p> <p>bit 7: Manufacturer specific</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Data Type   | UNSIGNED8                                                                                                                                                                                                                                                                                                                                                                                                                              |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x00      |
| Lower Limit   | 0x00      |
| Upper Limit   | 0xFF      |
| Unit          | -         |

**1002h: Manufacturer Status Register (CAN only)****Object Description**

|             |                                                              |
|-------------|--------------------------------------------------------------|
| Index       | 1002                                                         |
| Description | A common status register for manufacturer specific purposes. |
| Object Code | Variable                                                     |
| Data Type   | UNSIGNED32                                                   |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

**1003h: Predefined Error Field (CAN only)****Object Description**

|             |                                                                                                                                                                              |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1003                                                                                                                                                                         |
| Description | Holds errors that occurred in the device and have been signaled via the Emergency object. It is an error history. Writing 0 to sub-index 0 deletes the entire error history. |
| Object Code | Array                                                                                                                                                                        |
| Data Type   | UNSIGNED32                                                                                                                                                                   |

**Entry Description**

|                |                  |
|----------------|------------------|
| Sub-Index      | 000              |
| Description    | Number of Errors |
| Entry Category | Mandatory        |
| Access         | Read/Write       |
| PDO Mapping    | No               |
| Default Value  | 0x00             |
| Lower Limit    | 0x00             |
| Upper Limit    | 0xFE             |
| Unit           | -                |

|                       |                                                            |
|-----------------------|------------------------------------------------------------|
| <b>Sub-Index</b>      | 001 – 002 – 003 – 004 – 005<br>006 – 007 – 008 – 009 – 010 |
| <b>Description</b>    | Standard Error Field                                       |
| <b>Entry Category</b> | Mandatory                                                  |
| <b>Data Type</b>      | UNSIGNED32                                                 |
| <b>Access</b>         | Read Only                                                  |
| <b>PDO Mapping</b>    | No                                                         |
| <b>Default Value</b>  | 0x00000000                                                 |
| <b>Lower Limit</b>    | 0x00000000                                                 |
| <b>Upper Limit</b>    | 0xFFFFFFFF                                                 |
| <b>Unit</b>           | -                                                          |

## 1005h: COB-ID SYNC (CAN only)

### Object Description

|                    |                                                                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Index</b>       | 1005                                                                                                                                                                                                                            |
| <b>Description</b> | Defines the COB ID of the synchronization object (SYNC).<br>If bit 30 is set to high, the device generates a SYNC message to be used by the drive.<br>The meaning of other bits is the same as for other communication objects. |
| <b>Object Code</b> | Variable                                                                                                                                                                                                                        |
| <b>Data Type</b>   | UNSIGNED32                                                                                                                                                                                                                      |

### Entry Description

|                      |            |
|----------------------|------------|
| <b>Access</b>        | Read/Write |
| <b>PDO Mapping</b>   | No         |
| <b>Default Value</b> | 0x00000080 |
| <b>Lower Limit</b>   | 0x00000001 |
| <b>Upper Limit</b>   | 0xFFFFFFFF |
| <b>Unit</b>          | -          |

**1006h: Communication Cycle Period (CAN only)****Object Description**

|             |                                                                 |
|-------------|-----------------------------------------------------------------|
| Index       | 1006                                                            |
| Description | Defines the communication cycle period.<br>It is 0 if not used. |
| Object Code | Variable                                                        |
| Data Type   | UNSIGNED32                                                      |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | μs         |

**1007h: Synchronous Window Length****Object Description**

|             |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| Index       | 1007                                                                                       |
| Description | Defines the length of the time window for synchronous messages.<br>Value is 0 if not used. |
| Object Code | Variable                                                                                   |
| Data Type   | UNSIGNED32                                                                                 |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | μs         |

**1008h: Manufacturer Device Name (CAN only)****Object Description**

|             |                                       |
|-------------|---------------------------------------|
| Index       | 1008                                  |
| Description | Device name assigned by manufacturer. |
| Object Code | Variable                              |
| Data Type   | VISIBLE_STRING                        |

**Entry Description**

|               |                    |
|---------------|--------------------|
| Access        | Constant           |
| PDO Mapping   | No                 |
| Default Value | Hardware-dependent |
| Lower Limit   | -                  |
| Upper Limit   | -                  |
| Unit          | -                  |

**1009h: Manufacturer Hardware Version (CAN only)****Object Description**

|             |                                          |
|-------------|------------------------------------------|
| Index       | 1009                                     |
| Description | Device version assigned by manufacturer. |
| Object Code | Variable                                 |
| Data Type   | VISIBLE_STRING                           |

**Entry Description**

|               |                    |
|---------------|--------------------|
| Access        | Constant           |
| PDO Mapping   | No                 |
| Default Value | Hardware-dependent |
| Lower Limit   | -                  |
| Upper Limit   | -                  |
| Unit          | -                  |

**100Ah: Manufacturer Software Version (CAN only)****Object Description**

|             |                                                   |
|-------------|---------------------------------------------------|
| Index       | 100A                                              |
| Description | The version number of the manufacturers software. |
| Object Code | Variable                                          |
| Data Type   | VISIBLE_STRING                                    |

**Entry Description**

|               |                    |
|---------------|--------------------|
| Access        | Constant           |
| PDO Mapping   | No                 |
| Default Value | Hardware-dependent |
| Lower Limit   | -                  |
| Upper Limit   | -                  |
| Unit          | -                  |

**100Ch: Guard Time (CAN only)****Object Description**

|             |                                                             |
|-------------|-------------------------------------------------------------|
| Index       | 100C                                                        |
| Description | The guard time, in milliseconds.<br>Value is 0 if not used. |
| Object Code | Variable                                                    |
| Data Type   | UNSIGNED16                                                  |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | ms         |

**100Dh: Life Time Factor (CAN only)****Object Description**

|             |                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------|
| Index       | 100D                                                                                                               |
| Description | The life time factor multiplied with the guard time gives the life time for the device.<br>Value is 0 if not used. |
| Object Code | Variable                                                                                                           |
| Data Type   | UNSIGNED8                                                                                                          |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xFF       |
| Unit          | -          |

## 1010h: Store Parameter Field

### Object Description

|             |                                                                                                                                                                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1010                                                                                                                                                                                                                                                          |
| Description | <a href="#">VarCom - SAVE</a><br>Controls the saving of parameters in non-volatile memory.<br>Writing 65766173h (ASCII value of "save") to the sub-index saves the parameters.<br>Several parameter groups are distinguished.<br>Sub-index 1 - All parameters |
| Object Code | Array                                                                                                                                                                                                                                                         |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                    |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x01              |
| Lower Limit    | 0x01              |
| Upper Limit    | 0x01              |
| Unit           | -                 |

|                |                     |
|----------------|---------------------|
| Sub-Index      | 001                 |
| Description    | Save All Parameters |
| Entry Category | Optional            |
| Data Type      | UNSIGNED32          |
| Access         | Read/Write          |
| PDO Mapping    | No                  |
| Default Value  | 0x00000000          |
| Lower Limit    | 0x00000000          |
| Upper Limit    | 0xFFFFFFFF          |
| Unit           | -                   |

**1011h: Restore Default Parameters (CAN only)****Object Description**

|             |                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1011                                                                                                                                                                                                                                                                                                                                                                                  |
| Description | <a href="#">VarCom - LOAD</a><br>Loads the default values of parameters.<br>Writing 64616F6Ch (ASCII value of "load") to the sub-index restores the parameters.<br>Several parameter groups are distinguished.<br>Sub-index 1 - All parameters<br>Sub-index 2 - Communication parameters<br>Sub-index 3 - Application parameters<br>Sub-index 4-127 - Manufacturer defined parameters |
| Object Code | Array                                                                                                                                                                                                                                                                                                                                                                                 |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                                                                                            |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x01              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x7F              |
| Unit           | -                 |

|                |                                |
|----------------|--------------------------------|
| Sub-Index      | 001                            |
| Description    | Restore All Default Parameters |
| Entry Category | Optional                       |
| Data Type      | UNSIGNED32                     |
| Access         | Read/Write                     |
| PDO Mapping    | No                             |
| Default Value  | 0x00000000                     |
| Lower Limit    | 0x00000000                     |
| Upper Limit    | 0xFFFFFFFF                     |
| Unit           | -                              |

**1014h: COB-ID EMCY (CAN only)****Object Description**

|             |                                                    |
|-------------|----------------------------------------------------|
| Index       | 1014                                               |
| Description | Defines the COB ID of the Emergency object (EMCY). |
| Object Code | Variable                                           |
| Data Type   | UNSIGNED32                                         |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000080 |
| Lower Limit   | 0x00000001 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

**1015h: Inhibit Time Emergency (CAN only)****Object Description**

|             |                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------|
| Index       | 1015                                                                                               |
| Description | The inhibit time used for emergency message (Emergency Server).<br>Defined in multiples of 100 ms. |
| Object Code | Variable                                                                                           |
| Data Type   | UNSIGNED16                                                                                         |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | ms         |

## 1016h: Heartbeat Consumer Entries (CAN only)

### Object Description

|             |                                                                                                                                                                                                                                                                                                                               |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1016                                                                                                                                                                                                                                                                                                                          |
| Description | The consumer heartbeat time defines the expected heartbeat cycle time and thus has to be higher than the corresponding producer heartbeat time configured on the device producing this heartbeat.<br>bits 31 - 24 of each sub-index must be 0.<br>bits 23 - 16 contain the node ID.<br>bits 15 - 0 contain the heartbeat time |
| Object Code | Array                                                                                                                                                                                                                                                                                                                         |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                                    |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x01              |
| Upper Limit    | 0x7F              |
| Unit           | -                 |

|                |                           |
|----------------|---------------------------|
| Sub-Index      | 001                       |
| Description    | Consumer Heartbeat Time 1 |
| Entry Category | Optional                  |
| Data Type      | UNSIGNED32                |
| Access         | Read/Write                |
| PDO Mapping    | No                        |
| Default Value  | 0x00000000                |
| Lower Limit    | 0x00000000                |
| Upper Limit    | 0x02FFFFFF                |
| Unit           | -                         |

|                       |                           |
|-----------------------|---------------------------|
| <b>Sub-Index</b>      | 002                       |
| <b>Description</b>    | Consumer Heartbeat Time 2 |
| <b>Entry Category</b> | Optional                  |
| <b>Data Type</b>      | UNSIGNED32                |
| <b>Access</b>         | Read/Write                |
| <b>PDO Mapping</b>    | No                        |
| <b>Default Value</b>  | 0x00000000                |
| <b>Lower Limit</b>    | 0x00000000                |
| <b>Upper Limit</b>    | 0x02FFFFFF                |
| <b>Unit</b>           | -                         |

|                       |                           |
|-----------------------|---------------------------|
| <b>Sub-Index</b>      | 003                       |
| <b>Description</b>    | Consumer Heartbeat Time 3 |
| <b>Entry Category</b> | Optional                  |
| <b>Data Type</b>      | UNSIGNED32                |
| <b>Access</b>         | Read/Write                |
| <b>PDO Mapping</b>    | No                        |
| <b>Default Value</b>  | 0x00000000                |
| <b>Lower Limit</b>    | 0x00000000                |
| <b>Upper Limit</b>    | 0x02FFFFFF                |
| <b>Unit</b>           | -                         |

**1017h: Producer Heartbeat Time (CAN only)****Object Description**

|             |                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1017                                                                                                                                   |
| Description | Defines the cycle time of the heartbeat, which must be a multiple of 1 millisecond. It is 0 if not used. Defined in multiples of 1 ms. |
| Object Code | Variable                                                                                                                               |
| Data Type   | UNSIGNED16                                                                                                                             |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | ms         |

## 1018h: Identity Object

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1018                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Description | <p>Contains general information about the device.</p> <p>Sub-index 1 - Contains a unique value allocated each manufacturer.</p> <p>Sub-index 2 - Identifies the manufacturer specific product code (device version).</p> <p>Sub-index 3 - Contains the revision number.</p> <p>    bit 31-16: major revision number</p> <p>    bit 15-0: minor revision number.</p> <p>Sub-index 4 - Identifies a manufacturer specific serial number.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Mandatory         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x04              |
| Lower Limit    | 0x01              |
| Upper Limit    | 0x04              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Vendor ID  |
| Entry Category | Mandatory  |
| Data Type      | UNSIGNED32 |
| Access         | Read Only  |
| PDO Mapping    | No         |
| Default Value  | 0x000002E1 |
| Lower Limit    | 0x00000000 |
| Upper Limit    | 0xFFFFFFFF |
| Unit           | -          |

|                       |                                                                                           |
|-----------------------|-------------------------------------------------------------------------------------------|
| <b>Sub-Index</b>      | 002                                                                                       |
| <b>Description</b>    | Product Code                                                                              |
| <b>Entry Category</b> | Optional                                                                                  |
| <b>Data Type</b>      | UNSIGNED32                                                                                |
| <b>Access</b>         | Read Only                                                                                 |
| <b>PDO Mapping</b>    | No                                                                                        |
| <b>Default Value</b>  | 0x000002AF = drive model AF<br>0x000002EC = drive model EC<br>0x000002EB = drive model EB |
| <b>Lower Limit</b>    | 0x00000000                                                                                |
| <b>Upper Limit</b>    | 0xFFFFFFFF                                                                                |
| <b>Unit</b>           | -                                                                                         |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 003             |
| <b>Description</b>    | Revision Number |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read Only       |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |               |
|-----------------------|---------------|
| <b>Sub-Index</b>      | 004           |
| <b>Description</b>    | Serial Number |
| <b>Entry Category</b> | Optional      |
| <b>Data Type</b>      | UNSIGNED32    |
| <b>Access</b>         | Read Only     |
| <b>PDO Mapping</b>    | No            |
| <b>Default Value</b>  | 0x00000000    |
| <b>Lower Limit</b>    | 0x00000000    |
| <b>Upper Limit</b>    | 0xFFFFFFFF    |
| <b>Unit</b>           | -             |

**1019h: Synchronous Counter Overflow Value (CAN only)****Object Description**

|             |                                                                                                                                                                                                                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1019                                                                                                                                                                                                                                                                                          |
| Description | Defines whether a counter is mapped into the SYNC message, and the highest possible value of the counter.<br>0 - SYNC message transmitted with length 0<br>1 - Reserved<br>2..240 - SYNC message transmitted with length 1, first data byte contains the counter value<br>241..255 - Reserved |
| Object Code | Variable                                                                                                                                                                                                                                                                                      |
| Data Type   | UNSIGNED8                                                                                                                                                                                                                                                                                     |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xF0       |
| Unit          | -          |

**1029h: Error Behavior (CAN only)****Object Description**

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1029                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Description | <p>Sub-index 000 - contains the number of error classes.</p> <p>Sub-index 001 - contains the error class for a communication error.</p> <p>Sub-indices 001 to 254 - contain device profile or manufacturer specific error classes.</p> <p>Possible values of an error class:</p> <p>0 = Pre-operational</p> <p>1 = No state change</p> <p>2 = Stopped</p> <p>3 .. 127 = Reserved</p> <p>128 = Ignore CAN interface bus-off condition</p> |
| Object Code | Array                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Data Type   | UNSIGNED8                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Mandatory         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x01              |
| Lower Limit    | 0x01              |
| Upper Limit    | 0xFE              |
| Unit           | -                 |

|                |                     |
|----------------|---------------------|
| Sub-Index      | 001                 |
| Description    | Communication Error |
| Entry Category | Mandatory           |
| Data Type      | UNSIGNED8           |
| Access         | Read/Write          |
| PDO Mapping    | No                  |
| Default Value  | 0x00                |
| Lower Limit    | 0x00                |
| Upper Limit    | 0x7F                |
| Unit           | -                   |

**1200h: Server SDO Parameter 1 (CAN only)****Object Description**

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| Index       | 1200                                                                     |
| Description | Contains the parameters for the SDOs for which the device is the server. |
| Object Code | Record                                                                   |
| Data Type   | Manufacturer-specific, varies by sub-index.                              |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                |                         |
|----------------|-------------------------|
| Sub-Index      | 001                     |
| Description    | COB-ID Client -> Server |
| Entry Category | Mandatory               |
| Data Type      | UNSIGNED32              |
| Access         | Read Only               |
| PDO Mapping    | No                      |
| Default Value  | 0x00000600              |
| Lower Limit    | 0x00000600              |
| Upper Limit    | 0xBFFFFFFF              |
| Unit           | -                       |

|                |                         |
|----------------|-------------------------|
| Sub-Index      | 002                     |
| Description    | COB-ID Server -> Client |
| Entry Category | Mandatory               |
| Data Type      | UNSIGNED32              |
| Access         | Read Only               |
| PDO Mapping    | No                      |
| Default Value  | 0x00000580              |
| Lower Limit    | 0x00000580              |
| Upper Limit    | 0xBFFFFFFF              |
| Unit           | -                       |

## 1201h: Server SDO Parameter 2 (CAN only)

### Object Description

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| Index       | 1201                                                                     |
| Description | Contains the parameters for the SDOs for which the device is the server. |
| Object Code | Record                                                                   |
| Data Type   | Manufacturer-specific, varies by sub-index.                              |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x03              |
| Unit           | -                 |

|                       |                         |
|-----------------------|-------------------------|
| <b>Sub-Index</b>      | 001                     |
| <b>Description</b>    | COB-ID Client -> Server |
| <b>Entry Category</b> | Mandatory               |
| <b>Data Type</b>      | UNSIGNED32              |
| <b>Access</b>         | Read/Write              |
| <b>PDO Mapping</b>    | No                      |
| <b>Default Value</b>  | 0x80000000              |
| <b>Lower Limit</b>    | 0x00000001              |
| <b>Upper Limit</b>    | 0xFFFFFFFF              |
| <b>Unit</b>           | -                       |

|                       |                         |
|-----------------------|-------------------------|
| <b>Sub-Index</b>      | 002                     |
| <b>Description</b>    | COB-ID Server -> Client |
| <b>Entry Category</b> | Mandatory               |
| <b>Data Type</b>      | UNSIGNED32              |
| <b>Access</b>         | Read/Write              |
| <b>PDO Mapping</b>    | No                      |
| <b>Default Value</b>  | 0x80000000              |
| <b>Lower Limit</b>    | 0x00000001              |
| <b>Upper Limit</b>    | 0xFFFFFFFF              |
| <b>Unit</b>           | -                       |

|                       |                           |
|-----------------------|---------------------------|
| <b>Sub-Index</b>      | 003                       |
| <b>Description</b>    | Node ID of the SDO Client |
| <b>Entry Category</b> | Optional                  |
| <b>Data Type</b>      | UNSIGNED8                 |
| <b>Access</b>         | Read/Write                |
| <b>PDO Mapping</b>    | No                        |
| <b>Default Value</b>  | 0x00                      |
| <b>Lower Limit</b>    | 0x00                      |
| <b>Upper Limit</b>    | 0x7F                      |
| <b>Unit</b>           | -                         |

## 1400h: Receive PDO Communication Parameter 1 (CAN only)

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1400                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description | Contains the communication parameters of the current PDO the device is able to receive.<br>Sub-index 0 - Defines the number of PDO parameters implemented.<br>Sub-index 1 - Defines the COB ID. If bit 31 is set, the PDO is disabled.<br>Sub-index 2 - Defines the transmission type.<br>Sub-index 3 - Defines the inhibit time, in 100 microseconds.<br>Sub-index 4 - Define an event time for asynchronous PDOs. |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                              |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                         |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x2               |
| Upper Limit    | 0x5               |
| Unit           | -                 |
| Sub-Index      | 001               |
| Description    | COB-ID            |
| Entry Category | Optional          |
| Data Type      | UNSIGNED32        |
| Access         | Read/Write        |
| PDO Mapping    | No                |
| Default Value  | 0x00000200        |
| Lower Limit    | 0x00000001        |
| Upper Limit    | 0xFFFFFFFF        |
| Unit           | -                 |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 002               |
| <b>Description</b>    | Transmission Type |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED8         |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0xFF              |
| <b>Lower Limit</b>    | 0x0               |
| <b>Upper Limit</b>    | 0xFF              |
| <b>Unit</b>           | -                 |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 003          |
| <b>Description</b>    | Inhibit Time |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED16   |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x0000       |
| <b>Lower Limit</b>    | 0x0000       |
| <b>Upper Limit</b>    | 0xFFFF       |
| <b>Unit</b>           | 100 $\mu$ s  |

## 1401h: Receive PDO Communication Parameter 2 (CAN only)

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1401                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description | Contains the communication parameters of the current PDO the device is able to receive.<br>Sub-index 0 - Defines the number of PDO parameters implemented.<br>Sub-index 1 - Defines the COB ID. If bit 31 is set, the PDO is disabled.<br>Sub-index 2 - Defines the transmission type.<br>Sub-index 3 - Defines the inhibit time, in 100 microseconds.<br>Sub-index 4 - Define an event time for asynchronous PDOs. |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                              |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                         |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x05              |
| Unit           | -                 |
| Sub-Index      | 001               |
| Description    | COB-ID            |
| Entry Category | Optional          |
| Data Type      | UNSIGNED32        |
| Access         | Read/Write        |
| PDO Mapping    | No                |
| Default Value  | 0x00000300        |
| Lower Limit    | 0x00000001        |
| Upper Limit    | 0xFFFFFFFF        |
| Unit           | -                 |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 002               |
| <b>Description</b>    | Transmission Type |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED8         |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x01              |
| <b>Lower Limit</b>    | 0x00              |
| <b>Upper Limit</b>    | 0xFF              |
| <b>Unit</b>           | -                 |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 003          |
| <b>Description</b>    | Inhibit Time |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED16   |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x0000       |
| <b>Lower Limit</b>    | 0x0000       |
| <b>Upper Limit</b>    | 0xFFFF       |
| <b>Unit</b>           | 100 $\mu$ s  |

**1402h: Receive PDO Communication Parameter 3 (CAN only)****Object Description**

|             |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1402                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description | Contains the communication parameters of the current PDO the device is able to receive.<br>Sub-index 0 - Defines the number of PDO parameters implemented.<br>Sub-index 1 - Defines the COB ID. If bit 31 is set, the PDO is disabled.<br>Sub-index 2 - Defines the transmission type.<br>Sub-index 3 - Defines the inhibit time, in 100 microseconds.<br>Sub-index 4 - Define an event time for asynchronous PDOs. |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                              |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                         |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x05              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | COB-ID     |
| Entry Category | Optional   |
| Data Type      | UNSIGNED32 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x00000400 |
| Lower Limit    | 0x00000001 |
| Upper Limit    | 0xFFFFFFFF |
| Unit           | -          |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 002               |
| <b>Description</b>    | Transmission Type |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED8         |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x01              |
| <b>Lower Limit</b>    | 0x00              |
| <b>Upper Limit</b>    | 0xFF              |
| <b>Unit</b>           | -                 |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 003          |
| <b>Description</b>    | Inhibit Time |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED16   |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x0000       |
| <b>Lower Limit</b>    | 0x0000       |
| <b>Upper Limit</b>    | 0xFFFF       |
| <b>Unit</b>           | 100 $\mu$ s  |

**1403h: Receive PDO Communication Parameter 4 (CAN only)****Object Description**

|             |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1403                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description | Contains the communication parameters of the current PDO the device is able to receive.<br>Sub-index 0 - Defines the number of PDO parameters implemented.<br>Sub-index 1 - Defines the COB ID. If bit 31 is set, the PDO is disabled.<br>Sub-index 2 - Defines the transmission type.<br>Sub-index 3 - Defines the inhibit time, in 100 microseconds.<br>Sub-index 4 - Define an event time for asynchronous PDOs. |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                              |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                         |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x05              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | COB-ID     |
| Entry Category | Optional   |
| Data Type      | UNSIGNED32 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x00000500 |
| Lower Limit    | 0x00000001 |
| Upper Limit    | 0xFFFFFFFF |
| Unit           | -          |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 002               |
| <b>Description</b>    | Transmission Type |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED8         |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x01              |
| <b>Lower Limit</b>    | 0x00              |
| <b>Upper Limit</b>    | 0xFF              |
| <b>Unit</b>           | -                 |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 003          |
| <b>Description</b>    | Inhibit Time |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED16   |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x0000       |
| <b>Lower Limit</b>    | 0x0000       |
| <b>Upper Limit</b>    | 0xFFFF       |
| <b>Unit</b>           | 100 µs       |

## 1600h: Receive PDO Mapping Parameter 1

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Description | <p>Contains the mapping for the PDOs the device is able to receive.</p> <p>Sub-index 0 - Defines the number of valid entries in the mapping record. This number of entries is also the number of the application variables that are received with the corresponding PDO.</p> <p>Sub-index 1 to [<i>number of entries</i>] - Contain information about the mapped application variables. These entries describe the PDO contents by their index (16 bit), sub-index (8 bit) and length (8 bit).</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Mandatory         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                |                 |
|----------------|-----------------|
| Sub-Index      | 001             |
| Description    | Mapping Entry 1 |
| Entry Category | Optional        |
| Data Type      | UNSIGNED32      |
| Access         | Read/Write      |
| PDO Mapping    | No              |
| Default Value  | 0x60400010      |
| Lower Limit    | 0x00000000      |
| Upper Limit    | 0xFFFFFFFF      |
| Unit           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 002             |
| <b>Description</b>    | Mapping Entry 2 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x60600008      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 003             |
| <b>Description</b>    | Mapping Entry 3 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 004             |
| <b>Description</b>    | Mapping Entry 4 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 005             |
| <b>Description</b>    | Mapping Entry 5 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 006             |
| <b>Description</b>    | Mapping Entry 6 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

## 1601h: Receive PDO Mapping Parameter 2

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1601                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Description | <p>Contains the mapping for the PDOs the device is able to receive.</p> <p>Sub-index 0 - Defines the number of valid entries in the mapping record. This number of entries is also the number of the application variables that are received with the corresponding PDO.</p> <p>Sub-index 1 to [<i>number of entries</i>] - Contain information about the mapped application variables. These entries describe the PDO contents by their index (16 bit), sub-index (8 bit) and length (8 bit).</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Mandatory         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                |                 |
|----------------|-----------------|
| Sub-Index      | 001             |
| Description    | Mapping Entry 1 |
| Entry Category | Optional        |
| Data Type      | UNSIGNED32      |
| Access         | Read/Write      |
| PDO Mapping    | No              |
| Default Value  | 0x60400010      |
| Lower Limit    | 0x00000000      |
| Upper Limit    | 0xFFFFFFFF      |
| Unit           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 002             |
| <b>Description</b>    | Mapping Entry 2 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x60600008      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 003             |
| <b>Description</b>    | Mapping Entry 3 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 004             |
| <b>Description</b>    | Mapping Entry 4 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 005             |
| <b>Description</b>    | Mapping Entry 5 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 006             |
| <b>Description</b>    | Mapping Entry 6 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

## 1602h: Receive PDO Mapping Parameter 3

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1602                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Description | <p>Contains the mapping for the PDOs the device is able to receive.</p> <p>Sub-index 0 - Defines the number of valid entries in the mapping record. This number of entries is also the number of the application variables that are received with the corresponding PDO.</p> <p>Sub-index 1 to [number of entries] - Contain information about the mapped application variables. These entries describe the PDO contents by their index (16 bit), sub-index (8 bit) and length (8 bit).</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Mandatory         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x01              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                |                 |
|----------------|-----------------|
| Sub-Index      | 001             |
| Description    | Mapping Entry 1 |
| Entry Category | Optional        |
| Data Type      | UNSIGNED32      |
| Access         | Read/Write      |
| PDO Mapping    | No              |
| Default Value  | 0x60FE0120      |
| Lower Limit    | 0x00000000      |
| Upper Limit    | 0xFFFFFFFF      |
| Unit           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 002             |
| <b>Description</b>    | Mapping Entry 2 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 003             |
| <b>Description</b>    | Mapping Entry 3 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 004             |
| <b>Description</b>    | Mapping Entry 4 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 005             |
| <b>Description</b>    | Mapping Entry 5 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 006             |
| <b>Description</b>    | Mapping Entry 6 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

## 1603h: Receive PDO Mapping Parameter 4

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1603                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Description | <p>Contains the mapping for the PDOs the device is able to receive.</p> <p>Sub-index 0 - Defines the number of valid entries in the mapping record. This number of entries is also the number of the application variables that are received with the corresponding PDO.</p> <p>Sub-index 1 to [number of entries] - Contain information about the mapped application variables. These entries describe the PDO contents by their index (16 bit), sub-index (8 bit) and length (8 bit).</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Mandatory         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                |                 |
|----------------|-----------------|
| Sub-Index      | 001             |
| Description    | Mapping Entry 1 |
| Entry Category | Optional        |
| Data Type      | UNSIGNED32      |
| Access         | Read/Write      |
| PDO Mapping    | No              |
| Default Value  | 0x60710010      |
| Lower Limit    | 0x00000000      |
| Upper Limit    | 0xFFFFFFFF      |
| Unit           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 002             |
| <b>Description</b>    | Mapping Entry 2 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x60B20010      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 003             |
| <b>Description</b>    | Mapping Entry 3 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x60600008      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 004             |
| <b>Description</b>    | Mapping Entry 4 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 005             |
| <b>Description</b>    | Mapping Entry 5 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 006             |
| <b>Description</b>    | Mapping Entry 6 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

## 1800h: Transmit PDO Communication Parameter 1

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Description | <p>Contains the communication parameters of the current PDO the device is able to transmit.</p> <p>Sub-index 0 - Defines the number of PDO parameters implemented.</p> <p>Sub-index 1 - Describes the COB ID. If bit 31 is set, the PDO is disabled.</p> <p>Sub-index 2 - Defines the transmission type.</p> <p>Sub-index 3 - Defines the inhibit time.</p> <p>Sub-index 4 - Reserved</p> <p>Sub-index 5 - Defines the event time, in 100 microseconds</p> <p>Sub-index 6 - Defines the SYNC start value.</p> <p>Start value 0 = SYNC message has no data content.</p> <p>Start value 1 to 240 = SYNC message has 1 byte data.</p> <p>This data byte is considered a counter value. The SYNC message whose counter value equals the SYNC start value is considered the first received SYNC message.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x05              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | COB-ID     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000180 |
| <b>Lower Limit</b>    | 0x00000001 |
| <b>Upper Limit</b>    | 0xFFFFFFFF |
| <b>Unit</b>           | -          |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 002               |
| <b>Description</b>    | Transmission Type |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED8         |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x01              |
| <b>Lower Limit</b>    | 0x00              |
| <b>Upper Limit</b>    | 0xFF              |
| <b>Unit</b>           | -                 |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 003          |
| <b>Description</b>    | Inhibit Time |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED16   |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x0000       |
| <b>Lower Limit</b>    | 0x0000       |
| <b>Upper Limit</b>    | 0xFFFF       |
| <b>Unit</b>           | 100 µs       |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 004                 |
| <b>Description</b>    | Compatibility Entry |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED8           |
| <b>Access</b>         | Read/Write          |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x00                |
| <b>Lower Limit</b>    | 0x00                |
| <b>Upper Limit</b>    | 0xFF                |
| <b>Unit</b>           | -                   |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 005         |
| <b>Description</b>    | Event Timer |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | UNSIGNED16  |
| <b>Access</b>         | Read/Write  |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x0000      |
| <b>Lower Limit</b>    | 0x0000      |
| <b>Upper Limit</b>    | 0xFFFF      |
| <b>Unit</b>           | ms          |

## 1801h: Transmit PDO Communication Parameter 2

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1801                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Description | <p>Contains the communication parameters of the current PDO the device is able to transmit.</p> <p>Sub-index 0 - Defines the number of PDO parameters implemented.</p> <p>Sub-index 1 - Describes the COB ID. If bit 31 is set, the PDO is disabled.</p> <p>Sub-index 2 - Defines the transmission type.</p> <p>Sub-index 3 - Defines the inhibit time.</p> <p>Sub-index 4 - Reserved</p> <p>Sub-index 5 - Defines the event time, in 100 microseconds</p> <p>Sub-index 6 - Defines the SYNC start value.</p> <p>Start value 0 = SYNC message has no data content.</p> <p>Start value 1 to 240 = SYNC message has 1 byte data. This data byte is considered a counter value. The SYNC message whose counter value equals the SYNC start value is considered the first received SYNC message.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x05              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | COB-ID     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000280 |
| <b>Lower Limit</b>    | 0x00000001 |
| <b>Upper Limit</b>    | 0xFFFFFFFF |
| <b>Unit</b>           | -          |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 002               |
| <b>Description</b>    | Transmission Type |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED8         |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x01              |
| <b>Lower Limit</b>    | 0x00              |
| <b>Upper Limit</b>    | 0xFF              |
| <b>Unit</b>           | -                 |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 003          |
| <b>Description</b>    | Inhibit Time |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED16   |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x0000       |
| <b>Lower Limit</b>    | 0x0000       |
| <b>Upper Limit</b>    | 0xFFFF       |
| <b>Unit</b>           | 100 µs       |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 004                 |
| <b>Description</b>    | Compatibility Entry |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED8           |
| <b>Access</b>         | Read/Write          |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x00                |
| <b>Lower Limit</b>    | 0x00                |
| <b>Upper Limit</b>    | 0xFF                |
| <b>Unit</b>           | -                   |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 005         |
| <b>Description</b>    | Event Timer |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | UNSIGNED16  |
| <b>Access</b>         | Read/Write  |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x0000      |
| <b>Lower Limit</b>    | 0x0000      |
| <b>Upper Limit</b>    | 0xFFFF      |
| <b>Unit</b>           | ms          |

## 1802h: Transmit PDO Communication Parameter 3

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1802                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Description | <p>Contains the communication parameters of the current PDO the device is able to transmit.</p> <p>Sub-index 0 - Defines the number of PDO parameters implemented.</p> <p>Sub-index 1 - Describes the COB ID. If bit 31 is set, the PDO is disabled.</p> <p>Sub-index 2 - Defines the transmission type.</p> <p>Sub-index 3 - Defines the inhibit time.</p> <p>Sub-index 4 - Reserved</p> <p>Sub-index 5 - Defines the event time, in 100 microseconds</p> <p>Sub-index 6 - Defines the SYNC start value.</p> <p>Start value 0 = SYNC message has no data content.</p> <p>Start value 1 to 240 = SYNC message has 1 byte data. This data byte is considered a counter value. The SYNC message whose counter value equals the SYNC start value is considered the first received SYNC message.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x05              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | COB-ID     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000380 |
| <b>Lower Limit</b>    | 0x00000001 |
| <b>Upper Limit</b>    | 0xFFFFFFFF |
| <b>Unit</b>           | -          |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 002               |
| <b>Description</b>    | Transmission Type |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED8         |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x01              |
| <b>Lower Limit</b>    | 0x00              |
| <b>Upper Limit</b>    | 0xFF              |
| <b>Unit</b>           | -                 |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 003          |
| <b>Description</b>    | Inhibit Time |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED16   |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x0000       |
| <b>Lower Limit</b>    | 0x0000       |
| <b>Upper Limit</b>    | 0xFFFF       |
| <b>Unit</b>           | 100 µs       |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 004                 |
| <b>Description</b>    | Compatibility Entry |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED8           |
| <b>Access</b>         | Read/Write          |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x00                |
| <b>Lower Limit</b>    | 0x00                |
| <b>Upper Limit</b>    | 0xFF                |
| <b>Unit</b>           | -                   |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 005         |
| <b>Description</b>    | Event Timer |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | UNSIGNED16  |
| <b>Access</b>         | Read/Write  |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x0000      |
| <b>Lower Limit</b>    | 0x0000      |
| <b>Upper Limit</b>    | 0xFFFF      |
| <b>Unit</b>           | ms          |

## 1803h: Transmit PDO Communication Parameter 4

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1803                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Description | <p>Contains the communication parameters of the current PDO the device is able to transmit.</p> <p>Sub-index 0 - Defines the number of PDO parameters implemented.</p> <p>Sub-index 1 - Describes the COB ID. If bit 31 is set, the PDO is disabled.</p> <p>Sub-index 2 - Defines the transmission type.</p> <p>Sub-index 3 - Defines the inhibit time.</p> <p>Sub-index 4 - Reserved</p> <p>Sub-index 5 - Defines the event time, in 100 microseconds</p> <p>Sub-index 6 - Defines the SYNC start value.</p> <p>Start value 0 = SYNC message has no data content.</p> <p>Start value 1 to 240 = SYNC message has 1 byte data. This data byte is considered a counter value. The SYNC message whose counter value equals the SYNC start value is considered the first received SYNC message.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x05              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | COB-ID     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000480 |
| <b>Lower Limit</b>    | 0x00000001 |
| <b>Upper Limit</b>    | 0xFFFFFFFF |
| <b>Unit</b>           | -          |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 002               |
| <b>Description</b>    | Transmission Type |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED8         |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x01              |
| <b>Lower Limit</b>    | 0x00              |
| <b>Upper Limit</b>    | 0xFF              |
| <b>Unit</b>           | -                 |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 003          |
| <b>Description</b>    | Inhibit Time |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED16   |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x0000       |
| <b>Lower Limit</b>    | 0x0000       |
| <b>Upper Limit</b>    | 0xFFFF       |
| <b>Unit</b>           | 100 µs       |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 004                 |
| <b>Description</b>    | Compatibility Entry |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED8           |
| <b>Access</b>         | Read/Write          |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x00                |
| <b>Lower Limit</b>    | 0x00                |
| <b>Upper Limit</b>    | 0xFF                |
| <b>Unit</b>           | -                   |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 005         |
| <b>Description</b>    | Event Timer |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | UNSIGNED16  |
| <b>Access</b>         | Read/Write  |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x0000      |
| <b>Lower Limit</b>    | 0x0000      |
| <b>Upper Limit</b>    | 0xFFFF      |
| <b>Unit</b>           | ms          |

## 1A00h: Transmit PDO Mapping Parameter 1

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1A00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Description | <p>Contains the mapping for the PDOs the device is able to transmit.</p> <p>The type of the PDO mapping parameter is at index 21h.</p> <p>Sub-index 0 - Defines the number of valid entries in the mapping record. This number of entries is also the number of the application variables that are transmitted with the corresponding PDO.</p> <p>Sub-indices 1 to [<i>number of entries</i>] - Contain information about the mapped application variables. These entries describe the PDO contents by their index, sub-index and length.</p> <p>This parameter can be used to verify the overall mapping length. It is mandatory.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Mandatory         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                |                                    |
|----------------|------------------------------------|
| Sub-Index      | 001                                |
| Description    | Mapping Entry 1                    |
| Entry Category | Optional                           |
| Data Type      | UNSIGNED32                         |
| Access         | Read/Write                         |
| PDO Mapping    | No                                 |
| Default Value  | CAN: 0x60410010<br>ECT: 0x60FD0020 |
| Lower Limit    | 0x00000000                         |
| Upper Limit    | 0xFFFFFFFF                         |
| Unit           | -                                  |

|                       |                                    |
|-----------------------|------------------------------------|
| <b>Sub-Index</b>      | 002                                |
| <b>Description</b>    | Mapping Entry 2                    |
| <b>Entry Category</b> | Optional                           |
| <b>Data Type</b>      | UNSIGNED32                         |
| <b>Access</b>         | Read/Write                         |
| <b>PDO Mapping</b>    | No                                 |
| <b>Default Value</b>  | CAN: 0x60610008<br>ECT: 0x60FD0020 |
| <b>Lower Limit</b>    | 0x00000000                         |
| <b>Upper Limit</b>    | 0xFFFFFFFF                         |
| <b>Unit</b>           | -                                  |

|                       |                                    |
|-----------------------|------------------------------------|
| <b>Sub-Index</b>      | 003                                |
| <b>Description</b>    | Mapping Entry 3                    |
| <b>Entry Category</b> | Optional                           |
| <b>Data Type</b>      | UNSIGNED32                         |
| <b>Access</b>         | Read/Write                         |
| <b>PDO Mapping</b>    | No                                 |
| <b>Default Value</b>  | CAN: 0x60770010<br>ECT: 0x60F40020 |
| <b>Lower Limit</b>    | 0x00000000                         |
| <b>Upper Limit</b>    | 0xFFFFFFFF                         |
| <b>Unit</b>           | -                                  |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 004             |
| <b>Description</b>    | Mapping Entry 4 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 005             |
| <b>Description</b>    | Mapping Entry 5 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 006             |
| <b>Description</b>    | Mapping Entry 6 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

## 1A01h: Transmit PDO Mapping Parameter 2

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1A01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Description | <p>Contains the mapping for the PDOs the device is able to transmit.</p> <p>The type of the PDO mapping parameter is at index 21h.</p> <p>Sub-index 0 - Defines the number of valid entries in the mapping record. This number of entries is also the number of the application variables that are transmitted with the corresponding PDO.</p> <p>Sub-indices 1 to [<i>number of entries</i>] - Contain information about the mapped application variables. These entries describe the PDO contents by their index, sub-index and length.</p> <p>This parameter can be used to verify the overall mapping length. It is mandatory.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Mandatory         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                |                 |
|----------------|-----------------|
| Sub-Index      | 001             |
| Description    | Mapping Entry 1 |
| Entry Category | Optional        |
| Data Type      | UNSIGNED32      |
| Access         | Read/Write      |
| PDO Mapping    | No              |
| Default Value  | 0x60640020      |
| Lower Limit    | 0x00000000      |
| Upper Limit    | 0xFFFFFFFF      |
| Unit           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 002             |
| <b>Description</b>    | Mapping Entry 2 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x606C0020      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 003             |
| <b>Description</b>    | Mapping Entry 3 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 004             |
| <b>Description</b>    | Mapping Entry 4 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 005             |
| <b>Description</b>    | Mapping Entry 5 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x0             |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 006             |
| <b>Description</b>    | Mapping Entry 6 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x0             |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

## 1A02h: Transmit PDO Mapping Parameter 3

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1A02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Description | <p>Contains the mapping for the PDOs the device is able to transmit.</p> <p>The type of the PDO mapping parameter is at index 21h.</p> <p>Sub-index 0 - Defines the number of valid entries in the mapping record. This number of entries is also the number of the application variables that are transmitted with the corresponding PDO.</p> <p>Sub-indices 1 to [<i>number of entries</i>] - Contain information about the mapped application variables. These entries describe the PDO contents by their index, sub-index and length.</p> <p>This parameter can be used to verify the overall mapping length. It is mandatory.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Mandatory         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                |                 |
|----------------|-----------------|
| Sub-Index      | 001             |
| Description    | Mapping Entry 1 |
| Entry Category | Optional        |
| Data Type      | UNSIGNED32      |
| Access         | Read/Write      |
| PDO Mapping    | No              |
| Default Value  | 0x60740010      |
| Lower Limit    | 0x00000000      |
| Upper Limit    | 0xFFFFFFFF      |
| Unit           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 002             |
| <b>Description</b>    | Mapping Entry 2 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x20F20010      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 003             |
| <b>Description</b>    | Mapping Entry 3 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 004             |
| <b>Description</b>    | Mapping Entry 4 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 005             |
| <b>Description</b>    | Mapping Entry 5 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 006             |
| <b>Description</b>    | Mapping Entry 6 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

## 1A03h: Transmit PDO Mapping Parameter 4

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1A03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Description | <p>Contains the mapping for the PDOs the device is able to transmit.</p> <p>The type of the PDO mapping parameter is at index 21h.</p> <p>Sub-index 0 - Defines the number of valid entries in the mapping record. This number of entries is also the number of the application variables that are transmitted with the corresponding PDO.</p> <p>Sub-indices 1 to [<i>number of entries</i>] - Contain information about the mapped application variables. These entries describe the PDO contents by their index, sub-index and length.</p> <p>This parameter can be used to verify the overall mapping length. It is mandatory.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### Entry Description

|                |                                |
|----------------|--------------------------------|
| Sub-Index      | 000                            |
| Description    | Number of Entries              |
| Entry Category | Mandatory                      |
| Access         | Read Only                      |
| PDO Mapping    | No                             |
| Default Value  | CAN:     0x03<br>ECT:     0x02 |
| Lower Limit    | 0x00                           |
| Upper Limit    | 0x06                           |
| Unit           | -                              |

|                       |                                    |
|-----------------------|------------------------------------|
| <b>Sub-Index</b>      | 001                                |
| <b>Description</b>    | Mapping Entry 1                    |
| <b>Entry Category</b> | Optional                           |
| <b>Data Type</b>      | UNSIGNED32                         |
| <b>Access</b>         | Read/Write                         |
| <b>PDO Mapping</b>    | No                                 |
| <b>Default Value</b>  | CAN: 0x60FD0020<br>ECT: 0x60410010 |
| <b>Lower Limit</b>    | 0x00000000                         |
| <b>Upper Limit</b>    | 0xFFFFFFFF                         |
| <b>Unit</b>           | -                                  |

|                       |                                    |
|-----------------------|------------------------------------|
| <b>Sub-Index</b>      | 002                                |
| <b>Description</b>    | Mapping Entry 2                    |
| <b>Entry Category</b> | Optional                           |
| <b>Data Type</b>      | UNSIGNED32                         |
| <b>Access</b>         | Read/Write                         |
| <b>PDO Mapping</b>    | No                                 |
| <b>Default Value</b>  | CAN: 0x20B60020<br>ECT: 0x60770010 |
| <b>Lower Limit</b>    | 0x00000000                         |
| <b>Upper Limit</b>    | 0xFFFFFFFF                         |
| <b>Unit</b>           | -                                  |

|                       |                                    |
|-----------------------|------------------------------------|
| <b>Sub-Index</b>      | 003                                |
| <b>Description</b>    | Mapping Entry 3                    |
| <b>Entry Category</b> | Optional                           |
| <b>Data Type</b>      | UNSIGNED32                         |
| <b>Access</b>         | Read/Write                         |
| <b>PDO Mapping</b>    | No                                 |
| <b>Default Value</b>  | CAN: 0x60F40020<br>ECT: 0x00000000 |
| <b>Lower Limit</b>    | 0x00000000                         |
| <b>Upper Limit</b>    | 0xFFFFFFFF                         |
| <b>Unit</b>           | -                                  |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 004             |
| <b>Description</b>    | Mapping Entry 4 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 005             |
| <b>Description</b>    | Mapping Entry 5 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 006             |
| <b>Description</b>    | Mapping Entry 6 |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED32      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x00000000      |
| <b>Lower Limit</b>    | 0x00000000      |
| <b>Upper Limit</b>    | 0xFFFFFFFF      |
| <b>Unit</b>           | -               |

**1C00h: Sync Manager Communication Type (ECT only)****Description**

|             |                                                                                                                                                                                                                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 1C00                                                                                                                                                                                                                                                                                                    |
| Description | Up to 32 sync manager types can be described. The first four sync manager types are fixed, and the remainder can be configured to one of the four types.<br>The default configuration is the following:<br>1 - Mailbox receive<br>2 - Mailbox send<br>3 - Process data output<br>4 - Process data input |
| Object Code | Array                                                                                                                                                                                                                                                                                                   |
| Data Type   | UNSIGNED8                                                                                                                                                                                                                                                                                               |

**Entry Description**

|               |                   |
|---------------|-------------------|
| Sub-Index     | 000               |
| Description   | Number of Entries |
| Access        | Read Only         |
| PDO Mapping   | no                |
| Default Value | 0x04              |
| Lower Limit   | 0x00              |
| Upper Limit   | 0x20              |
| Sub-Index     | 001               |
| Description   | Sub-Index 1       |
| Data Type     | UNSIGNED8         |
| Access        | Read Only         |
| PDO Mapping   | no                |
| Default Value | 0x01              |
| Lower Limit   | 0x00              |
| Upper Limit   | 0x04              |

|                      |             |
|----------------------|-------------|
| <b>Sub-Index</b>     | 002         |
| <b>Description</b>   | Sub-Index 2 |
| <b>Data Type</b>     | UNSIGNED8   |
| <b>Access</b>        | Read Only   |
| <b>PDO Mapping</b>   | no          |
| <b>Default Value</b> | 0x02        |
| <b>Lower Limit</b>   | 0x00        |
| <b>Upper Limit</b>   | 0x04        |

|                      |                               |
|----------------------|-------------------------------|
| <b>Sub-Index</b>     | 003                           |
| <b>Description</b>   | Sub-Index 3                   |
| <b>Data Type</b>     | UNSIGNED8                     |
| <b>Access</b>        | Read Only/Read Only/Read Only |
| <b>PDO Mapping</b>   | no                            |
| <b>Default Value</b> | 0x03                          |
| <b>Lower Limit</b>   | 0x00                          |
| <b>Upper Limit</b>   | 0x04                          |

|                      |             |
|----------------------|-------------|
| <b>Sub-Index</b>     | 004         |
| <b>Description</b>   | Sub-Index 4 |
| <b>Data Type</b>     | UNSIGNED8   |
| <b>Access</b>        | Read Only   |
| <b>PDO Mapping</b>   | no          |
| <b>Default Value</b> | 0x04        |
| <b>Lower Limit</b>   | 0x00        |
| <b>Upper Limit</b>   | 0x04        |

**1C10h: Sync Manager 0 PDO Assignment (ECT only)****Description**

|             |                                                                         |
|-------------|-------------------------------------------------------------------------|
| Index       | 1C10                                                                    |
| Description | Used to to assign PDOs to the Sync Managers starting at Sync Manager 2. |
| Object Code | Array                                                                   |
| Data Type   | UNSIGNED16                                                              |

**Entry Description**

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | no        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0x0000    |

**1C11h: Sync Manager 1 PDO Assignment (ECT only)****Description**

|             |                               |
|-------------|-------------------------------|
| Index       | 1C11                          |
| Description | Sync Manager 1 PDO Assignment |
| Object Code | Array                         |
| Data Type   | UNSIGNED16                    |

**Entry Description**

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | no        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0x0000    |

**1C12h: Sync Manager 2 PDO Assignment (ECT only)****Description**

|             |                               |
|-------------|-------------------------------|
| Index       | 1C12                          |
| Description | Sync Manager 2 PDO Assignment |
| Object Code | Array                         |
| Data Type   | UNSIGNED16                    |

**Entry Description**

|                      |                          |
|----------------------|--------------------------|
| <b>Sub-Index</b>     | 000                      |
| <b>Description</b>   | Number of Assigned RxPDO |
| <b>Access</b>        | Read/Write               |
| <b>PDO Mapping</b>   | no                       |
| <b>Default Value</b> | 0x0004                   |
| <b>Lower Limit</b>   | 0x0000                   |
| <b>Upper Limit</b>   | 0x0004                   |

|                      |             |
|----------------------|-------------|
| <b>Sub-Index</b>     | 001         |
| <b>Description</b>   | Sub-Index 1 |
| <b>Data Type</b>     | UNSIGNED16  |
| <b>Access</b>        | Read/Write  |
| <b>PDO Mapping</b>   | no          |
| <b>Default Value</b> | 0x1600      |
| <b>Lower Limit</b>   | 0x1600      |
| <b>Upper Limit</b>   | 0x17FF      |

|                      |             |
|----------------------|-------------|
| <b>Sub-Index</b>     | 002         |
| <b>Description</b>   | Sub-Index 2 |
| <b>Data Type</b>     | UNSIGNED16  |
| <b>Access</b>        | Read/Write  |
| <b>PDO Mapping</b>   | no          |
| <b>Default Value</b> | 0x1601      |
| <b>Lower Limit</b>   | 0x1600      |
| <b>Upper Limit</b>   | 0x17FF      |

|                      |             |
|----------------------|-------------|
| <b>Sub-Index</b>     | 003         |
| <b>Description</b>   | Sub-Index 3 |
| <b>Data Type</b>     | UNSIGNED16  |
| <b>Access</b>        | Read/Write  |
| <b>PDO Mapping</b>   | no          |
| <b>Default Value</b> | 0x1602      |
| <b>Lower Limit</b>   | 0x1600      |
| <b>Upper Limit</b>   | 0x17FF      |

|               |             |
|---------------|-------------|
| Sub-Index     | 004         |
| Description   | Sub-Index 4 |
| Data Type     | UNSIGNED16  |
| Access        | Read/Write  |
| PDO Mapping   | no          |
| Default Value | 0x1603      |
| Lower Limit   | 0x1600      |
| Upper Limit   | 0x17FF      |

### 1C13h: Sync Manager 3 PDO Assignment (ECT only)

#### Description

|             |                               |
|-------------|-------------------------------|
| Index       | 1C13                          |
| Description | Sync Manager 3 PDO Assignment |
| Object Code | Array                         |
| Data Type   | UNSIGNED16                    |

#### Entry Description

|               |                           |
|---------------|---------------------------|
| Sub-Index     | 000                       |
| Description   | Number of Assigned TxPDOs |
| Access        | Read/Write                |
| PDO Mapping   | no                        |
| Default Value | 0x0004                    |
| Lower Limit   | 0x0000                    |
| Upper Limit   | 0x00FF                    |

|               |                                  |
|---------------|----------------------------------|
| Sub-Index     | 001                              |
| Description   | Sub-Index 1                      |
| Data Type     | UNSIGNED16                       |
| Access        | Read/Write/Read/Write/Read/Write |
| PDO Mapping   | no                               |
| Default Value | 0x1A00                           |
| Lower Limit   | 0x1A00                           |
| Upper Limit   | 0x1BFF                           |

|                      |             |
|----------------------|-------------|
| <b>Sub-Index</b>     | 002         |
| <b>Description</b>   | Sub-Index 2 |
| <b>Data Type</b>     | UNSIGNED16  |
| <b>Access</b>        | Read/Write  |
| <b>PDO Mapping</b>   | no          |
| <b>Default Value</b> | 0x1A01      |
| <b>Lower Limit</b>   | 0x1A00      |
| <b>Upper Limit</b>   | 0x1BFF      |

|                      |             |
|----------------------|-------------|
| <b>Sub-Index</b>     | 003         |
| <b>Description</b>   | Sub-Index 3 |
| <b>Data Type</b>     | UNSIGNED16  |
| <b>Access</b>        | Read/Write  |
| <b>PDO Mapping</b>   | no          |
| <b>Default Value</b> | 0x1A02      |
| <b>Lower Limit</b>   | 0x1A00      |
| <b>Upper Limit</b>   | 0x1BFF      |

|                      |             |
|----------------------|-------------|
| <b>Sub-Index</b>     | 004         |
| <b>Description</b>   | Sub-Index 4 |
| <b>Data Type</b>     | UNSIGNED16  |
| <b>Access</b>        | Read/Write  |
| <b>PDO Mapping</b>   | no          |
| <b>Default Value</b> | 0x1A03      |
| <b>Lower Limit</b>   | 0x1A00      |
| <b>Upper Limit</b>   | 0x1BFF      |

## 9 Manufacturer-Specific Objects

### 2002h: Configuration Command

#### Object Description

|             |                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | <a href="#">VarCom - CONFIG</a><br>Performs a configuration sequence of the drive according to its internal parameters.<br>Write 01 to initiate the configuration command. |
| Description | Configuration Command                                                                                                                                                      |
| Object Code | Variable                                                                                                                                                                   |
| Data Type   | UNSIGNED8                                                                                                                                                                  |

#### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xFF       |
| Unit          | -          |

### 2003h: Current BEMF Compensation Gain

#### Object Description

|             |                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------|
| Index       | 2003                                                                                                |
| Description | <a href="#">VarCom - KCBEMF</a><br>The feedforward BEMF compensation ratio for the current control. |
| Object Code | Variable                                                                                            |
| Data Type   | REAL32                                                                                              |

#### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 1.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 2.0        |
| Unit          | -          |

**2006h: Current KI Gain****Object Description**

|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| Index       | 2006                                                                         |
| Description | <a href="#">VarCom - KCI</a><br>The current controller integrator (KI) gain. |
| Object Code | Variable                                                                     |
| Data Type   | REAL32                                                                       |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 1.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 100.0      |
| Unit          | -          |

**2007h: Current KP Gain****Object Description**

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 2007                                                                           |
| Description | <a href="#">VarCom - KCP</a><br>The current controller proportional (KP) gain. |
| Object Code | Variable                                                                       |
| Data Type   | REAL32                                                                         |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 1.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 100.0      |
| Unit          | -          |

## 200Ah: HD Anti-Vibration 2 Filter – Gain

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 200A                                                                                                           |
| Description | <a href="#">VarCom - NLANTIVIBGAIN2</a><br>The HD position control loop anti-vibration module 3 filter - gain. |
| Object Code | Variable                                                                                                       |
| Data Type   | REAL32                                                                                                         |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 1000.0     |
| Unit          | -          |

## 200Bh: HD Anti-Vibration 1 Filter - Sharpness

### Object Description

|             |                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------|
| Index       | 200B                                                                                                               |
| Description | <a href="#">VarCom - NLANTIVIBSHARP</a><br>The HD position control loop anti-vibration module 1 filter - sharpness |
| Object Code | Variable                                                                                                           |
| Data Type   | REAL32                                                                                                             |

### Entry Description

|               |                  |
|---------------|------------------|
| Access        | Read/Write       |
| PDO Mapping   | No               |
| Default Value | 0.5              |
| Lower Limit   | 0.00999999977648 |
| Upper Limit   | 10.0             |
| Unit          | -                |

## 200Ch: HD Anti-Vibration 1 Filter - Gain

### Object Description

|             |                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------|
| Index       | 200C                                                                                                          |
| Description | <a href="#">VarCom - NLANTIVIBGAIN</a><br>The HD position control loop anti-vibration module 1 filter - gain. |
| Object Code | Variable                                                                                                      |
| Data Type   | REAL32                                                                                                        |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0.0                     |
| Lower Limit   | 0.0                     |
| Upper Limit   | 10000.0                 |
| Unit          | Rad*10 <sup>-3</sup> /N |

## 200Eh: Automatic Homing Mode

### Object Description

|             |                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 200E                                                                                                                                                                            |
| Description | <a href="#">VarCom - AUTOHOME</a><br>The type of automatic homing to be performed on power up.<br>Possible values:<br>0 = No Homing<br>1 = Attempt once at power up. Fail once. |
| Object Code | Variable                                                                                                                                                                        |
| Data Type   | UNSIGNED16                                                                                                                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 200Fh: Fieldbus Unit Scaling

### Object Description

|             |                                                                                                                                                                              |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 200F                                                                                                                                                                         |
| Description | <a href="#">VarCom - FBSCALE</a><br>Fieldbus unit scaling for internal counts. Defines the number of bits of a 32-bit position that are equivalent to a number of revolution |
| Object Code | Variable                                                                                                                                                                     |
| Data Type   | UNSIGNED16                                                                                                                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x000C     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0014     |
| Unit          | -          |

## 2010h: Velocity Loop Bandwidth for Pole Placement

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 2010                                                                                                  |
| Description | <a href="#">VarCom - BW</a><br>The velocity control loop bandwidth for the pole placement controller. |
| Object Code | Variable                                                                                              |
| Data Type   | UNSIGNED16                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x001E     |
| Lower Limit   | 0x000A     |
| Upper Limit   | 0x0258     |
| Unit          | Hz         |

## 2011h: Warning Bits

### Object Description

|             |                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2011                                                                                                                                        |
| Description | Lists warnings, by bits. Warnings are 64 bits, split into two 32-bit segments.<br>Refer to the section Warning Messages in the User Manual. |
| Object Code | Array                                                                                                                                       |
| Data Type   | UNSIGNED32                                                                                                                                  |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Low Bits   |
| Entry Category | Optional   |
| Data Type      | UNSIGNED32 |
| Access         | Read Only  |
| PDO Mapping    | No         |
| Default Value  | 0x00000000 |
| Lower Limit    | 0x00000000 |
| Upper Limit    | 0xFFFFFFFF |
| Unit           | -          |

|                |            |
|----------------|------------|
| Sub-Index      | 002        |
| Description    | High Bits  |
| Entry Category | Optional   |
| Data Type      | UNSIGNED32 |
| Access         | Read Only  |
| PDO Mapping    | No         |
| Default Value  | 0x00000000 |
| Lower Limit    | 0x00000000 |
| Upper Limit    | 0xFFFFFFFF |
| Unit           | -          |

## 2013h: Voltage Command D Component

### Object Description

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 2013                                                                           |
| Description | <a href="#">VarCom - CLVD</a><br>Shows the D output of the current controller. |
| Object Code | Variable                                                                       |
| Data Type   | INTEGER16                                                                      |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x8000    |
| Upper Limit   | 0x7FFF    |
| Unit          | -         |

## 2014h: Voltage Command Q Component

### Object Description

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 2014                                                                           |
| Description | <a href="#">VarCom - CLVQ</a><br>Shows the Q output of the current controller. |
| Object Code | Variable                                                                       |
| Data Type   | INTEGER16                                                                      |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x8000    |
| Upper Limit   | 0x7FFF    |
| Unit          | -         |

## 2015h: Drive Name (CAN only)

### Object Description

|             |                                                                            |
|-------------|----------------------------------------------------------------------------|
| Index       | 2015                                                                       |
| Description | <a href="#">VarCom - DRIVENAME</a><br>The name assigned to the drive unit. |
| Object Code | Variable                                                                   |
| Data Type   | VISIBLE_STRING                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0          |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

## 2016h: Electrical Position

### Object Description

|             |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| Index       | 2016                                                                                       |
| Description | <a href="#">VarCom - ELECTANGLE</a><br>The electrical angle position in 16-bit resolution. |
| Object Code | Variable                                                                                   |
| Data Type   | UNSIGNED16                                                                                 |

### Entry Description

|               |                     |
|---------------|---------------------|
| Access        | Read Only           |
| PDO Mapping   | No                  |
| Default Value | 0x0000              |
| Lower Limit   | 0x0000              |
| Upper Limit   | 0xFFFF              |
| Unit          | 65536/(elect cycle) |

## 2017h: HD Derivative Gain

### Object Description

|             |                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2017                                                                                                                             |
| Description | <a href="#">VarCom - KNLD</a><br>The HD control equivalent of PID D. It is used in the HD control loop to reduce velocity error. |
| Object Code | Variable                                                                                                                         |
| Data Type   | REAL32                                                                                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 2000.0     |
| Unit          | Hz         |

## 2018h: HD Integral Gain

### Object Description

|             |                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2018                                                                                                                                  |
| Description | <a href="#">VarCom - KNLI</a><br>The HD control equivalent of PID I.<br>It is used in the HD control loop to reduce standstill error. |
| Object Code | Variable                                                                                                                              |
| Data Type   | REAL32                                                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 200.0      |
| Unit          | Hz         |

## 2019h: HD Derivative-Integral Gain

### Object Description

|             |                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2019                                                                                                                                                                                             |
| Description | <a href="#">VarCom - KNLIV</a><br>The HD control equivalent of PID D and I.<br>It is used in the HD control loop to reduce both error and steady state error and to increases control stiffness. |
| Object Code | Variable                                                                                                                                                                                         |
| Data Type   | REAL32                                                                                                                                                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 400.0      |
| Unit          | Hz         |

## 201Ah: HD Proportional Gain

### Object Description

|             |                                                                                                                                     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 201A                                                                                                                                |
| Description | <a href="#">VarCom - KNLP</a><br>The HD control equivalent of PID P.<br>It is used in the HD control loop to reduce position error. |
| Object Code | Variable                                                                                                                            |
| Data Type   | REAL32                                                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 400.0      |
| Unit          | Hz         |

## 201Bh: HD Global Gain

### Object Description

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| Index       | 201B                                                                     |
| Description | <a href="#">VarCom - KNLUSERGAIN</a><br>HD adaptive gain scaling factor. |
| Object Code | Variable                                                                 |
| Data Type   | REAL32                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.5        |
| Lower Limit   | 0.1        |
| Upper Limit   | 3.0        |
| Unit          | -          |

## 201Ch: Position Acceleration Feedforward to Current

### Object Description

|             |                                                                                           |
|-------------|-------------------------------------------------------------------------------------------|
| Index       | 201C                                                                                      |
| Description | <a href="#">VarCom - KPAFRC</a><br>The position acceleration feedforward to current loop. |
| Object Code | Variable                                                                                  |
| Data Type   | REAL32                                                                                    |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | -1000.0    |
| Upper Limit   | 1000.0     |
| Unit          | -          |

## 201Dh: Position Acceleration Feedforward

### Object Description

|             |                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------|
| Index       | 201D                                                                                                |
| Description | <a href="#">VarCom - KPAFRV</a><br>The acceleration feedforward for the linear position controller. |
| Object Code | Variable                                                                                            |
| Data Type   | REAL32                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | -1000.0    |
| Upper Limit   | 1000.0     |
| Unit          | -          |

## 201Eh: Position Derivative Gain

### Object Description

|             |                                                                               |
|-------------|-------------------------------------------------------------------------------|
| Index       | 201E                                                                          |
| Description | <a href="#">VarCom - KPD</a><br>The position controller derivative (KD) gain. |
| Object Code | Variable                                                                      |
| Data Type   | REAL32                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 1000.0     |
| Unit          | -          |

## 201Fh: Position Proportional Adaptive Gain

### Object Description

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| Index       | 201F                                                                     |
| Description | <a href="#">VarCom - KPE</a><br>The position proportional adaptive gain. |
| Object Code | Variable                                                                 |
| Data Type   | REAL32                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 4.0        |
| Unit          | -          |

## 2020h: Position Integral Gain

### Object Description

|             |                                                                        |
|-------------|------------------------------------------------------------------------|
| Index       | 2020                                                                   |
| Description | <a href="#">VarCom - KPI</a><br>The position controller integral gain. |
| Object Code | Variable                                                               |
| Data Type   | REAL32                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 1000.0     |
| Unit          | Hz         |

## 2021h: Position Integral Saturation Output

### Object Description

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 2021                                                                           |
| Description | <a href="#">VarCom - KPISATOUT</a><br>The position integral output saturation. |
| Object Code | Variable                                                                       |
| Data Type   | UNSIGNED32                                                                     |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x00000000              |
| Upper Limit   | 0xFFFFFFFF              |
| Unit          | CAN user velocity units |

## 2022h: Position Proportional Gain

### Object Description

|             |                                                                                           |
|-------------|-------------------------------------------------------------------------------------------|
| Index       | 2022                                                                                      |
| Description | <a href="#">VarCom - KPP</a><br>The proportional gain for the linear position controller. |
| Object Code | Variable                                                                                  |
| Data Type   | REAL32                                                                                    |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 1.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 1200.0     |
| Unit          | -          |

## 2023h: Position Velocity Feedforward

### Object Description

|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| Index       | 2023                                                                         |
| Description | <a href="#">VarCom - KPVFR</a><br>The position control velocity feedforward. |
| Object Code | Variable                                                                     |
| Data Type   | REAL32                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | -1000.0    |
| Upper Limit   | 1000.0     |
| Unit          | -          |

## 2024h: Motor Type

### Object Description

|             |                                                          |
|-------------|----------------------------------------------------------|
| Index       | 2024                                                     |
| Description | <a href="#">VarCom - MOTORTYPE</a><br>The type of motor. |
| Object Code | Variable                                                 |
| Data Type   | UNSIGNED8                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x2        |
| Unit          | -          |

## 2025h: Velocity Feedforward Ratio

### Object Description

|             |                                                                 |
|-------------|-----------------------------------------------------------------|
| Index       | 2025                                                            |
| Description | <a href="#">VarCom - KVFR</a><br>The velocity feedforward ratio |
| Object Code | Variable                                                        |
| Data Type   | REAL32                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 1.0        |
| Unit          | -          |

## 2026h: Velocity Integral Gain

### Object Description

|             |                                                             |
|-------------|-------------------------------------------------------------|
| Index       | 2026                                                        |
| Description | <a href="#">VarCom - KVI</a><br>The velocity integral gain. |
| Object Code | Variable                                                    |
| Data Type   | REAL32                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 200000.0   |
| Unit          | Hz         |

## 2027h: Velocity Proportional Gain

### Object Description

|             |                                                                 |
|-------------|-----------------------------------------------------------------|
| Index       | 2027                                                            |
| Description | <a href="#">VarCom - KVP</a><br>The velocity proportional gain. |
| Object Code | Variable                                                        |
| Data Type   | REAL32                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 1000000.0  |
| Unit          | -          |

## 2028h: Mechanical Angle

### Object Description

|             |                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------|
| Index       | 2028                                                                                          |
| Description | <a href="#">VarCom - MECHANGLE</a><br>The actual position of the motor within one revolution. |
| Object Code | Variable                                                                                      |
| Data Type   | UNSIGNED16                                                                                    |

### Entry Description

|               |             |
|---------------|-------------|
| Access        | Read Only   |
| PDO Mapping   | No          |
| Default Value | 0x0000      |
| Lower Limit   | 0x8000      |
| Upper Limit   | 0x7FFF      |
| Unit          | 65536/Cycle |

## 2029h: Motor Encoder Type

### Object Description

|             |                                                                 |
|-------------|-----------------------------------------------------------------|
| Index       | 2029                                                            |
| Description | <a href="#">VarCom - MENCTYPE</a><br>The type of motor encoder. |
| Object Code | Variable                                                        |
| Data Type   | UNSIGNED16                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x000B     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x000B     |
| Unit          | -          |

## 202Ah: Motor Encoder Index Position (CAN only)

### Object Description

|             |                                                                  |
|-------------|------------------------------------------------------------------|
| Index       | 202A                                                             |
| Description | <a href="#">VarCom – MENCZPOS</a><br>The encoder index position. |
| Object Code | Variable                                                         |
| Data Type   | UNSIGNED16                                                       |

### Entry Description

|               |                   |
|---------------|-------------------|
| Access        | Read/Write        |
| PDO Mapping   | No                |
| Default Value | 0x0078            |
| Lower Limit   | 0x0000            |
| Upper Limit   | 0x0167            |
| Unit          | electrical degree |

## 202Bh: Motor and Feedback Direction

### Object Description

|             |                                                                                          |
|-------------|------------------------------------------------------------------------------------------|
| Index       | 202B                                                                                     |
| Description | <a href="#">VarCom - MFBDIR</a><br>The direction and polarity of the motor and feedback. |
| Object Code | Variable                                                                                 |
| Data Type   | UNSIGNED16                                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x07       |
| Unit          | -          |

## 202Ch: Position Command Move Low Pass Filter

### Object Description

|             |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| Index       | 202C                                                                                       |
| Description | <a href="#">VarCom - MOVESMOOTHLPFHZ</a><br>The low pass filter for position command move. |
| Object Code | Variable                                                                                   |
| Data Type   | INTEGER16                                                                                  |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x1388     |
| Lower Limit   | 0x000A     |
| Upper Limit   | 0x1388     |
| Unit          | -          |

## 202Dh: Motor Feedback Mode

### Object Description

|             |                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------|
| Index       | 202D                                                                                                                |
| Description | <a href="#">VarCom - MFBMODE</a><br>Enables/disables the resolution enhancement mechanism for incremental encoders. |
| Object Code | Variable                                                                                                            |
| Data Type   | UNSIGNED16                                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x01       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x01       |
| Unit          | -          |

## 202Eh: Motor Foldback Status

### Object Description

|             |                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------|
| Index       | 202E                                                                                                                           |
| Description | <a href="#">VarCom - MFOLD</a><br>Indicates whether the motor foldback limit has dropped below the application current limits. |
| Object Code | Variable                                                                                                                       |
| Data Type   | UNSIGNED16                                                                                                                     |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x8000    |
| Upper Limit   | 0x7FFF    |
| Unit          | -         |

## 202Fh: Motor Foldback Delay Time

### Object Description

|             |                                                                                                                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 202F                                                                                                                                                                                                  |
| Description | <a href="#">VarCom - MFOLDD</a><br>Motor foldback delay time. This is the amount of time the system current can exceed Motor Continuous Current (6075h) before the drive enters motor foldback state. |
| Object Code | Variable                                                                                                                                                                                              |
| Data Type   | REAL32                                                                                                                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 5.0        |
| Lower Limit   | 1.0        |
| Upper Limit   | 2400.0     |
| Unit          | second     |

## 2030h: Motor Foldback Disable

### Object Description

|             |                                                                                 |
|-------------|---------------------------------------------------------------------------------|
| Index       | 2030                                                                            |
| Description | <a href="#">VarCom - MFOLDDIS</a><br>Enables/disables motor foldback protection |
| Object Code | Variable                                                                        |
| Data Type   | UNSIGNED16                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 2031h: Motor Foldback Recovery Time

### Object Description

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| Index       | 2031                                                                     |
| Description | <a href="#">VarCom - MFOLDR</a><br>The recovery time for motor foldback. |
| Object Code | Variable                                                                 |
| Data Type   | REAL32                                                                   |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 70.0      |
| Lower Limit   | 5.0       |
| Upper Limit   | 3600.0    |
| Unit          | second    |

## 2032h: Motor Foldback Time Constant

### Object Description

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| Index       | 2032                                                                     |
| Description | <a href="#">VarCom - MFOLDT</a><br>The time constant for motor foldback. |
| Object Code | Variable                                                                 |
| Data Type   | REAL32                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 5.0        |
| Lower Limit   | 1.0        |
| Upper Limit   | 1200.0     |
| Unit          | second     |

## 2033h: Motor Foldback Current

### Object Description

|             |                                                                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2033                                                                                                                                                                                                 |
| Description | <a href="#">VarCom - MIFOLD</a><br>The current limit derived from the motor foldback mechanism. Foldback condition occurs when Motor Foldback Current (2033h) goes below User Current Limit (6072h). |
| Object Code | Variable                                                                                                                                                                                             |
| Data Type   | UNSIGNED32                                                                                                                                                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | mA         |

## 2034h: Motor Foldback Fault Threshold

### Object Description

|             |                                                                               |
|-------------|-------------------------------------------------------------------------------|
| Index       | 2034                                                                          |
| Description | <a href="#">VarCom - MIFOLDFTHRESH</a><br>The motor foldback fault threshold. |
| Object Code | Variable                                                                      |
| Data Type   | UNSIGNED32                                                                    |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | mA         |

## 2035h: Motor Foldback Warning Threshold

### Object Description

|             |                                                                                 |
|-------------|---------------------------------------------------------------------------------|
| Index       | 2035                                                                            |
| Description | <a href="#">VarCom - MIFOLDWTHRESH</a><br>The motor foldback warning threshold. |
| Object Code | Variable                                                                        |
| Data Type   | UNSIGNED32                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | mA         |

## 2036h: Motor Peak Current

### Object Description

|             |                                                                         |
|-------------|-------------------------------------------------------------------------|
| Index       | 2036                                                                    |
| Description | <a href="#">VarCom - MIPEAK</a><br>The peak rated current of the motor. |
| Object Code | Variable                                                                |
| Data Type   | UNSIGNED32                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | mA         |

## 2037h: Rotor Inertia

### Object Description

|             |                                                                     |
|-------------|---------------------------------------------------------------------|
| Index       | 2037                                                                |
| Description | <a href="#">VarCom - MJ</a><br>The rotor inertia of a rotary motor. |
| Object Code | Variable                                                            |
| Data Type   | REAL32                                                              |

### Entry Description

|               |                                     |
|---------------|-------------------------------------|
| Access        | Read/Write                          |
| PDO Mapping   | No                                  |
| Default Value | 0.02                                |
| Lower Limit   | 0.0                                 |
| Upper Limit   | 2000000.0                           |
| Unit          | kg-m <sup>2</sup> ×10 <sup>-3</sup> |

## 2038h: Force Constant for Linear Motor

### Object Description

|             |                                                                             |
|-------------|-----------------------------------------------------------------------------|
| Index       | 2038                                                                        |
| Description | <a href="#">VarCom - MKF</a><br>The motor force constant for linear motors. |
| Object Code | Variable                                                                    |
| Data Type   | REAL32                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.016      |
| Lower Limit   | 0.001      |
| Upper Limit   | 1000.0     |
| Unit          | -          |

## 2039h: Torque Constant

### Object Description

|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| Index       | 2039                                                                         |
| Description | <a href="#">VarCom - MKT</a><br>The motor torque constant for rotary motors. |
| Object Code | Variable                                                                     |
| Data Type   | REAL32                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.016      |
| Lower Limit   | 0.001      |
| Upper Limit   | 65.0       |
| Unit          | -          |

## 203Ah: Motor Inductance

### Object Description

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Index       | 203A                                                                      |
| Description | <a href="#">VarCom - ML</a><br>The motor minimum line-to-line inductance. |
| Object Code | Variable                                                                  |
| Data Type   | REAL32                                                                    |

### Entry Description

|               |                 |
|---------------|-----------------|
| Access        | Read/Write      |
| PDO Mapping   | No              |
| Default Value | 0.0             |
| Lower Limit   | 0.0010000000475 |
| Upper Limit   | 1000.0          |
| Unit          | mHz             |

## 203Bh: Adaptive Gain at Continuous Motor Current

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 203B                                                                                                  |
| Description | <a href="#">VarCom - MLGAINC</a><br>The current loop adaptive gain value at continuous motor current. |
| Object Code | Variable                                                                                              |
| Data Type   | REAL32                                                                                                |

### Entry Description

|               |               |
|---------------|---------------|
| Access        | Read/Write    |
| PDO Mapping   | No            |
| Default Value | 1.0           |
| Lower Limit   | 0.10000000149 |
| Upper Limit   | 1.0           |
| Unit          | -             |

## 203Ch: Adaptive Gain at Peak Motor Current

### Object Description

|             |                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------|
| Index       | 203C                                                                                            |
| Description | <a href="#">VarCom - MLGAINP</a><br>The current loop adaptive gain value at peak motor current. |
| Object Code | Variable                                                                                        |
| Data Type   | REAL32                                                                                          |

### Entry Description

|               |               |
|---------------|---------------|
| Access        | Read/Write    |
| PDO Mapping   | No            |
| Default Value | 1.0           |
| Lower Limit   | 0.10000000149 |
| Upper Limit   | 1.0           |
| Unit          | -             |

## 203Dh: Mass of Linear Motor Without Load

### Object Description

|             |                                                                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 203D                                                                                                                                                                 |
| Description | <a href="#">VarCom - MMASS</a><br>The mass of the linear motor carriage without any additional payload. It is used as the base for estimating the total moving mass. |
| Object Code | Variable                                                                                                                                                             |
| Data Type   | REAL32                                                                                                                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 10000.0    |
| Unit          | kg         |

## 203Eh: Motor Commutation Type

### Object Description

|             |                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------|
| Index       | 203E                                                                                          |
| Description | <a href="#">VarCom - MOTORCOMMTYPE</a><br>The type of motor commutation - brushless or brush. |
| Object Code | Variable                                                                                      |
| Data Type   | UNSIGNED16                                                                                    |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 203Fh: Motor Name

### Object Description

|             |                                                                       |
|-------------|-----------------------------------------------------------------------|
| Index       | 203F                                                                  |
| Description | <a href="#">VarCom - MOTORNAME</a><br>The name assigned to the motor. |
| Object Code | Variable                                                              |
| Data Type   | VISIBLE_STRING                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0          |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

## 2041h: Motor Setup

### Object Description

|             |                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2041                                                                                                                                  |
| Description | <a href="#">VarCom - MOTORSETUP</a><br>Runs an automatic procedure for setting commutation related variables.<br>Write 1 to activate. |
| Object Code | Variable                                                                                                                              |
| Data Type   | INTEGER8                                                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x01       |
| Unit          | -          |

## 2042h: Motor Setup Status

### Object Description

|             |                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------|
| Index       | 2042                                                                                                                 |
| Description | <a href="#">VarCom - MOTORSETUPST</a><br>Indicates the status of the automatic motor setup procedure (object 2041h). |
| Object Code | Variable                                                                                                             |
| Data Type   | UNSIGNED32                                                                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 2043h: Commutation Offset

### Object Description

|             |                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2043                                                                                                                                            |
| Description | <a href="#">VarCom - MPHASE</a><br>The feedback phase relative to the standard commutation table. It is used to compensate for feedback offset. |
| Object Code | Variable                                                                                                                                        |
| Data Type   | UNSIGNED16                                                                                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0167     |
| Unit          | degree     |

## 2044h: Drive Temperature

### Object Description

|             |                                                                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2044                                                                                                                                                                                                             |
| Description | <a href="#">VarCom - DRIVETEMP</a><br>The drive temperature in Celsius degrees.<br>Sub-index 1 - Control board temperature.<br>Sub-index 2 - Power board temperature.<br>Sub-index 3 - Power module temperature. |
| Object Code | Array                                                                                                                                                                                                            |
| Data Type   | INTEGER16                                                                                                                                                                                                        |

### Entry Description

|                |                     |
|----------------|---------------------|
| Sub-Index      | 000                 |
| Description    | Number of Entries   |
| Entry Category | Optional            |
| Access         | Read Only           |
| PDO Mapping    | No                  |
| Default Value  | 0x0003              |
| Lower Limit    | 0x0000              |
| Upper Limit    | 0x0003              |
| Unit           | -                   |
|                |                     |
| Sub-Index      | 001                 |
| Description    | Control Temperature |
| Entry Category | Optional            |
| Data Type      | INTEGER16           |
| Access         | Read Only           |
| PDO Mapping    | No                  |
| Default Value  | 0x0000              |
| Lower Limit    | 0x8000              |
| Upper Limit    | 0x7FFF              |
| Unit           | Celcius degree      |

|                |                   |
|----------------|-------------------|
| Sub-Index      | 002               |
| Description    | Power Temperature |
| Entry Category | Optional          |
| Data Type      | INTEGER16         |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x0000            |
| Lower Limit    | 0x8000            |
| Upper Limit    | 0x7FFF            |
| Unit           | Celcius degree    |

|                |                          |
|----------------|--------------------------|
| Sub-Index      | 003                      |
| Description    | Power Module Temperature |
| Entry Category | Optional                 |
| Data Type      | INTEGER16                |
| Access         | Read Only                |
| PDO Mapping    | No                       |
| Default Value  | 0x0000                   |
| Lower Limit    | 0x8000                   |
| Upper Limit    | 0x7FFF                   |
| Unit           | Celcius degree           |

## 2045h: Feedback Direction

### Object Description

|             |                                                              |
|-------------|--------------------------------------------------------------|
| Index       | 2045                                                         |
| Description | <a href="#">VarCom - DIR</a><br>Feedback positive direction. |
| Object Code | Variable                                                     |
| Data Type   | UNSIGNED16                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 2046h: Disabling Mode

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 2046                                                                                                  |
| Description | <a href="#">VarCom - DISMODE</a><br>Defines if and how Disabling mode is used for stopping the motor. |
| Object Code | Variable                                                                                              |
| Data Type   | UNSIGNED16                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0005     |
| Unit          | -          |

## 2049h: Quick Stop Deceleration Time

### Object Description

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Index       | 2049                                                                                                   |
| Description | <a href="#">VarCom - DECSTOPTIME</a><br>The deceleration rate for an Active Disable or emergency stop. |
| Object Code | Variable                                                                                               |
| Data Type   | UNSIGNED16                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x1964     |
| Unit          | ms         |

## 204Ah: Active Disable Speed Threshold

### Object Description

|             |                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 204A                                                                                                                                                                  |
| Description | <a href="#">VarCom - DISSPEED</a><br>The velocity threshold below which the motor is considered stopped and the Active Disable timer starts the countdown to disable. |
| Object Code | Variable                                                                                                                                                              |
| Data Type   | UNSIGNED32                                                                                                                                                            |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x00000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user velocity units |

## 204Bh: Active Disable Time

### Object Description

|             |                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 204B                                                                                                                                                                                   |
| Description | <a href="#">VarCom - DISTIME</a><br>The time to wait after motor speed goes below Active Disable Speed Threshold (0204Ah) before the drive is disabled by the Active Disable function. |
| Object Code | Variable                                                                                                                                                                               |
| Data Type   | UNSIGNED16                                                                                                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x000A     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x1964     |
| Unit          | ms         |

## 204Ch: Factory Restore

### Object Description

|             |                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 204C                                                                                                                                                      |
| Description | <a href="#">VarCom - FACTORYRESTORE</a><br>Restores all configuration variables to factory default settings.<br>Write 01 to initiate the factory restore. |
| Object Code | Variable                                                                                                                                                  |
| Data Type   | UNSIGNED8                                                                                                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xFF       |
| Unit          | -          |

## 204Dh: Feedback Type

### Object Description

|             |                                                                      |
|-------------|----------------------------------------------------------------------|
| Index       | 204D                                                                 |
| Description | <a href="#">VarCom - FEEDBACKTYPE</a><br>The type of motor feedback. |
| Object Code | Variable                                                             |
| Data Type   | UNSIGNED16                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0002     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0015     |
| Unit          | -          |

## 204Eh: Velocity Loop Output Filter Parameter 1

### Object Description

|             |                                                                                  |
|-------------|----------------------------------------------------------------------------------|
| Index       | 204E                                                                             |
| Description | <a href="#">VarCom - FILTHZ1</a><br>Velocity loop output filter first parameter. |
| Object Code | Variable                                                                         |
| Data Type   | UNSIGNED16                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00C8     |
| Lower Limit   | 0x0001     |
| Upper Limit   | 0x2710     |
| Unit          | Hz         |

## 204Fh: Velocity Loop Output Filter Parameter 2

### Object Description

|             |                                                                                   |
|-------------|-----------------------------------------------------------------------------------|
| Index       | 204F                                                                              |
| Description | <a href="#">VarCom - FILTHZ2</a><br>Velocity loop output filter second parameter. |
| Object Code | Variable                                                                          |
| Data Type   | UNSIGNED16                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00C8     |
| Lower Limit   | 0x0001     |
| Upper Limit   | 0x2710     |
| Unit          | Hz         |

## 2050h: Velocity Loop Output Filter Mode

### Object Description

|             |                                                                               |
|-------------|-------------------------------------------------------------------------------|
| Index       | 2050                                                                          |
| Description | <a href="#">VarCom - FILTMODE</a><br>Defines the velocity loop output filter. |
| Object Code | Variable                                                                      |
| Data Type   | UNSIGNED8                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x07       |
| Unit          | -          |

## 2051h: Foldback Status

### Object Description

|             |                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2051                                                                                                                                 |
| Description | <a href="#">VarCom - FOLD</a><br>Indicates whether the Drive Foldback Limit (2069h) has dropped below the User Current Limit (6073h) |
| Object Code | Variable                                                                                                                             |
| Data Type   | UNSIGNED16                                                                                                                           |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0xFFFF    |
| Unit          | -         |

## 2052h: Friction Compensation Negative Current

### Object Description

|             |                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2052                                                                                                                                                             |
| Description | <a href="#">VarCom - FRICINEG</a><br>The current added to the current command when commanded velocity is negative.<br>Limited by the Drive Peak Current (207Bh). |
| Object Code | Variable                                                                                                                                                         |
| Data Type   | INTEGER32                                                                                                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

## 2053h: Friction Compensation Positive Current

### Object Description

|             |                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2053                                                                                                                                                             |
| Description | <a href="#">VarCom - FRICIPOS</a><br>The current added to the current command when commanded velocity is positive.<br>Limited by the Drive Peak Current (207Bh). |
| Object Code | Variable                                                                                                                                                         |
| Data Type   | INTEGER32                                                                                                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

## 2054h: Friction Compensation Negative Velocity Hysteresis

### Object Description

|             |                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2054                                                                                                                              |
| Description | <a href="#">VarCom - FRICNVHYST</a><br>The velocity hysteresis in the negative direction for the friction compensation mechanism. |
| Object Code | Variable                                                                                                                          |
| Data Type   | INTEGER32                                                                                                                         |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user velocity units |

## 2055h: Friction Compensation Positive Velocity Hysteresis

### Object Description

|             |                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2055                                                                                                                              |
| Description | <a href="#">VarCom - FRICPVHYST</a><br>The velocity hysteresis in the positive direction for the friction compensation mechanism. |
| Object Code | Variable                                                                                                                          |
| Data Type   | INTEGER32                                                                                                                         |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user velocity units |

## 2056h: Halls State

### Object Description

|             |                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2056                                                                                                                                                 |
| Description | <a href="#">VarCom - HALLS</a><br>The state of the Hall commutation sensors.<br>Sub-index 1 - Hall U<br>Sub-index 2 - Hall V<br>Sub-index 3 - Hall W |
| Object Code | Array                                                                                                                                                |
| Data Type   | UNSIGNED8                                                                                                                                            |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x03              |
| Unit           | -                 |

|                |           |
|----------------|-----------|
| Sub-Index      | 001       |
| Description    | Hall U    |
| Entry Category | Optional  |
| Data Type      | UNSIGNED8 |
| Access         | Read Only |
| PDO Mapping    | No        |
| Default Value  | 0x0       |
| Lower Limit    | 0x0       |
| Upper Limit    | 0x1       |
| Unit           | -         |

|                       |           |
|-----------------------|-----------|
| <b>Sub-Index</b>      | 002       |
| <b>Description</b>    | Hall V    |
| <b>Entry Category</b> | Optional  |
| <b>Data Type</b>      | UNSIGNED8 |
| <b>Access</b>         | Read Only |
| <b>PDO Mapping</b>    | No        |
| <b>Default Value</b>  | 0x0       |
| <b>Lower Limit</b>    | 0x0       |
| <b>Upper Limit</b>    | 0x1       |
| <b>Unit</b>           | -         |

|                       |           |
|-----------------------|-----------|
| <b>Sub-Index</b>      | 003       |
| <b>Description</b>    | Hall W    |
| <b>Entry Category</b> | Optional  |
| <b>Data Type</b>      | UNSIGNED8 |
| <b>Access</b>         | Read Only |
| <b>PDO Mapping</b>    | No        |
| <b>Default Value</b>  | 0x0       |
| <b>Lower Limit</b>    | 0x0       |
| <b>Upper Limit</b>    | 0x1       |
| <b>Unit</b>           | -         |

## 2057h: Invert Hall Signals

### Object Description

|             |                                                                                                                                                                                                                                            |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2057                                                                                                                                                                                                                                       |
| Description | <a href="#">VarCom - HALLSINV</a><br>Inverts the polarity of the Hall signals associated with motor phases UVW.<br>Sub-index 1, value 1 = inverts Hall U<br>Sub-index 2, value 1 = inverts Hall V<br>Sub-index 3, value 1 = inverts Hall W |
| Object Code | Array                                                                                                                                                                                                                                      |
| Data Type   | UNSIGNED8                                                                                                                                                                                                                                  |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x03              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Hall U     |
| Entry Category | Optional   |
| Data Type      | UNSIGNED8  |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x00       |
| Lower Limit    | 0x00       |
| Upper Limit    | 0x01       |
| Unit           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | Hall V     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED8  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00       |
| <b>Lower Limit</b>    | 0x00       |
| <b>Upper Limit</b>    | 0x01       |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | Hall W     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED8  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00       |
| <b>Lower Limit</b>    | 0x00       |
| <b>Upper Limit</b>    | 0x01       |
| <b>Unit</b>           | -          |

## 2058h: Hall Signals Type

### Object Description

|             |                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2058                                                                                                                                      |
| Description | <a href="#">VarCom - HALLSTYPE</a><br>The source and method used for connecting Hall sensors to the drive - single-ended or differential. |
| Object Code | Variable                                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0002     |
| Unit          | -          |

## 205Ah: Harmonic Correction Feedback Parameter 1

### Object Description

|             |                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------|
| Index       | 205A                                                                                                                  |
| Description | Harmonic feedback correction parameter 1.<br>Write 01 to the Config sub-index to perform the parameter configuration. |
| Object Code | Array                                                                                                                 |
| Data Type   | UNSIGNED32                                                                                                            |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x04              |
| Lower Limit    | 0x04              |
| Upper Limit    | 0x04              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | Config     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x00000000 |
| <b>Upper Limit</b>    | 0xFFFFFFFF |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | Argument_1 |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x00000000 |
| <b>Upper Limit</b>    | 0x00000028 |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | Argument_2 |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x00000167 |
| <b>Upper Limit</b>    | 0x00000000 |
| <b>Unit</b>           | -          |

|                |                         |
|----------------|-------------------------|
| Sub-Index      | 004                     |
| Description    | Argument_3              |
| Entry Category | Optional                |
| Data Type      | UNSIGNED32              |
| Access         | Read/Write              |
| PDO Mapping    | No                      |
| Default Value  | 0x00000000              |
| Lower Limit    | 0x00000000              |
| Upper Limit    | 0xFFFFFFFF              |
| Unit           | CAN user position units |

## 205Bh: Harmonic Correction Feedback Parameter 2

### Object Description

|             |                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------|
| Index       | 205B                                                                                                                  |
| Description | Harmonic feedback correction parameter 2.<br>Write 01 to the Config sub-index to perform the parameter configuration. |
| Object Code | Array                                                                                                                 |
| Data Type   | UNSIGNED32                                                                                                            |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x04              |
| Lower Limit    | 0x04              |
| Upper Limit    | 0x04              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | Config     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x00000000 |
| <b>Upper Limit</b>    | 0xFFFFFFFF |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | Argument_1 |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x00000000 |
| <b>Upper Limit</b>    | 0x00000028 |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | Argument_2 |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED32 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x00000000 |
| <b>Upper Limit</b>    | 0x00000167 |
| <b>Unit</b>           | -          |

|                |                         |
|----------------|-------------------------|
| Sub-Index      | 004                     |
| Description    | Argument_3              |
| Entry Category | Optional                |
| Data Type      | UNSIGNED32              |
| Access         | Read/Write              |
| PDO Mapping    | No                      |
| Default Value  | 0x00000000              |
| Lower Limit    | 0x00000000              |
| Upper Limit    | 0xFFFFFFFF              |
| Unit           | CAN user position units |

## 205Dh: Harmonic Current ICMD Parameter 1

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 205D                                                                                                           |
| Description | Harmonic current ICMD parameter 1.<br>Write 01 to the Config sub-index to perform the parameter configuration. |
| Object Code | Record                                                                                                         |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                    |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x04              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x04              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | Config     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED8  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00       |
| <b>Lower Limit</b>    | 0x00       |
| <b>Upper Limit</b>    | 0xFF       |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | Argument_1 |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x0000     |
| <b>Upper Limit</b>    | 0x0028     |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | Argument_2 |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x0000     |
| <b>Upper Limit</b>    | 0x0167     |
| <b>Unit</b>           | -          |

|                |            |
|----------------|------------|
| Sub-Index      | 004        |
| Description    | Argument_3 |
| Entry Category | Optional   |
| Data Type      | REAL32     |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0.0        |
| Lower Limit    | 0.0        |
| Upper Limit    | 0.0        |
| Unit           | -          |

## 205Eh: Harmonic Current ICMD Parameter 2

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 205E                                                                                                           |
| Description | Harmonic current ICMD parameter 2.<br>Write 01 to the Config sub-index to perform the parameter configuration. |
| Object Code | Record                                                                                                         |
| Data Type   | Manufacturer-specific, varies by sub-index                                                                     |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x04              |
| Lower Limit    | 0x04              |
| Upper Limit    | 0x04              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | Config     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED8  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00       |
| <b>Lower Limit</b>    | 0x00       |
| <b>Upper Limit</b>    | 0xFF       |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | Argument_1 |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x0000     |
| <b>Upper Limit</b>    | 0x0028     |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | Argument_2 |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x0000     |
| <b>Upper Limit</b>    | 0x0167     |
| <b>Unit</b>           | -          |

|                |            |
|----------------|------------|
| Sub-Index      | 004        |
| Description    | Argument_3 |
| Entry Category | Optional   |
| Data Type      | REAL32     |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0.0        |
| Lower Limit    | 0.0        |
| Upper Limit    | 0.0        |
| Unit           | -          |

## 2060h: HD Current Filter - Damping

### Object Description

|             |                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2060                                                                                                                                      |
| Description | <a href="#">VarCom - NLFILTDAMPING</a><br>Used in the HD control loop to maintain the bandwidth of the filter up to the cutoff frequency. |
| Object Code | Variable                                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0064     |
| Unit          | percentage |

**2061h: HD Current Filter - Notch Filter Center****Object Description**

|             |                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2061                                                                                                                                      |
| Description | <a href="#">VarCom - NLNOTCHCENTER</a><br>Used in the HD control loop to maintain the bandwidth of the filter up to the cutoff frequency. |
| Object Code | Variable                                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                                |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0064     |
| Lower Limit   | 0x0064     |
| Upper Limit   | 0x2710     |
| Unit          | Hz         |

**2062h: HD Current Filter - Notch Filter Bandwidth****Object Description**

|             |                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2062                                                                                                                                                     |
| Description | <a href="#">VarCom - NLNOTCHBW</a><br>Used in the HD control loop to define the width (sharpness) of a high frequency that is causing system vibrations. |
| Object Code | Variable                                                                                                                                                 |
| Data Type   | UNSIGNED16                                                                                                                                               |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x01F4     |
| Unit          | Hz         |

## 2063h: Hold Position Command

### Object Description

|             |                                                                                                                                     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2063                                                                                                                                |
| Description | <a href="#">VarCom - HOLD</a><br>Instructs motor whether to maintain its position.<br>0 = Do not hold position<br>1 = Hold position |
| Object Code | Variable                                                                                                                            |
| Data Type   | UNSIGNED16                                                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 2064h: Hardware Position External

### Object Description

|             |                                                                                             |
|-------------|---------------------------------------------------------------------------------------------|
| Index       | 2064                                                                                        |
| Description | <a href="#">VarCom - HWPEXT</a><br>The position as measured by an external feedback device. |
| Object Code | Variable                                                                                    |
| Data Type   | UNSIGNED16                                                                                  |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0xFFFF    |
| Unit          | counts    |

**2065h: Hardware Position (CAN only)****Object Description**

|             |                                                                                    |
|-------------|------------------------------------------------------------------------------------|
| Index       | 2065                                                                               |
| Description | <a href="#">VarCom - HWPOS</a><br>The position as measured by the feedback device. |
| Object Code | Variable                                                                           |
| Data Type   | UNSIGNED64                                                                         |

**Entry Description**

|               |                    |
|---------------|--------------------|
| Access        | Read Only          |
| PDO Mapping   | No                 |
| Default Value | 0x0000             |
| Lower Limit   | 0x0000000000000000 |
| Upper Limit   | 0xFFFFFFFFFFFFFFFF |
| Unit          | -                  |

**2066h: Current D Axis****Object Description**

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Index       | 2066                                                                                                   |
| Description | <a href="#">VarCom - ID</a><br>In vector control, indicates the value perpendicular to Current Q Axis. |
| Object Code | Variable                                                                                               |
| Data Type   | INTEGER32                                                                                              |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | Yes        |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

**2067h: Current Q Axis****Object Description**

|             |                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2067                                                                                                                                      |
| Description | <a href="#">VarCom - IQ</a><br>In vector control, indicates the current for the torque.<br>This value is perpendicular to Current D Axis. |
| Object Code | Variable                                                                                                                                  |
| Data Type   | INTEGER32                                                                                                                                 |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

**2068h: Current Feedforward Low Pass Filter****Object Description**

|             |                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------|
| Index       | 2068                                                                                                                  |
| Description | <a href="#">VarCom - IFFLPFHZ</a><br>The corner frequency of a first-order filter of the feedforward low pass filter. |
| Object Code | Variable                                                                                                              |
| Data Type   | UNSIGNED16                                                                                                            |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0050     |
| Lower Limit   | 0x000A     |
| Upper Limit   | 0x03E8     |
| Unit          | Hz         |

## 2069h: Drive Foldback Current Limit

### Object Description

|             |                                                                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2069                                                                                                                                                                                                 |
| Description | <a href="#">VarCom - IIFOLD</a><br>The current limit derived from the foldback mechanism. Foldback condition occurs when Drive Foldback Current Limit (2069h) goes below User Current Limit (6073h). |
| Object Code | Variable                                                                                                                                                                                             |
| Data Type   | INTEGER32                                                                                                                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

## 206Ah: Drive Foldback Fault Threshold

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 206A                                                                                                  |
| Description | <a href="#">VarCom - IFOLDFTHRESH</a><br>The current threshold for declaring a fault due to foldback. |
| Object Code | Variable                                                                                              |
| Data Type   | UNSIGNED32                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | mA         |

## 206Bh: Drive Foldback Warning Threshold

### Object Description

|             |                                                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 206B                                                                                                                                                               |
| Description | <a href="#">VarCom - IFOLDWTHRESH</a><br>The current threshold level for declaring a warning due to foldback.<br>Warning is declared when 2069h drops below 206Ah. |
| Object Code | Variable                                                                                                                                                           |
| Data Type   | UNSIGNED32                                                                                                                                                         |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | mA         |

## 206Ch: Gravity Compensation

### Object Description

|             |                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 206C                                                                                                                                  |
| Description | <a href="#">VarCom - IGRAV</a><br>Value added to the current loop command to compensate for gravity or similar constant interference. |
| Object Code | Variable                                                                                                                              |
| Data Type   | INTEGER32                                                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

## 206Fh: Encoder Index Position Feedback

### Object Description

|             |                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Index       | 206F                                                                                                                     |
| Description | <a href="#">VarCom - INDEXPFB</a><br>The position feedback captured at the first encoder index detection after power on. |
| Object Code | Variable                                                                                                                 |
| Data Type   | INTEGER32                                                                                                                |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 2070h: Input Inversion

### Object Description

|             |                                                                                                                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2070                                                                                                                                                                                                                                              |
| Description | <a href="#">VarCom - ININV</a><br>The inversion state of each digital input.<br>Write the index first.<br>Write the value to the input sub-index to execute the input inversion.<br>Reading the value indicates the inversion state of the input. |
| Object Code | Array                                                                                                                                                                                                                                             |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                        |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Index      |
| Entry Category | Optional   |
| Data Type      | UNSIGNED16 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x0001     |
| Lower Limit    | 0x0001     |
| Upper Limit    | 0x000B     |
| Unit           | -          |

|                |            |
|----------------|------------|
| Sub-Index      | 002        |
| Description    | Value      |
| Entry Category | Optional   |
| Data Type      | UNSIGNED16 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x0000     |
| Lower Limit    | 0x0000     |
| Upper Limit    | 0x0001     |
| Unit           | -          |

## 2071h: Dynamic Brake Current

### Object Description

|             |                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2071                                                                                                                                            |
| Description | <a href="#">VarCom - ISTOP</a><br>The maximum current allowed during the dynamic braking process.<br>Limited by the Drive Peak Current (207Bh). |
| Object Code | Variable                                                                                                                                        |
| Data Type   | UNSIGNED32                                                                                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0x249F0    |
| Unit          | mA         |

## 2072h: Phase U Actual Current

### Object Description

|             |                                                                        |
|-------------|------------------------------------------------------------------------|
| Index       | 2072                                                                   |
| Description | <a href="#">VarCom - IU</a><br>The actual current at phase U (of UVW). |
| Object Code | Variable                                                               |
| Data Type   | INTEGER32                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

## 2073h: Phase U Current Offset

### Object Description

|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| Index       | 2073                                                                         |
| Description | <a href="#">VarCom - IUOFFSET</a><br>The current offset at phase U (of UVW). |
| Object Code | Variable                                                                     |
| Data Type   | INTEGER32                                                                    |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

**2074h: Phase V Actual Current****Object Description**

|             |                                                                        |
|-------------|------------------------------------------------------------------------|
| Index       | 2074                                                                   |
| Description | <a href="#">VarCom - IV</a><br>The actual current at phase V (of UVW). |
| Object Code | Variable                                                               |
| Data Type   | INTEGER32                                                              |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

**2075h: Phase V Current Offset****Object Description**

|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| Index       | 2075                                                                         |
| Description | <a href="#">VarCom - IVOFFSET</a><br>The current offset at phase V (of UVW). |
| Object Code | Variable                                                                     |
| Data Type   | INTEGER32                                                                    |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x0        |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | mA         |

## 2076h: Zero Procedure Current

### Object Description

|             |                                                                               |
|-------------|-------------------------------------------------------------------------------|
| Index       | 2076                                                                          |
| Description | <a href="#">VarCom - IZERO</a><br>The current for the ZERO (20DFh) procedure. |
| Object Code | Variable                                                                      |
| Data Type   | INTEGER32                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | DIPEAK     |
| Unit          | mA         |

## 2077h: Position Integral Saturation Input

### Object Description

|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| Index       | 2077                                                                         |
| Description | <a href="#">VarCom - KPISATIN</a><br>The position integral input saturation. |
| Object Code | Variable                                                                     |
| Data Type   | REAL32                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 10000.0    |
| Unit          | -          |

## 2078h: Limit Switch Negative Status

### Object Description

|             |                                                                                                                               |
|-------------|-------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2078                                                                                                                          |
| Description | <a href="#">VarCom - LIMSWITCHNEG</a><br>The state of the hardware limit switch in the negative direction; defined by inputs. |
| Object Code | Variable                                                                                                                      |
| Data Type   | UNSIGNED16                                                                                                                    |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0x0001    |
| Unit          | -         |

## 2079h: Limit Switch Positive Status

### Object Description

|             |                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------|
| Index       | 2079                                                                                                                      |
| Description | <a href="#">VarCom - LIMSWITCHPOS</a><br>The state of the hardware limit switch in positive direction; defined by inputs. |
| Object Code | Variable                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0x0001    |
| Unit          | -         |

## 207Ah: Load to Motor Inertia Ratio

### Object Description

|             |                                                                                      |
|-------------|--------------------------------------------------------------------------------------|
| Index       | 207A                                                                                 |
| Description | <a href="#">VarCom - LMJR</a><br>The ratio of the load inertia to the motor inertia. |
| Object Code | Variable                                                                             |
| Data Type   | REAL32                                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 600.0      |
| Unit          | -          |

## 207Bh: Drive Peak Current

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 207B                                                                                                           |
| Description | <a href="#">VarCom - DIPEAK</a><br>The rated peak current of the drive (sinusoidal peak).<br>Hardware-defined. |
| Object Code | Variable                                                                                                       |
| Data Type   | UNSIGNED32                                                                                                     |

### Entry Description

|               |                    |
|---------------|--------------------|
| Access        | Read/Write         |
| PDO Mapping   | No                 |
| Default Value | Hardware-dependent |
| Lower Limit   | Hardware-dependent |
| Upper Limit   | Hardware-dependent |
| Unit          | mA                 |

## 207Ch: Drive Continuous Current

### Object Description

|             |                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------|
| Index       | 207C                                                                                                                  |
| Description | <a href="#">VarCom - DICONT</a><br>The continuous rated current for the drive (sinusoidal peak).<br>Hardware defined. |
| Object Code | Variable                                                                                                              |
| Data Type   | UNSIGNED32                                                                                                            |

### Entry Description

|               |                    |
|---------------|--------------------|
| Access        | Read/Write         |
| PDO Mapping   | No                 |
| Default Value | Hardware-dependent |
| Lower Limit   | Hardware-dependent |
| Upper Limit   | Hardware-dependent |
| Unit          | mA                 |

## 207Dh: Motor Pitch

### Object Description

|             |                                                                |
|-------------|----------------------------------------------------------------|
| Index       | 207D                                                           |
| Description | <a href="#">VarCom - MPITCH</a><br>The pitch of a linear motor |
| Object Code | Variable                                                       |
| Data Type   | UNSIGNED32                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000020 |
| Lower Limit   | 0x00000001 |
| Upper Limit   | 0x000186A0 |
| Unit          | mm         |

## 207Eh: Motor Poles

### Object Description

|             |                                                                                             |
|-------------|---------------------------------------------------------------------------------------------|
| Index       | 207E                                                                                        |
| Description | <a href="#">VarCom - MPOLES</a><br>The number of individual poles (not pairs) in the motor. |
| Object Code | Variable                                                                                    |
| Data Type   | UNSIGNED16                                                                                  |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0002     |
| Lower Limit   | 0x0002     |
| Upper Limit   | 0x0050     |
| Unit          | poles      |

## 207Fh: Motor Resistance

### Object Description

|             |                                                      |
|-------------|------------------------------------------------------|
| Index       | 207F                                                 |
| Description | <a href="#">VarCom - MR</a><br>The motor resistance. |
| Object Code | Variable                                             |
| Data Type   | REAL32                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 10.0       |
| Unit          | ohm        |

## 2080h: Motor Resolver Poles

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 2080                                                                                                  |
| Description | <a href="#">VarCom - MRESPOLES</a><br>The number of individual poles in the resolver feedback device. |
| Object Code | Variable                                                                                              |
| Data Type   | UNSIGNED16                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0002     |
| Lower Limit   | 0x0002     |
| Upper Limit   | 0x0050     |
| Unit          | poles      |

## 2082h: Current KFF Gain

### Object Description

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Index       | 2082                                                                      |
| Description | <a href="#">VarCom - KCFF</a><br>The current controller feedforward gain. |
| Object Code | Variable                                                                  |
| Data Type   | REAL32                                                                    |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 1.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 100.0      |
| Unit          | -          |

**2083h: Torque Commutation Angle Advance at Motor Continuous Current****Object Description**

|             |                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2083                                                                                                                                   |
| Description | <a href="#">Varcom - MTANGLC</a><br>The value of the torque-related commutation angle advance at the motors continuous current rating. |
| Object Code | Variable                                                                                                                               |
| Data Type   | UNSIGNED16                                                                                                                             |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x002D     |
| Unit          | degree     |

**2084h: Torque Commutation Angle Advance at Motor Peak Current****Object Description**

|             |                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------|
| Index       | 2084                                                                                                                      |
| Description | <a href="#">Varcom - MTANGLP</a><br>The value of the torque-related commutation angle advance at the motors peak current. |
| Object Code | Variable                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x002D     |
| Unit          | degree     |

**2085h: Velocity Commutation Angle Advance at Motor Maximum Speed****Object Description**

|             |                                                                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2085                                                                                                                                                           |
| Description | <a href="#">Varcom - MVANGLF</a><br>The value of the velocity-related commutation angle advance to be used when the motor is operating at motor maximum speed. |
| Object Code | Variable                                                                                                                                                       |
| Data Type   | UNSIGNED16                                                                                                                                                     |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x005A     |
| Unit          | degree     |

**2086h: Velocity Commutation Angle Advance at Motor Maximum Speed/2****Object Description**

|             |                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2086                                                                                                                                                             |
| Description | <a href="#">Varcom - MVANGLH</a><br>The value of the velocity-related commutation angle advance to be used when the motor is operating at motor maximum speed/2. |
| Object Code | Variable                                                                                                                                                         |
| Data Type   | UNSIGNED16                                                                                                                                                       |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x005A     |
| Unit          | degree     |

## 2087h: HD Spring Filter

### Object Description

|             |                                                                                                                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2087                                                                                                                                                                                                                                                             |
| Description | <a href="#">VarCom - NLAFFLPFHZ</a><br>Used with HD Flexibility Compensation (208Fh) to reduce the vibrations induced to the load by abrupt changes in acceleration (jerk), and reduce tracking error. Can also be used to minimize overshoot and settling time. |
| Object Code | Variable                                                                                                                                                                                                                                                         |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x1B58     |
| Lower Limit   | 0x000A     |
| Upper Limit   | 0x1B58     |
| Unit          | Hz         |

## 2088h: Position Backup

### Object Description

|             |                                                                                                                                          |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2088                                                                                                                                     |
| Description | <a href="#">VarCom - PFBBACKUP</a><br>Reads the position values from non-volatile memory that were saved by the Position Backup process. |
| Object Code | Variable                                                                                                                                 |
| Data Type   | INTEGER32                                                                                                                                |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 2089h: Position Backup Mode

### Object Description

|             |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| Index       | 2089                                                                                       |
| Description | <a href="#">VarCom - PFBACKUPMODE</a><br>Enables and disables the position backup process. |
| Object Code | Variable                                                                                   |
| Data Type   | UNSIGNED16                                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 208Ah: HD Maximum Adaptive Gain

### Object Description

|             |                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 208A                                                                                                                                              |
| Description | <a href="#">VarCom - NLMAXGAIN</a><br>Autotuning automatically sets this gain according to the encoder resolution. This is the recommended value. |
| Object Code | Variable                                                                                                                                          |
| Data Type   | REAL32                                                                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 1.6        |
| Lower Limit   | 1.0        |
| Upper Limit   | 5.0        |
| Unit          | -          |

**208Bh: HD Current Filter - Second Notch Filter Bandwidth****Object Description**

|             |                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 208B                                                                                                                                                      |
| Description | <a href="#">VarCom - NLNOTCH2BW</a><br>Used in the HD control loop to define the width (sharpness) of a high frequency that is causing system vibrations. |
| Object Code | Variable                                                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                                                |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x01F4     |
| Unit          | Hz         |

**208Ch: HD Current Filter - Second Notch Filter Center****Object Description**

|             |                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 208C                                                                                                                                            |
| Description | <a href="#">VarCom - NLNOTCH2CENTER</a><br>Used in the HD control loop to block an additional high frequency that is causing system vibrations. |
| Object Code | Variable                                                                                                                                        |
| Data Type   | UNSIGNED16                                                                                                                                      |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0064     |
| Lower Limit   | 0x0064     |
| Upper Limit   | 0x2710     |
| Unit          | Hz         |

## 208Dh: Emergency or Controlled Stop Current Limit

### Object Description

|             |                                                                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 208D                                                                                                                                                    |
| Description | <a href="#">VarCom - ESTOPILIM</a><br>The current limit during an emergency or controlled stop.<br>Expressed as a factor of User Current Limit (6073h). |
| Object Code | Variable                                                                                                                                                |
| Data Type   | REAL32                                                                                                                                                  |

### Entry Description

|               |                     |
|---------------|---------------------|
| Access        | Read/Write          |
| PDO Mapping   | No                  |
| Default Value | 1.0                 |
| Lower Limit   | 0.0010000000475     |
| Upper Limit   | 1.0                 |
| Unit          | User position units |

## 208Eh: Position Command

### Object Description

|             |                                                                     |
|-------------|---------------------------------------------------------------------|
| Index       | 208E                                                                |
| Description | <a href="#">VarCom - PCMD</a><br>The value of the position command. |
| Object Code | Variable                                                            |
| Data Type   | INTEGER32                                                           |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 208Fh: HD Flexibility Compensation

### Object Description

|             |                                                                                                                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 208F                                                                                                                                                                                                                                               |
| Description | <a href="#">VarCom - NLPEAFF</a><br>Used with HD Spring Filter (2087h) to reduce the vibrations induced to the load by abrupt changes in acceleration (jerk), and reduce tracking error; can also be used to minimize overshoot and settling time. |
| Object Code | Variable                                                                                                                                                                                                                                           |
| Data Type   | REAL32                                                                                                                                                                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 200000.0   |
| Unit          | Hz         |

## 2090h: Homing Status

### Object Description

|             |                                                                                  |
|-------------|----------------------------------------------------------------------------------|
| Index       | 2090                                                                             |
| Description | <a href="#">VarCom - HOMESTATE</a><br>Indicates the state of the homing process. |
| Object Code | Variable                                                                         |
| Data Type   | UNSIGNED8                                                                        |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x00      |
| Lower Limit   | 0x00      |
| Upper Limit   | 0xFF      |
| Unit          | -         |

**2091h: HD Acceleration/Deceleration Spring Filter Gain****Object Description**

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 2091                                                                                                  |
| Description | <a href="#">VarCom - NLPEDFFRATIO</a><br>Determines the acceleration/deceleration spring filter gain. |
| Object Code | Variable                                                                                              |
| Data Type   | REAL32                                                                                                |

**Entry Description**

|               |               |
|---------------|---------------|
| Access        | Read/Write    |
| PDO Mapping   | No            |
| Default Value | 1.0           |
| Lower Limit   | 0.0           |
| Upper Limit   | 1.99899995327 |
| Unit          | -             |

**2095h: Position Offset****Object Description**

|             |                                                                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2095                                                                                                                                                                 |
| Description | <a href="#">VarCom - PBFOFFSET</a><br>A feedback offset that is added to the internal cumulative position counter, to give the actual value of the position (6064h). |
| Object Code | Variable                                                                                                                                                             |
| Data Type   | INTEGER32                                                                                                                                                            |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

**2096h: HD Anti-Vibration 1 Filter - Center Frequency****Object Description**

|             |                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------|
| Index       | 2096                                                                                                                  |
| Description | <a href="#">VarCom - NLANTIVIBHZ</a><br>The HD position control loop anti-vibration module 1 filter center frequency. |
| Object Code | Variable                                                                                                              |
| Data Type   | REAL32                                                                                                                |

**Entry Description**

|               |               |
|---------------|---------------|
| Access        | Read/Write    |
| PDO Mapping   | No            |
| Default Value | 400.000030518 |
| Lower Limit   | 5.0           |
| Upper Limit   | 400.0         |
| Unit          | Hz            |

**2097h: HD Anti-Vibration 2 Filter - Center Frequency****Object Description**

|             |                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------|
| Index       | 2097                                                                                                                   |
| Description | <a href="#">VarCom - NLANTIVIBHZ2</a><br>The HD position control loop anti-vibration module 2 filter center frequency. |
| Object Code | Variable                                                                                                               |
| Data Type   | REAL32                                                                                                                 |

**Entry Description**

|               |               |
|---------------|---------------|
| Access        | Read/Write    |
| PDO Mapping   | No            |
| Default Value | 400.000030518 |
| Lower Limit   | 5.0           |
| Upper Limit   | 400.0         |
| Unit          | Hz            |

**2099h: Current Level 1 for Digital Output Definition****Object Description**

|             |                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------|
| Index       | 2099                                                                                                              |
| Description | <a href="#">VarCom - OUTILVL1</a><br>The first current level used for a condition that controls a digital output. |
| Object Code | Variable                                                                                                          |
| Data Type   | INTEGER32                                                                                                         |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0x000249F0 |
| Unit          | mA         |

**209Ah: Current Level 2 for Digital Output Definition****Object Description**

|             |                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------|
| Index       | 209A                                                                                                               |
| Description | <a href="#">VarCom - OUTILVL2</a><br>The second current level used for a condition that controls a digital output. |
| Object Code | Variable                                                                                                           |
| Data Type   | INTEGER32                                                                                                          |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0x000249F0 |
| Unit          | mA         |

## 209Bh: Output Inversion

### Object Description

|             |                                                                                                                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 209B                                                                                                                                                                                                                                                         |
| Description | <a href="#">VarCom - OUTINV</a><br>The inversion state of each digital output.<br>Write the index first.<br>Then write the value to the output index execute the output inversion.<br>Reading the value indicates the inversion state of the digital output. |
| Object Code | Array                                                                                                                                                                                                                                                        |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                   |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Index      |
| Entry Category | Optional   |
| Data Type      | UNSIGNED16 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x0001     |
| Lower Limit    | 0x0001     |
| Upper Limit    | 0x0007     |
| Unit           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | Value      |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x0000     |
| <b>Upper Limit</b>    | 0x0001     |
| <b>Unit</b>           | -          |

## 209Ch: Output Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 209C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description | <p><a href="#">VarCom - OUTMODE</a></p> <p>Defines the condition that will activate the specified digital output.</p> <p>Write the output index first. Then write the function to the corresponding output index.</p> <p>0 = Idle</p> <p>1 = Active (enabled)</p> <p>2 = Brake release signal</p> <p>3 = Alarm for any fault</p> <p>4 = In position indication matching INPOS</p> <p>5 = Stopped indication (matching STOPPED=2)</p> <p>6 = Foldback indication (motor or drive) (fault or FOLD)</p> <p>7 = Average current exceeds OUTILVL1</p> <p>8 = Average current is above OUTILVL1 and below OUTILVL2</p> <p>9 = Velocity exceeds OUTVLVL1. Output will be activated when velocity exceeds the level set by OUTVLVL1.</p> <p>10 = Velocity is above OUTVLVL1 and below OUTVLVL2. Output will be activated when velocity is above the level set by OUTVLVL1 and below the level set by OUTVLVL2.</p> <p>11 = Position (PFB) is above OUTPLVL1. Output will be activated when position exceeds the level set by OUTPLVL1.</p> <p>12 = Position (PFB) is above OUTPLVL1 and below OUTPLVL2. Output will be activated when position is above the level set by OUTPLVL1 and below the level set by OUTPLVL2.</p> <p>13 = Encoder battery low voltage fault</p> <p>14 = Warning on</p> <p>15 = Faults or disabled</p> <p>16 = Encoder battery low voltage warning</p> <p>17 = Phase find succeeded</p> <p>18 = Over-current fault exists</p> <p>19 = Over-voltage fault exists</p> <p>20 = Under-voltage fault exists</p> <p>21 = Phase find required</p> <p>22 = Alarm for any fault except phase find failure</p> <p>23 = Homing complete</p> <p>24 = Encoder simulation index</p> <p>25 = Zero position after homing</p> <p>27 = PCOM module 1 output</p> <p>28 = PCOM module 2 output</p> |
| Object Code | Array                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x0002            |
| Lower Limit    | 0x0002            |
| Upper Limit    | 0x0002            |
| Unit           | -                 |

|                |              |
|----------------|--------------|
| Sub-Index      | 001          |
| Description    | Output Index |
| Entry Category | Optional     |
| Data Type      | UNSIGNED16   |
| Access         | Read/Write   |
| PDO Mapping    | No           |
| Default Value  | 0x0001       |
| Lower Limit    | 0x0000       |
| Upper Limit    | 0xFFFF       |
| Unit           | -            |

|                |               |
|----------------|---------------|
| Sub-Index      | 002           |
| Description    | Function Code |
| Entry Category | Optional      |
| Data Type      | UNSIGNED16    |
| Access         | Read/Write    |
| PDO Mapping    | No            |
| Default Value  | 0x0000        |
| Lower Limit    | 0x0000        |
| Upper Limit    | 0xFFFF        |
| Unit           | -             |

**209Dh: Position Level 1 for Digital Output Definition****Object Description**

|             |                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------|
| Index       | 209D                                                                                                          |
| Description | <a href="#">VarCom - OUTPLVL1</a><br>The first position value for a condition that controls a digital output. |
| Object Code | Variable                                                                                                      |
| Data Type   | INTEGER32                                                                                                     |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

**209Eh: Position Level 2 for Digital Output Definition****Object Description**

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 209E                                                                                                           |
| Description | <a href="#">VarCom - OUTPLVL2</a><br>The second position value for a condition that controls a digital output. |
| Object Code | Variable                                                                                                       |
| Data Type   | INTEGER32                                                                                                      |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 209Fh: Velocity Level 1 for Digital Output Definition

### Object Description

|             |                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------|
| Index       | 209F                                                                                                          |
| Description | <a href="#">VarCom - OUTVLVL1</a><br>The first velocity value for a condition that controls a digital output. |
| Object Code | Variable                                                                                                      |
| Data Type   | INTEGER32                                                                                                     |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user velocity units |

## 20A0h: Velocity Level 2 for Digital Output Definition

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 20A0                                                                                                           |
| Description | <a href="#">VarCom - OUTVLVL2</a><br>The second velocity value for a condition that controls a digital output. |
| Object Code | Variable                                                                                                       |
| Data Type   | INTEGER32                                                                                                      |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user velocity units |

## 20A1h: Over-Voltage Threshold

### Object Description

|             |                                                                                             |
|-------------|---------------------------------------------------------------------------------------------|
| Index       | 20A1                                                                                        |
| Description | <a href="#">VarCom - OVTHRESH</a><br>The threshold level for detection of bus over-voltage. |
| Object Code | Variable                                                                                    |
| Data Type   | UNSIGNED16                                                                                  |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0xFFFF    |
| Unit          | V         |

## 20A2h: Software Enable Status

### Object Description

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| Index       | 20A2                                                                     |
| Description | <a href="#">VarCom - SWEN</a><br>Indicates the state of software enable. |
| Object Code | Variable                                                                 |
| Data Type   | UNSIGNED8                                                                |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x00      |
| Lower Limit   | 0x00      |
| Upper Limit   | 0x01      |
| Unit          | -         |

## 20A3h: Position Loop Position Error

### Object Description

|             |                                                                                    |
|-------------|------------------------------------------------------------------------------------|
| Index       | 20A3                                                                               |
| Description | <a href="#">VarCom - PELOOP</a><br>Position error value used by the position loop. |
| Object Code | Variable                                                                           |
| Data Type   | INTEGER32                                                                          |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 20A4h: Phase Find Command

### Object Description

|             |                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20A4                                                                                                                                                                  |
| Description | <a href="#">VarCom - PHASEFIND</a><br>Starts a procedure that initializes commutation for incremental encoder systems.<br>Write 1 to initiate the phase find command. |
| Object Code | Variable                                                                                                                                                              |
| Data Type   | UNSIGNED8                                                                                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x01       |
| Unit          | -          |

## 20A5h: Forced Electrical Position

### Object Description

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 20A5                                                                           |
| Description | <a href="#">VarCom - PHASEFINDANGLE</a><br>The position within one revolution. |
| Object Code | Variable                                                                       |
| Data Type   | UNSIGNED16                                                                     |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read/Write             |
| PDO Mapping   | No                     |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | 65536/electrical cycle |

## 20A6h: Phase Find Gain

### Object Description

|             |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| Index       | 20A6                                                                                       |
| Description | <a href="#">VarCom - PHASEFINDGAIN</a><br>Adjusts the gain of the phase finding mechanism. |
| Object Code | Variable                                                                                   |
| Data Type   | REAL32                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 1.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 10.0       |
| Unit          | -          |

## 20A7h: Phase Find Current

### Object Description

|             |                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20A7                                                                                                                              |
| Description | <a href="#">VarCom - PHASEFINDI</a><br>Adjusts the current of the phase finding mechanism.<br>Limited by Maximum Current (6073h). |
| Object Code | Variable                                                                                                                          |
| Data Type   | REAL32                                                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | IMAX       |
| Unit          | mA         |

## 20A8h: Phase Find Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20A8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Description | <p><a href="#">VarCom - PHASEFINDMODE</a></p> <p>Defines commutation for phase finding.</p> <p>2 = Soft start. Default. Also referred to as a Wake-No-Shake routine.</p> <p>4 = Smooth start. Sets commutation angle to 180 degrees and increases current until a movement of 1 electrical angle is detected.</p> <p>5 = High torque start. Sets commutation angle to 180 degrees and increases current until a movement of 1 electrical angle is detected.</p> <p>11 = Manual commutation. Commutation offset is defined by the value of Forced Electrical Position (20A5h).</p> <p>12 = Zeroing. Applies the ZERO command and uses the resulting MPHASE. Supports systems with Z axis.</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0002     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x000B     |
| Unit          | -          |

## 20A9h: Phase Find Status

### Object Description

|             |                                                                                                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20A9                                                                                                                                                                                                               |
| Description | <a href="#">VarCom - PHASEFINDST</a><br>Indicates the state of the commutation Phase Find procedure for incremental encoders.<br>Possible values:<br>0 = Not started<br>1 = Running<br>2 = Succeeded<br>3 = Failed |
| Object Code | Variable                                                                                                                                                                                                           |
| Data Type   | UNSIGNED16                                                                                                                                                                                                         |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0xFFFF    |
| Unit          | -         |

## 20AAh: Phase Find Duration

### Object Description

|             |                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------|
| Index       | 20AA                                                                                                       |
| Description | <a href="#">VarCom - PHASEFINDTIME</a><br>Limits the duration of phase finding (20A8h) in soft start mode. |
| Object Code | Variable                                                                                                   |
| Data Type   | UNSIGNED16                                                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0064     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x2710     |
| Unit          | ms         |

## 20ABh: Position Loop Controller Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20AB                                                                                                                                                                                                                                                                                                                              |
| Description | <a href="#">VarCom - POSCONTROLMODE</a><br>Defines the type of position loop controller.<br>Possible values:<br>0 = Linear control loop<br>1 = HD control loop; for backward compatibility only<br>2 = HD control loop with 250 s sample rate<br>5 = HD control loop with 125 s sample rate; recommended for all new applications |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                          |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 20ACh: Position Limiting Mode

### Object Description

|             |                                                                                   |
|-------------|-----------------------------------------------------------------------------------|
| Index       | 20AC                                                                              |
| Description | <a href="#">VarCom - POSLIMMODE</a><br>Enables/disables software position limits. |
| Object Code | Variable                                                                          |
| Data Type   | UNSIGNED16                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 20ADh: PRB Generator Frequency

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                          |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20AD                                                                                                                                                                                                                                                                                                                                     |
| Description | <a href="#">VarCom - PRBFRQ</a><br>Defines the frequency for PRB excitation.<br>For pseudo binary noise (208Fh sub-index 1= 0,1), this object has no effect.<br>For sine and square wave generators (208Fh sub-index 1=2 or 208Fh sub-index 1=3), this object defines the frequency of the sine and square wave generator, respectively. |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                 |
| Data Type   | REAL32                                                                                                                                                                                                                                                                                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 100.0      |
| Lower Limit   | 0.0        |
| Upper Limit   | 5000.0     |
| Unit          | Hz         |

## 20AEh: PRB Generator Mode

### Object Description

|             |                                                                                                                                                                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20AE                                                                                                                                                                                                                                                  |
| Description | <a href="#">VarCom - PRBMODE</a><br>Defines if and how the PRB signal generator is activated.<br>Possible values:<br>0 = PRB generator not activated<br>1 = PRB generator activated only during recording<br>2 = PRB generator activated continuously |
| Object Code | Variable                                                                                                                                                                                                                                              |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0002     |
| Unit          | -          |

## 20AFh: PRB Generator Configuration

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20AF                                                                                                                                                                                                                                                                                                                                                            |
| Description | <a href="#">VarCom - PRBPARAM</a><br>PRB generator configuration:<br>Signal Type:<br>0 = 8 bit random noise<br>1 = 10 bit random noise<br>2 = Sine wave<br>3 = Square wave<br>Current Amplitude is limited by Max Current (6073h).<br>Velocity Amplitude is limited by Max Profile Velocity (607Fh).<br>Counter Period is relative to current loop update rate. |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                          |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                     |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x5               |
| Lower Limit    | 0x5               |
| Upper Limit    | 0x5               |
| Unit           | -                 |

|                |             |
|----------------|-------------|
| Sub-Index      | 001         |
| Description    | Signal Type |
| Entry Category | Optional    |
| Data Type      | UNSIGNED16  |
| Access         | Read/Write  |
| PDO Mapping    | No          |
| Default Value  | 0x0000      |
| Lower Limit    | 0x0000      |
| Upper Limit    | 0x0003      |
| Unit           | -           |

|                       |                        |
|-----------------------|------------------------|
| <b>Sub-Index</b>      | 002                    |
| <b>Description</b>    | Current Amplitude      |
| <b>Entry Category</b> | Optional               |
| <b>Data Type</b>      | INTEGER32              |
| <b>Access</b>         | Read/Write             |
| <b>PDO Mapping</b>    | No                     |
| <b>Default Value</b>  | 0x00000000             |
| <b>Lower Limit</b>    | 0x80000000             |
| <b>Upper Limit</b>    | 0x7FFFFFFF             |
| <b>Unit</b>           | CAN user current units |

|                       |                         |
|-----------------------|-------------------------|
| <b>Sub-Index</b>      | 003                     |
| <b>Description</b>    | Velocity Amplitude      |
| <b>Entry Category</b> | Optional                |
| <b>Data Type</b>      | INTEGER32               |
| <b>Access</b>         | Read/Write              |
| <b>PDO Mapping</b>    | No                      |
| <b>Default Value</b>  | 0x00000000              |
| <b>Lower Limit</b>    | 0x80000000              |
| <b>Upper Limit</b>    | 0x7FFFFFFF              |
| <b>Unit</b>           | CAN user velocity units |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 004            |
| <b>Description</b>    | Counter Period |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | UNSIGNED16     |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0000         |
| <b>Lower Limit</b>    | 0x0000         |
| <b>Upper Limit</b>    | 0xFFFF         |
| <b>Unit</b>           | -              |

|                |            |
|----------------|------------|
| Sub-Index      | 005        |
| Description    | Config     |
| Entry Category | Optional   |
| Data Type      | UNSIGNED16 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x0000     |
| Lower Limit    | 0x0000     |
| Upper Limit    | 0x0001     |
| Unit           | -          |

## 20B0h: Position Command Generator Target Error

### Object Description

|             |                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20B0                                                                                                                                                     |
| Description | <a href="#">VarCom - PTPTE</a><br>The target error during a motion profile, which is the distance remaining to the destination in a point-to-point move. |
| Object Code | Variable                                                                                                                                                 |
| Data Type   | INTEGER32                                                                                                                                                |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 20B1h: Position Command Generator Velocity

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 20B1                                                                                                  |
| Description | <a href="#">VarCom - PTPVCMD</a><br>The derivative of the position command profile in velocity units. |
| Object Code | Variable                                                                                              |
| Data Type   | INTEGER32                                                                                             |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user velocity units |

## 20B2h: PWM Frequency

### Object Description

|             |                                                                      |
|-------------|----------------------------------------------------------------------|
| Index       | 20B2                                                                 |
| Description | <a href="#">VarCom - PWMFRQ</a><br>The frequency of the PWM signals. |
| Object Code | Variable                                                             |
| Data Type   | REAL32                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 16.0       |
| Lower Limit   | 0.0        |
| Upper Limit   | 0.0        |
| Unit          | kHz        |

## 20B3h: Gearing Mode

### Object Description

|             |                                                                     |
|-------------|---------------------------------------------------------------------|
| Index       | 20B3                                                                |
| Description | <a href="#">VarCom - GEARMODE</a><br>The gearing source and method. |
| Object Code | Variable                                                            |
| Data Type   | UNSIGNED8                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x04       |
| Unit          | -          |

## 20B5h: In Position Indication

### Object Description

|             |                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20B5                                                                                                                                              |
| Description | <a href="#">VarCom - INPOS</a><br>Indicates whether the position error is within the allowed tolerance.<br>0 = Not in position<br>1 = In position |
| Object Code | Variable                                                                                                                                          |
| Data Type   | UNSIGNED16                                                                                                                                        |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0x0001    |
| Unit          | -         |

## 20B6h: Hardware Position External (DSP)

### Object Description

|             |                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20B6                                                                                                                                                                                             |
| Description | <a href="#">VarCom - HWPEXTMACHN</a><br>The position as measured by an external feedback device (DSP);.<br>32-bit counter of the pulse and direction input from the machine interface connector. |
| Object Code | Variable                                                                                                                                                                                         |
| Data Type   | INTEGER32                                                                                                                                                                                        |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x00000000             |
| Lower Limit   | 0x80000000             |
| Upper Limit   | 0x7FFFFFFF             |
| Unit          | -                      |

## 20B8h: Fault Relay Status

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 20B8                                                                                                  |
| Description | <a href="#">VarCom - RELAY</a><br>The state of the fault relay.<br>0 = Relay open<br>1 = Relay closed |
| Object Code | Variable                                                                                              |
| Data Type   | UNSIGNED16                                                                                            |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0xFFFF    |
| Unit          | -         |

## 20B9h: Fault Relay Mode

### Object Description

|             |                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------|
| Index       | 20B9                                                                                             |
| Description | <a href="#">VarCom - RELAYMODE</a><br>0 = Relay opens upon fault<br>1 = Relay opens upon disable |
| Object Code | Variable                                                                                         |
| Data Type   | UNSIGNED16                                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 20BAh: Remote Hardware Enable Status

### Object Description

|             |                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20BA                                                                                                                                               |
| Description | <a href="#">VarCom - REMOTE</a><br>The state of the external hardware enable input.<br>0 = Remote enable input off.<br>1 = Remote enable input on. |
| Object Code | Variable                                                                                                                                           |
| Data Type   | UNSIGNED16                                                                                                                                         |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0xFFFF    |
| Unit          | -         |

## 20BBh: Resolver Amplitude Range

### Object Description

|             |                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20BB                                                                                                                                   |
| Description | <a href="#">VarCom - RESAMPLRANGE</a><br>The acceptable range of deviation of resolver sine/cosine signals, expressed as a percentage. |
| Object Code | Variable                                                                                                                               |
| Data Type   | UNSIGNED16                                                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0023     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0064     |
| Unit          | percentage |

## 20BCh: Resolver Conversion Bandwidth

### Object Description

|             |                                                                      |
|-------------|----------------------------------------------------------------------|
| Index       | 20BC                                                                 |
| Description | <a href="#">VarCom - RESBW</a><br>The resolver conversion bandwidth. |
| Object Code | Variable                                                             |
| Data Type   | UNSIGNED16                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x012C     |
| Lower Limit   | 0x00C8     |
| Upper Limit   | 0x0320     |
| Unit          | Hz         |

## 20BDh: Save/Load Status

### Object Description

|             |                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20BD                                                                                                                                         |
| Description | Save/load status.<br>Copies all system configuration variables from working RAM to non-volatile memory.<br>Write 01 to initiate the command. |
| Object Code | Variable                                                                                                                                     |
| Data Type   | UNSIGNED8                                                                                                                                    |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x00      |
| Lower Limit   | 0x00      |
| Upper Limit   | 0xFF      |
| Unit          | -         |

## 20BEh: Sine/Cosine Calibration Command

### Object Description

|             |                                                                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20BE                                                                                                                                                                                                                  |
| Description | <a href="#">VarCom - SININIT</a><br>Activates a procedure that calibrates sine encoder or resolver sine and cosine signals. The calibration serves to reduce harmonic errors in the sine encoder or resolver reading. |
| Object Code | Variable                                                                                                                                                                                                              |
| Data Type   | UNSIGNED16                                                                                                                                                                                                            |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0x0001    |
| Unit          | -         |

## 20BFh: Sine/Cosine Calibration Mode

### Object Description

|             |                                                                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20BF                                                                                                                                                |
| Description | <a href="#">VarCom - SININITMODE</a><br>Enables/disables the automatic calibration of sine encoder or resolver sine and cosine signals at power up. |
| Object Code | Variable                                                                                                                                            |
| Data Type   | UNSIGNED16                                                                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 20C0h: Sine/Cosine Calibration Status

### Object Description

|             |                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------|
| Index       | 20C0                                                                                                    |
| Description | <a href="#">VarCom - SININITST</a><br>The status of the sine encoder or resolver calibration procedure. |
| Object Code | Variable                                                                                                |
| Data Type   | UNSIGNED16                                                                                              |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0xFFFF    |
| Unit          | -         |

**20C1h: Sine/Cosine Calibration Parameters (CAN only)****Object Description**

|             |                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------|
| Index       | 20C1                                                                                                                 |
| Description | <a href="#">VarCom - SINPARAM</a><br>Returns the parameters for calibration of the resolver sine and cosine signals. |
| Object Code | Variable                                                                                                             |
| Data Type   | VISIBLE_STRING                                                                                                       |

**Entry Description**

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0         |
| Lower Limit   | -         |
| Upper Limit   | -         |
| Unit          | -         |

## 20C2h: Synchronization Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20C2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Description | <p><a href="#">VarCom - SYNCSOURCE</a></p> <p>Sets the method used to synchronize the drive clock to an external sync signal.</p> <p>When the drive detects a SYNC signal from EtherCAT or CANopen, it automatically sets SYNCSOURCE to a value of 5 or 6, respectively.</p> <p>Possible values:</p> <p>0 = Disabled; no sync</p> <p>1 = Sync drive clock to controller based on fast digital input 5</p> <p>2 = Sync drive clock to controller based on fast digital input 6</p> <p>3 = Sync drive clock based on pulse differential input (Pulse &amp; Direction)</p> <p>4 = Sync signal source is pulse input from Machine I/F</p> <p>5 = Automatically set in EtherCAT drive (EC and EB models). Read only.</p> <p>6 = Automatically set in CAN drive (AF model). Read only.</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0005     |
| Unit          | -          |

## 20C3h: Tracking Factor

### Object Description

|             |                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------|
| Index       | 20C3                                                                                             |
| Description | <a href="#">VarCom - TF</a><br>The derivative factor for tracking with PDFF velocity controller. |
| Object Code | Variable                                                                                         |
| Data Type   | UNSIGNED16                                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0064     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x00C8     |
| Unit          | percentage |

## 20C4h: Motor Over-Temperature

### Object Description

|             |                                                                                                                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20C4                                                                                                                                                                                                                                                                            |
| Description | <a href="#">VarCom - THERM</a><br>The state of the motor thermostat input that indicates an over-temperature condition.<br>0 = Thermostat input closed (normal) or ignored when Motor Over-Temperature Mode (20C6h) = 3.<br>1 = Thermostat input open, indicating overheating . |
| Object Code | Variable                                                                                                                                                                                                                                                                        |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                      |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0xFFFF    |
| Unit          | -         |

## 20C5h: Motor Over-Temperature Clear Fault Level

### Object Description

|             |                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------|
| Index       | 20C5                                                                                                      |
| Description | <a href="#">VarCom - THERMCLEARLEVEL</a><br>The level at which a motor over-temperature fault is cleared. |
| Object Code | Variable                                                                                                  |
| Data Type   | UNSIGNED32                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000064 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0x000F4240 |
| Unit          | ohm        |

## 20C6h: Motor Over-Temperature Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20C6                                                                                                                                                                                                                                                                                                                   |
| Description | <a href="#">VarCom - THERMODE</a><br>Defines how the drive will respond to an over-temperature fault.<br>Possible values:<br>0 = Disable drive immediately<br>3 = Ignore thermostat input<br>4 = Issue warning only<br>5 = Issue warning. If condition persists after Motor Over-Temperature Time (20C8h), issue fault |
| Object Code | Variable                                                                                                                                                                                                                                                                                                               |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0005     |
| Unit          | -          |

## 20C7h: Motor Temperature

### Object Description

|             |                                                                 |
|-------------|-----------------------------------------------------------------|
| Index       | 20C7                                                            |
| Description | <a href="#">VarCom - THERMREADOUT</a><br>The motor temperature. |
| Object Code | Variable                                                        |
| Data Type   | INTEGER32                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | ohm        |

## 20C8h: Motor Over-Temperature Time

### Object Description

|             |                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20C8                                                                                                                                                       |
| Description | <a href="#">VarCom - THERMTIME</a><br>The number of seconds after detection of motor over-temperature until the drive opens the fault relay.33333333333333 |
| Object Code | Variable                                                                                                                                                   |
| Data Type   | UNSIGNED16                                                                                                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x001E     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x012C     |
| Unit          | second     |

## 20C9h: Motor Over-Temperature Fault Level

### Object Description

|             |                                                                                    |
|-------------|------------------------------------------------------------------------------------|
| Index       | 20C9                                                                               |
| Description | <a href="#">VarCom - THERMTRIPLEVEL</a><br>The motor over-temperature fault level. |
| Object Code | Variable                                                                           |
| Data Type   | UNSIGNED32                                                                         |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000096 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0x000F4240 |
| Unit          | ohm        |

## 20CAh: Motor Over-Temperature Type

### Object Description

|             |                                                                                                                                                                         |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20CA                                                                                                                                                                    |
| Description | <a href="#">VarCom - THERMTYPE</a><br>The type of motor temperature sensor.<br>0 = Positive temperature coefficient (PTC)<br>1 = Negative temperature coefficient (NTC) |
| Object Code | Variable                                                                                                                                                                |
| Data Type   | UNSIGNED16                                                                                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 20CBh: Tamagawa Multi-Turn Reset

### Object Description

|             |                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20CB                                                                                                                              |
| Description | <a href="#">VarCom - TMTURNRESET</a><br>Resets the counter of a Tamagawa multi-turn encoder.<br>Write 01 to initiate the command. |
| Object Code | Variable                                                                                                                          |
| Data Type   | UNSIGNED8                                                                                                                         |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x01       |
| Unit          | -          |

## 20CCh: Run Time (CAN only)

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 20CC                                                                                                           |
| Description | <a href="#">VarCom - TRUN</a><br>The total elapsed run time of the drive since production.<br>Cannot be reset. |
| Object Code | Variable                                                                                                       |
| Data Type   | VISIBLE_STRING                                                                                                 |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0         |
| Lower Limit   | -         |
| Upper Limit   | -         |
| Unit          | -         |

## 20CDh: Under-Voltage Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20CD                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description | <a href="#">VarCom - UVMODE</a><br>Defines how the drive will respond to an under-voltage fault.<br>Possible values:<br>0 = Latches fault immediately if drive disabled or enabled.<br>1 = Issues warning if drive enabled. Ignores if drive disabled.<br>2 = Issues warning if drive enabled, then waits Under-Voltage Time (20Dh) before latching the fault. Ignores if drive disabled.<br>3 = Issues warning if drive disabled. Latches fault immediately if drive enabled. |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0003     |
| Unit          | -          |

## 20CEh: Under-Voltage Recovery Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20CE                                                                                                                                                                                                                                                                                      |
| Description | <a href="#">VarCom - UVRECOVER</a><br>Defines how the drive will recover from an under voltage fault.<br>0 = Recovers by toggling drive from disable to enable condition after the under voltage condition clears.<br>1 = Automatically recovers when the under voltage condition clears. |
| Object Code | Variable                                                                                                                                                                                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 20CFh: Under-Voltage Threshold 64

### Object Description

|             |                                                                                             |
|-------------|---------------------------------------------------------------------------------------------|
| Index       | 20CF                                                                                        |
| Description | <a href="#">VarCom - UVTHRESH</a><br>The level for detection of an under-voltage condition. |
| Object Code | Variable                                                                                    |
| Data Type   | UNSIGNED16                                                                                  |

### Entry Description

|               |                    |
|---------------|--------------------|
| Access        | Read/Write         |
| PDO Mapping   | No                 |
| Default Value | Hardware-dependent |
| Lower Limit   | 0x0014             |
| Upper Limit   | 0x0190             |
| Unit          | V                  |

## 20D0h: Under-Voltage Time

### Object Description

|             |                                                                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20D0                                                                                                                                                |
| Description | <a href="#">VarCom - UVTIME</a><br>The amount of time an under-voltage warning is displayed before it is latched in Under-Voltage Mode (20CDh) = 2. |
| Object Code | Variable                                                                                                                                            |
| Data Type   | UNSIGNED16                                                                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x001E     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x012C     |
| Unit          | second     |

## 20D1h: Bus Voltage (DC)

### Object Description

|             |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| Index       | 20D1                                                                                       |
| Description | <a href="#">VarCom - VBUS</a><br>The drive bus voltage used for current controller design. |
| Object Code | Variable                                                                                   |
| Data Type   | UNSIGNED16                                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0140     |
| Lower Limit   | 0x000A     |
| Upper Limit   | 0x0352     |
| Unit          | V          |

## 20D3h: Velocity Error

### Object Description

|             |                                                                         |
|-------------|-------------------------------------------------------------------------|
| Index       | 20D3                                                                    |
| Description | <a href="#">VarCom - VE</a><br>The velocity error of the velocity loop. |
| Object Code | Variable                                                                |
| Data Type   | INTEGER32                                                               |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user velocity units |

## 20D4h: Velocity Loop Controller

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20D4                                                                                                                                                                                                                                                                                                                                                                             |
| Description | <a href="#">VarCom - VELCONTROLMODE</a><br>Defines the type of velocity loop controller.<br>Possible values:<br>0 = PI controller (uses 2026h, 2027h)<br>1 = PDFF controller (uses 2025h, 2026h, 2027h)<br>2 = Standard pole placement controller (uses 2037h, 2039h, 2010h, 207Ah, 20C3h)<br>7 = HD velocity loop with integrator (uses 2017h, 201Ah)<br>3,4,5,6 = not for user |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                         |
| Data Type   | UNSIGNED8                                                                                                                                                                                                                                                                                                                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x07       |
| Unit          | -          |

## 20D5h: Velocity Design Conversion (CAN only)

### Object Description

|             |                                                                                                                                                                                                                                                                                            |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20D5                                                                                                                                                                                                                                                                                       |
| Description | <a href="#">VarCom - VELDESIGN</a><br>Velocity design structure.<br>Returns a conversion of the internal velocity controller as set by one of the standard velocity control modes to a general extended polynomial controller structure.<br>Applicable only to linear position controller. |
| Object Code | Variable                                                                                                                                                                                                                                                                                   |
| Data Type   | VISIBLE_STRING                                                                                                                                                                                                                                                                             |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0         |
| Lower Limit   | -         |
| Upper Limit   | -         |
| Unit          | -         |

## 20D6h: Velocity Filter Mode

### Object Description

|             |                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20D6                                                                                                                                                                       |
| Description | <a href="#">VarCom - VELFILTMODE</a><br>Defines the type of filter for extracting a velocity signal from the position feedback.<br>0 = No filter<br>1 = First order filter |
| Object Code | Variable                                                                                                                                                                   |
| Data Type   | UNSIGNED16                                                                                                                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0001     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0003     |
| Unit          | -          |

## 20D7h: Drive Version (CAN only)

### Object Description

|             |                                                                |
|-------------|----------------------------------------------------------------|
| Index       | 20D7                                                           |
| Description | <a href="#">VarCom - VER</a><br>The firmware version of drive. |
| Object Code | Variable                                                       |
| Data Type   | VISIBLE_STRING                                                 |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0         |
| Lower Limit   | -         |
| Upper Limit   | -         |
| Unit          | -         |

## 20D8h: Velocity Loop Output Filter

### Object Description

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| Index       | 20D8                                                                     |
| Description | <a href="#">VarCom - VF</a><br>User defined velocity loop output filter. |
| Object Code | Record                                                                   |
| Data Type   | Manufacturer-specific, varies by sub-index.                              |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x08              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 001            |
| <b>Description</b>    | Polynom_Term_1 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 002            |
| <b>Description</b>    | Polynom_Term_2 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 003            |
| <b>Description</b>    | Polynom_Term_3 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 004            |
| <b>Description</b>    | Polynom_Term_4 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x00000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 005            |
| <b>Description</b>    | Polynom_Term_5 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 006            |
| <b>Description</b>    | Polynom_Term_6 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 007            |
| <b>Description</b>    | Polynom_Term_7 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x00000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 008          |
| <b>Description</b>    | Term_Execute |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED8    |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x00         |
| <b>Lower Limit</b>    | 0x00         |
| <b>Upper Limit</b>    | 0x01         |
| <b>Unit</b>           | -            |

## 20D9h: Velocity Loop Input Filter

### Object Description

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| Index       | 20D9                                                                     |
| Description | <a href="#">VarCom - VFI</a><br>User defined velocity loop input filter. |
| Object Code | Record                                                                   |
| Data Type   | Manufacturer-specific, varies by sub-index.                              |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x08              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |                |
|----------------|----------------|
| Sub-Index      | 001            |
| Description    | Polynom_Term_1 |
| Entry Category | Optional       |
| Data Type      | INTEGER32      |
| Access         | Read/Write     |
| PDO Mapping    | No             |
| Default Value  | 0x00000000     |
| Lower Limit    | 0x80000000     |
| Upper Limit    | 0x7FFFFFFF     |
| Unit           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 002            |
| <b>Description</b>    | Polynom_Term_2 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 003            |
| <b>Description</b>    | Polynom_Term_3 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 004            |
| <b>Description</b>    | Polynom_Term_4 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x00000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 005            |
| <b>Description</b>    | Polynom_Term_5 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 006            |
| <b>Description</b>    | Polynom_Term_6 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 007            |
| <b>Description</b>    | Polynom_Term_7 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x00000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                |              |
|----------------|--------------|
| Sub-Index      | 008          |
| Description    | Term_Execute |
| Entry Category | Optional     |
| Data Type      | UNSIGNED8    |
| Access         | Read/Write   |
| PDO Mapping    | No           |
| Default Value  | 0x00         |
| Lower Limit    | 0x00         |
| Upper Limit    | 0x1          |
| Unit           | -            |

## 20DAh: Advanced Pole Placement H Polynomial

### Object Description

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Index       | 20DA                                                                      |
| Description | <a href="#">VarCom - VH</a><br>Extended velocity controller H-polynomial. |
| Object Code | Record                                                                    |
| Data Type   | Manufacturer-specific, varies by sub-index.                               |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x0D              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Sub-Index</b>      | 001                         |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_1 |
| <b>Entry Category</b> | Optional                    |
| <b>Data Type</b>      | INTEGER32                   |
| <b>Access</b>         | Read/Write                  |
| <b>PDO Mapping</b>    | No                          |
| <b>Default Value</b>  | 0x00000000                  |
| <b>Lower Limit</b>    | 0x80000000                  |
| <b>Upper Limit</b>    | 0x7FFFFFFF                  |
| <b>Unit</b>           | -                           |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Sub-Index</b>      | 002                         |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_2 |
| <b>Entry Category</b> | Optional                    |
| <b>Data Type</b>      | INTEGER32                   |
| <b>Access</b>         | Read/Write                  |
| <b>PDO Mapping</b>    | No                          |
| <b>Default Value</b>  | 0x00000000                  |
| <b>Lower Limit</b>    | 0x00000000                  |
| <b>Upper Limit</b>    | 0x7FFFFFFF                  |
| <b>Unit</b>           | -                           |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Sub-Index</b>      | 003                         |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_3 |
| <b>Entry Category</b> | Optional                    |
| <b>Data Type</b>      | INTEGER32                   |
| <b>Access</b>         | Read/Write                  |
| <b>PDO Mapping</b>    | No                          |
| <b>Default Value</b>  | 0x00000000                  |
| <b>Lower Limit</b>    | 0x80000000                  |
| <b>Upper Limit</b>    | 0x7FFFFFFF                  |
| <b>Unit</b>           | -                           |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Sub-Index</b>      | 004                         |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_4 |
| <b>Entry Category</b> | Optional                    |
| <b>Data Type</b>      | INTEGER32                   |
| <b>Access</b>         | Read/Write                  |
| <b>PDO Mapping</b>    | No                          |
| <b>Default Value</b>  | 0x00000000                  |
| <b>Lower Limit</b>    | 0x00000000                  |
| <b>Upper Limit</b>    | 0x7FFFFFFF                  |
| <b>Unit</b>           | -                           |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Sub-Index</b>      | 005                         |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_5 |
| <b>Entry Category</b> | Optional                    |
| <b>Data Type</b>      | INTEGER32                   |
| <b>Access</b>         | Read/Write                  |
| <b>PDO Mapping</b>    | No                          |
| <b>Default Value</b>  | 0x00000000                  |
| <b>Lower Limit</b>    | 0x80000000                  |
| <b>Upper Limit</b>    | 0x7FFFFFFF                  |
| <b>Unit</b>           | -                           |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Sub-Index</b>      | 006                         |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_6 |
| <b>Entry Category</b> | Optional                    |
| <b>Data Type</b>      | INTEGER32                   |
| <b>Access</b>         | Read/Write                  |
| <b>PDO Mapping</b>    | No                          |
| <b>Default Value</b>  | 0x00000000                  |
| <b>Lower Limit</b>    | 0x00000000                  |
| <b>Upper Limit</b>    | 0x7FFFFFFF                  |
| <b>Unit</b>           | -                           |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Sub-Index</b>      | 007                         |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_7 |
| <b>Entry Category</b> | Optional                    |
| <b>Data Type</b>      | INTEGER32                   |
| <b>Access</b>         | Read/Write                  |
| <b>PDO Mapping</b>    | No                          |
| <b>Default Value</b>  | 0x00000000                  |
| <b>Lower Limit</b>    | 0x80000000                  |
| <b>Upper Limit</b>    | 0x7FFFFFFF                  |
| <b>Unit</b>           | -                           |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Sub-Index</b>      | 008                         |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_8 |
| <b>Entry Category</b> | Optional                    |
| <b>Data Type</b>      | INTEGER32                   |
| <b>Access</b>         | Read/Write                  |
| <b>PDO Mapping</b>    | No                          |
| <b>Default Value</b>  | 0x00000000                  |
| <b>Lower Limit</b>    | 0x00000000                  |
| <b>Upper Limit</b>    | 0x7FFFFFFF                  |
| <b>Unit</b>           | -                           |

|                       |                             |
|-----------------------|-----------------------------|
| <b>Sub-Index</b>      | 009                         |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_9 |
| <b>Entry Category</b> | Optional                    |
| <b>Data Type</b>      | INTEGER32                   |
| <b>Access</b>         | Read/Write                  |
| <b>PDO Mapping</b>    | No                          |
| <b>Default Value</b>  | 0x00000000                  |
| <b>Lower Limit</b>    | 0x80000000                  |
| <b>Upper Limit</b>    | 0x7FFFFFFF                  |
| <b>Unit</b>           | -                           |

|                       |                              |
|-----------------------|------------------------------|
| <b>Sub-Index</b>      | 010                          |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_10 |
| <b>Entry Category</b> | Optional                     |
| <b>Data Type</b>      | INTEGER32                    |
| <b>Access</b>         | Read/Write                   |
| <b>PDO Mapping</b>    | No                           |
| <b>Default Value</b>  | 0x00000000                   |
| <b>Lower Limit</b>    | 0x00000000                   |
| <b>Upper Limit</b>    | 0x7FFFFFFF                   |
| <b>Unit</b>           | -                            |

|                       |                              |
|-----------------------|------------------------------|
| <b>Sub-Index</b>      | 011                          |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_11 |
| <b>Entry Category</b> | Optional                     |
| <b>Data Type</b>      | INTEGER32                    |
| <b>Access</b>         | Read/Write                   |
| <b>PDO Mapping</b>    | No                           |
| <b>Default Value</b>  | 0x00000000                   |
| <b>Lower Limit</b>    | 0x80000000                   |
| <b>Upper Limit</b>    | 0x7FFFFFFF                   |
| <b>Unit</b>           | -                            |

|                       |                              |
|-----------------------|------------------------------|
| <b>Sub-Index</b>      | 012                          |
| <b>Description</b>    | manu_spec_Vh_Polynom_Term_12 |
| <b>Entry Category</b> | Optional                     |
| <b>Data Type</b>      | INTEGER32                    |
| <b>Access</b>         | Read/Write                   |
| <b>PDO Mapping</b>    | No                           |
| <b>Default Value</b>  | 0x00000000                   |
| <b>Lower Limit</b>    | 0x00000000                   |
| <b>Upper Limit</b>    | 0x7FFFFFFF                   |
| <b>Unit</b>           | -                            |

|                |                                   |
|----------------|-----------------------------------|
| Sub-Index      | 013                               |
| Description    | manu_spec_Vh_Polynom_Term_Execute |
| Entry Category | Optional                          |
| Data Type      | UNSIGNED8                         |
| Access         | Read/Write                        |
| PDO Mapping    | No                                |
| Default Value  | 0x00                              |
| Lower Limit    | 0x00                              |
| Upper Limit    | 0x01                              |
| Unit           | -                                 |

## 20DBh: Advanced Pole Placement R Polynomial

### Object Description

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Index       | 20DB                                                                      |
| Description | <a href="#">VarCom - VR</a><br>Extended velocity controller R-polynomial. |
| Object Code | Record                                                                    |
| Data Type   | Manufacturer-specific, varies by sub-index.                               |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x0B              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 001            |
| <b>Description</b>    | Polynom_Term_1 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 002            |
| <b>Description</b>    | Polynom_Term_2 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x00000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 003            |
| <b>Description</b>    | Polynom_Term_3 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 004            |
| <b>Description</b>    | Polynom_Term_4 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x00000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 005            |
| <b>Description</b>    | Polynom_Term_5 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 006            |
| <b>Description</b>    | Polynom_Term_6 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x00000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 007            |
| <b>Description</b>    | Polynom_Term_7 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 008            |
| <b>Description</b>    | Polynom_Term_8 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x00000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 009            |
| <b>Description</b>    | Polynom_Term_9 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                |                 |
|----------------|-----------------|
| Sub-Index      | 010             |
| Description    | Polynom_Term_10 |
| Entry Category | Optional        |
| Data Type      | INTEGER32       |
| Access         | Read/Write      |
| PDO Mapping    | No              |
| Default Value  | 0x00000000      |
| Lower Limit    | 0x00000000      |
| Upper Limit    | 0x7FFFFFFF      |
| Unit           | -               |

|                |              |
|----------------|--------------|
| Sub-Index      | 011          |
| Description    | Term_Execute |
| Entry Category | Optional     |
| Data Type      | UNSIGNED8    |
| Access         | Read/Write   |
| PDO Mapping    | No           |
| Default Value  | 0x00         |
| Lower Limit    | 0x00         |
| Upper Limit    | 0x01         |
| Unit           | -            |

## 20DCh: Wake No Shake Status (CAN only)

### Object Description

|             |                                                         |
|-------------|---------------------------------------------------------|
| Index       | 20DC                                                    |
| Description | <a href="#">VarCom - WNSERR</a><br>Wake No Shake Status |
| Object Code | Variable                                                |
| Data Type   | VISIBLE_STRING                                          |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0         |
| Lower Limit   | -         |
| Upper Limit   | -         |
| Unit          | -         |

## 20DDh: Display Warnings (CAN only)

### Object Description

|             |                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------|
| Index       | 20DD                                                                                                     |
| Description | <a href="#">VarCom - WRN</a><br>Lists the warnings that have occurred since the buffer was last cleared. |
| Object Code | Variable                                                                                                 |
| Data Type   | VISIBLE_STRING                                                                                           |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0         |
| Lower Limit   | -         |
| Upper Limit   | -         |
| Unit          | -         |

## 20DEh: External Encoder Resolution

### Object Description

|             |                                                                             |
|-------------|-----------------------------------------------------------------------------|
| Index       | 20DE                                                                        |
| Description | <a href="#">VarCom - XENCRES</a><br>The resolution of the external encoder. |
| Object Code | Variable                                                                    |
| Data Type   | INTEGER32                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000800 |
| Lower Limit   | 0x00000064 |
| Upper Limit   | 0x00989680 |
| Unit          | -          |

## 20DFh: Zeroing Command

### Object Description

|             |                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 20DF                                                                                                                                                                                                                                             |
| Description | <a href="#">VarCom - ZERO</a><br>Activates Zeroing mode, which locks the rotor in place by passing a fixed current through two phases. This is useful for determining the commutation offset on motors that have a resolver or absolute encoder. |
| Object Code | Variable                                                                                                                                                                                                                                         |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## **20E0h: Input Mode**

### **Object Description**

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Index</b>       | 20E0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Description</b> | <p><b>VarCom - INMODE</b></p> <p>Defines the function of each digital input.</p> <p>Write the input index first. Then write the value to assign the function to the corresponding input index.</p> <p>Possible values:</p> <ul style="list-style-type: none"> <li>0 = Idle</li> <li>1 = Remote enable</li> <li>2 = Clear faults</li> <li>3 = Phase lock loop (PLL) synchronization</li> <li>4 = Emergency stop, activates Active Disable</li> <li>5 = Limit switch positive</li> <li>6 = Limit switch negative</li> <li>7 = Reserved</li> <li>8 = Home switch</li> <li>9 = Script trigger</li> <li>10 = Script bit 0</li> <li>11 = Script bit 1</li> <li>12 = Script bit 2</li> <li>13 = Script bit 3</li> <li>14 = Script bit 4</li> <li>15 = Reserved</li> <li>16 = Reserved</li> <li>17 = Gearing pulse signal on digital input 5 only</li> <li>18 = Gearing direction signal - on digital input 6 only</li> <li>19 to 25 = Reserved</li> <li>26 = Homing command</li> <li>27 = Touch probe 1</li> <li>28 = Reserved</li> <li>29 = Reserved</li> <li>30 = Hold and resume motion</li> <li>31 = Reserved</li> <li>32 = Operation mode change while drive enabled</li> <li>33 = Explicitly sets OPMODE 4 and ENCFOLLOWER 1</li> <li>34 = Explicitly sets OPMODE 4 and ENCFOLLOWER 2</li> <li>35 = Explicitly sets OPMODE 4 and ENCFOLLOWER 3</li> <li>36 = Explicitly sets OPMODE 4 and ENCFOLLOWER 4</li> <li>37 = Explicitly sets OPMODE 4 and ENCFOLLOWER 5</li> <li>38 = JOG motor to positive direction at speed JOGSPD1</li> <li>39 = JOG motor to negative direction at speed -JOGSPD1</li> <li>40 = JOG motor to positive direction at speed JOGSPD2</li> <li>41 = JOG motor to negative direction at speed -JOGSPD2</li> </ul> |
| <b>Object Code</b> | Array                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Data Type</b>   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

**Entry Description**

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 000               |
| <b>Description</b>    | Number of Entries |
| <b>Entry Category</b> | Optional          |
| <b>Access</b>         | Read Only         |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x02              |
| <b>Lower Limit</b>    | 0x02              |
| <b>Upper Limit</b>    | 0x02              |
| <b>Unit</b>           | -                 |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 001         |
| <b>Description</b>    | Input Index |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | UNSIGNED16  |
| <b>Access</b>         | Read/Write  |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x0001      |
| <b>Lower Limit</b>    | 0x0001      |
| <b>Upper Limit</b>    | 0x000B      |
| <b>Unit</b>           | -           |

|                       |               |
|-----------------------|---------------|
| <b>Sub-Index</b>      | 002           |
| <b>Description</b>    | Function Code |
| <b>Entry Category</b> | Optional      |
| <b>Data Type</b>      | UNSIGNED16    |
| <b>Access</b>         | Read/Write    |
| <b>PDO Mapping</b>    | No            |
| <b>Default Value</b>  | 0x0001        |
| <b>Lower Limit</b>    | 0x0000        |
| <b>Upper Limit</b>    | 0x0029        |
| <b>Unit</b>           | -             |

## 20E1h: Rotary Address Switch

### Object Description

|             |                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------|
| Index       | 20E1                                                                                                     |
| Description | <a href="#">VarCom - ADDR</a><br>The rotary switch position that defines the drive communication address |
| Object Code | Variable                                                                                                 |
| Data Type   | VISIBLE_STRING                                                                                           |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0         |
| Lower Limit   | -         |
| Upper Limit   | -         |
| Unit          | -         |

## 20E2h: Test Digital Display

### Object Description

|             |                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------|
| Index       | 20E2                                                                                               |
| Description | <a href="#">VarCom - DISPLAYTEST</a><br>Tests the digital display on the front panel of the drive. |
| Object Code | Variable                                                                                           |
| Data Type   | UNSIGNED16                                                                                         |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 20E3h: Encoder Simulation Mode

### Object Description

|             |                                                                                        |
|-------------|----------------------------------------------------------------------------------------|
| Index       | 20E3                                                                                   |
| Description | <a href="#">VarCom - ENCOUTMODE</a><br>Indicates the status of the encoder simulation. |
| Object Code | Variable                                                                               |
| Data Type   | UNSIGNED16                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 20E4h: Encoder Simulation Line Resolution

### Object Description

|             |                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------|
| Index       | 20E4                                                                                                       |
| Description | <a href="#">VarCom - ENCOUTRES</a><br>The resolution of the encoder simulation output, in number of lines. |
| Object Code | Variable                                                                                                   |
| Data Type   | INTEGER32                                                                                                  |

### Entry Description

|               |                 |
|---------------|-----------------|
| Access        | Read/Write      |
| PDO Mapping   | No              |
| Default Value | 0x00000800      |
| Lower Limit   | 0xFF676980      |
| Upper Limit   | 0x00989680      |
| Unit          | Number of lines |

## 20E5h: Encoder Simulation Index Position

### Object Description

|             |                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------|
| Index       | 20E5                                                                                            |
| Description | <a href="#">VarCom - ENCOUTZPOS</a><br>The index offset value of the encoder simulation output. |
| Object Code | Variable                                                                                        |
| Data Type   | UNSIGNED32                                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0x02625A00 |
| unit          | counts     |

## 20E6h: Recording Done

### Object Description

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Index       | 20E6                                                                                                   |
| Description | <a href="#">VarCom - RECDONE</a><br>Indicates whether the recording is complete and data is available. |
| Object Code | Variable                                                                                               |
| Data Type   | UNSIGNED8                                                                                              |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x00      |
| Lower Limit   | 0x00      |
| Upper Limit   | 0x01      |
| Unit          | -         |

**20E7h: Get Recorded Data (CAN only)****Object Description**

|             |                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------|
| Index       | 20E7                                                                                                    |
| Description | <a href="#">VarCom - GET</a><br>Gets the recorded data that was captured using the recording mechanism. |
| Object Code | Record                                                                                                  |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                             |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x06              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |               |
|----------------|---------------|
| Sub-Index      | 001           |
| Description    | Packet Select |
| Entry Category | Optional      |
| Data Type      | UNSIGNED8     |
| Access         | Read/Write    |
| PDO Mapping    | No            |
| Default Value  | 0x00          |
| Lower Limit    | 0x00          |
| Upper Limit    | 0xFF          |
| Unit           | -             |

|                       |           |
|-----------------------|-----------|
| <b>Sub-Index</b>      | 002       |
| <b>Description</b>    | Domain    |
| <b>Entry Category</b> | Optional  |
| <b>Data Type</b>      | DOMAIN    |
| <b>Access</b>         | Read Only |
| <b>PDO Mapping</b>    | No        |
| <b>Default Value</b>  | 0x0       |
| <b>Lower Limit</b>    | -         |
| <b>Upper Limit</b>    | -         |
| <b>Unit</b>           | -         |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 003         |
| <b>Description</b>    | Data Length |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | INTEGER16   |
| <b>Access</b>         | Read Only   |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x0000      |
| <b>Lower Limit</b>    | 0x8000      |
| <b>Upper Limit</b>    | 0x7FFF      |
| <b>Unit</b>           | -           |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 004         |
| <b>Description</b>    | Data Status |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | UNSIGNED16  |
| <b>Access</b>         | Read Only   |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x0000      |
| <b>Lower Limit</b>    | 0x0000      |
| <b>Upper Limit</b>    | 0xFFFF      |
| <b>Unit</b>           | -           |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 005                 |
| <b>Description</b>    | RT Data Acknowledge |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED16          |
| <b>Access</b>         | Read Only           |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x0000              |
| <b>Lower Limit</b>    | 0x0000              |
| <b>Upper Limit</b>    | 0xFFFF              |
| <b>Unit</b>           | -                   |

|                       |                    |
|-----------------------|--------------------|
| <b>Sub-Index</b>      | 006                |
| <b>Description</b>    | Number of Channels |
| <b>Entry Category</b> | Optional           |
| <b>Data Type</b>      | UNSIGNED16         |
| <b>Access</b>         | Read/Write         |
| <b>PDO Mapping</b>    | No                 |
| <b>Default Value</b>  | 0x0000             |
| <b>Lower Limit</b>    | 0x0000             |
| <b>Upper Limit</b>    | 0xFFFF             |
| <b>Unit</b>           | -                  |

**20E8h: Trigger Recording (CAN only)****Object Description**

|             |                                                             |
|-------------|-------------------------------------------------------------|
| Index       | 20E8                                                        |
| Description | <a href="#">VarCom - RECTRIG</a><br>Triggers the recording. |
| Object Code | Record                                                      |
| Data Type   | Manufacturer-specific, varies by sub-index.                 |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x05              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |                |
|----------------|----------------|
| Sub-Index      | 001            |
| Description    | Var            |
| Entry Category | Optional       |
| Data Type      | VISIBLE_STRING |
| Access         | Read/Write     |
| PDO Mapping    | No             |
| Default Value  | 0              |
| Lower Limit    | -              |
| Upper Limit    | -              |
| Unit           | -              |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | ThrsLvl    |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | REAL32     |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0.0        |
| <b>Lower Limit</b>    | 0          |
| <b>Upper Limit</b>    | 0          |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | PreTrg     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x0000     |
| <b>Upper Limit</b>    | 0xFFFF     |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 004        |
| <b>Description</b>    | EdgePlr    |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED8  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00       |
| <b>Lower Limit</b>    | 0x00       |
| <b>Upper Limit</b>    | 0xFF       |
| <b>Unit</b>           | -          |

|                |            |
|----------------|------------|
| Sub-Index      | 005        |
| Description    | Activate   |
| Entry Category | Optional   |
| Data Type      | UNSIGNED8  |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x00       |
| Lower Limit    | 0x00       |
| Upper Limit    | 0xFF       |
| Unit           | -          |

## 20E9h: Stop Recording (CAN only)

### Object Description

|             |                                                               |
|-------------|---------------------------------------------------------------|
| Index       | 20E9                                                          |
| Description | <a href="#">VarCom - RECOFF</a><br>Stops an active recording. |
| Object Code | Variable                                                      |
| Data Type   | UNSIGNED8                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xFF       |
| Unit          | -          |

**20EAh: Record Command (CAN only)****Object Description**

|             |                                                                               |
|-------------|-------------------------------------------------------------------------------|
| Index       | 20EA                                                                          |
| Description | <a href="#">VarCom - RECORD</a><br>The command for recording realtime values. |
| Object Code | Record                                                                        |
| Data Type   | Manufacturer-specific, varies by sub-index.                                   |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x09              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |             |
|----------------|-------------|
| Sub-Index      | 001         |
| Description    | Sample Time |
| Entry Category | Optional    |
| Data Type      | UNSIGNED16  |
| Access         | Read/Write  |
| PDO Mapping    | No          |
| Default Value  | 0x0000      |
| Lower Limit    | 0x0000      |
| Upper Limit    | 0xFFFF      |
| Unit           | -           |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | Num Points |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0001     |
| <b>Lower Limit</b>    | 0x0001     |
| <b>Upper Limit</b>    | 0xFFFF     |
| <b>Unit</b>           | -          |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 003            |
| <b>Description</b>    | Var1           |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | VISIBLE_STRING |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0              |
| <b>Lower Limit</b>    | -              |
| <b>Upper Limit</b>    | -              |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 004            |
| <b>Description</b>    | Var2           |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | VISIBLE_STRING |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0              |
| <b>Lower Limit</b>    | -              |
| <b>Upper Limit</b>    | -              |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 005            |
| <b>Description</b>    | Var3           |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | VISIBLE_STRING |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | -              |
| <b>Upper Limit</b>    | -              |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 006            |
| <b>Description</b>    | Var4           |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | VISIBLE_STRING |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | -              |
| <b>Upper Limit</b>    | -              |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 007            |
| <b>Description</b>    | Var5           |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | VISIBLE_STRING |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | -              |
| <b>Upper Limit</b>    | -              |
| <b>Unit</b>           | -              |

|                |                |
|----------------|----------------|
| Sub-Index      | 008            |
| Description    | Var6           |
| Entry Category | Optional       |
| Data Type      | VISIBLE_STRING |
| Access         | Read/Write     |
| PDO Mapping    | No             |
| Default Value  | 0x0            |
| Lower Limit    | -              |
| Upper Limit    | -              |
| Unit           | -              |

|                |            |
|----------------|------------|
| Sub-Index      | 009        |
| Description    | Activate   |
| Entry Category | Optional   |
| Data Type      | UNSIGNED8  |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x00       |
| Lower Limit    | 0x00       |
| Upper Limit    | 0xFF       |
| Unit           | -          |

## 20EBh: Recording Status

### Object Description

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 20EB                                                                           |
| Description | <a href="#">VarCom - RECING</a><br>Indicates if data recording is in progress. |
| Object Code | Variable                                                                       |
| Data Type   | UNSIGNED8                                                                      |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x00      |
| Lower Limit   | 0x00      |
| Upper Limit   | 0xFF      |
| Unit          | -         |

## 20ECh: Ready to Record

### Object Description

|             |                                                                                           |
|-------------|-------------------------------------------------------------------------------------------|
| Index       | 20EC                                                                                      |
| Description | <a href="#">VarCom - RECRDY</a><br>Indicates the ready status of the recording mechanism. |
| Object Code | Variable                                                                                  |
| Data Type   | INTEGER16                                                                                 |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x8000    |
| Upper Limit   | 0x7FFF    |
| Unit          | -         |

## 20EEh: Maximum Velocity for Drive and Motor

### Object Description

|             |                                                                                        |
|-------------|----------------------------------------------------------------------------------------|
| Index       | 20EE                                                                                   |
| Description | <a href="#">VarCom - VMAX</a><br>The maximum velocity for drive and motor combination. |
| Object Code | Variable                                                                               |
| Data Type   | INTEGER32                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 20EFh: Dead Time Compensation Minimal Level

### Object Description

|             |                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------|
| Index       | 20EF                                                                                              |
| Description | <a href="#">VarCom - KCD</a><br>Minimum current level to start compensation for dead-time effect. |
| Object Code | Variable                                                                                          |
| Data Type   | REAL32                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 1.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 10.0       |
| Unit          | -          |

## 20F0h: Maximum Current for Drive and Motor

### Object Description

|             |                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------|
| Index       | 20F0                                                                                          |
| Description | <a href="#">VarCom - IMAX</a><br>The maximum current limit for a drive and motor combination. |
| Object Code | Variable                                                                                      |
| Data Type   | INTEGER32                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0x000249F0 |
| Unit          | mA         |

## 20F2h: Analog Input 1

### Object Description

|             |                                                                |
|-------------|----------------------------------------------------------------|
| Index       | 20F2                                                           |
| Description | <a href="#">VarCom - ANIN1</a><br>The value of analog input 1. |
| Object Code | Variable                                                       |
| Data Type   | INTEGER16                                                      |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x8000                 |
| Upper Limit   | 0x7FFF                 |
| Unit          | V                      |

## 20F3h: Analog Input 1 Deadband

### Object Description

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Index       | 20F3                                                                      |
| Description | <a href="#">VarCom - ANIN1DB</a><br>The deadband range of analog input 1. |
| Object Code | Variable                                                                  |
| Data Type   | UNSIGNED16                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x8000     |
| Upper Limit   | 0x7FFF     |
| Unit          | V          |

## 20F4h: Analog Input 1 Current Scaling

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 20F4                                                                                                  |
| Description | <a href="#">VarCom - ANIN1ISCALE</a><br>The scaling value of the analog current command from input 1. |
| Object Code | Variable                                                                                              |
| Data Type   | INTEGER32                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | V          |

## 20F5h: Analog Input 1 Low Pass Filter

### Object Description

|             |                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------|
| Index       | 20F5                                                                                                                   |
| Description | <a href="#">VarCom - ANIN1LPFHZ</a><br>The corner frequency of a first order filter that is applied to analog input 1. |
| Object Code | Variable                                                                                                               |
| Data Type   | INTEGER16                                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x03E8     |
| Lower Limit   | 0x000A     |
| Upper Limit   | 0x2710     |
| Unit          | Hz         |

## 20F6h: Analog Input 1 Offset

### Object Description

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 20F6                                                                           |
| Description | <a href="#">VarCom - ANIN1OFFSET</a><br>The offset voltage for analog input 1. |
| Object Code | Variable                                                                       |
| Data Type   | INTEGER16                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x8000     |
| Upper Limit   | 0x7FFF     |
| Unit          | V          |

## 20F7h: Analog Input 1 Velocity Scaling

### Object Description

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Index       | 20F7                                                                                                   |
| Description | <a href="#">VarCom - ANIN1VSCALE</a><br>The scaling value of the analog velocity command from input 1. |
| Object Code | Variable                                                                                               |
| Data Type   | INTEGER32                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | V          |

## 20F8h: Analog Input 1 Zeroing

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 20F8                                                                                                           |
| Description | <a href="#">VarCom - ANIN1ZERO</a><br>Zeroes the value of analog input 1 by modifying the analog offset value. |
| Object Code | Variable                                                                                                       |
| Data Type   | UNSIGNED16                                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 20F9h: Analog Input 2

### Object Description

|             |                                                                |
|-------------|----------------------------------------------------------------|
| Index       | 20F9                                                           |
| Description | <a href="#">VarCom - ANIN2</a><br>The value of analog input 2. |
| Object Code | Variable                                                       |
| Data Type   | INTEGER16                                                      |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x8000                 |
| Upper Limit   | 0x7FFF                 |
| Unit          | V                      |

## 20FAh: Analog Input 2 Deadband

### Object Description

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Index       | 20FA                                                                      |
| Description | <a href="#">VarCom - ANIN2DB</a><br>The deadband range of analog input 2. |
| Object Code | Variable                                                                  |
| Data Type   | UNSIGNED16                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x8000     |
| Upper Limit   | 0x7FFF     |
| Unit          | V          |

## 20FBh: Analog Input 2 Current Scaling

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 20FB                                                                                                  |
| Description | <a href="#">VarCom - ANIN2ISCALE</a><br>The scaling value of the analog current command from input 2. |
| Object Code | Variable                                                                                              |
| Data Type   | INTEGER32                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | V          |

## 20FCh: Analog Input 2 Low Pass Filter

### Object Description

|             |                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------|
| Index       | 20FC                                                                                                                   |
| Description | <a href="#">VarCom - ANIN2LPFHZ</a><br>The corner frequency of a first order filter that is applied to analog input 2. |
| Object Code | Variable                                                                                                               |
| Data Type   | INTEGER16                                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x03E8     |
| Lower Limit   | 0x000A     |
| Upper Limit   | 0x2710     |
| Unit          | Hz         |

## 20FDh: Analog Input 2 Offset

### Object Description

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 20FD                                                                           |
| Description | <a href="#">VarCom - ANIN2OFFSET</a><br>The offset voltage for analog input 2. |
| Object Code | Variable                                                                       |
| Data Type   | INTEGER16                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x8000     |
| Upper Limit   | 0x7FFF     |
| Unit          | V          |

## 20FFh: Analog Input 2 Zeroing

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 20FF                                                                                                           |
| Description | <a href="#">VarCom - ANIN2ZERO</a><br>Zeroes the value of analog input 2 by modifying the analog offset value. |
| Object Code | Variable                                                                                                       |
| Data Type   | UNSIGNED16                                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 2100h: Analog Input 2 Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2100                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Description | <a href="#">VarCom - ANIN2MODE</a><br>Defines the function of analog input 2.<br>Possible values:<br>-1= Hardware defined dual gain. ANIN2 is inactive, ANIN1 has a 16 bit resolution, ANIN2MODE is read only.<br>0 = Idle. ANIN2 input voltage is read only.<br>1 = Dual gain. External jumper connection between the analog inputs is required.<br>2 = Current limit mode. Second analog input limits current command. |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Data Type   | INTEGER16                                                                                                                                                                                                                                                                                                                                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0xFFFF     |
| Upper Limit   | 0x0002     |
| Unit          | -          |

## 2103h: Homing Command

### Object Description

|             |                                                                |
|-------------|----------------------------------------------------------------|
| Index       | 2103                                                           |
| Description | <a href="#">VarCom - HOMECMD</a><br>Starts the homing process. |
| Object Code | Variable                                                       |
| Data Type   | UNSIGNED8                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xFF       |
| Unit          | -          |

## 2104h: Current Level for Homing on Hard Stop

### Object Description

|             |                                                                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2104                                                                                                                                                                                            |
| Description | <a href="#">VarCom - HOMEIHARDSTOP</a><br>The current level at which a hard stop is detected. Used when the homing process uses a hard stop (instead of a limit switch) for direction-reversal. |
| Object Code | Variable                                                                                                                                                                                        |
| Data Type   | INTEGER32                                                                                                                                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

## 2106h: Current Loop Compatibility Mode

### Object Description

|             |                                                                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2106                                                                                                                                                                 |
| Description | <a href="#">VarCom - KCMODE</a><br>The type of current control loop.<br>Enables use of new firmware version while maintaining the existing current control settings. |
| Object Code | Variable                                                                                                                                                             |
| Data Type   | INTEGER16                                                                                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x8000     |
| Upper Limit   | 0x7FFF     |
| Unit          | -          |

## 2108h: Position Command Moving Average Filter

### Object Description

|             |                                                                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2108                                                                                                                                                                                        |
| Description | <a href="#">VarCom - MOVESMOOTHAVG</a><br>The moving average filter. Can be applied to a position or velocity reference command to smooth the command and shape it into an S-curve profile. |
| Object Code | Variable                                                                                                                                                                                    |
| Data Type   | REAL32                                                                                                                                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

## 2109h: Position Command Smoothing Mode

### Object Description

|             |                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------|
| Index       | 2109                                                                                                 |
| Description | <a href="#">VarCom - MOVESMOOTHMODE</a><br>Defines the method of smoothing for the position command. |
| Object Code | Variable                                                                                             |
| Data Type   | UNSIGNED16                                                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

## 210Bh: HD Anti-Vibration - Load to Motor Inertia Ratio

### Object Description

|             |                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------|
| Index       | 210B                                                                                                                      |
| Description | <a href="#">VarCom - NLANTIVIBLMJR</a><br>The HD position control loop anti-vibration filter load to motor inertia ratio. |
| Object Code | Variable                                                                                                                  |
| Data Type   | REAL32                                                                                                                    |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 0.0        |
| Unit          | -          |

**210Ch: HD Anti-Vibration Filter - Divider****Object Description**

|             |                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------|
| Index       | 210C                                                                                                 |
| Description | <a href="#">VarCom - NLANTIVIBN</a><br>The HD position control loop anti-vibration filter – divider. |
| Object Code | Variable                                                                                             |
| Data Type   | REAL32                                                                                               |

**Entry Description**

|               |                  |
|---------------|------------------|
| Access        | Read/Write       |
| PDO Mapping   | No               |
| Default Value | 0.00999999977648 |
| Lower Limit   | 0.00999999977648 |
| Upper Limit   | 100.0            |
| Unit          | -                |

**210Dh: HD Current Filter Low Pass Filter Rise Time****Object Description**

|             |                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------|
| Index       | 210D                                                                                                            |
| Description | <a href="#">VarCom - NLFILTT1</a><br>Used in the HD control loop to define the inverse of the cutoff frequency. |
| Object Code | Variable                                                                                                        |
| Data Type   | REAL32                                                                                                          |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 0.0        |
| Unit          | -          |

**2113h: Drive Ready****Object Description**

|             |                                                                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2113                                                                                                                                          |
| Description | <a href="#">VarCom - READY</a><br>Indicates whether the drive is ready for activation with only external remote enable switch still required. |
| Object Code | Variable                                                                                                                                      |
| Data Type   | UNSIGNED8                                                                                                                                     |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

**2114h: Drive Status (CAN only)****Object Description**

|             |                                                                        |
|-------------|------------------------------------------------------------------------|
| Index       | 2114                                                                   |
| Description | <a href="#">VarCom - ST</a><br>Returns detailed drive status messages. |
| Object Code | Record                                                                 |
| Data Type   | NLTUNE DOMAIN                                                          |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                       |               |
|-----------------------|---------------|
| <b>Sub-Index</b>      | 001           |
| <b>Description</b>    | Status Select |
| <b>Entry Category</b> | Optional      |
| <b>Data Type</b>      | UNSIGNED8     |
| <b>Access</b>         | Read Only     |
| <b>PDO Mapping</b>    | No            |
| <b>Default Value</b>  | 0x00          |
| <b>Lower Limit</b>    | 0x00          |
| <b>Upper Limit</b>    | 0xFF          |
| <b>Unit</b>           | -             |

|                       |           |
|-----------------------|-----------|
| <b>Sub-Index</b>      | 002       |
| <b>Description</b>    | Domain    |
| <b>Entry Category</b> | Optional  |
| <b>Data Type</b>      | DOMAIN    |
| <b>Access</b>         | Read Only |
| <b>PDO Mapping</b>    | No        |
| <b>Default Value</b>  | 0x0       |
| <b>Lower Limit</b>    | -         |
| <b>Upper Limit</b>    | -         |
| <b>Unit</b>           | -         |

## 2115h: Step Command

### Object Description

|             |                                                                                                                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2115                                                                                                                                                                                                                     |
| Description | <a href="#">VarCom - STEP</a><br>Generates a step or square wave velocity command.<br>Sub-index 1 - Duration1<br>Sub-index 2 - Velocity1<br>Sub-index 3 - Duration2<br>Sub-index 4 - Velocity2<br>Sub-index 5 - Activate |
| Object Code | Record                                                                                                                                                                                                                   |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                              |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x06              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Duration1  |
| Entry Category | Optional   |
| Data Type      | UNSIGNED16 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x0000     |
| Lower Limit    | 0x0000     |
| Upper Limit    | 0xFFFF     |
| Unit           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | Velocity1  |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | INTEGER32  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x80000000 |
| <b>Upper Limit</b>    | 0x7FFFFFFF |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | Duration2  |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | INTEGER16  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x8000     |
| <b>Upper Limit</b>    | 0x7FFF     |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 004        |
| <b>Description</b>    | Velocity2  |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | INTEGER32  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x80000000 |
| <b>Upper Limit</b>    | 0x7FFFFFFF |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 005        |
| <b>Description</b>    | Activate   |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED8  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00       |
| <b>Lower Limit</b>    | 0x00       |
| <b>Upper Limit</b>    | 0x1        |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 006        |
| <b>Description</b>    | Select     |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED8  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00       |
| <b>Lower Limit</b>    | 0x00       |
| <b>Upper Limit</b>    | 0x1        |
| <b>Unit</b>           | -          |

## 2116h: Position Motion Ended

### Object Description

|             |                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2116                                                                                                                                             |
| Description | <a href="#">VarCom - STOPPED</a><br>Indicates whether the position profile has been completed, therefore allowing the next command to be issued. |
| Object Code | Variable                                                                                                                                         |
| Data Type   | INTEGER16                                                                                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0xFFFF     |
| Lower Limit   | 0xFFFF     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 2117h: Units Linear Acc/Dec

### Object Description

|             |                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Index       | 2117                                                                                                                     |
| Description | <a href="#">VarCom - UNITSLINACC</a><br>Defines the units of acceleration and deceleration variables in a linear system. |
| Object Code | Variable                                                                                                                 |
| Data Type   | UNSIGNED16                                                                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 2118h: Units Linear Position

### Object Description

|             |                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------|
| Index       | 2118                                                                                                |
| Description | <a href="#">VarCom - UNITSLINPOS</a><br>Defines the units of position variables in a linear system. |
| Object Code | Variable                                                                                            |
| Data Type   | UNSIGNED16                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 2119h: Units Linear Velocity

### Object Description

|             |                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------|
| Index       | 2119                                                                                                |
| Description | <a href="#">VarCom - UNITSLINVEL</a><br>Defines the units of velocity variables in a linear system. |
| Object Code | Variable                                                                                            |
| Data Type   | UNSIGNED16                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 211Ah: Units Rotary Acc/Dec

### Object Description

|             |                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Index       | 211A                                                                                                                     |
| Description | <a href="#">VarCom - UNITSROTACC</a><br>Defines the units of acceleration and deceleration variables in a rotary system. |
| Object Code | Variable                                                                                                                 |
| Data Type   | UNSIGNED16                                                                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 211Bh: Units Rotary Position

### Object Description

|             |                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------|
| Index       | 211B                                                                                                |
| Description | <a href="#">VarCom - UNITSROTPOS</a><br>Defines the units of position variables in a rotary system. |
| Object Code | Variable                                                                                            |
| Data Type   | UNSIGNED16                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 211Ch: Units Rotary Velocity

### Object Description

|             |                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------|
| Index       | 211C                                                                                                |
| Description | <a href="#">VarCom - UNITSROTVEL</a><br>Defines the units of velocity variables in a rotary system. |
| Object Code | Variable                                                                                            |
| Data Type   | UNSIGNED16                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 211Dh: Velocity Filter Pole Frequency

### Object Description

|             |                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 211D                                                                                                                                                                |
| Description | <a href="#">VarCom - VELFILTRQ</a><br>Used to set the first order filter, which is applied to the velocity feedback signal before applying the velocity controller. |
| Object Code | Variable                                                                                                                                                            |
| Data Type   | UNSIGNED16                                                                                                                                                          |

### Entry Description

|               |        |
|---------------|--------|
| Access        | RW     |
| PDO Mapping   | No     |
| Default Value | 0x0014 |
| Lower Limit   | 0x0014 |
| Upper Limit   | 0x07D0 |
| Unit          | -      |

## 211Eh: Gearing

### Object Description

|             |                                                            |
|-------------|------------------------------------------------------------|
| Index       | 211E                                                       |
| Description | <a href="#">VarCom - GEAR</a><br>Enables/disables gearing. |
| Object Code | Variable                                                   |
| Data Type   | UNSIGNED8                                                  |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x01       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x01       |
| Unit          | -          |

## 2120h: Gearing Acceleration Threshold

### Object Description

|             |                                                                                 |
|-------------|---------------------------------------------------------------------------------|
| Index       | 2120                                                                            |
| Description | <a href="#">VarCom - GEARACCTHRESH</a><br>The maximum acceleration for gearing. |
| Object Code | Variable                                                                        |
| Data Type   | INTEGER32                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 2121h: Gearing Filter Acceleration Feedforward

### Object Description

|             |                                                                                   |
|-------------|-----------------------------------------------------------------------------------|
| Index       | 2121                                                                              |
| Description | <a href="#">VarCom - GEARFILTAFF</a><br>The gear filter acceleration feedforward. |
| Object Code | Variable                                                                          |
| Data Type   | REAL32                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

## 2122h: Gearing Filter Mode

### Object Description

|             |                                                                                    |
|-------------|------------------------------------------------------------------------------------|
| Index       | 2122                                                                               |
| Description | <a href="#">VarCom - GEARFILTMODE</a><br>Defines whether gear filter is activated. |
| Object Code | Variable                                                                           |
| Data Type   | UNSIGNED8                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x02       |
| Unit          | -          |

## 2123h: Gearing Filter Depth

### Object Description

|             |                                                                               |
|-------------|-------------------------------------------------------------------------------|
| Index       | 2123                                                                          |
| Description | <a href="#">VarVom - GEARFILTT1</a><br>Gear filter depth (in 0.25 ms quanta). |
| Object Code | Variable                                                                      |
| Data Type   | REAL32                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

## 2124h: Gearing Filter Velocity and Acceleration Depth

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 2124                                                                                                           |
| Description | <a href="#">VarVom - GEARFILTT2</a><br>Gear filter velocity and acceleration filter depth (in 0.25 ms quanta). |
| Object Code | Variable                                                                                                       |
| Data Type   | REAL32                                                                                                         |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

## 2125h: Gearing Filter Velocity Feedforward

### Object Description

|             |                                                                                 |
|-------------|---------------------------------------------------------------------------------|
| Index       | 2125                                                                            |
| Description | <a href="#">VarVom - GEARFILTVELFF</a><br>The gear filter velocity feedforward. |
| Object Code | Variable                                                                        |
| Data Type   | REAL32                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | -          |
| Upper Limit   | -          |
| Unit          | -          |

## 2126h: Gearing Ratio Numerator

### Object Description

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Index       | 2126                                                                      |
| Description | <a href="#">VarCom - GEARIN</a><br>The numerator of the gearing equation. |
| Object Code | Variable                                                                  |
| Data Type   | INTEGER32                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000001 |
| Lower Limit   | 0x80000001 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 2127h: Gearing Input Interpolation

### Object Description

|             |                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------|
| Index       | 2127                                                                                             |
| Description | <a href="#">VarCom - GEARINMODE</a><br>Defines whether gearing input interpolation is activated. |
| Object Code | Variable                                                                                         |
| Data Type   | UNSIGNED8                                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x01       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xFF       |
| Unit          | -          |

## 2128h: Gearing Following Limits Mode

### Object Description

|             |                                                                                           |
|-------------|-------------------------------------------------------------------------------------------|
| Index       | 2128                                                                                      |
| Description | <a href="#">VarCom - GEARLIMITSMODE</a><br>Defines the type of limits for gear following. |
| Object Code | Variable                                                                                  |
| Data Type   | UNSIGNED8                                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xFF       |
| Unit          | -          |

## 2129h: Gearing Ratio Denominator

### Object Description

|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| Index       | 2129                                                                         |
| Description | <a href="#">VarCom - GEAROUT</a><br>The denominator of the gearing equation. |
| Object Code | Variable                                                                     |
| Data Type   | UNSIGNED32                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000001 |
| Lower Limit   | 0x00000001 |
| Upper Limit   | 0x1FFFFFFF |
| Unit          | -          |

## 212Ah: Drive Info (CAN only)

### Object Description

|             |                                             |
|-------------|---------------------------------------------|
| Index       | 212A                                        |
| Description | Returns information about the drive.        |
| Object Code | Record                                      |
| Data Type   | Manufacturer-specific, varies by sub-index. |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x2               |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |               |
|----------------|---------------|
| Sub-Index      | 001           |
| Description    | Status Select |
| Entry Category | Optional      |
| Data Type      | UNSIGNED8     |
| Access         | Read Only     |
| PDO Mapping    | No            |
| Default Value  | 0x00          |
| Lower Limit    | 0x00          |
| Upper Limit    | 0xFF          |
| Unit           | -             |

|                |           |
|----------------|-----------|
| Sub-Index      | 002       |
| Description    | Domain    |
| Entry Category | Optional  |
| Data Type      | DOMAIN    |
| Access         | Read Only |
| PDO Mapping    | No        |
| Default Value  | 0x0       |
| Lower Limit    | -         |
| Upper Limit    | -         |
| Unit           | -         |

## 212Bh: Torque Window

### Object Description

|             |                              |
|-------------|------------------------------|
| Index       | 212B                         |
| Description | Indicates the torque window. |
| Object Code | Variable                     |
| Data Type   | UNSIGNED32                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x000000FE |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 212Ch: Block Controlword

### Object Description

|             |                                                                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 212C                                                                                                                                                                                               |
| Description | Blocks bit 4 (enable) in the control word (6040h)<br>0 = bit 4 in controlword can be written in operational state only.<br>1234 = bit 4 in controlword can be written in all communication states. |
| Object Code | Variable                                                                                                                                                                                           |
| Data Type   | UNSIGNED16                                                                                                                                                                                         |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 212Dh: HD Anti-Vibration 2 Filter - Sharpness

### Object Description

|             |                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------|
| Index       | 212D                                                                                                                 |
| Description | <a href="#">VarCom - NLANTIVIBSHARP2</a><br>The HD position control loop anti-vibration module 2 filter - sharpness. |
| Object Code | Variable                                                                                                             |
| Data Type   | REAL32                                                                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.5        |
| Lower Limit   | 0.01       |
| Upper Limit   | 10.0       |
| Unit          | -          |

## 2131h: Touch Probe Event Counter

### Object Description

|             |                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2131                                                                                                                                  |
| Description | <a href="#">VarCom - PROBECOUNTER</a><br>The number of captured events. The value is incremented each time a configured event occurs. |
| Object Code | Variable                                                                                                                              |
| Data Type   | UNSIGNED16                                                                                                                            |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0x00FF    |
| Unit          | -         |

## 2133h: Analog Output Value

### Object Description

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 2133                                                                           |
| Description | <a href="#">VarCom - ANOUT</a><br>Indicates the analog output value, in volts. |
| Object Code | Variable                                                                       |
| Data Type   | REAL32                                                                         |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0.0       |
| Lower Limit   | -12.0     |
| Upper Limit   | 12.0      |
| Unit          | V         |

## 2134h: Analog Output Command

### Object Description

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Index       | 2134                                                                      |
| Description | <a href="#">VarCom - ANOUTCMD</a><br>The analog output value set by user. |
| Object Code | Variable                                                                  |
| Data Type   | INTEGER32                                                                 |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x00000000                                            |
| Lower Limit   | 0x80000000                                            |
| Upper Limit   | 0x7FFFFFFF                                            |
| Unit          | mV                                                    |

## 2135h: Analog Output Current Scaling

### Object Description

|             |                                                                                                                                            |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2135                                                                                                                                       |
| Description | <a href="#">VarCom - ANOUTISCALE</a><br>The scaling of the analog output voltage that represents the motor current or the current command. |
| Object Code | Variable                                                                                                                                   |
| Data Type   | REAL32                                                                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 400.0      |
| Unit          | A/V        |

## 2136h: Analog Output Voltage Limit

### Object Description

|             |                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------|
| Index       | 2136                                                                                                 |
| Description | <a href="#">VarCom - ANOUTLIM</a><br>The maximum voltage of the analog output command for all modes. |
| Object Code | Variable                                                                                             |
| Data Type   | REAL32                                                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 10.0       |
| Lower Limit   | 1.0        |
| Upper Limit   | 12.0       |
| Unit          | V          |

## 2137h: Analog Output Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2137                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description | <p><a href="#">VarCom - ANOUTMODE</a></p> <p>Defines the function of the analog output.</p> <p>0 = User command. Uses value set by ANOUTCMD.</p> <p>1 = Tachometer mode. For velocity feedback.</p> <p>2 = Equivalent current monitoring.</p> <p>3 = Velocity error monitoring.</p> <p>4 = Current command monitoring.</p> <p>5 = Triangle wave at low frequency (0.041 Hz). For testing.</p> <p>6 = Current in-phase component (IQ) monitoring.</p> <p>7 = Reserved (output 0).</p> <p>8 = Reserved (output 0).</p> <p>9 = Reserved.</p> <p>10 = Reserved.</p> <p>11 = Triangle wave (10 Hz).</p> <p>12 = Rectangular wave (10 Hz).</p> <p>13 = Velocity command (VCMD).</p> <p>14 = Deactivated (object not supported; typically due to hardware limitation).</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Data Type   | UNSIGNED8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0x0C       |
| Unit          | -          |

## 2138h: Analog Output Velocity Scaling

### Object Description

|             |                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2138                                                                                                                                        |
| Description | <a href="#">VarCom - ANOUTVSCALE</a><br>The scaling of the analog output voltage that represents the actual velocity or the velocity error. |
| Object Code | Variable                                                                                                                                    |
| Data Type   | REAL32                                                                                                                                      |

### Entry Description

|               |              |
|---------------|--------------|
| Access        | Read/Write   |
| PDO Mapping   | No           |
| Default Value | 0.0          |
| Lower Limit   | -239999.9375 |
| Upper Limit   | 239999.9375  |
| Unit          | -            |

## 2139h: Secondary Feedback Mode

### Object Description

|             |                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2139                                                                                                                           |
| Description | <a href="#">VarCom - SFBMODE</a><br>Defines whether secondary feedback is enabled and whether it is used for the control loop. |
| Object Code | Variable                                                                                                                       |
| Data Type   | UNSIGNED16                                                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 213Ah: Secondary Feedback Type

### Object Description

|             |                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 213A                                                                                                                                  |
| Description | <a href="#">VarCom - SFBTYPE</a><br>Defines the type of secondary encoder (rotary or linear) and the type of communication interface. |
| Object Code | Variable                                                                                                                              |
| Data Type   | UNSIGNED16                                                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0001     |
| Lower Limit   | 0x0001     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 213Dh: Motor to Load Scaling Numerator

### Object Description

|             |                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Index       | 213D                                                                                                                     |
| Description | <a href="#">VarCom - LMUNITSNUM</a><br>The numerator of the mechanical ratio of the motor feedback to the load feedback. |
| Object Code | Variable                                                                                                                 |
| Data Type   | INTEGER32                                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000001 |
| Lower Limit   | 0x80000001 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 213Eh: Motor to Load Scaling Denominator

### Object Description

|             |                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------|
| Index       | 213E                                                                                                                       |
| Description | VarCom - <a href="#">LMUNITSDEN</a><br>The denominator of the mechanical ratio of the motor feedback to the load feedback. |
| Object Code | Variable                                                                                                                   |
| Data Type   | INTEGER32                                                                                                                  |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000001 |
| Lower Limit   | 0x00000001 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 213Fh: Secondary Feedback Offset

### Object Description

|             |                            |
|-------------|----------------------------|
| Index       | 213F                       |
| Description | Secondary feedback offset. |
| Object Code | Variable                   |
| Data Type   | INTEGER32                  |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000001 |
| Lower Limit   | 0x80000001 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

**2140h: Secondary Feedback Position Actual Value****Object Description**

|             |                                                                 |
|-------------|-----------------------------------------------------------------|
| Index       | 2140                                                            |
| Description | The actual position according to the secondary feedback device. |
| Object Code | Variable                                                        |
| Data Type   | INTEGER32                                                       |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000001 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

**2141h: Secondary Feedback Load Velocity****Object Description**

|             |                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------|
| Index       | 2141                                                                                          |
| Description | <a href="#">VarCom - SFBVEL</a><br>The velocity according to the feedback device on the load. |
| Object Code | Variable                                                                                      |
| Data Type   | INTEGER32                                                                                     |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 2142h: Primary Position Actual Value

### Object Description

|             |                                                               |
|-------------|---------------------------------------------------------------|
| Index       | 2142                                                          |
| Description | The actual position according to the primary feedback device. |
| Object Code | Variable                                                      |
| Data Type   | INTEGER32                                                     |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x00000000             |
| Lower Limit   | 0x80000000             |
| Upper Limit   | 0x7FFFFFFF             |
| Unit          | -                      |

## 2143h: Motor Velocity

### Object Description

|             |                                                                                              |
|-------------|----------------------------------------------------------------------------------------------|
| Index       | 2143                                                                                         |
| Description | <a href="#">VarCom - MVEL</a><br>The velocity according to the feedback device on the motor. |
| Object Code | Variable                                                                                     |
| Data Type   | INTEGER32                                                                                    |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x00000000             |
| Lower Limit   | 0x80000000             |
| Upper Limit   | 0x7FFFFFFF             |
| Unit          | -                      |

**2144h: Secondary Feedback Position Error Max****Object Description**

|             |                                            |
|-------------|--------------------------------------------|
| Index       | 2144                                       |
| Description | Secondary feedback maximum position error. |
| Object Code | Variable                                   |
| Data Type   | INTEGER32                                  |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

**2145h: Secondary Feedback Position Error Threshold****Object Description**

|             |                                              |
|-------------|----------------------------------------------|
| Index       | 2145                                         |
| Description | Secondary feedback position error threshold. |
| Object Code | Variable                                     |
| Data Type   | INTEGER32                                    |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 2147h: Touch Probe Sampled Data Rising

### Object Description

|             |                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------|
| Index       | 2147                                                                                                                 |
| Description | <a href="#">VarCom - PROBEDATARISE</a><br>Reads and stores the captured data from the last event on the rising edge. |
| Object Code | Record                                                                                                               |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                          |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |                        |
|----------------|------------------------|
| Sub-Index      | 001                    |
| Description    | PE_INTRP               |
| Entry Category | Optional               |
| Data Type      | INTEGER32              |
| Access         | Read Only              |
| PDO Mapping    | CAN: Yes<br>ECT: TxPDO |
| Default Value  | 0x00000000             |
| Lower Limit    | 0x80000000             |
| Upper Limit    | 0x7FFFFFFF             |
| Unit           | -                      |

|                       |                        |
|-----------------------|------------------------|
| <b>Sub-Index</b>      | 002                    |
| <b>Description</b>    | V_INTRP                |
| <b>Entry Category</b> | Optional               |
| <b>Data Type</b>      | INTEGER32              |
| <b>Access</b>         | Read Only              |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO |
| <b>Default Value</b>  | 0x00000000             |
| <b>Lower Limit</b>    | 0x80000000             |
| <b>Upper Limit</b>    | 0x7FFFFFFF             |
| <b>Unit</b>           | -                      |

|                       |                        |
|-----------------------|------------------------|
| <b>Sub-Index</b>      | 003                    |
| <b>Description</b>    | I_INTRP                |
| <b>Entry Category</b> | Optional               |
| <b>Data Type</b>      | INTEGER16              |
| <b>Access</b>         | Read Only              |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO |
| <b>Default Value</b>  | 0x0000                 |
| <b>Lower Limit</b>    | 0x8000                 |
| <b>Upper Limit</b>    | 0x7FFF                 |
| <b>Unit</b>           | -                      |

## 2148h: Touch Probe Sampled Data Falling

### Object Description

|             |                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------|
| Index       | 2148                                                                                                                  |
| Description | <a href="#">VarCom - PROBEDATAFALL</a><br>Reads and stores the captured data from the last event on the falling edge. |
| Object Code | Record                                                                                                                |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                           |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |                        |
|----------------|------------------------|
| Sub-Index      | 001                    |
| Description    | PE_INTRP               |
| Entry Category | Optional               |
| Data Type      | INTEGER32              |
| Access         | Read Only              |
| PDO Mapping    | CAN: Yes<br>ECT: TxPDO |
| Default Value  | 0x00000000             |
| Lower Limit    | 0x80000000             |
| Upper Limit    | 0x7FFFFFFF             |
| Unit           | -                      |

|                       |                        |
|-----------------------|------------------------|
| <b>Sub-Index</b>      | 002                    |
| <b>Description</b>    | V_INTRP                |
| <b>Entry Category</b> | Optional               |
| <b>Data Type</b>      | INTEGER32              |
| <b>Access</b>         | Read Only              |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO |
| <b>Default Value</b>  | 0x00000000             |
| <b>Lower Limit</b>    | 0x80000000             |
| <b>Upper Limit</b>    | 0x7FFFFFFF             |
| <b>Unit</b>           | -                      |

|                       |                        |
|-----------------------|------------------------|
| <b>Sub-Index</b>      | 003                    |
| <b>Description</b>    | I_INTRP                |
| <b>Entry Category</b> | Optional               |
| <b>Data Type</b>      | INTEGER16              |
| <b>Access</b>         | Read Only              |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO |
| <b>Default Value</b>  | 0x0000                 |
| <b>Lower Limit</b>    | 0x8000                 |
| <b>Upper Limit</b>    | 0x7FFF                 |
| <b>Unit</b>           | -                      |

## 2149h: Touch Probe Variables

### Object Description

|             |                                                                                                                                                                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2149                                                                                                                                                                                                                                                                   |
| Description | Configures the variables to be probed (bit-wise). All combinations are supported. Default variable is position.<br>bit 0: Position<br>bit 1: Position error<br>bit 2: Velocity<br>bit 3: Current<br>If two touch probe channels are in use, this setting affects both. |
| Object Code | Variable                                                                                                                                                                                                                                                               |
| Data Type   | INTEGER16                                                                                                                                                                                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x8000     |
| Upper Limit   | 0x7FFF     |
| Unit          | -          |

## 214Ah: Software Position Limit Switch Hysteresis Value

### Object Description

|             |                                                                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 214A                                                                                                                                                                                           |
| Description | <a href="#">VarCom - POSLIMHYST</a><br>Hysteresis value around the software position limit switch. Used to prevent false activation of a software limit switch due to an unstable control loop |
| Object Code | Variable                                                                                                                                                                                       |
| Data Type   | UNSIGNED32                                                                                                                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 214Bh: Touch Probe 1 Stable Input Level Duration

### Object Description

|             |                                                                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 214B                                                                                                                                                                                 |
| Description | <a href="#">VarCom - PROBELEVELPRD</a><br>The minimum length of time required for a stable input level after a trigger event.<br>Serves to overcome the bouncing effect of a switch. |
| Object Code | Variable                                                                                                                                                                             |
| Data Type   | UNSIGNED16                                                                                                                                                                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0005     |
| Lower Limit   | 0x0001     |
| Upper Limit   | 0x0020     |
| Unit          | -          |

## 214Ch: sensAR Encoder Info (CAN only)

### Object Description

|             |                                                                                      |
|-------------|--------------------------------------------------------------------------------------|
| Index       | 214C                                                                                 |
| Description | <a href="#">VarCom – SRVSNSINFO</a><br>Returns information about the SensAR encoder. |
| Object Code | Record                                                                               |
| Data Type   | NLTUNE DOMAIN                                                                        |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                       |               |
|-----------------------|---------------|
| <b>Sub-Index</b>      | 001           |
| <b>Description</b>    | Status Select |
| <b>Entry Category</b> | Optional      |
| <b>Data Type</b>      | UNSIGNED8     |
| <b>Access</b>         | Read Only     |
| <b>PDO Mapping</b>    | No            |
| <b>Default Value</b>  | 0x00          |
| <b>Lower Limit</b>    | 0x00          |
| <b>Upper Limit</b>    | 0xFF          |
| <b>Unit</b>           | -             |

|                       |           |
|-----------------------|-----------|
| <b>Sub-Index</b>      | 002       |
| <b>Description</b>    | Domain    |
| <b>Entry Category</b> | Optional  |
| <b>Data Type</b>      | DOMAIN    |
| <b>Access</b>         | Read Only |
| <b>PDO Mapping</b>    | No        |
| <b>Default Value</b>  | 0x0       |
| <b>Lower Limit</b>    | -         |
| <b>Upper Limit</b>    | -         |
| <b>Unit</b>           | -         |

## 214Eh: Position Modulo Mode

### Object Description

|             |                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------|
| Index       | 214E                                                                                                                      |
| Description | <a href="#">VarCom - MODMODE</a><br>Enables/disables the position modulo.<br>0 = Normal operation<br>1 = Modulo operation |
| Object Code | Variable                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 214Fh: Position Modulo Range

### Object Description

|             |                                                                                         |
|-------------|-----------------------------------------------------------------------------------------|
| Index       | 214F                                                                                    |
| Description | <a href="#">VarCom – PROTARY</a><br>Specifies the lower and upper limits of the modulo. |
| Object Code | Array                                                                                   |
| Data Type   | INTEGER32                                                                               |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                |             |
|----------------|-------------|
| Sub-Index      | 001         |
| Description    | Lower Limit |
| Entry Category | Optional    |
| Data Type      | INTEGER32   |
| Access         | Read/Write  |
| PDO Mapping    | No          |
| Default Value  | 0x00000000  |
| Lower Limit    | 0x80000000  |
| Upper Limit    | 0x7FFFFFFF  |
| Unit           | -           |

|                |             |
|----------------|-------------|
| Sub-Index      | 002         |
| Description    | Upper Limit |
| Entry Category | Optional    |
| Data Type      | INTEGER32   |
| Access         | Read/Write  |
| PDO Mapping    | No          |
| Default Value  | 0x00000000  |
| Lower Limit    | 0x80000000  |
| Upper Limit    | 0x7FFFFFFF  |
| Unit           | -           |

## 2150h: Counts Per Revolution

### Object Description

|             |                        |
|-------------|------------------------|
| Index       | 2150                   |
| Description | Counts per revolution. |
| Object Code | Variable               |
| Data Type   | UNSIGNED32             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x800      |
| Lower Limit   | 0x00000001 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 2158h: Force Digital Output State on Fault

### Object Description

|             |                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2158                                                                                                                              |
| Description | <a href="#">VarCom - OUTFLTLVL</a><br>Used to force digital outputs to a certain state when the drive is disabled due to a fault. |
| Object Code | Variable                                                                                                                          |
| Data Type   | UNSIGNED32                                                                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 2159h: Heartbeat Tolerance

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2159                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Description | <p>The tolerance allowed for a heartbeat, defined as a percentage. Also applied for BUSOFF and NODE GUARDING faults.</p> <p>Example: Assuming that a heartbeat is 200 ms (as set by object 1016h):</p> <p style="padding-left: 40px;">A value of 0 in object 2159h will show an effective value of 200 ms</p> <p style="padding-left: 40px;">A value of 50 in object 2159h will show effective value of 300 ms</p> <p style="padding-left: 40px;">A value of 1000 in object 2159h will show effective value of 400 ms</p> <p>Heartbeats are counted in integers only.</p> <p>Example: Assuming a heartbeat is 1 ms:</p> <p style="padding-left: 40px;">A value of 0 in object 2159h will show an effective value of 1 ms</p> <p style="padding-left: 40px;">A value of 50 in object 2159h will show an effective value of 1 ms</p> <p style="padding-left: 40px;">A value of 100 in object 2159h will produce a change (2 ms)</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0064     |
| Unit          | percentage |

## 215Ah: Sankyo Multi-Turn Reset

### Object Description

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
| Index       | 215A                                                                                                                            |
| Description | <a href="#">VarCom - SKTURNRESET</a><br>Resets the counter of a Sankyo multi-turn encoder.<br>Write 01 to initiate the command. |
| Object Code | Variable                                                                                                                        |
| Data Type   | UNSIGNED16                                                                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 215Bh: Voltage State

### Object Description

|             |                                                      |
|-------------|------------------------------------------------------|
| Index       | 215B                                                 |
| Description | Voltage state. Automatic calibration process status. |
| Object Code | Variable                                             |
| Data Type   | UNSIGNED16                                           |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0xFFFF    |
| Unit          | V         |

## 215Ch: Voltage Non-Volatile State

### Object Description

|             |                                                                   |
|-------------|-------------------------------------------------------------------|
| Index       | 215C                                                              |
| Description | Voltage non-volatile state. Automatic calibration process status. |
| Object Code | Variable                                                          |
| Data Type   | UNSIGNED16                                                        |

### Entry Description

|               |           |                               |
|---------------|-----------|-------------------------------|
| Access        | Read Only | Read Only/Read Only/Read Only |
| PDO Mapping   | No        | no                            |
| Default Value | 0x0000    | 0x0000                        |
| Lower Limit   | 0x0000    | 0x0000                        |
| Upper Limit   | 0xFFFF    | 0xFFFF                        |
| Unit          | V         | V                             |

## 2161h: Secondary Feedback Position

### Object Description

|             |                                                                                                                                    |
|-------------|------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2161                                                                                                                               |
| Description | <a href="#">VarCom - SFB</a><br>The position value of the feedback device on the load, including any offsets that have been added. |
| Object Code | Variable                                                                                                                           |
| Data Type   | REAL32                                                                                                                             |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 1.0       |
| Lower Limit   | 0.0       |
| Upper Limit   | 0.0       |
| Unit          | -         |

## 2162h: Secondary Feedback Offset - User Units

### Object Description

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Index       | 2162                                                                                                   |
| Description | <a href="#">VarCom - SFBOFFSET</a><br>The offset value added to the secondary feedback, in user units. |
| Object Code | Variable                                                                                               |
| Data Type   | REAL32                                                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0.0        |
| Lower Limit   | 0.0        |
| Upper Limit   | 0.0        |
| Unit          | -          |

## 2168h: Secondary Feedback Position Error

### Object Description

|             |                                    |
|-------------|------------------------------------|
| Index       | 2168                               |
| Description | Secondary feedback position error. |
| Object Code | Variable                           |
| Data Type   | INTEGER32                          |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO  |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN position user units |

**216Bh: Touch Probe 2 Stable Input Level Duration****Object Description**

|             |                                                                                     |
|-------------|-------------------------------------------------------------------------------------|
| Index       | 216B                                                                                |
| Description | The minimum length of time required for a stable input level after a trigger event. |
| Object Code | Variable                                                                            |
| Data Type   | UNSIGNED16                                                                          |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x05       |
| Lower Limit   | 0x0001     |
| Upper Limit   | 0x0020     |
| Unit          | -          |

**216Ch: CANopen Manufacturer Specific SDO Abort Code (CAN only)****Object Description**

|             |                                               |
|-------------|-----------------------------------------------|
| Index       | 216C                                          |
| Description | CANopen manufacturer specific SDO abort code. |
| Object Code | Variable                                      |
| Data Type   | UNSIGNED32                                    |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 216Dh: Analog Input 2 Voltage in User Units

### Object Description

|             |                                                                                                                                                                                                                                                                                         |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 216D                                                                                                                                                                                                                                                                                    |
| Description | <a href="#">VarCom - ANIN2USER</a><br>Returns the value of the analog input 2 voltage converted into a user-defined unit.<br>The conversion for ANIN2USER is as follows:<br>$\text{ANIN2USER} = \text{ANIN2} \times (\text{ANIN2USERNUM}/\text{ANIN2USERDEN}) + \text{ANIN2USEROFFSET}$ |
| Object Code | Array                                                                                                                                                                                                                                                                                   |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                              |

### Entry Description

|                |                                         |
|----------------|-----------------------------------------|
| Sub-Index      | 000                                     |
| Description    | Number of Entries                       |
| Entry Category | Optional                                |
| Access         | Read Only                               |
| PDO Mapping    | No                                      |
| Default Value  | 0x02                                    |
| Lower Limit    | 0x02                                    |
| Upper Limit    | 0x02                                    |
| Unit           | -                                       |
|                |                                         |
| Sub-Index      | 001                                     |
| Description    | Analog Input 2 User Command - high bits |
| Entry Category | Optional                                |
| Data Type      | UNSIGNED32                              |
| Access         | Read Only                               |
| PDO Mapping    | No                                      |
| Default Value  | 0x00000000                              |
| Lower Limit    | 0x00000000                              |
| Upper Limit    | 0xFFFFFFFF                              |
| Unit           | -                                       |

|                |                                        |
|----------------|----------------------------------------|
| Sub-Index      | 002                                    |
| Description    | Analog Input 2 User Command - low bits |
| Entry Category | Optional                               |
| Data Type      | UNSIGNED32                             |
| Access         | Read Only                              |
| PDO Mapping    | No                                     |
| Default Value  | 0x00000000                             |
| Lower Limit    | 0x00000000                             |
| Upper Limit    | 0xFFFFFFFF                             |
| Unit           | -                                      |

## 216Eh: Analog Input 2 Value Conversion - Denominator

### Object Description

|             |                                                                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 216E                                                                                                                                                                                                     |
| Description | <a href="#">VarCom - ANIN2USERDEN</a><br>The denominator value in the ANIN2USER equation:<br>$\text{ANIN2USER} = \text{ANIN2} \times (\text{ANIN2USERNUM}/\text{ANIN2USERDEN}) + \text{ANIN2USEROFFSET}$ |
| Object Code | Variable                                                                                                                                                                                                 |
| Data Type   | UNSIGNED32                                                                                                                                                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000001 |
| Lower Limit   | 0x00000001 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | V          |

## 216Fh: Analog Input 2 Value Conversion - Numerator

### Object Description

|             |                                                                                                                                                                                                                                                                                         |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 216F                                                                                                                                                                                                                                                                                    |
| Description | <a href="#">VarCom - ANIN2USERNUM</a><br>The numerator value in the ANIN2USER equation:<br>$\text{ANIN2USER} = \text{ANIN2} \times (\text{ANIN2USERNUM}/\text{ANIN2USERDEN}) + \text{ANIN2USEROFFSET}$<br>Defines the number of counts represented in ANIN2USER per ANIN2USERDEN volts. |
| Object Code | Variable                                                                                                                                                                                                                                                                                |
| Data Type   | INTEGER32                                                                                                                                                                                                                                                                               |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000064 |
| Lower Limit   | 0x80000001 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 2170h: Analog Input 2 Value Conversion - Offset

### Object Description

|             |                                                                                                                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2170                                                                                                                                                                                                   |
| Description | <a href="#">VarCom - ANIN2USEROFFSET</a><br>The offset value in the ANIN2USER equation:<br>$\text{ANIN2USER} = \text{ANIN2} \times (\text{ANIN2USERNUM}/\text{ANIN2USERDEN}) + \text{ANIN2USEROFFSET}$ |
| Object Code | Variable                                                                                                                                                                                               |
| Data Type   | INTEGER32                                                                                                                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000001 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 2173h: Motor Pitch High Resolution

### Object Description

|             |                                      |
|-------------|--------------------------------------|
| Index       | 2173                                 |
| Description | Linear motor pitch, high resolution. |
| Object Code | Variable                             |
| Data Type   | UNSIGNED32                           |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x000003E8 |
| Upper Limit   | 0x05F5E100 |
| Unit          | 0.001 mm   |

## 2176h: BiSS-C Protocol Properties

### Object Description

|             |                                                                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2176                                                                                                                                                                 |
| Description | <a href="#">VarCom - BISSFIELDS</a><br>Sets the number of bits allocated for transmission of position data within a BiSS-C packet, and the number of effective bits. |
| Object Code | Array                                                                                                                                                                |
| Data Type   | UNSIGNED16                                                                                                                                                           |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x04              |
| Lower Limit    | 0x04              |
| Upper Limit    | 0x04              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | Field 1    |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x0000     |
| <b>Upper Limit</b>    | 0x0048     |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 002        |
| <b>Description</b>    | Field 2    |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x0000     |
| <b>Upper Limit</b>    | 0x0048     |
| <b>Unit</b>           | -          |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | Field 3    |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0000     |
| <b>Lower Limit</b>    | 0x0000     |
| <b>Upper Limit</b>    | 0x0048     |
| <b>Unit</b>           | -          |

|                |            |
|----------------|------------|
| Sub-Index      | 004        |
| Description    | Field 4    |
| Entry Category | Optional   |
| Data Type      | UNSIGNED16 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x0000     |
| Lower Limit    | 0x0000     |
| Upper Limit    | 0x0048     |
| Unit           | -          |

## 2179h: Halls-Only Commutation Mode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2179                                                                                                                                                                                                                                                                                                                                                                                |
| Description | <a href="#">VarCom - HALLSONLYCOMM</a><br>Defines Halls-only commutation.<br>0 = Six-step commutation with MPHASE correction (backward compatible).<br>1 = Commutation is based on an extrapolated position while velocity exceeds the defined threshold of Hall signals per second and changes to six-step when velocity falls below 75% of the Hall signals per second threshold. |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                            |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 217Ah: Debug Position Command

### Object Description

|             |                                                                             |
|-------------|-----------------------------------------------------------------------------|
| Index       | 217A                                                                        |
| Description | A debug object for reading the position command from master (object 607Ah). |
| Object Code | Variable                                                                    |
| Data Type   | INTEGER32                                                                   |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO  |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 217Bh: Zeroing MPHASE Value

### Object Description

|             |                                                                                                                                            |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 217B                                                                                                                                       |
| Description | <a href="#">VarCom - ZEROST</a><br>Returns the motor phase degree after a successful zeroing command.<br>-1 indicates that zeroing failed. |
| Object Code | Variable                                                                                                                                   |
| Data Type   | INTEGER16                                                                                                                                  |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0xFFFF    |
| Upper Limit   | 0x7FFF    |
| Unit          | degree    |

## 217Ch: Reference Offset Value

### Object Description

|             |                                                                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 217C                                                                                                                                                                                              |
| Description | <a href="#">Var - REOFFSETVAL</a><br>Internal offset after homing. When using an absolute encoder, this value is saved and used to maintain a home reference position when drive power is cycled. |
| Object Code | Variable                                                                                                                                                                                          |
| Data Type   | INTEGER32                                                                                                                                                                                         |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0xFFFFFFFF              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 217Dh: Hardware Version

### Object Description

|             |                                                                               |
|-------------|-------------------------------------------------------------------------------|
| Index       | 217D                                                                          |
| Description | Hardware version.<br>Sub-index 1 - Control board<br>Sub-index 2 - Power board |
| Object Code | Array                                                                         |
| Data Type   | UNSIGNED16                                                                    |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                       |                       |
|-----------------------|-----------------------|
| <b>Sub-Index</b>      | 001                   |
| <b>Description</b>    | Control board version |
| <b>Entry Category</b> | Optional              |
| <b>Data Type</b>      | UNSIGNED16            |
| <b>Access</b>         | Read Only             |
| <b>PDO Mapping</b>    | No                    |
| <b>Default Value</b>  | 0x0000                |
| <b>Lower Limit</b>    | 0x0000                |
| <b>Upper Limit</b>    | 0xFFFF                |
| <b>Unit</b>           | -                     |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 002                 |
| <b>Description</b>    | Power board version |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED16          |
| <b>Access</b>         | Read Only           |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x0000              |
| <b>Lower Limit</b>    | 0x0000              |
| <b>Upper Limit</b>    | 0xFFFF              |
| <b>Unit</b>           | -                   |

## 2182h: Hardware Position External (FPGA)

### Object Description

|             |                                                                                                                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2182                                                                                                                                                                                                        |
| Description | <a href="#">VarCom - HWPEXTCNTRLR</a><br>Indicates the position as measured by an external feedback device (FPGA); 32-bit counter of the pulse and direction input from the controller interface connector. |
| Object Code | Variable                                                                                                                                                                                                    |
| Data Type   | INTEGER32                                                                                                                                                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 2183h: Touch Probe 2 Event Counter

### Object Description

|             |                                                          |
|-------------|----------------------------------------------------------|
| Index       | 2183                                                     |
| Description | Returns the number of captured events for touch probe 2. |
| Object Code | Variable                                                 |
| Data Type   | UNSIGNED16                                               |

### Entry Description

|               |                       |
|---------------|-----------------------|
| Access        | Read Only             |
| PDO Mapping   | CAN Yes<br>ECT: TxPDO |
| Default Value | 0x0000                |
| Lower Limit   | 0x0000                |
| Upper Limit   | 0xFFFF                |
| Unit          | -                     |

**2184h: Touch Probe 2 Sampled Data Rising (CAN only)****Object Description**

|             |                                                                                             |
|-------------|---------------------------------------------------------------------------------------------|
| Index       | 2184                                                                                        |
| Description | Reads and stores the captured data from the last event on the rising edge on touch probe 2. |
| Object Code | Record                                                                                      |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                 |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |                        |
|----------------|------------------------|
| Sub-Index      | 001                    |
| Description    | PE_INTRP               |
| Entry Category | Optional               |
| Data Type      | INTEGER32              |
| Access         | Read Only              |
| PDO Mapping    | CAN: Yes<br>ECT: TxPDO |
| Default Value  | 0x00000000             |
| Lower Limit    | 0x80000000             |
| Upper Limit    | 0x7FFFFFFF             |
| Unit           | -                      |

|                       |                        |
|-----------------------|------------------------|
| <b>Sub-Index</b>      | 002                    |
| <b>Description</b>    | V_INTRP                |
| <b>Entry Category</b> | Optional               |
| <b>Data Type</b>      | INTEGER32              |
| <b>Access</b>         | Read Only              |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO |
| <b>Default Value</b>  | 0x00000000             |
| <b>Lower Limit</b>    | 0x80000000             |
| <b>Upper Limit</b>    | 0x7FFFFFFF             |
| <b>Unit</b>           | -                      |

|                       |                        |
|-----------------------|------------------------|
| <b>Sub-Index</b>      | 003                    |
| <b>Description</b>    | I_INTRP                |
| <b>Entry Category</b> | Optional               |
| <b>Data Type</b>      | INTEGER16              |
| <b>Access</b>         | Read Only              |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO |
| <b>Default Value</b>  | 0x0000                 |
| <b>Lower Limit</b>    | 0x8000                 |
| <b>Upper Limit</b>    | 0x7FFF                 |
| <b>Unit</b>           | -                      |

## 2185h: Touch Probe 2 Sampled Data Falling

### Object Description

|             |                                                                                              |
|-------------|----------------------------------------------------------------------------------------------|
| Index       | 2185                                                                                         |
| Description | Reads and stores the captured data from the last event on the falling edge on touch probe 2. |
| Object Code | Record                                                                                       |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                  |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |                        |
|----------------|------------------------|
| Sub-Index      | 001                    |
| Description    | PE_INTRP               |
| Entry Category | Optional               |
| Data Type      | INTEGER32              |
| Access         | Read Only              |
| PDO Mapping    | CAN: Yes<br>ECT: TxPDO |
| Default Value  | 0x00000000             |
| Lower Limit    | 0x80000000             |
| Upper Limit    | 0x7FFFFFFF             |
| Unit           | -                      |

|                       |                        |
|-----------------------|------------------------|
| <b>Sub-Index</b>      | 002                    |
| <b>Description</b>    | V_INTRP                |
| <b>Entry Category</b> | Optional               |
| <b>Data Type</b>      | INTEGER32              |
| <b>Access</b>         | Read Only              |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO |
| <b>Default Value</b>  | 0x00000000             |
| <b>Lower Limit</b>    | 0x80000000             |
| <b>Upper Limit</b>    | 0x7FFFFFFF             |
| <b>Unit</b>           | -                      |

|                       |                        |
|-----------------------|------------------------|
| <b>Sub-Index</b>      | 003                    |
| <b>Description</b>    | I_INTRP                |
| <b>Entry Category</b> | Optional               |
| <b>Data Type</b>      | INTEGER16              |
| <b>Access</b>         | Read Only              |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO |
| <b>Default Value</b>  | 0x00000                |
| <b>Lower Limit</b>    | 0x8000                 |
| <b>Upper Limit</b>    | 0x7FFF                 |
| <b>Unit</b>           | -                      |

**2186h: Multi-turn Encoder Reset (CAN only)****Object Description**

|             |                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2186                                                                                                                                         |
| Description | <a href="#">VarCom – MTTURNRESET</a><br>Resets the position counter of an absolute multi-turn encoder, and clears battery low voltage fault. |
| Object Code | Variable                                                                                                                                     |
| Data Type   | UNSIGNED16                                                                                                                                   |

**Entry Description**

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x0000    |
| Upper Limit   | 0x00FF    |
| Unit          | -         |

**2187h: Ignore Absolute Encoder Battery Fault (CAN only)****Object Description**

|             |                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2187                                                                                                                                                                                                                                             |
| Description | <a href="#">VarCom - IGNOREBATTFLT</a><br>Defines whether the drive will respond to an encoder battery voltage warning or fault.<br>Allows a multi-turn absolute encoder to be used without a backup battery, as a single-turn absolute encoder. |
| Object Code | Variable                                                                                                                                                                                                                                         |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                       |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 2188h: Advanced Pole Placement D Polynomial

### Object Description

|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Index       | 2188                                                                      |
| Description | <a href="#">VarCom - VD</a><br>Extended velocity controller D-polynomial. |
| Object Code | Record                                                                    |
| Data Type   | Manufacturer-specific, varies by sub-index.                               |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x09              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                |                |
|----------------|----------------|
| Sub-Index      | 001            |
| Description    | Polynom_Term_1 |
| Entry Category | Optional       |
| Data Type      | INTEGER32      |
| Access         | Read/Write     |
| PDO Mapping    | No             |
| Default Value  | 0x00000000     |
| Lower Limit    | 0x80000000     |
| Upper Limit    | 0x7FFFFFFF     |
| Unit           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 002            |
| <b>Description</b>    | Polynom_Term_2 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 003            |
| <b>Description</b>    | Polynom_Term_3 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 004            |
| <b>Description</b>    | Polynom_Term_4 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 005            |
| <b>Description</b>    | Polynom_Term_5 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 006            |
| <b>Description</b>    | Polynom_Term_6 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 007            |
| <b>Description</b>    | Polynom_Term_7 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x00000000     |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                |                |
|----------------|----------------|
| Sub-Index      | 008            |
| Description    | Polynom_Term_8 |
| Entry Category | Optional       |
| Data Type      | INTEGER32      |
| Access         | Read/Write     |
| PDO Mapping    | No             |
| Default Value  | 0x00000000     |
| Lower Limit    | 0x00000000     |
| Upper Limit    | 0x7FFFFFFF     |
| Unit           | -              |

|                |              |
|----------------|--------------|
| Sub-Index      | 009          |
| Description    | Term_Execute |
| Entry Category | Optional     |
| Data Type      | UNSIGNED8    |
| Access         | Read/Write   |
| PDO Mapping    | No           |
| Default Value  | 0x00         |
| Lower Limit    | 0x00         |
| Upper Limit    | 0xFF         |
| Unit           | -            |

## 2189h: Advanced Pole Placement Global Gain

### Object Description

|             |                                                                                    |
|-------------|------------------------------------------------------------------------------------|
| Index       | 2189                                                                               |
| Description | <a href="#">VarCom - VG</a><br>The gain of the Advanced Pole Placement controller. |
| Object Code | Variable                                                                           |
| Data Type   | REAL32                                                                             |

### Entry Description

|               |               |
|---------------|---------------|
| Access        | Read/Write    |
| PDO Mapping   | No            |
| Default Value | 1.0           |
| Lower Limit   | 0.10000000149 |
| Upper Limit   | 10.0          |
| Unit          | -             |

## 218Ah: PRB Current Command

### Object Description

|             |                                                                                     |
|-------------|-------------------------------------------------------------------------------------|
| Index       | 218A                                                                                |
| Description | <a href="#">VarCom – PRBICMD</a><br>Indicates the PRB injection to current command. |
| Object Code | Variable                                                                            |
| Data Type   | INTEGER16                                                                           |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x0000    |
| Lower Limit   | 0x8000    |
| Upper Limit   | 0x7FFF    |
| Unit          | -         |

## 218Bh: PRB Hold Mode

### Object Description

|             |                                                                                                                                                                                                                                                                               |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 218B                                                                                                                                                                                                                                                                          |
| Description | <a href="#">VarCom – PRBHOLD</a><br>When PRB Hold Mode is active and the PRB generator is activated only during recording (PRBMODE=1), the output of the linear velocity controller is synchronized to the data recording, and will be updated when a record sample is taken. |
| Object Code | Variable                                                                                                                                                                                                                                                                      |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                    |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 218Dh: Delayed Position Error

### Object Description

|             |                                                                             |
|-------------|-----------------------------------------------------------------------------|
| Index       | 218D                                                                        |
| Description | <a href="#">VarCom – PEDELAYED</a><br>Indicates the delayed position error. |
| Object Code | Variable                                                                    |
| Data Type   | INTEGER32                                                                   |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 218Eh: Delay for Delayed Position Error

### Object Description

|             |                                                                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 218E                                                                                                                                          |
| Description | <a href="#">VarCom – PEDELAYTIME</a><br>The delay time for the position command that will be used for calculating the delayed position error. |
| Object Code | Variable                                                                                                                                      |
| Data Type   | INTEGER16                                                                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x001F     |
| Unit          | -          |

## 218Fh: KPP Change Mode

### Object Description

|             |                                                                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 218F                                                                                                                                                                                                                  |
| Description | <a href="#">VarCom – KPPCHANGEMODE</a><br>Defines the behavior of the linear position controller proportional gain (KPP).<br>When set to 1 the linear position controller proportional gain is doubled during motion. |
| Object Code | Variable                                                                                                                                                                                                              |
| Data Type   | UNSIGNED16                                                                                                                                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 2191h: PCOM 1 Module Configuration

### Object Description

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Index       | 2191                                                                                                   |
| Description | <a href="#">VarCom - PCOMCNTRL1</a><br>Configures the Position-Compare Trigger Output (PCOM) module 1. |
| Object Code | Variable                                                                                               |
| Data Type   | UNSIGNED16                                                                                             |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read/Write             |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | -                      |

## 2192h: PCOM 2 Module Configuration

### Object Description

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Index       | 2192                                                                                                   |
| Description | <a href="#">VarCom - PCOMCNTRL2</a><br>Configures the Position-Compare Trigger Output (PCOM) module 2. |
| Object Code | Variable                                                                                               |
| Data Type   | UNSIGNED16                                                                                             |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read/Write             |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | -                      |

## 2193h: PCOM 1 Statusword

### Object Description

|             |                                                              |
|-------------|--------------------------------------------------------------|
| Index       | 2193                                                         |
| Description | <a href="#">VarCom - PCOMSTATUS1</a><br>PCOM Actual Status 1 |
| Object Code | Variable                                                     |
| Data Type   | UNSIGNED16                                                   |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | -                      |

## 2194h: PCOM 2 Statusword

### Object Description

|             |                                                              |
|-------------|--------------------------------------------------------------|
| Index       | 2194                                                         |
| Description | <a href="#">VarCom - PCOMSTATUS2</a><br>PCOM Actual Status 2 |
| Object Code | Variable                                                     |
| Data Type   | UNSIGNED16                                                   |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | -                      |

**2195h: PCOM 1 Direction****Object Description**

|             |                                                       |
|-------------|-------------------------------------------------------|
| Index       | 2195                                                  |
| Description | <a href="#">VarCom - PCOMDIR1</a><br>PCOM Direction 1 |
| Object Code | Variable                                              |
| Data Type   | UNSIGNED16                                            |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

**2196h: PCOM 2 Direction****Object Description**

|             |                                                       |
|-------------|-------------------------------------------------------|
| Index       | 2196                                                  |
| Description | <a href="#">VarCom - PCOMDIR2</a><br>PCOM Direction 2 |
| Object Code | Variable                                              |
| Data Type   | UNSIGNED16                                            |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

**2197h: PCOM 1 Table Length****Object Description**

|             |                                                               |
|-------------|---------------------------------------------------------------|
| Index       | 2197                                                          |
| Description | <a href="#">VarCom - PCOMTABLELEN1</a><br>PCOM Table Length 1 |
| Object Code | Variable                                                      |
| Data Type   | UNSIGNED16                                                    |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0020     |
| Unit          | -          |

**2198h: PCOM 2 Table Length****Object Description**

|             |                                                               |
|-------------|---------------------------------------------------------------|
| Index       | 2198                                                          |
| Description | <a href="#">VarCom - PCOMTABLELEN2</a><br>PCOM Table Length 2 |
| Object Code | Variable                                                      |
| Data Type   | UNSIGNED16                                                    |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0020     |
| Unit          | -          |

## 2199h: PCOM 1 Output Pulse Width

### Object Description

|             |                                                                  |
|-------------|------------------------------------------------------------------|
| Index       | 2199                                                             |
| Description | <a href="#">VarCom - PCOMWIDTH1</a><br>PCOM Output Pulse Width 1 |
| Object Code | Variable                                                         |
| Data Type   | UNSIGNED32                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000064 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 219Ah: PCOM 2 Output Pulse Width

### Object Description

|             |                                                                  |
|-------------|------------------------------------------------------------------|
| Index       | 219A                                                             |
| Description | <a href="#">VarCom - PCOMWIDTH2</a><br>PCOM Output Pulse Width 2 |
| Object Code | Variable                                                         |
| Data Type   | UNSIGNED32                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000064 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 219Bh: PCOM 1 Periodic Start

### Object Description

|             |                                                                    |
|-------------|--------------------------------------------------------------------|
| Index       | 219B                                                               |
| Description | <a href="#">VarCom - PCOMSTART1</a><br>PCOM Range Start Position 1 |
| Object Code | Variable                                                           |
| Data Type   | INTEGER32                                                          |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 219Ch: PCOM 2 Periodic Start

### Object Description

|             |                                                                    |
|-------------|--------------------------------------------------------------------|
| Index       | 219C                                                               |
| Description | <a href="#">VarCom - PCOMSTART2</a><br>PCOM Range Start Position 2 |
| Object Code | Variable                                                           |
| Data Type   | INTEGER32                                                          |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

**219Dh: PCOM 1 Periodic End****Object Description**

|             |                                                                |
|-------------|----------------------------------------------------------------|
| Index       | 219D                                                           |
| Description | <a href="#">VarCom - PCOMEND1</a><br>PCOM Range End Position 1 |
| Object Code | Variable                                                       |
| Data Type   | INTEGER32                                                      |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

**219Eh: PCOM 2 Periodic End****Object Description**

|             |                                                                |
|-------------|----------------------------------------------------------------|
| Index       | 219E                                                           |
| Description | <a href="#">VarCom - PCOMEND2</a><br>PCOM Range End Position 2 |
| Object Code | Variable                                                       |
| Data Type   | INTEGER32                                                      |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 219Fh: PCOM 1 Periodic Interval

### Object Description

|             |                                                             |
|-------------|-------------------------------------------------------------|
| Index       | 219F                                                        |
| Description | <a href="#">VarCom - PCOMN1</a><br>PCOM Periodic Interval 1 |
| Object Code | Variable                                                    |
| Data Type   | INTEGER32                                                   |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 21A0h: PCOM 2 Periodic Interval

### Object Description

|             |                                                             |
|-------------|-------------------------------------------------------------|
| Index       | 21A0                                                        |
| Description | <a href="#">VarCom - PCOMN2</a><br>PCOM Periodic Interval 2 |
| Object Code | Variable                                                    |
| Data Type   | INTEGER32                                                   |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 21A1h: PCOM 1 Table Entry

### Object Description

|             |                                                              |
|-------------|--------------------------------------------------------------|
| Index       | 21A1                                                         |
| Description | <a href="#">VarCom - PCOMTABLE1</a><br>PCOM Table Position 1 |
| Object Code | Array                                                        |
| Data Type   | INTEGER32                                                    |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x03              |
| Upper Limit    | 0x03              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Address    |
| Entry Category | Optional   |
| Data Type      | INTEGER32  |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x00000000 |
| Lower Limit    | 0x00000000 |
| Upper Limit    | 0x000000FF |
| Unit           | -          |

|                       |                         |
|-----------------------|-------------------------|
| <b>Sub-Index</b>      | 002                     |
| <b>Description</b>    | Value                   |
| <b>Entry Category</b> | Optional                |
| <b>Data Type</b>      | INTEGER32               |
| <b>Access</b>         | Read/Write              |
| <b>PDO Mapping</b>    | No                      |
| <b>Default Value</b>  | 0x00000000              |
| <b>Lower Limit</b>    | 0x80000000              |
| <b>Upper Limit</b>    | 0x7FFFFFFF              |
| <b>Unit</b>           | CAN user position units |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | Execute    |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | INTEGER32  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x00000000 |
| <b>Upper Limit</b>    | 0x00000001 |
| <b>Unit</b>           | -          |

## 21A2h: PCOM 2 Table Entry

### Object Description

|             |                                                              |
|-------------|--------------------------------------------------------------|
| Index       | 21A2                                                         |
| Description | <a href="#">VarCom - PCOMTABLE2</a><br>PCOM Table Position 2 |
| Object Code | Array                                                        |
| Data Type   | INTEGER32                                                    |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x03              |
| Lower Limit    | 0x03              |
| Upper Limit    | 0x03              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Address    |
| Entry Category | Optional   |
| Data Type      | INTEGER32  |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x00000000 |
| Lower Limit    | 0x00000000 |
| Upper Limit    | 0x000000FF |
| Unit           | -          |

|                       |                         |
|-----------------------|-------------------------|
| <b>Sub-Index</b>      | 002                     |
| <b>Description</b>    | Value                   |
| <b>Entry Category</b> | Optional                |
| <b>Data Type</b>      | INTEGER32               |
| <b>Access</b>         | Read/Write              |
| <b>PDO Mapping</b>    | No                      |
| <b>Default Value</b>  | 0x00000000              |
| <b>Lower Limit</b>    | 0x80000000              |
| <b>Upper Limit</b>    | 0x7FFFFFFF              |
| <b>Unit</b>           | CAN user position units |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 003        |
| <b>Description</b>    | Execute    |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | INTEGER32  |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x00000000 |
| <b>Lower Limit</b>    | 0x00000000 |
| <b>Upper Limit</b>    | 0x00000001 |
| <b>Unit</b>           | -          |

## 21A3h: Differential Port Mode

### Object Description

|             |                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------|
| Index       | 21A3                                                                                                              |
| Description | <a href="#">VarCom – DIFPORTMODE</a><br>Defines the differential (RS422) digital port hardware and functionality. |
| Object Code | Array                                                                                                             |
| Data Type   | UNSIGNED16                                                                                                        |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Address    |
| Entry Category | Optional   |
| Data Type      | UNSIGNED16 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x0000     |
| Lower Limit    | 0x0000     |
| Upper Limit    | 0xFFFF     |
| Unit           | -          |

|                |                         |
|----------------|-------------------------|
| Sub-Index      | 002                     |
| Description    | Value                   |
| Entry Category | Optional                |
| Data Type      | UNSIGNED16              |
| Access         | Read/Write              |
| PDO Mapping    | No                      |
| Default Value  | 0x0000                  |
| Lower Limit    | 0x0000                  |
| Upper Limit    | 0xFFFF                  |
| Unit           | CAN user position units |

## 21A4h: Secondary Feedback Direction

### Object Description

|             |                                                                                      |
|-------------|--------------------------------------------------------------------------------------|
| Index       | 21A4                                                                                 |
| Description | <a href="#">VarCom – SFBDIR</a><br>The positive direction of feedback from the load. |
| Object Code | Variable                                                                             |
| Data Type   | INTEGER16                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 21A5h: Secondary Feedback Type AqB Encoder

### Object Description

|             |                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------|
| Index       | 21A5                                                                                                |
| Description | <a href="#">VarCom – SFBENCTYPE</a><br>The type of AqB encoder used as a secondary feedback device. |
| Object Code | Variable                                                                                            |
| Data Type   | UNSIGNED16                                                                                          |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0001     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x000B     |
| Unit          | -          |

## 21A6h: Secondary Feedback Resolution

### Object Description

|             |                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 21A6                                                                                                                                             |
| Description | <a href="#">VarCom – SFBRES</a><br>The resolution of the feedback device on the load, in number of lines per revolution or lines per millimeter. |
| Object Code | Variable                                                                                                                                         |
| Data Type   | UNSIGNED32                                                                                                                                       |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000800 |
| Lower Limit   | 0x00000010 |
| Upper Limit   | 0x00989680 |
| Unit          | -          |

## 21A8h: Motor Acceleration

### Object Description

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Index       | 21A8                                                                                                   |
| Description | <a href="#">VarCom - MACC</a><br>The acceleration value according to the feedback device on the motor. |
| Object Code | Variable                                                                                               |
| Data Type   | UNSIGNED32                                                                                             |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | No                                                    |
| Default Value | 0x00000001                                            |
| Lower Limit   | 0x00000001                                            |
| Upper Limit   | 0xFFFFFFFF                                            |
| Unit          | CAN user acc/dec units                                |

## 21A9h: Secondary Feedback Acceleration

### Object Description

|             |                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------|
| Index       | 21A9                                                                                                    |
| Description | <a href="#">VarCom – SFBACC</a><br>The acceleration value according to the feedback device on the load. |
| Object Code | Variable                                                                                                |
| Data Type   | UNSIGNED32                                                                                              |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | No                                                    |
| Default Value | 0x00000001                                            |
| Lower Limit   | 0x00000001                                            |
| Upper Limit   | 0xFFFFFFFF                                            |
| Unit          | CAN user acc/dec units                                |

## 21AAh: Motor Deceleration

### Object Description

|             |                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------|
| Index       | 21AA                                                                                                   |
| Description | <a href="#">VarCom – MDEC</a><br>The deceleration value according to the feedback device on the motor. |
| Object Code | Variable                                                                                               |
| Data Type   | UNSIGNED32                                                                                             |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | No                                                    |
| Default Value | 0x00000001                                            |
| Lower Limit   | 0x00000001                                            |
| Upper Limit   | 0xFFFFFFFF                                            |
| Unit          | CAN user acc/dec units                                |

## 21ABh: Secondday Feedback Deceleration

### Object Description

|             |                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------|
| Index       | 21AB                                                                                                    |
| Description | <a href="#">VarCom – SFBDEC</a><br>The deceleration value according to the feedback device on the load. |
| Object Code | Variable                                                                                                |
| Data Type   | UNSIGNED32                                                                                              |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | No                                                    |
| Default Value | 0x00000001                                            |
| Lower Limit   | 0x00000001                                            |
| Upper Limit   | 0xFFFFFFFF                                            |
| Unit          | CAN user acc/dec units                                |

## 21ACh: User Parameter

### Object Description

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 21AC                                                                           |
| Description | <a href="#">VarCom – USERPARAM</a><br>Intended for use by firmware developers. |
| Object Code | Variable                                                                       |
| Data Type   | UNSIGNED32                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000001 |
| Lower Limit   | 0x00000001 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | -          |

## 21ADh: Parameters Over FOE Results

### Object Description

|             |                             |
|-------------|-----------------------------|
| Index       | 21AD                        |
| Description | Parameters over FOE Results |
| Object Code | Array                       |
| Data Type   | UNSIGNED16                  |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x04              |
| Lower Limit    | 0x04              |
| Upper Limit    | 0x04              |
| Unit           | -                 |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 001                 |
| <b>Description</b>    | First Parsing Error |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED16          |
| <b>Access</b>         | Read Only           |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x0000              |
| <b>Lower Limit</b>    | 0x0000              |
| <b>Upper Limit</b>    | 0xFFFF              |
| <b>Unit</b>           | -                   |

|                       |                                     |
|-----------------------|-------------------------------------|
| <b>Sub-Index</b>      | 002                                 |
| <b>Description</b>    | Index of First Command Which Failed |
| <b>Entry Category</b> | Optional                            |
| <b>Data Type</b>      | UNSIGNED16                          |
| <b>Access</b>         | Read Only                           |
| <b>PDO Mapping</b>    | No                                  |
| <b>Default Value</b>  | 0x0000                              |
| <b>Lower Limit</b>    | 0x0000                              |
| <b>Upper Limit</b>    | 0xFFFF                              |
| <b>Unit</b>           | -                                   |

|                       |                          |
|-----------------------|--------------------------|
| <b>Sub-Index</b>      | 003                      |
| <b>Description</b>    | Number of Parsing Errors |
| <b>Entry Category</b> | Optional                 |
| <b>Data Type</b>      | UNSIGNED16               |
| <b>Access</b>         | Read Only                |
| <b>PDO Mapping</b>    | No                       |
| <b>Default Value</b>  | 0x0000                   |
| <b>Lower Limit</b>    | 0x0000                   |
| <b>Upper Limit</b>    | 0xFFFF                   |
| <b>Unit</b>           | -                        |

|                |                           |
|----------------|---------------------------|
| Sub-Index      | 004                       |
| Description    | Number of Parsed Commands |
| Entry Category | Optional                  |
| Data Type      | UNSIGNED16                |
| Access         | Read Only                 |
| PDO Mapping    | No                        |
| Default Value  | 0x0000                    |
| Lower Limit    | 0x0000                    |
| Upper Limit    | 0xFFFF                    |
| Unit           | -                         |

## 2200h: Gantry Settings

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Description | <p>Gantry configuration.</p> <p>Sub-index 1 - <a href="#">VarCom</a> - GANTRYMODE</p> <p>Sub-index 2 - <a href="#">VarCom</a> - GANTRYCMDTYPE</p> <p>Sub-index 3 - <a href="#">VarCom</a> - GANTRYFINDOFF</p> <p>Sub-index 4 - <a href="#">VarCom</a> - GANTRYALIGNMODE</p> <p>Sub-index 5 - <a href="#">VarCom</a> - GANTRYTYPE</p> <p>Sub-index 6 - <a href="#">VarCom</a> - GANTRYINTERFACE</p> <p>Sub-index 7 - <a href="#">VarCom</a> - GANTRYOFFSETST</p> <p>Sub-index 8 - <a href="#">VarCom</a> - GANTRYOFFSET</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x08              |
| Lower Limit    | 0x08              |
| Upper Limit    | 0x08              |
| Unit           | -                 |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 001         |
| <b>Description</b>    | Gantry Mode |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | UNSIGNED16  |
| <b>Access</b>         | Read/Write  |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x0000      |
| <b>Lower Limit</b>    | 0x0000      |
| <b>Upper Limit</b>    | 0x0002      |
| <b>Unit</b>           | -           |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 002                 |
| <b>Description</b>    | Gantry Command Type |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED16          |
| <b>Access</b>         | Read/Write          |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x1                 |
| <b>Lower Limit</b>    | 0x1                 |
| <b>Upper Limit</b>    | 0x2                 |
| <b>Unit</b>           | -                   |

|                       |                            |
|-----------------------|----------------------------|
| <b>Sub-Index</b>      | 003                        |
| <b>Description</b>    | Gantry Find Offset Command |
| <b>Entry Category</b> | Optional                   |
| <b>Data Type</b>      | UNSIGNED16                 |
| <b>Access</b>         | Read/Write                 |
| <b>PDO Mapping</b>    | No                         |
| <b>Default Value</b>  | 0x1                        |
| <b>Lower Limit</b>    | 0x1                        |
| <b>Upper Limit</b>    | 0x1                        |
| <b>Unit</b>           | -                          |

|                       |                       |
|-----------------------|-----------------------|
| <b>Sub-Index</b>      | 004                   |
| <b>Description</b>    | Gantry Alignment Mode |
| <b>Entry Category</b> | Optional              |
| <b>Data Type</b>      | UNSIGNED16            |
| <b>Access</b>         | Read/Write            |
| <b>PDO Mapping</b>    | No                    |
| <b>Default Value</b>  | 0x1                   |
| <b>Lower Limit</b>    | 0x0                   |
| <b>Upper Limit</b>    | 0x2                   |
| <b>Unit</b>           | -                     |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 005         |
| <b>Description</b>    | Gantry Type |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | UNSIGNED16  |
| <b>Access</b>         | Read/Write  |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x0         |
| <b>Lower Limit</b>    | 0x0         |
| <b>Upper Limit</b>    | 0x1         |
| <b>Unit</b>           | -           |

|                       |                                      |
|-----------------------|--------------------------------------|
| <b>Sub-Index</b>      | 006                                  |
| <b>Description</b>    | Gantry Drive Communication Interface |
| <b>Entry Category</b> | Optional                             |
| <b>Data Type</b>      | UNSIGNED16                           |
| <b>Access</b>         | Read/Write                           |
| <b>PDO Mapping</b>    | No                                   |
| <b>Default Value</b>  | 0x0                                  |
| <b>Lower Limit</b>    | 0x0                                  |
| <b>Upper Limit</b>    | 0x1                                  |
| <b>Unit</b>           | -                                    |

|                       |                                   |
|-----------------------|-----------------------------------|
| <b>Sub-Index</b>      | 007                               |
| <b>Description</b>    | Gantry Difference Offset Validity |
| <b>Entry Category</b> | Optional                          |
| <b>Data Type</b>      | UNSIGNED16                        |
| <b>Access</b>         | Read/Write                        |
| <b>PDO Mapping</b>    | No                                |
| <b>Default Value</b>  | 0x0                               |
| <b>Lower Limit</b>    | 0x0                               |
| <b>Upper Limit</b>    | 0x1                               |
| <b>Unit</b>           | -                                 |

|                       |                          |
|-----------------------|--------------------------|
| <b>Sub-Index</b>      | 008                      |
| <b>Description</b>    | Gantry Difference Offset |
| <b>Entry Category</b> | Optional                 |
| <b>Data Type</b>      | INTEGER32                |
| <b>Access</b>         | Read/Write               |
| <b>PDO Mapping</b>    | No                       |
| <b>Default Value</b>  | 0x00000000               |
| <b>Lower Limit</b>    | 0x80000000               |
| <b>Upper Limit</b>    | 0x7FFFFFFF               |
| <b>Unit</b>           | -                        |

## 2201h: Gantry Position Feedback

### Object Description

|             |                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2201                                                                                                                                           |
| Description | Gantry axes position feedback.<br>Sub-index 1 - <a href="#">VarCom - GANTRYMSTRPFB</a><br>Sub-index 2 - <a href="#">VarCom - GANTRYDIFFPFB</a> |
| Object Code | CAN:     Array<br>ECT:     Record                                                                                                              |
| Data Type   | INTEGER32                                                                                                                                      |

### Entry Description

|                |                                      |
|----------------|--------------------------------------|
| Sub-Index      | 000                                  |
| Description    | Number of Entries                    |
| Entry Category | Optional                             |
| Access         | Read Only                            |
| PDO Mapping    | No                                   |
| Default Value  | CAN:     0x00000002<br>ECT:     0x2  |
| Lower Limit    | CAN:     0x80000000<br>ECT:     0x00 |
| Upper Limit    | CAN:     0x7FFFFFFF<br>ECT:     0xFF |
| Unit           | -                                    |

|                |                                |
|----------------|--------------------------------|
| Sub-Index      | 001                            |
| Description    | Gantry Master Position         |
| Entry Category | Optional                       |
| Data Type      | INTEGER32                      |
| Access         | Read Only                      |
| PDO Mapping    | CAN:     Yes<br>ECT:     TxPDO |
| Default Value  | 0x00000000                     |
| Lower Limit    | 0x80000000                     |
| Upper Limit    | 0x7FFFFFFF                     |
| Unit           | CAN user position units        |

|                |                            |
|----------------|----------------------------|
| Sub-Index      | 002                        |
| Description    | Gantry Difference Position |
| Entry Category | Optional                   |
| Data Type      | INTEGER32                  |
| Access         | Read Only                  |
| PDO Mapping    | CAN: Yes<br>ECT: TxPDO     |
| Default Value  | 0x00000000                 |
| Lower Limit    | 0x80000000                 |
| Upper Limit    | 0x7FFFFFFF                 |
| Unit           | CAN user position units    |

## 2202h: Gantry Velocity Feedback

### Object Description

|             |                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2202                                                                                                                                           |
| Description | Gantry axes velocity feedback.<br>Sub-index 1 - <a href="#">VarCom - GANTRYMSTRVFB</a><br>Sub-index 2 - <a href="#">VarCom - GANTRYDIFFVFB</a> |
|             | GANTRYMSTRPFB                                                                                                                                  |
| Object Code | CAN: Array<br>ECT: Record                                                                                                                      |
| Data Type   | CAN: INTEGER32<br>ECT: GANTRY_VELOCITY_FEEDBACK                                                                                                |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x00              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                       |                           |
|-----------------------|---------------------------|
| <b>Sub-Index</b>      | 001                       |
| <b>Description</b>    | Average Position Velocity |
| <b>Entry Category</b> | Optional                  |
| <b>Data Type</b>      | INTEGER32                 |
| <b>Access</b>         | Read Only                 |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO    |
| <b>Default Value</b>  | 0x00000000                |
| <b>Lower Limit</b>    | 0x80000000                |
| <b>Upper Limit</b>    | 0x7FFFFFFF                |
| <b>Unit</b>           | User velocity units       |

|                       |                              |
|-----------------------|------------------------------|
| <b>Sub-Index</b>      | 002                          |
| <b>Description</b>    | Position Difference Velocity |
| <b>Entry Category</b> | Optional                     |
| <b>Data Type</b>      | INTEGER32                    |
| <b>Access</b>         | Read Only                    |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO       |
| <b>Default Value</b>  | 0x00000000                   |
| <b>Lower Limit</b>    | 0x80000000                   |
| <b>Upper Limit</b>    | 0x7FFFFFFF                   |
| <b>Unit</b>           | User velocity units          |

## 2203h: Gantry Position Controllers Current Commands

### Object Description

|             |                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2203                                                                                                                                           |
| Description | Gantry axes current command.<br>Sub-index 1 - <a href="#">VarCom - GANTRYMSTRICMD</a><br>Sub-index 2 - <a href="#">VarCom - GANTRYDIFFICMD</a> |
| Object Code | CAN:     Array<br>ECT:     Record                                                                                                              |
| Data Type   | CAN:     INTEGER16<br>ECT:     GANTRY_POS_CONTROLLERS_CURRENT_COMM                                                                             |

### Entry Description

|                |                                               |
|----------------|-----------------------------------------------|
| Sub-Index      | 000                                           |
| Description    | Number of Entries                             |
| Entry Category | Optional                                      |
| Access         | Read Only                                     |
| PDO Mapping    | No                                            |
| Default Value  | 0x02                                          |
| Lower Limit    | 0x00                                          |
| Upper Limit    | 0x02                                          |
| Unit           | -                                             |
|                |                                               |
| Sub-Index      | 001                                           |
| Description    | Current Command from Gantry Master Controller |
| Entry Category | Optional                                      |
| Data Type      | INTEGER16                                     |
| Access         | Read Only                                     |
| PDO Mapping    | CAN:     Yes<br>ECT:     TxPDO                |
| Default Value  | 0x0000                                        |
| Lower Limit    | 0x8000                                        |
| Upper Limit    | 0x7FFF                                        |
| Unit           | -                                             |

|                |                                                   |
|----------------|---------------------------------------------------|
| Sub-Index      | 002                                               |
| Description    | Current Command from Gantry Difference Controller |
| Entry Category | Optional                                          |
| Data Type      | INTEGER16                                         |
| Access         | Read Only                                         |
| PDO Mapping    | CAN: Yes<br>ECT: TxPDO                            |
| Default Value  | 0x0000                                            |
| Lower Limit    | 0x8000                                            |
| Upper Limit    | 0x7FFF                                            |
| Unit           | -                                                 |

## 2204h: Gantry Indicators

### Object Description

|             |                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2204                                                                                                                                        |
| Description | Gantry status indicators:<br>Sub-index 1 - <a href="#">VarCom - GANTRYALIGNED</a><br>Sub-index 2 - <a href="#">VarCom - GANTRYCOMMSTATE</a> |
| Object Code | CAN: Array<br>ECT: Record                                                                                                                   |
| Data Type   | CAN: UNSIGNED16<br>ECT: Gantry Indicators                                                                                                   |

### Entry Description

|                |                          |
|----------------|--------------------------|
| Sub-Index      | 000                      |
| Description    | Number of Entries        |
| Entry Category | Optional                 |
| Access         | Read Only                |
| PDO Mapping    | No                       |
| Default Value  | 0x02                     |
| Lower Limit    | 0x00                     |
| Upper Limit    | CAN: 0xFFFF<br>ECT: 0xFF |
| Unit           | -                        |

|                       |                         |
|-----------------------|-------------------------|
| <b>Sub-Index</b>      | 001                     |
| <b>Description</b>    | Gantry Alignment Status |
| <b>Entry Category</b> | Optional                |
| <b>Data Type</b>      | UNSIGNED16              |
| <b>Access</b>         | Read Only               |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO  |
| <b>Default Value</b>  | 0x0                     |
| <b>Lower Limit</b>    | 0x0000                  |
| <b>Upper Limit</b>    | 0xFFFF                  |
| <b>Unit</b>           | -                       |

|                       |                            |
|-----------------------|----------------------------|
| <b>Sub-Index</b>      | 002                        |
| <b>Description</b>    | Gantry Communication State |
| <b>Entry Category</b> | Optional                   |
| <b>Data Type</b>      | UNSIGNED16                 |
| <b>Access</b>         | Read Only                  |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: TxPDO     |
| <b>Default Value</b>  | 0x0                        |
| <b>Lower Limit</b>    | 0x0000                     |
| <b>Upper Limit</b>    | 0xFFFF                     |
| <b>Unit</b>           | -                          |

**2205h: PCOM 1 Time Offset****Object Description**

|             |                                                                      |
|-------------|----------------------------------------------------------------------|
| Index       | 2205                                                                 |
| Description | Time offsets and output states for output trigger for PCOM module 1. |
| Object Code | CAN:     Array<br>ECT:     Record                                    |
| Data Type   | UNSIGNED32                                                           |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read/Write        |
| PDO Mapping    | No                |
| Default Value  | 0x4               |
| Lower Limit    | 0x00000000        |
| Upper Limit    | 0xFFFFFFFF        |
| Unit           | -                 |

|                |                                                                                                                             |
|----------------|-----------------------------------------------------------------------------------------------------------------------------|
| Sub-Index      | 001                                                                                                                         |
| Description    | Time offset 1 from SYNC0 for transition and output state (TM1)<br>bit 0-30: time offset<br>bit 31: state<br>0=low<br>1=high |
| Entry Category | Optional                                                                                                                    |
| Data Type      | UNSIGNED32                                                                                                                  |
| Access         | Read/Write                                                                                                                  |
| PDO Mapping    | CAN:     Yes<br>ECT:     RxPDO                                                                                              |
| Default Value  | 0x0                                                                                                                         |
| Lower Limit    | 0x00000000                                                                                                                  |
| Upper Limit    | 0xFFFFFFFF                                                                                                                  |
| Unit           | -                                                                                                                           |

|                       |                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Sub-Index</b>      | 002                                                                                                                         |
| <b>Description</b>    | Time offset 2 from SYNC0 for transition and output state (TM2)<br>bit 0-30: time offset<br>bit 31: state<br>0=low<br>1=high |
| <b>Entry Category</b> | Optional                                                                                                                    |
| <b>Data Type</b>      | UNSIGNED32                                                                                                                  |
| <b>Access</b>         | Read/Write                                                                                                                  |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                                                                                      |
| <b>Default Value</b>  | 0x0                                                                                                                         |
| <b>Lower Limit</b>    | 0x00000000                                                                                                                  |
| <b>Upper Limit</b>    | 0xFFFFFFFF                                                                                                                  |
| <b>Unit</b>           | -                                                                                                                           |

|                       |                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Sub-Index</b>      | 003                                                                                                                         |
| <b>Description</b>    | Time offset 3 from SYNC0 for transition and output state (TM3)<br>bit 0-30: time offset<br>bit 31: state<br>0=low<br>1=high |
| <b>Entry Category</b> | Optional                                                                                                                    |
| <b>Data Type</b>      | UNSIGNED32                                                                                                                  |
| <b>Access</b>         | Read/Write                                                                                                                  |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                                                                                      |
| <b>Default Value</b>  | 0x0                                                                                                                         |
| <b>Lower Limit</b>    | 0x00000000                                                                                                                  |
| <b>Upper Limit</b>    | 0xFFFFFFFF                                                                                                                  |
| <b>Unit</b>           | -                                                                                                                           |

|                |                                                                                                                             |
|----------------|-----------------------------------------------------------------------------------------------------------------------------|
| Sub-Index      | 004                                                                                                                         |
| Description    | Time offset 4 from SYNC0 for transition and output state (TM4)<br>bit 0-30: time offset<br>bit 31: state<br>0=low<br>1=high |
| Entry Category | Optional                                                                                                                    |
| Data Type      | UNSIGNED32                                                                                                                  |
| Access         | Read/Write                                                                                                                  |
| PDO Mapping    | CAN: Yes<br>ECT: RxPDO                                                                                                      |
| Default Value  | 0x0                                                                                                                         |
| Lower Limit    | 0x00000000                                                                                                                  |
| Upper Limit    | 0xFFFFFFFF                                                                                                                  |
| Unit           | -                                                                                                                           |

## 2206h: PCOM 2 Time Offset

### Object Description

|             |                                                                      |
|-------------|----------------------------------------------------------------------|
| Index       | 2206                                                                 |
| Description | Time offsets and output states for output trigger for PCOM module 2. |
| Object Code | Array<br>ECT: Record                                                 |
| Data Type   | UNSIGNED32                                                           |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read/Write        |
| PDO Mapping    | No                |
| Default Value  | 0x4               |
| Lower Limit    | 0x00000000        |
| Upper Limit    | 0xFFFFFFFF        |
| Unit           | -                 |

|                       |                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Sub-Index</b>      | 001                                                                                                                         |
| <b>Description</b>    | Time offset 1 from SYNC0 for transition and output state (TM1)<br>bit 0-30: time offset<br>bit 31: state<br>0=low<br>1=high |
| <b>Entry Category</b> | Optional                                                                                                                    |
| <b>Data Type</b>      | UNSIGNED32                                                                                                                  |
| <b>Access</b>         | Read/Write                                                                                                                  |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                                                                                      |
| <b>Default Value</b>  | 0x0                                                                                                                         |
| <b>Lower Limit</b>    | 0x00000000                                                                                                                  |
| <b>Upper Limit</b>    | 0xFFFFFFFF                                                                                                                  |
| <b>Unit</b>           | -                                                                                                                           |

|                       |                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Sub-Index</b>      | 002                                                                                                                         |
| <b>Description</b>    | Time offset 2 from SYNC0 for transition and output state (TM2)<br>bit 0-30: time offset<br>bit 31: state<br>0=low<br>1=high |
| <b>Entry Category</b> | Optional                                                                                                                    |
| <b>Data Type</b>      | UNSIGNED32                                                                                                                  |
| <b>Access</b>         | Read/Write                                                                                                                  |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                                                                                      |
| <b>Default Value</b>  | 0x0                                                                                                                         |
| <b>Lower Limit</b>    | 0x00000000                                                                                                                  |
| <b>Upper Limit</b>    | 0xFFFFFFFF                                                                                                                  |
| <b>Unit</b>           | -                                                                                                                           |

|                       |                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Sub-Index</b>      | 003                                                                                                                         |
| <b>Description</b>    | Time offset 3 from SYNC0 for transition and output state (TM3)<br>bit 0-30: time offset<br>bit 31: state<br>0=low<br>1=high |
| <b>Entry Category</b> | Optional                                                                                                                    |
| <b>Data Type</b>      | UNSIGNED32                                                                                                                  |
| <b>Access</b>         | Read/Write                                                                                                                  |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                                                                                      |
| <b>Default Value</b>  | 0x0                                                                                                                         |
| <b>Lower Limit</b>    | 0x00000000                                                                                                                  |
| <b>Upper Limit</b>    | 0xFFFFFFFF                                                                                                                  |
| <b>Unit</b>           | -                                                                                                                           |

|                       |                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Sub-Index</b>      | 004                                                                                                                         |
| <b>Description</b>    | Time offset 4 from SYNC0 for transition and output state (TM4)<br>bit 0-30: time offset<br>bit 31: state<br>0=low<br>1=high |
| <b>Entry Category</b> | Optional                                                                                                                    |
| <b>Data Type</b>      | UNSIGNED32                                                                                                                  |
| <b>Access</b>         | Read/Write                                                                                                                  |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                                                                                      |
| <b>Default Value</b>  | 0x0                                                                                                                         |
| <b>Lower Limit</b>    | 0x00000000                                                                                                                  |
| <b>Upper Limit</b>    | 0xFFFFFFFF                                                                                                                  |
| <b>Unit</b>           | -                                                                                                                           |

## 220Ah: Gearing Filter Depth

### Object Description

|             |                                                                                    |
|-------------|------------------------------------------------------------------------------------|
| Index       | 220A                                                                               |
| Description | <a href="#">VarCom – GEARFILTDEPTH</a><br>Gearing filter depth, in 0.25 ms quanta. |
| Object Code | Variable                                                                           |
| Data Type   | REAL32                                                                             |

### Entry Description

|               |                     |
|---------------|---------------------|
| Access        | Read/Write          |
| PDO Mapping   | No                  |
| Default Value | 0.0                 |
| Lower Limit   | -3.40282346639e+038 |
| Upper Limit   | 3.40282346639e+038  |
| Unit          | -                   |

## 220Ch: Commutation Error Counter

### Object Description

|             |                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------|
| Index       | 220C                                                                                                        |
| Description | <a href="#">VarCom - COMMERRMAXCNT</a><br>The commutation error count since COMMERRMAXCNT was last cleared. |
| Object Code | Variable                                                                                                    |
| Data Type   | UNSIGNED16                                                                                                  |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read/Write             |
| PDO Mapping   | No                     |
| Default Value | 0x00                   |
| Lower Limit   | 0x0000                 |
| Upper Limit   | CAN: 0x00<br>ECT: FFFF |
| Unit          | -                      |

## 220Dh: Commutation Error Threshold

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 220D                                                                                                  |
| Description | <a href="#">VarCom - COMMERRTTHRESH</a><br>Error-counter value that will generate a commutation fault |
| Object Code | Variable                                                                                              |
| Data Type   | UNSIGNED16                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xBB8      |
| Unit          | -          |

## 220Eh: Commutation Velocity Deviation

### Object Description

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Index       | 220E                                                                                                           |
| Description | <a href="#">VarCom - COMMERRVTHRESH</a><br>Value of velocity deviation that will generate a commutation fault. |
| Object Code | Variable                                                                                                       |
| Data Type   | UNSIGNED32                                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x3C       |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0x1770     |
| Unit          | -          |

## 220Fh: Commutation Index Deviation

### Object Description

|             |                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 220F                                                                                                                                   |
| Description | <a href="#">VarCom - COMMFLTRESH</a><br>Value of commutation deviation from the index position that will generate a commutation fault. |
| Object Code | Variable                                                                                                                               |
| Data Type   | UNSIGNED16                                                                                                                             |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x02       |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x14       |
| Unit          | -          |

## 2210h: Active Axis

### Object Description

|             |             |
|-------------|-------------|
| Index       | 2210        |
| Description | No varcom . |
| Object Code | Variable    |
| Data Type   | UNSIGNED16  |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x1        |
| Lower Limit   | 0x1        |
| Upper Limit   | 0x2        |
| Unit          | -          |

## 2211h: Velocity Loop Second Filter Mode

### Object Description

|             |                                                                                                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------|
| Index       | 2211                                                                                                                |
| Description | <a href="#">VarCom – FILTEXTMODE</a><br>Defines the function of an additional filter for the velocity control loop. |
| Object Code | Variable                                                                                                            |
| Data Type   | UNSIGNED8                                                                                                           |

### Entry Description

|               |                       |
|---------------|-----------------------|
| Access        | Read/Write            |
| PDO Mapping   | No                    |
| Default Value | 0x00                  |
| Lower Limit   | 0x00                  |
| Upper Limit   | CAN: 0x7<br>ECT: 0xFF |
| Unit          | -                     |

## 2212h: Velocity Loop Second Filter Parameter 1

### Object Description

|             |                                                                                                                             |
|-------------|-----------------------------------------------------------------------------------------------------------------------------|
| Index       | 2212                                                                                                                        |
| Description | <a href="#">VarCom – FILTEXTHZ1</a><br>A multi-function parameter for setting the output filter of the velocity controller. |
| Object Code | Variable                                                                                                                    |
| Data Type   | UNSIGNED16                                                                                                                  |

### Entry Description

|               |                            |
|---------------|----------------------------|
| Access        | Read/Write                 |
| PDO Mapping   | No                         |
| Default Value | CAN: 0xC8<br>ECT: 0x00     |
| Lower Limit   | CAN: 0x1<br>ECT: 0x0000    |
| Upper Limit   | CAN: 0x2710<br>ECT: 0xFFFF |
| Unit          | Hz                         |

## 2213h: Velocity Loop Second Filter Parameter 2

### Object Description

|             |                                                                                              |
|-------------|----------------------------------------------------------------------------------------------|
| Index       | 2213                                                                                         |
| Description | <a href="#">VarCom - FILTEXTHZ2</a><br>Velocity loop output extended filter second parameter |
| Object Code | Variable                                                                                     |
| Data Type   | UNSIGNED16                                                                                   |

### Entry Description

|               |                            |
|---------------|----------------------------|
| Access        | Read/Write                 |
| PDO Mapping   | No                         |
| Default Value | CAN: 0xC8<br>ECT: 0x00     |
| Lower Limit   | CAN: 0x1<br>ECT: 0x0000    |
| Upper Limit   | CAN: 0x2710<br>ECT: 0xFFFF |
| Unit          | Hz                         |

## 2214h: Velocity Loop Second Filter User-Defined

### Object Description

|             |                                                                            |
|-------------|----------------------------------------------------------------------------|
| Index       | 2214                                                                       |
| Description | <a href="#">VarCom - VFEXT</a><br>Velocity Loop Second Filter User Defined |
| Object Code | Record                                                                     |
| Data Type   | VF_VFI_T                                                                   |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x8               |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 001            |
| <b>Description</b>    | Polynom Term 1 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 002            |
| <b>Description</b>    | Polynom Term 2 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 003            |
| <b>Description</b>    | Polynom Term 3 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 004            |
| <b>Description</b>    | Polynom Term 4 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 005            |
| <b>Description</b>    | Polynom Term 5 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 006            |
| <b>Description</b>    | Polynom Term 6 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | 0x80000000     |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |                |
|-----------------------|----------------|
| <b>Sub-Index</b>      | 007            |
| <b>Description</b>    | Polynom Term 7 |
| <b>Entry Category</b> | Optional       |
| <b>Data Type</b>      | INTEGER32      |
| <b>Access</b>         | Read/Write     |
| <b>PDO Mapping</b>    | No             |
| <b>Default Value</b>  | 0x0            |
| <b>Lower Limit</b>    | 0x0            |
| <b>Upper Limit</b>    | 0x7FFFFFFF     |
| <b>Unit</b>           | -              |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 008          |
| <b>Description</b>    | Term Execute |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED8    |
| <b>Access</b>         | Read/Write   |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x0          |
| <b>Lower Limit</b>    | 0x00         |
| <b>Upper Limit</b>    | 0x1          |
| <b>Unit</b>           | -            |

## 2216h: HD Current Filter – First Notch Filter Mode

### Object Description

|             |                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------|
| Index       | 2216                                                                                            |
| Description | <a href="#">VarCom - NLFILTMODE</a><br>The mode of first notch filter for the HD control loop . |
| Object Code | Variable                                                                                        |
| Data Type   | UNSIGNED16                                                                                      |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00                    |
| Lower Limit   | 0x0000                  |
| Upper Limit   | CAN: 0x1<br>ECT: 0xFFFF |
| Unit          | -                       |

## 2217h: HD Current Filter – Second Notch Filter Mode

### Object Description

|             |                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------|
| Index       | 2217                                                                                              |
| Description | <a href="#">VarCom - NLFILTMODE2</a><br>The mode of second notch filter for the HD control loop . |
| Object Code | Variable                                                                                          |
| Data Type   | UNSIGNED16                                                                                        |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00                    |
| Lower Limit   | 0x0000                  |
| Upper Limit   | CAN: 0x1<br>ECT: 0xFFFF |
| Unit          | -                       |

## 2218h: Error Correction Start Offset

### Object Description

|             |                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------|
| Index       | 2218                                                                                                      |
| Description | <a href="#">VarCom - ERRCORSTARTOFF</a><br>Offset to the first active entry at the error correction table |
| Object Code | Variable                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x3E7      |
| Unit          | -          |

## 2219h: Error Correction Active Entries

### Object Description

|             |                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------|
| Index       | 2219                                                                                               |
| Description | <a href="#">VarCom - ERRCORACTIVENUM</a><br>The number of active entries in error correction table |
| Object Code | Variable                                                                                           |
| Data Type   | UNSIGNED16                                                                                         |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x3E8      |
| Unit          | -          |

## 221Ah: Error Correction Start Position

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 221A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Description | <p><a href="#">VarCom - ERRCORSTARTPOS</a></p> <p>The position corresponding the first active entry of the error correction table.</p> <p>This object is a 64-bit variable that is expressed by two 32-bit indexes.</p> <p>The value of the two indexes is determined by the calculation shown in the following example (which assumes a start position value of one hundred billion and fifty (microdegrees):</p> <p>Multiply the user value by 1000.</p> <p>Convert to hexadecimal representation:</p> $100000000050 * 1000 = 100000000050000 ==> 0x5AF3107B0350.$ <p>Assign low/high 32 bits to the sub-indexes:</p> <p>Sub-index 1: Low 32 bits = 107B0350</p> <p>Sub-index 2: High 32 bits = 5AF3</p> |
| Object Code | Array                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x2               |
| Lower Limit    | 0x0               |
| Upper Limit    | 0x2               |
| Unit           | -                 |

|                |            |
|----------------|------------|
| Sub-Index      | 001        |
| Description    | Index      |
| Entry Category | Optional   |
| Data Type      | UNSIGNED32 |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x0        |
| Lower Limit    | 0x00000000 |
| Upper Limit    | 0xFFFFFFFF |
| Unit           | -          |

|                |            |
|----------------|------------|
| Sub-Index      | 002        |
| Description    | Value      |
| Entry Category | Optional   |
| Data Type      | INTEGER32  |
| Access         | Read/Write |
| PDO Mapping    | No         |
| Default Value  | 0x0        |
| Lower Limit    | 0x80000000 |
| Upper Limit    | 0x7FFFFFFF |
| Unit           | -          |

## 221Bh: Error Correction Interval

### Object Description

|             |                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 221B                                                                                                                                      |
| Description | <a href="#">VarCom - ERRCORINTERVAL</a><br>Distance between the positions at which errors are measured and added to the correction table. |
| Object Code | Variable                                                                                                                                  |
| Data Type   | REAL32                                                                                                                                    |

### Entry Description

|               |                     |
|---------------|---------------------|
| Access        | Read/Write          |
| PDO Mapping   | No                  |
| Default Value | 0                   |
| Lower Limit   | -3.40282346639e+038 |
| Upper Limit   | 3.40282346639e+038  |
| Unit          | -                   |

## 221Ch: Error Correction Active Index

### Object Description

|             |                                                                                                                          |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
| Index       | 221C                                                                                                                     |
| Description | <a href="#">VarCom - ERRCORINDEX</a><br>Index of the error correction table entry whose value is currently added to PFB. |
| Object Code | Variable                                                                                                                 |
| Data Type   | INTEGER32                                                                                                                |

### Entry Description

|               |                                    |
|---------------|------------------------------------|
| Access        | Read Only                          |
| PDO Mapping   | No                                 |
| Default Value | 0x00                               |
| Lower Limit   | 0x80000000                         |
| Upper Limit   | CAN: 0x7FFFFFFF<br>ECT: 0xFFFFFFFF |
| Unit          | -                                  |

## 221Dh: Error Correction Set Index Value

### Object Description

|             |                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------|
| Index       | 221D                                                                                                        |
| Description | <a href="#">VarCom - ERRCORSETINDEX</a><br>A correction value for a specific entry in the correction table. |
| Object Code | Array/Record                                                                                                |
| Data Type   |                                                                                                             |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x2               |
| Lower Limit    | 0x00              |
| Upper Limit    | 0xFF              |
| Unit           | -                 |

|                       |            |
|-----------------------|------------|
| <b>Sub-Index</b>      | 001        |
| <b>Description</b>    | Index      |
| <b>Entry Category</b> | Optional   |
| <b>Data Type</b>      | UNSIGNED16 |
| <b>Access</b>         | Read/Write |
| <b>PDO Mapping</b>    | No         |
| <b>Default Value</b>  | 0x0001     |
| <b>Lower Limit</b>    | 0x0001     |
| <b>Upper Limit</b>    | 0x03E8     |
| <b>Unit</b>           | -          |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 002                 |
| <b>Description</b>    | Value               |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | REAL32              |
| <b>Access</b>         | Read/Write          |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0                   |
| <b>Lower Limit</b>    | -3.40282346639e+038 |
| <b>Upper Limit</b>    | 3.40282346639e+038  |
| <b>Unit</b>           | -                   |

## 221Eh: Error Correction Reset Parameters

### Object Description

|             |                                                                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 221E                                                                                                                                                  |
| Description | <a href="#">VarCom - ERRCORRESET</a><br>Resets all error correction parameters and table entries to default values. Reset occurs when value set to 1. |
| Object Code | Variable                                                                                                                                              |
| Data Type   | UNSIGNED16                                                                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 221Fh: Error Correction Enable

### Object Description

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Index       | 221F                                                                                                  |
| Description | <a href="#">VarCom - ERRCOREN</a><br>Request to activate or deactivate the error correction function. |
| Object Code | Variable                                                                                              |
| Data Type   | UNSIGNED16                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

**2220h: Error Correction State****Object Description**

|             |                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------|
| Index       | 2220                                                                                                             |
| Description | <a href="#">VarCom - ERRCORST</a><br>The status of the error correction function after ERRCOREN has been issued. |
| Object Code | Variable                                                                                                         |
| Data Type   | INTEGER16                                                                                                        |

**Entry Description**

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | 0x00      |
| Lower Limit   | 0xFFFFD   |
| Upper Limit   | 0x0004    |
| Unit          | -         |

**2221h: Error Correction PFB Raw****Object Description**

|             |           |
|-------------|-----------|
| Index       | 2221      |
| Description |           |
| Object Code | Variable  |
| Data Type   | INTEGER32 |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | Yes        |
| Default Value | 0x00       |
| Lower Limit   | 0x80000000 |
| Upper Limit   | 0x7FFFFFFF |
| Unit          | -          |

## 2222h: Error Correction Failed Index

### Object Description

|             |                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2222                                                                                                                            |
| Description | <a href="#">VarCom - ERRCORFAILINDEX</a><br>Index of the error correction table entry that failed due to an invalid error size. |
| Object Code | Variable                                                                                                                        |
| Data Type   | INTEGER32                                                                                                                       |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | Yes       |
| Default Value | 0x00      |
| Lower Limit   | 0xFFFF    |
| Upper Limit   | 0x3E8     |
| Unit          | -         |

## 2223h: Error Correction Units

### Object Description

|             |                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------|
| Index       | 2223                                                                                                                  |
| Description | <a href="#">VarCom - ERRCORUNITS</a><br>The units of the error position data delivered by the error correction table. |
| Object Code | Variable                                                                                                              |
| Data Type   | CAN: INTEGER16<br>ECT: UNSIGNED16                                                                                     |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0004     |
| Unit          | -          |

**2227h: EtherCAT Command Delay****Object Description**

|             |                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 2227                                                                                                                                                         |
| Description | Returns the calculated delay between the time the target command is issued by the master and the corresponding PFB is reported to the master. In [ns] units. |
| Object Code | Variable                                                                                                                                                     |
| Data Type   | UNSIGNED32                                                                                                                                                   |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read Only  |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | ns         |

# 10 Standard Servo Drive Objects

The following standard device profile objects are implemented in the CDHD2 servo drives.  
For more information, refer to the relevant CAN documentation.

## 603Fh: Error Code

### Object Description

|             |                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------|
| Index       | 603F                                                                                                          |
| Description | <a href="#">VarCom - FLT</a><br>Indicates the error code of the last error that occurred in the drive device. |
| Object Code | Variable                                                                                                      |
| Data Type   | UNSIGNED16                                                                                                    |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | -                      |

**6040h: Controlword****Object Description**

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Index</b>       | 6040                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b> | <p>Used to control the CiA-402 FSA, CiA-402 modes and manufacturer-specific entities.</p> <p>Sets the operating states and modes of the state machine.</p> <p>This object is organized bit-wise. The bits have the following meaning:</p> <p>bit 0: Switch on</p> <p>bit 1: Enable voltage</p> <p>bit 2: Quick stop</p> <p>bit 3: Enable operation</p> <p>bits 4-6: Mode specific</p> <p>bit 7: Fault reset</p> <p>bit 8: Halt</p> <p>bit 9: Mode specific</p> <p>bit 10: Reserved</p> <p>bits 11-15: Manufacturer specific</p> |
| <b>Object Code</b> | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Data Type</b>   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

**Entry Description**

|                      |                                                       |
|----------------------|-------------------------------------------------------|
| <b>Access</b>        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| <b>PDO Mapping</b>   | CAN: Yes<br>ECT: RxPDO                                |
| <b>Default Value</b> | 0x0000                                                |
| <b>Lower Limit</b>   | 0x0000                                                |
| <b>Upper Limit</b>   | 0xFFFF                                                |
| <b>Unit</b>          | -                                                     |

**6041h: Statusword****Object Description**

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Index</b>       | 6041                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Description</b> | <p>Indicates the current state of the FSA, the operation mode and manufacturer specific entities.</p> <p>This object is organized bit-wise. The bits have the following meaning:</p> <p>bit 0: Ready to switch on</p> <p>bit 1: Switched on</p> <p>bit 2: Operation enabled</p> <p>bit 3: Fault</p> <p>bit 4: Voltage enabled</p> <p>bit 5: Quick stop</p> <p>6: Switch on disabled</p> <p>7: Warning</p> <p>8: Manufacturer specific</p> <p>9: Remote</p> <p>bit 10: Target reached</p> <p>bit 11: Internal limit active</p> <p>bits 12-13: Mode specific</p> <p>bits 14-15: Manufacturer specific</p> |
| <b>Object Code</b> | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Data Type</b>   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Entry Description**

|                      |                                   |
|----------------------|-----------------------------------|
| <b>Access</b>        | Read Only                         |
| <b>PDO Mapping</b>   | <p>CAN: Yes</p> <p>ECT: TxPDO</p> |
| <b>Default Value</b> | 0x0000                            |
| <b>Lower Limit</b>   | 0x0000                            |
| <b>Upper Limit</b>   | 0xFFFF                            |
| <b>Unit</b>          | -                                 |

**605Bh: Shutdown Option Code****Object Description**

|             |                                                                                                                                                                                                                                                                                                                                                                               |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 605B                                                                                                                                                                                                                                                                                                                                                                          |
| Description | Indicates the action to be performed upon a transition from Operation Enabled state to the Ready To Switch On state. Ramp down is the deceleration value of the operation mode in use.<br>Possible values:<br>0 = Disables the drive, then switches off the drive power stage.<br>1 = Slows down with ramp down, then disables the drive.<br>-1 = According to VarCom DISMODE |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                      |
| Data Type   | INTEGER16                                                                                                                                                                                                                                                                                                                                                                     |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0xFFFF     |
| Lower Limit   | 0xFFFF     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 605Ch: Disable Operation Option Code

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 605C                                                                                                                                                                                                                                                                                                                                                                                                 |
| Description | <p>Indicates the action to be performed upon a transition from Operation Enabled state to the Switched On state.</p> <p>Ramp down is the deceleration value of the operation mode in use.</p> <p>Possible values:</p> <p>0 = Disables the drive, then switches off the drive power stage.</p> <p>1 = Slows down with ramp down, then disables the drive.</p> <p>-1 = According to VarCom DISMODE</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                             |
| Data Type   | INTEGER16                                                                                                                                                                                                                                                                                                                                                                                            |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0xFFFF     |
| Lower Limit   | 0xFFFF     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 605Dh: Halt Option Code

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 605D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Description | <p>Indicates the action to be performed when the halt function is executed. Ramp down is the deceleration value of the operation mode in use.</p> <p>Possible values:</p> <p>1 = Slow down on ramp down and remain in Operation Enabled</p> <p>2 = Slow down on quick stop ramp and remain in Operation Enabled</p> <p>3 = Slow down on the current limit and remain in Operation Enabled</p> <p>4 = Slow down on voltage limit and remain in Operation Enabled</p> <p>-x = manufacturer-specific</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Data Type   | INTEGER16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### Entry Description

|               |                                        |
|---------------|----------------------------------------|
| Access        | Read/Write                             |
| PDO Mapping   | <p>CAN: No</p> <p>ECT: Not allowed</p> |
| Default Value | 0x0001                                 |
| Lower Limit   | 0x0001                                 |
| Upper Limit   | 0x0003                                 |
| Unit          | -                                      |

## 605Eh: Fault Response Options

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 605E                                                                                                                                                                                                                                                                                                                                                                                           |
| Description | <p>Indicates the action to be performed when a fault (excluding communication faults) causes the drive to switch to Fault Reaction Active (see object 6007h).</p> <p>Ramp down is the deceleration value of the operation mode in use.</p> <p>Possible values:</p> <p>0 = Disable drive, motor is free to rotate</p> <p>1 = Slow down on ramp down</p> <p>-1 = According to VarCom DISMODE</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                       |
| Data Type   | INTEGER16                                                                                                                                                                                                                                                                                                                                                                                      |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0xFFFF     |
| Lower Limit   | 0xFFFF     |
| Upper Limit   | 0x0001     |
| Unit          | -          |

## 6060h: Modes of Operation

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6060                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description | <p>The requested operational mode. The actual operation mode is reflected in the Modes of Operation Display object.</p> <p>Possible values:</p> <p>0 = No mode change / no mode assigned</p> <p>1 = Profile position mode</p> <p>3 = Profile velocity mode</p> <p>4 = Profile torque mode</p> <p>5 = Reserved</p> <p>6 = Homing mode</p> <p>7 = Interpolated position mode</p> <p>8 = Cyclic synchronous position mode</p> <p>9 = Cyclic synchronous velocity mode</p> <p>10 = Cyclic synchronous torque mode</p> <p>-x = Manufacturer specific</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Data Type   | INTEGER8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### Entry Description

|               |                                                                   |
|---------------|-------------------------------------------------------------------|
| Access        | <p>CAN: SDO: Read/Write<br/>PDO: Write</p> <p>ECT: Read/Write</p> |
| PDO Mapping   | <p>CAN: Yes</p> <p>ECT: RxPDO</p>                                 |
| Default Value | 0x00                                                              |
| Lower Limit   | 0x80                                                              |
| Upper Limit   | 0x0A                                                              |
| Unit          | -                                                                 |

## 6061h: Modes of Operation Display

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6061                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Description | <p>The actual operation mode.</p> <p>Possible values:</p> <p>0 = No mode change / no mode assigned</p> <p>1 = Profile Position mode</p> <p>2 = Velocity mode</p> <p>3 = Profile velocity mode</p> <p>4 = Profile torque mode</p> <p>5 = Reserved</p> <p>6 = Homing mode</p> <p>7 = Interpolated position mode</p> <p>8 = Cyclic synchronous position mode</p> <p>9 = Cyclic synchronous velocity mode</p> <p>10 = Cyclic synchronous torque mode</p> <p>-x = Manufacturer specific</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Data Type   | INTEGER8                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

### Entry Description

|               |                                   |
|---------------|-----------------------------------|
| Access        | Read Only                         |
| PDO Mapping   | <p>CAN: Yes</p> <p>ECT: RxPDO</p> |
| Default Value | 0x00                              |
| Lower Limit   | 0x80                              |
| Upper Limit   | 0x0A                              |
| Unit          | -                                 |

## 6062h: Position Demand Value

### Object Description

|             |                              |
|-------------|------------------------------|
| Index       | 6062                         |
| Description | The demanded position value. |
| Object Code | Variable                     |
| Data Type   | INTEGER32                    |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 6063h: Position Actual Internal Value

### Object Description

|             |                                                      |
|-------------|------------------------------------------------------|
| Index       | 6063                                                 |
| Description | The actual value of the position measurement device. |
| Object Code | Variable                                             |
| Data Type   | INTEGER32                                            |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO  |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

**6064h: Position Actual Value****Object Description**

|             |                                                                                     |
|-------------|-------------------------------------------------------------------------------------|
| Index       | 6064                                                                                |
| Description | <a href="#">VarCom - PFB</a><br>The actual value of the position measurement device |
| Object Code | Variable                                                                            |
| Data Type   | INTEGER32                                                                           |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO  |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 6065h: Following Error Window

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6065                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Description | <a href="#">VarCom - PEMA</a><br>Maximum allowed position error without producing a fault.<br>This object defines the range of tolerated position values symmetrical to the target position. If the position actual value is outside the following error window, a following error occurs. A following error may occur when a drive is blocked, an unreachable profile velocity occurs, or if closed-loop coefficients are wrong.<br>If the value of the following error window is FFFF FFFFh, the following control is disabled. |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x00000001                                            |
| Lower Limit   | 0x00000000                                            |
| Upper Limit   | 0xFFFFFFFF                                            |
| Unit          | CAN user position units                               |

**6066h: Following Error Time Out****Object Description**

|             |                                                                                                                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6066                                                                                                                                                                                                                                                                  |
| Description | <p>The time for a following error condition, after which bit 13 of the status word is set to 1 in the profile position mode and in the cyclic synchronous position mode.</p> <p>The response of the drive when a following error occurs is manufacturer-specific.</p> |
| Object Code | Variable                                                                                                                                                                                                                                                              |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                            |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | ms         |

## 6067h: Position Window

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6067                                                                                                                                                                                                                                                                                                                                            |
| Description | <a href="#">VarCom - PEINPOS</a><br>The symmetrical range of accepted positions relative to the target position. If the actual value of the position encoder is within the position window, this target position is considered to be reached.<br>If the value of the position window is FFFF FFFFh the position window control is switched off. |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                        |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                                                      |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x00000000                                            |
| Lower Limit   | 0x00000000                                            |
| Upper Limit   | 0xFFFFFFFF                                            |
| Unit          | CAN user position units                               |

**6068h: Position Window Time****Object Description**

|             |                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------|
| Index       | 6068                                                                                                                      |
| Description | <a href="#">VarCom - PEINPOSTIME</a><br>The time during which the actual position within the position window is measured. |
| Object Code | Variable                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                |

**Entry Description**

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x000A     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | ms         |

**606Bh: Velocity Demand Value****Object Description**

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Index       | 606B                                                                           |
| Description | <a href="#">VarCom - VCMD</a><br>The output value of the trajectory generator. |
| Object Code | Variable                                                                       |
| Data Type   | INTEGER32                                                                      |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user velocity units |

## 606Ch: Velocity Actual Value

### Object Description

|             |                                                                                                                         |
|-------------|-------------------------------------------------------------------------------------------------------------------------|
| Index       | 606C                                                                                                                    |
| Description | <a href="#">VarCom - V</a><br>The actual velocity value derived either from the velocity sensor or the position sensor. |
| Object Code | Variable                                                                                                                |
| Data Type   | INTEGER32                                                                                                               |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO  |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user velocity units |

## 606Dh: Velocity Window

### Object Description

|             |                      |
|-------------|----------------------|
| Index       | 606D                 |
| Description | The velocity window. |
| Object Code | Variable             |
| Data Type   | UNSIGNED16           |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x0000                  |
| Lower Limit   | 0x0000                  |
| Upper Limit   | 0xFFFF                  |
| Unit          | CAN user velocity units |

## 606Eh: Velocity Window Time

### Object Description

|             |                           |
|-------------|---------------------------|
| Index       | 606E                      |
| Description | The velocity window time. |
| Object Code | Variable                  |
| Data Type   | UNSIGNED16                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | ms         |

## 606Fh: Velocity Threshold

### Object Description

|             |                         |
|-------------|-------------------------|
| Index       | 606F                    |
| Description | The velocity threshold. |
| Object Code | Variable                |
| Data Type   | UNSIGNED16              |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x0000                  |
| Lower Limit   | 0x0000                  |
| Upper Limit   | 0xFFFF                  |
| Unit          | CAN user velocity units |

## 6070h: Velocity Threshold Time

### Object Description

|             |                              |
|-------------|------------------------------|
| Index       | 6070                         |
| Description | The velocity threshold time. |
| Object Code | Variable                     |
| Data Type   | UNSIGNED16                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | ms         |

## 6071h: Target Torque

### Object Description

|             |                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------|
| Index       | 6071                                                                                                              |
| Description | <a href="#">VarCom - T</a> (Current Command)<br>The input value for the torque controller in profile torque mode. |
| Object Code | Variable                                                                                                          |
| Data Type   | INTEGER16                                                                                                         |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x0000                                                |
| Lower Limit   | 0x8000                                                |
| Upper Limit   | 0x7FFF                                                |
| Unit          | mNm                                                   |

## 6073h: Maximum Current

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                              |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6073                                                                                                                                                                                                                                                                                                                                                         |
| Description | <p><a href="#">VarCom - ILIM</a> (User Current Limit)</p> <p>The maximum permissible torque creating current in the motor.<br/>Defined as MICON (Motor Continuous Current)/1000</p> <p>Thus, if MICON = 10A:<br/>A value of 100 for 6073h = 1A<br/>A value of 500 for 6073h = 5A<br/>A value of 1000 for 6073h = 10A<br/>A value of 2000 for 6073h = 20A</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                     |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                   |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x0000                                                |
| Lower Limit   | 0x0000                                                |
| Upper Limit   | 0xFFFF                                                |
| Unit          | mA                                                    |

## 6074h: Torque Demand Value

### Object Description

|             |                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------|
| Index       | 6074                                                                                          |
| Description | <a href="#">VarCom - ICMD</a> (Current Command)<br>The output value of torque limit function. |
| Object Code | Variable                                                                                      |
| Data Type   | INTEGER16                                                                                     |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x8000                 |
| Upper Limit   | 0x7FFF                 |
| Unit          | mNm                    |

## 6075h: Motor Rated Current

### Object Description

|             |                                                                                                                                                                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6075                                                                                                                                                                                                                                                       |
| Description | <a href="#">VarCom - MICON</a> T<br>The motor rated current. It is taken from the motor nameplate. Depending on the motor and drive technology this current is DC, peak or root mean square (rms) current. All relative current data refers to this value. |
| Object Code | Variable                                                                                                                                                                                                                                                   |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                 |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | mA         |

## 6076h: Motor Rated Torque

### Object Description

|             |                                                                                                                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6076                                                                                                                                                                                                                                         |
| Description | The motor rated torque. It is obtained from the motor nameplate. All related torque data must refer to this value.<br>For linear motors, the object name is not changed, but the motor rated force value must be entered as multiples of mN. |
| Object Code | Variable                                                                                                                                                                                                                                     |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | mNm        |

## 6077h: Torque Actual Value

### Object Description

|             |                                                                            |
|-------------|----------------------------------------------------------------------------|
| Index       | 6077                                                                       |
| Description | The actual value of the torque. It corresponds to the torque in the motor. |
| Object Code | Variable                                                                   |
| Data Type   | INTEGER16                                                                  |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x8000                 |
| Upper Limit   | 0x7FFF                 |
| Unit          | mNm                    |

**6078h: Current Actual Value****Object Description**

|             |                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------|
| Index       | 6078                                                                                                                       |
| Description | <a href="#">VarCom - I</a> (Motor Current)<br>The actual value of the current. It corresponds to the current in the motor. |
| Object Code | Variable                                                                                                                   |
| Data Type   | INTEGER16                                                                                                                  |

**Entry Description**

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x8000                 |
| Upper Limit   | 0x7FFF                 |
| Unit          | mA                     |

**6079h: DC Link Circuit Voltage****Object Description**

|             |                                                                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6079                                                                                                                                                                      |
| Description | <a href="#">VarCom - VBUSREADOUT</a><br>The bus voltage measured by sensors on the power module. Indicates the instantaneous DC link current voltage at the drive device. |
| Object Code | Variable                                                                                                                                                                  |
| Data Type   | UNSIGNED32                                                                                                                                                                |

**Entry Description**

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x00000000             |
| Lower Limit   | 0x00000000             |
| Upper Limit   | 0xFFFFFFFF             |
| Unit          | mV                     |

## 607Ah: Target Position

### Object Description

|             |                                                                                                                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 607A                                                                                                                                                                                                                   |
| Description | The commanded position the drive will move to in position profile mode or cyclic synchronous position mode. The value of this object can be interpreted as absolute or relative depending on bit 6 of the Controlword. |
| Object Code | Variable                                                                                                                                                                                                               |
| Data Type   | INTEGER32                                                                                                                                                                                                              |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO  |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 607Ch: Home Offset

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 607C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Description | <p><a href="#">VarCom - HOMEOFFSET</a></p> <p>The configured difference between the zero position for the application and the machine home position (found during homing). During homing the machine home position is found and once the homing is completed the zero position is offset from the home position by adding the home offset to the home position. All subsequent absolute moves are taken relative to this new zero position.</p> <p>If this object is not implemented then the home offset is regarded as zero. The value of this object is in CAN position user units. Negative values indicate the opposite direction.</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Data Type   | INTEGER32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 607Dh: Software Position Limit

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 607D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Description | Sub-index 1 - <a href="#">VarCom - POSLIMNEG</a><br>Sub-index 2 - <a href="#">VarCom - POSLIMPOS</a><br>The configured maximum and minimum position limits. These parameters define the absolute position limits for the position demand value and the position actual value. Every new target position is checked against these limits. The limit positions is always relative to the machine home position. Before being compared with the target position they are corrected internally by the home offset as follows:<br>Corrected min position limit = min position limit - home offset<br>Corrected max position limit = max position limit - home offset |
| Object Code | Array                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Data Type   | INTEGER32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x00000002        |
| Lower Limit    | 0x00000002        |
| Upper Limit    | 0x00000002        |
| Unit           | -                 |

|                |                             |
|----------------|-----------------------------|
| Sub-Index      | 001                         |
| Description    | Min Software Position Limit |
| Entry Category | Optional                    |
| Data Type      | INTEGER32                   |
| Access         | Read/Write                  |
| PDO Mapping    | No                          |
| Default Value  | 0x00000000                  |
| Lower Limit    | 0x80000000                  |
| Upper Limit    | 0x7FFFFFFF                  |
| Unit           | CAN user position units     |

|                |                             |
|----------------|-----------------------------|
| Sub-Index      | 002                         |
| Description    | Max Software Position Limit |
| Entry Category | Optional                    |
| Data Type      | INTEGER32                   |
| Access         | Read/Write                  |
| PDO Mapping    | No                          |
| Default Value  | 0x00000000                  |
| Lower Limit    | 0x80000000                  |
| Upper Limit    | 0x7FFFFFFF                  |
| Unit           | CAN user position units     |

## 607Eh: Polarity

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 607E                                                                                                                                                                                                                                                                                                                                                                        |
| Description | <p>Determines the sign of the position demand value or the velocity demand value.</p> <p>This object is organized bit-wise.</p> <p>The bits have the following meaning:</p> <p>bit 7: Position polarity is affected</p> <p>bit 6: Velocity polarity is affected</p> <p>Bit values:</p> <p>0 = multiply the demand value by 1</p> <p>1 = multiply the demand value by -1</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                    |
| Data Type   | UNSIGNED8                                                                                                                                                                                                                                                                                                                                                                   |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00       |
| Lower Limit   | 0x00       |
| Upper Limit   | 0xC0       |
| Unit          | -          |

## 607Fh: Maximum Profile Velocity

### Object Description

|             |                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------|
| Index       | 607F                                                                                                        |
| Description | <a href="#">VarCom - VLIM</a><br>The maximum velocity allowed in either direction during a profiled motion. |
| Object Code | Variable                                                                                                    |
| Data Type   | UNSIGNED32                                                                                                  |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000001              |
| Lower Limit   | 0x00000001              |
| Upper Limit   | 0xFFFFFFFF              |
| Unit          | CAN user velocity units |

## 6080h: Motor Maximum Speed

### Object Description

|             |                                                                                                                                                                         |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6080                                                                                                                                                                    |
| Description | <a href="#">VarCom - MSPEED</a><br>The maximum speed allowed for the motor in either direction. It is used to protect the motor and is taken from the motor data sheet. |
| Object Code | Variable                                                                                                                                                                |
| Data Type   | UNSIGNED32                                                                                                                                                              |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x00000000 |
| Lower Limit   | 0x00000000 |
| Upper Limit   | 0xFFFFFFFF |
| Unit          | rpm        |

## 6081h: Profile Velocity in Profile Position Mode

### Object Description

|             |                                                                                                                                                                                                                                            |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6081                                                                                                                                                                                                                                       |
| Description | The configured velocity normally attained at the end of the acceleration ramp during a profiled motion. It is valid for both directions of motion.<br><br>This object is used in the profile position mode and interpolated position mode. |
| Object Code | Variable                                                                                                                                                                                                                                   |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                 |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x00000000                                            |
| Lower Limit   | 0x00000000                                            |
| Upper Limit   | 0xFFFFFFFF                                            |
| Unit          | CAN user velocity units                               |

## 6083h: Profile Acceleration

### Object Description

|             |                                                                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6083                                                                                                                                                                              |
| Description | <a href="#">VarCom - ACC</a><br>The commanded acceleration.<br>It is used in the following modes:<br>Profile position mode<br>Profile velocity mode<br>Interpolated position mode |
| Object Code | Variable                                                                                                                                                                          |
| Data Type   | UNSIGNED32                                                                                                                                                                        |

**Entry Description**

|                      |                                                       |
|----------------------|-------------------------------------------------------|
| <b>Access</b>        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| <b>PDO Mapping</b>   | CAN: Yes<br>ECT: RxPDO                                |
| <b>Default Value</b> | 0x00000001                                            |
| <b>Lower Limit</b>   | 0x00000001                                            |
| <b>Upper Limit</b>   | 0xFFFFFFFF                                            |
| <b>Unit</b>          | CAN user acc/dec units                                |

**6084h: Profile Deceleration****Object Description**

|                    |                                                                                                                                                                                                                                                                              |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Index</b>       | 6084                                                                                                                                                                                                                                                                         |
| <b>Description</b> | <a href="#">VarCom - DEC</a><br>The commanded acceleration.<br>It is used in the following modes:<br>Profile position mode<br>Profile velocity mode<br>Interpolated position mode<br>If this parameter is not supported, then Profile Acceleration is used for deceleration. |
| <b>Object Code</b> | Variable                                                                                                                                                                                                                                                                     |
| <b>Data Type</b>   | UNSIGNED32                                                                                                                                                                                                                                                                   |

**Entry Description**

|                      |                                                       |
|----------------------|-------------------------------------------------------|
| <b>Access</b>        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| <b>PDO Mapping</b>   | CAN: Yes<br>ECT: RxPDO                                |
| <b>Default Value</b> | 0x00000001                                            |
| <b>Lower Limit</b>   | 0x00000001                                            |
| <b>Upper Limit</b>   | 0xFFFFFFFF                                            |
| <b>Unit</b>          | CAN user acc/dec units                                |

## 6085h: Quick Stop Deceleration

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6085                                                                                                                                                                                                                                                                                                                                                    |
| Description | <a href="#">VarCom - DECSTOP</a><br>The deceleration rate for an Active Disable/emergency stop.<br>The deceleration used to stop the motor when the quick stop function is activated and the quick stop option code is set to 2 or 6.<br>The quick stop deceleration is also used if the fault reaction option code is 2 and the halt option code is 2. |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                                                              |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read/Write             |
| PDO Mapping   | No                     |
| Default Value | 0x00000001             |
| Lower Limit   | 0x00000001             |
| Upper Limit   | 0xFFFFFFFF             |
| Unit          | CAN user acc/dec units |

## 6087h: Torque Slope

### Object Description

|             |                               |
|-------------|-------------------------------|
| Index       | 6087                          |
| Description | The rate of change of torque. |
| Object Code | Variable                      |
| Data Type   | UNSIGNED32                    |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x186A0                                               |
| Lower Limit   | 0x1                                                   |
| Upper Limit   | 0x1C9C380                                             |
| Unit          | mNm/s                                                 |

## 608Fh: Position Encoder Resolution

### Object Description

|             |                                                                                                                                                                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 608F                                                                                                                                                                                                                                                                                                                  |
| Description | <p>The resolution of the motor encoder in number of lines per revolution of the motor.</p> <p>The position encoder resolution is calculated as:</p> $\text{position encoder resolution} = \text{encoder increments} / \text{motor revolutions}$ <p>The drive must be configured whenever this object is modified.</p> |
| Object Code | Array                                                                                                                                                                                                                                                                                                                 |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                            |

### Entry Description

|                |                    |
|----------------|--------------------|
| Sub-Index      | 000                |
| Description    | Number of Entries  |
| Entry Category | Optional           |
| Access         | Read Only          |
| PDO Mapping    | No                 |
| Default Value  | 0x02               |
| Lower Limit    | 0x02               |
| Upper Limit    | 0x02               |
| Unit           | -                  |
|                |                    |
| Sub-Index      | 001                |
| Description    | Encoder Increments |
| Entry Category | Optional           |
| Data Type      | UNSIGNED32         |
| Access         | Read/Write         |
| PDO Mapping    | No                 |
| Default Value  | 0x00000800         |
| Lower Limit    | 0x00000010         |
| Upper Limit    | 0x00989680         |
| Unit           | -                  |

|                |                   |
|----------------|-------------------|
| Sub-Index      | 002               |
| Description    | Motor Revolutions |
| Entry Category | Optional          |
| Data Type      | UNSIGNED32        |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x00000001        |
| Lower Limit    | 0x00000001        |
| Upper Limit    | 0x00000001        |
| Unit           | -                 |

## 6091h: Fieldbus Gearing Ratio

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6091                                                                                                                                                                                                                                                                                                                                                                             |
| Description | <p>Sub-index 1 - <a href="#">VarCom - FBGMS</a> - Gear Motor Shaft Scaling</p> <p>Sub-index 2 - <a href="#">VarCom - FBGDS</a> - Gear Driving Shaft Scaling</p> <p>The configured number of motor shaft revolutions and number of driving shaft revolutions.</p> <p>The gear ratio is calculated as:</p> $gear\ ratio = motor\ shaft\ revolutions / driving\ shaft\ revolutions$ |
| Object Code | Array                                                                                                                                                                                                                                                                                                                                                                            |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                                                                                       |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 001               |
| <b>Description</b>    | Motor Revolutions |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED32        |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x00000001        |
| <b>Lower Limit</b>    | 0x00000001        |
| <b>Upper Limit</b>    | 0xFFFFFFFF        |
| <b>Unit</b>           | -                 |

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 002               |
| <b>Description</b>    | Shaft Revolutions |
| <b>Entry Category</b> | Optional          |
| <b>Data Type</b>      | UNSIGNED32        |
| <b>Access</b>         | Read/Write        |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x00000001        |
| <b>Lower Limit</b>    | 0x00000001        |
| <b>Upper Limit</b>    | 0xFFFFFFFF        |
| <b>Unit</b>           | -                 |

## 6092h: Feed Constant

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                        |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6092                                                                                                                                                                                                                                                                                                                                   |
| Description | Sub-index 1 - <a href="#">VarCom - PNUM</a><br>Sub-index 2 - <a href="#">VarCom - PDEN</a><br>The configured feed constant, which is the measurement distance per one revolution of the output shaft of the gearbox.<br>The feed constant is calculated as:<br>$\text{feed constant} = \text{feed} / \text{driving shaft revolutions}$ |
| Object Code | Array                                                                                                                                                                                                                                                                                                                                  |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                                             |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                |                         |
|----------------|-------------------------|
| Sub-Index      | 001                     |
| Description    | Feed                    |
| Entry Category | Optional                |
| Data Type      | UNSIGNED32              |
| Access         | Read/Write              |
| PDO Mapping    | No                      |
| Default Value  | 0x00057E40              |
| Lower Limit    | 0x00000001              |
| Upper Limit    | 0xFFFFFFFF              |
| Unit           | CAN user position units |

|                |                   |
|----------------|-------------------|
| Sub-Index      | 002               |
| Description    | Shaft Revolutions |
| Entry Category | Optional          |
| Data Type      | UNSIGNED32        |
| Access         | Read/Write        |
| PDO Mapping    | No                |
| Default Value  | 0x00000001        |
| Lower Limit    | 0x00000001        |
| Upper Limit    | 0xFFFFFFFF        |
| Unit           | -                 |

## 6098h: Homing Method

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6098                                                                                                                                                                                                                                                                                                                                            |
| Description | <p><a href="#">VarCom - HOMETYPE</a></p> <p>The homing method to be used.</p> <p>Possible values:</p> <p>0 = No homing method assigned</p> <p>1 = Homing method 1</p> <p>.</p> <p>.</p> <p>36 = Homing method 36</p> <p>-x = Manufacturer specific</p> <p>Refer to the CiA-402 standard for the detailed description of each homing method.</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                        |
| Data Type   | INTEGER8                                                                                                                                                                                                                                                                                                                                        |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x01       |
| Lower Limit   | 0xC0       |
| Upper Limit   | 0x24       |
| Unit          | -          |

## 6099h: Homing Speeds

### Object Description

|             |                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6099                                                                                                                                                             |
| Description | Sub-index 1 - <a href="#">VarCom - HOMESPEED1</a><br>Sub-index 2 - <a href="#">VarCom - HOMESPEED2</a><br>The commanded speeds used during the homing procedure. |
| Object Code | Array                                                                                                                                                            |
| Data Type   | UNSIGNED32                                                                                                                                                       |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x02              |
| Lower Limit    | 0x02              |
| Upper Limit    | 0x02              |
| Unit           | -                 |

|                |                         |
|----------------|-------------------------|
| Sub-Index      | 001                     |
| Description    | Fast Homing Speed       |
| Entry Category | Optional                |
| Data Type      | UNSIGNED32              |
| Access         | Read/Write              |
| PDO Mapping    | No                      |
| Default Value  | 0x00000001              |
| Lower Limit    | 0x00000001              |
| Upper Limit    | 0xFFFFFFFF              |
| Unit           | CAN user velocity units |

|                |                         |
|----------------|-------------------------|
| Sub-Index      | 002                     |
| Description    | Slow Homing Speed       |
| Entry Category | Optional                |
| Data Type      | UNSIGNED32              |
| Access         | Read/Write              |
| PDO Mapping    | No                      |
| Default Value  | 0x00000001              |
| Lower Limit    | 0x00000001              |
| Upper Limit    | 0xFFFFFFFF              |
| Unit           | CAN user velocity units |

## 609Ah: Homing Acceleration

### Object Description

|             |                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------|
| Index       | 609A                                                                                                      |
| Description | <a href="#">VarCom - HOMEACC</a><br>The acceleration and deceleration to be used during homing operation. |
| Object Code | Variable                                                                                                  |
| Data Type   | UNSIGNED32                                                                                                |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read/Write             |
| PDO Mapping   | No                     |
| Default Value | 0x00000001             |
| Lower Limit   | 0x00000001             |
| Upper Limit   | 0xFFFFFFFF             |
| Unit          | CAN user acc/dec units |

**60B0h: Position Offset****Object Description**

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60B0                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description | <p>The offset of the target position.</p> <p>The value itself is absolute and thus independent of how often it is transmitted over the communication system; for example, transmitting twice does not double the value. Since the additive position value represents an offset to the target position, it can be also used to control the drive with relative values in regard to the target position.</p> <p>This object is used in the cyclic synchronous position mode.</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Data Type   | INTEGER32                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read/Write              |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 60B1h: Velocity Offset

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60B1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Description | <p><a href="#">VarCom - EXTADDITIVEVCMD</a></p> <p>Velocity offset value. Takes a commanded velocity value from the host controller and adds it to the velocity command entering the velocity loop.</p> <p>In Cyclic Synchronous Position mode this object contains the input value for velocity feed forward.</p> <p>In Cyclic Synchronous Velocity mode it contains the commanded offset of the drive device.</p> <p>The value itself is absolute and thus independent of how often it is transmitted over the communication system; that is, twice transmitted does not mean double value. Since the additive velocity value represents an offset to the target velocity, it can be also used to control the drive with relative values in regard to the target velocity.</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Data Type   | INTEGER32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x00000000                                            |
| Lower Limit   | 0x80000000                                            |
| Upper Limit   | 0x7FFFFFFF                                            |
| Unit          | CAN user velocity units                               |

## 60B2h: Torque Offset

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60B2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Description | <p><a href="#">VarCom - EXTADDITIVEICMD</a></p> <p>Torque offset value. Takes a commanded current value from the host controller and adds it to the current command entering the current loop.</p> <p>In Cyclic Synchronous Position mode and Cyclic Synchronous Velocity mode, this object contains the input value for torque feed forward.</p> <p>In Cyclic Synchronous Torque mode, it contains the commanded additive torque of the drive, which is added to the target torque value.</p> <p>The value itself is absolute and thus independent of how often it is transmitted over the communication system; that is, twice transmitted does not mean double value.</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Data Type   | INTEGER16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

### Entry Description

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x0000                                                |
| Lower Limit   | 0x8000                                                |
| Upper Limit   | 0x7FFF                                                |
| Unit          | -                                                     |

## 60B8h: Touch Probe Function

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60B8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description | <p><a href="#">VarCom - PROBECONFIG</a></p> <p>The configured function of the touch probe.</p> <p>This object is bit-structured. The following value definition is valid:</p> <p>bit 0: bit value = 0: switch off touch probe 1<br/>bit value = 1: enable touch probe 1</p> <p>bit 1: bit value = 0: trigger first event<br/>bit value = 1: continuous</p> <p>bit 2: bit value = 0: trigger touch probe 1 input<br/>bit value = 1: trigger with zero pulse signal or position encoder</p> <p>bit 3: reserved</p> <p>bit 4: bit value = 0: switch off sampling at positive edge of touch probe 1<br/>bit value = 1: enable sampling at positive edge of touch probe 1</p> <p>bit 5: bit value = 0: switch off sampling at negative edge of touch probe 1<br/>bit value = 1: enable sampling at negative edge of touch probe 1</p> <p>bit 6,7: user-defined (e.g. for testing)</p> <p>bit 8: bit value = 0: switch off touch probe 2<br/>bit value = 1: enable touch probe 2</p> <p>bit 9: bit value = 0: trigger first event<br/>bit value = 1: continuous</p> <p>bit 10: bit value = 0: trigger with touch probe 2 input<br/>bit value = 1: trigger with zero pulse signal or position encoder</p> <p>bit 11: reserved</p> <p>bit 12: bit value = 0: switch off sampling at positive edge of touch probe 2<br/>bit value = 1: enable sampling at positive edge of touch probe 2</p> <p>bit 13: bit value = 0: switch off sampling on negative edge of touch probe 2<br/>bit value = 1: enable sampling at negative edge of touch probe 2</p> <p>bit 14,15: user-defined (e.g. for testing)</p> |
| Note        | <p>To enable touch probe operation when the motor encoder does not have physical index (such as sensAR, Endat 2.2, Tamagawa), enable a simulated index by setting <a href="#">ENCOUTMODE=1</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                    |            |
|--------------------|------------|
| <b>Object Code</b> | Variable   |
| <b>Data Type</b>   | UNSIGNED16 |

**Entry Description**

|                      |                                                       |
|----------------------|-------------------------------------------------------|
| <b>Access</b>        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| <b>PDO Mapping</b>   | CAN: Yes<br>ECT: RxPDO                                |
| <b>Default Value</b> | 0x0000                                                |
| <b>Lower Limit</b>   | 0x0000                                                |
| <b>Upper Limit</b>   | 0xFFFF                                                |
| <b>Unit</b>          | -                                                     |

## 60B9h: Touch Probe Status

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60B9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Description | <p><a href="#">VarCom - PROBESTATUS</a></p> <p>The status of the touch probe.</p> <p>This object is bit-structured. The following value definition is valid:</p> <p>bit 0: bit value = 0: touch probe 1 is switched off<br/> bit value = 1: touch probe 1 is enabled</p> <p>bit 1: bit value = 0: touch probe 1 no positive edge value stored<br/> bit value = 1: touch probe 1 negative edge position stored</p> <p>bit 2: bit value = 0: touch probe 1 no negative edge value stored<br/> bit value = 1: touch probe 1 positive edge position stored</p> <p>bit 3-5: reserved</p> <p>bit 6,7: user-defined (e.g. for testing)</p> <p>bit 8: bit value = 0: touch probe 2 is switched off<br/> bit value = 1: touch probe 2 is enabled</p> <p>bit 9: bit value = 0: touch probe 2 no positive edge value stored<br/> bit value = 1: touch probe 2 negative edge position stored</p> <p>bit 10: bit value = 0: touch probe 2 no negative edge value stored<br/> bit value = 1: touch probe 2 positive edge position stored</p> <p>bit 11-13: reserved</p> <p>bit 14,15: user-defined (e.g. for testing)</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

### Entry Description

|               |                              |
|---------------|------------------------------|
| Access        | Read Only                    |
| PDO Mapping   | CAN:    Yes<br>ECT:    TxPDO |
| Default Value | 0x0000                       |
| Lower Limit   | 0x0000                       |
| Upper Limit   | 0xFFFF                       |
| Unit          | -                            |

**60BAh: Touch Probe 1 Position Positive Value****Object Description**

|             |                                                           |
|-------------|-----------------------------------------------------------|
| Index       | 60BA                                                      |
| Description | The position value of touch probe 1 at the positive edge. |
| Object Code | Variable                                                  |
| Data Type   | INTEGER32                                                 |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO  |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

**60BBh: Touch Probe 1 Position Negative Value****Object Description**

|             |                                                           |
|-------------|-----------------------------------------------------------|
| Index       | 60BB                                                      |
| Description | The position value of touch probe 1 at the negative edge. |
| Object Code | Variable                                                  |
| Data Type   | INTEGER32                                                 |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO  |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

**60BCh: Touch Probe 2 Position Positive Value****Object Description**

|             |                                                           |
|-------------|-----------------------------------------------------------|
| Index       | 60BC                                                      |
| Description | The position value of touch probe 2 at the positive edge. |
| Object Code | Variable                                                  |
| Data Type   | INTEGER32                                                 |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | Yes                     |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

**60BDh: Touch Probe 2 Position Negative Value****Object Description**

|             |                                                           |
|-------------|-----------------------------------------------------------|
| Index       | 60BD                                                      |
| Description | The position value of touch probe 2 at the negative edge. |
| Object Code | Variable                                                  |
| Data Type   | INTEGER32                                                 |

**Entry Description**

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | Yes                     |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 60C0h: Interpolation Submode

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60C0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Description | <p><a href="#">VarCom - FBINTTYPE</a></p> <p>Defines the interpolation mode.</p> <p>0 = Linear interpolation</p> <p>1= Manufacturer-specific: Cubic interpolation with position and velocity.</p> <p>2= Manufacturer-specific: Cubic interpolation with position only – strict. Forces the interpolated path to pass via the original position commands sent by the controller; this may cause an abrupt velocity profile when velocity changes.</p> <p>3= Manufacturer-specific: Cubic interpolation with position only – loose. Does not force the interpolated path to pass via the original position commands sent by the controller, thus resulting in a smoother velocity profile.</p> <p>If linear interpolation is the only algorithm available, it is not necessary to implement this object.</p> <p>If the linear interpolation mode is selected, the interpolation data given in the interpolation data record is used.</p> <p>If a manufacturer-specific interpolation mode is selected, the corresponding interpolation data record must be implemented in the manufacturer-specific profile area of the object dictionary.</p> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Data Type   | INTEGER16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0x0003     |
| Unit          | -          |

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Range</b> | <p>0 = Linear interpolation.</p> <p>1= Cubic interpolation with position and velocity.</p> <p>2= Cubic interpolation with position only – strict. Forces the interpolated path to pass via the original position commands sent by the controller; this may cause an abrupt velocity profile when velocity changes.</p> <p>3= Cubic interpolation with position only – loose. Does not force the interpolated path to pass via the original position commands sent by the controller, thus resulting in a smoother velocity profile.</p> |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 60C1h: Interpolation Data Record

### Object Description

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Index</b>       | 60C1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b> | <p>This object indicates the number of data words, which are needed for execution of the interpolation algorithm. The number of data words in the record is defined by interpolation data configuration</p> <p>The interpretation of the data words in the interpolation data record may vary due to the various possible modes and submodes that can be selected.</p> <p>For the linear interpolation mode, each interpolation data record simply is regarded as a new position set-point.</p> |
| <b>Object Code</b> | Array                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Data Type</b>   | INTEGER32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

### Entry Description

|                       |                   |
|-----------------------|-------------------|
| <b>Sub-Index</b>      | 000               |
| <b>Description</b>    | Number of Entries |
| <b>Entry Category</b> | Optional          |
| <b>Access</b>         | Read Only         |
| <b>PDO Mapping</b>    | No                |
| <b>Default Value</b>  | 0x00000004        |
| <b>Lower Limit</b>    | 0x00000001        |
| <b>Upper Limit</b>    | 0x000000FE        |
| <b>Unit</b>           | -                 |

|                       |                                                       |
|-----------------------|-------------------------------------------------------|
| <b>Sub-Index</b>      | 001                                                   |
| <b>Description</b>    | Data Record 1                                         |
| <b>Entry Category</b> | Optional                                              |
| <b>Data Type</b>      | INTEGER32                                             |
| <b>Access</b>         | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                |
| <b>Default Value</b>  | 0x00000000                                            |
| <b>Lower Limit</b>    | 0x80000000                                            |
| <b>Upper Limit</b>    | 0x7FFFFFFF                                            |
| <b>Unit</b>           | -                                                     |

|                       |                                                       |
|-----------------------|-------------------------------------------------------|
| <b>Sub-Index</b>      | 002                                                   |
| <b>Description</b>    | Data Record 2                                         |
| <b>Entry Category</b> | Optional                                              |
| <b>Data Type</b>      | INTEGER32                                             |
| <b>Access</b>         | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                |
| <b>Default Value</b>  | 0x00000000                                            |
| <b>Lower Limit</b>    | 0x80000000                                            |
| <b>Upper Limit</b>    | 0x7FFFFFFF                                            |
| <b>Unit</b>           | -                                                     |

|                       |                                                       |
|-----------------------|-------------------------------------------------------|
| <b>Sub-Index</b>      | 003                                                   |
| <b>Description</b>    | Data Record 3                                         |
| <b>Entry Category</b> | Optional                                              |
| <b>Data Type</b>      | INTEGER32                                             |
| <b>Access</b>         | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                |
| <b>Default Value</b>  | 0x00000000                                            |
| <b>Lower Limit</b>    | 0x80000000                                            |
| <b>Upper Limit</b>    | 0x7FFFFFFF                                            |
| <b>Unit</b>           | -                                                     |

|                       |                                                       |
|-----------------------|-------------------------------------------------------|
| <b>Sub-Index</b>      | 004                                                   |
| <b>Description</b>    | Data Record 4                                         |
| <b>Entry Category</b> | Optional                                              |
| <b>Data Type</b>      | INTEGER32                                             |
| <b>Access</b>         | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                |
| <b>Default Value</b>  | 0x00000000                                            |
| <b>Lower Limit</b>    | 0x80000000                                            |
| <b>Upper Limit</b>    | 0x7FFFFFFF                                            |
| <b>Unit</b>           | -                                                     |

## 60C2h: Fieldbus Interpolation Time

### Object Description

|             |                                                                                                                                                                                                                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60C2                                                                                                                                                                                                                                                                                                |
| Description | <a href="#">Sub-index 1 - VarCom - FBITPRD</a><br><a href="#">Sub-index 2 - VarCom - FBITIDX</a><br>The configured interpolation cycle time.<br>The EtherCAT/CANopen Master must set the interpolated time period, and must use the time period to send the SYNC message for clock synchronization. |
| Object Code | Record                                                                                                                                                                                                                                                                                              |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                         |

### Entry Description

|                |                                                   |
|----------------|---------------------------------------------------|
| Sub-Index      | 000                                               |
| Description    | Number of Entries                                 |
| Entry Category | Optional                                          |
| Access         | Read Only                                         |
| PDO Mapping    | No                                                |
| Default Value  | 0x02                                              |
| Lower Limit    | 0x00                                              |
| Upper Limit    | 0x02                                              |
| Unit           | -                                                 |
|                |                                                   |
| Sub-Index      | 001                                               |
| Description    | Interpolation time                                |
| Entry Category | Optional                                          |
| Data Type      | UNSIGNED8                                         |
| Access         | Read/Write                                        |
| PDO Mapping    | No                                                |
| Default Value  | 0x02                                              |
| Lower Limit    | 0x01                                              |
| Upper Limit    | 0xFF                                              |
| Unit           | 10 <sup>(interpolation time index)</sup> [second] |

|                       |                          |
|-----------------------|--------------------------|
| <b>Sub-Index</b>      | 002                      |
| <b>Description</b>    | Interpolation time index |
| <b>Entry Category</b> | Optional                 |
| <b>Data Type</b>      | INTEGER8                 |
| <b>Access</b>         | Read/Write               |
| <b>PDO Mapping</b>    | No                       |
| <b>Default Value</b>  | 0xFD                     |
| <b>Lower Limit</b>    | 0x80                     |
| <b>Upper Limit</b>    | 0x3F                     |
| <b>Unit</b>           | -                        |

## 60C4h: Interpolation Data Configuration

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60C4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Description | <p>Configures and handles the buffer for the data records, and configures the data records.</p> <p>Sub-index 1 - The number of interpolation data records.</p> <p>Sub-index 2 - The number of interpolation data records.</p> <p>Sub-index 3 - Specifies the buffer organization:</p> <p style="padding-left: 40px;">0 = FIFO</p> <p style="padding-left: 40px;">1 = ring</p> <p>Sub-index 4 - The next free buffer entry point.</p> <p>Sub-index 5 - The size of the data record.</p> <p>Sub-index 6 - Clears the buffer.</p> <p>Writing 0 to sub-index 6 clears the buffer inputs, disables access, and clears all IP data records.</p> <p>Writing 1 to sub-index 6 enables access to the input buffers.</p> |
| Object Code | Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Data Type   | Manufacturer-specific, varies by sub-index.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

### Entry Description

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x06              |
| Lower Limit    | 0x06              |
| Upper Limit    | 0x06              |
| Unit           | -                 |

|                |                     |
|----------------|---------------------|
| Sub-Index      | 001                 |
| Description    | Maximum Buffer Size |
| Entry Category | Optional            |
| Data Type      | UNSIGNED32          |
| Access         | Read Only           |
| PDO Mapping    | No                  |
| Default Value  | 0x00000001          |
| Lower Limit    | 0x00000000          |
| Upper Limit    | 0xFFFFFFFF          |
| Unit           | -                   |

|                       |                    |
|-----------------------|--------------------|
| <b>Sub-Index</b>      | 002                |
| <b>Description</b>    | Actual Buffer Size |
| <b>Entry Category</b> | Optional           |
| <b>Data Type</b>      | UNSIGNED32         |
| <b>Access</b>         | Read/Write         |
| <b>PDO Mapping</b>    | No                 |
| <b>Default Value</b>  | 0x00000001         |
| <b>Lower Limit</b>    | 0x00000001         |
| <b>Upper Limit</b>    | 0x00000001         |
| <b>Unit</b>           | -                  |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 003                 |
| <b>Description</b>    | Buffer Organization |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED8           |
| <b>Access</b>         | Read/Write          |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x00                |
| <b>Lower Limit</b>    | 0x00                |
| <b>Upper Limit</b>    | 0x01                |
| <b>Unit</b>           | -                   |

|                       |                 |
|-----------------------|-----------------|
| <b>Sub-Index</b>      | 004             |
| <b>Description</b>    | Buffer Position |
| <b>Entry Category</b> | Optional        |
| <b>Data Type</b>      | UNSIGNED16      |
| <b>Access</b>         | Read/Write      |
| <b>PDO Mapping</b>    | No              |
| <b>Default Value</b>  | 0x0000          |
| <b>Lower Limit</b>    | 0x0000          |
| <b>Upper Limit</b>    | 0xFFFF          |
| <b>Unit</b>           | -               |

|                       |                     |
|-----------------------|---------------------|
| <b>Sub-Index</b>      | 005                 |
| <b>Description</b>    | Size of Data Record |
| <b>Entry Category</b> | Optional            |
| <b>Data Type</b>      | UNSIGNED8           |
| <b>Access</b>         | WO                  |
| <b>PDO Mapping</b>    | No                  |
| <b>Default Value</b>  | 0x04                |
| <b>Lower Limit</b>    | 0x04                |
| <b>Upper Limit</b>    | 0x04                |
| <b>Unit</b>           | bytes               |

|                       |              |
|-----------------------|--------------|
| <b>Sub-Index</b>      | 006          |
| <b>Description</b>    | Buffer Clear |
| <b>Entry Category</b> | Optional     |
| <b>Data Type</b>      | UNSIGNED8    |
| <b>Access</b>         | WO           |
| <b>PDO Mapping</b>    | No           |
| <b>Default Value</b>  | 0x00         |
| <b>Lower Limit</b>    | 0x00         |
| <b>Upper Limit</b>    | 0x01         |
| <b>Unit</b>           | -            |

## 60C5h: Maximum Acceleration

### Object Description

|             |                                                                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60C5                                                                                                                                                            |
| Description | The maximum acceleration. It is used to limit the acceleration to an acceptable value in order to prevent the motor and the moved mechanics from being damaged. |
| Object Code | Variable                                                                                                                                                        |
| Data Type   | UNSIGNED32                                                                                                                                                      |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read/Write             |
| PDO Mapping   | No                     |
| Default Value | 0xFFFFFFFF             |
| Lower Limit   | 0x00000001             |
| Upper Limit   | 0xFFFFFFFF             |
| Unit          | CAN user acc/dec units |

## 60C6h: Maximum Deceleration

### Object Description

|             |                                                                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60C6                                                                                                                                                            |
| Description | The maximum deceleration. It is used to limit the deceleration to an acceptable value in order to prevent the motor and the moved mechanics from being damaged. |
| Object Code | Variable                                                                                                                                                        |
| Data Type   | UNSIGNED32                                                                                                                                                      |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read/Write             |
| PDO Mapping   | No                     |
| Default Value | 0xFFFFFFFF             |
| Lower Limit   | 0x00000001             |
| Upper Limit   | 0xFFFFFFFF             |
| Unit          | CAN user acc/dec units |

**60D0h: Touch Probe Source (CAN only)****Object Description**

|             |                    |
|-------------|--------------------|
| Index       | 60D0               |
| Description | Touch Probe Source |
| Object Code | Array              |
| Data Type   | INTEGER16          |

**Entry Description**

|                |                   |
|----------------|-------------------|
| Sub-Index      | 000               |
| Description    | Number of Entries |
| Entry Category | Optional          |
| Access         | Read Only         |
| PDO Mapping    | No                |
| Default Value  | 0x0002            |
| Lower Limit    | 0x8000            |
| Upper Limit    | 0x7FFF            |
| Unit           | -                 |

|                |                      |
|----------------|----------------------|
| Sub-Index      | 001                  |
| Description    | Touch Probe 1 Source |
| Entry Category | Optional             |
| Data Type      | INTEGER16            |
| Access         | Read/Write           |
| PDO Mapping    | No                   |
| Default Value  | 0x0001               |
| Lower Limit    | 0x002                |
| Upper Limit    | 0x002                |
| Unit           | -                    |

|                |                      |
|----------------|----------------------|
| Sub-Index      | 002                  |
| Description    | Touch Probe 2 Source |
| Entry Category | Optional             |
| Data Type      | INTEGER16            |
| Access         | Read/Write           |
| PDO Mapping    | No                   |
| Default Value  | 0x0001               |
| Lower Limit    | 0x8000               |
| Upper Limit    | 0x7FFF               |
| Unit           | -                    |

## 60D5h: Touch Probe 1 Positive Edge Counter

### Object Description

|             |                                     |
|-------------|-------------------------------------|
| Index       | 60D5                                |
| Description | Touch probe 1 positive edge counter |
| Object Code | Variable                            |
| Data Type   | UNSIGNED16                          |

### Entry Description

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | -                      |

**60D6h: Touch Probe 1 Negative Edge Counter****Object Description**

|             |                                     |
|-------------|-------------------------------------|
| Index       | 60D6                                |
| Description | Touch probe 1 negative edge counter |
| Object Code | Variable                            |
| Data Type   | UNSIGNED16                          |

**Entry Description**

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | -                      |

**60D7h: Touch Probe 2 Positive Edge Counter****Object Description**

|             |                                     |
|-------------|-------------------------------------|
| Index       | 60D7                                |
| Description | Touch probe 2 positive edge counter |
| Object Code | Variable                            |
| Data Type   | UNSIGNED16                          |

**Entry Description**

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | -                      |

**60D8h: Touch Probe 2 Negative Edge Counter****Object Description**

|             |                                     |
|-------------|-------------------------------------|
| Index       | 60D8                                |
| Description | Touch probe 2 negative edge counter |
| Object Code | Variable                            |
| Data Type   | UNSIGNED16                          |

**Entry Description**

|               |                        |
|---------------|------------------------|
| Access        | Read Only              |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO |
| Default Value | 0x0000                 |
| Lower Limit   | 0x0000                 |
| Upper Limit   | 0xFFFF                 |
| Unit          | -                      |

## 60F2h: Positioning Option Code

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60F2                                                                                                                                                                                                                                                                                                                                                                                                      |
| Description | The configured positioning behavior, as described by the profile positioning mode or the interpolated positioning mode. This object is organized bit-wise. The bits have the following meaning:<br>bit 0,1: relative option<br>bit 2,3: change immediately option<br>bit 4,5: request-response option<br>bit 6,7: reserved<br>bit 8-11: ip option<br>bit 12-14: reserved<br>bit 15: manufacturer-specific |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                  |
| Data Type   | UNSIGNED16                                                                                                                                                                                                                                                                                                                                                                                                |

### Entry Description

|               |            |
|---------------|------------|
| Access        | Read/Write |
| PDO Mapping   | No         |
| Default Value | 0x0000     |
| Lower Limit   | 0x0000     |
| Upper Limit   | 0xFFFF     |
| Unit          | -          |

## 60F4h: Following Error Actual Value

### Object Description

|             |                                                         |
|-------------|---------------------------------------------------------|
| Index       | 60F4                                                    |
| Description | VarCom - PE<br>The actual value of the following error. |
| Object Code | Variable                                                |
| Data Type   | INTEGER32                                               |
| Access      | Read Only                                               |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | CAN: Yes<br>ECT: TxPDO  |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 60FCh: Position Demand Internal Value

### Object Description

|             |                                                                  |
|-------------|------------------------------------------------------------------|
| Index       | 60FC                                                             |
| Description | The output of the trajectory generator in profile position mode. |
| Object Code | Variable                                                         |
| Data Type   | INTEGER32                                                        |

### Entry Description

|               |                         |
|---------------|-------------------------|
| Access        | Read Only               |
| PDO Mapping   | No                      |
| Default Value | 0x00000000              |
| Lower Limit   | 0x80000000              |
| Upper Limit   | 0x7FFFFFFF              |
| Unit          | CAN user position units |

## 60FDh: Digital Inputs

### Object Description

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Index</b>       | 60FD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Description</b> | <p><b>VarCom - IN</b></p> <p>Indicates the state of the digital inputs.<br/> The digital inputs object has 32 bits.<br/> The first 16 bits (bits 0-15) indicate the status of various types of switches. Those switches are functions assigned to some of the digital inputs.</p> <p><b>bit 0:</b> Negative limit switch<br/> 1=digital input assigned to the negative limit switch is on.<br/> 0=digital input assigned to the negative limit switch is off.</p> <p><b>bit 1:</b> Positive limit switch<br/> 1=digital input assigned to the positive limit switch is on.<br/> 0=digital input assigned to the positive limit switch is off.</p> <p><b>bit 2:</b> Home switch<br/> 1=digital input assigned to the home switch is on.<br/> 0=digital input assigned to the home switch is off.</p> <p><b>bit 3:</b> STO status<br/> 1= 24V is not supplied to drive STO module; drive is in Safe Torque Off state.<br/> 0= 24V is supplied to drive STO module</p> <p>The last 16 bits indicate the status of each digital input, regardless of the input's functionality.<br/> bit 16: digital input 1<br/> bit 17: digital input 2<br/> ...<br/> bit 25: digital input 10<br/> bit 26: digital input 11<br/> If input is on, corresponding bit is set.</p> |
| <b>Object Code</b> | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Data Type</b>   | UNSIGNED32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

**Entry Description**

|                      |                                |
|----------------------|--------------------------------|
| <b>Access</b>        | Read Only                      |
| <b>PDO Mapping</b>   | CAN:     Yes<br>ECT:     TxPDO |
| <b>Default Value</b> | 0x00000000                     |
| <b>Lower Limit</b>   | 0x00000000                     |
| <b>Upper Limit</b>   | 0xFFFFFFFF                     |
| <b>Unit</b>          | -                              |

## 60FEh: Digital Outputs

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 60FE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Description | <p><a href="#">VarCom - OUT</a></p> <p>Indicates the state of the digital outputs. The object has two sub-indices.</p> <p>Sub-index 1 has 32 bits. The bits in the first word (bits 0-15) indicate the status of the brake.</p> <p>bit 0 = brake (CDHD2 drives do not support this bit)</p> <p>0 = Digital output is off, brake is not set</p> <p>1 = Digital output is on, brake is set</p> <p>The bits in the second word (bits 16-31) indicate the state of each digital output, regardless of the output's functionality. For example, to read the status of digital output 1 (regardless of its functionality; it can be idle), read bit 16.</p> <p>bit 16: Digital output 1</p> <p>bit 17: Digital output 2</p> <p>bit 18: Digital output 3</p> <p>... and so on</p> <p>Possible bit values:</p> <p>0 = off</p> <p>1 = on</p> <p>Sub-index 2 - Mask for the physical outputs.</p> <p>Possible bit values:</p> <p>0 = Disable output (output state will not be changed)</p> <p>1 = Enable output (output state can be changed)</p> |
| Object Code | CAT:     Array<br>ECT:     Record                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

### Entry Description

|                |                                |
|----------------|--------------------------------|
| Sub-Index      | 000                            |
| Description    | Number of Entries              |
| Entry Category | Optional                       |
| Access         | Read Only                      |
| PDO Mapping    | No                             |
| Default Value  | 0x02                           |
| Lower Limit    | 0x02                           |
| Upper Limit    | CAT:     0x02<br>ECT:     0xFF |
| Unit           | -                              |

|                       |                                                       |
|-----------------------|-------------------------------------------------------|
| <b>Sub-Index</b>      | 001                                                   |
| <b>Description</b>    | Physical Outputs                                      |
| <b>Entry Category</b> | Optional                                              |
| <b>Data Type</b>      | UNSIGNED32                                            |
| <b>Access</b>         | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| <b>PDO Mapping</b>    | CAN: Yes<br>ECT: RxPDO                                |
| <b>Default Value</b>  | 0x00000000                                            |
| <b>Lower Limit</b>    | 0x00000000                                            |
| <b>Upper Limit</b>    | 0xFFFFFFFF                                            |
| <b>Unit</b>           | -                                                     |

|                       |             |
|-----------------------|-------------|
| <b>Sub-Index</b>      | 002         |
| <b>Description</b>    | Output Mask |
| <b>Entry Category</b> | Optional    |
| <b>Data Type</b>      | UNSIGNED32  |
| <b>Access</b>         | Read/Write  |
| <b>PDO Mapping</b>    | No          |
| <b>Default Value</b>  | 0x00000000  |
| <b>Lower Limit</b>    | 0x00000000  |
| <b>Upper Limit</b>    | 0xFFFFFFFF  |
| <b>Unit</b>           | -           |

**60FFh: Target Velocity****Object Description**

|             |                                                                              |
|-------------|------------------------------------------------------------------------------|
| Index       | 60FF                                                                         |
| Description | The configured target velocity. It is as input for the trajectory generator. |
| Object Code | Variable                                                                     |
| Data Type   | INTEGER32                                                                    |

**Entry Description**

|               |                                                       |
|---------------|-------------------------------------------------------|
| Access        | CAN: SDO: Read/Write<br>PDO: Write<br>ECT: Read/Write |
| PDO Mapping   | CAN: Yes<br>ECT: RxPDO                                |
| Default Value | 0x00000000                                            |
| Lower Limit   | 0x80000000                                            |
| Upper Limit   | 0x7FFFFFFF                                            |
| Unit          | CAN user velocity units                               |

## 6502h: Supported Drive Modes

### Object Description

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Index       | 6502                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Description | <p>This object provides information on the supported drive modes. This object is organized bit-wise. The bits have the following meaning:</p> <ul style="list-style-type: none"> <li>bit 0: Profile position mode</li> <li>bit 1: Velocity mode</li> <li>bit 2: Profile velocity mode</li> <li>bit 3: Profile torque mode</li> <li>bit 4: Reserved</li> <li>bit 5: Homing mode</li> <li>bit 6: Interpolated position mode</li> <li>bit 7: Cyclic synchronous position mode</li> <li>bit 8: Cyclic synchronous velocity mode</li> <li>bit 9: Cyclic synchronous torque mode</li> <li>bit 10-15: Reserved</li> <li>bit 16-31: Manufacturer-specific</li> </ul> <p>The bit values have the following meaning:</p> <ul style="list-style-type: none"> <li>0 = mode is not supported</li> <li>1 = mode is supported</li> </ul> |
| Object Code | Variable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Data Type   | UNSIGNED32                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

### Entry Description

|               |           |
|---------------|-----------|
| Access        | Read Only |
| PDO Mapping   | No        |
| Default Value | --        |
| Lower Limit   | --        |
| Upper Limit   | --        |
| Unit          | -         |

# 11 CANopen and EtherCAT Error Codes

## 11.1 Warning Codes

CDHD2 warnings are reported in object **2011h**.

CDHD2 warnings are 64 bits, divided into two 32-bit segments.

Refer to the section **Warning Messages** in the *CDHD2 User Manual*.

## 11.2 Error Codes

If the master device issues an invalid SDO request to the drive, the drive returns a service request error (abort) code to the master.

An SDO operation may return one of the SDO abort codes specified in the CANopen standard, listed in Table 11-1.

If an SDO fails due to a manufacturer-specific error, the SDO abort code will be 08000000h (general error) and the detailed error code will be available in object **216Ch**.

Refer to the section **Error Messages** in the *CDHD2 User Manual*.

Table 11-1. CANopen Standard SDO Abort Codes

| Abort Code | Description                                                                |
|------------|----------------------------------------------------------------------------|
| 0503 0000h | Toggle bit not alternated.                                                 |
| 0504 0000h | SDO protocol timed out.                                                    |
| 0504 0001h | Client/server command specifier not valid or unknown.                      |
| 0504 0002h | Invalid block size (block mode only).                                      |
| 0504 0003h | Invalid sequence number (block mode only).                                 |
| 0504 0004h | CRC error (block mode only).                                               |
| 0504 0005h | Out of memory.                                                             |
| 0601 0000h | Unsupported access to an object.                                           |
| 0601 0001h | Attempt to read a write only object.                                       |
| 0601 0002h | Attempt to write a read only object.                                       |
| 0602 0000h | Object does not exist in the object dictionary.                            |
| 0604 0041h | Object cannot be mapped to the PDO.                                        |
| 0604 0042h | The number and length of the objects to be mapped would exceed PDO length. |
| 0604 0043h | General parameter incompatibility reason.                                  |
| 0604 0047h | General internal incompatibility in the device.                            |
| 0606 0000h | Access failed due to an hardware error.                                    |
| 0607 0010h | Data type does not match, length of service parameter does not match       |
| 0607 0012h | Data type does not match, length of service parameter too high             |
| 0607 0013h | Data type does not match, length of service parameter too low              |

|            |                                                                                                                                                                              |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0609 0011h | Sub-index does not exist.                                                                                                                                                    |
| 0609 0030h | Invalid value for parameter (download only).                                                                                                                                 |
| 0609 0031h | Value of parameter written too high (download only).                                                                                                                         |
| 0609 0032h | Value of parameter written too low (download only).                                                                                                                          |
| 0609 0036h | Maximum value is less than minimum value.                                                                                                                                    |
| 060A 0023h | Resource not available: SDO connection                                                                                                                                       |
| 0800 0000h | General error                                                                                                                                                                |
| 0800 0020h | Data cannot be transferred or stored to the application.                                                                                                                     |
| 0800 0021h | Data cannot be transferred or stored to the application because of local control.                                                                                            |
| 0800 0022h | Data cannot be transferred or stored to the application because of the present device state.                                                                                 |
| 0800 0023h | Object dictionary dynamic generation fails or no object dictionary is present (e.g. object dictionary is generated from file and generation fails because of an file error). |
| 0800 0024h | No data available                                                                                                                                                            |

## 11.3 Emergency Error (Fault) Codes

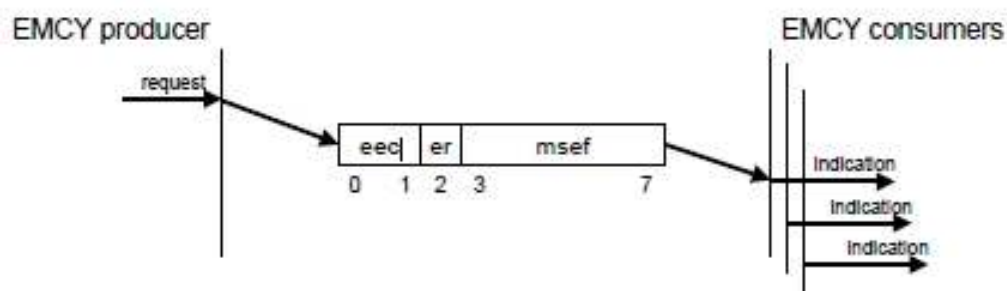
Refer to the section **Fault Messages** in the *CDHD2 User Manual*.

Unlike the synchronous service request error (abort) codes which are always sent as response to a request, the emergency error (fault) codes are asynchronous. These events can occur at any time regardless of the user command (for example, temperature is too high).

Upon detection of internal device errors, the drive will transmit emergency message frames over the CANopen network using COB-ID EMCY. An emergency message frame will be transmitted only once per error event and consists of the error code and the actual state of the Error Register object.

**Table 11-2. Emergency Message Frame**

| Byte        | 0                    | 1 | 2              | 3 | 4                     | 5 | 6 | 7 |
|-------------|----------------------|---|----------------|---|-----------------------|---|---|---|
| Description | Emergency error code |   | Error register |   | Manufacturer-specific |   |   |   |



When an illegal state occurs in the drive, the drive sends the code to the master device as object 603Fh (Error Code).

Whenever the value of 603Fh is not zero, there is a fault in the drive. The CANopen state machine enters Fault mode, and the drive cannot be enabled.

If, for example, the Motor Feedback interface cable is disconnected from the drive, the motion control of the drive will not function; the drive will send the code 7383h (A/B line break fault) to the master device as object 603Fh (Error Code).



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