



# **EtherCAT and CANopen Reference Manual**

## **CDHD2 Servo Drive**

Revision: 1.4

Firmware Version 2.38.x

## Revision History

Doc. Rev.	Date	Remarks
1.4	Jan. 2022	Updated for firmware 2.38.x. Added objects: Object 2040h: MOTORPHASESCAN Object 220Bh: VLIMIT Object 222Ch: HWPEXTMACHN2 Object 2230h: ERRCORMODMODE Object 2233h: PCOMSOURCE Object 2234h: FLTCLRMODE Object 2236h: FCMODE Object 2237h: FCLPF Object 2238h: FCSLOPE Object 2239h: FCKP Object 223Ah: FCEINSETTIME Object 223Bh: FCE Object 223Ch: FCEINSET Object 223Dh: FCCMD Object 2240h: ANIN1INV Object 2243h: CSPLIMITSMODE Object 2245h: PCOMHOMEMODE Object 2246h: SFBTMTURNRESET
1.3	Aug. 2020	New chapter: Configuring OMRON Controller for CDHD2 EtherCAT. OMRON/Sysmac trademark info. (Nov.2018)
1.2	Oct. 2018	Connection wiring diagrams updated 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. Description of the object.
Object Code	Variable   Array   Record
Data Type	INTEGER8   INTEGER16   INTEGER32 UNSIGNED8   UNSIGNED16   UNSIGNED32 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 Unsigned8   Unsigned16 Unsigned32   Real32   Visible_String	
<b>Access</b>	Read/Write	Read and write access
	Read Only	Read only
	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

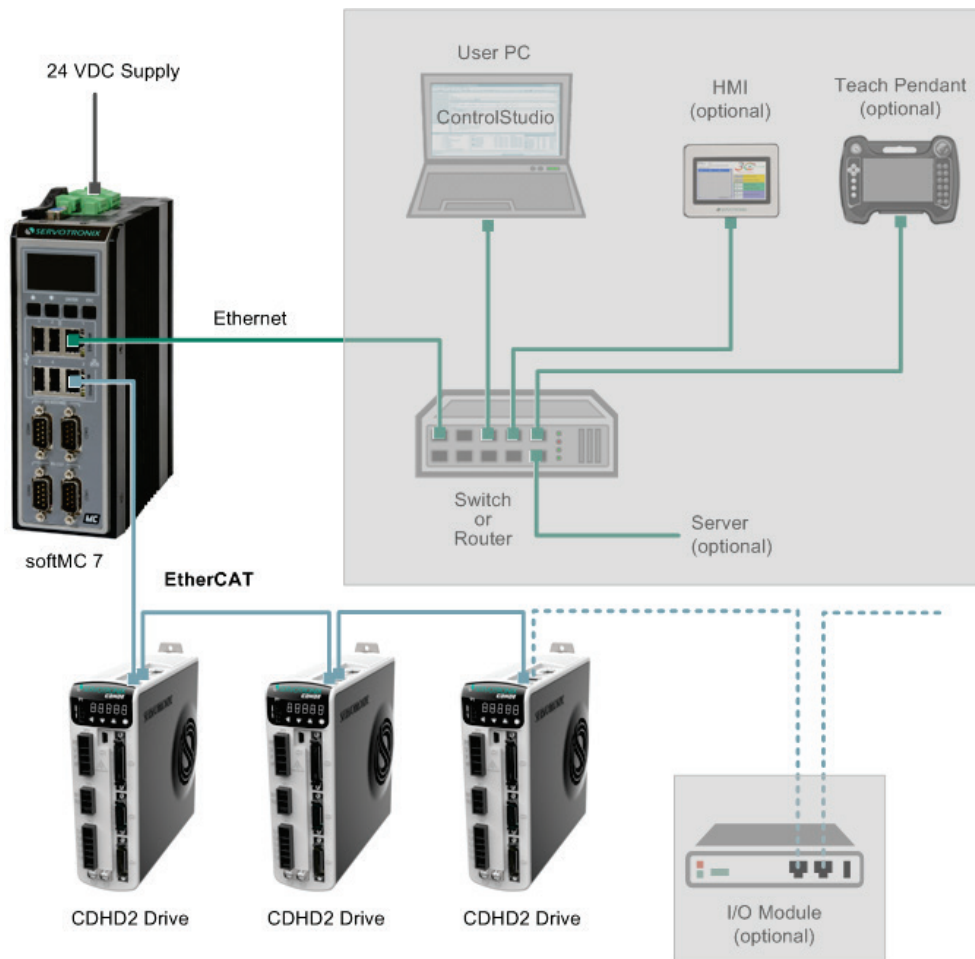


Figure 2-1. CDHD2 – EtherCAT Configuration – softMC 7 Controller – Example

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

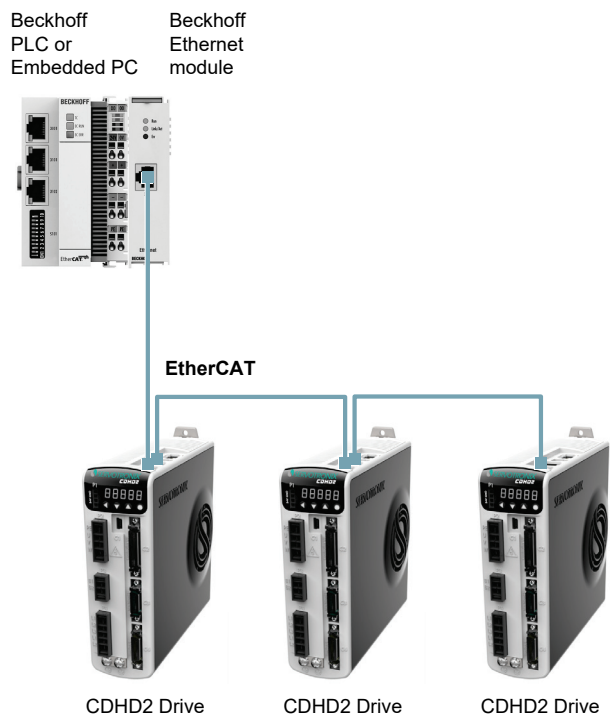


Figure 2-2. CDHD2 – EtherCAT Configuration – Beckhoff Controller – Example

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

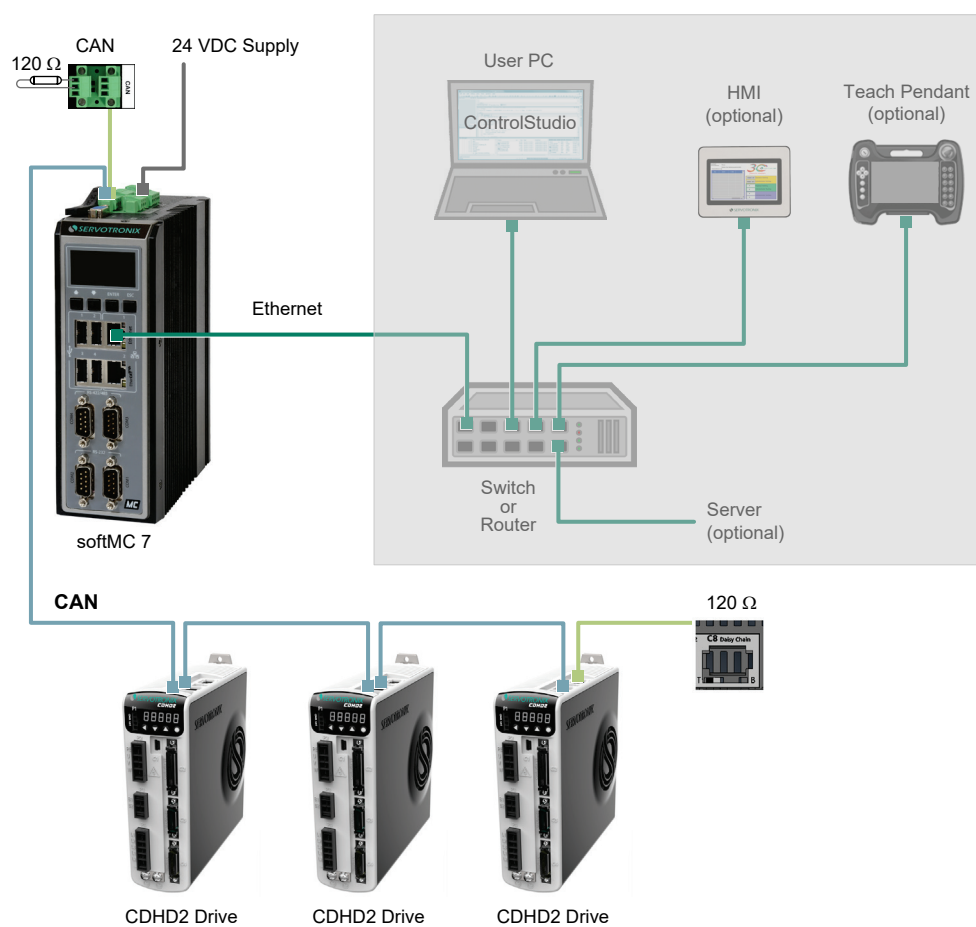


Figure 2-3. CDHD2 – CAN Configuration – softMC 7 Controller – Example

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

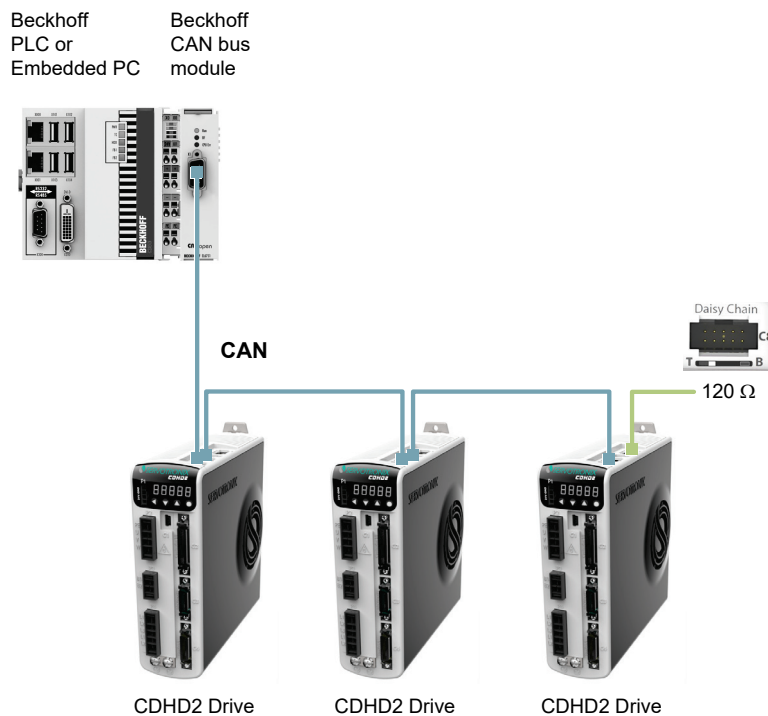


Figure 2-4. CDHD2 – CAN Configuration – Beckhoff Controller – Example

## 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).

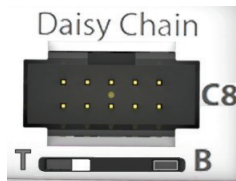


Figure 2-5. Terminator Resistor Switch (T) on Interface C8

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 ( <a href="#">ACTIVE</a> ) and motion commands are transmitted via a serial, pulse or analog interface.	<a href="#">COMMODE 0</a>
---------------------	--	---------------------------

### 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.

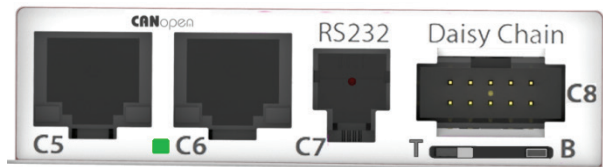


Figure 2-6. Top Panel Interfaces and LEDs on CANopen models

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:

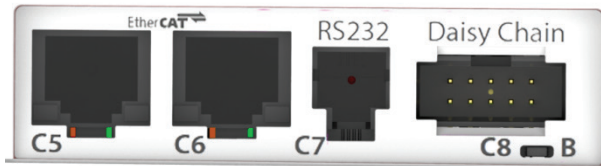


Figure 2-7. LEDs on Interfaces C5 and C6

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.servotronics.com/wiki/Category:EtherCAT:EC\\_SETUP](http://softmc.servotronics.com/wiki/Category:EtherCAT:EC_SETUP)
2. [http://softmc.servotronics.com/wiki/EtherCAT:EC\\_INSTALL\\_STX\\_CDHD](http://softmc.servotronics.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 Servotronics 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**.

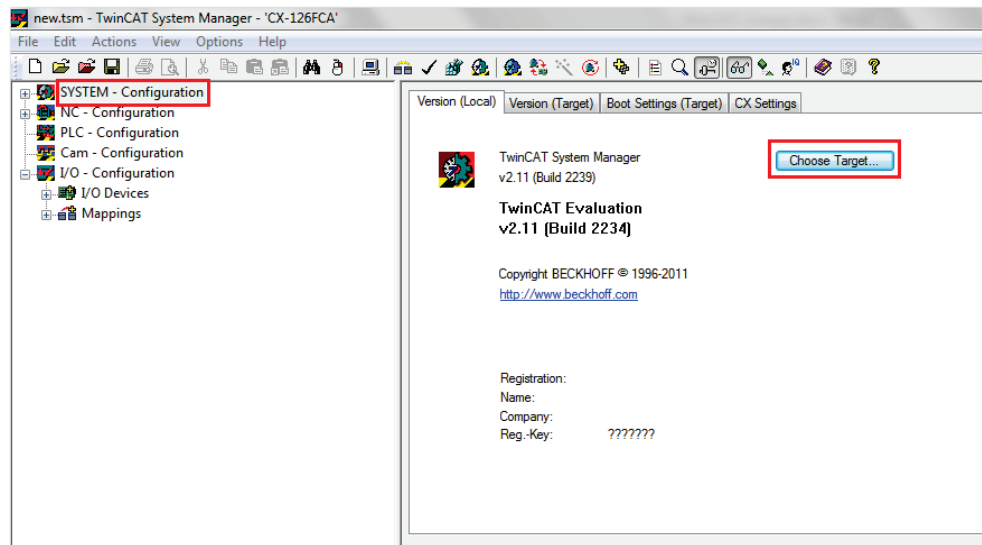


Figure 4-1.

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

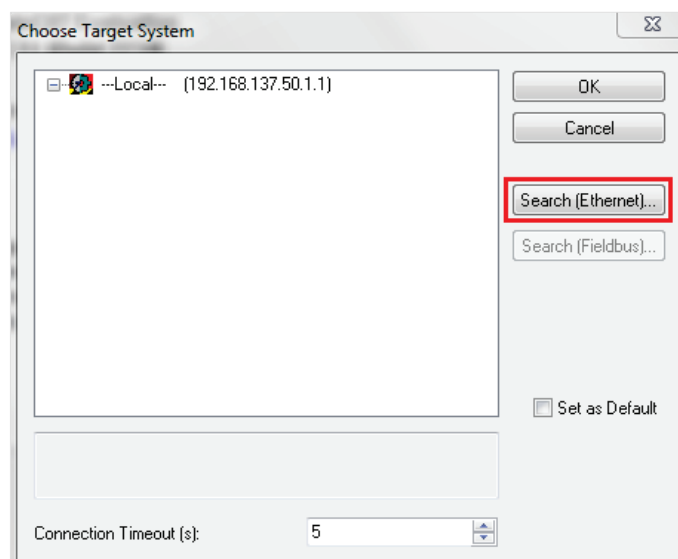


Figure 4-2.

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

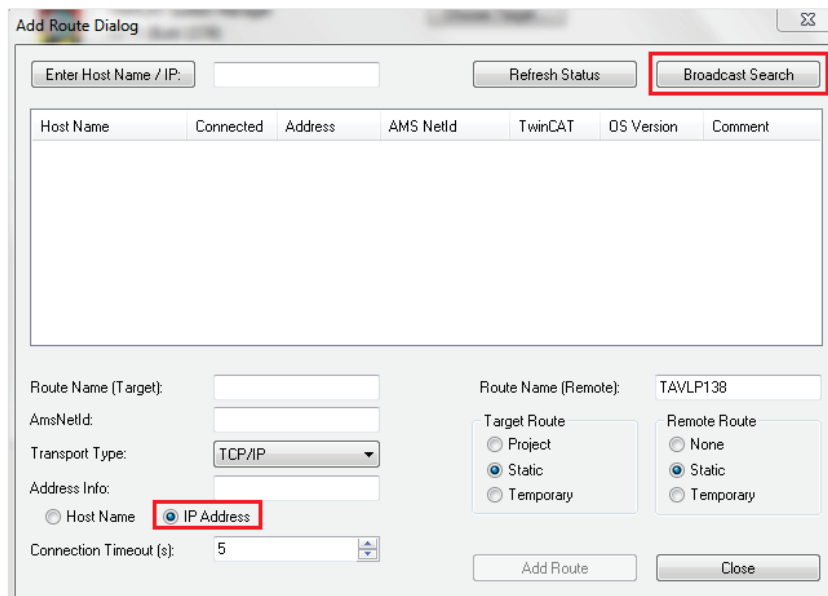


Figure 4-3.

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.

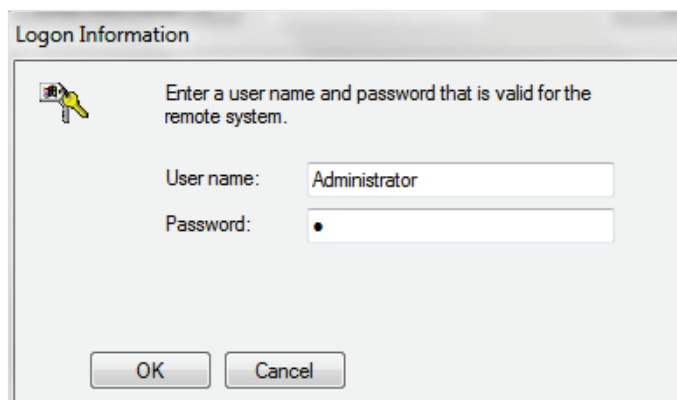


Figure 4-4.

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.

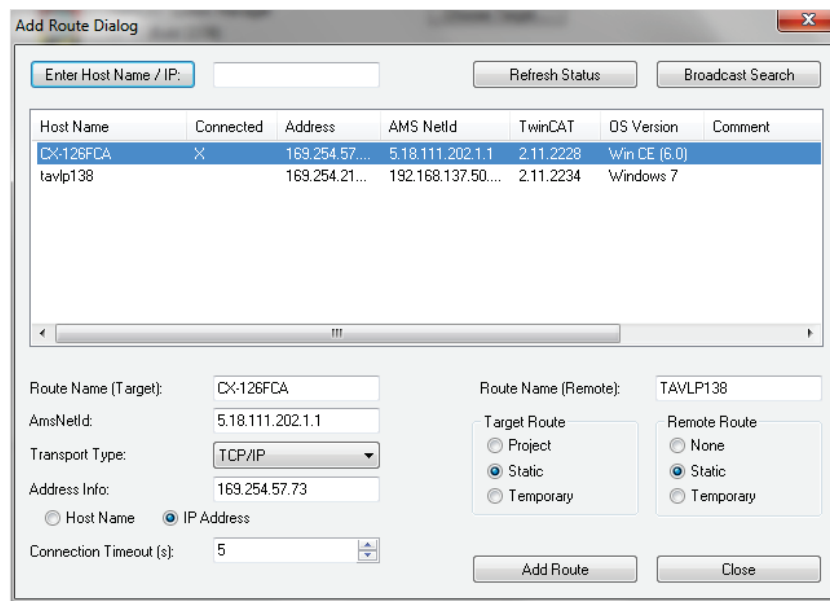


Figure 4-5.

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

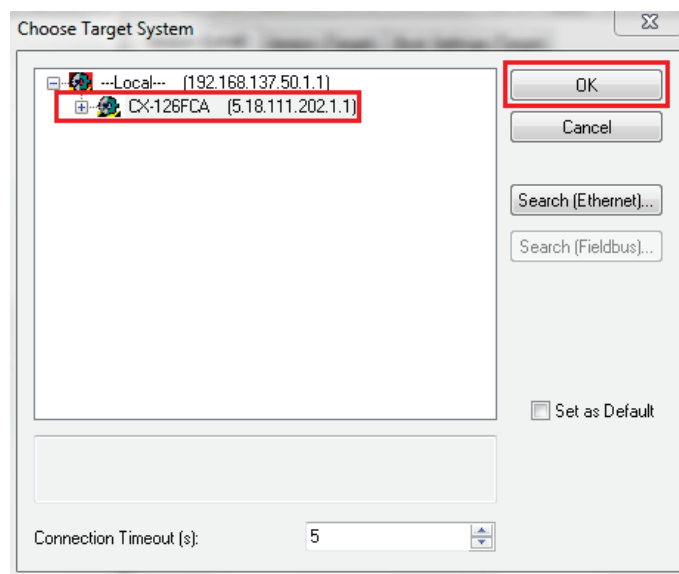


Figure 4-6.

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.

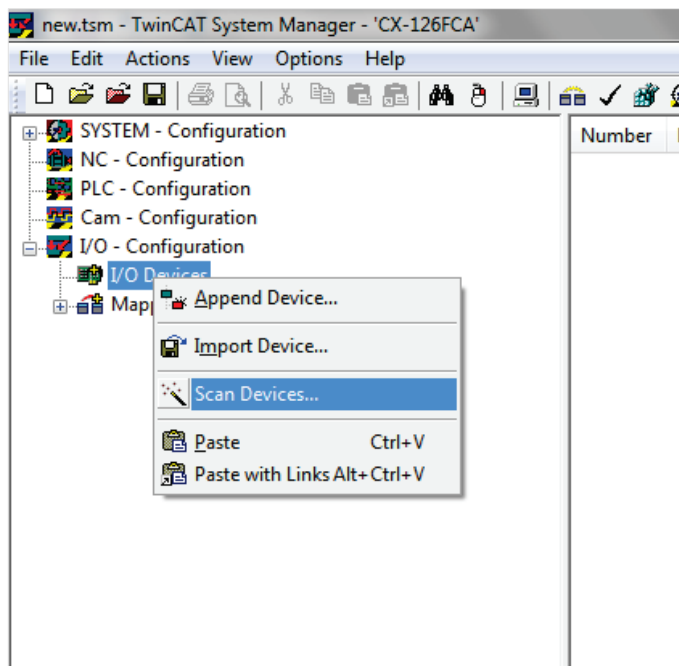


Figure 4-8.

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

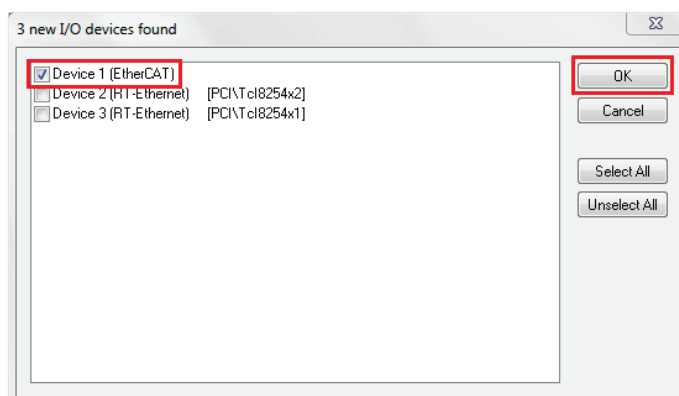


Figure 4-9.

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

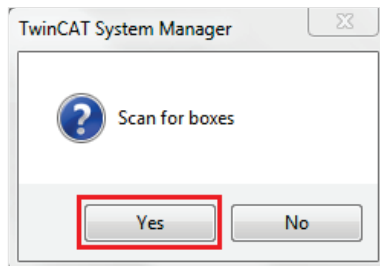


Figure 4-10.

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

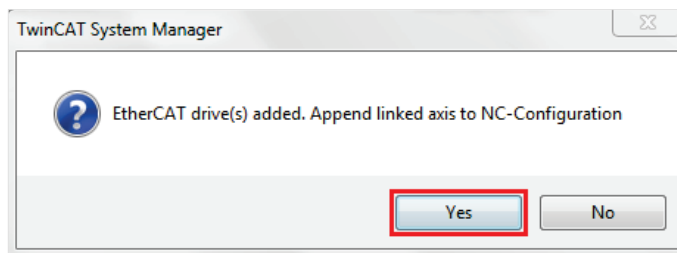


Figure 4-11.

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

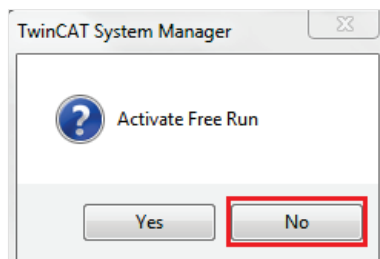


Figure 4-12.

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**.

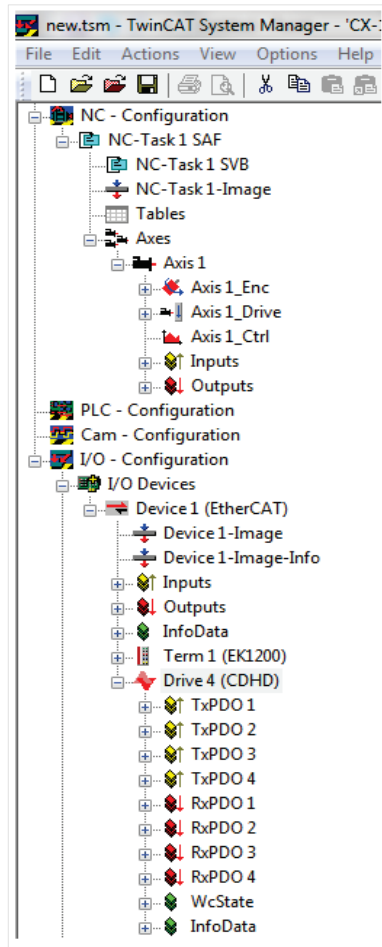


Figure 4-13.

## 4.4 Generating Motion

### 4.4.1 Setup for Motion

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

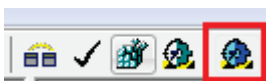


Figure 4-14.

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



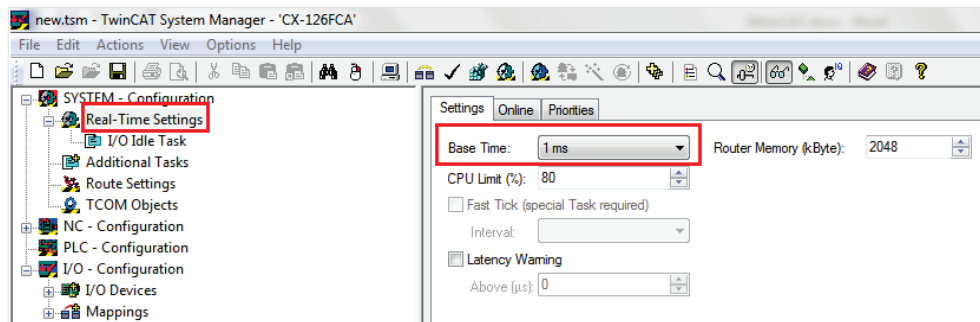


Figure 4-15.

- In the Priorities tab, enable Automatic Priority Management.

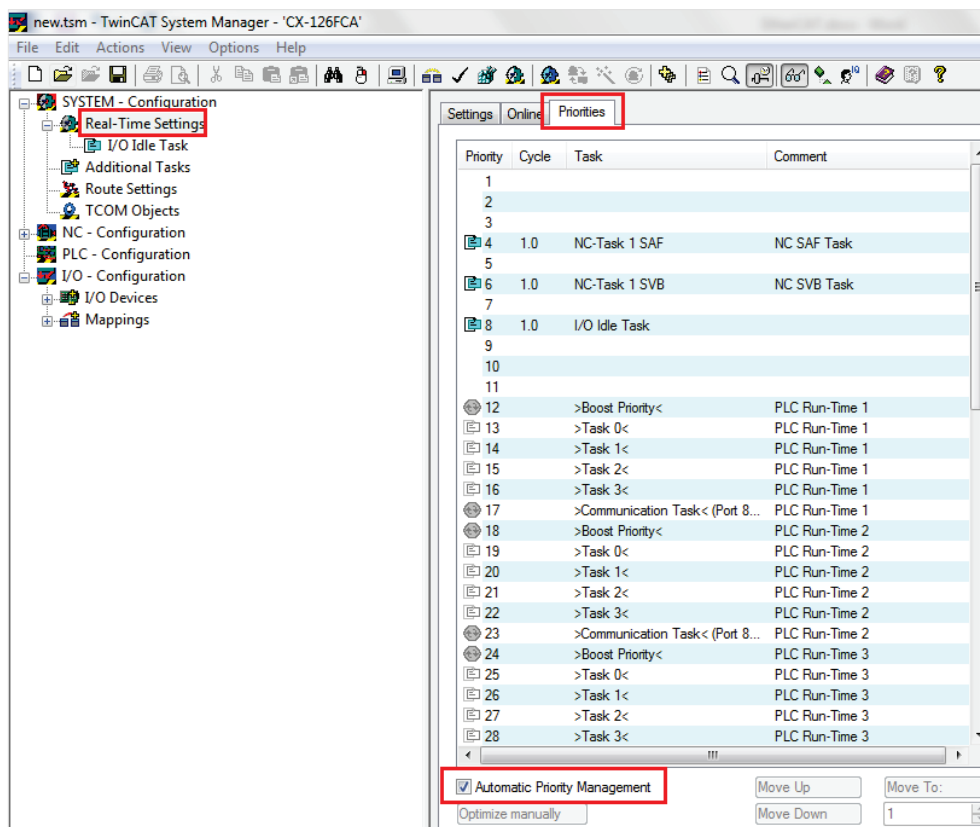


Figure 4-16.

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

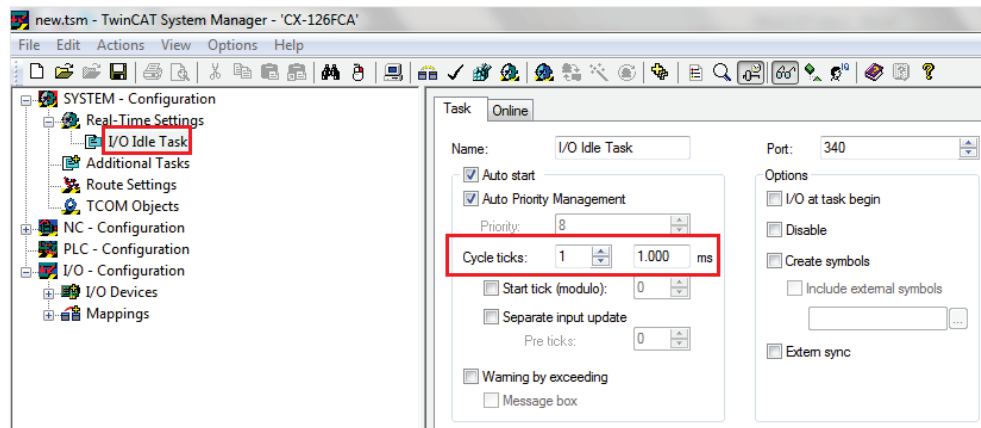


Figure 4-17.

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

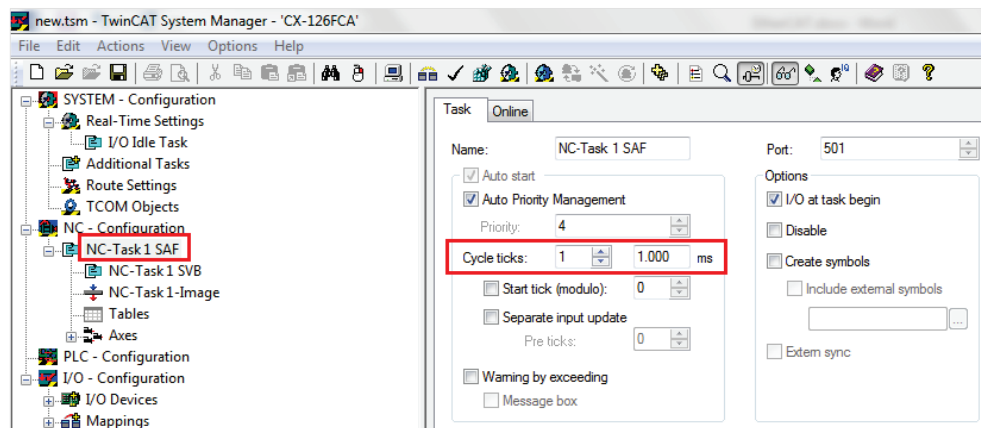


Figure 4-18.

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.

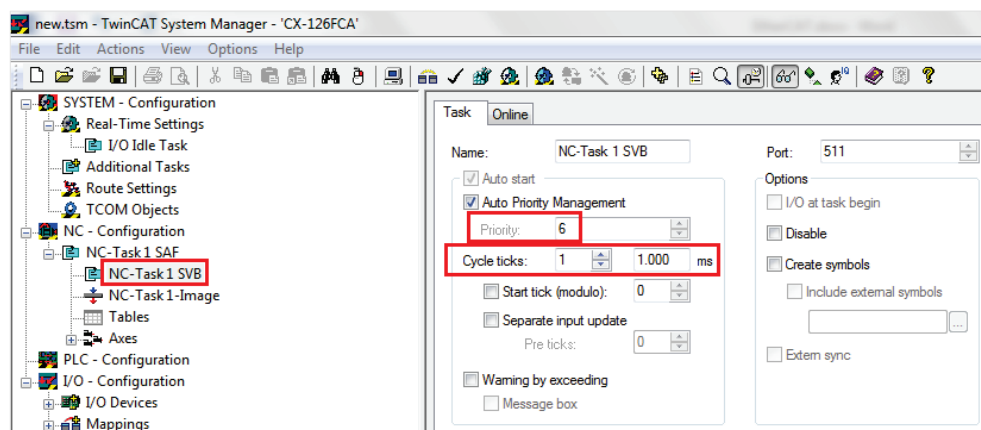


Figure 4-19.

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

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

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

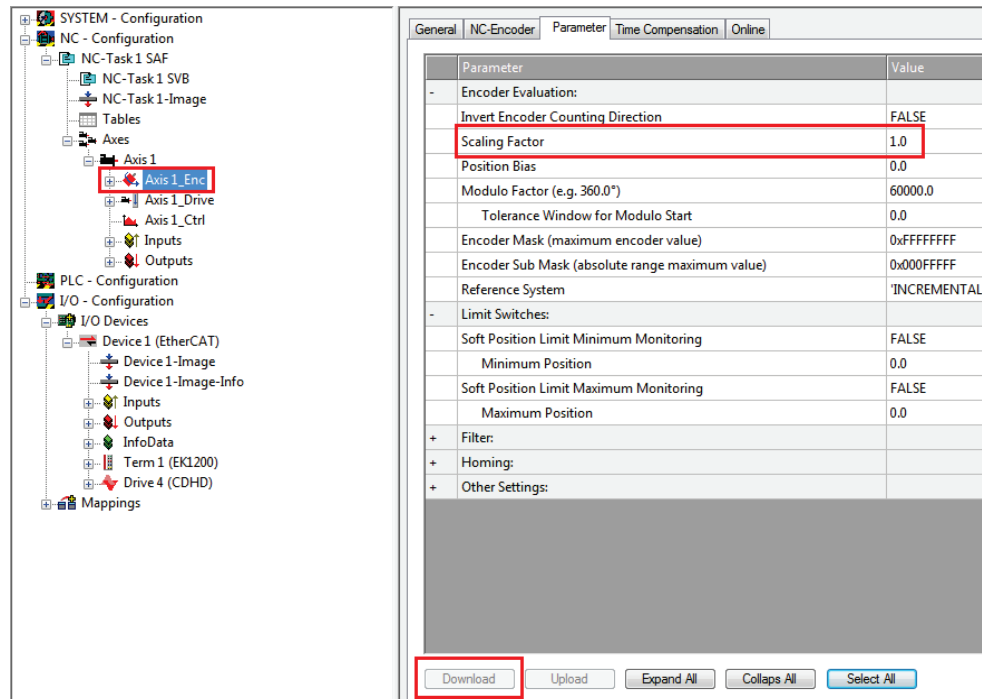


Figure 4-20.

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

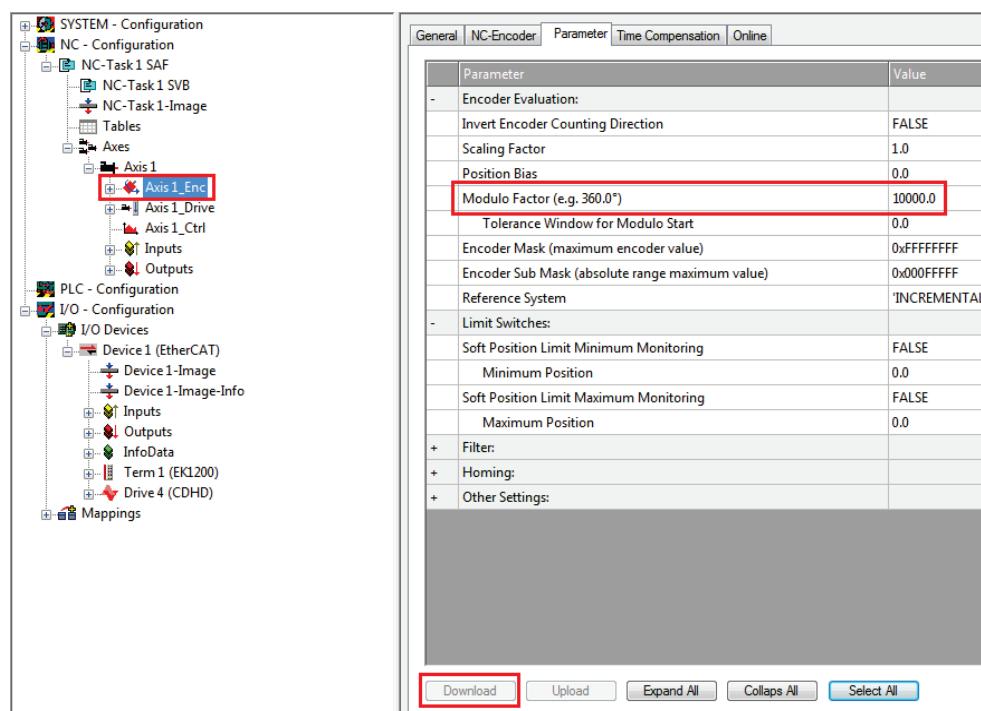


Figure 4-21.

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

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

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

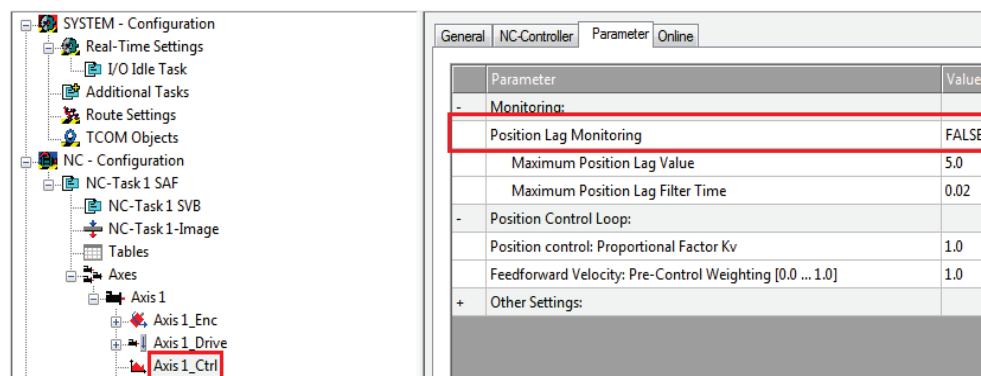


Figure 4-22.

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**

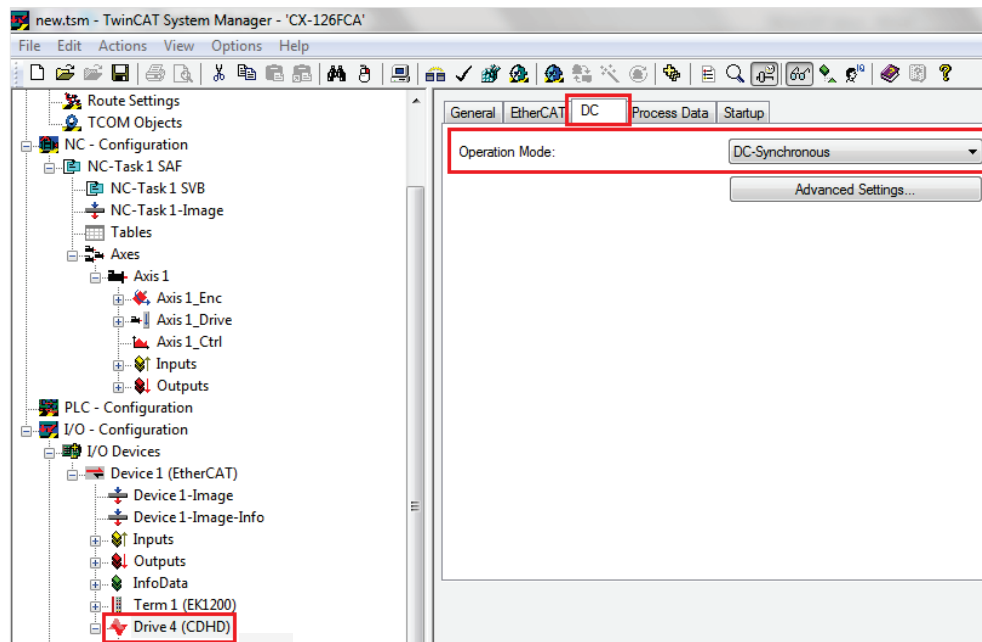


Figure 4-23.

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

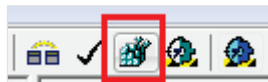


Figure 4-24.

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.

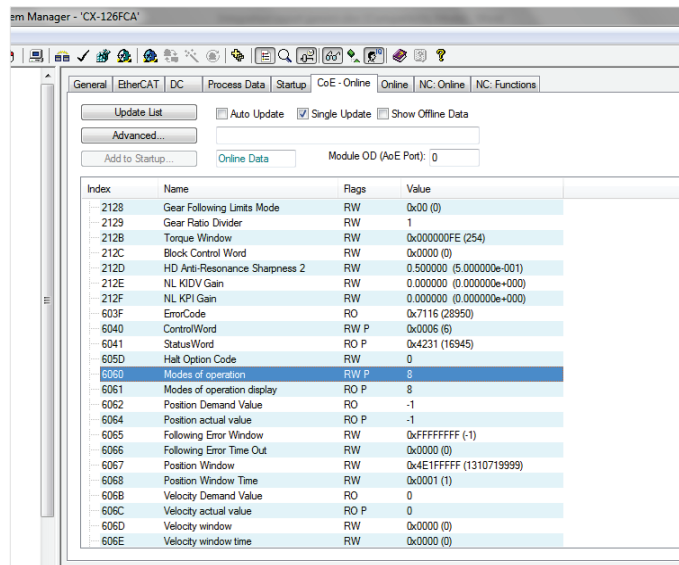


Figure 4-25.

- 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).

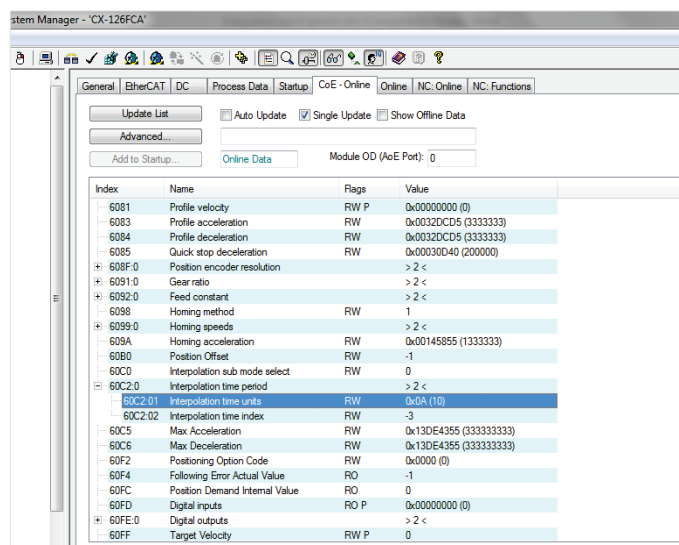


Figure 4-26.

**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).

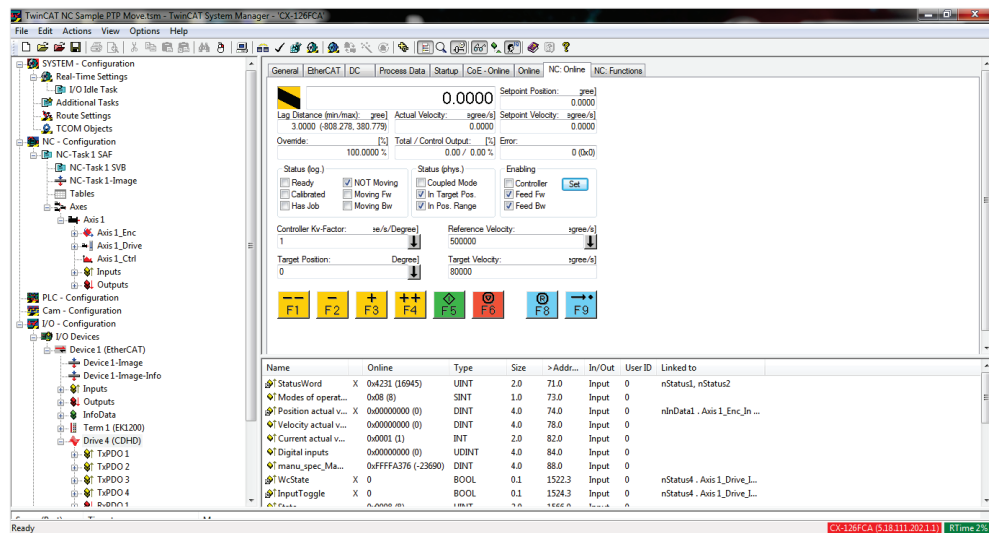


Figure 4-28.

## 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.

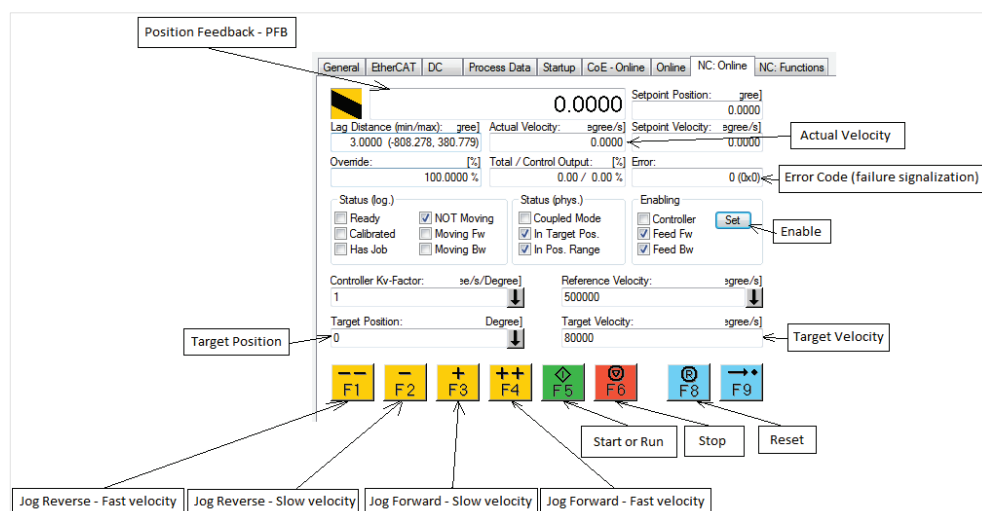


Figure 4-29.

## 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**

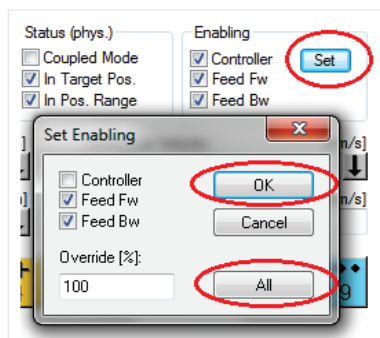


Figure 4-30.

**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.

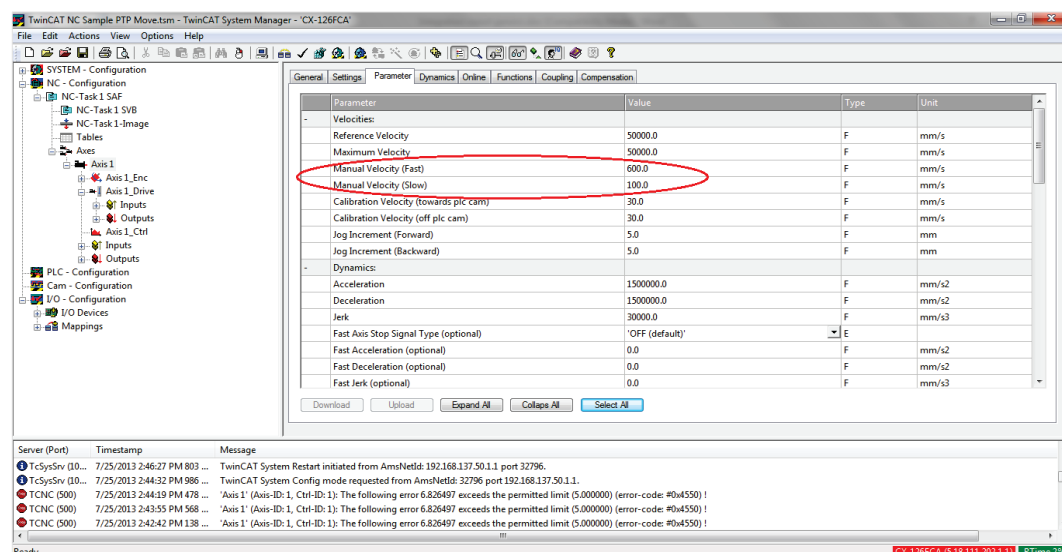


Figure 4-31.



- 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 a CNC control interface with the following data:

- General Tab:**
  - Position: 49999.0000
  - Setpoint Position: 50000.0000
  - Lag Distance (min/max): 1.0000 (-192.669, 436.048)
  - Actual Velocity: 0.0000
  - Setpoint Velocity: 0.0000
  - Override: 100.0000 %
  - Total / Control Output: 0.00 / 0.00 %
  - Error: 0 (0x0)
- Status (log.):**
  - ☒ Ready
  - ☒ NOT Moving
  - ☐ Calibrated
  - ☐ Moving Fw
  - ☐ Has Job
  - ☐ Moving Bw
- Status (phys.):**
  - ☐ Coupled Mode
  - ☒ In Target Pos.
  - ☒ In Pos. Range
- Enabling:**
  - ☒ Controller
  - ☒ Feed Fw
  - ☒ Feed Bw
- Controller Kv-Factor:** 1
- Reference Velocity:** 50000
- Target Position:** 50000
- Target Velocity:** 30000

At the bottom, there are function buttons: F1 (yellow, --), F2 (yellow, -), F3 (yellow, +), F4 (yellow, ++), F5 (green, diamond), F6 (red, stop), F8 (blue, R), and F9 (blue, right arrow).

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:

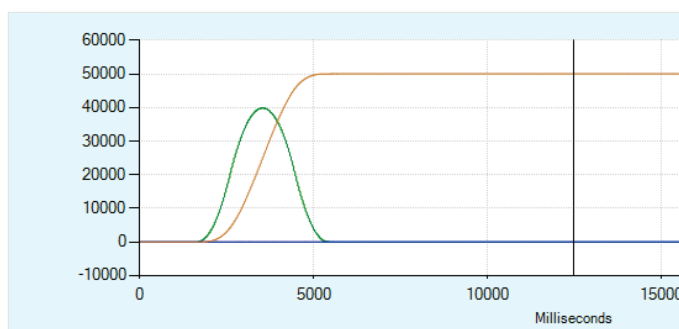


Figure 4-33.

- 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 displays the 'Functions' tab in the CDHD2 software. The interface includes a top navigation bar with tabs: General, Settings, Parameter, Dynamics, Online, Functions (selected), Coupling, and Compensation. Below the navigation bar, a large digital display shows '28571.0000'. To its right, 'Setpoint Position: [degree]' is set to '28492.5000'. The main configuration area is divided into several sections:

- Extended Start:** Contains a 'Start Mode' dropdown set to 'Absolute' and a 'Start' button. Below this are input fields for 'Target Position: 0 [Degree]', 'Target Velocity: 5000 [Degree/s]', 'Acceleration: 1000 [Degree/s²]' (checked), 'Deceleration: 5000 [Degree/s²]' (checked), and 'Jerk: 8000 [Degree/s³]' (checked). A 'Stop' button is located to the right of the Target Position field.
- Raw Drive Output:** Contains an 'Output Mode' dropdown set to 'Percent' and a 'Change' button. Below this is an 'Output Value' field set to '10 [%]' and a 'Stop' button.
- Set Actual Position:** Contains a dropdown set to 'Absolute', a value field set to '0', and a 'Set' button.
- Set Target Position:** Contains a dropdown set to 'Absolute', a value field set to '0', and a 'Set' button.

At the bottom right of the configuration area, 'Last Time: [s]' is displayed as '33.78000'.

Figure 4-34.

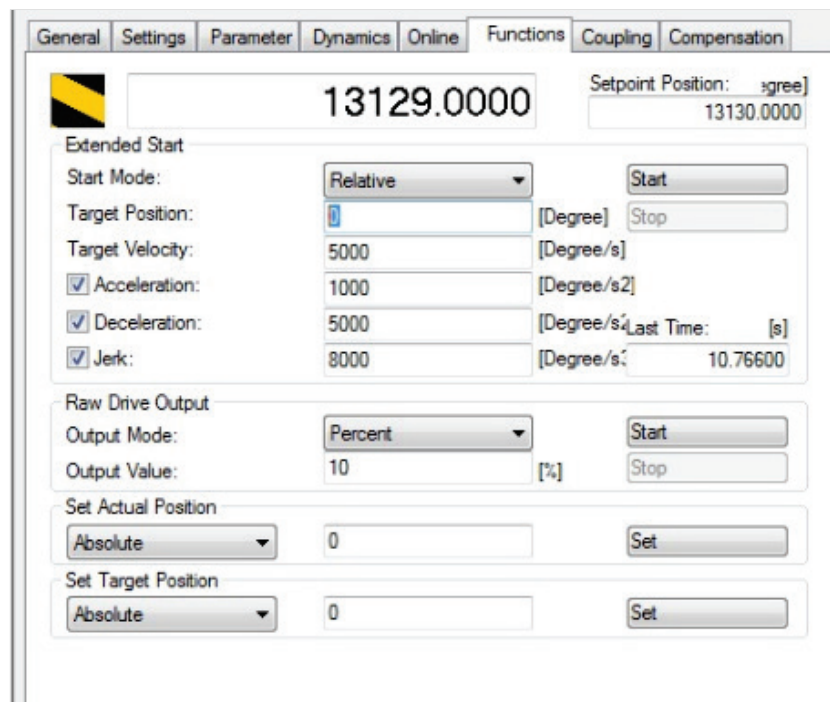


Figure 4-35.

#### 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.

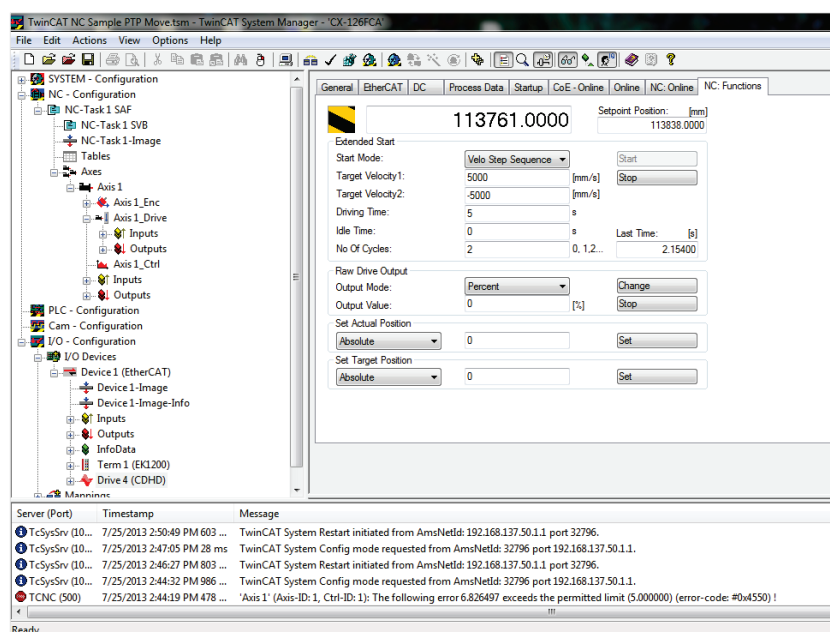


Figure 4-36.

The graph in the following figure reflects the motion performed:

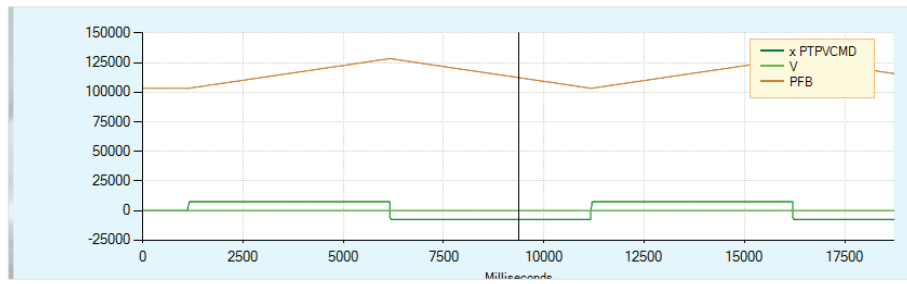


Figure 4-37.

- 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 OMRON Controller for CDHD2 EtherCAT

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

The application system consists of the following elements:

- CDHD2 Ethernet servo drive with firmware 2.15.x, servo motor, ServoStudio software, and XML file for fieldbus devices.
- OMRON controller with EtherCAT communication module, and Sysmac Studio software.

### 5.1 CDHD2 Hardware and Software Settings

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

- *Fieldbus Wiring*
- *Command Interface Mode*
- *Interpolation Time*

Before activating the Sysmac Studio, make sure the correct \*.xml file (according to the CDHD2 firmware version) resides at:

C:\Program Files (x86)\OMRON\Sysmac Studio\IODeviceProfiles\EsiFiles\UserEsiFiles

### 5.2 Communication between Controller and PC

Using Sysmac Studio, do the following:

1. Open a new project.

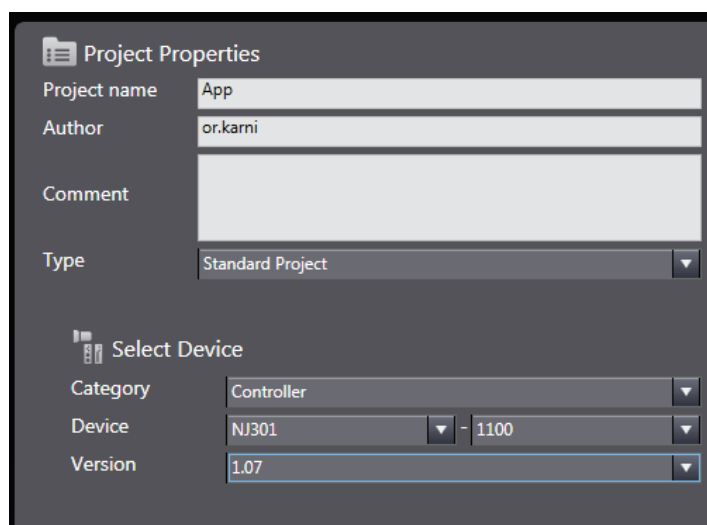


Figure 4-1.

2. Get the PLC IP:  
Select Tools > EtherNet/IP Connection Settings.

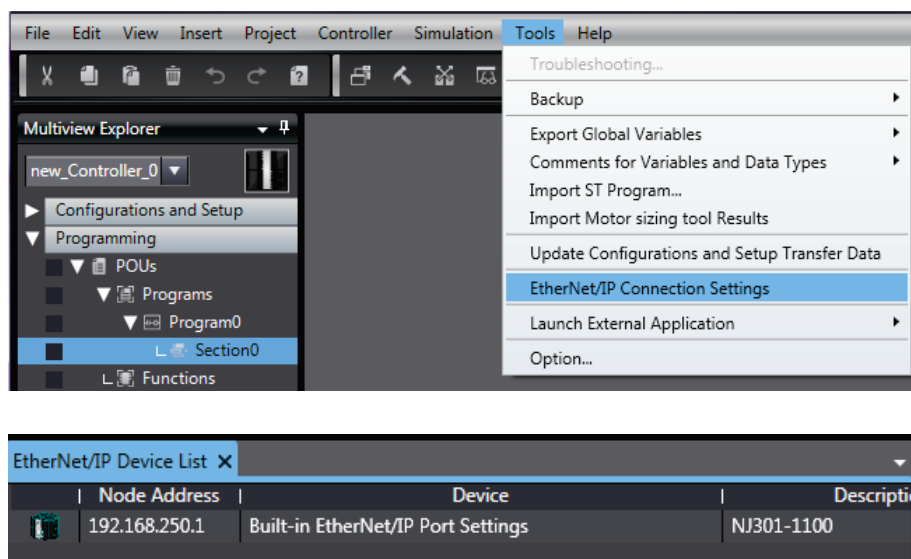


Figure 4-2.

3. Communications Setup:  
Select Controller > Communications Setup.

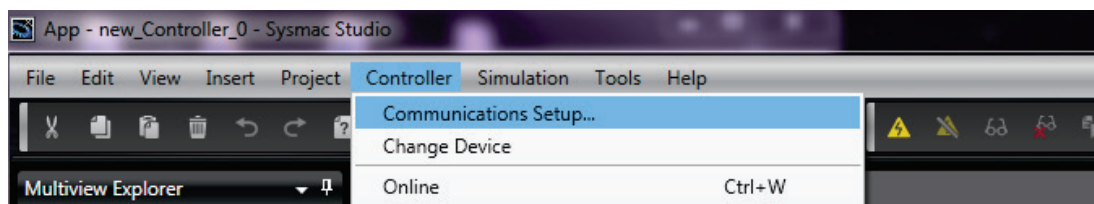


Figure 4-3.

- Connection Type:  
Select **Ethernet connection via a hub**.
- Remote IP Address:  
Set the controller's IP address.  
Make sure the PC IP is in the same subnet.
- Press **Ethernet Communications Test**.  
Wait for the message "Test OK".

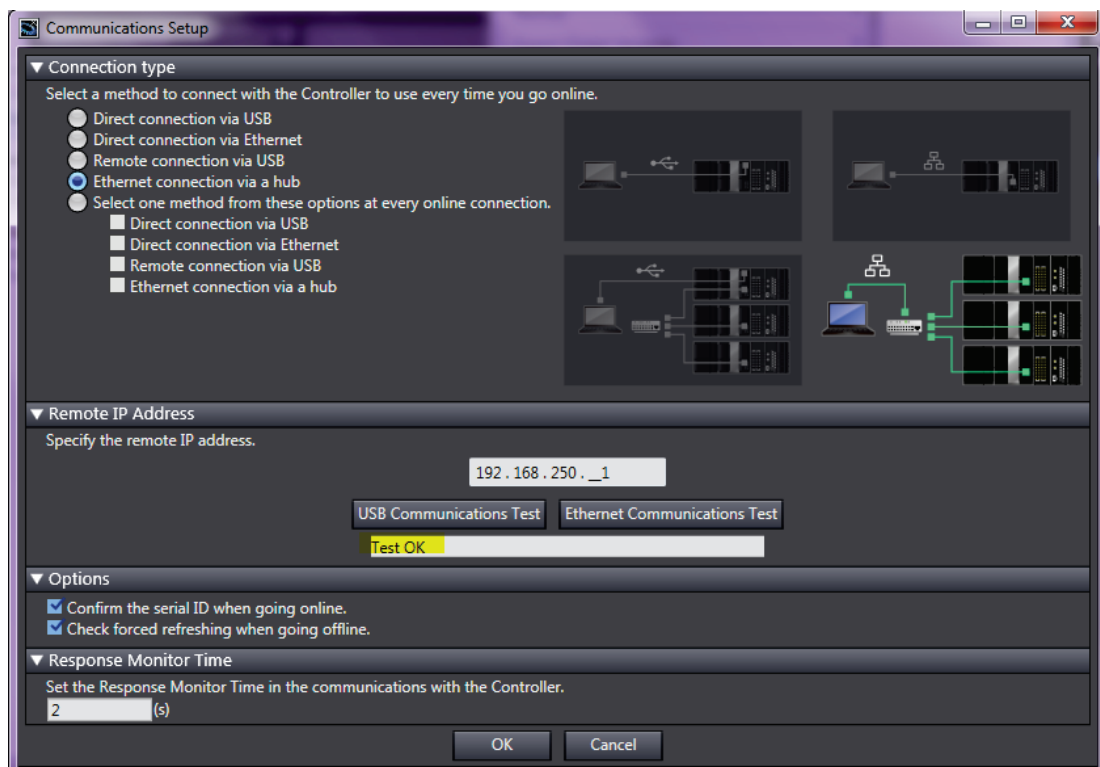


Figure 4-4.

4. EtherCAT Node Device.
  - Select Toolbox > Groups > EtherCAT Drives.
  - Double-click on CDHD2.
5. Change Node Address to 1.
6. Press **Edit PDO Map Settings**.

### Add Touchprobe PDOs:

- 0x60B8 Rx
- 0x60B9 Tx
- 0x60BA Tx

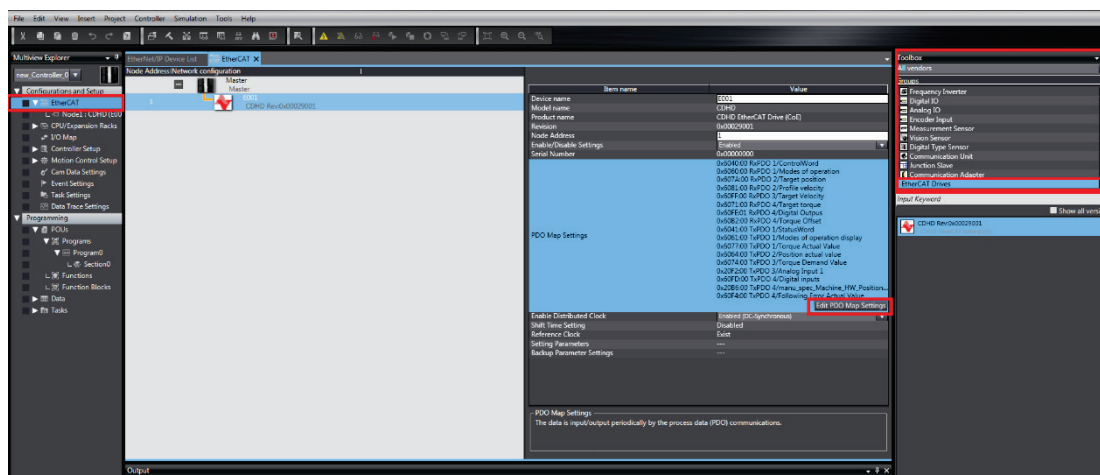


Figure 4-5.

7. Motion Control Setup.
  - Right-click on Axis Settings > Add > Motion Control Axis.
  - Double-click on the new axis, MC\_Axis000 (0), listed under Axis Settings.

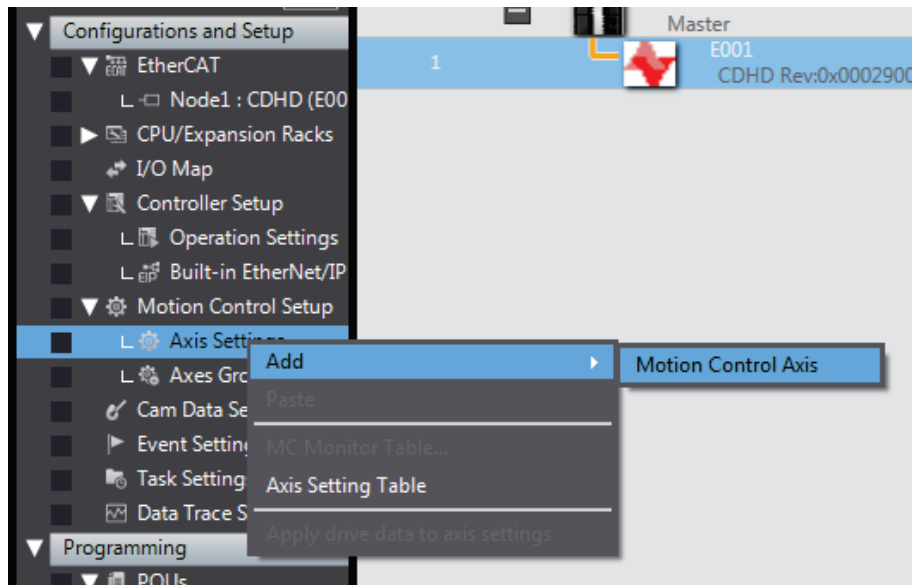


Figure 4-6.

8. Axis Settings.
  - Axis type > Servo axis.
  - Output device 1 > CDHD2.

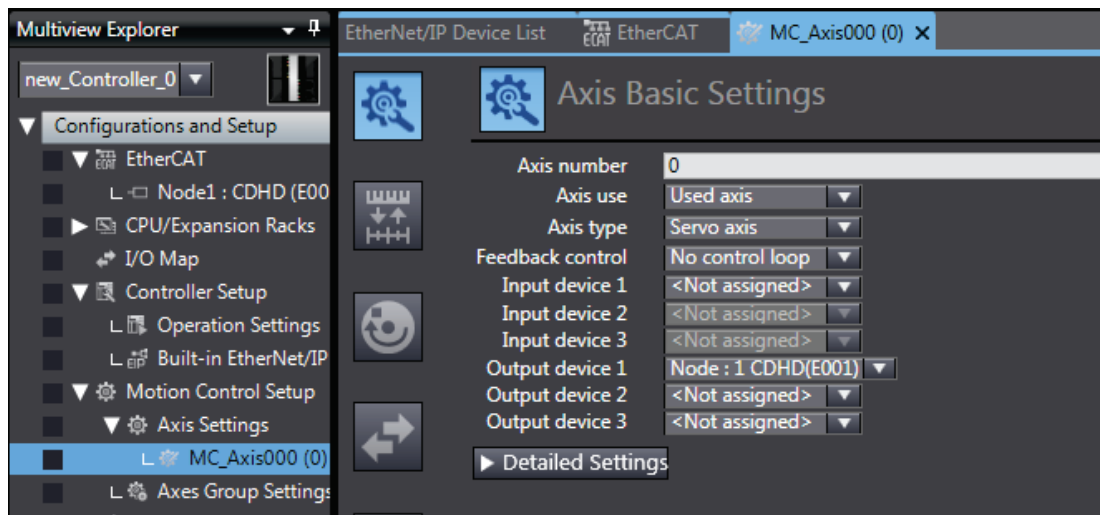


Figure 4-7.



## 9. Detailed Settings.

Set Function Names to the corresponding PDOs (especially touch probe PDOs).

Note that Home Switch is **not** required.

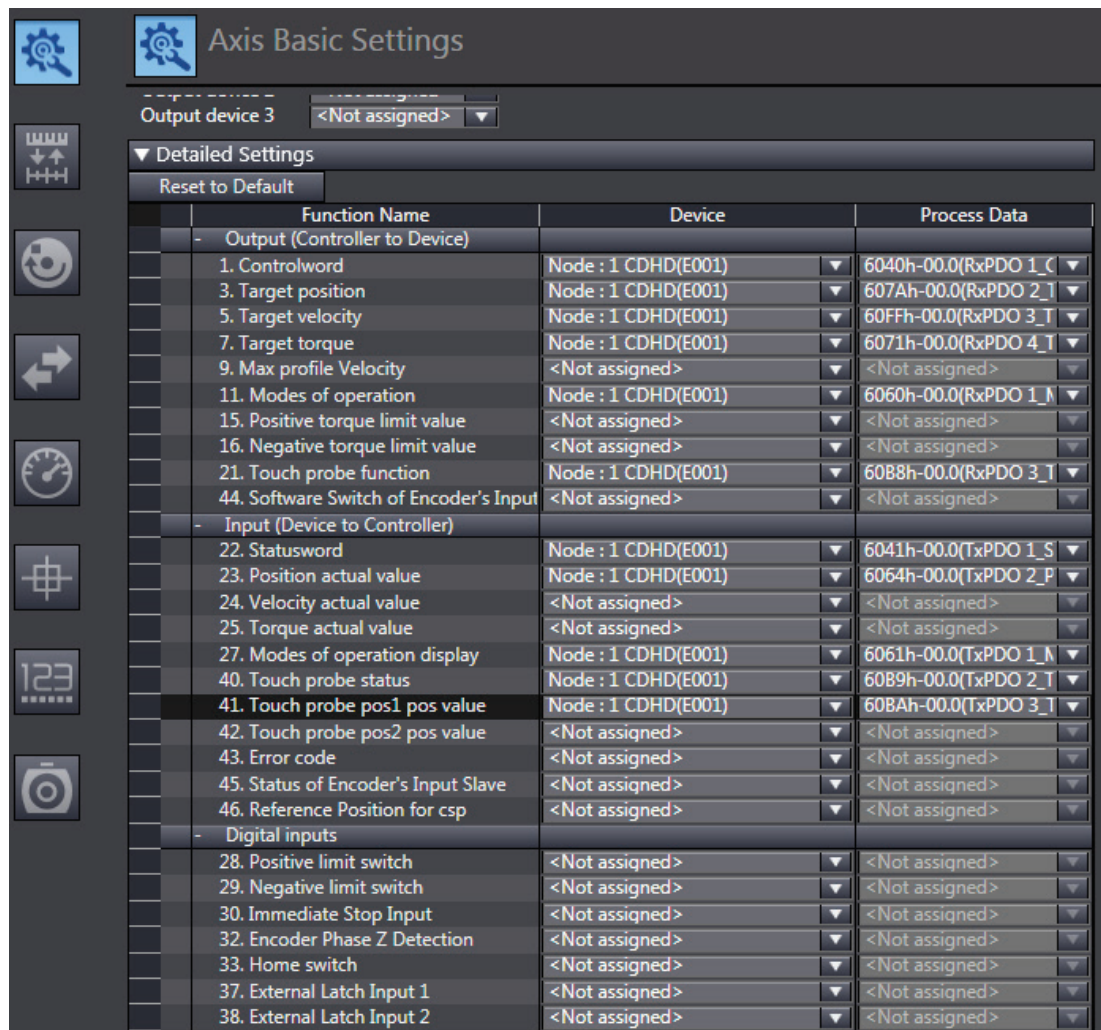


Figure 4-8.

## 5.3 Configure and Perform Homing on Index

### 1. Homing Settings:

For homing on index, use the settings shown in the following screen.

Make sure homing velocities are high enough.

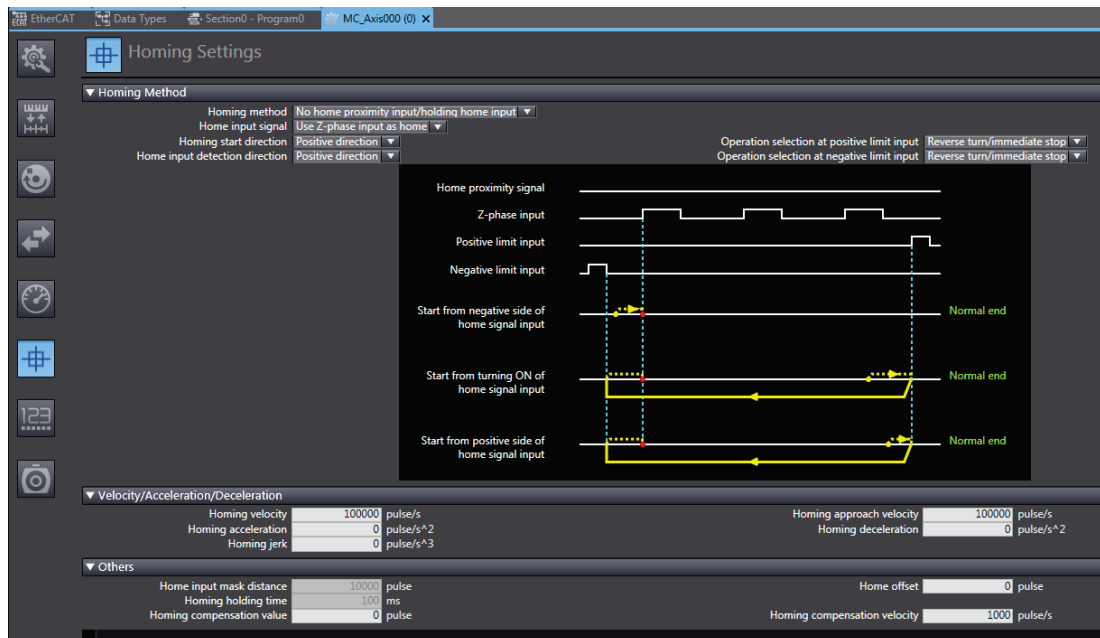


Figure 4-9.

### 2. Section0 tab > right-click on the first line, and select **Insert Function Block**.

Make sure you are working offline.

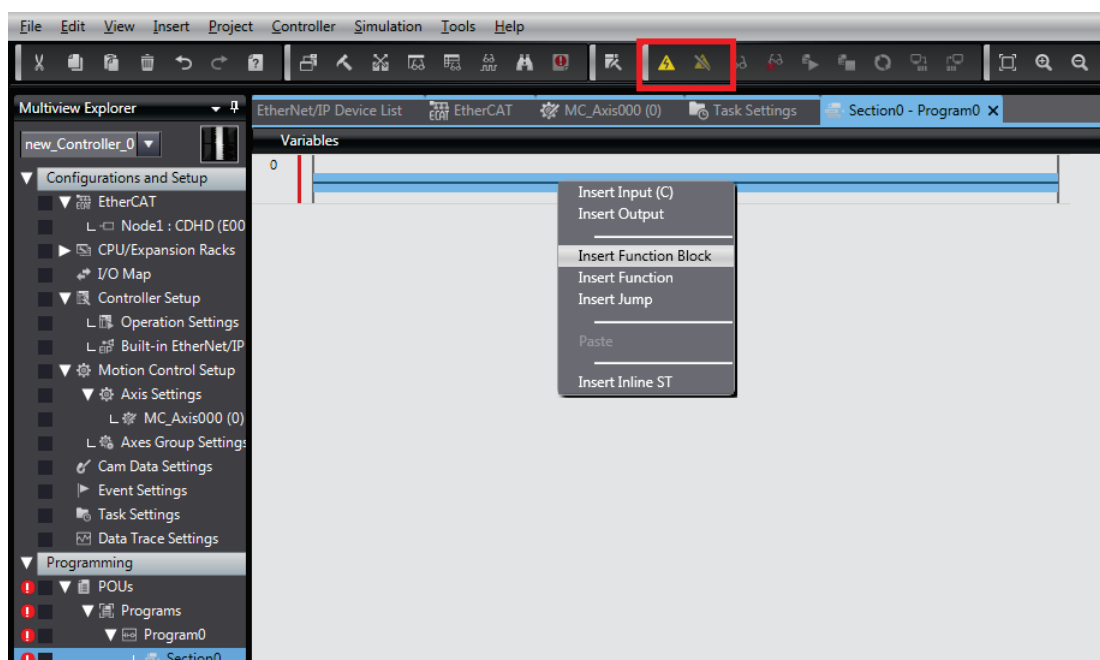


Figure 4-10.

3. Double-click on Variables, and add the parameters shown in the following screen.
4. Build MC\_Power and MC\_Home. Insert inputs and outputs as shown in the screen.

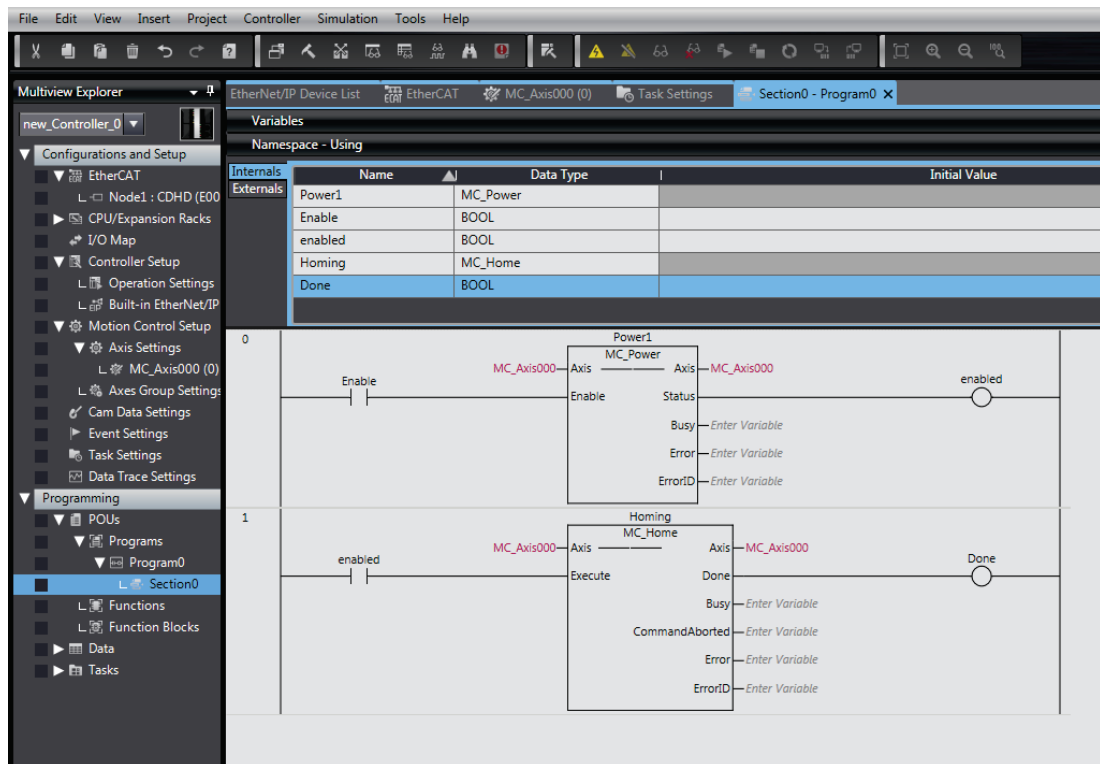


Figure 4-11.

5. Select Project > Build Controller.
- When done, press **Go Online**.

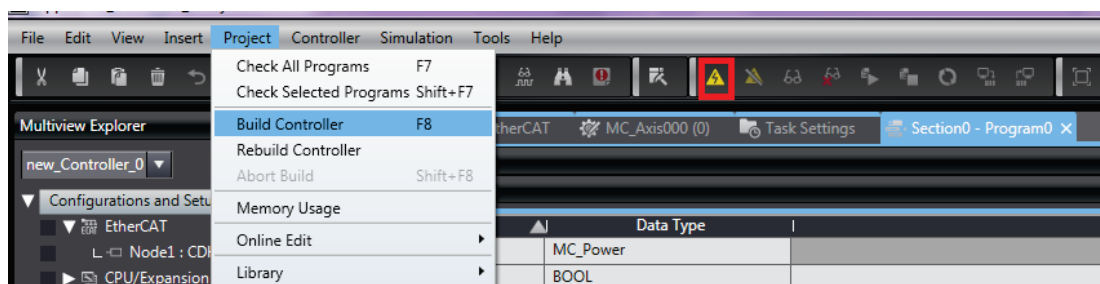


Figure 4-12.

6. Select Controller > Synchronize.

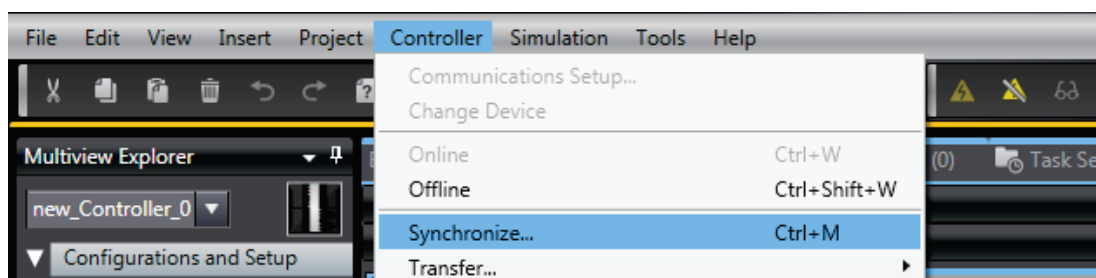


Figure 4-13.

7. Press Transfer to Controller.

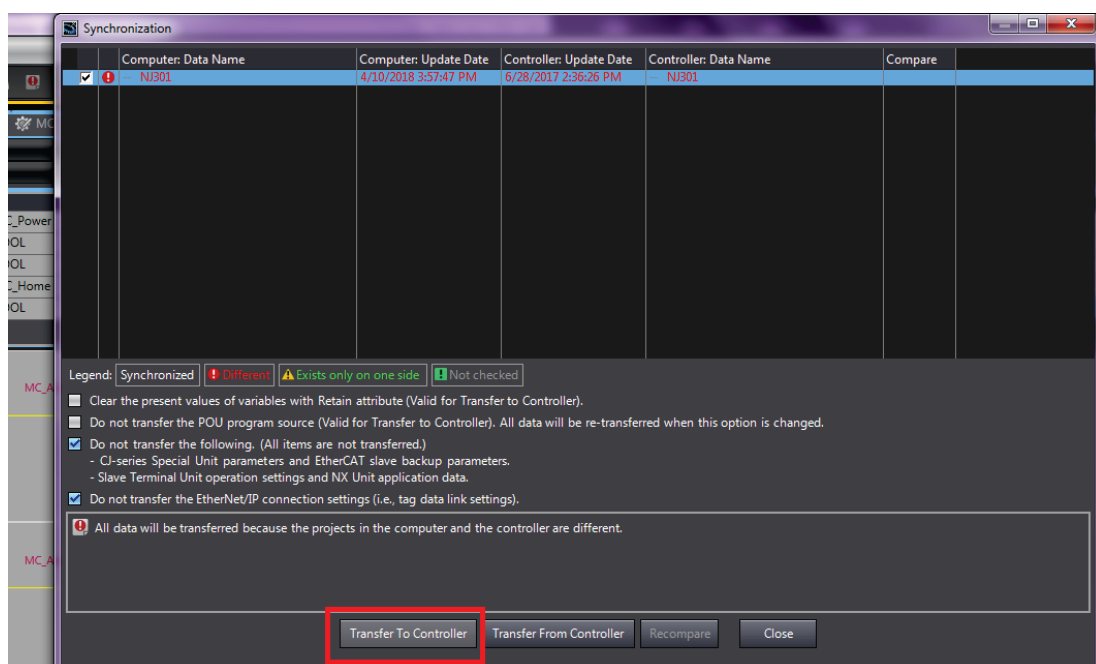


Figure 4-14.

8. Press the Troubleshooting button to check for faults.

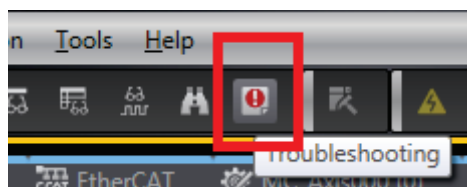


Figure 4-15.

9. In the Troubleshooting screen, press **Reset All** to clear the list of faults.

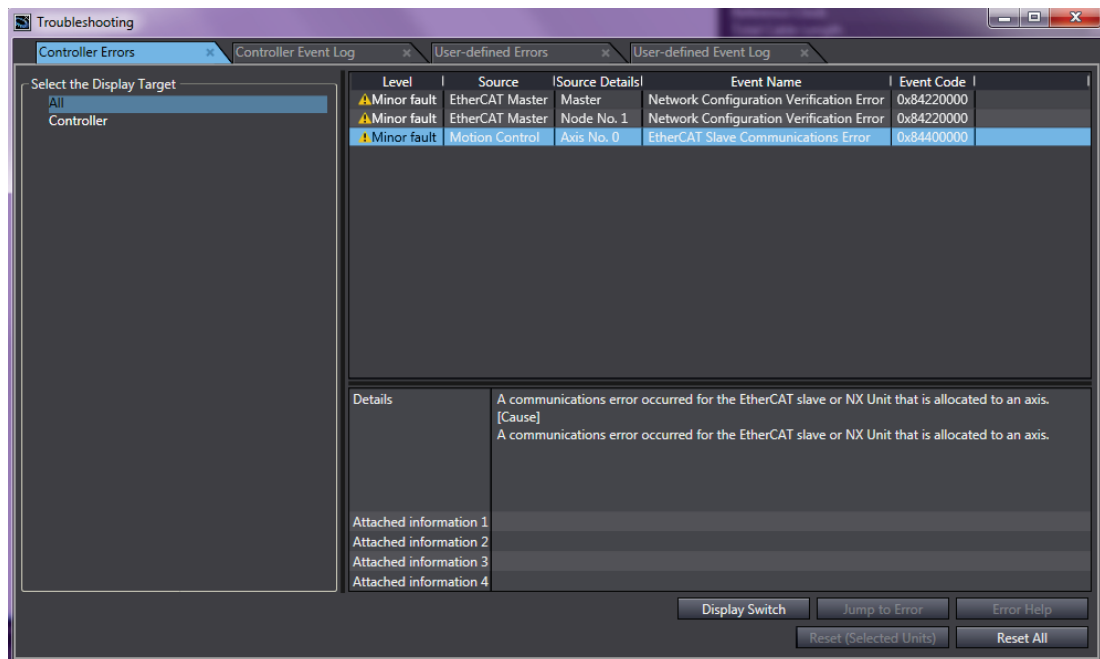


Figure 4-16.

If an address-related error is displayed, update the CDHD2 address:

- EtherCAT tab > right-click on Master > Write Slave Node Address.
- Set Node Address to 1.
- Press **Write**.
- Power cycle the CDHD2.
- In the Troubleshooting screen, press **Reset All** to clear the list of faults.

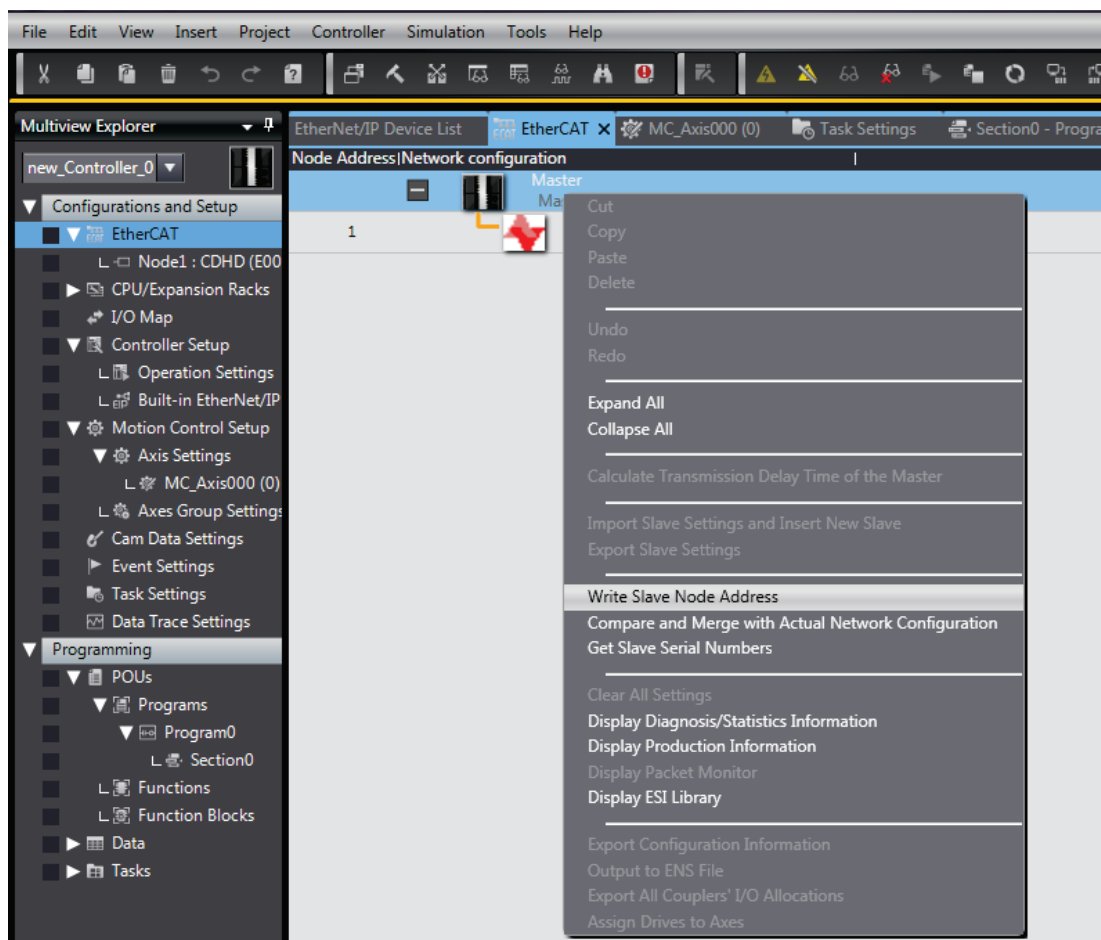


Figure 4-17.

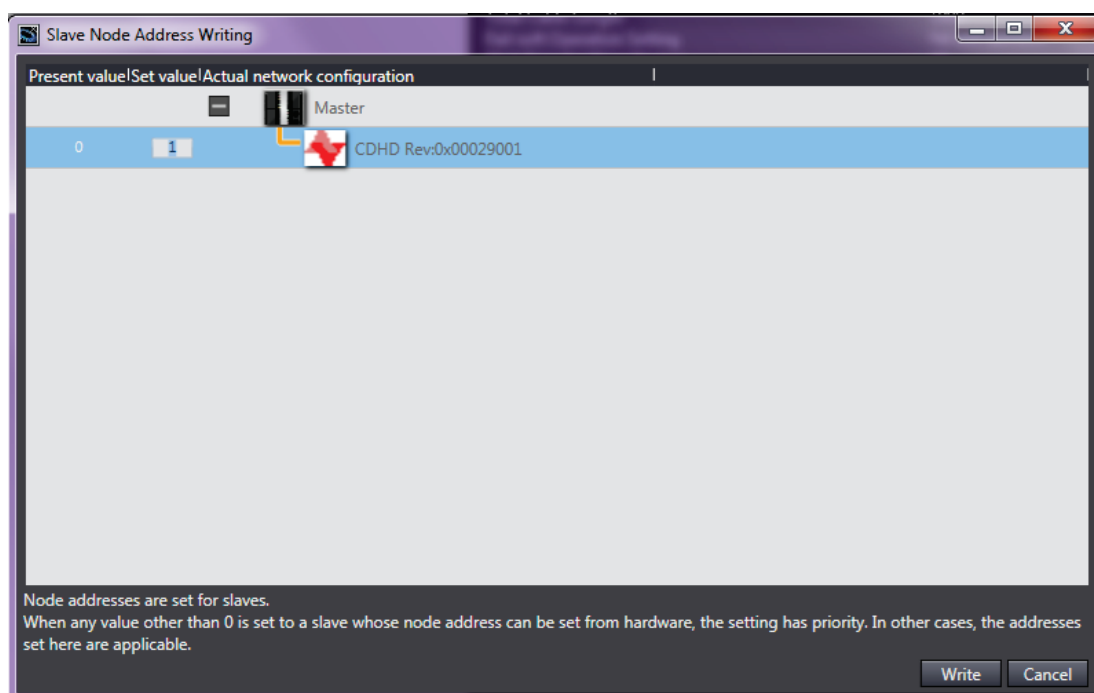


Figure 4-18.

10. Activate Run mode (if not already set):  
Controller > Mode > Run mode.
11. Enable.

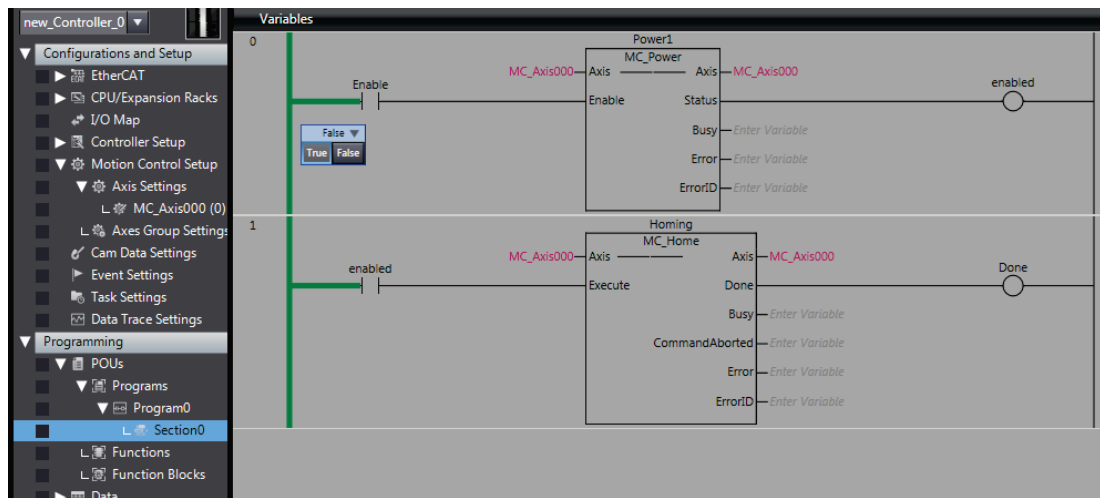


Figure 4-19.

12. Start homing by setting the **Enable** input to **True**.

#### Note

If any changes need to be downloaded for the controller, do the following:

1. Go offline and make the changes.
2. When done editing, go online, and use Controller > Synchronization.
3. In the Troubleshooting screen, press Reset All to clear the list of faults.

## 5.4 Perform Homing on Home Switch

1. To perform homing on a home switch:
  - In Homing Settings, set Home input signal to **Use external home input**.

Note that external home input in OMRON is configured as **touch probe**. It does not relate to the CDHD2 home switch.

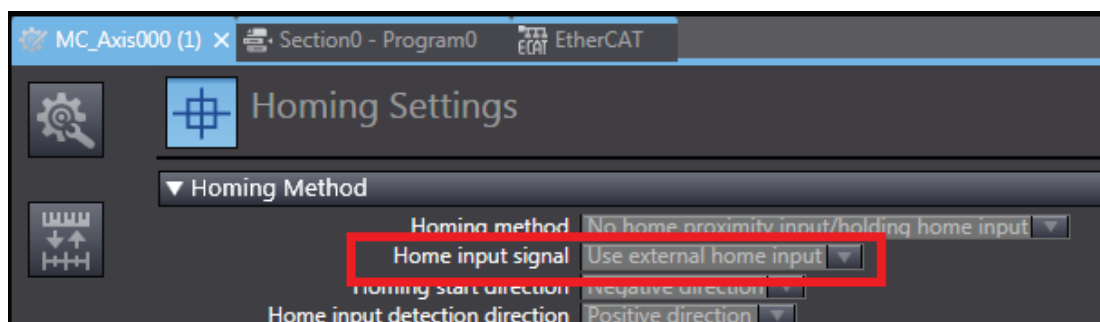


Figure 4-20.

- The only configuration required in CDHD2 is to set the function mode to Touch Probe 1 on the appropriate digital input.

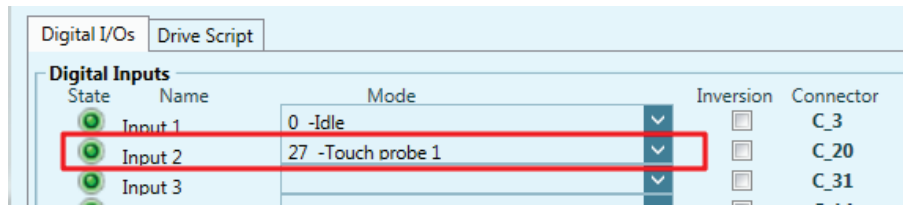


Figure 4-21.

## 5.5 Read SDO

Set global parameters, and monitor and/or modify parameters in the Watch tab:

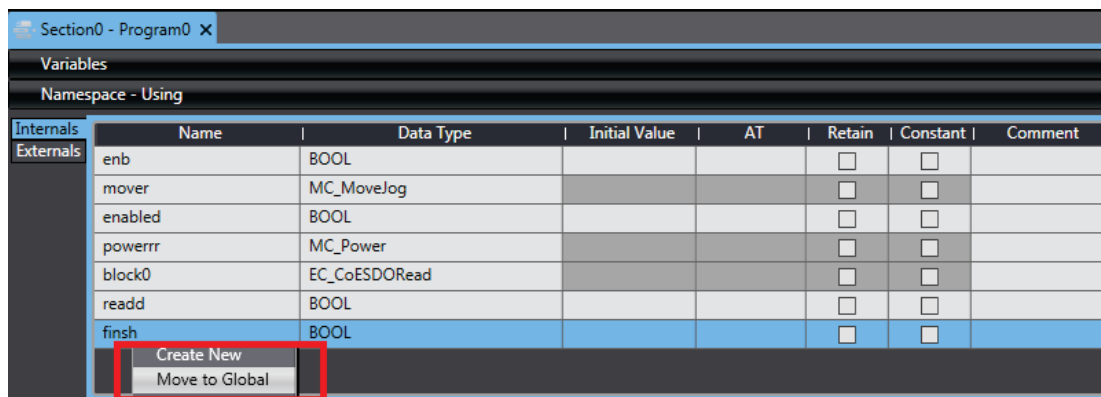


Figure 4-22.

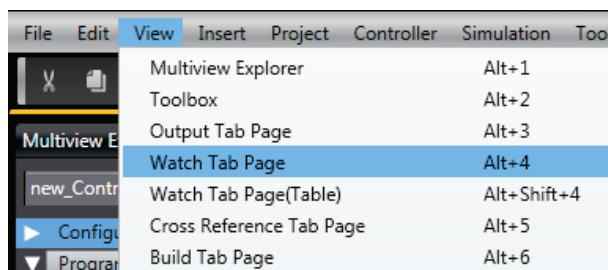


Figure 4-23.



It is also possible to monitor axis properties:

Device name	Name	Online value	Modify	Comment	Data type	AT	Display format
new_Controller_0	MC_Axis000				_sAXIS_REF	MC//_MC_AX[0]	
	▶ Cfg				_sAXIS_REF_CFG		
	▶ Scale				_sAXIS_REF_SCAI		
	▶ Status				_sAXIS_REF_STA		
	▶ Details				_sAXIS_REF_DET		
	▶ Dir				_sAXIS_REF_DIR		
	▶ DrvStatus				_sAXIS_REF_STA		
	▶ Cmd				_sAXIS_REF_CMC		
	▶ Act				_sAXIS_REF_ACT		
	Pos	10973			LREAL		Real
	Vel	0			LREAL		Real
	Trq	0			LREAL		Real
	TimeStamp	0			ULINT		Decimal
	▶ Reserved[0-23]						
	▶ MFaultLvl				_sMC_REF_EVEN		

Figure 4-24.

### 3. Configure the following parameters and function blocks

The screenshot displays the Siemens TIA Portal interface. On the left, the 'Multiview Explorer' shows the project structure. The main workspace shows the 'Section0 - Program0' with a ladder logic diagram. The diagram includes a 'mover' block (MC\_MoveLog) and an 'EC\_CoESDORRead' block. The 'Variables' table at the top lists the following parameters:

Name	Data Type	Constant	Comment
MC_Axis000	_sAXIS_REF	<input checked="" type="checkbox"/>	
READ_DATA	INT	<input type="checkbox"/>	
sdo_obj	_sSDO_ACCESS	<input type="checkbox"/>	
SizeBit	UINT	<input type="checkbox"/>	

The ladder logic diagram shows the following connections:

- Network 1:** The 'enabled' input of the 'mover' block is connected to a normally open contact. The 'Axis' input is connected to 'MC\_Axis000'. The 'PositiveEnable' input is connected to a normally open contact. The 'NegativeEnable' input is connected to a normally open contact. The 'CommandAborted' input is connected to a normally open contact. The 'Velocity' input is connected to '10000'. The 'Acceleration' input is connected to '10000'. The 'Deceleration' input is connected to '100000'.
- Network 2:** The 'readdd' input of the 'EC\_CoESDORRead' block is connected to a normally open contact. The 'NodeAdr' input is connected to '1'. The 'SdoObj' input is connected to 'sdo\_obj'. The 'TimeOut' input is connected to '2000'. The 'ReadDat' input is connected to 'READ\_DATA'. The 'ReadSize' input is connected to 'SizeBit'. The 'Done' output is connected to a coil. The 'Error' output is connected to a coil. The 'ErrorID' output is connected to a coil. The 'AbortCode' output is connected to a coil.

The 'Watch (Project1)' table at the bottom shows the current values of the variables:

Device name	Name	Online value	Modify	Comment	Data type	AT	Display format
new_Controller_0	MC_Axis000				_sAXIS_REF	MC//_MC_AX[0]	
new_Controller_0	sdo_obj.Index	6060	6060		UINT		Hexadecimal
new_Controller_0	sdo_obj.Subindex	0			USINT		Decimal
new_Controller_0	SizeBit	1			UINT		Decimal
new_Controller_0	READ_DATA	8			INT		Decimal

Figure 4-25.

## 6. 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 Servotronix 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.

## 7. CANopen Operation

### 7.1 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)

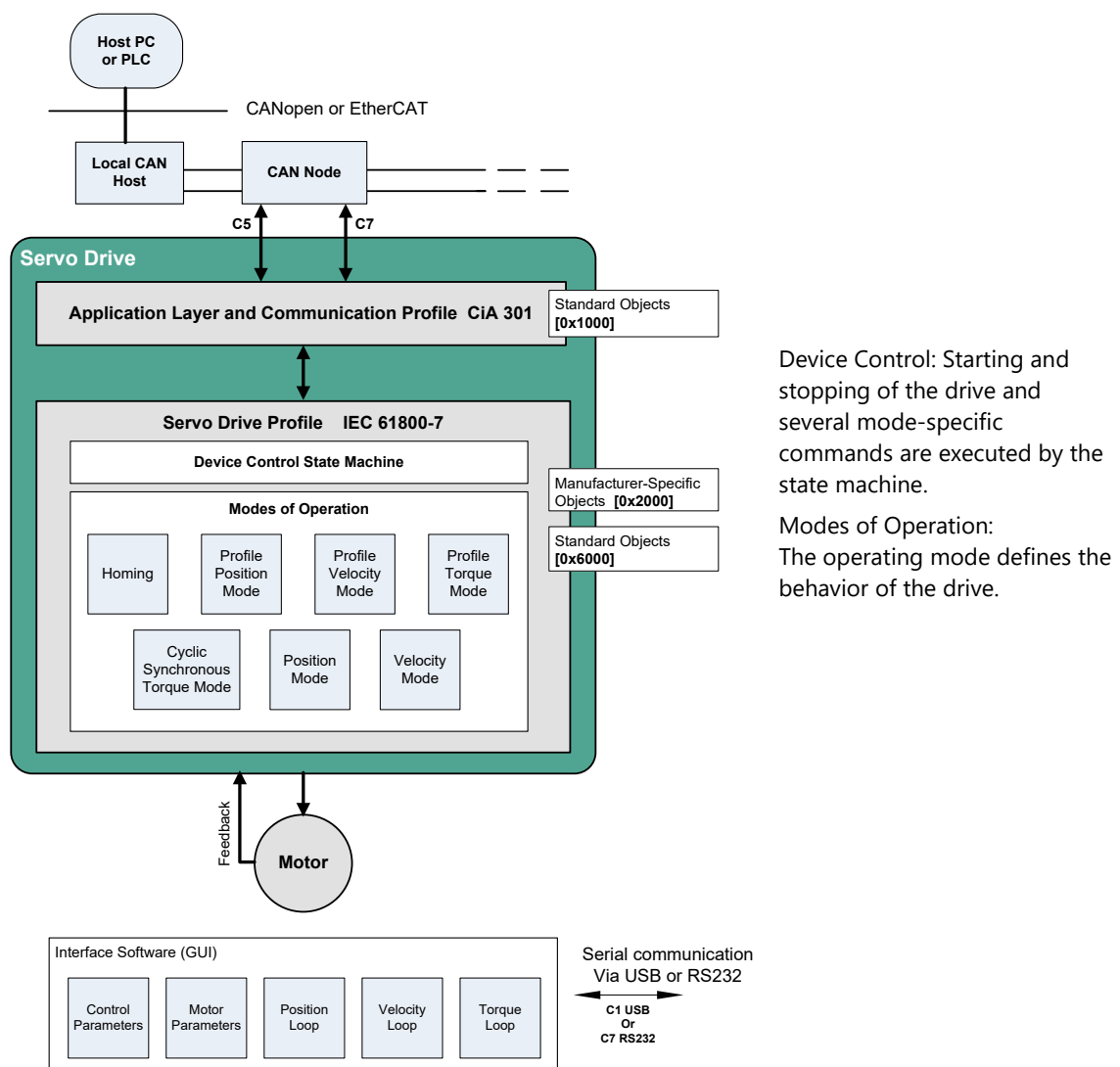


Figure 6-1. Communication Architecture

## 7.2 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.

### 7.2.1 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).

### 7.2.2 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

### 7.3 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.

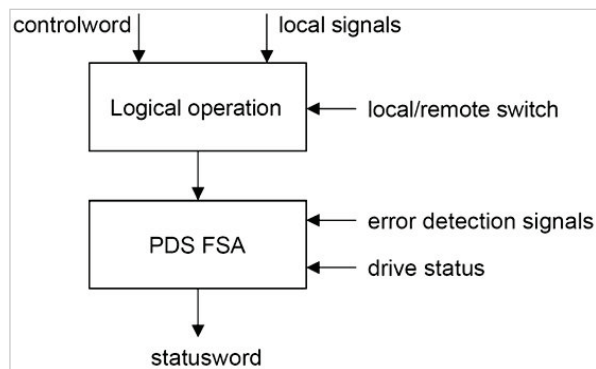


Figure 6-2. Remote and Local Control

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.

## 7.4 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.

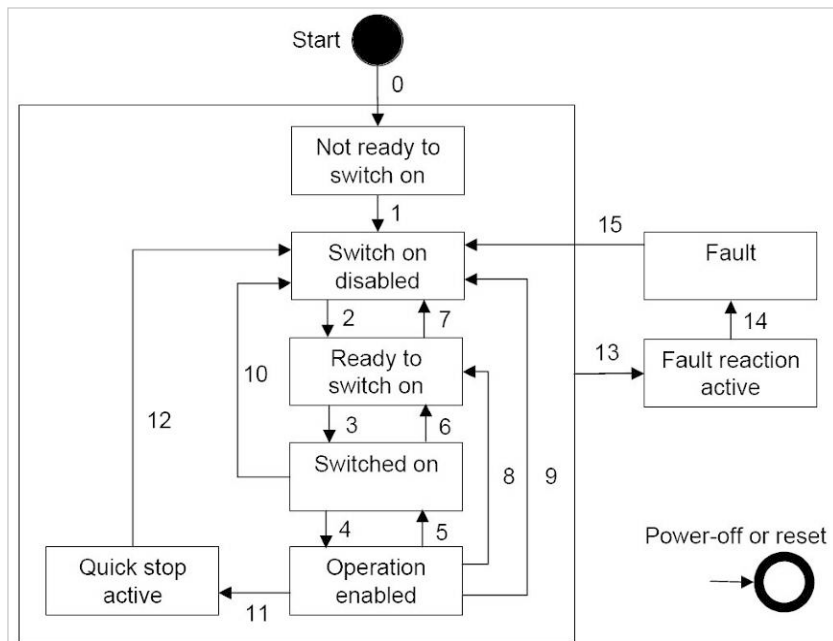


Figure 6-3. Power Drive System State Diagram

### 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: Switch On Disabled	Bit 5: Quick Stop	Bit 3: Fault	Bit 2: Operation Enabled	Bit 1: Switch On	Bit 0: Ready to Switch 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 R/W
<b>Statusword</b>	Bits 0–3 = Status bits Bit 4 = Voltage enabled Bits 5–6 = Status bits Bit 7 = Warning Bit 8 = Reserved Bit 9 = Remote Bit 10 = Target reached Bit 11 = Internal limit is active Bit 12 = Operating mode-specific Bit 13 = Operating mode-specific Bit 14 = Manufacturer-specific Bit 15 = Manufacturer-specific	Unsigned16 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.



## 7.5 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 Bit 1 = Enable Voltage Bit 2 = Quick Stop Bit 3 = Enable Operation Bits 4–6 = Operating Mode specific Bit 7 = Fault Reset Bit 8 = Halt Bit 9 = Reserved Bits 10–15 = Reserved (must be 0) Changed settings become active immediately.	Unsigned16 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 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.

## 7.6 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
<b>Mode of operation</b>	Operating mode	Integer8
	1 Profile Position	Read/Write
	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
<b>Mode of operation</b>	Operating mode	Integer8
	1 Profile Position	Read/Write
	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.	

## 7.7 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 6092h	1	Numerator (Position factor)	R_PDO	Unsigned32	Immediately
6091h 6092h	2	Speed constant (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: Change Set Point Immediately	Bit 4: New Target Value	Meaning
0	0 » 1	Starts a movement to a target position. 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. 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 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 1 = Target position reached
Bit 12 = Target value acknowledge	0 = New position possible 1 = New target position accepted
Bit 13 = Following error bit	0 = No following error 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 601 / 23 7A 60 00 A0 0F 00 00
« 581 / 60 7A 60 00 00 00 00 00
» NMT Start remote node 0 / 01 00
« T_PDO2 with Statusword 281 / 31 66 00 00 00 00 00
» Enable power stage with R_PDO1 201 / 00 00 00 00 00 00 00 201 / 06 00 00 00 00 00 00 201 / 0F 00 00 00 00 00 00
« T_PDO1 (operating state: 6 Operation Enabled) 181 / 37 42 00 00 00 00 00
» Starting the operating mode 601 / 2F 60 60 00 01 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 01 61 08 00
» Issue a move command 601 / 23 40 60 00 00 00 00 1F
« 581 / 60 40 60 00 00 00 00 00

## 7.8 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 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 100 601 / 23 99 60 01 64 00 00 00
« 581 / 60 99 60 01 00 00 00 00
» Velocity for moving away from switch to 10 601 / 23 99 60 02 0A 00 00 00
« 581 / 60 99 60 02 00 00 00 00
» NMT Start remote node 0 / 01 00
« T_PDO1 with Statusword 181 / 31 62
» Enable power stage with R_PDO1 201 / 00 00 201 / 06 00 201 / 0F 00
« T_PDO1 (operating state: 6 operation enabled) 181 / 37 42
» Starting the operating mode 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 581 / 4F 61 60 00 06 61 01 00

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



## 7.9 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 1 = Target velocity reached
Bit 12 = Velocity	0 = Velocity > 0 1 = Velocity = 0
Bit 14 = Manufacturer-specific	
Bit 15 = Manufacturer-specific	

## Example Node Address 1

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

Work Step	
COB ID / Data	
»	R_PDO3: Specification of target velocity 1000 301 / E8 03 00 00
«	T_PDO2 with Statusword and velocity actual value 381 / 37 02 00 00 00 00
«	Target velocity reached 381 / 37 06 E8 03 00 00
»	Terminate operating mode with Quick Stop with R_PDO3 401 / 0B 00 00 00 00 00
«	T_PDO3 with Statusword 381 / 17 66 00 00 00 00
»	Clear Quick Stop with R_PDO3 401 / 0F 00 00 00 00 00
«	T_PDO3 with Statusword 381 / 37 46 00 00 00 00

## 7.10 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 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 00 201 / 06 00 201 / 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 201 / 0F 00
«	T_PDO1 with Statusword 181 / 37 46

## 7.11 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 (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: New Target Value	Meaning
0 » 1	Starts a movement to a target position. 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 1 = Target position reached
Bit 12 = Target value acknowledge	0 = New position possible 1 = New target position accepted
Bit 13 = Following error bit	0 = No following error 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

## 7.12 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 (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 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* 601 : sD : 40 61 60 00 00 00 00 00
« 581 : sD : 4f 61 60 00 08 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

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

## 7.13 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 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* 601 : sD : 40 61 60 00 00 00 00 00
« 581 : sD : 4f 61 60 00 09 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 velocity via PDO 401 : sD : 64 00 00 00

## 7.14 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 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 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 torque via PDO 501 : sD : 64 00 00 00

## 7.15 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).



## 8. Units

### 8.1 Units Overview

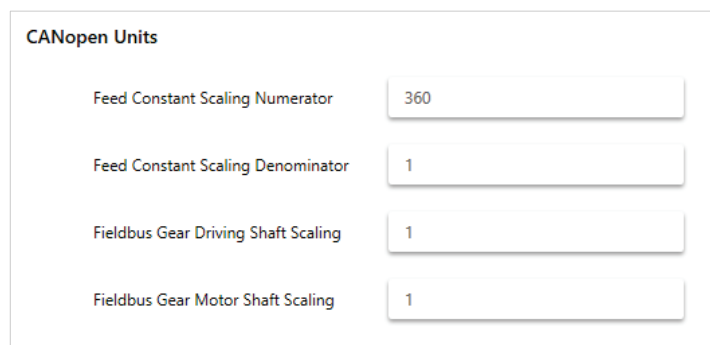
CiA and ETG standards provide two objects for setting the gear ratio and the feed constant conversion factors, each of which has two sub-indices.

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 the 'CANopen Units' configuration window. It contains four labeled input fields, each with a numerical value:

- 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

### 8.2 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 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 position units = 1 motor revolution.

### 8.2.1 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.

### 8.3 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:

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

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

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

$$6092\text{h sub-index } 2 = 1$$

Therefore:

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

That is, 1048576 velocity units = 1 rps

### 8.4 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:

$$6091\text{h sub-index } 1 = 1,048,576$$

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

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

$$6092\text{h sub-index } 2 = 1$$

Therefore:

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

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

## 8.5 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

## 8.6 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

## 8.7 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.

## 8.8 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

CAN Object	Parameter	Value
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.

## 9. 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 – 005 006 – 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). If bit 30 is set to high, the device generates a SYNC message to be used by the drive. 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. 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. 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. 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. 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> Controls the saving of parameters in non-volatile memory. Writing 65766173h (ASCII value of "save") to the sub-index saves the parameters. Several parameter groups are distinguished. 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> Loads the default values of parameters. Writing 64616F6Ch (ASCII value of "load") to the sub-index restores the parameters. Several parameter groups are distinguished. Sub-index 1 - All parameters Sub-index 2 - Communication parameters Sub-index 3 - Application parameters 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). 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. bits 31 - 24 of each sub-index must be 0. bits 23 - 16 contain the node ID. 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	-

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

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

## 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 0x000002EC = drive model EC 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. 0 - SYNC message transmitted with length 0 1 - Reserved 2..240 - SYNC message transmitted with length 1, first data byte contains the counter value 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. Sub-index 0 - Defines the number of PDO parameters implemented. Sub-index 1 - Defines the COB ID. If bit 31 is set, the PDO is disabled. Sub-index 2 - Defines the transmission type. Sub-index 3 - Defines the inhibit time, in 100 microseconds. 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 µs

## 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. Sub-index 0 - Defines the number of PDO parameters implemented. Sub-index 1 - Defines the COB ID. If bit 31 is set, the PDO is disabled. Sub-index 2 - Defines the transmission type. Sub-index 3 - Defines the inhibit time, in 100 microseconds. 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. Sub-index 0 - Defines the number of PDO parameters implemented. Sub-index 1 - Defines the COB ID. If bit 31 is set, the PDO is disabled. Sub-index 2 - Defines the transmission type. Sub-index 3 - Defines the inhibit time, in 100 microseconds. 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 µs

## 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. Sub-index 0 - Defines the number of PDO parameters implemented. Sub-index 1 - Defines the COB ID. If bit 31 is set, the PDO is disabled. Sub-index 2 - Defines the transmission type. Sub-index 3 - Defines the inhibit time, in 100 microseconds. 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 $\mu$ s

## 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>	-

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<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>	-

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<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>	-



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<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. 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 $\mu$ s

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<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

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<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.</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>	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 $\mu$ s

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<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 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 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 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 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 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 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 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. The default configuration is the following: 1 - Mailbox receive 2 - Mailbox send 3 - Process data output 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

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# 10. Manufacturer-Specific Objects

## 2002h: Configuration Command

### Object Description

Index	<a href="#">VarCom - CONFIG</a> Performs a configuration sequence of the drive according to its internal parameters. 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> 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> 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> 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> 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> 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> 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> The type of automatic homing to be performed on power up. Possible values: 0 = No Homing 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> 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> 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. 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> 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> 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> 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> 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> 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> The HD control equivalent of PID I. 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> The HD control equivalent of PID D and I. 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> The HD control equivalent of PID P. 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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	-

## 2040h: Phase Disconnect Scan

### Object Description

Index	2040
Description	<a href="#">VarCom - MOTORPHASESCAN</a> Enables/disables detection of wire breaks in motor phases.
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

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

## 2041h: Motor Setup

### Object Description

Index	2041
Description	<a href="#">VarCom - MOTORSETUP</a> Runs an automatic procedure for setting commutation related variables. 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> 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> 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> The drive temperature in Celsius degrees. Sub-index 1 - Control board temperature. Sub-index 2 - Power board temperature. 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> 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> 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> 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> 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> 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> Restores all configuration variables to factory default settings. 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> 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> 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> 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> 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> 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> The current added to the current command when commanded velocity is negative. 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> The current added to the current command when commanded velocity is positive. 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> 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> 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> The state of the Hall commutation sensors. Sub-index 1 - Hall U Sub-index 2 - Hall V 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> Inverts the polarity of the Hall signals associated with motor phases UVW. Sub-index 1, value 1 = inverts Hall U Sub-index 2, value 1 = inverts Hall V 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> 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. 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. 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. 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. 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> 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> 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> 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> Instructs motor whether to maintain its position. 0 = Do not hold position 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> 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> 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	0xFFFFFFFFFFFFFFF
Unit	-

## 2066h: Current D Axis

### Object Description

Index	2066
Description	<a href="#">VarCom - ID</a> 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> In vector control, indicates the current for the torque. 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> 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> 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> 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> The current threshold level for declaring a warning due to foldback. 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> 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> 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> The inversion state of each digital input. Write the index first. Write the value to the input sub-index to execute the input inversion. 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: Dynanic Brake Current

### Object Description

Index	2071
Description	<a href="#">VarCom - ISTOP</a> The maximum current allowed during the dynamic braking process. 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> The rated peak current of the drive (sinusoidal peak). 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> The continuous rated current for the drive (sinusoidal peak). 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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 - ESTOPLIM</a> The current limit during an emergency or controlled stop. 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> The inversion state of each digital output. Write the index first. Then write the value to the output index execute the output inversion. 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**

<b>Index</b>	209C
<b>Description</b>	<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>
<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>	0x0002
<b>Lower Limit</b>	0x0002
<b>Upper Limit</b>	0x0002
<b>Unit</b>	-

<b>Sub-Index</b>	001
<b>Description</b>	Output 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>	0x0000
<b>Upper Limit</b>	0xFFFF
<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>	0x0000
<b>Lower Limit</b>	0x0000
<b>Upper Limit</b>	0xFFFF
<b>Unit</b>	-

## 209Dh: Position Level 1 for Digital Output Definition

### Object Description

Index	209D
Description	<a href="#">VarCom - OUTPLVL1</a> 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> 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> 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> 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> 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> 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> 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> Starts a procedure that initializes commutation for incremental encoder systems. 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> 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> 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> Adjusts the current of the phase finding mechanism. 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> Indicates the state of the commutation Phase Find procedure for incremental encoders. Possible values: 0 = Not started 1 = Running 2 = Succeeded 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> 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> Defines the type of position loop controller. Possible values: 0 = Linear control loop 1 = HD control loop; for backward compatibility only 2 = HD control loop with 250 s sample rate 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> 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> Defines the frequency for PRB excitation. For pseudo binary noise (208Fh sub-index 1= 0,1), this object has no effect. 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> Defines if and how the PRB signal generator is activated. Possible values: 0 = PRB generator not activated 1 = PRB generator activated only during recording 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> PRB generator configuration: Signal Type: 0 = 8 bit random noise 1 = 10 bit random noise 2 = Sine wave 3 = Square wave Current Amplitude is limited by Max Current (6073h). Velocity Amplitude is limited by Max Profile Velocity (607Fh). 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> 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> 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> 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> 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> Indicates whether the position error is within the allowed tolerance. 0 = Not in position 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> The position as measured by an external feedback device (DSP);. 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 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> The state of the fault relay. 0 = Relay open 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> 0 = Relay opens upon fault 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> The state of the external hardware enable input. 0 = Remote enable input off. 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> 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> 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. Copies all system configuration variables from working RAM to non-volatile memory. 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> 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> 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> 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> 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> 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> The state of the motor thermostat input that indicates an over-temperature condition. 0 =     Thermostat input closed (normal) or ignored when Motor Over-Temperature Mode (20C6h) = 3. 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> 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> Defines how the drive will respond to an over-temperature fault. Possible values: 0 = Disable drive immediately 3 = Ignore thermostat input 4 = Issue warning only 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> 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> 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> 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> The type of motor temperature sensor. 0 = Positive temperature coefficient (PTC) 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> Resets the counter of a Tamagawa multi-turn encoder. 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> The total elapsed run time of the drive since production. 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> Defines how the drive will respond to an under-voltage fault. Possible values: 0 = Latches fault immediately if drive disabled or enabled. 1 = Issues warning if drive enabled. Ignores if drive disabled. 2 = Issues warning if drive enabled, then waits Under-Voltage Time (20Dh) before latching the fault. Ignores if drive disabled. 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> Defines how the drive will recover from an under voltage fault. 0 = Recovers by toggling drive from disable to enable condition after the under voltage condition clears. 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> 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> 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> 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> 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> Defines the type of velocity loop controller. Possible values: 0 = PI controller (uses 2026h, 2027h) 1 = PDFF controller (uses 2025h, 2026h, 2027h) 2 = Standard pole placement controller (uses 2037h, 2039h, 2010h, 207Ah, 20C3h) 7 = HD velocity loop with integrator (uses 2017h, 201Ah) 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> Velocity design structure. 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. 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> Defines the type of filter for extracting a velocity signal from the position feedback. 0 = No filter 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> 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> 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> 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>	-

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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> 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>	-



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<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>	-

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<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_Polynomial_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> 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>	-

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<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>	-

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<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>	-

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<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>	-

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<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> 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> 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> 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> 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><a href="#">VarCom - INMODE</a></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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> The value of analog input 1.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	Read Only
PDO Mapping	CAN: Yes 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> 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> 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> 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> 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> 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> 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> The value of analog input 2.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	Read Only
PDO Mapping	CAN: Yes 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> 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> 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> 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> 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> 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> Defines the function of analog input 2. Possible values: -1= Hardware defined dual gain. ANIN2 is inactive, ANIN1 has a 16 bit resolution, ANIN2MODE is read only. 0 = Idle. ANIN2 input voltage is read only. 1 = Dual gain. External jumper connection between the analog inputs is required. 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> 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> 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> The type of current control loop. 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> 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> 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> 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> 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> 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> 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> 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> Generates a step or square wave velocity command. Sub-index 1 - Duration1 Sub-index 2 - Velocity1 Sub-index 3 - Duration2 Sub-index 4 - Velocity2 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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	VarCom - GEAROUT 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) 0 = bit 4 in controlword can be written in operational state only. 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> 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> 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> 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> The analog output value set by user.
Object Code	Variable
Data Type	INTEGER32

### Entry Description

Access	CAN: SDO: Read/Write PDO: Write ECT: Read/Write
PDO Mapping	CAN: Yes 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> 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> 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> 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> 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	VarCom - SFBTYPE 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	VarCom - LMUNITSNUM 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> 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> 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 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> 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 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> 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 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 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 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> 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 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 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 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. bit 0: Position bit 1: Position error bit 2: Velocity bit 3: Current 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> 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> The minimum length of time required for a stable input level after a trigger event. 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> 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	-



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<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> Enables/disables the position modulo. 0 = Normal operation 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> 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> 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> Resets the counter of a Sankyo multi-turn encoder. 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> 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> 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 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> Returns the value of the analog input 2 voltage converted into a user-defined unit. The conversion for ANIN2USER is as follows: $\text{ANIN2USER} = \text{ANIN2} \times (\text{ANIN2USERNUM}/\text{ANIN2USERDEN}) + \text{ANIN2USEROFFSET}$
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> The denominator value in the ANIN2USER equation: $\text{ANIN2USER} = \text{ANIN2} \times (\text{ANIN2USERNUM}/\text{ANIN2USERDEN}) + \text{ANIN2USEROFFSET}$
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> The numerator value in the ANIN2USER equation: $\text{ANIN2USER} = \text{ANIN2} \times (\text{ANIN2USERNUM}/\text{ANIN2USERDEN}) + \text{ANIN2USEROFFSET}$ 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> The offset value in the ANIN2USER equation: $\text{ANIN2USER} = \text{ANIN2} \times (\text{ANIN2USERNUM}/\text{ANIN2USERDEN}) + \text{ANIN2USEROFFSET}$
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> 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	<p><a href="#">VarCom - HALLSONLYCOMM</a>  Defines Halls-only commutation.</p> <p>0 = Six-step commutation with MPHASE correction (backward compatible).</p> <p>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.</p>
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 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> Returns the motor phase degree after a successful zeroing command. -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> 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. Sub-index 1 - Control board 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> 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 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 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 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 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 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 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 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> 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/Write
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 - IGNOREBATFLT</a> Defines whether the drive will respond to an encoder battery voltage warning or fault. 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> 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> 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> 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> 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> 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> 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	Defines the behavior of the linear position controller proportional gain (KPP). 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> Configures the Position-Compare Trigger Output (PCOM) module 1.
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read/Write
PDO Mapping	CAN: Yes 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> Configures the Position-Compare Trigger Output (PCOM) module 2.
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read/Write
PDO Mapping	CAN: Yes 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> PCOM Actual Status 1
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read Only
PDO Mapping	CAN: Yes 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> PCOM Actual Status 2
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read Only
PDO Mapping	CAN: Yes 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> 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> The acceleration value according to the feedback device on the motor.
Object Code	Variable
Data Type	UNSIGNED32

### Entry Description

Access	CAN: SDO: Read/Write PDO: Write 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> The acceleration value according to the feedback device on the load.
Object Code	Variable
Data Type	UNSIGNED32

### Entry Description

Access	CAN: SDO: Read/Write PDO: Write 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> The deceleration value according to the feedback device on the motor.
Object Code	Variable
Data Type	UNSIGNED32

### Entry Description

Access	CAN: SDO: Read/Write PDO: Write ECT: Read/Write
PDO Mapping	No
Default Value	0x00000001
Lower Limit	0x00000001
Upper Limit	0xFFFFFFFF
Unit	CAN user acc/dec units

## 21ABh: Secondary Feedback Deceleration

### Object Description

Index	21AB
Description	<a href="#">VarCom – SFBDEC</a> The deceleration value according to the feedback device on the load.
Object Code	Variable
Data Type	UNSIGNED32

### Entry Description

Access	CAN: SDO: Read/Write PDO: Write 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> 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>	-

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<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. Sub-index 1 - <a href="#">VarCom - GANTRYMSTRPFB</a> Sub-index 2 - <a href="#">VarCom - GANTRYDIFFPFB</a>
Object Code	CAN:     Array 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 ECT:     0x2
Lower Limit	CAN:     0x80000000 ECT:     0x00
Upper Limit	CAN:     0x7FFFFFFF ECT:     0xFF
Unit	-

Sub-Index	001
Description	Gantry Master Position
Entry Category	Optional
Data Type	INTEGER32
Access	Read Only
PDO Mapping	CAN:     Yes 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 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. Sub-index 1 - <a href="#">VarCom - GANTRYMSTRVFB</a> Sub-index 2 - <a href="#">VarCom - GANTRYDIFFVFB</a>
	GANTRYMSTRPFB
Object Code	CAN: Array ECT: Record
Data Type	CAN: INTEGER32 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 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 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. Sub-index 1 - <a href="#">VarCom - GANTRYMSTRICMD</a> Sub-index 2 - <a href="#">VarCom - GANTRYDIFFICMD</a>
Object Code	CAN:     Array ECT:     Record
Data Type	CAN:     INTEGER16 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 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 ECT: TxPDO
Default Value	0x0000
Lower Limit	0x8000
Upper Limit	0x7FFF
Unit	-

## 2204h: Gantry Indicators

### Object Description

Index	2204
Description	Gantry status indicators: Sub-index 1 - <a href="#">VarCom - GANTRYALIGNED</a> Sub-index 2 - <a href="#">VarCom - GANTRYCOMMSTATE</a>
Object Code	CAN: Array ECT: Record
Data Type	CAN: UNSIGNED16 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 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 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 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 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) bit 0-30: time offset bit 31: state 0=low 1=high
Entry Category	Optional
Data Type	UNSIGNED32
Access	Read/Write
PDO Mapping	CAN:     Yes 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) bit 0-30: time offset bit 31: state 0=low 1=high
<b>Entry Category</b>	Optional
<b>Data Type</b>	UNSIGNED32
<b>Access</b>	Read/Write
<b>PDO Mapping</b>	CAN: Yes 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) bit 0-30: time offset bit 31: state 0=low 1=high
<b>Entry Category</b>	Optional
<b>Data Type</b>	UNSIGNED32
<b>Access</b>	Read/Write
<b>PDO Mapping</b>	CAN: Yes 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) bit 0-30: time offset bit 31: state 0=low 1=high
Entry Category	Optional
Data Type	UNSIGNED32
Access	Read/Write
PDO Mapping	CAN: Yes 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 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) bit 0-30: time offset bit 31: state 0=low 1=high
<b>Entry Category</b>	Optional
<b>Data Type</b>	UNSIGNED32
<b>Access</b>	Read/Write
<b>PDO Mapping</b>	CAN: Yes 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) bit 0-30: time offset bit 31: state 0=low 1=high
<b>Entry Category</b>	Optional
<b>Data Type</b>	UNSIGNED32
<b>Access</b>	Read/Write
<b>PDO Mapping</b>	CAN: Yes 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) bit 0-30: time offset bit 31: state 0=low 1=high
<b>Entry Category</b>	Optional
<b>Data Type</b>	UNSIGNED32
<b>Access</b>	Read/Write
<b>PDO Mapping</b>	CAN: Yes 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) bit 0-30: time offset bit 31: state 0=low 1=high
<b>Entry Category</b>	Optional
<b>Data Type</b>	UNSIGNED32
<b>Access</b>	Read/Write
<b>PDO Mapping</b>	CAN: Yes 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> 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	-

## 220Bh: Velocity Limit Torque Mode

### Object Description

Index	220B
Description	<a href="#">VarCom - VLIMIT</a> User-defined velocity limit for the application when the drive is in Torque mode.
Object Code	Variable
Data Type	INTEGER32

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0.0
Unit	-

## 220Ch: Commutation Error Counter

### Object Description

Index	220C
Description	The commutation error count since the counter 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 ECT: FFFF
Unit	-

## 220Dh: Commutation Error Threshold

### Object Description

Index	220D
Description	<a href="#">VarCom - COMMERRTTHRESH</a> 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> 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 - COMMFLTTHRESH</a> 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> 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 ECT: 0xFF
Unit	-

## 2212h: Velocity Loop Second Filter Parameter 1

### Object Description

Index	2212
Description	<a href="#">VarCom – FILTEXTHZ1</a> 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 ECT: 0x00
Lower Limit	CAN: 0x1 ECT: 0x0000
Upper Limit	CAN: 0x2710 ECT: 0xFFFF
Unit	Hz

## 2213h: Velocity Loop Second Filter Parameter 2

### Object Description

Index	2213
Description	<a href="#">VarCom - FILTEXTHZ2</a> 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 ECT: 0x00
Lower Limit	CAN: 0x1 ECT: 0x0000
Upper Limit	CAN: 0x2710 ECT: 0xFFFF
Unit	Hz

## 2214h: Velocity Loop Second Filter User-Defined

### Object Description

Index	2214
Description	<a href="#">VarCom - VFEXT</a> 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	-

Sub-Index	001
Description	Polynom Term 1
Entry Category	Optional
Data Type	INTEGER32
Access	Read/Write
PDO Mapping	No
Default Value	0x0
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>	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>	-



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<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>	-

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<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>	-

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<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>	-

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Sub-Index	008
Description	Term Execute
Entry Category	Optional
Data Type	UNSIGNED8
Access	Read/Write
PDO Mapping	No
Default Value	0x0
Lower Limit	0x00
Upper Limit	0x1
Unit	-

## 2216h: HD Current Filter – First Notch Filter Mode

### Object Description

Index	2216
Description	<a href="#">VarCom - NLFILTMODE</a> 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 ECT: 0xFFFF
Unit	-

## 2217h: HD Current Filter – Second Notch Filter Mode

### Object Description

Index	2217
Description	<a href="#">VarCom - NLFILTMODE2</a> 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 ECT: 0xFFFF
Unit	-

## 2218h: Error Correction Start Offset

### Object Description

Index	2218
Description	<a href="#">VarCom - ERRCORSTARTOFF</a> 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> 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> 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> 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 ECT: 0xFFFFFFFF
Unit	-

## 221Dh: Error Correction Set Index Value

### Object Description

Index	221D
Description	<a href="#">VarCom - ERRCORSETINDEX</a> 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> 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> 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> 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> 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> The units of the error position data delivered by the error correction table.
Object Code	Variable
Data Type	CAN: INTEGER16 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

## 222Ch: Hardware Position External 2

### Object Description

Index	222C
Description	<a href="#">VarCom - HWPEXTMACHN2</a> The position as measured by an external feedback device. The upper 16 bits indicate the number of revolutions, and the lower 16 bits indicate the position within a revolution.
Object Code	Variable
Data Type	INTEGER32

### Entry Description

Access	Read Only
PDO Mapping	Yes
Default Value	0x00
Unit	-

## 2230h: Error Correction Modulo Mode

### Object Description

Index	2230
Description	<a href="#">VarCom - ERRCORMODMODE</a> Enables/disables the error correction modulo block.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x00
Unit	-

## 2233h: PCOM 1 Source

### Object Description

Index	2233
Description	<a href="#">VarCom - PCOMSOURCE</a> Defines whether PCOM module 1 receives signals from the motor feedback or the secondary feedback device.
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	PCOMSOURCE
Unit	-

## 2234h: Fault Clear Mode

### Object Description

Index	2234
Description	<a href="#">VarCom - FLTCLRMODE</a> Fault clear mode. Prevent users from clearing certain faults.
Object Code	Variable
Data Type	UNSIGNED32

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x00000000
Unit	-

## 2236h: Force Control Mode

### Object Description

Index	2236
Description	<a href="#">VarCom - FCMODE</a> The force control mode,used to maintain a constant force on the tool endpoint.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x0001
Unit	-

## 2237h: Force Control Command Low Pass Filter

### Object Description

Index	2237
Description	<a href="#">VarCom - FCLPF</a> The low pass filter value that is used in the force control command before the proportional gain is applied.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x0001
Unit	-

## 2238h: Force Control Slope

### Object Description

Index	2238
Description	<a href="#">VarCom - FCSLOPE</a> The rate of change in acceleration/deceleration when the force control function is in use VarCom: FCSLOPE
Object Code	Variable
Data Type	UNSIGNED32

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x0000
Unit	-

## 2239h: Force Control Proportional Gain

### Object Description

Index	2239
Description	<a href="#">VarCom - FCKP</a> The proportional gain for the force control command.
Object Code	Variable
Data Type	REAL32

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0.0
Unit	-

## 223Ah: Force Control Tolerance Duration

### Object Description

Index	223A
Description	<a href="#">VarCom - FCEINSETTIME</a> The period of time for declaring "force at target value" (setpoint reached).
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x0001
Unit	-



## 223Bh: Force Control Error

### Object Description

Index	223B
Description	<a href="#">VarCom - FCE</a> The difference between the force control command voltage value and the actual voltage input on the force control sensor.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	Read/Write
PDO Mapping	Yes
Default Value	0x000
Unit	-

## 223Ch Force Control Voltage Tolerance

### Object Description

Index	223C
Description	<a href="#">VarCom - FCEINSET</a> The voltage tolerance at which the force is considered to be at the target value.
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x000
Unit	-

## 223Dh: Force Control Command

### Object Description

Index	2203D
Description	VarCom - <a href="#">FCCMD</a> The actual value of voltage applied to the proportional gain when the force control function is in use.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	Read Only
PDO Mapping	Yes
Default Value	0x0000
Unit	-

## 2240h: Analog Input 1 Inverter

### Object Description

Index	2240
Description	VarCom - <a href="#">ANIN1INV</a> Defines whether the sign of analog input 1 value is inverted.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x00
Unit	-

## 2243h: CSP Limits Mode

### Object Description

Index	2243
Description	VarCom - <a href="#">CSPLIMITSMODE</a> Defines whether the values of parameters VLIM, ACC and DEC remain in effect while the drive is operating in Cyclic Synchronous Position Profile mode (fieldbus opmode 8), or if the controller sets these values.
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x0000
Unit	-

## 2245h PCOM Homing Mode

### Object Description

Index	2245
Description	VarCom - <a href="#">PCOMHOMEMODE</a> Defines whether the Homing process is required before any of the PCOM module parameters can be set.
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x0000
Unit	-

## 2246h: Tamagawa SFB Multi-Turn Reset

### Object Description

Index	2246
Description	VarCom - <a href="#">SFBTMTURNRESET</a> When a Tamagawa 17/23-bit multi-turn encoder is connected as a secondary feedback device, this command zeroes the value of the multi-turn count.
Object Code	Variable
Data Type	UNSIGNED8

### Entry Description

Access	Read/Write
PDO Mapping	No
Default Value	0x00
Unit	-

# 11. 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> 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 ECT: TxPDO
Default Value	0x0000
Lower Limit	0x0000
Upper Limit	0xFFFF
Unit	-

## 6040h: Controlword

### Object Description

Index	6040
Description	<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> <ul style="list-style-type: none"> <li>bit 0: Switch on</li> <li>bit 1: Enable voltage</li> <li>bit 2: Quick stop</li> <li>bit 3: Enable operation</li> <li>bits 4-6: Mode specific</li> <li>bit 7: Fault reset</li> <li>bit 8: Halt</li> <li>bit 9: Mode specific</li> <li>bit 10: Reserved</li> <li>bits 11-15: Manufacturer specific</li> </ul>
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	CAN: SDO: Read/Write PDO: Write ECT: Read/Write
PDO Mapping	CAN: Yes ECT: RxPDO
Default Value	0x0000
Lower Limit	0x0000
Upper Limit	0xFFFF
Unit	-

## 6041h: Statusword

### Object Description

Index	6041
Description	<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>
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	Read Only
PDO Mapping	<p>CAN: Yes</p> <p>ECT: TxPDO</p>
Default Value	0x0000
Lower Limit	0x0000
Upper Limit	0xFFFF
Unit	-

## 605Bh: Shutdown Option Code

### Object Description

Index	605B
Description	<p>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.</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	-



## 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</p> <p>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 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> The actual value of the position measurement device
Object Code	Variable
Data Type	INTEGER32

### Entry Description

Access	Read Only
PDO Mapping	CAN: Yes 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> X Maximum allowed position error without producing a fault. 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. 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 PDO: Write ECT: Read/Write
PDO Mapping	CAN: Yes 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> 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. 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 PDO: Write ECT: Read/Write
PDO Mapping	CAN: Yes 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> 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> 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> 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 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) The input value for the torque controller in profile torque mode.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	CAN: SDO: Read/Write PDO: Write ECT: Read/Write
PDO Mapping	CAN: Yes 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. Defined as MICON (Motor Continuous Current)/1000</p> <p>Thus, if MICON = 10A: A value of 100 for 6073h = 1A A value of 500 for 6073h = 5A A value of 1000 for 6073h = 10A A value of 2000 for 6073h = 20A</p>
Object Code	Variable
Data Type	UNSIGNED16

### Entry Description

Access	<p>CAN: SDO: Read/Write PDO: Write</p> <p>ECT: Read/Write</p>
PDO Mapping	<p>CAN: Yes</p> <p>ECT: RxPDO</p>
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) The output value of torque limit function.
Object Code	Variable
Data Type	INTEGER16

### Entry Description

Access	Read Only
PDO Mapping	CAN: Yes 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> 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. 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 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) 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 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> 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 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 ECT: RxPDO
Default Value	0x00000000
Lower Limit	0x80000000
Upper Limit	0x7FFFFFFF
Unit	CAN user position units

## 607Ch: Home Offset

### Object Description

Index	607C
Description	<a href="#">VarCom - HOMEOFFSET</a> 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. 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.
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	<p>Sub-index 1 - <a href="#">VarCom - POSLIMNEG</a></p> <p>Sub-index 2 - <a href="#">VarCom - POSLIMPOS</a></p> <p>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:</p> <p>Corrected min position limit = min position limit - home offset</p> <p>Corrected max position limit = max position limit - home offset</p>
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> 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> 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.  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 PDO: Write ECT: Read/Write
PDO Mapping	CAN: Yes 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> The commanded acceleration. It is used in the following modes: Profile position mode Profile velocity mode Interpolated position mode
Object Code	Variable
Data Type	UNSIGNED32



**Entry Description**

<b>Access</b>	CAN: SDO: Read/Write PDO: Write ECT: Read/Write
<b>PDO Mapping</b>	CAN: Yes 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> The commanded acceleration. It is used in the following modes: Profile position mode Profile velocity mode Interpolated position mode 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 PDO: Write ECT: Read/Write
<b>PDO Mapping</b>	CAN: Yes 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> The deceleration rate for an Active Disable/emergency stop. 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. 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 PDO: Write ECT: Read/Write
PDO Mapping	CAN: Yes 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> <p><i>gear ratio = motor shaft revolutions / driving shaft revolutions</i></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	-

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<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> Sub-index 2 - <a href="#">VarCom - PDEN</a> The configured feed constant, which is the measurement distance per one revolution of the output shaft of the gearbox. The feed constant is calculated as: $\text{feed constant} = \text{feed} / \text{driving shaft revolutions}$
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	<a href="#">VarCom - HOMETYPE</a> The homing method to be used. Possible values: 0 = No homing method assigned 1 = Homing method 1 . . 36 = Homing method 36 -x = Manufacturer specific Refer to the CiA-402 standard for the detailed description of each homing method.
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> Sub-index 2 - <a href="#">VarCom - HOMESPEED2</a> 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> 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 PDO: Write ECT: Read/Write
PDO Mapping	CAN: Yes 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 PDO: Write ECT:     Read/Write
PDO Mapping	CAN:     Yes 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  bit value = 1: enable touch probe 1</p> <p>bit 1: bit value = 0: trigger first event  bit value = 1: continuous</p> <p>bit 2: bit value = 0: trigger touch probe 1 input  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  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  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  bit value = 1: enable touch probe 2</p> <p>bit 9: bit value = 0: trigger first event  bit value = 1: continuous</p> <p>bit 10: bit value = 0: trigger with touch probe 2 input  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  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  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 PDO: Write ECT: Read/Write
<b>PDO Mapping</b>	CAN: Yes 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  bit value = 1: touch probe 1 is enabled</p> <p>bit 1: bit value = 0: touch probe 1 no positive edge value stored  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  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  bit value = 1: touch probe 2 is enabled</p> <p>bit 9: bit value = 0: touch probe 2 no positive edge value stored  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  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 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 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 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>
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## 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 PDO: Write ECT: Read/Write
<b>PDO Mapping</b>	CAN: Yes 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 PDO: Write ECT: Read/Write
<b>PDO Mapping</b>	CAN: Yes 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 PDO: Write ECT: Read/Write
<b>PDO Mapping</b>	CAN: Yes 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 PDO: Write ECT: Read/Write
<b>PDO Mapping</b>	CAN: Yes 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> <a href="#">Sub-index 2 - VarCom - FBITIDX</a> The configured interpolation cycle time. 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]

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<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	-



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<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>	-

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<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>	-

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<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>	-

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Sub-Index	005
Description	Size of Data Record
Entry Category	Optional
Data Type	UNSIGNED8
Access	WO
PDO Mapping	No
Default Value	0x04
Lower Limit	0x04
Upper Limit	0x04
Unit	bytes

Sub-Index	006
Description	Buffer Clear
Entry Category	Optional
Data Type	UNSIGNED8
Access	WO
PDO Mapping	No
Default Value	0x00
Lower Limit	0x00
Upper Limit	0x01
Unit	-

## 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 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 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 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 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: bit 0,1: relative option bit 2,3: change immediately option bit 4,5: request-response option bit 6,7: reserved bit 8-11: ip option bit 12-14: reserved 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	<a href="#">VarCom - PE</a> 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 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.</p> <p>The digital inputs object has 32 bits.</p> <p>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 1=digital input assigned to the negative limit switch is on. 0=digital input assigned to the negative limit switch is off.</p> <p><b>bit 1:</b> Positive limit switch 1=digital input assigned to the positive limit switch is on. 0=digital input assigned to the positive limit switch is off.</p> <p><b>bit 2:</b> Home switch 1=digital input assigned to the home switch is on. 0=digital input assigned to the home switch is off.</p> <p><b>bit 3:</b> STO status 1= 24V is not supplied to drive STO module; drive is in Safe Torque Off state. 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.</p> <p>bit 16: digital input 1 bit 17: digital input 2 ... bit 25: digital input 10 bit 26: digital input 11 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 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 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 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 PDO: Write ECT: Read/Write
<b>PDO Mapping</b>	CAN: Yes 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 PDO: Write ECT: Read/Write
PDO Mapping	CAN: Yes 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> <p>bit 0: Profile position mode  bit 1: Velocity mode  bit 2: Profile velocity mode  bit 3: Profile torque mode  bit 4: Reserved  bit 5: Homing mode  bit 6: Interpolated position mode  bit 7: Cyclic synchronous position mode  bit 8: Cyclic synchronous velocity mode  bit 9: Cyclic synchronous torque mode  bit 10-15: Reserved  bit 16-31: Manufacturer-specific</p> <p>The bit values have the following meaning:  0 = mode is not supported  1 = mode is supported</p>
Object Code	Variable
Data Type	UNSIGNED32

### Entry Description

Access	Read Only
PDO Mapping	No
Default Value	--
Lower Limit	--
Upper Limit	--
Unit	-

## 12. CANopen and EtherCAT Error Codes

### 12.1 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*.

### 12.2 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

## 12.3 Emergency Error (Fault) Codes

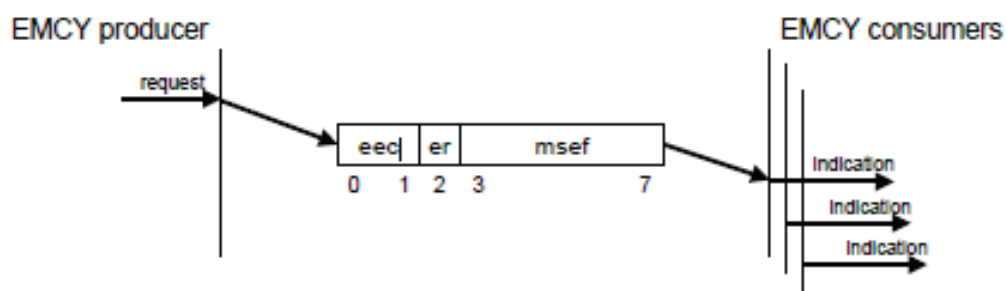
Refer to the section **Fault Messages** in the *CDHD2 User Manual*.

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).