

# Object Dictionary

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## Accessing the Objects in TwinCAT3

# Communication Objects

## 0x1000: Device Type

Provides information on the device type.

| Sub-index | Description | Range            | Default    | Type  | Access | PDO Mapping |
|-----------|-------------|------------------|------------|-------|--------|-------------|
| 0x00      | Device Type | 0x00-0xFFFFFFFFh | 0x00040192 | UDINT | ro     | No          |

Explanation of set value

| Bits  | Name                  | Description                |
|-------|-----------------------|----------------------------|
| 0-15  | Device Profile Number | 402 (0x192): Drive Profile |
| 16-23 | Type                  | 04: Step motor             |
| 24-31 | Mode                  | 0: Manufacturer specific   |

## 0x1001: Error Register

Indicates the error type that occurs in the slave device. The generic error bit is set on all errors. Specific error codes can be found in object [Object Dictionary#0x603F](#)

| Sub-index | Description    | Range     | Default | Type  | Access | PDO Mapping |
|-----------|----------------|-----------|---------|-------|--------|-------------|
| 0x00      | Error Register | 0x00-0xFF | 0x00    | USINT | ro     | No          |

Definition of bits:

| Bit | Error Description       |
|-----|-------------------------|
| 0   | Generic                 |
| 1   | Current                 |
| 2   | Voltage                 |
| 3   | Temperature             |
| 4   | Communication Error     |
| 5   | Device profile specific |
| 6   | N/A                     |
| 7   | Manufacturer specific   |

## 0x1008: Manufacturer Device Name

Indicates the manufacturers device name

| Sub-index | Description               | Range | Default | Type   | Access | PDO Mapping |
|-----------|---------------------------|-------|---------|--------|--------|-------------|
| 0x00      | Manufacturers Device Name | -     | "CM1-E" | STRING | ro     | No          |

## 0x1009: Manufacturer Hardware Version

Indicates the EtherCAT hardware version.

| Sub-index | Description                   | Range | Default     | Type   | Access | PDO Mapping |
|-----------|-------------------------------|-------|-------------|--------|--------|-------------|
| 0x00      | Manufacturer Hardware Version | -     | "MYO28-02A" | STRING | ro     | No          |

## 0x100A: Manufacturer Software Version

Indicates the version of the EtherCAT firmware

| Sub-index | Description                   | Range | Default | Type   | Access | PDO Mapping |
|-----------|-------------------------------|-------|---------|--------|--------|-------------|
| 0x00      | Manufacturer Software Version | -     | "1.0.0" | STRING | ro     | No          |

## 0x1018: Identity Object

Indicates general device information

| Sub-index | Description | Range | Default | Type | Access | PDO Mapping |
|-----------|-------------|-------|---------|------|--------|-------------|
|-----------|-------------|-------|---------|------|--------|-------------|

|      |                   |                 |            |       |    |    |
|------|-------------------|-----------------|------------|-------|----|----|
| 0x00 | Number of Entries | 0x01-0x04       | 0x04       | USINT | ro | No |
| 0x01 | Vendor ID         | 0x00-0xFFFFFFFF | 0x00004441 | UDINT | ro | No |
| 0x02 | Product Code      | 0x00-0xFFFFFFFF | 0x44412002 | UDINT | ro | No |
| 0x03 | Revision Number   | 0x00-0xFFFFFFFF | 0x20020001 | UDINT | ro | No |
| 0x04 | Serial Number     | 0x00-0xFFFFFFFF | 0x00000000 | UDINT | ro | No |

## PDO Mapping Objects

### 0x1600: Receive PDO mapping parameter - Dynamic switching of modes

| Sub-index | Description               | Value      | Access | PDO Mapping |
|-----------|---------------------------|------------|--------|-------------|
| 0x00      | Number of entries         | 0x07       | ro     | No          |
| 0x01      | Controlword mapping       | 0x60400010 | ro     | No          |
| 0x02      | Target position mapping   | 0x607A0020 | ro     | No          |
| 0x03      | Target velocity mapping   | 0x60FF0020 | ro     | No          |
| 0x04      | Digital outputs mapping   | 0x60FE0010 | ro     | No          |
| 0x05      | Mode of operation mapping | 0x60600008 | ro     | No          |

### 0x1601: Receive PDO mapping parameter - CSP mode

| Sub-index | Description             | Value      | Access | PDO Mapping |
|-----------|-------------------------|------------|--------|-------------|
| 0x00      | Number of entries       | 0x04       | ro     | No          |
| 0x01      | Controlword mapping     | 0x60400010 | ro     | No          |
| 0x02      | Target position mapping | 0x607A0020 | ro     | No          |
| 0x03      | Digital outputs mapping | 0x60FE0010 | ro     | No          |

### 0x1602: Receive PDO mapping parameter - CSV mode

| Sub-index | Description             | Value      | Access | PDO Mapping |
|-----------|-------------------------|------------|--------|-------------|
| 0x00      | Number of entries       | 0x04       | ro     | No          |
| 0x01      | Controlword mapping     | 0x60400010 | ro     | No          |
| 0x02      | Target velocity mapping | 0x60FF0020 | ro     | No          |
| 0x03      | Digital outputs mapping | 0x60FE0010 | ro     | No          |

### 0x1603: Receive PDO mapping parameter - Profile mode

| Sub-index | Description                  | Value      | Access | PDO Mapping |
|-----------|------------------------------|------------|--------|-------------|
| 0x00      | Number of entries            | 0x06       | ro     | No          |
| 0x01      | Controlword mapping          | 0x60400010 | ro     | No          |
| 0x03      | Target Position mapping      | 0x607A0020 | ro     | No          |
| 0x04      | Target Velocity mapping      | 0x60FF0020 | ro     | No          |
| 0x05      | Profile Velocity mapping     | 0x60810020 | ro     | No          |
| 0x06      | Profile Acceleration mapping | 0x60830020 | ro     | No          |
| 0x07      | Mode of operation mapping    | 0x60600008 | ro     | No          |

### 0x1A00: Transmit PDO mapping parameter - Dynamic switching of modes

| Sub-index | Description | Value | Access | PDO Mapping |
|-----------|-------------|-------|--------|-------------|
|-----------|-------------|-------|--------|-------------|

|      |                                    |            |    |    |
|------|------------------------------------|------------|----|----|
| 0x00 | Number of entries                  | 0x0B       | ro | No |
| 0x01 | Statusword mapping                 | 0x60410010 | ro | No |
| 0x02 | Position actual value mapping      | 0x60640020 | ro | No |
| 0x03 | Velocity actual value mapping      | 0x606C0020 | ro | No |
| 0x04 | Torque actual value mapping        | 0x60770020 | ro | No |
| 0x05 | Digital input mapping              | 0x60FD0010 | ro | No |
| 0x06 | Error code mapping                 | 0x603F0010 | ro | No |
| 0x07 | Temperature-C mapping              | 0x23010010 | ro | No |
| 0x08 | DC voltage mapping                 | 0x60790010 | ro | No |
| 0x09 | Modes of operation display mapping | 0x60610008 | ro | No |

### 0x1A01: Transmit PDO mapping parameter - CSP mode

| Sub-index | Description                   | Value      | Access | PDO Mapping |
|-----------|-------------------------------|------------|--------|-------------|
| 0x00      | Number of entries             | 0x07       | ro     | No          |
| 0x01      | Statusword mapping            | 0x60410010 | ro     | No          |
| 0x02      | Position actual value mapping | 0x60640020 | ro     | No          |
| 0x03      | Velocity actual value mapping | 0x606C0020 | ro     | No          |
| 0x04      | Torque actual value mapping   | 0x60770020 | ro     | No          |
| 0x05      | Digital input mapping         | 0x60FD0010 | ro     | No          |
| 0x06      | Error code mapping            | 0x603F0010 | ro     | No          |

### 0x1A02: Transmit PDO mapping parameter - CSV mode

| Sub-index | Description                   | Value      | Access | PDO Mapping |
|-----------|-------------------------------|------------|--------|-------------|
| 0x00      | Number of entries             | 0x07       | ro     | No          |
| 0x01      | Statusword mapping            | 0x60410010 | ro     | No          |
| 0x02      | Position actual value mapping | 0x60640020 | ro     | No          |
| 0x03      | Velocity actual value mapping | 0x606C0020 | ro     | No          |
| 0x04      | Torque actual value mapping   | 0x60770020 | ro     | No          |
| 0x05      | Digital input mapping         | 0x60FD0010 | ro     | No          |
| 0x06      | Error code mapping            | 0x603F0010 | ro     | No          |

### 0x1A03: Transmit PDO mapping parameter - Profile mode

| Sub-index | Description                       | Value      | Access | PDO Mapping |
|-----------|-----------------------------------|------------|--------|-------------|
| 0x00      | Number of entries                 | 0x0B       | ro     | No          |
| 0x01      | Statusword mapping                | 0x60410010 | ro     | No          |
| 0x02      | Position actual value mapping     | 0x60640020 | ro     | No          |
| 0x03      | Velocity actual value mapping     | 0x606C0020 | ro     | No          |
| 0x04      | Torque actual value mapping       | 0x60770020 | ro     | No          |
| 0x05      | Digital input mapping             | 0x60FD0010 | ro     | No          |
| 0x06      | Error code mapping                | 0x603F0010 | ro     | No          |
| 0x07      | Temperature-C mapping             | 0x23010010 | ro     | No          |
| 0x08      | DC voltage mapping                | 0x60790010 | ro     | No          |
| 0x09      | Mode of operation display mapping | 0x60610008 | ro     | No          |

# CiA402 Drive Profile Objects

## 0x603F: Error Code

Indicates specific error code when an error occurs.

| Sub-index | Description | Range         | Default | Type | Access | PDO Mapping |
|-----------|-------------|---------------|---------|------|--------|-------------|
| 0x00      | Error Code  | 0x0000-0xFFFF | 0x0000  | UINT | ro     | No          |

The following table outlines the error and the relevant objects that are set.

| 0x603F<br>Error Code | 0x1001<br>Error Register | 0x6041 Fault<br>(Bit 3) | Description                                                     |
|----------------------|--------------------------|-------------------------|-----------------------------------------------------------------|
| 0x0000               | 0x00                     | 0                       | No error                                                        |
| 0x2310               | 0x03                     | 1                       | Continuous over current error (torque overload)                 |
| 0x4310               | 0x09                     | 1                       | Drive over temperature                                          |
| 0x4502               | 0x00                     | 0                       | No mode selected (0x6060=0) <sup>1</sup>                        |
| 0x7310               | 0x81                     | 1                       | Over speed error                                                |
| 0x7320               | 0x81                     | 1                       | Position Error overflow                                         |
| 0x7500               | 0x11                     | 1                       | Motor communication error                                       |
| 0x7510               | 0x11                     | 1                       | Motor drive to EtherCAT slave communication error               |
| 0x8611               | 0x00                     | 0                       | Motor not currently following commanded position <sup>1,2</sup> |
| 0xFF01               | 0x00                     | 0                       | Motor disabled by command <sup>1</sup>                          |
| 0xFF04               | 0x81                     | 1                       | Emergency stop active                                           |
| 0xFF05               | 0x11                     | 0/1 <sup>3</sup>        | 24V drive power not present                                     |

1. Not an error state
2. The motor is not following because for example the FSM state is not in Operation Enabled.
3. If the FSM is in Operation Enabled the loss of 24V power will generate a fault on the statusword otherwise the fault bit will not show an error.

## 0x6040: Controlword

| Sub-index | Description                               | Type | Access | PDO Mapping |
|-----------|-------------------------------------------|------|--------|-------------|
| 0x00      | Used to control the drive's state machine | UINT | rw     | Yes         |

For more information on the Controlword usage see the chapter [CiA 402 - Drives and Motion Control Device Profile](#)

## 0x6041: Statusword

| Sub-index | Description                                      | Type | Access | PDO Mapping |
|-----------|--------------------------------------------------|------|--------|-------------|
| 0x00      | Displays the status of the drive's state machine | UINT | ro     | Yes         |

For more information on the Statusword usage see the chapter [CiA 402 - Drives and Motion Control Device Profile](#)

## 0x6060: Modes of operation

| Sub-index | Description                       | Type | Access | PDO Mapping |
|-----------|-----------------------------------|------|--------|-------------|
| 0x00      | Set the desired mode of operation | SINT | rw     | Yes         |

| Value | Mode of Operation                      |
|-------|----------------------------------------|
| 0     | No mode selected                       |
| 3     | Profile Velocity (PV) Mode             |
| 6     | Homing Mode (HM)                       |
| 8     | Cyclic Synchronois Position (CSP) Mode |
| 9     | Cyclic Synchronous Velocity (CSV) Mode |

### 0x6061: Modes of operation display

| Sub-index | Description                                           | Type | Access | PDO Mapping |
|-----------|-------------------------------------------------------|------|--------|-------------|
| 0x00      | Read the mode of operation currently set on the drive | SINT | ro     | Yes         |

| Value | Mode of Operation                      |
|-------|----------------------------------------|
| 0     | No mode selected                       |
| 3     | Profile Velocity (PV) Mode             |
| 8     | Cyclic Synchronois Position (CSP) Mode |
| 9     | Cyclic Synchronous Velocity (CSV) Mode |

### 0x6064: Position actual value

| Sub-index | Description                                                                                                                              | Type | Access | PDO Mapping |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Read the actual position of the motor.<br><ul style="list-style-type: none"> <li>Unit - pulses<br/>(50,000 pulses/revolution)</li> </ul> | DINT | ro     | Yes         |

### 0x606C: Speed actual value

| Sub-index | Description                                                                                                                                       | Type | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Read the actual speed of the motor.<br><ul style="list-style-type: none"> <li>Unit - pulses/millisecond<br/>(50,000 pulses/revolution)</li> </ul> | DINT | ro     | Yes         |

### 0x6072: Peak torque

| Sub-index | Description                                                                                                         | Type | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Read the peak torque of the motor.<br><ul style="list-style-type: none"> <li>Unit - 0.1% of rated torque</li> </ul> | UINT | ro     | Yes         |

### 0x6073: Motor max current

| Sub-index | Description                                                                                                          | Type | Access | PDO Mapping |
|-----------|----------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Read the max current of the motor.<br><ul style="list-style-type: none"> <li>Unit - 0.1% of rated current</li> </ul> | UINT | ro     | No          |

### 0x6075: Motor rated current

| Sub-index | Description | Type | Access | PDO Mapping |
|-----------|-------------|------|--------|-------------|
|-----------|-------------|------|--------|-------------|

|      |                                                                                                   |       |    |    |
|------|---------------------------------------------------------------------------------------------------|-------|----|----|
| 0x00 | Read the rated current of the motor.<br><ul style="list-style-type: none"><li>Unit - mA</li></ul> | UDINT | ro | No |
|------|---------------------------------------------------------------------------------------------------|-------|----|----|

### 0x6076: Motor rated torque

| Sub-index | Description                                                                                       | Type  | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------|-------|--------|-------------|
| 0x00      | Read the rated torque of the motor.<br><ul style="list-style-type: none"><li>Unit - nNm</li></ul> | UDINT | ro     | Yes         |

### 0x6077: Torque actual value

| Sub-index | Description                                                                                                         | Type | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Read the actual torque of the motor.<br><ul style="list-style-type: none"><li>Unit - 0.1% of rated torque</li></ul> | INT  | ro     | Yes         |

### 0x6079: DC link circuit voltage

| Sub-index | Description                                                                                             | Type | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Read the actual value of the 24V DC bus.<br><ul style="list-style-type: none"><li>Unit - 0.1V</li></ul> | DINT | ro     | Yes         |

### 0x607A: Target position

| Sub-index | Description                                                                                                                                                         | Type | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Set the target position of the motor.<br><ul style="list-style-type: none"><li>Unit - pulses (50,000 pulses/revolution)</li><li>Used in CSP and CML modes</li></ul> | DINT | rw     | Yes         |

### 0x607C: Home offset

| Sub-index | Description                                                                                                                                                                                                                                                                       | Type | Access | PDO Mapping |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Set the offset after a home switch/hardstop has been found.<br><ul style="list-style-type: none"><li>Unit - pulses (50,000 pulses/revolution)<ul style="list-style-type: none"><li>Internally will be rounded to the closest 100.</li></ul></li><li>Used in homing mode</li></ul> | DINT | rw     | No          |

### 0x6081: Profile velocity

| Sub-index | Description                                                                                                                                                                          | Type  | Access | PDO Mapping |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------|
| 0x00      | Set the target velocity in profile position mode<br><ul style="list-style-type: none"><li>Unit - pulses/s (50,000 pulses/revolution)</li><li>Used in profile position mode</li></ul> | UDINT | rw     | Yes         |

### 0x6083: Profile acceleration

| Sub-index | Description | Type | Access | PDO Mapping |
|-----------|-------------|------|--------|-------------|
|-----------|-------------|------|--------|-------------|

|      |                                                                                                                                                                                                            |       |    |     |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|-----|
| 0x00 | Set the profile acceleration.<br><br><ul style="list-style-type: none"> <li>Unit - pulses/s<sup>2</sup> (50,000 pulses/revolution)</li> <li>Used in profile position and profile velocity modes</li> </ul> | UDINT | rw | Yes |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|-----|

## 0x6084: Profile deceleration

| Sub-index | Description                                                                                                                                                                                                   | Type  | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------|
| 0x00      | Set the profile deceleration in profile velocity mode.<br><br><ul style="list-style-type: none"> <li>Unit - pulses/s<sup>2</sup> (50,000 pulses/revolution)</li> <li>Used in profile velocity mode</li> </ul> | UDINT | rw     | No          |

## 0x6098: Homing method

| Sub-index | Description                                                                                                                                                                                                                                                                                               | Type | Access | PDO Mapping |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Set the method of the home routine.<br><br><ul style="list-style-type: none"> <li>0: No home routine selected</li> <li>-1: Hardstop CW</li> <li>-2: Hardstop CCW</li> <li>-3: Input 2 sensor CW</li> <li>-4: Input 2 sensor CCW</li> <li>-5: Input 3 sensor CW</li> <li>-6: Input 3 sensor CCW</li> </ul> | SINT | rw     | No          |

## 0x6099: Homing speeds

| Sub-index | Description                                                                                                                                                                                                                                                                                 | Type  | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------|
| 0x00      | Highest sub-index supported                                                                                                                                                                                                                                                                 | SINT  | rw     | No          |
| 0x01      | Speed during search for switch or hardstop<br><br><ul style="list-style-type: none"> <li>The homing speed is written to an internal register which has a unit of 100 pulses/s. The value written into 0x6099:01 will be rounded to the closest 100.</li> <li>Used in homing mode</li> </ul> | UDINT | rw     | No          |
| 0x02      | N/A<br><br>Speed during search for 0 uses the same speed as search for switch/hardstop                                                                                                                                                                                                      | UDINT | rw     | No          |

## 0x609A: Homing acceleration

| Sub-index | Description                                                                                                                                                                                                                                                                                                                                                        | Type  | Access | PDO Mapping |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------|
| 0x00      | Set the homing acceleration in homing mode.<br><br><ul style="list-style-type: none"> <li>Unit - pulses/s<sup>2</sup> (50,000 pulses/revolution)</li> <li>The homing acceleration is written to an internal register which has a unit of 1000 pulses/s. The value written into 0x609A will be rounded to the closest 1000.</li> <li>Used in homing mode</li> </ul> | UDINT | rw     | No          |

## 0x60F6: K Parameter Settings

| Sub-index | Description                                                                                                                                                                                                                                                     | Type  | Access | PDO Mapping |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------|
| 0x00      | Highest sub-index supported = 0x51 (81 <sub>h</sub> )                                                                                                                                                                                                           | USINT | rw     | No          |
| 0x51      | K parameter settings.<br><br><ul style="list-style-type: none"> <li>See standard Cool Muscle documentation for details</li> <li>Typically these parameters do not need to be modified as the current profile mode changes them directly as required.</li> </ul> | UINT  | rw     | No          |
| ...       |                                                                                                                                                                                                                                                                 |       |        |             |
| 0x51      |                                                                                                                                                                                                                                                                 |       |        |             |



## 0x60FB: H Parameter Settings (Tuning Parameters)

| Sub-index | Description       | Type | Access | PDO Mapping |
|-----------|-------------------|------|--------|-------------|
| 0x00      | Number of entries | UINT | ro     | No          |
| 0x01      | H0                | INT  | rw     | No          |
| 0x02      | H1                | INT  | rw     | No          |
| 0x03      | H2                | INT  | rw     | No          |
| 0x04      | H3                | INT  | rw     | No          |
| 0x05      | H4                | INT  | rw     | No          |
| 0x06      | H5                | INT  | rw     | No          |
| 0x07      | H6                | INT  | rw     | No          |
| 0x08      | H7                | INT  | rw     | No          |
| 0x09      | H8                | INT  | rw     | No          |

- The H parameters are stored in non-volatile memory in the drive. The value will be retained on power down and do not need to be reloaded after a power cycle.
- Information on the H infinity parameters can be found in the [RT3 user manual - Motor Tuning](#).

## 0x60FD: Digital inputs

| Sub-index | Description                   | Type | Access | PDO Mapping |
|-----------|-------------------------------|------|--------|-------------|
| 0x00      | Read the status of the inputs | UINT | ro     | Yes         |

| Bit   | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------|---|---|---|---|---|---|---|---|
| INPUT | - | - | - | - | 4 | 3 | 2 | 1 |

## 0x60FE: Digital outputs

| Sub-index | Description            | Type | Access | PDO Mapping |
|-----------|------------------------|------|--------|-------------|
| 0x00      | Set the digital output | UINT | rw     | Yes         |

| Bit    | 7 | 6 | 5 | 4 | 3 | 2 | 1    | 0    |
|--------|---|---|---|---|---|---|------|------|
| OUTPUT | - | - | - | - | - | - | OUT2 | OUT1 |

- Output 1 is driven by 0x60FD
- Output 2 is driven by 0x60FD or by the motor driver depending on the K34 value. See [K Parameters](#) for additional information.
  - Set K34=40 for 0x60FD
  - Set K34=20 for alarm output
  - Set K34=10 for inposition signal output.

## 0x60FF: Target velocity

| Sub-index | Description                                                                                                                                                                 | Type | Access | PDO Mapping |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Set the target velocity of the motor. <ul style="list-style-type: none"><li>• Unit - pulses/ms (50,000 pulses/revolution)</li><li>• Used in CSV, PV and CML modes</li></ul> | DINT | rw     | Yes         |

## 0x6502: Supported drive modes

| Sub-index | Description | Type | Access | PDO Mapping |
|-----------|-------------|------|--------|-------------|
|-----------|-------------|------|--------|-------------|

|      |                                                                                                                                                                                                                                                                                                                                                |       |    |    |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|----|
| 0x00 | Shows support drive modes<br><br>Value = 0x1A5<br><br><i>Bit0 = 1: PP mode</i><br><i>Bit1 = 0: VL mode</i><br><i>Bit2 = 1: PV mode</i><br><i>Bit3 = 0: TQ mode</i><br><i>Bit4 = 0: reserved</i><br><i>Bit5 = 1: HM mode</i><br><i>Bit6 = 0: IP mode</i><br><i>Bit7 = 1: CSP mode</i><br><i>Bit8 = 1: CSV mode</i><br><i>Bit9 = 0: CST mode</i> | UDINT | ro | No |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|----|

## Manufacturer Specific Objects

### 0x2201: 32bit User Variables

This object contains 4 volatile variables. Variable1 in addition has BIT15 and BIT14 mapped to the manufacturer specific bits, B15 and B14, on the Statusword (0x6041).

An example of usage would be if the application requires a custom home routine. These bit could be set as a flag to indicate the home routine has been completed. Due to the volatile nature of the variables if a reset occurs on the drive the flag bit would be reset.

| Sub-index | Description       | Type | Access | PDO Mapping                                                      |
|-----------|-------------------|------|--------|------------------------------------------------------------------|
| 0x00      | Number of entries | UINT | ro     | No                                                               |
| 0x01      | Variable1         | DINT | rw     | BIT15 and B14 are mapped to the Statusword 0x6041 BIT15 and B14. |
| 0x02      | Variable2         | DINT | rw     | No                                                               |
| 0x03      | Variable3         | DINT | rw     | No                                                               |
| 0x04      | Variable4         | DINT | rw     | No                                                               |

### 0x2301: Drive temperature

| Sub-index | Description                                          | Type | Access | PDO Mapping |
|-----------|------------------------------------------------------|------|--------|-------------|
| 0x00      | Read the drive temperature<br><br>• Unit - degrees C | INT  | ro     | Yes         |

### 0xFE00: PDO Timing

The PDO time is autodetected by the slave. The detected time can be read in 0xFE00.

Only PDO rates of 200s, 250s, 500s and 1000s (1ms) are accepted by the CM1-E.

| Sub-index | Description       | Type | Access | PDO Mapping |
|-----------|-------------------|------|--------|-------------|
| 0x00      | Number of entries | UINT | ro     | No          |
| 0x01      | PDO Time in s     | UINT | ro     | No          |
| 0x02      | N/A               | UINT | ro     | No          |
| 0x03      | N/A               | UINT | ro     | No          |
| 0x04      | N/A               | UINT | ro     | No          |

### 0xFF00: Status LED brightness

| Sub-index | Description                                                                                                                                                                                                                           | Type | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------|-------------|
| 0x00      | Set the brightness of the <a href="#">system and motor status LED</a> . This is a non-volatile object that is stored in memory.<br><br>• Range [0,16]<br>• 0 - OFF<br>• 1 - minimum brightness (default)<br>• 16 - maximum brightness | SINT | rw     | No          |

0xFF01: Status LED Override

| Sub-index | Description                                                                                                                                                                     | Type  | Access | PDO Mapping |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------|
| 0x00      | Override the status LED colour and flash.<br><br>This allows the user to use the status LED to indicate custom operations such as identify a motor in a large axes application. | UDINT | rw     | No          |

Byte Description

|             | Byte3                           | Byte2                               | Byte1                             | Byte0                                                                                                                                  |
|-------------|---------------------------------|-------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Description | Red LED on/off                  | Green LED on/off                    | Blue LED on/off                   | Override on/off<br><br>Bit 0 - override on/off<br>Bit 1 - flash on/off                                                                 |
| Values      | 0x00 - Red OFF<br>0x01 - Red ON | 0x00 - Green OFF<br>0x01 - Green ON | 0x00 - Blue OFF<br>0x01 - Blue ON | 0x00 - No override<br>0x01 - Override with solid colour defined in bytes 3-1<br>0x03 - Override with flash colour defined in bytes 3-1 |

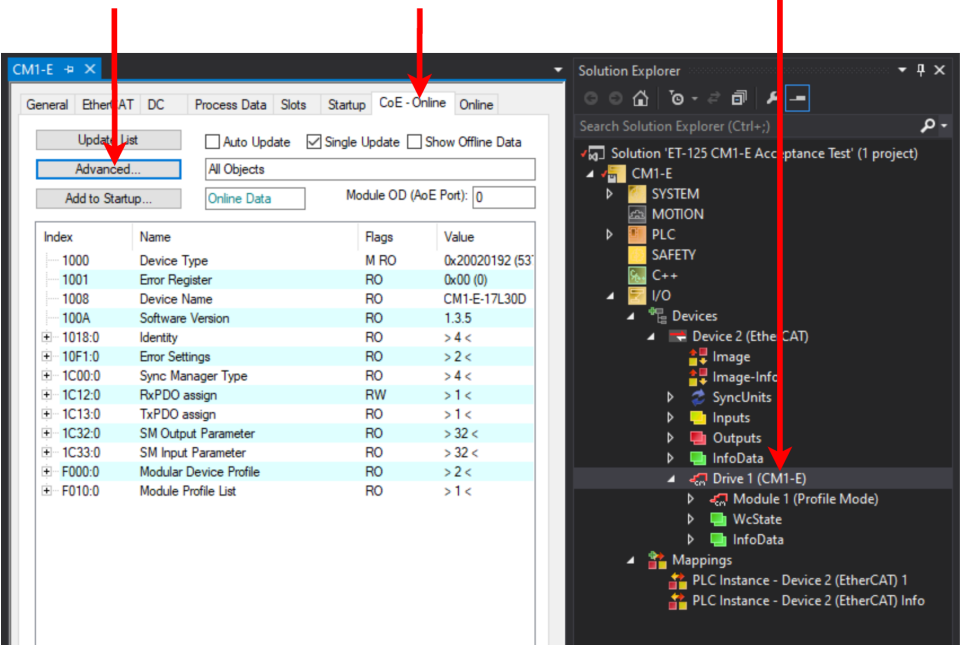
Example Values

- 0xFF01 = 0x01010101 - LED will turn solid white
- 0xFF01 = 0x01000003 - LED will flash red

Accessing the Objects in TwinCAT3

The following instructions show how to read/write the objects in TwinCAT3 through the online object dictionary. It assumes a CM1-E drive has already been added.

1. In the Solution Explorer select the CM1-E drive
2. Select the CoE-Online tab. Only the objects listed in the EDS are currently listed.
3. Click the Advanced button to enable reading all objects.
3. Click the Advanced Button
2. Select the CoE-Online Tab
1. Select the CM1-E

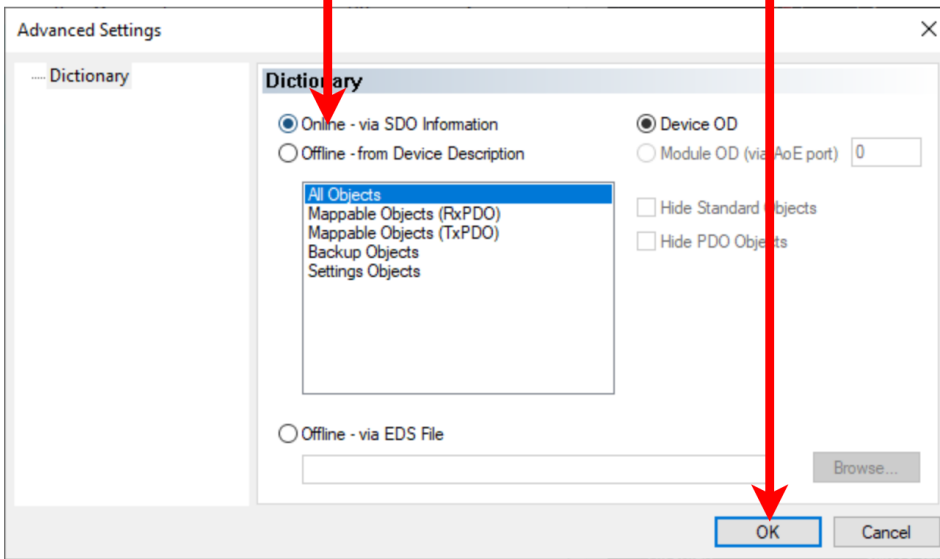


4. Select the Online radio button

5. Click OK

1. Select Online

2. Click OK



The full object dictionary is now available. The K and H parameters are shown below in red. Expand the list to see all the parameters.

Update List

☐ Auto Update ☒ Single Update ☐ Show Offline Data

Advanced...

All Objects

Add to Startup...

Online Data

Module OD (AoE Port): 0

| Index    | Name                          | Flags | Value         |
|----------|-------------------------------|-------|---------------|
| + 1C00:0 | Sync Manager Type             | RO    | > 4 <         |
| + 1C12:0 | RxPDO Assign                  | RW    | > 1 <         |
| + 1C13:0 | TxPDO Assign                  | RW    | > 1 <         |
| + 1C32:0 | SM Output Parameter           | RO    | > 32 <        |
| + 1C33:0 | SM Input Parameter            | RO    | > 32 <        |
| + 2201:0 | 32bit User Variables          | RO    | > 4 <         |
| 2301     | Temperature-C                 | RO P  | 54            |
| 603F     | Error Code                    | RO P  | 0x4502 (1766) |
| 6040     | Control Word                  | RW P  | 0x0000 (0)    |
| 6041     | Status Word                   | RO P  | 0x0230 (560)  |
| 605A     | Quickstop Option Code         | RW    | 2             |
| 605B     | Shutdown Option Code          | RW    | 0             |
| 605C     | Disable Operation Option Code | RW    | 1             |
| 605E     | Fault Reaction Code           | RW    | 0             |
| 6060     | Modes of Operation            | RW P  | 0             |
| 6061     | Modes of Operation Display    | RO P  | 0             |
| 6064     | Position Actual Value         | RO P  | 32            |
| 606C     | Velocity Actual Value         | RO P  | 0             |
| 6072     | Max Torque                    | RO    | 0x04E2 (1250) |
| 6073     | Motor Max Current             | RO    | 0x04B0 (1200) |
| 6075     | Motor Rated Current           | RO    | 0x000005DC    |
| 6076     | Rated Torque                  | RO    | 0x00000168    |
| 6077     | Torque Actual Value           | RO P  | 0             |
| 6079     | DC Voltage                    | RO P  | 238           |
| 607A     | Target Position               | RW P  | 0             |
| 607C     | Home Offset                   | RW    | 0             |
| 6081     | Profile Velocity              | RW P  | 0             |
| 6083     | Profile Acceleration          | RW P  | 0x00000000    |
| 6084     | Profile Dcceleration          | RW    | 0x00000019    |
| 6098     | Homing Method                 | RW    | 0             |
| + 6099:0 | Homing Speed                  | RO    | > 2 <         |
| 609A     | Homing Acceleration           | RW    | 0x000186A0    |
| + 60F6:0 | K Parameter Settings          | RO    | > 81 <        |
| + 60FB:0 | H Parameter Settings          | RO    | > 8 <         |
| 60FD     | Digital Inputs                | RO P  | 0x0000 (0)    |
| 60FE     | Digital Outputs               | RW P  | 0x0000 (0)    |