



## NEXTW EtherCAT Slave Terminals

EC1101

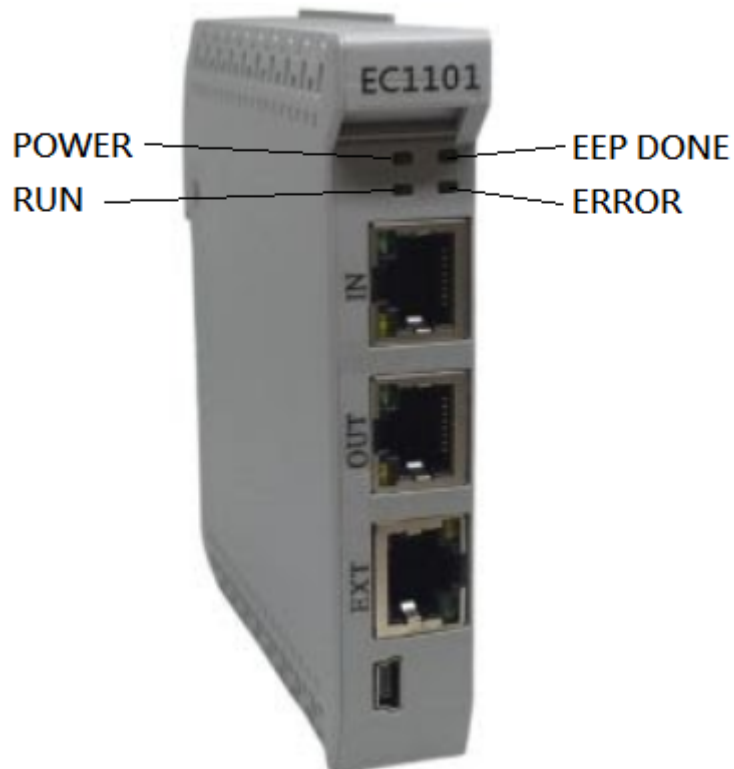
ED1010

EM2244

USER MANUAL

## Chapter 1: Product Introduction

### 1.1 EC1101



### Key Features

- EtherCAT Input Port/ EtherCAT Output Port
- Power Connection
- Indicate Device State with 4 LEDs

## 1.1.1 Hardware Specifications

### Power Requirements

- DC input range: DC 24V  $\pm$ 2V with over-voltage and reversed-voltage protection(Terminal #1: 24V & Terminal #2: 0V)

### EtherCAT Section

- Data transfer medium: Ethernet cable (CAT5e), shield type: S/STP or S/UTP
- Ethernet interface: 2x RJ-45, Golden Finger(TXP, TXN, RXP, RXN)
- Data transfer rate: 100Mbps, full duplex
- Protocol: EtherCAT
- Device profile: CiA 402

### Environment Section

- Operating temperature: 0°C to 65°C
- Dimension (mm): 100(W) x 95(L) x 20(H)

## 1.1.2 EC1101 LED Indicator

| POWER LED |   |
|-----------|---|
| ON        | Power supply has been connected to 24 VDC |
| OFF       | Power supply is not connected to 24 VDC   |

| RUN LED      |               |
|--------------|---------------|
| LED Response | FSM State     |
| off          | 1-Init        |
| Flash 1x-12x | 4-Safe OP, 1x |
| Blinking     | 2-PreOp       |
| Flickering   | 3-Bootstrap   |

|    |      |
|----|------|
| On | 8-Op |
|----|------|

| ERROR LED    |                                    |
|--------------|------------------------------------|
| LED Response | Error State                        |
| off          | No Error                           |
| Flash 1x-12x | Process Data Watchdogtimeout, 2x   |
| Blinking     | PDI configuration unsupported type |
| Flickering   | I2C EEPROM loading error           |
| On           | PDI Watchdog timeout               |

| EEPDONE LED  |             |
|--------------|-------------|
| LED Response |             |
| OFF          | Fail        |
| ON           | EEPROM done |

## 1.2 ED1010



### Key Features

- Digital Input and Digital Output
- Power Connection

### 1.2.1 Hardware Specifications

#### Digital Input and Output

- 16 input channels and 16 output channels
- Input current range : 1mA~50mA
- Optical isolated

#### Power Requirements

- DC input : DC 5V supported by EC1101

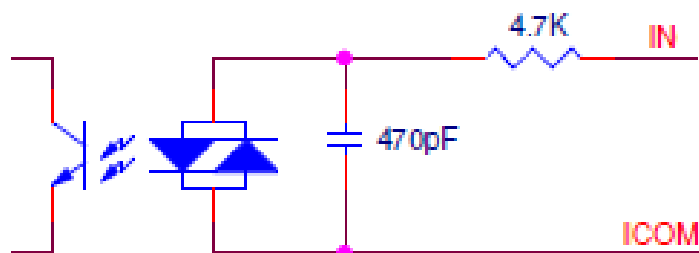
#### EtherCAT Section

- Data transfer medium: Ethernet cable (CAT5e), shield type: S/STP or S/UTP
- Ethernet interface: Golden Finger(TXP、TXN、RXP、RXN)
- Data transfer rate: 100Mbps, full duplex
- Protocol: EtherCAT
- Device profile: CiA 402

## Environment Section

- Operating temperature: 0°C to 65°C
- Dimension (mm): 100mm(W) x 107.7mm(L) x 12mm(H)

### 1.2.2 EC1101 GPIO Pin Definition

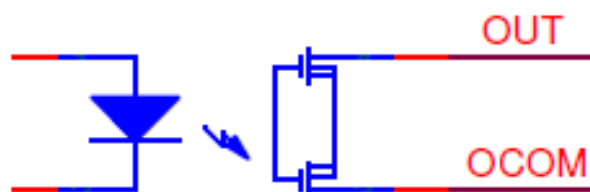


#### IN0~IN15:

- Type: Input
- Isolated Input with 3750 Vrms
- Current range: 1mA~50mA
- Peak forward current (t = 10μs) : 1A

#### IN\_COM:

- Type: Power
- DC Power Supply
- Current limit: 2A



#### OUT0~OUT15:

- Type: Output
- DC power Supply
- Total current limit : 8A

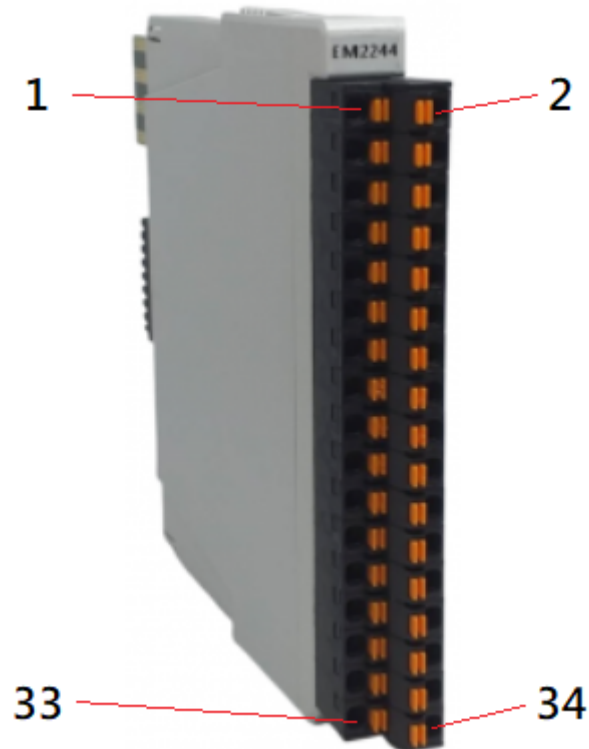
- Average current 500mA (Total current limit / Number of channels)

## OUT\_COM:

- Type: Power
- Isolated output with 1500 Vrms
- Single max current : 2A
- Voltage range: 5~60V

| Definition | Pin(Left) | Pin(Right) | Definition |
|------------|-----------|------------|------------|
| IN0        | 1         | 2          | OUT0       |
| IN1        | 3         | 4          | OUT1       |
| IN2        | 5         | 6          | OUT2       |
| IN3        | 7         | 8          | OUT3       |
| IN4        | 9         | 10         | OUT4       |
| IN5        | 11        | 12         | OUT5       |
| IN6        | 13        | 14         | OUT6       |
| IN7        | 15        | 16         | OUT7       |
| IN8        | 17        | 18         | OUT8       |
| IN9        | 19        | 20         | OUT9       |
| IN10       | 21        | 22         | OUT10      |
| IN11       | 23        | 24         | OUT11      |
| IN12       | 25        | 26         | OUT12      |
| IN13       | 27        | 28         | OUT13      |
| IN14       | 29        | 30         | OUT14      |
| IN15       | 31        | 32         | OUT15      |
| IN_COM     | 33        | 34         | OUT_COM    |

## 1.3 EM2244



### Key Features

- Encoder
- High Speed Pulse Output (HSP)
- Axis limit
- RS485
- ESTOP
- SERVOON

### 1.3.1 Hardware Specifications

#### High Speed Pulse Output

- 2 sets of High Speed Pulse output
- Max. output frequency: 500KHz
- Format: CW/CCW, Pulse/Direction

#### Quadrature Encoder Input

- 2 sets of Quadrature Encoder Input



- Type: Incremental
- Format: AB, CW/CCW, P/D
- Index input
- Data length: 32bits
- Max. input frequency: 32MHz

## Power Requirements

- DC input : DC 5V supported by EC1101
- Encoder Support Voltage: 5V
- Switch Input Current:  $\pm 50$  mA, Peak: 1A

## EtherCAT Section

- Data transfer medium: Ethernet cable (CAT5e), shield type: S/STP or S/UTP
- Ethernet interface: Golden Finger(TXP, TXN, RXP, RXN)
- Data transfer rate: 100Mbps, full duplex
- Protocol: EtherCAT
- Device profile: CiA 402

## Environment Section

- Operating temperature: 0°C to 65°C
- Dimension (mm): 100mm(W) x 107.7mm(L) x 12mm(H)

### 1.3.2 Pin Definition

| Definition | Pin(Left) | Pin(Right) | Definition |
|------------|-----------|------------|------------|
| 5V         | 1         | 2          | GND        |
| EAP0       | 3         | 4          | EAP1       |
| EAN0       | 5         | 6          | EAN1       |
| EBP0       | 7         | 8          | EBP1       |
| EBN0       | 9         | 10         | EBN1       |
| ECP0       | 11        | 12         | ECP1       |
| ECN0       | 13        | 14         | ECN1       |

|             |    |    |             |
|-------------|----|----|-------------|
| PAP0        | 15 | 16 | PAP1        |
| PAN0        | 17 | 18 | PAN1        |
| PBP0        | 19 | 20 | PBP1        |
| PBN0        | 21 | 22 | PBN1        |
| RS485_Data+ | 23 | 24 | RS485_Data- |
| OTP0        | 25 | 26 | OTP1        |
| OTN0        | 27 | 28 | OTN1        |
| HOME0       | 29 | 30 | HOME1       |
| ESTOP       | 31 | 32 | SERVO_ON    |
| IN_COM      | 33 | 34 | OUT_COM     |

| Pin | Name | Type  | Definition           |
|-----|------|-------|----------------------|
| 1   | 5V   | Power | DC 5V                |
| 2   | GND  | Power | DC 0V                |
| 3   | EAP0 | Input | Channel 0, Phase A + |
| 4   | EAP1 | Input | Channel 1, Phase A + |
| 5   | EAN0 | Input | Channel 0, Phase A - |
| 6   | EAN1 | Input | Channel 1, Phase A-  |
| 7   | EBP0 | Input | Channel 0, Phase B + |
| 8   | EBP1 | Input | Channel 1, Phase B + |
| 9   | EBN0 | Input | Channel 0, Phase B - |
| 10  | EBN1 | Input | Channel 1, Phase B - |

|    |                 |                  |   |
|----|-----------------|------------------|---|
| 11 | ECP0            | Input            | Channel 0, Index +                                  |
| 12 | ECP1            | Input            | Channel 1, Index +                                  |
| 13 | ECN0            | Input            | Channel 0, Index -                                  |
| 14 | ECN1            | Input            | Channel 1, Index -                                  |
| 15 | PAP0            | Output           | Channel 0 positive line of differential CW0+ / P0+  |
| 16 | PAP1            | Output           | Channel 1 positive line of differential CW0+ / P0+  |
| 17 | PAN0            | Output           | Channel 0 negative line of differential CW0- / P0-  |
| 18 | PAN1            | Output           | Channel 1 negative line of differential CW0- / P0-  |
| 19 | PBP0            | Output           | Channel 0 positive line of differential CCW0+ / D0+ |
| 20 | PBP1            | Output           | Channel 1 positive line of differential CCW0+ / D0+ |
| 21 | PBN0            | Output           | Channel 0 negative line of differential CCW0- / D0- |
| 22 | PBN1            | Output           | Channel 1 negative line of differential CCW0- / D0- |
| 23 | RS485_<br>Data+ | Input/<br>Output | RS-485 Data+<br>Voltage: -9V~14V                    |
| 24 | RS485_<br>Data- | Input/<br>Output | RS-485 Data -<br>Voltage: -9V~14V                   |
| 25 | OTP0            | Input            | Channel 0, Positive Limit Switch                    |
| 26 | OTP1            | Input            | Channel 1, Positive Limit Switch                    |

|    |          |        |  |
|----|----------|--------|--|
| 27 | OTN0     | Input  | Channel 0, Negative Limit Switch                   |
| 28 | OTN1     | Input  | Channel 1, Negative Limit Switch                   |
| 29 | HOME0    | Input  | Channel 0, Home Switch                             |
| 30 | HOME1    | Input  | Channel 1, Home Switch                             |
| 31 | ESTOP    | Input  | Emergency Stop                                     |
| 32 | SERVO_ON | Output | Channel 0 or Channel 1 servo on:<br>High, Vmax:60V |
| 33 | IN_COM   | Power  | Input COM  |
| 34 | OUT_COM  | Power  | Output COM   |

## Chapter 2: Operation with TwinCAT and ECM-SK

### 2.1 EtherCAT Slave Information (ESI)

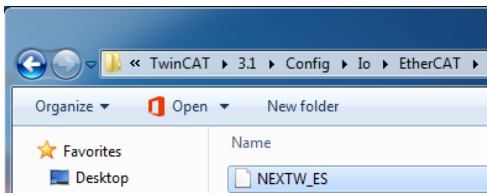
According to EtherCAT standard document ETG.2000, every EtherCAT slave must be delivered an ESI file (a XML format to describe EtherCAT slave information) for the EtherCAT Master. The ESI file contains the necessary communication settings for the ES-16I16O.

The following file is provided for ES-16I16O:

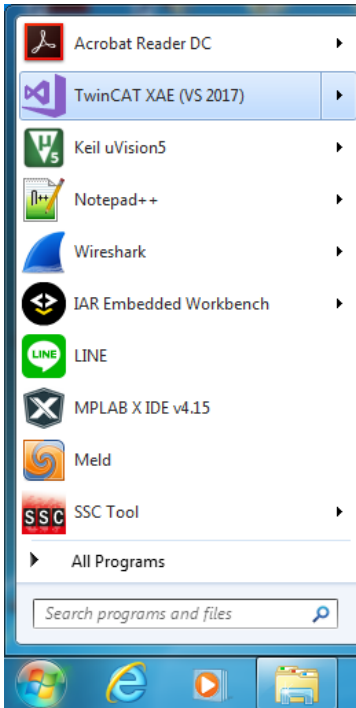
- NEXTW\_ES.xml

### 2.2 Using TwinCAT to Check(Control) EC1101 &ED1010 &EM2244

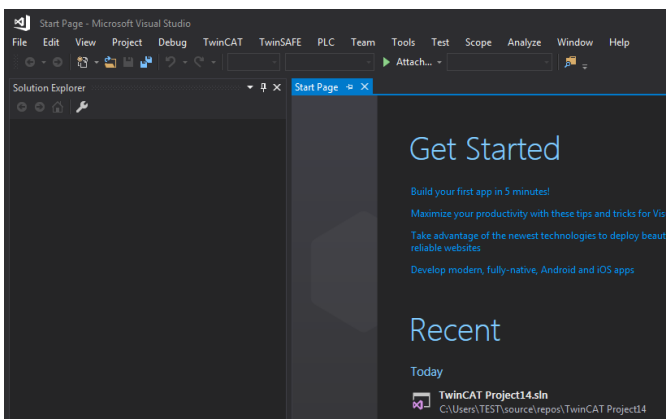
STEP1. Check the ESI file is loaded into TwinCAT Specified path.



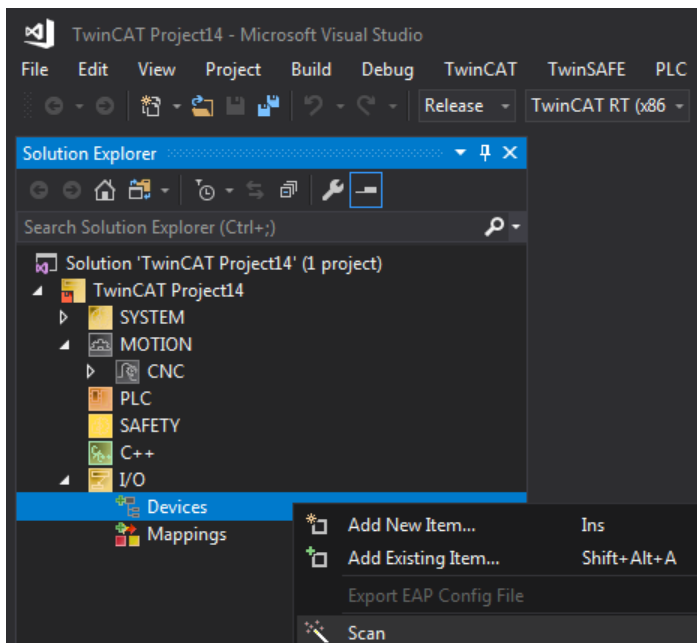
STEP2. Open TwinCAT XAE



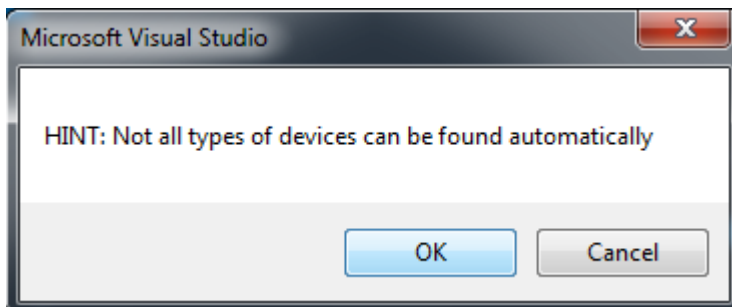
STEP3. open a new TwinCAT project or existing project



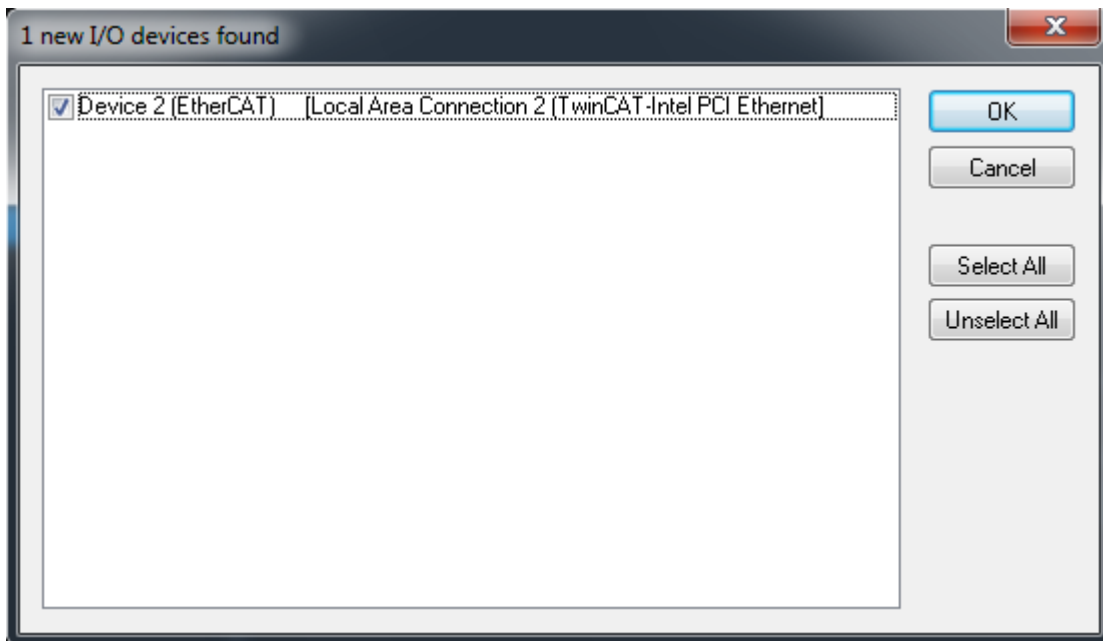
STEP4. Check the ethernet cable is correctly connected and then right click the Devices, click “Scan”



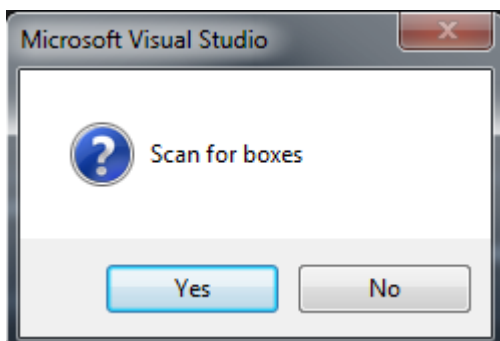
STEP5. Check the Hint, click “OK”



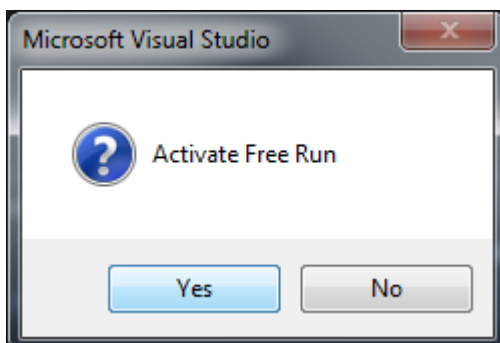
STEP6. Check and tick the box, click “OK”



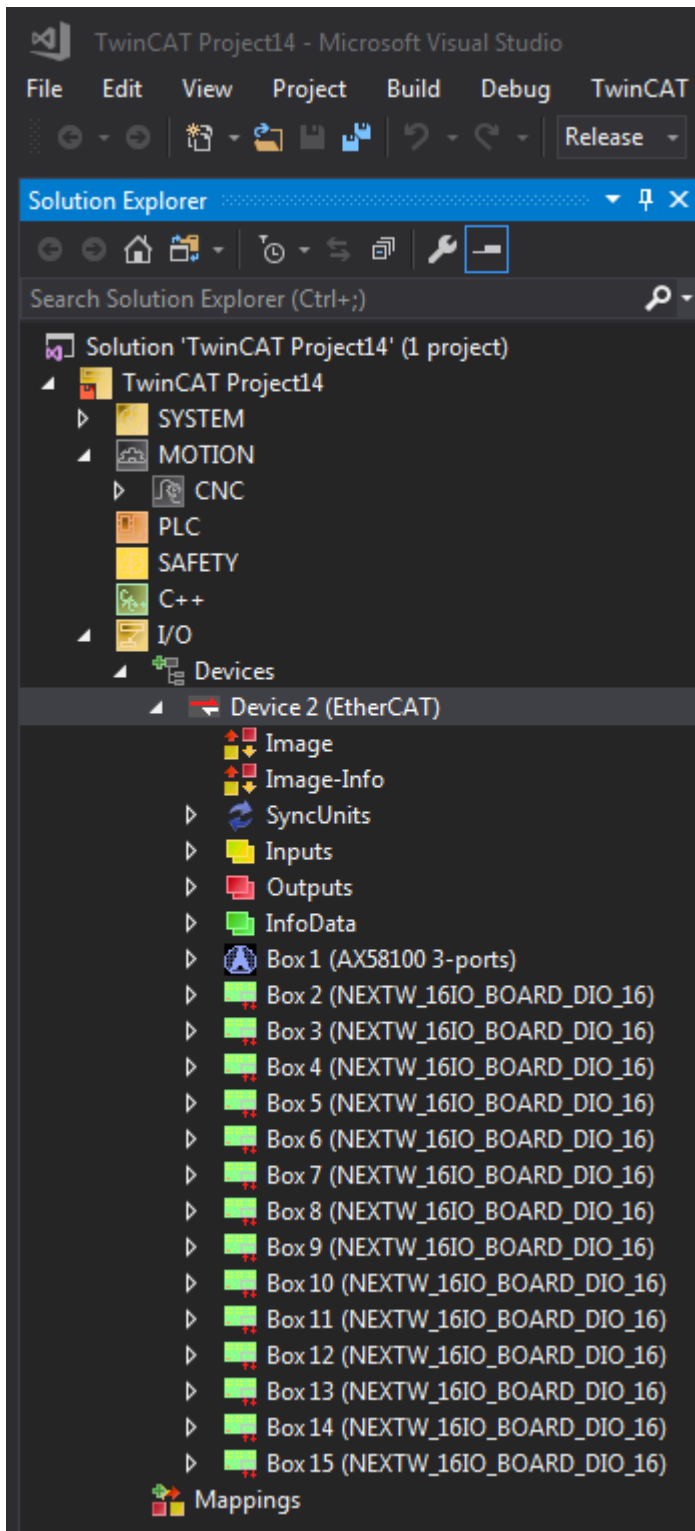
STEP7. Scan for boxes



STEP8. Activate Free Run



STEP9. After successful scanning, you can see the Box1(EC1101), Box2~Box15(ED1010) in TwinCAT project.







## 2.3 Using NEXTW ECM-SK to Scan NEXTW\_ES

## Chapter 3: Object Dictionary

### 3.1 Architecture of Object Dictionary

| Index (Hex)   | Meaning                                  |
|---------------|--|
| 0x0000~0x0FFF | Reserved                                 |
| 0x1000~0x1FFF | CoE communication objects                |
| 0x2000~0x5FFF | Manufacturer Specific Objects            |
| 0x6000~0x7FFF | CANOpen CiA 402 Profile Specific Objects |

### 3.2 Object Type and Attributes

| Code   | C/C++ type | Description            | Size (byte) | Range                  |
|--------|------------|------------------------|-------------|------------------------|
| USINT  | uint8_t    | unsigned byte          | 1           | 0~255                  |
| UINT   | uint16_t   | unsigned short integer | 2           | 0~65535                |
| UDINT  | uint32_t   | unsigned long integer  | 4           | 0~4294967295           |
| SINT   | int8_t     | signed byte            | 1           | -128~127               |
| INT    | int16_t    | signed short integer   | 2           | -32768~32767           |
| DINT   | int32_t    | signed long integer    | 4           | -2147483648~2147483647 |
| STRING | -          | string value           | -           | -                      |

| Attribute | Description |
|-----------|-------------|
|-----------|-------------|

|           |                                    |
|-----------|------------------------------------|
| <b>RO</b> | This object is only for read.      |
| <b>WO</b> | This object is only for write.     |
| <b>RW</b> | This object can be read and write. |

### 3.3 Object Dictionary List

| Object Dictionaries                           |  | Refer to   |
|---|--|------------|
| <b>General Objects</b>                        | <b>Device Type (1000h)</b>   | <b>4.4</b> |
|   | <b>Manufacturer Device Name (1008h)</b>                            | <b>4.4</b> |
|   | <b>Manufacturer Hardware Version (1009h)</b>                       | <b>4.4</b> |
|   | <b>Manufacturer Software Version (100Ah)</b>                       | <b>4.4</b> |
|   | <b>Identity Object (1018h)</b>                                     | <b>4.4</b> |
|   | <b>Error Settings(10F1h)</b>                                       | <b>4.4</b> |
| <b>PDO Mapping Objects</b>                    | <b>Receive PDO Mapping (1600h to 1602h) &amp;(1610h to 1612h)</b>  | <b>4.4</b> |
|   | <b>Transmit PDO Mapping (1A00h to 1A02h) &amp;(1A10h to 1A12h)</b> | <b>4.4</b> |
| <b>Sync Manager<br/>Communication Objects</b> | <b>Sync Manager Type (1C00h)</b>                                   | <b>4.4</b> |
|   | <b>RxPDO assign (1C12h)</b>  | <b>4.4</b> |
|   | <b>TxPDO assign (1C13h)</b>  | <b>4.4</b> |
|   | <b>SM output parameter (1C32h)</b>                                 | <b>4.4</b> |
|   | <b>SM input parameter (1C33h)</b>                                  | <b>4.4</b> |

|                                      |  |            |
|--------------------------------------|--|------------|
| <b>Manufacturer Specific Objects</b> | <b>Pulse Mode (2000h)</b>                    | <b>4.5</b> |
|                                      | <b>Accelaration Divisor (2001h)</b>          | <b>4.5</b> |
|                                      | <b>Encoder Enable (2004h)</b>                | <b>4.5</b> |
|                                      | <b>Analog Input (2010h)</b>                  | <b>4.5</b> |
|                                      | <b>Pulse Mode (2800h)</b>                    | <b>4.5</b> |
|                                      | <b>Accelaration Divisor (2801h)</b>          | <b>4.5</b> |
|                                      | <b>Encoder Enable (2804h)</b>                | <b>4.5</b> |
|                                      | <b>Analog Input (2810h)</b>                  | <b>4.5</b> |
| <b>Device Control</b>                | <b>Control Word (6040h)</b>                  | <b>4.6</b> |
|                                      | <b>Status Word (6041h)</b>                   | <b>4.6</b> |
|                                      | <b>Quickstop Option Code (605Ah)</b>         | <b>4.6</b> |
|                                      | <b>Shutdown Option Code (605Bh)</b>          | <b>4.6</b> |
|                                      | <b>Disable Operation Option Code (605Ch)</b> | <b>4.6</b> |
|                                      | <b>Halt Option Code (605Dh)</b>              | <b>4.6</b> |
|                                      | <b>Fault Reaction Code (605Eh)</b>           | <b>4.6</b> |
|                                      | <b>Modes of Operation (6060h)</b>            | <b>4.6</b> |
|                                      | <b>Modes of Operation Display (6061h)</b>    | <b>4.6</b> |
|                                      | <b>Supported Drive Modes (6502h)</b>         | <b>4.6</b> |
|                                      | <b>Control Word(6840h)</b>                   | <b>4.6</b> |
|                                      | <b>Status Word(6841h)</b>                    | <b>4.6</b> |
|                                      | <b>Quickstop Option Code(685Ah)</b>          | <b>4.6</b> |
|                                      | <b>Shutdown Option Code (685Bh)</b>          | <b>4.6</b> |
|                                      | <b>Disable Operation Option Code (685Ch)</b> | <b>4.6</b> |
|                                      | <b>Halt Option Code (685Dh)</b>              | <b>4.6</b> |
|                                      | <b>Fault Reaction Code (685Eh)</b>           | <b>4.6</b> |
|                                      | <b>Modes of Operation (6860h)</b>            | <b>4.6</b> |

|   |   |            |
|---|---|------------|
|   | <b>Modes of Operation Display (6861h)</b> | <b>4.6</b> |
|   | <b>Supported Drive Modes(6d02h)</b>       | <b>4.6</b> |
| <b>Cyclic Synchronous<br/>Position Mode/<br/>Cyclic Synchronous<br/>Velocity Mode</b> | <b>Position Actual Value (6064h)</b>      | <b>4.6</b> |
|   | <b>Velocity Actual Value (606Ch)</b>      | <b>4.6</b> |
|   | <b>Target Position (607Ah)</b>            | <b>4.6</b> |
|   | <b>Software Position Limit (607Dh)</b>    | <b>4.6</b> |
|   | <b>Max Profile Velocity (607Fh)</b>       | <b>4.6</b> |
|   | <b>Profile Acceleration (6083h)</b>       | <b>4.6</b> |
|   | <b>Profile Deceleration (6084h)</b>       | <b>4.6</b> |
|   | <b>Quick stop Deceleration (6085h)</b>    | <b>4.6</b> |
|   | <b>Target Velocity (60FFh)</b>            | <b>4.6</b> |
|   | <b>Interpolation Time (60C2h)</b>         | <b>4.6</b> |
|   | <b>Position Actual Value (6864h)</b>      | <b>4.6</b> |
|   | <b>Velocity Actual Value (686Ch)</b>      | <b>4.6</b> |
|   | <b>Target Position (687Ah)</b>            | <b>4.6</b> |
|   | <b>Software Position Limit (687Dh)</b>    | <b>4.6</b> |
|   | <b>Max Profile Velocity (687Fh)</b>       | <b>4.6</b> |
|   | <b>Profile Acceleration (6883h)</b>       | <b>4.6</b> |
|   | <b>Profile Deceleration (6884h)</b>       | <b>4.6</b> |
|   | <b>Quickstop Declaration (6885h)</b>      | <b>4.6</b> |
|   | <b>Target Velocity(68FFh)</b>             | <b>4.6</b> |
|   | <b>Interpolation Time (68C2h)</b>         | <b>4.6</b> |
| <b>Homing Mode</b>  | <b>Homing Offset (607Ch)</b>              | <b>4.6</b> |
|   | <b>Homing Method (6098h)</b>              | <b>4.6</b> |
|   | <b>Homing Speed(6099h)</b>                | <b>4.6</b> |

|                        |                             |     |
|------------------------|-----------------------------|-----|
|                        | Homing Acceleration (609Ah) | 4.6 |
|                        | Homing Offset(687Ch)        | 4.6 |
|                        | Homing Method(6898h)        | 4.6 |
|                        | Homing Speed(6899h)         | 4.6 |
|                        | Homing Acceleration (689Ah) | 4.6 |
| Digital Inputs/Outputs | Digital Inputs(60FDh)       | 4.6 |
|                        | Digital Outputs(60FEh)      | 4.6 |
|                        | Digital Inputs(68FDh)       | 4.6 |
|                        | Digital Outputs(68FEh)      | 4.6 |

### 3.4 CoE Communication Objects (0x1000~0x1FFF)

#### Device type

| Index  | Sub | Name        | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-------------|-----------|--------|-------------|---------------|
| 0x1000 | 00  | Device type | UDINT     | RO     | N           | 0x192         |

- 0x1000:00 Device type: 0x192 (DS402 device)

#### Device name

| Index  | Sub | Name        | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-------------|-----------|--------|-------------|---------------|
| 0x1008 | 00  | Device name | STRING    | RO     | N           | NEXTW402      |

#### Hardware version

| Index  | Sub | Name             | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|------------------|-----------|--------|-------------|---------------|
| 0x1009 | 00  | Hardware version | STRING    | RO     | N           | -             |

## Software version

| Index  | Sub | Name             | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|------------------|-----------|--------|-------------|---------------|
| 0x100A | 00  | Software version | STRING    | RO     | N           | -             |

## Identity

| Index  | Sub | Name          | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------|-----------|--------|-------------|---------------|
| 0x1018 | 00  | Count         | USINT     | RO     | N           | 4             |
|        | 01  | Vendor ID     | UDINT     | RO     | N           | 0x101010      |
|        | 02  | Product code  | UDINT     | RO     | N           | 0x26483052    |
|        | 03  | Revision      | UDINT     | RO     | N           | 0             |
|        | 04  | Serial number | UDINT     | RO     | N           | 0             |

## Error Settings

| Index  | Sub | Name                     | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------------------|-----------|--------|-------------|---------------|
| 0x10F1 | 00  | Count                    | USINT     | RO     | N           | 2             |
|        | 01  | Local Error Reaction     | Reserved  | -      | -           | -             |
|        | 02  | Sync Error Counter Limit | UINT      | RW     | N           | 4             |

### • 0x10F1:02 Sync Error Counter Limit:

In DC mode, if the local error counter reaches the limit, the EtherCAT state machine will change to SAFEOP state. The local error counter is set to 0 when the state machine changing to OP state. If the slave miss an SM2 event between two Sync0 event, the local error counter increases by 3; otherwise, the counter decreases by 1.

### CSP/CSV RxDPO of Axis 0

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x1600 | 00  | Count               | USINT     | RO     | N           | 5             |
|        | 01  | The 1st RxDPO entry | UDINT     | RO     | N           | 0x60400010    |
|        | 02  | The 2nd RxDPO entry | UDINT     | RO     | N           | 0x607A0020    |
|        | 03  | The 3rd RxDPO entry | UDINT     | RO     | N           | 0x60FF0020    |
|        | 04  | The 4th RxDPO entry | UDINT     | RO     | N           | 0x60600008    |
|        | 05  | The 5th RxDPO entry | UDINT     | RO     | N           | 0x00000008    |

- 0x1600:01 The 1st RxDPO entry: 0x6040:00 (Control word of Axis 0)
- 0x1600:02 The 2nd RxDPO entry: 0x607A:00 (Target position of Axis 0)
- 0x1600:03 The 3rd RxDPO entry: 0x60FF:00 (Target velocity of Axis 0)
- 0x1600:04 The 4th RxDPO entry: 0x6060:00 (Mode of operation of Axis 0)
- 0x1600:05 The 5th RxDPO entry: padding byte

### CSP RxDPO of Axis 0

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x1601 | 00  | Count               | USINT     | RO     | N           | 3             |
|        | 01  | The 1st RxDPO entry | UDINT     | RO     | N           | 0x60400010    |



|  |           |                            |              |           |          |                   |
|--|-----------|----------------------------|--------------|-----------|----------|-------------------|
|  | <b>02</b> | <b>The 2nd RxDPO entry</b> | <b>UDINT</b> | <b>RO</b> | <b>N</b> | <b>0x607A0020</b> |
|  | <b>03</b> | <b>The 3rd RxDPO entry</b> | <b>UDINT</b> | <b>RO</b> | <b>N</b> | <b>0x60FE0020</b> |

- **0x1601:01 The 1st RxDPO entry: 0x6040:00 (Control word of Axis 0)**
- **0x1601:02 The 2nd RxDPO entry: 0x607A:00 (Target position of Axis 0)**
- **0x1601:03 The 3rd RxDPO entry: 0x60FE:00 (Digital outputs of channel 0 to 7)**

### CSV RxDPO of Axis 0

| <b>Index</b>  | <b>Sub</b> | <b>Name</b>                | <b>Data Type</b> | <b>Access</b> | <b>PDO Mapping</b> | <b>Default Value</b> |
|---------------|------------|----------------------------|------------------|---------------|--------------------|----------------------|
| <b>0x1602</b> | <b>00</b>  | <b>Count</b>               | <b>USINT</b>     | <b>RO</b>     | <b>N</b>           | <b>3</b>             |
|               | <b>01</b>  | <b>The 1st RxDPO entry</b> | <b>UDINT</b>     | <b>RO</b>     | <b>N</b>           | <b>0x60400010</b>    |
|               | <b>02</b>  | <b>The 2nd RxDPO entry</b> | <b>UDINT</b>     | <b>RO</b>     | <b>N</b>           | <b>0x60FF0020</b>    |
|               | <b>03</b>  | <b>The 3rd RxDPO entry</b> | <b>UDINT</b>     | <b>RO</b>     | <b>N</b>           | <b>0x60FE0020</b>    |

- **0x1602:01 The 1st RxDPO entry: 0x6040:00 (Control word of Axis 0)**
- **0x1602:02 The 2nd RxDPO entry: 0x60FF:00 (Target velocity of Axis 0)**
- **0x1602:03 The 3rd RxDPO entry: 0x60FE:00 (Digital outputs of channel 0 to 7)**

### CSP/CSV RxDPO of Axis 1

| <b>Index</b>  | <b>Sub</b> | <b>Name</b>  | <b>Data Type</b> | <b>Access</b> | <b>PDO Mapping</b> | <b>Default Value</b> |
|---------------|------------|--------------|------------------|---------------|--------------------|----------------------|
| <b>0x1610</b> | <b>00</b>  | <b>Count</b> | <b>USINT</b>     | <b>RO</b>     | <b>N</b>           | <b>5</b>             |

|  |           |                     |       |    |   |            |
|--|-----------|---------------------|-------|----|---|------------|
|  | <b>01</b> | The 1st RxPDO entry | UDINT | RO | N | 0x68400010 |
|  | <b>02</b> | The 2nd RxPDO entry | UDINT | RO | N | 0x687A0020 |
|  | <b>03</b> | The 3rd RxPDO entry | UDINT | RO | N | 0x68FF0020 |
|  | <b>04</b> | The 4th RxPDO entry | UDINT | RO | N | 0x68600008 |
|  | <b>05</b> | The 5th RxPDO entry | UDINT | RO | N | 0x00000008 |

- 0x1610:01 The 1st RxPDO entry: 0x6840:00 (Control word of Axis 1)
- 0x1610:02 The 2nd RxPDO entry: 0x687A:00 (Target position of Axis 1)
- 0x1610:03 The 3rd RxPDO entry: 0x68FF:00 (Target velocity of Axis 1)
- 0x1610:04 The 4th RxPDO entry: 0x6860:00 (Mode of operation of Axis 1)
- 0x1610:05 The 5th RxPDO entry: padding byte

### CSP RxPDO of Axis 1

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x1611 | 00  | Count               | USINT     | RO     | N           | 3             |
|        | 01  | The 1st RxPDO entry | UDINT     | RO     | N           | 0x68400010    |
|        | 02  | The 2nd RxPDO entry | UDINT     | RO     | N           | 0x687A0020    |

|  |    |                     |       |    |   |            |
|--|----|---------------------|-------|----|---|------------|
|  | 03 | The 3rd RxPDO entry | UDINT | RO | N | 0x68FE0020 |
|--|----|---------------------|-------|----|---|------------|

- 0x1611:01 The 1st RxPDO entry: 0x6840:00 (Control word of Axis 1)
- 0x1611:02 The 2nd RxPDO entry: 0x687A:00 (Target position of Axis 1)
- 0x1611:03 The 3rd RxPDO entry: 0x68FE:00 (Digital outputs of channel 8 to 15)

### CSV RxPDO of Axis 1

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x1612 | 00  | Count               | USINT     | RO     | N           | 3             |
|        | 01  | The 1st RxPDO entry | UDINT     | RO     | N           | 0x68400010    |
|        | 02  | The 2nd RxPDO entr  | UDINT     | RO     | N           | 0x68FF0020    |
|        | 03  | The 3rd RxPDO entry | UDINT     | RO     | N           | 0x68FE0020    |

- 0x1612:01 The 1st RxPDO entry: 0x6840:00 (Control word of Axis 1)
- 0x1612:02 The 2nd RxPDO entry: 0x68FF:00 (Target velocity of Axis 1)
- 0x1612:03 The 3rd RxPDO entry: 0x68FE:00 (Digital outputs of channel 8 to 15)

### CSP/CSV TxPDO of Axis 0

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x1A00 | 00  | Count               | USINT     | RO     | N           | 5             |
|        | 01  | The 1st TxPDO entry | UDINT     | RO     | N           | 0x60410010    |

|  |           |                     |       |    |   |            |
|--|-----------|---------------------|-------|----|---|------------|
|  | <b>02</b> | The 2nd TxPDO entry | UDINT | RO | N | 0x60640020 |
|  | <b>03</b> | The 3rd TxPDO entry | UDINT | RO | N | 0x606C0020 |
|  | <b>04</b> | The 4th TxPDO entry | UDINT | RO | N | 0x60610008 |
|  | <b>05</b> | The 5th TxPDO entry | UDINT | RO | N | 0x00000008 |

- 0x1A00:01 The 1st TxPDO entry: 0x6041:00 (Status word of Axis 0)
- 0x1A00:02 The 2nd TxPDO entry: 0x6064:00 (Actual position of Axis 0)
- 0x1A00:03 The 3rd TxPDO entry: 0x606C:00 (Actual velocity of Axis 0)
- 0x1A00:04 The 4th TxPDO entry: 0x6061:00 (Mode of operation display of Axis 0)
- 0x1A00:05 The 5th TxPDO entry: padding byte

### csp TxPDO of Axis 0

| Index         | Sub       | Name                | Data Type | Access | PDO Mapping | Default Value |
|---------------|-----------|---------------------|-----------|--------|-------------|---------------|
| <b>0x1A01</b> | <b>00</b> | Count               | USINT     | RO     | N           | 3             |
|               | <b>01</b> | The 1st TxPDO entry | UDINT     | RO     | N           | 0x60410010    |
|               | <b>02</b> | The 2nd TxPDO entry | UDINT     | RO     | N           | 0x60640020    |
|               | <b>03</b> | The 3rd TxPDO entry | UDINT     | RO     | N           | 0x60FD0020    |

- 0x1A01:01 The 1st TxPDO entry: 0x6041:00 (Status word of Axis 0)
- 0x1A01:02 The 2nd TxPDO entry: 0x6064:00 (Target position of Axis 0)

- 0x1A01:03 The 3rd TxPDO entry: 0x60FD:00 (Digital inputs of channel 0 to 7)

### CSV TxPDO of Axis 0

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x1A02 | 00  | Count               | USINT     | RO     | N           | 3             |
|        | 01  | The 1st TxPDO entry | UDINT     | RO     | N           | 0x60410010    |
|        | 02  | The 2nd TxPDO entry | UDINT     | RO     | N           | 0x60640020    |
|        | 03  | The 3rd TxPDO entry | UDINT     | RO     | N           | 0x60FD0020    |

- 0x1A02:01 The 1st TxPDO entry: 0x6041:00 (Status word of Axis 0)
- 0x1A02:02 The 2nd TxPDO entry: 0x6064:00 (Target position of Axis 0)
- 0x1A02:03 The 3rd TxPDO entry: 0x60FD:00 (Digital inputs of channel 0 to 7)

### CSP/CSV TxPDO of Axis 1

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x1A10 | 00  | Count               | USINT     | RO     | N           | 5             |
|        | 01  | The 1st TxPDO entry | UDINT     | RO     | N           | 0x68410010    |
|        | 02  | The 2nd TxPDO entry | UDINT     | RO     | N           | 0x68640020    |
|        | 03  | The 3rd TxPDO entry | UDINT     | RO     | N           | 0x686C0020    |

|  |           |                     |       |    |   |            |
|--|-----------|---------------------|-------|----|---|------------|
|  | <b>04</b> | The 4th TxPDO entry | UDINT | RO | N | 0x68610008 |
|  | <b>05</b> | The 5th TxPDO entry | UDINT | RO | N | 0x00000008 |

- 0x1A10:01 The 1st TxPDO entry: 0x6841:00 (Status word of Axis 0)
- 0x1A10:02 The 2nd TxPDO entry: 0x6864:00 (Actual position of Axis 0)
- 0x1A10:03 The 3rd TxPDO entry: 0x686C:00 (Actual velocity of Axis 0)
- 0x1A10:04 The 4th TxPDO entry: 0x6861:00 (Mode of operation display of Axis 0)
- 0x1A10:05 The 5th TxPDO entry: padding byte

### csp TxPDO of Axis 2

| Index         | Sub       | Name                | Data Type | Access | PDO Mapping | Default Value |
|---------------|-----------|---------------------|-----------|--------|-------------|---------------|
| <b>0x1A11</b> | <b>00</b> | Count               | USINT     | RO     | N           | 3             |
|               | <b>01</b> | The 1st TxPDO entry | UDINT     | RO     | N           | 0x68410010    |
|               | <b>02</b> | The 2nd TxPDO entry | UDINT     | RO     | N           | 0x68640020    |
|               | <b>03</b> | The 3rd TxPDO entry | UDINT     | RO     | N           | 0x68FD0020    |

- 0x1A11:01 The 1st TxPDO entry: 0x6841:00 (Status word of Axis 1)
- 0x1A11:02 The 2nd TxPDO entry: 0x6864:00 (Target position of Axis 1)
- 0x1A11:03 The 3rd TxPDO entry: 0x68FD:00 (Digital inputs of channel 8 to 15)

### CSV TxPDO of Axis 2

| Index         | Sub       | Name  | Data Type | Access | PDO Mapping | Default Value |
|---------------|-----------|-------|-----------|--------|-------------|---------------|
| <b>0x1A12</b> | <b>00</b> | Count | USINT     | RO     | N           | 3             |

|  |    |                     |       |    |   |            |
|--|----|---------------------|-------|----|---|------------|
|  |    |                     |       |    |   |            |
|  | 01 | The 1st TxPDO entry | UDINT | RO | N | 0x68410010 |
|  | 02 | The 2nd TxPDO entry | UDINT | RO | N | 0x68640020 |
|  | 03 | The 3rd TxPDO entry | UDINT | RO | N | 0x68FD0020 |

- 0x1A12:01 The 1st TxPDO entry: 0x6841:00 (Status word of Axis 1)
- 0x1A12:02 The 2nd TxPDO entry: 0x6864:00 (Target position of Axis 1)
- 0x1A12:03 The 3rd TxPDO entry: 0x68FD:00 (Digital inputs of channel 8 to 15)

### Sync Manager Type

| Index  | Sub | Name                      | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------------|-----------|--------|-------------|---------------|
| 0x1C00 | 00  | Count                     | USINT     | RO     | N           | 4             |
|        | 01  | Communication type of SM0 | USINT     | RO     | N           | 1             |
|        | 02  | Communication type of SM1 | USINT     | RO     | N           | 2             |
|        | 03  | Communication type of SM2 | USINT     | RO     | N           | 3             |
|        | 04  | Communication type of SM3 | USINT     | RO     | N           | 4             |

- 0x1C00:01 Communication type of SM0: 1 (mailbox out)
- 0x1C00:02 Communication type of SM1: 2 (mailbox in)
- 0x1C00:03 Communication type of SM2: 3 (process data out)
- 0x1C00:04 Communication type of SM3: 4 (process data in)

### RxPDO assign

| Index  | Sub | Name            | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------|-----------|--------|-------------|---------------|
| 0x1C12 | 00  | Number of RxPDO | USINT     | RW*    | N           | 2             |
|        | 01  | 1st RxPDO       | UINT      | RW*    | N           | 0x1602        |
|        | 02  | 2nd RxPDO       | UINT      | RW*    | N           | 0x1612        |

\*Writable in only pre-operation state

- 0x1C12:00 Number of RxPDO: 0 to 2

Set to 1 for one-axis mode, or 2 for two-axis mode.

- 0x1C12:01 1st RxPDO: 0x1600 to 0x1602

Set to 0x1600 for CSP/CSV mode, 0x1601 for CSP mode, or 0x1602 for CSV mode.

- 0x1C12:02 2nd RxPDO: 0x1610 to 0x1612

Set to 0x1610 for CSP/CSV mode, 0x1611 for CSP mode, or 0x1612 for CSV mode.

### Setup Procedure of RxPDO Mapping:

1. Set object 0x1C12:00 to 0.
2. Set object 0x1C12:01 or 0x1C12:02 if necessary.
3. Set object 0x1C12:00 to 1 for one-axis mode, or 2 for two-axis mode.

### TxPDO assign

| Index  | Sub | Name            | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------|-----------|--------|-------------|---------------|
| 0x1C13 | 00  | Number of TxPDO | USINT     | RW*    | N           | 2             |



|  |    |           |      |     |   |        |
|--|----|-----------|------|-----|---|--------|
|  | 01 | 1st TxPDO | UINT | RW* | N | 0x1A02 |
|  | 02 | 2nd TxPDO | UINT | RW* | N | 0x1A12 |

\*Writable in only pre-operation state

• 0x1C13:00 Number of TxPDO: 0 to 2

Set to 1 for one-axis mode, or 2 for two-axis mode.

• 0x1C13:01 1st TxPDO: 0x1A00 to 0x1A02

Set to 0x1A00 for CSP/CSV mode, 0x1A01 for CSP mode, or 0x1A02 for CSV mode.

• 0x1C13:02 2nd TxPDO: 0x1A10 to 0x1A12

Set to 0x1A10 for CSP/CSV mode, 0x1A11 for CSP mode, or 0x1A12 for CSV mode.

Setup Procedure of TxPDO Mapping:

4. Set object 0x1C13:00 to 0.
5. Set object 0x1C13:01 or 0x1C13:02 if necessary.
6. Set object 0x1C13:00 to 1 for one-axis mode, or 2 for two-axis mode.

### SM output parameter

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x1C32 | 00  | Count                | USINT     | RO     | N           | 32            |
|        | 01  | Synchronization Type | UINT      | RO     | N           | 0             |
|        | 02  | Cycle Time           | UDINT     | RO     | N           | 0             |
|        | 03  | Reserved             | -         | -      | -           | -             |
|        | 04  | Reserved             | -         | -      | -           | -             |
|        | 05  | Minimum Cycle Time   | UDINT     | RO     | N           | 250000        |
|        | 06  | Reserved             | -         | -      | -           | -             |

|  |       |                  |       |    |   |   |
|--|-------|------------------|-------|----|---|---|
|  |       | d                |       |    |   |   |
|  | 07    | Reserved         | -     | -  | - | - |
|  | 08    | Reserved         | -     | -  | - | - |
|  | 09    | Delay Time       | UDINT | RO | N | 0 |
|  | 0a    | Sync0 Cycle Time | UDINT | RO | N | 0 |
|  | 0b    | SM-Event Missed  | UINT  | RO | N | 0 |
|  | 0c    | Reserved         | -     | -  | - | - |
|  | 0d~1f | Reserved         | -     | -  | - | - |
|  | 20    | Sync Error       | BOOL  | RO | N | 0 |

- 0x1C32:01 Synchronization Type: 0 for free-run mode, 1 for SM-sync mode, or 2 for DC-sync mode.
- 0x1C32:02 Cycle Time: Time between Sync0 events [ns]
- 0x1C32:05 Minimum Cycle Time: 250000 [ns]
- 0x1C32:0B SM-Event Missed: Referred to object 0x10F1
- 0x1C32:20 Sync Error: 1 for sync error occurs.

### SM input parameter

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x1C33 | 00  | SubIndex 000         | uint8     | RO     | N           | 32            |
|        | 01  | Synchronization Type | UINT      | RO     | N           | 0             |
|        | 02  | Cycle Time           | UDINT     | RO     | N           | 0             |

|              |  |                 |           |          |               |
|--------------|--|-----------------|-----------|----------|---------------|
| <b>03</b>    | <b>SubIndex 003</b>                    | <b>Reserved</b> | -         | -        | -             |
| <b>04</b>    | <b>Synchronization Types supported</b> | <b>Reserved</b> | -         | -        | -             |
| <b>05</b>    | <b>Minimum Cycle Time</b>              | <b>UDINT</b>    | <b>RO</b> | <b>N</b> | <b>250000</b> |
| <b>06</b>    | <b>Calc and Copy Time</b>              | <b>Reserved</b> | -         | -        | -             |
| <b>07</b>    | <b>SubIndex 007</b>                    | <b>Reserved</b> | -         | -        | -             |
| <b>08</b>    | <b>Get Cycle Time</b>                  | <b>uint16</b>   | <b>RO</b> | <b>N</b> | <b>0</b>      |
| <b>09</b>    | <b>Delay Time</b>                      | <b>UDINT</b>    | <b>RO</b> | <b>N</b> | <b>0</b>      |
| <b>0a</b>    | <b>Sync0 Cycle Time</b>                | <b>UDINT</b>    | <b>RO</b> | <b>N</b> | <b>0</b>      |
| <b>0b</b>    | <b>SM-Event Missed</b>                 | <b>UINT</b>     | <b>RO</b> | <b>N</b> | <b>0</b>      |
| <b>0c</b>    | <b>Cycle Time Too Small</b>            | <b>UINT</b>     | <b>RO</b> | <b>N</b> | <b>0</b>      |
| <b>0d</b>    | <b>Shift Time Too Short</b>            | <b>Reserved</b> | -         | -        | -             |
| <b>0e~1f</b> | -                                      | <b>Reserved</b> | -         | -        | -             |
| <b>20</b>    | <b>Sync Error</b>                      | <b>BOOL</b>     | <b>RO</b> | <b>N</b> | <b>0</b>      |

- **0x1C33:01 Synchronization Type:** 0 for free-run mode, 1 for SM-sync mode, or 2 for DC-sync mode.
- **0x1C33:02 Cycle Time:** Time between Sync0 events [ns]
- **0x1C33:05 Minimum Cycle Time:** 250000 [ns]
- **0x1C33:0B SM-Event Missed:** Referred to object 0x10F1
- **0x1C33:20 Sync Error:** 1 for sync error occurs.

## 3.5 Manufacturer Specific Objects –General (0x2000~0x2FFF)

### Pulse Mode

| Index  | Sub | Name       | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|------------|-----------|--------|-------------|---------------|
| 0x2000 | 00  | Pulse Mode | USINT     | RW     | N           | 0             |

- **0x2000:00 Pulse Mode of Axis 0:** 0 to 1

**0:** Pulse/direction mode

**1:** CW/CCW mode

**Note:** This object is loaded from and written to data flash.

### Acceleration Divisor

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x2001 | 00  | Acceleration Divisor | UDINT     | RW     | N           | 1000          |

- **0x2001:00 Acceleration Divisor of Axis 0:** 1 to 0xFFFFFFFF

The divisor of profile acceleration, homing acceleration, and quick stop acceleration.

**Note:** This object is loaded from and written to data flash.

### Encoder Enable

| Index  | Sub | Name           | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------|-----------|--------|-------------|---------------|
| 0x2004 | 00  | Encoder Enable | USINT     | RW     | N           | 1             |

- **0x2004:00 Encoder Enable of Axis 0:** 0 to 2

**0:** Disable encoder mode

1: Enable X4 encoder mode

2: Enable X2 encoder mode

Note: This object is loaded from and written to data flash.

## Analog Input

| Index  | Sub | Name         | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------|-----------|--------|-------------|---------------|
| 0x2010 | 00  | Analog Input | DINT      | RO     | N           | -             |

• 0x2010:00 Analog Input Channel 0:

12-bit single-ended ADC.

Analog input voltage range: 0 to 3.3V

## Pulse Mode

| Index  | Sub | Name       | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|------------|-----------|--------|-------------|---------------|
| 0x2800 | 00  | Pulse Mode | USINT     | RW     | N           | 0             |

• 0x2800:00 Pulse Mode of Axis 1: Referred to Object 0x2000:00

Note: This object is loaded from and written to data flash.

## Acceleration Divisor

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x2801 | 00  | Acceleration Divisor | UDINT     | RW     | N           | 1000          |

• 0x2801:00 Acceleration Divisor of Axis 1: Referred to Object 0x2001:00

Note: This object is loaded from and written to data flash.

## Encoder Enable

| Index  | Sub | Name           | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------|-----------|--------|-------------|---------------|
| 0x2804 | 00  | Encoder Enable | USINT     | RW     | N           | 1             |

• 0x2804:00 Encoder Enable of Axis 1: Referred to Object 0x2004:00

Note: This object is loaded from and written to data flash.

| Index  | Sub | Name         | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------|-----------|--------|-------------|---------------|
| 0x2810 | 00  | Analog Input | DINT      | RO     | N           | -             |

- 0x2810:00 Analog Input Channel 1: Referred to Object 0x2010:00

### 3.6 CANOpen CiA 402 Profile Specific Objects (0x6000~0x7FFF)

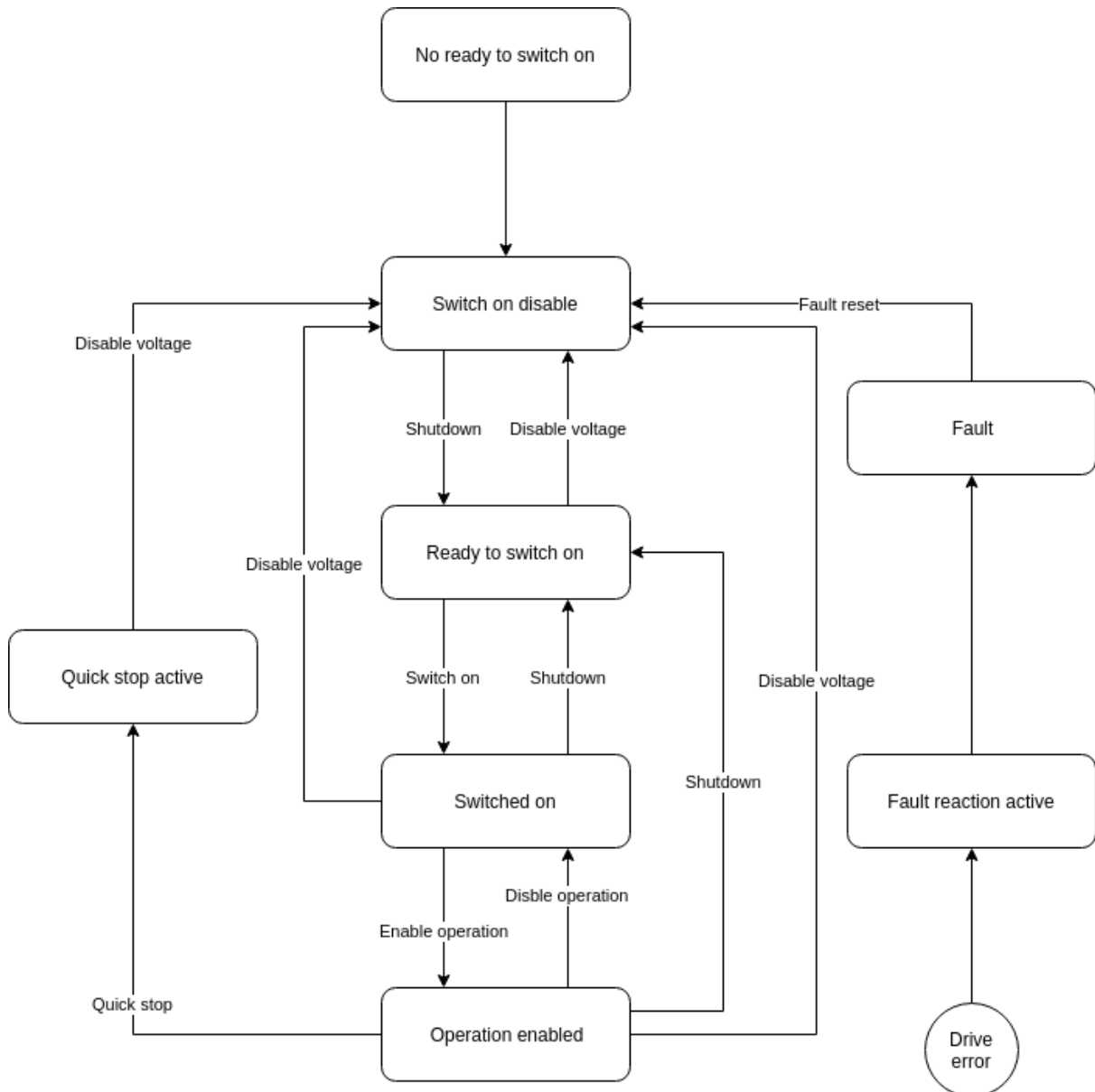
#### Control Word

| Index  | Sub | Name         | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------|-----------|--------|-------------|---------------|
| 0x6040 | 00  | Control Word | UINT      | RW     | Y           | 0             |

- 0x6040:00 Control Word of Axis 0:

Bit 0 to 3 and bit 7: for the controlling command of the drive state

| Command           | bit 7 | bit 3 | bit 2 | bit 1 | bit 0 |
|-------------------|-------|-------|-------|-------|-------|
| Shutdown          | 0     | -     | 1     | 1     | 0     |
| Switch on         | 0     | 0     | 1     | 1     | 1     |
| Disable voltage   | 0     | -     | -     | 0     | -     |
| Quick stop        | 0     | -     | 0     | 1     | 0     |
| Disable operation | 0     | 0     | 1     | 1     | 1     |
| Enable operation  | 0     | 1     | 1     | 1     | 1     |
| Fault reset       | 0→1   | -     | -     | -     | -     |



▲ DS402 state machine

Bit 4, 5, 6, 8 and 9: for the controlling of Homing mode

| Bit | Function               | Value | Description                        |
|-----|------------------------|-------|------------------------------------|
| 4   | Homing operation start | 0     | Stop homing procedure              |
|     |                        | 1     | Start or continue homing procedure |
| 5   | -                      | 0     | Reserved                           |
| 6   | -                      | 0     | Reserved                           |
| 8   | Halt                   | 0     | Do not halt homing procedure       |

|   |   |   |                       |
|---|---|---|-----------------------|
|   |   | 1 | Halt homing procedure |
| 9 | - | 0 | Reserved              |

**Bit 4, 5, 6, 8 and 9: for the controlling of CSP/CSV/PV mode**

| Bit | Function | Value | Description                      |
|-----|----------|-------|----------------------------------|
| 4   | -        | 0     | Reserved                         |
| 5   | -        | 0     | Reserved                         |
| 6   | -        | 0     | Reserved                         |
| 8   | Halt     | 0     | Do not halt CSP/CSV/PV procedure |
|     |          | 1     | Halt CSP/CSV/PV procedure        |
| 9   | -        | 0     | Reserved                         |

**Bit 10 to 15: reserved. These bits should be set to 0.**

| Index  | Sub | Name        | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-------------|-----------|--------|-------------|---------------|
| 0x6041 | 00  | Status Word | UINT      | RO     | Y           | *(See below)  |

• 0x6041:00 Status Word of Axis 0:

**Bit 0 to 3 and bit 5 to 6: for the current state of the drive**

| Command                | bit 6 | bit 5 | bit 3 | bit 2 | bit 1 | bit 0 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Not ready to switch on | 0     | 0     | 0     | 0     | 0     | 0     |
| Switch on disabled     | 1     | 0     | 0     | 0     | 0     | 0     |
| Ready to switch on     | 0     | 1     | 0     | 0     | 0     | 1     |
| Switched on            | 0     | 1     | 0     | 0     | 1     | 1     |
| Operation enabled      | 0     | 1     | 0     | 1     | 1     | 1     |



|                       |   |   |   |   |   |   |
|-----------------------|---|---|---|---|---|---|
| Quick stop active     | 0 | 0 | 0 | 1 | 1 | 1 |
| Fault reaction active | 0 | 0 | 1 | 1 | 1 | 1 |
| Fault                 | 0 | 0 | 1 | 0 | 0 | 0 |

### Bit 10, 12 and 13: for Homing mode

| Bit | Status          | Value | Description   |
|-----|-----------------|-------|---|
| 10  | Target reached  | 0     | Halt (Bit 8 in Controlword) = 0:<br>Target not reached<br>Halt (Bit 8 in Controlword) = 1:<br>Axis decelerates  |
|     |                 | 1     | Halt (Bit 8 in Controlword) = 0:<br>Target reached<br>Halt (Bit 8 in Controlword) = 1:<br>Velocity of axis is 0 |
| 12  | Homing attained | 0     | Homing mode not yet complete  |
|     |                 | 1     | Homing mode complete successfully   |
| 13  | -               | -     | Reserved  |

### Bit 10, 12 and 13: for Profile velocity mode

| Bit | Status         | Value | Description   |
|-----|----------------|-------|---|
| 10  | Target reached | 0     | Halt (Bit 8 in Controlword) = 0:<br>Target not reached<br>Halt (Bit 8 in Controlword) = 1:<br>Axis decelerates  |
|     |                | 1     | Halt (Bit 8 in Controlword) = 0:<br>Target reached<br>Halt (Bit 8 in Controlword) = 1:<br>Velocity of axis is 0 |
| 12  | -              | -     | Reserved  |
| 13  | -              | -     | Reserved  |

## Quickstop Option Code

| Index  | Sub | Name                  | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------------|-----------|--------|-------------|---------------|
| 0x605A | 00  | Quickstop Option Code | INT       | RW     | N           | 2             |

- **0x605A:00 Quickstop Option Code of Axis 0:**
- 0:** Disable driver function (turns the servo OFF)
- 1:** Slow down on slow down ramp and stay in Operation Enabled. The slow down deceleration is defined as the following object.
  - Cyclic Position, Cyclic Velocity mode: Object 0x6084
  - Homing mode: Object 0x609A
- 2:** Slow down on quick stop ramp and stay in Operation Enabled.
- Others:** Reserve.

## Shutdown Option Code

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x605B | 00  | Shutdown Option Code | INT       | RW     | N           | 0             |

- **0x605B:00 Shutdown Option Code of Axis 0:**
- 0:** Disable driver function (turns the servo OFF)
- 1:** Slow down on slow down ramp and stay in Operation Enabled. The slow down deceleration is defined as the following object.
  - Cyclic Position, Cyclic Velocity mode: Object 0x6084
  - Homing mode: Object 0x609A
- Others:** Reserved.

## Disable Operation Option Code

| Index  | Sub | Name                          | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-------------------------------|-----------|--------|-------------|---------------|
| 0x605C | 00  | Disable Operation Option Code | INT       | RW     | N           | 1             |

- **0x605C:00 Disable Operation Option Code of Axis 0:**
- 0:** Disable driver function (turns the servo OFF)
- 1:** Slow down on slow down ramp and stay in Operation Enabled. The slow down deceleration is defined as the following object.
  - Cyclic Position, Cyclic Velocity mode: Object 0x6084
  - Homing mode: Object 0x609A

**Others: Reserved.**

### Halt Option Code

| Index  | Sub | Name             | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|------------------|-----------|--------|-------------|---------------|
| 0x605D | 00  | Halt Option Code | INT       | RW     | N           | 1             |

• **0x605D:00 Halt Option Code of Axis 0:**

**0: Disable driver function (turns the servo OFF)**

**1: Slow down on slow down ramp and stay in Operation Enabled. The slow down deceleration is defined as the following object.**

- **Cyclic Position, Cyclic Velocity mode: Object 0x6084**
- **Homing mode: Object 0x609A**

**2: Slow down on quick stop ramp and stay in Operation Enabled.**

**Others: Reserved.**

### Fault Reaction Code

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x605E | 00  | Fault Reaction Code | INT       | RW     | N           | 2             |

• **0x605E:00 Fault Reaction Code of Axis 0:**

**0: Disable driver function (turns the servo OFF)**

**1: Slow down on slow down ramp and stay in Operation Enabled. The slow down deceleration is defined as the following object.**

- **Cyclic Position, Cyclic Velocity mode: Object 0x6084**
- **Homing mode: Object 0x609A**

**2: Slow down on quick stop ramp and stay in Operation Enabled.**

**Others: Reserved.**

### Modes of Operation

| Index  | Sub | Name               | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------------|-----------|--------|-------------|---------------|
| 0x6060 | 00  | Modes of Operation | SINT      | RW     | Y           | 0             |

• **0x6060:00 Modes of Operation of Axis 0:**

**3: Profile velocity mode.**

**5: Homing mode.**

- 8: Cyclic synchronous position mode.
- 9: Cyclic synchronous velocity mode.
- Others: Reserved.

### Modes of Operation Display

| Index  | Sub | Name                       | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------------|-----------|--------|-------------|---------------|
| 0x6061 | 00  | Modes of Operation Display | SINT      | RO     | Y           | 0             |

- 0x6061:00 Modes of Operation Display of Axis 0:

- 3: Profile velocity mode.
- 5: Homing mode.
- 8: Cyclic synchronous position mode.
- 9: Cyclic synchronous velocity mode.
- Others: Reserved.

### Position Actual Value

| Index  | Sub | Name                  | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------------|-----------|--------|-------------|---------------|
| 0x6064 | 00  | Position Actual Value | DINT      | RO     | Y           | 0             |

- 0x6064:00 Position Actual Value of Axis 0: -2147483648 to 2147483647 [*pulse*]

### Velocity Actual Value

| Index  | Sub | Name                  | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------------|-----------|--------|-------------|---------------|
| 0x606C | 00  | Velocity Actual Value | DINT      | RO     | Y           | 0             |

- 0x606C:00 Velocity Actual Value of Axis 0: -2147483648 to 2147483647

$$\text{Actual velocity} = \frac{\text{Object}[0x606C:00]}{\text{cycle time}} \text{ [pulse/sec]}$$

### Target Position

| Index | Sub | Name | Data Type | Access | PDO Mapping | Default Value |
|-------|-----|------|-----------|--------|-------------|---------------|
|-------|-----|------|-----------|--------|-------------|---------------|

|        |    |                 |      |    |   |   |
|--------|----|-----------------|------|----|---|---|
| 0x607A | 00 | Target Position | DINT | RW | Y | 0 |
|--------|----|-----------------|------|----|---|---|

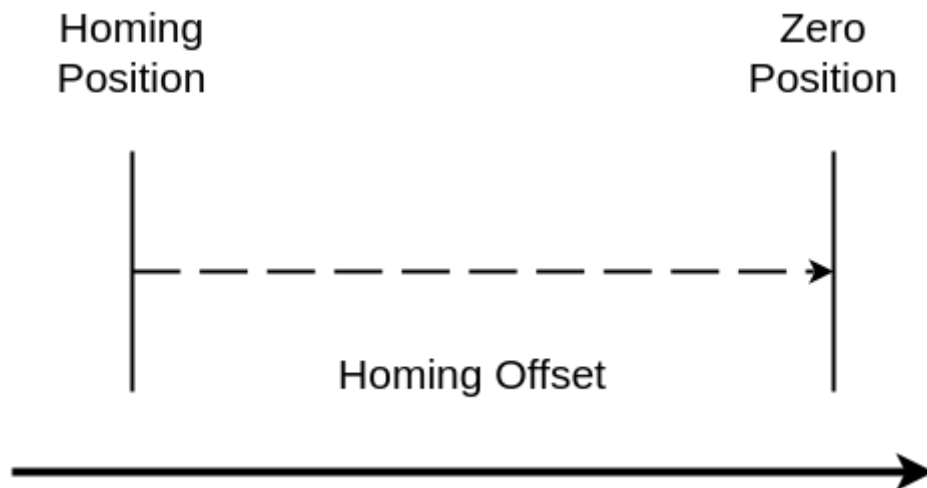
• 0x607A:00 Target Position of Axis 0: -2147483648 to 2147483647 [*pulse*]

### Homing Offset

| Index  | Sub | Name          | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------|-----------|--------|-------------|---------------|
| 0x607C | 00  | Homing Offset | UDINT     | RW     | N           | 0             |

• 0x607C:00 Homing Offset of Axis 0: -2147483648 to 2147483647 [*pulse*]

The homing offset = zero position - homing position



### Software Position Limit

| Index  | Sub | Name               | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------------|-----------|--------|-------------|---------------|
| 0x607D | 00  | Count              | USINT     | RO     | N           | 2             |
|        | 01  | Min position limit | DINT      | RW     | N           | -200000000    |
|        | 02  | Max position limit | DINT      | RW     | N           | 200000000     |

• 0x607D:01 Minimum position limit of Axis 0: -2147483648 to 2147483647

[*pulse*]

- **0x607D:02** Maximun position limit of Axis 0: -2147483648 to 2147483647

[pulse]

If  $Object[0x607D:01] \geq Object[0x607D:02]$ , the software limit is disabled.

### Max Profile Velocity

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x607F | 00  | Max Profile Velocity | UDINT     | RW     | N           | 500           |

- **0x607F:00** Max Profile Velocity of Axis 0: 1 to 4294967295

$$\text{Max profile velocity} = \frac{Object[0x607F:00]}{\text{cycle time}} \text{ [pulse/sec]}$$

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x6083 | 00  | Profile Acceleration | UDINT     | RW     | N           | 1             |

- **0x6083:00** Profile Acceleration of Axis 0: 1 to 4294967295

$$\text{Profile Acceleration} = \frac{Object[0x6083:00]/Object[0x2001:00]}{\text{cycle time}} \text{ [pulse/sec}^2\text{]}$$

### Profile Deceleration

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x6084 | 00  | Profile Deceleration | UDINT     | RW     | N           | 1             |

- **0x6084:00** Profile Deceleration of Axis 0: 1 to 4294967295

$$\text{Profile Deceleration} = \frac{Object[0x6084:00]/Object[0x2001:00]}{\text{cycle time}} \text{ [pulse/sec}^2\text{]}$$

### Quick stop Deceleration

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x6085 | 00  | Quick stop Decelera | DINT      | RW     | N           | 10            |

|  |  |      |  |  |  |  |
|--|--|------|--|--|--|--|
|  |  | tion |  |  |  |  |
|--|--|------|--|--|--|--|

- 0x6085:00 Quick stop acceleration of Axis 0: 1 to 4294967295

$$\text{Quick stop acceleration} = \frac{\text{Object}[0x6085:00]/\text{Object}[0x2001:00]}{\text{cycle time}} \left[ \text{pulse/sec}^2 \right]$$

### Homing Method

| Index  | Sub | Name          | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------|-----------|--------|-------------|---------------|
| 0x6098 | 00  | Homing Method | USINT     | RW     | N           | 0             |

- 0x6098:00 Home Method of Axis 0: 33 to 35.

| Value | Definition                     | Description  |
|-------|--------------------------------|--|
| 33,34 | Homing on index pulse          |  |
| 35    | Homing on the current position | In this method, the current position shall be taken to be the home position. |

### Homing Speeds

| Index  | Sub | Name           | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------|-----------|--------|-------------|---------------|
| 0x6099 | 00  | SubIndex x 000 | USINT     | RO     | N           | 2             |
|        | 01  | Switch Speed   | UDINT     | RW     | N           | 1             |
|        | 02  | Zero Speed     | UDINT     | RW     | N           | 1             |

- 0x6099:01 Switch Speed of Axis 0: 1 to 4294967295

$$\text{Finding limit switch speed} = \frac{\text{Object}[0x6099:01]}{\text{cycle time}} \text{ [pulse/sec]}$$

- **0x6099:02 Zero Speed of Axis 0: 1 to 4294967295**

$$\text{Finding Zero switch speed} = \frac{\text{Object}[0x6099:02]}{\text{cycle time}} \text{ [pulse/sec]}$$

### Homing Acceleration

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x609A | 00  | Homing Acceleration | UDINT     | RW     | N           | 1             |

- **0x609A:00 Homing acceleration of Axis 0: 1 to 4294967295**

$$\text{Homing acceleration} = \frac{\text{Object}[0x609A:00]/\text{Object}[0x2001:00]}{\text{cycle time}} \text{ [pulse/sec}^2\text{]}$$

### Interpolation Time

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x60C2 | 00  | Count                | USINT     | RO     | N           | 2             |
|        | 01  | Interpolation period | USINT     | RW     | N           | 1             |
|        | 02  | Interpolation Index  | SINT      | RW     | N           | -3            |

- **0x60C2:01 Interpolation Period of Axis 0: 1 to 250**
- **0x60C2:02 Interpolation Index of Axis 0: -6 to -3**

$$\text{Interpolation time} = \text{Object}[0x60C2: 01] \times 10^{\text{Object}[0x60C2:02]} \text{ [sec]}$$

This object must be set properly in free run mode.

### Digital Inputs

| Index  | Sub | Name           | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------|-----------|--------|-------------|---------------|
| 0x60FD | 00  | Digital Inputs | UDINT     | RO     | Y           | -             |

- **0x60FD:00 Digital Inputs Channel 0 to 7:**

Bit 0 to 7: digital inputs channel 0 to 7.

Bit 8 to 31: reserved.



## Digital Outputs

| Index  | Sub | Name            | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------|-----------|--------|-------------|---------------|
| 0x60FE | 00  | Digital Outputs | UDINT     | RW     | Y           | 0             |

- 0x60FE:00 Digital Outputs Channel 0 to 7:

Bit 0 to 7: digital outputs channel 0 to 7.

Bit 8 to 31: reserved.

## Target Velocity

| Index  | Sub | Name            | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------|-----------|--------|-------------|---------------|
| 0x60FF | 00  | Target Velocity | DINT      | RW     | Y           | 0             |

- 0x60FF:00 Target Velocity of Axis 0: 0 to 4294967295

$$\text{Target velocity} = \frac{\text{Object}[0x60FF:00]}{\text{cycle time}} \quad [\text{pulse/sec}]$$

## Supported Drive Modes

| Index  | Sub | Name                  | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------------|-----------|--------|-------------|---------------|
| 0x6502 | 00  | Supported Drive Modes | UDINT     | RO     | N           | *(See below)  |

- 0x6502:00 Supported Drive Modes of Axis 0:

For CSV/CSP PDO mapping, PV/CSV/CSP/Homing modes are supported.

(value=0x1a4)

For CSP PDO mapping, CSP/Homing modes are supported. (value=0xa0)

For CSV PDO mapping, PV/CSV/Homing modes are supported. (value=0x124)

## Control Word

| Index  | Sub | Name         | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------|-----------|--------|-------------|---------------|
| 0x6840 | 00  | Control Word | UINT      | RW     | Y           | 0             |

- 0x6840:00 Control Word of Axis 1: Referred to Object 0x6040:00

## Status Word

| Index  | Sub | Name        | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-------------|-----------|--------|-------------|---------------|
| 0x6841 | 00  | Status Word | UINT      | RO     | Y           | *             |

- 0x6841:00 Status Word of Axis 1: Referred to Object 0x6041:00

### Quickstop Option Code

| Index  | Sub | Name                  | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------------|-----------|--------|-------------|---------------|
| 0x685A | 00  | Quickstop Option Code | INT       | RW     | N           | 2             |

- 0x685A:00 Quickstop Option Code of Axis 1: Referred to Object 0x605A:00

### Shutdown Option Code

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x685B | 00  | Shutdown Option Code | INT       | RW     | N           | 0             |

- 0x685B:00 Shutdown Option Code of Axis 1: Referred to Object 0x605B:00

### Disable Operation Option Code

| Index  | Sub | Name                          | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-------------------------------|-----------|--------|-------------|---------------|
| 0x685C | 00  | Disable Operation Option Code | INT       | RW     | N           | 1             |

- 0x685C:00 Disable Operation Option Code of Axis 1: Referred to Object 0x605C:00

### Halt Option Code

| Index  | Sub | Name             | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|------------------|-----------|--------|-------------|---------------|
| 0x685D | 00  | Halt Option Code | INT       | RW     | N           | 1             |

- 0x685D:00 Halt Option Code of Axis 1: Referred to Object 0x605D:00

### Fault Reaction Code

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x685E | 00  | Fault Reaction Code | INT       | RW     | N           | 2             |

- 0x685E:00 Fault Reaction Code of Axis 1: Referred to Object 0x605E:00

### Modes of Operation

| Index  | Sub | Name               | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------------|-----------|--------|-------------|---------------|
| 0x6860 | 00  | Modes of Operation | SINT      | RW     | Y           | 0             |

- 0x6860:00 Modes of Operation of Axis 1: Referred to Object 0x6060:00

### Modes of Operation Display

| Index  | Sub | Name                       | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------------|-----------|--------|-------------|---------------|
| 0x6861 | 00  | Modes of Operation Display | SINT      | RO     | Y           | 0             |

- 0x6861:00 Modes of Operation Display of Axis 1: Referred to Object 0x6061:00

### Position Actual Value

| Index  | Sub | Name                  | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------------|-----------|--------|-------------|---------------|
| 0x6864 | 00  | Position Actual Value | DINT      | RO     | Y           | 0             |

- 0x6864:00 Position Actual Value of Axis 1: Referred to Object 0x6064:00

### Velocity Actual Value

| Index | Sub | Name | Data | Access | PDO | Default |
|-------|-----|------|------|--------|-----|---------|
|-------|-----|------|------|--------|-----|---------|

|        |    |                       | Type |    | Mapping | Value |
|--------|----|-----------------------|------|----|---------|-------|
| 0x686C | 00 | Velocity Actual Value | DINT | RO | Y       | 0     |

- 0x686C:00 Velocity Actual Value of Axis 1: Referred to Object 0x606C:00

### Target Position

| Index  | Sub | Name            | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------|-----------|--------|-------------|---------------|
| 0x687A | 00  | Target Position | DINT      | RW     | Y           | 0             |

- 0x687A:00 Target Position of Axis 1: Referred to Object 0x607A:00

### Homing Offset

| Index  | Sub | Name          | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------|-----------|--------|-------------|---------------|
| 0x687C | 00  | Homing Offset | DINT      | RW     | N           | 0             |

- 0x687C:00 Homing Offset of Axis 1: Referred to Object 0x607C:00

### Software Position Limit

| Index  | Sub | Name               | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------------|-----------|--------|-------------|---------------|
| 0x687D | 00  | SubIndex 000       | USINT     | RO     | N           | 2             |
|        | 01  | Min position limit | DINT      | RW     | N           | -200000000    |
|        | 02  | Max position limit | DINT      | RW     | N           | 200000000     |

- 0x687D:01 Minimum position limit of Axis 1: Referred to Object 0x607D:01
- 0x687D:02 Minimum position limit of Axis 1: Referred to Object 0x607D:02

### Max Profile Velocity

| Index | Sub | Name | Data | Access | PDO | Default |
|-------|-----|------|------|--------|-----|---------|
|-------|-----|------|------|--------|-----|---------|

|        |    |                      | Type  |    | Mapping | Value |
|--------|----|----------------------|-------|----|---------|-------|
| 0x687F | 00 | Max Profile Velocity | UDINT | RW | N       | 500   |

- 0x687F:00 Max Profile Velocity of Axis 1: Referred to Object 0x607F:00

### Profile Acceleration

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x6883 | 00  | Profile Acceleration | UDINT     | RW     | N           | 1             |

- 0x6883:00 Profile Acceleration of Axis 1: Referred to Object 0x6083:00

### Profile Deceleration

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x6884 | 00  | Profile Deceleration | UDINT     | RW     | N           | 1             |

- 0x6884:00 Profile Deceleration of Axis 1: Referred to Object 0x6084:00

### Quickstop Declaration

| Index  | Sub | Name                  | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------------|-----------|--------|-------------|---------------|
| 0x6885 | 00  | Quickstop Declaration | DINT      | RW     | N           | 10            |

- 0x6885:00 Quickstop acceleration of Axis 1: Referred to Object 0x6085:00

### Homing Method

| Index  | Sub | Name          | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------|-----------|--------|-------------|---------------|
| 0x6898 | 00  | Homing Method | SINT      | RW     | N           | 0             |

- 0x6898:00 Home Method of Axis 1: Referred to Object 0x6098:00

## Homing Speeds

| Index  | Sub | Name         | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|--------------|-----------|--------|-------------|---------------|
| 0x6899 | 00  | SubIndex 000 | USINT     | RO     | N           | 2             |
|        | 01  | Switch Speed | UDINT     | RW     | N           | 1             |
|        | 02  | Zero Speed   | UDINT     | RW     | N           | 1             |

- 0x6899:01 Switch Speed of Axis 1: Referred to Object 0x6099:01
- 0x6899:02 Zero Speed of Axis 1: Referred to Object 0x6099:02

## Homing Acceleration

| Index  | Sub | Name                | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|---------------------|-----------|--------|-------------|---------------|
| 0x689A | 00  | Homing Acceleration | UDINT     | RW     | N           | 1             |

- 0x689A:00 Homing acceleration of Axis 1: Referred to Object 0x609A:00

## Interpolation Time

| Index  | Sub | Name                 | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|----------------------|-----------|--------|-------------|---------------|
| 0x68C2 | 00  | SubIndex 000         | USINT     | RO     | N           | 2             |
|        | 01  | Interpolation period | USINT     | RW     | N           | 1             |
|        | 02  | Interpolation Index  | SINT      | RW     | N           | -3            |

- 0x68C2:01 Interpolation Period of Axis 1: Referred to Object 0x60C2:01
- 0x68C2:02 Interpolation Index of Axis 1: Referred to Object 0x60C2:02

## Digital Inputs

| Index | Sub | Name | Data | Access | PDO | Default |
|-------|-----|------|------|--------|-----|---------|
|-------|-----|------|------|--------|-----|---------|

|        |    |                | Type  |    | Mapping | Value |
|--------|----|----------------|-------|----|---------|-------|
| 0x68FD | 00 | Digital Inputs | UDINT | RO | Y       | -     |

• 0x68FD:00 Digital Inputs Channel 8 to 15:

Bit 0 to 7: digital inputs channel 8 to 15.

Bit 8 to 31: reserved.

### Digital Outputs

| Index  | Sub | Name            | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------|-----------|--------|-------------|---------------|
| 0x68FE | 00  | Digital Outputs | UDINT     | RW     | Y           | 0             |

• 0x68FE:00 Digital Outputs Channel 8 to 15:

Bit 0 to 7: digital outputs channel 8 to 15.

Bit 8 to 31: reserved.

### Target Velocity

| Index  | Sub | Name            | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------|-----------|--------|-------------|---------------|
| 0x68FF | 00  | Target Velocity | DINT      | RW     | Y           | 0             |

• 0x68FF:00 Target Velocity of Axis 1: Referred to Object 0x60FF:00

### Supported Drive Modes

| Index  | Sub | Name                  | Data Type | Access | PDO Mapping | Default Value |
|--------|-----|-----------------------|-----------|--------|-------------|---------------|
| 0x6D02 | 00  | Supported Drive Modes | UDINT     | RO     | N           | *             |

• 0x6D02:00 Supported Drive Modes of Axis 1: Referred to Object 0x6502:00