

Features

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- ```

graph TD
 Start(()) -- (1) --> Init[Initialization]
 Init -- (2) --> Startup[Startup Info.]
 Startup --> PreRun[Pre Run]
 PreRun -- (4) --> Stop[Stop]
 Stop -- (3) --> Run[Run]
 Run -- (5) --> Stop
 Stop -- (6) --> PreRun
 Stop -- (6) --> Init
 Run -- (6) --> Init

```
- The flowchart illustrates the control logic for the engine start sequence. It begins with an initial input (1) leading to the 'Initialization' block. From 'Initialization', the process moves to 'Startup Info.' (2), then to 'Pre Run'. From 'Pre Run', there are two paths: one leading to 'Stop' (4) and another leading to 'Run' (3). From 'Run', there are two paths: one leading to 'Stop' (5) and another leading back to 'Initialization' (6). From 'Stop', there are two paths: one leading back to 'Pre Run' (6) and another leading back to 'Initialization' (6).

### Initialization

This is the state that CANopen device enters for the first time after power on or hardware reset. After reading the parameter information stored in EPROM and completing the basic device initialization, CANopen device (encoder) automatically sends the startup information to the main controller to enter the "pre operation" state.

### Pre Run

In this state, it can communicate through SDO. Because PDO does not exist, it cannot communicate through PDO. The configuration and parameter configuration of PDO can be completed by configuration program. The encoder can be put into operation directly by sending "start remote node".

### Run

In this state, all communication objects are available. The slave device can send process data through PDO according to the parameter settings in the object dictionary. The main controller can access the object dictionary through PDO. The main controller sends "pre operation" message to make it enter "pre operation" state.

### Stop

In this state, the slave device is forced to stop all communication (except the monitoring node). Communication through SDO through PDO is also. By sending specific NMT message, the master controller can directly enter into pre run or run state from the encoder.

### Communication Object

There are four kinds of communication messages:

- Network management NMT: the NMT master controller controls the NMT status of the NMT slave device.
- Process data object PDO: used to transfer real-time data.-Service data object SDO: object dictionary for direct access to CANopen devices.
- Special function object:
  - Synchronous transmission (sync): provides a basic network synchronization mechanism. With this service,main controller can send real-time data.
  - Emergency: use this object whenever an error event occurs.
  - Node guard: used to view the operation status of the slave device.

#### Relationship between device state and communication object:

|         | Initialization | Pre Run | Run | Stop |
|---------|----------------|---------|-----|------|
| NMT     |                | X       | X   | X    |
| PDO     |                |         | X   |      |
| SDO     |                | X       | X   |      |
| Sync    |                |         | X   |      |
| Emerg   | X              | X       | X   |      |
| Boot-up |                |         |     |      |
| Nodeg   |                | X       | X   | X    |

### Predefined connection instructions

| Main Controller→Encoder(Broadcast)      |                        |                     |
|-----------------------------------------|------------------------|---------------------|
| Communication Object COB Type           | Function Code (Binary) | COB-ID(Hexadecimal) |
| NMT                                     | 0000                   | 001                 |
| Sync                                    | 0001                   | 080                 |
| Main Controller→Encoder(Point to Point) |                        |                     |
| Emerg                                   | 0001                   | 081-0FF             |
| PD01(Send)                              | 0011                   | 181-1FF             |
| PD02(Send)                              | 0101                   | 281-2FF             |
| SDO(Send)                               | 1011                   | 581-5FF             |
| SDO(Receive)                            | 1110                   | 601-67F             |
| Node monitoring                         |                        | 701-77F             |

"Communication object type" (send / receive) is from the perspective of device (encoder).  
The start message uses the cob-id of the node monitoring object.

**NMT Object****NMT Structure**

| COB-ID(11Bit) |         | 2 Bytes CAN Data |            |
|---------------|---------|------------------|------------|
| Function Code | Node ID | Order            | Encoder ID |
| 0000          | 0       | NMD Function     | Encoder ID |

If the encoder ID is 00h, NMT message is sent to all network accessing nodes.

**NMT Function**

| Order(Hexadecimal) | NMT function      | Node State |
|--------------------|-------------------|------------|
| 01                 | Start Remote Node | Run        |
| 02                 | Stop Remote Node  | Stop       |
| 80                 | Enter Pre Run     | Pre Run    |
| 81                 | Reset Node        | Pre Run    |
| 82                 | Reset Commuaction | Pre Run    |

**Start Boot-up Object****Boot-up message structure:**

| COD-ID(Hexadecimal) | 1 Byte CAN Data |
|---------------------|-----------------|
| 700+Node ID         | 00              |

**POD Object**

PDO(Send) message consists of four CAN data bytes, to transmit the position value of the encoder

**POD Structure**

| Identification      |         | 4 Bytes CAN Data |              |                 |                 |
|---------------------|---------|------------------|--------------|-----------------|-----------------|
| COD-ID(Hexadecimal) |         | Byte 0           | Byte 1       | Byte 2          | Byte 3          |
| Function Code       | Node ID | $2^7-2^0$        | $2^{15}-2^8$ | $2^{23}-2^{16}$ | $2^{31}-2^{24}$ |
|                     |         | Low Byte         | ...          | ...             | High Byte       |

**The three types PDO are defined as follows:**

PDO1 cyclic mode: asynchronous transmission. The absolute rotary encoder automatically sends current process data cyclically without querying the host. The cycle time can be set programmatically. The value is between 1 and 65536. The unit is ms. (see "cycle time: 6200h object"). Circular mode can be used (or disabled) by setting the highest position of cob-id used by PDO1 (object 1800h, sub item 1) to "0" ("1").

PDO2 synchronous mode: synchronous transmission. Synchronization refers to sending PDO after main controller synchronizaton.

Synchronous message is a cob with a highest priority sent by the master controller to all slave devices. After receiving the synchronous message, the encoder will send back the process data. Each slave device transmits data according to its own node ID. If the encoder does not respond to all synchron-ization commands,

it should be set to respond after "n" units synchronization commands. The value of PDO2 "n" can be set by sub item 2 of object 1801h.

The value of PDO3, "n" can be set through the sub item 2 of object 1802h.

The synchronization mode can be used (or disabled) by setting the highest position of cob-id used by PDO (object 1801h or 1802h, sub item 1) to "0" ("1").

Note:Multiple transport modes can coexist.

**SDO Object**

SDO messages are used to query or change the parameters of the encoder, which are included in the object dictionary. The maximum of CAN data is 4 bytes, and the other 4 bytes are used for command, index, sub index and other fields. When the controller sends an SDO message to the encoder, the encoder will send the response information to the main controller (If error happens, error will be alarmed).

## SDO Structure

| Identifier      |         | 4 Bytes CAN Data |          |           |          | 1-4 Bytes CAN Data |     |     |           |
|-----------------|---------|------------------|----------|-----------|----------|--------------------|-----|-----|-----------|
| Identifier Hex. |         | 0                | 1        | 2         | 3        | 4                  | 5   | 6   | 7         |
| Function Code   | Node ID | Order            | Indexes  |           | Subindex | Process Data       |     |     |           |
|                 |         | 1 Byte           | Low Byte | High Byte | 1 Byte   | Low Byte           | ... | ... | High Byte |

## Order

The content of command byte is transmitted through can network in the form of message.

There are three message forms:

-Settings: send configuration parameters to the device;

-Request: the main controller is used to read the data of the device;

-Alarm: the encoder is used to send error information to the main controller (for example, index does not exist, parameter is invalid, etc.)

## Object Dictionary

Each object is represented as follows:

Index - sub index object name [data type, property]

-Indexes and subindexes are identified in hexadecimal.

-Properties: RO = read-only, RW = read-write.

## -Unsigned 16 Data Type:

| Process Data Byte |           |
|-------------------|-----------|
| Byte 4            | Byte 5    |
| Low Byte          | High Byte |

## -Unsigned 32 Data Type:

| Process Data Byte |        |        |           |
|-------------------|--------|--------|-----------|
| Byte 4            | Byte 5 | Byte 6 | Byte 7    |
| Low Byte          | ...    | ...    | High Byte |

## Standard Object(DS301)

| Index - Subindex | Object Name                                                                                                                                                                                                                                                                                                                                                                                                                                               | [Data Type, Property] |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|-----------|-----------|-----------|-----------|----|--|--|--------|----|----|----|----|----|----|----|----|--|
| 1000-00          | Device Type<br>Default value: 0001 0196h=Single Turn Absolute Encoder, DS 406<br>0002 0196h=Multi-turn Absolute Encoder, DS 406                                                                                                                                                                                                                                                                                                                           | [ Unsigned32,ro]      |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 1001-00          | Error register<br>If a bit of the register is set to "1", its corresponding error has occurred.<br>Default value: 00h                                                                                                                                                                                                                                                                                                                                     | [Unsigned 8, ro]      |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 1003             | Predefined error fields<br>This object saves errors that the device has generated.<br>Number of errors [unsigned 8, RW]<br>Write 00h to clear the error history.<br>Last error                                                                                                                                                                                                                                                                            | [unsigned 32, RO]     |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| -00              |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| -01              |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| -02              |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| .                |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| .                |                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| -04              | An earlier error                                                                                                                                                                                                                                                                                                                                                                                                                                          | [unsigned 32, RO]     |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 1005-00          | Cob ID synchronous message<br>Default value: 0000 0080h                                                                                                                                                                                                                                                                                                                                                                                                   | [unsigned 32, RW]     |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 1008-00          | Equipment manufacturer name<br>Default: "ADK"                                                                                                                                                                                                                                                                                                                                                                                                             | [string, RO]          |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 1009-00          | Hardware version                                                                                                                                                                                                                                                                                                                                                                                                                                          | [string, RO]          |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 100A-00          | Software version                                                                                                                                                                                                                                                                                                                                                                                                                                          | [string, RO]          |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 100C-00          | Monitoring time<br>Default: 03e8h (MS)                                                                                                                                                                                                                                                                                                                                                                                                                    | [unsigned 16, RW]     |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 100D-00          | Life time factor<br>Default value: 05H "node life time" = "0bj_100c" "0bj_100d".<br>When "node life time" is not equal to 0, "node monitoring" is enabled. If the slave device is not monitored in the service life, the "service life monitoring event" will be triggered. The red LED indicates the monitoring error, and the content of 1001h and 1003h objects will be updated.<br>In order to eliminate errors, "reset node" message should be sent. | [unsigned 8, RW]      |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 1010-01          | Storage parameter<br>This object holds all parameters to non-volatile memory. The signal written is "save".<br><b>Controller → encoder (write)</b>                                                                                                                                                                                                                                                                                                        | [unsigned 32, RW]     |       |           |           |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
|                  | <table><tr><th>COB-ID</th><th>Order</th><th colspan="2">Index</th><th>Sub Index</th><th colspan="4">Data Byte</th></tr><tr><td>600+ID</td><td>23</td><td>10</td><td>10</td><td>01</td><td>73</td><td>61</td><td>76</td><td>65</td></tr></table>                                                                                                                                                                                                           | COB-ID                | Order | Index     |           | Sub Index | Data Byte |    |  |  | 600+ID | 23 | 10 | 10 | 01 | 73 | 61 | 76 | 65 |  |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Index                 |       | Sub Index | Data Byte |           |           |    |  |  |        |    |    |    |    |    |    |    |    |  |
| 600+ID           | 23                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 10                    | 10    | 01        | 73        | 61        | 76        | 65 |  |  |        |    |    |    |    |    |    |    |    |  |

## CAS60 -CANopen Series Absolute Encoder

| Index - Subindex | Object Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | [Data Type, Property]                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|-----------|----|-----------|-----------|--|--|--|--------|----|----|----|----|----|----|----|----|--------|-------|-------|--|-----------|-----------|--|--|--|--------|----|----|----|----|----|----|----|----|--------|-------|-----------------|-----|----|----|--------|-------|--------|----|
|                  | <b>Encoder → controller (confirm)</b> <table><tr><td>COB-ID</td><td>Order</td><td colspan="2">Index</td><td>Sub Index</td><td colspan="4">Data Byte</td></tr><tr><td>580+ID</td><td>60</td><td>10</td><td>10</td><td>01</td><td>00</td><td>00</td><td>00</td><td>00</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | COB-ID | Order     | Index     |    | Sub Index | Data Byte |  |  |  | 580+ID | 60 | 10 | 10 | 01 | 00 | 00 | 00 | 00 |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Index                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        | Sub Index | Data Byte |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 580+ID           | 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10     | 01        | 00        | 00 | 00        | 00        |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 1011-01          | Restore default parameter [unsigned 32, RW]<br>This object is used to restore the default values of all parameters. When the written signal is "load", after setting reset, the restored default value takes effect.<br><b>Controller → Encoder (write)</b> <table><tr><td>COB-ID</td><td>Order</td><td colspan="2">Index</td><td>Sub Index</td><td colspan="4">Data Byte</td></tr><tr><td>580+ID</td><td>23</td><td>11</td><td>10</td><td>01</td><td>6F</td><td>6C</td><td>61</td><td>64</td></tr></table> <b>Encoder → Controller (confirm)</b> <table><tr><td>COB-ID</td><td>Order</td><td colspan="2">Index</td><td>Sub Index</td><td colspan="4">Data Byte</td></tr><tr><td>580+ID</td><td>60</td><td>11</td><td>10</td><td>01</td><td>00</td><td>00</td><td>00</td><td>00</td></tr></table> <div><b>Controller → Encoder (Reset Node)</b><table><tr><td>COB-ID</td><td>Order</td><td>Slave Device ID</td></tr><tr><td>000</td><td>81</td><td>ID</td></tr></table><b>Encoder → Controller (Boot up)</b><table><tr><td>COB-ID</td><td>Order</td></tr><tr><td>700+ID</td><td>00</td></tr></table></div><br>In order to save the default values, the function of "store parameters" need to be performed (see object 1010h). |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | COB-ID | Order     | Index     |    | Sub Index | Data Byte |  |  |  | 580+ID | 23 | 11 | 10 | 01 | 6F | 6C | 61 | 64 | COB-ID | Order | Index |  | Sub Index | Data Byte |  |  |  | 580+ID | 60 | 11 | 10 | 01 | 00 | 00 | 00 | 00 | COB-ID | Order | Slave Device ID | 000 | 81 | ID | COB-ID | Order | 700+ID | 00 |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Index                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        | Sub Index | Data Byte |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 580+ID           | 23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10     | 01        | 6F        | 6C | 61        | 64        |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Index                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        | Sub Index | Data Byte |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 580+ID           | 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10     | 01        | 00        | 00 | 00        | 00        |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Slave Device ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 000              | 81                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 700+ID           | 00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 1014-00          | EMCY COB-ID [Unsigned32,rw]<br>Default value 80h + node ID<br>This object defines the cob-id of the emcy writing service                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 1018             | -01<br>-02<br>-03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Identifying objects<br>Sales firm [unsigned 32, RO]<br>Manufacturer [unsigned 32, RO]<br>Revision number [unsigned 32, RO]                                                                                                                                                                                                                                                                                                                                                                          |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 1800             | -01<br>-02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PD 01 Transmission Parameter this type of PDO asynchronously transmits the position value of the encoder.<br>For the setting of the cycle timer, see object 6200h<br>COB ID of PDO1 [unsigned 32, RW]<br>Default value: 4000 0180h + node ID (COB ID without RTR)<br>Transmission type [unsigned 8, RW]<br>Default: FEH (asynchronous transfer)                                                                                                                                                     |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 1801             | -01<br>-02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PDO2 transmission parameter synchronously transmits the position value of encoder.<br>Cod ID of PDO2 [unsigned 32, RW]<br>Default value: 4000 0280h + node ID (COB ID without RTR)<br>Transmission type [unsigned 8, RW]<br>Default value: 01h (synchronous transmission)<br>For the n-value that requires n synchronous signals, it can be set in sub index 2 of object 1801h.                                                                                                                     |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 1802             | -01<br>-02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PDO3 transmission parameter synchronously transmits the position value of encoder.<br>Cob ID of PDO3 [unsigned 32, RW]<br>Default value: C000 0380h + node ID (PDO3 disabled, no RTR)<br>Transmission type [unsigned 8, RW]<br>Default value: 01h (synchronous transmission)<br>For the n value of N response signals, it can be set in sub index 2 of object 1802h.<br>Note:<br>It can be used (disabled) by setting the highest bit of cob ID (object 180xh, sub index 1) of PDO to "0" (or "1"). |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 1A01-01          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PDO1 mapping parameter [unsigned 32, RW]<br>Default value: 6004 0020h<br>This object follows ds406 and contains the position value of the encoder.                                                                                                                                                                                                                                                                                                                                                  |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 1A01-01          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PDO2 mapping parameter [unsigned 32, RW]<br>See object 1a00h, sub index 1.                                                                                                                                                                                                                                                                                                                                                                                                                          |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |
| 1A01-01          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PDO3 mapping parameter [unsigned 32, RW]<br>See object 1a00h, sub index 1.                                                                                                                                                                                                                                                                                                                                                                                                                          |        |           |           |    |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |       |  |           |           |  |  |  |        |    |    |    |    |    |    |    |    |        |       |                 |     |    |    |        |       |        |    |

## Manufacturer Related Objects

| Index - Subindex | Object Name                                                                                                                                                                                                                                                                               | [Data Type, Property] |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| 2104-00          | Min. Value of Limit switch [unsigned 32, RW]<br>Default value: 0000 0010h<br>If the position value is less than the value specified by the object 2104h, 12 bits of the object 6500h are set to "1".<br>This function can be turned on by setting the 12 bits of the object 6000h to "1". |                       |

## CAS60-CANopen Series Absolute Encoder

| Index - Subindex | Object Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | [Data Type, Property] |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------|-----------|-----------------------|-----------|--------|--------|---------|-----|---------|-----|----------------------|--------|---------|-------|---------|-----------|----------|--------|-------|-------|----|-----------|-------------|--------|-------|-----------------|-----|----|-----------------------|--------|-------|--------|----|-----------|------|--------|----|----|----|----|-------------|--------|-------|-----------------|-----|----|----|--------|-------|--------|----|------------------|
| 2105-00          | Max Value of Limit Switch<br>Default value: 003F FFF0H<br>If the position value is greater than the value specified by the object 2105h, 13 bits of the object 6500h are set to "1".<br>This function can be turned on by setting the 13 bits of the object 6000h to "1".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | [unsigned 32, RW]     |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 3000-00          | <div><div>Baud rate<br/>This object defines the bit rate of the device, as shown in the following table</div><table><thead><tr><th>Data</th><th>Baud Rate</th></tr></thead><tbody><tr><td>00h</td><td>20Kb/s</td></tr><tr><td>01h</td><td>50Kb/s</td></tr><tr><td>02h</td><td>100Kb/s</td></tr><tr><td>03h</td><td>125Kb/s</td></tr><tr><td>04h</td><td>250Kb/s</td></tr><tr><td>05h</td><td>500Kb/s</td></tr><tr><td>06h</td><td>800Kb/s</td></tr><tr><td>07h</td><td>1000Kb/s</td></tr></tbody></table><div><b>To change the baud rate:</b><br/>set the object 3000h,<br/>then send the command "reset node"<br/>(or "reset communication"), and finally store the parameters.</div><div><b>Controller → Encoder</b><table><thead><tr><th>COB-ID</th><th>Order</th><th colspan="2">Index</th><th>Sub Index</th><th>Data</th></tr></thead><tbody><tr><td>600+ID</td><td>2F</td><td>00</td><td>30</td><td>00</td><td>See The List 00 00 00</td></tr></tbody></table><b>Encoder → Controller (confirm)</b><table><thead><tr><th>COB-ID</th><th>Order</th><th colspan="2">Index</th><th>Sub Index</th><th>Data</th></tr></thead><tbody><tr><td>580+ID</td><td>60</td><td>00</td><td>30</td><td>00</td><td>00 00 00 00</td></tr></tbody></table><div><b>Controller → Encoder (Reset Node)</b><table><thead><tr><th>COB-ID</th><th>Order</th><th>Slave Device ID</th></tr></thead><tbody><tr><td>000</td><td>81</td><td>ID</td></tr></tbody></table><b>Encoder → Controller (Boot up)</b><table><thead><tr><th>COB-ID</th><th>Order</th></tr></thead><tbody><tr><td>700+ID</td><td>00</td></tr></tbody></table></div><div>The stored the parameters (see object 1010h).<br/>If it cannot be stored, the original baud rate will be used after power on again.</div></div></div> | Data                  | Baud Rate | 00h       | 20Kb/s                | 01h       | 50Kb/s | 02h    | 100Kb/s | 03h | 125Kb/s | 04h | 250Kb/s              | 05h    | 500Kb/s | 06h   | 800Kb/s | 07h       | 1000Kb/s | COB-ID | Order | Index |    | Sub Index | Data        | 600+ID | 2F    | 00              | 30  | 00 | See The List 00 00 00 | COB-ID | Order | Index  |    | Sub Index | Data | 580+ID | 60 | 00 | 30 | 00 | 00 00 00 00 | COB-ID | Order | Slave Device ID | 000 | 81 | ID | COB-ID | Order | 700+ID | 00 | [unsigned 8, RW] |
| Data             | Baud Rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 00h              | 20Kb/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 01h              | 50Kb/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 02h              | 100Kb/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 03h              | 125Kb/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 04h              | 250Kb/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 05h              | 500Kb/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 06h              | 800Kb/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 07h              | 1000Kb/s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Index                 |           | Sub Index | Data                  |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 600+ID           | 2F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 00                    | 30        | 00        | See The List 00 00 00 |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Index                 |           | Sub Index | Data                  |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 580+ID           | 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 00                    | 30        | 00        | 00 00 00 00           |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Slave Device ID       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 000              | 81                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ID                    |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 700+ID           | 00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 3001-01          | <div><div>Node ID [unsigned 8, RW] this object defines the node identifier of the device.<br/>Default value: 01h<br/>The steps to change the node address are: set the object for 3001h, send the command "reset node",<br/>and store the parameters.</div><div><b>Controller → Encoder</b><table><thead><tr><th>COB-ID</th><th>Order</th><th colspan="2">Index</th><th>Sub Index</th><th>Data</th></tr></thead><tbody><tr><td>600+ID</td><td>2F</td><td>01</td><td>30</td><td>00</td><td>New Node ID 00 00 00</td></tr></tbody></table><b>Encoder → Controller (confirm)</b><table><thead><tr><th>COB-ID</th><th>Order</th><th colspan="2">Index</th><th>Sub Index</th><th>Data</th></tr></thead><tbody><tr><td>580+ID</td><td>60</td><td>01</td><td>30</td><td>00</td><td>00 00 00 00</td></tr></tbody></table><div><b>Controller → Encoder (Reset Node)</b><table><thead><tr><th>COB-ID</th><th>Order</th><th>Slave Device ID</th></tr></thead><tbody><tr><td>000</td><td>81</td><td>Original ID</td></tr></tbody></table><b>Encoder → Controller (Boot up)</b><table><thead><tr><th>COB-ID</th><th>Order</th></tr></thead><tbody><tr><td>700+ID</td><td>00</td></tr></tbody></table></div><div>The stored parameters (see object 1010h).<br/>If it cannot be stored, the original node ID will be used after power on again</div></div></div>                                                                                                                                                                                                                                                                                                                                                                                                                           | COB-ID                | Order     | Index     |                       | Sub Index | Data   | 600+ID | 2F      | 01  | 30      | 00  | New Node ID 00 00 00 | COB-ID | Order   | Index |         | Sub Index | Data     | 580+ID | 60    | 01    | 30 | 00        | 00 00 00 00 | COB-ID | Order | Slave Device ID | 000 | 81 | Original ID           | COB-ID | Order | 700+ID | 00 |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Index                 |           | Sub Index | Data                  |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 600+ID           | 2F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 01                    | 30        | 00        | New Node ID 00 00 00  |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Index                 |           | Sub Index | Data                  |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 580+ID           | 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 01                    | 30        | 00        | 00 00 00 00           |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Slave Device ID       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 000              | 81                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Original ID           |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| COB-ID           | Order                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |
| 700+ID           | 00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |           |           |                       |           |        |        |         |     |         |     |                      |        |         |       |         |           |          |        |       |       |    |           |             |        |       |                 |     |    |                       |        |       |        |    |           |      |        |    |    |    |    |             |        |       |                 |     |    |    |        |       |        |    |                  |

## Objects specified in the equipment regulations (DS 406)

| Index - Subindex | Object Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | [Data Type, Property] |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------|-------|-------|---|----------------------------|----|-----|---|-----|--|--|---|---------------|----------|--------|------|-----|--|--|----|---------------------------------------------------|----------|--------|----|---------------------------------------------------|----------|--------|-------|-----|--|--|----|-------------------------|--------------|--------|------------------|
| 6000-00          | Running Parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
|                  | <table><tr><th>Bit</th><th>Function</th><th>Bit=0</th><th>Bit=1</th></tr><tr><td>0</td><td>Encoder counting direction</td><td>CW</td><td>CCW</td></tr><tr><td>1</td><td colspan="3">N/A</td></tr><tr><td>2</td><td>Zoom function</td><td>Prohibit</td><td>Usable</td></tr><tr><td>3-11</td><td colspan="3">N/A</td></tr><tr><td>12</td><td>Min. Value of Position</td><td>Prohibit</td><td>Usable</td></tr><tr><td>13</td><td>Min. Value of Position</td><td>Prohibit</td><td>Usable</td></tr><tr><td>14-15</td><td colspan="3">N/A</td></tr></table>                                                                                                                                            | Bit                   | Function | Bit=0 | Bit=1 | 0 | Encoder counting direction | CW | CCW | 1 | N/A |  |  | 2 | Zoom function | Prohibit | Usable | 3-11 | N/A |  |  | 12 | Min. Value of Position                            | Prohibit | Usable | 13 | Min. Value of Position                            | Prohibit | Usable | 14-15 | N/A |  |  |    |                         |              |        |                  |
| Bit              | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Bit=0                 | Bit=1    |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 0                | Encoder counting direction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | CW                    | CCW      |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 1                | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 2                | Zoom function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Prohibit              | Usable   |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 3-11             | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 12               | Min. Value of Position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Prohibit              | Usable   |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 13               | Min. Value of Position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Prohibit              | Usable   |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 14-15            | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
|                  | Default value: 0000H<br>-The encoder counting direction defines whether the counting value increases or decreases when the rotation axis rotates clockwise or anticlockwise from the encoder axis.<br>-Zoom function: if this function is disabled, the physical resolution is used (see objects 6501h and 6502h); if this function is used, the transmitted position value has the following relationship with the actual position value<br>posTx=obj_6001 Real Pos obj_6002/Obj_6501                                                                                                                                                                                                           |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 6001-00          | Resolution per revolution<br>This object determines the number of steps for each revolution of the encoder. If the second digit of 6000h is "1", then the object is enabled.<br>To prevent counting errors, make sure that the result of obj_6501 is an integer.<br>obj_6001                                                                                                                                                                                                                                                                                                                                                                                                                     | [unsigned 32, RW]     |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 6002-00          | Total measurement range<br>This object determines the total number of steps in the measurement range.<br>If the second position of 6000h is "1", the object is used.<br>Give an example:<br>The "total hardware resolution" of the multi turn encoder is 16777216, and the 6501h value of the object is 4096, If the value of object 6001h is 2048, then obj_6002 = (16777216 x 2048)/4096 = 8388608;                                                                                                                                                                                                                                                                                            | [unsigned 32, RW]     |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 6003-00          | Preset value<br>The preset value is the set position value, which will be reached when the encoder shaft rotates to a certain angle.<br>To prevent operational errors, the default value must not exceed "total hardware resolution."                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 6004-00          | Position value<br>This object defines the position output values of the communication objects 1800h, 1801h and 1802h.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | [unsigned 32, RO]     |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 6200-00          | Cycle time<br>Default value: 0064h (100ms).<br>Cycle timer is used in asynchronous communication to adjust the cycle interval of pd01 (object 1800h) transmission.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | [unsigned 16, RW]     |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 6500-00          | Running Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
|                  | <table><tr><th>Bit</th><th>Function</th><th>Bit=0</th><th>Bit=1</th></tr><tr><td>0</td><td>Encoder counting direction</td><td>CW</td><td>CCW</td></tr><tr><td>1</td><td colspan="3">N/A</td></tr><tr><td>2</td><td>Zoom function</td><td>Prohibit</td><td>Usable</td></tr><tr><td>3-11</td><td colspan="3">N/A</td></tr><tr><td>12</td><td>Less than the minimum value or not (object 2104h)</td><td>Prohibit</td><td>Usable</td></tr><tr><td>13</td><td>Less than the minimum value or not (object 2104h)</td><td>Prohibit</td><td>Usable</td></tr><tr><td>14</td><td colspan="3">N/A</td></tr><tr><td>15</td><td>Actual operation status</td><td>Stop/Pre Run</td><td>Runing</td></tr></table> | Bit                   | Function | Bit=0 | Bit=1 | 0 | Encoder counting direction | CW | CCW | 1 | N/A |  |  | 2 | Zoom function | Prohibit | Usable | 3-11 | N/A |  |  | 12 | Less than the minimum value or not (object 2104h) | Prohibit | Usable | 13 | Less than the minimum value or not (object 2104h) | Prohibit | Usable | 14    | N/A |  |  | 15 | Actual operation status | Stop/Pre Run | Runing | [Unsigned16, ro] |
| Bit              | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Bit=0                 | Bit=1    |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 0                | Encoder counting direction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | CW                    | CCW      |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 1                | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 2                | Zoom function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Prohibit              | Usable   |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 3-11             | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 12               | Less than the minimum value or not (object 2104h)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Prohibit              | Usable   |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 13               | Less than the minimum value or not (object 2104h)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Prohibit              | Usable   |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 14               | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
| 15               | Actual operation status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Stop/Pre Run          | Runing   |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |
|                  | -encoder rotation direction: from the direction of the shaft, whether the encoder rotates clockwise or anticlockwise.<br>-limit switch min / Max: this function can be used by setting the 12 and 13 positions of the object 6000h to "1".<br>-actual operation status: with this function, to know the actual operation status of the encoder (see Chapter 5.2):<br>Bit15 = 0: "stop" or "pre run" status;<br>Bit15 = 1: "running" status.                                                                                                                                                                                                                                                      |                       |          |       |       |   |                            |    |     |   |     |  |  |   |               |          |        |      |     |  |  |    |                                                   |          |        |    |                                                   |          |        |       |     |  |  |    |                         |              |        |                  |

## Objects specified in the equipment regulations (DS 406)

| Index - Subindex | Object Name                                                                                                                                                                                                         | [Data Type, Property] |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| 6501-00          | Hardware resolution per revolution<br>This object is used to define the number of resolvable steps per revolution on the hardware.<br>To use other values, see object 6001h.                                        | [unsigned 32, RO]     |
| 6502-00          | Total turns of hardware<br>This object defines the maximum number of turns that can be measured on the hardware.<br>"Total hardware resolution" = "obj_6501" X "obj_6502". To use other values, see 6001h and 6002h | [unsigned 32, RO]     |
| 6504-00          | Supported error messages<br>Default value: 0000H (alarm not supported)                                                                                                                                              | [unsigned 16, RO]     |
| 6506-00          | Supported alarm information<br>Default value: 0000H (alarm not supported))                                                                                                                                          | [unsigned 16, RO]     |
| 6507-00          | Regulations and software version<br>Default value: 0301 0101h (software version = 1.1 encoder profile version = 3.1).                                                                                               | [unsigned 32, RO]     |
| 6508-00          | Run time [unsigned 32, RO]<br>Default = FFFF FFFFH (not used)                                                                                                                                                       |                       |
| 6509-00          | Offset<br>This object contains offset values, which are calculated based on preset and location values                                                                                                              | [integer32, RO]       |
| 650A-01          | Production offset value<br>This object contains the manufacturing offset value.<br>This value gives the offset between the physical zero point and the numerical zero point on the encoder disk.                    | [integer32, RO]       |
| 650B-00          | Serial number<br>Default = FFFF FFFFH (not used)                                                                                                                                                                    | [unsigned 32, RO]     |

**Note:**

In order for the changed parameters to take effect, you need to perform the save parameters operation (see object 1010h). If the operation of "save parameter" is not executed, the parameter will be lost when the "reset node" command, the "reset communication" command or the power is turned off.

**Parameter Setting**

The following are some examples of data exchange between the main controller and the encoder when setting parameters.

"Id" is used to represent the address of the encoder. The value is written in hexadecimal.

·Set operation and pre operation status

**NMT Message**

Run

Pre Run

| COB-ID | Order | Node |
|--------|-------|------|
| 000    | 01    | ID   |
| 000    | 80    | ID   |

**Set Single Turn Resolution( $2^{16}=0001\ 0000h$ )**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index | Sub Index | Process Data |
|--------|-------|-------|-----------|--------------|
| 600+ID | 23    | 01    | 60        | 00 00 01 00  |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index | Sub Index | Process Data |
|--------|-------|-------|-----------|--------------|
| 580+ID | 60    | 01    | 60        | 00 00 00 00  |

**Set Total Resolution( $2^{28}=1000\ 0000h$ )**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index | Sub Index | Process Data |
|--------|-------|-------|-----------|--------------|
| 600+ID | 23    | 02    | 60        | 00 00 00 10  |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index | Sub Index | Process Data |
|--------|-------|-------|-----------|--------------|
| 580+ID | 60    | 02    | 60        | 00 00 00 00  |

## CAX60 CAS60-CANopen Series Absolute Encoder

**Set Running Parameters (counting direction: clockwise, scaling function: use, limit switch: disable)**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 600+ID | 2B    | 00    | 60 | 00        | 04           | 00 | 00 | 00 |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 580+ID | 60    | 00    | 60 | 00        | 00           | 00 | 00 | 00 |

**Set preset value (preset value is 1000 = 03e8h)**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 600+ID | 23    | 03    | 60 | 00        | E8           | 03 | 00 | 00 |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 580+ID | 60    | 03    | 60 | 00        | 00           | 00 | 00 | 00 |

**Set synchronization counter (n = 5 = 05H)**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 600+ID | 2F    | 01    | 18 | 02        | 05           | 00 | 00 | 00 |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 580+ID | 60    | 01    | 18 | 02        | 00           | 00 | 00 | 00 |

**Disable sync mode**

**Read COB-ID via PDO2**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 600+ID | 40    | 01    | 18 | 01        | 00           | 00 | 00 | 00 |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 580+ID | 43    | 01    | 18 | 01        | B0           | B1 | B2 | B3 |

COB-ID read by PDO2: ((B3 < 24) (B3 < 16) (B1 < 8) (B0)).

The highest position is 1: B3 = 0x80;

**Set the new COB-ID with PDO2:**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 600+ID | 23    | 01    | 18 | 01        | B0           | B1 | B2 | B3 |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 580+ID | 60    | 01    | 18 | 01        | 00           | 00 | 00 | 00 |

**Use Cycle Mode****Set Cycle Time (100ms = 64H)**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 600+ID | 2B    | 00    | 62 | 00        | 64           | 00 | 00 | 00 |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 580+ID | 60    | 00    | 62 | 00        | 00           | 00 | 00 | 00 |

**Read COB-ID via PD 01**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 600+ID | 40    | 00    | 18 | 01        | 00           | 00 | 00 | 00 |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 580+ID | 43    | 00    | 18 | 01        | B0           | B1 | B2 | B3 |

COB-ID read by pd01: ((B3 &lt; 24) (B3 &lt; 16) (B1 &lt; 8) (B0)).

The highest position is 0: B3 &amp; = 0x7F;

**Set the new COB-ID with PD 01:**

Controller→Encoder(Setting Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 600+ID | 23    | 00    | 18 | 01        | B0           | B1 | B2 | B3 |

Encoder→Controller(Confirm Request)

| COB-ID | Order | Index |    | Sub Index | Process Data |    |    |    |
|--------|-------|-------|----|-----------|--------------|----|----|----|
| 580+ID | 60    | 00    | 18 | 01        | 00           | 00 | 00 | 00 |

In order to make the changed parameters to take effect, you need to perform the save parameters operation (see object 1010h).

If the operation of "save parameters" is not performed, the parameters will be lost when the "Resurrection node" command, the "reset communication" command or the power is turned off.

**Warning objects**For the meaning of the warning information, please refer to the section "SDO abnormal interrupt code" in "draft CIA standard 301" on [www.can-cia.org](http://www.can-cia.org).**Emergency object**

An emergency object is triggered when an error occurs inside the device.

**Emergency Object Structure**

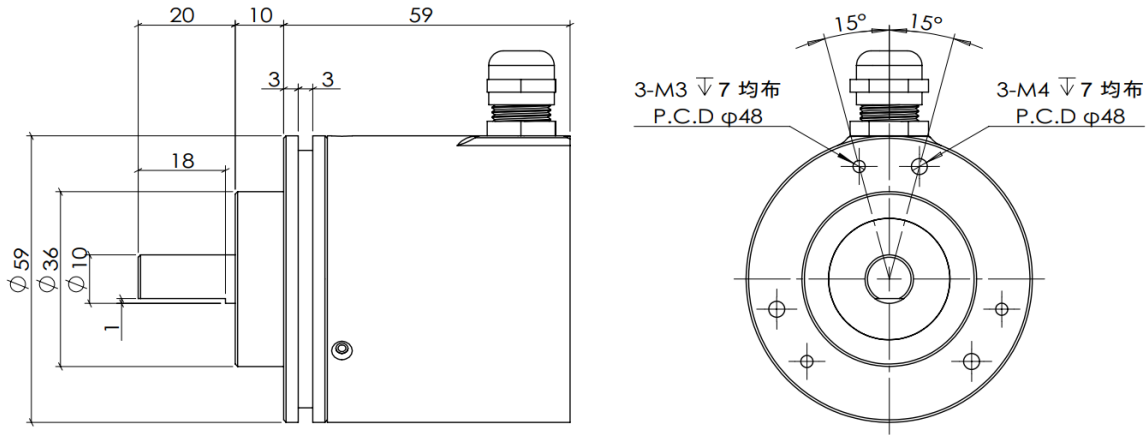
| Identification | CAN Data        |                  |                |                |
|----------------|-----------------|------------------|----------------|----------------|
| COB-ID (HEX)   | 0               | 1                | 2              | 3~7            |
| Object 1014h   | Error Code      |                  | Error Register | Specific code  |
|                | Lowest position | Highest position | 1001           | 00 00 00 00 00 |

-Error code defined: 1000h

-node monitoring error5530h

-memory error

### External Dimension



The External Dimension can be customized as per customers demands

### Note:

- ▶ Adopt elastic soft connection shall be applied between encoder shaft and output shaft of user end to avoid damage of encoder shaft system due to serial movement and run out of user shaft.
- ▶ Please pay attention to the allowable axle load during installation.
- ▶ Make Sure that the difference Between Axial Degree of encoder shaft and user output shaft shall be no more than 0.20mm, and the deviation angle with axis shall be less than  $1.5^\circ$ .
- ▶ Try to avoid knocking and falling collision during installation;
- ▶ Do not connect the power line and the ground wire in reverse.
- ▶ The GND wire shall be as thick as possible, generally larger than  $\phi 3$ .
- ▶ Output lines of encoder shall not be overlapped with each other to avoid damaging output circuit.
- ▶ Signal line of encoder shall not be connected to DC power supply or AC current to avoid damaging output circuit.
- ▶ The motor and other equipment connected to the encoder shall be well grounded without static electricity.
- ▶ Shielded cable shall be used for wiring.
- ▶ Before starting the machine, carefully check whether the wiring is correct.
- ▶ During long-distance transmission, the signal attenuation factor shall be considered, and the output mode with low output impedance and strong anti-interference ability shall be selected.
- ▶ Avoid using in strong electromagnetic environment.