EtherCAT Multi Axis

User Manual

MOONS'

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AMP & MOONS' Automation

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1 Introduction

1.1 About this manual

This manual provides the details of EtherCAT communication about MOONS' Stepper and Step-Servodrives. It is used for engineers or technicians that develop a motion control system with EtherCAT communication. It is necessary that the user should know both a basic EtherCAT protcol and this manual.

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH,Germany.

1.2 Reference documents

Hardware Manual of MOONS' drive

CiA 402

ETG 1000

ETG 6010

MOONS' Host Command Reference

1.3 Commonly used acronyms

100Base-Tx	100 MBit/s Ethernet on twisted pairs
AL	Application Layer
CAN	Controller Area Network
CANopen	Application layer protocol for the CAN bus
CoE	CANopen over EtherCAT
DC	Distributed Clocks Mechanism to synchronize EtherCAT slaves and master
DL	Data Link Layer
EMCY	Emergency Object
ESI	EtherCAT Slave Information
ESC	EtherCAT Slave Controller
ETG	EtherCAT Technology Group
PDO	Process Data Object
SDO	Service Data Object
XML	eXtensible Markup Language - used for the ESI file

1.4 Revisions

Data	Revisions	Changes
8/12/2020	2.1	Update and rectification
7/25/2024	2.2	Update and rectification

This manual mainly introduces the communication description of Step-Servo and Stepper drives.

Stepper drives:

Model	Firmware
STF05-4X-ECX	
STF05-4X-ECX-S	
STF10-4X-ECX	
STF10-4X-ECX-S	
STF05-2XU-ECX	
STF05-2XU-ECX-S	
STF10-2XU-ECX	
STF10-2XU-ECX-S	
STF05-4XU-ECX	
STF05-4XU-ECX-S	
STF10-4XU-ECX	
STF10-4XU-ECX-S	

Step-Servo drives:

Model	Firmware
SSDC06-4X-ECX	
SSDC06-4X-ECX-S	
SSDC10-4X-ECX	
SSDC10-4X-ECX-S	
SSDC06-2XU-ECX	
SSDC06-2XU-ECX-S	
SSDC10-2XU-ECX	
SSDC10-2XU-ECX-S	
SSDC06-4XU-ECX	
SSDC06-4XU-ECX-S	
SSDC10-4XU-ECX	
SSDC10-4XU-ECX-S	

2 EtherCAT communication specification

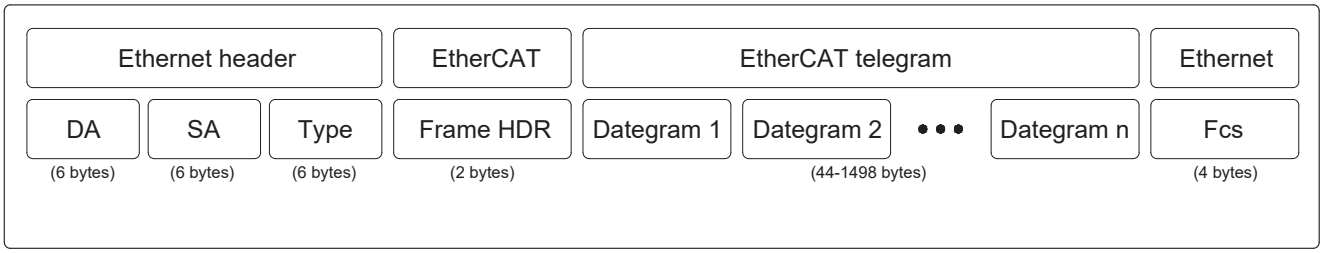
2.1 Introduction to EtherCAT

EtherCAT (Ethernet for Control Automation Technology) is a real-time Industrial Ethernet technology originally developed by Beckhoff Automation. The EtherCAT protocol which is disclosed in the IEC standard IEC61158 is suitable for hard and soft real-time requirements in automation technology, in test and measurement and many other applications.

The main focus during the development of EtherCAT was on short cycle times (≤ 100 µs), low jitter for accurate synchronization (≤ 1 µs) and low hardware costs.

2.2 EtherCAT protocol

EtherCAT embeds its payload in a standard Ethernet frame. The frame is identified with the Identifier (0x88A4) in the EtherType field. Since the EtherCAT protocol is optimized for short cyclic process data, the use of protocol stacks, such as TCP/IP or UDP/IP, can be eliminated.



To ensure Ethernet IT communication between the nodes, TCP/IP connections can optionally be tunneled through a mailbox channel without impacting real-time data transfer. During startup, the master device configures and maps the process data on the slave devices. Different amounts of data can be exchanged with each slave, from one bit to a few bytes, or even up to kilobytes of data.

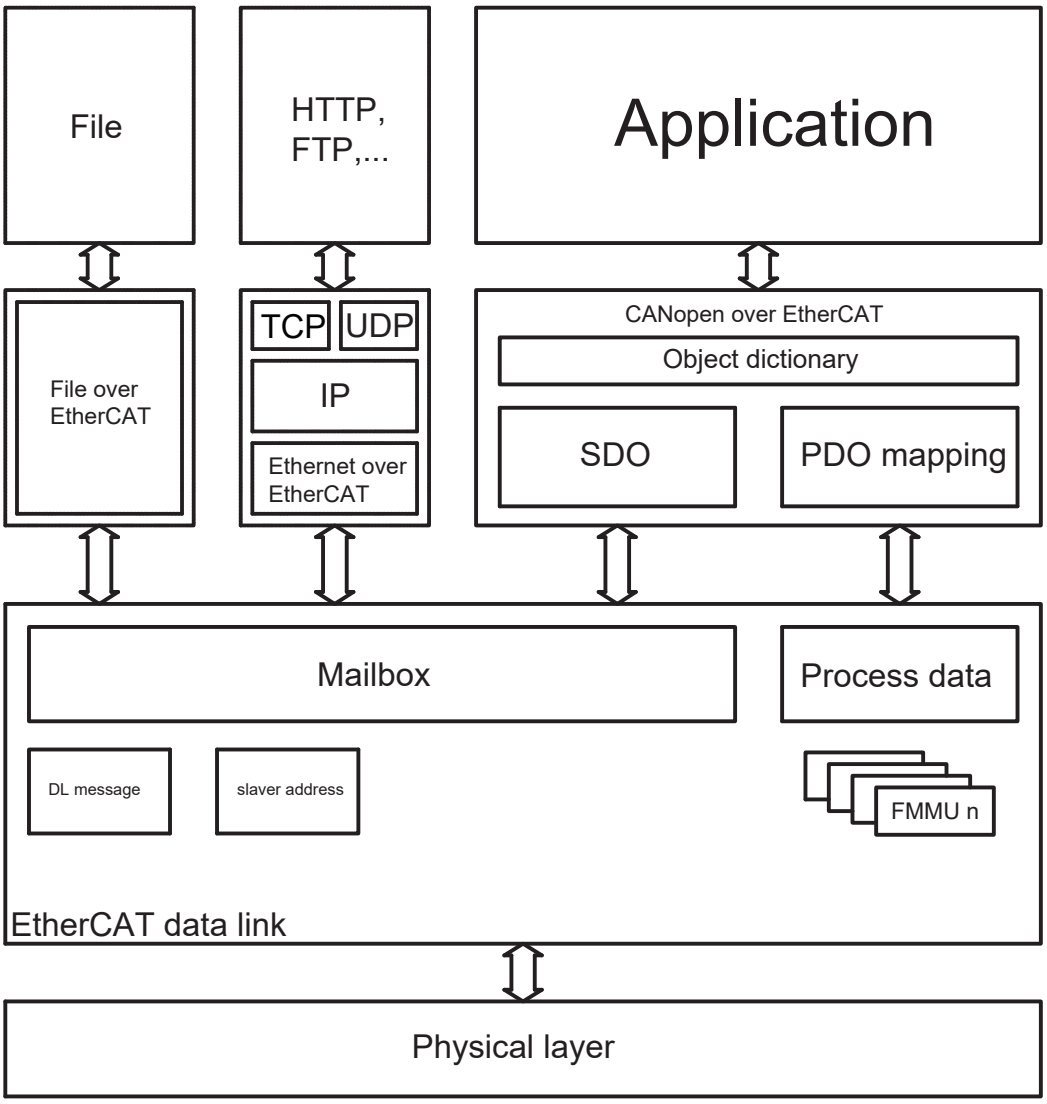
The EtherCAT frame contains one or more datagrams. The datagram header indicates what type of access the master device would like to execute:

-Read, write, read-write

Access to a specific slave device through direct addressing, or access to multiple slave devices through logical addressing (implicit addressing)

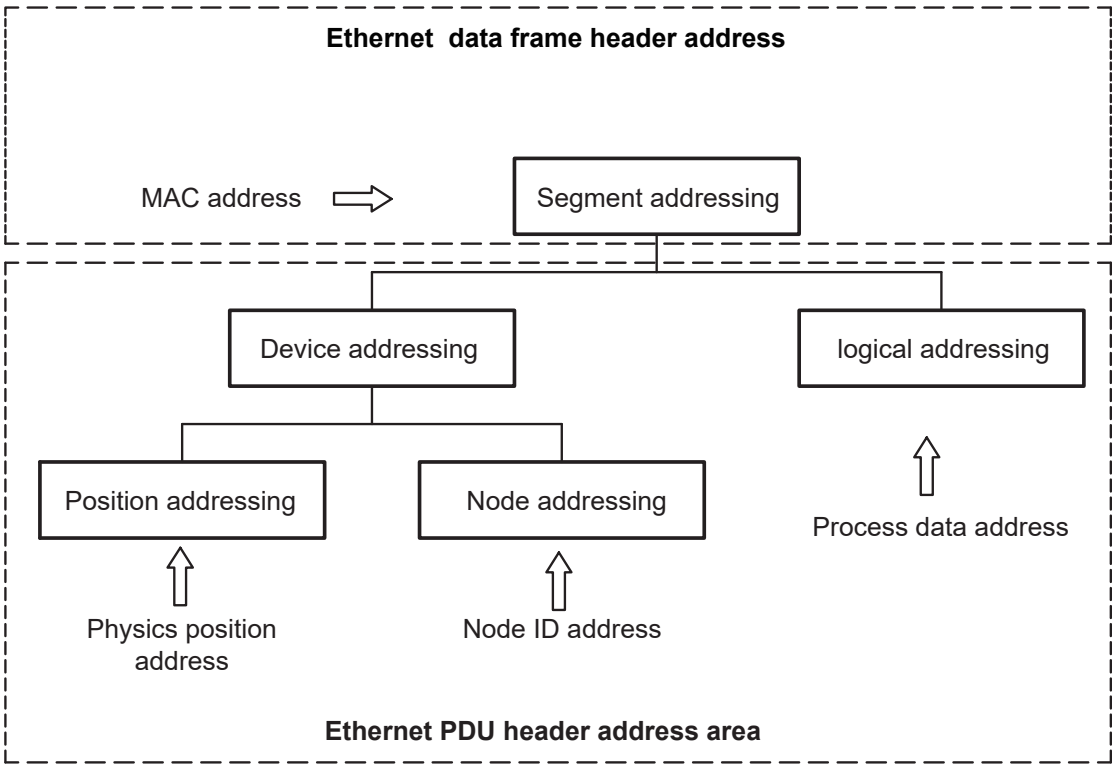
2.3 CANopen over EtherCAT

With the CoE protocol, EtherCAT provides the same communication mechanisms as in CANopen®-Standard EN 50325-4: Object Dictionary, PDO Mapping (Process Data Objects) and SDO (Service Data Objects) – even the network management is similar. This makes it possible to implement EtherCAT with minimal effort in devices that were previously outfitted with CANopen®, and large portions of the CANopen® Firmware are even reusable. Optionally, the legacy 8-byte PDO limitation can be waived, and it's also possible to use the enhanced bandwidth of EtherCAT to support the upload of the entire Object Dictionary. The device profiles, such as the drive profile CiA 402, can also be reused for EtherCAT.



2.4 EtherCAT addressing

EtherCAT communication is that the master read and write the data from the internal flash of EtherCAT slave. There has two ways for addressing to controll the internal ESC register. EtherCAT addressing is as follow.

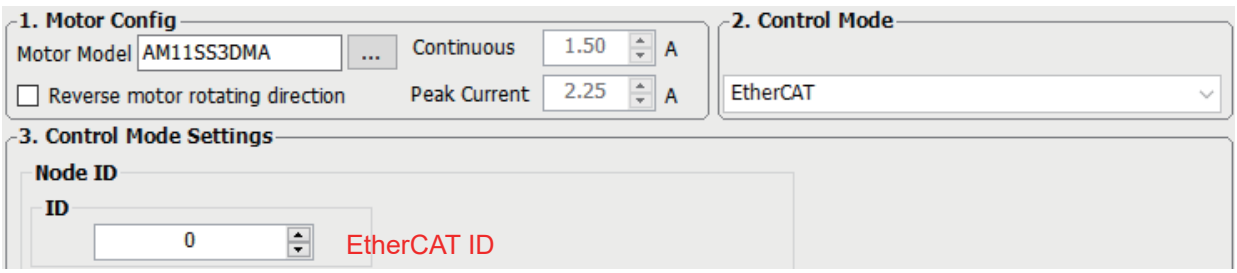


Hereby we describe about the Node addressing. Node addressing is that the salve adddress is nothing to do with the physics position of the topology.

There has two ways for addressing:

- -The master configurate the EtherCAT ID to the slave during the data link startup phase.
- - EtherCAT ID upload from EEPROM of slaver during the data link startup phase.

The EtherCAT ID of MOONS' drive is zero in default, it means the master should assign address to the drive for EhterCAT communication when first power up. If you assign ID to the EhterCAT alias address from the software or switch of the drive except zero, the master can upload the ID from EtherCAT alias address of EEPROM with the drive.
Assign EtherCAT ID by software in the picture below:



Plesase reference the hardware manual of drives for details about EtherCAT ID setting.

2.5 EtherCAT slaver information

For each EtherCAT Slave a device description, the so called EtherCAT Slave Information(ESI) has to be delivered. This is done in form of an XML file (eXtensible Markup Language). It descibes EtherCAT specific as well as application specific features of the slave.

The ESI file is used by an EtherCAT configuration tool to generate the EtherCAT Network Information (ENI).

There is always one unique ESI file for a device. Revision changes on the device's hardware and/or software may have to be reflected in the ESI of this device(usually by the revision Number).

The XML file can be found from our webside: https://www.moonsindustries.com/.

2.6 Distributed clock

Distributed clock can make all the EtherCAT slave synchronize with a same reference clock. The slave that supports the distributed clock is called the DC slave. MOONS' Stepper and Step-Servo drive have three methold for EtherCAT communication；

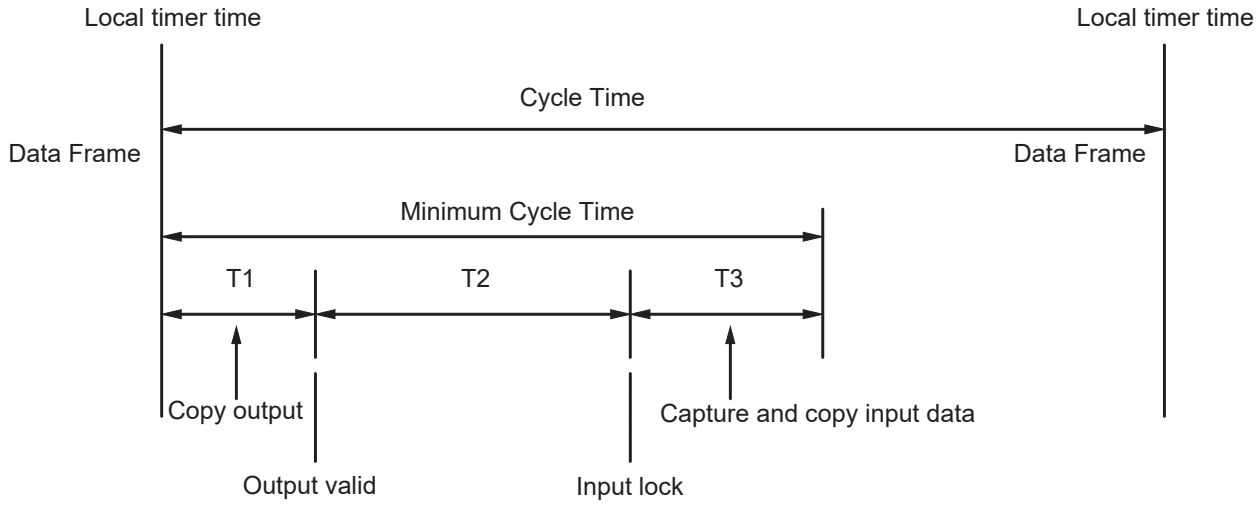
-Free Run

-SM synchron

-DC synchron

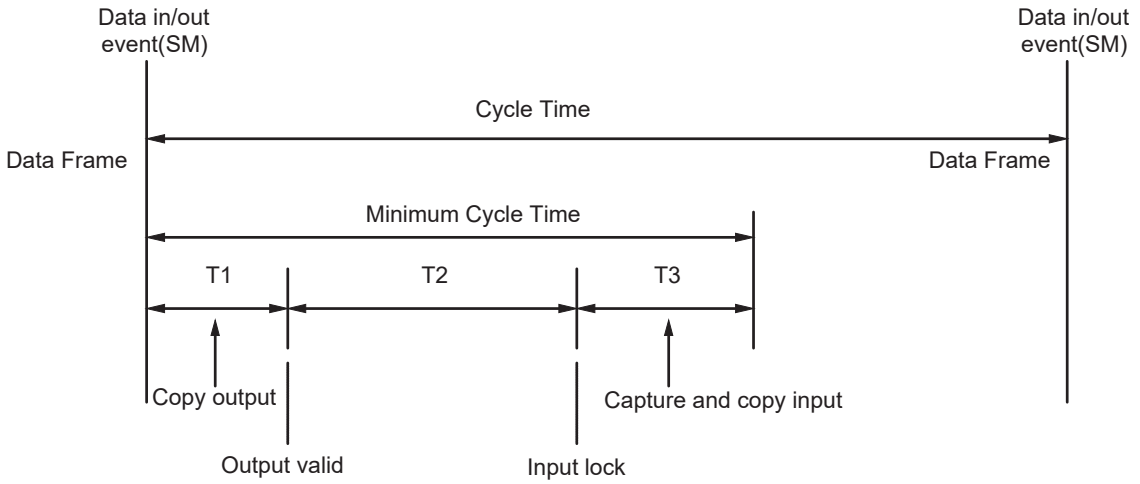
Free Run

With this mode, the data cycle time based on the local timer time. T1 and T2 is that the MPU copy the data from frame, then set output valid and caculate time.T3 is hardware delay.



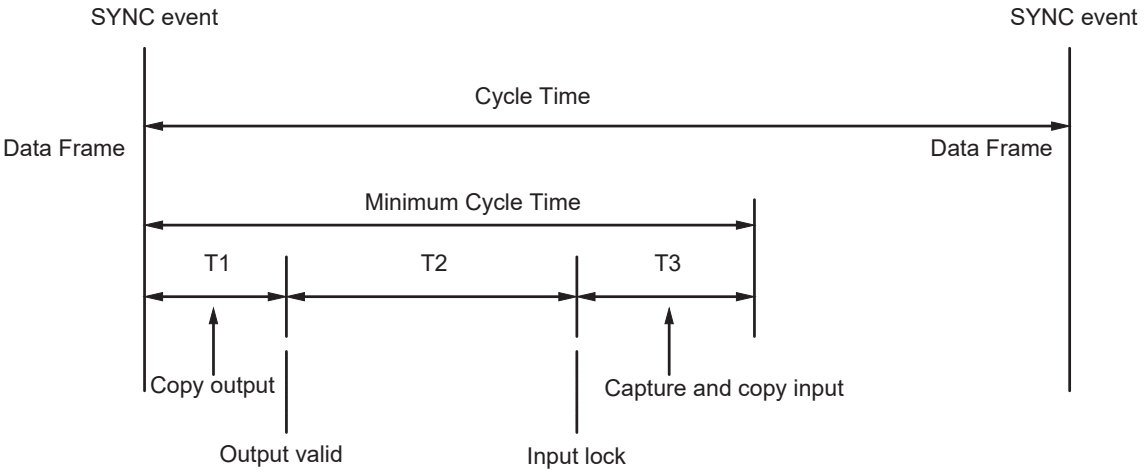
SM synchron

Synchronized with data in/out event, the local timer is trigger by the data in/out event.

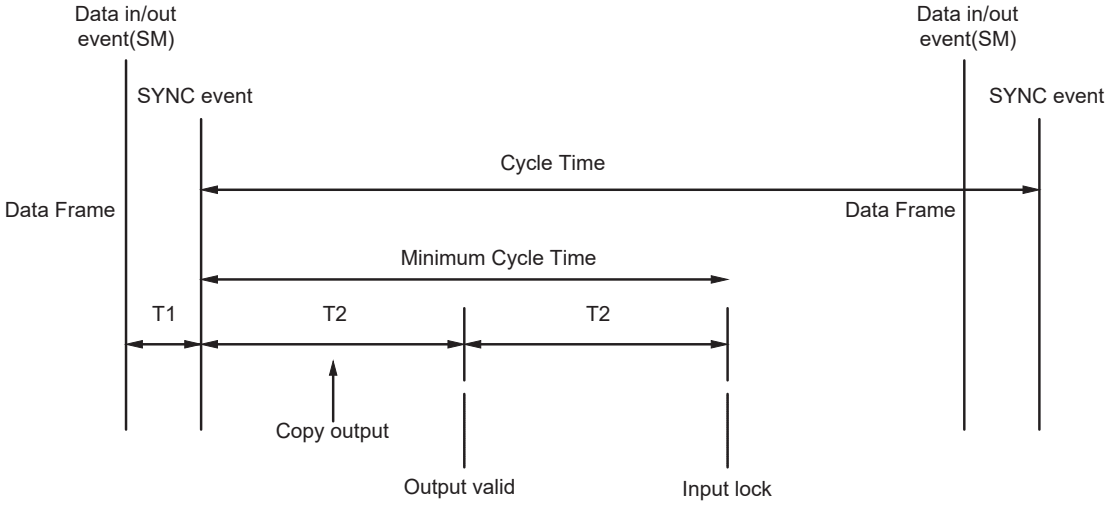


DC synchron

Synchronized with SYNC event, the EtherCAT master should transmit the data frame before the SYNC trigger. Then the EtherCAT master should synchronzie with the same clock.

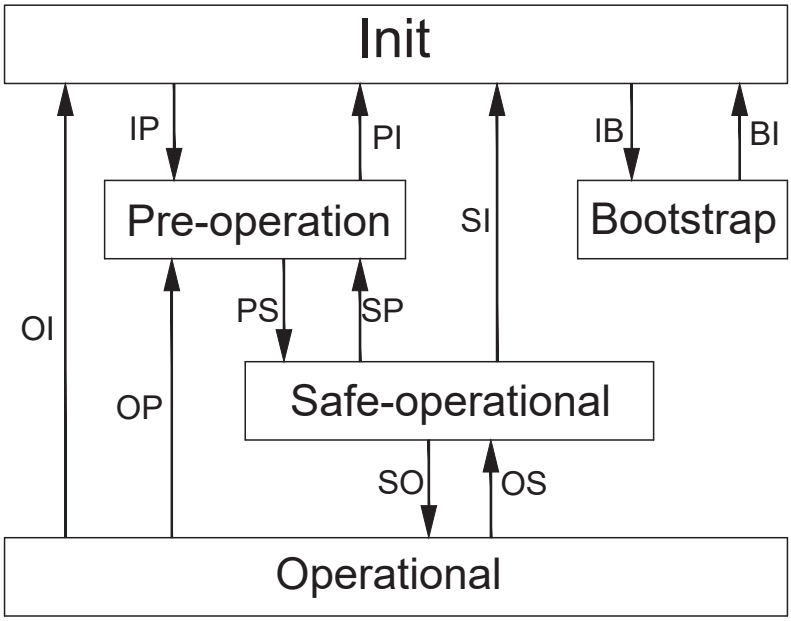


To improve synchronization performance of slave communication, the master can copy the output message of receiving process frame when the data frame out/in event is trigger.



2.7 EtherCAT state machine(ESM)

ESM (EtherCAT state machine) is used to coordinate the master and slave when in start up or working . As shown below, It indicate the transition diagram of EtherCAT state.

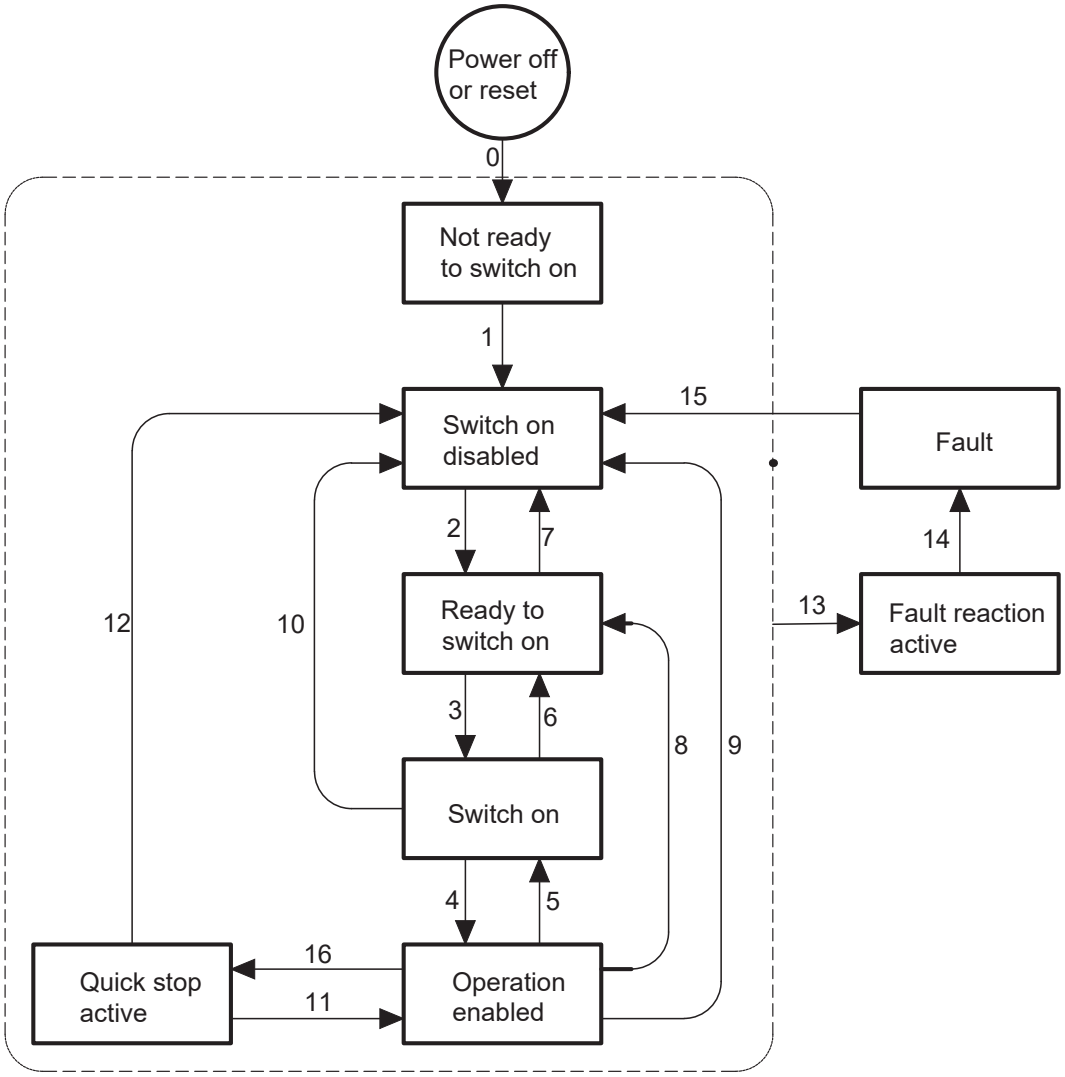


State transition	Description
IP	Start Mailbox Communication
PI	Stop mailbox commnunication
PS	Start input update
SP	Stop input update
SO	Start output update
OS	Stop output update
OP	Stop output update,stop input update
SI	Stop input update, stop mailbox communication
OI	Stop output update, stop input update, stop mailbox communication
IB	Start bootstrap mode
BI	Restart device

3 Motion control

3.1 Control the power drive system

MOONS' drive follows the CANopen protocol in EtherCAT communication(CANopen over EtherCAT) at application layer. So the PDS FSA control system is aslo suitable for EtherCAT application.



The state cording in FSA

Statusword(6041h)	PDS FSA state
xxxx xxxx x0xx 0000	Not ready to switch on
xxxx xxxx x1xx 0000	Switch on disabled
xxxx xxxx x01x 0001	Ready to switch on
xxxx xxxx x01x 0011	Switch on
xxxx xxxx x01x 0111	Operation enabled
xxxx xxxx x00x 0111	Quick stop active
xxxx xxxx x0xx 1111	Fault reaction active
xxxx xxxx x0xx 1000	Fault

Transition	Event(s)	Action(s)
0	Automatic transition after power-on or reset application	Drive device self-test and/or self initialization shall be performed.
1	Automatic transition	Communication shall be activated.
2	Shut down command from control device or local signal	None
3	Switch on command received from control device or local signal	The high-level power shall be switched on, if possible.
4	Enable operation command received from control device or local signal	The drive function shall be enabled and all internal set-points cleared.
5	Disable operation command received from control device or local signal	The drive function shall be disabled.
6	Shut down command received from control device or local signal	The high-level power shall be switched off, if possible.
7	Quick stop or disable voltage command from control device or local signal	None
8	Shut down command from control device or local signal	The drive function shall be disabled, and the high-level power shall be switched off, if possible.
9	Disable voltage command from control device or local signal	The drive function shall be disabled, and the high-level power shall be switched off, if possible.
10	Disable voltage or quick stop command from control device or local signal	The high-level power shall be switched off, if possible.
11	Quick stop command from control device or local signal	The quick stop function shall be started.
12	Automatic transition when the quick stop function is completed and quick stop option code is 1, 2, 3 or 4, or disable voltage command received from control device (depends on the quick stop option code)	The drive function shall be disabled, and the high-level power shall be switched off, if possible.
13	Fault signal	The configured fault reaction function shall be executed.
14	Automatic transition	The drive function shall be disabled; the high-level power shall be switched off, if possible.
15	Fault reset command from control device or local signal	A reset of the fault condition is carried out, if no fault exists currently on the drive device; after leaving the fault state, the fault reset bit in the controlword shall be cleared by the control device.
16	Enable operation command from control device, if the quick stop option code is 5, 6, 7, or 8	The drive function shall be enabled.

The command codes with object at 6040h.

Command	Bits of the controlword					Transitions
	Bit7	Bit3	Bit2	Bit1	Bit0	
Shutdown	0	x	1	1	0	2,6,8
Switch on	0	0	1	1	1	3
Switch on + Enable operation	0	1	1	1	1	3+4
Quick stop	0	x	x	0	x	7,9,10,12
Disable operation	0	0	1	1	1	5
Enable operation	0	1	1	1	1	4,16
Fault reset	↑	x	x	x	x	15

3.2 Mode of operation

The following operation modes for MOONS' Stepper and Step-Servo are recommended:

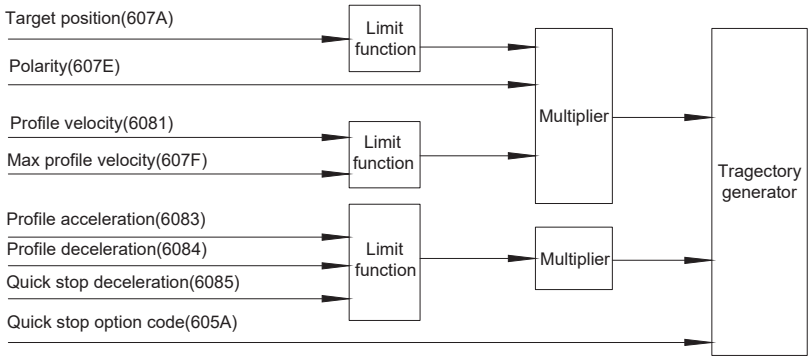
Mode of operation	Code(6060)
Profile position mode	1
Profile velocity mode	3
Profile Torque mode	4
Homing mode	6
Cynclic synchronous position mode	8
Cynclic synchronous velocity mode	9

0x6060/0x6860/0x7060/0x7860 object is the register for change control mode. when the mode of operation has been change, the object 0x6061/0x6861/0x7061/0x7861 will be update too.

3.3 Profile position mode

3.3.1 General information

Profile position mode is a point to point operating mode using set points which consist of velocity, acceleration, deceleration, and target position. Once all these parameters have been set, the drive buffers the commands and begins executing the set point. When using a set of set points method, a new set point can be sent to the drive while a previously sent set point is still executing.



3.3.2 Main controlling object

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT16	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT16	RO	YES
0x6060	0x6860	0x7060	0x7860	Modes of operation	INT8	WO	YES
0x6061	0x6861	0x7061	0x7861	Modes of operation display	INT8	RO	YES
0x607A	0x687A	0x707A	0x787A	Target position	INT32	RW	YES
0x6081	0x6881	0x7081	0x7881	Profile velocity	UINT32	RW	YES
0x6083	0x6883	0x7083	0x7883	Profile acceleration	UINT32	RW	YES
0x6084	0x6884	0x7084	0x7884	Profile deceleration	UINT32	RW	YES
0x6085	0x6885	0x7085	0x7885	Quick stop deceleration	UINT32	RW	YES
0x605A	0x685A	0x705A	0x785A	Quick stop option code	INT16	RW	NO

Controlword of profile position mode (6040h)

15 10	9	8	7	6	5	4	3 0
***	Change on set point	Halt	***	Abs/Rel	Change set immediately	New set point	***

***: See object description

Bit	Name	Value	Description
4	New set point	0	Toggle this bit from 0->1 to clock in a new set point
		1	
5	Change set point immediately	0	Positioning shall be completed before the next one gets started
		1	Next positioning shall be started immediately
6	Abs/Rel	0	Target position shall be an absolute value
		1	Target position shall be an relative value
8	Halt	0	positioning shall be executed or continued
		1	Axis shall be stopped
9	Change of set point	0	The previous set-point will be completed and the motor will come to rest before a new set point is processed
		1	The motor will continue at the speed commanded by the previous set point until it has reached the position commanded by the previous set point, then transition to the speed of the new set point

Statusword of profile position mode (6041h / 6841h / 7041h / 7841h).

15 14	13	12	11	10	9 0
****	Following error	Set point acknowledge	****	Target reached	****

***: See object description

Bit	Name	Value	Description
10	Target reached	0	Halt (bit 8 in controlword) = 0: Target position not reached
			Halt (bit 8 in controlword) = 1: Axis decelerates
		1	Halt (bit 8 in controlword) = 0: Target position reached
			Halt (bit 8 in controlword) = 1: Velocity of axis is 0
12	Set point ACK	0	Previous set-point already processed, waiting for new set-point
		1	Previous set-point still in process, set-point overwriting shall be accepted
13	Following error	0	No following error
		1	Following error

3.3.3 Functional description

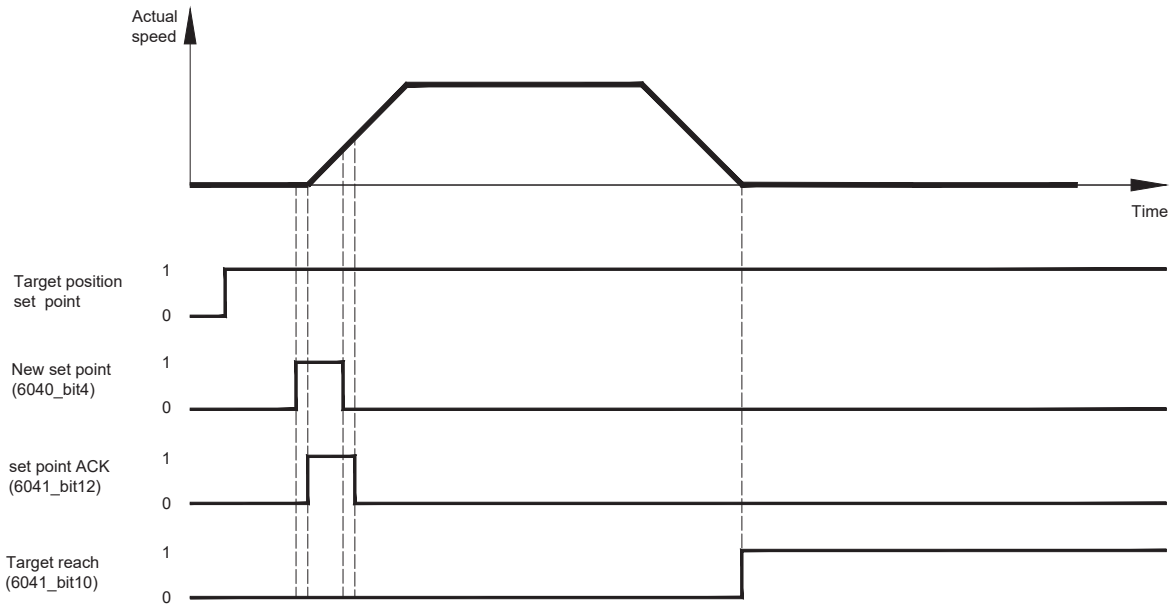
General

The setting of set-points is controlled by the timing of the new set-point bit and the change set immediately bit in the controlword as well as the set-point acknowledge bit in the statusword.

If the change set immediately bit of the controlword is set to 1, a single set-point is expected by the drive device. If the change set immediately bit of the controlword is set to 0, a set of set-points is expected by the drive device.

Set point

After a set-point is applied to the drive device, the control device signals that the set-point is valid by a rising edge of the new set-point bit in the controlword. The drive device sets the set-point acknowledge bit in the statusword to 1, and afterwards, the drive device signals with the set-point acknowledge bit set to 0 its ability to accept new set-points.



NOTE: The figure takes axis 1 as an example.

The data of controlling object:

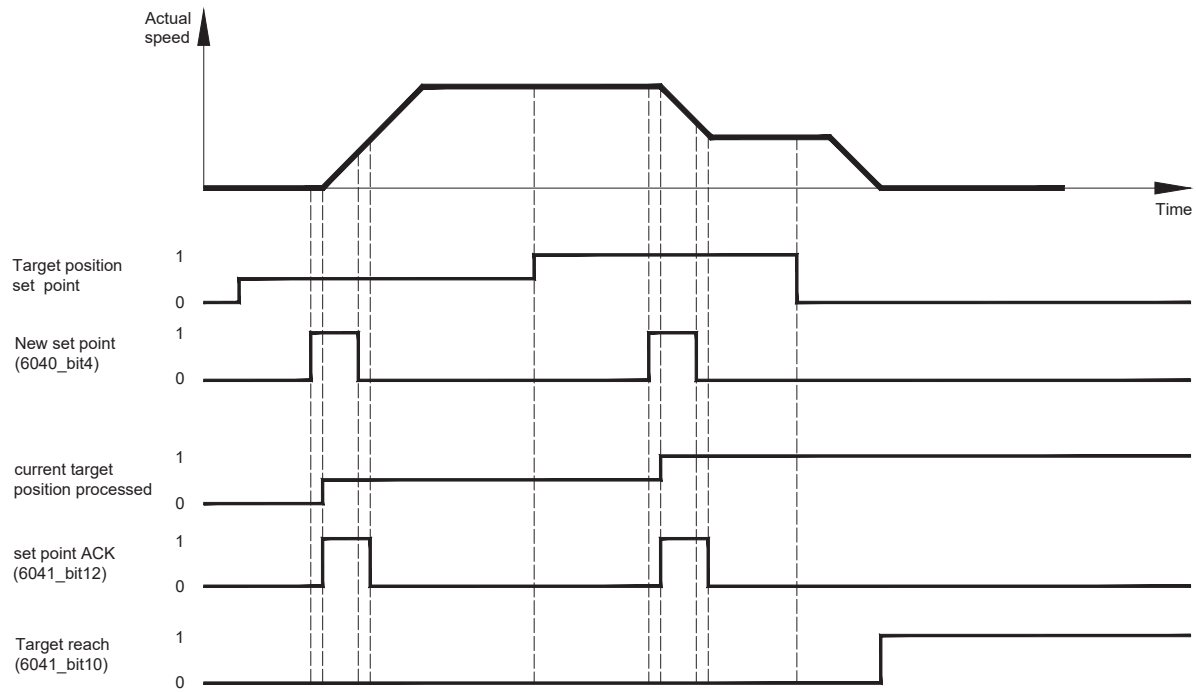
Event		Set parameter
Enable motor power	Shut down	0x6040=6(06h)
	Switch on	0x6040=7(07h)
	Switch on + enable operation	0x6040=15(0Fh)
Set mode of operation	Profile position mode	0x6060=1(01h)
Set motion parameters	Distance	0x607A=100000(0186A0h)
	Velocity	0x6081=20000(4E20h)
	Acceleration	0x6083=50000(C350h)
	Deceleration	0x6084=50000(C350h)
Set point absolute	New set point	0x6040=31(1Fh)
	Clear new set point	0x6040=15(0Fh)
Set point relative	New set point	0x6040=95(5Fh)
	Clear new set point	0x6040=79(4Fh)

NOTE: The table takes axis 1 as an example.

If one set-point is still in progress and a new one is validated, two methods of handling are supported: single set-point (change set immediately bit of controlword is 1) and set of set points (change set immediately bit of controlword is 0).

Single set-point

When a set-point is in progress and a new set-point is validated by the new set-point (bit 4) in the controlword, the new set-point shall be processed immediately.



NOTE: The figure takes axis 1 as an example.

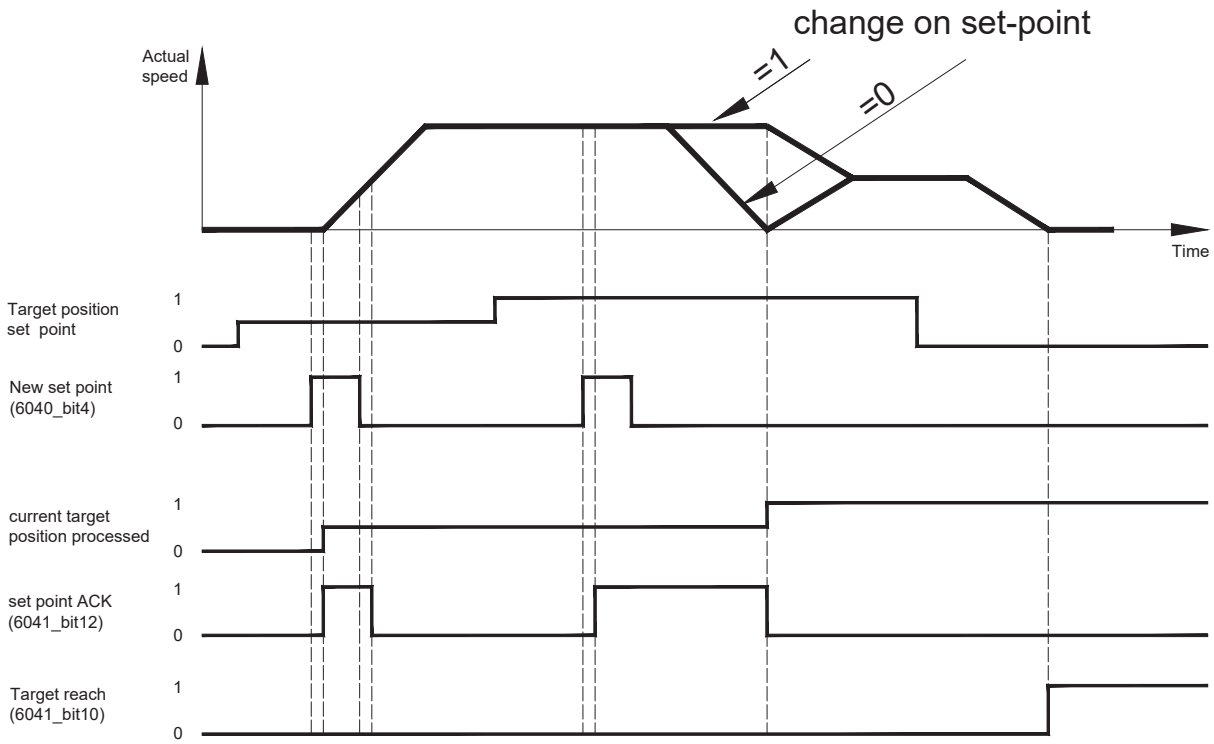
The data of controlling object:

Event		Set parameter
Enable motor power	Shut down	0x6040=6(06h)
	Switch on	0x6040=7(07h)
	Switch on + enable operation	0x6040=15(0Fh)
Set mode of operation	Profile position mode	0x6060=1(01h)
Set motion parameters	Acceleration	0x6083=50000(C350h)
	Deceleration	0x6084=50000(C350h)
Single set point	First part of velocity	0x6081=30000(7530h)
	First part of distance	0x607A=200000(030D40h)
	New set point	0x6040=639(27Fh)
	Clear new set point	0x6040=623(26Fh)
	Second part of velocity	0x6081=20000(4E20h)
	Second part of distance	0x607A=100000(0186A0h)
	New set point	0x6040=639(27Fh)
	Clear new set point	0x6040=623(26Fh)

NOTE: The table takes axis 1 as an example.

Set of set-points

When a set-point is in progress and a new set-point is validated by the new set-point (bit 4) in the controlword, the new set-point shall be processed only after the previous has been reached.



NOTE: The figure takes axis 1 as an example.

The data of controlling object:

Event	Set parameter	Set parameter
Enable motor power	Shut down	0x6040=6(06h)
	Switch on	0x6040=7(07h)
	Switch on + enable operation	0x6040=15(0Fh)
Set mode of operation	Profile position mode	0x6060=1(01h)
Set motion parameters	Acceleration	0x6083=50000(C350h)
	Deceleration	0x6084=50000(C350h))
Set of set-points with change on set-point=0	First part of velocity	0x6081=30000(7530h)
	First part of distance	0x607A=400000(061A80h)
	New set point	0x6040=95(5Fh)
	Clear new set point	0x6040=79(4Fh)
	Second part of velocity	0x6081=20000(4E20h)
	Second part of distance	0x607A=300000(7530h)
	New set point	0x6040=95(5Fh)
	Clear new set point	0x6040=79(4Fh)
Set of set-points with change on set-point=1	First part of velocity	0x6081=30000(7530h)
	First part of distance	0x607A=400000(061A80h)
	New set point	0x6040=607(25Fh)
	Clear new set point	0x6040=591(24Fh)
	Second part of velocity	0x6081=20000(4E20h)
	Second part of distance	0x607A=300000(0493E0h)
	New set point	0x6040=607(25Fh)
	Clear new set point	0x6040=591(24Fh)

NOTE: The table takes axis 1 as an example.

MOONS' EtherCAT drive can be set up with two set-points, if the bit 12 of statusword is 1, then the buffer is full and another set-point will be ignored.

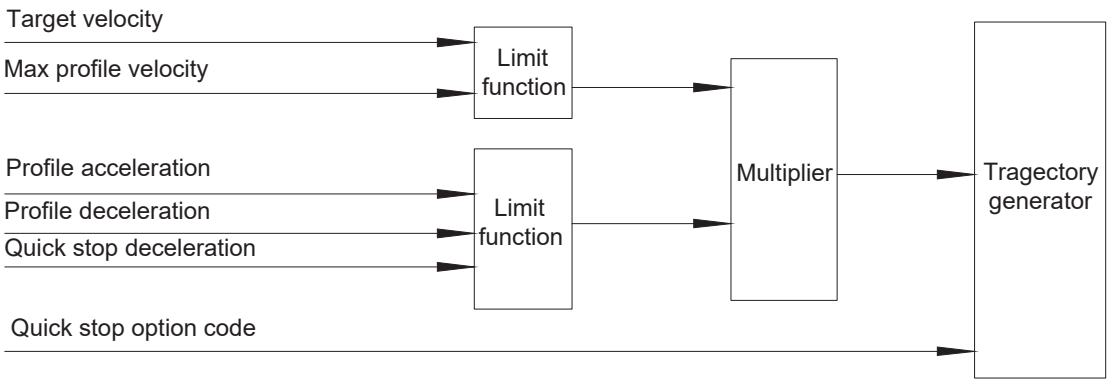
Stop the motor with halt (0x6040 / 0x7040 / 0x7840_bit8)

If a drive is processing a set-point, the halt bit (bit 8 of the controlword) can be used to stop the motor and keep it in position control. After releasing the halt bit the processing of the actual set-point is continued.

3.4 Profile velocity mode

3.4.1 General information

Profile Velocity Mode is a relatively simple operating mode. Once the velocity, acceleration, and deceleration are set, the drive will either command the motor to accelerate to the running velocity according to the acceleration parameter, or to halt movement according to the deceleration parameter.



3.4.2 Main controlling object

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT16	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT16	RO	YES
0x6060	0x6860	0x7060	0x7860	Modes of operation	INT8	WO	YES
0x6061	0x6861	0x7061	0x7861	Modes of operation display	INT8	RO	YES
0x60FF	0x68FF	0x70FF	0x78FF	Target velocity	UINT32	RW	YES
0x6083	0x6883	0x7083	0x7883	Profile acceleration	UINT32	RW	YES
0x6084	0x6884	0x7084	0x7884	Profile deceleration	UINT32	RW	YES

Controlword of profile velocity mode

15 9	8	7	6	5	4	3 0
***	Halt	****	***	***	***	***

***: See object description

Bit	Name	Value	Description
8	Halt	0	The motion shall be executed or continued
		1	Axis shall be stopped according to the halt option code (0x605D)

Statusword of profile velocity mode

15 14	13	12	11	10	9 0
***	Max slippage error	Speed	***	Target reached	***

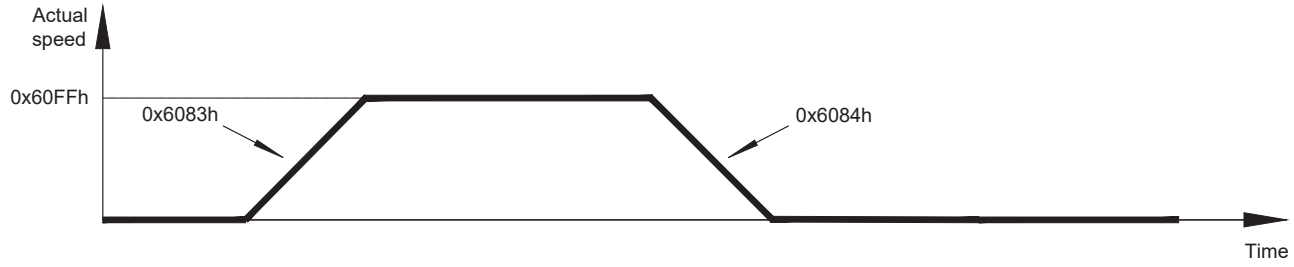
***: See object description

Bit	Name	Value	Description
10	Target reached	0	Halt (bit 8 in controlword) = 0: Target not reached Halt (bit 8 in controlword) = 1: Axis decelerates
		1	Halt (bit 8 in controlword) = 0: Target reached Halt (bit 8 in controlword) = 1: Velocity of axis is 0
12	Speed	0	Speed is not equal 0
		1	Speed is equal 0
13	Max slippage error	0	Maximum slippage not reached
		1	Maximum slippage reached

3.4.3 Functional description

Profile velocity mode is according to the specified velocity, acceleration and deceleration value for moving. And to stopped with halt (6040_bit8) control.

1. Target velocity (60FFh / 68FFh / 70FFh / 78FFh)
2. Profile acceleration (6083h / 6883h / 7083h / 7883h)
3. Profile deceleration (6084h / 6884h / 7084h / 7884h)



NOTE: The figure takes axis 1 as an example.

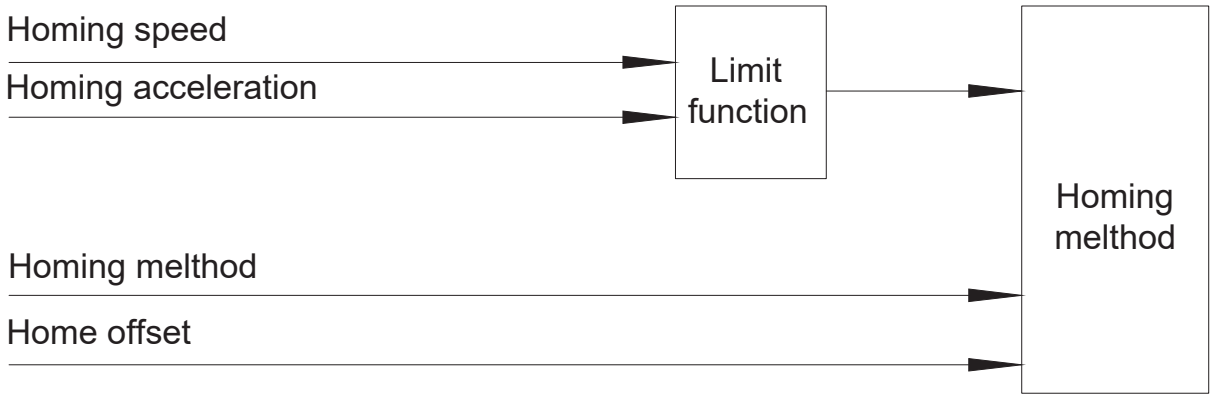
Event		Set parameter
Enable motor power	Shut down	0x6040=6(06h)
	Switch on	0x6040=7(07h)
	Switch on + enable operation +halt	0x6040=271(010Fh)
Set mode of operation	Profile velocity mode	0x6060=3(3h)
Set motion parameter	Target velocity	0x60FF=20000(4E20h)
	Acceleration	0x6083=50000(C350h)
	Deceleration	0x6084=50000(C350h)
Velocity mode	Start	0x6040=15(Fh)
	Stop	0x6040=271(010Fh)

NOTE: The table takes axis 1 as an example.

3.5 Homing mode

3.5.1 General information

This clause describes the method by which a drive seeks the home position (also called, the datum, reference point or zero point). There are various methods of achieving this using limit. switches at the ends of travel or a home switch (zero point switch) in mid-travel, most of the methods also use the index (zero) pulse train from an incremental encoder.



3.5.2 Main controlling object

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT16	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT16	RO	YES
0x6060	0x6860	0x7060	0x7860	Mode of operation	INT8	WO	YES
0x6098	0x6898	0x7098	0x7898	Home method	INT8	RW	NO
0x6099	0x6899	0x7099	0x7899	Homing speed	-	-	-
0x609A	0x689A	0x709A	0x789A	Homing acceleration	INT32	RW	YES
0x3271	0x3471	0x3671	0x3871	Home switch_Step Servo	INT8	RW	YES
0x2620	0x2820	0x2A20	0x2C20	Home switch_Step	INT32	RW	YES
0x607C	0x687C	0x707C	0x787C	Home offset	INT32	RW	YES

Controlword of homing mode

15 9	8	7	6 5	4	3 0
***	Halt	****	Reserved(0)	Homing operation start	***

***: See object description

Bit	Name	Value	Description
4	Homing operation start	0	Do not start homing procedure
		1	Start or continue homing procedure
8	Halt	0	Enable bit4
		1	Stop axis according to halt option code (0x605D)

Statusword of homing mode

15 14	13	12	11	10	9 0
***	Homing error	Homing attained	****	Target reached	***

**: See object description

Bit13	Bit12	Bit10	definition
0	0	0	Homing procedure is in progress
0	0	1	Homing procedure is interrupted or not started
0	1	0	Homing is attained, but target is not reached
0	1	1	Homing is procedure is completed successfully
1	0	0	Homing error occurred, velocity is not 0
1	0	1	Homing error occurred, velocity is 0
1	1	X	Reserved

3.5.3 Functional description

The homing modes are working on logical values of the limit and homing switches (0x60FDh / 0x68FDh / 0x70FDh / 0x78FDh).

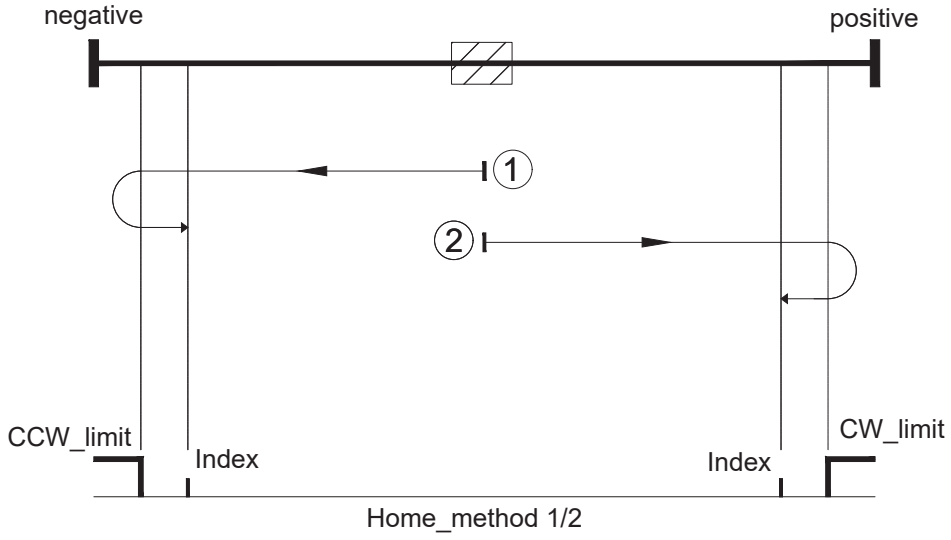
The data of controlling object:

Event		Set parameter
Enable motor power	Shut down	0x6040=06(06h)
	Switch on	0x6040=07(07h)
	Switch on+ enable operation	0x6040=15(0Fh)
Set mode of operation	Homing mode	0x6060=06(06h)
Set home method	Home method=13	0x6098=13(0Dh)
Set motion parameters	Homing acceleration	0x609A=200000(030D40h)
	Velocity for switch	0x6099_sub1=20000(4E20h)
	Velocity for index	0x6099_sub2=2000(07D0h)
	Homing offset	0x607C=100000(0186A0h)
	Homing switch	0x2001=5(05h)
Homing mode	Homing start	0x6040=31(1Fh)
	Homing stop	0x6040=287(011Fh)

NOTE: The table takes axis 1 as an example.

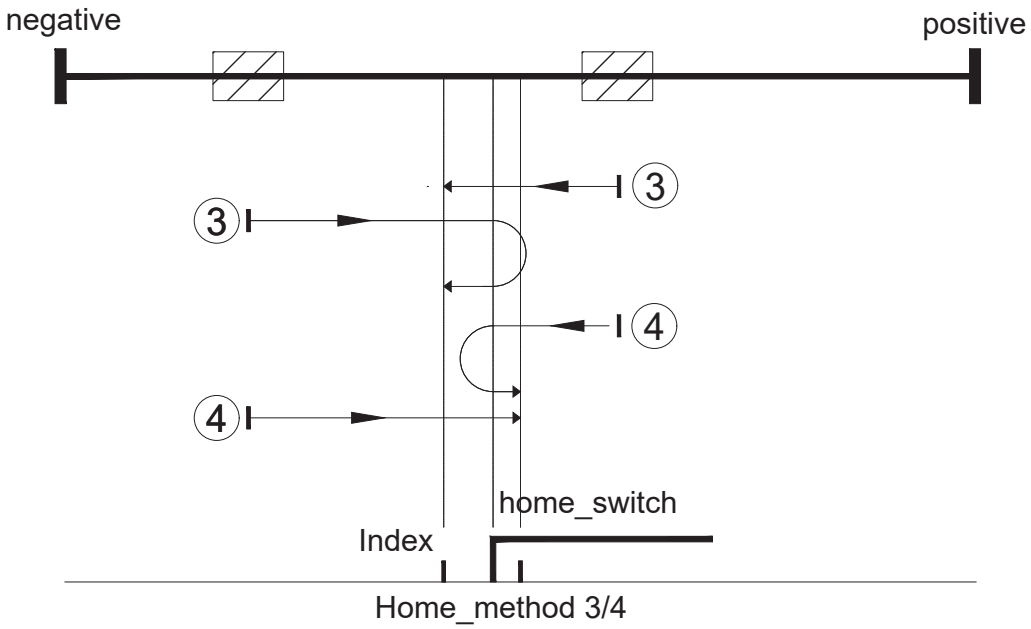
3.5.4 Method 1 and 2

The initial direction of movement shall be leftward (method 1) or rightward (method 2) if the limit switch is inactive. The position of home shall be at the first index pulse to the limit switch becomes inactive.



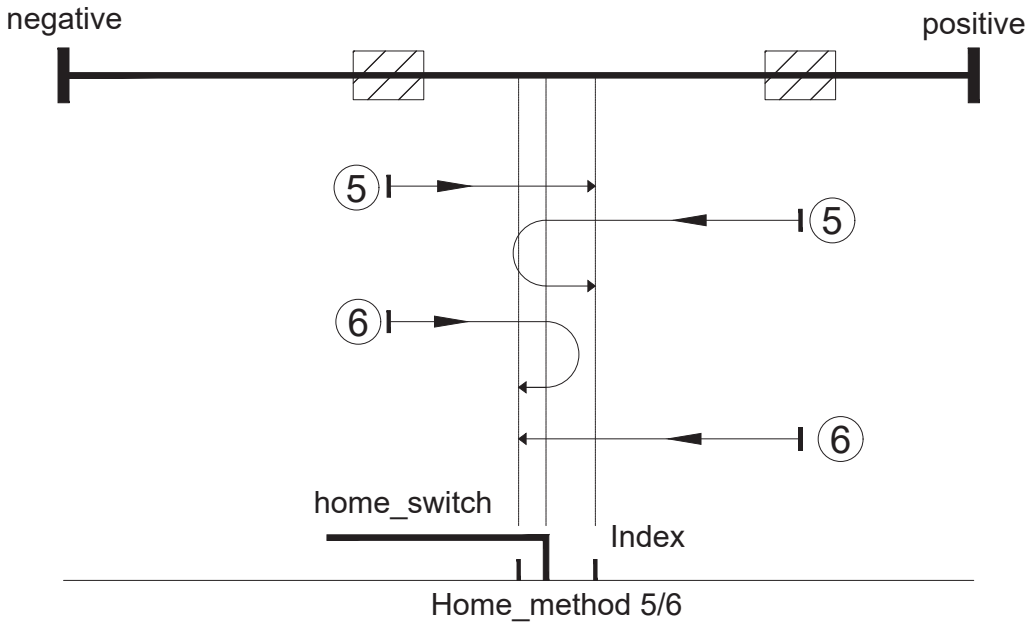
3.5.5 Method 3 and 4

The initial direction of movement shall be dependent on the state of the home switch. The home position shall be at the index pulse to either to the left or the right of the point where the home switch changes state. If the initial position is situated so that the direction of movement shall reverse during homing, the point at which the reversal takes place is anywhere after a change of state of the home switch.



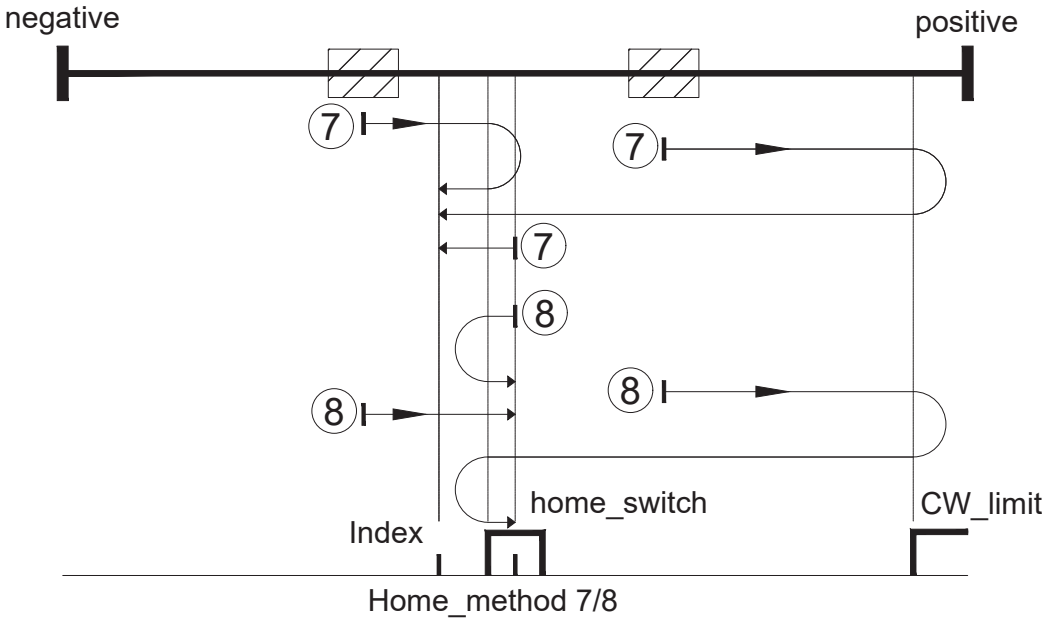
3.5.6 Method 5 and 6

The initial direction of movement shall be dependent on the state of the home switch. The home position shall be at the index pulse to either to the left or the right of the point where the home switch changes state. If the initial position is situated so that the direction of movement shall reverse during homing, the point at which the reversal takes place is anywhere after a change of state of the home switch.



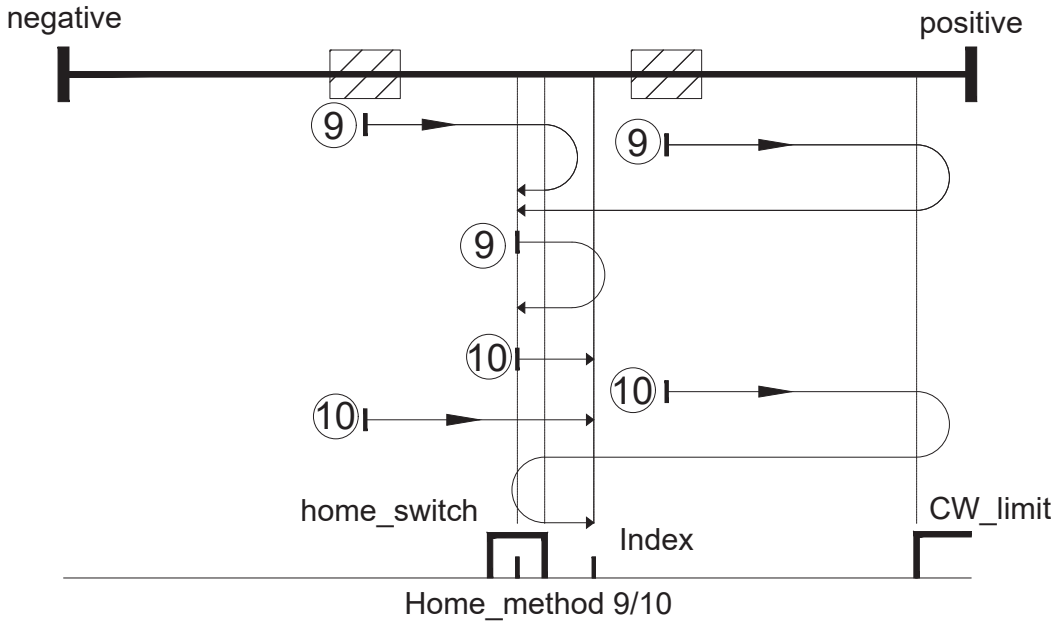
3.5.7 Method 7 and 8

The initial direction of movement shall be rightward if the positive limit switch is inactive. With the method 7, the home position shall be at the first index pulse to the left side of the home switch which the changes status is on falling edge. The home position shall be at the first index pulse to the left side of home switch which the changes status is on rising edge that moved from negative to positive on method 8 .



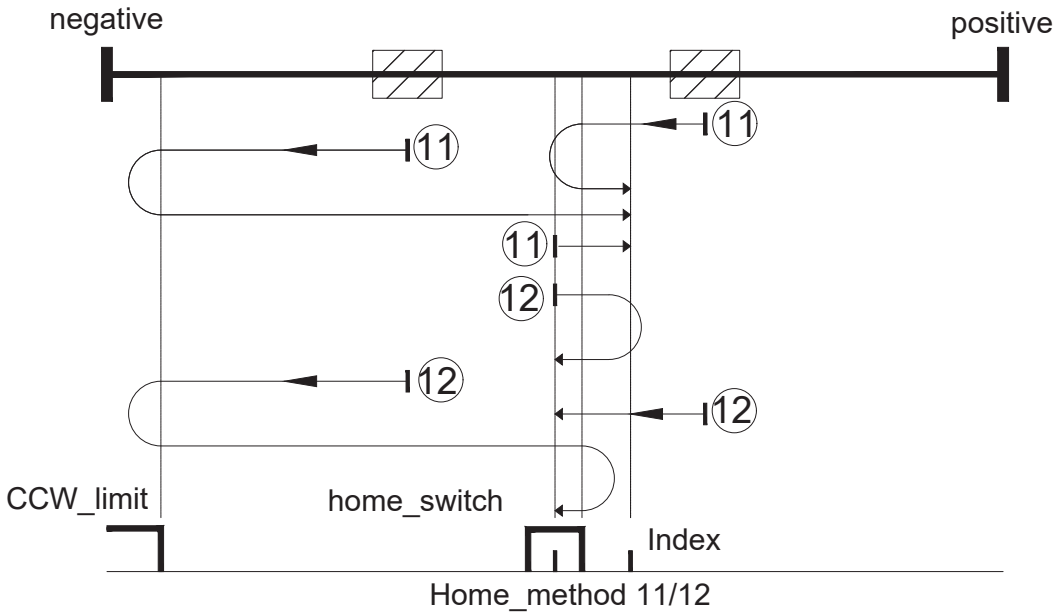
3.5.8 Method 9 and 10

The initial direction of movement shall be rightward if the positive limit switch is inactive. With the method 9, the home position shall be at the first index pulse to the right side of the home switch which the changes status is on rising edge that moved from positive to negative. The home position shall be at the first index pulse to the right side of home switch which the changes status is on falling edge with method 10.



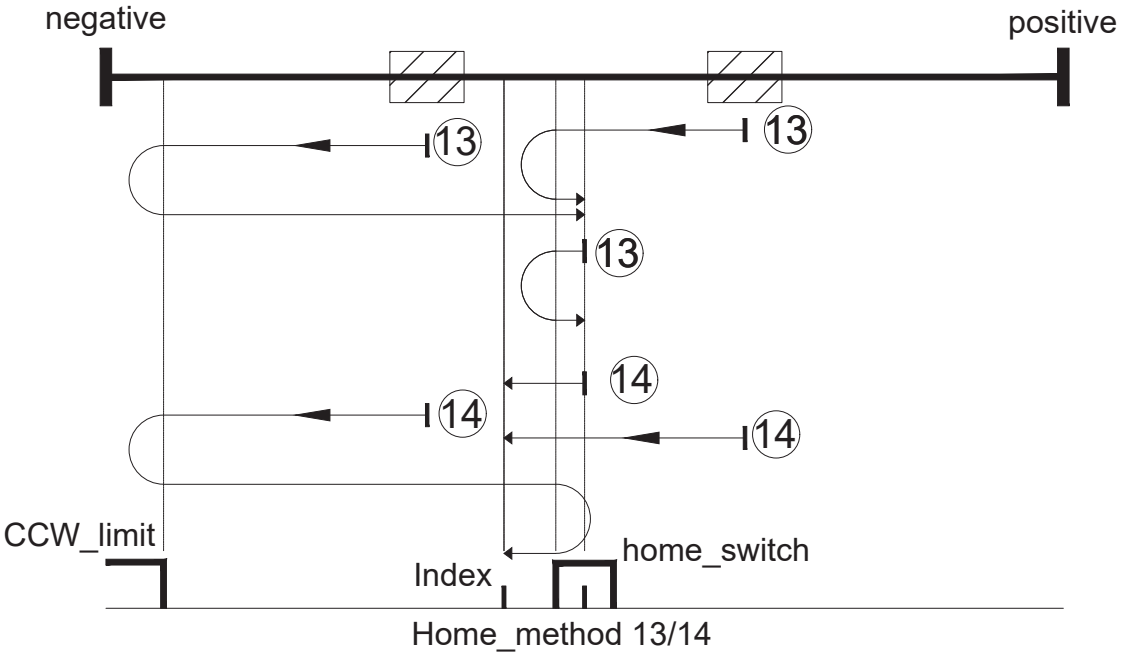
3.5.9 Method 11 and 12

The initial direction of movement shall be leftward if the negative limit switch is inactive. With the method 11, the home position shall be at the first index pulse to the right side of the home switch which the changes status is on falling edge. The home position shall be at the first index pulse on the right side of home switch which the changes status is on rising edge with method 12.



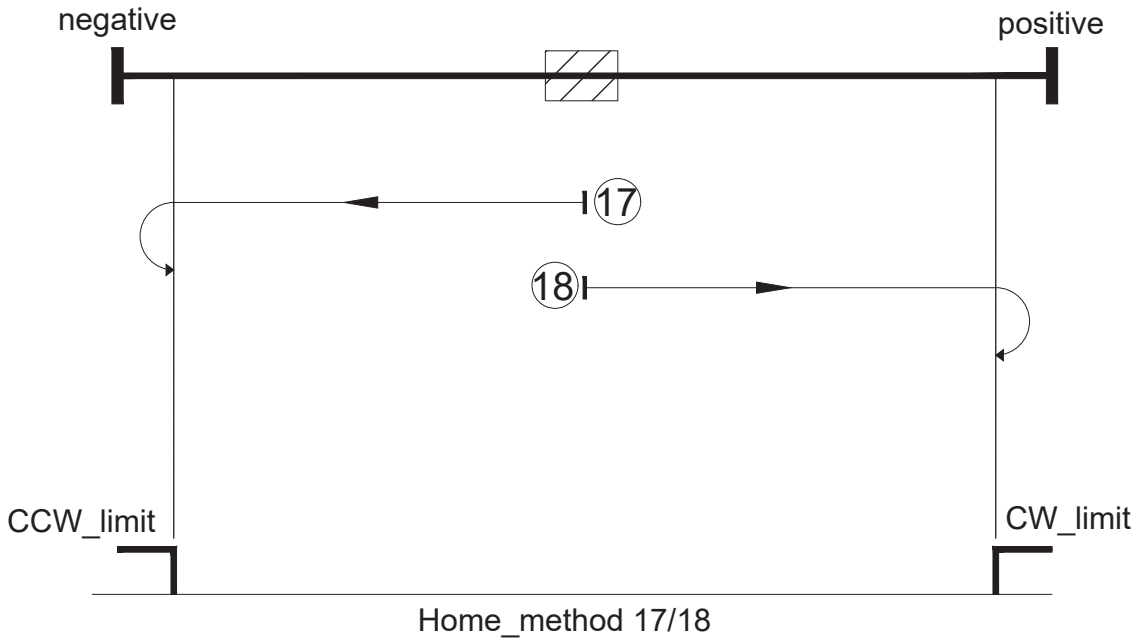
3.5.10 Method 13 and 14

The initial direction of movement shall be leftward if the negative limit switch is inactive. With the method 13, the home position shall be at the first index pulse to the left side of the home switch which the changes status is on falling edge. The home position shall be at the first index pulse to the left side of home switch which the changes status is on rising edge that moved from negative to positive on method 14.



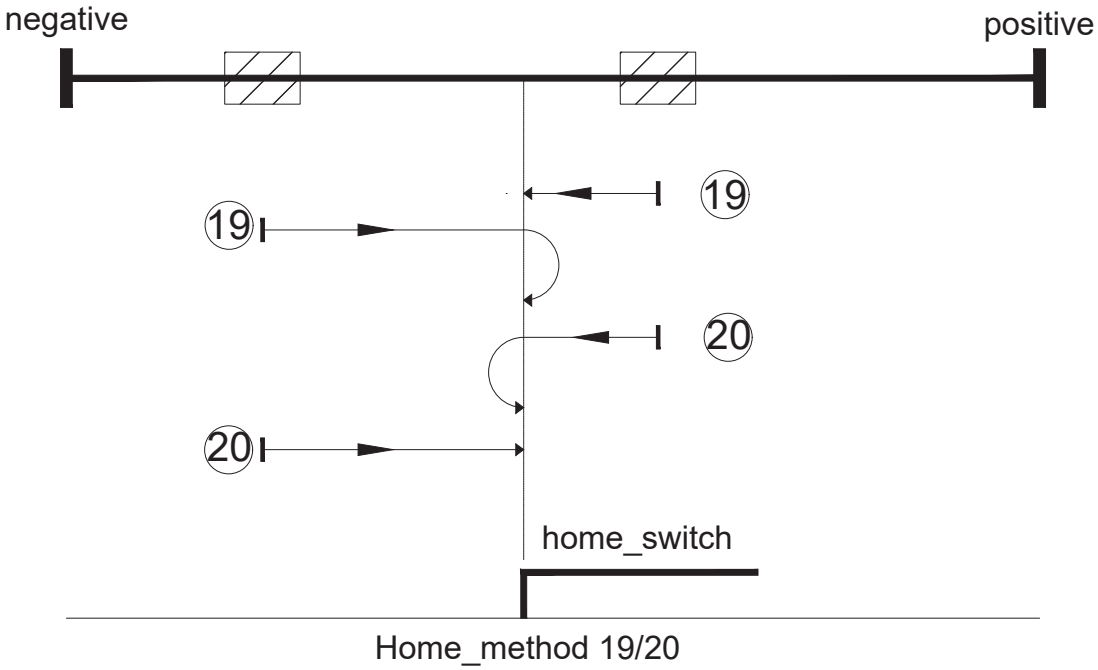
3.5.11 Method 17 and 18

The method17 and 18 are similar to methods 1 and 2 except that the home position is not dependent on the index pulse but only dependent on the relevant home or limit switch transitions.



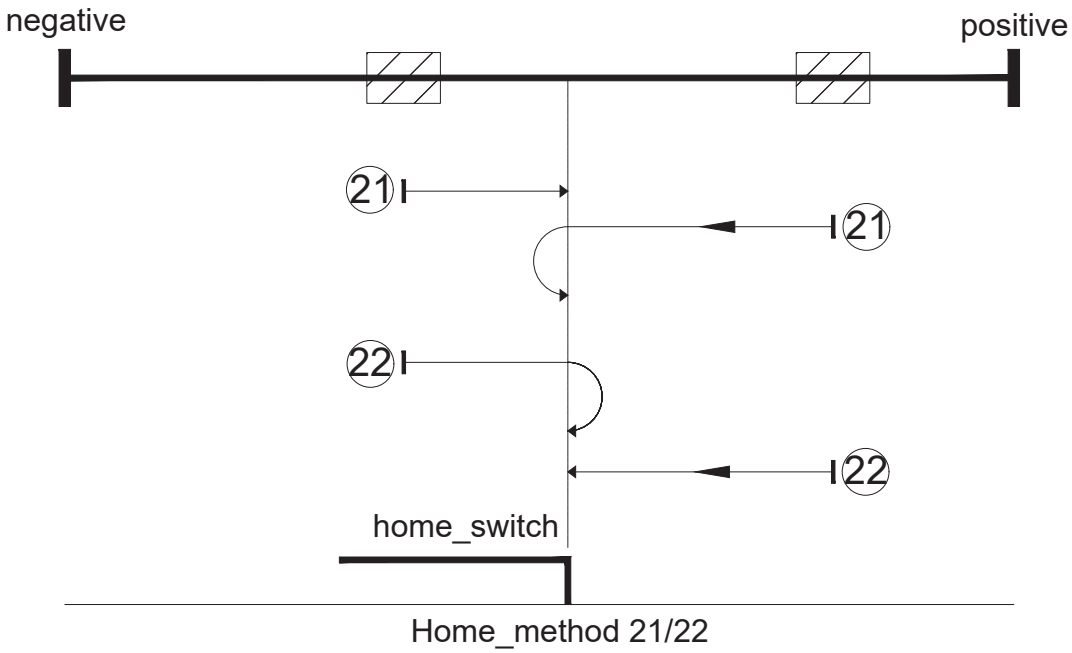
3.5.12 Method 19 and 20

The method 19 and 20 are similar to methods 3 and 4 except that the home position is not dependent on the index pulse but only dependent on the relevant home or limit switch transitions.



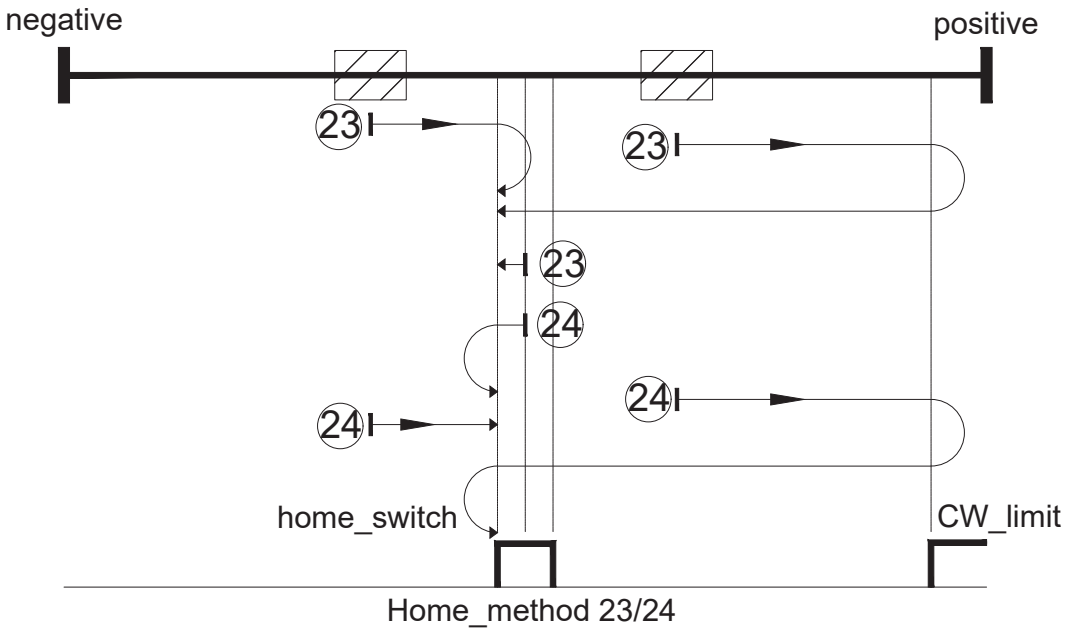
3.5.13 Method 21 and 22

The method 21 and 22 are similar to methods 5 and 6 except that the home position is not dependent on the index pulse but only dependent on the relevant home or limit switch transitions.



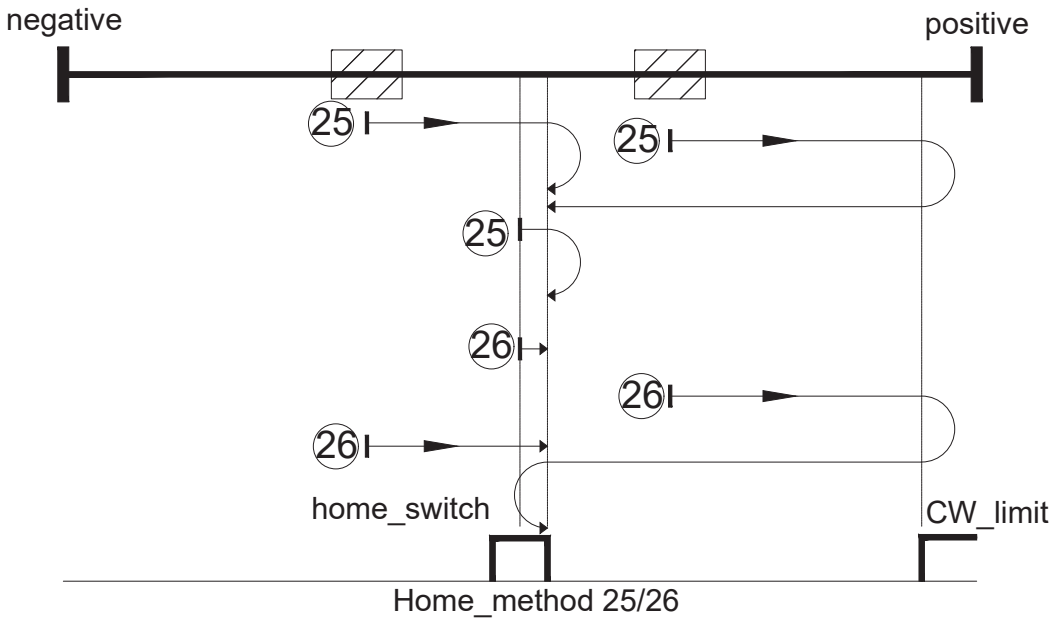
3.5.14 Method 23 and 24

The method 23 and 24 are similar to methods 7 and 8 except that the home position is not dependent on the index pulse but only dependent on the relevant home or limit switch transitions.



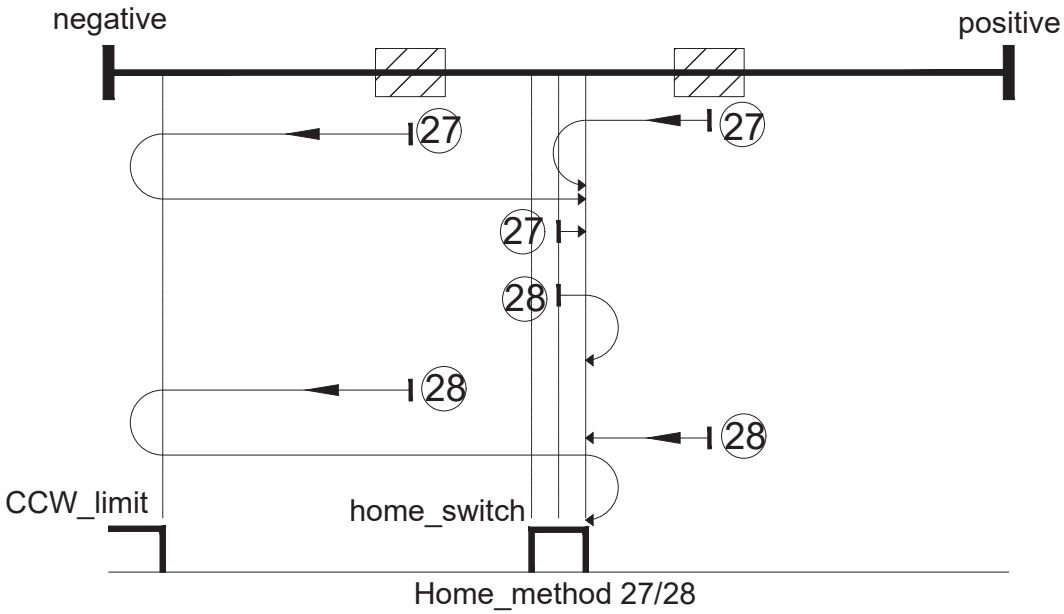
3.5.15 Method 25 and 26

The method 25 and 26 are similar to methods 9 and 10 except that the home position is not dependent on the index pulse but only dependent on the relevant home or limit switch transitions.



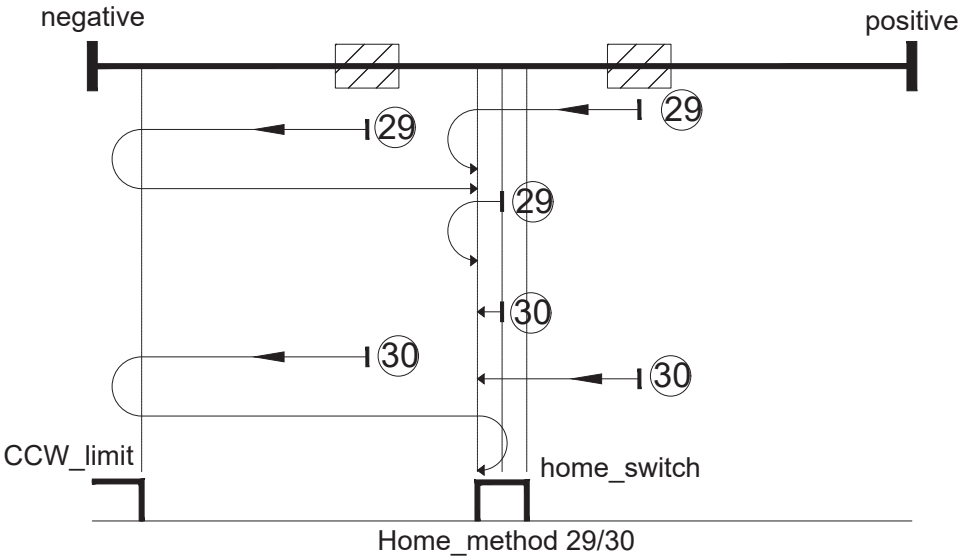
3.5.16 Method 27 and 28

The method 27 and 28 are similar to methods 11 and 12 except that the home position is not dependent on the index pulse but only dependent on the relevant home or limit switch transitions.



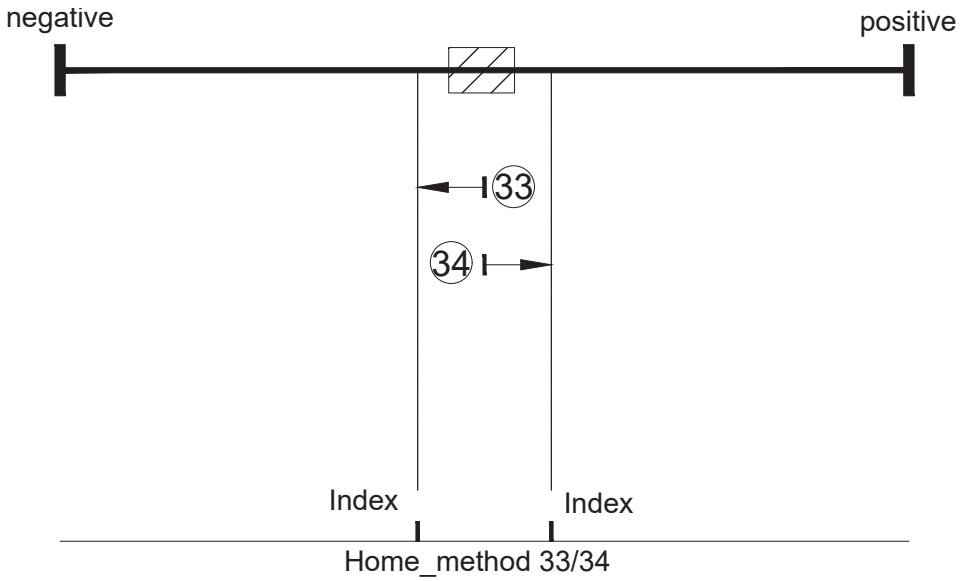
3.5.17 Method 29 and 30

The method 29 and 30 are similar to methods 13 and 14 except that the home position is not dependent on the index pulse but only dependent on the relevant home or limit switch transitions.



3.5.18 Method 33 and 34

Using these methods, the direction of homing is negative or positive respectively. The home position shall be at the index pulse found in the selected direction



3.5.19 Method 35

In this method, the current position shall be taken to be the home position. This method does not require the drive device to be in operational enabled state.

3.5.20 Method 37

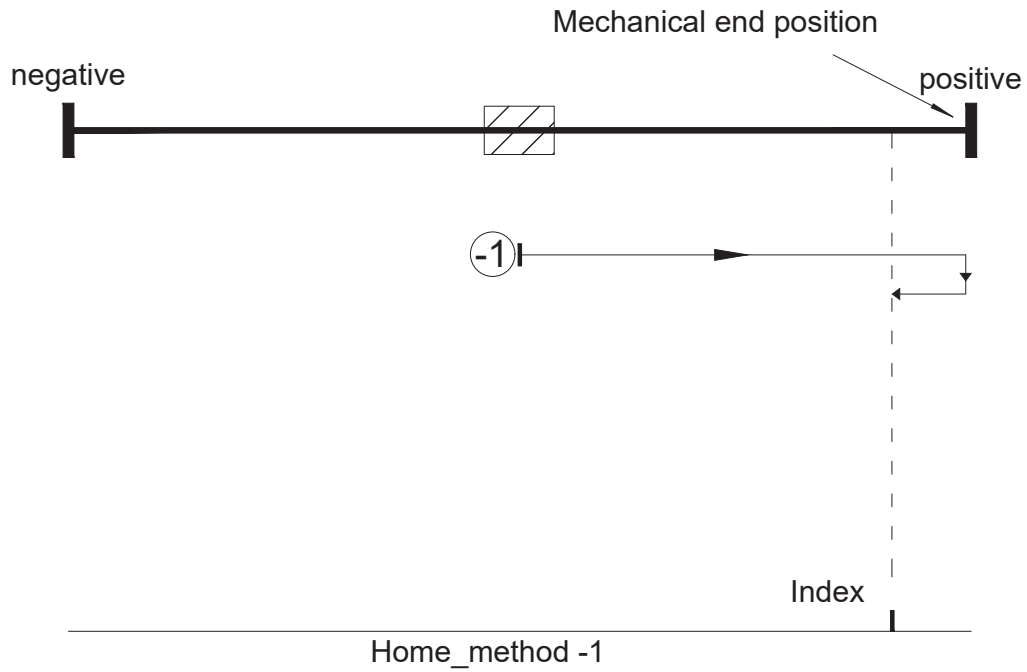
In this method, the position sensor information (converted in user-defined position units) shall be taken to be the home position. This method does not require the drive device to be in operation enabled state. At the home position (i.e. after the homing process) the position actual value (6064h) is calculated as follows:

Position actual value (6064h) = Home offset ($607C_h$)

In addition, we provide the hard stop homing without limit switch.

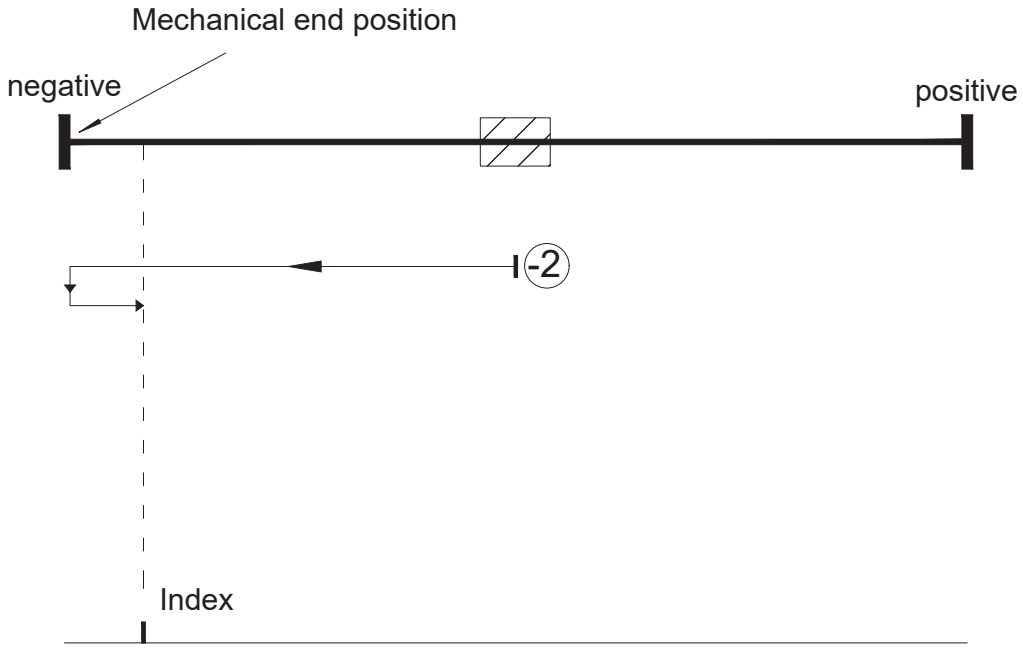
3.5.21 Method -1

In this method, the initial direction of movement shall be rightward and reach the mechanical end position. Then the motor will return to the first index pulse.



3.5.22 Method -2

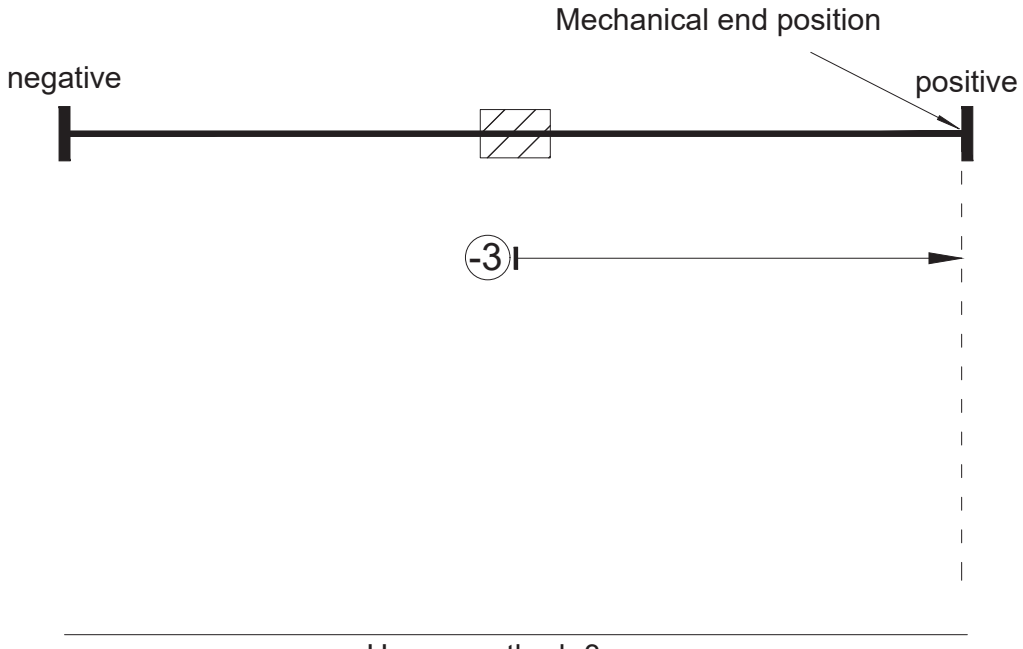
In this method, the initial direction of movement shall be leftward and reach the mechanical end position. Then the motor will return to the first index pulse.



Home method -2

3.5.23 Method -3

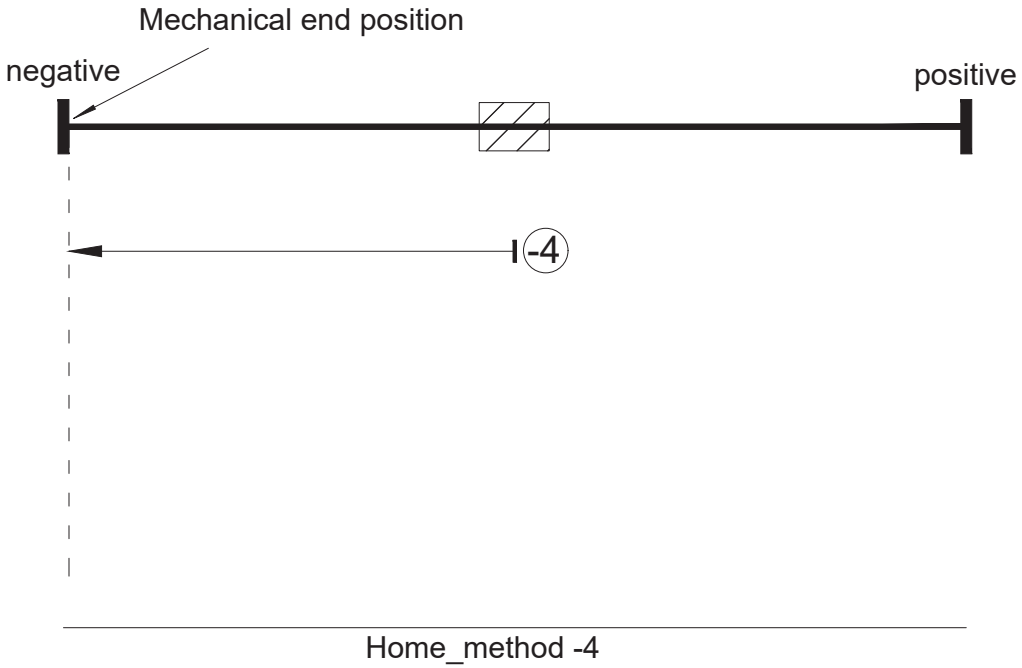
In this method, the initial direction of movement shall be rightward and reach the mechanical end position.



Home_method -3

3.5.24 Method -4

In this method, the initial direction of movement shall be leftward and reach the mechanical end position.

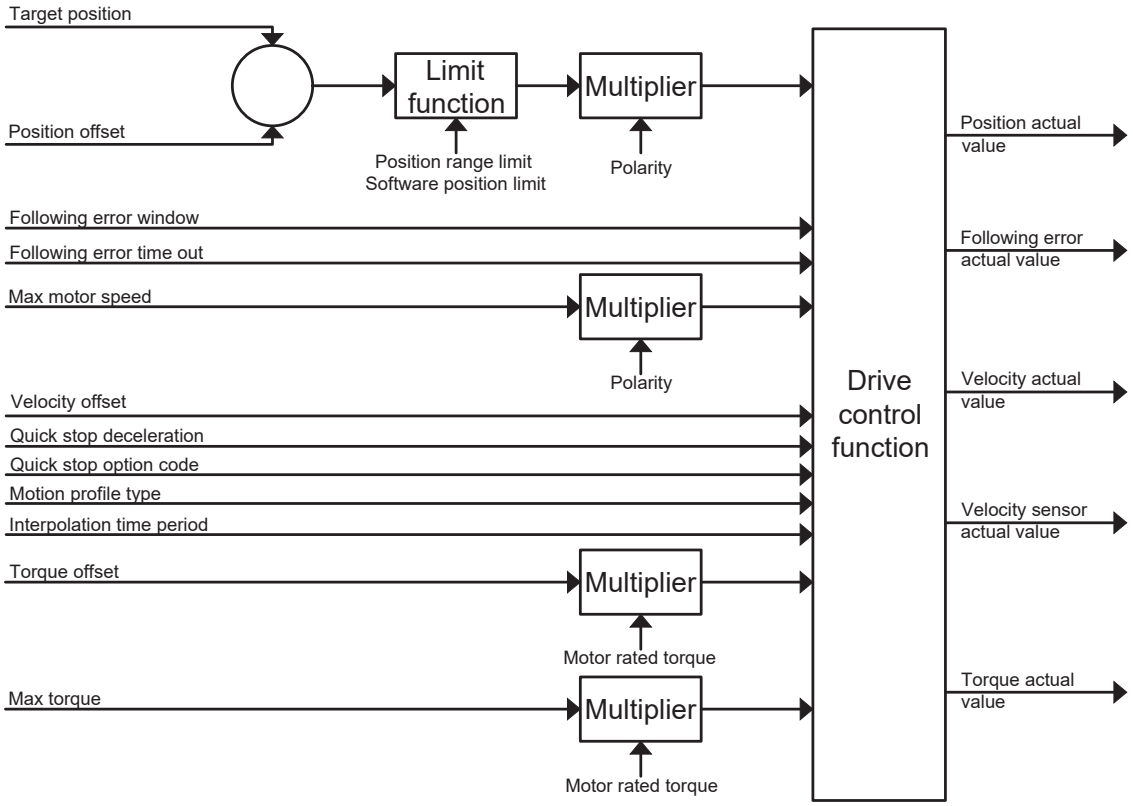


Home_method -4

3.6 Cyclic synchronous position mode

3.6.1 General information

With this mode, the trajectory generator is located in the control device, not in the drive device. In cyclic synchronous manner, it provides a target position to the drive device, which performs position control, velocity control and torque control.



3.6.2 Main controlling object

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT	RO	YES
0x6060	0x6860	0x7060	0x7860	Mode of operation	INT	WO	YES
0x607A	0x687A	0x707A	0x787A	Target position	INT	WO	YES
0x60B0	0x68B0	0x70B0	0x78B0	Position offset	DINT	RW	YES
0x6085	0x6885	0x7085	0x7885	Quick stop deceleration	UDINT	RW	YES
0x605A	0x685A	0x705A	0x785A	Quick stop option code	INT	RW	YES
0x6064	0x6864	0x7064	0x7864	Position actual value	DINT	RO	YES
0x60F4	0x68F4	0x70F4	0x78F4	Following error actual value	DINT	RO	YES
0x606C	0x686C	0x706C	0x786C	Velocity actual value	DINT	RO	YES
0x6065	0x6865	0x7065	0x7865	Following error window	UDINT	RW	NO

Controlword

The cyclic synchronous position mode uses no mode-specific bits of the controlword .

Statusword

15 14	13	12	11	10	9 0
***	Following error	Drive follows the command value	****	Status toggle	***

***: See object description

Bit	Value	Definition
10	0	Reserved
	1	Reserved
12	0	Target position ignored
	1	Target position used as input to position control loop
13	0	No following error
	1	Following error

In the statusword Bit 12 is mandatory. The Bit 13 is recommended.

The Bit 10 is used in Profile position mode as "Target reached" information. In csp the new target position is given cyclically be the control device. This bit is used as Status Toggle information to indicate if the device provides updated input data. The bit shall be toggled with every update of the input process data.

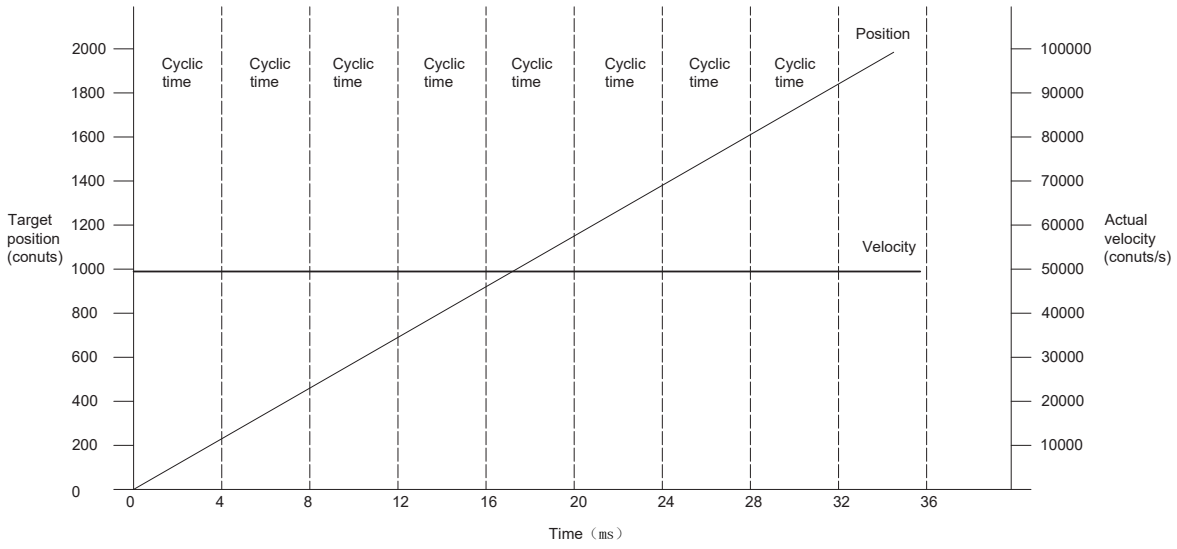
The Bite 12 drive follows the command value shall be zero if the drive does not follow the target value(position,velocity or torque) because of local reasons(internal set-point settings).E.g. if a local Input is configured to a halt function or a safety function prevents the drive in operational to follow the target set point. The control device shal evaluate the bit. The Bit 12 shal be set if the drive is in state operation enabled and follows the target and set-point values of the control device. In all other cases it shall be zero. If the bit is not supported it shall be fix set to 1 in the statusword.

3.6.3 Functional description

With this mode, the control device should provide the target position with every cyclic communication.

The velocity, acceleration, deceleration of motor is based on cyclic time and tartget position.

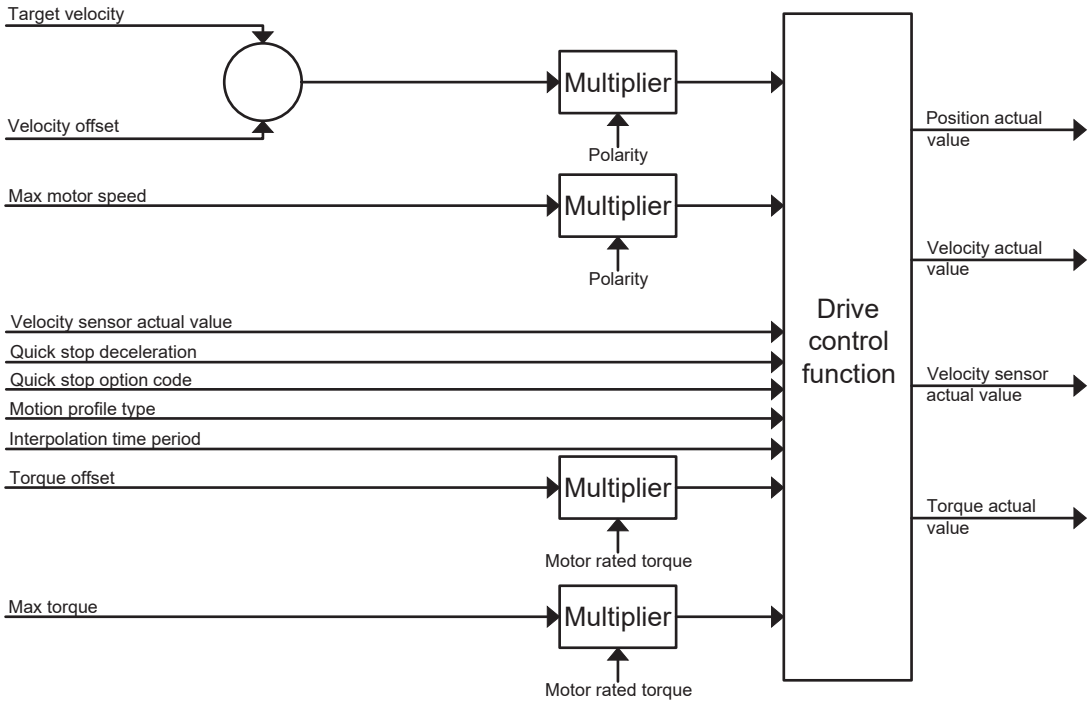
Note: Before the drvie mode has changed to CSP and operation mode, the control device should update the target position to the same as the position actual valul of drive. if it is not equal to position actual value of drive, the drive will move to new position when operation mode activated.



3.7 Cyclic synchronous velocity mode

3.7.1 General information

With this mode, the trajectory generator is located in the control device, not in the drive device. In cyclic synchronous manner, it provides a target velocity to the drive device, which performs velocity control and torque control.



3.7.2 Main controlling object

Index				Name	Type	Access	Mapping
0x6040	0x6840	0x7040	0x7840	Controlword	UINT	WO	YES
0x6041	0x6841	0x7041	0x7841	Statusword	UINT	RO	YES
0x6060	0x6860	0x7060	0x7860	Mode of operation	INT	WO	YES
0x60FF	0x68FF	0x70FF	0x78FF	Target velocity	INT	WO	YES
0x60B1	0x68B1	0x70B1	0x78B1	Velocity offset	DINT	RW	YES
0x6085	0x6885	0x7085	0x7885	Quick stop deceleration	UDINT	RW	NO
0x60FF	0x68FF	0x70FF	0x78FF	Target velocity	DINT	RW	YES

Controlword

The cyclic synchronous position mode uses no mode-specific bits of the controlword .

Statusword

15	14	13	12	11	10	9	0
***		Reserved	Drive follows the command value	****	Reserved	***	

***: See object description

Bit	Value	definition
10	0	Reserved
	1	Reserved
12	0	Target velocity ignored
	1	Target velocity used as input to velocity control loop
13	0	Reserved
	1	Reserved

In the statusword Bit 12 is mandatory.

In CSV mode Bit 10 is used as Status Toggle information to indicate if the device provides updated input data. The bit shall be toggled with every update of the input process data.

The Bite 12 drive follows the command value shall be zero if the drive does not follow the target value(position,velocity or torque) because of local reasons(internal set-point settings).E.g. if a local Input is configured to a halt function or a safety function prevents the drive in operational to follow the target set point. The control device shal evaluate the bit. The Bit 12 shal be set if the drvie is in state operation enabled and follows the target and set-point values of the control device. In all other cases it shall be zero. If the bit is not supported it shall be fix set to 1 in the statusword.

3.7.3 Functional description

With CSV mode, drive can change speed with every cyclic time. when drive has been to operation mode, the motor speed is located with target velocity (0x60FF/0x68FF/0x70FF/0x78FF) object, change target velocity means change the current velocity on one cyclic time.

The acceleration and deceleration is based on cyclic time and target velocity.

3.8 Touch probe

3.8.1 General information

Touch probe function is used to latch the feedback position by capture the rasing or falling edge of input sensor and index. With touch probe , assign X7 or X8 to touch probe function is essential by the software of MOONS' drive.

3.8.2 Main control object

Index				Name	Type	Access	Mapping
0x60B8	0x68B8	0x70B8	0x78B8	Touch probe function	INT	RW	YES
0x60B9	0x68B9	0x70B9	0x78B9	Touch probe status	UINT	RO	YES
0x60BA	0x68BA	0x70BA	0x78BA	Touch probe pos1 pos value	DINT	RO	YES
0x60BB	0x68BB	0x70BB	0x78BB	Touch probe pos1 neg value	DINT	RO	YES
0x60BC	0x68BC	0x70BC	0x78BC	Touch probe pos2 pos value	DINT	RO	YES
0x60BD	0x68BD	0x70BD	0x78BD	Touch probe pos2 neg value	DINT	RO	YES

3.8.3 Functional description

0x60B8 / 0x68B8 / 0x70B8 / 0x78B8 Touch probe function

This object indicate the configured function of touch probe.

Bit	Value	Definition
0	0	Swith off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continous
3,2	00	Trigger with touch probe 1 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index01
	11	Reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negtive edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6,7	-	Reserved
8	0	Swith off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	Continous
11,10	00	Trigger with touch probe 2 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index02
	11	Reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negtive edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14,15	-	Reserved

0x60B9 / 0x68B9 / 0x70B9 / 0x78B9 Touch probe function

This obejct provide the status of touch probe.

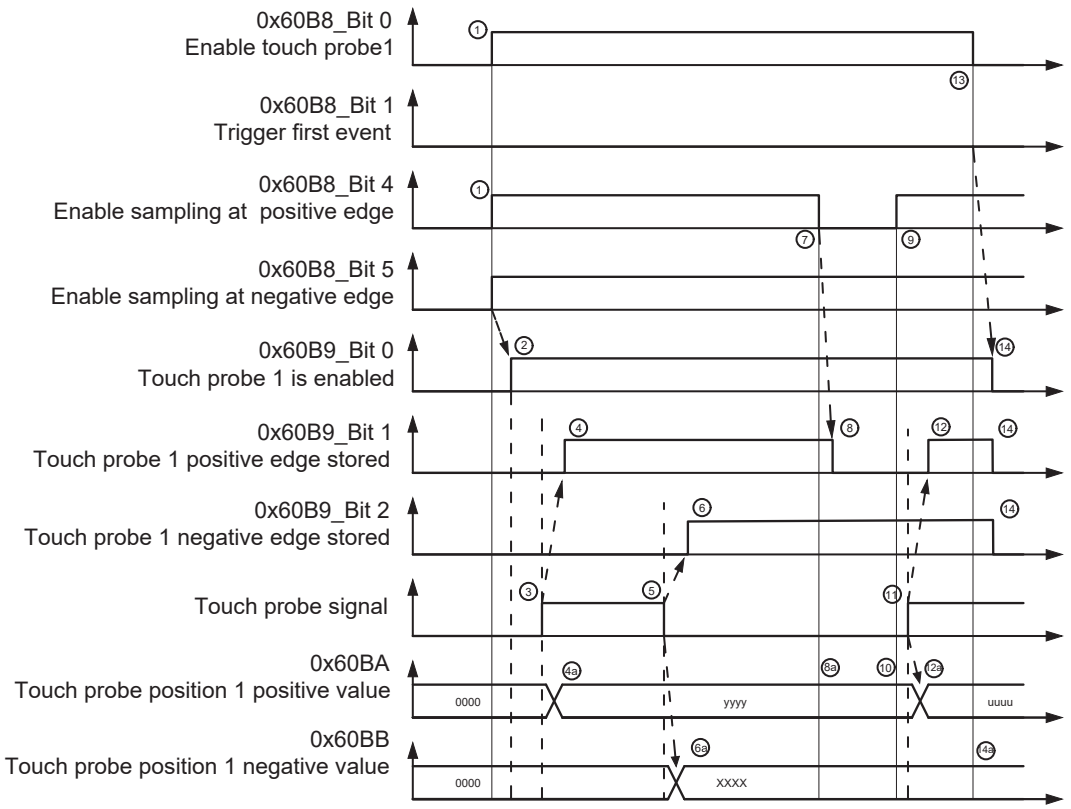
Bit	Value	Definition
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3...7	-	Reserved
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe 2 negative edge position stored
11...15	-	Reserved

0x60BA / 0x68BA / 0x70BA / 0x78BA ~ 0x60BD / 0x68BD / 0x70BD / 0x78BD Touch probe position value

This object shall provide the captual position value of touch probe.

3.8.4 Timing diagrame

The figure in below shows a timing diagram for an example touch probe configuration and the corresponding behavior. And the table explains the timing diagram.



NOTE: The figure takes axis 1 as an example.

Number	Touch probe behavior	
（1）	60B8_bit0 = 1 60B8_bit1,4,5	Enable touch probe 1 Configure and enable touch probe 1 positive and negative edge
（2）	→60B9_bit 0 = 1	Status"Touch probe 1 enabled" is set
（3）	External touch probe signal has positive edge	
（4）	→60B9_bit 1 = 1	Status"Touch probe 1 positive edge stored" is set
（4a）	→60BA	Touch probe position 1 positive value is stored
（5）	External touch probe signal has negative edge	
（6）	→60B9_bit 2 = 1	Status"Touch probe 1 negative edge stored" is set
（6a）	60BB	Touch probe positione 1 negative value is stored
（7）	60B8_bit 4 = 0	Sample positive edge is disabled
（8）	→60B9_bit 0 = 0	Status"Touch probe 1 positive edge stored" is reset
（8a）	→60BA	Touch probe position 1 positive value is not changed
（9）	60B8_bit 4 = 1	Sample positive edge is enabled
（10）	→60BA	Touch probe position 1 positive value is not changed
（11）	External touch probe signal has positive edge	
（12）	→ 60B9_bit 1 = 1	Status “Touch probe 1 positve edge stored” is set
（12a）	→ 60BA	Touch probe position 1 positive value is stored
（13）	60B8_bit 0 = 0	Touch probe 1 is disabled
（14）	→ 60B9_bit 0, 1, 2 = 0	Status bits are reset
（14a）	→ 60BA, 60BB	Touch probe position 1 positive/negative value are not changed

NOTE: The table takes axis 1 as an example.

4 Object dictionary

With CoE protocol, MOONS' Stepper and Step-Servo EtherCAT drives has follow with CANopen specifiction, the object dictionay is same as CANopen drive. the table obtain the object area of EtherCAT drives in below.

4.1 CoE object dictionary description

Index	Description
0x0000~0x0FFF	Data type area
0x1000~0x1FFF	CoE communication area
0x2000~0x5FFF	Manufacturer specific area
0x6000~0x9FFF	Profile area
0xA000~0xFFFF	Reserved

4.2 Communication profile for Dual axis

4.2.1 CoE(1000h) Profile

	Index	Sub	Name	Access	Type	Mapping
CoE(1000h)	0x1000	-	Device type	RO	UDINT	NO
	0x1001	-	Error register	RO	USINT	NO
	0x1008	-	Device name	RO	STRING(20)	NO
	0x1009	-	Manufacturer hardware version	RO	STRING(4)	NO
	0x100A	-	Manufacturer software version	RO	STRING(4)	NO
	0x1010	-	Store parameters	-	-	-
		1	Store all parameters	RW	UDINT	NO
	0x1011	-	Restore default parameters	-	-	-
		1	Restore default parameters	RW	UDINT	NO
	0x1018	-	Identity object	-	-	-
		1	Vendor ID	RO	UDINT	NO
		2	Product code	RO	UDINT	NO
		3	Revision	RO	UDINT	NO
		4	Serial number	RO	UDINT	NO
	0x10F1	-	Error settings	-	-	-
		1	Local error reaction	RW	UDINT	NO
		2	Sync error counter limit	RW	UINT	NO

	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
CoE	0x1600~1603	0x1610~1613	8	RPDO mapping parameter 1~4	-	-	-
			1	Mapping entry 1	RW	UDINT	NO
			2	Mapping entry 2	RW	UDINT	NO
			...	...	RW	UDINT	NO
			12	Mapping entry 12	RW	UDINT	NO
	0x1A00~1A03	0x1A10~1A13	-	TPDO mapping parameter1~4	-	-	-
			1	Mapping entry 1	RW	UDINT	NO
			2	Mapping entry 2	RW	UDINT	NO
			...	...	...	...	-
			12	Mapping entry 12	RW	UDINT	NO

	Index	Sub	Name	Access	Type	Mapping
CoE(1000h)	0x1C00	-	SYNC manager type	-	-	-
		1	SM0 communication type	RO	USINT	NO
		2	SM1 communication type	RO	USINT	NO
		3	SM2 communication type	RO	USINT	NO
		4	SM3 communication type	RO	USINT	NO
	0x1C12~1C13	-	RxPDO~TxPDO assign	-	-	-
		1	RxPDO~TxPDO 1 mapping object	RW	UINT	NO
		2	RxPDO~TxPDO 1 mapping object	RW	UINT	NO
		3	RxPDO~TxPDO 1 mapping object	RW	UINT	NO
		4	RxPDO~TxPDO 1 mapping object	RW	UINT	NO
	0x1C32~1C33	-	SM output~input parameter	-	-	-
		1	Synchronization type	RW	UINT	NO
		2	Cycle time	RO	UDINT	NO
		3	Shift time	RW	UDINT	NO
		4	Synchronization types supported	RO	UINT	NO
		5	Minimum cycle time	RO	UDINT	NO
		6	Calc and copy time	RO	UDINT	NO
		8	Get cycle time	RW	UINT	NO
		9	Delay time	RO	UDINT	NO
		10	Sync0 cycle time	RW	UDINT	NO
		11	SYNC-Event missed	RO	UINT	NO
		12	Cycle time too small	RO	UINT	NO
		32	Sync error	RO	BOOL	NO

0x1000 Device type

Contains information about the device type. The object at index 1000h describes the type of device and its functionality. It is composed of a 16-bit field which describes the device profile that is used and a second 16-bit field which gives additional information about optional functionality of the device. The Additional Information parameter is device profile specific. Its specification does not fall within the scope of this document, it is defined in the appropriate device profile. The value 0000h indicates a device that does not follow a standardized device profile.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1000	-	Device type	UDINT32	RO	NO	-

Bit 0-15: Device profile number

Bit 16-31: Additional information

0x1001 Error register

This object is an error register for the device. The device can map internal errors in this byte. This entry is mandatory for all devices. It is a part of an Emergency object.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1001	-	Error register	USINT8	RO	NO	-

Bit 0: generic error

Bit 1: current

Bit 2: voltage

Bit 3: temperature

Bit 4: communication error (overrun, error state)

Bit 5-7: Reserved (always 0)

0x1008 Device name

Contains the manufacturer device name.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1008	-	Manufacturer device name	STRING(20)	CONST	NO	-

Name of the manufacturer as string.

0x1009 Hardware version

Contains the hardware version description.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1009	-	Hardware version	STRING(4)	CONST	NO	-

0x100A Software version

Contains the software version description.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x100A	-	Software version	STRING(4)	CONST	NO	-

0x1010 Store parameters

This object supports the saving of parameters in non-volatile memory. By read access the device provides information about its saving capabilities. Several parameter groups are distinguished:

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1010	0	Number of sub-index	USINT8	RO	NO	1
	1	Store parameters	UDINT32	RW	NO	0

In order to avoid storage of parameters by mistake, storage is only executed when a specific signature is written to the appropriate Sub-Index 1. The signature is “save”.

	MSB			LSB
Signature ISO	e	v	a	s
8859("ASCII")hex	65h	76h	61h	73h

Storage write access signature

0x1011 Restore default parameters

With this object the default values of parameters according to the communication or device profile are restored.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1011	0	Number of sub-index	USINT8	RO	NO	1
	1	Restore parameters	UDINT32	RW	NO	0

In order to avoid storage of parameters by mistake, storage is only executed when a specific signature is written to the appropriate Sub-Index 1. The signature is "load".

	MSB			LSB
Signature ISO	e	v	a	s
8859("ASCII")hex	64h	61h	6Fh	6Ch

Storage write access signature

0x1018 Identity object

The object at index 1018h contains general information about the device.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1018	0	Number of sub-index	USINT8	RO	NO	4
	1	Vendor-ID	UDINT32	RO	NO	-
	2	Product code	UIDINT32	RO	NO	-
	3	Revision number	UDINT32	RO	NO	-
	4	Serial number	UDINT32	RO	NO	-

0x10F1 Error settings

Reserved.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x10F1	0	Number of sub-index	USINT8	RO	NO	4
	1	Local error reaction	UDINT32	RW	NO	1
	2	SYNC error counter limit	UIDINT32	RW	NO	4

0x1600~1603 / 0x1610~1613 Axis Receive PDO mapping parameter

Contains the mapping for the PDOs the device is able to receive.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x1600-1603	0x1610-1613	0	Number of sub-index	USINT8	RW	NO	4
		1	Mapping entry 1	UDINT32	RW	NO	-
		2	Mapping entry 2	UIDINT32	RW	NO	-
		3	Mapping entry 3	UDINT32	RW	NO	-
		4	Mapping entry 4	UDINT32	RW	NO	-
		5	Mapping entry 5	UDINT32	RW	NO	-
		6	Mapping entry 6	UDINT32	RW	NO	-
		7	Mapping entry 7	UDINT32	RW	NO	-
		8	Mapping entry 8	UDINT32	RW	NO	-
		9	Mapping entry 9	UDINT32	RW	NO	-
		10	Mapping entry 10	UDINT32	RW	NO	-
		11	Mapping entry 11	UDINT32	RW	NO	-
		12	Mapping entry 12	UDINT32	RW	NO	-

0x1A00~1A03 / 0x1A10~1A13 Transmit PDO mapping parameter

Contains the mapping for the PDOs the device is able to transmit.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x1A00-1A03	0x1A10-1A13	0	Number of sub-index	USINT8	RW	NO	12
		1	Mapping entry 1	UDINT32	RW	NO	-
		2	Mapping entry 2	UIDINT32	RW	NO	-
		3	Mapping entry 3	UDINT32	RW	NO	-
		4	Mapping entry 4	UDINT32	RW	NO	-
		5	Mapping entry 5	UDINT32	RW	NO	-
		6	Mapping entry 6	UDINT32	RW	NO	-
		7	Mapping entry 7	UDINT32	RW	NO	-
		8	Mapping entry 8	UDINT32	RW	NO	-
		9	Mapping entry 9	UDINT32	RW	NO	-
		10	Mapping entry 10	UDINT32	RW	NO	-
		11	Mapping entry 11	UDINT32	RW	NO	-
		12	Mapping entry 12	UDINT32	RW	NO	-

0x1C00 Sync manager type

The sync manager communication type set the communication type of each SM manager. The type of communication that:

1. Mailbox reception
2. Mailbox sending
3. RxPDO
4. TxPDO

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C00	0	Number of sub-index	USINT8	RW	NO	4
	1	SM0 communication type	UDINT32	RW	NO	1
	2	SM1 communication type	UIDINT32	RW	NO	2
	3	SM2 communication type	UDINT32	RW	NO	3
	4	SM3 communicaiton type	UDINT32	RW	NO	4

0x1C12 RxPDO assign object

The sync manager of RxPDO allocation, sub-indx1-4 set to the index of mapping.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C12	0	Number of sub-index	USINT8	RW	NO	1
	1	RxPDO1 mapping object	UDINT32	RW	NO	0x1600
	2	RxPDO2 mapping object	UIDINT32	RW	NO	-
	3	RxPDO3 mapping object	UDINT32	RW	NO	-
	4	RxPDO4 mapping object	UDINT32	RW	NO	-

0x1C13 TxPDO assign object

The sync manager of TxPDO allocation, sub-indx1-4 set to the index of mapping.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C13	0	Number of sub-index	USINT8	RW	NO	1
	1	TxPDO1 mapping object	UDINT32	RW	NO	0x1A00
	2	TxPDO2 mapping object	UIDINT32	RW	NO	-
	3	TxPDO3 mapping object	UDINT32	RW	NO	-
	4	TxPDO4 mapping object	UDINT32	RW	NO	-

0x1C32 SM output parameter

The SYNC manager parameter.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C32	0	Number of sub-index	USINT8	RO	NO	32
	1	Synchronization type	UINT16	RW	NO	2
	2	Cycle time	UDINT32	RO	NO	0
	3	Shift time	UDINT32	RW	NO	0
	4	Synchronization types supported	UDINT32	RO	NO	0x401F
	5	Minimum cycle time	UDINT32	RO	NO	0x7A120
	6	Calc and copy time	UINT16	RW	NO	0
	8	Get cycle time	UINT	RW	NO	0
	9	Delay time	UDINT	RO	NO	0
	10	Sync0 cycle time	UDINT	RW	NO	0x3D0900
	11	SM-event missed	UINT	RO	NO	0
	12	Cycle time too small	UINT	RO	NO	0
	32	Sync error	BOOL	RO	NO	false

0x1C33 SM intput parameter

The SYNC manager parameter.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C33	0	Number of sub-index	USINT8	RO	NO	32
	1	Synchronization type	UINT16	RW	NO	2
	2	Cycle time	UDINT32	RO	NO	0
	3	Shift time	UDINT32	RW	NO	0
	4	Synchronization types supported	UDINT32	RO	NO	0x401F
	5	Minimum cycle time	UDINT32	RO	NO	0x7A120
	6	Calc and copy time	UINT16	RW	NO	0
	8	Get cycle time	UINT	RW	NO	0
	9	Delay time	UDINT	RO	NO	0
	10	Sync0 cycle time	UDINT	RW	NO	0x3D0900
	11	SM-event missed	UINT	RO	NO	0
	12	Cycle time too small	UINT	RO	NO	0
	32	Sync error	BOOL	RO	NO	false

4.2.2 0x2000~2100h Manufacturer profile

	Index	Sub	Name	Access	Type	Mapping
0x2000~ 2100h	0x2001	-	EtherCAT ID	RO	UINT16	NO
	0x2002	-	Physical Address	RO	UINT16	NO
	0x2003	-	Alias Source	RO	UINT	NO
	0x2005	-	Bus Voltage	RO	UINT16	NO
	0x2006	-	DSP Version	RO	STRING(10)	NO
	0x2007	-	Drive Temperature 1	RO	UINT	NO
	0x2010	-	Set EtherCAT ID	RW	UINT	NO

	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
0x2000~ 2100h	0x2020	0x2040	-	Axis Output Status	RO	UDINT	NO
	0x2021	0x2041	-	Axis DSP Status Code	RO	UINT32	YES
	0x2022	0x2042	-	Axis DSP Alarm Code	RO	UINT32	YES

0x2001 EtherCAT ID

This object contains the EtherCAT ID of drives.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2001	-	EtherCAT ID	RO	UINT	NO	-

0x2002 Physical Address

This object contains the physical address of drives.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2002	-	Physical address	RO	UINT	NO	-

0x2003 Alias Source

This object is used to set the methold of EtherCAT address setting. The value is 0 means that set by software, 1 means set by the EtherCAT master.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2003	-	Alias Source	RO	UINT	NO	-

0x2005 Bus Voltage

This object shall provide the present value of drive's DC bus voltage.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2005	-	Bus Voltage	RO	UINT	NO	-

0x2006 DSP Version

This object shall provide the DSP version of the drive.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2006	-	DSP Version	RO	UINT	NO	-

0x2007 Drive Temperature 1

This object contains the information of device temperature.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2007	-	Drive Temperature 1	RO	UINT	NO	0

The unit of this object is in 0.1 centigrade.

0x2010 Set EtherCAT ID

This object contains the EtherCAT ID of drives.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2010	-	Set EtherCAT ID	RW	UINT	NO	0

0x2020 / 0x2040 Axis Output Status

This object shall indicate the digital output status.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2020	0x2040	-	Axis Output Status	RO	UDINT	NO	0x000F0000

Bit	31 ~ 20	19	18	17	16	15 ~ 0
Output	Reserved	Y4	Y3	Y2	Y1	Reserved

0x2021 / 0x2041 Axis DSP Status Code

This object represents the current status code of the drive.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2021	0x2041	-	Axis 1 DSP Status Code	RO	UDINT	YES	-

BIT	Status Code Bit Definition
0	Motor Enabled - motor disabled is this bit = 0
1	Sampling - for Quick Tuner
2	Drive Fault - check alarm code
3	In Position - motor is in position
4	Moving - motor is moving
5	Jogging - currently in jog mode
6	Stopping - in the process of stopping from a stop command
7	Waiting - for an input
8	Saving - parameter data is being saved
9	Alarm present - check alarm code
10	Homing - executing an SH command
11	Wait Time - executing a WT command
12	Wizard running - timing wizard is running
13	Checking encoder - timing wizard is running
14	Q Program is running
15	Initializing

0x2022 / 0x2042 Axis DSP Alarm Code

This object shall indicate the high 16bit field of alarm code about the object at 0x603F.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2022	0x2042	-	Axis DSP Alarm Code	RO	UDINT	YES	-

4.2.3 Manufacturer parameter for Dual axis Step-Servo

	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
0x3200~ 4000h	0x3200	0x3400	-	Continuous current	RW	UINT	NO
	0x3201	0x3401	-	Peak current	RW	UINT	NO
	0x3202	0x3402	-	Hard stop current limit	RW	UINT	NO
	0x3203	0x3403	-	Idle current	RW	UINT	NO
	0x3204	0x3404	-	Idle current delay time	RW	UINT	NO
	0x3205	0x3405	-	Acceleration current	RW	UINT	NO
	0x3206	0x3406	-	Stall prevention time	RW	UINT	NO
	0x3207	0x3407	-	Steps per rev	RO	UINT	NO
	0x3208	0x3408	-	Reverse motor direction	RW	UINT	NO
	0x3209	0x3409	-	Powerup probing	RW	UINT	NO
	0x320B	0x340B	-	Fault output on Y1	RW	UINT	NO
	0x320C	0x340C	-	Brake Output on Y2	-	-	-
			1	Brake Output	RW	UINT	NO
			2	Brake Disengage Delay	RW	UINT	NO
			3	Brake Engage Delay			
	0x320D	0x340D	-	Motion Output	-	-	-
			1	Motion Output on Y1	RW	UINT	NO
			2	Motion Output on Y2	RW	UINT	NO
			3	Motion Output on Y3	RW	UINT	NO
			4	Motion Output on Y4			
	0x320F	0x340F	-	Define limits	RW	UINT	NO
	0x3210	0x3410	-	Inputs filter	-	-	-
			1	Inputs filter X1 filter time	RW	UINT	NO
			2	Inputs filter X2 filter time	RW	UINT	NO
			...	...	...	...	...
			8	Inputs filter X8 filter time	RW	UINT	NO
	0x3211	0x3411	-	Notch filter	-	-	-
			1	Notch filter_paraA	RW	INT	NO
			2	Notch filter_paraB	RW	INT	NO
			...	...	...	...	...
			8	Notch filter_paraH	RW	INT	NO
	0x3212	0x3412	-	Analog configuration	-	-	-
			1	Analog deadband	RW	UINT	NO
			2	Analog offset vallue	RW	UINT	NO
			3	Analog filter	RW	UINT	NO
			4	Analog threshold	RW	UINT	NO
			5	Analog scaling	RW	UINT	NO
	0x3213	0x3413	-	Analog auto zero	RW	UINT	NO
	0x3214	0x3414	-	Operation mode	RW	UINT	NO
	0x3215	0x3415	-	Jog mode	RW	UINT	NO
	0x3216	0x3416	-	Torque constant	RW	UINT	NO

	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
0x3200~ 4000h	0x3218	0x3418	-	Encoder resolution	RO	UINT	NO
	0x3220	0x3420	-	Position gain	RW	UINT	NO
	0x3221	0x3421	-	Positionderi gain	RW	UINT	NO
	0x3222	0x3422	-	Positionderi filter	RW	UINT	NO
	0x3224	0x3424	-	Velocity gain	RW	UINT	NO
	0x3225	0x3425	-	Velocityinterg gain	RW	UINT	NO
	0x3226	0x3426	-	Accfeedforward	RW	UINT	NO
	0x3227	0x3427	-	PID filter	RW	UINT	NO
	0x3252	0x3452	-	Inposition counts	RW	UINT	NO
	0x3253	0x3453	-	CSP complete time	RW	UINT	NO
	0x3254	0x3454	-	Inposition error range	RW	UINT	NO
	0x3255	0x3455	-	Inposition time	RW	UINT	NO
	0x3260	0x3460	-	Actual current	RO	INT	NO
	0x3261	0x3461	-	Analog Reading	RO	INT	NO
			1	Analog Reading Value	RO	INT	YES
			2	Analog Reading Input1	RO	INT	YES
			3	Analog Reading Input2	RO	INT	YES
	0x3262	0x3462	-	Motor name	RO	STRING(5)	NO
	0x3271	0x3471	-	Home switch	RW	UINT8	YES
	0x3272	0x3472	-	Clear alarm	WO	UINT8	YES
	0x3274	0x3474	-	Zero position	WO	UINT8	NO
	0x3275	0x3475	-	S-Curve filter time	RW	UINT	NO
	0x3276	0x3476	-	Move homeoffset	RW	UINT	NO
	0x3280	0x3480	-	User registers	-	-	-

0x3200 / 0x3400 Continuous current

This object is used to set the continuous (RMS) current of the Step-Servo drives.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3200	0x3400	-	Continuous current	RW	UINT	NO	-

0x3201 / 0x3401 Peak current

This object is used to set the peak (RMS) current of the Step-Servo drives.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3201	0x3401	-	Peak current	RW	UINT	NO	-

0x3202 / 0x3402 Hardstop current limit

This object is used for hard stop homing mode that setting the current when the motor hit the hard stop position.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3202	0x3402	-	Hardstop current limit	RW	UINT	NO	-

0x3203 / 0x3403 Idle current

This object configures monitors the motor holding current of the device in idle mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3203	0x3403	-	Idle current	RW	UINT	NO	-

If the reading value is 100. That means 1.00Amps.

0x3204 / 0x3404 Idle current delay time

This object is used to set the amount of time the drive will delay before transitioning from full current (CC) to idle current(CI).

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3204	0x3404	-	Idle current delay time	RW	UINT	NO	-

The value shall be given in second, If the reading value is 10. That means 1.0 seconds.

0x3205 / 0x3405 Acceleration current

This object shall provide the acceleration current when the motor is running with stepper mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3205	0x3405	-	Acceleration current	RW	UINT	NO	-

If the reading value is 100 that means 1.00Amps.

0x3206 / 0x3406 Stall prevention time

This obeject is used to set the stall prevention time.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3206	0x3406	-	Stall precention time	RW	UINT	NO	-

The value shall be given in second, If the reading value is 10. That means 1.0 seconds.

0x3207 / 0x3407 Steps per rev

This object is used to get the steps per revolution about motor.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3207	0x3407	-	Step per rev	RO	UINT	NO	-

The value shall be given in steps/rev.

0x3208 / 0x3408 Reverse motor direction

This object is used to reverse motor rotating direction.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3208	0x3408	-	Reverse motor direction	RW	UINT	NO	-

The value can be set to 0 - 1.
Value =0 default rotating direction
=1 reverse rotating direction

0x3209 / 0x3409 Powerup probing

This obejct is used to set the drive to probe when power up.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3209	0x3409	-	Powerup probing	RW	UINT	NO	-

Value =0 NO probing
=1 Probing

0x320B / 0x340B Fault output on Y1

This object is used to set the fault output on Y1.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x320B	0x340B	-	Fault output on Y1	RW	UINT	NO	-

Value =1 output Y1 is open when the driver is fault
=2 output Y1 is closed when the driver is fault
=3 output Y1 is used for general purpose

0x320C / 0x340C Brake output on Y2

This object at 0x220C is used to set the parameter of brake configuration. There has 3 sub-index to configure brake, the first is used for brake output, and the second is used for disengage delay. The last is used to set brake engage delay.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x320C	0x340C	-	Fault output on Y1	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Brake output	RW	UINT	NO	-
		2	Brake disengage delay	RW	UINT	NO	-
		3	Brake engage delay	RW	UINT	NO	-

Brake output:

Value =1 output is closed when drive is enabled, and open when the drive is disabled.
=2 output is open when drive is enabled, and closed when the drive is disabled.
=3 output is not used as a brake output and can be used as g general purpose output.

Brake disengage delay and brake engage delay

The units is 1ms, if write 100 to the index means 0.1s.

0x320D / 0x340D Motion output

This object is used to define the drive Motion output function.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x320C	0x340C	-	Motion Output	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Motion output on Y1	RW	UINT	NO	-
		2	Motion output on Y2	RW	UINT	NO	-
		3	Motion output on Y3	RW	UINT	NO	-
		4	Motion output on Y4	RW	UINT	NO	-

They can be set to various functions.

Value	=1	Open when static position error less than in-position counts.
	=2	Closed when static position error less than in-position counts.
	=3	General purpose
	=4	Tach output with 100 pulses/rev
	=5	Tach output with 200 pulses/rev
	=6	Tach output with 400 pulses/rev
	=7	Tach output with 800 pulses/rev
	=8	Tach output with 1600 pulses/rev
	=9	Closed (energized) when dynamic position error is less than set value.
	=10	Open (de-energized) when dynamic position error is less than set value.
	=11	Timing out (50 pulses/rev)

0x320F / 0x340F Define limits

This object is used to set the definition of limit.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x320F	0x340F	-	Define limits	RW	UINT	NO	-

Value	=0x01	At end of travel, (X3=CW,X4=CCW)will be closed
	=0x02	At end of travel, (X3=CW,X4=CCW)will be open
	=0x07	At end of travel, X3=CW will be closed, X4=GP
	=0x08	At end of travel, X3=CW will be open, X4=GP
	=0x09	At end of travel, X4=CCW will be closed, X3=GP
	=0x0A	At end of travel, X4=CCW will be open, X3=GP
	=0x0B	At end of travel, (X3=CCW,X4=CW)will be closed
	=0x0C	At end of travel, (X3=CCW,X4=CW)will be open
	=0x11	At end of travel, X3=CCW will be closed, X4=GP
	=0x12	At end of travel, X3=CCW will be open, X4=GP
	=0x13	At end of travel, X4=CW will be closed, X3=GP
	=0x14	At end of travel, X4=CW will be open, X3=GP
	=0x15	At end of travel, (X3=CW,X4=CCW)will be closed[No Alarm]
	=0x16	At end of travel, (X3=CW,X4=CCW)will be open[No Alarm]
	=0x1B	At end of travel, X3=CW will be closed, X4=GP[No Alarm]
	=0x1C	At end of travel, X3=CW will be open, X4=GP[No Alarm]
	=0x1D	At end of travel, X4=CCW will be closed, X3=GP[No Alarm]
	=0x1E	At end of travel, X4=CCW will be open, X3=GP[No Alarm]
	=0x1F	At end of travel, (X3=CCW,X4=CW)will be closed[No Alarm]
	=0x20	At end of travel, (X3=CCW,X4=CW)will be open[No Alarm]
	=0x25	At end of travel, X3=CCW will be closed, X4=GP[No Alarm]
	=0x26	At end of travel, X3=CCW will be open, X4=GP[No Alarm]
	=0x27	At end of travel, X4=CW will be closed, X3=GP[No Alarm]
	=0x28	At end of travel, X4=CW will be open, X3=GP[No Alarm]

0x3210 / 0x3410 Input filter

This object is used to set a digital filter to the input.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3210	0x3410	-	Input filter time	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	8
		1	Input X1 filter time	RW	UINT	NO	-
		2	Input X2 filter time	RW	UINT	NO	-
		3	Input X3 filter time	RW	UINT	NO	-
		4	Input X4 filter time	RW	UINT	NO	-
		5	Input X5 filter time	RW	UINT	NO	-
		6	Input X6 filter time	RW	UINT	NO	-
		7	Input X7 filter time	RW	UINT	NO	-
		8	Input X8 filter time	RW	UINT	NO	-

The unit of this parameter is 200us. If the value you set to 100, means 20ms delay.

0x3211 / 0x3411 Notch filter

These eight objects shall configure the Notch Filter parameters in torque mode. This object is only available on StepSERVO drive.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3211	0x3411	-	Notch filter	RW	INT	NO	-
		0	Number of sub-index	RO	USINT8	NO	8
		1	Notch filter_paraA	RW	INT	NO	-
		2	Notch filter_paraB	RW	INT	NO	-
		3	Notch filter_paraC	RW	INT	NO	-
		4	Notch filter_paraD	RW	INT	NO	-
		5	Notch filter_paraE	RW	INT	NO	-
		6	Notch filter_paraF	RW	INT	NO	-
		7	Notch filter_paraG	RW	INT	NO	-
		8	Notch filter_paraH	RW	INT	NO	-

0x3212 / 0x3412 Analog configuration

This object shall indicate the configuration of running mode about analog. We should set the value of this object when running with analog velocity/position/torque mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3212	0x3412	-	Analog Configuration	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	5
		1	Analog deadband	RW	UINT	NO	-
		2	Analog offset value	RW	UINT	NO	-
		3	Analog filter	RW	UINT	NO	-
		4	Analog threshold	RW	UINT	NO	-
		5	Analog scaling	RW	UINT	NO	-

Analog deadband

The unit is in 0.001volit

Analog filter

Filter value = 72090 / [(1400 / x) + 2.2].

Where x = desired value of the analog filter in Hz

Analog scaling

Value	=0	single-ended +/- 10 volts
	=1	single-ended 0 - 10 volts
	=2	single-ended +/- 5 volts
	=3	single-ended 0 - 5 volts
	=4	differential +/- 10 volts
	=5	differential 0 - 10 volts
	=6	differential +/- 5 volts
	=7	differential 0 - 5 volts

0x3213 / 0x3413 Analog auto zero

This object is used to set the current analog to zero, the value can be set to 1.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3213	0x3413	-	Analog auto zero	RW	UINT	NO	-

0x3214 / 0x3414 Operation mode

This object is used to set the power-up mode of the drive.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3214	0x3414	-	Operation mode	RW	UINT	NO	-

Value	=1	Si program
	=2	Q/SCL(drive enabled)
	=3	Quick tuner(servos) or Configurator(steppers)
	=4	SiNET Hub
	=5	Q/SCL(drive disabled)
	=6	not used
	=7	Q program, auto-execute

0x3215 / 0x3415 Jog mode

This object is used to set the jog mode. There has two mode for MOONS' drive.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3215	0x3415	-	Jog mode	RW	UINT	NO	-

Value =1 position-type servo control when jogging
=2 velocity-type servo control when jogging

0x3216 / 0x3416 Torque constant

This object shall configure the motor's torque constant in manufacturer specific units. The units should be mN·m/Amps.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3216	0x3416	-	Torque constant	RW	UINT	NO	-

该对象只支持步进伺服驱动器。0x2216=最大输出扭矩/最大运行电流（依据不同参数设定）。

0x3218 / 0x3418 Encoder resolution

This object shall provide the encoder configuration of the motor. It contains how many counts per revolution.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3218	0x3418	-	Encoder resolution	RO	UINT	NO	-

0x3220 / 0x3420 Position gain

This object shall configure the proportional Gain in Position loop to Step-Servo drives.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3220	0x3420	-	Position gain	RW	UINT	NO	-

0x3221 / 0x3421 Position derigain

This object shall configure the Derivative Gain in Position loop to Step-Servo drives.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3221	0x3421	-	Positionderi gain	RW	UINT	NO	-

0x3222 / 0x3422 Position derifilter

This object provides a very simple single-pole low pass filter that is used to limit this high frequency noise and make the system quieter and more stable.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3222	0x3422	-	Positionderi filter	RW	UINT	NO	-

0x3224 / 0x3424 Velocity gain

This object shall configure the proportional Gain in Velocity loop to Step-Servo drives.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3224	0x3424	-	Velocity gain	RW	UINT	NO	-

0x3225 / 0x3425 Velocityinterg gain

This object shall configure the Integral Gain in Velocity loop to Step-Servo drive.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3225	0x3425	-	Velocityinterg gain	RW	UINT	NO	-

0x3226 / 0x3426 Accfeedforward

This object shall configure to add a feed forward acceleration/deceleration to the torque command to faster the system's response.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3226	0x3426	-	Accfeedforward	RW	UINT	NO	-

0x3227 / 0x3427 PID filter

This object provide a torque command over-all filter at the end of Velocity loop. The filter is a very simple single-pole low pass filter that is used to limit the high frequency response of the Velocity and therefore the Position control loops.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3227	0x3427	-	PID filter	RW	UINT	NO	-

0x3252 / 0x3452 Inposition counts

This object is used to set static in-position error range.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3252	0x3452	-	Inposition counts	RW	UINT	NO	-

0x3253 / 0x3453 CSP complete time

This object is used to set the delay time that the motor is in completion of rotating with CSP mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3253	0x3453	-	CSP complete time	RW	UINT	NO	-

The units is 0.001 second.

0x3254 / 0x3454 In position error range

This object is used to set static in-position error range. When the actual position is within the target In position error range for a time duration that exceeds the PE specified timing, then the driver will define the motion complete or motor in-position.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3254	0x3454	-	In position error range	RW	UINT	NO	-

0x3255 / 0x3455 In position time

This object is used to set the time duration for in range determination. For example, when In position error PD is defined, PE will set the time duration for in-position test condition. The drive defines the motor as in position when the actual position is within the target position range (PD) for the defined minimum time (PE).

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3255	0x3455	-	In position time	RW	UINT	NO	-

0x3260 / 0x3460 Actual current

This object shall provide the current of the motor.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3260	0x3460	-	Actual current	RO	INT	NO	-

0x3261 / 0x3461 Analog reading

This object shall provide the analog value of drive.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3261	0x3461	-	Analog Reading	RW	INT	YES	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Analog reading	RW	INT	YES	-
		2	Analog reading input 1	RW	INT	YES	-
		3	Analog reading inupt 2	RW	INT	YES	-

0x3262 / 0x3462 Motor name

This object shall provide the name of the motor.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3262	0x3462	-	Motor	RO	STRING(15)	NO	-

0x3271 / 0x3471 Home switch

This object shall configure the number of Inputs as the Home switch in Homing mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3271	0x3471	-	Home switch	RW	USINT	NO	-

Bit	Name	Value	Description
0	Home switch number	It can be set to 3、4、7	X3、X4、X7
1			
2			
3			
4	Effective method for setting home switch	0	When closed
		1	When open
5-7	Reserved		

0x3272 / 0x3472 Clear alarm

This object provides the feature to clear alarm of the drives.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3272	0x3472	-	Clear alarm	RW	USINT	YES	-

Multi-Axis Series: Set the value with 0x55 to 0xAA can clear all alarm

0x3274 / 0x3474 Zero position

This object provides the feature to zero all position parameters, such as position actual value (which index is 0x6064h).Set this value to 01h can zero all position parameters.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3274	0x3474	-	Zero position	RW	USINT	NO	-

0x3275 / 0x3475 S-Curve filter time

This object is used to be set the S-Curve fliter time.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3275	0x3475	-	S-Curve filter time	RW	UINT	NO	-

0x3276 / 0x3476 Move home offset

This object is used to set homing offset mode.

Object Type	Data Type	Access Type	PDO mapping	COS	Default Value
VAR	UINT16	RW	NO	NO	0

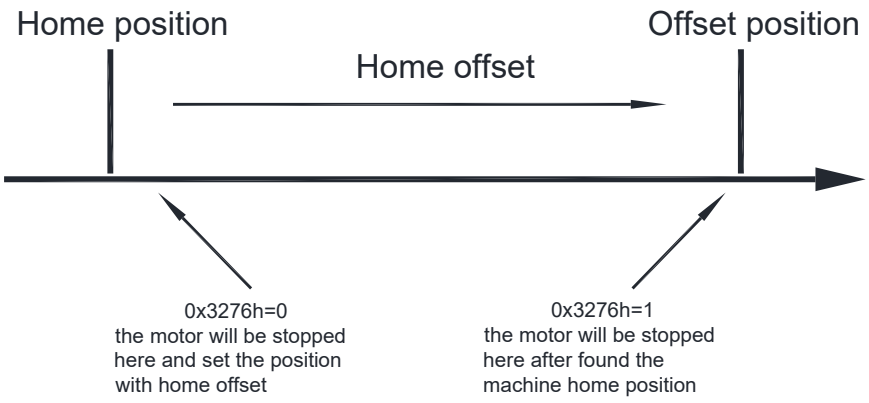
NOTE: This function is only effective when Homing Method is 1~35.

Set the value to 0:

The motor will be stopped on machine home position and the current position value is the home offset.

Set the value to 1:

The motor will moving with a distance that home offset provided after the machine home position has found. The new position is the offset position.



0x3280 / 0x3480 User registers

This object provide user 23 general purpose registers. They are volatile, so the information sent there will not be saved after a power cycle.

Index		Sub	Name	Access Type	Data Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x3280	0x3480	0	User Registers	RO	USINT	NO	23
		1	User register0	RO	DINT	YES	-
		2	User register1	RW	DINT	YES	-
		3	User register2	RW	DINT	YES	-
		4	User register3	RW	DINT	YES	-
		5	User register4	RW	DINT	YES	-
		6	User register5	RW	DINT	YES	-
		7	User register6	RW	DINT	YES	-
		8	User register7	RW	DINT	YES	-
		9	User register8	RW	DINT	YES	-
		10	User register9	RW	DINT	YES	-
		11	User register10	RW	DINT	YES	-
		12	User register11	RW	DINT	YES	-
		13	User register12	RW	DINT	YES	-
		14	User register13	RW	DINT	YES	-
		15	User register14	RW	DINT	YES	-
		16	User register15	RW	DINT	YES	-
		17	User register16	RW	DINT	YES	-
		18	User register17	RW	DINT	YES	-
		19	User register18	RW	DINT	YES	-
		20	User register19	RW	DINT	YES	-
		21	User register20	RW	DINT	YES	-
		22	User register21	RW	DINT	YES	-
		23	User register22	RW	DINT	YES	-

4.2.4 Manufacturer parameter for Dual axis Stepper

	Index		Sub	Name	Access	Type	mapping
	Aixs1	Aixs2					
0x2600~2E00	0x2600	0x2800	-	Running current	RW	UINT	NO
	0x2601	0x2801	-	Idle current	RW	UINT	NO
	0x2602	0x2802	-	Idle current delya time	RW	UINT	NO
	0x2603	0x2803	-	Acceleration current	RW	UINT	NO
	0x2604	0x2804	-	Steps per rev	RW	UINT	NO
	0x2605	0x2805	-	Reverse motor direction	RW	UINT	NO
	0x2606	0x2806	-	Fault output on Y1	RW	UINT	NO
	0x2607	0x2807	-	Brake Output on Y2	-	-	-
			1	Brake Output	RW	UINT	NO
			2	Brake Disengage Delay	RW	UINT	NO
			3	Brake Engage Delay	RW	UINT	NO
	0x2608	0x2808	-	Motion Output	-	-	-
			1	Motion Output on Y1	RW	UINT	NO
			2	Motion Output on Y2	RW	UINT	NO
			3	Motion Output on Y3	RW	UINT	NO
			4	Motion Output on Y4			
	0x260B	0x280B	-	Define limits	RW	UINT	NO
	0x260C	0x280C	-	Inputs Filter	-	-	-
			1	Input X1 Filter Time	RW	UINT	NO
				...	...	...	...
			8	Inputs X8 filter time	RW	UINT	NO
	0x260D	0x280D	-	Dynamic open winding detection	RW	UINT	NO
	0x260E	0x280E	-	Open winding detect speed limit	RW	UDINT	NO
	0x260F	0x280F	-	Powerup open winding detection	RW	UINT	NO
	0x2610	0x2810	-	Motor model number	RW	UINT	NO
	0x2611	0x2811	-	Load ratio	RW	UINT	NO

	Index		Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2					
0x2600~ 2E00h	0x2612	0x2812	-	Third party motor parameters	-	ARRAY	NO
			1	MotorName 1	RW	UDINT	NO
			2	MotorName 2	RW	UDINT	NO
			3	MotorName 3	RW	UDINT	NO
			4	MotorName 4	RW	UDINT	NO
			5	MotorPara_01	RW	UINT	NO
			6	MotorPara_02	RW	UINT	NO
			...	...	...	...	...
			12	MotorPara_14	RW	UINT	NO
			13	Reserved_01	RW	UINT	NO
			14	Reserved_02	RW	UINT	NO
			...	..	...	...	...
			18	Reserved_06	RW	UINT	NO
	0x2615	0x2815	-	StepInputs counts	RO	DINT	NO
	0x2618	0x2818	-	Waveform Smoothing	-	-	-
			1	Harmonic Gain	RW	INT	NO
			2	Harmonic Phase			
	0x2619	0x2819	-	Current coeff	RW	UINT	NO
	0x2620	0x2820	-	Home switch	RW	UINT8	YES
	0x2621	0x2821	-	Clear alarm	WO	UINT8	YES
	0x2623	0x2823	-	Zero position	WO	UINT8	NO
	0x2624	0x2824	-	S-Curve filter time	RW	UINT	NO
	0x2625	0x2825	-	User Registers			
	0x2626	0x2826	-	Move homeoffset	RW	UINT	NO

0x2600 / 0x2800 Running current

This object is used to set the continuous (RMS) current of the Stepper drives.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2600	0x2800	-	Running current	RW	UINT	NO	-

0x2601 / 0x2801 Idle current

This object configures monitors the motor holding current of the device in idle mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2601	0x2801	-	Idle current	RW	UINT	NO	-

If the reading value is 100. That means 1.00Amps.

0x2602 / 0x2802 Idle current delay time

This object is used to set the amount of time the drive will delay before transitioning from full current (CC) to idle current(CI).

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2602	0x2802	-	Idle current delay time	RW	UINT	NO	-

The value shall be given in second, If the reading value is 10. That means 1.0 seconds.

0x2603 / 0x2803 Acceleration current

This object shall provide the acceleration current when the motor is running with stepper mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2603	0x2803	-	Acceleration current	RW	UINT	NO	-

If the reading value is 100 that means 1.00Amps.

0x2604 / 0x2804 Steps per rev

This object is used to get the steps per revolution about motor.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2604	0x2804	-	Step per rev	RW	UINT	NO	-

The value shall be given in steps/rev.

0x2605 / 0x2805 Reverse motor direction

This object is used to reverse motor rotating direction.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2605	0x2805	-	Reverse motor direction	RW	UINT	NO	-

The value can be set to 0 - 1.
Value =0 default rotating direction
=1 reverse rotating direction

0x2606 / 0x2806 Fault output on Y1

This object is used to set the fault output on Y1.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2606	0x2806	-	Fault output on Y1	RW	UINT	NO	-

Value =1 output Y1 is open when the driver is fault
=2 output Y1 is closed when the driver is fault
=3 output Y1 is used for general purpose

0x2607 / 0x2807 Brake output on Y2

This object at 0x220C is used to set the parameter of brake configuration. There has 3 sub-index to configure brake, the first is used for brake output, and the second is used for disengage delay. The last is used to set brake engage delay.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2607	0x2807	-	Brake Output on Y2	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Brake output	RW	UINT	NO	-
		2	Brake disengage delay	RW	UINT	NO	-
		3	Brake engage delay	RW	UINT	NO	-

Brake output:

Value =1 output is closed when drive is enabled, and open when the drive is disabled.
=2 output is open when drive is enabled, and closed when the drive is disabled.
=3 output is not used as a brake output and can be used as g general purpose output.

Brake disengage delay and brake engage delay

The units is 1ms, if write 100 to the index means 0.1s.

0x2608 / 0x2808 Motion output

This object is used to define the drive Motion output function.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2608	0x2808	-	Motion Output	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	3
		1	Motion output on Y1	RW	UINT	NO	-
		2	Motion output on Y2	RW	UINT	NO	-
		3	Motion output on Y3	RW	UINT	NO	-
		4	Motion output on Y4	RW	UINT	NO	-

Value =1 Open when static position error less than in-position counts.
=2 Closed when static positi
=3 General purpose (fault output or brake output)
=4 Tach output with 100 pulses/rev
=5 Tach output with 200 pulses/rev
=6 Tach output with 400 pulses/rev
=7 Tach output with 800 pulses/rev
=8 Tach output with 1600 pulses/rev
=9 Closed (energized) when dynamic position error is less than set value.
=10 Open (de-energized) when dynamic position error is less than set value.
=11 Timing out (50 pulses/rev)

0x260B / 0x280B Define limits

This object is used to set the definition of limit.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260B	0x280B	-	Alarm reset on input X6	RW	UINT	NO	-

Value =0x01 At end of travel, (X3=CW,X4=CCW)will be closed
=0x02 At end of travel, (X3=CW,X4=CCW)will be open
=0x07 At end of travel, X3=CW will be closed, X4=GP
=0x08 At end of travel, X3=CW will be open, X4=GP
=0x09 At end of travel, X4=CCW will be closed, X3=GP
=0x0A At end of travel, X4=CCW will be open, X3=GP
=0x0B At end of travel, (X3=CCW,X4=CW)will be closed
=0x0C At end of travel, (X3=CCW,X4=CW)will be open
=0x11 At end of travel, X3=CCW will be closed, X4=GP
=0x12 At end of travel, X3=CCW will be open, X4=GP
=0x13 At end of travel, X4=CW will be closed, X3=GP
=0x14 At end of travel, X4=CW will be open, X3=GP
=0x15 At end of travel, (X3=CW,X4=CCW)will be closed[No Alarm]
=0x16 At end of travel, (X3=CW,X4=CCW)will be open[No Alarm]
=0x1B At end of travel, X3=CW will be closed, X4=GP[No Alarm]
=0x1C At end of travel, X3=CW will be open, X4=GP[No Alarm]
=0x1D At end of travel, X4=CCW will be closed, X3=GP[No Alarm]
=0x1E At end of travel, X4=CCW will be open, X3=GP[No Alarm]
=0x1F At end of travel, (X3=CCW,X4=CW)will be closed[No Alarm]
=0x20 At end of travel, (X3=CCW,X4=CW)will be open[No Alarm]
=0x25 At end of travel, X3=CCW will be closed, X4=GP[No Alarm]
=0x26 At end of travel, X3=CCW will be open, X4=GP[No Alarm]
=0x27 At end of travel, X4=CW will be closed, X3=GP[No Alarm]
=0x28 At end of travel, X4=CW will be open, X3=GP[No Alarm]

0x260C / 0x280C Inputs filter

This object is used to set a digital filter to the input.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260C	0x280C	-	Inputs Filter	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	8
		1	Input X1 filter time	RW	UINT	NO	-
		2	Input X2 filter time	RW	UINT	NO	-
		3	Input X3 filter time	RW	UINT	NO	-
		4	Input X4 filter time	RW	UINT	NO	-
		5	Input X5 filter time	RW	UINT	NO	-
		6	Input X6 filter time	RW	UINT	NO	-
		7	Input X7 filter time	RW	UINT	NO	-
		8	Input X8 filter time	RW	UINT	NO	-

The unit of this parameter is 200us. If the value you set to 100, means 20ms delay.

0x260D / 0x280D Dynamic open winding detection

This object is used to set the function of Dynamic open winding detection.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260D	0x280D	-	Dynamic open winding detection	RW	UINT	NO	-

Value =0 disable
=1 enable

0x260E / 0x280E Open winding detection speed limit

This object is used to set the velocity limit of the open winding status detect when the motor is moving.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260E	0x280E	-	Open winding detection speed limit	RW	UDINT	NO	-

The unit of this object is counts/s.

0x260F / 0x280F Powerup open winding detection

This object is used to configurate the detection of open winding when power up.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x260F	0x280F	-	Powerup open winding detection	RW	UINT	NO	-

0x2610 / 0x2810 Motor model number

This object provide the model number of motor.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2610	0x2810	-	Motor model number	RW	UINT	NO	-

0x2611 / 0x2811 Load ratio

This object sets the ratio of the load inertia to the rotor inertia.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2611	0x2811	-	Load ratio	RW	UINT	NO	-

Value =1 1x rotor inertia
=2 1x-3x rotor inertia
=3 3x-5x rotor inertia
=4 5x-7x rotor inertia
=5 7x-10x rotor inertia

0x2612 / 0x2812 Third party motor parameters

This object shall indicate the motor of custom.

Index		Sub	Name	Access Type	Data Type	PDO mapping	-Default Value-
Aixs1	Aixs2						
0x2612	0x2812	-	Number of Entries	RW	UDINT	NO	-
		0	Motor Name1	RO	USINT8	NO	25
		1	Motor Name2	RW	UDINT	NO	-
		2	Motor Name3	RW	UDINT	NO	-
		3	Motor Name4	RW	UDINT	NO	-
		4	Motor Paramter1	RW	UDINT	NO	-
		5	Motor Paramter2	RW	UINT	NO	-
		6	Motor Paramter3	RW	UINT	NO	-
		7	Motor Paramter4	RW	UINT	NO	-
		8	Motor Paramter5	RW	UINT	NO	-
		9	Motor Paramter6	RW	UINT	NO	-
		A	Motor Paramter7	RW	UINT	NO	-
		B	Motor Paramter8	RW	UINT	NO	-
		C	Motor Paramter9	RW	UINT	NO	-
		D	Motor Paramter10	RW	UINT	NO	-
		E	Motor Paramter11	RW	UINT	NO	-
		F	Motor Paramter12	RW	UINT	NO	-
		10	Motor Paramter13	RW	UINT	NO	-
		11	Motor Paramter14	RW	UINT	NO	-
		12	Reserved1	RW	UINT	NO	-
		13	Reserved2	RW	UINT	NO	-
		14	Reserved3	RW	UINT	NO	--
		15	Reserved4	RW	UINT	NO	-
		16	Reserved5	RW	UINT	NO	-
		17	Reserved6	RW	UINT	NO	-

0x2615 / 0x2815 StepInputs counts

This object provide the pulse counter coming into the X1/STEP and X2/DIR input of the drive.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2615	0x2815	-	StepInputs counts	RO	DINT	YES	0

0x2618 / 0x2818 Waveform smoothiing

This object is used to set the 4th harmonic filter gain/phase setting.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2618	0x2818	-	Waveform Smoothing	RW	UINT	NO	-
		0	Number of sub-index	RO	USINT8	NO	2
		1	Harmonic gain	RW	UINT	NO	-
		2	Harmonic phase	RW	UINT	NO	-

0x2619 / 0x2819 Current coeff

This object shall indicate the value of current coefficient, the value should be given per hundard of rated current.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2619	0x2819	-	Current coeff	RW	UINT	NO	-

0x2620 / 0x2820 Home switch

This object shall configure the number of Inputs as the Home switch in Homing mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2620	0x2820	-	Home switch	RW	USINT	NO	-

Value	8	7	6	5	4	3	2	1
Output	X8	X7	X6	X5	X4	X3	X2	X1

0x2621 / 0x2821 Clear alarm

This object provides the feature to clear alarm of the drives.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2621	0x2821	-	Clear alarm	RW	USINT	YES	-

Multi-Axis Series: Set the value with 0x55 to 0xAA can clear all alarm

0x2623 / 0x2823 Zero position

This object provides the feature to zero all position parameters, such as position actual value (which index is 0x6064h).Set this value to 01h can zero all position parameters.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2623	0x2823	-	Zero position	RW	USINT	NO	-

0x2624 / 0x2824 S-Curve filter time

This object is used to be set the S-Curve fliter time.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2624	0x2824	-	S-Curve filter time	RW	UINT	NO	-

0x2625 / 0x2825 User registers

This object provide user 23 general purpose registers. They are volatile, so the information sent there will not be saved after a power cycle.

Index		Sub	Name	Access Type	Data Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x2625	0x2825	-	User Registers	RW	DINT	YES	-
		0	Number of sub-index	RO	USINT	NO	23
		1	User register0	RO	DINT	YES	-
		2	User register1	RW	DINT	YES	-
		3	User register2	RW	DINT	YES	-
		4	User register3	RW	DINT	YES	-
		5	User register4	RW	DINT	YES	-
		6	User register5	RW	DINT	YES	-
		7	User register6	RW	DINT	YES	-
		8	User register7	RW	DINT	YES	-
		9	User register8	RW	DINT	YES	-
		10	User register9	RW	DINT	YES	-
		11	User register10	RW	DINT	YES	-
		12	User register11	RW	DINT	YES	-
		13	User register12	RW	DINT	YES	-
		14	User register13	RW	DINT	YES	-
		15	User register14	RW	DINT	YES	-
		16	User register15	RW	DINT	YES	-
		17	User register16	RW	DINT	YES	-
		18	User register17	RW	DINT	YES	-
		19	User register18	RW	DINT	YES	-
		20	User register19	RW	DINT	YES	-
		21	User register20	RW	DINT	YES	-
		22	User register21	RW	DINT	YES	-
		23	User register22	RW	DINT	YES	-

0x2626 / 0x2826 Move home offset

This object is used to set homing offset mode.

Object Type	Data Type	Access Type	PDO mapping	COS	Default Value
VAR	UINT16	RW	NO	NO	0

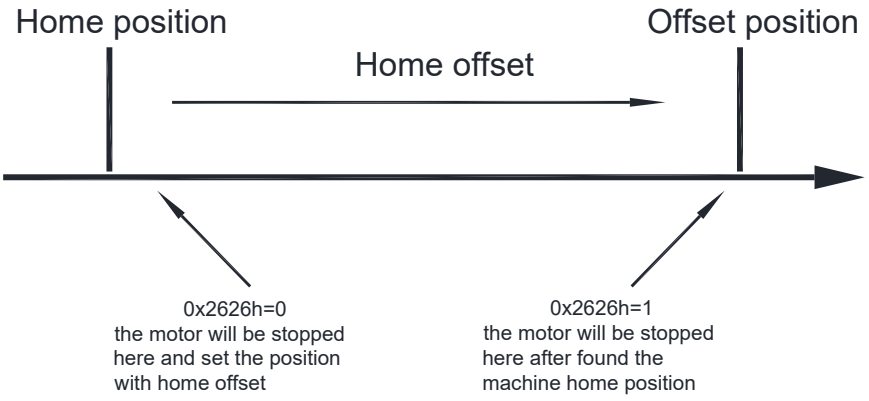
NOTE: This function is only effective when Homing Method is 1~35.

Set the value to 0:

The motor will be stopped on machine home position and the current position value is the home offset.

Set the value to 1:

The motor will moving with a distance that home offset provided after the machine home position has found. The new position is the offset position.



4.2.5 Motion control profile for Dual axis

	Index		Sub	Name	Access	Type	Mapping
	Axis1	Axis2					
CoE	0x603F	0x683F	-	Error code	RO	UINT16	YES
	0x6040	0x6840	-	Controlword	WO	UINT16	YES
	0x6041	0x6841	-	Statusword	RO	UINT16	YES
	0x605A	0x685A	-	Quick stop option code	RW	INT16	NO
	0x605B	0x685B	-	Shut down option code	RW	INT16	NO
	0x605C	0x685C	-	Disable operation option code	RW	INT16	NO
	0x605D	0x685D	-	Halt option code	RW	INT16	NO
	0x605E	0x685E	-	Fault reaction code	RW	INT16	NO
	0x6060	0x6860	-	Modes of operation	WO	INT8	YES
	0x6061	0x6861	-	Modes of operation display	RO	INT8	YES
	0x6064	0x6864	-	Position actual value	RO	INT32	YES
	0x6065	0x6865	-	Following error window	RW	UINT32	NO
	0x606C	0x686C	-	Velocity actual value	RO	INT32	YES
	0x6071	0x6871	-	Target torque	RW	INT16	YES
	0x6073	0x6873	-	Max current	RW	UINT16	YES
	0x6074	0x6874	-	Torque demand	RO	INT16	YES
	0x6077	0x6877	-	Torque actual value		INT	YES
	0x6078	0x6878	-	Current actual value	RO	INT16	YES
	0x607A	0x687A	-	Target position	RW	INT32	YES
	0x607C	0x687C	-	Home offset	RW	INT32	YES
	0x607D	0x687D	-	Software position limit	-	-	-
			1	Min position limit	RW	DINT	NO
			2	Max position limit	RW	DINT	NO
	0x607E	0x687E	-	Polarity	RW	UINT8	YES
	0x607F	0x687F	-	Max profile velocity	RW	UINT32	YES
	0x6081	0x6881	-	Profile velocity	RW	UINT32	YES
	0x6083	0x6883	-	Profile acceleration	RW	UINT32	YES
	0x6084	0x6884	-	Profile deceleration	RW	UINT32	YES
	0x6085	0x6885	-	Quick stop deceleration	RW	UINT32	YES
	0x6087	0x6887	-	Torque slope	RW	UINT32	YES
	0x6098	0x6898	-	Homing method	RW	INT8	YES
	0x6099	0x6899	-	Homing speed	-	ARRAY	-
			1	Search switch	RW	UDINT	YES
			2	Search zero	RW	UDINT	YES
	0x609A	0x689A	-	Homing acceleration	RW	UDINT32	YES
	0x60B0	0x68B0		Position offset	RW	DINT32	YES
	0x60B1	0x68B1	-	Velocity offset	RW	DINT	YES
	0x60B2	0x68B2		Torque offset	RW	DINT	YES
	0x60B8	0x68B8		Touch probe function	RW	UINT	YES
	0x60B9	0x68B9		Touch probe status	RO	UINT	YES
	0x60BA	0x68BA		Touch probe pos1 pos value	RO	DINT	YES
	0x60BB	0x68BB		Touch probe pos1 neg value	RO	DINT	YES

	Index		Sub	Name	Access	Type	Mapping
	Axis1	Axis2					
CoE	0x60E0	0x68E0		Positive torque limit value	RW	UINT	YES
	0x60E1	0x68E1	-	Negative torque limit value	RW	UINT	YES
	0x60F4	0x68F4	-	Following error actual value	RO	DINT	YES
	0x60FD	0x68FD	-	Digital inputs	RO	UDINT	YES
	0x60FE	0x68FE	2	Digital outputs	-	ARRAY	NO
			1	Physical outputs	RW	UDINT	YES
			2	Bit mask	RW	UDINT	NO
	0x60FF	0x68FF	-	Target velocity	RW	DINT	YES
	0x6502	0x6D02	-	Supported drive modes	RO	UDINT	NO

0x603F / 0x683F Error code

The error code captures the alarm code of the last error that occurred in the drive.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x603F	0x683F	-	Error code	UINT	RO	YES	-

Each bit in code indicate one type alarm or faults status.

Error Code	Description
0x7500	EtherCAT Communication Error
0xFF01	***Over Current***
0xFF02	***Over Voltage***
0xFF03	***Over Temperature***
0xFF04	***Open Motor Winding***
0xFF05	***Internal Voltage Bad***
0xFF06	***Position limit***
0xFF07	***Encoder bad***
0xFF08	***Fc position limit***
0xFF09	***Fc encoder bad***
0xFF0A	***Regen failed***
0xFF0B	***STO***
0xFF0C	***E-stop error***
0xFF31	CW Limit
0xFF32	CCW Limit
0xFF33	***CCW CW limit***
0xFF34	***Current limit***
0xFF35	Move When Disable
0xFF36	Voltage Low
0xFF37	Qprogram Blank
0xFF41	Save Failed
0xFF42	Xmlread Failed
0xFFFF	Other Error

0x6040 / 0x6840 Controlword

This object shall indicate the received command controlling the PDS FSA. The bits 7, 3, 2, 1, and 0 shall be supported. The bits 0 to 9 shall be supported according to the mode of operation. If the related functionality is not available, an appropriate emergency message shall be generated. The manufacturer-specific bits may be supported.

All implemented bits of the controlword are valid independent of the PDS FSA state. Starting of any movement is operation mode specific and is described in the related clause.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6040	0x6840	-	Controlword	RW	UINT	YES	-

The bits of the controlword are defined as follows:

15 11	10 9	8	7	6 4	3	2	1	0
manufacturer specific	reserved	halt	Fault reset	Operation mode specific	Enable operation	Quick stop	Enable voltage	Switch on
O	O	O	M	O	M	M	M	M

MSB LSB

0 - Optional M - Mandatory

0x6041 / 0x6841 Statusword

The status word indicates the current state of the drive. No bits are latched. The status word consist of bits for:

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6041	0x6841	-	Statusword	RO	UINT	YES	-

The bits of the statuslword are defined as follows:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
ms		oms		ila	tr	rm	ms	w	sod	qs	ve	f	oe	so	rtso

Key:

ms	manufacturer specific
oms	operation mode specific
ila	internal limit active
tr	target reached
rm	remote
w	warning
sod	switch on disabled
qs	quick stop
ve	voltage enabled
f	fault
oe	operation enabled
so	switched on
rtso	ready to switch on

statusword(6041h)	PDS FSA state
xxxx xxxx x0xx 0000	Not ready to switch on
xxxx xxxx x1xx 0000	Switch on disabled
xxxx xxxx x01x 0001	Ready to switch on
xxxx xxxx x01x 0011	Switch on
xxxx xxxx x01x 0111	Operation enabled
xxxx xxxx x00x 0111	Quick stop active
xxxx xxxx x0xx 1111	Fault reaction active
xxxx xxxx x0xx 1000	Fault

0x605A / 0x685A Quick stop option code

The parameter quick stop option code determines what action should be taken if the Quick Stop Function is executed.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605A	0x685A	-	Quick stop option code	RW	INT	NO	-

Quick stop option code	Action
-32768…-1	Manufacturer Specific
0	Disable drive function
1	Slow down on slow down ramp and transit into switch on disabled
2	Slow down on quick stop ramp and transit into switch on disabled
3	Slow down on the current limit and transit into switch on disabled
4	Slow down on the voltage limit and transit into switch on disabled
5	Slow down on slow down ramp and stay in quick stop active
6	Slow down on quick stop ramp and stay in quick stop active
7	Slow down on slow current limit and stay in quick stop active
8	Slow down on voltage limit and stay in quick stop active
9…32767	Reserved

It is only supported of option code 1 and 2 feature at this moment.

0x605B / 0x685B Shutdown option code

This object shall indicate what action is performed if there is a transition from operation enabled state to ready to switch on state. The slow down ramp is the deceleration value of the used mode of operations.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605B	0x685B	-	Shutdown option code	RW	INT	NO	-

Value	Action
-32768…-1	Manufacturer Specific
0	Disable drive function(switch-off drive power stage)
1	Slow down on slow down ramp disable of the drive function
2…32767	Reserved

0x605C / 0x685C Disable operation option code

This object shall indicate what action is performed if there is a transition from operation enabled state to switched on state. The slow down ramp is the deceleration value of the used mode of operations.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605C	0x685C	-	Disable operation option code	RW	INT	NO	-

Value	Action
-32768···-1	Manufacturer Specific
0	Disable drive function(switch-off drive power stage)
1	Slow down on slow down ramp and then disable of the drive function
2···32767	Reserved

0x605D / 0x685D Halt option code

This object shall indicate what action is performed when the halt function is executed. The slow down ramp is the deceleration value of the used mode of operations.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605D	0x685D	-	Halt option code	RW	INT	NO	-

Value	Action
-32768···-1	Manufacturer Specific
0	Reserved
1	Slow down on slow down ramp and stay in operation enabled
2	Slow down on quick stop ramp and stay in operation enabled
3	Slow down on current limit and stay in operation enabled
4	Slow down on voltage limit and atay in operation enabled
5 + 32767	Reserved

0x605E / 0x685E Fault reaction option code

This object shall indicate what action is performed when fault is detected in the PDS. The slow down ramp is the deceleration value of the used mode of operations.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x605E	0x685E	-	Fault reaction option code	RW	INT	NO	-

Value	Action
-32768···-1	Manufacturer Specific
0	Disable drive function, motor is free t rotate
1	Slow down on slow down ramp
2	Slow down on quick stop ramp
3	Slow down on current limit
4	Slow down on voltage limit
5 + 32767	Reserved

0x6060 / 0x6860 Mode of operation

The parameter modes of operation switches the actually chosen operation mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6060	0x6860	-	Mode of operation	RW	SINT	NO	-

Mode of operation	Value
Profile position mode	1
Profile velicuty mode	3
Profile Torque mode	4
Homing mode	6
Cynclic synchronous position mode	8
Cynclic synchronous velocity mode	9
Q mode(manufacturer specific mode)	-1

0x6061 / 0x6861 Mode of operation display

The modes of operation display shows the current mode of operation. The meaning of the returned value corresponds to that of the modes of operation option code (index 6060h).

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6061	0x6861	-	Modes of operation display	RO	SINT	YES	-

0x6064 / 0x6864 Position actual value

This object represents the actual value of the position.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6064	0x6864	-	Position actual value	RO	DINT	YES	-

0x6065 / 0x6865 Following error window

The following error window defines a range of tolerated position values symmetrically to the position demand value. It is the position fault limit in encoder counts. As it is in most cases used with user defined units, a transformation into increments with the position factor is necessary. If the position actual value is out of the following error window, a following error occurs

A following error might occur when:

• A drive is blocked

• Unreachable profile velocity occurs

• At wrong closed loop coefficients

If the value of the following error window is 0 ,the following control is switched off.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6065	0x6865	-	Following error window	RW	UDINT	NO	-

0x606C / 0x686C Velocity actual value

The velocity actual value is also represented in velocity units and is coupled to the velocity used as input to the velocity controller.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x606C	0x686C	-	Velocity actual value	RO	DINT	YES	-

The unit of this object is in counts/s.

0x6071 / 0x6871 Target torque

This parameter is the input value for the torque controller in profile torque mode and the value is given per thousand of rated torque. The units should be mN·m.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6071	0x6871	-	Target torque	RW	INT	YES	-

This object only can be accessed in StepSERVO drives and this object parameters is related to the other torque values, such as current actual value (index 0x6078) and torque constant (index 0x2216).

0x6073 / 0x6873 Max current

This value represents the maximum permissible torque creating current in the motor.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6073	0x6873	-	Max current	RW	UINT	NO	-

If the reading value is 100 that means 1.00Amps.

0x6074 / 0x6874 Torque demand

This parameter is the output value of the torque limit function (if the torque control and power-stage function are available).

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6074	0x6874	-	Torque demand value	RO	INT	YES	-

This object is only available on Step-Servo drives and the unit of this object is mNm.

0x6077 / 0x6877 torque actual value

This object shall provide the actual value of the torque. It shall correspond to the instantaneous torque in the motor.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6077	0x6877	-	Torque actual value	RO	INT	YES	-

0x6078 / 0x6878 Current actual value

This object shall provide the actual value of the current. It shall correspond to the current in the motor.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6078	0x6878	-	Current actual value	RO	INT	YES	-

This object is only available on Step-Servo drives and the unit of object is 0.01Amps.

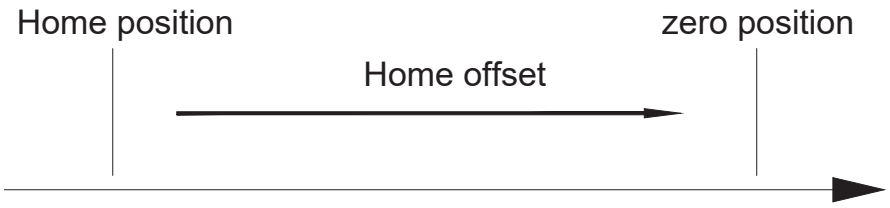
0x607A / 0x687A Target position

This object is the position that the drive should move to in position profile mode using the current settings of motion control parameters such as velocity, acceleration, deceleration, motion profile type etc. The target position is given in terms of Electrical Gear parameters steps per motor shaft revolution. The target position will be interpreted as absolute or relative depending on the ‘abs / rel' flag in the controword.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607A	0x687A	-	Target position	RW	DINT	YES	-

0x607C / 0x687C Home offset

The home offset object is the difference between the zero position for the application and the machine home position (found during homing), it is measured in position units. During homing the machine home position is found and once the homing is completed the zero position is offset from the home position by adding the home offset to the home position. All subsequent absolute moves shall be taken relative to this new zero position. This is illustrated in the following diagram.

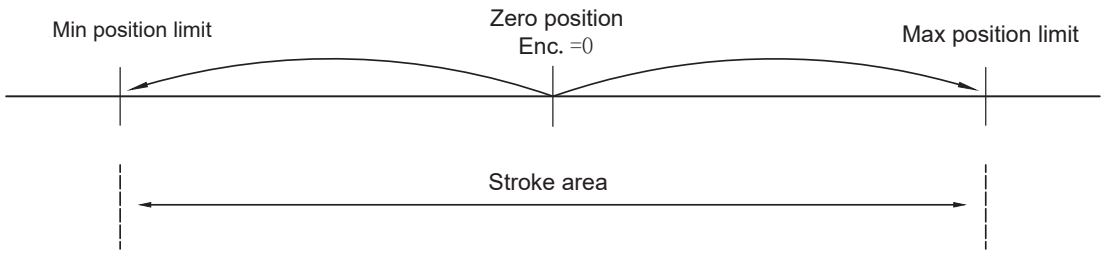


Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607C	0x687C	-	Home offset	RW	DINT	YES	-

0x607D / 0x687D Software position limit

This object shall indicate the configured maximal and minimal software position limits. These parameters shall define the absolute position limits for the position demand value and the position actual value as specified in below.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607D	0x687D	0	Number of sub-index	RW	USINT8	NO	2
		1	Min position limit	RW	DINT	NO	-
		2	Max position limit	RW	DINT	NO	-



0x607E / 0x687E Polarity

Position demand value and position actual value are multiplied by 1 or -1 depending on the value of the polarity flag. PP PV Mode.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607E	0x687E	-	Polarity	RW	USINT	YES	-

7	6	5	4	3	2	1	0
Position Polarity	Velocity Polarity	Reserved					

MSB LSB

Value	Description
0	Multiply by 1
1	Multiply by -1

0x607F / 0x687F Max profile speed

The max profile velocity is the maximum allowed speed in either direction during a profiled move. It is given in the same units as profile velocity.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x607F	0x687F	-	Max profile speed	RW	UDINT	YES	-

The unit of this object is in counts/s.

0x6081 / 0x6881 Profile velocity

The profile velocity is the velocity normally attained at the end of the acceleration ramp during a profiled move and is valid for both directions of motion.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6081	0x6881	-	Profile velocity	RW	UDINT	YES	-

The unit of this object is in counts/s.

0x6083 / 0x6883 Profile acceleration

The profile acceleration is given in counts/s^2. It is converted to position increments per second2 using the normalizing factors.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6083	0x6883	-	Profile acceleration	RW	UDINT	YES	-

0x6084 / 0x6884 Profile deceleration

The profile deceleration is given in the same units as profile acceleration.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6084	0x6884	-	Profile deceleration	RW	UDINT	YES	-

0x6085 / 0x6885 Quick stop deceleration

The quick stop deceleration is the deceleration used to stop the motor if the ‘Quick Stop’ command is given and the quick stop option code (see 605Ah) is set to 2. The quick stop deceleration is given in the same units as the profile acceleration.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6085	0x6885	-	Quick stop deceleration	RW	UDINT	NO	-

0x6087 / 0x6887 Torque slope

This parameter describes the rate of change of torque in units of per thousand of rated torque per second.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6087	0x6887	-	Torque slope	RW	UDINT	YES	-

The units is Nm/s.

0x6098 / 0x6898 Home method

The homing method object determines the method that will be used during homing.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6098	0x6898	-	Home method	RW	SINT	YES	-

Value	Description
128	manufacturer specific
0	No homing operation required
1…37	Methods 1 to 37
38-127	Reserved

0x6099 / 0x6899 Homing speed

This entry in the object dictionary defines the speeds used during homing.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6099	0x6899	-	Number of sub-index	RW	USINT8	NO	2

The value shall be given in counts/s.

0x609A / 0x689A Homing acceleration

该对象定义了回原点加速度，在标准回原点模式下，该对象同时用在加速度和减速度下。

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x609A	0x689A	-	Homing acceleration	RW	UDINT	YES	-

The value shall be given in counts/s.

0x60B0 / 0x68B0 Position offset

This object shall provide the offset of the target position.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B0	0x68B0	-	Position offset	RW	DINT	YES	-

0x60B1 / 0x68B1 Velocity offset

This object shall provide the offset for the velocity value. In cyclic synchronous position mode, this object contains the input value for velocity feed forward. In cyclic synchronous velocity mode, it contains the commanded offset of the drive device.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B1	0x68B1	-	Velocity offset	RW	DINT	YES	-

0x60B2 / 0x68B2 Torque offset

This object shall provide the offset for the torque value. In cyclic synchronous position mode and cyclic synchronous velocity mode, this object contains the input value for torque feed forward. In cyclic synchronous torque mode. it contains the commanded additive torque of the drive, which is added to the target torque value.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B2	0x68B2	-	Torque offset	RW	INT	YES	-

0x60B8 / 0x68B8 Touch probe function

This object shall indicate the configured function of the touch probe.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B8	0x68B8	-	Touch probe function	RW	UINT	YES	-

Bit	Value	Definition
0	0	Swith off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continous
3,2	00	Trigger with touch probe 1 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index01
	11	Reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negtive edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6,7	-	Reserved
8	0	Swith off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	Continous
11,10	00	Trigger with touch probe 2 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index02
	11	Reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negtive edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14,15	-	Reserved

0x60B9 / 0x68B9 Touch probe status

This object shall provide the status of the touch probe.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60B9	0x68B9	-	Velocity offset	RW	DINT	YES	-

Bit	Value	Definition
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3...7	-	Reserved
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe 2 negative edge position stored
11...15	-	Reserved

0x60BA / 0x68BA Touch probe 1 positive edge

This object shall provide the position value of the touch probe 1 at positive edge.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60BA	0x68BA	-	Touch probe 1 positive edge	RO	DINT	YES	-

0x60BB / 0x68BB Touch probe 1 negative edge

This object shall provide the position value of the touch probe 1 at negative edge.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60BB	0x68BB	-	Touch probe 1 negative edge	RO	DINT	YES	-

0x60E0 / 0x68E0 Positive torque limit value

This object shall indicate the configured maximum positive torque in the motor. Positive torque takes effect in the case of motive operation is positive velocity or regenerative operation is negative velocity.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60E0	0x68E0	-	Positive torque limit value	RW	UINT	YES	-

0x60E1 / 0x68E1 Negative torque limit value

This object shall indicate the configured maximum negative torque in the motor. Negative torque takes effect in the case of motive operation is negative velocity or regenerative operation is positive velocity.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60E1	0x68E1	-	Positive torque limit value	RW	UINT	YES	-

0x60F4 / 0x68F4 Follow error actual value

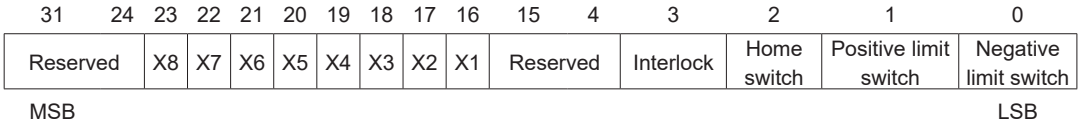
This object shall provide the actual value of the following error.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60F4	0x68F4	-	Follow error actual value	RO	DINT	YES	-

0x60FD / 0x68FD Digital inputs

This object shall provide digital inputs. This object shall represent the logical input levels.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60FD	0x68FD	-	Digital inputs	RO	UDINT	YES	-



Bit 3 (interlock) provides the state of the interlock input. If the logical input signal changes to not activated, the drive shall enter the switch on disabled or fault reaction active state. This means the power stage of the drive is disabled and locked against switching on.

0x60FE / 0x68FE Digital outputs

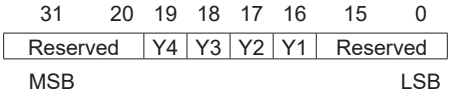
This object shall command the digital outputs. This object shall represent the logical output levels.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60FE	0x68FE	0	Number of sub-index	RW	USINT8	NO	2
		1	Physical outputs	RW	UDINT	YES	-
		2	Bit mask	RW	UDINT	NO	-

The first sub-index defines the assigned outputs. The second sub-index describes a mask to specify which of the outputs shall be used.

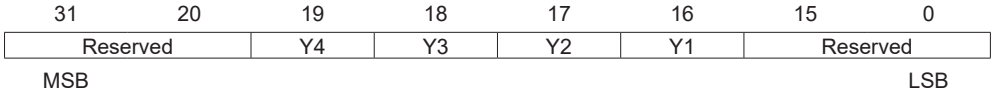
Note: the second sub-index are edge triggered, you must set the second sub-index first and then set the bit of first sub-index for change the status of output.

Physical outputs:



Field	Value	Definition
Each bit	0 1	Switch off Switch on

Bit mask:



Field	Value	Definition
Each bit	0 1	Disable output Enable output

0x60FF / 0x68FF Target velocity

This object shall indicate the configured target velocity and shall be used as input for the trajectory generator. The value shall be given in counts/s.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x60FF	0x68FF	-	Target velocity	RW	DINT	YES	-

0x6502 / 0x6D02 Supported drive modes

This object shall provide information on the supported drive modes.

Index		Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2						
0x6502	0x6D02	-	Supported drive modes	RO	UDINT	NO	-

31 16	15 11	10	9	8	7	6	5	4	3	2	1	0
Reserved	Reserved	CSTCA	CST	CSV	CSP	IP	HM	R	TQ	PV	VL	PP
MSB												LSB

The supported mode in Moons' EtherCAT drive:

- Bit0: Profile Position Mode
- Bit2: Profile Velocity Mode
- Bit3: Profile Torque Mode (StepSERVO)
- Bit5: Homing Mode
- Bit7: CSP
- Bit8: CSV

4.3 Communication profile for Four axis

4.3.1 CoE(1000h) Profile

	Index	Sub	Name	Access	Type	Mapping
CoE(1000h)	0x1000	-	Device type	RO	UDINT	NO
	0x1001	-	Error register	RO	USINT	NO
	0x1008	-	Device name	RO	STRING(20)	NO
	0x1009	-	Manufacturer hardware version	RO	STRING(4)	NO
	0x100A	-	Manufacturer software version	RO	STRING(4)	NO
	0x1010	-	Store parameters	-	-	-
		1	Store all parameters	RW	UDINT	NO
	0x1011	-	Restore default parameters	-	-	-
		1	Restore default parameters	RW	UDINT	NO
	0x1018	-	Identity object	-	-	-
		1	Vendor ID	RO	UDINT	NO
		2	Product code	RO	UDINT	NO
		3	Revision	RO	UDINT	NO
		4	Serial number	RO	UDINT	NO
	0x10F1	-	Error settings	-	-	-
		1	Local error reaction	RW	UDINT	NO
		2	Sync error counter limit	RW	UINT	NO

	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
CoE	0x1600~1603	0x1610~1613	0x1620~1623	0x1630~1633	8	RPDO mapping parameter 1~4	-	-	-
					1	Mapping entry 1	RW	UDINT	NO
					2	Mapping entry 2	RW	UDINT	NO
					...	...	RW	UDINT	NO
					12	Mapping entry 12	RW	UDINT	NO
	0x1A00~1A03	0x1A10~1A13	0x1A20~1A23	0x1A30~1A33	-	TPDO mapping parameter1~4	-	-	-
					1	Mapping entry 1	RW	UDINT	NO
					2	Mapping entry 2	RW	UDINT	NO
					...	...	...	...	-
					12	Mapping entry 12	RW	UDINT	NO

	Index	Sub	Name	Access	Type	Mapping
CoE(1000h)	0x1C00	-	SYNC manager type	-	-	-
		1	SM0 communication type	RO	USINT	NO
		2	SM1 communication type	RO	USINT	NO
		3	SM2 communication type	RO	USINT	NO
		4	SM3 communication type	RO	USINT	NO
	0x1C12~1C13	-	RxPDO~TxPDO assign	-	-	-
		1	RxPDO~TxPDO 1 mapping object	RW	UINT	NO
		2	RxPDO~TxPDO 2 mapping object	RW	UINT	NO
		3	RxPDO~TxPDO 3 mapping object	RW	UINT	NO
		4	RxPDO~TxPDO 4 mapping object	RW	UINT	NO
	0x1C32~1C33	-	SM output~input parameter	-	-	-
		1	Synchronization type	RW	UINT	NO
		2	Cycle time	RO	UDINT	NO
		3	Shift time	RW	UDINT	NO
		4	Synchronization types supported	RO	UINT	NO
		5	Minimum cycle time	RO	UDINT	NO
		6	Calc and copy time	RO	UDINT	NO
		8	Get cycle time	RW	UINT	NO
		9	Delay time	RO	UDINT	NO
		10	Sync0 cycle time	RW	UDINT	NO
		11	SYNC-Event missed	RO	UINT	NO
		12	Cycle time too small	RO	UINT	NO
		32	Sync error	RO	BOOL	NO

0x1000 Device type

Contains information about the device type. The object at index 1000h describes the type of device and its functionality. It is composed of a 16-bit field which describes the device profile that is used and a second 16-bit field which gives additional information about optional functionality of the device. The Additional Information parameter is device profile specific. Its specification does not fall within the scope of this document, it is defined in the appropriate device profile. The value 0000h indicates a device that does not follow a standardized device profile.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1000	-	Device type	UDINT32	RO	NO	-

Bit 0-15: Device profile number
Bit 16-31: Additional information

0x1001 Error register

This object is an error register for the device. The device can map internal errors in this byte. This entry is mandatory for all devices. It is a part of an Emergency object.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1001	-	Error register	USINT8	RO	NO	-

Bit 0: generic error
Bit 1: current
Bit 2: voltage
Bit 3: temperature
Bit 4: communication error (overrun, error state)
Bit 5-7: Reserved (always 0)

0x1008 Manufacturer device name

Contains the manufacturer device name.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1008	-	Manufacturer device name	STRING(20)	CONST	NO	-

Name of the manufacturer as string.

0x1009 Hardware version

Contains the hardware version description.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1009	-	Hardware version	STRING(4)	CONST	NO	-

0x100A Software version

Contains the software version description.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x100A	-	Software version	STRING(4)	CONST	NO	-

0x1010 Store parameters

This object supports the saving of parameters in non-volatile memory. By read access the device provides information about its saving capabilities. Several parameter groups are distinguished:

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1010	0	Number of sub-index	USINT8	RO	NO	1
	1	Store parameters	UDINT32	RW	NO	0

In order to avoid storage of parameters by mistake, storage is only executed when a specific signature is written to the appropriate Sub-Index 1. The signature is “save”.

	MSB			LSB
Signature ISO	e	v	a	s
8859("ASCII")hex	65h	76h	61h	73h

Storage write access signature

0x1011 Restore default parameters

With this object the default values of parameters according to the communication or device profile are restored.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1011	0	Number of sub-index	USINT8	RO	NO	1
	1	Restore parameters	UDINT32	RW	NO	0

In order to avoid storage of parameters by mistake, storage is only executed when a specific signature is written to the appropriate Sub-Index 1. The signature is "load".

	MSB			LSB
Signature ISO	e	v	a	s
8859("ASCII")hex	64h	61h	6Fh	6Ch

Storage write access signature

0x1018 Identity object

The object at index 1018h contains general information about the device.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1018	0	Number of sub-index	USINT8	RO	NO	4
	1	Vendor-ID	UDINT32	RO	NO	-
	2	Product code	UIDINT32	RO	NO	-
	3	Revision number	UDINT32	RO	NO	-
	4	Serial number	UDINT32	RO	NO	-

0x10F1 Error settings

Reserved.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x10F1	0	Number of sub-index	USINT8	RO	NO	4
	1	Local error reaction	UDINT32	RW	NO	1
	2	SYNC error counter limit	UIDINT32	RW	NO	4

0x1600~1603 / 0x1610~1613 / 0x1620~1632 / 0x1630~1633 Axis Receive PDO mapping parameter

Contains the mapping for the PDOs the device is able to receive.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x1600-1603	0x1610-1613	0x1620-1623	0x1630-1633	0	Number of sub-index	USINT8	RW	NO	4
				1	Mapping entry 1	UDINT32	RW	NO	-
				2	Mapping entry 2	UIDINT32	RW	NO	-
				3	Mapping entry 3	UDINT32	RW	NO	-
				4	Mapping entry 4	UDINT32	RW	NO	-
				5	Mapping entry 5	UDINT32	RW	NO	-
				6	Mapping entry 6	UDINT32	RW	NO	-
				7	Mapping entry 7	UDINT32	RW	NO	-
				8	Mapping entry 8	UDINT32	RW	NO	-
				9	Mapping entry 9	UDINT32	RW	NO	-
				10	Mapping entry 10	UDINT32	RW	NO	-
				11	Mapping entry 11	UDINT32	RW	NO	-
				12	Mapping entry 12	UDINT32	RW	NO	-

0x1A00~1A03 / 0x1A10~1A13 / 0x1A20~1A23 / 0x1A30~1A33 Axis Transmit PDO mapping parameter

Contains the mapping for the PDOs the device is able to transmit.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x1A00-1A03	0x1A10-1A13	0x1A20-1A23	0x1A30-1A33	0	Number of sub-index	USINT8	RW	NO	12
				1	Mapping entry 1	UDINT32	RW	NO	-
				2	Mapping entry 2	UIDINT32	RW	NO	-
				3	Mapping entry 3	UDINT32	RW	NO	-
				4	Mapping entry 4	UDINT32	RW	NO	-
				5	Mapping entry 5	UDINT32	RW	NO	-
				6	Mapping entry 6	UDINT32	RW	NO	-
				7	Mapping entry 7	UDINT32	RW	NO	-
				8	Mapping entry 8	UDINT32	RW	NO	-
				9	Mapping entry 9	UDINT32	RW	NO	-
				10	Mapping entry 10	UDINT32	RW	NO	-
				11	Mapping entry 11	UDINT32	RW	NO	-
				12	Mapping entry 12	UDINT32	RW	NO	-

0x1C00 Sync manager type

The sync manager communication type set the communication type of each SM manager. The type of communication that:

1. Mailbox reception
2. Mailbox sending
3. RxPDO
4. TxPDO

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C00	0	Number of sub-index	USINT8	RW	NO	4
	1	SM0 communication type	UDINT32	RW	NO	1
	2	SM1 communication type	UIDINT32	RW	NO	2
	3	SM2 communication type	UDINT32	RW	NO	3
	4	SM3 communicaiton type	UDINT32	RW	NO	4

0x1C12 RxPDO assign object

The sync manager of RxPDO allocation, sub-indx1-4 set to the index of mapping.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C12	0	Number of sub-index	USINT8	RW	NO	1
	1	RxPDO1 mapping object	UDINT32	RW	NO	0x1600
	2	RxPDO2 mapping object	UIDINT32	RW	NO	-
	3	RxPDO3 mapping object	UDINT32	RW	NO	-
	4	RxPDO4 mapping object	UDINT32	RW	NO	-

0x1C13 TxPDO assign object

The sync manager of TxPDO allocation, sub-indx1-4 set to the index of mapping.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C13	0	Number of sub-index	USINT8	RW	NO	1
	1	TxPDO1 mapping object	UDINT32	RW	NO	0x1A00
	2	TxPDO2 mapping object	UIDINT32	RW	NO	-
	3	TxPDO3 mapping object	UDINT32	RW	NO	-
	4	TxPDO4 mapping object	UDINT32	RW	NO	-

0x1C32 SM output parameter

The SYNC manager parameter.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C32	0	Number of sub-index	USINT8	RO	NO	32
	1	Synchronization type	UINT16	RW	NO	2
	2	Cycle time	UDINT32	RO	NO	0
	3	Shift time	UDINT32	RW	NO	0
	4	Synchronization types supported	UDINT32	RO	NO	0x401F
	5	Minimum cycle time	UDINT32	RO	NO	0x7A120
	6	Calc and copy time	UINT16	RW	NO	0
	8	Get cycle time	UINT	RW	NO	0
	9	Delay time	UDINT	RO	NO	0
	10	Sync0 cycle time	UDINT	RW	NO	0x3D0900
	11	SM-event missed	UINT	RO	NO	0
	12	Cycle time too small	UINT	RO	NO	0
	32	Sync error	BOOL	RO	NO	false

0x1C33 SM intput parameter

The SYNC manager parameter.

Index	Sub	Name	Data Type	Access Type	PDO mapping	Default Value
0x1C33	0	Number of sub-index	USINT8	RO	NO	32
	1	Synchronization type	UINT16	RW	NO	2
	2	Cycle time	UDINT32	RO	NO	0
	3	Shift time	UDINT32	RW	NO	0
	4	Synchronization types supported	UDINT32	RO	NO	0x401F
	5	Minimum cycle time	UDINT32	RO	NO	0x7A120
	6	Calc and copy time	UINT16	RW	NO	0
	8	Get cycle time	UINT	RW	NO	0
	9	Delay time	UDINT	RO	NO	0
	10	Sync0 cycle time	UDINT	RW	NO	0x3D0900
	11	SM-event missed	UINT	RO	NO	0
	12	Cycle time too small	UINT	RO	NO	0
	32	Sync error	BOOL	RO	NO	false

4.3.2 0x2000~2100h Manufacturer profile

	Index	Sub	Name	Access	Type	Mapping
0x2000~2100h	0x2001	-	EtherCAT ID	RO	UINT16	NO
	0x2002	-	Physical Address	RO	UINT16	NO
	0x2003	-	Alias Source	RO	UINT	NO
	0x2005	-	Bus Voltage	RO	UINT16	NO
	0x2006	-	DSP Version	RO	STRING(10)	NO
	0x2007	-	Drive Temperature 1	RO	UINT	NO
	0x2010	-	Set EtherCAT ID	RW	UINT	NO

	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
0x2000~2100h	0x2020	0x2040	0x2060	0x2080	-	Axis Output Status	RO	UDINT	NO
	0x2021	0x2041	0x2061	0x2081	-	Axis DSP Status Code	RO	UINT32	YES
	0x2022	0x2042	0x2062	0x2082	-	Axis DSP Alarm Code	RO	UINT32	YES

0x2001 EtherCAT ID

This object contains the EtherCAT ID of drives.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2001	-	EtherCAT ID	RO	UINT	NO	-

0x2002 Physical Address

This object contains the physical address of drives.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2002	-	Physical address	RO	UINT	NO	-

0x2003 Alias Source

This object is used to set the methold of EtherCAT address setting. The value is 0 means that set by software, 1 means set by the EtherCAT master.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2003	-	Alias Source	RO	UINT	NO	-

0x2005 Bus Voltage

This object shall provide the present value of drive's DC bus voltage.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2005	-	Bus Voltage	RO	UINT	NO	-

0x2006 DSP Version

This object shall provide the DSP version of the drive.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2006	-	DSP Version	RO	UINT	NO	-

0x2007 Drive Temperature 1

This object contains the information of device temperature.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2007	-	Drive Temperature 1	RO	UINT	NO	0

The unit of this object is in 0.1 centigrade.

0x2010 Set EtherCAT ID

This object contains the EtherCAT ID of drives.

Index	Sub	Name	Access Type	Data Type	PDO mapping	Default Value
0x2010	-	Set EtherCAT ID	RW	UINT	NO	0

0x2020 / 0x2040 / 0x2060 / 0x2080 Axis Output Status

This object shall indicate the digital output status.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2020	0x2040	0x2060	0x2080	-	Axis Output Status	RO	UDINT	NO	0x000F0000

Bit	31 ~ 20	19	18	17	16	15 ~ 0
Output	Reserved	Y4	Y3	Y2	Y1	Reserved

0x2021 / 0x2041 / 0x2061 / 0x2081 Axis DSP Status Code

This object represents the current status code of the drive.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2021	0x2041	0x2061	0x2081	-	Axis 1 DSP Status Code	RO	UDINT	YES	-

BIT	Status Code Bit Definition
0	Motor Enabled - motor disabled is this bit = 0
1	Sampling - for Quick Tuner
2	Drive Fault - check alarm code
3	In Position - motor is in position
4	Moving - motor is moving
5	Jogging - currently in jog mode
6	Stopping - in the process of stopping from a stop command
7	Waiting - for an input
8	Saving - parameter data is being saved
9	Alarm present - check alarm code
10	Homing - executing an SH command
11	Wait Time - executing a WT command
12	Wizard running - timing wizard is running
13	Checking encoder - timing wizard is running
14	Q Program is running
15	Initializing

0x2022 / 0x2042 / 0x2062 / 0x2082 Axis DSP Alarm Code

This object shall indicate the high 16bit field of alarm code about the object at 0x603F.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2022	0x2042	0x2062	0x2082	-	Axis DSP Alarm Code	RO	UDINT	YES	-

4.3.3 Manufacturer parameter for Dual axis Step-Servo

	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
0x3200~ 4000h	0x3200	0x3400	0x3600	0x3800	-	Continuous current	RW	UINT	NO
	0x3201	0x3401	0x3601	0x3801	-	Peak current	RW	UINT	NO
	0x3202	0x3402	0x3602	0x3802	-	Hard stop current limit	RW	UINT	NO
	0x3203	0x3403	0x3603	0x3803	-	Idle current	RW	UINT	NO
	0x3204	0x3404	0x3604	0x3804	-	Idle current delay time	RW	UINT	NO
	0x3205	0x3405	0x3605	0x3805	-	Acceleration current	RW	UINT	NO
	0x3206	0x3406	0x3606	0x3806	-	Stall prevention time	RW	UINT	NO
	0x3207	0x3407	0x3607	0x3807	-	Steps per rev	RO	UINT	NO
	0x3208	0x3408	0x3608	0x3808	-	Reverse motor direction	RW	UINT	NO
	0x3209	0x3409	0x3609	0x3809	-	Powerup probing	RW	UINT	NO
	0x320B	0x340B	0x360B	0x380B	-	Fault output on Y1	RW	UINT	NO
	0x320C	0x340C	0x360C	0x380C	-	Brake Output on Y2	-	-	-
					1	Brake Output	RW	UINT	NO
					2	Brake Disengage Delay	RW	UINT	NO
					3	Brake Engage Delay			
	0x320D	0x340D	0x360D	0x380D	-	Motion Output	-	-	-
					1	Motion Output on Y1	RW	UINT	NO
					2	Motion Output on Y2	RW	UINT	NO
					3	Motion Output on Y3	RW	UINT	NO
					4	Motion Output on Y4			
	0x320F	0x340F	0x360F	0x380F	-	Define limits	RW	UINT	NO
	0x3210	0x3410	0x3610	0x3810	-	Inputs filter	-	-	-
					1	Inputs filter X1 filter time	RW	UINT	NO
					2	Inputs filter X2 filter time	RW	UINT	NO
					...	...	...	...	...
					8	Inputs filter X8 filter time	RW	UINT	NO
	0x3211	0x3411	0x3611	0x3811	-	Notch filter	-	-	-
					1	Notch filter_paraA	RW	INT	NO
					2	Notch filter_paraB	RW	INT	NO
					...	...	...	...	...
					8	Notch filter_paraH	RW	INT	NO
	0x3212	0x3412	0x3612	0x3812	-	Analog configuration	-	-	-
					1	Analog deadband	RW	UINT	NO
					2	Analog offset vallue	RW	UINT	NO
					3	Analog filter	RW	UINT	NO
					4	Analog threshold	RW	UINT	NO
					5	Analog scaling	RW	UINT	NO
	0x3213	0x3413	0x3613	0x3813	-	Analog auto zero	RW	UINT	NO
	0x3214	0x3414	0x3614	0x3814	-	Operation mode	RW	UINT	NO
	0x3215	0x3415	0x3615	0x3815	-	Jog mode	RW	UINT	NO
	0x3216	0x3416	0x3616	0x3816	-	Torque constant	RW	UINT	NO

	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
0x3200~ 4000h	0x3218	0x3418	0x3618	0x3818	-	Encoder resolution	RO	UINT	NO
	0x3220	0x3420	0x3620	0x3820	-	Position gain	RW	UINT	NO
	0x3221	0x3421	0x3621	0x3821	-	Positionderi gain	RW	UINT	NO
	0x3222	0x3422	0x3622	0x3822	-	Positionderi filter	RW	UINT	NO
	0x3224	0x3424	0x3624	0x3824	-	Velocity gain	RW	UINT	NO
	0x3225	0x3425	0x3625	0x3825	-	Velocityinterg gain	RW	UINT	NO
	0x3226	0x3426	0x3626	0x3826	-	Accfeedforward	RW	UINT	NO
	0x3227	0x3427	0x3627	0x3827	-	PID filter	RW	UINT	NO
	0x3252	0x3452	0x3652	0x3852	-	Inposition counts	RW	UINT	NO
	0x3253	0x3453	0x3653	0x3853	-	CSP complete time	RW	UINT	NO
	0x3254	0x3454	0x3654	0x3854	-	Inposition error range	RW	UINT	NO
	0x3255	0x3455	0x3655	0x3855	-	Inposition time	RW	UINT	NO
	0x3260	0x3460	0x3660	0x3860	-	Actual current	RO	INT	NO
	0x3261	0x3461	0x3661	0x3861	-	Analog Reading	RO	INT	NO
					1	Analog Reading Value	RO	INT	YES
					2	Analog Reading Input1	RO	INT	YES
					3	Analog Reading Input2	RO	INT	YES
	0x3262	0x3462	0x3662	0x3862	-	Motor name	RO	STRING(5)	NO
	0x3265	0x3465	0x3665	0x3865	-	E-Stop on input X8	RW	UINT	NO
	0x3271	0x3471	0x3671	0x3871	-	Home switch	RW	UINT8	YES
	0x3272	0x3472	0x3672	0x3872	-	Clear alarm	WO	UINT8	YES
	0x3274	0x3474	0x3674	0x3874	-	Zero position	WO	UINT8	NO
	0x3275	0x3475	0x3675	0x3875	-	S-Curve filter time	RW	UINT	NO
	0x3276	0x3476	0x3676	0x3876	-	Move homeoffset	RW	UINT	NO
	0x3280	0x3480	0x3680	0x3880	-	User registers	-	-	-

0x3200 / 0x3400 / 0x3600 / 0x3800 Continuous current

This object is used to set the continuous (RMS) current of the Step-Servo drives.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3200	0x3400	0x3600	0x3800	-	Continuous current	RW	UINT	NO	-

0x3201 / 0x3401 / 0x3601 / 0x3801 Peak current

This object is used to set the peak (RMS) current of the Step-Servo drives.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3201	0x3401	0x3601	0x3801	-	Peak current	RW	UINT	NO	-

0x3202 / 0x3402 / 0x3602 / 0x3802 Hardstop current limit

This object is used for hard stop homing mode that setting the current when the motor hit the hard stop position.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3202	0x3402	0x3602	0x3802	-	Hardstop current limit	RW	UINT	NO	-

0x3203 / 0x3403 / 0x3603 / 0x3803 Idle current

This object configures monitors the motor holding current of the device in idle mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3203	0x3403	0x3603	0x3803	-	Idle current	RW	UINT	NO	-

If the reading value is 100. That means 1.00Amps.

0x3204 / 0x3404 / 0x3604 / 0x3804 Idle current delay time

This object is used to set the amount of time the drive will delay before transitioning from full current (CC) to idle current(CI).

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3204	0x3404	0x3604	0x3804	-	Idle current delay time	RW	UINT	NO	-

The value shall be given in second, If the reading value is 10. That means 1.0 seconds.

0x3205 / 0x3405 / 0x3605 / 0x3805 Acceleration current

This object shall provide the acceleration current when the motor is running with stepper mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3205	0x3405	0x3605	0x3805	-	Acceleration current	RW	UINT	NO	-

If the reading value is 100 that means 1.00Amps.

0x3206 / 0x3406 / 0x3606 / 0x3806 Stall prevention time

This obeject is used to set the stall prevention time.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3206	0x3406	0x3606	0x3806	-	Stall precention time	RW	UINT	NO	-

If the value is 10 means set to 0.1 second.

0x3207 / 0x3407 / 0x3607 / 0x3807 Steps per rev

This object is used to get the steps per revolution about motor.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3207	0x3407	0x3607	0x3807	-	Step per rev	RO	UINT	NO	-

The value shall be given in steps/rev.

0x3208 / 0x3408 / 0x3608 / 0x3808 Reverse motor direction

This object is used to reverse motor rotating direction.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3208	0x3408	0x3608	0x3808	-	Reverse motor direction	RW	UINT	NO	-

The value can be set to 0 - 1.
Value =0 default rotating direction
=1 reverse rotating direction

0x3209 / 0x3409 / 0x3609 / 0x3809 Powerup probing

This obejct is used to set the drive to probe when power up.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3209	0x3409	0x3609	0x3809	-	Powerup probing	RW	UINT	NO	-

Value =0 NO probing
=1 Probing

0x320B / 0x340B / 0x360B / 0x380B Fault output on Y1

This object is used to set the fault output on Y1.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x320B	0x340B	0x360B	0x380B	-	Fault output on Y1	RW	UINT	NO	-

Value =1 output Y1 is open when the driver is fault
=2 output Y1 is closed when the driver is fault
=3 output Y1 is used for general purpose

0x320C / 0x340C / 0x360C / 0x380C Brake output on Y2

This object at 0x220C is used to set the parameter of brake configuration. There has 3 sub-index to configure brake, the first is used for brake output, and the second is used for disengage delay. The last is used to set brake engage delay.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x320C	0x340C	0x360C	0x380C	-	Fault output on Y1	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Brake output	RW	UINT	NO	-
				2	Brake disengage delay	RW	UINT	NO	-
				3	Brake engage delay	RW	UINT	NO	-

Brake output:

Value =1 output is closed when drive is enabled, and open when the drive is disabled.
=2 output is open when drive is enabled, and closed when the drive is disabled.
=3 output is not used as a brake output and can be used as g general purpose output.

Brake disengage delay and brake engage delay

The units is 1ms, if write 100 to the index means 0.1s.

0x320D / 0x240D / 0x360D / 0x380D Motion output

This object is used to define the drive Motion output function.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x320C	0x340C	0x360C	0x380C	-	Motion Output	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Motion output on Y1	RW	UINT	NO	-
				2	Motion output on Y2	RW	UINT	NO	-
				3	Motion output on Y3	RW	UINT	NO	-
				4	Motion output on Y4	RW	UINT	NO	-

They can be set to various functions.

Value =1 Open when static position error less than in-position counts.
=2 Closed when static position error less than in-position counts.
=3 General purpose
=4 Tach output with 100 pulses/rev
=5 Tach output with 200 pulses/rev
=6 Tach output with 400 pulses/rev
=7 Tach output with 800 pulses/rev
=8 Tach output with 1600 pulses/rev
=9 Closed (energized) when dynamic position error is less than set value.
=10 Open (de-energized) when dynamic position error is less than set value.
=11 Timing out (50 pulses/rev)

0x320F / 0x340F / 0x360F / 0x380F Define limits

This object is used to set the definition of limit.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x320F	0x340F	0x360F	0x380F	-	Define limits	RW	UINT	NO	-

Value =0x01 At end of travel, (X3=CW,X4=CCW)will be closed
=0x02 At end of travel, (X3=CW,X4=CCW)will be open
=0x07 At end of travel, X3=CW will be closed, X4=GP
=0x08 At end of travel, X3=CW will be open, X4=GP
=0x09 At end of travel, X4=CCW will be closed, X3=GP
=0x0A At end of travel, X4=CCW will be open, X3=GP
=0x0B At end of travel, (X3=CCW,X4=CW)will be closed
=0x0C At end of travel, (X3=CCW,X4=CW)will be open
=0x11 At end of travel, X3=CCW will be closed, X4=GP
=0x12 At end of travel, X3=CCW will be open, X4=GP
=0x13 At end of travel, X4=CW will be closed, X3=GP
=0x14 At end of travel, X4=CW will be open, X3=GP
=0x15 At end of travel, (X3=CW,X4=CCW)will be closed[No Alarm]
=0x16 At end of travel, (X3=CW,X4=CCW)will be open[No Alarm]
=0x1B At end of travel, X3=CW will be closed, X4=GP[No Alarm]
=0x1C At end of travel, X3=CW will be open, X4=GP[No Alarm]
=0x1D At end of travel, X4=CCW will be closed, X3=GP[No Alarm]
=0x1E At end of travel, X4=CCW will be open, X3=GP[No Alarm]
=0x1F At end of travel, (X3=CCW,X4=CW)will be closed[No Alarm]
=0x20 At end of travel, (X3=CCW,X4=CW)will be open[No Alarm]
=0x25 At end of travel, X3=CCW will be closed, X4=GP[No Alarm]
=0x26 At end of travel, X3=CCW will be open, X4=GP[No Alarm]
=0x27 At end of travel, X4=CW will be closed, X3=GP[No Alarm]
=0x28 At end of travel, X4=CW will be open, X3=GP[No Alarm]

0x3210 / 0x3410 / 0x3610 / 0x3810 Input filter

This object is used to set a digital filter to the input.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3210	0x3410	0x3610	0x3810	-	Input filter time	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	8
				1	Input X1 filter time	RW	UINT	NO	-
				2	Input X2 filter time	RW	UINT	NO	-
				3	Input X3 filter time	RW	UINT	NO	-
				4	Input X4 filter time	RW	UINT	NO	-
				5	Input X5 filter time	RW	UINT	NO	-
				6	Input X6 filter time	RW	UINT	NO	-
				7	Input X7 filter time	RW	UINT	NO	-
				8	Input X8 filter time	RW	UINT	NO	-

The unit of this parameter is 200us. If the value you set to 100, means 20ms delay.

0x3211 / 0x3411 / 0x3611 / 0x3811 Notch filter

These eight objects shall configure the Notch Filter parameters in torque mode. This object is only available on StepSERVO drive.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3211	0x3411	0x3611	0x3811	-	Notch filter	RW	INT	NO	-
				0	Number of sub-index	RO	USINT8	NO	8
				1	Notch filter_paraA	RW	INT	NO	-
				2	Notch filter_paraB	RW	INT	NO	-
				3	Notch filter_paraC	RW	INT	NO	-
				4	Notch filter_paraD	RW	INT	NO	-
				5	Notch filter_paraE	RW	INT	NO	-
				6	Notch filter_paraF	RW	INT	NO	-
				7	Notch filter_paraG	RW	INT	NO	-
				8	Notch filter_paraH	RW	INT	NO	-

0x3212 / 0x3412 / 0x3612 / 0x3812 Analog configuration

This object shall indicate the configuration of running mode about analog. We should set the value of this object when running with analog velocity/position/torque mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3212	0x3412	0x3612	0x3812	-	Analog Configuration	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	5
				1	Analog deadband	RW	UINT	NO	-
				2	Analog offset value	RW	UINT	NO	-
				3	Analog filter	RW	UINT	NO	-
				4	Analog threshold	RW	UINT	NO	-
				5	Analog scaling	RW	UINT	NO	-

Analog deadband

The unit is in 0.001volit

Analog filter

Filter value = 72090 / [(1400 / x) + 2.2].

Where x = desired value of the analog filter in Hz

Analog scaling

Value	=0	single-ended +/- 10 volts
	=1	single-ended 0 - 10 volts
	=2	single-ended +/- 5 volts
	=3	single-ended 0 - 5 volts
	=4	differential +/- 10 volts
	=5	differential 0 - 10 volts
	=6	differential +/- 5 volts
	=7	differential 0 - 5 volts

0x3213 / 0x3413 / 0x3613 / 0x3813 Analog auto zero

This object is used to set the current analog to zero, the value can be set to 1.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3213	0x3413	0x3613	0x3813	-	Analog auto zero	RW	UINT	NO	-

0x3214 / 0x3414 / 0x3614 / 0x3814 Operation mode

This object is used to set the power-up mode of the drive.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3214	0x3414	0x3614	0x3814	-	Operation mode	RW	UINT	NO	-

Value	=1	Si program
	=2	Q/SCL(drive enabled)
	=3	Quick tuner(servos) or Configurator(steppers)
	=4	SiNET Hub
	=5	Q/SCL(drive disabled)
	=6	not used
	=7	Q program, auto-execute

0x3215 / 0x3415 / 0x3615 / 0x3815 Jog mode

This object is used to set the jog mode. There has two mode for MOONS' drive.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3215	0x3415	0x3615	0x3815	-	Jog mode	RW	UINT	NO	-

Value =1 position-type servo control when jogging
=2 velocity-type servo control when jogging

0x3216 / 0x3416 / 0x3616 / 0x3816 Torque constant

This object shall configure the motor's torque constant in manufacturer specific units. The units should be mN·m/Amps.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3216	0x3416	0x3616	0x3816	-	Torque constant	RW	UINT	NO	-

This object only supported in Step-servo drives. 0x2216=MAX toque / MAX continuous current (base on different motor parameters).

0x3218 / 0x3418 / 0x3618 / 0x3818 Encoder resolution

This object shall provide the encoder configuration of the motor. It contains how many counts per revolution.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3218	0x3418	0x3618	0x3818	-	Encoder resolution	RO	UINT	NO	-

0x3220 / 0x3420 / 0x3620 / 0x3820 Position gain

This object shall configure the proportional Gain in Position loop to Step-Servo drives.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3220	0x3420	0x3620	0x3820	-	Position gain	RW	UINT	NO	-

0x3221 / 0x3421 / 0x3621 / 0x3821 Position derigain

This object shall configure the Derivative Gain in Position loop to Step-Servo drives.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3221	0x3421	0x3621	0x3821	-	Positionderi gain	RW	UINT	NO	-

0x3222 / 0x3422 / 0x3622 / 0x3822 Position derifilter

This object provides a very simple single-pole low pass filter that is used to limit this high frequency noise and make the system quieter and more stable.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3222	0x3422	0x3622	0x3822	-	Positionderi filter	RW	UINT	NO	-

0x3224 / 0x3424 / 0x3624 / 0x3824 Velocity gain

This object shall configure the proportional Gain in Velocity loop to Step-Servo drives.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3224	0x3424	0x3624	0x3824	-	Velocity gain	RW	UINT	NO	-

0x3225 / 0x3425 / 0x3625 / 0x3825 Velocityinterg gain

This object shall configure the Integral Gain in Velocity loop to Step-Servo drive.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3225	0x3425	0x3625	0x3825	-	Velocityinterg gain	RW	UINT	NO	-

0x3226 / 0x3426 / 0x3626 / 0x3826 Accfeedforward

This object shall configure to add a feed forward acceleration/deceleration to the torque command to faster the system's response.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3226	0x3426	0x3626	0x3826	-	Accfeedforward	RW	UINT	NO	-

0x3227 / 0x3427 / 0x3627 / 0x3827 PID filter

This object provide a torque command over-all filter at the end of Velocity loop. The filter is a very simple single-pole low pass filter that is used to limit the high frequency response of the Velocity and therefore the Position control loops.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3227	0x3427	0x3627	0x3827	-	PID filter	RW	UINT	NO	-

0x3252 / 0x3452 / 0x3652 / 0x3852 Inposition counts

This object is used to set static in-position error range.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3252	0x3452	0x3652	0x3852	-	Inposition counts	RW	UINT	NO	-

0x3253 / 0x3453 / 0x3653 / 0x3853 CSP complete time

This object is used to set the delay time that the motor is in completion of rotating with CSP mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3253	0x3453	0x3653	0x3853	-	CSP complete time	RW	UINT	NO	-

The units is 0.001 second.

0x3254 / 0x3454 / 0x3654 / 0x3854 In position error range

This object is used to set static in-position error range. When the actual position is within the target In position error range for a time duration that exceeds the PE specified timing, then the driver will define the motion complete or motor in-position.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3254	0x3454	0x3654	0x3854	-	In position error range	RW	UINT	NO	-

0x3255 / 0x3455 / 0x3655 / 0x3855 In position time

This object is used to set the time duration for in range determination. For example, when In position error PD is defined, PE will set the time duration for in-position test condition. The drive defines the motor as in position when the actual position is within the target position range (PD) for the defined minimum time (PE).

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3255	0x3455	0x3655	0x3855	-	In position time	RW	UINT	NO	-

0x3260 / 0x3460 / 0x3660 / 0x3860 Actual current

This object shall provide the current of the motor.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3260	0x3460	0x3660	0x3860	-	Actual current	RO	INT	NO	-

0x3261 / 0x3461 / 0x3661 / 0x3861 Analog reading

This object shall provide the analog value of drive.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3261	0x3461	0x3661	0x3861	-	Analog Reading	RW	INT	YES	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Analog reading	RW	INT	YES	-
				2	Analog reading input 1	RW	INT	YES	-
				3	Analog reading inupt 2	RW	INT	YES	-

0x3262 / 0x3462 / 0x3662 / 0x3862 Motor name

This object shall provide the name of the motor.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3262	0x3462	0x3662	0x3862	-	Motor	RO	STRING(15)	NO	-

0x3265 / 0x3465 / 0x3665 / 0x3865 E-Stop on input X8（-4X Only）

This object is used to set the E-Stop function on input X8.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3265	0x3465	0x3665	0x3865	-	E-Stop on input X8	RW	UINT	NO	0

Value =1 Emergency stop when closed(fault)
=2 Emergency stop when open(fault)
=3 General purpose/Touch probe2
=5 Emergency stop when closed(warning)
=6 Emergency stop when open(warning)
=7 Emergency stop when closed(auto clear alarm)
=8 Emergency stop when open(auto clear alarm)

0x3271 / 0x3471 / 0x3671 / 0x3871 Home switch

This object shall configure the number of Inputs as the Home switch in Homing mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3271	0x3471	0x3671	0x3871	-	Home switch	RW	USINT	NO	-

Bit	Name	Value	Description
0	Home switch number	It can be set to 3、4、7	X3、X4、X7
1			
2			
3			
4	Effective method for setting home switch	0	When closed
		1	When open
5-7	Reserved		

0x3272 / 0x3472 / 0x3672 / 0x3872 Clear alarm

This object provides the feature to clear alarm of the drives.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3272	0x3472	0x3672	0x3872	-	Clear alarm	RW	USINT	YES	-

STF**-EC，SSDC**-EC: Set to 0x01 can clear all alarm

STF**-ECX，SSDC**-ECX: Set the value with 0x55 to 0xAA can clear all alarm

0x3274 / 0x3474 / 0x3674 / 0x3874 Zero position

This object provides the feature to zero all position parameters, such as position actual value (which index is 0x6064h).Set this value to 01h can zero all position parameters.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3274	0x3474	0x3674	0x3874	-	Zero position	RW	USINT	NO	-

0x3275 / 0x3475 / 0x3675 / 0x3875 S-Curve filter time

This object is used to be set the S-Curve fliter time.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3275	0x3475	0x3675	0x3875	-	S-Curve filter time	RW	UINT	NO	-

0x3276 / 0x3476 / 0x3676 / 0x3876 Move home offset

This object is used to set homing offset mode.

Object Type	Data Type	Access Type	PDO mapping	COS	Default Value
VAR	UINT16	RW	NO	NO	0

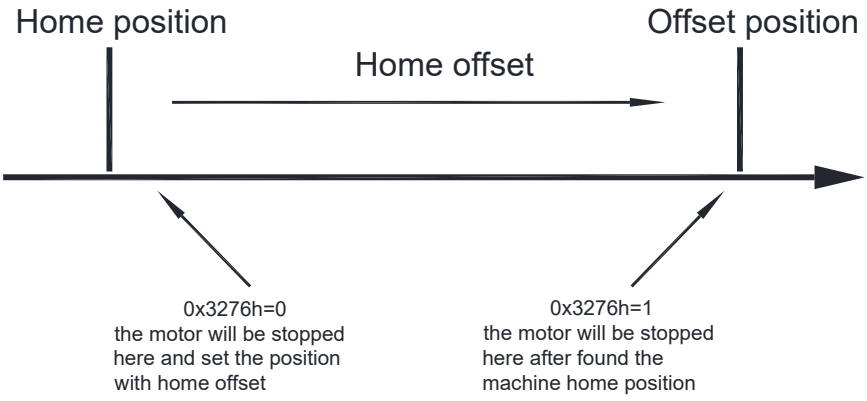
NOTE: This function is only effective when Homing Method is 1~35.

Set the value to 0:

The motor will be stopped on machine home position and the current position value is the home offset.

Set the value to 1:

The motor will moving with a distance that home offset provided after the machine home position has found. The new position is the zero position.



0x3280 / 0x3480 / 0x3680 / 0x3880 User registers

This object provide user 23 general purpose registers. They are volatile, so the information sent there will not be saved after a power cycle.

Index				Sub	Name	Access Type	Data Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x3280	0x3480	0x3680	0x3880	0	User Registers	RO	USINT	NO	23
				1	User register0	RO	DINT	YES	-
				2	User register1	RW	DINT	YES	-
				3	User register2	RW	DINT	YES	-
				4	User register3	RW	DINT	YES	-
				5	User register4	RW	DINT	YES	-
				6	User register5	RW	DINT	YES	-
				7	User register6	RW	DINT	YES	-
				8	User register7	RW	DINT	YES	-
				9	User register8	RW	DINT	YES	-
				10	User register9	RW	DINT	YES	-
				11	User register10	RW	DINT	YES	-
				12	User register11	RW	DINT	YES	-
				13	User register12	RW	DINT	YES	-
				14	User register13	RW	DINT	YES	-
				15	User register14	RW	DINT	YES	-
				16	User register15	RW	DINT	YES	-
				17	User register16	RW	DINT	YES	-
				18	User register17	RW	DINT	YES	-
				19	User register18	RW	DINT	YES	-
				20	User register19	RW	DINT	YES	-
				21	User register20	RW	DINT	YES	-
				22	User register21	RW	DINT	YES	-
				23	User register22	RW	DINT	YES	-

4.3.4 Manufacturer parameter for Dual axis Stepper

	Index				Sub	Name	Access	Type	mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
0x2600~2E00	0x2600	0x2800	0x2A00	0x2C00	-	Running current	RW	UINT	NO
	0x2601	0x2801	0x2A01	0x2C01	-	Idle current	RW	UINT	NO
	0x2602	0x2802	0x2A02	0x2C02	-	Idle current delya time	RW	UINT	NO
	0x2603	0x2803	0x2A03	0x2C03	-	Acceleration current	RW	UINT	NO
	0x2604	0x2804	0x2A04	0x2C04	-	Steps per rev	RW	UINT	NO
	0x2605	0x2805	0x2A05	0x2C05	-	Reverse motor direction	RW	UINT	NO
	0x2606	0x2806	0x2A06	0x2C06	-	Fault output on Y1	RW	UINT	NO
	0x2607	0x2807	0x2A07	0x2C07	-	Brake Output on Y2	-	-	-
					1	Brake Output	RW	UINT	NO
					2	Brake Disengage Delay	RW	UINT	NO
					3	Brake Engage Delay	RW	UINT	NO
	0x2608	0x2808	0x2A08	0x2C08	-	Motion Output	-	-	-
					1	Motion Output on Y1	RW	UINT	NO
					2	Motion Output on Y2	RW	UINT	NO
					3	Motion Output on Y3	RW	UINT	NO
					4	Motion Output on Y4			
	0x260B	0x280B	0x2A0B	0x2C0B	-	Define limits	RW	UINT	NO
	0x260C	0x280C	0x2A0C	0x2C0C	-	Inputs Filter	-	-	-
					1	Input X1 Filter Time	RW	UINT	NO
						...	...	...	...
					8	Inputs X8 filter time	RW	UINT	NO
	0x260D	0x280D	0x2A0D	0x2C0D	-	Dynamic open winding detection	RW	UINT	NO
	0x260E	0x280E	0x2A0E	0x2C0E	-	Open winding detect speed limit	RW	UDINT	NO
	0x260F	0x280F	0x2A0F	0x2C0F	-	Powerup open winding detection	RW	UINT	NO
	0x2610	0x2810	0x2A10	0x2C10	-	Motor model number	RW	UINT	NO
	0x2611	0x2811	0x2A11	0x2C11	-	Load ratio	RW	UINT	NO

0x2600~2E00h	Index				Sub	Name	Access	Type	Mapping
	Aixs1	Aixs2	Aixs3	Aixs4					
	0x2612	0x2812	0x2A12	0x2C12	-	Third party motor parameters	-	ARRAY	NO
					1	MotorName 1	RW	UDINT	NO
					2	MotorName 2	RW	UDINT	NO
					3	MotorName 3	RW	UDINT	NO
					4	MotorName 4	RW	UDINT	NO
					5	MotorPara_01	RW	UINT	NO
					6	MotorPara_02	RW	UINT	NO
					...	...	...	...	...
					12	MotorPara_14	RW	UINT	NO
					13	Reserved_01	RW	UINT	NO
					14	Reserved_02	RW	UINT	NO
					...	..	...	...	...
					18	Reserved_06	RW	UINT	NO
	0x2615	0x2815	0x2A15	0x2C15	-	StepInputs counts	RO	DINT	NO
	0x2617	0x2817	0x2A17	0x2C17	-	E-stop on input X8	RW	UINT	NO
	0x2618	0x2818	0x2A18	0x2C18	-	Waveform Smoothing	-	-	-
					1	Harmonic Gain	RW	INT	NO
					2	Harmonic Phase			
	0x2619	0x2819	0x2A19	0x2C19	-	Current coeff	RW	UINT	NO
	0x2620	0x2820	0x2A20	0x2C20	-	Home switch	RW	UINT8	YES
	0x2621	0x2821	0x2A21	0x2C21	-	Clear alarm	WO	UINT8	YES
	0x2623	0x2823	0x2A23	0x2C23	-	Zero position	WO	UINT8	NO
	0x2624	0x2824	0x2A24	0x2C24	-	S-Curve filter time	RW	UINT	NO
	0x2625	0x2825	0x2A25	0x2C25	-	User Registers			
	0x2626	0x2826	0x2A26	0x2C26	-	Move homeoffset	RW	UINT	NO

0x2600 / 0x2800 / 0x2A00 / 0x2C00 Running current

This object is used to set the continuous (RMS) current of the Stepper drives.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2600	0x2800	0x2A00	0x2C00	-	Running current	RW	UINT	NO	-

0x2601 / 0x2801 / 0x2A01 / 0x2C01 Idle current

This object configures monitors the motor holding current of the device in idle mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2601	0x2801	0x2A01	0x2C01	-	Idle current	RW	UINT	NO	-

If the reading value is 100. That means 1.00Amps.

0x2602 / 0x2802 / 0x2A02 / 0x2C02 Idle current delay time

This object is used to set the amount of time the drive will delay before transitioning from full current (CC) to idle current(CI).

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2602	0x2802	0x2A02	0x2C02	-	Idle current delay time	RW	UINT	NO	-

If the reading value is 10. That means 1.0 seconds.

0x2603 / 0x2803 / 0x2A03 0x2C03 Acceleration current

This object shall provide the acceleration current when the motor is running with stepper mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2603	0x2803	0x2A03	0x2C03	-	Acceleration current	RW	UINT	NO	-

If the reading value is 100 that means 1.00Amps.

0x2604 / 0x2804 / 0x2A04 / 0x2C04 Steps per rev

This object is used to get the steps per revolution about motor.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2604	0x2804	0x2A04	0x2C04	-	Step per rev	RW	UINT	NO	-

The value shall be given in steps/rev.

0x2605 / 0x2805 / 0x2A05 / 0x2C05 Reverse motor direction

This object is used to reverse motor rotating direction.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2605	0x2805	0x2A05	0x2C05	-	Reverse motor direction	RW	UINT	NO	-

The value can be set to 0 - 1.
Value =0 default rotating direction
=1 reverse rotating direction

0x2606 / 0x2806 / 0x2A06 / 0x2C06 Fault output on Y1

This object is used to set the fault output on Y1.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2606	0x2806	0x2A06	0x2C06	-	Fault output on Y1	RW	UINT	NO	-

Value =1 output Y1 is open when the driver is fault
=2 output Y1 is closed when the driver is fault
=3 output Y1 is used for general purpose

0x2607 / 0x2807 / 0x2A07 / 0x2C07 Brake output on Y2

This object at 0x220C is used to set the parameter of brake configuration. There has 3 sub-index to configure brake, the first is used for brake output, and the second is used for disengage delay. The last is used to set brake engage delay.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2607	0x2807	0x2A07	0x2C07	-	Brake Output on Y2	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Brake output	RW	UINT	NO	-
				2	Brake disengage delay	RW	UINT	NO	-
				3	Brake engage delay	RW	UINT	NO	-

Brake output:

Value =1 output is closed when drive is enabled, and open when the drive is disabled.
=2 output is open when drive is enabled, and closed when the drive is disabled.
=3 output is not used as a brake output and can be used as g general purpose output.

Brake disengage delay and brake engage delay

The units is 1ms, if write 100 to the index means 0.1s.

0x2608 / 0x2808 / 0x2A08 / 0x2C08 Motion output

This object is used to define the drive Motion output function.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2608	0x2808	0x2A08	0x2C08	-	Motion Output	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	3
				1	Motion output on Y1	RW	UINT	NO	-
				2	Motion output on Y2	RW	UINT	NO	-
				3	Motion output on Y3	RW	UINT	NO	-
				4	Motion output on Y4	RW	UINT	NO	-

Value =1 Open when static position error less than in-position counts.
=2 Closed when static positi
=3 General purpose (fault output or brake output)
=4 Tach output with 100 pulses/rev
=5 Tach output with 200 pulses/rev
=6 Tach output with 400 pulses/rev
=7 Tach output with 800 pulses/rev
=8 Tach output with 1600 pulses/rev
=9 Closed (energized) when dynamic position error is less than set value.
=10 Open (de-energized) when dynamic position error is less than set value.
=11 Timing out (50 pulses/rev)

0x260B / 0x280B / 0x2A0B / 0x2C0B Define limits

This object is used to set the definition of limit.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260B	0x280B	0x2A0B	0x2C0B	-	Alarm reset on input X6	RW	UINT	NO	-

Value =0x01 At end of travel, (X3=CW,X4=CCW)will be closed
=0x02 At end of travel, (X3=CW,X4=CCW)will be open
=0x07 At end of travel, X3=CW will be closed, X4=GP
=0x08 At end of travel, X3=CW will be open, X4=GP
=0x09 At end of travel, X4=CCW will be closed, X3=GP
=0x0A At end of travel, X4=CCW will be open, X3=GP
=0x0B At end of travel, (X3=CCW,X4=CW)will be closed
=0x0C At end of travel, (X3=CCW,X4=CW)will be open
=0x11 At end of travel, X3=CCW will be closed, X4=GP
=0x12 At end of travel, X3=CCW will be open, X4=GP
=0x13 At end of travel, X4=CW will be closed, X3=GP
=0x14 At end of travel, X4=CW will be open, X3=GP
=0x15 At end of travel, (X3=CW,X4=CCW)will be closed[No Alarm]
=0x16 At end of travel, (X3=CW,X4=CCW)will be open[No Alarm]
=0x1B At end of travel, X3=CW will be closed, X4=GP[No Alarm]
=0x1C At end of travel, X3=CW will be open, X4=GP[No Alarm]
=0x1D At end of travel, X4=CCW will be closed, X3=GP[No Alarm]
=0x1E At end of travel, X4=CCW will be open, X3=GP[No Alarm]
=0x1F At end of travel, (X3=CCW,X4=CW)will be closed[No Alarm]
=0x20 At end of travel, (X3=CCW,X4=CW)will be open[No Alarm]
=0x25 At end of travel, X3=CCW will be closed, X4=GP[No Alarm]
=0x26 At end of travel, X3=CCW will be open, X4=GP[No Alarm]
=0x27 At end of travel, X4=CW will be closed, X3=GP[No Alarm]
=0x28 At end of travel, X4=CW will be open, X3=GP[No Alarm]

0x260C / 0x280C / 0x2A0C / 0x2C0C Inputs filter

This object is used to set a digital filter to the input.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260C	0x280C	0x2A0C	0x2C0C	-	Inputs Filter	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	8
				1	Input X1 filter time	RW	UINT	NO	-
				2	Input X2 filter time	RW	UINT	NO	-
				3	Input X3 filter time	RW	UINT	NO	-
				4	Input X4 filter time	RW	UINT	NO	-
				5	Input X5 filter time	RW	UINT	NO	-
				6	Input X6 filter time	RW	UINT	NO	-
				7	Input X7 filter time	RW	UINT	NO	-
				8	Input X8 filter time	RW	UINT	NO	-

The unit of this parameter is 200us. If the value you set to 100, means 20ms delay.

0x260D / 0x280D / 0x2A0D / 0x2C0D Dynamic open winding detection

This object is used to set the function of Dynamic open winding detection.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260D	0x280D	0x2A0D	0x2C0D	-	Dynamic open winding detection	RW	UINT	NO	-

Value =0 disable
=1 enable

0x260E / 0x280E / 0x2A0E / 2C0E Open winding detection speed limit

This object is used to set the velocity limit of the open winding status detect when the motor is moving.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260E	0x280E	0x2A0E	2C0E	-	Open winding detection speed limit	RW	UDINT	NO	-

The unit of this object is counts/s.

0x260F / 0x280F / 0x2A0F / 2C0F Powerup open winding detection

This object is used to configurate the detection of open winding when power up.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x260F	0x280F	0x2A0F	2C0F	-	Powerup open winding detection	RW	UINT	NO	-

0x2610 / 0x2810 / 0x2A10 / 2C10 Motor model number

This object provide the model number of motor.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2610	0x2810	0x2A10	2C10	-	Motor model number	RW	UINT	NO	-

0x2611 / 0x2811 / 0x2A11 / 0x2C11 Load ratio

This object sets the ratio of the load inertia to the rotor inertia.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2611	0x2811	0x2A11	0x2C11	-	Load ratio	RW	UINT	NO	-

Value =1 1x rotor inertia
=2 1x-3x rotor inertia
=3 3x-5x rotor inertia
=4 5x-7x rotor inertia
=5 7x-10x rotor inertia

0x2612 / 0x2812 / 0x2A12 / 0x2C12 Third party motor parameters

This object shall indicate the motor of custom.

Index				Sub	Name	Access Type	Data Type	PDO mapping	-Default Value-
Aixs1	Aixs2	Aixs3	Aixs4						
0x2612	0x2812	0x2A12	0x2C12	-	Number of Entries	RW	UDINT	NO	-
				0	Motor Name1	RO	USINT8	NO	25
				1	Motor Name2	RW	UDINT	NO	-
				2	Motor Name3	RW	UDINT	NO	-
				3	Motor Name4	RW	UDINT	NO	-
				4	Motor Paramter1	RW	UDINT	NO	-
				5	Motor Paramter2	RW	UINT	NO	-
				6	Motor Paramter3	RW	UINT	NO	-
				7	Motor Paramter4	RW	UINT	NO	-
				8	Motor Paramter5	RW	UINT	NO	-
				9	Motor Paramter6	RW	UINT	NO	-
				A	Motor Paramter7	RW	UINT	NO	-
				B	Motor Paramter8	RW	UINT	NO	-
				C	Motor Paramter9	RW	UINT	NO	-
				D	Motor Paramter10	RW	UINT	NO	-
				E	Motor Paramter11	RW	UINT	NO	-
				F	Motor Paramter12	RW	UINT	NO	-
				10	Motor Paramter13	RW	UINT	NO	-
				11	Motor Paramter14	RW	UINT	NO	-
				12	Reserved1	RW	UINT	NO	-
				13	Reserved2	RW	UINT	NO	-
				14	Reserved3	RW	UINT	NO	--
				15	Reserved4	RW	UINT	NO	-
				16	Reserved5	RW	UINT	NO	-
				17	Reserved6	RW	UINT	NO	-

0x2615 / 0x2815 / 0x2A15 / 0x2C15 StepInputs counts

This object provide the pulse counter coming into the X1/STEP and X2/DIR input of the drive.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2615	0x2815	0x2A15	0x2C15	-	StepInputs counts	RO	DINT	YES	0

0x2617 / 0x2817 / 0x2A17 / 0x2C17 E-stop on input X8（-4x only）

This object is used to set usage of the E-stop input.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2617	0x2817	0x2A17	0x2C17	-	E-stop on input X8	RW	UINT	NO	-

Value =1 Emergency stop when closed(fault)
=2 Emergency stop when open(fault)
=3 General purpose/Touch probe2
=5 Emergency stop when closed(warning)
=6 Emergency stop when open(warning)
=7 Emergency stop when closed(auto clear alarm)
=8 Emergency stop when open(auto clear alarm)

0x2618 / 0x2818 / 0x2A18 / 0x2C18 Waveform smoothiing

This object is used to set the 4th harmonic filter gain/phase setting.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2618	0x2818	0x2A18	0x2C18	-	Waveform Smoothing	RW	UINT	NO	-
				0	Number of sub-index	RO	USINT8	NO	2
				1	Harmonic gain	RW	UINT	NO	-
				2	Harmonic phase	RW	UINT	NO	-

0x2619 / 0x2819 / 0x2A19 / 0x2C19 Current coeff

This object shall indicate the value of current coefficient, the value should be given per hundard of rated current.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2619	0x2819	0x2A19	0x2C19	-	Current coeff	RW	UINT	NO	-

0x2620 / 0x2820 / 0x2A20 / 0x2C20 Home switch

This object shall configure the number of Inputs as the Home switch in Homing mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2620	0x2820	0x2A20	0x2C20	-	Home switch	RW	USINT	NO	-

Value	8	7	6	5	4	3	2	1
Output	X8	X7	X6	X5	X4	X3	X2	X1

0x2621 / 0x2821 / 0x2A21 / 0x2C21 Clear alarm

This object provides the feature to clear alarm of the drives.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2621	0x2821	0x2A21	0x2C21	-	Clear alarm	RW	USINT	YES	-

STF**-EC，SSDC**-EC: Set to 0x01 can clear all alarm

STF**-ECX，SSDC**-ECX: Set the value with 0x55 to 0xAA can clear all alarm

0x2623 / 0x2823 / 0x2A23 / 0x2C23 Zero position

This object provides the feature to zero all position parameters, such as position actual value (which index is 0x6064h).Set this value to 01h can zero all position parameters.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2623	0x2823	0x2A23	0x2C23	-	Zero position	RW	USINT	NO	-

0x2624 / 0x2824 / 0x2A24 / 0x2C24 S-Curve filter time

This object is used to be set the S-Curve fliter time.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2624	0x2824	0x2A24	0x2C24	-	S-Curve filter time	RW	UINT	NO	-

0x2625 / 0x2825 / 0x2A25 / 0x2C25 User registers

This object provide user 23 general purpose registers. They are volatile, so the information sent there will not be saved after a power cycle.

Index				Sub	Name	Access Type	Data Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x2625	0x2825	0x2A25	0x2C25	-	User Registers	RW	DINT	YES	-
				0	Number of sub-index	RO	USINT	NO	23
				1	User register0	RO	DINT	YES	-
				2	User register1	RW	DINT	YES	-
				3	User register2	RW	DINT	YES	-
				4	User register3	RW	DINT	YES	-
				5	User register4	RW	DINT	YES	-
				6	User register5	RW	DINT	YES	-
				7	User register6	RW	DINT	YES	-
				8	User register7	RW	DINT	YES	-
				9	User register8	RW	DINT	YES	-
				10	User register9	RW	DINT	YES	-
				11	User register10	RW	DINT	YES	-
				12	User register11	RW	DINT	YES	-
				13	User register12	RW	DINT	YES	-
				14	User register13	RW	DINT	YES	-
				15	User register14	RW	DINT	YES	-
				16	User register15	RW	DINT	YES	-
				17	User register16	RW	DINT	YES	-
				18	User register17	RW	DINT	YES	-
				19	User register18	RW	DINT	YES	-
				20	User register19	RW	DINT	YES	-
				21	User register20	RW	DINT	YES	-
				22	User register21	RW	DINT	YES	-
				23	User register22	RW	DINT	YES	-

0x2626 / 0x2826 / 0x2A26 / 0x2C26 Move home offset

This object is used to set homing offset mode.

Object Type	Data Type	Access Type	PDO mapping	COS	Default Value
VAR	UINT16	RW	NO	NO	0

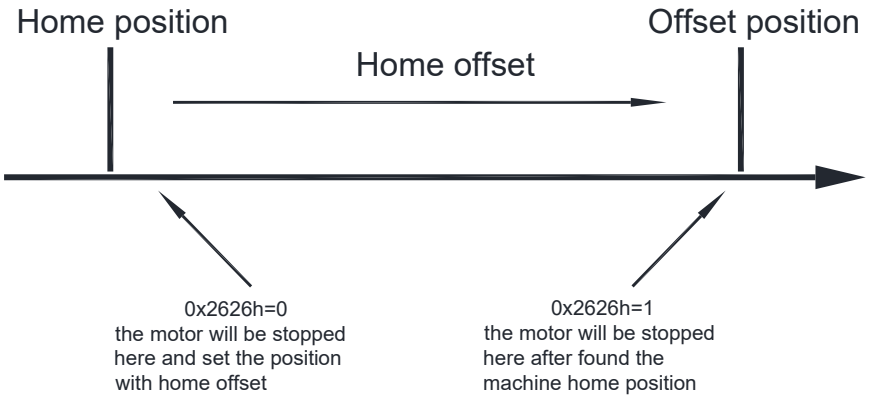
NOTE: This function is only effective when Homing Method is 1~35.

Set the value to 0:

The motor will be stopped on machine home position and the current position value is the home offset.

Set the value to 1:

The motor will moving with a distance that home offset provided after the machine home position has found. The new position is the offset position.



4.3.5 Motion control profile for Four axis

	Index				Sub	Name	Access	Type	Mapping
	Axis1	Axis2	Axis3	Axis4					
CoE	0x603F	0x683F	0x703F	0x783F	-	Error code	RO	UINT16	YES
	0x6040	0x6840	0x7040	0x7840	-	Controlword	WO	UINT16	YES
	0x6041	0x6841	0x7041	0x7841	-	Statusword	RO	UINT16	YES
	0x605A	0x685A	0x705A	0x785A	-	Quick stop option code	RW	INT16	NO
	0x605B	0x685B	0x705B	0x785B	-	Shut down option code	RW	INT16	NO
	0x605C	0x685C	0x705C	0x785C	-	Disable operation option code	RW	INT16	NO
	0x605D	0x685D	0x705D	0x785D	-	Halt option code	RW	INT16	NO
	0x605E	0x685E	0x705E	0x785E	-	Fault reaction code	RW	INT16	NO
	0x6060	0x6860	0x7060	0x7860	-	Modes of operation	WO	INT8	YES
	0x6061	0x6861	0x7061	0x7861	-	Modes of operation display	RO	INT8	YES
	0x6064	0x6864	0x7064	0x7864	-	Position actual value	RO	INT32	YES
	0x6065	0x6865	0x7065	0x7865	-	Following error window	RW	UINT32	NO
	0x606C	0x686C	0x706C	0x786C	-	Velocity actual value	RO	INT32	YES
	0x6071	0x6871	0x7071	0x7871	-	Target torque	RW	INT16	YES
	0x6073	0x6873	0x7073	0x7873	-	Max current	RW	UINT16	YES
	0x6074	0x6874	0x7074	0x7874	-	Torque demand	RO	INT16	YES
	0x6077	0x6877	0x7077	0x7877	-	Torque actual value		INT	YES
	0x6078	0x6878	0x7078	0x7878	-	Current actual value	RO	INT16	YES
	0x607A	0x687A	0x707A	0x787A	-	Target position	RW	INT32	YES
	0x607C	0x687C	0x707C	0x787C	-	Home offset	RW	INT32	YES
	0x607D	0x687D	0x707D	0x787D	-	Software position limit	-	-	-
					1	Min position limit	RW	DINT	NO
					2	Max position limit	RW	DINT	NO
	0x607E	0x687E	0x707E	0x787E	-	Polarity	RW	UINT8	YES
	0x607F	0x687F	0x707F	0x787F	-	Max profile velocity	RW	UINT32	YES
	0x6081	0x6881	0x7081	0x7881	-	Profile velocity	RW	UINT32	YES
	0x6083	0x6883	0x7083	0x7883	-	Profile acceleration	RW	UINT32	YES
	0x6084	0x6884	0x7084	0x7884	-	Profile deceleration	RW	UINT32	YES
	0x6085	0x6885	0x7085	0x7885	-	Quick stop deceleration	RW	UINT32	YES
	0x6087	0x6887	0x7087	0x7887	-	Torque slope	RW	UINT32	YES
	0x6098	0x6898	0x7098	0x7898	-	Homing method	RW	INT8	YES
	0x6099	0x6899	0x7099	0x7899	-	Homing speed	-	ARRAY	-
					1	Search switch	RW	UDINT	YES
					2	Search zero	RW	UDINT	YES
	0x609A	0x689A	0x709A	0x789A	-	Homing acceleration	RW	UDINT32	YES
	0x60B0	0x68B0	0x70B0	0x78B0		Position offset	RW	DINT32	YES
	0x60B1	0x68B1	0x70B1	0x78B1	-	Velocity offset	RW	DINT	YES
	0x60B2	0x68B2	0x70B2	0x78B2		Torque offset	RW	DINT	YES
	0x60B8	0x68B8	0x70B8	0x78B8		Touch probe function	RW	UINT	YES
	0x60B9	0x68B9	0x70B9	0x78B9		Touch probe status	RO	UINT	YES
	0x60BA	0x68BA	0x70BA	0x78BA		Touch probe pos1 pos value	RO	DINT	YES
	0x60BB	0x68BB	0x70BB	0x78BB		Touch probe pos1 neg value	RO	DINT	YES

	Index				Sub	Name	Access	Type	Mapping
	Axis1	Axis2	Axis3	Axis4					
CoE	0x60E0	0x68E0	0x70E0	0x78E0		Positive torque limit value	RW	UINT	YES
	0x60E1	0x68E1	0x70E1	0x78E1	-	Negative torque limit value	RW	UINT	YES
	0x60F4	0x68F4	0x70F4	0x78F4	-	Following error actual value	RO	DINT	YES
	0x60FD	0x68FD	0x70FD	0x78FD	-	Digital inputs	RO	UDINT	YES
	0x60FE	0x68FE	0x70FE	0x78FE	2	Digital outputs	-	ARRAY	NO
					1	Physical outputs	RW	UDINT	YES
					2	Bit mask	RW	UDINT	NO
	0x60FF	0x68FF	0x70FF	0x78FF	-	Target velocity	RW	DINT	YES
	0x6502	0x6d02	0x7502	0x7D02	-	Supported drive modes	RO	UDINT	NO

0x603F / 0x683F / 0x703F / 0x783F Error code

The error code captures the alarm code of the last error that occurred in the drive.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x603F	0x683F	0x703F	0x783F	-	Error code	UINT	RO	YES	-

Each bit in code indicate one type alarm or faults status.

Error Code	Description
0x7500	EtherCAT Communication Error
0xFF01	***Over Current***
0xFF02	***Over Voltage***
0xFF03	***Over Temperature***
0xFF04	***Open Motor Winding***
0xFF05	***Internal Voltage Bad***
0xFF06	***Position limit***
0xFF07	***Encoder bad***
0xFF08	***Fc position limit***
0xFF09	***Fc encoder bad***
0xFF0A	***Regen failed***
0xFF0B	***STO***
0xFF0	***E-stop error***
0xFF31	CW Limit
0xFF32	CCW Limit
0xFF33	***CCW CW limit***
0xFF34	***Current limit***
0xFF35	Move When Disable
0xFF36	Voltage Low
0xFF37	Qprogram Blank
0xFF41	Save Failed
0xFF42	Xmlread Failed
0xFFFF	Other Error

0x6040 / 0x6840 / 0x7040 / 0x7840 Controlword

This object shall indicate the received command controlling the PDS FSA. The bits 7, 3, 2, 1, and 0 shall be supported. The bits 0 to 9 shall be supported according to the mode of operation. If the related functionality is not available, an appropriate emergency message shall be generated. The manufacturer-specific bits may be supported.

All implemented bits of the controlword are valid independent of the PDS FSA state. Starting of any movement is operation mode specific and is described in the related clause.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6040	0x6840	0x7040	0x7840	-	Controlword	RW	UINT	YES	-

The bits of the controlword are defined as follows:

15	11	10	9	8	7	6	4	3	2	1	0
manufacturer specific		reserved		halt	Fault reset	Operation mode specific		Enable operation	Quick stop	Enable voltage	Switch on
O		O		O	M	O		M	M	M	M

MSB LSB

0 - Optional M - Mandatory

0x6041 / 0x6841 / 0x7041 / 0x7841 Statusword

The status word indicates the current state of the drive. No bits are latched. The status word consist of bits for:

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6041	0x6841	0x7041	0x7841	-	Statusword	RO	UINT	YES	-

The bits of the statuslword are defined as follows:

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
ms		oms		ila	tr	rm	ms	w	sod	qs	ve	f	oe	so	rtso

Key:

ms	manufacturer specific
oms	operation mode specific
ila	internal limit active
tr	target reached
rm	remote
w	warning
sod	switch on disabled
qs	quick stop
ve	voltage enabled
f	fault
oe	operation enabled
so	switched on
rtso	ready to switch on

statusword(6041h)	PDS FSA state
xxxx xxxx x0xx 0000	Not ready to switch on
xxxx xxxx x1xx 0000	Switch on disabled
xxxx xxxx x01x 0001	Ready to switch on
xxxx xxxx x01x 0011	Switch on
xxxx xxxx x01x 0111	Operation enabled
xxxx xxxx x00x 0111	Quick stop active
xxxx xxxx x0xx 1111	Fault reaction active
xxxx xxxx x0xx 1000	Fault

0x605A / 0x685A / 0x705A / 0x785A Quick stop option code

The parameter quick stop option code determines what action should be taken if the Quick Stop Function is executed.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605A	0x685A	0x705A	0x785A	-	Quick stop option code	RW	INT	NO	-

Quick stop option code	Action
-32768⋯-1	Manufacturer Specific
0	Disable drive function
1	Slow down on slow down ramp and transit into switch on disabled
2	Slow down on quick stop ramp and transit into switch on disabled
3	Slow down on the current limit and transit into switch on disabled
4	Slow down on the voltage limit and transit into switch on disabled
5	Slow down on slow down ramp and stay in quick stop active
6	Slow down on quick stop ramp and stay in quick stop active
7	Slow down on slow current limit and stay in quick stop active
8	Slow down on voltage limit and stay in quick stop active
9⋯32767	Reserved

It is only supported of option code 1 and 2 feature at this moment.

0x605B / 0x685B / 0x705B / 0x785B Shutdown option code

This object shall indicate what action is performed if there is a transition from operation enabled state to ready to switch on state. The slow down ramp is the deceleration value of the used mode of operations.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605B	0x685B	0x705B	0x785B	-	Shutdown option code	RW	INT	NO	-

Value	Action
-32768⋯-1	Manufacturer Specific
0	Disable drive function(switch-off drive power stage)
1	Slow down on slow down ramp disable of the drive function
2⋯32767	Reserved

0x605C / 0x685C / 0x705C / 0x785C Disable operation option code

This object shall indicate what action is performed if there is a transition from operation enabled state to switched on state. The slow down ramp is the deceleration value of the used mode of operations.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605C	0x685C	0x705C	0x785C	-	Disable operation option code	RW	INT	NO	-

Value	Action
-32768···-1	Manufacturer Specific
0	Disable drive function(switch-off drive power stage)
1	Slow down on slow down ramp and then disable of the drive function
2···32767	Reserved

0x605D / 0x685D / 0x705D / 0x785D Halt option code

This object shall indicate what action is performed when the halt function is executed. The slow down ramp is the deceleration value of the used mode of operations.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605D	0x685D	0x705D	0x785D	-	Halt option code	RW	INT	NO	-

Value	Action
-32768···-1	Manufacturer Specific
0	Reserved
1	Slow down on slow down ramp and stay in operation enabled
2	Slow down on quick stop ramp and stay in operation enabled
3	Slow down on current limit and stay in operation enabled
4	Slow down on voltage limit and atay in operation enabled
5 + 32767	Reserved

0x605E / 0x685E / 0x705E / 0x785E Fault reaction option code

This object shall indicate what action is performed when fault is detected in the PDS. The slow down ramp is the deceleration value of the used mode of operations.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x605E	0x685E	0x705E	0x785E	-	Fault reaction option code	RW	INT	NO	-

Value	Action
-32768···-1	Manufacturer Specific
0	Disable drive function, motor is free t rotate
1	Slow down on slow down ramp
2	Slow down on quick stop ramp
3	Slow down on current limit
4	Slow down on voltage limit
5 + 32767	Reserved

0x6060 / 0x6860 / 0x7060 / 0x7860 Mode of operation

The parameter modes of operation switches the actually chosen operation mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6060	0x6860	0x7060	0x7860	-	Mode of operation	RW	SINT	NO	-

Mode of operation	Value
Profile position mode	1
Profile velicuty mode	3
Profile Torque mode	4
Homing mode	6
Cynclic synchronous position mode	8
Cynclic synchronous velocity mode	9
Q mode(manufacturer specific mode)	-1

0x6061 / 0x6861 / 0x7061 / 0x7861 Mode of operation display

The modes of operation display shows the current mode of operation. The meaning of the returned value corresponds to that of the modes of operation option code (index 6060h).

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6061	0x6861	0x7061	0x7861	-	Modes of operation display	RO	SINT	YES	-

0x6064 / 0x6864 / 0x7064 / 0x7864 Position actual value

This object represents the actual value of the position.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6064	0x6864	0x7064	0x7864	-	Position actual value	RO	DINT	YES	-

0x6065 / 0x6865 / 0x7065 / 0x7865 Following error window

The following error window defines a range of tolerated position values symmetrically to the position demand value. It is the position fault limit in encoder counts. As it is in most cases used with user defined units, a transformation into increments with the position factor is necessary. If the position actual value is out of the following error window, a following error occurs

A following error might occur when:

• A drive is blocked

• Unreachable profile velocity occurs

• At wrong closed loop coefficients

If the value of the following error window is 0 ,the following control is switched off.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6065	0x6865	0x7065	0x7865	-	Following error window	RW	UDINT	NO	-

0x606C / 0x686C / 0x706C / 0x786C Velocity actual value

The velocity actual value is also represented in velocity units and is coupled to the velocity used as input to the velocity controller.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x606C	0x686C	0x706C	0x786C	-	Velocity actual value	RO	DINT	YES	-

The unit of this object is in counts/s.

0x6071 / 0x6871 / 0x7071 / 0x7871 Target torque

This parameter is the input value for the torque controller in profile torque mode and the value is given per thousand of rated torque. The units should be mN·m.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6071	0x6871	0x7071	0x7871	-	Target torque	RW	INT	YES	-

This object only can be accessed in StepSERVO drives and this object parameters is related to the other torque values, such as current actual value (index 0x6078) and torque constant (index 0x2216).

0x6073 / 0x6873 / 0x7073 / 0x7873 Max current

This value represents the maximum permissible torque creating current in the motor.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6073	0x6873	0x7073	0x7873	-	Max current	RW	UINT	NO	-

If the reading value is 100 that means 1.00Amps.

0x6074 / 0x6874 / 0x7074 / 0x7874 Torque demand

This parameter is the output value of the torque limit function (if the torque control and power-stage function are available).

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6074	0x6874	0x7074	0x7874	-	Torque demand value	RO	INT	YES	-

This object is only available on StepSERVO drives and the unit of this object is mNm.

0x6077 / 0x6877 / 0x7077 / 0x7877 torque actual value

This object shall provide the actual value of the torque. It shall correspond to the instantaneous torque in the motor.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6077	0x6877	0x7077	0x7877	-	Torque actual value	RO	INT	YES	-

0x6078 / 0x6878 / 0x7078 / 0x7878 Current actual value

This object shall provide the actual value of the current. It shall correspond to the current in the motor.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6078	0x6878	0x7078	0x7878	-	Current actual value	RO	INT	YES	-

This object is only available on Step-Servo drives and the unit of object is 0.01Amps.

0x607A / 0x687A / 0x707A / 0x787A Target position

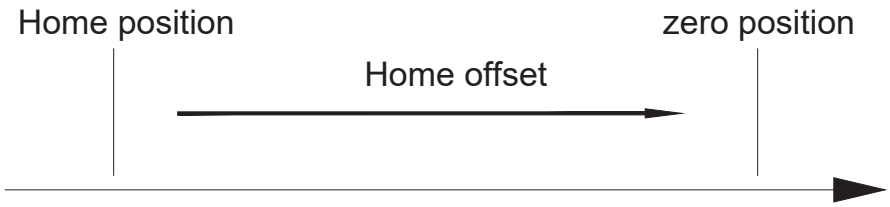
This object is the position that the drive should move to in position profile mode using the current settings of motion control parameters such as velocity, acceleration, deceleration, motion profile type etc. The target position is given in terms of Electrical Gear parameters steps per motor shaft revolution.

The target position will be interpreted as absolute or relative depending on the ‘abs / rel' flag in the controword.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607A	0x687A	0x707A	0x787A	-	Target position	RW	DINT	YES	-

0x607C / 0x687C / 0x707C / 0x787C Home offset

The home offset object is the difference between the zero position for the application and the machine home position (found during homing), it is measured in position units. During homing the machine home position is found and once the homing is completed the zero position is offset from the home position by adding the home offset to the home position. All subsequent absolute moves shall be taken relative to this new zero position. This is illustrated in the following diagram.

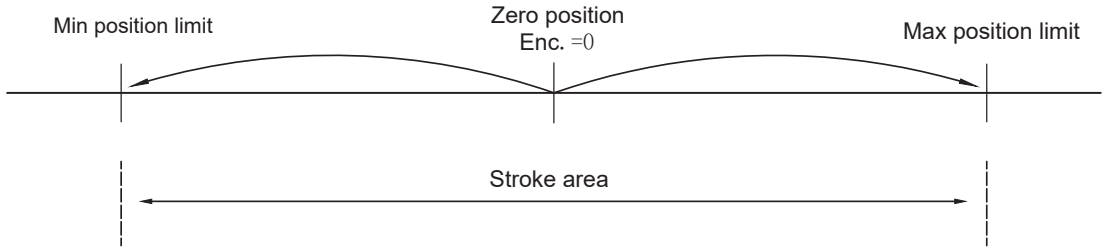


Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607C	0x687C	0x707C	0x787C	-	Home offset	RW	DINT	YES	-

0x607D / 0x687D / 0x707D / 0x787D Software position limit

This object shall indicate the configured maximal and minimal software position limits. These parameters shall define the absolute position limits for the position demand value and the position actual value as specified in below.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607D	0x687D	0x707D	0x787D	0	Number of sub-index	RW	USINT8	NO	2
				1	Min position limit	RW	DINT	NO	-
				2	Max position limit	RW	DINT	NO	-



0x607E / 0x687E / 0x707E / 0x787E Polarity

Position demand value and position actual value are multiplied by 1 or -1 depending on the value of the polarity flag. PP PV Mode.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607E	0x687E	0x707E	0x787E	-	Polarity	RW	USINT	YES	-

7	6	5	4	3	2	1	0
Position Polarity	Velocity Polarity	Reserved					
MSB							LSB

Value	Description
0	Multiply by 1
1	Multiply by -1

0x607F / 0x687F / 0x707F / 0x787F Max profile speed

The max profile velocity is the maximum allowed speed in either direction during a profiled move. It is given in the same units as profile velocity.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x607F	0x687F	0x707F	0x787F	-	Max profile speed	RW	UDINT	YES	-

The unit of this object is in counts/s.

0x6081 / 0x6881 / 0x7081 / 0x7881 Profile velocity

The profile velocity is the velocity normally attained at the end of the acceleration ramp during a profiled move and is valid for both directions of motion.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6081	0x6881	0x7081	0x7881	-	Profile velocity	RW	UDINT	YES	-

The unit of this object is in counts/s.

0x6083 / 0x6883 / 0x7083 / 0x7883 Profile acceleration

The profile acceleration is given in counts/s^2. It is converted to position increments per second2 using the normalizing factors.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6083	0x6883	0x7083	0x7883	-	Profile acceleration	RW	UDINT	YES	-

0x6084 / 0x6884 / 0x7084 / 0x7884 Profile deceleration

The profile deceleration is given in the same units as profile acceleration.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6084	0x6884	0x7084	0x7884	-	Profile deceleration	RW	UDINT	YES	-

0x6085 / 0x6885 / 0x7085 / 0x7885 Quick stop deceleration

The quick stop deceleration is the deceleration used to stop the motor if the ‘Quick Stop’ command is given and the quick stop option code (see 605Ah) is set to 2. The quick stop deceleration is given in the same units as the profile acceleration.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6085	0x6885	0x7085	0x7885	-	Quick stop deceleration	RW	UDINT	NO	-

0x6087 / 0x6887 / 0x7087 / 0x7887 Torque slope

This parameter describes the rate of change of torque in units of per thousand of rated torque per second.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6087	0x6887	0x7087	0x7887	-	Torque slope	RW	UDINT	YES	-

The units is Nm/s.

0x6098 / 0x6898 / 0x7098 / 0x7898 Home method

The homing method object determines the method that will be used during homing.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6098	0x6898	0x7098	0x7898	-	Home method	RW	SINT	YES	-

Value	Description
128	manufacturer specific
0	No homing operation required
1…37	Methods 1 to 37
38-127	Reserved

0x6099 / 0x6899 / 0x7099 / 0x7899 Homing speed

This entry in the object dictionary defines the speeds used during homing.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6099	0x6899	0x7099	0x7899	-	Number of sub-index	RW	USINT8	NO	2

The value shall be given in counts/s.

0x609A / 0x689A / 0x709A / 0x789A Homing acceleration

The homing acceleration establishes the acceleration to be used for all accelerations and decelerations with the standard homing modes.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x609A	0x689A	0x709A	0x789A	-	Homing acceleration	RW	UDINT	YES	-

The value units should be the same as profile acceleration/deceleration objects.

0x60B0 / 0x68B0 / 0x70B0 / 0x78B0 Position offset

This object shall provide the offset of the target position.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B0	0x68B0	0x70B0	0x78B0	-	Position offset	RW	DINT	YES	-

0x60B1 / 0x68B1 / 0x70B1 / 0x78B1 Velocity offset

This object shall provide the offset for the velocity value. In cyclic synchronous position mode, this object contains the input value for velocity feed forward. In cyclic synchronous velocity mode, it contains the commanded offset of the drive device.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B1	0x68B1	0x70B1	0x78B1	-	Velocity offset	RW	DINT	YES	-

0x60B2 / 0x68B2 / 0x70B2 / 0x78B2 Torque offset

This object shall provide the offset for the torque value. In cyclic synchronous position mode and cyclic synchronous velocity mode, this object contains the input value for torque feed forward. In cyclic synchronous torque mode. it contains the commanded additive torque of the drive, which is added to the target torque value.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B2	0x68B2	0x70B2	0x78B2	-	Torque offset	RW	INT	YES	-

0x60B8 / 0x68B8 / 0x70B8 / 0x78B8 Touch probe function

This object shall indicate the configured function of the touch probe.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B8	0x68B8	0x70B8	0x78B8	-	Touch probe function	RW	UINT	YES	-

Bit	Value	Definition
0	0	Swith off touch probe 1
	1	Enable touch probe 1
1	0	Trigger first event
	1	Continous
3,2	00	Trigger with touch probe 1 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index01
	11	Reserved
4	0	Switch off sampling at positive edge of touch probe 1
	1	Enable sampling at positive edge of touch probe 1
5	0	Switch off sampling at negtive edge of touch probe 1
	1	Enable sampling at negative edge of touch probe 1
6,7	-	Reserved
8	0	Swith off touch probe 2
	1	Enable touch probe 2
9	0	Trigger first event
	1	Continous
11,10	00	Trigger with touch probe 2 input
	01	Trigger with zero impulse signal or position encoder
	10	Touch probe source as defined in object 60D0, sub-index02
	11	Reserved
12	0	Switch off sampling at positive edge of touch probe 2
	1	Enable sampling at positive edge of touch probe 2
13	0	Switch off sampling at negtive edge of touch probe 2
	1	Enable sampling at negative edge of touch probe 2
14,15	-	Reserved

0x60B9 / 0x68B9 / 0x70B9 / 0x78B9 Touch probe status

This object shall provide the status of the touch probe.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60B9	0x68B9	0x70B9	0x78B9	-	Velocity offset	RW	DINT	YES	-

Bit	Value	Definition
0	0	Touch probe 1 is switched off
	1	Touch probe 1 is enabled
1	0	Touch probe 1 no positive edge value stored
	1	Touch probe 1 positive edge position stored
2	0	Touch probe 1 no negative edge value stored
	1	Touch probe 1 negative edge position stored
3...7	-	Reserved
8	0	Touch probe 2 is switched off
	1	Touch probe 2 is enabled
9	0	Touch probe 2 no positive edge value stored
	1	Touch probe 2 positive edge position stored
10	0	Touch probe 2 no negative edge value stored
	1	Touch probe 2 negative edge position stored
11...15	-	Reserved

0x60BA / 0x68BA / 0x70BA / 0x78BA Touch probe 1 positive edge

This object shall provide the position value of the touch probe 1 at positive edge.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60BA	0x68BA	0x70BA	0x78BA	-	Touch probe 1 positive edge	RO	DINT	YES	-

0x60BB / 0x68BB / 0x70BB / 0x78BB Touch probe 1 negative edge

This object shall provide the position value of the touch probe 1 at negative edge.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60BB	0x68BB	0x70BB	0x78BB	-	Touch probe 1 negative edge	RO	DINT	YES	-

0x60E0 / 0x68E0 / 0x70E0 / 0x78E0 Positive torque limit value

This object shall indicate the configured maximum positive torque in the motor. Positive torque takes effect in the case of motive operation is positive velocity or regenerative operation is negative velocity.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60E0	0x68E0	0x70E0	0x78E0	-	Positive torque limit value	RW	UINT	YES	-

0x60E1 / 0x68E1 / 0x70E1 / 0x78E1 Negative torque limit value

This object shall indicate the configured maximum negative torque in the motor. Negative torque takes effect in the case of motive operation is negative velocity or regenerative operation is positive velocity.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60E1	0x68E1	0x70E1	0x78E1	-	Positive torque limit value	RW	UINT	YES	-

0x60F4 / 0x68F4 / 0x70F4 / 0x78F4 Follow error actual value

This object shall provide the actual value of the following error.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60F4	0x68F4	0x70F4	0x78F4	-	Follow error actual value	RO	DINT	YES	-

0x60FD / 0x68FD / 0x70FD / 0x78FD Digital inputs

This object shall provide digital inputs. This object shall represent the logical input levels.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60FD	0x68FD	0x70FD	0x78FD	-	Digital inputs	RO	UDINT	YES	-

31 24	23	22	21	20	19	18	17	16	15 4	3	2	1	0
Reserved	X8	X7	X6	X5	X4	X3	X2	X1	Reserved	Interlock	Home switch	Positive limit switch	Negative limit switch
MSB													LSB

Bit 3 (interlock) provides the state of the interlock input. If the logical input signal changes to not activated, the drive shall enter the switch on disabled or fault reaction active state. This means the power stage of the drive is disabled and locked against switching on.

0x60FE / 0x68FE / 0x70FE / 0x78FE Digital outputs

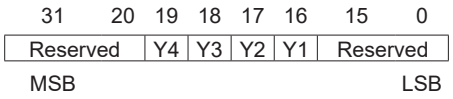
This object shall command the digital outputs. This object shall represent the logical output levels.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60FE	0x68FE	0x70FE	0x78FE	0	Number of sub-index	RW	USINT8	NO	2
				1	Physical outputs	RW	UDINT	YES	-
				2	Bit mask	RW	UDINT	NO	-

The first sub-index defines the assigned outputs. The second sub-index describes a mask to specify which of the outputs shall be used.

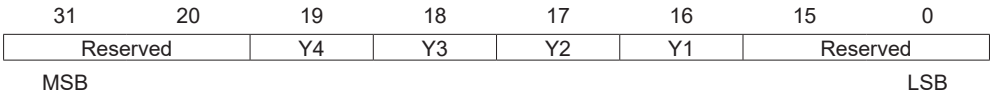
NOTE: the second sub-index are edge triggered, you must set the second sub-index first and then set the bit of first sub-index for change the status of output.

Physical outputs:



Field	Value	Definition
Each bit	0 1	Switch off Switch on

Bit mask:



Field	Value	Definition
Each bit	0 1	Disable output Enable output

0x60FF / 0x68FF / 0x70FF / 0x78FF Target velocity

This object shall indicate the configured target velocity and shall be used as input for the trajectory generator. The value shall be given in counts/s.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x60FF	0x68FF	0x70FF	0x78FF	-	Target velocity	RW	DINT	YES	-

0x6502 / 0x6D02 / 0x7502 / 0x7D02 Supported drive modes

This object shall provide information on the supported drive modes.

Index				Sub	Name	Data Type	Access Type	PDO mapping	Default Value
Aixs1	Aixs2	Aixs3	Aixs4						
0x6502	0x6D02	0x7502	0x7D02	-	Supported drive modes	RO	UDINT	NO	-

31 16	15 11	10	9	8	7	6	5	4	3	2	1	0
Reserved	Reserved	CSTCA	CST	CSV	CSP	IP	HM	R	TQ	PV	VL	PP
MSB												LSB

The supported mode in MOONS' EtherCAT drive:

- Bit0: Profile Position Mode
- Bit2: Profile Velocity Mode
- Bit3: Profile Torque Mode (StepSERVO)
- Bit5: Homing Mode
- Bit7: CSP
- Bit8: CSV

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