MOTOR POWER COMPANY

SEE IT BEFORE HAPPENS

CanOpen Manual



CANopen®

MTR 46 AD

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Content

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About this document

The Interface Description describes the interfaces and signals of the MTR.AD with Can Interface.

The latest version of this supplement can be found online at:

www.motorpowerco.com

All the information and advice in this document has been compiled with respect to applicable standards and regulations as well as the current state of the art.

- To ensure safe and faultless operation and to fulfil any warranty claims that may apply, first read the operating manuals of the MTR.AD and observe the instructions.



The manufacturer assumes no liability for damage and malfunctions that occur as a result of noncompliance with these operating manuals.



Should you still have any unanswered questions after reading the operating manuals, please contact Motor Power Company customer service.

Contact details for your region can be found online at https://www.motorpowerco.com/support

1.1 Object types / Abbreviations

VAR	**VARIANT**
INT8 / INT16 / INT32	Integer
UINT8 / UINT16 / UINT32	Unsigned Integer
STRING	Unformatierter Text
Dec	Decimal
SDO	Service Data Object
TxPDO	Process Data Object (write)
RxPDO	Process Data Object (read)
FW	Firmware
Ro	Read Only
Rw	Read Write
Const	Constant
Otw	One Time Wright

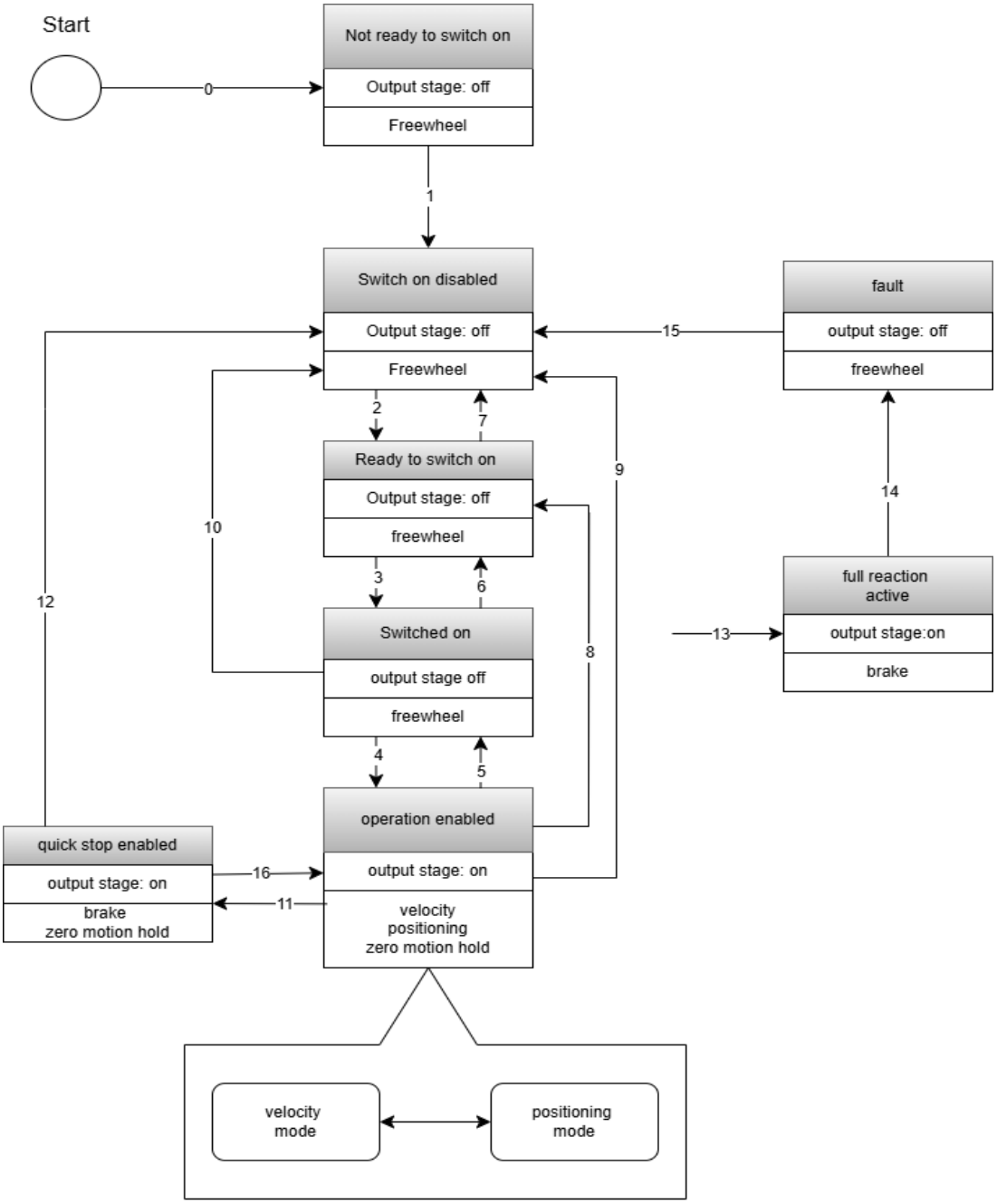
General information

2.1 The State machine

The MTR.AD is controlled by an internal state machine.

The transitions to the next state are made by entering the commands in the control word of the process data.

The feedback of the active state takes place in the status word of the process data



General information

2.2 Transitions

Transition	*Control Command*	*Bit 7...0 control word*				
		7	3	2	1	0
***1** „Not ready to switch on" to „Switch on disabled"*	-	-				
Automatic						
***2** „Switch on disabled" to „Ready to switch on"*	Shut down	0	X	1	1	0
***3** „Ready to switch on" to „Switched on"*	Switch on	0	X	1	1	1
***4** „Switched on" to „Operation enabled"*	Enable operation	0	1	1	1	1
Power is switched on						
***5** „Operation enabled" to „Switched on"*	Disable operation	0	0	1	1	1
Power is switched off						
***6** „Switched on" to „Ready to switch on"*	Shut down	0	X	1	1	0
***7** „Ready to switch on" to „Switch on disabled"*	Lock power	0	X	X	0	X
	Quick stop	0	X	0	1	X
***8** „Operation enabled" to „Ready to switch on"*	Shut down	0	X	1	1	0
***9** „Operation enabled" to „Switch on disabled"*	Lock power	0	X	X	0	X
***10** „Switched on" to „Switch on disabled"*	Lock power	0	X	X	0	X
	Quick stop	0	X	0	1	X
***11,** „Operationenabled" to „Quick stop enabled"*	Quick stop	0	X	0	1	X
***12** „Quick stop enabled" to „Switch on disabled"*	Lock power	0	X	X	0	X
***13** Automatically after the occurrence of a fault from any state*	-	-				
***14** Automatisch nach abgeschlossener Störungsreaktion („Störung aktiv")*	-	-				
***15** Error response*	Quit error	0	X	X	X	X
		->				
		1	X	X	X	X
***16** „Quick stop enabled" to „Operation enabled"*						

Addressing

2.1 Adressing

In the delivery state, every MTR.AD has the node ID 1.

This node ID has a special status and enables addressing using LSS (CiA_305).

The following modes are supported:

Switch state global protocol (CiA305 / 7.4.1)

With this procedure, every motor that is connected to the CAN bus receives the same node ID. For this reason, only one motor should be connected to the CAN bus!

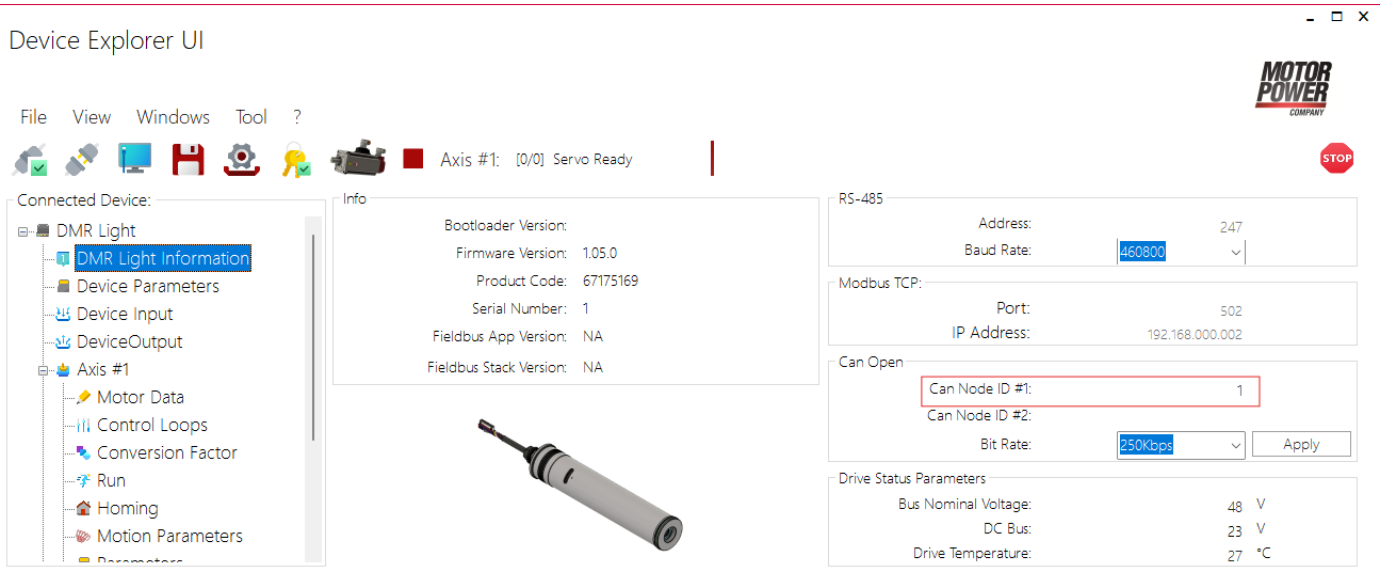
- With the node ID = 1, the assigned node ID becomes temporarily active after configuration.
- Without a store command, the assigned node ID is lost after a restart and the MTR.AD has the node ID 1 again.

Switch State Selective protocol (CiA305 / 7.4.2)

- Several MTR.AD can be connected to the bus.
- Only the MTR.AD will be brought into the LSS configuration mode, whose identity is based on the values
    - Vendor ID,
    - Product Code,
    - Revision number,
    - Serial number,
    - Is equivalent to.
- With the node ID = 1, the assigned node ID becomes temporarily active after the configuration.
- Without a store command, the assigned node ID is lost after a restart and the MTR.AD has the node ID 1 again.

Manual addressing

NodeID can be changed manually permanently or temporarily. As shown in the figure below, user can change NodeID value depending on the need (press “Apply” to confirm changes). With DevEx interface, connected via CAN communication, user is able also to save parameters on the drive.



1. How to changhe CAN NodeID on DevEx

MTR.AD in operation

4.1 Switching between operatings modes

Three different operating modes are supported:

- “Profile Position” Mode 1
- “Homing Mode” Mode 6
- “Profile Velocity” Mode 3 (Default)

The mode can be selected by object 6060h („General objects“ on page 31).

			x	x	x	1	2	3	4	5	6	7	51	52
			Switched on	Quick Stop enabled	Fault	Zero Motion Hold - position	start positioning	positioning	Finish positioning without stop	Finish positioning and stop	Zero Motion Hold - halt	abort positioning procedure	Zero Motion Hold - velocity	Run
State Nr	**State Name**	**Modus**	x	x	x	Positioning	Positioning	Positioning	Positioning	Positioning	Positioning	Positioning	Velocity	Velocity
x	Switched on	x	--	no	yes	yes	no	no	no	no	no	no	yes	no
x	Quick Stop enabled	x	no	--	yes	yes	no	no	no	no	no	no	yes	no
x	Fault	x	no	no	--	no	no	no	no	no	no	no	no	no
1	Zero Motion Hold - position	Positioning	yes	yes	yes	--	yes 1	no	no	no	yes 13.4	no	no	no
2	start positioning	Positioning	yes	yes	yes	no	--	yes 2	no	no	yes 13.1	no	no	no
3	positioning	Positioning	yes	yes	yes	yes 3	yes 4	--	yes 5	yes 8	yes 13.0	no	no	no
4	Finish positioning without stop	Positioning	yes	yes	yes	no	yes 11	yes 7	yes 6	no	yes 13.2	no	no	no
5	Finish positioning and stop	Positioning	yes	yes	yes	no	yes 12	yes 10	no	yes 9	yes 13.3	no	no	no
6	Zero Motion Hold - halt	Positioning	yes	yes	yes	yes 14.4	yes 14.1	yes 14.0	yes 14.2	yes 14.3	--	yes 15	yes 37	no
7	abort positioning procedure	Positioning	yes	yes	yes	no	no	no	no	no	no	--	yes 38	no
51	Zero Motion Hold - velocity	Velocity	yes	yes	yes	yes 30	no	no	no	no	no	no	--	yes 51
52	Run	Velocity	yes	yes	yes	no	no	no	no	no	no	no	yes 52	--

Transition matrix			x	x	x	1	2	3	4	5	6	7	51	52
INITIAL STATE			Switched on	Quick stop enabled	fault	Zero mtion hold position	Start posti oning	positioning	Finish positioning without stop	Finish positioning and stop	Zero motion hold_halt	Abort positioning porocedure	Zero motion hol_velocity	run
State Nr	State name	modus	x	x	x	positioning	positioning	positioning	positioning	positioning	positioning	positioning	velocity	velocity
X	Switched on	X	_	No	Yes	Yes	No	No	No	No	no	No	Yes	No
X	Quick stop enabled	X	No	_	yes	Yes	No	No	No	No	no	No	Yes	No
X	Fault	X	No	No	_	No	No	No	No	No	No	no	No	No
1	Zero motion hold position	Positioning	Yes	Yes	Yes	_	Yes1	No	No	No	Yes13.4	No	No	No
2	Start positioning	Positioning	Yes	Yes	Yes	No	_	Yes2	No	No	Yes13.1	No	No	No
3	Positioning	Positioning	Yes	Yes	Yes	Yes3	Yes4	_	Yes5	Yes8	Yes13.0	No	No	No
4	Finish positioning without stop	positioning	yes	yes	yes	no	Yes11	Yes7	Yes6	no	Yes13.2	no	no	no
5	Finish positioning and stop	Positioning	Yes	Yes	Yes	No	Yes12	Yes10	No	Yes9	Yes13.3	No	No	No
6	Zero motion hold-halt	Positioning	Yes	Yes	Yes	Yes 14, 4	Yes14 , 1	Yes14, 0	Yes14.2	Yes14.3	_	Yes15	Yes37	No

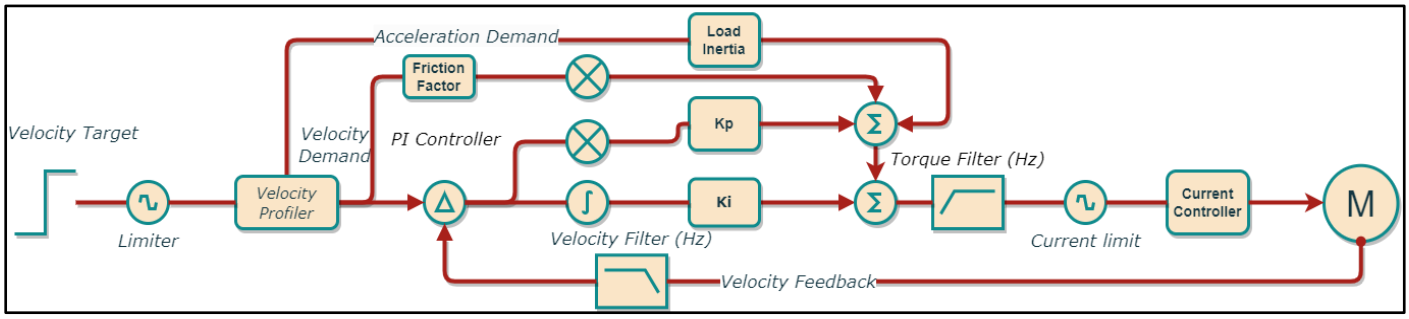
7	Abort positioning procedure	Positioning	Yes	Yes	Yes	No	No	No	No	No	No	_	Yes38	No
51	Zero moyion hold-velocity	Velocity	Yes	Yes	Yes	Yes 30	No	No	No	No	No	No	_	Yes51
52	run	velocity	yes	yes	Yes	no	no	no	no	no	No	No	Yes52	_

The table lists the transition numbers equivalent to the state machine:

4.2 Profile Velocity Mode

Communication objects

The following objects are needed to control or monitor the „velocity mode”.

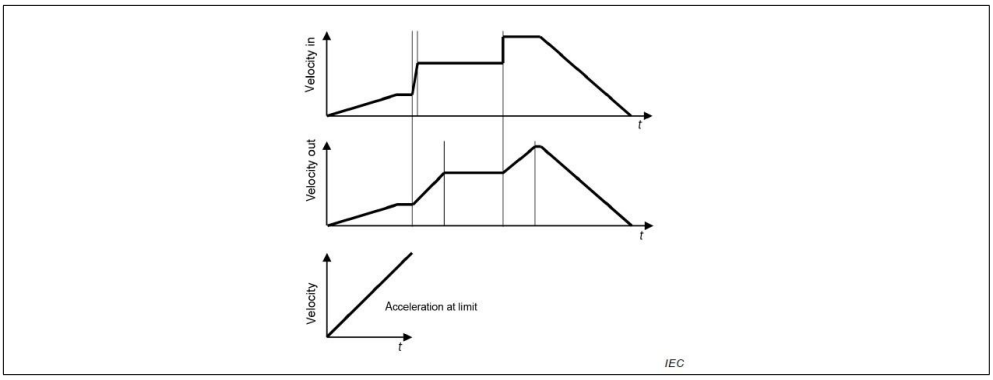


2. Velocity Loop Controller

Index	Object		Object Type	Data Type
60FFh	Target Velocity	[mm/s]	VAR	INT32
6083h	Profile Acceleration	[mm/s²]	VAR	UINT32
6084h	Profile Deceleration	[mm/s²]	VAR	UINT32
607Eh	Polarity		VAR	UINT8

Velocity Function

The actual velocity („Velocity actual value” - 606Ch) follows the target velocity („Target velocity” - 60FFh) bydefined ramps. The RD is stopped by setting the stop bit (bit 8) in the controlword or by specifying a target velocity („Target velocity”-60FFh) below theminimum possible velocity. As soon as the RD is below the minimum possible velocity, the current position at that moment is to be held (Zero Motion Hold)



The „profile velocity mode" can also be controlled via Halt Bit 8 of the control word. The meaning of the individual bits is listed in the following table

Bit 8 (Halt) can be used for stopping and starting.

Bit 8 (Halt) can be used to switch the Zero Motion Hold function on (motor stopped) and off (motor moving). If the RD is to be in idle mode at standstill, the output stage must be switched off by the control word (this is not possible in the analog variant).

Controlword-Bitregister

BIT	15	14	13	12	11	10	9	8
MEANING	Manu-facturer specific	Manu-Facturer specific	Manu-facturer specifc	Manu-facturer speciific	Manu-facturer specific	Reserved	Operation Mode specific	Halt
VALUE	X	X	X	X	X	0	X	0 rotating 1 standing
BIT	7	6	5	4	3	2	1	0
MEANING	Fault reset	Not used	Not used	Not used	Enable operation	Quick stop	Enable voltage	Switch on
VALUE	0	X	X	X	1	1	1	1

Controlword bit register in velocity mode -> during rotating movement

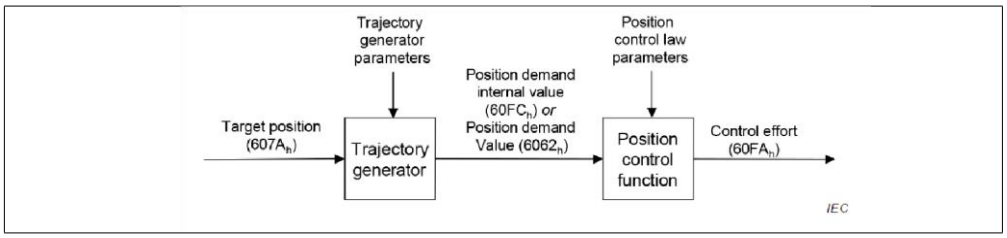
Statusword-Bitregister

BIT	15	14	13	12	11	10	9	8
MEANING	Manu-facturer specific	Manu facturer specific	Reserved	Reserved	Internal limit active	Reserved	Remote	Manufacturer specific/ Internal Error Bit
VALUE			0	0		0		0
BIT	7	6	5	4	3	2	1	0
MEANING	Warning	Switchon disabled	Quick stop	Voltage enabled	Fault	Operation enabled	Switched on	Ready to switch on

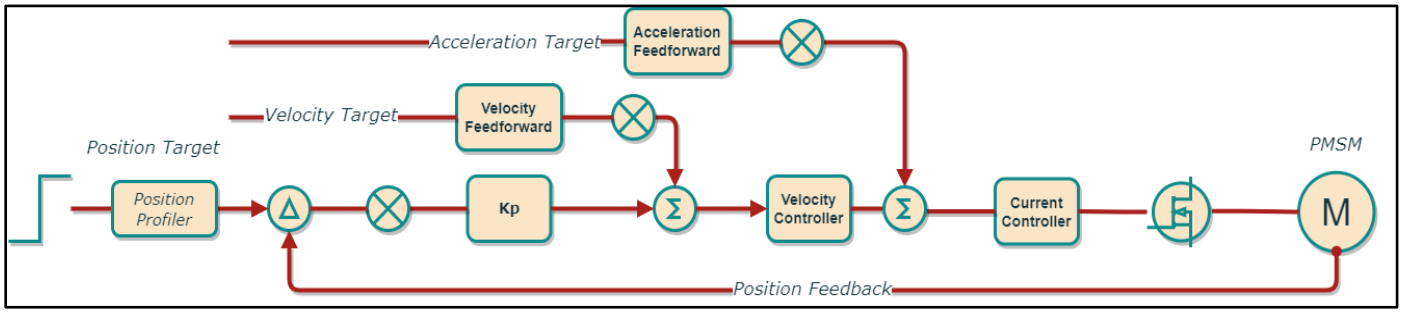
VALUE	
Statusword-Bitregister in velocity mode	

4.3 Profile Position Mode

During positioning, the RD is given a target position („Target position" -607Ah). This target position is approached with a defined target velocity („Max Interpolated Velocity" - 6081h). The acceleration ramp („Profile acceleration" - 6083h) and the deceleration ramp („Profile deceleration" - 6084h) are also specified. When the position has been reached, the position is held (Zero Motion Hold). Exactly the specified position is held.



The target positions („Target position" - 607Ah) can be specified as absolute value or as relative value. The relative and absolute positioning is distinguished via the control word bit 6 (abs/rel). Relative positioning is implemented when bit 6 of the control word is 1.



3. Position Loop Controller

Communication objects

OBJECT	NAME	MEANING	ACCESS	COMMUNICATION
6062H	Position demand value	Calculated/ controlled target position	ro	SDO
6064H	Position actual value	Actual postion	ro	TxPDO 2
607AH	Target position		rw	RxPDO 2
6081H	Profile velocity		rw	SDO
6083H	Profile acceleration		rw	SDO
6084H	Profile deceleration		rw	SDO

Controlword-Bitregister

BIT	15	14	13	12	11	10	9	8
MEANING	Manu-facturer specific	Manu-facturer specific	Manu-facturer specific	Manu-facturer specific	Manu-facturer specific	Reserved	Change of Setpoit	Halt
VALUE	X	X	X	X	X	0		0 rotating 1 standing
BIT	7	6	5	4	3	2	1	0
MEANING	Fault reset	Absolut/ Relative	Change set immediatly	New Set Point	Enable operation	Quick stop	Enable voltage	Switch on
VALUE	0				1	1	1	1

Controlword-Bitregister in position mode

Statusword-Bitregister

BIT	15	14	13	12	11	10	9	8
MEANING	Manu-facturer specific	Manu-facturer specific	Following Error	Set Point acknowledge	Internallimit active	Target reached	Remote	Manufacturer Specific /InternalError Bit
VALUE								
BIT	7	6	5	4	3	2	1	0
MEANING	Warning	Switch on disabled	Quick stop	Voltage enabled	Fault	Operation enabled	Switched on	Ready to switch on
VALUE								

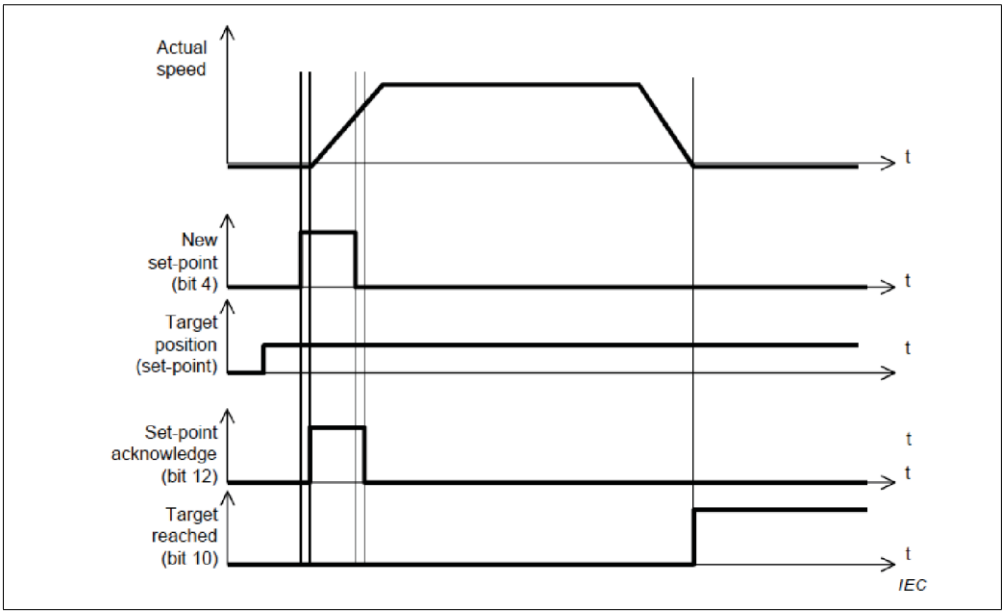
Statusword in position mode

Positioning Function

A target position is specified by object 607Ah („Target position”). This is the position that is declared as the next target. Only by setting the „New set point” bit (4) in the control word is it signaled to the RD that this position is to be approached. The RD confirms receiptof the positioning job by setting the „Set point acknowledge” bit (12) in the status word.

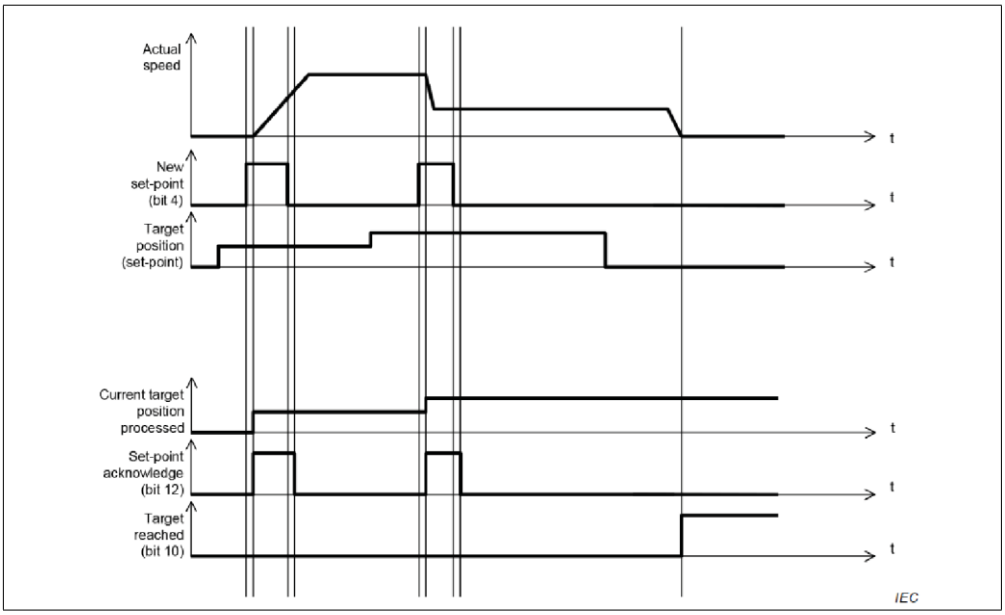
The control unit can then reset bit 4 „New set point”. The RD confirms this by resetting bit 12 „Set point acknowledge” in the status word. As soon as bit 12 has been reset, a new target address can be transmitted. When the target has been reached, this is signaled by means of bit 10 „Target reached”.

The acceleration, velocity and braking values are defined by objects 6081h („Profile velocity”) and 6083h („Profile acceleration”). The system level of the RD calculates independently when the RD must be braked in order to approach the position exactly and without overshoot



Single Position Mode

A positioning process can be interrupted by setting a new target address and setting bit 5 („Change set immediately") in the control word and then setting bit 4 („New Set Point") in the control word. The positioning is interrupted immediately and the new position is approached. (Transition 4).



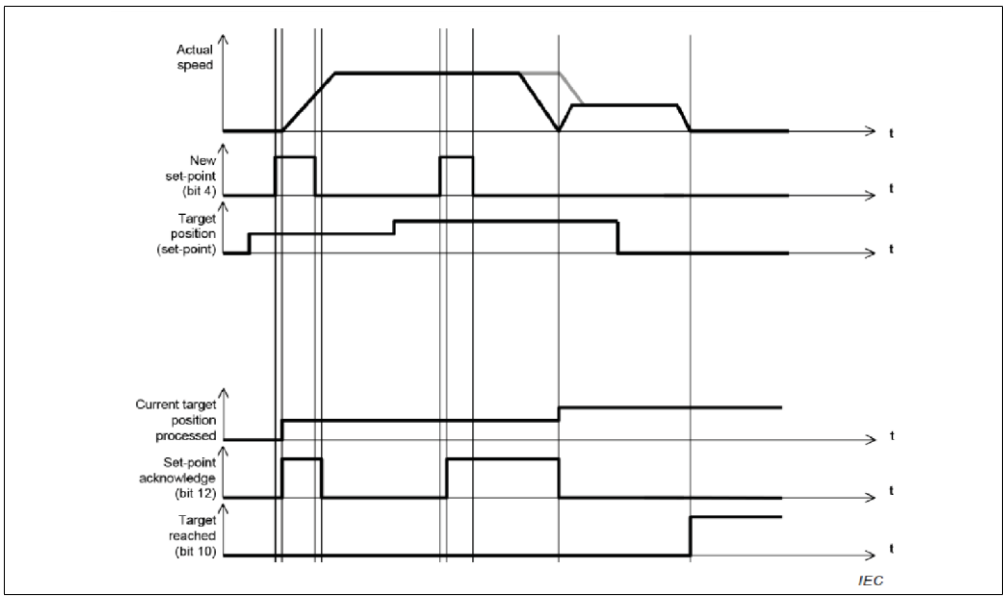
Set of Set-Points

Another target position („Target position" - 607Ah) can already be assigned to the RD in the buffer, which is to be approached when the current travel job is completed. Bit 5 („Change set immediately") is set to 0 for this purpose. Successful saving is confirmed by bit 12 (set point acknowledge) of the RD status word by means of an edge. The control unit then resets bit 4 („New set point") in the control word. However, the RD leaves a 1 on bit 12 („Set point acknowledge") until the current positioning is completed. Reaching the

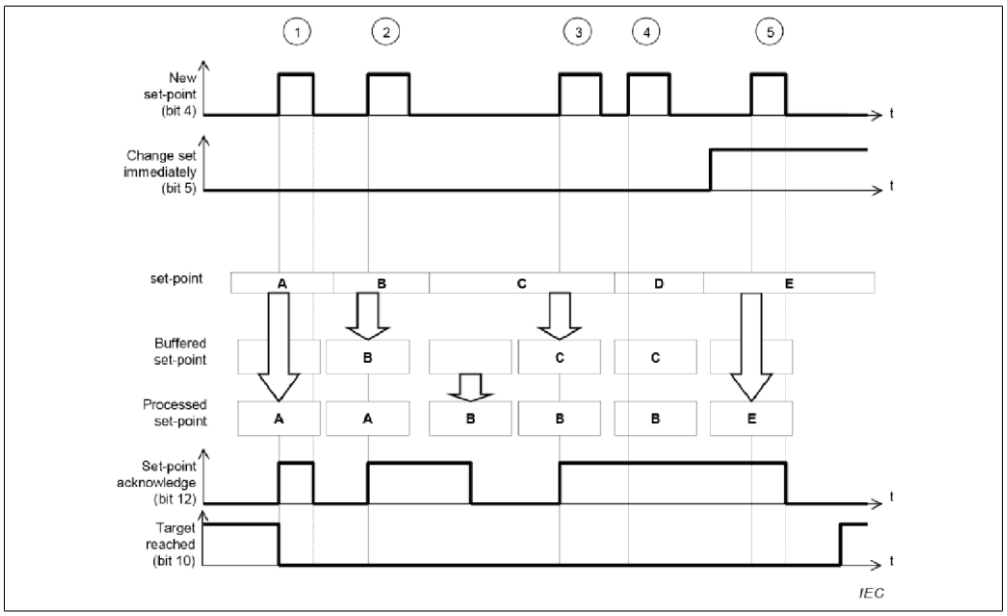
position is not signaled. The positioning of the second position can be started in two ways depending on bit 9 „Change of set point" of the control word.

• Bit 9 = 1 -> The first position is approached at full speed (no braking) and then the second position is approached directly. The speed is adjusted if necessary. (gray course of the speed)

• Bit 9 = 0 -> The first position is approached „normally" with final braking. As soon as the position is reached, the second position is approached directly. (Black course of the speed)



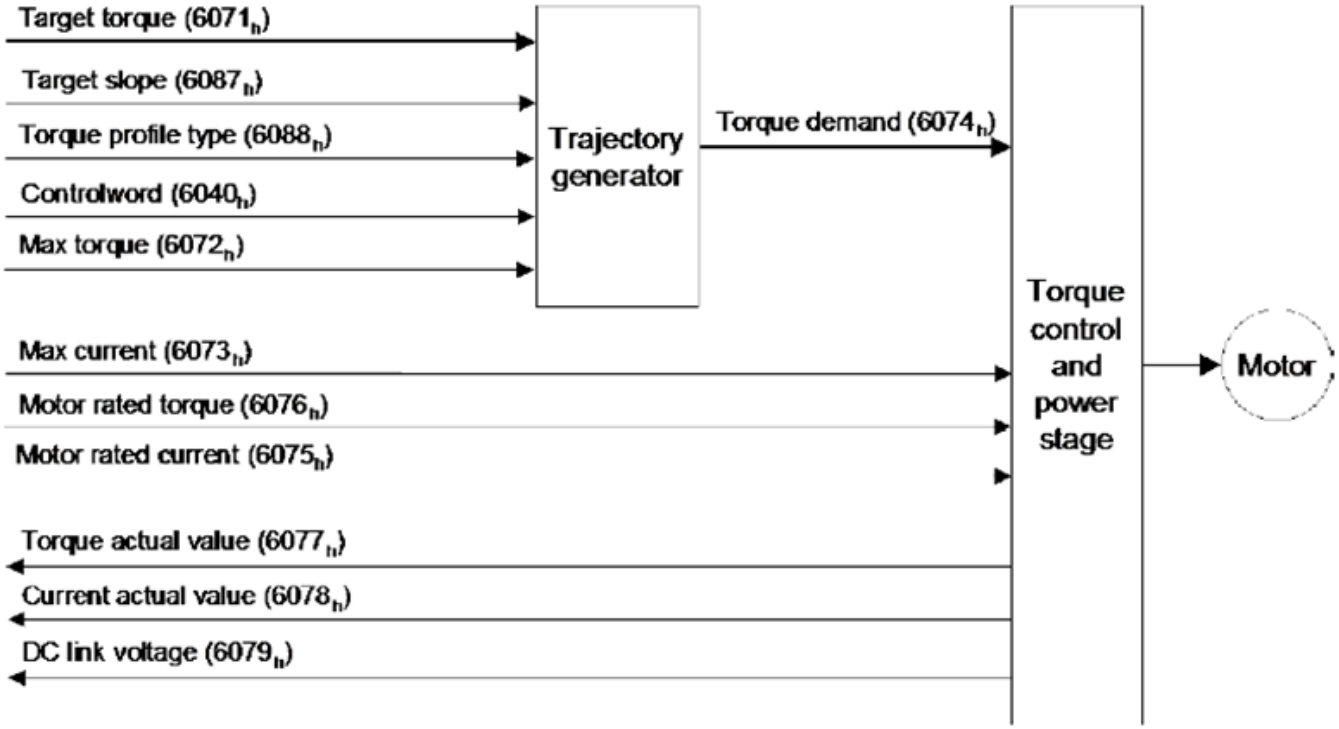
There can be a maximum of one position in the buffer. A new position can only be written into the buffer if the „Set Point acknowledge" bit (12) of the statusword is set to 0. However, if the „Change set immediately" bit (5) is set, the target position („Target position" - 607Ah) transmitted or present at that moment is adopted.



Profile Torque Mode

Description

In the operating mode Profile Torque, a movement is made with a desired target torque.



4.Structure of the Profile Torque Mode

Procedure

- Set [Mode of operation (6060)] to operating mode Profile Torque (4).
- Set [Controlword (6040h)] to start the operating mode.
- Set [Motor rated current (6075)] to a value according to motor specifications (unit = mA).
- Set [Target torque (6071h)] to the value for the target torque.
- Set [Controlword (6040h)] to start the movement.

Optional

- Query [Torque rated current (6075h)] to get the nominal current depending on the motor and the drive (unit = multiples of mA).
- Query [Current actual value (6078h)] to get the actual current.

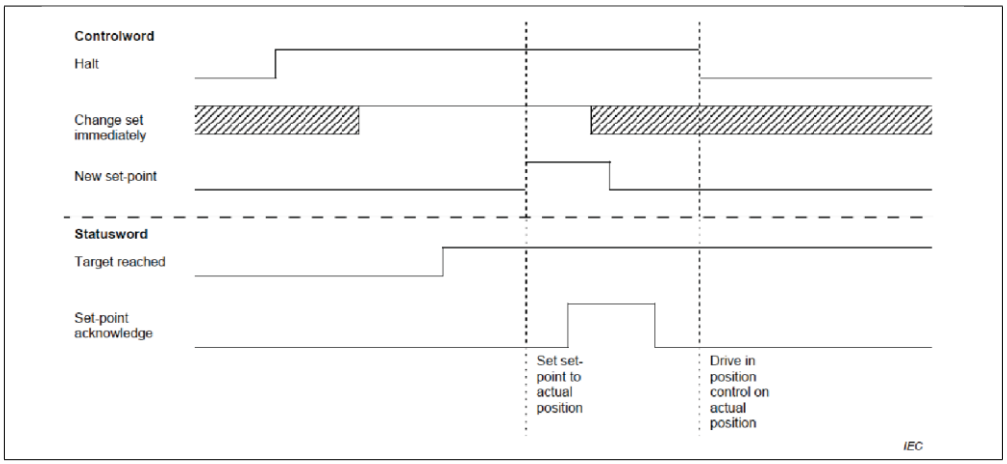
Associated Objects

Index	Sub-index	Object	PDO	Data Type	Takes Effect

6040h	0	Controlword	R_PDO	Unsigned16	Immediately
6041h	0	Statusword	T_PDO	Unsigned16	-
6060h	0	Modes of Operation	R_PDO	Integer8	Immediately
6061h	0	Modes of Operation Display	T_PDO	Integer8	-
6071h	0	Target Torque	R_PDO	Integer16	Immediately
6074h	0	Torque demand value	T_PDO	Integer16	-
6075h	0	Motor rated current	No	Unsigned32	-
6087h	0	Torque slope	R_PDO	Unsigned32	Immediately

Halt Function

By means of the „Halt" bit (bit 9) of the control word any positioning can be interrupted. The RD changes at that moment into a Zero Motion Halt state. When the „Halt" bit is reset, the RD jumps back to the state in which the RD was before and completes the positioning process. It is also possible to end the positioning process by using the handshake described in the following Figure. In this case, the current position is defined as the new „target position".



Homing mode

Homing mode 37 is supported in accordance with the CanOpen standard. This mode can be used to set the current position of the motor to zero. To execute the homing mode, the homing mode must first be selected. For this purpose, the drive must be in standstill with HaltBit or in an Operation disabled state. Bit 4 in the control word is then set to 1. Subsequently, another operating mode can be selected.

Error management

5.1 Predefined Error Field (1003h)

The last 8 error messages are stored in the Predefined Error Field. The newest message is always on the lowest SubIndex. All upcoming errors are entered in accordance with the standard; there is no entry for errors that no longer exist. The content of the error field is composed of the following content:

BYTE 3	BYTE 2	BYTE 1	BYTE 0
intern	Intern	Error	code

Monitoring

6.1 Objects

2200h Monitoring Values

All monitoring values are provided in the object 2200h („Monitoring values"). The values shown are stored in the respective subindices. The values are overwritten only in certain time intervals and with selected events around the memory to preserve. These objects are partially stored retentively:

2200H	MONITORING VALUES
01H	Start Stops
02H	Working hours in sec
03H	Uptime in sec(processor enabled)
04H	Temperature absolute minimum
05H	Temperature absolute maximum
06H	Actual temperature
07H	Number of Quick Stops
08H	Power average
09H	Number of rotations

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
1000H	00h	Device Type	UINT32	ro	0x00020192	x
1001H	00h	Error Register	UINT8	ro	0	TM
1002H	00h	Manufacturer Status Register	UINT32	ro	0	TM
1003H	00h	Pre-defined error field	UINT32	rw	0	x
1005H	00h	COB-ID SYNc Message	UINT32	rw	0x080	x
1006H	00h	CommunicationCycle Period	UINT32	rw	16000	x
1007H	00h	Synchronous Window Length	UINT32	rw	0	x
1008H	00h	Manufacturer Device Name	String	const	Motor Power Company	x

1009H	00h	Manufacturer Hardware Version	String	const	Rev 0.1	x
100AH	00h	Manufacturer Software Version	String	const	1050	x
1010H	00h	Store ParametersArray	UINT8	const	1	x
	01h	All ParametersExept NodeID	UINT32	otw	0	x

CANopen SDO-Objects MTR.AD

Communication Specified Objects

Ro =Read only rw = Read / Write const = Constant otw = One timewrite

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
1008H	00h	Manufacturer Device Name	VISIBLE_STRING	ro	EC5000	
1009H	00h	Manufacturer Hardware Version	VISIBLE_STRING	ro	1.00	
100AH	00h	Manufacturer Software Version	VISIBLE_STRING	ro		
1011H	00h	Restore Parameters – Number of entries	UINT8	rw	4	x
	01h	Restore Parameters – restore all parameters	UINT32	rw	"load"	x
1014H	00h	COB Id Emergency Message	UINT32	rw	0x80	x
1015H	00h	Inhibit Time EMCY	UINT16	rw	0	x
1016H	00h	Consumer Heartbeat Time – Number of entries	UINT8	const	1	x
	01h	Consumer Heartbeat Time [1][ms]	UINT32	rw	0	x
1017H		Producer Heartbeat Time [ms]	UINT16	rw	0	x
1018H	00h	Identity Object (Vendor-ID)	UINT8	ro	4	x
	01h	Vendor-ID	UINT32	ro	1019	x
	02h	Product Code	UINT32	ro	1	x
	03h	Revision Number	UINT32	ro	0x00010001	x
	04h	Serial Number	UINT32	ro	x	x
1029H	00h	Error Behavior	UINT8	ro	0	x
	01h	Communication Error	UINT8	rw	0	x

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
1200H	00h	1.SDO Server Parameter	UINT8	ro	2	x
	01h	COB-ID Client> Server	UINT32	ro	600h + NodeID	x

	02h	COB-ID Server->Client	UINT32	ro	580h+ NodeID	x
1400H	00h	1. RPDO Communication Parameter – No of entries	UINT8	ro	2	x
	01h	COB-ID	UINT32	rw	0x80000200 + NodeID	x
	02h	Transmission Type	UINT8	rw	255	x
1401H	00h	2. RPDO Communication Parameter	UINT8	ro	2	x
	01h	COB-ID	UINT32	rw	0x80000300h+ NodeID	x
	02h	Transmission Type	UINT8	rw	255	x
1402H	00h	3.RPDO Communication Parameter – No of entries	UINT8	ro	2	x
	01h	COB-ID	UINT32	rw	0x80000400h +NodeID	x
	02h	Transmission Type	UINT8	rw	255	x
1403H	00h	4. RPDO Communication Parameter – No of entries	UINT8	ro	2	x
	01h	COB-ID	UINT32	rw	0x80000500h + NodeID	x
	02h	Transmission Type	UINT8	rw	255	x

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
1600H	00h	1st RPDO mapping parameter – No of entries	UINT8	rw	3	x
	01h	1st mapping object	UINT32	rw	6040 0010h	x
	02h	2nd mappig object	UINT32	rw	6060 0008h	x
	03h	3rd mapping object	UINT32	rw	6081 0020h	x
	04h	4th mapping object	UINT32	rw	0	x
	05h	5th mapping object	UINT32	rw	0	x
	06h	6th mapping object	UINT32	rw	0	x
	07h	7th mapping object	UINT32	rw	0	x
	08h	8th mapping object	UINT32	rw	0	x
1601H	00h	2nd RPDO mapping parameter – No of entries	UINT8	rw	2	x
	01h	1st mapping object	UINT32	rw	6040 0010h	x
	02h	2nd mapping object	UINT32	rw	607A 0020h	x
	03h	3rd mapping object	UINT32	rw	0	x
	04h	4th mapping object	UINT32	rw	0	x
	05h	5th mapping object	UINT32	rw	0	x
	06h	6th mapping object	UINT32	rw	0	x
	07h	7th mapping object	UINT32	rw	0	x
	08h	8th mapping object	UINT32	rw	0	x

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
1602H	00h	3rd RPDO mapping parameter – No of entries	UINT8	rw	2	x
	01h	1st mapping object	UINT32	rw	6040 0010h	x
	02h	2nd mapping object	UINT32	rw	60FF 0020h	x
	03h	3rd mapping object	UINT32	rw	0	x
	04h	4th mapping object	UINT32	rw	0	x
	05h	5th mapping object	UINT32	rw	0	x
	06h	6th mapping object	UINT32	rw	0	x
	07h	7th mapping object	UINT32	rw	0	x
	08h	8th mapping object	UINT32	rw	0	x
1603H	00h	4th RPDO mapping parameter – No of entries	UINT8	rw	0	x
	01h	1st mapping object	UINT32	rw	0	x
	02h	2nd mapping object	UINT32	rw	0	x
	03h	3rd mapping object	UINT32	rw	0	x
	04h	4th mapping object	UINT32	rw	0	x
	05h	5th mapping object	UINT32	rw	0	x
	06h	6th mapping object	UINT32	rw	0	x
	07h	7th mapping object	UINT32	rw	0	x
	08h	8th mapping object	UINT32	rw	0	x

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
1800H	00h	1. TPDO Communication Parameter – No of entries	UINT8	ro	5	x
	01h	COB-ID	UINT32	rw	0180h+NodeID	x
	02h	Transmission Type	UINT8	rw	255	x
	03h	Inhibit Time [100µs]	UINT16	rw	1000	x
	05h	Event Timer[ms]	UINT16	rw	2000->0x07D0	x
1801H	00h	2. TPDO Communication Parameter – No of entries	UINT8	ro	5	x
	01h	COB-ID	UINT32	rw	0280h +NodeID	x
	02h	Transmission Type	UINT8	rw	255	x
	03h	Inhibit Time [100µs]	UINT16	rw	1000	x
	05h	Event Timer [ms]	UINT16	rw	2000-> 0x07D0	x
1802H	00h	3. TPDO Communication Parameter – No of entries	UINT8	ro	5	x
	01h	COB-ID	UINT32	rw	0380h+ NodeID	x
	02h	Transmission Type	UINT8	rw	1	x
	03h	Inhibit Time [100µs]	UINT16	rw	1000 -> 0x03E8	x
	05h	Event Timer [ms]	UINT16	rw	2000-> 0x07D0	x

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
1803H	00h	4th TPDO communication parameter – No of entries	UINT8	ro	5	x
	01h	COB ID	UINT32	rw	0480h+ node ID	x
	02h	Transmission type	UINT8	rw	255	x
	03h	Inhibit Time [100 µs]	UINT16	rw	1000	x
	05h	Event Timer [ms]	UINT16	rw	2000-> 0x07D0	x
1A00H	00h	1st TPDO mapping parameter – No of entries	UINT8	ro	5	x
	01h	1st mapping object	UINT32	ro	6041 0010h	x
	02h	2nd mapping object	UINT32	ro	6061 0008h	x
	03h	3rd mapping object	UINT32	ro	1001 0008h	x
	04h	4th mapping object	UINT32	ro	2200 0610h	x

	05h	5th mapping object	UINT32	ro	6077 0010h	x
	06h	6th mapping object	UINT32	ro	0	x
	07h	7th mapping object	UINT32	ro	0	x
	08h	8th mapping object	UINT32	ro	0	x
1A01H	00h	2nd TPDO mapping parameter – No of entries	UINT8	ro	2	x
	01h	1st mapping object	UINT32	ro	6041 0010h	x
	02h	2nd mapping object	UINT32	ro	6064 0020h	x
	03h	3rd mapping object	UINT32	ro	0	x
	04h	4th mapping object	UINT32	ro	0	x
	05h	5th mapping object	UINT32	ro	0	x
	06h	6th mapping object	UINT32	ro	0	x
	07h	7th mapping object	UINT32	ro	0	x
	08h	8th mapping object	UINT32	ro	0	x

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
1A02H	00h	3rd TPDO mapping parameter – No of entries	UINT8	ro	2	x
	01h	1st mapping object	UINT32	ro	6041 0010h	x
	02h	2nd mapping object	UINT32	ro	606C 0020h	x
	03h	3rd mapping object	UINT32	ro	0	x
	04h	4th mapping object	UINT32	ro	0	x
	05h	5th mapping object	UINT32	ro	0	x
	06h	6th mapping object	UINT32	ro	0	x
	07h	7th mapping object	UINT32	ro	0	x
	08h	8th mapping object	UINT32	ro	0	x
1A03H	00h	4th TPDO mapping parameter – No of entries	UINT8	rw	0	x
	01h	1st mapping object	UINT32	rw	0	x
	02h	2nd mapping object	UINT32	rw	0	x
	03h	3rd mapping object	UINT32	rw	0	x
	04h	4th mapping object	UINT32	rw	0	x
	05h	5th mapping object	UINT32	rw	0	x
	06h	6th mapping object	UINT32	rw	0	x
	07h	7th mapping object	UINT32	rw	0	x
	08h	8th mapping object	UINT32	rw	0	x

Bootloader objects

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	MAPPABLE
1F50H	02h	Parameters Data	DOMAIN	wo	
1F51H	01h	Command channel	UINT8	wo	
1F5AH	00h	Security Access Code	UINT32	wo	
1F5CH	00h	Bootloader Mode Switch	UINT8	wo	

Value „1” in the object ID 1F5Ch triggers a complete restart of this RollerDrive.

These objects belongs to the range defined by **CiA 302 (CANopen Framework for Programmable Devices and Firmware Download)**. It is typically used for **program/firmware download data transfer**.

Object 1F50h: Parameters Data

0x1F50 - Program Data (DOMAIN): This is where all firmware segments are sent. Use SDO segmented or block transfer to push chunks of the firmware here, it’s the data buffer for the firmware.

Object Description

Index	**$1F50_h$**
Name	Parameters Data
Object code	VAR

Data Type	DOMAIN
Category	Optional

Entry Description:

Sub-Index	**2**
Access	Write Only
PDO Mapping	NO
Value Range	DOMAIN

Object 1F51h: Command Channel

0x1F51 - Command Channel: acts as the **command channel**. Write commands here to trigger operations like “clear flash” or “start download”.

Object Description

Index	**$1F51_h$**
Name	Command channel
Object code	VAR
Data Type	UNSIGNED8
Category	Optional

Entry Description:

Sub-Index	**1**
Access	Write Only
PDO Mapping	NO
Value Range	UNSIGNED8

Object 1F5Ah: Security Access Code

0x1F5A - Security Access Code: This object is used to **manage secure access to the firmware/program functions** of a device. It ensures that only authorized hosts can perform sensitive operations like:

- Flash erase
- Firmware download
- Program start/stop

Object Description

Index	**$1F5A_h$**
Name	Security Access Code
Object code	VAR
Data Type	UNSIGNED32

Category	Optional

Entry Description:

Sub-Index	**0**
Access	Write Only
PDO Mapping	NO
Value Range	UNSIGNED32

Object 1F5Ch: Bootloader Mode Switch

0x1F5C - Bootloader Mode Switch: Host writes a command to 0x1F5C to request **bootloader mode**. If 0x1F5A access is correct, the device switches mode, otherwise, the request is rejected.

Object Description

Index	**$1F5C_h$**
Name	Bootloader Mode Switch
Object code	VAR
Data Type	UNSIGNED8
Category	Optional

Entry Description:

Sub-Index	**1**
Access	Write Only
PDO Mapping	NO
Value Range	UNSIGNED8

Monitoring Values

OBJECT ID	SUB INDEX	NAME	UNIT	DATA TYPE	ACC	DEFAULT	MAPPABLE
2200H	00h	Monitoring value – No of Entries		UINT8	ro	9	
	01h	Start stops		UINT32	ro	0	
	02h	Working hours	h	UINT32	ro	0	
	03h	Uptime(runtime)	h	UINT32	ro	0	
	04h	Absolute minimum temperature	C	INT16	ro	0	
	05h	Absolute maximum temperature	C	INT16	ro	0	
	06h	Actual temperature	C	INT16	ro	0	
	07h	Number of quick stops		UINT16	ro	0	
	08h	Power average(mech)	W/h	UINT8	ro	0	
	09h	Number of rotations		UINT32	ro	0	

Object 2200h: Monitoring Values

0x2200 – Monitoring Values: it is not a standardized CANopen object, it's vendor-specific. In most devices it's used to expose read-only runtime or diagnostic values so a CANopen master (PLC, PC tool, etc.) can monitor what the device is doing.

Object Description

Index	**2200_h**

Name	Monitoring Values
Object code	RECORD
Data Type	UNSIGNED8
Category	Optional

Entry Description:

Sub-Index	**0**
Name	Number Of Entries
Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED8

Sub-Index	**1**
Name	Monitor Start Stops
Description	This object is a counter that tracks how many times the device has been started and stopped since last reset.
Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED32

Sub-Index	**2**
Name	Monitor Working Hours (sec)
Description	This is a runtime counter that accumulates the total working/operating time of the device, measured in seconds.
Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED32

Sub-Index	**3**
Name	Monitor Uptime (Running Time) (sec)
Description	This counter tracks the total elapsed time the device has been powered on or enabled, i.e., uptime, measured in seconds.
Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED32

Sub-Index	**4**
Name	Monitor Temperature Absolute Minimum
Description	This object tracks the lowest temperature the device has experienced since the last reset or power-on.
Access	Read Only
PDO Mapping	YES
Value Range	SIGNED16

Sub-Index	**5**
Name	Monitor Temperature Absolute Maximum
Description	Tracks the highest temperature the device has experienced since the last reset or power-on.
Access	Read Only
PDO Mapping	YES
Value Range	SIGNED16

Sub-Index	**6**
Name	Monitor Actual Temperature
Description	This object shows the current temperature of the device, as measured by its internal temperature sensor.
Access	Read Only
PDO Mapping	YES
Value Range	SIGNED16

Sub-Index	**7**
Name	Number of Quick Stops
Description	This is a counter that tracks how many times the device has performed a quick stop.
Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED16

Sub-Index	**8**
Name	Monitor Power Average

Description	This object tracks the average electrical power the device has consumed over a certain period.
Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED8

Sub-Index	**9**
Name	Monitor Number of Rotations
Description	This object counts the total number of full rotations made by a rotating component of the device (e.g., motor shaft).
Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED32

General objects

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
6040H	00h	Control word	UINT16	rw	0	x
6041H	00h	Status word	UINT16	ro	0	x
6060H	00h	Mode of operation	INT8	rw	3	x
6061H	00h	Mode of operation display	INT8	ro		x

Object 6040h: Controlword

0x6040 – Controlword: The controlword consists of bits for:

- the controlling of the state,
- the controlling of operating modes and
- manufacturer specific options.

Object Description

Index	**6040_h**
Name	Control word
Object code	VAR
Data Type	UNSIGNED16
Category	Mandatory

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED16

Object 6041h: Statusword

0x6041 – Statusword: The statusword indicates the current state of the drive. No bits are latched. The statusword consists of bits for:

- the current state of the drive,
  - the operating state of the mode and
  - manufacturer specific options.

Object Description

Index	**6041_h**
Name	Status word
Object code	VAR
Data Type	UNSIGNED16
Category	Mandatory

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED16

Object 6060h: Modes of operation

0x6060 - Modes of operation: The parameter modes of operation switches the actually chosen operation mode.

Object Description

Index	**6060_h**
Name	Modes of operation
Object code	VAR
Data Type	UNSIGNED8
Category	Mandatory

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED8

List of possible operation modes:

Value	**Description**
-5	Stepper Mode
-4	Tuning Current Mode

-3	Tuning Velocity Mode
-1	Tuning Position Mode
1	Profile Position Mode
3	Profile Velocity Mode
4	Torque Profile Mode
6	Homing Mode
7	Interpolated Position Mode

Object 6061h: Modes of operation display

0x6061 - Modes of operation display: The modes of operation display show the current mode of operation. The meaning of the returned value corresponds to that of the modes of operation option code (index 6060h).

Object Description

Index	**6061_h**
Name	Modes of operation display
Object code	VAR
Data Type	UNSIGNED8
Category	Mandatory

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED8

Velocity mode

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
60FFH	00h	Target Velocity [mm/sec]	INT32	rw		x
606CH	00h	Velocity Actual value [mm/sec]	INT32	ro		x
6078	00h	Current Actual value	INT16	ro		x
607FH	00h	Max profile velocity[mm/sec]	UINT32	ro	3000	

Object 60FFh: Target Velocity

0x60FF – Target Velocity: The target velocity is the input for the trajectory generator and the value is given in velocity units.

Object Description

Index	**$60FF_h$**

Name	Target Velocity
Object code	VAR
Data Type	UNSIGNED32
Category	Mandatory

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED8
Default Value	0

Object 606Ch: Velocity actual value

0x606C – 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.

Object Description

Index	**$606C_h$**
Name	Velocity actual value
Object code	VAR
Data Type	SIGNED32
Category	Mandatory

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	SIGNED32
Default Value	0

Object 6078h: Actual Current

0x6078 – Actual current: Actual current active in the motor, in thousandth of the nominal current (6077h*In)/1000.

Object Description

Index	**6078_h**
Name	Actual Torque
Object code	VAR
Data Type	UNSIGNED16
Category	Optional

Entry Description:

Access	Read Only

PDO Mapping	YES
Value Range	UNSIGNED16
Default Value	0

Object 607Fh: Maximum Profile Velocity

0x607F – Max. profile velocity :The controller calculates a trajectory for moving the motor from the current position to a target position. It defines the upper limit for velocity along this trajectory. If a commanded velocity exceeds this value, the drive will clip it to the maximum.

Object Description

Index	**$607F_h$**
Name	Max. profile velocity
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	0

Profile position mode

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
6062H	00h	Position demand value	INT32	ro	0	x
6064H	00h	Position actual value	INT32	ro	0	x
607AH	00h	Target position	INT32	rw	0	x
6081H	00h	Profile velocity	UINT32	rw		x
6083H	00h	Profile acceleration*	UINT32	rw	6600	x
6084H	00h	Profile deceleration*	UINT32	rw	6600	x
6098H	00h	Homing method	INT8	rw	35	
6099H	00h	Homing speeds – No of entries	UINT8	ro	2	
	01h	Homing speed to switch	UINT32	rw	50	
	02h	Homing speed to zero	UINT32	rw	50	

*Values also apply in velocity mode.

For the positioning mode, the direction of rotation „clockwise” (factory setting) must be selected in the default settings!

Object 6062h: Position Demand Value

0x6062 – Position demand value: The position demand value is given in position units.

Object Description

Index	**6062_h**
Name	Actual Torque
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	0

Object 6064h: Position Actual Value

0x6064 – Position actual value: Reports the current position of the drive or motor in real time. When the drive is moving (in profile position, profile velocity, or other modes), 0x6064 constantly updates to show the actual position of the motor shaft.

Object Description

Index	**6064_h**

Name	Position actual value
Object code	VAR
Data Type	INTEGER32
Category	Mandatory

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	INTEGER32
Default Value	0

Object 607Ah: Target Position

0x607A – Target position: The target position 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 user defined position units. It is converted to position increments using the position factor. The target position will be interpreted as absolute or relative depending on the ‘abs / rel' flag in the control word.

Object Description

Index	**$607A_h$**
Name	Target Position
Object code	VAR
Data Type	INTEGER32
Category	Mandatory

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	INTEGER32

Object 6081h: Profile Velocity

0x6081 – 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. The profile velocity is given in user defined speed units. It is converted to position increments per second using the velocity encoder factor.

Object Description

Index	**6081_h**
Name	Profile Velocity
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED32

Object 6083h: Profile Acceleration

0x6083 – Profile acceleration: Defines the acceleration rate the drive uses when performing profile-based movements (e.g., Profile Position Mode or Profile Velocity Mode). It is converted to position mm per seconds^2.

Object Description

Index	**6083_h**
Name	Profile Acceleration
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	6600

Object 6084h: Profile Decelaration

0x6084 – Profile deceleration: The profile deceleration is given in the same units as profile acceleration.

Object Description

Index	**6084_h**
Name	Profile Acceleration
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	6600

Object 6098h: Homing Method

0x6098 – Homing method: The homing method object determines the method that will be used during homing.

Object Description

Index	**6098_h**
Name	Homing Method
Object code	VAR
Data Type	INTEGER8
Category	Optional

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	INTEGER8
Default Value	35

Object 6099h: Homing Speeds

0x6099 – Homing speeds: This entry in the object dictionary defines the speeds used during homing and is given velocity units.

Object Description

Index	**6099_h**
Name	Homing Speeds
Object code	ARRAY
Data Type	UNSIGNED32
Category	Mandatory

Entry Description:

Sub-Index	**0**
Description	Number of entries
Entry Category	Mandatory
Access	Read Only
PDO Mapping	NO
Value Range	UNSIGNED8
Default Value	2

Sub-Index	**1**
Description	Speed during search for switch

Entry Category	Mandatory
Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	50

Sub-Index	**2**
Description	Speed during search for zero
Entry Category	Mandatory
Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	50

Required torque values

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
6073H	00h	Torque Limit	UINT16	rw	3500	TM
6077H	00h	Actual torque value	INT16	ro		TM
6078H	00h	Current actual value	INT32	ro		x

Object 6073h: Torque Limit

0x6073 – Torque Limit: Defines the maximum torque the drive is allowed to generate, independent of the commanded torque. Maximum current that the driver could deliver to the motor in (6073h*In)/1000, thousandth of the nominal current. It is related to the I2t protection.

Object Description

Index	**6073_h**
Name	Torque Limit
Object code	VAR
Data Type	UNSIGNED16
Category	Optional

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED16

Default Value	3500

Object 6077h: Actual Torque Value

0x6077 – Actual Torque: It is the real, measured torque produced by the motor — derived from the measured Iq current of the drive's current loop. Actual torque active in the motor, in thousandth of the nominal current (6077h*In)/1000. For calculating the torque use the Kt of the motor with active current.

Object Description

Index	**6077_h**
Name	Actual Torque
Object code	VAR
Data Type	INTEGER16
Category	Optional

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	INTEGER16

Object 6078h: Current Actual Value

0x6078 – Actual current: It is the measured motor phase current (Iq component) coming from the drive's current controller. Actual current active in the motor, in thousandth of the nominal current (6077h*In)/1000.

Index	**6078_h**
Name	Actual Current
Object code	VAR
Data Type	INTEGER16
Category	Optional

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	INTEGER16
Default Value	0

General objects

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
6403H	00h	Motor catalogue number	Visible_ String	ro	DMR_LIGHT 48V 100\0	x

6404H	00h	Motor manufacturer device name	String	ro	Motor Power Company	x

Object 6403h: Motor Catalogue Number

0x6403 – Motor Catalogue Number: This object contains the identifier of the motor stored inside the drive:

- Part number
- Model code
- Catalogue reference used by the manufacturer

It tells you which motor parameter set is currently active in the drive.

Object Description

Index	**6403_h**
Name	Motor Catalogue Number
Object code	STRING
Data Type	VISIBLE STRING
Category	Optional

Entry Description:

Access	Read Only
PDO Mapping	NO

Object 6404h: Motor Manufacturer Device Name

0x6404 – Motor Manufacturer Device Name: Identifies the specific motor model that is configured or loaded in the drive.

Object Description

Index	**6404_h**
Name	Motor Manufacturer Device Name
Object code	STRING
Data Type	VISIBLE STRING
Category	Optional

Entry Description:

Access	Read Only
PDO Mapping	NO

Factor Group

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
60A8H	00h	SI unit position	UINT32	rw	4244701184	
60A9H	00h	SI unit velocity	UINT32	ro	4244701952	x
60AAH	00h	SI unit acceleration	UINT32	ro	4244723456	x
6092H	00h	Feed Constant – No of entries	UINT8	ro	2	x
	01h	Feed [mm]	UINT32	ro	157	x
	02h	Shaft Revolutions	UINT32	ro	1	x
607EH	00h	Polarity	UINT8	ro	0	x
60C5H	00h	Max Acceleration [mm/sec]	UINT32	rw	6600	x
60C6H	00h	Max Deceleration [mm/sec^2]	UINT32	rw	6600	x

Object 60A8h: Position in SI Units

0x60A8 – Position in SI Units: Provides actual motor or actuator position converted to real-world SI units, instead of raw encoder counts.

Object Description

Index	**60A8$_h$**
Name	Position in SI Units
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	0xFD010000

Object 60A9h: Velocity in SI Units

0x60A9 – Velocity in SI Units: Provides the actual motor or axis velocity in real-world SI units, instead of raw counts per time unit.

Object Description

Index	**60A9$_h$**
Name	Velocity in SI Units
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	0xFD010300

Object 60AAh: Acceleration in SI Units

0x60AA – Acceleration in SI Units: Gives the profile acceleration in physical units.

Object Description

Index	**$60AA_h$**
Name	Acceleration in SI Units
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read Only
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	0xFD015700

Object 6092h: Feed Constant

0x6092 – Feed Constant: Defines the conversion factor between motor shaft revolutions and linear axis movement.

Object Description

Index	**6092_h**
Name	Feed Constant
Object code	VAR
Data Type	UNSIGNED8
Category	Optional

Entry Description:

Sub-Index	**0**
Description	Number of entries
Entry Category	Optional
Access	Read Only
PDO Mapping	NO

Value Range	UNSIGNED8
Default Value	2

Sub-Index	**1**
Description	Feed in mm
Entry Category	Optional
Access	Read Only
PDO Mapping	NO
Value Range	UNSIGNED32
Default Value	157

Sub-Index	**2**
Description	Feed shaft revolution
Entry Category	Optional
Access	Read Only
PDO Mapping	NO
Value Range	UNSIGNED32
Default Value	1

Object 60C5h: Profile Acceleration

0x60C5 – Profile acceleration: Defines the acceleration rate the drive uses when performing profile-based movements (e.g., Profile Position Mode or Profile Velocity Mode). It is converted to position mm per seconds^2.

Object Description

Index	**$60C5_h$**
Name	Profile Acceleration
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED32

Default Value	6600

Object 60C6h: Profile Decelaration

0x60C6 – Profile deceleration: The profile deceleration is given in the same units as profile acceleration.

Object Description

Index	**$60C6_h$**
Name	Profile Acceleration
Object code	VAR
Data Type	UNSIGNED32
Category	Optional

Entry Description:

Access	Read/Write
PDO Mapping	YES
Value Range	UNSIGNED32
Default Value	6600

Controlling the power drive system

OBJECT ID	SUB INDEX	NAME	DATA TYPE	ACC	DEFAULT	MAPPABLE
6502H	00h	Supported drive modes	UINT32	ro	109	x
6504H	00h	Drive Manufacturer	STRING	ro	MOTOR POWER COMPANY	

PDO Mapping

RxPDO Frame	Frame to receive								
Index	**Byte 0**	**Byte 1**	**Byte 2**	**Byte 3**	**Byte 4**	**Byte 5**	**Byte 6**	**Byte 7**	
RxPDO 1 1600h *RxPDO 1 1600h*	6040h 00h 10h Controlword		6060h 00h 08h Mode of operation	6081h 00h 20h Profile Velocity					200+NodeID
RxPDO 2 1601h *RxPDO 2 1601h*	6040h 00h 10h Controlword		607Ah 00h 20h Target Position						300+NodeID
RxPDO 3 1602h *RxPDO 3 1602h*	6040h 00h 10h Controlword		607Ah 00h 20h Target Velocity						400+NodeID
RxPDO 4 1603h *RxPDO 4 1603h*	Can be used freely								500+NodeID

Note for sending the RPDOs:

Evaluate the desired change in the status word or wait min 50ms between sending two commands.

TxPDO Frame	Frame to send								
Index	**Byte 0**	**Byte 1**	**Byte 2**	**Byte 3**	**Byte 4**	**Byte 5**	**Byte 6**	**Byte 7**	
TxPDO 1 1A00h *TxPDO 1 1A00h*	6041h 00h 10h Statusword		6060h 00h 08h Mode of Operation display	1001h 00h 08h Error Register	2200h 06h 10h Actual Temperature		6077h 00h 10h Torque actual value		180+NodeID
TxPDO 2 1A01h *TxPDO 2 1A01h*	6041h 00h 10h Statusword		6064h 00h 20h Position actual value						280+NodeID
TxPDO 3 1A02h *TxPDO 3 1A02h*	6041h 00h 10h Statusword		606Ch 00h 20h Velocity actual value						380+NodeID
TxPDO 4 1A03h *TxPDO 4 1A03h*	Can be used freely								480+NodeID

	Inhibit Time (ms)	Event Timer (ms)	Condition for sending the information
TxPDO 1 1A00h	1000	2000	It is sent in all state modes when the value changes
TxPDO 1 1A00h	1000	2000	It is sent in all state modes when the value changes
TxPDO 1 1A00h	1000	2000	It is sent in all state modes when the value changes

Error codes

9.1 CiA Errors

CIA CODE	ERROR / WARNING	DESCRIPTION
0X0000	E	Error reset or no warning
0X1001	E	Generic Error
0X1002	E	Current Error
0X1003	E	Voltage Error
0X1004	E	Temperature Error
0X1005	E	Device Hardware Error
0X1006	E	Device Sware Error
0X1007	E	Internal bus error
0X1008	E	Other device-specific error
0X3210	E	Supply voltage too high
0X3220	E	Supply voltage too low
0X3310	E	Output voltage too high
0X3320	E	Output voltage too low
0X5000	E	Device hardware error group
0X6000	E	Device software error group
0X6100	E	Internal software error
0X6110	E	Parameter error
0X6120	E	EEPROM access error
0X6300	E	Data set error
0X7305	E	Communication error
0X8100	E	CAN communication error
0X8110	E	CAN overrun (receive buffer full)
0X8120	E	CAN passive mode error
0X8130	E	NMT heartbeat error
0X8140	E	CAN bus off
0X8200	E	PDO not processed due to timeout
0X8210	E	PDO not processed, length error
0X8321	E	PDO mapping error

9.2 Fault register

Can Open Object 0x603F sub 0x00 reports some drive faults.

FAULT REGISTER BITS	FAULT DESCRIPTION
BIT 0	Overvoltage
BIT 1	Undervoltage
BIT 2	Peak Motor Current
BIT 3	Rated Motor Current
BIT 4	Short Circuit
BIT 5	Rated Brake Current
BIT 6	Hall Signals
BIT 7	Analog Input
BIT 8	Position Tracking Error
BIT 9	Velocity Tracking Error
BIT 10	Overvelocity
BIT 11	Motor Overtemperature
BIT 12	Drive Overtemperature
BIT 13	CanOpen Heartbeat Event
BIT 14	CanOpen Sync
BIT 15	Master Slave

9.3 CANopen abort codes

CANOPEN ABORT CODE	DESCRIPTION
0503 0000H	Toggle bit not alternate
0504 0000H	SDO protocol timed out
0504 0001H	Client / server command specifier not valid or unknown
0504 0002H	Invalid block size (block mode and only in bootloader)
0504 0005H	Out of memory
0601 0001H	Attempt to read a write only object
0601 0002H	Attempt to write a read only object
0602 0000H	Object does not exist in the object dictionary
0604 0041H	Object cannot be mapped to the PDO
0604 0042H	The number and length of the objects to be mapped would exceed PDO length
0604 0047H	General internal incompatibility in the device
0607 0010H	Data type does not match, length of service parameter does not match
0607 0012H	Data type does not match, length of service parameter too high
0609 0011H	Sub-index does not exist
0800 0000H	General error
0800 0020H	Data cannot be transferred or stored to the application
0800 0022H	Data cannot be transferred or stored to the application because of the present device state
0800 0023H	Object dictionary dynamic generation fails or no object dictionary is present (e.g. object dictionary is generated from file and generation fails because of an file error)
0800 0024H	No data available

Document Versioning

VERSION	DATE	AUTHOR	NOTE
1.0	15/01/2026	Ambra Perrino	First Release

CANopen Compatibility

EDS VERSION	FW VERSION	AUTHOR	NOTE
4.0	1.05.0	Michele Piacentini	

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