Baumer

Passion for Sensors

Manual

Absolute Encoder with EtherCAT

Firmware revision number from 5.02

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Contents

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1 Introduction

1.1 Scope of delivery

Please check the delivery upon completeness prior to commissioning.
Depending on encoder configuration and part number delivery is including:

- Basic encoder with EtherCAT bus cover
- CD with describing file and manual (also available as download in the Internet).

1.2 Product assignment

Shaft encoder

Product	Product family
AMG 11 E13	AMG 11 - Singleturn
AMG 11 E29	AMG 11 - Multiturn

Hollow / Endshaft encoder

Product	Product family
HMG 11 E13	HMG 11 - Singleturn
HMG 11 E29	HMG 11 - Multiturn

2 Safety and operating instructions

Supplementary information
- This manual is intended as a supplement to already existing documentation (catalogues, data sheets and assembly instructions). They are placed on the delivered CD or can be downloaded at www.baumer.com.
- The manual must be read without fail before initial commissioning of the equipment.

Intended purpose of the equipment
- The encoder is a precision measurement device. It is used to determine angular positions and revolutions, and to prepare and supply measured values in the form of electrical output signals for control systems. Encoders may only be used for this purpose.

Commissioning
- Encoders may only be installed and assembled by suitably qualified experts.
- Observe the operating instructions of the machine manufacturer.

Safety remarks
- Prior to commissioning the equipment, check all electrical connections.
- If installation, electrical connection or any other work performed at the encoder or at the equipment is not correctly executed, this can result in a malfunction or failure of the encoder.
- Steps must be taken to exclude any risk of personal injury, damage to the plant or to the operating equipment as a result of encoder failure or malfunction by providing suitable safety precautions.
- Encoders must not be operated outside the limited values specified in the product information (see detailed product documentation).

Failure to comply with the safety remarks can result in malfunctions, personal injury or damage to property.

Transport and storage
- Only ever transport or store encoders in their original packaging.
- Never drop encoders or expose them to major vibrations.

Assembly
- Avoid impacts or shocks on the housing and shaft.
- Avoid any twist or torsion on the housing.
- Do not open the encoder or make any mechanical changes to it.

The shaft, ball bearings, glass disc or electronic components can be damaged. In this case, safe and reliable operation cannot be guaranteed.

Electrical commissioning

- Do not make any electrical changes at the encoder.
- Do not carry out any wiring work when the encoder is under power supply.
- Never plug or unplug the electrical connection when the encoder is under power supply.
- Ensure that the entire plant is installed in line with EMC/EMI requirements. The installation environment and wiring affect the electromagnetic compatibility of the encoder. Install the encoder and supply cables separately or at a long distance from cables with high interference emissions (frequency converters, contactors etc.)
- When working with consumers with high emitted interference provide separate encoder supply voltage for the encoder.
- Completely shield the encoder housing and connecting cable.
- Connect the encoder to the protective earth (PE) using shielded cable. The braided shield must be connected to the cable gland or plug. Ideally, aim at bilateral connection to protective earth (PE), the housing via the mechanical assembly, the cable shield via the downstream devices. In case of earth loop problems, earth on one side only as a minimum requirement.

Failure to observe these instructions can result in malfunctions, material damage or personal injury!

Disposal

- Dispose of encoder components in accordance with locally applicable legislation.

3 Encoder operating parameters

Description of operating parameters

Table: operating parameters (factory default)

Product	Resolution per turn 0x6001			Number of turns 0x6502			Measuring range 0x6002		
	Decimal	Hex	Bit	Decimal	Hex	Bit	Decimal	Hex	Bit
AMG 11 E13	8192	2000	13	1	1	0	8192	2000	13
AMG 11 E29	8192	2000	13	65536	10000	16	536870912	20000000	29
HMG 11 E13	8192	2000	13	1	1	0	8192	2000	13
HMG 11 E29	8192	2000	13	65536	10000	16	536870912	20000000	29

The enabled scaling functionality in CoE is prerequisite for further user-specific parameterization such as resolution, total measuring range, direction of rotation and preset.

See chapter: SDO (Service Data Objects)

4 Encoder data

4.1 PDO (Process Data Object)

Depending on the configuration, the encoder will provide the following process data (input data):

XML file	PDO Mapping	Product code	Applied in version
BAUMER Group absolute EtherCAT encoders.xml	**10Byte PDO: (default)** 4 Byte Position value 2 Byte Warnings 4 Byte System Time **or** **4Byte PDO: (configurable)** 4 Byte Position value **2Byte PDO: (configurable)** 2 Byte Position value	**20** **25** **30**	**V5.02 and up**

10Byte PDO (Default)

Value	Data type	Explanation
Position value	UDINT	Current absolute encoder position value. For range-related information refer to „Encoder operating parameters“
Warnings	UINT	Warnings Bit 2: 1 → Lithium battery power low Bit 4: 1 → Excess shaft turns during power-off Bit 5: 1 → Incorrect encoder configuration
System Time	UDINT	Present system time, resolution in ns

4Byte PDO

Value	Data type	Explanation
Position value	UDINT	Current absolute encoder position value. For range-related information refer to „Encoder operating parameters“

2Byte PDO

Value	Data type	Explanation
Position value	UINT	Current absolute encoder position value. For range-related information refer to „Encoder operating parameters“

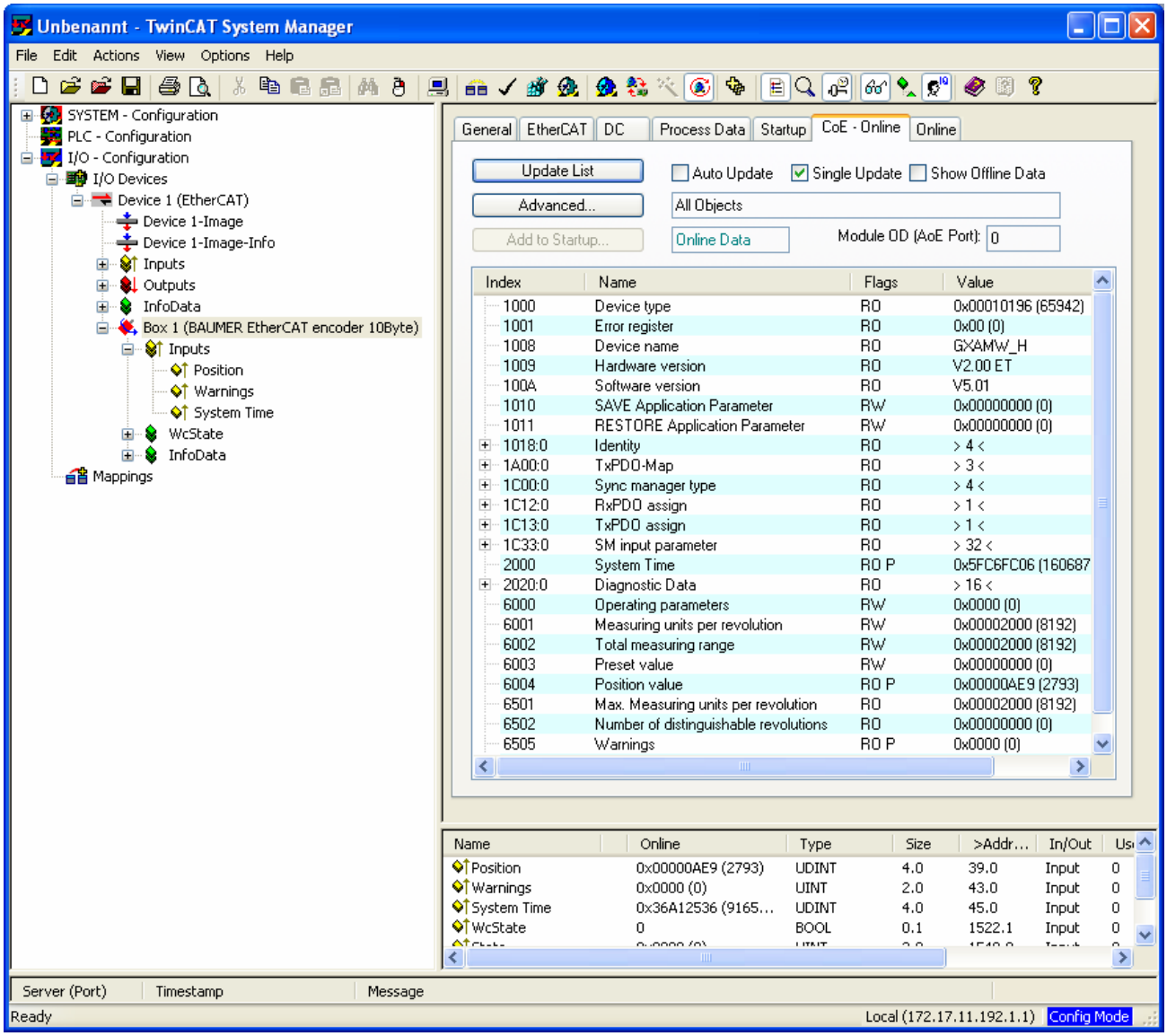
The configuration 4Byte PDO / 2Byte PDO allows for shorter cycle times.

Cycle times are configuration-related, see chapter cycle times

4.2 SDO (Service Data Objects)

SDOs access is in the TwinCAT System Manger under tab **CoE - Online (CANopen over EtherCAT)**.

Since there is a large variety of CANopen device and application profiles they may be applied in EtherCAT slaves.
EtherCAT encoders provide partial implementation of the CANopen DS406 encoder device profile.



Please consider that every CoE access (mailbox communication) will shortly interrupt generation of encoder input data for the time of mailbox communication. With short cycle times in Distributed Clocks Mode this may imply that not in every Sync cycle a new position is detected.

Object list Detailed explanations on the most important SDO objects

Object 0x1000 Device Type

SubIndex	0
Data type	Unsigned 32
Access	ReadOnly
Default	Multiturn: 0x00020196 Singleturn: 0x00010196h
EEPROM	No
Significance	Information on device profile and device type
Values	

Object 0x1008 Device Name

SubIndex	0
Data type	VISIBLE_STRING
Access	ReadOnly
Default	According to connected basic encoder "GXMMW_H","GXAMW_H"
EEPROM	No
Significance	Device name in ASCII
Values	

Object 0x1009 Hardware Version

SubIndex	0
Data type	VISIBLE_STRING
Access	ReadOnly
Default	
EEPROM	No
Significance	Hardware version in ASCII
Values	

Object 0x100A Manufacturer Software Version

SubIndex	0
Data type	VISIBLE_STRING
Access	ReadOnly
Default	
EEPROM	No
Significance	Software version in ASCII
Values	

Object 0x1010 SAVE Application Parameter

Object 0x1010 is utilized to save device-specific objects (0x6000..0x6FFF) out of RAM into non-volatile memory (EEPROM). To prevent inadvertent saving operations the signature „**save**“ must be written into object 0x1010 Subindex 0.

Signature MSB LSB

ISO 8859

e	**v**	**a**	**s**	character
0x65	**0x76**	**0x61**	**0x73**	hex
1702257011				dez

Object 0x1011 RESTORE Application Parameter

Object 0x1011 restores ROM default in device-specific objects (0x6000..0x6FFF) both in RAM and EEPROM.
To prevent any inadvertent restore, the signature „**load**“ must be written in object 0x1011 Subindex 0.

Signature	MSB			LSB	
ISO 8859	**d**	**a**	**o**	**l**	character
	0x64	**0x61**	**0x6F**	**0x6C**	hex
	1684107116				dez

Object 0x1018 Identity Object

SubIndex	0
Data type	Unsigned 8
Access	ReadOnly
Default	4
EEPROM	No
Significance	Maximum supported subindex
Values	4 = Maximum supported subIndex

SubIndex	1
Data type	Unsigned 32
Access	ReadOnly
Default	Ech
EEPROM	No
Significance	VendorID for Baumer IVO GmbH & Co. KG assigned by CiA
Values	0xEC (in the Internet under www.can-cia.de)

SubIndex	2
Data type	Unsigned 32
Access	ReadOnly
Default	0x0A → GXMMW_H ; 0x0B → GXAMW_H
EEPROM	No
Significance	Product Code
Values	

SubIndex	3
Data type	Unsigned 32
Access	ReadOnly
Default	
EEPROM	No
Significance	Revision no.
Values	

SubIndex	4
Data type	Unsigned 32
Access	ReadOnly
Default	
EEPROM	No
Significance	Serial no.
Values	

Object 0x1A00 TxPDO1 Mapping

SubIndex	0
Data type	Unsigned 8
Access	ReadOnly
Default	
EEPROM	No
Significance	Maximum supported subindex
Values	3

SubIndex	1
Data type	Unsigned 32
Access	ReadOnly
Default	
EEPROM	No
Significance	Position value
Values	0x6004

SubIndex	2
Data type	Unsigned 16
Access	ReadOnly
Default	
EEPROM	No
Significance	Warnings
Values	0x6505

SubIndex	3
Data type	Unsigned 32
Access	ReadOnly
Default	
EEPROM	No
Significance	System time
Values	0x2000

Object 0x1C33 SM (Sync Manager) Input Parameter SM3

Sub Index	Data Type	Access	Description	Measurand	Values
0	Unsigned 8	ReadOnly	SM Input Parameter	-	Maximum supported Subindex 32
1	Unsigned 16	ReadOnly	Sync Mode	-	0x00 Free Run (not synchronized) 0x03 DC SYNC1, synchronized with SYNC1 Event
2	Unsigned 32	ReadOnly	Cycle time	Nanoseconds ns	SYNC0/SYNC1 cycle time
3	Unsigned 32	ReadOnly	Shift time	Nanoseconds ns	Shift time from SYNC1 until input data latch (absolute position)
4	Unsigned 16	ReadOnly	Sync modes supported	-	0x0009 Free run supported Synchronous supported DC SYNC1 Dynamic Cycle times
5	Unsigned 32	ReadOnly	Minimum cycle time	Nanoseconds ns	Minimum cycle time supported
6	Unsigned 32	ReadOnly	Calc and copy time	Nanoseconds ns	Calculation and copy time of process data out of local memory into SyncManager

Device-specific objects

Object 0x6000 Operating parameters

SubIndex	0
Data type	Unsigned 16
Access	ReadWrite
Default	0 , scaling OFF, CW
EEPROM	Yes
Significance	Operating parameters
Values	Bit 0: direction of rotation 0 CW 1 CCW Entries ≠ default values are only effective with scaling ON (0x6000). Bit 2: scaling ON/OFF 0 scaling disabled. Encoder provides raw data (less offset). 1 scaling enabled. Encoder provides position values under consideration of scaling factor and offset ². Example: Value 0x0004 -> scaling on, CW

This object allows for enabling the scaling functionality which is a precondition for further user-specific parameterization such as resolution, total measuring range, direction of rotation and preset.
See chapter parameterization.
The above parameters will be preliminarily saved in the volatile RAM memory and can optionally be saved non-volatile in EEProm using object SAVE Application Parameter (0x1010).
Please note that with scaling ON the input data (TxPDO) will be produced much more slowly, i.e. PLC cycle times for encoder readout should be correspondingly enlarged.
See chapter cycle times.

Object 0x6001 Measuring units per revolution

SubIndex	0	
Data type	Unsigned 32	
Access	ReadWrite	
Default	0x2000 = 8192 = 13bit	→ GXxMW_H
	0x1000 = 4096 = 12bit	→ GCxMW_H
	0x40000 = 262144 = 18bit	→ GBxMW_H, GDxMW_H
EEPROM	Yes	
Significance	Optional number of steps per revolution.	
Values	1..n.. max. number of steps per revolution (0x6501) Entries ≠ default values are only effective with enabled scaling function (0x6000).	

In general, when writing on this object any previously saved offset (0x6509) will be cleared (value = 0).

Object 0x6002 Total measuring range

SubIndex	0	
Data type	Unsigned 32	
Access	ReadWrite	
Default	0x20000000 = 536870912 = 29bit	→ GXMMW_H
	0x2000 = 8192 = 13bit	→ GXAMW_H
	0x10000000 = 268435456= 28bit	→ GCMMW_H
	0x1000 = 4096 = 12bit	→ GCAMW_H
	0x80000000 = 2147483648 = 31bit ²	→ GBMMW_H, GDMMW_H
	0x40000 = 262144 = 18bit	→ GBAMW_H, GDAMW_H
EEPROM	Yes	
Significance	Total measuring range in steps optionally programmable. Consequence: Number of revolutions = total measuring range / resolution The maximum resolution (0x6502) must not be exceeded since otherwise the selected total resolution range is too wide and will be rejected.	
Values	1..n.. max. total measuring range in steps (0x 6502) Entries ≠ default values are only effective with enabled scaling function (0x6000).	

² with disabled scaling 32 bit

Writing in these object will clear any previously saved offset (0x6509, value = 0)

Important for multiturn encoder operation:
Continuous operation will be automatically supported where required.

Consequently, no specific relationship between total measuring range and measuring units per revolution must be observed in the parameterization.

With enabled continuous operation and during power off, the encoder shaft may be turned up to ¼ of the maximum permissible turns. Any excess turn may entail void position values which will be signaled by a warning and call for a new referencing operation.

Non-continuous operation allows for an unlimited number of turns during power-off.

Proceed as below to find out whether your parameterization enables continuous operation:

- The „maximum possible number of turns“ provided by the encoder (depending on the configuration: 16 bits = 65536 or 13 bits = 8192) is multiplied by the parameterized measuring units per revolution.
- The result is devided by parameterized total measuring range.
- A remainder in the result (fractional digits) means continuous operation enabled.

Example: Parameterization with disabled continuous operation:

Max. possible number of turns	65536	(16 bits multiturn)
Measuring units per turn :	3600	
Total measuring range	29.491.200	(8192 x 3600)
Calculation:	65536 x 3600 / 29.491.200 = 8 (no remainder)	

Example: Parameterization with enabled continuous operation:

Max. possible number of turns	65536	(16 bits multiturn)
Measuring units per turn	3600	
Total measuring range	100.000	
Calculation:	65536 x 3600 / 100.000 = 2359 remainder 29600	

Object 0x6003 Preset value

SubIndex	0
DatenTyp	Unsigned 32
Zugriff	ReadWrite
Default	0
EEPROM	Yes
Beschreibung	Optionally programmable position value. In this operation an offset value is calculated and saved in object 0x6509.
Werte	0..actual total measuring range (0x6002) -1 Entries ≠ default values are only effective with enabled scaling function (0x6000).

Object 0x6004 Position value

SubIndex	0
Data type	Unsigned 32
Access	ReadOnly
Default	
EEPROM	No
Significance	Value of actual position in steps
Values	0..actual total measuring range (0x6002) -1

Object 0x6501 Max. measuring units per revolution (max. resolution in steps)

SubIndex	0	
Data type	Unsigned 32	
Access	ReadOnly	
Default	0x2000 = 8192 = 13bit	→ GXxMW_H
	0x1000 = 4096 = 12bit	→ GCxMW_H
	0x40000 = 262144 = 18bit	→ GBxMW_H, GDxMW_H
EEPROM	No	
Significance	Maximum singleturn resolution in steps	
Values		

Object 0x6502 Number of distinguishable revolutions

SubIndex	0
Data type	Unsigned 32
Access	ReadOnly
Default	0x10000 = 65536= 16bit
EEPROM	No
Significance	Maximum number of revolutions
Values	With singleturn encoders =0, otherwise according to basic encoder

Object 0x6505 (Warnings)

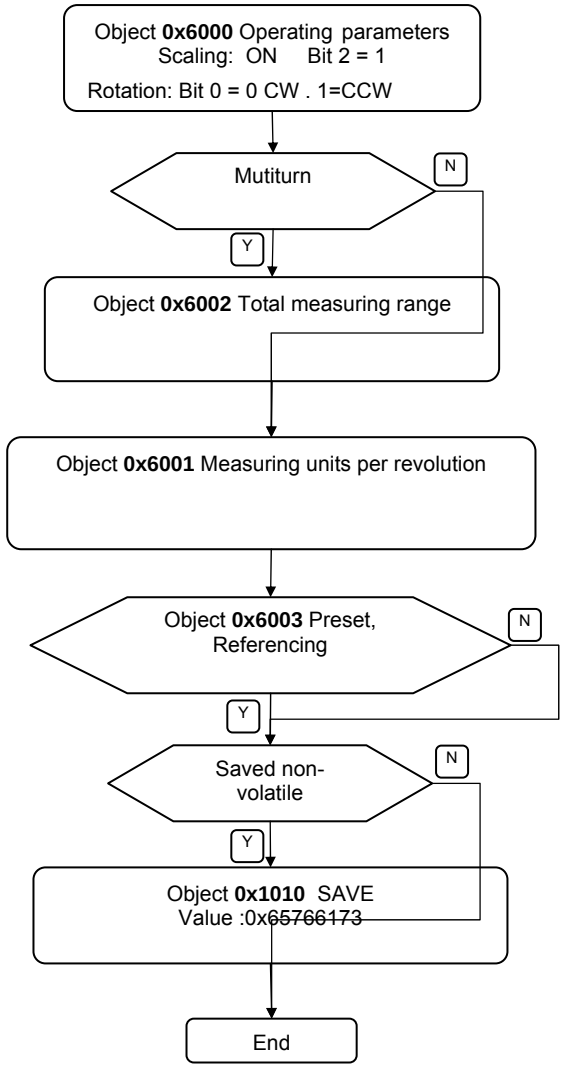
SubIndex	0	
Data type	Unsigned 16	
Access	ReadOnly	
Default	0	
EEPROM	No	
Significance	Warnings	
Values	Multiturn encoder	Bit 2: 1 → Lithium battery voltage low Bit 4: 1 → Excess shaft turns during power off Bit 5: 1 → inappropriate sensor configuration

Object 0x6509 Offset

SubIndex	0
Data type	Unsigned 32
Access	ReadOnly
Default	0
EEPROM	Yes
Significance	Value is calculated upon writing on object Preset (0x 6003)
Values	

4.3 Parameterization

Proceed as below for user-specific parameterization of direction of rotation, resolution, total resolution, preset:



Examples: Scaling ON in object 0x6000

Scaling	Rotation	Value 0x6000
OFF	CW	0x0000
OFF	CCW	0x0001
ON	CW	0x0004
ON	CCW	0x0005

CW = clockwise = increasing values with clockwise shaft rotation

CCW = counterclockwise = increasing values with counterclockwise shaft rotation

Reference: when looking at flange

4.4 Free Run Mode (default)

In "Free Run" mode, a local timer interrupt of the application controller will trip the local cycle which in Free Run is independent of communication cycle and/or master cycle. The encoder will generate the process data in asynchronous cyclic manner.

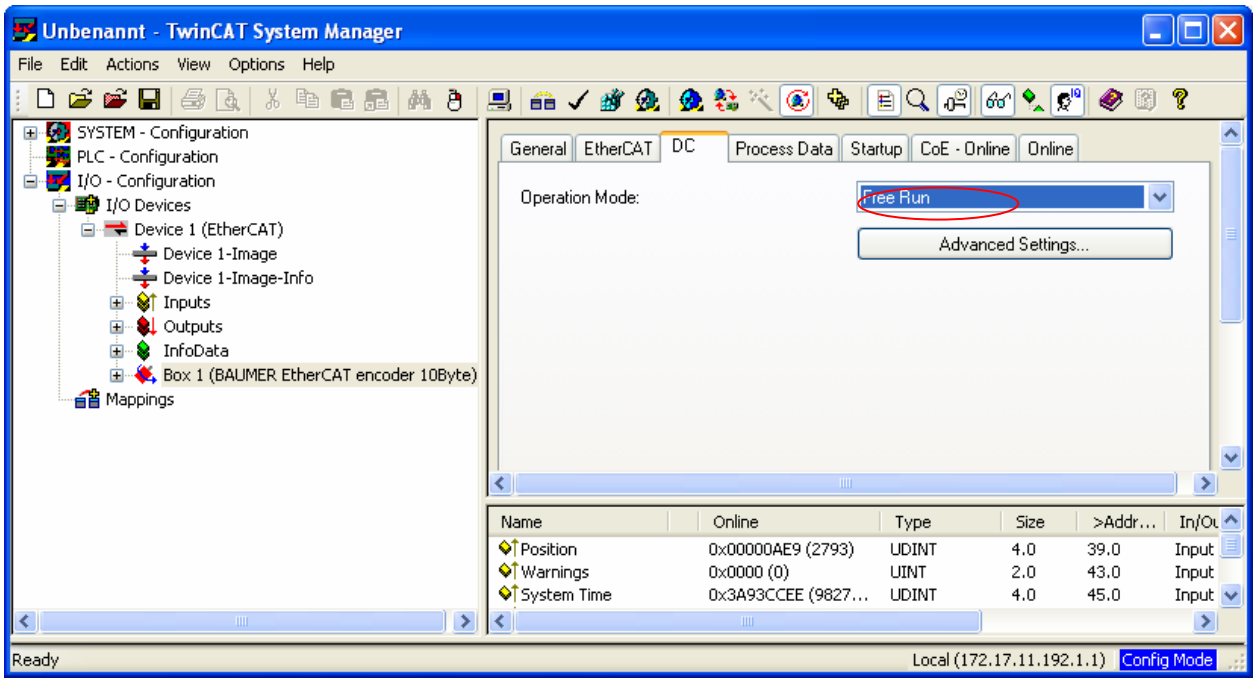
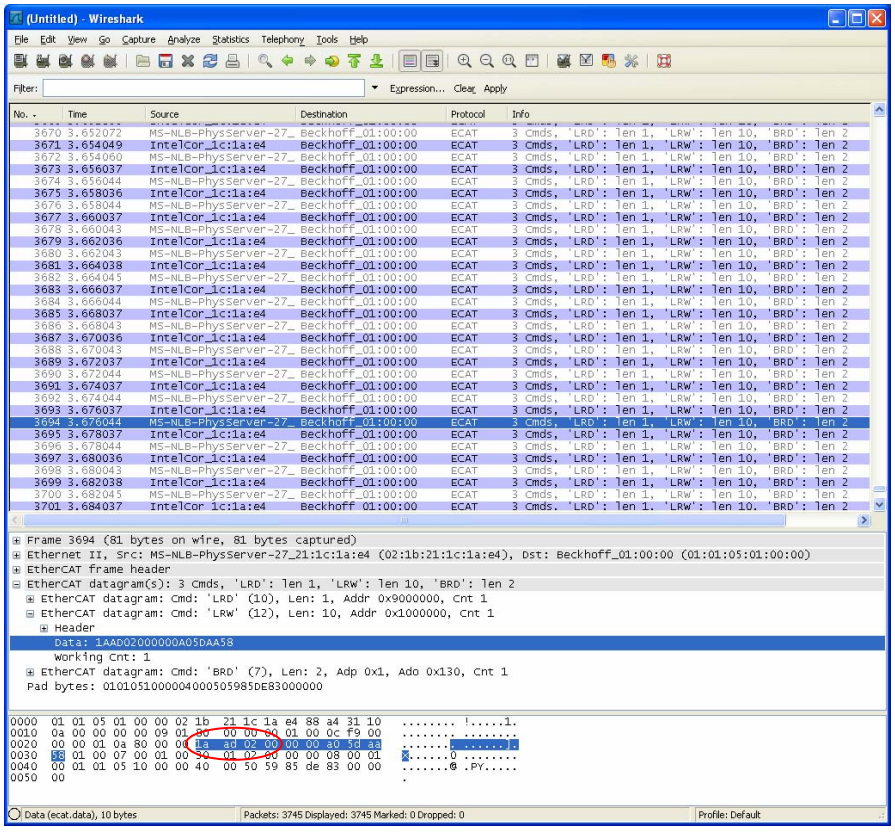


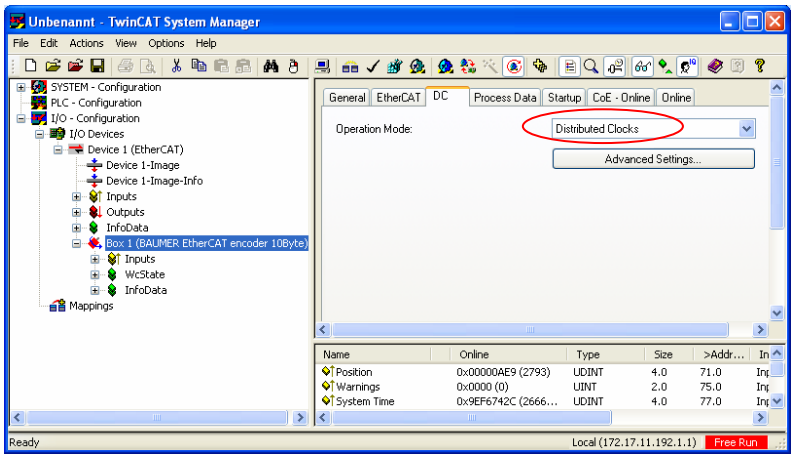
Fig.: Wireshark Network session, encoder input data

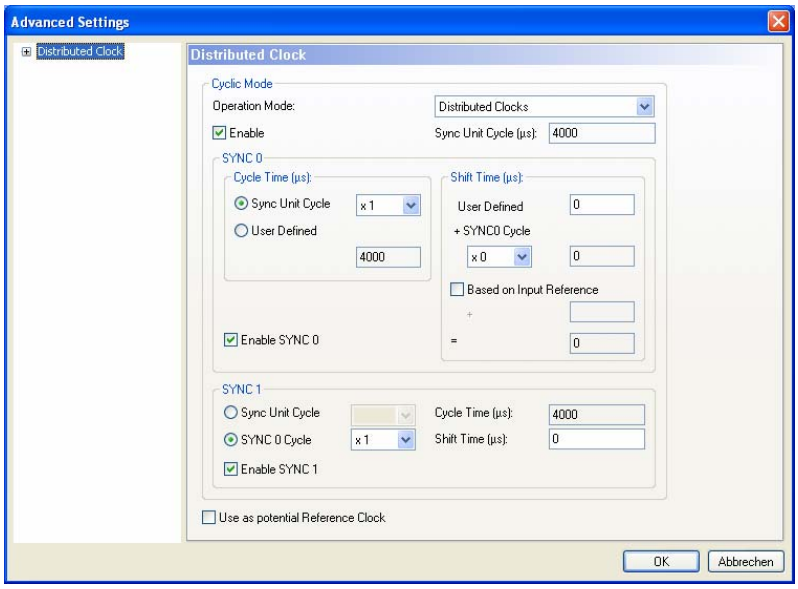


4.5 Distributed Clocks Mode

Distributed clocks mode enables exactly the same time with all bus users.
The encoder can be utilized and configurated as reference clock for synchronisation purposes of both other users and master. Thus a high-precision time base is available throughout the network.
The encoder generates process data synchronously to a Sync Signal.
The local cycle will be tripped once SYNC0/SYNC1 Event has been received. Prior to receiving the next SYNC0/SYNC1 Event the process data frame must be completely processed by the slave.

4.5.1 Activation Distributed Clocks under TwinCAT

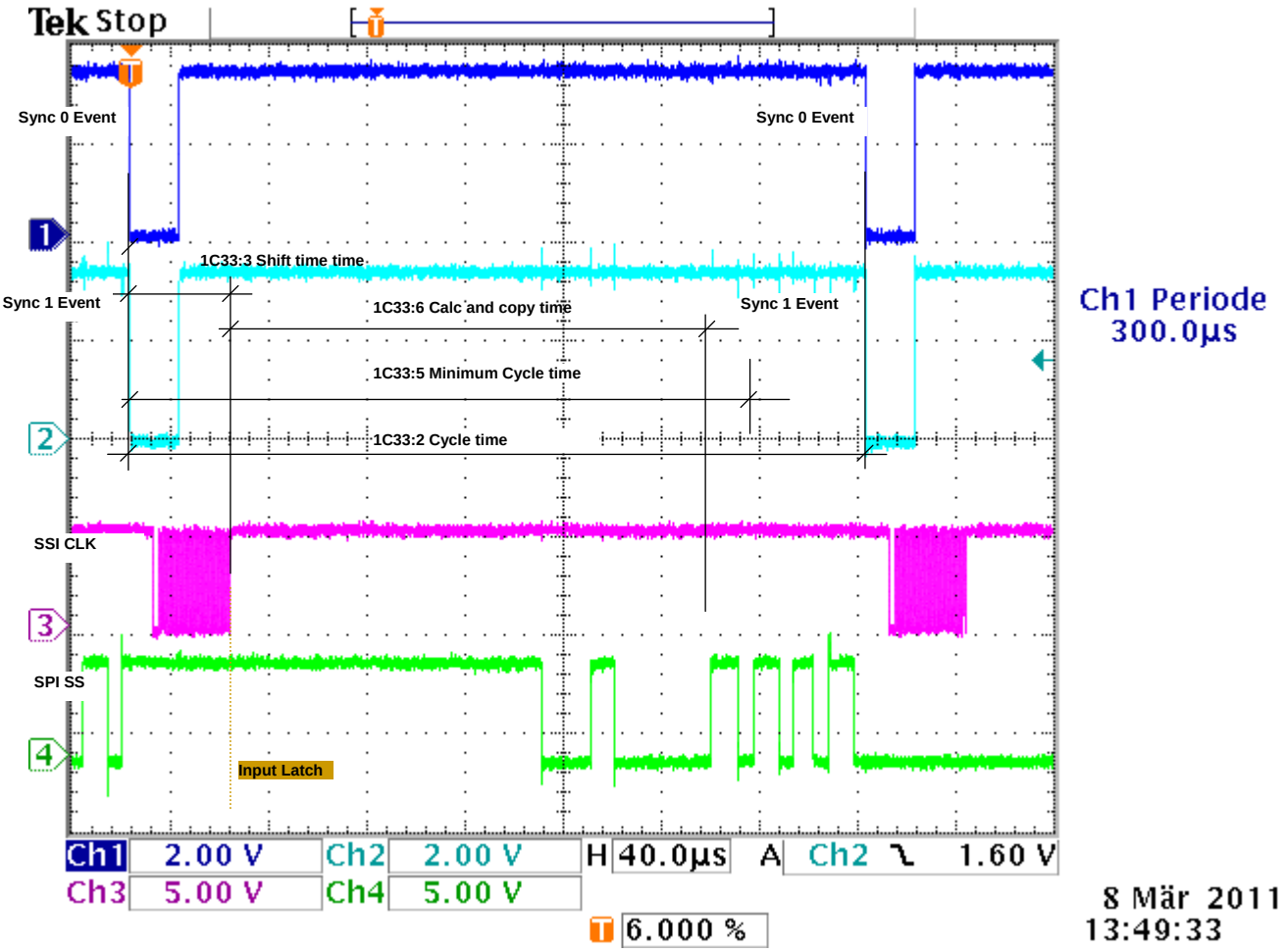




Important:

- Enable SYNC0 **and** SYNC1.
- Ever proceed any cycle time modification in the SYNC0 settings only.
- Do not alter any SYNC1 settings.

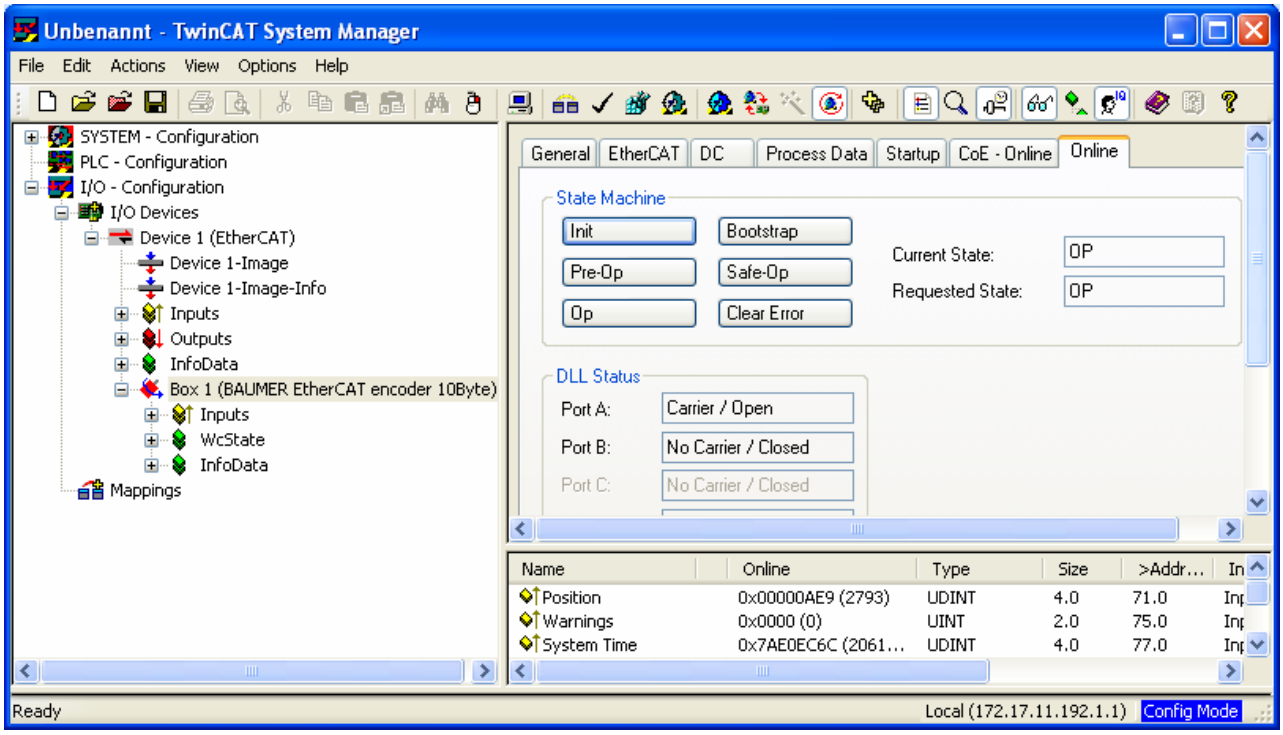
Fig.: Local cycle synchronized with SYNC0/SYNC1

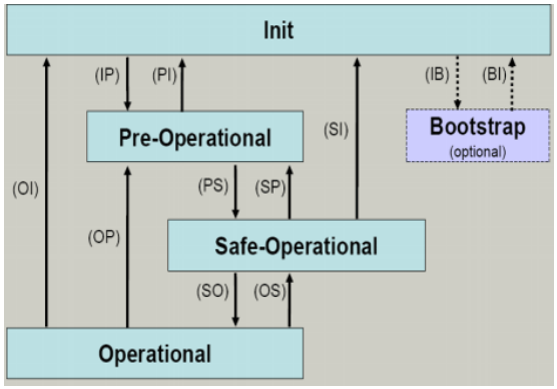


Cycle times corresponding to configuration, see chapter Cycle times

4.6 Network management

The encoder's State Machine can be switched in the TwinCAT System Manager under tab **Online.**





EtherCAT State Machine

The EtherCAT State Machine (ESM) will control the state of the EtherCAT slave with state-related access and execution of several functionalities. Specific commands by the EtherCAT master are required in each state during slave bootup.
The states of an EtherCAT slave are:

- Init
- Pre-Operational
- Safe-Operational and
- Operational
- Boot (not supported)

After bootup each EtherCAT slave will be in state Op.

Init
Initial state of EtherCAT slave after switch on. There is neither mailbox nor process data communication. The SyncManager channels 0 and 1 for mailbox communication are being initialized by the EtherCAT master.

Pre-Operational (Pre-Op)
The EtherCAT slave will verify proper mailbox initialising when changing from Init to Pre-Op. Pre-Op enables mailbox communication but not process data communication. The EtherCAT master will initialize the SyncManager channels (up from 2) for the process data, the FMMU channels and PDO mapping or SyncManager PDO assignment, provided the slave supports configurable mapping.
Furthermore, the process data transmission settings as well as clamp-specific parameterization- other than default and where appropriate - are transmitted in Pre-Op state

Safe-Operational (Safe-Op)
Upon changing from Pre-Op to Safe-Op, the EtherCAT slave will verify whether the SyncManager channels for process data communication and the Distributed Clock settings are valid. Prior to confirming Safe-Op, the slave will copy the current input data into the related DP-RAM areas of the EtherCAT Slave Controller (ESC). In Safe-Op both mailbox and process data communication are enabled, however the slave will keep its outputs safe (not relevant to encoder). Cyclic update of input data.

Operational (Op)
Process data and mailbox communication is in Op state.
Cyclic update of input data.

Boot (for firmware update): not supported.

5 Terminal assignment and commissioning

5.1 Electrical connection

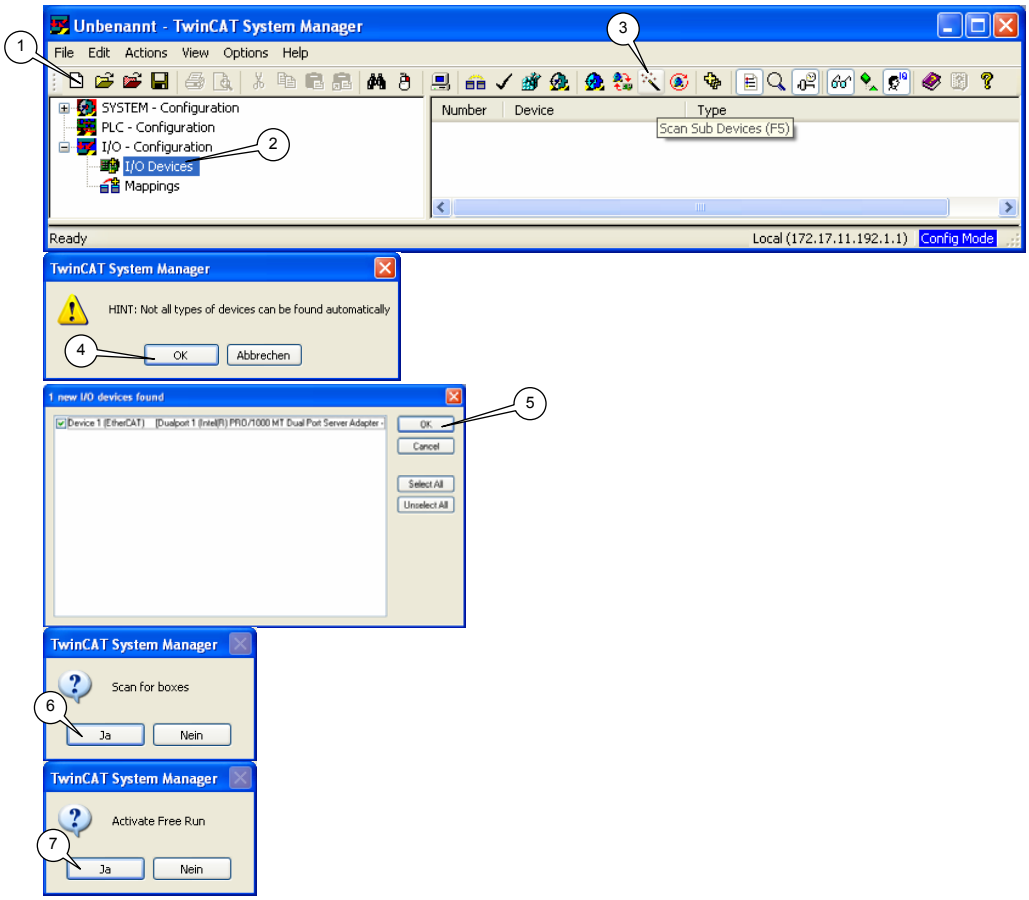
Assignment – M12 connector

Follow also the instructions of the respective supplier.

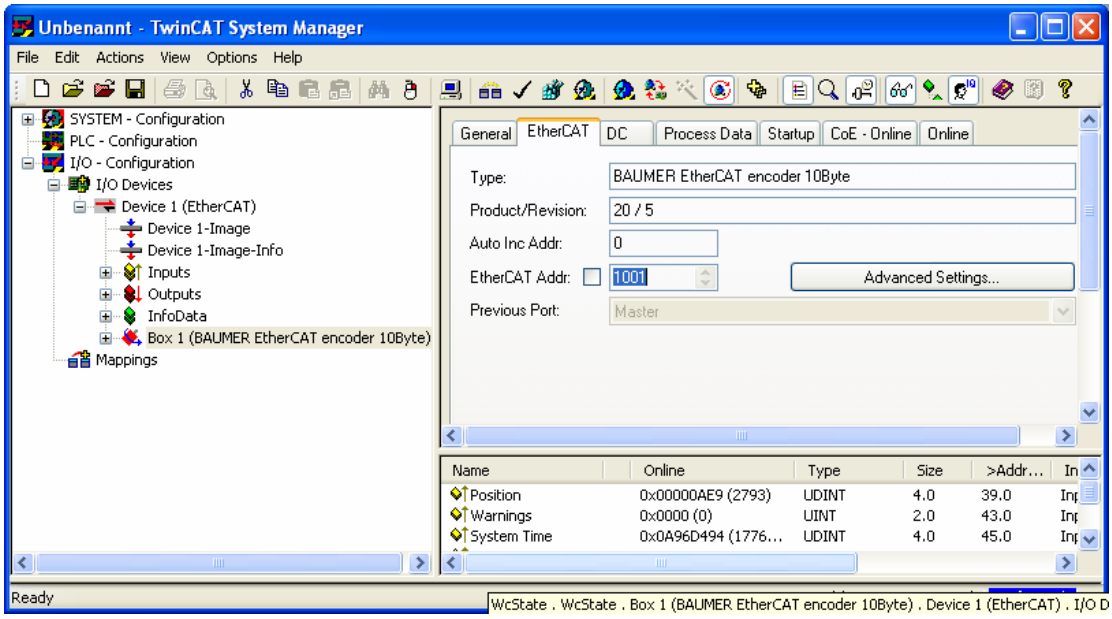
- Press mating connector softly into the plug.
- Turn mating connector carefully until the code mark is interlocking the corresponding space provided by the plug. Insert bushing completely. Tighten the nut as far as possible.

5.1.1 Initialising under TwinCAT system manager

- The included XML file must be copied into the respective directory: ..\TwinCAT\Io\EtherCAT
- Start TwinCAT system manager
- Then proceed as described below.

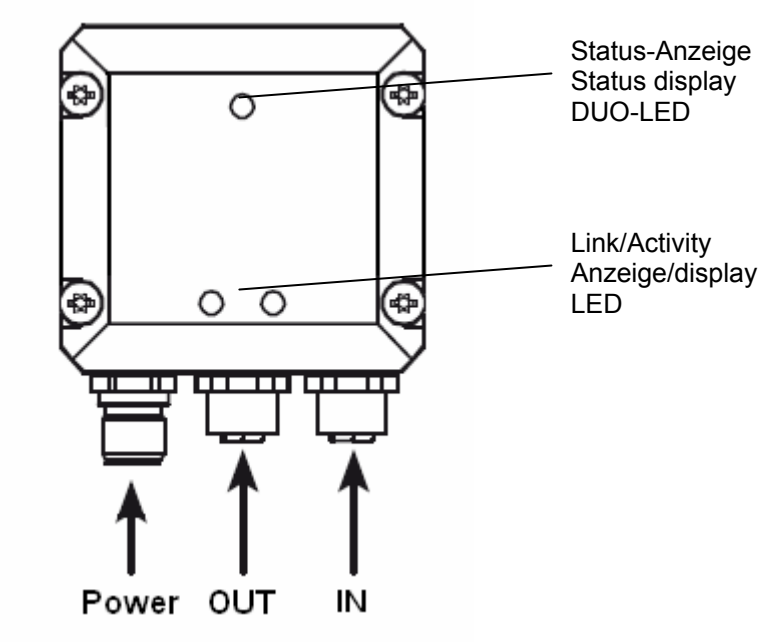


EtherCAT devices should appear like in screen below



5.1.2 Terminal assignment

Bus cover EtherCAT



1 x M12 connector (male), a-coded

2 x M12 connector (female), D-coded

Pin	Assignment
1	UB (10...30 VDC)
2	N.C.
3	GND
4	N.C.

Pin	Assignment
1	TxD+
2	RxD+
3	TxD-
4	RxD-

5.2 Display elements

5.2.1 State indicator

The bus cover provides a DUO LED (green/red) operating in line with EtherCAT Indicator Specification V0.91.

DUO-LED green RUN State

RUN State	Status	Description	Category
Off	INIT	The device is in state INIT	Mandatory
Blinking	PRE-OPERATIONAL	The device is in state PRE-OPERATIONAL	Mandatory
Single Flash	SAFE-OPERATIONAL	The device is in state SAFE-OPERATIONAL	Mandatory
On	OPERATIONAL	The device is in state OPERATIONAL	Mandatory
Flickering	INITIALISATION or BOOTSTRAP	The device is booting and has not yet entered the INIT state, or the device is in state BOOTSTRAP.Firmware download operation in progress	Optional
Double Flash	Reserved	Reserved for future use	reserved
Triple Flash	Reserved	Reserved for future use	reserved
Quadruple	Reserved	Reserved for future use	reserved

DUO-LED red ERR State

ERR State	Error	Description	Example	Category
Off	No error	The EtherCAT communication of the device is in working condition		Mandatory
Flickering	Booting Error Booting	Error was detected. INIT state reached, but Parameter "Change" in the AL status register is set to 0x01:change error	Checksum Error in Flash Memory.	Optional
Blinking	Invalid Configuration	General Configuration Error	State change commanded by master is impossible due to register or object settings.	Mandatory
Single Flash	Unsolicited State Change	Slave device application has changed the EtherCAT state autonomously: Parameter "Change" in the AL status register is set to 0x01:change/error.	Synchronisation Error, device enters Safe-Operational automatically.	Mandatory
Double Flash	Application Watchdog Timeout	An application watchdog timeout has occurred.	Sync Manager Watchdog timeout	Mandatory
Triple Flash	Reserved	Reserved for future use		Reserved
Quadruple Flash	Reserved	Reserved for future use		Reserved
On	PDI Watchdog Timeout	A PDI Watchdog timeout has occurred	Application controller is not responding any more	Optional

5.2.2 Link/Activity indicator

One LED each for input and output.

Link	Activity	State of Link/Activity indicator
Yes	No	On
Yes	Yes	Flickering
No	Not applicable	Off

Note: All LED´s are “off“ if the encoder is under power supply but not yet connected to Ethernet.

5.3 Cycle times

Cycle times relate to the following settings:

- Basic encoder type
- Scaling on/off (0x6000 Bit 2^2)
- Configuration 10 byte PDO/ 4 byte PDO/ 2 byte PDO

Scaling ON: 0x6000 2^2 =1; Scaling OFF: 0x6000 2^2 =0;

Chart on cycle times All times in ns

10 Byte PDO (default)					
0x1C33:3 Shift time	**0x1C33:5 Minimum cycle time**		**0x1C33:6 Calc and copy time**		**Basic encoder**
	Scaling OFF	Scaling ON	Scaling OFF	Scaling ON	Device name
21300	214500	419500	188700	393700	GCAM
41800	234000	413000	185200	364200	GCMM
25000	217000	419000	183000	385000	GXAM
41000	233000	410000	183000	360000	GXMM
33600	228000	416000	185400	373400	GBAM
50600	245000	423000	185400	363400	GBMM

4 Byte PDO					
0x1C33:3 Shift time	**0x1C33:5 Minimum cycle time**		**0x1C33:6 Calc and copy time**		**Basic encoder**
	Scaling OFF	Scaling ON	Scaling OFF	Scaling ON	Device name
21300	74500	279500	48700	253700	GCAM
41800	92000	271000	43200	222200	GCMM
25000	76000	278000	42000	244000	GXAM
41000	92000	269000	42000	219000	GXMM
33600	86000	274000	43400	231400	GBAM
50600	104000	282000	44400	222400	GBMM

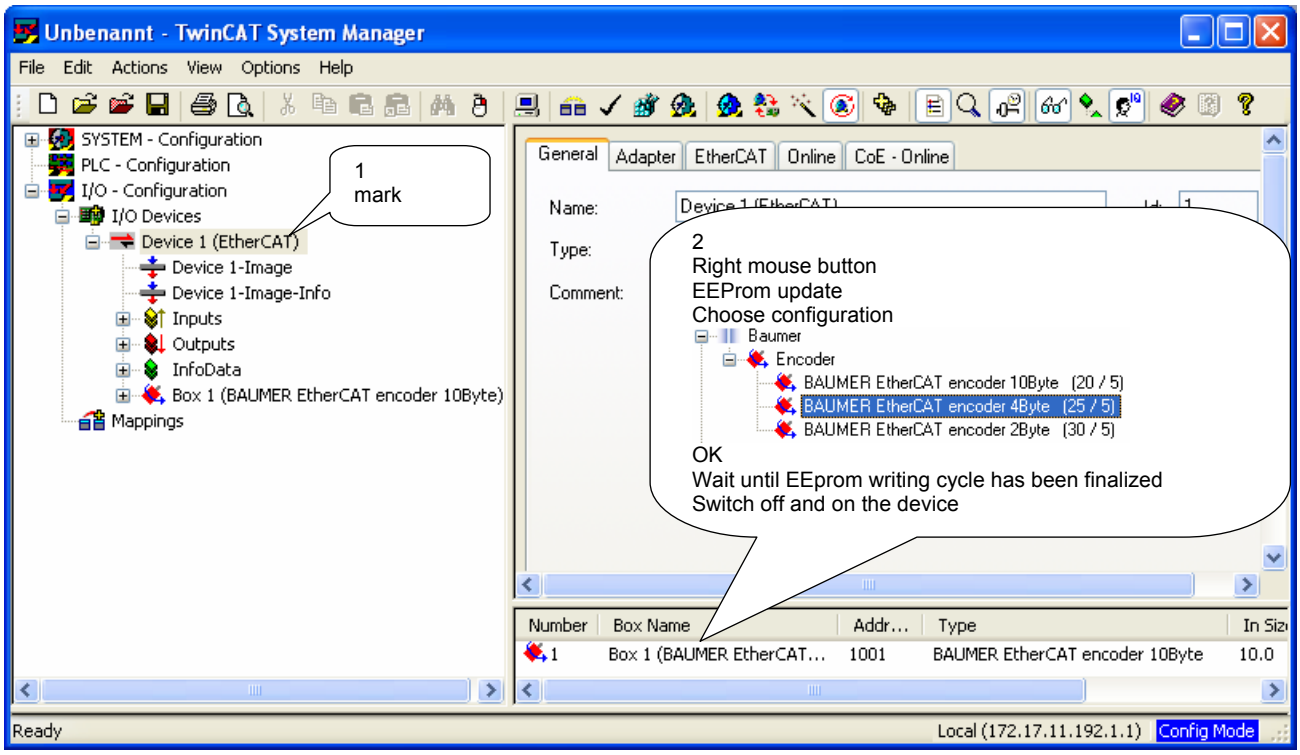
2 Byte PDO					
0x1C33:3 Shift time	**0x1C33:5 Minimum cycle time**		**0x1C33:6 Calc and copy time**		**Basic encoder**
	Scaling OFF	Scaling ON	Scaling OFF	Scaling ON	Device name
21300	62500	267500	36700	241700	GCAM
41800	85000	264000	36200	215200	GCMM
25000	68000	270000	34000	236000	GXAM
41000	84000	261000	34000	211000	GXMM
33600	78000	266000	35400	223400	GBAM
50600	96000	274000	36400	214400	GBMM

Note: Setting 2 byte PDO means input data will be limited to 2 bytes, no matter what the maximum total encoder resolution is.

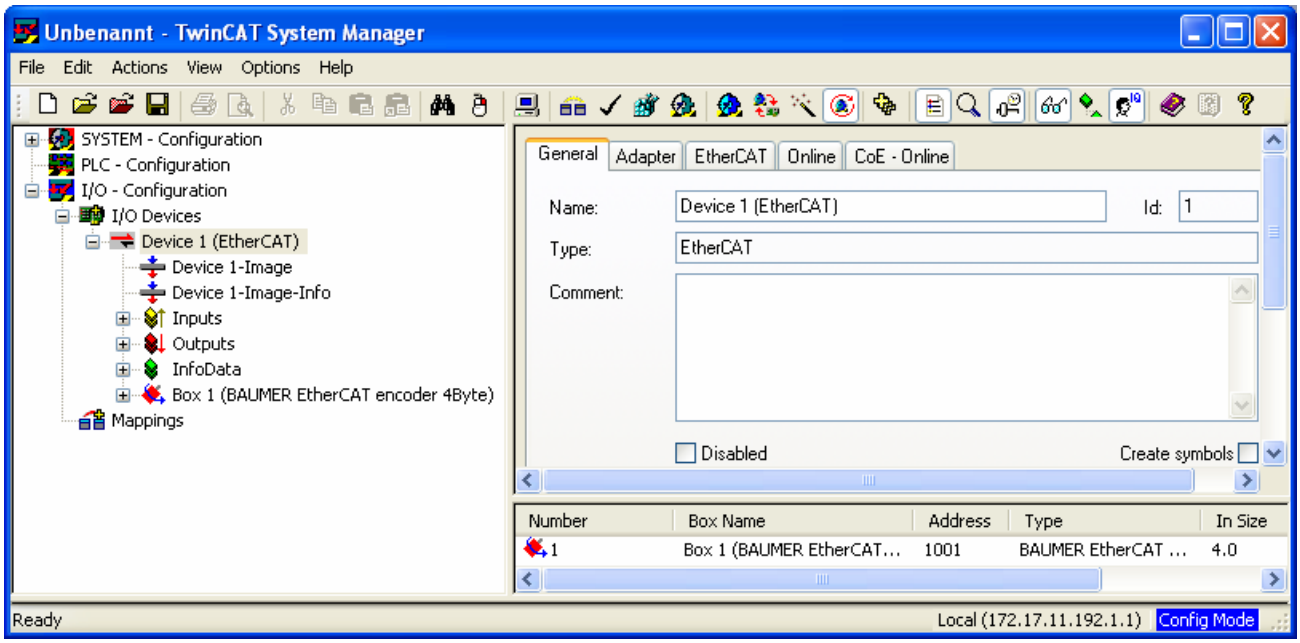
5.4 Configuration 10 Byte PDO / 4 Byte PDO / 2 Byte PDO by TwinCAT

Default encoder configuration is 10 Byte PDO.
As an option, the encoder configuration may be changed to 4 Byte PDO or 2 Byte PDO to enable shorter cycle times where appropriate (see chapter cycle times).

Example: How to alter the 10 Byte PDO configuration (default) to 4 Byte PDO



OFF/ON, File new, device search using F5



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