BECKHOFF New Automation Technology

Documentation | EN

EP1258

EtherCAT Box modules with digital inputs, timestamp

2025-03-18 | Version: 1.0

Table of contents

1 Foreword

1.1 Notes on the documentation

This description is intended exclusively for trained specialists in control and automation technology who are familiar with the applicable national standards.
The documentation and the following notes and explanations must be complied with when installing and commissioning the components.
The trained specialists must always use the current valid documentation.

The trained specialists must ensure that the application and use of the products described is in line with all safety requirements, including all relevant laws, regulations, guidelines, and standards.

Disclaimer

The documentation has been compiled with care. The products described are, however, constantly under development.
We reserve the right to revise and change the documentation at any time and without notice.
Claims to modify products that have already been supplied may not be made on the basis of the data, diagrams, and descriptions in this documentation.

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1.2 For your safety

Safety regulations

Read the following explanations for your safety.
Always observe and follow product-specific safety instructions, which you may find at the appropriate places in this document.

Exclusion of liability

All the components are supplied in particular hardware and software configurations which are appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

Personnel qualification

This description is only intended for trained specialists in control, automation, and drive technology who are familiar with the applicable national standards.

Signal words

The signal words used in the documentation are classified below. In order to prevent injury and damage to persons and property, read and follow the safety and warning notices.

Personal injury warnings

⚠ DANGER
Hazard with high risk of death or serious injury.

⚠ WARNING
Hazard with medium risk of death or serious injury.

⚠ CAUTION
There is a low-risk hazard that could result in medium or minor injury.

Warning of damage to property or environment

NOTICE
The environment, equipment, or data may be damaged.

Information on handling the product

This information includes, for example:
recommendations for action, assistance or further information on the product.

1.3 Documentation issue status

Version	Comment
1.0	• First release

Firmware and hardware versions

This documentation refers to the firmware and hardware version that was applicable at the time the documentation was written.

The module features are continuously improved and developed further. Modules having earlier production statuses cannot have the same properties as modules with the latest status. However, existing properties are retained and are not changed, so that older modules can always be replaced with new ones.

The firmware and hardware version (delivery state) can be found in the batch number (D-number) printed on the side of the EtherCAT Box.

Syntax of the batch number (D-number)

D: WW YY FF HH	Example with D no. 29 10 02 01:
WW - week of production (calendar week) YY - year of production FF - firmware version HH - hardware version	29 - week of production 29 10 - year of production 2010 02 - firmware version 02 01 - hardware version 01

Further information on this topic: Version identification of EtherCAT devices [▶ 116].

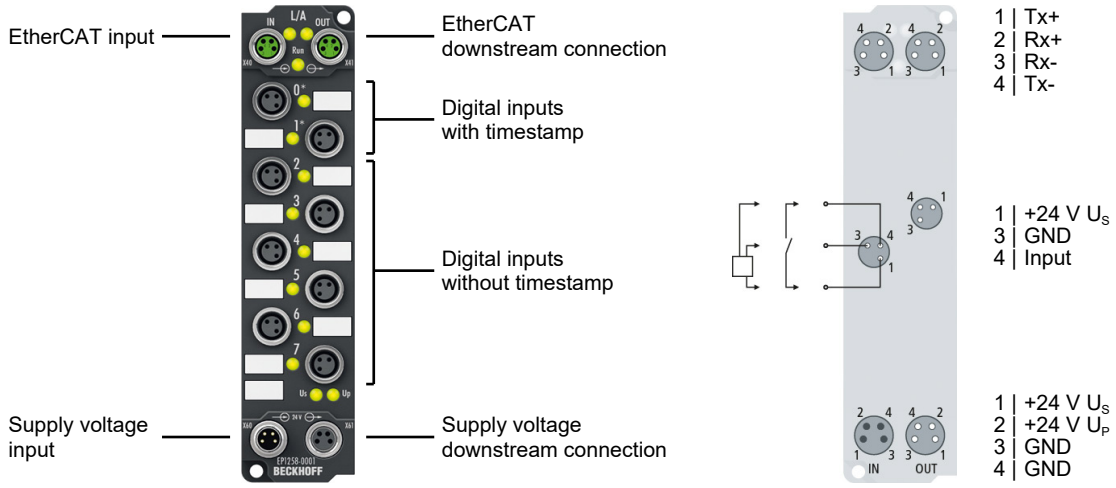
2 Product overview

The following table shows the products described in this documentation and the main distinguishing features.

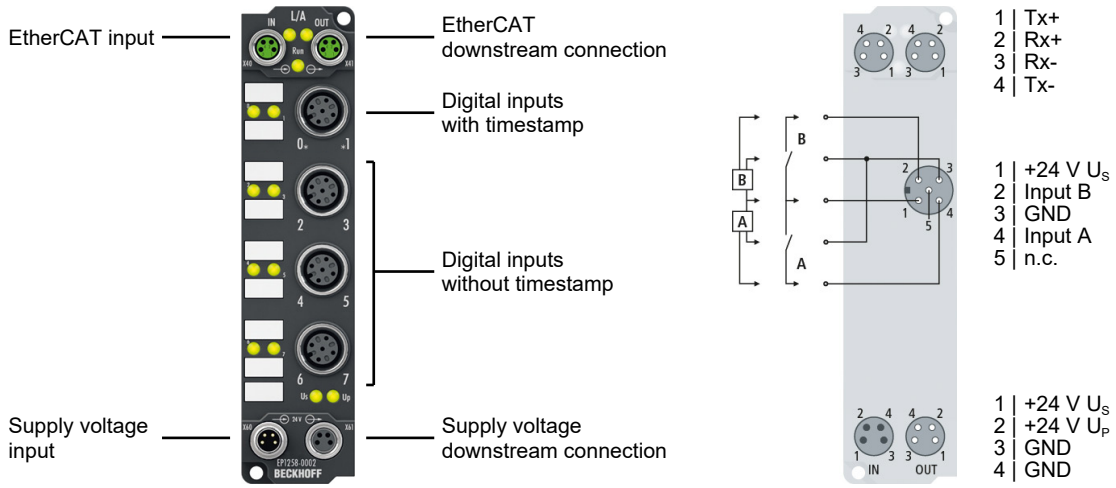
Product	Number of timestamp inputs	Signal interface	Timestamp technology
EP1258-0001 [▶ 9]	2	M8 sockets	Timestamp
EP1258-0002 [▶ 9]	2	M12 sockets	Timestamp
EP1258-0502 [▶ 11]	8	M12 sockets	Multi-timestamp

2.1 EP1258-0001 and EP1258-0002

EP1258-0001



EP1258-0002



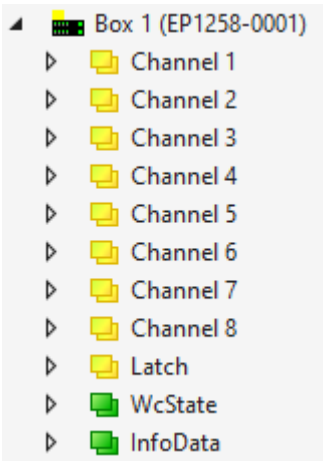
The EP1258-0001 and EP1258-0002 EtherCAT Box modules with digital inputs acquire fast binary control signals from the process level and transmit them electrically isolated to the controller. The signals 0 and 1 are furnished with a timestamp that shows the time of the last edge change with a resolution of 1 ns. This technology enables signal curves to be traced exactly over time and correlated with the distributed clocks throughout the system. With this technology, machine-wide parallel hardware wiring of digital inputs or encoder signals for synchronization purposes is often no longer required. As a result, responses with equidistant time intervals, independent of the bus cycle time, are to a large extent possible.

Quick links

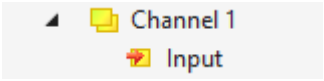
Technical data [▶ 15]
Process image [▶ 10]
Signal interface EP1258-0001 [▶ 32]
Signal interface EP1258-0002 [▶ 33]
Commissioning [▶ 42]

2.1.1 Process image EP1258-0001 and EP1258-0002

The following screenshot shows an example of the process image of EP1258-0001. The process images of EP1258-0001 and EP1258-0002 are identical.



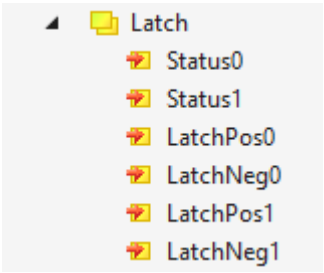
Channel 1 to Channel 8



Input
The current signal level without timestamp information.

Latch

This process data object contains the timestamp information for channels 1 and 2. The variable names for channel 1 end with the number 0, those for channel 2 end with the number 1.



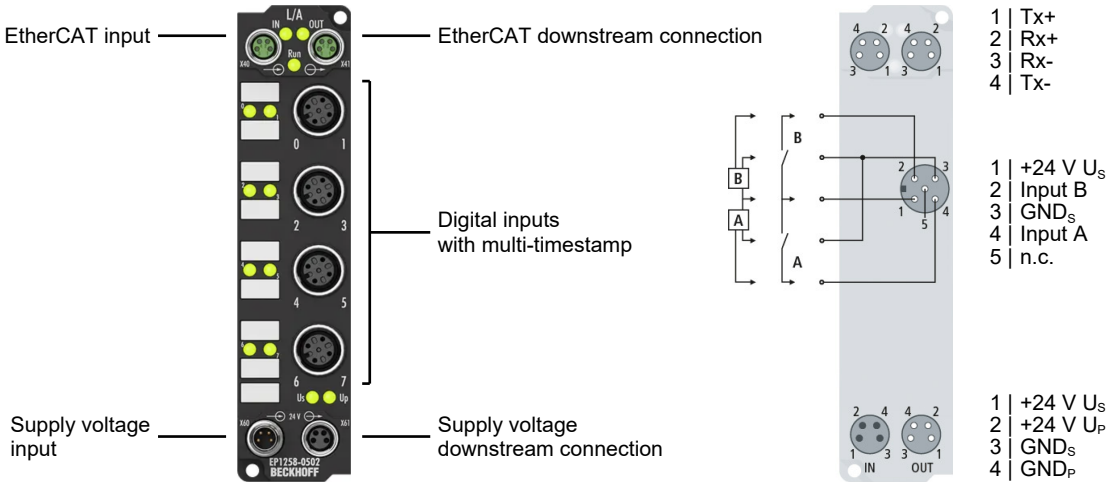
Status0, Status1
Information as to whether the last recorded signal edge was a rising or a falling signal edge:

- Bit 2 = 1: rising signal edge
- Bit 2 = 0: falling signal edge

LatchPos0, LatchPos1
Timestamp of the last detected rising signal edge.
Representation: 1 ns/LSB

LatchNeg0, LatchNeg1
Timestamp of the last detected falling signal edge.
Representation: 1 ns/LSB

2.2 EP1258-0502



The EP1258-0002 EtherCAT Box with digital inputs acquires binary control signals from the process level and transmits them to the controller under electrical isolation. Compared to the EP1258-0002, the EP1258-0502 offers higher performance thanks to the XFC multi-timestamping function. Timestamp technology allows signals to be precisely retraced over time. Whereas the EP1258-0002 can accept one edge change with timestamp per bus cycle, the EP1258-0502 offers the possibility to register up to 32 events with timestamps. The EP1258-0502 is synchronized with other EtherCAT devices through the distributed clocks system, so that events in the whole system can be measured with a uniform timebase. The signal connection is established via screw-type M12 connectors. Two channels are available per M12 socket.

Quick links

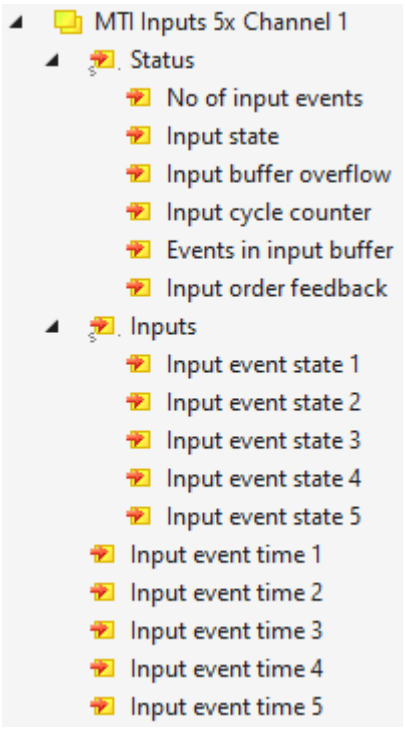
Technical data [▶ 15]
Process image [▶ 12]
Signal interface [▶ 35]
Commissioning [▶ 43]

2.2.1 Process image EP1258-0502

The process image depends on the configuration of the channels, see chapter Configuring the process image [▶ 46].

2.2.1.1 Process data objects

MTI Inputs xx Channel n



(screenshot example for channel 1 with MTSF = 5)

No of input events
Number of events (signal edges) that were delivered to the master in the current process data set.

Input state
Current signal level at the digital input. Corresponds to the input value of a classic digital input without timestamp information.

Input buffer overflow
Indicates that more signal edges were detected than could be stored in the channel's buffer.

Input cycle counter
A 2-bit counter that is incremented each time the process data is transferred from the box to the EtherCAT master.

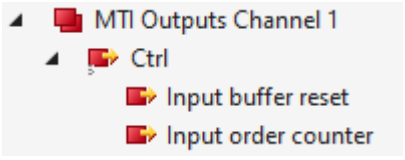
Events in input buffer
Number of events/signal edges that are in the channel's buffer and have not yet been supplied in the current process data set.

Input order feedback
(asynchronous operation)
Contains the value of "Input order counter", which was output by the controller in the previous PLC cycle, see PDO "MTI Outputs Channel n". Used to check whether the "Input order counter" has been received by the box.

Input event state n
Direction of the detected signal edges:
0 = falling edge
1 = rising edge
The number of these variables depends on the MTSF, see chapter Multi-timestamp factor (MTSF) [▶ 44].

Input event time n
Timestamp for the events stored in "Input event state n" in ns.
The number of these variables depends on the MTSF, see chapter Multi-timestamp factor (MTSF) [▶ 44].

MTI Outputs Channel n

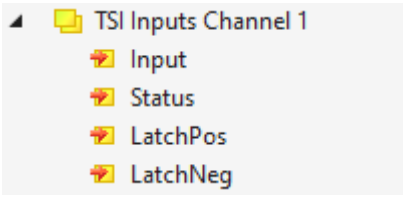


Input buffer reset
Empty the channel buffer. This can be useful in the event of a buffer overflow, for example.

Input order counter
(asynchronous operation)
When this counter is incremented by the controller, the channel sends the next set of stored events to the controller via the process data.

TSI Inputs Channel n

PDO of a channel in compatibility mode.



Input
Current signal level at the digital input. Corresponds to the input value of a classic digital input without timestamp information.

Status
Bit 0 is set for an EtherCAT cycle if a rising edge is detected.
Bit 1 is set for an EtherCAT cycle if a falling edge is detected.

LatchPos
Timestamp of the last recorded rising signal edge in ns.

LatchNeg
Timestamp of the last recorded falling signal edge in ns.

2.3 Scope of supply

Make sure that the following components are included in the scope of delivery:

- 1x EtherCAT Box EP1258-000x
- 2x protective cap for EtherCAT socket, M8, green (pre-assembled)
- 1x protective cap for supply voltage input, M8, transparent (pre-assembled)
- 1x protective cap for supply voltage output, M8, black (pre-assembled)
- 10x labels, blank (1 strip of 10)

Pre-assembled protective caps do not ensure IP67 protection

Protective caps are pre-assembled at the factory to protect connectors during transport. They may not be tight enough to ensure IP67 protection.

Ensure that the protective caps are correctly seated to ensure IP67 protection.

2.4 Technical data

All values are typical values over the entire temperature range, unless stated otherwise.

EtherCAT	EP1258-0001	EP1258-0002	EP1258-0502
Connection	2 x M8 socket, 4-pin, A-coded, shielded		
Electrical isolation	500 V		
Distributed Clocks	yes		
Minimum cycle time	n/a		See chapter EP1258-0502 Macrocycle time [▶ 17].

Supply voltages	EP1258-0001	EP1258-0002	EP1258-0502
Connection	Input: M8 connector, 4-pin, A-coded Downstream connection: M8 socket, 4-pin, A-coded		
U_S nominal voltage	24 V_{DC} (-15 % / +20 %)		
U_S sum current: $I_{S,sum}$	max. 4 A		
Current consumption from U_S	120 mA + sensor power supply		100 mA + sensor power supply
U_P nominal voltage	24 V_{DC} (-15 % / +20 %)		
U_P sum current: $I_{P,sum}$	max. 4 A		
Current consumption from U_P	5 mA (LED "Up")		
Electrical isolation GND_S / GND_P	no		yes

Digital inputs	EP1258-0001	EP1258-0002	EP1258-0502
Number	2 x digital input with timestamp 6 x digital input without timestamp		8 x digital input with multi-timestamp
Connection	8 x M8 socket, 3-pin, A-coded	4 x M12 socket, 5-pin, A-coded	4 x M12 socket, 5-pin, A-coded
Cable length	max. 30 m		
Nominal input voltage	24 V_{DC} (-15 %/+20 %)		
Input filter	10 µs No filter at the inputs with timestamp.		< 1 µs typ.
Signal voltage "0"	-3 … +5 V (similar to EN 61131-2, type 3)		
Signal voltage "1"	+11 … +30 V (similar to EN 61131-2, type 3)		
Input current	typically 3 mA (similar to EN 61131-2, type 3)		
Sensor power supply	24 V_{DC} from U_S max. 0.5 A, short-circuit proof in total		
Microcycle time (Internal sampling rate/execution)	n/a		< 10...40 µs, corresponds to 100...25 k detectable edges/s, see chapter EP1258-0502 Microcycle time [▶ 17].
Accuracy of Distributed Clocks	<< 1 µs		

Housing data	
Dimensions W x H x D	30 mm x 126 mm x 26.5 mm (without connectors)
Weight	approx. 165 g
Installation position	variable
Material	PA6 (polyamide)

Environmental conditions	
Ambient temperature during operation	-25 … +60 °C -25 … +55 °C according to cURus 0 … +55 °C according to ATEX
Ambient temperature during storage	-40 … +85 °C
Vibration resistance, shock resistance	conforms to EN 60068-2-6 / EN 60068-2-27 Additional tests [▶ 16]
EMC immunity / emission	conforms to EN 61000-6-2 / EN 61000-6-4
Protection rating	IP65, IP66, IP67 (according to EN 60529)

Approvals/markings	EP1258-0001	EP1258-0002	EP1258-0502
Approvals/markings *)	• CE • cURus [▶ 37] • ATEX [▶ 38]	• CE • cURus [▶ 37] • ATEX [▶ 38]	• CE • cURus [▶ 37]

*) Real applicable approvals/markings see type plate on the side (product marking).

Additional tests

The devices have undergone the following additional tests:

Test	Explanation
Vibration	10 frequency sweeps in 3 axes
	5 Hz < f < 60 Hz displacement 0.35 mm, constant amplitude
	60.1 Hz < f < 500 Hz acceleration 5 g, constant amplitude
Shocks	1000 shocks in each direction, in 3 axes
	35 g, 11 ms

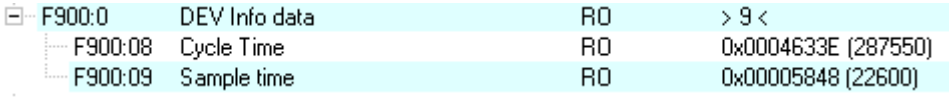
2.4.1 EP1258-0502 Macrocycle time

The box requires a certain time for internal cyclic processing of the operations. Depending on the number of active channels and the configured MTSF, this results in an internal processing time in the range of several 100 µs.

The macrocycle time is to be regarded as the absolute lower limit for EtherCAT communication. The EtherCAT cycle time should be selected 10...20 % higher depending on the performance of the system. The macrocycle times listed in the table below have been determined empirically and should be regarded as guide values.

Number of activated channels	Macrocycle time, typ.				
	MTSF = 1	MTSF = 2	MTSF = 5	MTSF = 10	Compatibility mode
1	130 µs	140 µs	160 µs	170 µs	50 µs
2	130 µs	140 µs	160 µs	170 µs	70 µs
4	130 µs	140 µs	170 µs	200 µs	90 µs
8	130 µs	160 µs	190 µs	290 µs	120 µs

The actual macrocycle time occurring on the system should be checked during commissioning in CoE parameter 0xF900:08 "Cycle Time".



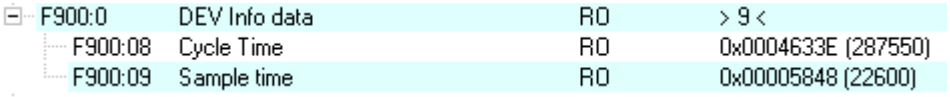
2.4.2 EP1258-0502 Microcycle time

The microcycle is the internal cycle of the box in which the inputs are sampled. It depends on the number of activated channels, but not on the MTSF.

A switching edge that arrives at an input channel from outside at any time is recorded during the next microcycle and placed in the buffer. The time inaccuracy for the recording is therefore approx. -x / +0 µs (where x = microcycle time).

Number of activated channels	Microcycle time, typ.	Microcycle time, typ. in compatibility mode
1	7 µs	7 µs
2	10 µs	9 µs
4	14 µs	13 µs
8	23 µs	21 µs

You can read the current microcycle time in ns from the CoE parameter 0xF900:09 "Sample time".



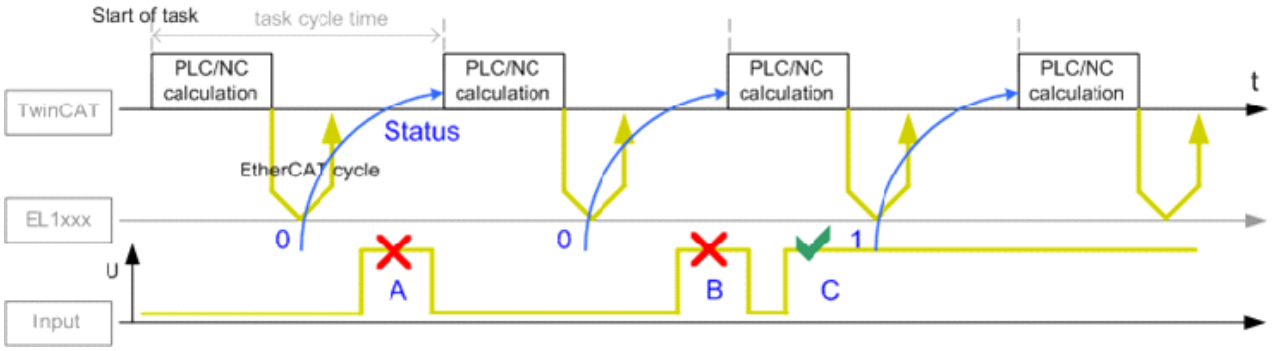
3 Basic function principles

3.1 Sampling of digital inputs

A PLC usually samples digital inputs once per PLC cycle. This type of sampling has two disadvantages:

- Short pulses that occur between the sampling times are not detected.
- The temporal resolution depends on the PLC cycle time.

Example



Pulses A and B are not detected in this figure. Only pulse C is long enough and present at the sampling time (blue arrow) so that the "1" is detected by the bus cycle.

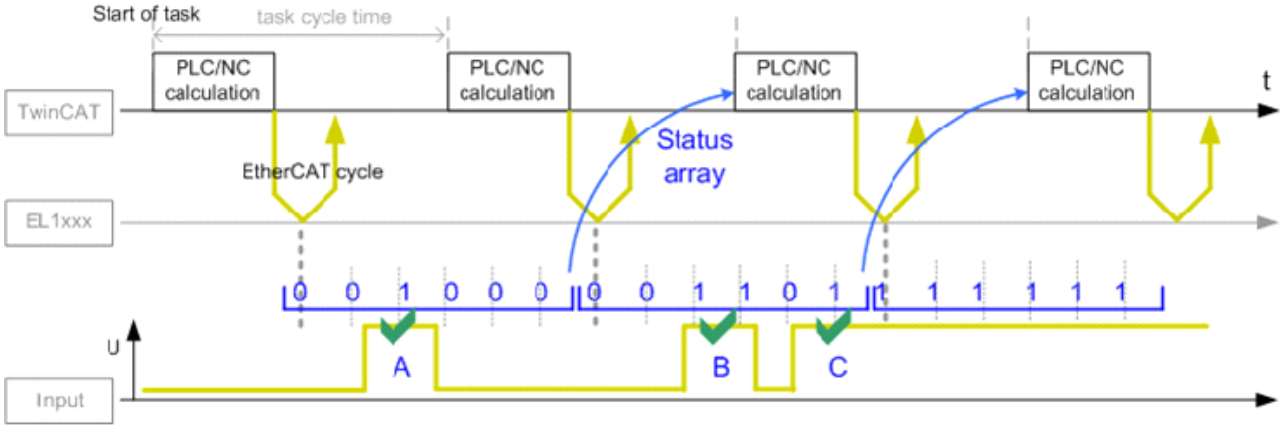
Remedy

In order to compensate for the disadvantages mentioned, sampling methods have been developed that also enable precise temporal detection of very short pulses at any PLC cycle time:

- Oversampling [▶ 19]
- Timestamp [▶ 20] (EP1258-0001, EP1258-0002)
- Multi-timestamp [▶ 21] (EP1258-0502)

3.1.1 Oversampling

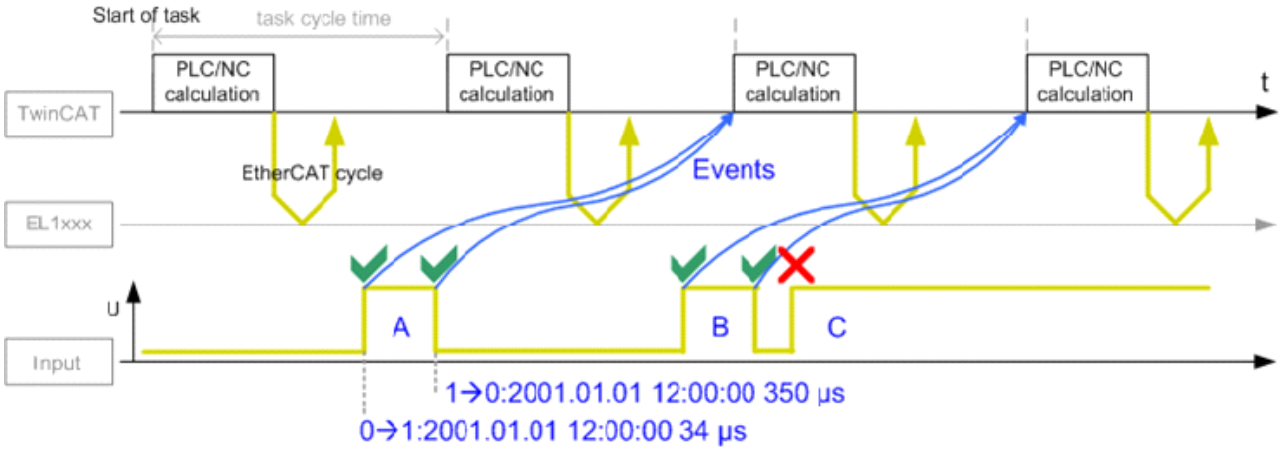
An oversampling input reads the state of the input n times within the specified (configurable) cycle time and saves the states in an array that is transferred to the controller in the bus cycle. The correspondingly finer time frame, the microcycle, thus enables a slow bus cycle time with nevertheless extremely fine sampling.



In this figure, pulses A and B are also detected in comparison to the standard sampling. Over the known microcycle time each individual pulse can be determined from the resulting data stream. However, a constantly high volume of data is transferred with each EtherCAT cycle, even if there are no edge changes at all at the input.

3.1.2 Timestamp

With this method, the digital input works only event-based. Two pieces of information are saved for each edge change detected: the current input state 0/1 after the edge change and the exact time of the edge change, the timestamp. The time is derived from the synchronized EtherCAT distributed clocks system, which synchronizes all capable EtherCAT devices in the network to a time accuracy of << 1 µs without special configuration (for further information see Basic EtherCAT documentation).

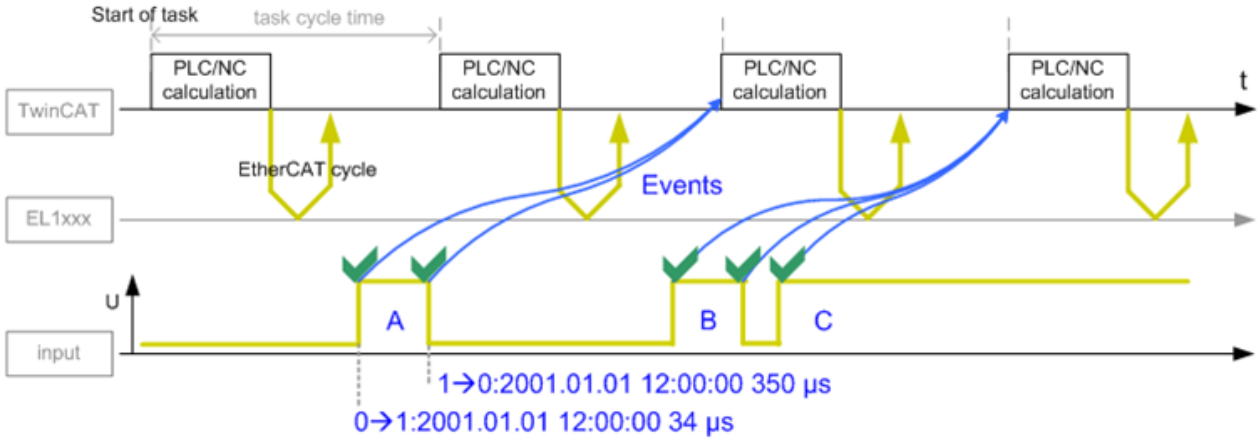


In this figure, the rising and falling edges of pulse A are now recorded as events, each with a timestamp, and transmitted to the controller via the EtherCAT cycle. The temporal resolution is 1 ns here – an 'infinitely' fine time resolution in mechanical terms. The device only saves one falling and one rising edge per cycle. If several edge changes occur, such as the rising edge of pulse C, the first or last event is saved, depending on the configuration.

3.1.3 Multi-timestamp

The multi-timestamp capability opens up new application possibilities for digital inputs:

- All channels operate completely independently of one another
- Each channel is capable of sampling not only one, but up to 32 signal edges (“events”) per cycle
- Each channel has its own buffer. Events are held in the buffer, if more signal edge changes arrive at the input during a cycle than are retrieved via the process data. The buffer can be sent continuously to the controller via the cyclic process data. A handshake mode is also possible – thus no signals to the controller are lost in the event of communication errors.
- The process data size can be configured individually for each channel, i.e. how many timestamped events per cycle are to be retrieved from the channel by the PLC
- These functions require a process image that differs from the process image of devices with standard sampling. For reasons of compatibility with the existing user software, however, it is possible to switch to a compatible process image (without the new functions).
- Sampling of the input state 0/1 takes place based on a microcycle of several µs, depending on the selected setting, i.e. significantly faster than the EtherCAT bus cycle time
- The timestamp allocated to a signal edge detected in this way is the start time of the microcycle in which it was sampled
- An adjustable digital filter can be enabled for each channel which blanks signals that are too short (spikes)
- In this way significantly more signal changes can be sampled with timestamp during each cycle, and no event information is lost in the buffer



3.2 Multi-timestamp terms

Some basic terms relating to the multi-timestamp function are described below. These are based on the chapter Sampling of digital inputs [▶ 18].

Cyclic process data/PDO

Each channel has 2 different types of cyclic PDO:

- Diagnostics/status/control values created specifically for the buffer
- The actual "values" as time-stamped Boolean data in the form of an array. The array should be set to a suitable size in the configuration. It cannot be changed during runtime.

See chapter Process image EP1258-0502 [▶ 12].

Parameter data/CoE

Each channel has a parameter range 0x80n0:ff in the CoE directory with suitable settings, e.g. to configure the buffer or the input behavior.

Buffer

Each channel has its own buffer (memory) for 32 events, based on the FIFO principle. It is operated via the channel's own PDO, see chapter Process image EP1258-0502 [▶ 12].

The channel state is queried for its switching state 0/1 based on the microcycle. Any changes that are detected are stored in the buffer. Depending on the configured multi-timestamp factor of the channel (MTSF), the buffer content is retrieved completely or in several steps by the controller/PLC via EtherCAT. The behavior in the event of a buffer overflow can be configured. An overflow of the buffer is displayed in the process data. If necessary the buffer can be emptied by the controller.

Event

An event is a signal edge at a digital input, i.e. the change of the input state from 0 to 1 or from 1 to 0. The timestamp and state 0/1 are saved for each event after the change.

Timestamp

Originally, the EtherCAT distributed clocks time has the following properties: start time 1.1.2000 00:00, 64-bit scope with 1 ns resolution (~ 584 years). In order to avoid redundant process data, the multi-timestamp terminals operate with a reduced timestamp width of 32 bits (~ 4.29 sec.). Input events must be processed within 4.2 seconds, otherwise an overflow will occur and the time actually recorded will no longer be saved.

MTSF: Multi-timestamp Factor

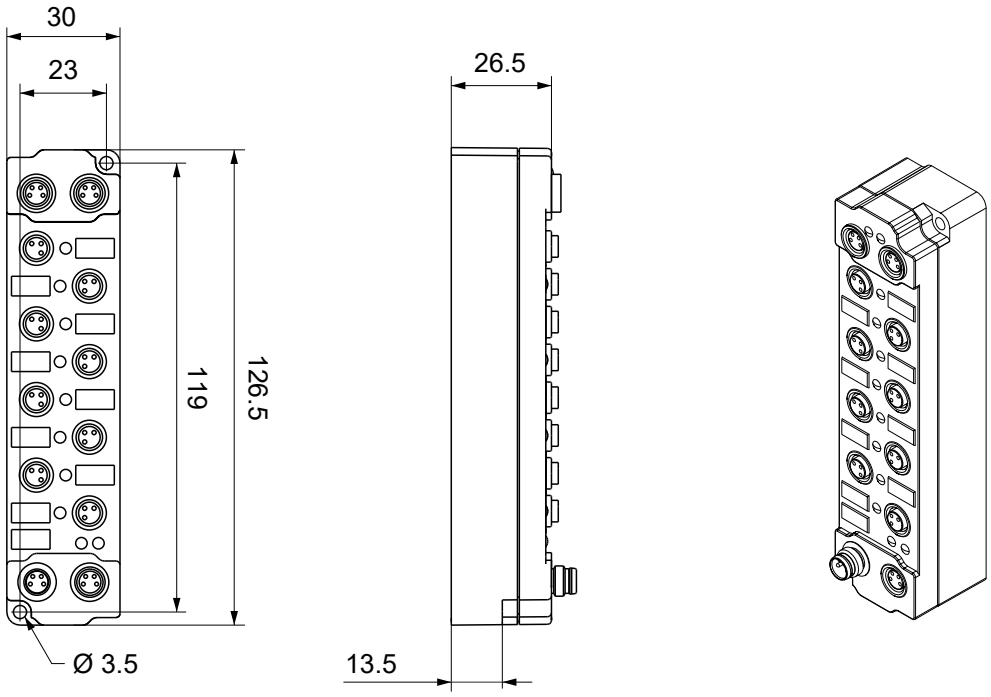
In the configuration each channel can be configured to a fixed, maximum number of events that can be transferred per EtherCAT cycle. This means that a maximum of the same number of events can be exchanged with the controller/PLC per cycle. These process data are to be understood as placeholders, which are not all to be filled at all times.

The number of input events placed in the process data for the controller by a channel matches the number of events that arrived at the input during the last cycle or are still in the buffer.

4 Mounting and connection

4.1 Mounting

4.1.1 Dimensions EP1258-0001

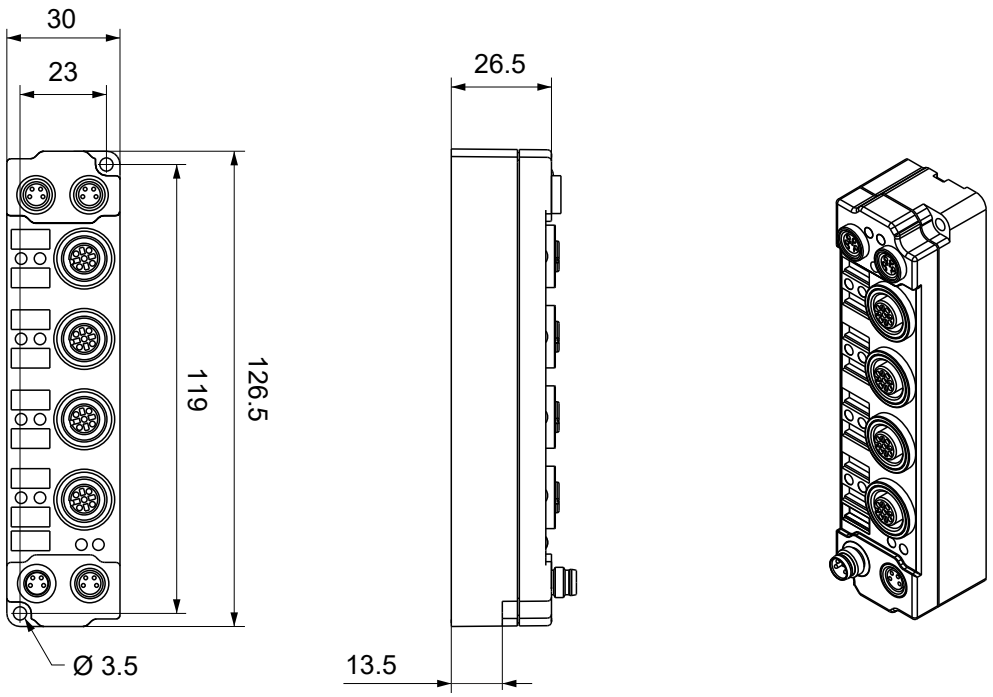


All dimensions are given in millimeters.
The drawing is not true to scale.

Housing features

Housing material	PA6 (polyamide)
Sealing compound	polyurethane
Mounting	two mounting holes Ø 3.5 mm for M3
Metal parts	brass, nickel-plated
Contacts	CuZn, gold-plated
Power feed through	max. 4 A
Installation position	variable
Protection class	IP65, IP66, IP67 (conforms to EN 60529) when screwed together
Dimensions (H x W x D)	approx. 126 x 30 x 26.5 mm (without connectors)

4.1.2 Dimensions EP1258-0x02



All dimensions are given in millimeters.
The drawing is not true to scale.

Housing features

Housing material	PA6 (polyamide)
Sealing compound	polyurethane
Mounting	two mounting holes Ø 3.5 mm for M3
Metal parts	brass, nickel-plated
Contacts	CuZn, gold-plated
Power feed through	max. 4 A
Installation position	variable
Protection class	IP65, IP66, IP67 (conforms to EN 60529) when screwed together
Dimensions (H x W x D)	approx. 126 x 30 x 26.5 mm (without connectors)

4.1.3 Fixing

NOTICE

Dirt during assembly

Dirty connectors can lead to malfunctions. Protection class IP67 can only be guaranteed if all cables and connectors are connected.

- Protect the plug connectors against dirt during the assembly.

Mount the module with two M3 screws on the mounting holes in the corners of the module. The mounting holes have no thread.

4.2 Connection

4.2.1 Tightening torques for plug connectors

Screw connectors tight with a torque wrench. (e.g. ZB8801 from Beckhoff)

Connector diameter	Tightening torque
M8	0.4 Nm
M12	0.6 Nm

4.2.2 Protective caps

- Seal unused connectors with protective caps.
- Ensure the correct seating of pre-assembled protective caps.
  Protective caps are pre-assembled at the factory to protect connectors during transport. They may not be tight enough to ensure IP67 protection.

4.2.3 EtherCAT

4.2.3.1 Connectors

NOTICE

Risk of confusion: supply voltages and EtherCAT

Defect possible through incorrect insertion.

- Observe the color coding of the connectors:
  black: Supply voltages
  green: EtherCAT

EtherCAT Box Modules have two green M8 sockets for the incoming and downstream EtherCAT connections.

Connection

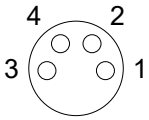


Fig. 1: M8 socket

EtherCAT	M8 socket	Core colors		
Signal	**Contact**	**ZB9010, ZB9020, ZB9030, ZB9032, ZK1090-6292, ZK1090-3xxx-xxxx**	**ZB9031 and old versions of ZB9030, ZB9032, ZK1090-3xxx-xxxx**	**TIA-568B**
Tx +	1	yellow[1)]	orange/white	white/orange
Tx -	4	orange[1)]	orange	orange
Rx +	2	white[1)]	blue/white	white/green
Rx -	3	blue[1)]	blue	green
Shield	Housing	Shield	Shield	Shield

[1)] Core colors according to EN 61918

Adaptation of core colors for cables ZB9030, ZB9032 and ZK1090-3xxxx-xxxx

For standardization, the core colors of the ZB9030, ZB9032 and ZK1090-3xxx-xxxx cables have been changed to the EN61918 core colors: yellow, orange, white, blue. So there are different color codes in circulation. The electrical properties of the cables have been retained when the core colors were changed.

4.2.3.2 Status LEDs

L/A (Link/Act)

A green LED labelled "L/A" is located next to each EtherCAT socket. The LED indicates the communication state of the respective socket:

LED	Meaning
off	no connection to the connected EtherCAT device
lit	LINK: connection to the connected EtherCAT device
flashes	ACT: communication with the connected EtherCAT device

Run

Each EtherCAT slave has a green LED labelled "Run". The LED signals the status of the slave in the EtherCAT network:

LED	Meaning
off	Slave is in "Init" state
flashes uniformly	Slave is in "Pre-Operational“ state
flashes sporadically	Slave is in "Safe-Operational" state
lit	Slave is in "Operational" state

Description of the EtherCAT slave states

4.2.3.3 Cables

For connecting EtherCAT devices only shielded Ethernet cables that meet the requirements of at least category 5 (CAT5) according to EN 50173 or ISO/IEC 11801 should be used.

EtherCAT uses four wires for signal transmission.
Thanks to automatic line detection ("Auto MDI-X"), both symmetrical (1:1) or cross-over cables can be used between Beckhoff EtherCAT.

Detailed recommendations for the cabling of EtherCAT devices

4.2.4 Supply voltages

⚠ WARNING

Power supply from SELV / PELV power supply unit!

SELV / PELV circuits (safety extra-low voltage / protective extra-low voltage) according to IEC 61010-2-201 must be used to supply this device.

Notes:

- SELV / PELV circuits may give rise to further requirements from standards such as IEC 60204-1 et al, for example with regard to cable spacing and insulation.
- A SELV supply provides safe electrical isolation and limitation of the voltage without a connection to the protective conductor, a PELV supply also requires a safe connection to the protective conductor.

⚠ CAUTION

Observe the UL requirements

- When operating under UL conditions, observe the warnings in the chapter UL Requirements [▶ 37].

The EtherCAT Box has one input for two supply voltages:

- **Control voltage U_S**
  The following sub-functions are supplied from the control voltage U_S:
  - the fieldbus
  - the processor logic
  - typically the inputs and the sensors if the EtherCAT Box has inputs.
- **Peripheral voltage U_P**
  For EtherCAT Box modules with digital outputs the digital outputs are typically supplied from the peripheral voltage U_P. U_P can be supplied separately. If U_P is switched off, the fieldbus function, the function of the inputs and the supply of the sensors are maintained.

The exact assignment of U_S and U_P can be found in the pin assignment of the I/O connections.

Redirection of the supply voltages

The power IN and OUT connections are bridged in the module. Hence, the supply voltages U_s and U_p can be passed from EtherCAT Box to EtherCAT Box in a simple manner.

NOTICE

Note the maximum current!

Ensure that the permitted current for the connectors is not exceeded when routing the supply voltages U_S and U_P:

M8 connector: max. 4 A
7/8" connector: max 16 A

NOTICE

Unintentional cancellation of the electrical isolation possible

In some types of EtherCAT Box modules the ground potentials GND_S and GND_P are connected.

- If several EtherCAT Box modules are supplied with the same electrically isolated voltages, check whether there is an EtherCAT Box among them in which the ground potentials are connected.

4.2.4.1 Connectors

NOTICE

Risk of confusion: supply voltages and EtherCAT

Defect possible through incorrect insertion.

- Observe the color coding of the connectors:
  black: Supply voltages
  green: EtherCAT

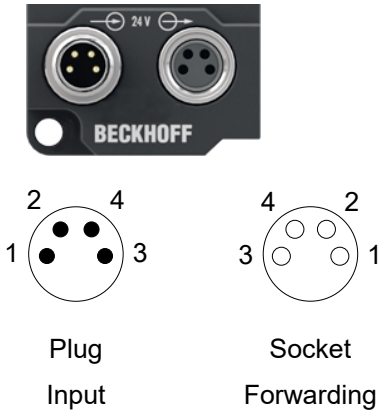


Fig. 2: M8 connector

Contact	Function	Description	Core color [1]
1	U_S	Control voltage	Brown
2	U_P	Peripheral voltage	White
3	GND_S	GND to U_S	Blue
4	GND_P	GND to U_P	Black

[1] The core colors apply to cables of the type: Beckhoff ZK2020-3xxx-xxxx

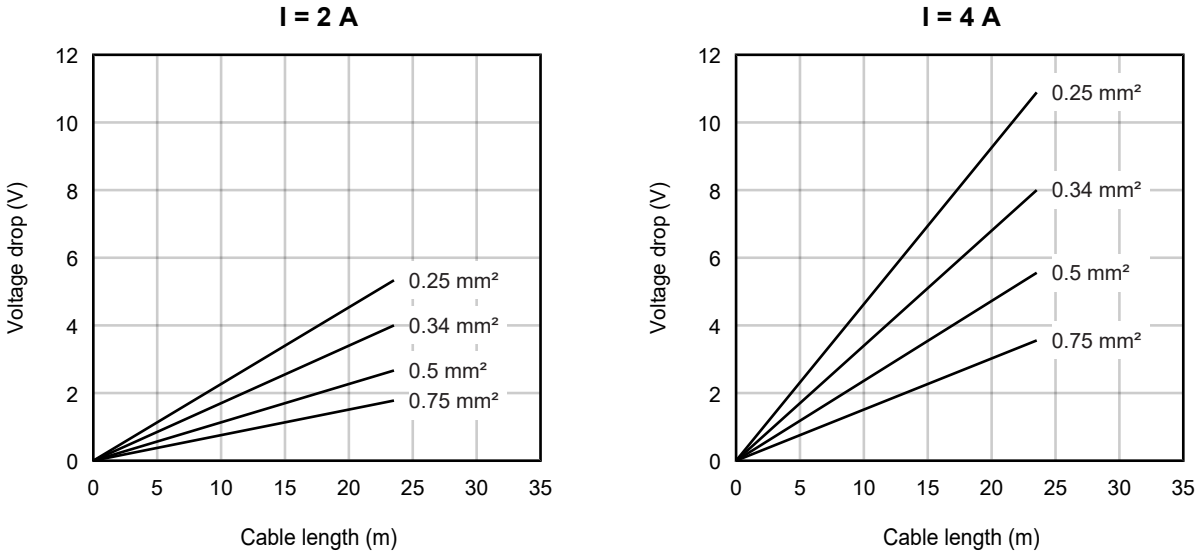
4.2.4.2 Status LEDs

LED	Display	Meaning
U_S (control voltage)	off	The supply voltage U_S is not available.
	green illuminated	The supply voltage U_S is available.
U_P (peripheral voltage)	off	The supply voltage U_P is not available.
	green illuminated	The supply voltage U_P is available.

4.2.4.3 Conductor losses

Take into account the voltage drop on the supply line when planning a system. Avoid the voltage drop being so high that the supply voltage at the box lies below the minimum nominal voltage.
Variations in the voltage of the power supply unit must also be taken into account.

Voltage drop on the supply line



4.2.5 Digital inputs

4.2.5.1 EP1258-0001

NOTICE

Measuring errors due to EMC

The digital inputs are optimized for fast signal transmission and are therefore susceptible to electromagnetic interference.

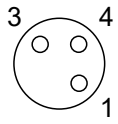
Under the influence of electromagnetic interference, incorrect signal levels or edges can be detected.

- If necessary, use shielded signal lines or enable the digital filters, see chapter Filter [▶ 47].

NOTICE

Risk of confusion

The connections for channels 1 to 8 are labeled on the housing with the numbers 0 to 7. Connection 0 is channel 1, connection 1 is channel 2, etc.

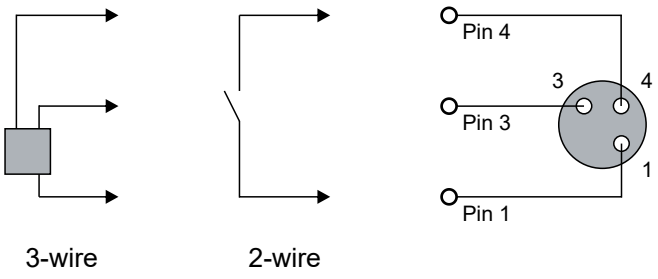


Pin assignment

Pin	Function	Core color [1]
1	U_S	brown
3	GND	blue
4	Input	black

[1] The core colors apply to sensor cables from Beckhoff. See chapter Accessories [▶ 115].

Connection examples



Status LEDs

There is a green LED next to each M8 socket. The LED lights up when a high level is detected at the digital input.

4.2.5.2 EP1258-0002

NOTICE

Measuring errors due to EMC

The digital inputs are optimized for fast signal transmission and are therefore susceptible to electromagnetic interference.

Under the influence of electromagnetic interference, incorrect signal levels or edges can be detected.

- If necessary, use shielded signal lines or enable the digital filters, see chapter Filter [▶ 47].

NOTICE

Risk of confusion

The connections for channels 1 to 8 are labeled on the housing with the numbers 0 to 7. Connection 0 is channel 1, connection 1 is channel 2, etc.

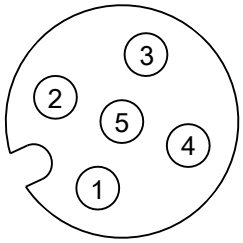
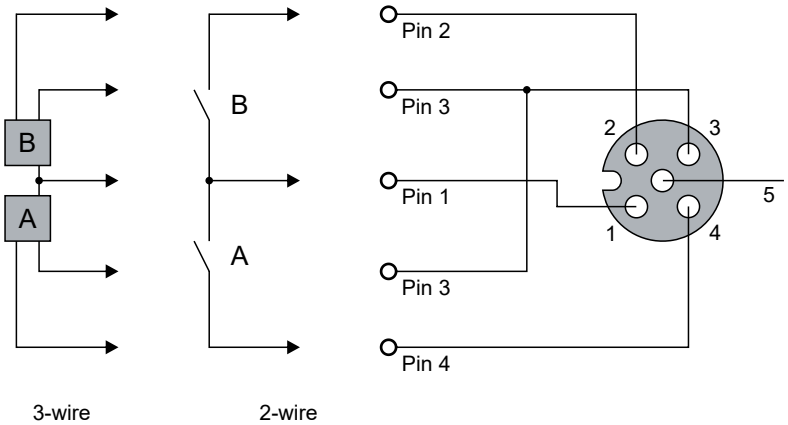


Fig. 3: M12 socket

Pin	Function	Core color [1]
1	U_S	brown
2	Input B	white
3	GND	blue
4	Input A	black
5	-	gray

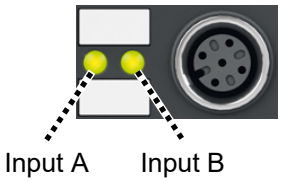
[1] The core colors apply to M12 cables from Beckhoff: ZK2000-5xxx, ZK2000-6xxx, ZK2000-7xxx

Connection examples



Status LEDs

Each M12 socket has two green LEDs. An LED lights up when a high level is detected at the respective input.



4.2.5.3 EP1258-0502

NOTICE

Measuring errors due to EMC

The digital inputs are optimized for fast signal transmission and are therefore susceptible to electromagnetic interference.

Under the influence of electromagnetic interference, incorrect signal levels or edges can be detected.

- If necessary, use shielded signal lines or enable the digital filters, see chapter Filter [▶ 47].

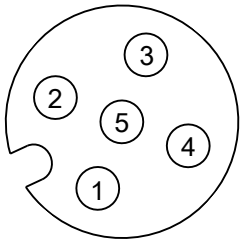
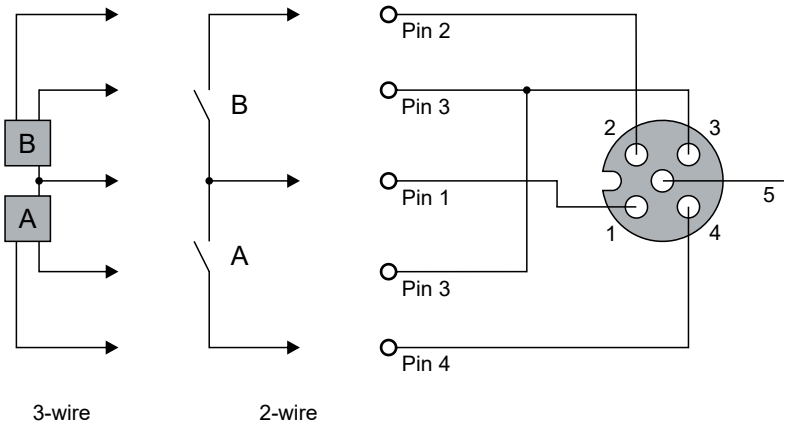


Fig. 4: M12 socket

Pin	Function	Wire color [1)]
1	U_S	brown
2	Input B	white
3	GND_S	blue
4	Input A	black
5	-	gray

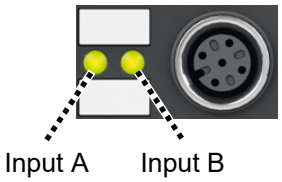
[1)] The core colors apply to M12 cables from Beckhoff: ZK2000-5xxx, ZK2000-6xxx, ZK2000-7xxx

Connection examples



Status LEDs

Each M12 socket has two green LEDs. An LED lights up when a high level is detected at the respective input.



4.3 UL Requirements

The installation of the EtherCAT Box Modules certified by UL has to meet the following requirements.

Supply voltage

⚠ CAUTION

CAUTION!

This UL requirements are valid for all supply voltages of all marked EtherCAT Box Modules!
For the compliance of the UL requirements the EtherCAT Box Modules should only be supplied

- by a 24 V_{DC} supply voltage, supplied by an isolating source and protected by means of a fuse (in accordance with UL248), rated maximum 4 Amp, or
- by a 24 V_{DC} power source, that has to satisfy *NEC class 2*.
  A *NEC class 2* power supply shall not be connected in series or parallel with another (class 2) power source!

⚠ CAUTION

CAUTION!

To meet the UL requirements, the EtherCAT Box Modules must not be connected to unlimited power sources!

Networks

⚠ CAUTION

CAUTION!

To meet the UL requirements, EtherCAT Box Modules must not be connected to telecommunication networks!

Ambient temperature range

⚠ CAUTION

CAUTION!

To meet the UL requirements, EtherCAT Box Modules has to be operated only at an ambient temperature range of -25 °C to +55 °C!

Marking for UL

All EtherCAT Box Modules certified by UL (Underwriters Laboratories) are marked with the following label.

Fig. 5: UL label

4.4 ATEX notes

4.4.1 ATEX - Special conditions

⚠ WARNING

Observe the special conditions for the intended use of EtherCAT Box modules in potentially explosive areas – directive 94/9/EU.

- The certified components are to be installed with a BG2000-0000 or BG2000-0010 protection enclosure [▶ 39] that guarantees a protection against mechanical hazards!
- If the temperatures during rated operation are higher than 70°C at the feed-in points of cables, lines or pipes, or higher than 80°C at the wire branching points, then cables must be selected whose temperature data correspond to the actual measured temperature values!
- Observe the permissible ambient temperature range of 0 to 55°C for the use of EtherCAT Box modules in potentially explosive areas!
- Measures must be taken to protect against the rated operating voltage being exceeded by more than 40% due to short-term interference voltages!
- The connections of the certified components may only be connected or disconnected if the supply voltage has been switched off or if a non-explosive atmosphere is ensured!

Standards

The fundamental health and safety requirements are fulfilled by compliance with the following standards:

- EN 60079-0: 2006
- EN 60079-15: 2005

Marking

The EtherCAT Box modules certified for potentially explosive areas bear the following marking:

II 3 G Ex nA II T4 DEKRA 11ATEX0080 X Ta: 0 - 55°C

or

II 3 G Ex nA nC IIC T4 DEKRA 11ATEX0080 X Ta: 0 - 55°C

Batch number (D number)

The EtherCAT Box modules bear a batch number (D number) that is structured as follows:

D: WW YY FF HH

WW - week of production (calendar week)
YY - year of production
FF - firmware version
HH - hardware version

Example with batch number 29 10 02 01:

29 - week of production 29
10 - year of production 2010
02 - firmware version 02
01 - hardware version 01

4.4.2 BG2000 - EtherCAT Box protection enclosures

⚠ WARNING

Risk of electric shock and damage of device!

Bring the EtherCAT system into a safe, powered down state before starting installation, disassembly or wiring of the modules!

ATEX

⚠ WARNING

Mount a protection enclosure!

To fulfill the special conditions according to ATEX [▶ 38], a BG2000-0000 or BG2000-0010 protection enclosure has to be mounted over the EtherCAT Box.

Installation

Put the cables for EtherCAT, power supply and sensors/actuators through the hole of the protection enclosure.

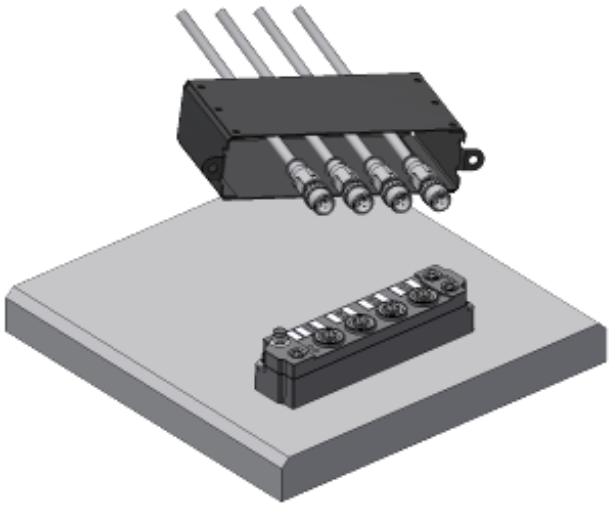


Fig. 6: BG2000 - putting the cables

Fix the wires for EtherCAT, power supply and sensors/actuators to the EtherCAT Box. Also seal unused connectors with protective caps!

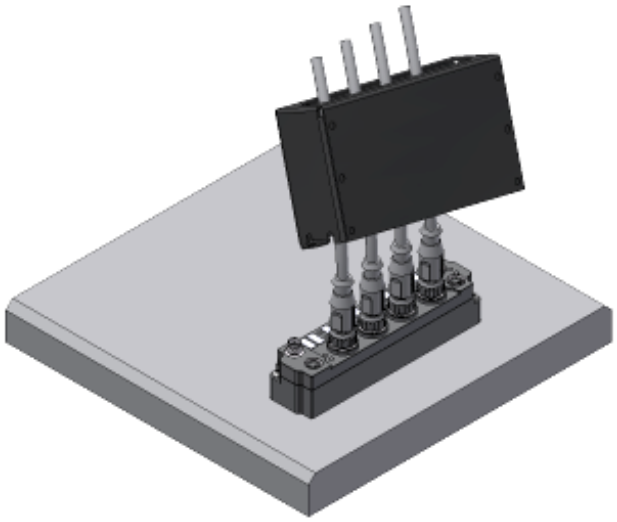


Fig. 7: BG2000 - fixing the cables

Mount the protection enclosure over the EtherCAT Box.

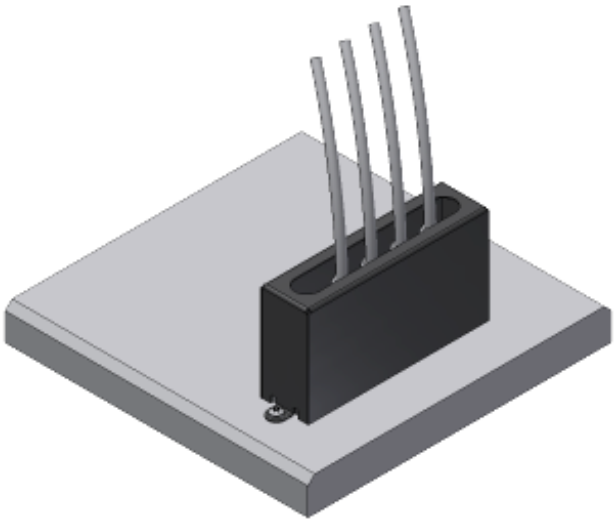


Fig. 8: BG2000 - mounting the protection enclosure

4.4.3 ATEX Documentation

Notes about operation of EtherCAT Box Modules (EPxxxx-xxxx) in potentially explosive areas (ATEX)

Pay also attention to the continuative documentationNotes about operation of EtherCAT Box Modules (EPxxxx-xxxx) in potentially explosive areas (ATEX) that is available in the download area of the Beckhoff homepage http:\\www.beckhoff.com!

5 Commissioning and configuration

5.1 Integrating into a TwinCAT project

The procedure for integration in a TwinCAT project is described in these Quick start guide.

5.2 Timestamp inputs (EP1258-000x)

A timestamp input provides two timestamps:

- The timestamp of the last detected rising signal edge “LatchPos”
- The timestamp of the last detected falling signal edge “LatchNeg”

Each time a signal edge is detected, the corresponding timestamp is overwritten with the current timestamp.

5.2.1 Configuration for multiple edges per PLC cycle

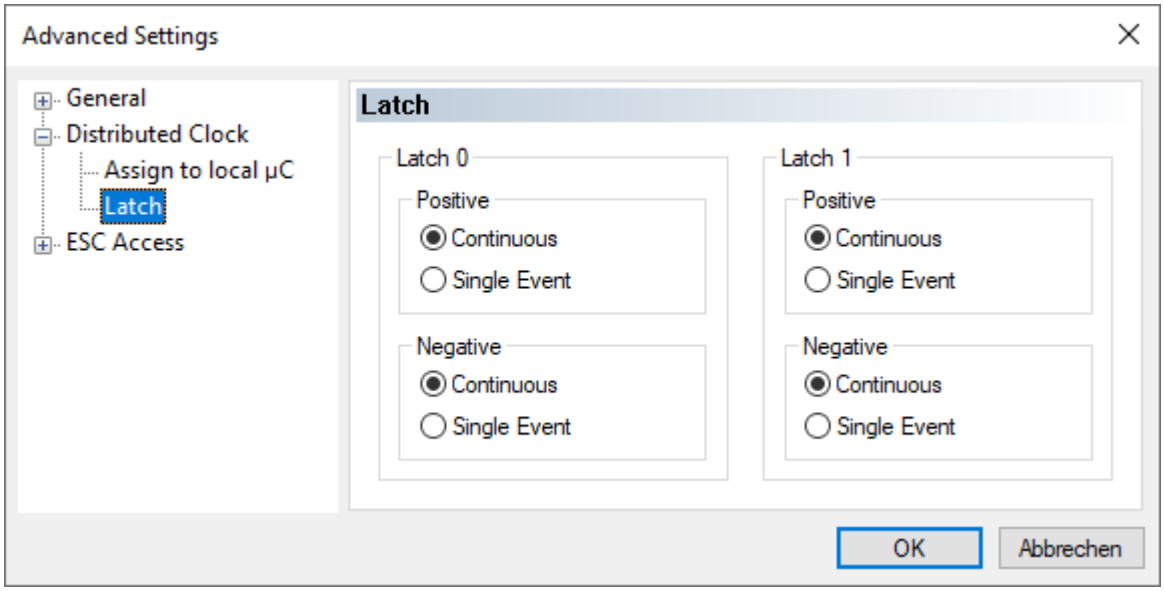
The process data is only transferred once per PLC cycle. If, for example, several positive signal edges occur within a PLC cycle, the timestamp is only saved for one of these edges.

You can set which timestamp is to be saved:

- The timestamp of the first detected signal edge in the PLC cycle, positive or negative in each case
- The timestamp of the last detected signal edge in the PLC cycle, positive or negative in each case

Proceed as follows:

1. Click on the box in the Solution Explorer.
2. Select the "EtherCAT" tab.
3. Click the "Advanced Settings..." button.
4. Navigate to the entry "Distributed Clocks" > "Latch".



5. Select "Continuous" to save the timestamp of the last edge in the PLC cycle.
   Select "Single Event" to save the timestamp of the first edge in the PLC cycle.
6. Activate the TwinCAT configuration to apply the setting.

5.3 Multi-timestamp inputs (EP1258-0502)

This chapter describes the commissioning of the multi-timestamp inputs.

5.3.1 Synchronous or asynchronous operation?

Synchronous operation (default)

Synchronous operation should be selected if events are to be transferred from the channel to the controller as quickly as possible.

- In each EtherCAT cycle as many events as possible are loaded into the buffer. The number of events per channel can be read via "Events in input buffer". The maximum number of events that can be saved is 32.
- The MTSF is used to specify how many events per cycle are transferred from the buffer into the process data. The factor is currently limited to a maximum of 10.
- If the number of detected events continuously exceeds the MTSF value, the buffer may overflow. The CoE parameter 0x80n0:13 can be used to configure the behavior in the event of a buffer overflow.

Asynchronous operation

If high data security is required, asynchronous handshake operation should be selected.

Application from the PLC:

1. Wait until the channel with "No of input events" > 0 reports that data is available.
2. Apply the data (input event states and timestamps) from the process data.
3. Increment the counter "Input order counter" (+1).
   ⇨ In the next cycle, "Input order feedback" has taken the value of "Input order counter".
4. If there are other events in the buffer, these are shown in the process image.
5. Starting from the beginning...

Setting the operation mode

Set the selected operation mode via the CoE parameter 0x8pp0:12 of the respective channel.

8000:0	MTI settings Ch.1	RW	> 20 <
8000:01	Enable digital filter	RW	FALSE
8000:11	Buffer reset behaviour	RW	Reset on rising edge (0)
8000:12	Buffer mode	RW	Asynchronous (Buffered) (0)
8000:13	Buffer overflow behaviour	RW	Lock buffer (0)
8000:14	Digital filter count	RW	0x0001 (1)

5.3.2 Multi-timestamp factor (MTSF)

The MTSF specifies how many events (signal edges) are transferred from the buffer to the controller per PLC cycle.

The buffer has a capacity of 32 events; the MTSF can be 1, 2, 5, or 10 events.

Calculation of the MTSF

To choose the right MTSF, estimate the frequency of events expected at the input.

In order to avoid the transfer of excessive quantities of process data, the following configuration recommendations apply:

- Synchronous operation:

$$\mathrm{MTSF} \geq \mathrm{n_{Events}} + 1$$

- Asynchronous operation:

$$\mathrm{MTSF} \geq 2 \times \mathrm{n_{Events}} + 1$$

(n_{Events} is the expected maximum number of input events per PLC cycle)

In asynchronous mode, only half as many events can be retrieved per time as in synchronous mode due to the handshake.

Setting the MTSF

Set the MTSF by selecting the corresponding Predefined PDO Assignment. See chapter Configuring the process image [▶ 46].

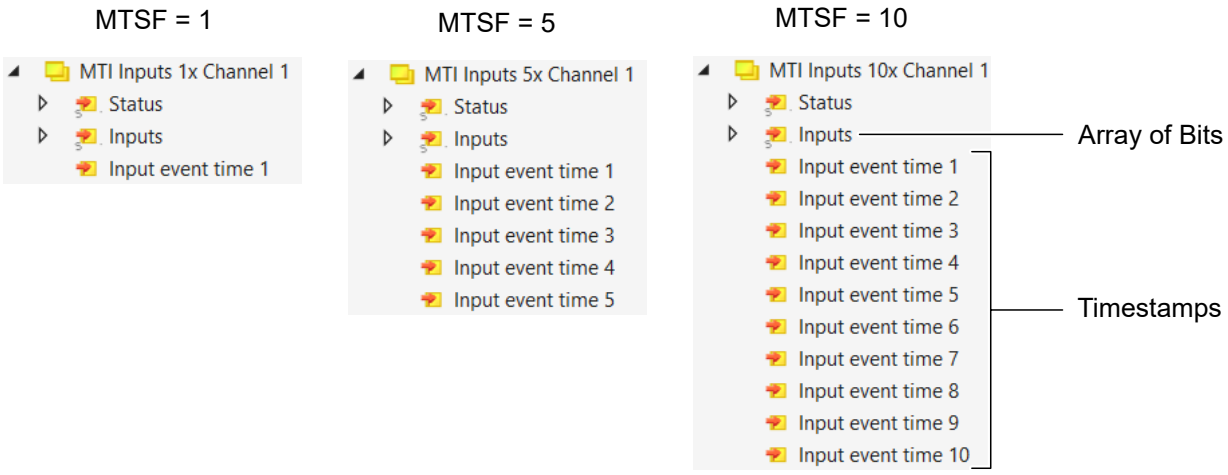
Example

With a cycle time of 1 ms, a maximum of 4 events/ms per channel are expected. All 8 channels of the box are to be used.

- Synchronous transfer: MTSF ≥ 5
  - Select the Predefined PDO Assignment "Multi-Timestamping 8 Ch. 5x".
  - If more than five events occur in a cycle, these are temporarily stored in the channel buffer. The buffer can then be emptied by the controller in the subsequent cycles.
- Asynchronous transfer: MTSF ≥ 9
  - Select the Predefined PDO Assignment "Multi-Timespamping 8 Ch. 10x".

Process data

For example, the process data of an input channel for MTSF = 1, 5 and 10 are as follows:



A bit in the inputs array (right-aligned) and a timestamp are available for each event.
These process data are placeholders that will receive events, if there are any to transmit.

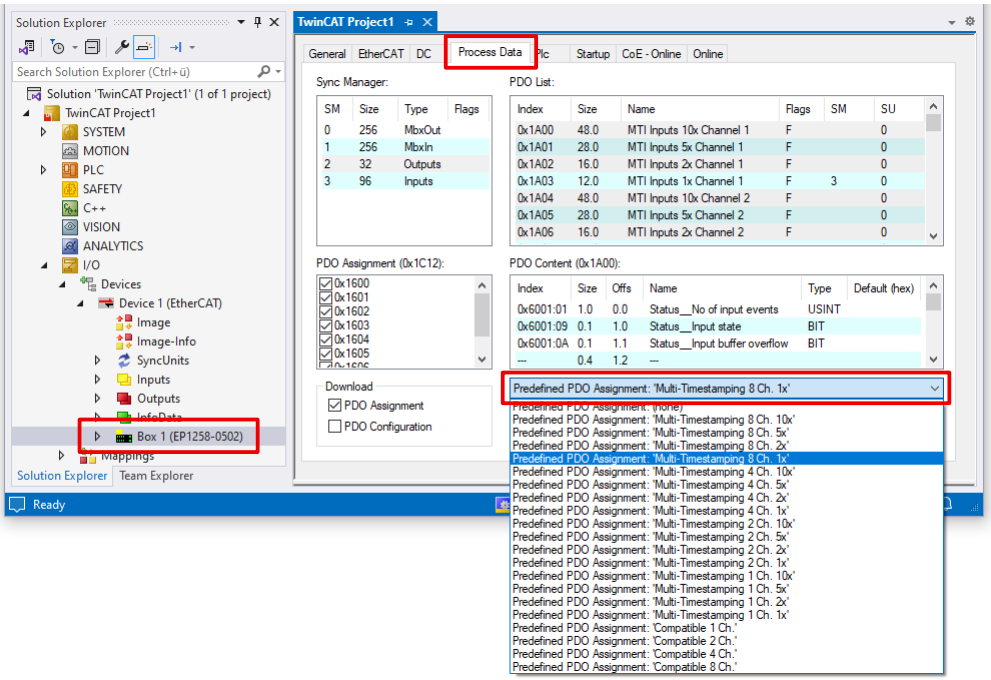
If fewer channels are required, Predefined PDO Assignments is also available for 4, 2 or 1 channel, each with an MTSF of 1x, 2x, 5x and 10x.

If fewer events arrive at the input than defined by the MTSF, the remaining PDOs are set to 0, in order to highlight this.

Example: For "No of input events" = 3 and MTSF = 5, this means that the first 3 events are delivered in the timestamps "Input event time 1...3"; the timestamps "Input event time 4...5" have the value 0.

5.3.3 Configuring the process image

You can configure the process image by selecting a Predefined PDO Assignment.



The following Predefined PDO Assignments are available:

Predefined PDO Assignment	Activated channels	Timestamp technology	MTSF
Multi-Timestamping 8 Ch. 10x	1…8	Multi-timestamp	10
Multi-Timestamping 8 Ch. 5x	1…8	Multi-timestamp	5
Multi-Timestamping 8 Ch. 2x	1…8	Multi-timestamp	2
Multi-Timestamping 8 Ch. 1x (default)	1…8	Multi-timestamp	1
Multi-Timestamping 4 Ch. 10x	1…4	Multi-timestamp	10
Multi-Timestamping 4 Ch. 5x	1…4	Multi-timestamp	5
Multi-Timestamping 4 Ch. 2x	1…4	Multi-timestamp	2
Multi-Timestamping 4 Ch. 1x	1…4	Multi-timestamp	1
Multi-Timestamping 2 Ch. 10x	1…2	Multi-timestamp	10
Multi-Timestamping 2 Ch. 5x	1…2	Multi-timestamp	5
Multi-Timestamping 2 Ch. 2x	1…2	Multi-timestamp	2
Multi-Timestamping 2 Ch. 1x	1…2	Multi-timestamp	1
Multi-Timestamping 1 Ch. 10x	1	Multi-timestamp	10
Multi-Timestamping 1 Ch. 5x	1	Multi-timestamp	5
Multi-Timestamping 1 Ch. 2x	1	Multi-timestamp	2
Multi-Timestamping 1 Ch. 1x	1	Multi-timestamp	1
Compatible 1 Ch.	1	Timestamp	-
Compatible 2 Ch.	1…2	Timestamp	-
Compatible 4 Ch.	1…4	Timestamp	-
Compatible 8 Ch.	1…8	Timestamp	-

5.3.4 Filter

The filters of all channels are disabled on delivery.

The filter can be used to hide short signal jumps (spikes). They are regarded as invalid.

Enabling a filter

1. Enable the filter via the CoE parameter 0x80n0:01 "Enable digital filter".
2. Set the filter time via the parameter 0x80n0:14 "Digital filter counter".
   Pulses that are shorter than the filter time are ignored. The filter time must be specified in microcycles. A "1" equals a disabled filter.
3. Check whether the macrocycle is smaller than the EtherCAT cycle time due to the selected settings.
   The current macrocycle time can be read in CoE parameter 0xF900:08 "CycleTime". As a rule, it should be 20 % lower than the EtherCAT cycle time.

5.3.5 Testing a multi-timestamp input

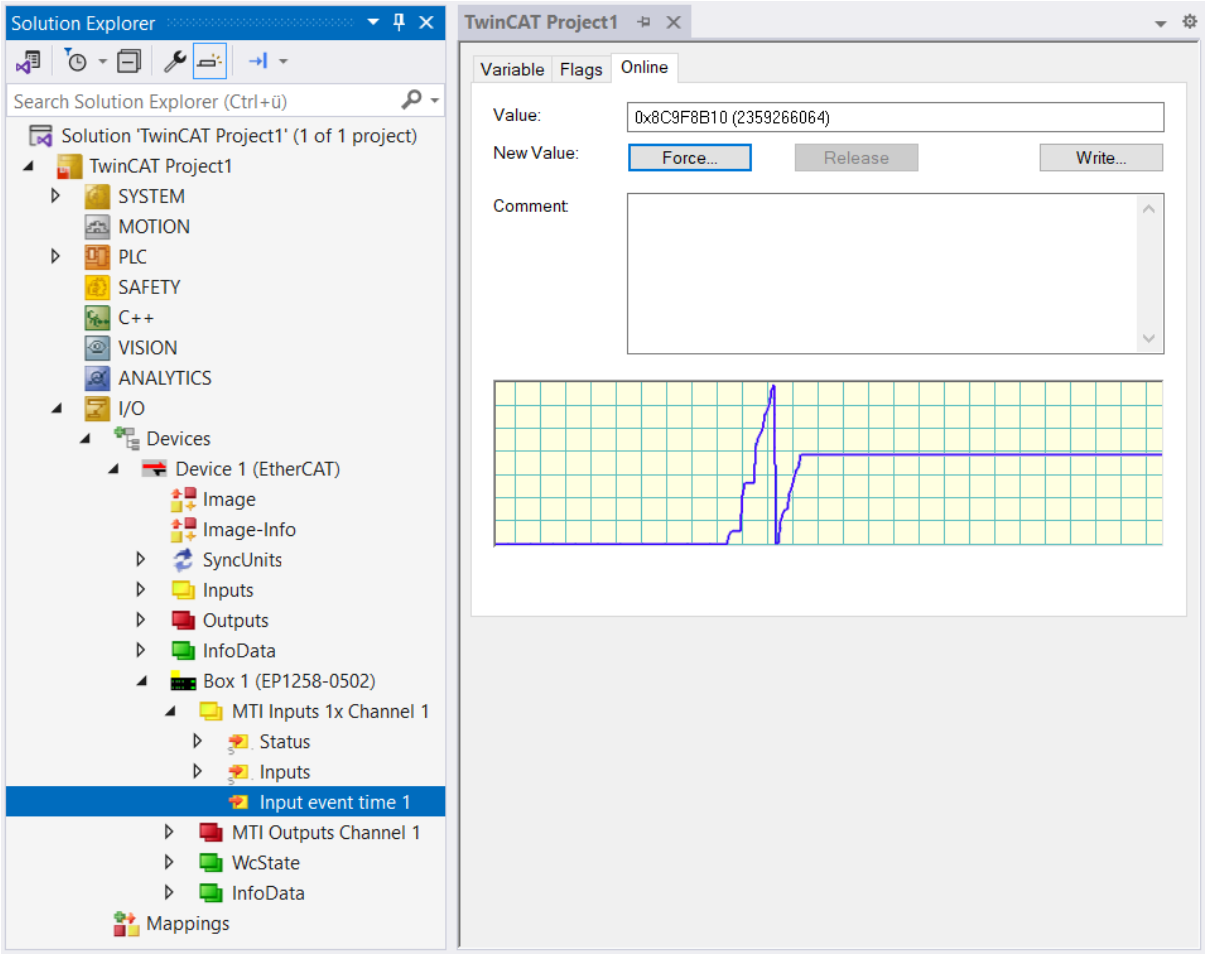
If an input channel is to be tested, the events are hardly visible in the System Manager, since in synchronous mode (default) they are immediately retrieved, and the process data always look "zeroed".

Remedy

- Set the channel to asynchronous mode, so that the events are retrieved in handshake mode.

or

- Track the event timestamp no. 1 in the "Online" tab:



5.3.6 Commissioning in compatibility mode

The EP1258-0502 can also be operated in compatibility mode with the EP1258-0001 and EP1258-0002.

To do this, set one of the following Predefined PDO Assignments:

- "Compatible 1 Ch."
- "Compatible 2 Ch."
- "Compatible 4 Ch."
- "Compatible 8 Ch."

The procedure for setting can be found in chapter Configuring the process image [▶ 46].

Configuration

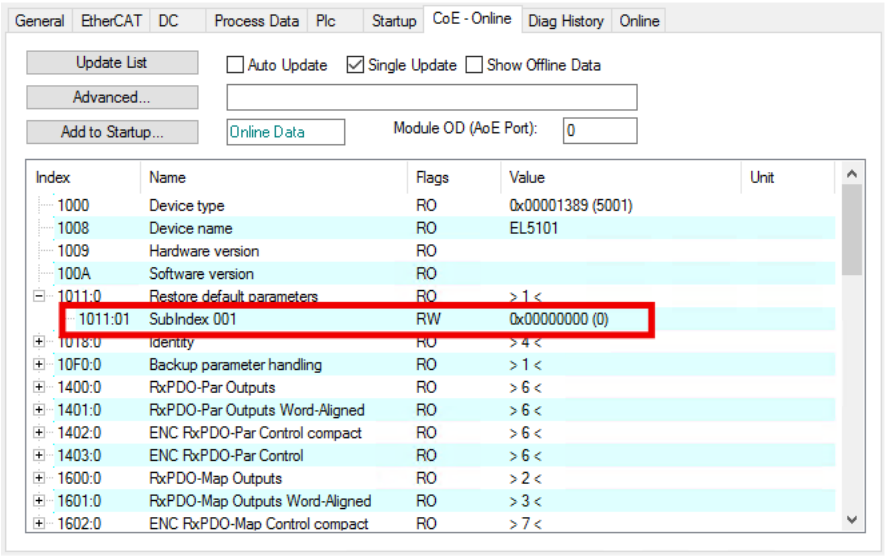
The CoE objects 0x80n0:0 "TSI Settings" can be used to define the behavior in the event of multiple events in an EtherCAT cycle, similar to EP1258-0001 and EP1258-0002. In this case MTSF = 1.

Parameter	Value	Enum	Description
80n0:01	0	Last edge	The last detected event is forwarded to the PLC
	1	First edge	The first detected event is forwarded to the PLC
80n0:02	0	Last edge	The last detected event is forwarded to the PLC
	1	First edge	The first detected event is forwarded to the PLC

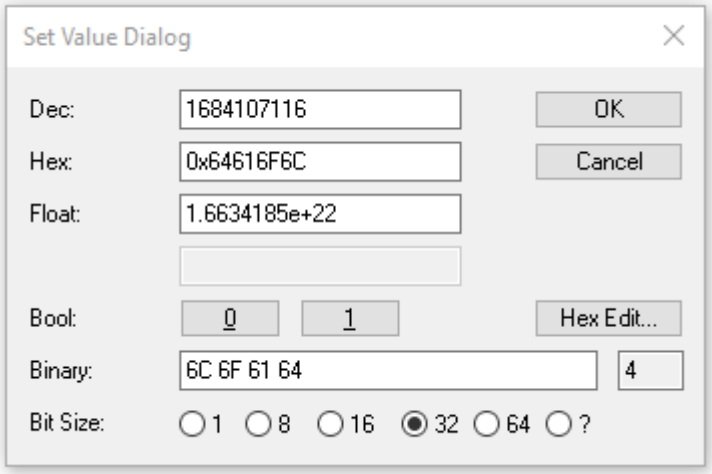
5.4 Restore the delivery state

You can restore the delivery state of the backup objects as follows:

1. Ensure that TwinCAT is running in Config mode.
2. In CoE object 1011:0 "Restore default parameters" select parameter 1011:01 "Subindex 001".



3. Double-click on "Subindex 001".
   ⇨ The "Set Value Dialog" dialog box opens.
4. Enter the value 1684107116 in the "Dec" field.
   Alternatively: enter the value 0x64616F6C in the "Hex" field.



5. Confirm with "OK".

⇨ All backup objects are reset to the delivery state.

Alternative restore value

With some older modules the backup objects can be changed with an alternative restore value:
Decimal value: 1819238756
Hexadecimal value: 0x6C6F6164

An incorrect entry for the restore value has no effect.

6 CoE parameters

6.1 EP1258-0502

6.1.1 Configuration objects

8000…8070 MTI settings Ch.n

- Channel 1: Index 8000
- Channel 2: Index 8010
- Channel 3: Index 8020
- ...

Index (hex)	Name	Meaning	Data type	Flags	Default
8pp0:0	MTI settings Ch.n		USINT	RO	0x14 (20_{dec})
8pp0:01	Enable digital filter	Enables the digital filter. The filter time can be set in subindex 14 "Digital filter count".	BOOL	RW	0
8pp0:11	Buffer reset behaviour	Controls the evaluation of the "Input buffer reset". Possible values: • 0: "Reset on rising edge" • 1: "Reset on high level"	UINT	RW	0
8pp0:12	Buffer mode	Selection of the operation mode. See chapter Synchronous or asynchronous operation? [▶ 43]. Possible values: • 0: "Asynchronous (Buffered)" • 1: "Synchronous"	UINT	RW	1
8pp0:13	Buffer overflow behaviour	Controls the processing of further events when the buffer is full. Possible values: • 0: "Lock buffer" If the buffer is full, all further detected events are discarded. • 1: "Overwrite oldest event" When the buffer is full, every subsequent detected event will overwrite the oldest event in the buffer.	UINT	RW	0
8pp0:14	Digital filter count	Filter time of the digital filter. Pulses that are shorter than the number of microcycles specified in this parameter are ignored. The length of a microcycle depends on the channel configuration, see chapter EP1258-0502 Microcycle time [▶ 17]. The value 1 disables the filter.	UINT	RW	1

800F…807F MTI Vendor data Ch.n

- Channel 1: Index 800F
- Channel 2: Index 801F
- Channel 3: Index 802F
- ...

These parameters can only be changed by the manufacturer.

Index (hex)	Name	Meaning	Data type	Flags	Default
8ppF:0	MTI Vendor data Ch.n		USINT	RO	0x12 (18_{dec})
8ppF:11	Offset pos	Shifting the timestamp of rising edges.	DINT	RW	-
8nF:12	Offset neg	Shifting the timestamp of falling edges.	DINT	RW	-

8080…80F0 TSI Settings Ch.n

- Channel 1: Index 8080
- Channel 2: Index 8090
- Channel 3: Index 80A0
- ...

Index (hex)	Name	Meaning	Data type	Flags	Default
8pp0:0	TSI Settings Ch.n		USINT	RO	0x2 (2_{dec})
8pp0:01	Pos Sample Mode	Behavior when more than one rising edge occurs in a PLC cycle. Possible values: • 0: "Last Edge" Save the timestamp of the last signal edge. • 1: "First Edge" Save the timestamp of the first signal edge.	BOOL	RW	0
8pp0:02	Neg Sample Mode	Behavior when more than one falling edge occurs in a PLC cycle. Possible values: • 0: "Last Edge" Save the timestamp of the last signal edge. • 1: "First Edge" Save the timestamp of the first signal edge.	BOOL	RW	0

808F…80FF TSI Vendor data Ch.n

- Channel 1: Index 808F
- Channel 2: Index 809F
- Channel 3: Index 80AF
- ...

These parameters can only be changed by the manufacturer.

Index (hex)	Name	Meaning	Data type	Flags	Default
8ppF:0	TSI Vendor data Ch.n		USINT	RO	0x12 (18_{dec})
8ppF:11	Offset pos	Shifting the timestamp of rising edges.	DINT	RW	-
8ppF:12	Offset neg	Shifting the timestamp of falling edges.	DINT	RW	-

6.1.2 Standard objects

1000 Device type

Index (hex)	Name	Meaning	Data type	Flags	Default
1000:0	Device type	Device type of the EtherCAT slave: the Lo-Word contains the used CoE profile (5001). The Hi-Word contains the module profile according to the modular device profile.	UDINT	RO	0x1389 (5001_{dec})

1008 Device name

Index (hex)	Name	Meaning	Data type	Flags	Default
1008:0	Device name	Device name of the EtherCAT slave	STRING(11)	RO	EP1258-0502

1009 Hardware version

Index (hex)	Name	Meaning	Data type	Flags	Default
1009:0	Hardware version	Hardware version of the EtherCAT slave	STRING(2)	RO	-

100A Software version

Index (hex)	Name	Meaning	Data type	Flags	Default
100A:0	Software version	Firmware version of the EtherCAT slave	STRING(2)	RO	-

1011 Restore default parameters

Index (hex)	Name	Meaning	Data type	Flags	Default
1011:0	Restore default parameters	Restore default parameters. If this object is set to "0x64616F6C" in the set value dialog, all backup objects are reset to their delivery state.	USINT	RO	0x1 (1_{dec})

1018 Identity

Index (hex)	Name	Meaning	Data type	Flags	Default
1018:0	Identity	Information for identifying the slave	USINT	RO	0x4 (4_{dec})
1018:01	Vendor ID	Vendor ID of the EtherCAT slave	UDINT	RO	0x2 (2_{dec})
1018:02	Product code	Product code of the EtherCAT slave	UDINT	RO	0x4ea4052 (82460754_{dec})
1018:03	Revision	Revision number of the EtherCAT slave; the Low Word (bit 0-15) indicates the special terminal number, the High Word (bit 16-31) refers to the device description	UDINT	RO	-
1018:04	Serial number	Serial number of the EtherCAT slave; the Low Byte (bit 0-7) of the Low Word contains the year of production, the High Byte (bit 8-15) of the Low Word contains the week of production, the High Word (bit 16-31) is 0	UDINT	RO	-

10F0 Backup parameter handling

Index (hex)	Name	Meaning	Data type	Flags	Default
10F0:0	Backup parameter handling		USINT	RO	0x1 (1_{dec})
10F0:01	Checksum	Checksum across all backup entries of the EtherCAT slave	UDINT	RO	-

1600 MTI RxPDO-Map Outputs Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
1600:0	MTI RxPDO-Map Outputs Ch.1		USINT	RO	0x4 (4_{dec})
1600:01	SubIndex 001		UDINT	RO	0x70000101 (1879048449_{dec})
1600:02	SubIndex 002		UDINT	RO	0xf (15_{dec})
1600:03	SubIndex 003		UDINT	RO	0x70001108 (1879052552_{dec})
1600:04	SubIndex 004		UDINT	RO	0x8 (8_{dec})

1601 MTI RxPDO-Map Outputs Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
1601:0	MTI RxPDO-Map Outputs Ch.2		USINT	RO	0x4 (4_{dec})
1601:01	SubIndex 001		UDINT	RO	0x70100101 (1880097025_{dec})
1601:02	SubIndex 002		UDINT	RO	0xf (15_{dec})
1601:03	SubIndex 003		UDINT	RO	0x70101108 (1880101128_{dec})
1601:04	SubIndex 004		UDINT	RO	0x8 (8_{dec})

1602 MTI RxPDO-Map Outputs Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
1602:0	MTI RxPDO-Map Outputs Ch.3		USINT	RO	0x4 (4_{dec})
1602:01	SubIndex 001		UDINT	RO	0x70200101 (1881145601_{dec})
1602:02	SubIndex 002		UDINT	RO	0xf (15_{dec})
1602:03	SubIndex 003		UDINT	RO	0x70201108 (1881149704_{dec})
1602:04	SubIndex 004		UDINT	RO	0x8 (8_{dec})

1603 MTI RxPDO-Map Outputs Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
1603:0	MTI RxPDO-Map Outputs Ch.4		USINT	RO	0x4 (4_{dec})
1603:01	SubIndex 001		UDINT	RO	0x70300101 (1882194177_{dec})
1603:02	SubIndex 002		UDINT	RO	0xf (15_{dec})
1603:03	SubIndex 003		UDINT	RO	0x70301108 (1882198280_{dec})
1603:04	SubIndex 004		UDINT	RO	0x8 (8_{dec})

1604 MTI RxPDO-Map Outputs Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
1604:0	MTI RxPDO-Map Outputs Ch.5		USINT	RO	0x4 (4_{dec})
1604:01	SubIndex 001		UDINT	RO	0x70400101 (1883242753_{dec})
1604:02	SubIndex 002		UDINT	RO	0xf (15_{dec})
1604:03	SubIndex 003		UDINT	RO	0x70401108 (1883246856_{dec})
1604:04	SubIndex 004		UDINT	RO	0x8 (8_{dec})

1605 MTI RxPDO-Map Outputs Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
1605:0	MTI RxPDO-Map Outputs Ch.6		USINT	RO	0x4 (4_{dec})
1605:01	SubIndex 001		UDINT	RO	0x70500101 (1884291329_{dec})
1605:02	SubIndex 002		UDINT	RO	0xf (15_{dec})
1605:03	SubIndex 003		UDINT	RO	0x70501108 (1884295432_{dec})
1605:04	SubIndex 004		UDINT	RO	0x8 (8_{dec})

1606 MTI RxPDO-Map Outputs Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
1606:0	MTI RxPDO-Map Outputs Ch.7		USINT	RO	0x4 (4_{dec})
1606:01	SubIndex 001		UDINT	RO	0x70600101 (1885339905_{dec})
1606:02	SubIndex 002		UDINT	RO	0xf (15_{dec})
1606:03	SubIndex 003		UDINT	RO	0x70601108 (1885344008_{dec})
1606:04	SubIndex 004		UDINT	RO	0x8 (8_{dec})

1607 MTI RxPDO-Map Outputs Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
1607:0	MTI RxPDO-Map Outputs Ch.8		USINT	RO	0x4 (4_{dec})
1607:01	SubIndex 001		UDINT	RO	0x70700101 (1886388481_{dec})
1607:02	SubIndex 002		UDINT	RO	0xf (15_{dec})
1607:03	SubIndex 003		UDINT	RO	0x70701108 (1886392584_{dec})
1607:04	SubIndex 004		UDINT	RO	0x8 (8_{dec})

1A00 MTI TxPDO-Map Inputs 10x Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
1A00:0	MTI TxPDO-Map Inputs 10x Ch.1		USINT	RO	0x1c (28_{dec})
1A00:01	SubIndex 001		UDINT	RO	0x60010108 (1610678536_{dec})
1A00:02	SubIndex 002		UDINT	RO	0x60010901 (1610680577_{dec})
1A00:03	SubIndex 003		UDINT	RO	0x60010a01 (1610680833_{dec})
1A00:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A00:05	SubIndex 005		UDINT	RO	0x60010f02 (1610682114_{dec})
1A00:06	SubIndex 006		UDINT	RO	0x60011108 (1610682632_{dec})
1A00:07	SubIndex 007		UDINT	RO	0x60011208 (1610682888_{dec})
1A00:08	SubIndex 008		UDINT	RO	0x60012101 (1610686721_{dec})
1A00:09	SubIndex 009		UDINT	RO	0x60012201 (1610686977_{dec})
1A00:0A	SubIndex 010		UDINT	RO	0x60012301 (1610687233_{dec})
1A00:0B	SubIndex 011		UDINT	RO	0x60012401 (1610687489_{dec})
1A00:0C	SubIndex 012		UDINT	RO	0x60012501 (1610687745_{dec})
1A00:0D	SubIndex 013		UDINT	RO	0x60012601 (1610688001_{dec})
1A00:0E	SubIndex 014		UDINT	RO	0x60012701 (1610688257_{dec})
1A00:0F	SubIndex 015		UDINT	RO	0x60012801 (1610688513_{dec})
1A00:10	SubIndex 016		UDINT	RO	0x60012901 (1610688769_{dec})
1A00:11	SubIndex 017		UDINT	RO	0x60012a01 (1610689025_{dec})
1A00:12	SubIndex 018		UDINT	RO	0x16 (22_{dec})
1A00:13	SubIndex 019		UDINT	RO	0x60014120 (1610694944_{dec})
1A00:14	SubIndex 020		UDINT	RO	0x60014220 (1610695200_{dec})
1A00:15	SubIndex 021		UDINT	RO	0x60014320 (1610695456_{dec})
1A00:16	SubIndex 022		UDINT	RO	0x60014420 (1610695712_{dec})

Index (hex)	Name	Meaning	Data type	Flags	Default
1A00:17	SubIndex 023		UDINT	RO	0x60014520 (1610695968_{dec})
1A00:18	SubIndex 024		UDINT	RO	0x60014620 (1610696224_{dec})
1A00:19	SubIndex 025		UDINT	RO	0x60014720 (1610696480_{dec})
1A00:1A	SubIndex 026		UDINT	RO	0x60014820 (1610696736_{dec})
1A00:1B	SubIndex 027		UDINT	RO	0x60014920 (1610696992_{dec})
1A00:1C	SubIndex 028		UDINT	RO	0x60014a20 (1610697248_{dec})

1A01 MTI TxPDO-Map Inputs 5x Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
1A01:0	MTI TxPDO-Map Inputs 5x Ch.1		USINT	RO	0x12 (18_{dec})
1A01:01	SubIndex 001		UDINT	RO	0x60010108 (1610678536_{dec})
1A01:02	SubIndex 002		UDINT	RO	0x60010901 (1610680577_{dec})
1A01:03	SubIndex 003		UDINT	RO	0x60010a01 (1610680833_{dec})
1A01:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A01:05	SubIndex 005		UDINT	RO	0x60010f02 (1610682114_{dec})
1A01:06	SubIndex 006		UDINT	RO	0x60011108 (1610682632_{dec})
1A01:07	SubIndex 007		UDINT	RO	0x60011208 (1610682888_{dec})
1A01:08	SubIndex 008		UDINT	RO	0x60012101 (1610686721_{dec})
1A01:09	SubIndex 009		UDINT	RO	0x60012201 (1610686977_{dec})
1A01:0A	SubIndex 010		UDINT	RO	0x60012301 (1610687233_{dec})
1A01:0B	SubIndex 011		UDINT	RO	0x60012401 (1610687489_{dec})
1A01:0C	SubIndex 012		UDINT	RO	0x60012501 (1610687745_{dec})
1A01:0D	SubIndex 013		UDINT	RO	0x1b (27_{dec})
1A01:0E	SubIndex 014		UDINT	RO	0x60014120 (1610694944_{dec})
1A01:0F	SubIndex 015		UDINT	RO	0x60014220 (1610695200_{dec})
1A01:10	SubIndex 016		UDINT	RO	0x60014320 (1610695456_{dec})
1A01:11	SubIndex 017		UDINT	RO	0x60014420 (1610695712_{dec})
1A01:12	SubIndex 018		UDINT	RO	0x60014520 (1610695968_{dec})

1A02 MTI TxPDO-Map Inputs 2x Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
1A02:0	MTI TxPDO-Map Inputs 2x Ch.1		USINT	RO	0xc (12_{dec})
1A02:01	SubIndex 001		UDINT	RO	0x60010108 (1610678536_{dec})
1A02:02	SubIndex 002		UDINT	RO	0x60010901 (1610680577_{dec})
1A02:03	SubIndex 003		UDINT	RO	0x60010a01 (1610680833_{dec})
1A02:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A02:05	SubIndex 005		UDINT	RO	0x60010f02 (1610682114_{dec})
1A02:06	SubIndex 006		UDINT	RO	0x60011108 (1610682632_{dec})
1A02:07	SubIndex 007		UDINT	RO	0x60011208 (1610682888_{dec})
1A02:08	SubIndex 008		UDINT	RO	0x60012101 (1610686721_{dec})
1A02:09	SubIndex 009		UDINT	RO	0x60012201 (1610686977_{dec})
1A02:0A	SubIndex 010		UDINT	RO	0x1e (30_{dec})
1A02:0B	SubIndex 011		UDINT	RO	0x60014120 (1610694944_{dec})
1A02:0C	SubIndex 012		UDINT	RO	0x60014220 (1610695200_{dec})

1A03 MTI TxPDO-Map Inputs 1x Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
1A03:0	MTI TxPDO-Map Inputs 1x Ch.1		USINT	RO	0xa (10_{dec})
1A03:01	SubIndex 001		UDINT	RO	0x60010108 (1610678536_{dec})
1A03:02	SubIndex 002		UDINT	RO	0x60010901 (1610680577_{dec})
1A03:03	SubIndex 003		UDINT	RO	0x60010a01 (1610680833_{dec})
1A03:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A03:05	SubIndex 005		UDINT	RO	0x60010f02 (1610682114_{dec})
1A03:06	SubIndex 006		UDINT	RO	0x60011108 (1610682632_{dec})
1A03:07	SubIndex 007		UDINT	RO	0x60011208 (1610682888_{dec})
1A03:08	SubIndex 008		UDINT	RO	0x60012101 (1610686721_{dec})
1A03:09	SubIndex 009		UDINT	RO	0x1f (31_{dec})
1A03:0A	SubIndex 010		UDINT	RO	0x60014120 (1610694944_{dec})

1A04 MTI TxPDO-Map Inputs 10x Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
1A04:0	MTI TxPDO-Map Inputs 10x Ch.2		USINT	RO	0x1c (28_{dec})
1A04:01	SubIndex 001		UDINT	RO	0x60110108 (1611727112_{dec})
1A04:02	SubIndex 002		UDINT	RO	0x60110901 (1611729153_{dec})
1A04:03	SubIndex 003		UDINT	RO	0x60110a01 (1611729409_{dec})
1A04:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A04:05	SubIndex 005		UDINT	RO	0x60110f02 (1611730690_{dec})
1A04:06	SubIndex 006		UDINT	RO	0x60111108 (1611731208_{dec})
1A04:07	SubIndex 007		UDINT	RO	0x60111208 (1611731464_{dec})
1A04:08	SubIndex 008		UDINT	RO	0x60112101 (1611735297_{dec})
1A04:09	SubIndex 009		UDINT	RO	0x60112201 (1611735553_{dec})
1A04:0A	SubIndex 010		UDINT	RO	0x60112301 (1611735809_{dec})
1A04:0B	SubIndex 011		UDINT	RO	0x60112401 (1611736065_{dec})
1A04:0C	SubIndex 012		UDINT	RO	0x60112501 (1611736321_{dec})
1A04:0D	SubIndex 013		UDINT	RO	0x60112601 (1611736577_{dec})
1A04:0E	SubIndex 014		UDINT	RO	0x60112701 (1611736833_{dec})
1A04:0F	SubIndex 015		UDINT	RO	0x60112801 (1611737089_{dec})
1A04:10	SubIndex 016		UDINT	RO	0x60112901 (1611737345_{dec})
1A04:11	SubIndex 017		UDINT	RO	0x60112a01 (1611737601_{dec})
1A04:12	SubIndex 018		UDINT	RO	0x16 (22_{dec})
1A04:13	SubIndex 019		UDINT	RO	0x60114120 (1611743520_{dec})
1A04:14	SubIndex 020		UDINT	RO	0x60114220 (1611743776_{dec})
1A04:15	SubIndex 021		UDINT	RO	0x60114320 (1611744032_{dec})
1A04:16	SubIndex 022		UDINT	RO	0x60114420 (1611744288_{dec})

Index (hex)	Name	Meaning	Data type	Flags	Default
1A04:17	SubIndex 023		UDINT	RO	0x60114520 (1611744544_{dec})
1A04:18	SubIndex 024		UDINT	RO	0x60114620 (1611744800_{dec})
1A04:19	SubIndex 025		UDINT	RO	0x60114720 (1611745056_{dec})
1A04:1A	SubIndex 026		UDINT	RO	0x60114820 (1611745312_{dec})
1A04:1B	SubIndex 027		UDINT	RO	0x60114920 (1611745568_{dec})
1A04:1C	SubIndex 028		UDINT	RO	0x60114a20 (1611745824_{dec})

1A05 MTI TxPDO-Map Inputs 5x Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
1A05:0	MTI TxPDO-Map Inputs 5x Ch.2		USINT	RO	0x12 (18_{dec})
1A05:01	SubIndex 001		UDINT	RO	0x60110108 (1611727112_{dec})
1A05:02	SubIndex 002		UDINT	RO	0x60110901 (1611729153_{dec})
1A05:03	SubIndex 003		UDINT	RO	0x60110a01 (1611729409_{dec})
1A05:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A05:05	SubIndex 005		UDINT	RO	0x60110f02 (1611730690_{dec})
1A05:06	SubIndex 006		UDINT	RO	0x60111108 (1611731208_{dec})
1A05:07	SubIndex 007		UDINT	RO	0x60111208 (1611731464_{dec})
1A05:08	SubIndex 008		UDINT	RO	0x60112101 (1611735297_{dec})
1A05:09	SubIndex 009		UDINT	RO	0x60112201 (1611735553_{dec})
1A05:0A	SubIndex 010		UDINT	RO	0x60112301 (1611735809_{dec})
1A05:0B	SubIndex 011		UDINT	RO	0x60112401 (1611736065_{dec})
1A05:0C	SubIndex 012		UDINT	RO	0x60112501 (1611736321_{dec})
1A05:0D	SubIndex 013		UDINT	RO	0x1b (27_{dec})
1A05:0E	SubIndex 014		UDINT	RO	0x60114120 (1611743520_{dec})
1A05:0F	SubIndex 015		UDINT	RO	0x60114220 (1611743776_{dec})
1A05:10	SubIndex 016		UDINT	RO	0x60114320 (1611744032_{dec})
1A05:11	SubIndex 017		UDINT	RO	0x60114420 (1611744288_{dec})
1A05:12	SubIndex 018		UDINT	RO	0x60114520 (1611744544_{dec})

1A06 MTI TxPDO-Map Inputs 2x Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
1A06:0	MTI TxPDO-Map Inputs 2x Ch.2		USINT	RO	0xc (12_{dec})
1A06:01	SubIndex 001		UDINT	RO	0x60110108 (1611727112_{dec})
1A06:02	SubIndex 002		UDINT	RO	0x60110901 (1611729153_{dec})
1A06:03	SubIndex 003		UDINT	RO	0x60110a01 (1611729409_{dec})
1A06:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A06:05	SubIndex 005		UDINT	RO	0x60110f02 (1611730690_{dec})
1A06:06	SubIndex 006		UDINT	RO	0x60111108 (1611731208_{dec})
1A06:07	SubIndex 007		UDINT	RO	0x60111208 (1611731464_{dec})
1A06:08	SubIndex 008		UDINT	RO	0x60112101 (1611735297_{dec})
1A06:09	SubIndex 009		UDINT	RO	0x60112201 (1611735553_{dec})
1A06:0A	SubIndex 010		UDINT	RO	0x1e (30_{dec})
1A06:0B	SubIndex 011		UDINT	RO	0x60114120 (1611743520_{dec})
1A06:0C	SubIndex 012		UDINT	RO	0x60114220 (1611743776_{dec})

1A07 MTI TxPDO-Map Inputs 1x Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
1A07:0	MTI TxPDO-Map Inputs 1x Ch.2		USINT	RO	0xa (10_{dec})
1A07:01	SubIndex 001		UDINT	RO	0x60110108 (1611727112_{dec})
1A07:02	SubIndex 002		UDINT	RO	0x60110901 (1611729153_{dec})
1A07:03	SubIndex 003		UDINT	RO	0x60110a01 (1611729409_{dec})
1A07:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A07:05	SubIndex 005		UDINT	RO	0x60110f02 (1611730690_{dec})
1A07:06	SubIndex 006		UDINT	RO	0x60111108 (1611731208_{dec})
1A07:07	SubIndex 007		UDINT	RO	0x60111208 (1611731464_{dec})
1A07:08	SubIndex 008		UDINT	RO	0x60112101 (1611735297_{dec})
1A07:09	SubIndex 009		UDINT	RO	0x1f (31_{dec})
1A07:0A	SubIndex 010		UDINT	RO	0x60114120 (1611743520_{dec})

1A08 MTI TxPDO-Map Inputs 10x Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
1A08:0	MTI TxPDO-Map Inputs 10x Ch.3		USINT	RO	0x1c (28_{dec})
1A08:01	SubIndex 001		UDINT	RO	0x60210108 (1612775688_{dec})
1A08:02	SubIndex 002		UDINT	RO	0x60210901 (1612777729_{dec})
1A08:03	SubIndex 003		UDINT	RO	0x60210a01 (1612777985_{dec})
1A08:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A08:05	SubIndex 005		UDINT	RO	0x60210f02 (1612779266_{dec})
1A08:06	SubIndex 006		UDINT	RO	0x60211108 (1612779784_{dec})
1A08:07	SubIndex 007		UDINT	RO	0x60211208 (1612780040_{dec})
1A08:08	SubIndex 008		UDINT	RO	0x60212101 (1612783873_{dec})
1A08:09	SubIndex 009		UDINT	RO	0x60212201 (1612784129_{dec})
1A08:0A	SubIndex 010		UDINT	RO	0x60212301 (1612784385_{dec})
1A08:0B	SubIndex 011		UDINT	RO	0x60212401 (1612784641_{dec})
1A08:0C	SubIndex 012		UDINT	RO	0x60212501 (1612784897_{dec})
1A08:0D	SubIndex 013		UDINT	RO	0x60212601 (1612785153_{dec})
1A08:0E	SubIndex 014		UDINT	RO	0x60212701 (1612785409_{dec})
1A08:0F	SubIndex 015		UDINT	RO	0x60212801 (1612785665_{dec})
1A08:10	SubIndex 016		UDINT	RO	0x60212901 (1612785921_{dec})
1A08:11	SubIndex 017		UDINT	RO	0x60212a01 (1612786177_{dec})
1A08:12	SubIndex 018		UDINT	RO	0x16 (22_{dec})
1A08:13	SubIndex 019		UDINT	RO	0x60214120 (1612792096_{dec})
1A08:14	SubIndex 020		UDINT	RO	0x60214220 (1612792352_{dec})
1A08:15	SubIndex 021		UDINT	RO	0x60214320 (1612792608_{dec})
1A08:16	SubIndex 022		UDINT	RO	0x60214420 (1612792864_{dec})

Index (hex)	Name	Meaning	Data type	Flags	Default
1A08:17	SubIndex 023		UDINT	RO	0x60214520 (1612793120_{dec})
1A08:18	SubIndex 024		UDINT	RO	0x60214620 (1612793376_{dec})
1A08:19	SubIndex 025		UDINT	RO	0x60214720 (1612793632_{dec})
1A08:1A	SubIndex 026		UDINT	RO	0x60214820 (1612793888_{dec})
1A08:1B	SubIndex 027		UDINT	RO	0x60214920 (1612794144_{dec})
1A08:1C	SubIndex 028		UDINT	RO	0x60214a20 (1612794400_{dec})

1A09 MTI TxPDO-Map Inputs 5x Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
1A09:0	MTI TxPDO-Map Inputs 5x Ch.3		USINT	RO	0x12 (18_{dec})
1A09:01	SubIndex 001		UDINT	RO	0x60210108 (1612775688_{dec})
1A09:02	SubIndex 002		UDINT	RO	0x60210901 (1612777729_{dec})
1A09:03	SubIndex 003		UDINT	RO	0x60210a01 (1612777985_{dec})
1A09:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A09:05	SubIndex 005		UDINT	RO	0x60210f02 (1612779266_{dec})
1A09:06	SubIndex 006		UDINT	RO	0x60211108 (1612779784_{dec})
1A09:07	SubIndex 007		UDINT	RO	0x60211208 (1612780040_{dec})
1A09:08	SubIndex 008		UDINT	RO	0x60212101 (1612783873_{dec})
1A09:09	SubIndex 009		UDINT	RO	0x60212201 (1612784129_{dec})
1A09:0A	SubIndex 010		UDINT	RO	0x60212301 (1612784385_{dec})
1A09:0B	SubIndex 011		UDINT	RO	0x60212401 (1612784641_{dec})
1A09:0C	SubIndex 012		UDINT	RO	0x60212501 (1612784897_{dec})
1A09:0D	SubIndex 013		UDINT	RO	0x1b (27_{dec})
1A09:0E	SubIndex 014		UDINT	RO	0x60214120 (1612792096_{dec})
1A09:0F	SubIndex 015		UDINT	RO	0x60214220 (1612792352_{dec})
1A09:10	SubIndex 016		UDINT	RO	0x60214320 (1612792608_{dec})
1A09:11	SubIndex 017		UDINT	RO	0x60214420 (1612792864_{dec})
1A09:12	SubIndex 018		UDINT	RO	0x60214520 (1612793120_{dec})

1A0A MTI TxPDO-Map Inputs 2x Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
1A0A:0	MTI TxPDO-Map Inputs 2x Ch.3		USINT	RO	0xc (12_{dec})
1A0A:01	SubIndex 001		UDINT	RO	0x60210108 (1612775688_{dec})
1A0A:02	SubIndex 002		UDINT	RO	0x60210901 (1612777729_{dec})
1A0A:03	SubIndex 003		UDINT	RO	0x60210a01 (1612777985_{dec})
1A0A:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A0A:05	SubIndex 005		UDINT	RO	0x60210f02 (1612779266_{dec})
1A0A:06	SubIndex 006		UDINT	RO	0x60211108 (1612779784_{dec})
1A0A:07	SubIndex 007		UDINT	RO	0x60211208 (1612780040_{dec})
1A0A:08	SubIndex 008		UDINT	RO	0x60212101 (1612783873_{dec})
1A0A:09	SubIndex 009		UDINT	RO	0x60212201 (1612784129_{dec})
1A0A:0A	SubIndex 010		UDINT	RO	0x1e (30_{dec})
1A0A:0B	SubIndex 011		UDINT	RO	0x60214120 (1612792096_{dec})
1A0A:0C	SubIndex 012		UDINT	RO	0x60214220 (1612792352_{dec})

1A0B MTI TxPDO-Map Inputs 1x Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
1A0B:0	MTI TxPDO-Map Inputs 1x Ch.3		USINT	RO	0xa (10_{dec})
1A0B:01	SubIndex 001		UDINT	RO	0x60210108 (1612775688_{dec})
1A0B:02	SubIndex 002		UDINT	RO	0x60210901 (1612777729_{dec})
1A0B:03	SubIndex 003		UDINT	RO	0x60210a01 (1612777985_{dec})
1A0B:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A0B:05	SubIndex 005		UDINT	RO	0x60210f02 (1612779266_{dec})
1A0B:06	SubIndex 006		UDINT	RO	0x60211108 (1612779784_{dec})
1A0B:07	SubIndex 007		UDINT	RO	0x60211208 (1612780040_{dec})
1A0B:08	SubIndex 008		UDINT	RO	0x60212101 (1612783873_{dec})
1A0B:09	SubIndex 009		UDINT	RO	0x1f (31_{dec})
1A0B:0A	SubIndex 010		UDINT	RO	0x60214120 (1612792096_{dec})

1A0C MTI TxPDO-Map Inputs 10x Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
1A0C:0	MTI TxPDO-Map Inputs 10x Ch.4		USINT	RO	0x1c (28_{dec})
1A0C:01	SubIndex 001		UDINT	RO	0x60310108 (1613824264_{dec})
1A0C:02	SubIndex 002		UDINT	RO	0x60310901 (1613826305_{dec})
1A0C:03	SubIndex 003		UDINT	RO	0x60310a01 (1613826561_{dec})
1A0C:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A0C:05	SubIndex 005		UDINT	RO	0x60310f02 (1613827842_{dec})
1A0C:06	SubIndex 006		UDINT	RO	0x60311108 (1613828360_{dec})
1A0C:07	SubIndex 007		UDINT	RO	0x60311208 (1613828616_{dec})
1A0C:08	SubIndex 008		UDINT	RO	0x60312101 (1613832449_{dec})
1A0C:09	SubIndex 009		UDINT	RO	0x60312201 (1613832705_{dec})
1A0C:0A	SubIndex 010		UDINT	RO	0x60312301 (1613832961_{dec})
1A0C:0B	SubIndex 011		UDINT	RO	0x60312401 (1613833217_{dec})
1A0C:0C	SubIndex 012		UDINT	RO	0x60312501 (1613833473_{dec})
1A0C:0D	SubIndex 013		UDINT	RO	0x60312601 (1613833729_{dec})
1A0C:0E	SubIndex 014		UDINT	RO	0x60312701 (1613833985_{dec})
1A0C:0F	SubIndex 015		UDINT	RO	0x60312801 (1613834241_{dec})
1A0C:10	SubIndex 016		UDINT	RO	0x60312901 (1613834497_{dec})
1A0C:11	SubIndex 017		UDINT	RO	0x60312a01 (1613834753_{dec})
1A0C:12	SubIndex 018		UDINT	RO	0x16 (22_{dec})
1A0C:13	SubIndex 019		UDINT	RO	0x60314120 (1613840672_{dec})
1A0C:14	SubIndex 020		UDINT	RO	0x60314220 (1613840928_{dec})
1A0C:15	SubIndex 021		UDINT	RO	0x60314320 (1613841184_{dec})
1A0C:16	SubIndex 022		UDINT	RO	0x60314420 (1613841440_{dec})

Index (hex)	Name	Meaning	Data type	Flags	Default
1A0C:17	SubIndex 023		UDINT	RO	0x60314520 (1613841696$_{dec}$)
1A0C:18	SubIndex 024		UDINT	RO	0x60314620 (1613841952$_{dec}$)
1A0C:19	SubIndex 025		UDINT	RO	0x60314720 (1613842208$_{dec}$)
1A0C:1A	SubIndex 026		UDINT	RO	0x60314820 (1613842464$_{dec}$)
1A0C:1B	SubIndex 027		UDINT	RO	0x60314920 (1613842720$_{dec}$)
1A0C:1C	SubIndex 028		UDINT	RO	0x60314a20 (1613842976$_{dec}$)

1A0D MTI TxPDO-Map Inputs 5x Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
1A0D:0	MTI TxPDO-Map Inputs 5x Ch.4		USINT	RO	0x12 (18_{dec})
1A0D:01	SubIndex 001		UDINT	RO	0x60310108 (1613824264_{dec})
1A0D:02	SubIndex 002		UDINT	RO	0x60310901 (1613826305_{dec})
1A0D:03	SubIndex 003		UDINT	RO	0x60310a01 (1613826561_{dec})
1A0D:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A0D:05	SubIndex 005		UDINT	RO	0x60310f02 (1613827842_{dec})
1A0D:06	SubIndex 006		UDINT	RO	0x60311108 (1613828360_{dec})
1A0D:07	SubIndex 007		UDINT	RO	0x60311208 (1613828616_{dec})
1A0D:08	SubIndex 008		UDINT	RO	0x60312101 (1613832449_{dec})
1A0D:09	SubIndex 009		UDINT	RO	0x60312201 (1613832705_{dec})
1A0D:0A	SubIndex 010		UDINT	RO	0x60312301 (1613832961_{dec})
1A0D:0B	SubIndex 011		UDINT	RO	0x60312401 (1613833217_{dec})
1A0D:0C	SubIndex 012		UDINT	RO	0x60312501 (1613833473_{dec})
1A0D:0D	SubIndex 013		UDINT	RO	0x1b (27_{dec})
1A0D:0E	SubIndex 014		UDINT	RO	0x60314120 (1613840672_{dec})
1A0D:0F	SubIndex 015		UDINT	RO	0x60314220 (1613840928_{dec})
1A0D:10	SubIndex 016		UDINT	RO	0x60314320 (1613841184_{dec})
1A0D:11	SubIndex 017		UDINT	RO	0x60314420 (1613841440_{dec})
1A0D:12	SubIndex 018		UDINT	RO	0x60314520 (1613841696_{dec})

1A0E MTI TxPDO-Map Inputs 2x Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
1A0E:0	MTI TxPDO-Map Inputs 2x Ch.4		USINT	RO	0xc (12_{dec})
1A0E:01	SubIndex 001		UDINT	RO	0x60310108 (1613824264_{dec})
1A0E:02	SubIndex 002		UDINT	RO	0x60310901 (1613826305_{dec})
1A0E:03	SubIndex 003		UDINT	RO	0x60310a01 (1613826561_{dec})
1A0E:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A0E:05	SubIndex 005		UDINT	RO	0x60310f02 (1613827842_{dec})
1A0E:06	SubIndex 006		UDINT	RO	0x60311108 (1613828360_{dec})
1A0E:07	SubIndex 007		UDINT	RO	0x60311208 (1613828616_{dec})
1A0E:08	SubIndex 008		UDINT	RO	0x60312101 (1613832449_{dec})
1A0E:09	SubIndex 009		UDINT	RO	0x60312201 (1613832705_{dec})
1A0E:0A	SubIndex 010		UDINT	RO	0x1e (30_{dec})
1A0E:0B	SubIndex 011		UDINT	RO	0x60314120 (1613840672_{dec})
1A0E:0C	SubIndex 012		UDINT	RO	0x60314220 (1613840928_{dec})

1A0F MTI TxPDO-Map Inputs 1x Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
1A0F:0	MTI TxPDO-Map Inputs 1x Ch.4		USINT	RO	0xa (10_{dec})
1A0F:01	SubIndex 001		UDINT	RO	0x60310108 (1613824264_{dec})
1A0F:02	SubIndex 002		UDINT	RO	0x60310901 (1613826305_{dec})
1A0F:03	SubIndex 003		UDINT	RO	0x60310a01 (1613826561_{dec})
1A0F:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A0F:05	SubIndex 005		UDINT	RO	0x60310f02 (1613827842_{dec})
1A0F:06	SubIndex 006		UDINT	RO	0x60311108 (1613828360_{dec})
1A0F:07	SubIndex 007		UDINT	RO	0x60311208 (1613828616_{dec})
1A0F:08	SubIndex 008		UDINT	RO	0x60312101 (1613832449_{dec})
1A0F:09	SubIndex 009		UDINT	RO	0x1f (31_{dec})
1A0F:0A	SubIndex 010		UDINT	RO	0x60314120 (1613840672_{dec})

1A10 MTI TxPDO-Map Inputs 10x Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
1A10:0	MTI TxPDO-Map Inputs 10x Ch.5		USINT	RO	0x1c (28_{dec})
1A10:01	SubIndex 001		UDINT	RO	0x60410108 (1614872840_{dec})
1A10:02	SubIndex 002		UDINT	RO	0x60410901 (1614874881_{dec})
1A10:03	SubIndex 003		UDINT	RO	0x60410a01 (1614875137_{dec})
1A10:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A10:05	SubIndex 005		UDINT	RO	0x60410f02 (1614876418_{dec})
1A10:06	SubIndex 006		UDINT	RO	0x60411108 (1614876936_{dec})
1A10:07	SubIndex 007		UDINT	RO	0x60411208 (1614877192_{dec})
1A10:08	SubIndex 008		UDINT	RO	0x60412101 (1614881025_{dec})
1A10:09	SubIndex 009		UDINT	RO	0x60412201 (1614881281_{dec})
1A10:0A	SubIndex 010		UDINT	RO	0x60412301 (1614881537_{dec})
1A10:0B	SubIndex 011		UDINT	RO	0x60412401 (1614881793_{dec})
1A10:0C	SubIndex 012		UDINT	RO	0x60412501 (1614882049_{dec})
1A10:0D	SubIndex 013		UDINT	RO	0x60412601 (1614882305_{dec})
1A10:0E	SubIndex 014		UDINT	RO	0x60412701 (1614882561_{dec})
1A10:0F	SubIndex 015		UDINT	RO	0x60412801 (1614882817_{dec})
1A10:10	SubIndex 016		UDINT	RO	0x60412901 (1614883073_{dec})
1A10:11	SubIndex 017		UDINT	RO	0x60412a01 (1614883329_{dec})
1A10:12	SubIndex 018		UDINT	RO	0x16 (22_{dec})
1A10:13	SubIndex 019		UDINT	RO	0x60414120 (1614889248_{dec})
1A10:14	SubIndex 020		UDINT	RO	0x60414220 (1614889504_{dec})
1A10:15	SubIndex 021		UDINT	RO	0x60414320 (1614889760_{dec})
1A10:16	SubIndex 022		UDINT	RO	0x60414420 (1614890016_{dec})

Index (hex)	Name	Meaning	Data type	Flags	Default
1A10:17	SubIndex 023		UDINT	RO	0x60414520 (1614890272_{dec})
1A10:18	SubIndex 024		UDINT	RO	0x60414620 (1614890528_{dec})
1A10:19	SubIndex 025		UDINT	RO	0x60414720 (1614890784_{dec})
1A10:1A	SubIndex 026		UDINT	RO	0x60414820 (1614891040_{dec})
1A10:1B	SubIndex 027		UDINT	RO	0x60414920 (1614891296_{dec})
1A10:1C	SubIndex 028		UDINT	RO	0x60414a20 (1614891552_{dec})

1A11 MTI TxPDO-Map Inputs 5x Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
1A11:0	MTI TxPDO-Map Inputs 5x Ch.5		USINT	RO	0x12 (18_{dec})
1A11:01	SubIndex 001		UDINT	RO	0x60410108 (1614872840_{dec})
1A11:02	SubIndex 002		UDINT	RO	0x60410901 (1614874881_{dec})
1A11:03	SubIndex 003		UDINT	RO	0x60410a01 (1614875137_{dec})
1A11:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A11:05	SubIndex 005		UDINT	RO	0x60410f02 (1614876418_{dec})
1A11:06	SubIndex 006		UDINT	RO	0x60411108 (1614876936_{dec})
1A11:07	SubIndex 007		UDINT	RO	0x60411208 (1614877192_{dec})
1A11:08	SubIndex 008		UDINT	RO	0x60412101 (1614881025_{dec})
1A11:09	SubIndex 009		UDINT	RO	0x60412201 (1614881281_{dec})
1A11:0A	SubIndex 010		UDINT	RO	0x60412301 (1614881537_{dec})
1A11:0B	SubIndex 011		UDINT	RO	0x60412401 (1614881793_{dec})
1A11:0C	SubIndex 012		UDINT	RO	0x60412501 (1614882049_{dec})
1A11:0D	SubIndex 013		UDINT	RO	0x1b (27_{dec})
1A11:0E	SubIndex 014		UDINT	RO	0x60414120 (1614889248_{dec})
1A11:0F	SubIndex 015		UDINT	RO	0x60414220 (1614889504_{dec})
1A11:10	SubIndex 016		UDINT	RO	0x60414320 (1614889760_{dec})
1A11:11	SubIndex 017		UDINT	RO	0x60414420 (1614890016_{dec})
1A11:12	SubIndex 018		UDINT	RO	0x60414520 (1614890272_{dec})

1A12 MTI TxPDO-Map Inputs 2x Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
1A12:0	MTI TxPDO-Map Inputs 2x Ch.5		USINT	RO	0xc (12_{dec})
1A12:01	SubIndex 001		UDINT	RO	0x60410108 (1614872840_{dec})
1A12:02	SubIndex 002		UDINT	RO	0x60410901 (1614874881_{dec})
1A12:03	SubIndex 003		UDINT	RO	0x60410a01 (1614875137_{dec})
1A12:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A12:05	SubIndex 005		UDINT	RO	0x60410f02 (1614876418_{dec})
1A12:06	SubIndex 006		UDINT	RO	0x60411108 (1614876936_{dec})
1A12:07	SubIndex 007		UDINT	RO	0x60411208 (1614877192_{dec})
1A12:08	SubIndex 008		UDINT	RO	0x60412101 (1614881025_{dec})
1A12:09	SubIndex 009		UDINT	RO	0x60412201 (1614881281_{dec})
1A12:0A	SubIndex 010		UDINT	RO	0x1e (30_{dec})
1A12:0B	SubIndex 011		UDINT	RO	0x60414120 (1614889248_{dec})
1A12:0C	SubIndex 012		UDINT	RO	0x60414220 (1614889504_{dec})

1A13 MTI TxPDO-Map Inputs 1x Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
1A13:0	MTI TxPDO-Map Inputs 1x Ch.5		USINT	RO	0xa (10_{dec})
1A13:01	SubIndex 001		UDINT	RO	0x60410108 (1614872840_{dec})
1A13:02	SubIndex 002		UDINT	RO	0x60410901 (1614874881_{dec})
1A13:03	SubIndex 003		UDINT	RO	0x60410a01 (1614875137_{dec})
1A13:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A13:05	SubIndex 005		UDINT	RO	0x60410f02 (1614876418_{dec})
1A13:06	SubIndex 006		UDINT	RO	0x60411108 (1614876936_{dec})
1A13:07	SubIndex 007		UDINT	RO	0x60411208 (1614877192_{dec})
1A13:08	SubIndex 008		UDINT	RO	0x60412101 (1614881025_{dec})
1A13:09	SubIndex 009		UDINT	RO	0x1f (31_{dec})
1A13:0A	SubIndex 010		UDINT	RO	0x60414120 (1614889248_{dec})

1A14 MTI TxPDO-Map Inputs 10x Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
1A14:0	MTI TxPDO-Map Inputs 10x Ch.6		USINT	RO	0x1c (28_{dec})
1A14:01	SubIndex 001		UDINT	RO	0x60510108 (1615921416_{dec})
1A14:02	SubIndex 002		UDINT	RO	0x60510901 (1615923457_{dec})
1A14:03	SubIndex 003		UDINT	RO	0x60510a01 (1615923713_{dec})
1A14:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A14:05	SubIndex 005		UDINT	RO	0x60510f02 (1615924994_{dec})
1A14:06	SubIndex 006		UDINT	RO	0x60511108 (1615925512_{dec})
1A14:07	SubIndex 007		UDINT	RO	0x60511208 (1615925768_{dec})
1A14:08	SubIndex 008		UDINT	RO	0x60512101 (1615929601_{dec})
1A14:09	SubIndex 009		UDINT	RO	0x60512201 (1615929857_{dec})
1A14:0A	SubIndex 010		UDINT	RO	0x60512301 (1615930113_{dec})
1A14:0B	SubIndex 011		UDINT	RO	0x60512401 (1615930369_{dec})
1A14:0C	SubIndex 012		UDINT	RO	0x60512501 (1615930625_{dec})
1A14:0D	SubIndex 013		UDINT	RO	0x60512601 (1615930881_{dec})
1A14:0E	SubIndex 014		UDINT	RO	0x60512701 (1615931137_{dec})
1A14:0F	SubIndex 015		UDINT	RO	0x60512801 (1615931393_{dec})
1A14:10	SubIndex 016		UDINT	RO	0x60512901 (1615931649_{dec})
1A14:11	SubIndex 017		UDINT	RO	0x60512a01 (1615931905_{dec})
1A14:12	SubIndex 018		UDINT	RO	0x16 (22_{dec})
1A14:13	SubIndex 019		UDINT	RO	0x60514120 (1615937824_{dec})
1A14:14	SubIndex 020		UDINT	RO	0x60514220 (1615938080_{dec})
1A14:15	SubIndex 021		UDINT	RO	0x60514320 (1615938336_{dec})
1A14:16	SubIndex 022		UDINT	RO	0x60514420 (1615938592_{dec})

Index (hex)	Name	Meaning	Data type	Flags	Default
1A14:17	SubIndex 023		UDINT	RO	0x60514520 (1615938848_{dec})
1A14:18	SubIndex 024		UDINT	RO	0x60514620 (1615939104_{dec})
1A14:19	SubIndex 025		UDINT	RO	0x60514720 (1615939360_{dec})
1A14:1A	SubIndex 026		UDINT	RO	0x60514820 (1615939616_{dec})
1A14:1B	SubIndex 027		UDINT	RO	0x60514920 (1615939872_{dec})
1A14:1C	SubIndex 028		UDINT	RO	0x60514a20 (1615940128_{dec})

1A15 MTI TxPDO-Map Inputs 5x Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
1A15:0	MTI TxPDO-Map Inputs 5x Ch.6		USINT	RO	0x12 (18_{dec})
1A15:01	SubIndex 001		UDINT	RO	0x60510108 (1615921416_{dec})
1A15:02	SubIndex 002		UDINT	RO	0x60510901 (1615923457_{dec})
1A15:03	SubIndex 003		UDINT	RO	0x60510a01 (1615923713_{dec})
1A15:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A15:05	SubIndex 005		UDINT	RO	0x60510f02 (1615924994_{dec})
1A15:06	SubIndex 006		UDINT	RO	0x60511108 (1615925512_{dec})
1A15:07	SubIndex 007		UDINT	RO	0x60511208 (1615925768_{dec})
1A15:08	SubIndex 008		UDINT	RO	0x60512101 (1615929601_{dec})
1A15:09	SubIndex 009		UDINT	RO	0x60512201 (1615929857_{dec})
1A15:0A	SubIndex 010		UDINT	RO	0x60512301 (1615930113_{dec})
1A15:0B	SubIndex 011		UDINT	RO	0x60512401 (1615930369_{dec})
1A15:0C	SubIndex 012		UDINT	RO	0x60512501 (1615930625_{dec})
1A15:0D	SubIndex 013		UDINT	RO	0x1b (27_{dec})
1A15:0E	SubIndex 014		UDINT	RO	0x60514120 (1615937824_{dec})
1A15:0F	SubIndex 015		UDINT	RO	0x60514220 (1615938080_{dec})
1A15:10	SubIndex 016		UDINT	RO	0x60514320 (1615938336_{dec})
1A15:11	SubIndex 017		UDINT	RO	0x60514420 (1615938592_{dec})
1A15:12	SubIndex 018		UDINT	RO	0x60514520 (1615938848_{dec})

1A16 MTI TxPDO-Map Inputs 2x Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
1A16:0	MTI TxPDO-Map Inputs 2x Ch.6		USINT	RO	0xc (12_{dec})
1A16:01	SubIndex 001		UDINT	RO	0x60510108 (1615921416_{dec})
1A16:02	SubIndex 002		UDINT	RO	0x60510901 (1615923457_{dec})
1A16:03	SubIndex 003		UDINT	RO	0x60510a01 (1615923713_{dec})
1A16:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A16:05	SubIndex 005		UDINT	RO	0x60510f02 (1615924994_{dec})
1A16:06	SubIndex 006		UDINT	RO	0x60511108 (1615925512_{dec})
1A16:07	SubIndex 007		UDINT	RO	0x60511208 (1615925768_{dec})
1A16:08	SubIndex 008		UDINT	RO	0x60512101 (1615929601_{dec})
1A16:09	SubIndex 009		UDINT	RO	0x60512201 (1615929857_{dec})
1A16:0A	SubIndex 010		UDINT	RO	0x1e (30_{dec})
1A16:0B	SubIndex 011		UDINT	RO	0x60514120 (1615937824_{dec})
1A16:0C	SubIndex 012		UDINT	RO	0x60514220 (1615938080_{dec})

1A17 MTI TxPDO-Map Inputs 1x Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
1A17:0	MTI TxPDO-Map Inputs 1x Ch.6		USINT	RO	0xa (10_{dec})
1A17:01	SubIndex 001		UDINT	RO	0x60510108 (1615921416_{dec})
1A17:02	SubIndex 002		UDINT	RO	0x60510901 (1615923457_{dec})
1A17:03	SubIndex 003		UDINT	RO	0x60510a01 (1615923713_{dec})
1A17:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A17:05	SubIndex 005		UDINT	RO	0x60510f02 (1615924994_{dec})
1A17:06	SubIndex 006		UDINT	RO	0x60511108 (1615925512_{dec})
1A17:07	SubIndex 007		UDINT	RO	0x60511208 (1615925768_{dec})
1A17:08	SubIndex 008		UDINT	RO	0x60512101 (1615929601_{dec})
1A17:09	SubIndex 009		UDINT	RO	0x1f (31_{dec})
1A17:0A	SubIndex 010		UDINT	RO	0x60514120 (1615937824_{dec})

1A18 MTI TxPDO-Map Inputs 10x Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
1A18:0	MTI TxPDO-Map Inputs 10x Ch.7		USINT	RO	0x1c (28_{dec})
1A18:01	SubIndex 001		UDINT	RO	0x60610108 (1616969992_{dec})
1A18:02	SubIndex 002		UDINT	RO	0x60610901 (1616972033_{dec})
1A18:03	SubIndex 003		UDINT	RO	0x60610a01 (1616972289_{dec})
1A18:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A18:05	SubIndex 005		UDINT	RO	0x60610f02 (1616973570_{dec})
1A18:06	SubIndex 006		UDINT	RO	0x60611108 (1616974088_{dec})
1A18:07	SubIndex 007		UDINT	RO	0x60611208 (1616974344_{dec})
1A18:08	SubIndex 008		UDINT	RO	0x60612101 (1616978177_{dec})
1A18:09	SubIndex 009		UDINT	RO	0x60612201 (1616978433_{dec})
1A18:0A	SubIndex 010		UDINT	RO	0x60612301 (1616978689_{dec})
1A18:0B	SubIndex 011		UDINT	RO	0x60612401 (1616978945_{dec})
1A18:0C	SubIndex 012		UDINT	RO	0x60612501 (1616979201_{dec})
1A18:0D	SubIndex 013		UDINT	RO	0x60612601 (1616979457_{dec})
1A18:0E	SubIndex 014		UDINT	RO	0x60612701 (1616979713_{dec})
1A18:0F	SubIndex 015		UDINT	RO	0x60612801 (1616979969_{dec})
1A18:10	SubIndex 016		UDINT	RO	0x60612901 (1616980225_{dec})
1A18:11	SubIndex 017		UDINT	RO	0x60612a01 (1616980481_{dec})
1A18:12	SubIndex 018		UDINT	RO	0x16 (22_{dec})
1A18:13	SubIndex 019		UDINT	RO	0x60614120 (1616986400_{dec})
1A18:14	SubIndex 020		UDINT	RO	0x60614220 (1616986656_{dec})
1A18:15	SubIndex 021		UDINT	RO	0x60614320 (1616986912_{dec})
1A18:16	SubIndex 022		UDINT	RO	0x60614420 (1616987168_{dec})

Index (hex)	Name	Meaning	Data type	Flags	Default
1A18:17	SubIndex 023		UDINT	RO	0x60614520 (1616987424_{dec})
1A18:18	SubIndex 024		UDINT	RO	0x60614620 (1616987680_{dec})
1A18:19	SubIndex 025		UDINT	RO	0x60614720 (1616987936_{dec})
1A18:1A	SubIndex 026		UDINT	RO	0x60614820 (1616988192_{dec})
1A18:1B	SubIndex 027		UDINT	RO	0x60614920 (1616988448_{dec})
1A18:1C	SubIndex 028		UDINT	RO	0x60614a20 (1616988704_{dec})

1A19 MTI TxPDO-Map Inputs 5x Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
1A19:0	MTI TxPDO-Map Inputs 5x Ch.7		USINT	RO	0x12 (18_{dec})
1A19:01	SubIndex 001		UDINT	RO	0x60610108 (1616969992_{dec})
1A19:02	SubIndex 002		UDINT	RO	0x60610901 (1616972033_{dec})
1A19:03	SubIndex 003		UDINT	RO	0x60610a01 (1616972289_{dec})
1A19:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A19:05	SubIndex 005		UDINT	RO	0x60610f02 (1616973570_{dec})
1A19:06	SubIndex 006		UDINT	RO	0x60611108 (1616974088_{dec})
1A19:07	SubIndex 007		UDINT	RO	0x60611208 (1616974344_{dec})
1A19:08	SubIndex 008		UDINT	RO	0x60612101 (1616978177_{dec})
1A19:09	SubIndex 009		UDINT	RO	0x60612201 (1616978433_{dec})
1A19:0A	SubIndex 010		UDINT	RO	0x60612301 (1616978689_{dec})
1A19:0B	SubIndex 011		UDINT	RO	0x60612401 (1616978945_{dec})
1A19:0C	SubIndex 012		UDINT	RO	0x60612501 (1616979201_{dec})
1A19:0D	SubIndex 013		UDINT	RO	0x1b (27_{dec})
1A19:0E	SubIndex 014		UDINT	RO	0x60614120 (1616986400_{dec})
1A19:0F	SubIndex 015		UDINT	RO	0x60614220 (1616986656_{dec})
1A19:10	SubIndex 016		UDINT	RO	0x60614320 (1616986912_{dec})
1A19:11	SubIndex 017		UDINT	RO	0x60614420 (1616987168_{dec})
1A19:12	SubIndex 018		UDINT	RO	0x60614520 (1616987424_{dec})

1A1A MTI TxPDO-Map Inputs 2x Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
1A1A:0	MTI TxPDO-Map Inputs 2x Ch.7		USINT	RO	0xc (12_{dec})
1A1A:01	SubIndex 001		UDINT	RO	0x60610108 (1616969992_{dec})
1A1A:02	SubIndex 002		UDINT	RO	0x60610901 (1616972033_{dec})
1A1A:03	SubIndex 003		UDINT	RO	0x60610a01 (1616972289_{dec})
1A1A:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A1A:05	SubIndex 005		UDINT	RO	0x60610f02 (1616973570_{dec})
1A1A:06	SubIndex 006		UDINT	RO	0x60611108 (1616974088_{dec})
1A1A:07	SubIndex 007		UDINT	RO	0x60611208 (1616974344_{dec})
1A1A:08	SubIndex 008		UDINT	RO	0x60612101 (1616978177_{dec})
1A1A:09	SubIndex 009		UDINT	RO	0x60612201 (1616978433_{dec})
1A1A:0A	SubIndex 010		UDINT	RO	0x1e (30_{dec})
1A1A:0B	SubIndex 011		UDINT	RO	0x60614120 (1616986400_{dec})
1A1A:0C	SubIndex 012		UDINT	RO	0x60614220 (1616986656_{dec})

1A1B MTI TxPDO-Map Inputs 1x Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
1A1B:0	MTI TxPDO-Map Inputs 1x Ch.7		USINT	RO	0xa (10_{dec})
1A1B:01	SubIndex 001		UDINT	RO	0x60610108 (1616969992_{dec})
1A1B:02	SubIndex 002		UDINT	RO	0x60610901 (1616972033_{dec})
1A1B:03	SubIndex 003		UDINT	RO	0x60610a01 (1616972289_{dec})
1A1B:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A1B:05	SubIndex 005		UDINT	RO	0x60610f02 (1616973570_{dec})
1A1B:06	SubIndex 006		UDINT	RO	0x60611108 (1616974088_{dec})
1A1B:07	SubIndex 007		UDINT	RO	0x60611208 (1616974344_{dec})
1A1B:08	SubIndex 008		UDINT	RO	0x60612101 (1616978177_{dec})
1A1B:09	SubIndex 009		UDINT	RO	0x1f (31_{dec})
1A1B:0A	SubIndex 010		UDINT	RO	0x60614120 (1616986400_{dec})

1A1C MTI TxPDO-Map Inputs 10x Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
1A1C:0	MTI TxPDO-Map Inputs 10x Ch.8		USINT	RO	0x1c (28_{dec})
1A1C:01	SubIndex 001		UDINT	RO	0x60710108 (1618018568_{dec})
1A1C:02	SubIndex 002		UDINT	RO	0x60710901 (1618020609_{dec})
1A1C:03	SubIndex 003		UDINT	RO	0x60710a01 (1618020865_{dec})
1A1C:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A1C:05	SubIndex 005		UDINT	RO	0x60710f02 (1618022146_{dec})
1A1C:06	SubIndex 006		UDINT	RO	0x60711108 (1618022664_{dec})
1A1C:07	SubIndex 007		UDINT	RO	0x60711208 (1618022920_{dec})
1A1C:08	SubIndex 008		UDINT	RO	0x60712101 (1618026753_{dec})
1A1C:09	SubIndex 009		UDINT	RO	0x60712201 (1618027009_{dec})
1A1C:0A	SubIndex 010		UDINT	RO	0x60712301 (1618027265_{dec})
1A1C:0B	SubIndex 011		UDINT	RO	0x60712401 (1618027521_{dec})
1A1C:0C	SubIndex 012		UDINT	RO	0x60712501 (1618027777_{dec})
1A1C:0D	SubIndex 013		UDINT	RO	0x60712601 (1618028033_{dec})
1A1C:0E	SubIndex 014		UDINT	RO	0x60712701 (1618028289_{dec})
1A1C:0F	SubIndex 015		UDINT	RO	0x60712801 (1618028545_{dec})
1A1C:10	SubIndex 016		UDINT	RO	0x60712901 (1618028801_{dec})
1A1C:11	SubIndex 017		UDINT	RO	0x60712a01 (1618029057_{dec})
1A1C:12	SubIndex 018		UDINT	RO	0x16 (22_{dec})
1A1C:13	SubIndex 019		UDINT	RO	0x60714120 (1618034976_{dec})
1A1C:14	SubIndex 020		UDINT	RO	0x60714220 (1618035232_{dec})
1A1C:15	SubIndex 021		UDINT	RO	0x60714320 (1618035488_{dec})
1A1C:16	SubIndex 022		UDINT	RO	0x60714420 (1618035744_{dec})

Index (hex)	Name	Meaning	Data type	Flags	Default
1A1C:17	SubIndex 023		UDINT	RO	0x60714520 (1618036000_{dec})
1A1C:18	SubIndex 024		UDINT	RO	0x60714620 (1618036256_{dec})
1A1C:19	SubIndex 025		UDINT	RO	0x60714720 (1618036512_{dec})
1A1C:1A	SubIndex 026		UDINT	RO	0x60714820 (1618036768_{dec})
1A1C:1B	SubIndex 027		UDINT	RO	0x60714920 (1618037024_{dec})
1A1C:1C	SubIndex 028		UDINT	RO	0x60714a20 (1618037280_{dec})

1A1D MTI TxPDO-Map Inputs 5x Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
1A1D:0	MTI TxPDO-Map Inputs 5x Ch.8		USINT	RO	0x12 (18_{dec})
1A1D:01	SubIndex 001		UDINT	RO	0x60710108 (1618018568_{dec})
1A1D:02	SubIndex 002		UDINT	RO	0x60710901 (1618020609_{dec})
1A1D:03	SubIndex 003		UDINT	RO	0x60710a01 (1618020865_{dec})
1A1D:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A1D:05	SubIndex 005		UDINT	RO	0x60710f02 (1618022146_{dec})
1A1D:06	SubIndex 006		UDINT	RO	0x60711108 (1618022664_{dec})
1A1D:07	SubIndex 007		UDINT	RO	0x60711208 (1618022920_{dec})
1A1D:08	SubIndex 008		UDINT	RO	0x60712101 (1618026753_{dec})
1A1D:09	SubIndex 009		UDINT	RO	0x60712201 (1618027009_{dec})
1A1D:0A	SubIndex 010		UDINT	RO	0x60712301 (1618027265_{dec})
1A1D:0B	SubIndex 011		UDINT	RO	0x60712401 (1618027521_{dec})
1A1D:0C	SubIndex 012		UDINT	RO	0x60712501 (1618027777_{dec})
1A1D:0D	SubIndex 013		UDINT	RO	0x1b (27_{dec})
1A1D:0E	SubIndex 014		UDINT	RO	0x60714120 (1618034976_{dec})
1A1D:0F	SubIndex 015		UDINT	RO	0x60714220 (1618035232_{dec})
1A1D:10	SubIndex 016		UDINT	RO	0x60714320 (1618035488_{dec})
1A1D:11	SubIndex 017		UDINT	RO	0x60714420 (1618035744_{dec})
1A1D:12	SubIndex 018		UDINT	RO	0x60714520 (1618036000_{dec})

1A1E MTI TxPDO-Map Inputs 2x Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
1A1E:0	MTI TxPDO-Map Inputs 2x Ch.8		USINT	RO	0xc (12_{dec})
1A1E:01	SubIndex 001		UDINT	RO	0x60710108 (1618018568_{dec})
1A1E:02	SubIndex 002		UDINT	RO	0x60710901 (1618020609_{dec})
1A1E:03	SubIndex 003		UDINT	RO	0x60710a01 (1618020865_{dec})
1A1E:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A1E:05	SubIndex 005		UDINT	RO	0x60710f02 (1618022146_{dec})
1A1E:06	SubIndex 006		UDINT	RO	0x60711108 (1618022664_{dec})
1A1E:07	SubIndex 007		UDINT	RO	0x60711208 (1618022920_{dec})
1A1E:08	SubIndex 008		UDINT	RO	0x60712101 (1618026753_{dec})
1A1E:09	SubIndex 009		UDINT	RO	0x60712201 (1618027009_{dec})
1A1E:0A	SubIndex 010		UDINT	RO	0x1e (30_{dec})
1A1E:0B	SubIndex 011		UDINT	RO	0x60714120 (1618034976_{dec})
1A1E:0C	SubIndex 012		UDINT	RO	0x60714220 (1618035232_{dec})

1A1F MTI TxPDO-Map Inputs 1x Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
1A1F:0	MTI TxPDO-Map Inputs 1x Ch.8		USINT	RO	0xa (10_{dec})
1A1F:01	SubIndex 001		UDINT	RO	0x60710108 (1618018568_{dec})
1A1F:02	SubIndex 002		UDINT	RO	0x60710901 (1618020609_{dec})
1A1F:03	SubIndex 003		UDINT	RO	0x60710a01 (1618020865_{dec})
1A1F:04	SubIndex 004		UDINT	RO	0x4 (4_{dec})
1A1F:05	SubIndex 005		UDINT	RO	0x60710f02 (1618022146_{dec})
1A1F:06	SubIndex 006		UDINT	RO	0x60711108 (1618022664_{dec})
1A1F:07	SubIndex 007		UDINT	RO	0x60711208 (1618022920_{dec})
1A1F:08	SubIndex 008		UDINT	RO	0x60712101 (1618026753_{dec})
1A1F:09	SubIndex 009		UDINT	RO	0x1f (31_{dec})
1A1F:0A	SubIndex 010		UDINT	RO	0x60714120 (1618034976_{dec})

1A20 TSI TxPDO-Map Inputs Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
1A20:0	TSI TxPDO-Map Inputs Ch.1		USINT	RO	0x6 (6_{dec})
1A20:01	SubIndex 001		UDINT	RO	0x60800101 (1619001601_{dec})
1A20:02	SubIndex 002		UDINT	RO	0x7 (7_{dec})
1A20:03	SubIndex 003		UDINT	RO	0x60800908 (1619003656_{dec})
1A20:04	SubIndex 004		UDINT	RO	0x30 (48_{dec})
1A20:05	SubIndex 005		UDINT	RO	0x60804140 (1619018048_{dec})
1A20:06	SubIndex 006		UDINT	RO	0x60804240 (1619018304_{dec})

1A21 TSI TxPDO-Map Inputs Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
1A21:0	TSI TxPDO-Map Inputs Ch.2		USINT	RO	0x6 (6_{dec})
1A21:01	SubIndex 001		UDINT	RO	0x60900101 (1620050177_{dec})
1A21:02	SubIndex 002		UDINT	RO	0x7 (7_{dec})
1A21:03	SubIndex 003		UDINT	RO	0x60900908 (1620052232_{dec})
1A21:04	SubIndex 004		UDINT	RO	0x30 (48_{dec})
1A21:05	SubIndex 005		UDINT	RO	0x60904140 (1620066624_{dec})
1A21:06	SubIndex 006		UDINT	RO	0x60904240 (1620066880_{dec})

1A22 TSI TxPDO-Map Inputs Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
1A22:0	TSI TxPDO-Map Inputs Ch.3		USINT	RO	0x6 (6_{dec})
1A22:01	SubIndex 001		UDINT	RO	0x60a00101 (1621098753_{dec})
1A22:02	SubIndex 002		UDINT	RO	0x7 (7_{dec})
1A22:03	SubIndex 003		UDINT	RO	0x60a00908 (1621100808_{dec})
1A22:04	SubIndex 004		UDINT	RO	0x30 (48_{dec})
1A22:05	SubIndex 005		UDINT	RO	0x60a04140 (1621115200_{dec})
1A22:06	SubIndex 006		UDINT	RO	0x60a04240 (1621115456_{dec})

1A23 TSI TxPDO-Map Inputs Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
1A23:0	TSI TxPDO-Map Inputs Ch.4		USINT	RO	0x6 (6_{dec})
1A23:01	SubIndex 001		UDINT	RO	0x60b00101 (1622147329_{dec})
1A23:02	SubIndex 002		UDINT	RO	0x7 (7_{dec})
1A23:03	SubIndex 003		UDINT	RO	0x60b00908 (1622149384_{dec})
1A23:04	SubIndex 004		UDINT	RO	0x30 (48_{dec})
1A23:05	SubIndex 005		UDINT	RO	0x60b04140 (1622163776_{dec})
1A23:06	SubIndex 006		UDINT	RO	0x60b04240 (1622164032_{dec})

1A24 TSI TxPDO-Map Inputs Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
1A24:0	TSI TxPDO-Map Inputs Ch.5		USINT	RO	0x6 (6_{dec})
1A24:01	SubIndex 001		UDINT	RO	0x60c00101 (1623195905_{dec})
1A24:02	SubIndex 002		UDINT	RO	0x7 (7_{dec})
1A24:03	SubIndex 003		UDINT	RO	0x60c00908 (1623197960_{dec})
1A24:04	SubIndex 004		UDINT	RO	0x30 (48_{dec})
1A24:05	SubIndex 005		UDINT	RO	0x60c04140 (1623212352_{dec})
1A24:06	SubIndex 006		UDINT	RO	0x60c04240 (1623212608_{dec})

1A25 TSI TxPDO-Map Inputs Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
1A25:0	TSI TxPDO-Map Inputs Ch.6		USINT	RO	0x6 (6_{dec})
1A25:01	SubIndex 001		UDINT	RO	0x60d00101 (1624244481_{dec})
1A25:02	SubIndex 002		UDINT	RO	0x7 (7_{dec})
1A25:03	SubIndex 003		UDINT	RO	0x60d00908 (1624246536_{dec})
1A25:04	SubIndex 004		UDINT	RO	0x30 (48_{dec})
1A25:05	SubIndex 005		UDINT	RO	0x60d04140 (1624260928_{dec})
1A25:06	SubIndex 006		UDINT	RO	0x60d04240 (1624261184_{dec})

1A26 TSI TxPDO-Map Inputs Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
1A26:0	TSI TxPDO-Map Inputs Ch.7		USINT	RO	0x6 (6_{dec})
1A26:01	SubIndex 001		UDINT	RO	0x60e00101 (1625293057_{dec})
1A26:02	SubIndex 002		UDINT	RO	0x7 (7_{dec})
1A26:03	SubIndex 003		UDINT	RO	0x60e00908 (1625295112_{dec})
1A26:04	SubIndex 004		UDINT	RO	0x30 (48_{dec})
1A26:05	SubIndex 005		UDINT	RO	0x60e04140 (1625309504_{dec})
1A26:06	SubIndex 006		UDINT	RO	0x60e04240 (1625309760_{dec})

1A27 TSI TxPDO-Map Inputs Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
1A27:0	TSI TxPDO-Map Inputs Ch.8		USINT	RO	0x6 (6_{dec})
1A27:01	SubIndex 001		UDINT	RO	0x60f00101 (1626341633_{dec})
1A27:02	SubIndex 002		UDINT	RO	0x7 (7_{dec})
1A27:03	SubIndex 003		UDINT	RO	0x60f00908 (1626343688_{dec})
1A27:04	SubIndex 004		UDINT	RO	0x30 (48_{dec})
1A27:05	SubIndex 005		UDINT	RO	0x60f04140 (1626358080_{dec})
1A27:06	SubIndex 006		UDINT	RO	0x60f04240 (1626358336_{dec})

1A28 DEV TxPDO-Map Inputs Device

Index (hex)	Name	Meaning	Data type	Flags	Default
1A28:0	DEV TxPDO-Map Inputs Device		USINT	RO	0x6 (6_{dec})
1A28:01	SubIndex 001		UDINT	RO	0x1 (1_{dec})
1A28:02	SubIndex 002		UDINT	RO	0xf6110201 (4128309761_{dec})
1A28:03	SubIndex 003		UDINT	RO	0xf6110301 (4128310017_{dec})
1A28:04	SubIndex 004		UDINT	RO	0xf6110401 (4128310273_{dec})
1A28:05	SubIndex 005		UDINT	RO	0x3c (60_{dec})
1A28:06	SubIndex 006		UDINT	RO	0xf6112140 (4128317760_{dec})

1C00 Sync manager type

Index (hex)	Name	Meaning	Data type	Flags	Default
1C00:0	Sync manager type	Using the Sync Managers	USINT	RO	0x4 (4_{dec})

1C12 RxPDO assign

Index (hex)	Name	Meaning	Data type	Flags	Default
1C12:0	RxPDO assign	PDO Assign Outputs	USINT	RO	0x8 (8_{dec})

1C13 TxPDO assign

Index (hex)	Name	Meaning	Data type	Flags	Default
1C13:0	TxPDO assign	PDO Assign Inputs	USINT	RO	0x8 (8_{dec})

1C32 SM output parameter

Index (hex)	Name	Meaning	Data type	Flags	Default
1C32:0	SM output parameter	Synchronization parameters for the outputs	USINT	RO	0x20 (32_{dec})
1C32:01	Sync mode	Current synchronization mode: • 0: Free Run • 1: Synchron with SM 2 Event • 2: DC-Mode - Synchron with SYNC0 Event 3: DC-Mode - Synchron with SYNC1 Event	UINT	RW	-
1C32:02	Cycle time	Cycle time (in ns): • Free Run: cycle time of the local timer • Synchron with SM 2 Event: cycle time of the master • DC-Mode: SYNC0/SYNC1 Cycle Time	UDINT	RW	0xc3500 (800000_{dec})
1C32:03	Shift time	Time between SYNC0 event and output of the outputs (in ns, DC mode only)	UDINT	RO	0x384 (900_{dec})
1C32:04	Sync modes supported	Supported synchronization modes: • Bit 0 = 1: Free Run is supported • Bit 1 = 1: Synchron with SM 2 Event is supported • Bit 2-3 = 01: DC-Mode is supported • Bit 4-5 = 10: Output Shift with SYNC1 Event (only DC mode) • Bit 14 = 1: dynamic times (measurement through writing of 1C32:08)	UINT	RO	0x804 (2052_{dec})
1C32:05	Minimum cycle time	Minimum cycle time (in ns)	UDINT	RO	0x1f40 (8000_{dec})
1C32:06	Calc and copy time	Minimum time between SYNC0 and SYNC1 event (in ns, DC Mode only)	UDINT	RO	-
1C32:07	Minimum delay time		UDINT	RO	0x384 (900_{dec})
1C32:08	Command	• 0: Measurement of the local cycle time is stopped • 1: Measurement of the local cycle time is started	UINT	RW	-
1C32:09	Maximum delay time	Time between SYNC1 event and output of the outputs (in ns, DC mode only)	UDINT	RO	0x384 (900_{dec})
1C32:0B	SM event missed counter	Number of missed SM events in OPERATIONAL (DC Mode only)	UINT	RO	-
1C32:0C	Cycle exceeded counter	Number of occasions the cycle time was exceeded in OPERATIONAL (cycle was not completed in time or the next cycle began too early)	UINT	RO	-
1C32:0D	Shift too short counter	Number of intervals between SYNC0 and SYNC1 events that are too short (DC Mode only)	UINT	RO	-
1C32:20	Sync error	The synchronization was not correct in the last cycle (outputs were output too late; DC Mode only)	BOOL	RO	-

1C33 SM input parameter

Index (hex)	Name	Meaning	Data type	Flags	Default
1C33:0	SM input parameter	Synchronization parameters for the inputs	USINT	RO	0x20 (32_{dec})
1C33:01	Sync mode	Current synchronization mode: • 0: Free Run • 1: Synchron with SM 3 Event (no outputs available) • 2: DC - Synchron with SYNC0 Event • 3: DC - Synchron with SYNC1 Event • 34: Synchron with SM 2 Event (outputs available)	UINT	RW	-
1C33:02	Cycle time	as 1C32:02	UDINT	RW	0xc3500 (800000_{dec})
1C33:03	Shift time	Time between SYNC0 event and reading of the inputs (in ns, DC Mode only)	UDINT	RO	0x384 (900_{dec})
1C33:04	Sync modes supported	Supported synchronization modes: • Bit 0: Free Run is supported • Bit 1: Synchron with SM 2 Event is supported (outputs available) • Bit 1: Synchron with SM 3 Event is supported (no outputs available) • Bit 2-3 = 01: DC-Mode is supported • Bit 4-5 = 01: Input shift through local event (outputs available) • Bit 4-5 = 10: Input shift with SYNC1 event (no outputs available) • Bit 14 = 1: dynamic times (measurement through writing of 1C32:08 or 1C33:08)	UINT	RO	0x804 (2052_{dec})
1C33:05	Minimum cycle time	as 1C32:05	UDINT	RO	0x1f40 (8000_{dec})
1C33:06	Calc and copy time	Time between reading of the inputs and the inputs being available for the master (in ns, DC Mode only)	UDINT	RO	-
1C33:07	Minimum delay time		UDINT	RO	0x384 (900_{dec})
1C33:08	Command	as 1C32:08	UINT	RW	-
1C33:09	Maximum delay time	Time between SYNC1 event and reading of the inputs (in ns, DC Mode only)	UDINT	RO	0x384 (900_{dec})
1C33:0B	SM event missed counter	as 1C32:11	UINT	RO	-
1C33:0C	Cycle exceeded counter	as 1C32:12	UINT	RO	-
1C33:0D	Shift too short counter	as 1C32:13	UINT	RO	-
1C33:20	Sync error	as 1C32:32	BOOL	RO	-

6.1.3 Profile-specific objects

6001 MTI inputs Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
6001:0	MTI inputs Ch.1		USINT	RO	0x4a (74_{dec})
6001:01	No of input events		USINT	RO	-
6001:09	Input state		BOOL	RO	-
6001:0A	Input buffer overflow		BOOL	RO	-
6001:0F	Input cycle counter		BIT2	RO	-
6001:11	Events in input buffer		USINT	RO	-
6001:12	Input order feedback		USINT	RO	-
6001:21	Input event state 1		BOOL	RO	-
6001:22	Input event state 2		BOOL	RO	-
6001:23	Input event state 3		BOOL	RO	-
6001:24	Input event state 4		BOOL	RO	-
6001:25	Input event state 5		BOOL	RO	-
6001:26	Input event state 6		BOOL	RO	-
6001:27	Input event state 7		BOOL	RO	-
6001:28	Input event state 8		BOOL	RO	-
6001:29	Input event state 9		BOOL	RO	-
6001:2A	Input event state 10		BOOL	RO	-
6001:41	Input event time 1		UDINT	RO	-
6001:42	Input event time 2		UDINT	RO	-
6001:43	Input event time 3		UDINT	RO	-
6001:44	Input event time 4		UDINT	RO	-
6001:45	Input event time 5		UDINT	RO	-
6001:46	Input event time 6		UDINT	RO	-
6001:47	Input event time 7		UDINT	RO	-
6001:48	Input event time 8		UDINT	RO	-
6001:49	Input event time 9		UDINT	RO	-
6001:4A	Input event time 10		UDINT	RO	-

6011 MTI inputs Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
6011:0	MTI inputs Ch.2		USINT	RO	0x4a (74_{dec})
6011:01	No of input events		USINT	RO	-
6011:09	Input state		BOOL	RO	-
6011:0A	Input buffer overflow		BOOL	RO	-
6011:0F	Input cycle counter		BIT2	RO	-
6011:11	Events in input buffer		USINT	RO	-
6011:12	Input order feedback		USINT	RO	-
6011:21	Input event state 1		BOOL	RO	-
6011:22	Input event state 2		BOOL	RO	-
6011:23	Input event state 3		BOOL	RO	-
6011:24	Input event state 4		BOOL	RO	-
6011:25	Input event state 5		BOOL	RO	-
6011:26	Input event state 6		BOOL	RO	-
6011:27	Input event state 7		BOOL	RO	-
6011:28	Input event state 8		BOOL	RO	-
6011:29	Input event state 9		BOOL	RO	-
6011:2A	Input event state 10		BOOL	RO	-
6011:41	Input event time 1		UDINT	RO	-
6011:42	Input event time 2		UDINT	RO	-
6011:43	Input event time 3		UDINT	RO	-
6011:44	Input event time 4		UDINT	RO	-
6011:45	Input event time 5		UDINT	RO	-
6011:46	Input event time 6		UDINT	RO	-
6011:47	Input event time 7		UDINT	RO	-
6011:48	Input event time 8		UDINT	RO	-
6011:49	Input event time 9		UDINT	RO	-
6011:4A	Input event time 10		UDINT	RO	-

6021 MTI inputs Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
6021:0	MTI inputs Ch.3		USINT	RO	0x4a (74_{dec})
6021:01	No of input events		USINT	RO	-
6021:09	Input state		BOOL	RO	-
6021:0A	Input buffer overflow		BOOL	RO	-
6021:0F	Input cycle counter		BIT2	RO	-
6021:11	Events in input buffer		USINT	RO	-
6021:12	Input order feedback		USINT	RO	-
6021:21	Input event state 1		BOOL	RO	-
6021:22	Input event state 2		BOOL	RO	-
6021:23	Input event state 3		BOOL	RO	-
6021:24	Input event state 4		BOOL	RO	-
6021:25	Input event state 5		BOOL	RO	-
6021:26	Input event state 6		BOOL	RO	-
6021:27	Input event state 7		BOOL	RO	-
6021:28	Input event state 8		BOOL	RO	-
6021:29	Input event state 9		BOOL	RO	-
6021:2A	Input event state 10		BOOL	RO	-
6021:41	Input event time 1		UDINT	RO	-
6021:42	Input event time 2		UDINT	RO	-
6021:43	Input event time 3		UDINT	RO	-
6021:44	Input event time 4		UDINT	RO	-
6021:45	Input event time 5		UDINT	RO	-
6021:46	Input event time 6		UDINT	RO	-
6021:47	Input event time 7		UDINT	RO	-
6021:48	Input event time 8		UDINT	RO	-
6021:49	Input event time 9		UDINT	RO	-
6021:4A	Input event time 10		UDINT	RO	-

6031 MTI inputs Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
6031:0	MTI inputs Ch.4		USINT	RO	0x4a (74_{dec})
6031:01	No of input events		USINT	RO	-
6031:09	Input state		BOOL	RO	-
6031:0A	Input buffer overflow		BOOL	RO	-
6031:0F	Input cycle counter		BIT2	RO	-
6031:11	Events in input buffer		USINT	RO	-
6031:12	Input order feedback		USINT	RO	-
6031:21	Input event state 1		BOOL	RO	-
6031:22	Input event state 2		BOOL	RO	-
6031:23	Input event state 3		BOOL	RO	-
6031:24	Input event state 4		BOOL	RO	-
6031:25	Input event state 5		BOOL	RO	-
6031:26	Input event state 6		BOOL	RO	-
6031:27	Input event state 7		BOOL	RO	-
6031:28	Input event state 8		BOOL	RO	-
6031:29	Input event state 9		BOOL	RO	-
6031:2A	Input event state 10		BOOL	RO	-
6031:41	Input event time 1		UDINT	RO	-
6031:42	Input event time 2		UDINT	RO	-
6031:43	Input event time 3		UDINT	RO	-
6031:44	Input event time 4		UDINT	RO	-
6031:45	Input event time 5		UDINT	RO	-
6031:46	Input event time 6		UDINT	RO	-
6031:47	Input event time 7		UDINT	RO	-
6031:48	Input event time 8		UDINT	RO	-
6031:49	Input event time 9		UDINT	RO	-
6031:4A	Input event time 10		UDINT	RO	-

6041 MTI inputs Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
6041:0	MTI inputs Ch.5		USINT	RO	0x4a (74_{dec})
6041:01	No of input events		USINT	RO	-
6041:09	Input state		BOOL	RO	-
6041:0A	Input buffer overflow		BOOL	RO	-
6041:0F	Input cycle counter		BIT2	RO	-
6041:11	Events in input buffer		USINT	RO	-
6041:12	Input order feedback		USINT	RO	-
6041:21	Input event state 1		BOOL	RO	-
6041:22	Input event state 2		BOOL	RO	-
6041:23	Input event state 3		BOOL	RO	-
6041:24	Input event state 4		BOOL	RO	-
6041:25	Input event state 5		BOOL	RO	-
6041:26	Input event state 6		BOOL	RO	-
6041:27	Input event state 7		BOOL	RO	-
6041:28	Input event state 8		BOOL	RO	-
6041:29	Input event state 9		BOOL	RO	-
6041:2A	Input event state 10		BOOL	RO	-
6041:41	Input event time 1		UDINT	RO	-
6041:42	Input event time 2		UDINT	RO	-
6041:43	Input event time 3		UDINT	RO	-
6041:44	Input event time 4		UDINT	RO	-
6041:45	Input event time 5		UDINT	RO	-
6041:46	Input event time 6		UDINT	RO	-
6041:47	Input event time 7		UDINT	RO	-
6041:48	Input event time 8		UDINT	RO	-
6041:49	Input event time 9		UDINT	RO	-
6041:4A	Input event time 10		UDINT	RO	-

6051 MTI inputs Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
6051:0	MTI inputs Ch.6		USINT	RO	0x4a (74_{dec})
6051:01	No of input events		USINT	RO	-
6051:09	Input state		BOOL	RO	-
6051:0A	Input buffer overflow		BOOL	RO	-
6051:0F	Input cycle counter		BIT2	RO	-
6051:11	Events in input buffer		USINT	RO	-
6051:12	Input order feedback		USINT	RO	-
6051:21	Input event state 1		BOOL	RO	-
6051:22	Input event state 2		BOOL	RO	-
6051:23	Input event state 3		BOOL	RO	-
6051:24	Input event state 4		BOOL	RO	-
6051:25	Input event state 5		BOOL	RO	-
6051:26	Input event state 6		BOOL	RO	-
6051:27	Input event state 7		BOOL	RO	-
6051:28	Input event state 8		BOOL	RO	-
6051:29	Input event state 9		BOOL	RO	-
6051:2A	Input event state 10		BOOL	RO	-
6051:41	Input event time 1		UDINT	RO	-
6051:42	Input event time 2		UDINT	RO	-
6051:43	Input event time 3		UDINT	RO	-
6051:44	Input event time 4		UDINT	RO	-
6051:45	Input event time 5		UDINT	RO	-
6051:46	Input event time 6		UDINT	RO	-
6051:47	Input event time 7		UDINT	RO	-
6051:48	Input event time 8		UDINT	RO	-
6051:49	Input event time 9		UDINT	RO	-
6051:4A	Input event time 10		UDINT	RO	-

6061 MTI inputs Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
6061:0	MTI inputs Ch.7		USINT	RO	0x4a (74_{dec})
6061:01	No of input events		USINT	RO	-
6061:09	Input state		BOOL	RO	-
6061:0A	Input buffer overflow		BOOL	RO	-
6061:0F	Input cycle counter		BIT2	RO	-
6061:11	Events in input buffer		USINT	RO	-
6061:12	Input order feedback		USINT	RO	-
6061:21	Input event state 1		BOOL	RO	-
6061:22	Input event state 2		BOOL	RO	-
6061:23	Input event state 3		BOOL	RO	-
6061:24	Input event state 4		BOOL	RO	-
6061:25	Input event state 5		BOOL	RO	-
6061:26	Input event state 6		BOOL	RO	-
6061:27	Input event state 7		BOOL	RO	-
6061:28	Input event state 8		BOOL	RO	-
6061:29	Input event state 9		BOOL	RO	-
6061:2A	Input event state 10		BOOL	RO	-
6061:41	Input event time 1		UDINT	RO	-
6061:42	Input event time 2		UDINT	RO	-
6061:43	Input event time 3		UDINT	RO	-
6061:44	Input event time 4		UDINT	RO	-
6061:45	Input event time 5		UDINT	RO	-
6061:46	Input event time 6		UDINT	RO	-
6061:47	Input event time 7		UDINT	RO	-
6061:48	Input event time 8		UDINT	RO	-
6061:49	Input event time 9		UDINT	RO	-
6061:4A	Input event time 10		UDINT	RO	-

6071 MTI inputs Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
6071:0	MTI inputs Ch.8		USINT	RO	0x4a (74_{dec})
6071:01	No of input events		USINT	RO	-
6071:09	Input state		BOOL	RO	-
6071:0A	Input buffer overflow		BOOL	RO	-
6071:0F	Input cycle counter		BIT2	RO	-
6071:11	Events in input buffer		USINT	RO	-
6071:12	Input order feedback		USINT	RO	-
6071:21	Input event state 1		BOOL	RO	-
6071:22	Input event state 2		BOOL	RO	-
6071:23	Input event state 3		BOOL	RO	-
6071:24	Input event state 4		BOOL	RO	-
6071:25	Input event state 5		BOOL	RO	-
6071:26	Input event state 6		BOOL	RO	-
6071:27	Input event state 7		BOOL	RO	-
6071:28	Input event state 8		BOOL	RO	-
6071:29	Input event state 9		BOOL	RO	-
6071:2A	Input event state 10		BOOL	RO	-
6071:41	Input event time 1		UDINT	RO	-
6071:42	Input event time 2		UDINT	RO	-
6071:43	Input event time 3		UDINT	RO	-
6071:44	Input event time 4		UDINT	RO	-
6071:45	Input event time 5		UDINT	RO	-
6071:46	Input event time 6		UDINT	RO	-
6071:47	Input event time 7		UDINT	RO	-
6071:48	Input event time 8		UDINT	RO	-
6071:49	Input event time 9		UDINT	RO	-
6071:4A	Input event time 10		UDINT	RO	-

6080 TSI Inputs Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
6080:0	TSI Inputs Ch.1		USINT	RO	0x42 (66_{dec})
6080:01	Input		BOOL	RO	-
6080:09	Status		USINT	RO	-
6080:41	LatchPos		ULINT	RO	-
6080:42	LatchNeg		ULINT	RO	-

6090 TSI Inputs Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
6090:0	TSI Inputs Ch.2		USINT	RO	0x42 (66_{dec})
6090:01	Input		BOOL	RO	-
6090:09	Status		USINT	RO	-
6090:41	LatchPos		ULINT	RO	-
6090:42	LatchNeg		ULINT	RO	-

60A0 TSI Inputs Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
60A0:0	TSI Inputs Ch.3		USINT	RO	0x42 (66_{dec})
60A0:01	Input		BOOL	RO	-
60A0:09	Status		USINT	RO	-
60A0:41	LatchPos		ULINT	RO	-
60A0:42	LatchNeg		ULINT	RO	-

60B0 TSI Inputs Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
60B0:0	TSI Inputs Ch.4		USINT	RO	0x42 (66_{dec})
60B0:01	Input		BOOL	RO	-
60B0:09	Status		USINT	RO	-
60B0:41	LatchPos		ULINT	RO	-
60B0:42	LatchNeg		ULINT	RO	-

60C0 TSI Inputs Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
60C0:0	TSI Inputs Ch.5		USINT	RO	0x42 (66_{dec})
60C0:01	Input		BOOL	RO	-
60C0:09	Status		USINT	RO	-
60C0:41	LatchPos		ULINT	RO	-
60C0:42	LatchNeg		ULINT	RO	-

60D0 TSI Inputs Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
60D0:0	TSI Inputs Ch.6		USINT	RO	0x42 (66_{dec})
60D0:01	Input		BOOL	RO	-
60D0:09	Status		USINT	RO	-
60D0:41	LatchPos		ULINT	RO	-
60D0:42	LatchNeg		ULINT	RO	-

60E0 TSI Inputs Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
60E0:0	TSI Inputs Ch.7		USINT	RO	0x42 (66_{dec})
60E0:01	Input		BOOL	RO	-
60E0:09	Status		USINT	RO	-
60E0:41	LatchPos		ULINT	RO	-
60E0:42	LatchNeg		ULINT	RO	-

60F0 TSI Inputs Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
60F0:0	TSI Inputs Ch.8		USINT	RO	0x42 (66_{dec})
60F0:01	Input		BOOL	RO	-
60F0:09	Status		USINT	RO	-
60F0:41	LatchPos		ULINT	RO	-
60F0:42	LatchNeg		ULINT	RO	-

7000 MTI outputs Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
7000:0	MTI outputs Ch.1		USINT	RO	0x11 (17_{dec})
7000:01	Input buffer reset		BOOL	RO	-
7000:11	Input order counter		USINT	RO	-

7010 MTI outputs Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
7010:0	MTI outputs Ch.2		USINT	RO	0x11 (17_{dec})
7010:01	Input buffer reset		BOOL	RO	-
7010:11	Input order counter		USINT	RO	-

7020 MTI outputs Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
7020:0	MTI outputs Ch.3		USINT	RO	0x11 (17_{dec})
7020:01	Input buffer reset		BOOL	RO	-
7020:11	Input order counter		USINT	RO	-

7030 MTI outputs Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
7030:0	MTI outputs Ch.4		USINT	RO	0x11 (17_{dec})
7030:01	Input buffer reset		BOOL	RO	-
7030:11	Input order counter		USINT	RO	-

7040 MTI outputs Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
7040:0	MTI outputs Ch.5		USINT	RO	0x11 (17_{dec})
7040:01	Input buffer reset		BOOL	RO	-
7040:11	Input order counter		USINT	RO	-

7050 MTI outputs Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
7050:0	MTI outputs Ch.6		USINT	RO	0x11 (17_{dec})
7050:01	Input buffer reset		BOOL	RO	-
7050:11	Input order counter		USINT	RO	-

7060 MTI outputs Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
7060:0	MTI outputs Ch.7		USINT	RO	0x11 (17_{dec})
7060:01	Input buffer reset		BOOL	RO	-
7060:11	Input order counter		USINT	RO	-

7070 MTI outputs Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
7070:0	MTI outputs Ch.8		USINT	RO	0x11 (17_{dec})
7070:01	Input buffer reset		BOOL	RO	-
7070:11	Input order counter		USINT	RO	-

F000 Modular device profile

Index (hex)	Name	Meaning	Data type	Flags	Default
F000:0	Modular device profile		USINT	RO	0x2 (2_{dec})
F000:01	Module index distance		UINT	RO	0x10 (16_{dec})
F000:02	Maximum number of modules		UINT	RO	0x10 (16_{dec})

F008 Code word

Index (hex)	Name	Meaning	Data type	Flags	Default
F008:0	Code word		UDINT	RO	-

F010 Module list

Index (hex)	Name	Meaning	Data type	Flags	Default
F010:0	Module list		USINT	RO	0x10 (16_{dec})

F611 DEV Inputs

Index (hex)	Name	Meaning	Data type	Flags	Default
F611:0	DEV Inputs		USINT	RO	0x21 (33_{dec})
F611:02	Undervoltage Up		BOOL	RO	-
F611:03	Overtemperature		BOOL	RO	-
F611:04	Checksum error		BOOL	RO	-
F611:21	SysTime		ULINT	RO	-

FB00 Command

Index (hex)	Name	Meaning	Data type	Flags	Default
FB00:0	Command		USINT	RO	0x3 (3_{dec})
FB00:01	Request		ARRAY [0..1] OF BYTE	RW	[None]
FB00:02	Status		USINT	RO	-
FB00:03	Response		ARRAY [0..5] OF BYTE	RO	[None]

6.1.4 Diagnostic objects

A000 MTI Diag data Ch.1

Index (hex)	Name	Meaning	Data type	Flags	Default
A000:0	MTI Diag data Ch.1		USINT	RO	0x2 (2_{dec})
A000:01	Overtemperature		BOOL	RO	00
A000:02	Undervoltage		BOOL	RO	00

A001 MTI common Diag data

Index (hex)	Name	Meaning	Data type	Flags	Default
A001:0	MTI common Diag data		USINT	RO	0x11 (17_{dec})
A001:11	Checksum error counter		UINT	RO	-

A010 MTI Diag data Ch.2

Index (hex)	Name	Meaning	Data type	Flags	Default
A010:0	MTI Diag data Ch.2		USINT	RO	0x2 (2_{dec})
A010:01	Overtemperature		BOOL	RO	00
A010:02	Undervoltage		BOOL	RO	00

A020 MTI Diag data Ch.3

Index (hex)	Name	Meaning	Data type	Flags	Default
A020:0	MTI Diag data Ch.3		USINT	RO	0x2 (2_{dec})
A020:01	Overtemperature		BOOL	RO	00
A020:02	Undervoltage		BOOL	RO	00

A030 MTI Diag data Ch.4

Index (hex)	Name	Meaning	Data type	Flags	Default
A030:0	MTI Diag data Ch.4		USINT	RO	0x2 (2_{dec})
A030:01	Overtemperature		BOOL	RO	00
A030:02	Undervoltage		BOOL	RO	00

A040 MTI Diag data Ch.5

Index (hex)	Name	Meaning	Data type	Flags	Default
A040:0	MTI Diag data Ch.5		USINT	RO	0x2 (2_{dec})
A040:01	Overtemperature		BOOL	RO	00
A040:02	Undervoltage		BOOL	RO	00

A050 MTI Diag data Ch.6

Index (hex)	Name	Meaning	Data type	Flags	Default
A050:0	MTI Diag data Ch.6		USINT	RO	0x2 (2_{dec})
A050:01	Overtemperature		BOOL	RO	00
A050:02	Undervoltage		BOOL	RO	00

A060 MTI Diag data Ch.7

Index (hex)	Name	Meaning	Data type	Flags	Default
A060:0	MTI Diag data Ch.7		USINT	RO	0x2 (2_{dec})
A060:01	Overtemperature		BOOL	RO	00
A060:02	Undervoltage		BOOL	RO	00

A070 MTI Diag data Ch.8

Index (hex)	Name	Meaning	Data type	Flags	Default
A070:0	MTI Diag data Ch.8		USINT	RO	0x2 (2_{dec})
A070:01	Overtemperature		BOOL	RO	00
A070:02	Undervoltage		BOOL	RO	00

A080 TSI common Diag data

Index (hex)	Name	Meaning	Data type	Flags	Default
A080:0	TSI common Diag data		USINT	RO	0x11 (17_{dec})
A080:11	Checksum error counter		UINT	RO	-

F900 DEV Info data

Index (hex)	Name	Meaning	Data type	Flags	Default
F900:0	DEV Info data		USINT	RO	0x9 (9_{dec})
F900:08	Cycle Time	The current microcycle time in ns.	UDINT	RO	-
F900:09	Sample time	The current microcycle time (sample time) in ns.	UDINT	RO	-

7 Appendix

7.1 General operating conditions

Protection rating according to IP code

The degrees of protection are defined and divided into different classes in the IEC 60529 standard (EN 60529). Degrees of protection are designated by the letters "IP" and two numerals: **IPxy**

- Numeral x: Dust protection and contact protection
- Numeral y: Protection against water

x	Meaning
0	Not protected
1	Protected against access to dangerous parts with the back of the hand. Protected against solid foreign objects of 50 mm Ø
2	Protected against access to dangerous parts with a finger. Protected against solid foreign objects of 12.5 mm Ø
3	Protected against access to dangerous parts with a tool. Protected against solid foreign objects of 2.5 mm Ø
4	Protected against access to dangerous parts with a wire. Protected against solid foreign objects of 1 mm Ø
5	Protection against access to dangerous parts with a wire. Dust-protected. Ingress of dust is not prevented completely, although the quantity of dust able to penetrate is limited to such an extent that the proper function of the device and safety are not impaired
6	Protection against access to dangerous parts with a wire. Dust-tight. No ingress of dust

y	Meaning
0	Not protected
1	Protection against vertically falling water drops
2	Protection against vertically falling water drops when enclosure tilted up to 15°
3	Protection against spraying water. Water sprayed at an angle of up to 60° on either side of the vertical shall have no harmful effects
4	Protection against splashing water. Water splashed against the enclosure from any direction shall have no harmful effects
5	Protection against water jets.
6	Protection against powerful water jets.
7	Protected against the effects of temporary immersion in water. Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is immersed in water at a depth of 1 m for 30 minutes

Chemical resistance

The resistance refers to the housing of the IP67 modules and the metal parts used. In the table below you will find some typical resistances.

Type	Resistance
Water vapor	unstable at temperatures > 100 °C
Sodium hydroxide solution (ph value > 12)	stable at room temperature unstable > 40 °C
Acetic acid	unstable
Argon (technically pure)	stable

Key

- resistant: Lifetime several months
- non inherently resistant: Lifetime several weeks
- not resistant: Lifetime several hours resp. early decomposition

7.2 Accessories

Mounting

Ordering information	Description	Link
ZS5300-0011	Mounting rail	Website

Cables

A complete overview of pre-assembled cables can be found on the Beckhoff website: Link.

Ordering information	Description	Link
ZK1090-3xxx-xxxx	EtherCAT cable M8, green	Website
ZK1093-3xxx-xxxx	EtherCAT cable M8, yellow	Website
ZK2000-2xxx-xxxx	Sensor cable M8, 3-pin	Website
ZK2000-6xxx-xxxx	Sensor cable M12, 4-pin	Website
ZK2000-7xxx-0xxx	Sensor cable M12, 4-pin + shield	Website
ZK2020-3xxx-xxxx	Power cable M8, 4-pin	Website

Labeling material, protective caps

Ordering information	Description
ZS5000-0010	Protective cap for M8 sockets, IP67 (50 pieces)
ZS5000-0020	Protective cap for M12 sockets, IP67 (50 pcs.)
ZS5100-0000	Inscription labels, unprinted, 4 strips of 10
ZS5000-xxxx	Printed inscription labels on enquiry

Tools

Ordering information	Description
ZB8801-0000	Torque wrench for plugs, 0.4…1.0 Nm
ZB8801-0001	Torque cable key for M8 / wrench size 9 for ZB8801-0000
ZB8801-0002	Torque cable key for M12 / wrench size 13 for ZB8801-0000
ZB8801-0003	Torque cable key for M12 field assembly / wrench size 18 for ZB8801-0000

Further accessories

Further accessories can be found in the price list for fieldbus components from Beckhoff and online at https://www.beckhoff.com.

7.3 Version identification of EtherCAT devices

7.3.1 General notes on marking

Designation

A Beckhoff EtherCAT device has a 14-digit designation, made up of

- family key
- type
- version
- revision

Example	Family	Type	Version	Revision
EL3314-0000-0016	EL terminal 12 mm, non-pluggable connection level	3314 4-channel thermocouple terminal	0000 basic type	0016
ES3602-0010-0017	ES terminal 12 mm, pluggable connection level	3602 2-channel voltage measurement	0010 high-precision version	0017
CU2008-0000-0000	CU device	2008 8-port fast ethernet switch	0000 basic type	0000

Notes

- The elements mentioned above result in the **technical designation**. EL3314-0000-0016 is used in the example below.
- EL3314-0000 is the order identifier, in the case of “-0000” usually abbreviated to EL3314. “-0016” is the EtherCAT revision.
- The **order identifier** is made up of
  - family key (EL, EP, CU, ES, KL, CX, etc.)
  - type (3314)
  - version (-0000)
- The **revision** -0016 shows the technical progress, such as the extension of features with regard to the EtherCAT communication, and is managed by Beckhoff.
  In principle, a device with a higher revision can replace a device with a lower revision, unless specified otherwise, e.g. in the documentation.
  Associated and synonymous with each revision there is usually a description (ESI, EtherCAT Slave Information) in the form of an XML file, which is available for download from the Beckhoff web site.
  From 2014/01 the revision is shown on the outside of the IP20 terminals, see Fig. *“EL2872 with revision 0022 and serial number 01200815”*.
- The type, version and revision are read as decimal numbers, even if they are technically saved in hexadecimal.

7.3.2 Version identification of IP67 modules

The serial number/ data code for Beckhoff IO devices is usually the 8-digit number printed on the device or on a sticker. The serial number indicates the configuration in delivery state and therefore refers to a whole production batch, without distinguishing the individual modules of a batch.

Structure of the serial number: **KK YY FF HH**	Example with serial number 12 06 3A 02:
KK - week of production (CW, calendar week)	12 - production week 12
YY - year of production	06 - production year 2006
FF - firmware version	3A - firmware version 3A
HH - hardware version	02 - hardware version 02

Exceptions can occur in the **IP67 area**, where the following syntax can be used (see respective device documentation):

Syntax: D ww yy x y z u

D - prefix designation
ww - calendar week
yy - year
x - firmware version of the bus PCB
y - hardware version of the bus PCB
z - firmware version of the I/O PCB
u - hardware version of the I/O PCB

Example: D.22081501 calendar week 22 of the year 2008 firmware version of bus PCB: 1 hardware version of bus PCB: 5 firmware version of I/O PCB: 0 (no firmware necessary for this PCB) hardware version of I/O PCB: 1

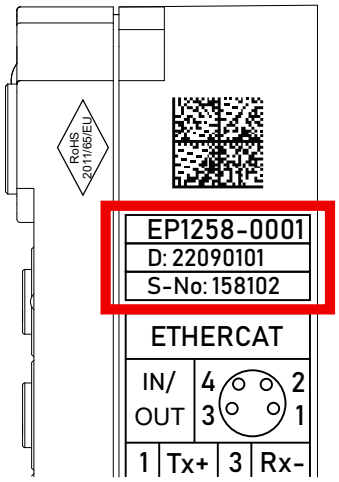


Fig. 9: EP1258-00001 IP67 EtherCAT Box with batch number/DateCode 22090101 and unique serial number 158102

7.3.3 Beckhoff Identification Code (BIC)

The Beckhoff Identification Code (BIC) is increasingly being applied to Beckhoff products to uniquely identify the product. The BIC is represented as a Data Matrix Code (DMC, code scheme ECC200), the content is based on the ANSI standard MH10.8.2-2016.

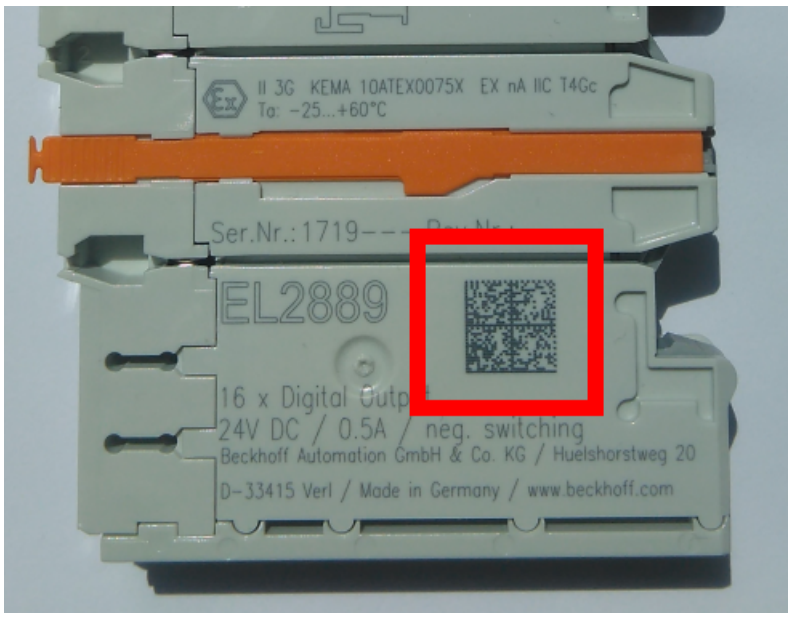


Fig. 10: BIC as data matrix code (DMC, code scheme ECC200)

The BIC will be introduced step by step across all product groups.

Depending on the product, it can be found in the following places:

- on the packaging unit
- directly on the product (if space suffices)
- on the packaging unit and the product

The BIC is machine-readable and contains information that can also be used by the customer for handling and product management.

Each piece of information can be uniquely identified using the so-called data identifier (ANSI MH10.8.2-2016). The data identifier is followed by a character string. Both together have a maximum length according to the table below. If the information is shorter, spaces are added to it.

Following information is possible, positions 1 to 4 are always present, the other according to need of production:

Position	Type of information	Explanation	Data identifier	Number of digits incl. data identifier	Example
1	Beckhoff order number	**Beckhoff order number**	1P	8	**1P**072222
2	Beckhoff Traceability Number (BTN)	**Unique serial number, see note below**	SBTN	12	**SBTN**k4p562d7
3	Article description	**Beckhoff article description, e.g. EL1008**	1K	32	**1K**EL1809
4	Quantity	**Quantity in packaging unit, e.g. 1, 10, etc.**	Q	6	**Q**1
5	Batch number	Optional: Year and week of production	2P	14	**2P**401503180016
6	ID/serial number	Optional: Present-day serial number system, e.g. with safety products	51S	12	**51S**678294
7	Variant number	Optional: Product variant number on the basis of standard products	30P	12	**30P**F971, 2*K183
...					

Further types of information and data identifiers are used by Beckhoff and serve internal processes.

Structure of the BIC

Example of composite information from positions 1 to 4 and with the above given example value on position 6. The data identifiers are highlighted in bold font:

1P072222**SBTN**k4p562d7**1K**EL1809 **Q**1 **51S**678294

Accordingly as DMC:

Fig. 11: Example DMC **1P**072222**SBTN**k4p562d7**1K**EL1809 **Q**1 **51S**678294

BTN

An important component of the BIC is the Beckhoff Traceability Number (BTN, position 2). The BTN is a unique serial number consisting of eight characters that will replace all other serial number systems at Beckhoff in the long term (e.g. batch designations on IO components, previous serial number range for safety products, etc.). The BTN will also be introduced step by step, so it may happen that the BTN is not yet coded in the BIC.

NOTICE

This information has been carefully prepared. However, the procedure described is constantly being further developed. We reserve the right to revise and change procedures and documentation at any time and without prior notice. No claims for changes can be made from the information, illustrations and descriptions in this documentation.

7.3.4 Electronic access to the BIC (eBIC)

Electronic BIC (eBIC)

The Beckhoff Identification Code (BIC) is applied to the outside of Beckhoff products in a visible place. If possible, it should also be electronically readable.

The interface that the product can be electronically addressed by is crucial for the electronic readout.

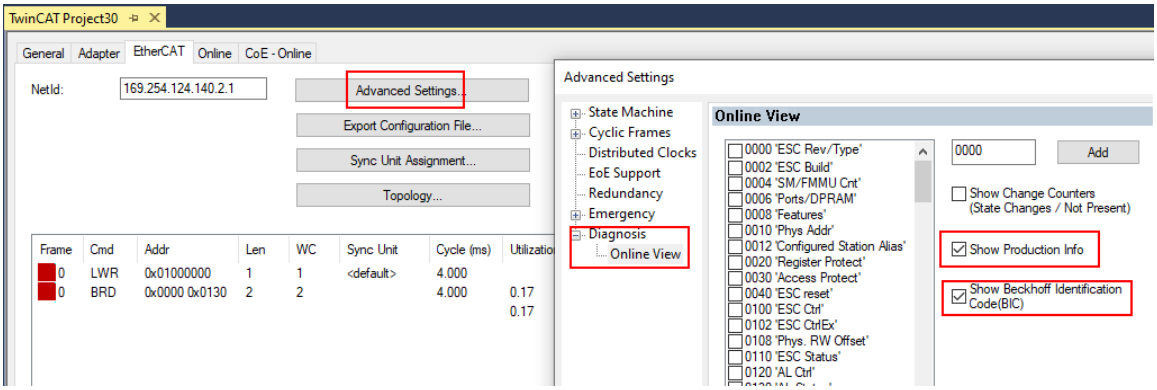
EtherCAT devices (IP20, IP67)

All Beckhoff EtherCAT devices have an ESI-EEPROM which contains the EtherCAT identity with the revision number. The EtherCAT slave information, also colloquially known as the ESI/XML configuration file for the EtherCAT master, is stored in it. See the corresponding chapter in the EtherCAT system manual (Link) for the relationships.

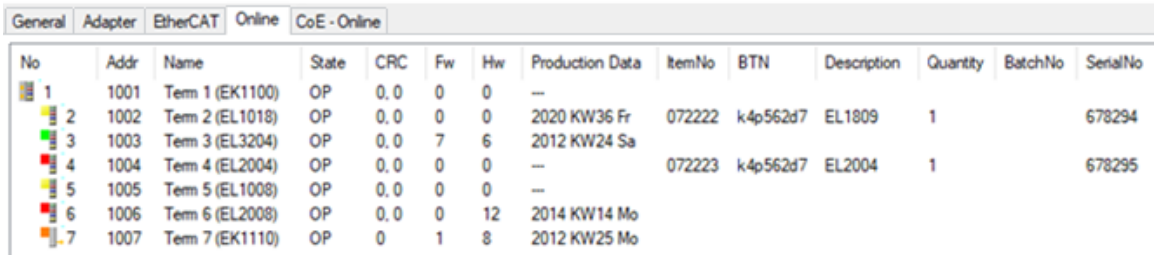
Beckhoff also stores the eBIC in the ESI-EEPROM. The eBIC was introduced into Beckhoff IO production (terminals, box modules) in 2020; as of 2023, implementation is largely complete.

The user can electronically access the eBIC (if present) as follows:

- With all EtherCAT devices, the EtherCAT master (TwinCAT) can read the eBIC from the ESI-EEPROM
  - From TwinCAT 3.1 build 4024.11, the eBIC can be displayed in the online view.
  - To do this, check the "Show Beckhoff Identification Code (BIC)" checkbox under EtherCAT → Advanced Settings → Diagnostics:

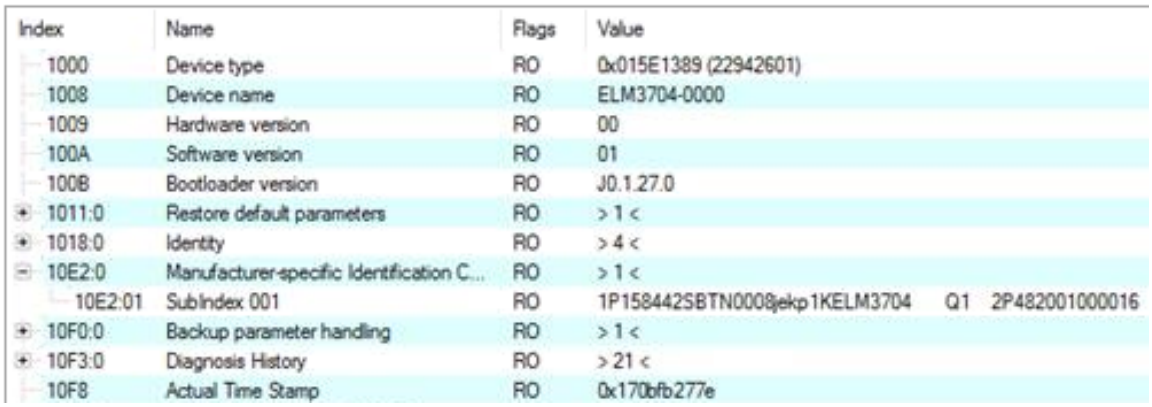


  - The BTN and its contents are then displayed:



  - Note: As shown in the figure, the production data HW version, FW version, and production date, which have been programmed since 2012, can also be displayed with "Show production info".
  - Access from the PLC: From TwinCAT 3.1. build 4024.24, the functions *FB_EcReadBIC* and *FB_EcReadBTN* for reading into the PLC are available in the Tc2_EtherCAT library from v3.3.19.0.
- EtherCAT devices with a CoE directory may also have the object 0x10E2:01 to display their own eBIC, which can also be easily accessed by the PLC:

- The device must be in PREOP/SAFEOP/OP for access:



Index	Name	Flags	Value
1000	Device type	RO	0x015E1389 (22942601)
1008	Device name	RO	ELM3704-0000
1009	Hardware version	RO	00
100A	Software version	RO	01
100B	Bootloader version	RO	J0.1.27.0
1011:0	Restore default parameters	RO	> 1 <
1018:0	Identity	RO	> 4 <
10E2:0	Manufacturer-specific Identification C...	RO	> 1 <
10E2:01	SubIndex 001	RO	1P158442SBTN0008jekp1KELM3704 Q1 2P482001000016
10F0:0	Backup parameter handling	RO	> 1 <
10F3:0	Diagnosis History	RO	> 21 <
10F8	Actual Time Stamp	RO	0x170bfb277e

  - The object 0x10E2 will be preferentially introduced into stock products in the course of necessary firmware revision.
  - From TwinCAT 3.1. build 4024.24, the functions *FB_EcCoEReadBIC* and *FB_EcCoEReadBTN* for reading into the PLC are available in the Tc2_EtherCAT library from v3.3.19.0
- The following auxiliary functions are available for processing the BIC/BTN data in the PLC in *Tc2_Utilities* as of TwinCAT 3.1 build 4024.24
  - F_SplitBIC: The function splits the Beckhoff Identification Code (BIC) sBICValue into its components using known identifiers and returns the recognized substrings in the ST_SplittedBIC structure as a return value
  - BIC_TO_BTN: The function extracts the BTN from the BIC and returns it as a return value
- Note: If there is further electronic processing, the BTN is to be handled as a string(8); the identifier "SBTN" is not part of the BTN.
- Technical background
  The new BIC information is written as an additional category in the ESI-EEPROM during device production. The structure of the ESI content is largely dictated by the ETG specifications, therefore the additional vendor-specific content is stored using a category in accordance with the ETG.2010. ID 03 tells all EtherCAT masters that they may not overwrite these data in the event of an update or restore the data after an ESI update.
  The structure follows the content of the BIC, see here. The EEPROM therefore requires approx. 50..200 bytes of memory.
- Special cases
  - If multiple hierarchically arranged ESCs are installed in a device, only the top-level ESC carries the eBIC information.
  - If multiple non-hierarchically arranged ESCs are installed in a device, all ESCs carry the eBIC information.
  - If the device consists of several sub-devices which each have their own identity, but only the top-level device is accessible via EtherCAT, the eBIC of the top-level device is located in the CoE object directory 0x10E2:01 and the eBICs of the sub-devices follow in 0x10E2:nn.

7.4 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for local support and service on Beckhoff products!

The addresses of Beckhoff's branch offices and representatives round the world can be found on her internet pages: www.beckhoff.com

You will also find further documentation for Beckhoff components there.

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The Beckhoff Support offers you comprehensive technical assistance, helping you not only with the application of individual Beckhoff products, but also with other, wide-ranging services:

- support
- design, programming and commissioning of complex automation systems
- and extensive training program for Beckhoff system components

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web:	www.beckhoff.com/support

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- spare parts service
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