BECKHOFF New Automation Technology

Documentation | EN

ED336x-0x00

EtherCAT Terminals, analog input, measuring bridge, full bridge, 24 bit, push-in

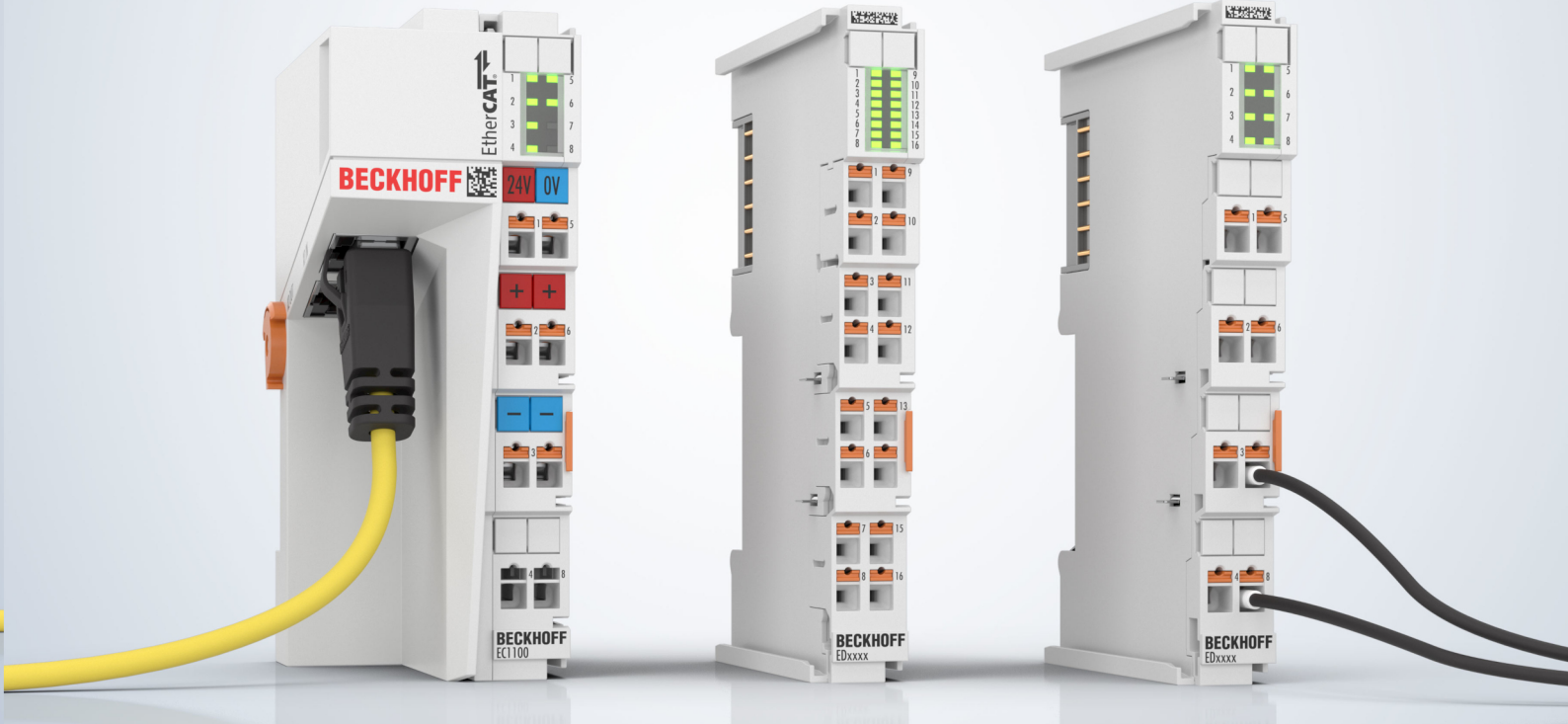

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Table of contents

1 Foreword

1.1 Product overview

This documentation covers the following products:

ED3361-0100 [▶ 9]	EtherCAT Terminal, 1-channel analog input, measuring bridge, full bridge, 24 bit, sensor power supply 5/10 V DC
ED3362-0100 [▶ 15]	EtherCAT Terminal, 2-channel analog input, measuring bridge, full bridge, 24 bit, sensor power supply 5/10 V DC

Use the tabular product overview or the product finder to find the right product for your application (https://www.beckhoff.com/IO).

1.2 Notes on the documentation

Intended audience

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.
It is essential that the documentation and the following notes and explanations are followed when installing and commissioning these components.
The qualified personnel is obliged to always use the currently valid documentation.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

Disclaimer

The documentation has been prepared 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 prior announcement.

No claims for the modification of products that have already been supplied may be made on the basis of the data, diagrams and descriptions in this documentation.

Trademarks

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https://www.beckhoff.com/trademarks

1.3 Guide through documentation

NOTICE

Further components of documentation

This documentation describes device-specific content. It is part of the modular documentation concept for Beckhoff I/O components. For the use and safe operation of the device / devices described in this documentation, additional cross-product descriptions are required, which can be found in the following table.

Title	Description
EtherCAT System Documentation (PDF)	• System overview • EtherCAT basics • Cable redundancy • Hot Connect • EtherCAT devices configuration
I/O Analog Manual (PDF)	Notes on I/O components with analog in and outputs
Infrastructure for EtherCAT/Ethernet (PDF)	Technical recommendations and notes for design, implementation and testing
Software Declarations I/O (PDF)	Open source software declarations for Beckhoff I/O components

The documentations can be viewed at and downloaded from the Beckhoff website (www.beckhoff.com) via:

- the “Documentation and Download” area of the respective product page,
- the Download finder,
- the Beckhoff Information System.

If you have any suggestions or proposals for our documentation, please send us an e-mail stating the documentation title and version number to: documentation@beckhoff.com

1.4 Safety instructions

Safety regulations

Please note the following safety instructions and explanations!
Product-specific safety instructions can be found on following pages or in the areas mounting, wiring, commissioning etc.

Exclusion of liability

All the components are supplied in particular hardware and software configurations 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 engineering 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.

2 Product description

2.1 ED3361-0100

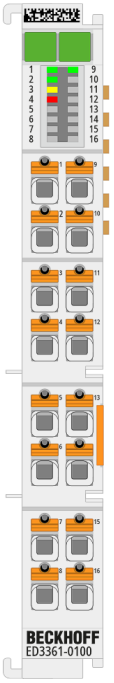


Fig. 1: ED3361-0100

EtherCAT Terminal, 1-channel analog input, measuring bridge, full bridge, 24 bit, push-in sensor power supply 5/10 V DC

The ED3361-0100 analog input terminal enables the direct connection of a resistance bridge (strain gauge – SG) or a load cell using a 4-wire or 6-wire connection technique.

It records the ratio of the bridge voltage UBridge to the measured supply voltage USense and outputs the calculated load value as a process value based on the terminal settings.

This enables precise acquisition of weights, torques, and vibrations.

Special features:

- integrated, switchable 5 V/10 V bridge supply U_{Exc}, generated from the power contacts
- Parallel connection of bridges possible thanks to powerful bridge supply
- Sampling rate of 10 ksps

The EtherCAT Terminals of the ED series feature push-in connection technology, which enables simple wiring without the need for tools.

The EtherCAT-Terminals of the ED series feature push-in connection technology, which enables simple wiring without the need for tools.

2.1.1 LEDs

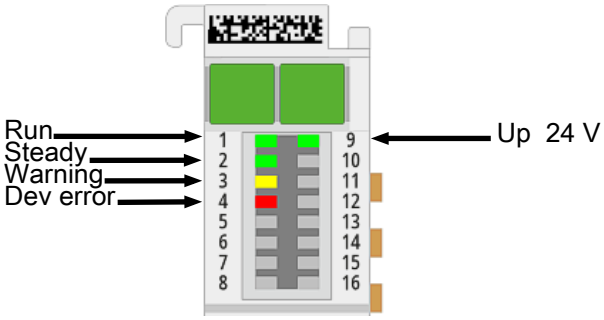


Fig. 2: ED3361-0100 LEDs

Name	No.	Color	Meaning	
RUN	1	green	This LED indicates the terminal's operating state:	
			off	State of the EtherCAT State Machine: **INIT** = initialization of the terminal
			flashing	State of the EtherCAT State Machine: **PREOP** = function for mailbox communication and different default settings set
			Single flash	State of the EtherCAT State Machine: **SAFEOP** = verification of the Sync Manager channels and the distributed clocks. Outputs remain in safe state
			on	State of the EtherCAT State Machine: **OP** = normal operating state; mailbox and process data communication is possible
			flickering	State of the EtherCAT State Machine: **BOOTSTRAP** = Function for Firmware updates [▶ 201] of the terminal
Steady	2	green	The measured value is stable	
Warning	3	yellow	Warning	
Dev error	4	red	Error	
Up 24 V	9	green	Supply voltage present	

2.1.2 Technical data

General	ED3361-0100
Number of channels | Total	1
Internal communication protocol	EtherCAT
Minimum cycle time	100 µs

Analog input measuring bridge (strain gauge)	ED3361-0100
Number of channels	1
Sensor type	Strain gauges (DMS), load cells
Connection technology	4-wire, 6-wire
Resolution | Technical	24 bit
Resolution | Process data	18.34... nV/V
Display | Process data	REAL32, INT16, INT32
ADC conversion method	Delta-Sigma
Type of conversion	simultaneous
Conversion time	min. 100 µs
Conversion rate	max. 10 ksps
Signal range $\|_{UBridge}$	± 4 V DC
Signal range $\|_{UBridge}$, end value (FSV)	4 V DC
Signal range | U_{Sense}	± 12 V DC
Signal range $\|_{USense}$, end value (FSV)	12 V DC
Internal resistance/impedance | U_{Bridge}	min. 5 MΩ
Internal resistance/impedance $\|U_{Sense}$	min. 5 MΩ
Ground reference	differential
Measuring procedure	ratiometric
Input filter cut-off frequency	10 kHz
Dielectric strength	max. 30 V
Accuracy/uncertainty | From FSV (23 °C)	< ±0.05 % for the ratio of U_{Bridge}/U_{Sense}
Accuracy/uncertainty | From FSV (largest short-term deviation during an electrical disturbance test)	< ±1 %
Temperature coefficient	typ. < 15 ppm/K
Channel crosstalk	typ. < -90 dB
Sensor power supply | Output voltage	5 V DC/10 V DC
Output current | sensor power supply	max. 100 mA
Wire break detection	yes (only forU_{Sense})

XFC	ED3361-0100
Distributed Clocks	no
Timestamp	no
Oversampling	no

Supply and electrical isolation	ED3361-0100
Electronics | supply voltage	via E-bus
E-bus | current consumption	typ. 100 mA
Power contacts | Input voltage	24 V DC (-15 %/+20 %)
Power contacts | Current carrying capacity	max. 10 A
Power contacts | Current consumption	load-dependent on the supply of the strain gauge used
Power contacts | Output voltage	corresponds to Power contacts | Input voltage
Electrical isolation | channel/channel	no
Electrical isolation | channel/bus	functional, 707 V_{DC} type test

Environmental conditions	ED3361-0100
Operating temperature	-25 … +55 °C
Storage temperature	-40…+85 °C
Relative humidity	95 %, no condensation
Installation position	variable

Standards and approvals	ED3361-0100
Vibration resistance	conforms to EN 60068-2-6
Shock resistance	conforms to EN 60068-2-27
EMC immunity	conforms to EN 61000-6-2
EMC emission	conforms to EN 61000-6-4
Markings*)	CE
Approvals*)	-
*) Real applicable approvals/markings see name plate on the side (product labeling)	

Housing data	ED-12-16pin
Weight	approx. 60 g
Protection rating	IP20
Material	Polycarbonate
Dimensions | Width (single)	15 mm
Dimensions | width (stacked)	12 mm
Dimensions | height	100 mm
Dimensions | depth	65 mm
Mounting | Terminal/Back wall	35-mm-mounting-rail (EN 60715)
Mounting | Terminal/Terminal	double groove-tongue connection
pluggable wiring level	no
Connection technology	Push-in
Connection cross-section | Single-wire, solid	0.08…1.5 mm²
Connection cross-section | Fine wire, stranded wire	0.25…1.5 mm²
Connection cross-section | ferrule	0.14…0.75 mm²
Connection cross-section AWG | Single-wire, solid	AWG28…16
Connection cross-section AWG | fine wire, stranded wire	AWG22…16
Connection cross section AWG | Wire end ferrule	AWG26…19
Strip length	8 … 9 mm
Power contact | "+" (left)	yes
Power contact | "+" (right)	yes
Power contact | "-" (left)	yes
Power contact | "-" (right)	yes
Power contact | "⏚" (left)	no
Power contact | "⏚" (right)	no
Slide-in lock for power contact "⏚"	yes

2.1.3 Connection

⚠ WARNING

Risk of electric shock and damage of device!

Bring the bus terminal system into a safe, powered down state before starting installation, disassembly or wiring of the bus terminals!

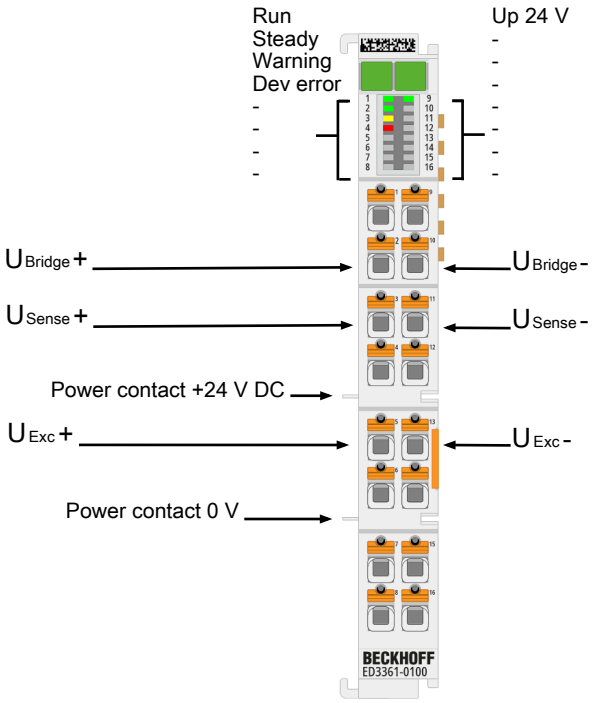


Fig. 3: ED3361-0100

NOTICE

Cable lengths > 30 m

For cable lengths > 30 m, suitable overvoltage protection (Surge-Protection) must be provided (e g. EL9540-0010) if corresponding interference could affect the signal cable.

Connection ED3361-0100

Terminal point		Description
Abbreviation	No.	
n.c.	1	not connected
UBridge+	2	Bridge voltage input+
USense+	3	Input reference voltage+
UExc+	4	Output sensor power supply+
n.c.	5	not connected
n.c.	6	not connected
n.c	7	not connected
n.c	8	not connected
n.c.	9	not connected
UBridge-	10	Bridge voltage input-
USense-	11	Input reference voltage-
UExc-	12	Output sensor power supply-
n.c.	13	not connected
n.c.	14	not connected
n.c	15	not connected
n.c	16	not connected

2.2 ED3362-0100

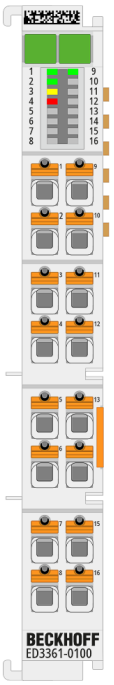


Fig. 4: ED3362-0100

EtherCAT Terminal, 2-channel analog input, measuring bridge, full bridge, 24 bit, push-in sensor power supply 5/10 V DC

The ED3362-0100 analog input terminal enables the direct connection of two independent resistance bridges (strain gauges – SG) or load cells using the 4-wire or 6-wire connection technique.

It records the ratio of the bridge voltage U_{Bridge} to the measured supply voltage U_{Sense} and outputs the calculated load value as a process value based on the terminal settings.

This enables precise acquisition of weights, torques, and vibrations.

Special features:

- integrated, switchable 5 V/10 V bridge supply U_{Exc}, generated from the power contacts
- Parallel connection of bridges possible thanks to powerful bridge supply
- Sampling rate of 10 ksps.

The EtherCAT-Terminals of the ED series feature push-in connection technology, which enables simple wiring without the need for tools.

2.2.1 Technical data

General	ED3362-0100
Number of channels | Total	2
Internal communication protocol	EtherCAT
Minimum cycle time	100 µs

Analog input measuring bridge (strain gauge)	ED3362-0100
Number of channels	2
Sensor type	Strain gauges (DMS), load cells
Connection technology	4-wire, 6-wire
Resolution | Technical	24 bit
Resolution | Process data	18.34... nV/V
Display | Process data	REAL32, INT16, INT32
ADC conversion method	Delta-Sigma
Type of conversion	simultaneous
Conversion time	min. 100 µs
Conversion rate	max. 10 ksps
Signal range $\|_{UBridge}$	± 4 V DC
Signal range $\|_{UBridge}$, end value (FSV)	4 V DC
Signal range | U_{Sense}	± 12 V DC
Signal range $\|_{USense}$, end value (FSV)	12 V DC
Internal resistance/impedance | U_{Bridge}	min. 5 MΩ
Internal resistance/impedance $\|U_{Sense}$	min. 5 MΩ
Ground reference	differential
Measuring procedure	ratiometric
Input filter cut-off frequency	10 kHz
Dielectric strength	max. 30 V
Accuracy/uncertainty | From FSV (23 °C)	< ±0.05 % for the ratio of U_{Bridge}/U_{Sense}
Accuracy/uncertainty | From FSV (largest short-term deviation during an electrical disturbance test)	< ±1 %
Temperature coefficient	typ. < 15 ppm/K
Channel crosstalk	typ. < -90 dB
Sensor power supply | Output voltage	5 V DC/10 V DC
Output current | sensor power supply	max. 100 mA
Wire break detection	yes (only forU_{Sense})

XFC	ED3362-0100
Distributed Clocks	no
Timestamp	no
Oversampling	no

Supply and electrical isolation	ED3362-0100
Electronics | supply voltage	via E-bus
E-bus | current consumption	typ. 100 mA
Power contacts | Input voltage	24 V DC (-15 %/+20 %)
Power contacts | Current carrying capacity	max. 10 A
Power contacts | Current consumption	load-dependent on the supply of the strain gauge used
Power contacts | Output voltage	corresponds to Power contacts | Input voltage
Electrical isolation | channel/channel	no
Electrical isolation | channel/bus	functional, 707 V_{DC} type test

Environmental conditions	ED3362-0100
Operating temperature	-25 … +55 °C
Storage temperature	-40…+85 °C
Relative humidity	95 %, no condensation
Installation position	variable

Standards and approvals	ED3362-0100
Vibration resistance	conforms to EN 60068-2-6
Shock resistance	conforms to EN 60068-2-27
EMC immunity	conforms to EN 61000-6-2
EMC emission	conforms to EN 61000-6-4
Markings*)	CE
Approvals*)	-
*) Real applicable approvals/markings see name plate on the side (product labeling)	

Housing data	ED-12-16pin
Weight	approx. 60 g
Protection rating	IP20
Material	Polycarbonate
Dimensions | Width (single)	15 mm
Dimensions | width (stacked)	12 mm
Dimensions | height	100 mm
Dimensions | depth	65 mm
Mounting | Terminal/Back wall	35-mm-mounting-rail (EN 60715)
Mounting | Terminal/Terminal	double groove-tongue connection
pluggable wiring level	no
Connection technology	Push-in
Connection cross-section | Single-wire, solid	0.08…1.5 mm²
Connection cross-section | Fine wire, stranded wire	0.25…1.5 mm²
Connection cross-section | ferrule	0.14…0.75 mm²
Connection cross-section AWG | Single-wire, solid	AWG28…16
Connection cross-section AWG | fine wire, stranded wire	AWG22…16
Connection cross section AWG | Wire end ferrule	AWG26…19
Strip length	8 … 9 mm
Power contact | "+" (left)	yes
Power contact | "+" (right)	yes
Power contact | "-" (left)	yes
Power contact | "-" (right)	yes
Power contact | "⏚" (left)	no
Power contact | "⏚" (right)	no
Slide-in lock for power contact "⏚"	yes

2.2.2 Connection

⚠ WARNING

Risk of electric shock and damage of device!

Bring the bus terminal system into a safe, powered down state before starting installation, disassembly or wiring of the bus terminals!

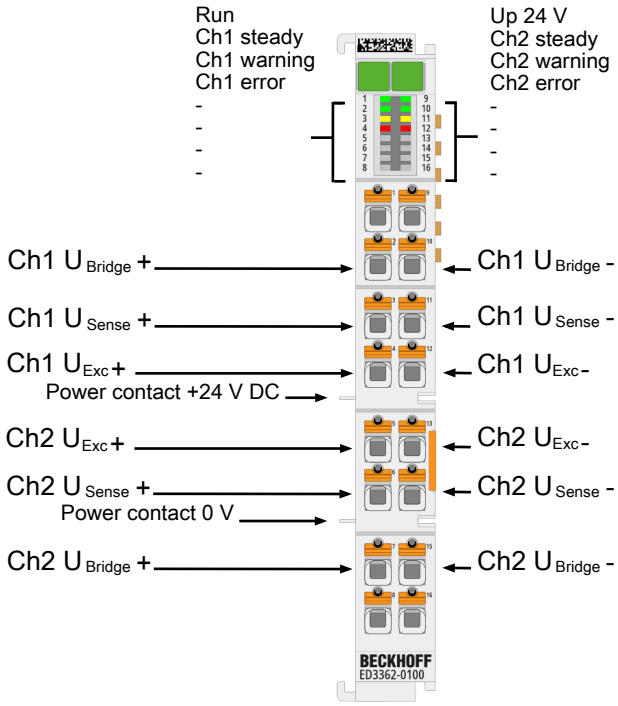


Fig. 5: ED3362-0100

NOTICE

Cable lengths > 30 m

For cable lengths > 30 m, suitable overvoltage protection (Surge-Protection) must be provided (e g. EL9540-0010) if corresponding interference could affect the signal cable.

Connection ED3362-0100

Terminal point		Description
Abbreviation	No.	
n.c.	1	not connected
Ch1 UBridge+	2	Channel 1 Input bridge voltage+
Ch1 USense+	3	Channel 1 Input reference voltage+
Ch1 UExc+	4	Channel 1 Output sensor power supply+
Ch2 UExc+	5	Channel 2 Output sensor power supply+
Ch2 USense+	6	Channel 2 Input reference voltage+
Ch2 UBridge+	7	Channel 2 Input bridge voltage+
n.c	8	not connected
n.c.	9	not connected
Ch1 UBridge-	10	Channel 1 Input bridge voltage-
Ch1 USense-	11	Channel 1 Input reference voltage-
Ch1 UExc-	12	Channel 1 Output sensor power supply-
Ch2 UExc-	13	Channel 2 Output sensor power supply-
Ch2 USense-	14	Channel 2 Input reference voltage-
Ch2 UBridge-	15	Channel 2 Input bridge voltage-
n.c	16	not connected

2.2.3 LEDs

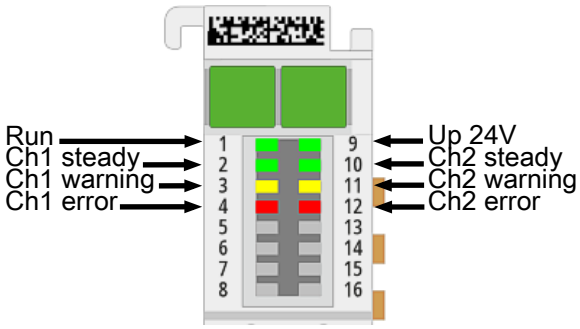


Fig. 6: ED3362-0100 LEDs

Name	No.	Color	Meaning	
RUN	1	green	This LED indicates the terminal's operating state:	
			off	State of the EtherCAT State Machine: **INIT** = initialization of the terminal
			flashing	State of the EtherCAT State Machine: **PREOP** = function for mailbox communication and different default settings set
			Single flash	State of the EtherCAT State Machine: **SAFEOP** = verification of the Sync Manager channels and the distributed clocks. Outputs remain in safe state
			on	State of the EtherCAT State Machine: **OP** = normal operating state; mailbox and process data communication is possible
			flickering	State of the EtherCAT State Machine: **BOOTSTRAP** = Function for Firmware updates [▶ 201] of the terminal
Ch1 steady	2	green	Channel 1: The measured value is stable	
Ch1 warning	3	yellow	Channel 1: Warning	
Ch1 error	4	red	Channel 1: Error	
Up 24 V	9	green	Supply voltage present	
Ch2 steady	10	green	Channel 2: The measured value is stable	
Ch2 warning	11	yellow	Channel 2: Warning	
Ch2 error	12	red	Channel 2: Error	

3 Mounting and wiring

3.1 Instructions for ESD protection

NOTICE

Destruction of the devices by electrostatic discharge possible!

The devices contain components at risk from electrostatic discharge caused by improper handling.

- When handling the components, ensure that there is no electrostatic discharge; also avoid touching the spring contacts directly (see illustration).
- Contact with highly insulating materials (synthetic fibers, plastic films, etc.) should be avoided when handling components at the same time.
- When handling the components, ensure that the environment (workplace, packaging and persons) is properly earthed.
- Each bus station must be terminated on the right-hand side with the EL9011 or EL9012 end cap to ensure the degree of protection and ESD protection.

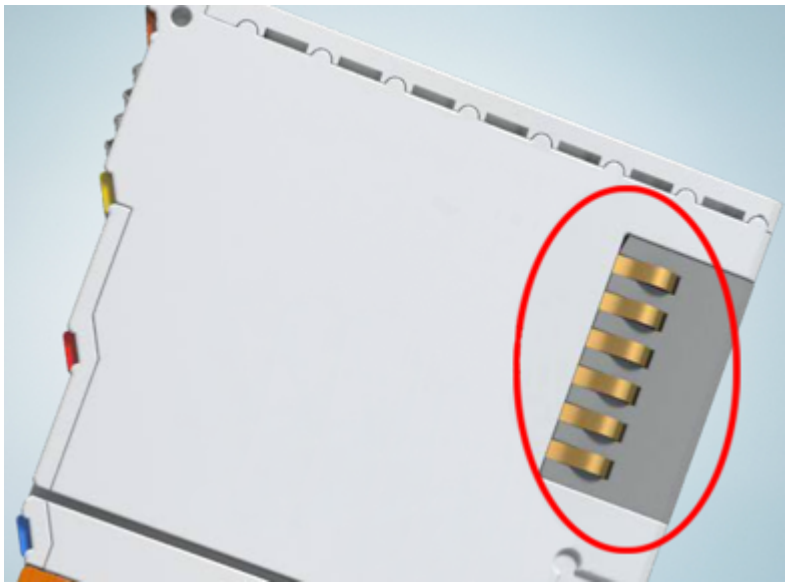


Fig. 7: Spring contacts of the Beckhoff I/O components

3.2 Mounting rail installation

⚠ WARNING

Risk of electric shock and damage of device!

Bring the bus terminal system into a safe, powered down state before starting installation, disassembly or wiring of the bus terminals!

The Bus Terminal system and is designed for mounting in a control cabinet or terminal box.

Assembly

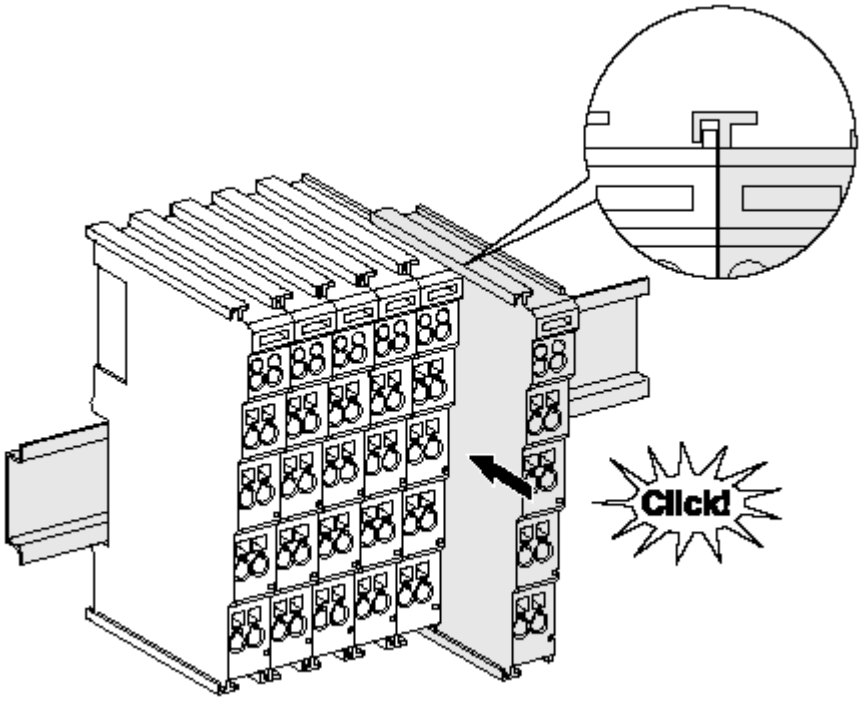


Fig. 8: Attaching on mounting rail

The bus coupler and bus terminals are attached to commercially available 35 mm mounting rails (DIN rails according to EN 60715) by applying slight pressure:

1. First attach the fieldbus coupler to the mounting rail.
2. The bus terminals are now attached on the right-hand side of the fieldbus coupler. Join the components with tongue and groove and push the terminals against the mounting rail, until the lock clicks onto the mounting rail.
   If the terminals are clipped onto the mounting rail first and then pushed together without tongue and groove, the connection will not be operational! When correctly assembled, no significant gap should be visible between the housings.

Fixing of mounting rails

The locking mechanism of the terminals and couplers extends to the profile of the mounting rail. At the installation, the locking mechanism of the components must not come into conflict with the fixing bolts of the mounting rail. To mount the mounting rails with a height of 7.5 mm under the terminals and couplers, you should use flat mounting connections (e.g. countersunk screws or blind rivets).

NOTICE

Ground the mounting rail!

Ensure that the mounting rail is sufficiently grounded.

Connections within a bus terminal block

The electric connections between the bus coupler and the bus terminals are automatically realized by joining the components:

- The six spring-loaded contacts of the E-bus/K-bus deal with the transfer of the data and the supply of the bus terminal electronics.
- The power contacts deal with the supply for the field electronics and thus represent a supply rail within the bus terminal block. The power contacts are supplied via terminal points on the bus coupler (up to 24 V) or via power supply terminals for higher voltages.

Power contacts

When configuring a bus terminal block, note the contact assignments of the individual bus terminals, as some types

- do not loop through the power contacts or do not loop them through completely (e. g. analog bus terminals or digital 4-channel bus terminals),
- the power contacts are disconnected, thus marking the start of a new supply rail (power supply terminals).

Power contact ⏚

The power contact labeled ⏚ (earthing connection according to IEC 60417-5017, British English: earth, American English: ground) can be used as grounding. For safety reasons this contact mates first when plugging together, and can ground short-circuit currents of up to 125 A.

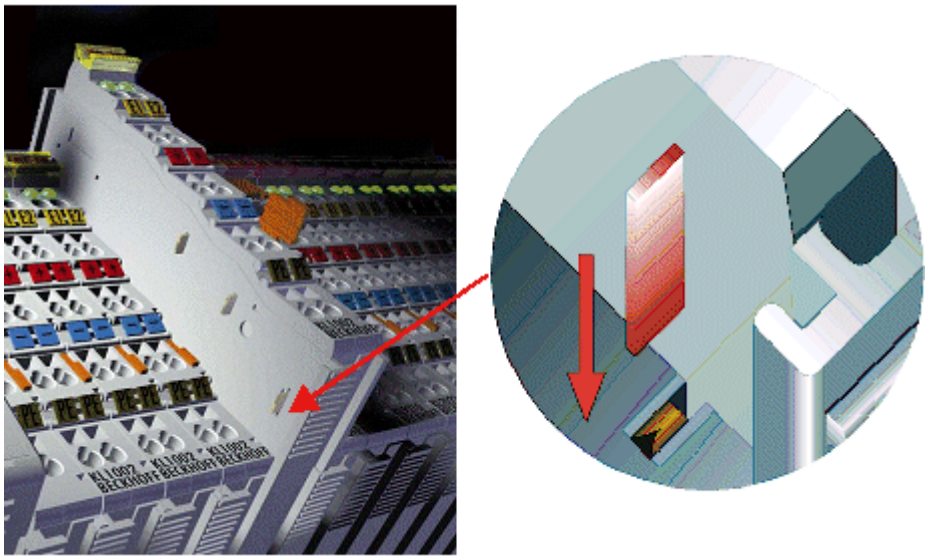


Fig. 9: Power contact on left side

⚠ WARNING

Risk of electric shock!

The power contact labeled ⏚ must not be used for other potentials!

NOTICE

Possible damage of the device

Note that, for reasons of electromagnetic compatibility, the earthing contacts are capacitatively coupled to the mounting rail. This may lead to incorrect results during insulation testing or to damage on the terminal (e.g. disruptive discharge to the earthing line during insulation testing of a consumer with a nominal voltage of 230 V). For insulation testing, disconnect the earthing supply line at the Bus Coupler or the Power Feed Terminal! In order to decouple further feed points for testing, these Power Feed Terminals can be released and pulled at least 10 mm from the group of terminals.

Disassembly

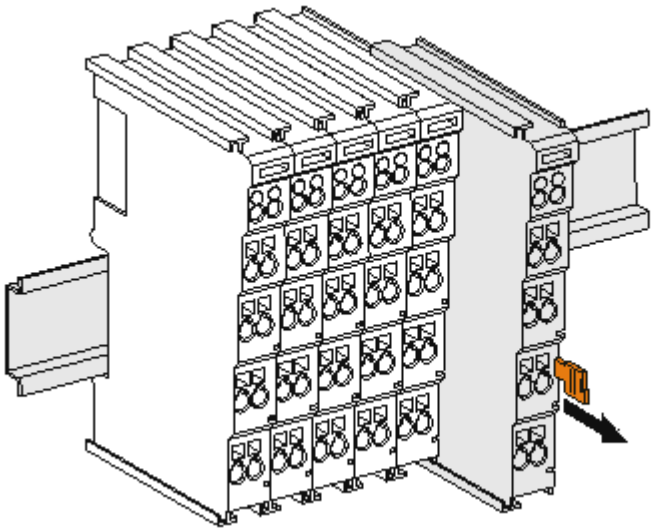


Fig. 10: Disassembling of terminal

Each terminal is secured by a lock on the mounting rail, which must be released for disassembly:

1. Pull the terminal by its orange-colored lugs approximately 1 cm away from the mounting rail. In doing so for this terminal the mounting rail lock is released automatically and you can pull the terminal out of the bus terminal block easily without excessive force.
2. Grasp the released terminal with thumb and index finger simultaneous at the upper and lower grooved housing surfaces and pull the terminal out of the bus terminal block.

3.3 Positioning of passive Terminals

Hint for positioning of passive terminals in the bus terminal block

EtherCAT Terminals, which do not take an active part in data transfer within the bus terminal block are so called passive terminals. The passive terminals have no current consumption out of the E-Bus.
To ensure an optimal data transfer, you must not directly string together more than two passive terminals!

Examples for positioning of passive terminals (highlighted)

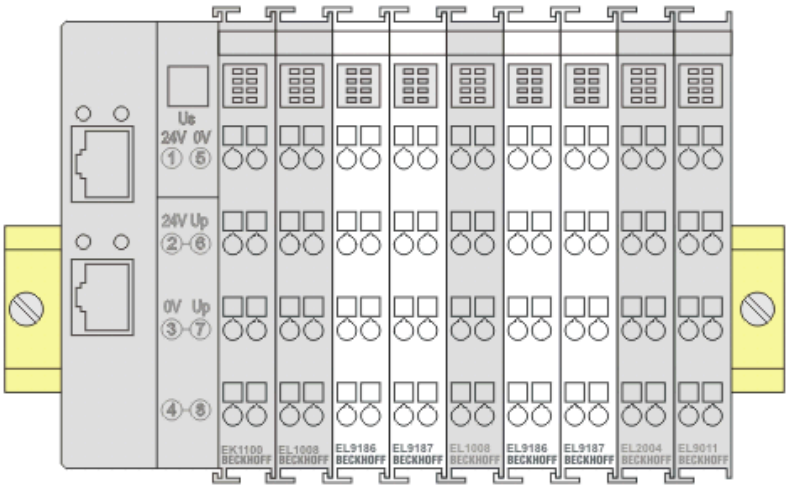


Fig. 11: Correct positioning

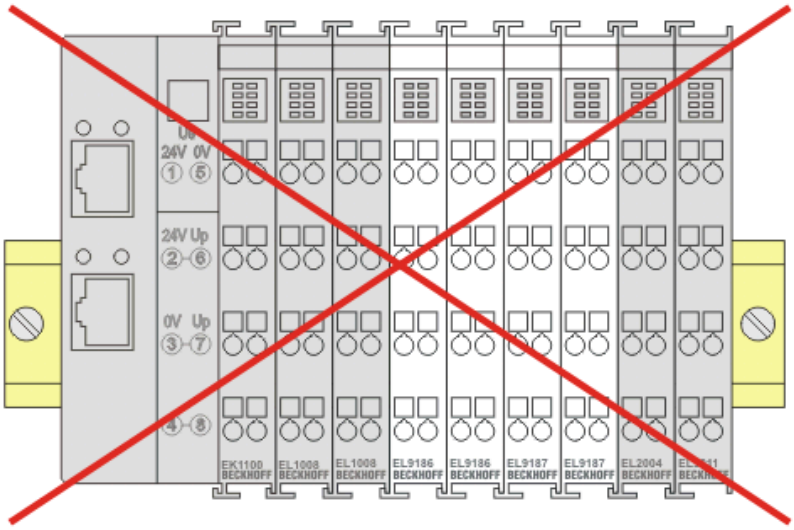


Fig. 12: Incorrect positioning

3.4 Installation positions

NOTICE

Constraints regarding installation position and operating temperature range

- Please refer to the technical data of the device to ascertain whether any restrictions regarding the installation position and/or the operating temperature range have been specified.
- When installing devices with increased heat dissipation, ensure that there is sufficient space above and below the devices during operation to guarantee adequate ventilation!

The installation positions and their names for mounting devices on mounting rails are specified below. The illustration of the devices in the following figures is an example.
The following applies to all installation positions: The reference direction "down" (see arrow) is the acceleration of gravity.

Horizontal installation (standard installation)

The mounting rail is mounted horizontally on a vertical mounting plate.
The connection level of the devices points to the front.

The devices are ventilated from below, which enables optimum cooling of the electronics through convection. This is therefore also the recommended installation position.

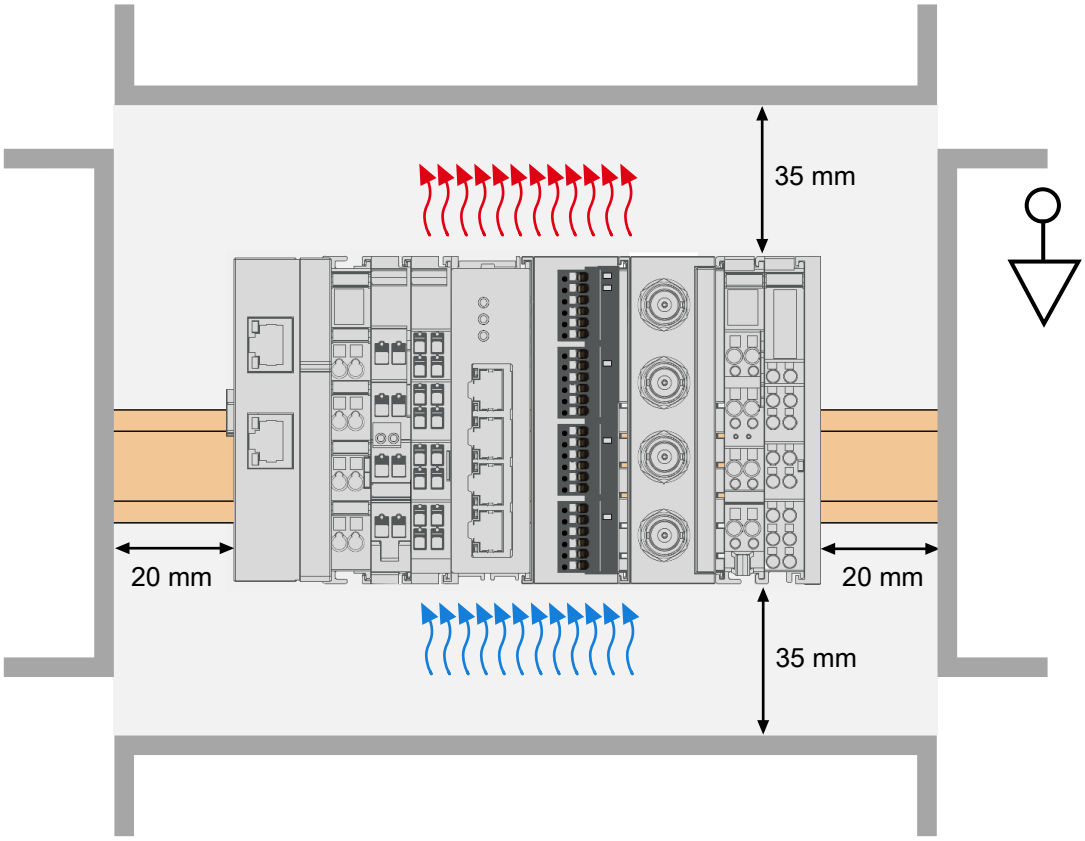


Fig. 13: Recommended minimum distances for standard installation position

NOTICE

Compliance with the minimum distances

Compliance with the minimum distances shown in the figure "Recommended minimum distances for standard installation position" is strongly recommended in all installation positions.

Vertical installation

The mounting rail is mounted vertically on a vertical mounting plate.
The connection level of the devices points to the front.
The devices can be arranged as follows:

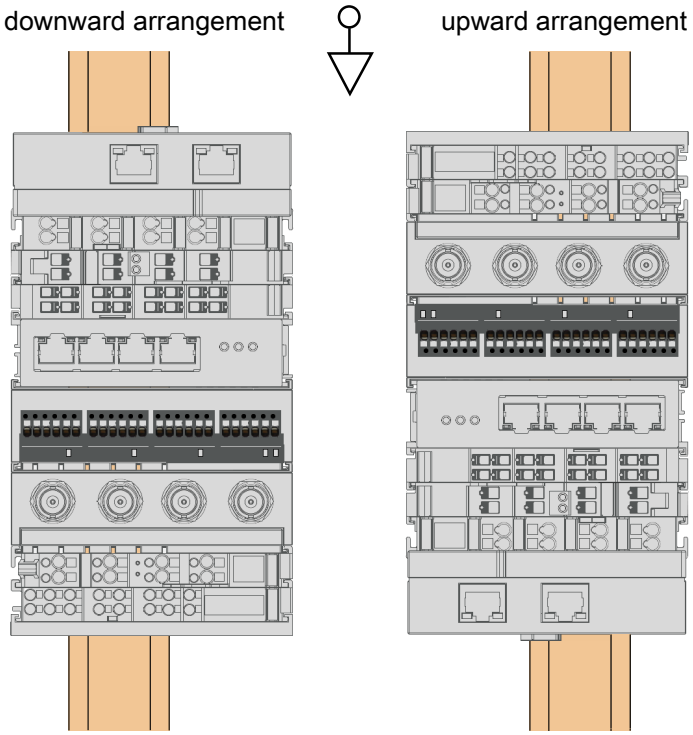


Fig. 14: Installation position Vertical, downward arrangement (left) / upward arrangement (right)

Flat installation

In the flat installation position, the mounting rail is laid on a horizontal mounting plate.
The connection level of the devices points upwards.

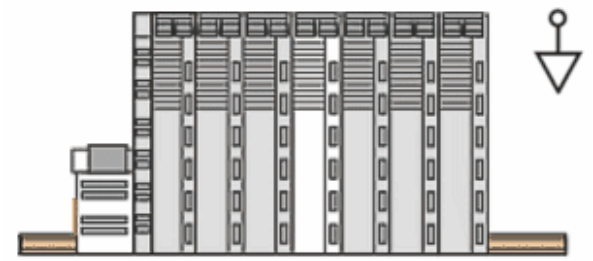


Fig. 15: Flat installation position

NOTICE

Danger of sliding off the mounting rail

Particularly in the "vertical" installation position, but also in other installation positions under corresponding mechanical load, the terminal segment may move on the mounting rail. These can lead to undesirable malfunctions.

- If this risk exists, secure the terminal segment with appropriate locking devices, e.g. by clamping it to the mounting rail.

NOTICE

Compliance with the minimum distances

Compliance with the minimum distances shown in the figure "Recommended minimum distances for standard installation position" is strongly recommended in all installation positions.

Installation positions with ZB8610 fan cartridge

If the cooling should or must be increased for the intended application, the ZB8610 fan cartridge can be mounted on the underside of the device. In the horizontal installation position, the devices are ventilated from bottom to top by the fan cartridge. The optimum cooling is further enhanced by convection ventilation (see following figure).

The fan cartridge can be used in any installation position.

Further information on operation with and without a fan can be found in the technical data for the device (e.g. derating, information on installation positions, etc.).

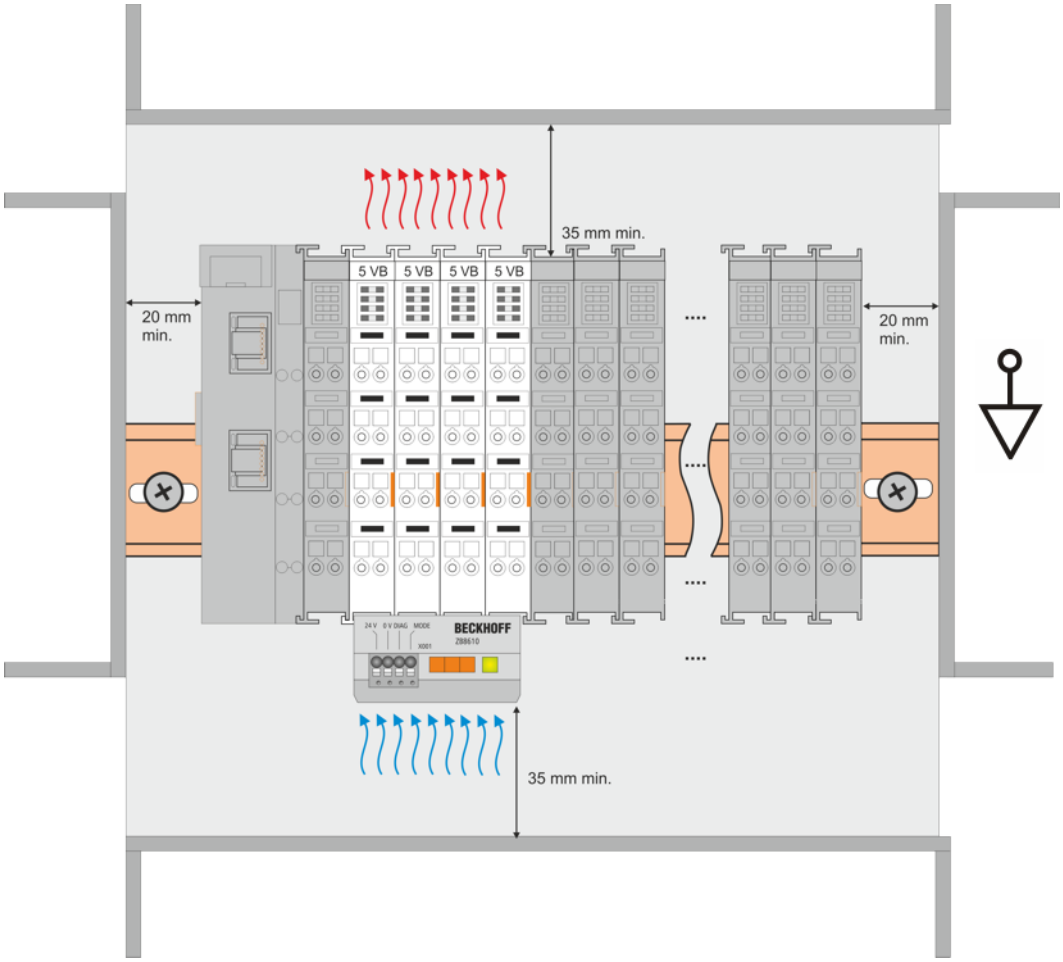


Fig. 16: Recommended minimum distances for operation with fan, using horizontal installation position as an example

NOTICE

Compliance with the minimum distances

Compliance with the minimum distances as shown in the figure "Recommended minimum distances for operation with fan" is strongly recommended.

3.5 Push-in connection technology (EC/ED/EFxxxx)

⚠ WARNING

Risk of electric shock and damage of device!

Bring the bus terminal system into a safe, powered down state before starting installation, disassembly or wiring of the bus terminals!

In the case of EC/ED/EFxxxx series terminals with push-in connection technology, solid conductors fitted with wire end ferrules can be plugged in directly without tools (see "Wiring [▶ 30]" section).

Ultrasonically compacted strands

Ultrasonically compacted (ultrasonically welded) strands can also be connected.

- Please note the information on the connection cross-section in the table housing data in the chapter Technical data of the relevant device!

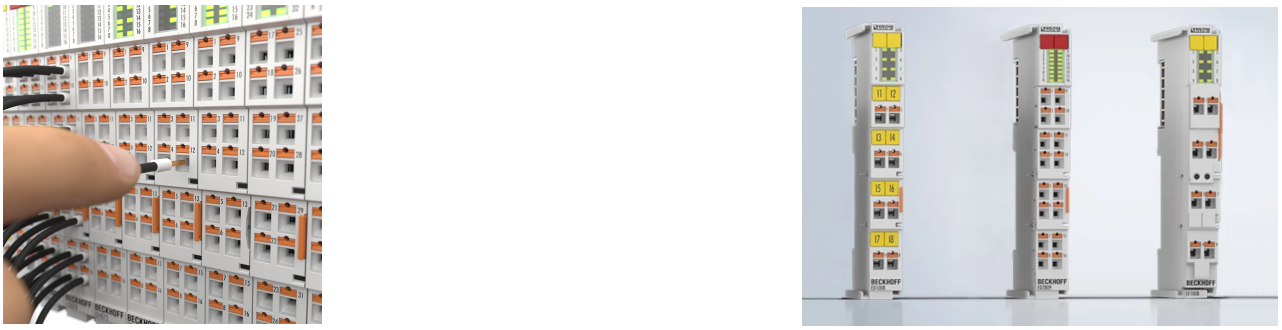


Fig. 17: Tool-free push-in connection; housing types ED-12-8pin, ED-12-16pin and EF-12-8pin

The following connection options are available for optimum adaptation to the application:

- The terminal blocks of the EC/EDxxxx series contain electronics and connection level in one housing.
- The terminal blocks in the EFxxxx series have a pluggable connection level. In the case of service, the pluggable connection level allows the entire wiring to be removed from the top of the housing as a single plug. This reduces the installation time and eliminates the risk of wires being mixed up. The plug is only slightly protruding (for dimensions, see Technical data -> Housing data of the corresponding product).
  Installation and wiring are carried out as for the EDxxxx series terminals.
  Proceed as follows when replacing:
  - Press the unlocking hub and pull the lower part out of the terminal block.
  - Push in the component to be replaced and plug the connector with the upright wiring back in.

Strain relief of the cable

A tab for strain relief of the cable simplifies assembly in many applications and prevents entangling of the individual connection wires when the connector is pulled.

Overview of enclosure designs

EC/EDxxxx housing designs, contain the electronics and connection level in one housing	EFxxxx Enclosure designs with pluggable wiring level	Description
EC-40-8pin	-	8 connection points on 40 mm
ED-12-8pin	EF-12-8pin	8 connection points on 12 mm
ED-24-2x8pin	EF-24-2x8pin	16 connection points on 24 mm
ED-12-16pin	-	16 connection points on 12 mm
ED-24-2x16pin	-	32 connection points on 24 mm

3.5.1 Wiring with push-in connection technology EC/ED/EFxxxx

⚠ WARNING

Risk of electric shock and damage of device!

Bring the bus terminal system into a safe, powered down state before starting installation, disassembly or wiring of the bus terminals!

1.) Tool-free connection for solid conductors and Conductors with ferrules

2.) Connection by push-button actuation for stranded wire conductors and loosening the conductor (with tools)

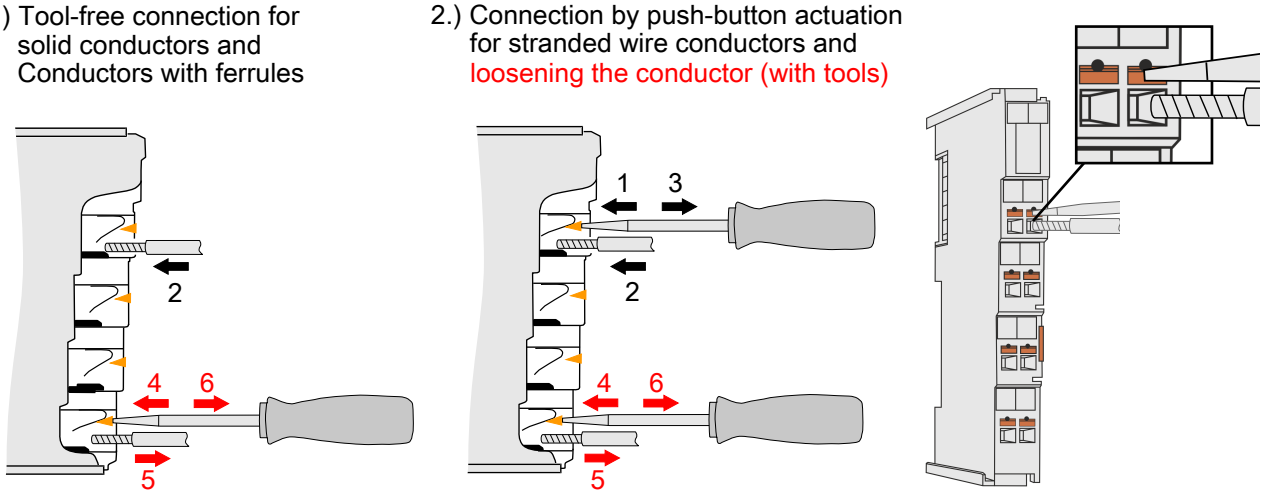


Fig. 18: Wiring and disconnecting the conductors

1. **Connect solid conductors and conductors with ferrules (Fig. top left, step 2)**
   These can be connected using the direct plug-in technique without tools.
   - Insert the conductor into the terminal point after stripping the insulation (2)
2. **Connect fine-stranded cables (Fig. top right, steps 1 - 3)**
   These must be connected via the push-button.
   - Use a screwdriver to press the push-button to open the contact point (1).
   - Then insert the conductor (2).
   - Release the push-button by pulling back the screwdriver to close the terminal point (3).

Release cables (Fig. above steps 4 - 6)
The release is carried out for all conductor types using the push-button.

- Use a screwdriver to press the push-button to unlock the contact (4).
- Then pull out the conductor (5).
- Release the push-button by pulling back the screwdriver to close the terminal point (6).

NOTICE

Observe the permissible connection cross-sections and strip lengths

The permissible conductor cross-section and strip length depend on the type of housing, please refer to the housing data in the "Technical data" chapter for the device in question.

3.5.2 Shielding

Shielding

Encoder, analog sensors and actuators should always be connected with shielded, twisted paired wires.

3.6 Note - power supply

⚠ 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.

3.7 Disposal

Products marked with a crossed-out wheeled bin shall not be discarded with the normal waste stream. The device is considered as waste electrical and electronic equipment. The national regulations for the disposal of waste electrical and electronic equipment must be observed.

4 Commissioning

NOTICE

Further information

For information on commissioning with TwinCAT and EtherCAT basics, please refer to the EtherCAT system documentation.

⚠ CAUTION

Watchdog settings

Changes to the watchdog settings can lead to unwanted system behavior or damage to devices.

- Observe the information in the chapter "Notes on watchdog settings" in the EtherCAT system documentation before making any changes to the watchdog settings!

4.1 Basic function principles

- The products are intended for the connection of force sensors that work with strain gauge measuring bridges. This allows weights, torques or vibrations to be recorded.
- This product is not a stand-alone scale, but is intended for use only in conjunction with a PLC/ Controller.
- A full bridge must be connected. If only a quarter or half bridge is available, external auxiliary bridges must be added. The nominal value must then be adjusted accordingly.
- If the U_{Exc} supply provided by the product is used, the product must be used in 6-wire operation or bridges must be set between U_{Exc} and U_{Sense}. The supply voltage is not passed on internally to theU_{Sense} channels.

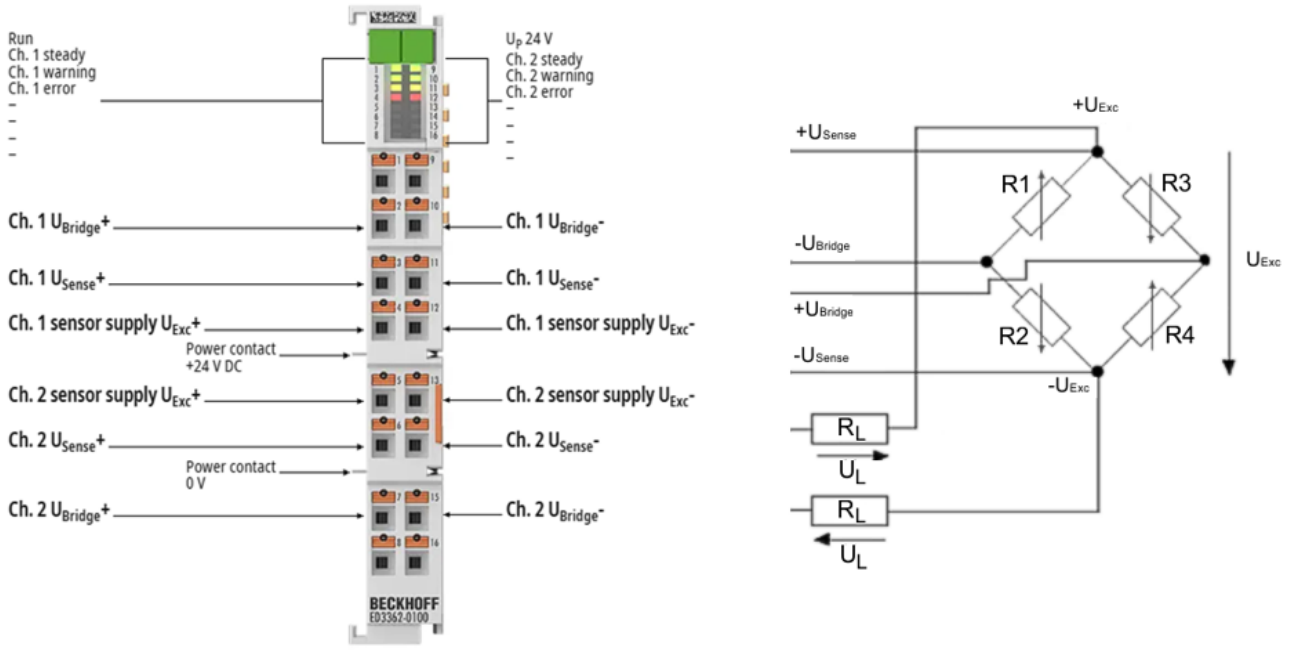


Fig. 19: ED3362-0100, 6-wire connection

- Several strain gauges can also be connected in parallel [▶ 57]. When using the U_{Exc} supply provided, the maximum supply current specified in the technical data must be observed.
- The change of the quotient of the bridge voltage to the reference voltage corresponds to the relative force acting on the load cell. The quotient is output separately as process data as the value of the ratio of the two voltages in mV/V or converted into a weight.
- The two analog channels for the measurement of bridge and reference voltage are not calibrated by the manufacturer, since this is not required for the relative measurement in strain gauge mode. This means that different values can be measured for the same signal source with different sources. If the

products output identical process values for identical applied voltages, meaning that they are exchangeable, each channel must be calibrated by the user by making settings for each channel in the CoE. User calibration or user scaling can be used for this purpose.

- The product has wire break detection for U_{Sense}. There is no wire break detection for U_{Bridge}. If one of the bridge lines is broken, however, the voltage measured there generally moves towards the end value, thus displaying an error in the status PDO. A wire break at U_{Exc} can be detected via the thresholds of Range Error (0x801D:27/28, 0x805D:27/28) and Range Warning (0x801D:2D/3D, 0x805D: 2D/3D) and in the corresponding U_{Sense} channel. The default settings lead to an error if the measured supply is <1 V.

Overview of commands

The product has several command areas

1. **0xFB00 DEV Command**
   applies to the entire product
2. **0xB030 RMB Command Ch.1**
   applies to measuring bridge channel 1 (RMB Ch.1)
3. **0xB070 RMB Command Ch.2** [only for ED3362, ED3362-0100]
   applies to measuring bridge channel 2 (RMB Ch.2)

The following commands are supported by the product

Command	Name	Meaning	Command area
0x3001	CMD_AIRESET_ALL	All counters and drag indicators are reset	0xFB00
0x301n	CMD_AIRESET_ PEAKHOLD(x)	The drag indicator (PeakHold) is reset	0xFB00
0x302n	CMD_AIRESET_ RANGEERR_CNT(x)	The range error counter is reset	0xFB00
0x303n	CMD_AIRESET_ LIMITCNT(x)	The limit counter is reset	0xFB00
0x304n	CMD_AIRESET_ RANGEWARN_CNT(x)	The range warning counter is reset	0xFB00
0x313n	CMD_SET_TARE(x)	A tare value is determined. The values are temporarily saved with this command	0xFB00
0x314n	CMD_RESET_TARE(x)	The current tare value is deleted	0xFB00
0x318n	CMD_STORE_TARE(x)	The current tare value is stored in the EEPROM (secured against power failure)	0xFB00
0x3190 0x3191	CMD_SET_USEROFFSET_TMP Ch. 1 / Ch. 2 (only for RMB channel)	A current value is determined in the user scale offset (0x80nD:0C) and the user scale (0x80n0:01) is activated. The values are temporarily saved with this command	0xFB00
0x31A0 0x31A1	CMD_RESET_USEROFFSET Ch. 1 / Ch. 2 (only for RMB channel)	The current value in the User Scale Offset (0x80nD:0C) is deleted and User Scale (0x80n0:01) is deactivated	0xFB00
0x31B0 0x31B1	CMD_STROE_USEROFFSET Ch. 1 / Ch. 2 (only for RMB channel)	User Scale Offset (0x80nD:0C) with activated User Scale (0x80n0:01) are stored fixed in the EEPROM	0xFB00
0x0101	CMD_OFFSET_ADJ	The offset calibration for the sensor calibration is performed [Zero balance]	0xB030, 0xB070
0x0102	CMD_GAIN_ADJ	The gain adjustment for the sensor calibration is performed [Sensitivity]	0xB030, 0xB070

The mapping of channel x to command index n is as follows:

Channel x	Command index n
U_{Bridge} Ch.1	0
U_{Sense} Ch.1	1
RMB Ch.1	2
U_{Bridge} Ch.2	4
U_{Sense} Ch.2	5
RMB Ch.2	6

4.2 Commissioning analog input

4.2.1 General information on commissioning the analog input

Each channel for a strain gauge measuring bridge consists of two analog inputs with different measuring ranges and different settings ex factory. The factory settings and the corresponding CoE index n for the respective analog inputs per channel are listed below. This information applies to CoE objects that are described as 0x80**n**0.

To be able to view the measured value of the analog input channels, these PDOs must first be added. After a scan in TwinCAT or manually adding to the configuration, only the PDOs for the calculated value of the measuring bridge are initially available, see chapter Process data [▶ 79].

Channel 1	Measuring range (default)	PDO data type (default)	CoE-Index n
U_{Bridge}	±20 mV	-	0
U_{Sense}	±12 V	-	1

Channel 2*)	Measuring range (default)	PDO data type (default)	CoE-Index n
U_{Bridge}	±20 mV	-	4
U_{Sense}	±12 V	-	5

*) only valid for ED3362-0x00

4.2.2 Data flow analog input voltage measurement

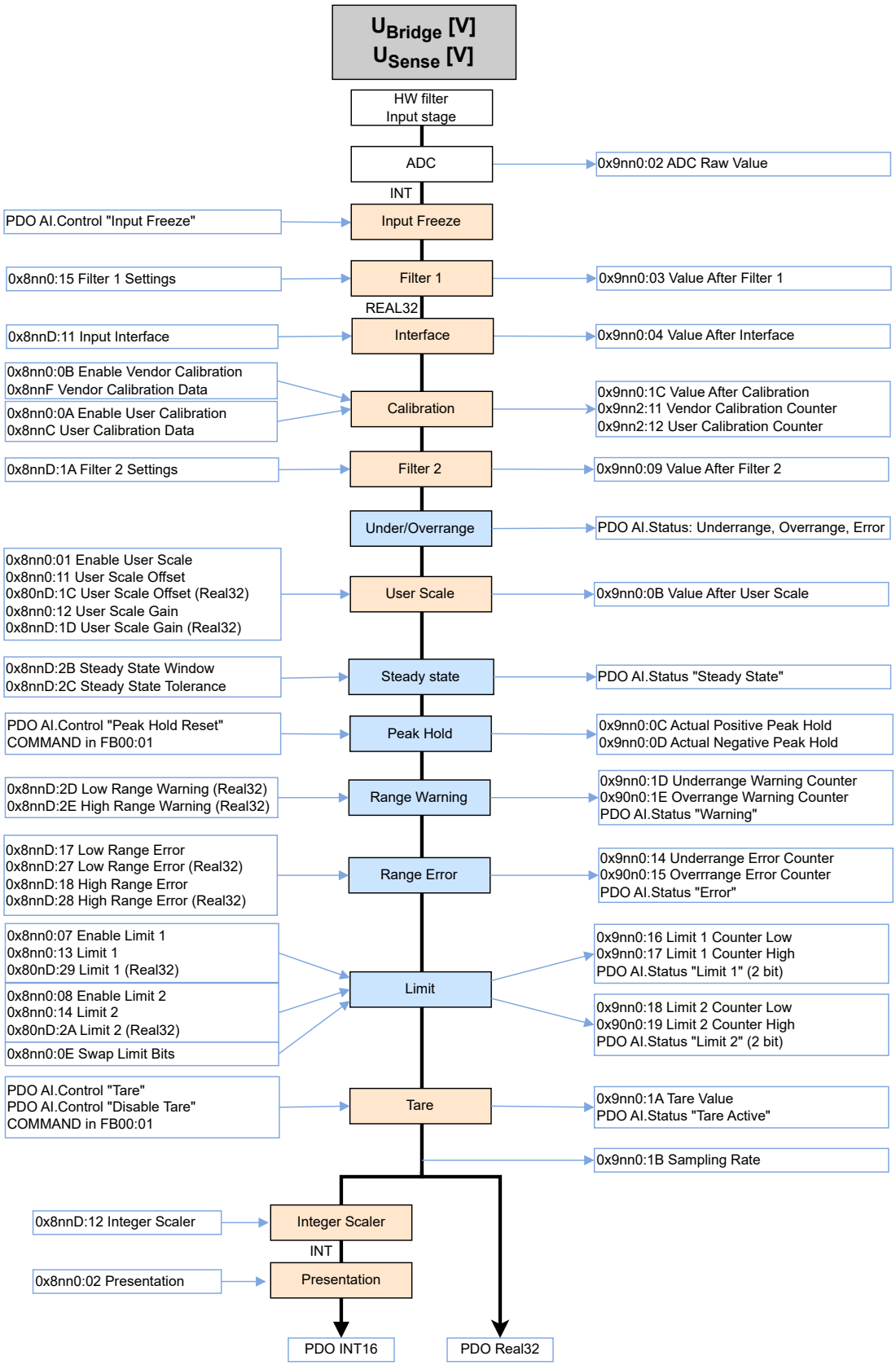


Fig. 20: Data flow analog input

Data flow diagram legend

Left column:	**Middle column:**	**Right column:**
Changeable parameters (CoE settings or status PDO) that influence processing	Functional units	Intermediate values and results, displayed in the CoE or status PDO

This terminal only uses floating point calculations internally, as shown in the data flow. This considerably simplifies and shortens the commissioning of the analog channel, which minimizes errors in understanding. In addition, intermediate values along the data calculation can be easily displayed in the CoE.

The Real32 and INT16 values are defined in the CoE without units. However, the unit is determined by the context and should, wherever possible, be regarded as an SI unit. For example, the voltage is measured in V, the current in A (even with 20 mA input!), the resistance in ohms and the ratio in V/V....

Note: Individual functional units (see data flow) have already been introduced in earlier analog devices based on INT16 (integer) and are controlled by these INT-based parameters. Such INT parameters are still supported for compatibility reasons. For example, existing code in the controller should access the CoE via ADS. This means that parameters of functional units are either

- only available as REAL32 types in the CoE if the functional unit was newly introduced with the FloatingPoint data flow, or
- are present in the CoE both as INT type and as REAL32 type with the same meaning, recognizable by the name suffix "(Real32)". The values are automatically mirrored by the firmware when they are changed or taken into account one after the other.

When re-implementing the analog function, it is recommended to use the Real32 parameters.

Commissioning of the analog input in TwinCAT should follow this data flow and is described below.

4.2.2.1 Input Freeze

If the terminal is placed in the freeze state by Input Freeze via the process data in the control word, no further analog measured values are relayed to the internal filter. This function can be used if an excessive load is expected at the measurement input, e g. if a filling surge is expected in a weighing application, which would unnecessarily overload the filters due to the force. This would result in a certain amount of time elapsing until the filter had settled again. The user must determine for himself how long the input freeze is useful; the time control and decision on the input freeze must be implemented by the user in the PLC, it is not part of the device.

To activate, the control PDO *Input Freeze* must be set to "1". As long as *Input Freeze* is set to "1", no values are passed on in the data flow.

Exemplary use: If the measured value has changed by more than 5 % from the last cycle (cycle time 100 µs) or by a fixed value such as 10 g as an indication of a sudden load, Input Freeze is activated by a TOF module for 50 ms. The peak load is no longer acknowledged by the device. If the change in measured value and the time are optimally adjusted to the expected force surge, the device can measure the current analogue value without overshoot.

4.2.2.2 Filter 1 (low-pass filter)

A digital filter with predefined properties is available in the analog channel. Depending on the setting, it can take on the characteristics of a filter with finite impulse response (FIR filter) or with infinite impulse response (IIR filter).

This filter works on the integer values and is therefore independent of the interface.

In CoE 0x90n0:1B *Sampling Rate* the current conversion rate is displayed in [Hz], depending on the filter setting.

The filter can be set per channel via CoE object 0x80n0:15 *Filter 1 Settings*. The filter is disabled via the selectable value "None".

Filter type	Name	0x80n0:15 (Dec)
FIR	50 Hz FIR	0 (default value)
FIR	60 Hz FIR	1
IIR	IIR 1	2
IIR	IIR 2	3
IIR	IIR 3	4
IIR	IIR 4	5
IIR	IIR 5	6
IIR	IIR 6	7
IIR	IIR 7	8
IIR	IIR 8	9
-	None	65535

FIR filter

The filter with FIR characteristics operates as a notch filter. A 50 Hz and a 60 Hz filter are available. Notch filter means that the filter has zeros (notches) in the frequency response at the filter frequency and multiples thereof, i.e. it attenuates the amplitude at these frequencies. The FIR filter works as a non-recursive filter.

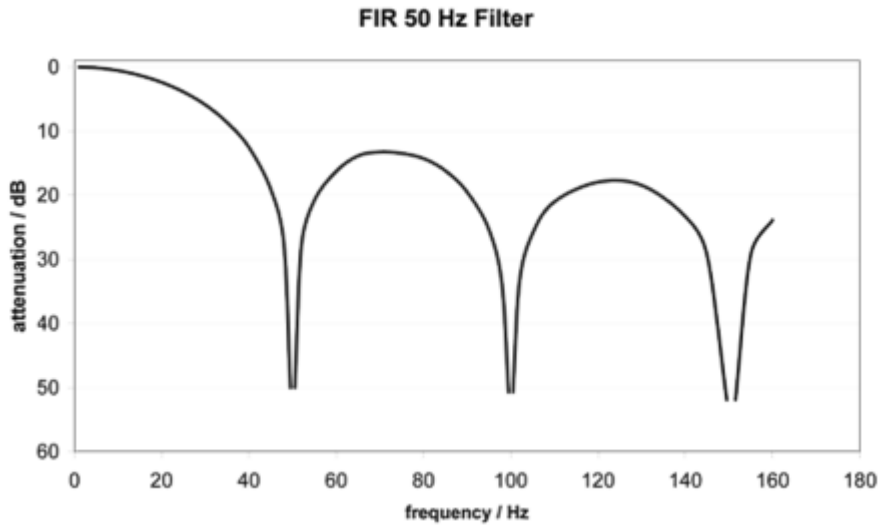


Fig. 21: FIR 50 Hz filter

IIR filter

The filter with IIR characteristic is a time-discrete, linear, time-invariant 1st order low-pass filter (-20 dB/decade), which can be set in 8 levels, i.e. cut-off frequencies (level 1 = weak recursive filter, up to level 8 = strong recursive filter). The IIR can be understood to be a moving average value calculation after a low-pass filter.

IIR filter	Cut-off frequency (-3 dB)
IIR 1	1 kHz
IIR 2	500 Hz
IIR 3	285 Hz
IIR 4	142 Hz
IIR 5	66 Hz
IIR 6	33 Hz
IIR 7	17 Hz
IIR 8	8.2 Hz

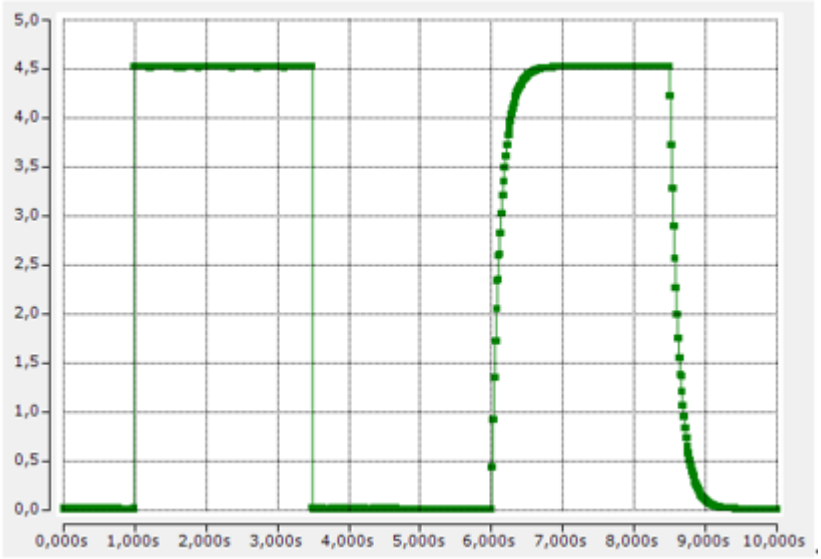


Fig. 22: Comparison of square wave signal 0.2 Hz/4.5 V, EtherCAT cycle time 100 µs, left filter disabled, right IIR8

4.2.2.3 Interface

The interface setting is fundamental for operation as an electrical measurement input.
Setting: CoE Index 0x80nD:11 "Input Interface"

Different measuring ranges are available depending on the channel:

Bridge voltage$_{UBridge}$ (for n=0 (Ch. 1), n=4 (Ch. 2))

- None
- ±20 mV
- ±75 mV
- ±4 V

Reference voltage$_{USense}$ (for n=1 (Ch. 1), n=5 (Ch. 2))

- None
- ±5 V
- ±10 V
- ±12 V

If the interface is set to "None", the corresponding channel is disabled.

Note: When the interface is changed, the following CoE parameters of UserScale, Range Error, Limit 1/2 are reset to the default setting.

The intermediate value after this functional unit can be viewed in index 0x90n0:03 "Value after interface".

4.2.2.4 Calibration

Vendor calibration

The electrical channel is calibrated by Beckhoff in the "Vendor Calibration" functional unit for compliance with the specified uncertainty (see Technical data, previously: Measuring error). The vendor calibration data from Beckhoff is available in this area.

Parameters:

Index (hex)	Name	Data Type	Meaning
80n0:0B	Enable vendor calibration	BOOL	enabled by default, the data is taken into account.
80nF	Vendor calibration data	-	not intended for user modification

The intermediate value after this functional unit can be viewed in index 0x90n0:1C "Value after Calibration". There is only one common Value after Calibration for all calibration values, in which all calibration values are displayed offset against the measured value.

The number of setting changes in this functional unit is counted up in index 0x90n2:11 as "Vendor Calibration Counter".

If any parameter in the data area is changed, the counter is incremented. Further changes in the data area within the next 30 seconds are not taken into account for the counter. After this time has elapsed, a parameter change will increment the counter again.

User calibration

The "User calibration" functional unit can be used by the user if alternative, system-dependent correction values are to be used permanently.

The gain/offset coefficients are available both in Real32 format for convenient operation and alternatively (but with the same mathematical effect) in INT16 format for compatibility with any existing code. Processing in "User Calibration" (if "Enable User calibration" = 1) is as follows:

- for setpoint >= 0: "Value after User calibration" = S0 + "Value after Vendor calibration" * S1 + ("Value after Vendor calibration")² * S2
- for setpoint < 0: "Value after User calibration" = S0 + "Value after Vendor calibration" * S1n + ("Value after Vendor calibration")² * S2

Parameters:

Index (hex)	Name	Data Type	Meaning
80n0:0A	Enable user calibration	BOOL	disabled by default, calculation only takes place if TRUE
80n0:17	User calibration Offset	SINT16	1 Bit = $FSV_{norm.}$/32767, default: 0
80n0:18	User calibration Gain	UINT16	1 bit corresponds to 2^{-16}, so "1" corresponds to $0x7FFF/32767_{dec}$
80nC:01	User calibration Data	BYTE4	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example
80nC:03… 0D	User Scale Gain (Real32)	REAL32	Real32 coefficients S0/S1/S2/S3/S1n of the calculation polynomial

The intermediate value after this functional unit can be viewed in index 0x9nn0:1C "Value after Calibration". There is only one common Value after Calibration for all calibration values, in which all calibration values are displayed offset against the measured value.

The number of setting changes in this functional unit is counted up in index 0x90n2:12 "User Calibration Counter".

If any parameter in the data area is changed, the counter is incremented. Further changes in the data area within the next 30 seconds are not taken into account for the counter. After this time has elapsed, a parameter change will increment the counter again.

Password protection for user data

Some user data are protected against unwanted or inadvertent writing by an additional password to be entered in CoE 0xF009:

- CoE write accesses by the user, PLC or startup entries in *Single* or *CompleteAccess* mode
- Overwrite the values by *RestoreDefaultParameter* Access to 0x80n0 (or 0x80nD, if available)

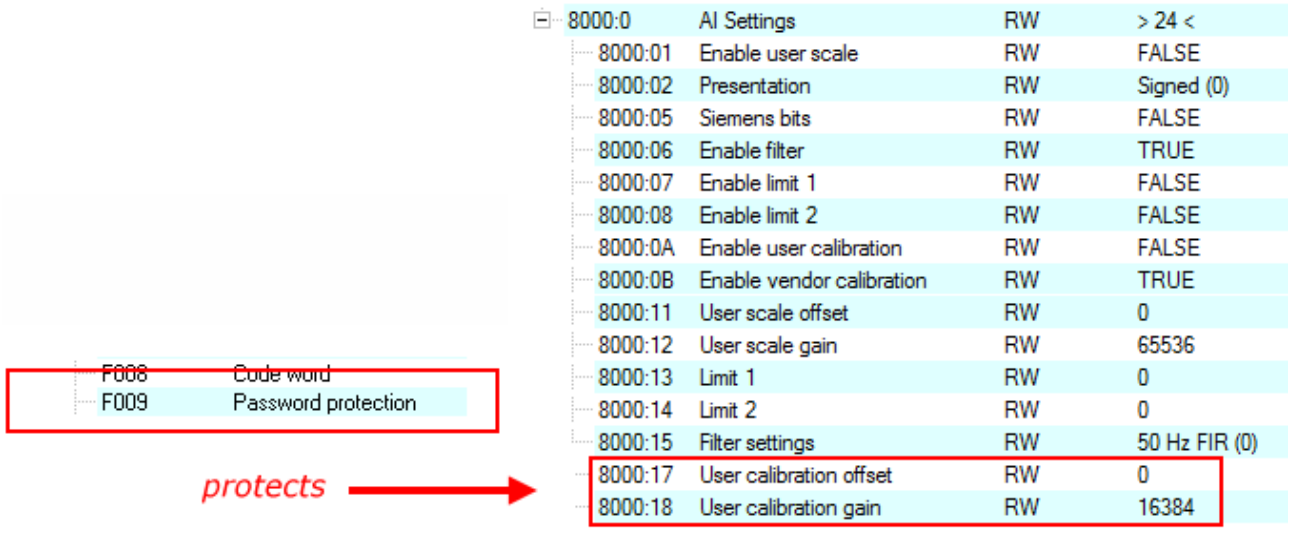


Fig. 23: Password protection for the 0x8000:17 and 0x8000:18 entries (example)

Use of CoE 0xF009

- Entering 0x12345678 enables the password protection → Object shows "1" (enabled)
  Protected objects can now no longer be changed, no error message occurs during a write access!
- Entering 0x11223344 disables password protection → Object displays "0" (disabled)

Password protection takes effect with the following AI settings:

Index (hex)	Designation
80n0:0A	Enable User calibration
80n0:0B	Enable Vendor calibration
80n0:17	User calibration offset
80n0:18	User calibration gain
80nC	User calibration Data
80nD:17	Low Range Error
80nD:18	High Range Error
80nD:27	Low Range Error (REAL32)
80nD:28	High Range Error (REAL32)

4.2.2.5 Filter 2 (high-pass filter)

CoE Index 0x80nD:1A "Filter 2 Settings" provides another digital filter with predefined properties for processing the signal. A digital high-pass filter is available here, for example, to eliminate the DC component of the input signal so that only the AC component of the signal is processed. However, it should be noted that the absolute signal remains within the technical measuring range, i.e. any positive DC component (offset) reduces the remaining measurable positive range by the same amount.

Parameter: "Filter 2 Settings" (Index 0x80nD:1A) [ENUM]

Filter type	Name
None	OFF (default)
IIR high-pass	HP 10 Hz
IIR high-pass	HP 1 Hz
IIR high-pass	HP 0.1 Hz
IIR high-pass	HP 0.01 Hz
IIR high-pass	HP 0.001 Hz (-3-dB cut-off frequencies of the high-pass filter)

The high-pass filter is of type IIR 1st order and therefore has a slope of +20 dB/dec.
Depending on the set cut-off frequency, the following actions lead to a settling time

- Change of the DC component (rapid change of the DC bias voltage).
- Change the setting in *Filter 2* from “Off” to a filter cut-off frequency.

Example: A 10 Hz, ±1 V sine wave is applied simultaneously to Ch1 + Ch2 of an EL4374 using a signal generator.
Setting: Ch1 without filter treatment, Ch2 with filter 2 Settings = "HP 1 Hz". With (A) an electrical offset of +1 V is added, the filter eliminates this within approx. 3 s. With (B) the electrical offset is removed again.

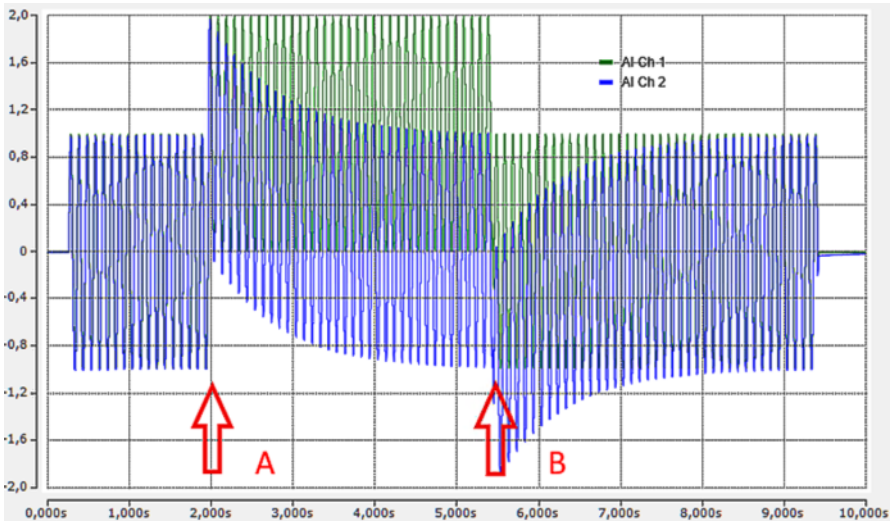


Fig. 24: Example signal generator, sine Ch.1 + 2

Effect of rapid temperature changes on the filter

Both firmware and hardware are involved in this high-pass filter. The controller compensates the DC component in the output signal. Since hardware is involved, the filter has a slight temperature coefficient, i.e. rapid temperature changes can lead to offset shifts in the output signal. In this case, the high-pass filter has to settle again, which takes a relatively long time, especially at the lowest cut-off frequencies. Continuous operation at a constant ambient temperature is therefore advantageous.

4.2.2.6 User Scale

User Scale

The “User Scale” functional unit is intended for reinterpretations/transformations of the measured value, so “10 V” can become “50 kg” with Gain = 5. It is implemented as a linear transformation with gain/offset.

The gain/offset coefficients are available both in Real32 format for convenient operation and alternatively (but with the same mathematical effect) in INT16 format for compatibility with any existing code.

Processing in "User Scale" (if "Enable User Scale" = 1) is as follows:

"Value after User scale" = Offset + value of filter 2 * Gain

Parameter:

Index (hex)	Name	Data type	Meaning
80n0:01	Enable User Scale	BOOL	disabled by default, calculation only takes place if TRUE
80n0:11	User Scale Offset	SINT16	is added directly in digits.
80n0:12	User Scale Gain	UINT16	1 bit corresponds to 2^{-16}, so "1" corresponds to $0x7FFF/32767_{dec}$
80nD:1C	User Scale Offset (Real32)	REAL32	-
80nD:1D	User Scale Gain (Real32)	REAL32	-

The intermediate value after this functional unit can be viewed in index 0x90n0:0B "Value After User Scale".

Changing the interface

When the interface is changed, the gain and offset are reset to 1 and 0 respectively!

4.2.2.7 Steady state

Signals at analog inputs can generate dynamic signals that lead to sudden changes in the measured value. After a change in the input signals, the measured value must first stabilize so that it can be used by the control system. The evaluation of the measured value and the decision on the degree of stability can be evaluated in the PLC or directly in the device with the Steady state functionality. The result is output via the process data in the status word.

- If the input value remains within a value range y for longer than a defined time x, the Steady state is activated in the status.
- As soon as this condition is no longer met, Steady state is set to FALSE
- The parameter x for the time window is specified in the CoE 0x80nD:2B in milliseconds
- The tolerance y for the fluctuations in the measured value is specified in CoE 0x80nD:2C
- The rating is significantly influenced by the set filter

4.2.2.8 Peak hold

This functional unit is a drag indicator function. It continuously monitors the measured value and saves extremes, which can be used to diagnose sensor overloads.

Index	Designation
90n0:0C	Actual Positive Peak Hold
90n0:0D	Actual Negative Peak Hold

The reset is carried out by

- an interface change
- or de-energizing [(Re-)Power-Cycle]
- or 0->1 in the PDO "AI Control.Peak Hold Reset"
- or the command x301n to index FB00:01 (channel 1: n=0, channel 2: n=1, ...).
  During execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed"
- and the command x3001 "Reset all counters"

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 25: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 26: General parameter incompatibility reason, 0x06040043

4.2.2.9 Range Warning

Range Warning

The *Range Warning* functional unit monitors the measured value according to 2 limit values (min. and max.), counts overrange/underrange and reports this as an warning (Warning bit in the status). There is no limitation of measured values.
In the default setting, the Range Warning limit values are set to negative and positive full scale value, e.g. in the "±10 V" measuring range to LowRangeWarning = -10.7 V and HighRangeWarning = +10.7 V, exceeding the limit is then output as an error in the PDO status and LED.

Index	Name
80nD:2D	Low Range Warning
80nD:2E	High Range Warning

NOTICE

Changing the interface or IntegerScaler

If you modify interface 0x80nD:11 or IntegerScaler 0x80nD:12 (Extended/Legacy Range), the limit values will be reset to the default settings specified in the interface!

Result	
PDO AI Status	Error bit
90n0:1D	Underrange Warning Counter
90n0:1E	Overrange Warning Counter

Resetting to the default setting according to the interface is done by

- an interface change
- or a de-energized setting [(re-)power cycle]
- or the command x302n to index FB00:01 (channel 1: n=0, channel 2: n=1, ...).
  During execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed"
- and the command x3001 "Reset all counters"

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 27: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 28: General parameter incompatibility reason, 0x06040043

4.2.2.10 Range Error

Overrange/Underrange

This functional unit monitors the measured value for exceeding or falling below the nom. FSV, for example in the measuring range "±10 V" to -10.0 V and +10.0 V.

Parameterization is not possible. The measured value is not limited.

Result	
PDO AI Status	Overrange-Bit Underrange-Bit

Range Error

The *Range Error* functional unit monitors the measured value according to 2 limit values (min. and max.), counts overrange/underrange and reports this as an error (error bit in the status). There is no limitation of measured values.
In the default settings, the RangeError limit values are set to negative and positive technical FSV, e.g. in the "±10 V" measuring range to LowRangeError = -10.7 V and HighRangeError = +10.7 V, exceeding the limit is then output as an error in the PDO status and LED.
Note: The limit values according to 0x80nD can be changed in the operation modes "Integer PDO, Extended Range" and "Real32 PDO"; in the operation mode "Integer PDO, Legacy Range", the limit values cannot be changed and are 0x7FFF / 32767 or -32768; the limit values according to 0x80nD are not taken into account.

Index [data type]	Designation
80nD:17 [DINT]	Low Range Error
80nD:27 [REAL32]	Low Range Error (REAL32)
80nD:18 [DINT	High Range Error
80nD:28 [REAL32]	High Range Error (REAL32)

NOTICE

Changing the interface or IntegerScaler 0x80nD:12

When changing the interface or IntegerScaler 0x80nD:12 (Extended/Legacy Range), the limit values are reset to the default setting according to the interface!

Result	
PDO AI Status	Error bit
90n0:14	Underrange Error Counter
90n0:15	Overrange Error Counter

Resetting to the default setting according to the interface is done by

- an interface change
- or de-energizing [(Re-)Power-Cycle]
- or the command x302n to index FB00:01 (channel 1: n=0, channel 2: n=1, ...).
  During execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed"
- and the command x3001 "Reset all counters"

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 29: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 30: General parameter incompatibility reason, 0x06040043

4.2.2.11 Limit

Limit value detection

Limit 1 and 2 are two identical, simultaneously usable functions for optional analysis of the analog value, function referred to below as "Limit n". The measured value is not limited. The function is therefore similar to *Range Error*, except that there is no error output (bit, LED).

Parameter:

Limit 1	
Index [data type]	**Designation**
80n0:07 [BOOL], disabled by default	Enable Limit 1
80n0:13 [SINT16]	Value Limit 1
80nD:29 [REAL32]	Value Limit 1 (Real32)

Limit 2	
Index [data type]	**Designation**
80n0:08 [BOOL], disabled by default	Enable Limit 2
80n0:14 [SINT16]	Value Limit 2
80nD:2A [REAL32]	Value Limit 2(Real32)

If the measured value exceeds/falls below the set limit, this is

- **displayed in the PDO status, output “Limit n” (2 bits):**
  - 0: not active, limit function disabled
  - 1: Measured value < limit value
  - 2: Measured value > limit value
  - 3: Measured value = limit value

Linking in the PLC with 2-bit values

The limit information consists of 2 bits. “Limit n” can be linked to the PLC or a task in the System Manager.

Note on the PLC: In the IEC61131 PLC, there is no 2-bit data type that can be linked directly to this process data. An input byte %I* must therefore be defined to transmit the limit information and the limit value (limit) must be linked to the VariableSizeMismatch dialog if the status word in the PLC is not interpreted bit by bit (recommended method).

- **counted informatively in the CoE**

Index	Designation	Meaning
90n0:16 or 90n0:18	Limit 1/2 counter low	Value has fallen below the limit value (edge detection)
90n0:17 or 90n0:19	Limit 1/2 counter high	Value has exceeded the limit value (edge detection)

The counters are reset by

- an interface change
- or de-energizing [(Re-)Power-Cycle]
- or the command x303n to index 0xFB00:01 (channel1: n=0, channel 2: n=1, ...).
  During execution, Status 255 "busy" is displayed in index 0xFB00:02, "0" means "successfully completed"
- and the command x3001 "Reset all counters"

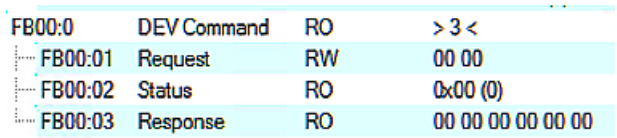


Fig. 31: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index 0xFB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 32: General parameter incompatibility reason, 0x06040043

- **Swap Limit Bits**

The limit function can be inverted using "SwapLimitBits" in index 0x80n0:0E in order to create compatibility with different application-side code.

Output “Limit n” (2 bits)

SwapLimitBits setting	Value
FALSE (default)	• 0: not active • 1: value < limit value • 2: value > limit value • 3: value = limit value
TRUE	• 0: not active • 1: value > limit value • 2: value < limit value • 3: value = limit value

4.2.2.12 Tare

In the application, it can be helpful to set the display value to zero with an unloaded sensor. In weighing technology, this is known as the tare process or "relative measurement". This means that the offset component of the unloaded sensor (in this case a scale) is already subtracted from the measuring device. Note: When using tare, the value output in the channel is shifted, which leads to a restriction of the dynamic range in the positive or negative direction. If the channel can measure 0..10 V electrically, for example, and is tared (zeroed) at 8 V, only +2/-8 V measuring range remains.

To avoid reaching the INT16 limits, the use of Real32 PDO is strongly recommended when using Tare.

The Tare function works as follows:

1. Tare start

Tare can be triggered in the same way by

- PDO: Tare bit in the "AI.Control" PDO

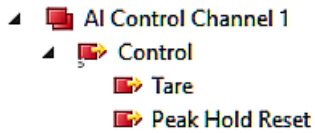


Fig. 33: PDO "AI Control"

then the tare bit from the control can trigger the tare via 0 → 1.

- or via CoE command "Save tare" Request = 0x313n to index 0xFB00: 01 (channel 1: n=0, channel 2: n=1, ...)

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 34: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index 0xFB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 35: General parameter incompatibility reason, 0x06040043

2. Measurement

The device now calculates an average value over 400 measured values; the duration of the process therefore depends on the conversion rate of the channel (see filter setting). During these approx. 250 ms, the electrical sensor signal should be stable. In some cases, it is recommended to support the tare process with a strongly attenuating low-pass filter (see chapter Filter1 [▶ 61]). After the tare process, the filter can be opened again.

During this time, PDO "AI Status.Tare Active" = FALSE

3. Calculation

Then

- the tare value is subtracted from the measured value and the measured value jumps once at this point.
- the determined tare value is displayed in CoE 0x90n0:1A.
- PDO "AI Status.Tare Active" = TRUE indicates that a tare value is being calculated

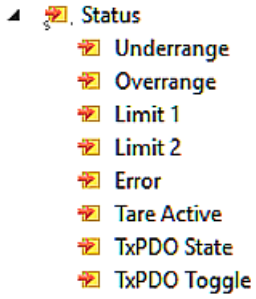


Fig. 36: "Tare active" in status word

The tare value is temporarily held in the channel, it is not secured against power failure. If it is to be saved permanently and thus secured against power failure, the request 0x318n must be sent to index 0xFB00:01 (channel 1: n=0, channel 2: n=1, ...).

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 37: CoE Index FB00, DEV Command

4. Reset

Tare is reset ("zeroed")

- by an interface change
- or de-energizing [(Re-)Power-Cycle], if not stored in fail-safe mode, see above.
- or the EtherCAT status BOOTSTRAP
- or the CoE command "Tare Reset" request = 0x314n to index 0xFB00: 01 (channel 1: n=0, channel 2: n=1, ...)

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 38: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index 0xFB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 39: General parameter incompatibility reason, 0x06040043

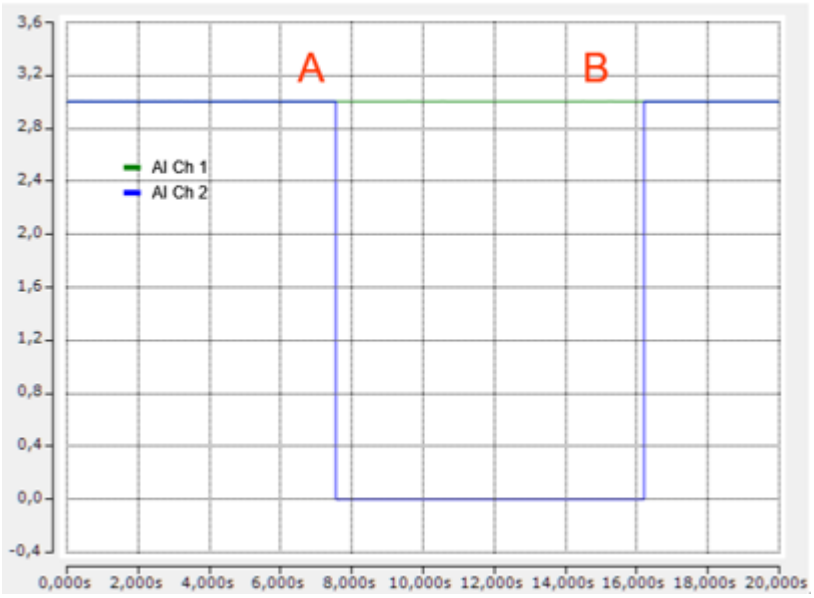


Fig. 40: Example: 3 V are electrically connected to Ch1+2 of an EL4374 at the same time, Filter1 = IIR8

At (A), Control.Tare = 1 is set on channel 2 (and the bit is then reset), the tare value is displayed in the CoE:

Tare Value	RO	3.003933 (3.003933e+00)

Fig. 41: Tare Value

As expected, the measured value goes to ~0.
At (B), tare is deleted again by command. Channel 1 runs without tare for comparison.

Optional: Disable tare.

If tare is to be disabled and then reactivated without recalculation, the “Disable Tare” option can be activated in the Control PDO. As long as this bit is activated, the measured value is not offset by the tare value. If this bit is reset to 0, the old tare value is reactivated without recalculation.

4.2.2.13 Integer scaler (only when using PDO INT16)

The optional extended range "107 %" has been introduced for Beckhoff analog channels in order to be able to measure slightly above the nominal full scale value (FSV_{nom}) of e.g. 10 V or 20 mA for commissioning and diagnostic purposes (support depends on the device). Then the channel actually measures up to a defined *technical* full scale value FSV_{techn} which is slightly higher than the *nominal* full scale value FSV_{nom}.

The definition for 16 bits is as follows:

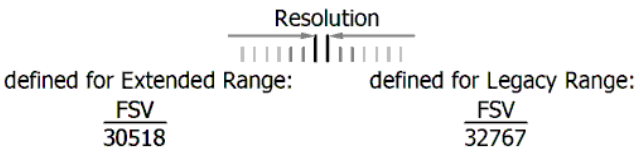


Fig. 42: Defined resolution, 16 bit

Setting:

- Index 80nD:12 = Extended Range Range (default setting)
  The channel measures up to the technical measuring range, which is approximately 107 % of the nominal measuring range.
  For the extended range with 16 bit SINT PDO (16 bits + sign), the PDO value ±30518 (0x7736) has been defined as the nom. FSV = 100 %. Accordingly, the displayable measuring range now extends to 0x7FFF = 32767 ~ 107.37 % of the nominal measuring range.

- Index 80nD:12 = Legacy Range
  The channel measures up to 100 % of the nominal measuring range.
  Accordingly, 0x7FFF = 32767 should be interpreted as 100 % of the nominal FSV.

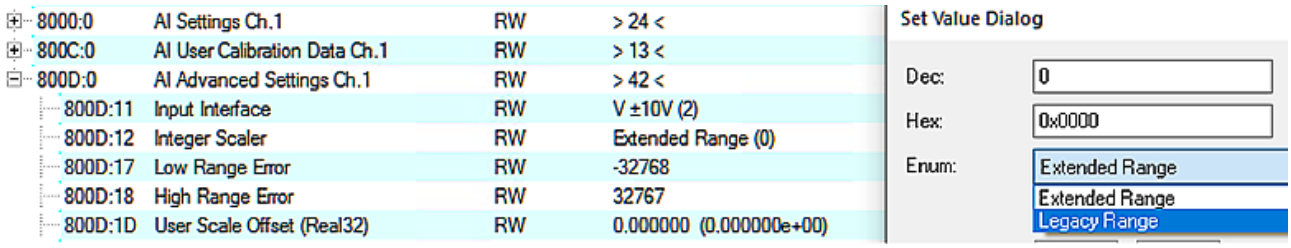


Fig. 43: Setting Index 80nD:12, Legacy Range, Extended Range

Depending on the interface, this then means SINT16 -> Real32 for the conversion in the controller (if the over/underrange PDO is set to the default setting):

Measuring range ±10 V (bipolar)

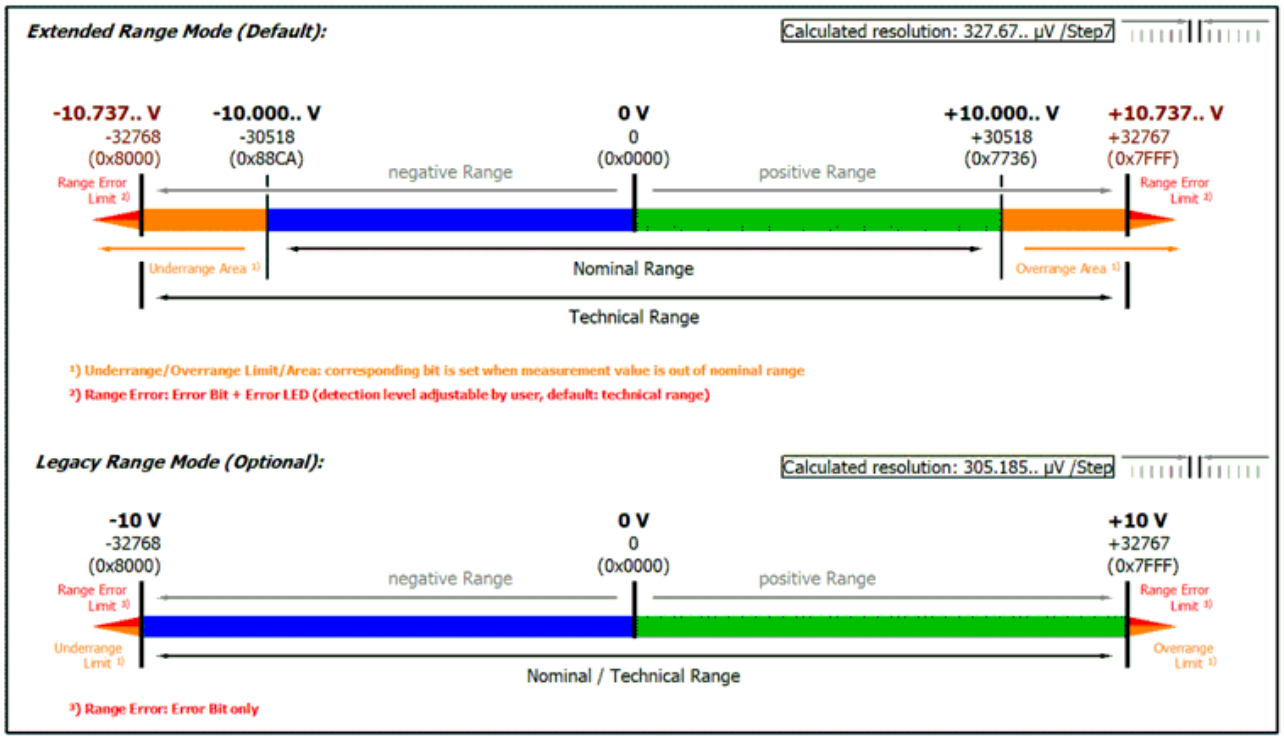


Fig. 44: Measuring range ±10 V

Measuring range 0...10 V (unipolar)

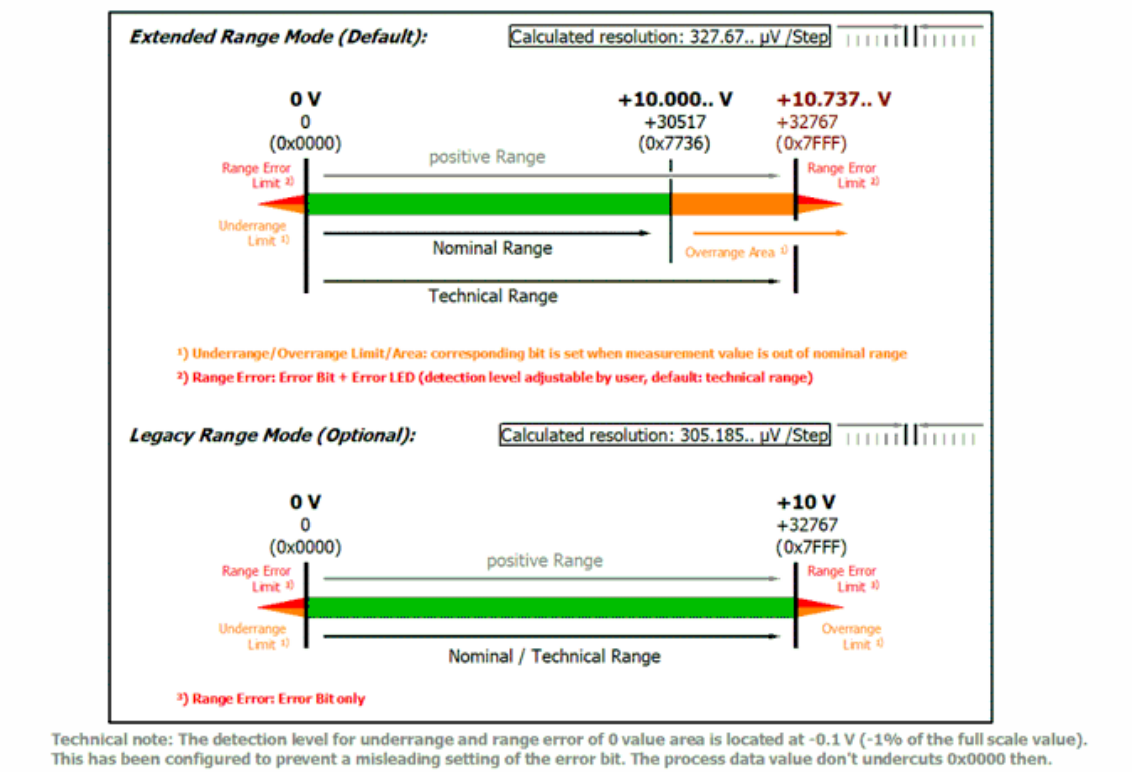


Fig. 45: Measuring range 0...10 V (unipolar)

4.2.2.14 Presentation (only when using PDO INT16)

For historical reasons, there are various formats in which the 16 bits of the SINT PDO (Signed Integer Process Data Object) can be interpreted.
The format can be set in the index 0x80n0:02 .

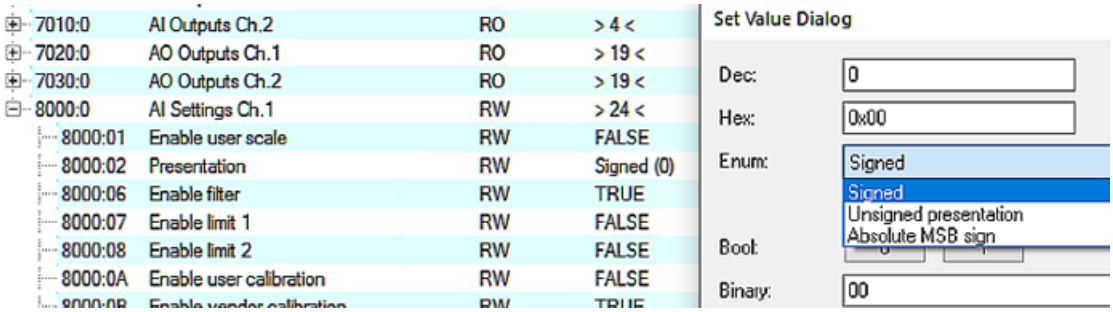


Fig. 46: PDO 0x80n0:02, "Presentation"

This analog channel supports:

- "Signed" (default): top/highest/0. Bit is sign, negative number in 2's complement in bit 1..15
- "Unsigned": all 16 bits are used for the amount of the analog value, resulting in double resolution for positive analog values. No transmission of negative values possible.
- "Absolute Value with sign": top/highest/0. Bit is sign, bits 1..15 carry the amount of the analog value
- "Absolute Value": the sign of the analog value is ignored, only the (positive) amount in bit 1..15 is transmitted

Legacy Range	Extended Range	Representation (values dec. / values hex.)			
		unsigned integer		Abs. value w. MSB as sign	
		Dec	Hex	Dec	Hex
100 %	107.37 %	32767	0x7FFF	32767	0x7FFF
-	100 %	30518	0x7736	30518	0x7736
0 %	0 %	0	0x0000	0	0x0000
-	-100 %	30518	0x7736	[-30518]	0xF736
-100 %	-107.37 %	32767	0x7FFF	[-32767]	0xFFFF

Presentation types

The presentation types "Unsigned integer" and "Absolute value with MSB as sign" have no function for unipolar terminals. There is no change in the presentation in the positive range.

Possible errors (Error) and underrange/overrange are also set and displayed in this functional unit.

If the measured value exceeds or falls below the 16 bit value limits due to the previous tare process, the value is limited to -32768/32767.

Please note: This cannot happen when using REAL32-PDO, as the FloatingPoint value is basically unlimited.

The analog measured value is now transmitted via EtherCAT.

4.3 Measuring bridge commissioning

4.3.1 General information on commissioning the measuring bridge

For each channel of the measuring bridge, the measured value is calculated using the quotient of U_{Bridge} andU_{Sense} for the respective channel and specified as an mV/V value. The associated CoE indices n for the respective analog inputs per channel are listed below. This information applies to CoE objects that are described as 0x80**n**0.

The calculated measured values of the measuring bridge are already available as a standard configuration after a scan in TwinCAT or manually adding them to the configuration in the PDO as a Real32 value.

Channel 1	Calculation via	PDO data type (default)	CoE-Index n
RMB	U_{Bridge} Ch. 1 /U_{Sense} Ch. 1	REAL32	2 3 (for sensor-specific settings)

Channel 2*)	Calculation via	PDO data type (default)	CoE-Index n
RMB	U_{Bridge} Ch. 2 /U_{Sense} Ch. 2	REAL32	6 7 (for sensor-specific settings)

*) only valid for ED3362-0x00

This means that only the default settings can be used for quick commissioning.

1. Choice of the Predefined PDO "RMB Standard (Real32)" (default)
2. Specifying the supply voltage (default: 10 V)
3. Setting the measuring range for U_{Bridge} (default: ±20 mV)
4. Setting the measuring range for$_{USense}$ (default: ±12 V)
5. Performing a sensor calibration [▶ 77]
6. Reading the measured value as a real value in mV/V

The optimum signal quality is achieved when using twisted-pair and shielded cables. A twisted pair should be used to connect the strain gauge power supply U_{Exc}, the sense lines U_{Sense} and the bridge differential voltage U_{Bridge}.

NOTICE

Short-circuiting unused inputs

Unused inputs on the same device should be properly short-circuited directly at the terminal points using short lines to prevent crosstalk!

Bridge supply U_{Exc}

The product is designed for 4-wire or 6-wire connection. The measuring bridge can be powered by the internally generated supply voltage U_{Exc} or externally. By feeding the bridge supply voltage U_{Exc} back to the measuring point U_{Sense}, the influence of line losses, temperature and drift effects is minimized.

The sensor power supply U_{Exc} is generated in the terminal from the 24 V of the power contacts and can be switched between 5 V, 10 V and OFF [external supply required].

The sensor power supply output at the U_{Exc} terminal points is not used internally. If a sensor is used that has no additional connections for supply voltage feedback in addition to connections for the U_{Exc} supply and connections for the U_{Bridge} bridge voltage, wire jumpers must be placed between the U_{Exc} and U_{Sense} terminals in order to measure the supply voltage directly at the terminal.

Alternatively, the measuring bridge can be supplied by an external source. This means that the terminal can be operated in a 4-wire connection, as only the bridge voltage U_{Bridge} and the feedback of the external supply voltage U_{Sense} are connected to the terminal and measured. If the bridge is supplied externally, the maximum permissible supply voltage is 12 V, as this is the full scale value for measuring the reference voltage U_{Sense}.

Parallel connection of strain gauges

Parallel use of load cells is permitted. Several sensors can be connected in parallel per channel, but the maximum output power of the supply must be taken into account, as the total bridge resistance of all the strain gauges connected together is significantly reduced by the parallel connection.

Each terminal can supply a current of up to 100 mA. This means that, for example, 7 load cells with a basic resistance of 350 Ω can be connected in parallel per channel with a 5 V supply, and 3 load cells with a 10 V supply.

This specific calculation applies to internal supply and must be adjusted accordingly for external supply.

Load cells approved and calibrated by the load cell manufacturer for parallel use should be used. The nominal characteristic values [mV/V], zero offset [mV/V] and impedance [Ω, ohm] are then usually adjusted accordingly.

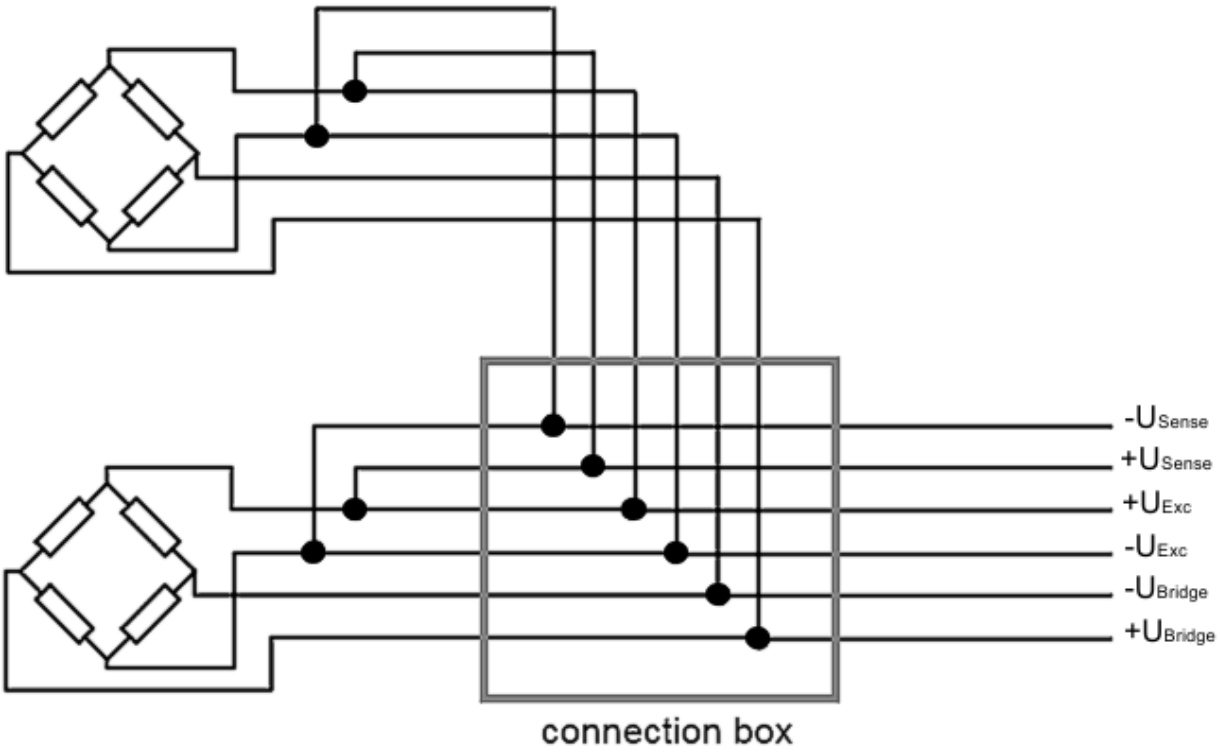


Fig. 47: Parallel connection of strain gauges

4.3.2 Data flow measuring bridge

To determine a bridge ratio from the bridge voltage U_{Bridge} and the measured supply voltage U_{Sense}, the two corresponding measured voltage values of the analog inputs are offset against each other in a virtual channel in the device. The ratio of U_{Bridge} Ch. 1 to U_{Sense} Ch. 1 then gives the result that can be read out in RMB Ch. 1. The signal acquisition and data processing of the virtual channel of this device is as follows:

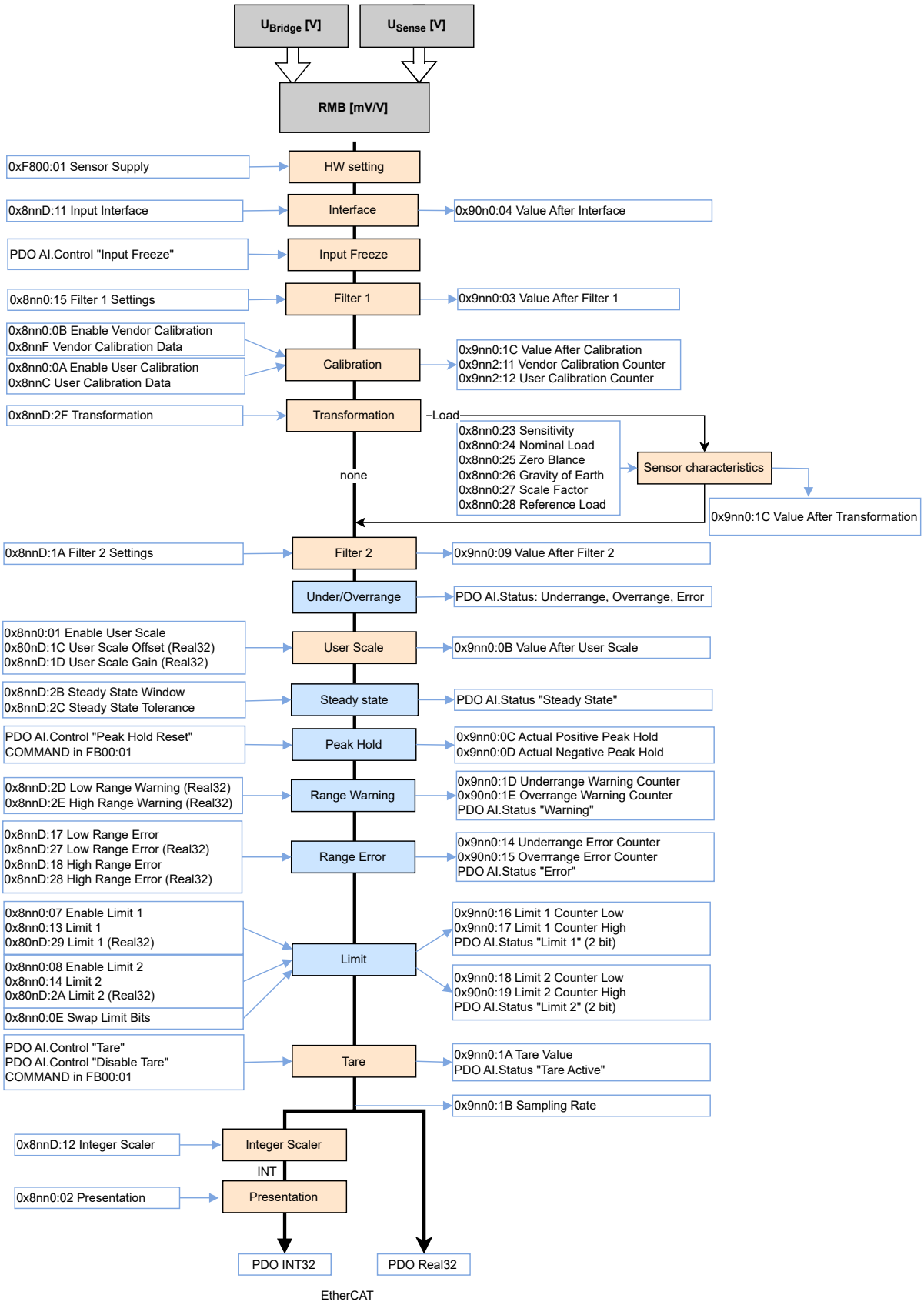


Fig. 48: Data flow measuring bridge

Data flow diagram legend

Left column:	**Middle column:**	**Right column:**
Changeable parameters (CoE settings or status PDO) that influence processing	Functional units	Intermediate values and results, displayed in the CoE or status PDO

This terminal only uses floating point calculations internally, as shown in the data flow. This considerably simplifies and shortens the commissioning of the analog channel, which minimizes errors in understanding. In addition, intermediate values along the data calculation can be easily displayed in the CoE.

The Real32 and INT16 values are defined in the CoE without units. However, the unit is determined by the context and should, wherever possible, be regarded as an SI unit. For example, the voltage is measured in V, the current in A (even with 20 mA input!), the resistance in ohms and the ratio in V/V....

Note: Individual functional units (see data flow) have already been introduced in earlier analog devices based on INT16 (integer) and are controlled by these INT-based parameters. Such INT parameters are still supported for compatibility reasons. For example, existing code in the controller should access the CoE via ADS. This means that parameters of functional units are either

- only available as REAL32 types in the CoE if the functional unit was newly introduced with the FloatingPoint data flow, or
- are present in the CoE both as INT type and as REAL32 type with the same meaning, recognizable by the name suffix "(Real32)". The values are automatically mirrored by the firmware when they are changed or taken into account one after the other.

When re-implementing the analog function, it is recommended to use the Real32 parameters.

Commissioning of the analog input in TwinCAT should follow this data flow and is described below.

4.3.2.1 Sensor power supply

The sensor power supply can be set between OFF, 5 V and 10 V in CoE object 0xF800:01 Sensor Supply.

Even with multi-channel devices, the sensor power supply can only be set once, internally the same power supply is used for generation. However, the supply for each channel is filtered separately.

If a different supply voltage is required for the strain gauge used or different supplies for different channels, this can be specified externally in the specified range and measured back via the U_{Sense} of the respective channel.

Even if the internal supply voltage U_{Exc} is used, this must be fed back to U_{Sense}, as there is no internal connection between U_{Exc} and U_{Sense}.

4.3.2.2 Interface

The interface setting is fundamental for operation as an electrical measurement input.
Setting: CoE Index 0x80nD:11 "Input Interface"

Different measuring ranges are available depending on the channel:

Bridge voltage$_{UBridge}$ (for n=0 (Ch. 1), n=4 (Ch. 2))

- None
- ±20 mV
- ±75 mV
- ±4 V

Reference voltage$_{USense}$ (for n=1 (Ch. 1), n=5 (Ch. 2))

- None
- ±5 V
- ±10 V
- ±12 V

If the interface is set to "None", the corresponding channel is disabled.

Note: When the interface is changed, the following CoE parameters of UserScale, Range Error, Limit 1/2 are reset to the default setting.

The intermediate value after this functional unit can be viewed in index 0x90n0:03 "Value after interface".

4.3.2.3 Input Freeze

If the terminal is placed in the freeze state by Input Freeze via the process data in the control word, no further analog measured values are relayed to the internal filter. This function can be used if an excessive load is expected at the measurement input, e g. if a filling surge is expected in a weighing application, which would unnecessarily overload the filters due to the force. This would result in a certain amount of time elapsing until the filter had settled again. The user must determine for himself how long the input freeze is useful; the time control and decision on the input freeze must be implemented by the user in the PLC, it is not part of the device.

To activate, the control PDO *Input Freeze* must be set to "1". As long as *Input Freeze* is set to "1", no values are passed on in the data flow.

Exemplary use: If the measured value has changed by more than 5 % from the last cycle (cycle time 100 µs) or by a fixed value such as 10 g as an indication of a sudden load, Input Freeze is activated by a TOF module for 50 ms. The peak load is no longer acknowledged by the device. If the change in measured value and the time are optimally adjusted to the expected force surge, the device can measure the current analogue value without overshoot.

4.3.2.4 Filter 1 (low-pass filter)

A digital filter with predefined properties is available in the analog channel. Depending on the setting, it can take on the characteristics of a filter with finite impulse response (FIR filter) or with infinite impulse response (IIR filter).

This filter works on the integer values and is therefore independent of the interface.

In CoE 0x90n0:1B *Sampling Rate* the current conversion rate is displayed in [Hz], depending on the filter setting.

The filter can be set per channel via CoE object 0x80n0:15 *Filter 1 Settings*. The filter is disabled via the selectable value "None".

Filter type	Name	0x80n0:15 (Dec)
FIR	50 Hz FIR	0 (default value)
FIR	60 Hz FIR	1
IIR	IIR 1	2
IIR	IIR 2	3
IIR	IIR 3	4
IIR	IIR 4	5
IIR	IIR 5	6
IIR	IIR 6	7
IIR	IIR 7	8
IIR	IIR 8	9
-	None	65535

FIR filter

The filter with FIR characteristics operates as a notch filter. A 50 Hz and a 60 Hz filter are available. Notch filter means that the filter has zeros (notches) in the frequency response at the filter frequency and multiples thereof, i.e. it attenuates the amplitude at these frequencies. The FIR filter works as a non-recursive filter.

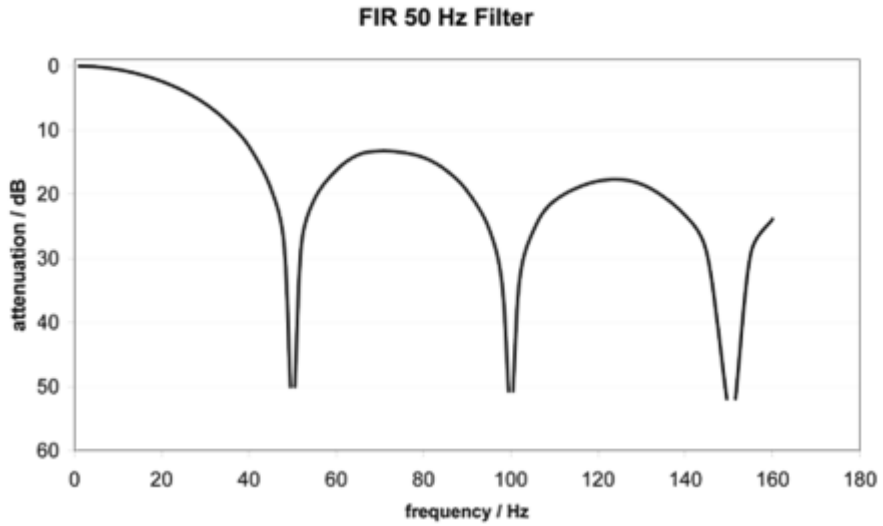


Fig. 49: FIR 50 Hz filter

IIR filter

The filter with IIR characteristic is a time-discrete, linear, time-invariant 1st order low-pass filter (-20 dB/decade), which can be set in 8 levels, i.e. cut-off frequencies (level 1 = weak recursive filter, up to level 8 = strong recursive filter). The IIR can be understood to be a moving average value calculation after a low-pass filter.

IIR filter	Cut-off frequency (-3 dB)
IIR 1	1 kHz
IIR 2	500 Hz
IIR 3	285 Hz
IIR 4	142 Hz
IIR 5	66 Hz
IIR 6	33 Hz
IIR 7	17 Hz
IIR 8	8.2 Hz

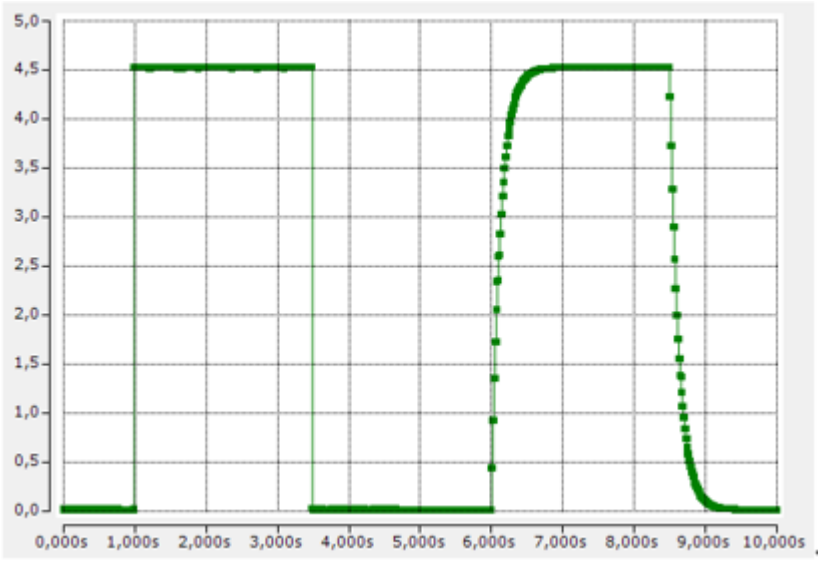


Fig. 50: Comparison of square wave signal 0.2 Hz/4.5 V, EtherCAT cycle time 100 µs, left filter disabled, right IIR8

4.3.2.5 Calibration

Vendor calibration

The electrical channel is calibrated by Beckhoff in the "Vendor Calibration" functional unit for compliance with the specified uncertainty (see Technical data, previously: Measuring error). The vendor calibration data from Beckhoff is available in this area.

Parameters:

Index (hex)	Name	Data Type	Meaning
80n0:0B	Enable vendor calibration	BOOL	enabled by default, the data is taken into account.
80nF	Vendor calibration data	-	not intended for user modification

The intermediate value after this functional unit can be viewed in index 0x90n0:1C "Value after Calibration". There is only one common Value after Calibration for all calibration values, in which all calibration values are displayed offset against the measured value.

The number of setting changes in this functional unit is counted up in index 0x90n2:11 as "Vendor Calibration Counter".

If any parameter in the data area is changed, the counter is incremented. Further changes in the data area within the next 30 seconds are not taken into account for the counter. After this time has elapsed, a parameter change will increment the counter again.

User calibration

The "User calibration" functional unit can be used by the user if alternative, system-dependent correction values are to be used permanently.

The gain/offset coefficients are available both in Real32 format for convenient operation and alternatively (but with the same mathematical effect) in INT16 format for compatibility with any existing code. Processing in "User Calibration" (if "Enable User calibration" = 1) is as follows:

- for setpoint >= 0: "Value after User calibration" = S0 + "Value after Vendor calibration" * S1 + ("Value after Vendor calibration")² * S2
- for setpoint < 0: "Value after User calibration" = S0 + "Value after Vendor calibration" * S1n + ("Value after Vendor calibration")² * S2

Parameters:

Index (hex)	Name	Data Type	Meaning
80n0:0A	Enable user calibration	BOOL	disabled by default, calculation only takes place if TRUE
80n0:17	User calibration Offset	SINT16	1 Bit = $FSV_{norm.}$/32767, default: 0
80n0:18	User calibration Gain	UINT16	1 bit corresponds to 2^{-16}, so "1" corresponds to $0x7FFF/32767_{dec}$
80nC:01	User calibration Data	BYTE4	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example
80nC:03… 0D	User Scale Gain (Real32)	REAL32	Real32 coefficients S0/S1/S2/S3/S1n of the calculation polynomial

The intermediate value after this functional unit can be viewed in index 0x9nn0:1C "Value after Calibration". There is only one common Value after Calibration for all calibration values, in which all calibration values are displayed offset against the measured value.

The number of setting changes in this functional unit is counted up in index 0x90n2:12 "User Calibration Counter".

If any parameter in the data area is changed, the counter is incremented. Further changes in the data area within the next 30 seconds are not taken into account for the counter. After this time has elapsed, a parameter change will increment the counter again.

Password protection for user data

Some user data are protected against unwanted or inadvertent writing by an additional password to be entered in CoE 0xF009:

- CoE write accesses by the user, PLC or startup entries in *Single* or *CompleteAccess* mode
- Overwrite the values by *RestoreDefaultParameter* Access to 0x80n0 (or 0x80nD, if available)

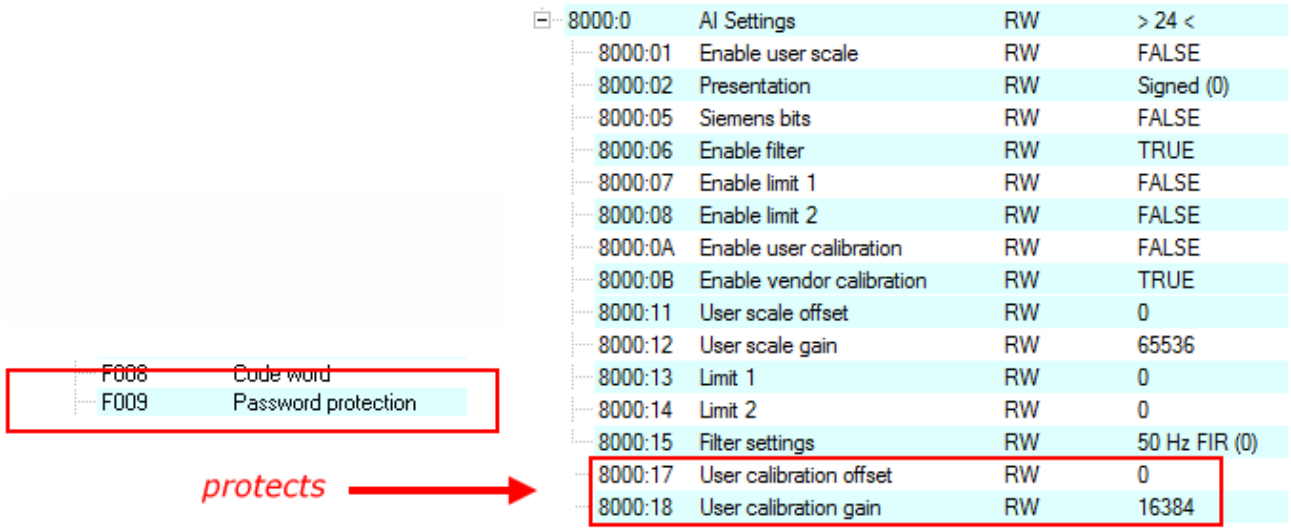


Fig. 51: Password protection for the 0x8000:17 and 0x8000:18 entries (example)

Use of CoE 0xF009

- Entering 0x12345678 enables the password protection → Object shows "1" (enabled)
  Protected objects can now no longer be changed, no error message occurs during a write access!
- Entering 0x11223344 disables password protection → Object displays "0" (disabled)

Password protection takes effect with the following AI settings:

Index (hex)	Designation
80n0:0A	Enable User calibration
80n0:0B	Enable Vendor calibration
80n0:17	User calibration offset
80n0:18	User calibration gain
80nC	User calibration Data
80nD:17	Low Range Error
80nD:18	High Range Error
80nD:27	Low Range Error (REAL32)
80nD:28	High Range Error (REAL32)

4.3.2.6 Transformation

The "Transformation" functional unit converts an electrical value into another parameter. This reinterpretation is usually dependent on sensor-specific data. If "none" is chosen for the transformation, no transformation is carried out and the electrical value is processed in the further steps in the data flow.

"Load" can be chosen as a possible transformation for this product. This transforms an mV/V value into a weight value. The associated data for the transformation then comes from the objects described under "Sensor characteristics".

4.3.2.7 Sensor Characteristics

Correct adjustment and calibration of the overall system are crucial for precise and reliable measurements.

For load cells, the simple ratio of the bridge voltage U_{Bridge} to the measured supply voltage U_{Sense} in mV/V is often not sufficient. Here the measured value must still be converted into a weight specification. To convert a measured value into a load, sensor-specific characteristic values must be specified. The information can either be taken from the data sheet or test report of the sensor or determined by calibrating the entire system (see chapter Sensor calibration [▶ 77]).

The unit of the result is determined by the nominal load. If the nominal load is specified in kilograms, for example, the result is also output in kilograms.

The weight is calculated using the following formula

$$\text{Load} = \frac{\text{Value}\left[\frac{\text{mV}}{\text{V}}\right] - \text{Zero Balance}\left[\frac{\text{mV}}{\text{V}}\right]}{\text{Sensitivity}\left[\frac{\text{mV}}{\text{V}}\right]} \cdot \text{Nominal Load} \cdot \frac{9{,}80665\,\frac{\text{m}}{\text{s}^2}}{\text{Gravity of Earth}}$$

Sensitivity

The nominal characteristic value of a strain gauge sensor describes the sensitivity, i.e. how much the output signal changes under a certain mechanical load, and is usually specified in mV/V.

Object 0x80n0:23 in the sensor-specific RMB areas (n = 3 (Ch. 1), n = 7 (Ch. 2)) can be used to parameterize the nominal characteristic value of the connected sensor. The value can be taken from the information on the sensor data sheet or even more accurate from the test report supplied. Alternatively, it can be determined by calibrating the entire system (see chapter Sensor calibration [▶ 77]).

Zero Balance

The zero offset denotes the output value of the sensor in the unloaded state in mV/V. An ideal sensor shows an output signal of zero at zero load. The real deviation is specified in the sensor's test log and entered in the object 0x80n0:25 in the sensor-specific RMB ranges (n = 3 (Ch. 1), n = 7 (Ch. 2)) or can be determined by calibrating the overall system (see chapter Sensor calibration [▶ 77]).

Nominal Load

The nominal load describes the maximum load that the strain gauge sensor can measure without being damaged or losing accuracy.

This information can be found in the sensor's data sheet and is entered in object 0x80n0:24 in the sensor-specific RMB ranges (n = 3 (Ch. 1), n = 7 (Ch. 2)). The firmware always calculates without units, the unit (kg, g, lb) used here must then also be applied to the result

Gravity of Earth

The force of gravity can influence the measurement, especially if the strain gauge sensor is used for weight measuring. The default value of the earth's gravitational force is 9.80665 m/s², but this value can vary depending on the geographical location and should be taken into account for precise measurements. This value can be changed channel-specifically in object 0x80n0:26 in the sensor-specific RMB ranges (n = 3 (Ch. 1), n = 7 (Ch. 2)).

Scale factor

The scaling factor can be used to rescale the process data value into another unit. To change the display from kg to g, for example, the factor 1000 can be entered in object 0x80n0:27 in the sensor-specific RMB ranges (n = 3 (Ch. 1), n = 7 (Ch. 2)).

Reference load

The reference load (also known as "adjustment weight") is a known load that is used to manually calibrate the strain gauge sensor. If the reference load is specified in object 0x80n0:28 in the sensor-specific RMB ranges (n = 3 (Ch. 1), n = 7 (Ch. 2)), the gain can be set when calibrating the overall system (see Sensor calibration [▶ 77]). The reference load must be within the measuring range of the sensor and should be at least 20% of the nominal load.

4.3.2.8 Filter 2 (high-pass filter)

CoE Index 0x80nD:1A "Filter 2 Settings" provides another digital filter with predefined properties for processing the signal. A digital high-pass filter is available here, for example, to eliminate the DC component of the input signal so that only the AC component of the signal is processed. However, it should be noted that the absolute signal remains within the technical measuring range, i.e. any positive DC component (offset) reduces the remaining measurable positive range by the same amount.

Parameter: "Filter 2 Settings" (Index 0x80nD:1A) [ENUM]

Filter type	Name
None	OFF (default)
IIR high-pass	HP 10 Hz
IIR high-pass	HP 1 Hz
IIR high-pass	HP 0.1 Hz
IIR high-pass	HP 0.01 Hz
IIR high-pass	HP 0.001 Hz (-3-dB cut-off frequencies of the high-pass filter)

The high-pass filter is of type IIR 1st order and therefore has a slope of +20 dB/dec.
Depending on the set cut-off frequency, the following actions lead to a settling time

- Change of the DC component (rapid change of the DC bias voltage).
- Change the setting in *Filter 2* from “Off” to a filter cut-off frequency.

Example: A 10 Hz, ±1 V sine wave is applied simultaneously to Ch1 + Ch2 of an EL4374 using a signal generator.
Setting: Ch1 without filter treatment, Ch2 with filter 2 Settings = "HP 1 Hz". With (A) an electrical offset of +1 V is added, the filter eliminates this within approx. 3 s. With (B) the electrical offset is removed again.

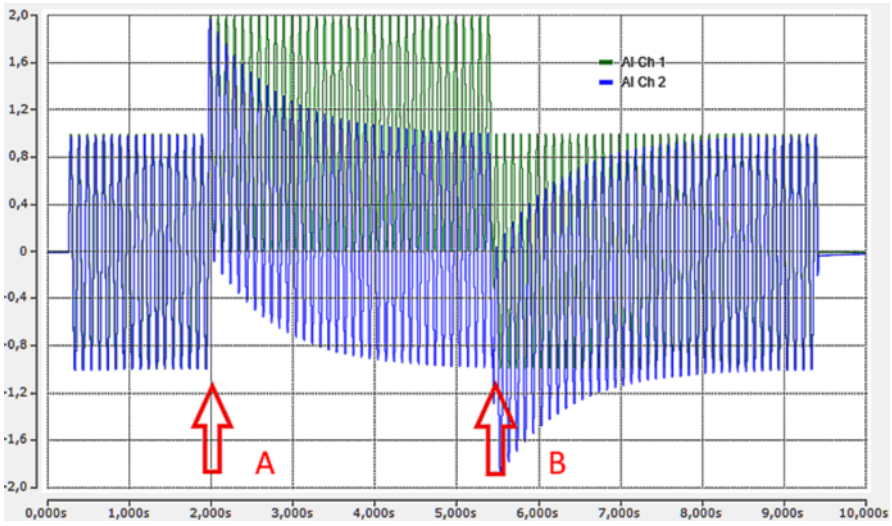


Fig. 52: Example signal generator, sine Ch.1 + 2

Effect of rapid temperature changes on the filter

Both firmware and hardware are involved in this high-pass filter. The controller compensates the DC component in the output signal. Since hardware is involved, the filter has a slight temperature coefficient, i.e. rapid temperature changes can lead to offset shifts in the output signal. In this case, the high-pass filter has to settle again, which takes a relatively long time, especially at the lowest cut-off frequencies. Continuous operation at a constant ambient temperature is therefore advantageous.

4.3.2.9 User Scale

User Scale

The “User Scale” functional unit is intended for reinterpretations/transformations of the measured value, so “10 V” can become “50 kg” with Gain = 5. It is implemented as a linear transformation with gain/offset.

The gain/offset coefficients are available both in Real32 format for convenient operation and alternatively (but with the same mathematical effect) in INT16 format for compatibility with any existing code.

Processing in "User Scale" (if "Enable User Scale" = 1) is as follows:

"Value after User scale" = Offset + value of filter 2 * Gain

Parameter:

Index (hex)	Name	Data type	Meaning
80n0:01	Enable User Scale	BOOL	disabled by default, calculation only takes place if TRUE
80n0:11	User Scale Offset	SINT16	is added directly in digits.
80n0:12	User Scale Gain	UINT16	1 bit corresponds to 2^{-16}, so "1" corresponds to $0x7FFF/32767_{dec}$
80nD:1C	User Scale Offset (Real32)	REAL32	-
80nD:1D	User Scale Gain (Real32)	REAL32	-

The intermediate value after this functional unit can be viewed in index 0x90n0:0B "Value After User Scale".

Changing the interface

When the interface is changed, the gain and offset are reset to 1 and 0 respectively!

4.3.2.10 Steady state

Signals at analog inputs can generate dynamic signals that lead to sudden changes in the measured value. After a change in the input signals, the measured value must first stabilize so that it can be used by the control system. The evaluation of the measured value and the decision on the degree of stability can be evaluated in the PLC or directly in the device with the Steady state functionality. The result is output via the process data in the status word.

- If the input value remains within a value range y for longer than a defined time x, the Steady state is activated in the status.
- As soon as this condition is no longer met, Steady state is set to FALSE
- The parameter x for the time window is specified in the CoE 0x80nD:2B in milliseconds
- The tolerance y for the fluctuations in the measured value is specified in CoE 0x80nD:2C
- The rating is significantly influenced by the set filter

4.3.2.11 Peak hold

This functional unit is a drag indicator function. It continuously monitors the measured value and saves extremes, which can be used to diagnose sensor overloads.

Index	Designation
90n0:0C	Actual Positive Peak Hold
90n0:0D	Actual Negative Peak Hold

The reset is carried out by

- an interface change
- or de-energizing [(Re-)Power-Cycle]
- or 0->1 in the PDO "AI Control.Peak Hold Reset"
- or the command x301n to index FB00:01 (channel 1: n=0, channel 2: n=1, ...).
  During execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed"
- and the command x3001 "Reset all counters"

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 53: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 54: General parameter incompatibility reason, 0x06040043

4.3.2.12 Range Warning

Range Warning

The *Range Warning* functional unit monitors the measured value according to 2 limit values (min. and max.), counts overrange/underrange and reports this as an warning (Warning bit in the status). There is no limitation of measured values.
In the default setting, the Range Warning limit values are set to negative and positive full scale value, e.g. in the "±10 V" measuring range to LowRangeWarning = -10.7 V and HighRangeWarning = +10.7 V, exceeding the limit is then output as an error in the PDO status and LED.

Index	Name
80nD:2D	Low Range Warning
80nD:2E	High Range Warning

NOTICE

Changing the interface or IntegerScaler

If you modify interface 0x80nD:11 or IntegerScaler 0x80nD:12 (Extended/Legacy Range), the limit values will be reset to the default settings specified in the interface!

Result	
PDO AI Status	Error bit
90n0:1D	Underrange Warning Counter
90n0:1E	Overrange Warning Counter

Resetting to the default setting according to the interface is done by

- an interface change
- or a de-energized setting [(re-)power cycle]
- or the command x302n to index FB00:01 (channel 1: n=0, channel 2: n=1, ...).
  During execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed"
- and the command x3001 "Reset all counters"

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 55: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 56: General parameter incompatibility reason, 0x06040043

4.3.2.13 Range Error

Overrange/Underrange

This functional unit monitors the measured value for exceeding or falling below the nom. FSV, for example in the measuring range "±10 V" to -10.0 V and +10.0 V.

Parameterization is not possible. The measured value is not limited.

Result	
PDO AI Status	Overrange-Bit Underrange-Bit

Range Error

The *Range Error* functional unit monitors the measured value according to 2 limit values (min. and max.), counts overrange/underrange and reports this as an error (error bit in the status). There is no limitation of measured values.
In the default settings, the RangeError limit values are set to negative and positive technical FSV, e.g. in the "±10 V" measuring range to LowRangeError = -10.7 V and HighRangeError = +10.7 V, exceeding the limit is then output as an error in the PDO status and LED.
Note: The limit values according to 0x80nD can be changed in the operation modes "Integer PDO, Extended Range" and "Real32 PDO"; in the operation mode "Integer PDO, Legacy Range", the limit values cannot be changed and are 0x7FFF / 32767 or -32768; the limit values according to 0x80nD are not taken into account.

Index [data type]	Designation
80nD:17 [DINT]	Low Range Error
80nD:27 [REAL32]	Low Range Error (REAL32)
80nD:18 [DINT	High Range Error
80nD:28 [REAL32]	High Range Error (REAL32)

NOTICE

Changing the interface or IntegerScaler 0x80nD:12

When changing the interface or IntegerScaler 0x80nD:12 (Extended/Legacy Range), the limit values are reset to the default setting according to the interface!

Result	
PDO AI Status	Error bit
90n0:14	Underrange Error Counter
90n0:15	Overrange Error Counter

Resetting to the default setting according to the interface is done by

- an interface change
- or de-energizing [(Re-)Power-Cycle]
- or the command x302n to index FB00:01 (channel 1: n=0, channel 2: n=1, ...).
  During execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed"
- and the command x3001 "Reset all counters"

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 57: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index FB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 58: General parameter incompatibility reason, 0x06040043

4.3.2.14 Limit

Limit value detection

Limit 1 and 2 are two identical, simultaneously usable functions for optional analysis of the analog value, function referred to below as "Limit n". The measured value is not limited. The function is therefore similar to *Range Error*, except that there is no error output (bit, LED).

Parameter:

Limit 1	
Index [data type]	**Designation**
80n0:07 [BOOL], disabled by default	Enable Limit 1
80n0:13 [SINT16]	Value Limit 1
80nD:29 [REAL32]	Value Limit 1 (Real32)

Limit 2	
Index [data type]	**Designation**
80n0:08 [BOOL], disabled by default	Enable Limit 2
80n0:14 [SINT16]	Value Limit 2
80nD:2A [REAL32]	Value Limit 2(Real32)

If the measured value exceeds/falls below the set limit, this is

- **displayed in the PDO status, output “Limit n” (2 bits):**
  - 0: not active, limit function disabled
  - 1: Measured value < limit value
  - 2: Measured value > limit value
  - 3: Measured value = limit value

Linking in the PLC with 2-bit values

The limit information consists of 2 bits. “Limit n” can be linked to the PLC or a task in the System Manager.

Note on the PLC: In the IEC61131 PLC, there is no 2-bit data type that can be linked directly to this process data. An input byte %I* must therefore be defined to transmit the limit information and the limit value (limit) must be linked to the VariableSizeMismatch dialog if the status word in the PLC is not interpreted bit by bit (recommended method).

- **counted informatively in the CoE**

Index	Designation	Meaning
90n0:16 or 90n0:18	Limit 1/2 counter low	Value has fallen below the limit value (edge detection)
90n0:17 or 90n0:19	Limit 1/2 counter high	Value has exceeded the limit value (edge detection)

The counters are reset by

- an interface change
- or de-energizing [(Re-)Power-Cycle]
- or the command x303n to index 0xFB00:01 (channel1: n=0, channel 2: n=1, ...).
  During execution, Status 255 "busy" is displayed in index 0xFB00:02, "0" means "successfully completed"
- and the command x3001 "Reset all counters"

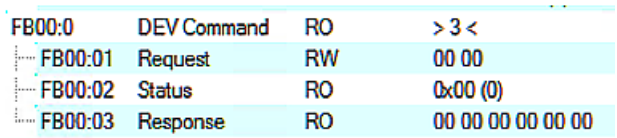


Fig. 59: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index 0xFB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 60: General parameter incompatibility reason, 0x06040043

- **Swap Limit Bits**

The limit function can be inverted using "SwapLimitBits" in index 0x80n0:0E in order to create compatibility with different application-side code.

Output “Limit n” (2 bits)

***SwapLimitBits* setting**	**Value**
FALSE (default)	• 0: not active • 1: value < limit value • 2: value > limit value • 3: value = limit value
TRUE	• 0: not active • 1: value > limit value • 2: value < limit value • 3: value = limit value

4.3.2.15 Tare

In the application, it can be helpful to set the display value to zero with an unloaded sensor. In weighing technology, this is known as the tare process or "relative measurement". This means that the offset component of the unloaded sensor (in this case a scale) is already subtracted from the measuring device. Note: When using tare, the value output in the channel is shifted, which leads to a restriction of the dynamic range in the positive or negative direction. If the channel can measure 0..10 V electrically, for example, and is tared (zeroed) at 8 V, only +2/-8 V measuring range remains.

To avoid reaching the INT16 limits, the use of Real32 PDO is strongly recommended when using Tare.

The Tare function works as follows:

1. Tare start

Tare can be triggered in the same way by

- PDO: Tare bit in the "AI.Control" PDO

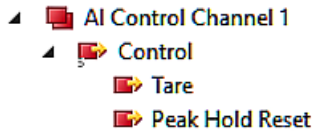


Fig. 61: PDO "AI Control"

then the tare bit from the control can trigger the tare via 0 → 1.

- or via CoE command "Save tare" Request = 0x313n to index 0xFB00: 01 (channel 1: n=0, channel 2: n=1, ...)

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 62: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index 0xFB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 63: General parameter incompatibility reason, 0x06040043

2. Measurement

The device now calculates an average value over 400 measured values; the duration of the process therefore depends on the conversion rate of the channel (see filter setting). During these approx. 250 ms, the electrical sensor signal should be stable. In some cases, it is recommended to support the tare process with a strongly attenuating low-pass filter (see chapter Filter1 [▶ 61]). After the tare process, the filter can be opened again.

During this time, PDO "AI Status.Tare Active" = FALSE

3. Calculation

Then

- the tare value is subtracted from the measured value and the measured value jumps once at this point.
- the determined tare value is displayed in CoE 0x90n0:1A.
- PDO "AI Status.Tare Active" = TRUE indicates that a tare value is being calculated

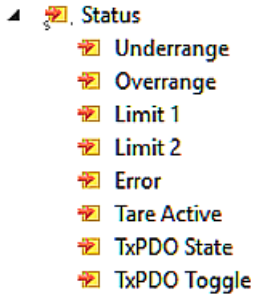


Fig. 64: "Tare active" in status word

The tare value is temporarily held in the channel, it is not secured against power failure. If it is to be saved permanently and thus secured against power failure, the request 0x318n must be sent to index 0xFB00:01 (channel 1: n=0, channel 2: n=1, ...).

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 65: CoE Index FB00, DEV Command

4. Reset

Tare is reset ("zeroed")

- by an interface change
- or de-energizing [(Re-)Power-Cycle], if not stored in fail-safe mode, see above.
- or the EtherCAT status BOOTSTRAP
- or the CoE command "Tare Reset" request = 0x314n to index 0xFB00: 01 (channel 1: n=0, channel 2: n=1, ...)

FB00:0	DEV Command	RO	> 3 <
FB00:01	Request	RW	00 00
FB00:02	Status	RO	0x00 (0)
FB00:03	Response	RO	00 00 00 00 00 00

Fig. 66: CoE Index FB00, DEV Command

During command execution, "Status" 255 "busy" is displayed in index 0xFB00:02, "0" means "successfully completed".

The firmware responds to an unknown command with

'Term 5 (EL4374)' (1002): CoE ('InitDown' 0xfb00:01) - SDO Abort ('General parameter incompatibility reason.', 0x06040043).

Fig. 67: General parameter incompatibility reason, 0x06040043

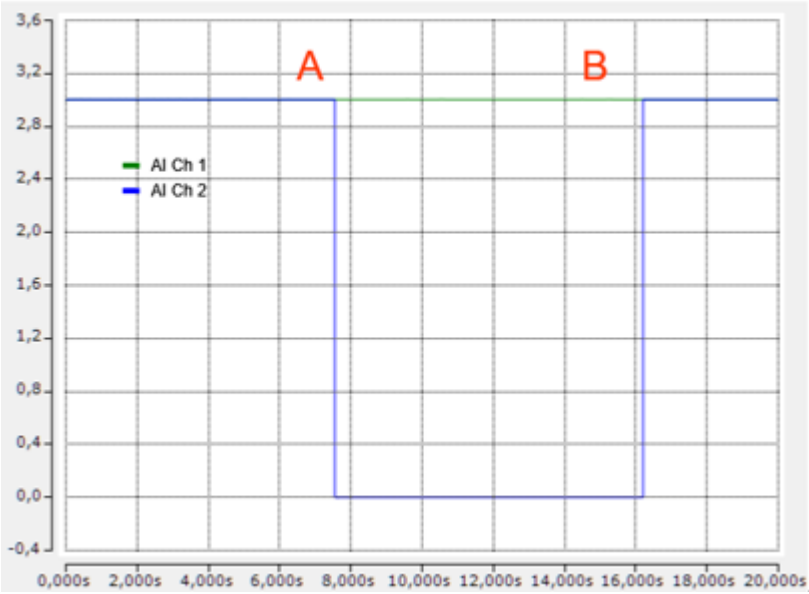


Fig. 68: Example: 3 V are electrically connected to Ch1+2 of an EL4374 at the same time, Filter1 = IIR8

At (A), Control.Tare = 1 is set on channel 2 (and the bit is then reset), the tare value is displayed in the CoE:

Tare Value	RO	3.003933 (3.003933e+00)

Fig. 69: Tare Value

As expected, the measured value goes to ~0.
At (B), tare is deleted again by command. Channel 1 runs without tare for comparison.

Optional: Disable tare.

If tare is to be disabled and then reactivated without recalculation, the “Disable Tare” option can be activated in the Control PDO. As long as this bit is activated, the measured value is not offset by the tare value. If this bit is reset to 0, the old tare value is reactivated without recalculation.

4.3.3 Sensor calibration

The sensor calibration adjusts the device to the characteristic curve of the sensor element. Two values are required for this procedure: the output value without a load (‘zero balance’) and fully loaded (‘rated output’). These values can be determined by a calibration protocol or by a calibration using calibration weights.

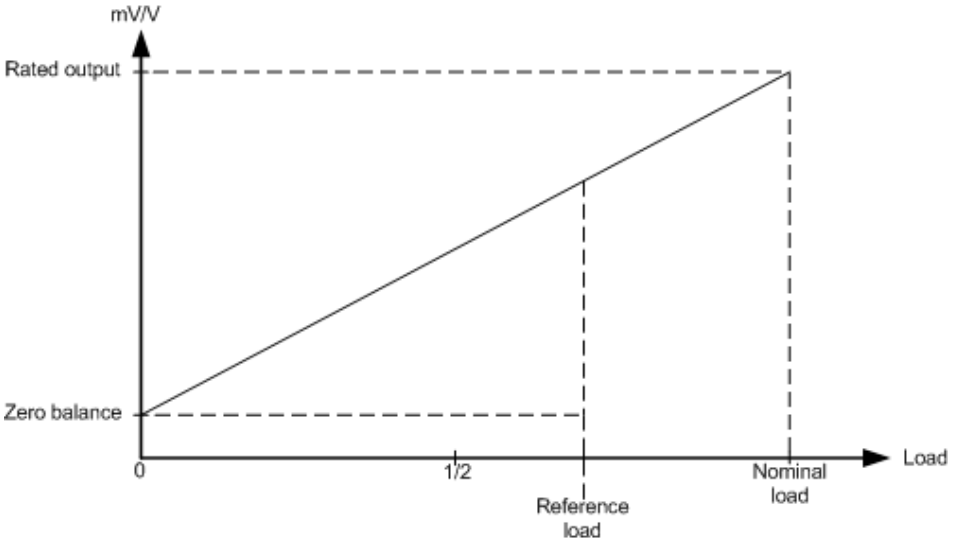


Fig. 70: Adaptation to the sensor curve

Calibration

The calibration is of great importance for the accuracy of the system. In order to increase this, the filter should be set as strong as possible over the entire calibration phase. It may take several seconds before a static value is obtained.

Local storage

The values modified during the theoretical and practical calibration are stored in a local EEPROM. This can be written to up to 1 million times. In order to prolong the service life of the EEPROM, therefore, the commands should not be executed cyclically.

Adjustment in the system

In the "practical" calibration, measurement takes place first with the scales unloaded, then with a defined load on the scales. The device automatically calculates the existing sensor characteristic values from the measured values.

To do this, follow the procedure below. The adjustment is channel-specific (n = 3 (Ch. 1), n = 7 (Ch. 2).

1. Perform CoE reset with object 0x1011:01 (see Restoring the delivery state [▶ 213])
2. Set scale factor(0x80n0:27) [▶ 103] to the desired value (default: 1000, 1 kg is displayed as 1000 g)
3. Set gravity of earth (0x80n0:26 [▶ 103]) if necessary (default: 9.80665016)
4. Set filter 1 (0x80n0:15 [▶ 89]) to the strongest level: IIR8
5. Specify the nominal load of the sensor in 0x80n0:24 [▶ 103] ("Nominal load"). The scaling must correspond to the scale factor. If the nominal load is specified as 4 kg and the scaling is set to 1000, you must
6. **Zero adjustment: Do not load the scales**
   - Wait until the measured value shows an unchanging value for at least 10 seconds (Control.PDO Steady state = 1)
   - Then execute the command "0x0101" (257_{dec}) on CoE object 0xB0n0:01 [▶ 107]. This command enters the current measured value into the ‘Zero balance’ object.
   - Check: CoE objects 0xB0n0:02 [▶ 107] and 0xB0n0:03 [▶ 107] must contain "0" after execution
7. **Gain adjustment: Apply a reference load to the balance**.

- The reference weight should be at least 20 % of the nominal load. The larger the reference load, the better the sensor values can be calculated.
- In object 0x80n0:28 [▶ 103] ("Reference load"), enter the load in the same unit as the nominal load (0x80n0:24 [▶ 103]).
- Wait until the measured value shows an unchanging value for at least 10 seconds (Control.PDO Steady state = 1)
- Then execute the command "0x0102" (258_{dec}) on CoE 0xB0n0:01 [▶ 107]. This command enters the current measured value in the "Sensitivity" object.
- Check: CoE objects 0xB0n0:02 [▶ 107] and 0xB0n0:03 [▶ 107] must contain "0" after execution

8. Reset: Execute command "0x0000" (0_{dec}) on CoE object 0xB0n0:01 [▶ 107].
9. Set the filter to a lower stage.

Theoretical adjustment according to sensor adjustment protocol

The sensor characteristic values according to the manufacturer's certificate are communicated here directly to the device, so that it can calculate the load.

1. Perform CoE reset with object 0x1011:01 (see Restoring the delivery state [▶ 88])
2. Gravity of earth (0x80n0:26 [▶ 103]) (default: 9.80665016)
3. Adopt the "Zero balance" (0x80n0:25 [▶ 103]) from the calibration protocol
4. Transfer "Sensitivity" (mV/V value 0x80n0:23 [▶ 103]) from the calibration protocol
5. Specify the nominal load of the sensor in 0x80n0:24 [▶ 103] ("Nominal load")
6. If required, change the scaling in 0x80n0:27 [▶ 103] ("Scale Factor"; default: 1000) to scale in grams, kilograms, tons, etc

4.4 Process data

4.4.1 Process data overview

The scope of the process data provided can be adjusted via the ‘Process Data’ tab (see the following figure: *ED3362 – SM2 Process Data tab (default)*).

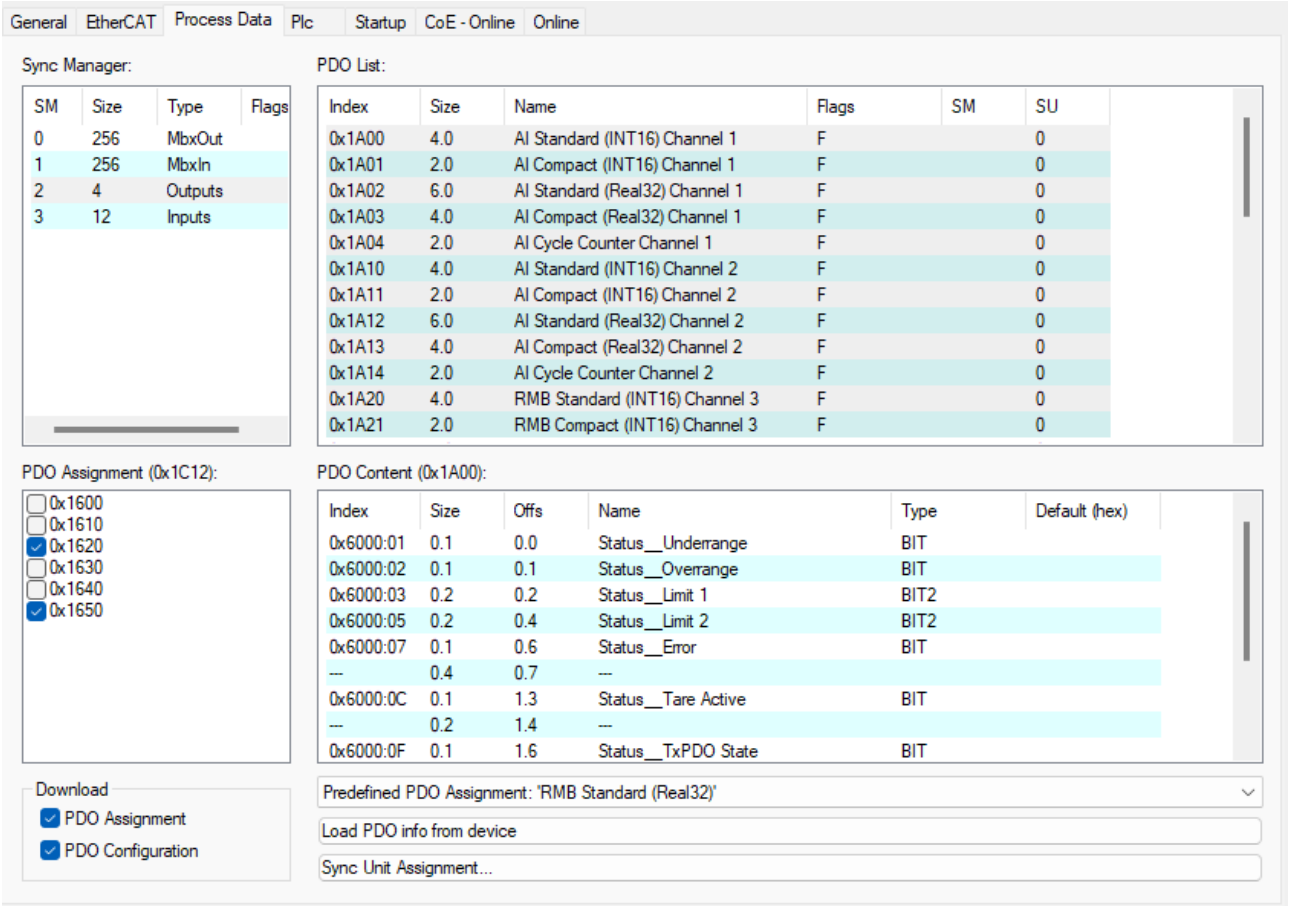


Fig. 71: ED3362 - Process data tab SM2 (default)

4.4.1.1 Control PDO

A 16 bit control PDO can be added to the measured value:

Bit	Name	Bit size	Data Type	Description
CW.0-2	-	3	-	Reserved for future use, not to be used
CW.3	Tare	1	BOOL	see "Tare [▶ 74]" functional unit
CW.4	Peak hold reset	1	BOOL	see "Peak Hold [▶ 69]" functional unit
CW.5	Input Freeze	1	BOOL	see "Input Freeze" functional unit
CW.6	Disable Tare	1	BOOL	see "Tare [▶ 74]" functional unit
CW.7-15	-	9	-	Reserved for future use, not to be used

Sync Manager 2 – SM2 Outputs

0x16n0 – AI Control Channel m (2.0)	
Contents **Index - Name Size (Byte.Bit)**	**Excluded PDOs**
0x70n0:04 - Control_Tare (0.1) 0x70n0:05 - Control_Peak Hold Reset (0.1) 0x70n0:06 - Input Freeze (0.1) 0x70n0:07 - Disable Tare (0.1)	-

4.4.1.2 Status PDO

The analog input channel has a status word (16 bits) in which real-time information is transported on a cycle-by-cycle basis.

Interpretation:

Under-range [Bool]	Over-range [Bool]	Limit 1/2 [2 bit]	Error (+ Error-LED) [Bool]	Steady state [Bool]	Tare Active [Bool]	Warning (+ Warning-LED) [Bool]	TxPDO State [Bool]	TxPDO Toggle [Bool]	Meaning
SW.0	SW.1	SW.3/2 SW.5/4	SW.6	SW.8	SW.11	SW.12	SW.14	SW.15	
1			1						Measuring range undershot, see chapter Range error [▶ 70]
	1		1						Measuring range exceeded, see chapter Range Error [▶ 70]
						1			Measuring range above or below the specified warning thresholds
		> 0							See limit function [▶ 72]
				1					Measured value is stable within the specified time and value window
							1		EtherCAT PDO transport failed
								0/1/0/1..	Value changes with each new measured value that is placed on EtherCAT
					1				Tare value has been calculated and is currently calculated internally, see Tare

Sync Manager 3 – SM3 Inputs

0x1An0 – AI Standard (INT16) Channel m (4.0)	
Contents **Index - Name Size (Byte.Bit)**	**PDOs connected** **Index - Name Size (byte.bit)**
0x60n0:01 - Status_Underrange (0.1) 0x60n0:02 - Status_Overrange (0.1) 0x60n0:03 - Status_Limit 1 (0.2) 0x60n0:05 - Status_Limit 2 (0.2) 0x60n0:07 - Status_Error (0.1) 0x60n0:09 - Status_Steady state (0.1) 0x60n0:0C - Status_Tare Active (0.1) 0x60n0:0D - Status_Warning (0.1) 0x60n0:0F - Status_TxPDO State (0.1) 0x60n0:10 - Status_TxPDO Toggle (0.1) 0x60n0:11 - Value (2.0)	0x1An1 0x1An2 0x1An3

0x1An1 – AI Compact (INT16) Channel m (2.0)	
Contents **Index - Name Size (Byte.Bit)**	**Excluded PDOs**
0x60n0:11 - Value (2.0)	0x1An0 0x1An2 0x1An3

0x1An2 - AI Standard (Real32) Channel m (6.0)	
Contents **Index - Name Size (Byte.Bit)**	**Excluded PDOs**
0x60n0:01 - Status_Underrange (0.1) 0x60n0:02 - Status_Overrange (0.1) 0x60n0:03 - Status_Limit 1 (0.2) 0x60n0:05 - Status_Limit 2 (0.2) 0x60n0:07 - Status_Error (0.1) 0x60n0:09 - Status_Steady state (0.1) 0x60n0:0C - Status_Tare Active (0.1) 0x60n0:0D - Status_Warning (0.1) 0x60n0:0F - Status_TxPDO State (0.1) 0x60n0:10 - Status_TxPDO Toggle (0.1) 0x60n0:11 - Value (Real32) (4.0)	0x1An0 0x1An1 0x1An3

0x1An3 - AI Compact (Real32) Channel m (4.0)	
Contents **Index - Name Size (Byte.Bit)**	**Excluded PDOs**
0x60n0:11 - Value (Real32) (4.0)	0x1An0 0x1An1 0x1An2

0x1An4 - AI Cycle Counter Channel m (2.0)	
Contents **Index - Name Size (Byte.Bit)**	**Excluded PDOs**
0x60n0:14 – Input Cycle Counter (2.0)	-

0x1A60 – DEV Inputs Device (2.0)	
Contents **Index - Name Size (Byte.Bit)**	**Excluded PDOs**
0xF600:04 – Status_Diag (0.1)	-

4.4.1.3 Device PDOs

4.4.2 Process data preselection (predefined PDOs)

The "Predefined PDO Assignment" enables a simplified selection of the process data. The desired function can be chosen from a drop-down menu at the bottom of the process data tab. As a result, all necessary PDOs are automatically enabled and the unnecessary PDOs are disabled.

The following PDO assignments are available:

Predefined PDO Assignment	PDO assignment (SM3)	PDO assignment (SM2)
RMB Standard (Real32)	0x1A22 - RMB Standard (Real32) Channel 1 0x1A52 - RMB Standard (Real32) Channel 2	0x1620 – RMB Control Channel 1 0x1650 – RMB Control Channel 1
AI Standard (Real32)	0x1A02 - AI Standard (Real32) UBridge Channel 1 0x1A12 - AI Standard (Real32) USense Channel 1 0x1A32 - AI Standard (Real32) UBridge Channel 2 0x1A42 - AI Standard (Real32) USense Channel 2	0x1600 - AI Control UBridge Channel 1 0x1610 - AI Control USense Channel 1 0x1630 - AI Control UBridge Channel 2 0x1640 - AI Control USense Channel 2
Full Standard (Real32)	0x1A02 - AI Standard (Real32) UBridge Channel 1 0x1A12 - AI Standard (Real32) USense Channel 1 0x1A22 - RMB Standard (Real32) Channel 1 0x1A32 - AI Standard (Real32) UBridge Channel 2 0x1A42 - AI Standard (Real32) USense Channel 2 0x1A52 - RMB Standard (Real32) Channel 2	0x1600 - AI Control UBridge Channel 1 0x1610 - AI Control USense Channel 1 0x1620 - RMB Control Channel 1 0x1630 - AI Control UBridge Channel 2 0x1640 - AI Control USense Channel 2 0x1650 - RMB Control Channel 1
RMB Standard (INT32)	0x1A20 RMB Standard (INT32) Channel 1 0x1A50 RMB Standard (INT32) Channel 2	0x1620 – RMB Control Channel 1 0x1650 – RMB Control Channel 1
AI Standard (INT16)	0x1A00 AI Standard (INT16) UBridge Channel 1 0x1A10 AI Standard (INT16) USense Channel 1 0x1A30 AI Standard (INT16) UBridge Channel 2 0x1A40 AI Standard (INT16) USense Channel 2	0x1600 - AI Control UBridge Channel 1 0x1610 - AI Control USense Channel 1 0x1630 - AI Control UBridge Channel 2 0x1640 - AI Control USense Channel 2
Full Standard (INT16/INT32)	0x1A00 AI Standard (INT16) UBridge Channel 1 0x1A10 AI Standard (INT16) USense Channel 1 0x1A20 RMB Standard (INT32) Channel 1 0x1A30 AI Standard (INT16) UBridge Channel 2 0x1A40 AI Standard (INT16) USense Channel 2 0x1A50 RMB Standard (INT32) Channel 2	0x1600 - AI Control UBridge Channel 1 0x1610 - AI Control USense Channel 1 0x1620 - RMB Control Channel 1 0x1630 - AI Control UBridge Channel 2 0x1640 - AI Control USense Channel 2 0x1650 - RMB Control Channel 1

4.4.3 Measured value transport

The following chapters describe the output of the Value PDO (measured value output of the analog input channel, Analog Input = AI). This analog channel supports the following PDOs:

Floating point output (Real32), default setting: "Floating Point (Real32)" (default setting of the channel)

During commissioning, the channel reports its analog measured value as a plain text-readable floating point value, both readable in the TwinCAT configuration

Name		Online	Type	Size
Value (REAL32)	X	3.0017853	REAL	4.0

Fig. 72: Value (floating point value), TwinCAT

as well as in the PLC Online View:

Expression	Type	Value
rIn	REAL	3.00178528

Fig. 73: Value (REAL) in PLC

The Real32 PDO can simply be linked to a REAL variable in PLC:

Fig. 74: Representation of the REAL variable in TwinCAT

This type of transmission avoids scaling errors, as the channel itself takes into account the measuring range (including any changes to the measuring range); commissioning and troubleshooting are significantly simplified compared to INT16.

Even if no unit (V, A, Ω, ..) is formally transmitted, the SI unit corresponding to the measurement context must be used, i.e. [A] and not [mA] for a 20 mA input.

Integer output (fixed point, INT16 or SINT16): "Standard (INT16)"

The channel reports its measured value as a 16-bit fixed point value (default incl. sign, signed integer), related to FSV (full scale value).

Name		Online	Type	Size
Value	X	9169 <2.798>	INT	2.0

Fig. 75: Value (fixed-point value), "Standard (INT16)"

The value range extends over -32767 ...0 ... 32768, knowledge of the measuring range is required for interpretation and transformation on the control side, e.g. 10V ~ x7FFF = 32767 in legacy representation.

If the channel is to be linked with existing PLC code, it can be converted to this INT16 format. Otherwise, the default setting "Real32" is recommended.

With this type, the channel provides the *AI status*, see the following section.

Integer output (fixed point, INT16 or SINT16): "Compact", without PDO status

Corresponds to the previous point, but without PDO AI status.
This option is supported for compatibility reasons and results in minimal data consumption in EtherCAT. However, operation without status makes diagnosis more difficult.

Name	Online	Type	Size
Value	8 <0.002>	INT	2.0
Value	-5 <-0.002>	INT	2.0

Fig. 76: Value (fixed-point value), "Compact (INT16)"

4.5 Diagnostics

4.5.1 Diagnostics via the status bits

The product has the following status bits in the process data, which can be used for diagnostics.

The virtual channel for the measuring bridge "RMB" always results from two electrical, analog channels "AI" for U_{Bridge} and U_{Sense}. The electrical channels forward their messages to the virtual channel and the associated LEDs, regardless of whether they are displayed in the process image or not. The messages of the electrical and virtual channels are linked with an OR, so that the messages displayed by the RMB channel are an OR for most bits. This procedure applies to Underrange, Overrange, Error, Tare active and Warning.

Index	Name	Description
0x60n0:01	Underrange	Value below measuring range
0x60n0:02	Overrange	Measuring range exceeded
0x60n0:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: Value is smaller than the limit value 1 2: Value is larger than the limit value 1 3: Value is equal to the limit value 1
0x60n0:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: Value is smaller than the limit value 2 2: Value is larger than the limit value 2 3: Value is equal to the limit value 2
0x60n0:07	Error	The error bit is set if the data is invalid (overrange, underrange)
0x60n0:09	Steady state	Measured value is stable
0x60n0:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active
0x60n0:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.
0x60n0:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).
0x60n0:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.
0x60n0:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.

4.5.2 Device diagnostic functions

Diagnostics in the CoE

The following device information can be read from the CoE:

Index	Name	Meaning
0xF900:11	Operating Time	operating time of the device in [min], cannot be deleted
0xF900:12	Device Temperature	current internal terminal temperature in [°C]. Note: this value depends on the installation position, it is usually well above the ambient temperature.
0xF900:13	Min. Device Temperature	minimum value ever observed by the terminal in [°C], cannot be deleted
0xF900:14	Max. Device Temperature	maximum value ever observed by the terminal in [°C], cannot be deleted
0xF900:15	Supply Voltage	Informative display of the power contact voltage, measurement uncertainty ±1.2 V in the range 20..29 V. Measurement is not guaranteed for voltages outside this range!

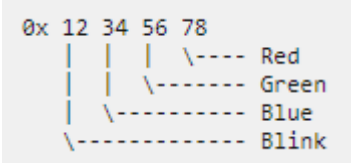
LED Status

The status of the terminal LEDs can be read electronically as follows:

Index	Name	Meaning
0xF915:01	RUN	EtherCAT Status
0xF915:02	Ch1 steady	Steady state Channel 1
0xF915:03	Ch1 warning	Channel 1 warning
0xF915:04	Ch1 error	Channel 1 error
0xF915:07	DI1	Digital input 1 (ED3361 and ED3362 only)
0xF915:08	DO1	Digital output 1 (ED3361 and ED3362 only)
0xF915:09	Up 24 V	Supply voltage
0xF915:0A	Ch2 steady	Steady state channel 2 (ED3362, ED3362-0100 only)
0xF915:0B	Ch2 warning	Channel 2 warning (ED3362, ED3362-0100 only)
0xF915:0C	Ch2 error	Channel 2 error (ED3362, ED3362-0100 only)
0xF915:0E	DI2	Digital input 2 (ED3362 only)
0xF915:0D	DO2	Digital output 2 (ED3362 only)

The status of the optical displays (LEDs) in the device can be read out electronically in CoE 0xF915 LED Status, e.g. for simultaneous LED display in the visualization.

These are four bytes that describe the RGB value and the light status:



- Byte 1 (from left to right): Flashing/lighting code
  - 0x00: Off/ not available
  - 0x01…0x14: 1..20 Hz
  - 0x80: EtherCAT PreOp
  - 0x81: EtherCAT SafeOp

- 0x82: EtherCAT Boot
- 0xFF: On/ available

- Byte 2..4:
  - 0x00: Off
  - 0xFF: On

Examples:

- 0x 00 00 00 00: LED not present
- 0x FF 00 00 00 : LED is on, RGB =0, i.e. not illuminated, meaning: LED is present

```
0x 00 00 00 FF : LED off (Red)
0x 00 00 FF 00 : LED off (Green)
0x 00 FF 00 00 : LED off (Blue)
0x 00 00 FF FF : LED off (Yellow)
0x 00 FF FF FF : LED off (White)
```

```
0x FF 00 00 FF : LED on  (Red)
0x FF 00 FF 00 : LED on  (Green)
0x FF FF 00 00 : LED on  (Blue)
0x FF 00 FF FF : LED on  (Yellow)
0x FF FF FF FF : LED on  (White)
```

Fig. 77: Examples LED status

4.5.3 Diag-Messages

The terminal provides the following diagnostic messages, they belong together in pairs:

Diag-Code	Meaning	TwinCAT Message	Troubleshooting
#x4101	Terminal-Overtemperature	Terminal-Overtemperature	Device is too warm internally, but continues to work, ensure cooling
#x170E	No overtemperature anymore	No overtemperature anymore	-
#x8601	Supply voltage too low	Supply voltage too low	Check voltage of power contacts Up
#x1180	Supply voltage ok	Supply voltage ok	-

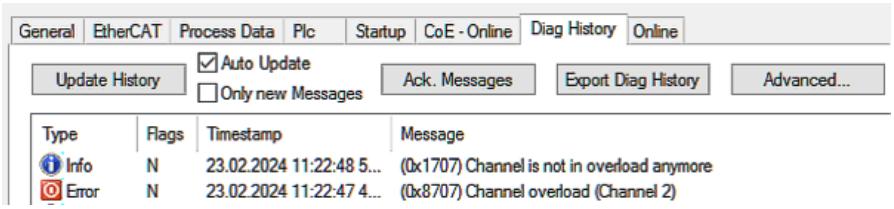


Fig. 78: Display in TwinCAT 3.1

The 0x1A60 DEV Inputs Device object can be added to the process data via the process data. This contains the Diag bit, which indicates that a new message is available in the Diag messages, which can then be read out accordingly.

4.6 Object description (CoE)

EtherCAT XML Device Description

The display matches that of the CoE objects from the EtherCAT ESI Device Description (XML).We recommend downloading the latest XML file from the download area of the Beckhoff website and installing it according to installation instructions.

Parameterization via the CoE list (CAN over EtherCAT)

The EtherCAT device is parameterized via the CoE-Online tab (double-click on the respective object) or via the Process Data tab (allocation of PDOs). Please note the following general CoE notes when using/manipulating the CoE parameters:

- Keep a startup list if components have to be replaced
- Differentiation between online/offline dictionary, existence of current XML description
- use “CoE reload [▶ 213]” for resetting changes

4.6.1 ED3361-0100

4.6.1.1 Restore objects

Index 1011 Restore default parameters

Index (hex)	Name	Meaning	Data type	Flags	Default
1011:0	Restore default parameters	Restore default parameters	UINT8	RO	0x01 (1dec)
1011:01	SubIndex 001	If this object is set to "0x64616F6C" in the set value dialog, all backup objects are reset to their delivery state.	UINT32	RW	0x00000000 (0dec)

4.6.1.2 Configuration data

Index 8000 AI Settings UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8000:0	AI Settings UBridge Ch.1	Max. Subindex	UINT8	RO	0x18 (24_{dec})
8000:01	Enable User Scale [▶ 67]	User scaling is active	BOOLEAN	RW	0x00 (0_{dec})
8000:02	Presentation [▶ 55]	0: *Signed presentation* The measured value is displayed in two's complement. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$ 1: *Unsigned presentation* Maximum presentation range for 16 bits: 0 ... $+65535_{dec}$ 2: *Absolute value with MSB as sign* The measured value is output in the signed amount representation. Maximum presentation range at 16 bits: - 32768_{dec} ... $+32767_{dec}$	BIT3	RW	0x00 (0_{dec})
8000:06	Enable Filter 1 [▶ 61]	Enable filter 1	BOOLEAN	RW	0x01 (1_{dec})
8000:07	Enable Limit 1 [▶ 72]	Enable Limit 1	BOOLEAN	RW	0x00 (0_{dec})
8000:08	Enable Limit 2 [▶ 72]	Enable Limit 2	BOOLEAN	RW	0x00 (0_{dec})
8000:0A	Enable user calibration [▶ 63]	Enable user calibration	BOOLEAN	RW	0x00 (0_{dec})
8000:0B	Enable vendor calibration [▶ 63]	Enable vendor calibration	BOOLEAN	RW	0x01 (1_{dec})
8000:0E	Swap Limit Bits	Swap limit bits	BOOLEAN	RW	0x00 (0_{dec})
8000:11	User Scale Offset [▶ 67]	User scale offset	INT16	RW	0x0000 (0_{dec})
8000:12	User Scale Gain [▶ 67]	User scale gain. The gain has a fixed-point representation with a factor of 2^{-16}. The value 1 corresponds to 65535 (0x00010000).	INT32	RW	0x00010000 (65536_{dec})
8000:13	Limit 1 [▶ 72]	First limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8000:14	Limit 2 [▶ 72]	Second limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8000:15	Filter 1 Settings [▶ 61]	This object determines the digital filter settings if it is active via Enable filter (Index 0x8000:06). The possible settings are numbered consecutively. 0: 50 Hz FIR 1: 60 Hz FIR 2: IIR 1 3: IIR 2 4: IIR 3 5: IIR 4 6: IIR 5 7: IIR 6 8: IIR 7 9: IIR 8 Refer to the Note on setting the filter characteristics	UINT16	RW	0x0000 (0_{dec})
8000:17	User calibration offset [▶ 63]	User calibration offset	INT16	RW	0x0000 (0_{dec})
8000:18	User calibration gain [▶ 63]	User calibration gain	UINT16	RW	0x7FFF (32767_{dec})

Index 800C AI User Calibration Data UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
800C:0	AI User Calibration Data UBridge Ch.1	Max. Subindex	UINT8	RO	0x0D (13_{dec})
800C:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
800C:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
800C:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
800C:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
800C:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
800C:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0dec)
800C:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0dec)

Index 800D AI Advanced Settings UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
800D:0	AI Advanced Settings UBridge Ch.1	Max. Subindex	UINT8	RO	0x2E (46$_{dec}$)
800D:11	Input Interface [▶ 61]	Values: 0 - None 48 - V ±20 mV 49 - V ±75 mV 50 - V ±4 V	UINT16	RW	0x0002 (2$_{dec}$)
800D:12	Integer Scaler [▶ 52]	Values: 0 - Extended Range 3 - Legacy Range	UINT16	RW	0x0000 (0$_{dec}$)
800D:17	Low Range Error [▶ 70]	Low Range limit value	INT32	RW	0xFFFF8000 (-32768$_{dec}$)
800D:018	High Range Error [▶ 70]	High Range limit value	INT32	RW	0x00007FFF (32767$_{dec}$)
800D:1A	Filter 2 Settings [▶ 66]	Values: 0 – Off 1 - HP 0.001 Hz 2 - HP 0.01 Hz 3 - HP 0.1 Hz 4 - HP 1 Hz 5 - HP 10 Hz	UINT16	RW	0x0000 (0$_{dec}$)
800D:1C	User Scale Offset (Real32) [▶ 67]	User scale offset (Real32)	REAL32	RW	0x00000000 (0.0)
800D:1D	User Scale Gain (Real32) [▶ 67]	User scale gain. (Real32)	REAL32	RW	0x3F800000 (1.0)
800D:27	Low Range Error (Real32) [▶ 70]	Limit value Low Range Error (Real32)	REAL32	RW	0xC12BCC79 (-10.7374201)
800D:28	High Range Error (Real32) [▶ 70]	Limit value High Range Error (Real32)	REAL32	RW	0x412BCC79 (10.7374201)
800D:29	Limit 1 (Real32) [▶ 72]	Limit value Limit1	REAL32	RW	0x00000000 (0.0)
800D:2A	Limit 2 (Real32) [▶ 72]	Limit 2 (INT16) in the AI settings is adjusted automatically	REAL32	RW	0x00000000 (0.0)
800D:2B	Steady state Window [▶ 68]	Time constant for the "Steady state" bit	UINT16	RW	0x0064 (100dec)
800D:2C	Steady state tolerance [▶ 68]	Tolerance window for the "Steady state" bit	REAL32	RW	0x3F800000 (1065353216dec)
800D:2D	Low Range Warning (Real32) [▶ 69]	Limit value Low Range Warning (Real32)	REAL32	RW	0xBCA3D70A (-1130113270 dec)
800D:2E	High Range Warning (Real32) [▶ 69]	Limit value High Range Warning (Real32)	REAL32	RW	0x3CA3D70A (1017370378dec)

Index 800F AI Vendor Calibration Data UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
800F:0	AI Vendor Calibration Data UBridge Ch.1	Max. Subindex	UINT8	RO	0x08 (8_{dec})
800F:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
800F:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
800F:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
800F:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
800F:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
800F:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0_{dec})
800F:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0_{dec})

Index 8010 AI Settings USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8010:0	AI Settings USense Ch.1	Max. Subindex	UINT8	RO	0x18 (24_{dec})
8010:01	Enable User Scale [▶ 67]	User scaling is active	BOOLEAN	RW	0x00 (0_{dec})
8010:02	Presentation [▶ 55]	0: *Signed presentation* The measured value is displayed in two's complement. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$ 1: *Unsigned presentation* Maximum presentation range for 16 bits: 0 ... $+65535_{dec}$ 2: *Absolute value with MSB as sign* The measured value is output in the signed amount representation. Maximum presentation range at 16 bits: - 32768_{dec} ... $+32767_{dec}$	BIT3	RW	0x00 (0_{dec})
8010:06	Enable Filter 1 [▶ 61]	Enable filter 1	BOOLEAN	RW	0x01 (1_{dec})
8010:07	Enable Limit 1 [▶ 72]	Enable Limit 1	BOOLEAN	RW	0x00 (0_{dec})
8010:08	Enable Limit 2 [▶ 72]	Enable Limit 2	BOOLEAN	RW	0x00 (0_{dec})
8010:0A	Enable user calibration [▶ 63]	Enable user calibration	BOOLEAN	RW	0x00 (0_{dec})
8010:0B	Enable vendor calibration [▶ 63]	Enable vendor calibration	BOOLEAN	RW	0x01 (1_{dec})
8010:0E	Swap Limit Bits	Swap limit bits	BOOLEAN	RW	0x00 (0_{dec})
8010:11	User Scale Offset [▶ 67]	User scale offset	INT16	RW	0x0000 (0_{dec})
8010:12	User Scale Gain [▶ 67]	User scale gain. The gain has a fixed-point representation with a factor of 2^{-16}. The value 1 corresponds to 65535 (0x00010000).	INT32	RW	0x00010000 (65536_{dec})
8010:13	Limit 1 [▶ 72]	First limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8010:14	Limit 2 [▶ 72]	Second limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8010:15	Filter 1 Settings [▶ 61]	This object determines the digital filter settings if it is active via Enable filter (Index 0x8010:06). The possible settings are numbered consecutively. 0: 50 Hz FIR 1: 60 Hz FIR 2: IIR 1 3: IIR 2 4: IIR 3 5: IIR 4 6: IIR 5 7: IIR 6 8: IIR 7 9: IIR 8 Refer to the Note on setting the filter characteristics	UINT16	RW	0x0000 (0_{dec})
8010:17	User calibration offset [▶ 63]	User calibration offset	INT16	RW	0x0000 (0_{dec})
8010:18	User calibration gain [▶ 63]	User calibration gain	UINT16	RW	0x7FFF (32767_{dec})

Index 801C AI User Calibration Data USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
801C:0	AI User Calibration Data USense Ch.1	Max. Subindex	UINT8	RO	0x0D (13_{dec})
801C:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
801C:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
801C:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
801C:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
801C:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
801C:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0dec)
801C:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0dec)

Index 801D AI Advanced Settings USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
801D:0	AI Advanced Settings USense Ch.1	Max. Subindex	UINT8	RO	0x2E (46_{dec})
801D:11	Input Interface [▶ 61]	Values: 0 - None 48 - V ±20 mV 49 - V ±75 mV 50 - V ±4 V	UINT16	RW	0x0002 (2_{dec})
801D:12	Integer Scaler [▶ 52]	Values: 0 - Extended Range 3 - Legacy Range	UINT16	RW	0x0000 (0_{dec})
801D:17	Low Range Error [▶ 70]	Low Range limit value	INT32	RW	0xFFFF8010 (-32768_{dec})
801D:18	High Range Error [▶ 70]	High Range limit value	INT32	RW	0x00007FFF (32767_{dec})
801D:1A	Filter 2 Settings [▶ 66]	Values: 0 – Off 1 - HP 0.001 Hz 2 - HP 0.01 Hz 3 - HP 0.1 Hz 4 - HP 1 Hz 5 - HP 10 Hz	UINT16	RW	0x0000 (0_{dec})
801D:1C	User Scale Offset (Real32) [▶ 67]	User scale offset (Real32)	REAL32	RW	0x00000000 (0.0)
801D:1D	User Scale Gain (Real32) [▶ 67]	User scale gain. (Real32)	REAL32	RW	0x3F800000 (1.0)
801D:27	Low Range Error (Real32) [▶ 70]	Limit value Low Range Error (Real32)	REAL32	RW	0xC12BCC79 (-10.7374201)
801D:28	High Range Error (Real32) [▶ 70]	Limit value High Range Error (Real32)	REAL32	RW	0x412BCC79 (10.7374201)
801D:29	Limit 1 (Real32) [▶ 72]	Limit value Limit1	REAL32	RW	0x00000000 (0.0)
801D:2A	Limit 2 (Real32) [▶ 72]	Limit 2 (INT16) in the AI settings is adjusted automatically	REAL32	RW	0x00000000 (0.0)
801D:2B	Steady state Window [▶ 68]	Time constant for the "Steady state" bit	UINT16	RW	0x0064 (100dec)
801D:2C	Steady state tolerance [▶ 68]	Tolerance window for the "Steady state" bit	REAL32	RW	0x3F800000 (1065353216dec)
801D:2D	Low Range Warning (Real32) [▶ 69]	Limit value Low Range Warning (Real32)	REAL32	RW	0xBCA3D70A (-1130113270dec)
801D:2E	High Range Warning (Real32) [▶ 69]	Limit value High Range Warning (Real32)	REAL32	RW	0x3CA3D70A (1017370378dec)

Index 801F AI Vendor Calibration Data USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
801F:0	AI Vendor Calibration Data USense Ch.1	Max. Subindex	UINT8	RO	0x08 (8_{dec})
801F:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
801F:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
801F:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
801F:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
801F:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
801F:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0_{dec})
801F:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0_{dec})

Index 8020 RMB Settings Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8020:0	RMB Settings Ch.1	Max. Subindex	UINT8	RO	0x18 (24_{dec})
8020:01	Enable User Scale [▶ 67]	User scaling is active	BOOLEAN	RW	0x00 (0_{dec})
8020:02	Presentation [▶ 55]	0: *Signed presentation* The measured value is displayed in two's complement. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$ 1: *Unsigned presentation* Maximum presentation range for 16 bits: 0 ... $+65535_{dec}$ 2: *Absolute value with MSB as sign* The measured value is output in the signed amount representation. Maximum presentation range at 16 bits: - 32768_{dec} ... $+32767_{dec}$	BIT3	RW	0x00 (0_{dec})
8020:06	Enable Filter 1 [▶ 61]	Enable filter 1	BOOLEAN	RW	0x01 (1_{dec})
8020:07	Enable Limit 1 [▶ 72]	Enable Limit 1	BOOLEAN	RW	0x00 (0_{dec})
8020:08	Enable Limit 2 [▶ 72]	Enable Limit 2	BOOLEAN	RW	0x00 (0_{dec})
8020:0A	Enable user calibration [▶ 63]	Enable user calibration	BOOLEAN	RW	0x00 (0_{dec})
8020:0B	Enable vendor calibration [▶ 63]	Enable vendor calibration	BOOLEAN	RW	0x01 (1_{dec})
8020:0E	Swap Limit Bits	Swap limit bits	BOOLEAN	RW	0x00 (0_{dec})
8020:11	User Scale Offset [▶ 67]	User scale offset	INT16	RW	0x0000 (0_{dec})
8020:12	User Scale Gain [▶ 67]	User scale gain. The gain has a fixed-point representation with a factor of 2^{-16}. The value 1 corresponds to 65535 (0x00010000).	INT32	RW	0x00010000 (65536_{dec})
8020:13	Limit 1 [▶ 72]	First limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8020:14	Limit 2 [▶ 72]	Second limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8020:15	Filter 1 Settings [▶ 61]	This object determines the digital filter settings if it is active via Enable filter (Index 0x8020:06). The possible settings are numbered consecutively. 0: 50 Hz FIR 1: 60 Hz FIR 2: IIR 1 3: IIR 2 4: IIR 3 5: IIR 4 6: IIR 5 7: IIR 6 8: IIR 7 9: IIR 8 Refer to the Note on setting the filter characteristics	UINT16	RW	0x0000 (0_{dec})
8020:17	User calibration offset [▶ 63]	User calibration offset	INT16	RW	0x0000 (0_{dec})
8020:18	User calibration gain [▶ 63]	User calibration gain	UINT16	RW	0x7FFF (32767_{dec})

Index 802C RMB User Calibration Data Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
802C:0	RMB User calibration Data Ch.1	Max. Subindex	UINT8	RO	0x0D (13_{dec})
802C:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
802C:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
802C:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
802C:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
802C:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
802C:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0dec)
802C:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0dec)

Index 802D RMB Advanced Settings Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
802D:0	RMB Advanced Settings Ch.1	Max. Subindex	UINT8	RO	0x2E (46_{dec})
802D:11	Input Interface [▶ 61]	Values: 0 - None 48 - V ±20 mV 49 - V ±75 mV 50 - V ±4 V	UINT16	RW	0x0002 (2_{dec})
802D:12	Integer Scaler [▶ 52]	Values: 0 - Extended Range 3 - Legacy Range	UINT16	RW	0x0000 (0_{dec})
802D:17	Low Range Error [▶ 70]	Low Range limit value	INT32	RW	0xFFFF8020 (-32768_{dec})
802D:018	High Range Error [▶ 70]	High Range limit value	INT32	RW	0x00007FFF (32767_{dec})
802D:1A	Filter 2 Settings [▶ 66]	Values: 0 – Off 1 - HP 0.001 Hz 2 - HP 0.01 Hz 3 - HP 0.1 Hz 4 - HP 1 Hz 5 - HP 10 Hz	UINT16	RW	0x0000 (0_{dec})
802D:1C	User Scale Offset (Real32) [▶ 67]	User scale offset (Real32)	REAL32	RW	0x00000000 (0.0)
802D:1D	User Scale Gain (Real32) [▶ 67]	User scale gain. (Real32)	REAL32	RW	0x3F800000 (1.0)
802D:27	Low Range Error (Real32) [▶ 70]	Limit value Low Range Error (Real32)	REAL32	RW	0xC12BCC79 (-10.7374201)
802D:28	High Range Error (Real32) [▶ 70]	Limit value High Range Error (Real32)	REAL32	RW	0x412BCC79 (10.7374201)
802D:29	Limit 1 (Real32) [▶ 72]	Limit value Limit1	REAL32	RW	0x00000000 (0.0)
802D:2A	Limit 2 (Real32) [▶ 72]	Limit 2 (INT16) in the RMB settings is automatically adjusted	REAL32	RW	0x00000000 (0.0)
802D:2B	Steady state Window [▶ 68]	Time constant for the "Steady state" bit	UINT16	RW	0x0064 (100dec)
802D:2C	Steady state tolerance [▶ 68]	Tolerance window for the "Steady state" bit	REAL32	RW	0x3F800000 (1065353216dec)
802D:2D	Low Range Warning (Real32) [▶ 69]	Limit value Low Range Warning (Real32)	REAL32	RW	0xBCA3D70A (-1130113270dec)
802D:2E	High Range Warning (Real32) [▶ 69]	Limit value High Range Warning (Real32)	REAL32	RW	0x3CA3D70A (1017370378dec)

Index 802F RMB Vendor Calibration Data Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
802F:0	RMB Vendor Calibration Data Ch.1	Max. Subindex	UINT8	RO	0x08 (8_{dec})
802F:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
802F:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
802F:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
802F:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
802F:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
802F:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0_{dec})
802F:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0_{dec})

Index 8030 RMB Sensor Settings Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8030:0	RMB Sensor Settings Ch.1		UINT8	RO	0x28 (40_{dec})
8030:23	Sensitivity	Characteristic value of the load cell mV/V	REAL32	RW	0x40000000 (1073741824_{dec})
8030:24	Nominal Load	Nominal load of the load cell	REAL32	RW	0x3F800000 (1065353216_{dec})
8030:25	Zero Balance	Zero offset of the load cell	REAL32	RW	0x00000000 (0_{dec})
8030:26	Gravity of Earth	Acceleration of gravity (normal: 9.806650)	REAL32	RW	0x411CE80A (1092413450_{dec})
8030:27	Scale factor	Scaling factor	REAL32	RW	0x447A0000 (1148846080_{dec})
8030:28	Reference load	Value of the weight used for adjustment	REAL32	RW	0x3F800000 (1065353216_{dec})

Index F800 DEV Settings

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F800:0	DEV Settings	Max. Subindex	UINT8	RO	0x01 (1dec)
F800:01	Sensor supply	Values: 0 - OFF 5000 - 5 V 10000 - 10 V	UINT16	RW	0x2710 (10000dec)

4.6.1.3 Information and diagnostic data

Index 9000E AI Internal data UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9000:0	AI Internal Data UBridge Ch.1	Max. Subindex	UINT8	RO	0x1B (27_{dec})
9000:02	ADC raw value	ADC Raw data	INT32	RO	0x00000000 (0_{dec})
9000:03	Value After Filter 1	Current measured value after filter 1	INT32	RO	0x00000000 (0_{dec})
9000:04	Value After Interface	Current measured value after interface evaluation	REAL32	RO	0x00000000 (0_{dec})
9000:09	Value After Filter 2	Current measured value after filter 2	REAL32	RO	0x00000000 (0_{dec})
9000:0B	Value After User Scale	Current measured value according to UserScale	REAL32	RO	0x00000000 (0_{dec})
9000:0C	Actual positive peak hold	Positive drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9000:0D	Actual negative peak hold	Negative drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9000:14	Underrange Error Counter	Counter for underrange errors	UINT32	RO	0x00000000 (0_{dec})
9000:15	Overrange Error Counter	Counter for overrange errors	UINT32	RO	0x00000000 (0_{dec})
9000:16	Limit 1 Counter Low	Counter for "Limit 1 Low" events	UINT32	RO	0x00000000 (0_{dec})
9000:17	Limit 1 Counter High	Counter for "Limit 1 High" events	UINT32	RO	0x00000000 (0_{dec})
9000:18	Limit 2 Counter Low	Counter for "Limit 2 Low" events	UINT32	RO	0x00000000 (0_{dec})
9000:19	Limit 2 Counter High	Counter for "Limit 2 High" events	UINT32	RO	0x00000000 (0_{dec})
9000:1A	Tare Value	Tare value currently taken into account	REAL32	RO	0x00000000 (0_{dec})
9000:1B	Sampling rate	Current effective sampling rate, [1/sec]	REAL32	RO	0x00000000 (0_{dec})
9000:1C	Value After Calibration	Current measured value after calibration	REAL32	RO	0x00000000 (0dec)
9000:1D	Underrange Warning Counter	Counter for underrange warning	UINT32	RO	0x00000000 (0dec)
9000:1E	Overrange Warning Counter	Counter for overrange warning	UINT32	RO	0x00000000 (0dec)

Index 9002 AI Info Data UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9002:0	AI Info Data UBridge Ch.1	Max. Subindex	UINT8	RO	0x12 (18_{dec})
9002:11	Vendor calibration counter [▶ 63]	Counter for changes to the vendor adjustment data	UINT32	RO	0x00000000 (0_{dec})
9002:12	User calibration Counter [▶ 63]	Counter for changes to the user calibration data	UINT32	RO	0x00000000 (0_{dec})

Index 9010 AI Internal Data USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9010:0	AI Internal Data USense Ch.1	Max. Subindex	UINT8	RO	0x1B (27_{dec})
9010:02	ADC raw value	ADC Raw data	INT32	RO	0x00000000 (0_{dec})
9010:03	Value After Filter 1	Current measured value after filter 1	INT32	RO	0x00000000 (0_{dec})
9010:04	Value After Interface	Current measured value after interface evaluation	REAL32	RO	0x00000000 (0_{dec})
9010:09	Value After Filter 2	Current measured value after filter 2	REAL32	RO	0x00000000 (0_{dec})
9010:0B	Value After User Scale	Current measured value according to UserScale	REAL32	RO	0x00000000 (0_{dec})
9010:0C	Actual positive peak hold	Positive drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9010:0D	Actual negative peak hold	Negative drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9010:14	Underrange Error Counter	Counter for underrange errors	UINT32	RO	0x00000000 (0_{dec})
9010:15	Overrange Error Counter	Counter for overrange errors	UINT32	RO	0x00000000 (0_{dec})
9010:16	Limit 1 Counter Low	Counter for "Limit 1 Low" events	UINT32	RO	0x00000000 (0_{dec})
9010:17	Limit 1 Counter High	Counter for "Limit 1 High" events	UINT32	RO	0x00000000 (0_{dec})
9010:18	Limit 2 Counter Low	Counter for "Limit 2 Low" events	UINT32	RO	0x00000000 (0_{dec})
9010:19	Limit 2 Counter High	Counter for "Limit 2 High" events	UINT32	RO	0x00000000 (0_{dec})
9010:1A	Tare Value	Tare value currently taken into account	REAL32	RO	0x00000000 (0_{dec})
9010:1B	Sampling rate	Current effective sampling rate, [1/sec]	REAL32	RO	0x00000000 (0_{dec})
9010:1C	Value After Calibration	Current measured value after calibration	REAL32	RO	0x00000000 (0dec)
9010:1D	Underrange Warning Counter	Counter for underrange warning	UINT32	RO	0x00000000 (0dec)
9010:1E	Overrange Warning Counter	Counter for overrange warning	UINT32	RO	0x00000000 (0dec)

Index 9012 AI Info Data USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9012:0	AI Info Data USense Ch.1	Max. Subindex	UINT8	RO	0x12 (18_{dec})
9012:11	Vendor calibration counter [▶ 63]	Counter for changes to the vendor adjustment data	UINT32	RO	0x00000000 (0_{dec})
9012:12	User calibration Counter [▶ 63]	Counter for changes to the user calibration data	UINT32	RO	0x00000000 (0_{dec})

Index 9020 RMB Internal Data Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9020:0	RMB Internal Data Ch.1	Max. Subindex	UINT8	RO	0x1B (27_{dec})
9020:02	ADC raw value	ADC Raw data	INT32	RO	0x00000000 (0_{dec})
9020:03	Value After Filter 1	Current measured value after filter 1	INT32	RO	0x00000000 (0_{dec})
9020:04	Value After Interface	Current measured value after interface evaluation	REAL32	RO	0x00000000 (0_{dec})
9020:09	Value After Filter 2	Current measured value after filter 2	REAL32	RO	0x00000000 (0_{dec})
9020:0B	Value After User Scale	Current measured value according to UserScale	REAL32	RO	0x00000000 (0_{dec})
9020:0C	Actual positive peak hold	Positive drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9020:0D	Actual negative peak hold	Negative drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9020:14	Underrange Error Counter	Counter for underrange errors	UINT32	RO	0x00000000 (0_{dec})
9020:15	Overrange Error Counter	Counter for overrange errors	UINT32	RO	0x00000000 (0_{dec})
9020:16	Limit 1 Counter Low	Counter for "Limit 1 Low" events	UINT32	RO	0x00000000 (0_{dec})
9020:17	Limit 1 Counter High	Counter for "Limit 1 High" events	UINT32	RO	0x00000000 (0_{dec})
9020:18	Limit 2 Counter Low	Counter for "Limit 2 Low" events	UINT32	RO	0x00000000 (0_{dec})
9020:19	Limit 2 Counter High	Counter for "Limit 2 High" events	UINT32	RO	0x00000000 (0_{dec})
9020:1A	Tare Value	Tare value currently taken into account	REAL32	RO	0x00000000 (0_{dec})
9020:1B	Sampling rate	Current effective sampling rate, [1/sec]	REAL32	RO	0x00000000 (0_{dec})
9020:1C	Value After Calibration	Current measured value after calibration	REAL32	RO	0x00000000 (0dec)
9020:1D	Underrange Warning Counter	Counter for underrange warning	UINT32	RO	0x00000000 (0dec)
9020:1E	Overrange Warning Counter	Counter for overrange warning	UINT32	RO	0x00000000 (0dec)

Index 9022 RMB Info Data Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9022:0	RMB Info Data Ch.1	Max. Subindex	UINT8	RO	0x12 (18_{dec})
9022:11	Vendor calibration counter [▶ 63]	Counter for changes to the vendor adjustment data	UINT32	RO	0x00000000 (0_{dec})
9022:12	User calibration Counter [▶ 63]	Counter for changes to the user calibration data	UINT32	RO	0x00000000 (0_{dec})

Index B030 RMB Command Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
B030:0	DEV Command	Max. Subindex	UINT8	RO	0x03 (3_{dec})
B030:01	Request	Command value, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x0000 (0_{dec})
B030:02	Status	Command state, for use see corresponding application chapter	UINT8	RW	0x00 (0_{dec})
B030:03	Response	Command response, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x00000000 (0_{dec})

Index F000 Modular device profile

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F000:0	Modular device profile	General information for the Modular Device Profiles (MDP) Organizational information on the profiles used in the device and listed in 0xF010	UINT8	RO	0x02 (2_{dec})
F000:01	Module index distance	Index distance of the objects of the individual channels	UINT16	RO	0x0010 (16_{dec})
F000:02	Maximum number of modules	Number of channels	UINT16	RO	0x0004 (4_{dec})

Index F010 Module Profile List

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F010:0	Module Profile List	Max. Subindex	UINT8	RO	0x04 (4_{dec})
F010:01	SubIndex 001	Profile 300	UINT32	RO	0x0000012C (300_{dec})
F010:02	SubIndex 002	Profile 300	UINT32	RO	0x0000012C (300_{dec})
F010:03	SubIndex 003	Profile 300	UINT32	RO	0x0000012C (300_{dec})
F010:04	SubIndex 004	Profile 370	UINT32	RO	0x00000172 (370_{dec})

Index F600 DEV Status

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F600:0	DEV Status	Max. Subindex	UINT8	RO	0x04 (4dec)
F600:04	Diag	New message available in the Diag messages	BOOLEAN	RO	0x00 (0dec)

Index F900 DEV Info Data

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F900:0	DEV Info Data	Max. Subindex	UINT8	RO	0x16 (22_{dec})
F900:11	Operating Time	total operating time of the device in [min]	UINT32	RO	0x00000000 (0_{dec})
F900:12	Device Temperature	current internal terminal temperature in [°C]	REAL32	RO	0x00000000 (0_{dec})
F900:13	Min. Device Temperature	minimum value ever observed by the terminal in [°C]	REAL32	RO	0x00000000 (0_{dec})
F900:14	Max. Device Temperature	maximum value ever observed by the terminal in [°C]	REAL32	RO	0x00000000 (0_{dec})
F900:15	Supply Voltage	Informative display of the power contact voltage, measurement uncertainty ±1.2 V in the range 20..29 V. Measurement is not guaranteed for voltages outside this range.	REAL32	RO	0x00000000 (0_{dec})

Index F915 LED Status

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F915:0	LED Status	Max. Subindex	UINT8	RO	0x0C (12_{dec})
F915:01	Run	"Run"-LED Status	UINT32	RO	0x00000000 (0_{dec})
F915:02	Ch1 steady	Status "Ch1 steady" LED	UINT32	RO	0x00000000 (0_{dec})
F915:03	Ch1 warning	"Ch1 warning"-LED Status	UINT32	RO	0x00000000 (0_{dec})
F915:04	Ch1 error	"Ch1 error"-LED Status	UINT32	RO	0x00000000 (0_{dec})
F915:09	Up 24 V	"Up 24 V"-LED Status	UINT32	RO	0x00000000 (0_{dec})

Index FB00 DEV Command

The command object is used for triggering an action in the terminal. The command is started by writing subindex 1 (request). Write access is disabled until the current command is completed.

Index (hex)	Name	Meaning	Data Type	Flags	Default value
FB00:0	DEV Command	Max. Subindex	UINT8	RO	0x03 (3_{dec})
FB00:01	Request	Command value, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x0000 (0_{dec})
FB00:02	Status	Command state, for use see corresponding application chapter	UINT8	RW	0x00 (0_{dec})
FB00:03	Response	Command response, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x00000000 (0_{dec})

4.6.1.4 Input data

Index 6000 AI Inputs UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
6000:0	AI Inputs UBridge Ch.1	Maximum subindex	INT16	RO	0x14 (20_{dec})
6000:01	Underrange	Value below measuring range; see also chapter "Data flow"	BOOLEAN	RO	0x00 (0_{dec})
6000:02	Overrange	Measuring range exceeded; see also chapter "Data flow".	BOOLEAN	RO	0x00 (0_{dec})
6000:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: value is smaller than limit value 1 2: value is greater than limit value 1 3: value is equal to limit value 1	BIT2	RO	0x00 (0_{dec})
6000:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: value is smaller than limit value 2 2: value is greater than limit value 2 3: value is equal to limit value 2	BIT2	RO	0x00 (0_{dec})
6000:07	Error	The error bit is set if the data is invalid (overrange, underrange)	BOOLEAN	RO	0x00 (0_{dec})
6000:09	Steady state	Measured value is stable	BOOLEAN	RO	0x00 (0_{dec})
6000:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active	BOOLEAN	RO	0x00 (0_{dec})
6000:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.	BOOLEAN	RO	0x00 (0_{dec})
6000:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).	BOOLEAN	RO	0x00 (0_{dec})
6000:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.	BOOLEAN	RO	0x00 (0_{dec})
6000:11	Value	Analog date of receipt	INT16	RO	0x0000 (0_{dec})
6000:13	Value (Real32)	Analog input date (Real32)	REAL32	RO	0x00000000 (0_{dec})
6000:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.	UINT16	RO	0x0000 (0_{dec})

Index 6010 AI Inputs USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
6010:0	AI Inputs USense Ch.1	Maximum subindex	INT16	RO	0x14 (20_{dec})
6010:01	Underrange	Value below measuring range; see also chapter "Data flow"	BOOLEAN	RO	0x00 (0_{dec})
6010:02	Overrange	Measuring range exceeded; see also chapter "Data flow".	BOOLEAN	RO	0x00 (0_{dec})
6010:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: value is smaller than limit value 1 2: value is greater than limit value 1 3: value is equal to limit value 1	BIT2	RO	0x00 (0_{dec})
6010:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: value is smaller than limit value 2 2: value is greater than limit value 2 3: value is equal to limit value 2	BIT2	RO	0x00 (0_{dec})
6010:07	Error	The error bit is set if the data is invalid (overrange, underrange)	BOOLEAN	RO	0x00 (0_{dec})
6010:09	Steady state	Measured value is stable	BOOLEAN	RO	0x00 (0_{dec})
6010:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active	BOOLEAN	RO	0x00 (0_{dec})
6010:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.	BOOLEAN	RO	0x00 (0_{dec})
6010:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).	BOOLEAN	RO	0x00 (0_{dec})
6010:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.	BOOLEAN	RO	0x00 (0_{dec})
6010:11	Value	Analog date of receipt	INT16	RO	0x0000 (0_{dec})
6010:13	Value (Real32)	Analog input date (Real32)	REAL32	RO	0x00000000 (0_{dec})
6010:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.	UINT16	RO	0x0000 (0_{dec})

Index 6030 RMB Sensor Inputs Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
6030:0	RMB Sensor Inputs Ch.1	Maximum subindex	INT16	RO	0x14 (20_{dec})
6030:01	Underrange	Value below measuring range; see also chapter "Data flow"	BOOLEAN	RO	0x00 (0_{dec})
6030:02	Overrange	Measuring range exceeded; see also chapter "Data flow".	BOOLEAN	RO	0x00 (0_{dec})
6030:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: value is smaller than limit value 1 2: value is greater than limit value 1 3: value is equal to limit value 1	BIT2	RO	0x00 (0_{dec})
6030:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: value is smaller than limit value 2 2: value is greater than limit value 2 3: value is equal to limit value 2	BIT2	RO	0x00 (0_{dec})
6030:07	Error	The error bit is set if the data is invalid (overrange, underrange)	BOOLEAN	RO	0x00 (0_{dec})
6030:09	Steady state	Measured value is stable	BOOLEAN	RO	0x00 (0_{dec})
6030:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active	BOOLEAN	RO	0x00 (0_{dec})
6030:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.	BOOLEAN	RO	0x00 (0_{dec})
6030:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).	BOOLEAN	RO	0x00 (0_{dec})
6030:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.	BOOLEAN	RO	0x00 (0_{dec})
6030:11	Value	Analog date of receipt	INT16	RO	0x0000 (0_{dec})
6030:13	Value (Real32)	Analog input date (Real32)	REAL32	RO	0x00000000 (0_{dec})
6030:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.	UINT16	RO	0x0000 (0_{dec})

4.6.1.5 Output data

Index 7000 AI Outputs UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
7000:0	AI Outputs UBridge Ch.1	Maximum subindex	UINT8	RO	0x06 (6_{dec})
7000:03	Input Freeze	The measurements are no longer passed on to the filter.	BOOLEAN	RO	0x00 (0_{dec})
7000:04	Tare	Rising edge starts the determination of the tare value.	BOOLEAN	RO	0x00 (0_{dec})
7000:05	Peak hold reset	Rising edge resets the peak hold objects	BOOLEAN	RO	0x00 (0_{dec})
7000:06	Disable Tare	The tare value is not taken into account.	BOOLEAN	RO	0x00 (0_{dec})

Index 7010 AI Outputs USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
7010:0	AI Outputs USense Ch.1	Maximum subindex	UINT8	RO	0x06 (6_{dec})
7010:03	Input Freeze	The measurements are no longer passed on to the filter.	BOOLEAN	RO	0x00 (0_{dec})
7010:04	Tare	Rising edge starts the determination of the tare value.	BOOLEAN	RO	0x00 (0_{dec})
7010:05	Peak hold reset	Rising edge resets the peak hold objects	BOOLEAN	RO	0x00 (0_{dec})
7010:06	Disable Tare	The tare value is not taken into account.	BOOLEAN	RO	0x00 (0_{dec})

Index 7030 RMB Sensor Outputs Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
7030:0	RMB Sensor Outputs Ch.1	Maximum subindex	UINT8	RO	0x06 (6_{dec})
7030:03	Input Freeze	The measurements are no longer passed on to the filter.	BOOLEAN	RO	0x00 (0_{dec})
7030:04	Tare	Rising edge starts the determination of the tare value.	BOOLEAN	RO	0x00 (0_{dec})
7030:05	Peak hold reset	Rising edge resets the peak hold objects	BOOLEAN	RO	0x00 (0_{dec})
7030:06	Disable Tare	The tare value is not taken into account.	BOOLEAN	RO	0x00 (0_{dec})

4.6.1.6 Standard objects

Index 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.	UINT32	RO	0x00001389 (5001_{dec})

Index 1008 Device name

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1008:0	Device name	Device name of the EtherCAT slave	STRING	RO	ED3361-0100

Index 1009 Hardware version

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

Index 100A Software version

Index (hex)	Name	Meaning	Data type	Flags	Default
100A:0	Software version	Firmware version of the EtherCAT slave	STRING	RO	00

Index 100B Bootloader version

Index (hex)	Name	Meaning	Data type	Flags	Default
100B:0	Bootloader version	Bootloader version	STRING	RO	n/a

Index 1018 Identity

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1018:0	Identity	Information for identifying the slave	UINT8	RO	0x04 (4_{dec})
1018:01	Vendor ID	Vendor ID of the EtherCAT slave	UINT32	RO	0x00000002 (2_{dec})
1018:02	Product code	Product code of the EtherCAT slave	UINT32	RO	0x0D221052 (220336210_{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	UINT32	RO	0x00000000 (0_{dec})
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	UINT32	RO	0x00000000 (0_{dec})

Index 10E2 Manufacturer-specific Identification Code*)

Index (hex)	Name	Meaning	Data type	Flags	Default
10E2:0	Manufacturer-specific Identification Code	Manufacturer specific Identification Code	UINT8	RO	0x01 (1_{dec})
10E2:01	SubIndex 001	reserved	STRING	RO	

Index 10F0 Backup parameter handling

Index (hex)	Name	Meaning	Data Type	Flags	Default value
10F0:0	Backup parameter handling	Information for standardized loading and saving of backup entries	UINT8	RO	0x01 (1_{dec})
10F0:01	Checksum	Checksum across all backup entries of the EtherCAT slave	UINT32	RO	0x00000000 (0_{dec})

Index 10F3 Diagnosis History

Index (hex)	Name	Meaning	Data type	Flags	Default
10F3:0	Diagnosis History	Maximum subindex	UINT8	RO	0x15 (21_{dec})
10F3:01	Maximum Messages	Maximum number of stored messages A maximum of 16 messages can be stored	UINT8	RO	0x00 (0_{dec})
10F3:02	Newest Message	Subindex of the latest message	UINT8	RO	0x00 (0_{dec})
10F3:03	Newest Acknowledged Message	Subindex of the last confirmed message	UINT8	RW	0x00 (0_{dec})
10F3:04	New Messages Available	Indicates that a new message is available	BOOLEAN	RO	0x00 (0_{dec})
10F3:05	Flags	not used	UINT16	RW	0x0000 (0_{dec})
10F3:06	Diagnosis Message 001	Message 1	OCTET-STRING[24]	RO	{0}
…	…	….	…	…	…
10F3:15	Diagnosis Message 016	Message 16	OCTET-STRING[24]	RO	{0}

Index 10F8 Timestamp Object

Index (hex)	Name	Meaning	Data type	Flags	Default
10F8:0	Timestamp Object	Timestamp Object [ns] For SM synchronous operation: Time since power-on For DC synchronous operation: copy of the DC time Time can be used by the device e.g. for timestamps of the DiagMessage	UINT64	RO	

Index 1600 AI RxPDO-Map Control UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1600:0	AI RxPDO-Map Control UBridge Channel 1	PDO Mapping RxPDO 1	UINT8	RO	0x06 (6dec)
1600:01	SubIndex 001	1. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1600:02	SubIndex 002	2. PDO mapping entry (object 0x7000 (AI Outputs UBridge Ch.1), entry 0x03 (Input Freeze))	UINT32	RO	0x7000:03, 1
1600:03	SubIndex 003	3. PDO Mapping entry (object 0x7000 (AI Outputs UBridge Ch.1), entry 0x04 (Tare))	UINT32	RO	0x7000:04, 1
1600:04	SubIndex 004	4. PDO Mapping entry (object 0x7000 (AI Outputs UBridge Ch.1), entry 0x05 (Peak Hold Reset))	UINT32	RO	0x7000:05, 1
1600:05	SubIndex 005	5. PDO Mapping entry (object 0x7000 (AI Outputs UBridge Ch.1), entry 0x06 (Disable Tare))	UINT32	RO	0x7000:06, 1
1600:06	SubIndex 006	6. PDO Mapping entry (10 bits align)	UINT32	RO	0x0000:00, 10

Index 1610 AI RxPDO-Map Control USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1610:0	AI RxPDO-Map Control USense Channel 1	PDO Mapping RxPDO 17	UINT8	RO	0x06 (6dec)
1610:01	SubIndex 001	1. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1610:02	SubIndex 002	2. PDO Mapping entry (object 0x7010 (AI Outputs USense Ch.1), entry 0x03 (Input Freeze))	UINT32	RO	0x7010:03, 1
1610:03	SubIndex 003	3. PDO Mapping entry (object 0x7010 (AI Outputs USense Ch.1), entry 0x04 (Tare))	UINT32	RO	0x7010:04, 1
1610:04	SubIndex 004	4. PDO Mapping entry (object 0x7010 (AI Outputs USense Ch.1), entry 0x05 (Peak Hold Reset))	UINT32	RO	0x7010:05, 1
1610:05	SubIndex 005	5. PDO Mapping entry (object 0x7010 (AI Outputs USense Ch.1), entry 0x06 (Disable Tare))	UINT32	RO	0x7010:06, 1
1610:06	SubIndex 006	6. PDO Mapping entry (10 bits align)	UINT32	RO	0x0000:00, 10

Index 1620 RMB RxPDO-Map Control Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1620:0	RMB RxPDO-Map Control Channel 1	PDO Mapping RxPDO 33	UINT8	RO	0x06 (6dec)
1620:01	SubIndex 001	1. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1620:02	SubIndex 002	2. PDO Mapping entry (object 0x7030 (RMB Sensor Outputs Ch.1), entry 0x03 (Input Freeze))	UINT32	RO	0x7030:03, 1
1620:03	SubIndex 003	3. PDO Mapping entry (object 0x7030 (RMB Sensor Outputs Ch.1), entry 0x04 (Tare))	UINT32	RO	0x7030:04, 1
1620:04	SubIndex 004	4. PDO Mapping entry (object 0x7030 (RMB Sensor Outputs Ch.1), entry 0x05 (Peak Hold Reset))	UINT32	RO	0x7030:05, 1
1620:05	SubIndex 005	5. PDO Mapping entry (object 0x7030 (RMB Sensor Outputs Ch.1), entry 0x06 (Disable Tare))	UINT32	RO	0x7030:06, 1
1620:06	SubIndex 006	6. PDO Mapping entry (10 bits align)	UINT32	RO	0x0000:00, 10

Index 1800 AI TxPDO-Par Standard (INT16) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1800:0	AI TxPDO-Par Standard (INT16) UBridge Channel	PDO Parameter TxPDO 1	UINT8	RO	0x06 (6_{dec})
1800:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 1	OCTET-STRING[6]	RO	01 1A 02 1A 03 1A

Index 1801 AI TxPDO-Par Compact (INT16) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1801:0	AI TxPDO-Par Compact (INT16) UBridge Channel 1	PDO Parameter TxPDO 2	UINT8	RO	0x06 (6_{dec})
1801:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 2	OCTET-STRING[6]	RO	00 1A 02 1A 03 1A

Index 1802 AI TxPDO-Par Standard (Real32) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1802:0	AI TxPDO-Par Standard (Real32) UBridge Channel 1	PDO Parameter TxPDO 3	UINT8	RO	0x06 (6_{dec})
1802:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 3	OCTET-STRING[6]	RO	00 1A 01 1A 03 1A

Index 1803 AI TxPDO-Par Compact (Real32) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1803:0	AI TxPDO-Par Compact (Real32) UBridge Channel 1	PDO Parameter TxPDO 4	UINT8	RO	0x06 (6_{dec})
1803:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 4	OCTET-STRING[6]	RO	00 1A 01 1A 02 1A

Index 1810 AI TxPDO-Par Standard (INT16) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1810:0	AI TxPDO-Par Standard (INT16) USense Channel 1	PDO Parameter TxPDO 17	UINT8	RO	0x06 (6_{dec})
1810:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 17	OCTET-STRING[6]	RO	11 1A 12 1A 13 1A

Index 1811 AI TxPDO-Par Compact (INT16) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1811:0	AI TxPDO-Par Compact (INT16) USense Channel 1	PDO Parameter TxPDO 18	UINT8	RO	0x06 (6_{dec})
1811:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 18	OCTET-STRING[6]	RO	10 1A 12 1A 13 1A

Index 1812 AI TxPDO-Par Standard (Real32) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1812:0	AI TxPDO-Par Standard (Real32) USense Channel 1	PDO Parameter TxPDO 19	UINT8	RO	0x06 (6_{dec})
1812:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 19	OCTET-STRING[6]	RO	10 1A 11 1A 13 1A

Index 1813 AI TxPDO-Par Compact (Real32) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1813:0	AI TxPDO-Par Compact (Real32) USense Channel 1	PDO Parameter TxPDO 20	UINT8	RO	0x06 (6_{dec})
1813:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 20	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1820 RMB TxPDO-Par Standard (INT32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1820:0	RMB TxPDO-Par Standard (INT32) Channel 1	PDO Parameter TxPDO 33	UINT8	RO	0x06 (6_{dec})
1820:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 33	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1821 RMB TxPDO-Par Compact (INT32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1821:0	RMB TxPDO-Par Compact (INT32) Channel 1	PDO Parameter TxPDO 34	UINT8	RO	0x06 (6_{dec})
1821:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 34	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1822 RMB TxPDO-Par Standard (Real32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1822:0	RMB TxPDO-Par Standard (Real32) Channel 1	PDO Parameter TxPDO 35	UINT8	RO	0x06 (6_{dec})
1822:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 35	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1823 RMB TxPDO-Par Compact (Real32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1823:0	RMB TxPDO-Par Compact (Real32) Channel 1	PDO Parameter TxPDO 36	UINT8	RO	0x06 (6_{dec})
1823:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 36	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1A00 AI TxPDO-Map Standard (INT16) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A00:0	AI TxPDO-Map Standard (INT16) UBridge Channel 1	PDO Mapping TxPDO 1	UINT8	RO	0x0E (14dec)
1A00:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6000:01, 1
1A00:02	SubIndex 002	2. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6000:02, 1
1A00:03	SubIndex 003	3. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6000:03, 2
1A00:04	SubIndex 004	4. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6000:05, 2
1A00:05	SubIndex 005	5. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x07 (Error))	UINT32	RO	0x6000:07, 1
1A00:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A00:07	SubIndex 007	7. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6000:09, 1
1A00:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A00:09	SubIndex 009	9. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6000:0C, 1
1A00:0A	SubIndex 010	10. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6000:0D, 1
1A00:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A00:0C	SubIndex 012	12. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6000:0F, 1
1A00:0D	SubIndex 013	13. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6000:10, 1
1A00:0E	SubIndex 014	14. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x11 (Value))	UINT32	RO	0x6000:11, 16

Index 1A01 AI TxPDO-Map Compact (INT16) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A01:0	AI TxPDO-Map Compact (INT16) UBridge Channel 1	PDO Mapping TxPDO 2	UINT8	RO	0x01 (1_{dec})
1A01:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs Ch.1), entry 0x11 (Value))	UINT32	RO	0x6000:11, 16

Index 1A02 AI TxPDO-Map Standard (Real32) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A02:0	AI TxPDO-Map Standard (Real32) UBridge Channel 1	PDO Mapping TxPDO 3	UINT8	RO	0x0E (14dec)
1A02:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6000:01, 1
1A02:02	SubIndex 002	2. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6000:02, 1
1A02:03	SubIndex 003	3. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6000:03, 2
1A02:04	SubIndex 004	4. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6000:05, 2
1A02:05	SubIndex 005	5. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x07 (Error))	UINT32	RO	0x6000:07, 1
1A02:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A02:07	SubIndex 007	7. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6000:09, 1
1A02:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A02:09	SubIndex 009	9. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6000:0C, 1
1A02:0A	SubIndex 010	10. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6000:0D, 1
1A02:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A02:0C	SubIndex 012	12. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6000:0F, 1
1A02:0D	SubIndex 013	13. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6000:10, 1
1A02:0E	SubIndex 014	14. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6000:13, 32

Index 1A03 AI TxPDO-Map Compact (Real32) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A03:0	AI TxPDO-Map Compact (Real32) UBridge Channel 1	PDO Mapping TxPDO 4	UINT8	RO	0x01 (1_{dec})
1A03:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6000:13, 32

Index 1A04 AI TxPDO-Map Cycle Counter UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A04:0	AI TxPDO-Map Cycle Counter UBridge Channel 1	PDO Mapping TxPDO 5	UINT8	RO	0x01 (1_{dec})
1A04:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs Ch.1), entry 0x14 (Input Cycle Counter))	UINT32	RO	0x6000:14, 16

Index 1A10 AI TxPDO-Map Standard (INT16) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A10:0	AI TxPDO-Map Standard (INT16) USense Channel 1	PDO Mapping TxPDO 17	UINT8	RO	0x0E (14dec)
1A10:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6010:01, 1
1A10:02	SubIndex 002	2. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6010:02, 1
1A10:03	SubIndex 003	3. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6010:03, 2
1A10:04	SubIndex 004	4. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6010:05, 2
1A10:05	SubIndex 005	5. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x07 (Error))	UINT32	RO	0x6010:07, 1
1A10:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A10:07	SubIndex 007	7. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6010:09, 1
1A10:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A10:09	SubIndex 009	9. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6010:0C, 1
1A10:0A	SubIndex 010	10. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6010:0D, 1
1A10:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A10:0C	SubIndex 012	12. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6010:0F, 1
1A10:0D	SubIndex 013	13. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6010:10, 1
1A10:0E	SubIndex 014	14. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x11 (Value))	UINT32	RO	0x6010:11, 16

Index 1A11 AI TxPDO-Map Compact (INT16) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A11:0	AI TxPDO-Map Compact (INT16) USense Channel 1	PDO Mapping TxPDO 18	UINT8	RO	0x01 (1_{dec})
1A11:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs Ch.2), entry 0x11 (Value))	UINT32	RO	0x6010:11, 16

Index 1A12 AI TxPDO-Map Standard (Real32) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A12:0	AI TxPDO-Map Standard (Real32) USense Channel 1	PDO Mapping TxPDO 19	UINT8	RO	0x0E (14dec)
1A12:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6010:01, 1
1A12:02	SubIndex 002	2. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6010:02, 1
1A12:03	SubIndex 003	3. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6010:03, 2
1A12:04	SubIndex 004	4. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6010:05, 2
1A12:05	SubIndex 005	5. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x07 (Error))	UINT32	RO	0x6010:07, 1
1A12:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A12:07	SubIndex 007	7. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6010:09, 1
1A12:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A12:09	SubIndex 009	9. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6010:0C, 1
1A12:0A	SubIndex 010	10. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6010:0D, 1
1A12:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A12:0C	SubIndex 012	12. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6010:0F, 1
1A12:0D	SubIndex 013	13. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6010:10, 1
1A12:0E	SubIndex 014	14. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6010:13, 32

Index 1A13 AI TxPDO-Map Compact (Real32) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A13:0	AI TxPDO-Map Compact (Real32) USense Channel 1	PDO Mapping TxPDO 20	UINT8	RO	0x01 (1dec)
1A13:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6010:13, 32

Index 1A14 AI TxPDO-Map Cycle Counter USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A14:0	AI TxPDO-Map Cycle Counter USense Channel 1	PDO Mapping TxPDO 21	UINT8	RO	0x01 (1dec)
1A14:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x14 (Input Cycle Counter))	UINT32	RO	0x6010:14, 16

Index 1A20 RMB TxPDO-Map Standard (INT32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A20:0	RMB TxPDO-Map Standard (INT32) Channel 1	PDO Mapping TxPDO 33	UINT8	RO	0x0E (14dec)
1A20:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6030:01, 1
1A20:02	SubIndex 002	2. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6030:02, 1
1A20:03	SubIndex 003	3. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6030:03, 2
1A20:04	SubIndex 004	4. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6030:05, 2
1A20:05	SubIndex 005	5. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x07 (Error))	UINT32	RO	0x6030:07, 1
1A20:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A20:07	SubIndex 007	7. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6030:09, 1
1A20:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A20:09	SubIndex 009	9. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6030:0C, 1
1A20:0A	SubIndex 010	10. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6030:0D, 1
1A20:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A20:0C	SubIndex 012	12. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6030:0F, 1
1A20:0D	SubIndex 013	13. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6030:10, 1
1A20:0E	SubIndex 014	14. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x11 (Value))	UINT32	RO	0x6030:11, 32

Index 1A21 RMB TxPDO-Map Compact (INT32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A21:0	RMB TxPDO-Map Compact (INT32) Channel 1	PDO Mapping TxPDO 34	UINT8	RO	0x01 (1dec)
1A21:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x11 (Value))	UINT32	RO	0x6030:11, 32

Index 1A22 RMB TxPDO-Map Standard (Real32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A22:0	RMB TxPDO-Map Standard (Real32) Channel 1	PDO Mapping TxPDO 35	UINT8	RO	0x0E (14dec)
1A22:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6030:01, 1
1A22:02	SubIndex 002	2. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6030:02, 1
1A22:03	SubIndex 003	3. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6030:03, 2
1A22:04	SubIndex 004	4. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6030:05, 2
1A22:05	SubIndex 005	5. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x07 (Error))	UINT32	RO	0x6030:07, 1
1A22:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A22:07	SubIndex 007	7. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6030:09, 1
1A22:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A22:09	SubIndex 009	9. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6030:0C, 1
1A22:0A	SubIndex 010	10. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6030:0D, 1
1A22:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A22:0C	SubIndex 012	12. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6030:0F, 1
1A22:0D	SubIndex 013	13. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6030:10, 1
1A22:0E	SubIndex 014	14. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6030:13, 32

Index 1A23 RMB TxPDO-Map Compact (Real32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A23:0	RMB TxPDO-Map Compact (Real32) Channel 1	PDO Mapping TxPDO 36	UINT8	RO	0x01 (1dec)
1A23:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6030:13, 32

Index 1A24 RMB TxPDO-Map Cycle Counter Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A24:0	RMB TxPDO-Map Cycle Counter Channel 1	PDO Mapping TxPDO 37	UINT8	RO	0x01 (1dec)
1A24:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x14 (Input Cycle Counter))	UINT32	RO	0x6030:14, 16

Index 1C00 Sync manager type

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1C00:0	Sync manager type	Using the Sync Managers	UINT8	RO	0x04 (4_{dec})
1C00:01	SubIndex 001	Sync Manager Type Channel 1: Mailbox Write	UINT8	RO	0x01 (1_{dec})
1C00:02	SubIndex 002	Sync Manager Type Channel 2: Mailbox Read	UINT8	RO	0x02 (2_{dec})
1C00:03	SubIndex 003	Sync Manager Type Channel 3: Process Data Write (Outputs)	UINT8	RO	0x03 (3_{dec})
1C00:04	SubIndex 004	Sync Manager Type Channel 4: Process Data Read (Inputs)	UINT8	RO	0x04 (4_{dec})

Index 1C12 RxPDO assign

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1C12:0	RxPDO assign	PDO Assign Outputs	UINT8	RW	0x02 (2_{dec})
1C12:01	Subindex 001	1. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x1622 (5666_{dec})
1C12:02	Subindex 002	2. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x1632 (5682_{dec})
1C12:03	Subindex 003	3. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:04	Subindex 004	4. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:05	Subindex 005	5. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:06	Subindex 006	6. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:07	Subindex 007	7. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:08	Subindex 008	8. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})

Index 1C13 TxPDO assign

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1C13:0	TxPDO assign	PDO Assign Inputs	UINT8	RW	0x04 (4_{dec})
1C13:01	Subindex 001	1. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A02 (6658_{dec})
1C13:02	Subindex 002	2. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A12 (6674_{dec})
1C13:03	Subindex 003	3. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A20 (6688_{dec})
1C13:04	Subindex 004	4. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A30 (6704_{dec})
1C13:05	Subindex 005	5. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C13:06	Subindex 006	6. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C13:07	Subindex 007	7. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A02 (6658_{dec})
1C13:08	Subindex 008	8. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A12 (6674_{dec})
1C13:09	Subindex 009	9. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A20 (6688_{dec})
1C13:0A	Subindex 010	10. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A30 (6704_{dec})
1C13:0B	Subindex 011	11. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C13:0C	Subindex 012	12. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C13:0D	Subindex 013	13. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A02 (6658_{dec})
1C13:0E	Subindex 014	14. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A12 (6674_{dec})

Index 1C32 SM output parameter

Index (hex)	Name	Meaning	Data type	Flags	Default
1C32:0	SM output parameter	Synchronization parameters for the outputs	UINT8	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	UINT16	RW	0x0000 (0_{dec})
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	UINT32	RW	0x000F4240 (1000000_{dec})
1C32:03	Shift time	Time between SYNC0 event and output of the outputs (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{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 0x1C32:08)	UINT16	RO	0x0001 (1_{dec})
1C32:05	Minimum cycle time	Minimum cycle time (in ns)	UINT32	RO	0x000186A0 (100000_{dec})
1C32:06	Calc and copy time	Minimum time between SYNC0 and SYNC1 event (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{dec})
1C32:09	Maximum delay time	Time between SYNC1 event and output of the outputs (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{dec})
1C32:0B	SM event missed counter	Number of missed SM events in OPERATIONAL (DC mode only)	UINT16	RO	0x0000 (0_{dec})
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)	UINT16	RO	0x0000 (0_{dec})
1C32:0D	Shift too short counter	Number of occasions that the interval between SYNC0 and SYNC1 event was too short (DC mode only)	UINT16	RO	0x0000 (0_{dec})
1C32:20	Sync error	The synchronization was not correct in the last cycle (outputs were output too late; DC mode only)	BOOLEAN	RO	0x00 (0_{dec})

Index 1C33 SM input parameter

Index (hex)	Name	Meaning	Data type	Flags	Default
1C33:0	SM input parameter	Synchronization parameters for the inputs	UINT8	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)	UINT16	RW	0x0000 (0_{dec})
1C33:02	Cycle time	• as 0x1C32:02 [▶ 125]	UINT32	RW	0x000F4240 (1000000_{dec})
1C33:03	Shift time	Time between SYNC0 event and reading of the inputs (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{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 0x1C32:08 [▶ 125] or 0x1C33:08)	UINT16	RO	0x0001 (1_{dec})
1C33:05	Minimum cycle time	as 0x1C32:05 [▶ 125]	UINT32	RO	0x000186A0 (100000_{dec})
1C33:06	Calc and copy time	Time between reading of the inputs and the inputs being available for the master (in ns, only DC mode)	UINT32	RO	0x00000000 (0_{dec})
1C33:07	Minimum delay time		UINT32	RO	0x00000000 (0_{dec})
1C33:09	Maximum delay time	Time between SYNC1 event and reading of the inputs (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{dec})
1C33:0B	SM event missed counter	as 0x1C32:11 [▶ 125]	UINT16	RO	0x0000 (0_{dec})
1C33:0C	Cycle exceeded counter	as 0x1C32:12 [▶ 125]	UINT16	RO	0x0000 (0_{dec})
1C33:0D	Shift too short counter	as 0x1C32:13 [▶ 125]	UINT16	RO	0x0000 (0_{dec})
1C33:20	Sync error	as 0x1C32:32 [▶ 125]	BOOLEAN	RO	0x00 (0_{dec})

Index F008 Code word

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F008:0	Code word	NoCoeStorage function: The input code of the code word 0x12345678 activates the NoCoeStorage function. Changes to the CoE directory are not saved if the function is active. The function is deactivated by: 1.) changing the code word or 2.) restarting the terminal.	UINT32	RW	0x00000000 (0_{dec})

Index F009 Password protection

Index (hex)	Name	Meaning	Data type	Flags	Default
F009:0	Password protection	Password protection user calibration	UINT32	RW	0x00000000 (0_{dec})

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4.6.2.1 Restore objects

Index 1011 Restore default parameters

Index (hex)	Name	Meaning	Data type	Flags	Default
1011:0	Restore default parameters	Restore default parameters	UINT8	RO	0x01 (1dec)
1011:01	SubIndex 001	If this object is set to "0x64616F6C" in the set value dialog, all backup objects are reset to their delivery state.	UINT32	RW	0x00000000 (0dec)

4.6.2.2 Configuration data

Index 8000 AI Settings UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8000:0	AI Settings UBridge Ch.1	Max. Subindex	UINT8	RO	0x18 (24_{dec})
8000:01	Enable User Scale [▶ 67]	User scaling is active	BOOLEAN	RW	0x00 (0_{dec})
8000:02	Presentation [▶ 55]	0: *Signed presentation* The measured value is displayed in two's complement. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$ 1: *Unsigned presentation* Maximum presentation range for 16 bits: 0 ... $+65535_{dec}$ 2: *Absolute value with MSB as sign* The measured value is output in the signed amount representation. Maximum presentation range at 16 bits: - 32768_{dec} ... $+32767_{dec}$	BIT3	RW	0x00 (0_{dec})
8000:06	Enable Filter 1 [▶ 61]	Enable filter 1	BOOLEAN	RW	0x01 (1_{dec})
8000:07	Enable Limit 1 [▶ 72]	Enable Limit 1	BOOLEAN	RW	0x00 (0_{dec})
8000:08	Enable Limit 2 [▶ 72]	Enable Limit 2	BOOLEAN	RW	0x00 (0_{dec})
8000:0A	Enable user calibration [▶ 63]	Enable user calibration	BOOLEAN	RW	0x00 (0_{dec})
8000:0B	Enable vendor calibration [▶ 63]	Enable vendor calibration	BOOLEAN	RW	0x01 (1_{dec})
8000:0E	Swap Limit Bits	Swap limit bits	BOOLEAN	RW	0x00 (0_{dec})
8000:11	User Scale Offset [▶ 67]	User scale offset	INT16	RW	0x0000 (0_{dec})
8000:12	User Scale Gain [▶ 67]	User scale gain. The gain has a fixed-point representation with a factor of 2^{-16}. The value 1 corresponds to 65535 (0x00010000).	INT32	RW	0x00010000 (65536_{dec})
8000:13	Limit 1 [▶ 72]	First limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8000:14	Limit 2 [▶ 72]	Second limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8000:15	Filter 1 Settings [▶ 61]	This object determines the digital filter settings if it is active via Enable filter (Index 0x8000:06). The possible settings are numbered consecutively. 0: 50 Hz FIR 1: 60 Hz FIR 2: IIR 1 3: IIR 2 4: IIR 3 5: IIR 4 6: IIR 5 7: IIR 6 8: IIR 7 9: IIR 8 Refer to the Note on setting the filter characteristics	UINT16	RW	0x0000 (0_{dec})
8000:17	User calibration offset [▶ 63]	User calibration offset	INT16	RW	0x0000 (0_{dec})
8000:18	User calibration gain [▶ 63]	User calibration gain	UINT16	RW	0x7FFF (32767_{dec})

Index 800C AI User Calibration Data UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
800C:0	AI User Calibration Data UBridge Ch.1	Max. Subindex	UINT8	RO	0x0D (13_{dec})
800C:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
800C:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
800C:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
800C:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
800C:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
800C:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0dec)
800C:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0dec)

Index 800D AI Advanced Settings UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
800D:0	AI Advanced Settings UBridge Ch.1	Max. Subindex	UINT8	RO	0x2E (46$_{dec}$)
800D:11	Input Interface [▶ 61]	Values: 0 - None 48 - V ±20 mV 49 - V ±75 mV 50 - V ±4 V	UINT16	RW	0x0002 (2$_{dec}$)
800D:12	Integer Scaler [▶ 52]	Values: 0 - Extended Range 3 - Legacy Range	UINT16	RW	0x0000 (0$_{dec}$)
800D:17	Low Range Error [▶ 70]	Low Range limit value	INT32	RW	0xFFFF8000 (-32768$_{dec}$)
800D:018	High Range Error [▶ 70]	High Range limit value	INT32	RW	0x00007FFF (32767$_{dec}$)
800D:1A	Filter 2 Settings [▶ 66]	Values: 0 – Off 1 - HP 0.001 Hz 2 - HP 0.01 Hz 3 - HP 0.1 Hz 4 - HP 1 Hz 5 - HP 10 Hz	UINT16	RW	0x0000 (0$_{dec}$)
800D:1C	User Scale Offset (Real32) [▶ 67]	User scale offset (Real32)	REAL32	RW	0x00000000 (0.0)
800D:1D	User Scale Gain (Real32) [▶ 67]	User scale gain. (Real32)	REAL32	RW	0x3F800000 (1.0)
800D:27	Low Range Error (Real32) [▶ 70]	Limit value Low Range Error (Real32)	REAL32	RW	0xC12BCC79 (-10.7374201)
800D:28	High Range Error (Real32) [▶ 70]	Limit value High Range Error (Real32)	REAL32	RW	0x412BCC79 (10.7374201)
800D:29	Limit 1 (Real32) [▶ 72]	Limit value Limit1	REAL32	RW	0x00000000 (0.0)
800D:2A	Limit 2 (Real32) [▶ 72]	Limit 2 (INT16) in the AI settings is adjusted automatically	REAL32	RW	0x00000000 (0.0)
800D:2B	Steady state Window [▶ 68]	Time constant for the "Steady state" bit	UINT16	RW	0x0064 (100dec)
800D:2C	Steady state tolerance [▶ 68]	Tolerance window for the "Steady state" bit	REAL32	RW	0x3F800000 (1065353216dec)
800D:2D	Low Range Warning (Real32) [▶ 69]	Limit value Low Range Warning (Real32)	REAL32	RW	0xBCA3D70A (-1130113270 dec)
800D:2E	High Range Warning (Real32) [▶ 69]	Limit value High Range Warning (Real32)	REAL32	RW	0x3CA3D70A (1017370378dec)

Index 800F AI Vendor Calibration Data UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
800F:0	AI Vendor Calibration Data UBridge Ch.1	Max. Subindex	UINT8	RO	0x08 (8_{dec})
800F:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
800F:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
800F:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
800F:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
800F:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
800F:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0_{dec})
800F:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0_{dec})

Index 8010 AI Settings USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8010:0	AI Settings USense Ch.1	Max. Subindex	UINT8	RO	0x18 (24_{dec})
8010:01	Enable User Scale [▶ 67]	User scaling is active	BOOLEAN	RW	0x00 (0_{dec})
8010:02	Presentation [▶ 55]	0: *Signed presentation* The measured value is displayed in two's complement. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$ 1: *Unsigned presentation* Maximum presentation range for 16 bits: 0 ... $+65535_{dec}$ 2: *Absolute value with MSB as sign* The measured value is output in the signed amount representation. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$	BIT3	RW	0x00 (0_{dec})
8010:06	Enable Filter 1 [▶ 61]	Enable filter 1	BOOLEAN	RW	0x01 (1_{dec})
8010:07	Enable Limit 1 [▶ 72]	Enable Limit 1	BOOLEAN	RW	0x00 (0_{dec})
8010:08	Enable Limit 2 [▶ 72]	Enable Limit 2	BOOLEAN	RW	0x00 (0_{dec})
8010:0A	Enable user calibration [▶ 63]	Enable user calibration	BOOLEAN	RW	0x00 (0_{dec})
8010:0B	Enable vendor calibration [▶ 63]	Enable vendor calibration	BOOLEAN	RW	0x01 (1_{dec})
8010:0E	Swap Limit Bits	Swap limit bits	BOOLEAN	RW	0x00 (0_{dec})
8010:11	User Scale Offset [▶ 67]	User scale offset	INT16	RW	0x0000 (0_{dec})
8010:12	User Scale Gain [▶ 67]	User scale gain. The gain has a fixed-point representation with a factor of 2^{-16}. The value 1 corresponds to 65535 (0x00010000).	INT32	RW	0x00010000 (65536_{dec})
8010:13	Limit 1 [▶ 72]	First limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8010:14	Limit 2 [▶ 72]	Second limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8010:15	Filter 1 Settings [▶ 61]	This object determines the digital filter settings if it is active via Enable filter (Index 0x8010:06). The possible settings are numbered consecutively. 0: 50 Hz FIR 1: 60 Hz FIR 2: IIR 1 3: IIR 2 4: IIR 3 5: IIR 4 6: IIR 5 7: IIR 6 8: IIR 7 9: IIR 8 Refer to the Note on setting the filter characteristics	UINT16	RW	0x0000 (0_{dec})
8010:17	User calibration offset [▶ 63]	User calibration offset	INT16	RW	0x0000 (0_{dec})
8010:18	User calibration gain [▶ 63]	User calibration gain	UINT16	RW	0x7FFF (32767_{dec})

Index 801C AI User Calibration Data USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
801C:0	AI User Calibration Data USense Ch.1	Max. Subindex	UINT8	RO	0x0D (13_{dec})
801C:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
801C:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
801C:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
801C:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
801C:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
801C:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0dec)
801C:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0dec)

Index 801D AI Advanced Settings USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
801D:0	AI Advanced Settings USense Ch.1	Max. Subindex	UINT8	RO	0x2E (46_{dec})
801D:11	Input Interface [▶ 61]	Values: 0 - None 48 - V ±20 mV 49 - V ±75 mV 50 - V ±4 V	UINT16	RW	0x0002 (2_{dec})
801D:12	Integer Scaler [▶ 52]	Values: 0 - Extended Range 3 - Legacy Range	UINT16	RW	0x0000 (0_{dec})
801D:17	Low Range Error [▶ 70]	Low Range limit value	INT32	RW	0xFFFF8010 (-32768_{dec})
801D:18	High Range Error [▶ 70]	High Range limit value	INT32	RW	0x00007FFF (32767_{dec})
801D:1A	Filter 2 Settings [▶ 66]	Values: 0 – Off 1 - HP 0.001 Hz 2 - HP 0.01 Hz 3 - HP 0.1 Hz 4 - HP 1 Hz 5 - HP 10 Hz	UINT16	RW	0x0000 (0_{dec})
801D:1C	User Scale Offset (Real32) [▶ 67]	User scale offset (Real32)	REAL32	RW	0x00000000 (0.0)
801D:1D	User Scale Gain (Real32) [▶ 67]	User scale gain. (Real32)	REAL32	RW	0x3F800000 (1.0)
801D:27	Low Range Error (Real32) [▶ 70]	Limit value Low Range Error (Real32)	REAL32	RW	0xC12BCC79 (-10.7374201)
801D:28	High Range Error (Real32) [▶ 70]	Limit value High Range Error (Real32)	REAL32	RW	0x412BCC79 (10.7374201)
801D:29	Limit 1 (Real32) [▶ 72]	Limit value Limit1	REAL32	RW	0x00000000 (0.0)
801D:2A	Limit 2 (Real32) [▶ 72]	Limit 2 (INT16) in the AI settings is adjusted automatically	REAL32	RW	0x00000000 (0.0)
801D:2B	Steady state Window [▶ 68]	Time constant for the "Steady state" bit	UINT16	RW	0x0064 (100dec)
801D:2C	Steady state tolerance [▶ 68]	Tolerance window for the "Steady state" bit	REAL32	RW	0x3F800000 (1065353216dec)
801D:2D	Low Range Warning (Real32) [▶ 69]	Limit value Low Range Warning (Real32)	REAL32	RW	0xBCA3D70A (-1130113270dec)
801D:2E	High Range Warning (Real32) [▶ 69]	Limit value High Range Warning (Real32)	REAL32	RW	0x3CA3D70A (1017370378dec)

Index 801F AI Vendor Calibration Data USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
801F:0	AI Vendor Calibration Data USense Ch.1	Max. Subindex	UINT8	RO	0x08 (8_{dec})
801F:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
801F:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
801F:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
801F:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
801F:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
801F:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0_{dec})
801F:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0_{dec})

Index 8020 RMB Settings Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8020:0	RMB Settings Ch.1	Max. Subindex	UINT8	RO	0x18 (24_{dec})
8020:01	Enable User Scale [▶ 67]	User scaling is active	BOOLEAN	RW	0x00 (0_{dec})
8020:02	Presentation [▶ 55]	0: *Signed presentation* The measured value is displayed in two's complement. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$ 1: *Unsigned presentation* Maximum presentation range for 16 bits: 0 ... $+65535_{dec}$ 2: *Absolute value with MSB as sign* The measured value is output in the signed amount representation. Maximum presentation range at 16 bits: - 32768_{dec} ... $+32767_{dec}$	BIT3	RW	0x00 (0_{dec})
8020:06	Enable Filter 1 [▶ 61]	Enable filter 1	BOOLEAN	RW	0x01 (1_{dec})
8020:07	Enable Limit 1 [▶ 72]	Enable Limit 1	BOOLEAN	RW	0x00 (0_{dec})
8020:08	Enable Limit 2 [▶ 72]	Enable Limit 2	BOOLEAN	RW	0x00 (0_{dec})
8020:0A	Enable user calibration [▶ 63]	Enable user calibration	BOOLEAN	RW	0x00 (0_{dec})
8020:0B	Enable vendor calibration [▶ 63]	Enable vendor calibration	BOOLEAN	RW	0x01 (1_{dec})
8020:0E	Swap Limit Bits	Swap limit bits	BOOLEAN	RW	0x00 (0_{dec})
8020:11	User Scale Offset [▶ 67]	User scale offset	INT16	RW	0x0000 (0_{dec})
8020:12	User Scale Gain [▶ 67]	User scale gain. The gain has a fixed-point representation with a factor of 2^{-16}. The value 1 corresponds to 65535 (0x00010000).	INT32	RW	0x00010000 (65536_{dec})
8020:13	Limit 1 [▶ 72]	First limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8020:14	Limit 2 [▶ 72]	Second limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8020:15	Filter 1 Settings [▶ 61]	This object determines the digital filter settings if it is active via Enable filter (Index 0x8020:06). The possible settings are numbered consecutively. 0: 50 Hz FIR 1: 60 Hz FIR 2: IIR 1 3: IIR 2 4: IIR 3 5: IIR 4 6: IIR 5 7: IIR 6 8: IIR 7 9: IIR 8 Refer to the Note on setting the filter characteristics	UINT16	RW	0x0000 (0_{dec})
8020:17	User calibration offset [▶ 63]	User calibration offset	INT16	RW	0x0000 (0_{dec})
8020:18	User calibration gain [▶ 63]	User calibration gain	UINT16	RW	0x7FFF (32767_{dec})

Index 802C RMB User Calibration Data Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
802C:0	RMB User calibration Data Ch.1	Max. Subindex	UINT8	RO	0x0D (13_{dec})
802C:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
802C:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
802C:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
802C:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
802C:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
802C:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0dec)
802C:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0dec)

Index 802D RMB Advanced Settings Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
802D:0	RMB Advanced Settings Ch.1	Max. Subindex	UINT8	RO	0x2E (46_{dec})
802D:11	Input Interface [▶ 61]	Values: 0 - None 48 - V ±20 mV 49 - V ±75 mV 50 - V ±4 V	UINT16	RW	0x0002 (2_{dec})
802D:12	Integer Scaler [▶ 52]	Values: 0 - Extended Range 3 - Legacy Range	UINT16	RW	0x0000 (0_{dec})
802D:17	Low Range Error [▶ 70]	Low Range limit value	INT32	RW	0xFFFF8020 (-32768_{dec})
802D:018	High Range Error [▶ 70]	High Range limit value	INT32	RW	0x00007FFF (32767_{dec})
802D:1A	Filter 2 Settings [▶ 66]	Values: 0 – Off 1 - HP 0.001 Hz 2 - HP 0.01 Hz 3 - HP 0.1 Hz 4 - HP 1 Hz 5 - HP 10 Hz	UINT16	RW	0x0000 (0_{dec})
802D:1C	User Scale Offset (Real32) [▶ 67]	User scale offset (Real32)	REAL32	RW	0x00000000 (0.0)
802D:1D	User Scale Gain (Real32) [▶ 67]	User scale gain. (Real32)	REAL32	RW	0x3F800000 (1.0)
802D:27	Low Range Error (Real32) [▶ 70]	Limit value Low Range Error (Real32)	REAL32	RW	0xC12BCC79 (-10.7374201)
802D:28	High Range Error (Real32) [▶ 70]	Limit value High Range Error (Real32)	REAL32	RW	0x412BCC79 (10.7374201)
802D:29	Limit 1 (Real32) [▶ 72]	Limit value Limit1	REAL32	RW	0x00000000 (0.0)
802D:2A	Limit 2 (Real32) [▶ 72]	Limit 2 (INT16) in the RMB settings is automatically adjusted	REAL32	RW	0x00000000 (0.0)
802D:2B	Steady state Window [▶ 68]	Time constant for the "Steady state" bit	UINT16	RW	0x0064 (100dec)
802D:2C	Steady state tolerance [▶ 68]	Tolerance window for the "Steady state" bit	REAL32	RW	0x3F800000 (1065353216dec)
802D:2D	Low Range Warning (Real32) [▶ 69]	Limit value Low Range Warning (Real32)	REAL32	RW	0xBCA3D70A (-1130113270dec)
802D:2E	High Range Warning (Real32) [▶ 69]	Limit value High Range Warning (Real32)	REAL32	RW	0x3CA3D70A (1017370378dec)

Index 802F RMB Vendor Calibration Data Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
802F:0	RMB Vendor Calibration Data Ch.1	Max. Subindex	UINT8	RO	0x08 (8_{dec})
802F:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
802F:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
802F:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
802F:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
802F:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
802F:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0_{dec})
802F:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0_{dec})

Index 8030 RMB Sensor Settings Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8030:0	RMB Sensor Settings Ch.1		UINT8	RO	0x28 (40_{dec})
8030:23	Sensitivity	Characteristic value of the load cell mV/V	REAL32	RW	0x40000000 (1073741824_{dec})
8030:24	Nominal Load	Nominal load of the load cell	REAL32	RW	0x3F800000 (1065353216_{dec})
8030:25	Zero Balance	Zero offset of the load cell	REAL32	RW	0x00000000 (0_{dec})
8030:26	Gravity of Earth	Acceleration of gravity (normal: 9.806650)	REAL32	RW	0x411CE80A (1092413450_{dec})
8030:27	Scale factor	Scaling factor	REAL32	RW	0x447A0000 (1148846080_{dec})
8030:28	Reference load	Value of the weight used for adjustment	REAL32	RW	0x3F800000 (1065353216_{dec})

Index 8040 AI Settings UBridge Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8040:0	AI Settings UBridge Ch.2	Max. Subindex	UINT8	RO	0x18 (24_{dec})
8040:01	Input Interface [▶ 61]	User scaling is active	BOOLEAN	RW	0x00 (0_{dec})
8040:02	Integer Scaler [▶ 52]	0: *Signed presentation* The measured value is displayed in two's complement. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$ 1: *Unsigned presentation* Maximum presentation range for 16 bits: 0 ... $+65535_{dec}$ 2: *Absolute value with MSB as sign* The measured value is output in the signed amount representation. Maximum presentation range at 16 bits: - 32768_{dec} ... $+32767_{dec}$	BIT3	RW	0x00 (0_{dec})
8040:06	Low Range Error [▶ 70]	Enable filter 1	BOOLEAN	RW	0x01 (1_{dec})
8040:07	High Range Error [▶ 70]	Enable Limit 1	BOOLEAN	RW	0x00 (0_{dec})
8040:08	Filter 2 Settings [▶ 66]	Enable Limit 2	BOOLEAN	RW	0x00 (0_{dec})
8040:0A	User Scale Offset (Real32) [▶ 67]	Enable user calibration	BOOLEAN	RW	0x00 (0_{dec})
8040:0B	User Scale Gain (Real32) [▶ 67]	Enable vendor calibration	BOOLEAN	RW	0x01 (1_{dec})
8040:0E	Low Range Error (Real32) [▶ 70]	Swap limit bits	BOOLEAN	RW	0x00 (0_{dec})
8040:11	High Range Error (Real32) [▶ 70]	User scale offset	INT16	RW	0x0000 (0_{dec})
8040:12	Limit 1 (Real32) [▶ 72]	User scale gain. The gain has a fixed-point representation with a factor of 2^{-16}. The value 1 corresponds to 65535 (0x00010000).	INT32	RW	0x00010000 (65536_{dec})
8040:13	Limit 2 (Real32) [▶ 72]	First limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8040:14	Steady state Window [▶ 68]	Second limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8040:15	Steady state tolerance [▶ 68]	This object determines the digital filter settings if it is active via Enable filter (Index 0x8040:06). The possible settings are numbered consecutively. 0: 50 Hz FIR 1: 60 Hz FIR 2: IIR 1 3: IIR 2 4: IIR 3 5: IIR 4 6: IIR 5 7: IIR 6 8: IIR 7 9: IIR 8 Refer to the Note on setting the filter characteristics	UINT16	RW	0x0000 (0_{dec})
8040:17	Low Range Warning (Real32) [▶ 69]	User calibration offset	INT16	RW	0x0000 (0_{dec})
8040:18	High Range Warning (Real32) [▶ 69]	User calibration gain	UINT16	RW	0x7FFF (32767_{dec})

Index 804C AI User Calibration Data UBridge Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
804C:0	AI User Calibration Data UBridge Ch.2	Max. Subindex	UINT8	RO	0x0D (13_{dec})
804C:01	Calibration [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
804C:03	S0	Real32 coefficient S0	REAL32	RW	0x0000000 0 (0_{dec})
804C:04	S1	Real32 coefficient S1	REAL32	RW	0x0000000 0 (0_{dec})
804C:05	S2	Real32 coefficient S2	REAL32	RW	0x0000000 0 (0_{dec})
804C:06	S3	Real32 coefficient S3	REAL32	RW	0x0000000 0 (0_{dec})
804C:07	T1	Real32 coefficient T1	REAL32	RW	0x0000000 0 (0dec)
804C:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x0000000 0 (0dec)

Index 804D AI Advanced Settings UBridge Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
804D:0	AI Advanced Settings UBridge Ch.2	Max. Subindex	UINT8	RO	0x2E (46_{dec})
804D:11	Input Interface [▶ 61]	Values: 0 - None 48 - V ±20 mV 49 - V ±75 mV 50 - V ±4 V	UINT16	RW	0x0002 (2_{dec})
804D:12	Integer Scaler [▶ 52]	Values: 0 - Extended Range 3 - Legacy Range	UINT16	RW	0x0000 (0_{dec})
804D:17	Low Range Error [▶ 70]	Low Range limit value	INT32	RW	0xFFFF8040 (-32768_{dec})
804D:018	High Range Error [▶ 70]	High Range limit value	INT32	RW	0x00007FFF (32767_{dec})
804D:1A	Filter 2 Settings [▶ 66]	Values: 0 – Off 1 - HP 0.001 Hz 2 - HP 0.01 Hz 3 - HP 0.1 Hz 4 - HP 1 Hz 5 - HP 10 Hz	UINT16	RW	0x0000 (0_{dec})
804D:1C	User Scale Offset (Real32) [▶ 67]	User scale offset (Real32)	REAL32	RW	0x00000000 (0.0)
804D:1D	User Scale Gain (Real32) [▶ 67]	User scale gain. (Real32)	REAL32	RW	0x3F804000 (1.0)
804D:27	Low Range Error (Real32) [▶ 70]	Limit value Low Range Error (Real32)	REAL32	RW	0xC12BCC79 (-10.7374201)
804D:28	High Range Error (Real32) [▶ 70]	Limit value High Range Error (Real32)	REAL32	RW	0x412BCC79 (10.7374201)
804D:29	Limit 1 (Real32) [▶ 72]	Limit value Limit1	REAL32	RW	0x00000000 (0.0)
804D:2A	Limit 2 (Real32) [▶ 72]	Limit 2 (INT16) in the AI settings is adjusted automatically	REAL32	RW	0x00000000 (0.0)
804D:2B	Steady state Window [▶ 68]	Time constant for the "Steady state" bit	UINT16	RW	0x0064 (100dec)
804D:2C	Steady state tolerance [▶ 68]	Tolerance window for the "Steady state" bit	REAL32	RW	0x3F804000 (1065353216dec)
804D:2D	Low Range Warning (Real32) [▶ 69]	Limit value Low Range Warning (Real32)	REAL32	RW	0xBCA3D70A (-1130113270dec)
804D:2E	High Range Warning (Real32) [▶ 69]	Limit value High Range Warning (Real32)	REAL32	RW	0x3CA3D70A (1017370378dec)

Index 804F AI Vendor Calibration Data UBridge Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
804F:0	AI Vendor Calibration Data UBridge Ch.2	Max. Subindex	UINT8	RO	0x08 (8_{dec})
804F:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
804F:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
804F:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
804F:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
804F:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
804F:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0_{dec})
804F:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0_{dec})

Index 8050 AI Settings USense Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8050:0	AI Settings USense Ch.2	Max. Subindex	UINT8	RO	0x18 (24_{dec})
8050:01	Enable User Scale [▶ 67]	User scaling is active	BOOLEAN	RW	0x00 (0_{dec})
8050:02	Presentation [▶ 55]	0: *Signed presentation* The measured value is displayed in two's complement. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$ 1: *Unsigned presentation* Maximum presentation range for 16 bits: 0 ... $+65535_{dec}$ 2: *Absolute value with MSB as sign* The measured value is output in the signed amount representation. Maximum presentation range at 16 bits: - 32768_{dec} ... $+32767_{dec}$	BIT3	RW	0x00 (0_{dec})
8050:06	Enable Filter 1 [▶ 61]	Enable filter 1	BOOLEAN	RW	0x01 (1_{dec})
8050:07	Enable Limit 1 [▶ 72]	Enable Limit 1	BOOLEAN	RW	0x00 (0_{dec})
8050:08	Enable Limit 2 [▶ 72]	Enable Limit 2	BOOLEAN	RW	0x00 (0_{dec})
8050:0A	Enable user calibration [▶ 63]	Enable user calibration	BOOLEAN	RW	0x00 (0_{dec})
8050:0B	Enable vendor calibration [▶ 63]	Enable vendor calibration	BOOLEAN	RW	0x01 (1_{dec})
8050:0E	Swap Limit Bits	Swap limit bits	BOOLEAN	RW	0x00 (0_{dec})
8050:11	User Scale Offset [▶ 67]	User scale offset	INT16	RW	0x0000 (0_{dec})
8050:12	User Scale Gain [▶ 67]	User scale gain. The gain has a fixed-point representation with a factor of 2^{-16}. The value 1 corresponds to 65535 (0x00010000).	INT32	RW	0x00010000 (65536_{dec})
8050:13	Limit 1 [▶ 72]	First limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8050:14	Limit 2 [▶ 72]	Second limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8050:15	Filter 1 Settings [▶ 61]	This object determines the digital filter settings if it is active via Enable filter (Index 0x8050:06). The possible settings are numbered consecutively. 0: 50 Hz FIR 1: 60 Hz FIR 2: IIR 1 3: IIR 2 4: IIR 3 5: IIR 4 6: IIR 5 7: IIR 6 8: IIR 7 9: IIR 8 Refer to the Note on setting the filter characteristics	UINT16	RW	0x0000 (0_{dec})
8050:17	User calibration offset [▶ 63]	User calibration offset	INT16	RW	0x0000 (0_{dec})
8050:18	User calibration gain [▶ 63]	User calibration gain	UINT16	RW	0x7FFF (32767_{dec})

Index 805C AI User Calibration Data USense Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
805C:0	AI User Calibration Data USense Ch.2	Max. Subindex	UINT8	RO	0x0D (13_{dec})
805C:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
805C:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
805C:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
805C:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
805C:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
805C:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0dec)
805C:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0dec)

Index 805D AI Advanced Settings USense Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
805D:0	AI Advanced Settings USense Ch.2	Max. Subindex	UINT8	RO	0x2E (46_{dec})
805D:11	Input Interface [▶ 61]	Values: 0 - None 48 - V ±20 mV 49 - V ±75 mV 50 - V ±4 V	UINT16	RW	0x0002 (2_{dec})
805D:12	Integer Scaler [▶ 52]	Values: 0 - Extended Range 3 - Legacy Range	UINT16	RW	0x0000 (0_{dec})
805D:17	Low Range Error [▶ 70]	Low Range limit value	INT32	RW	0xFFFF8050 (-32768_{dec})
805D:18	High Range Error [▶ 70]	High Range limit value	INT32	RW	0x00007FFF (32767_{dec})
805D:1A	Filter 2 Settings [▶ 66]	Values: 0 – Off 1 - HP 0.001 Hz 2 - HP 0.01 Hz 3 - HP 0.1 Hz 4 - HP 1 Hz 5 - HP 10 Hz	UINT16	RW	0x0000 (0_{dec})
805D:1C	User Scale Offset (Real32) [▶ 67]	User scale offset (Real32)	REAL32	RW	0x00000000 (0.0)
805D:1D	User Scale Gain (Real32) [▶ 67]	User scale gain. (Real32)	REAL32	RW	0x3F800000 (1.0)
805D:27	Low Range Error (Real32) [▶ 70]	Limit value Low Range Error (Real32)	REAL32	RW	0xC12BCC79 (-10.7374201)
805D:28	High Range Error (Real32) [▶ 70]	Limit value High Range Error (Real32)	REAL32	RW	0x412BCC79 (10.7374201)
805D:29	Limit 1 (Real32) [▶ 72]	Limit value Limit1	REAL32	RW	0x00000000 (0.0)
805D:2A	Limit 2 (Real32) [▶ 72]	Limit 2 (INT16) in the AI settings is adjusted automatically	REAL32	RW	0x00000000 (0.0)
805D:2B	Steady state Window [▶ 68]	Time constant for the "Steady state" bit	UINT16	RW	0x0064 (100dec)
805D:2C	Steady state tolerance [▶ 68]	Tolerance window for the "Steady state" bit	REAL32	RW	0x3F800000 (1065353216dec)
805D:2D	Low Range Warning (Real32) [▶ 69]	Limit value Low Range Warning (Real32)	REAL32	RW	0xBCA3D70A (-1130113270dec)
805D:2E	High Range Warning (Real32) [▶ 69]	Limit value High Range Warning (Real32)	REAL32	RW	0x3CA3D70A (1017370378dec)

Index 805F AI Vendor Calibration Data USense Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
805F:0	AI Vendor Calibration Data USense Ch.2	Max. Subindex	UINT8	RO	0x08 (8_{dec})
805F:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
805F:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
805F:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
805F:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
805F:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
805F:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0_{dec})
805F:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0_{dec})

Index 8060 RMB Settings Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8060:0	RMB Settings Ch.2	Max. Subindex	UINT8	RO	0x18 (24_{dec})
8060:01	Enable User Scale [▶ 67]	User scaling is active	BOOLEAN	RW	0x00 (0_{dec})
8060:02	Presentation [▶ 55]	0: *Signed presentation* The measured value is displayed in two's complement. Maximum presentation range at 16 bits: -32768_{dec} ... $+32767_{dec}$ 1: *Unsigned presentation* Maximum presentation range for 16 bits: 0 ... $+65535_{dec}$ 2: *Absolute value with MSB as sign* The measured value is output in the signed amount representation. Maximum presentation range at 16 bits: - 32768_{dec} ... $+32767_{dec}$	BIT3	RW	0x00 (0_{dec})
8060:06	Enable Filter 1 [▶ 61]	Enable filter 1	BOOLEAN	RW	0x01 (1_{dec})
8060:07	Enable Limit 1 [▶ 72]	Enable Limit 1	BOOLEAN	RW	0x00 (0_{dec})
8060:08	Enable Limit 2 [▶ 72]	Enable Limit 2	BOOLEAN	RW	0x00 (0_{dec})
8060:0A	Enable user calibration [▶ 63]	Enable user calibration	BOOLEAN	RW	0x00 (0_{dec})
8060:0B	Enable vendor calibration [▶ 63]	Enable vendor calibration	BOOLEAN	RW	0x01 (1_{dec})
8060:0E	Swap Limit Bits	Swap limit bits	BOOLEAN	RW	0x00 (0_{dec})
8060:11	User Scale Offset [▶ 67]	User scale offset	INT16	RW	0x0000 (0_{dec})
8060:12	User Scale Gain [▶ 67]	User scale gain. The gain has a fixed-point representation with a factor of 2^{-16}. The value 1 corresponds to 65535 (0x00010000).	INT32	RW	0x00010000 (65536_{dec})
8060:13	Limit 1 [▶ 72]	First limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})
8060:14	Limit 2 [▶ 72]	Second limit value for setting the status bits	INT16	RW	0x0000 (0_{dec})

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8060:15	Filter 1 Settings [▶ 61]	This object determines the digital filter settings if it is active via Enable filter (Index 0x8060:06). The possible settings are numbered consecutively. 0: 50 Hz FIR 1: 60 Hz FIR 2: IIR 1 3: IIR 2 4: IIR 3 5: IIR 4 6: IIR 5 7: IIR 6 8: IIR 7 9: IIR 8 Refer to the Note on setting the filter characteristics	UINT16	RW	0x0000 (0_{dec})
8060:17	User calibration offset [▶ 63]	User calibration offset	INT16	RW	0x0000 (0_{dec})
8060:18	User calibration gain [▶ 63]	User calibration gain	UINT16	RW	0x7FFF (32767_{dec})

Index 806C RMB User Calibration Data Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
806C:0	RMB User calibration Data Ch.2	Max. Subindex	UINT8	RO	0x0D (13_{dec})
806C:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
806C:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
806C:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
806C:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
806C:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
806C:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0dec)
806C:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0dec)

Index 806D RMB Advanced Settings Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
806D:0	RMB Advanced Settings Ch.2	Max. Subindex	UINT8	RO	0x2E (46_{dec})
806D:11	Input Interface [▶ 61]	Values: 0 - None 48 - V ±20 mV 49 - V ±75 mV 50 - V ±4 V	UINT16	RW	0x0002 (2_{dec})
806D:12	Integer Scaler [▶ 52]	Values: 0 - Extended Range 3 - Legacy Range	UINT16	RW	0x0000 (0_{dec})
806D:17	Low Range Error [▶ 70]	Low Range limit value	INT32	RW	0xFFFF8060 (-32768_{dec})
806D:018	High Range Error [▶ 70]	High Range limit value	INT32	RW	0x00007FFF (32767_{dec})
806D:1A	Filter 2 Settings [▶ 66]	Values: 0 – Off 1 - HP 0.001 Hz 2 - HP 0.01 Hz 3 - HP 0.1 Hz 4 - HP 1 Hz 5 - HP 10 Hz	UINT16	RW	0x0000 (0_{dec})
806D:1C	User Scale Offset (Real32) [▶ 67]	User scale offset (Real32)	REAL32	RW	0x00000000 (0.0)
806D:1D	User Scale Gain (Real32) [▶ 67]	User scale gain. (Real32)	REAL32	RW	0x3F806000 (1.0)
806D:27	Low Range Error (Real32) [▶ 70]	Limit value Low Range Error (Real32)	REAL32	RW	0xC12BCC79 (-10.7374201)
806D:28	High Range Error (Real32) [▶ 70]	Limit value High Range Error (Real32)	REAL32	RW	0x412BCC79 (10.7374201)
806D:29	Limit 1 (Real32) [▶ 72]	Limit value Limit1	REAL32	RW	0x00000000 (0.0)
806D:2A	Limit 2 (Real32) [▶ 72]	Limit 2 (INT16) in the RMB settings is automatically adjusted	REAL32	RW	0x00000000 (0.0)
806D:2B	Steady state Window [▶ 68]	Time constant for the "Steady state" bit	UINT16	RW	0x0064 (100dec)
806D:2C	Steady state tolerance [▶ 68]	Tolerance window for the "Steady state" bit	REAL32	RW	0x3F806000 (1065353216dec)
806D:2D	Low Range Warning (Real32) [▶ 69]	Limit value Low Range Warning (Real32)	REAL32	RW	0xBCA3D70A (-1130113270dec)
806D:2E	High Range Warning (Real32) [▶ 69]	Limit value High Range Warning (Real32)	REAL32	RW	0x3CA3D70A (1017370378dec)

Index 806F RMB Vendor Calibration Data Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
806F:0	RMB Vendor Calibration Data Ch.2	Max. Subindex	UINT8	RO	0x08 (8_{dec})
806F:01	Calibration Data [▶ 63]	4 bytes of free memory space; here it is possible to store the calibration date in the form of 8 CHAR, for example	OCTET-STRING[4]	RW	{0}
806F:03	S0	Real32 coefficient S0	REAL32	RW	0x00000000 (0_{dec})
806F:04	S1	Real32 coefficient S1	REAL32	RW	0x00000000 (0_{dec})
806F:05	S2	Real32 coefficient S2	REAL32	RW	0x00000000 (0_{dec})
806F:06	S3	Real32 coefficient S3	REAL32	RW	0x00000000 (0_{dec})
806F:07	T1	Real32 coefficient T1	REAL32	RW	0x00000000 (0_{dec})
806F:08	T1S1	Real32 coefficient T1S1	REAL32	RW	0x00000000 (0_{dec})

Index 8070 RMB Sensor Settings Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
8070:0	RMB Sensor Settings Ch.2		UINT8	RO	0x28 (40_{dec})
8070:23	Sensitivity	Characteristic value of the load cell mV/V	REAL32	RW	0x40000000 (1073741824_{dec})
8070:24	Nominal Load	Nominal load of the load cell	REAL32	RW	0x3F800000 (1065353216_{dec})
8070:25	Zero Balance	Zero offset of the load cell	REAL32	RW	0x00000000 (0_{dec})
8070:26	Gravity of Earth	Acceleration of gravity (normal: 9.806650)	REAL32	RW	0x411CE80A (1092413450_{dec})
8070:27	Scale factor	Scaling factor	REAL32	RW	0x447A0000 (1148846080_{dec})
8070:28	Reference load	Value of the weight used for adjustment	REAL32	RW	0x3F800000 (1065353216_{dec})

Index F800 DEV Settings

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F800:0	DEV Settings	Max. Subindex	UINT8	RO	0x01 (1dec)
F800:01	Sensor supply	Values: 0 - OFF 5000 - 5 V 10000 - 10 V	UINT16	RW	0x2710 (10000dec)

4.6.2.3 Information and diagnostic data

Index 9000E AI Internal data UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9000:0	AI Internal Data UBridge Ch.1	Max. Subindex	UINT8	RO	0x1B (27_{dec})
9000:02	ADC raw value	ADC Raw data	INT32	RO	0x00000000 (0_{dec})
9000:03	Value After Filter 1	Current measured value after filter 1	INT32	RO	0x00000000 (0_{dec})
9000:04	Value After Interface	Current measured value after interface evaluation	REAL32	RO	0x00000000 (0_{dec})
9000:09	Value After Filter 2	Current measured value after filter 2	REAL32	RO	0x00000000 (0_{dec})
9000:0B	Value After User Scale	Current measured value according to UserScale	REAL32	RO	0x00000000 (0_{dec})
9000:0C	Actual positive peak hold	Positive drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9000:0D	Actual negative peak hold	Negative drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9000:14	Underrange Error Counter	Counter for underrange errors	UINT32	RO	0x00000000 (0_{dec})
9000:15	Overrange Error Counter	Counter for overrange errors	UINT32	RO	0x00000000 (0_{dec})
9000:16	Limit 1 Counter Low	Counter for "Limit 1 Low" events	UINT32	RO	0x00000000 (0_{dec})
9000:17	Limit 1 Counter High	Counter for "Limit 1 High" events	UINT32	RO	0x00000000 (0_{dec})
9000:18	Limit 2 Counter Low	Counter for "Limit 2 Low" events	UINT32	RO	0x00000000 (0_{dec})
9000:19	Limit 2 Counter High	Counter for "Limit 2 High" events	UINT32	RO	0x00000000 (0_{dec})
9000:1A	Tare Value	Tare value currently taken into account	REAL32	RO	0x00000000 (0_{dec})
9000:1B	Sampling rate	Current effective sampling rate, [1/sec]	REAL32	RO	0x00000000 (0_{dec})
9000:1C	Value After Calibration	Current measured value after calibration	REAL32	RO	0x00000000 (0dec)
9000:1D	Underrange Warning Counter	Counter for underrange warning	UINT32	RO	0x00000000 (0dec)
9000:1E	Overrange Warning Counter	Counter for overrange warning	UINT32	RO	0x00000000 (0dec)

Index 9002 AI Info Data UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9002:0	AI Info Data UBridge Ch.1	Max. Subindex	UINT8	RO	0x12 (18_{dec})
9002:11	Vendor calibration counter [▶ 63]	Counter for changes to the vendor adjustment data	UINT32	RO	0x00000000 (0_{dec})
9002:12	User calibration Counter [▶ 63]	Counter for changes to the user calibration data	UINT32	RO	0x00000000 (0_{dec})

Index 9010 AI Internal Data USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9010:0	AI Internal Data USense Ch.1	Max. Subindex	UINT8	RO	0x1B (27_{dec})
9010:02	ADC raw value	ADC Raw data	INT32	RO	0x00000000 (0_{dec})
9010:03	Value After Filter 1	Current measured value after filter 1	INT32	RO	0x00000000 (0_{dec})
9010:04	Value After Interface	Current measured value after interface evaluation	REAL32	RO	0x00000000 (0_{dec})
9010:09	Value After Filter 2	Current measured value after filter 2	REAL32	RO	0x00000000 (0_{dec})
9010:0B	Value After User Scale	Current measured value according to UserScale	REAL32	RO	0x00000000 (0_{dec})
9010:0C	Actual positive peak hold	Positive drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9010:0D	Actual negative peak hold	Negative drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9010:14	Underrange Error Counter	Counter for underrange errors	UINT32	RO	0x00000000 (0_{dec})
9010:15	Overrange Error Counter	Counter for overrange errors	UINT32	RO	0x00000000 (0_{dec})
9010:16	Limit 1 Counter Low	Counter for "Limit 1 Low" events	UINT32	RO	0x00000000 (0_{dec})
9010:17	Limit 1 Counter High	Counter for "Limit 1 High" events	UINT32	RO	0x00000000 (0_{dec})
9010:18	Limit 2 Counter Low	Counter for "Limit 2 Low" events	UINT32	RO	0x00000000 (0_{dec})
9010:19	Limit 2 Counter High	Counter for "Limit 2 High" events	UINT32	RO	0x00000000 (0_{dec})
9010:1A	Tare Value	Tare value currently taken into account	REAL32	RO	0x00000000 (0_{dec})
9010:1B	Sampling rate	Current effective sampling rate, [1/sec]	REAL32	RO	0x00000000 (0_{dec})
9010:1C	Value After Calibration	Current measured value after calibration	REAL32	RO	0x00000000 (0dec)
9010:1D	Underrange Warning Counter	Counter for underrange warning	UINT32	RO	0x00000000 (0dec)
9010:1E	Overrange Warning Counter	Counter for overrange warning	UINT32	RO	0x00000000 (0dec)

Index 9012 AI Info Data USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9012:0	AI Info Data USense Ch.1	Max. Subindex	UINT8	RO	0x12 (18_{dec})
9012:11	Vendor calibration counter [▶ 63]	Counter for changes to the vendor adjustment data	UINT32	RO	0x00000000 (0_{dec})
9012:12	User calibration Counter [▶ 63]	Counter for changes to the user calibration data	UINT32	RO	0x00000000 (0_{dec})

Index 9020 RMB Internal Data Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9020:0	RMB Internal Data Ch.1	Max. Subindex	UINT8	RO	0x1B (27_{dec})
9020:02	ADC raw value	ADC Raw data	INT32	RO	0x00000000 (0_{dec})
9020:03	Value After Filter 1	Current measured value after filter 1	INT32	RO	0x00000000 (0_{dec})
9020:04	Value After Interface	Current measured value after interface evaluation	REAL32	RO	0x00000000 (0_{dec})
9020:09	Value After Filter 2	Current measured value after filter 2	REAL32	RO	0x00000000 (0_{dec})
9020:0B	Value After User Scale	Current measured value according to UserScale	REAL32	RO	0x00000000 (0_{dec})
9020:0C	Actual positive peak hold	Positive drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9020:0D	Actual negative peak hold	Negative drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9020:14	Underrange Error Counter	Counter for underrange errors	UINT32	RO	0x00000000 (0_{dec})
9020:15	Overrange Error Counter	Counter for overrange errors	UINT32	RO	0x00000000 (0_{dec})
9020:16	Limit 1 Counter Low	Counter for "Limit 1 Low" events	UINT32	RO	0x00000000 (0_{dec})
9020:17	Limit 1 Counter High	Counter for "Limit 1 High" events	UINT32	RO	0x00000000 (0_{dec})
9020:18	Limit 2 Counter Low	Counter for "Limit 2 Low" events	UINT32	RO	0x00000000 (0_{dec})
9020:19	Limit 2 Counter High	Counter for "Limit 2 High" events	UINT32	RO	0x00000000 (0_{dec})
9020:1A	Tare Value	Tare value currently taken into account	REAL32	RO	0x00000000 (0_{dec})
9020:1B	Sampling rate	Current effective sampling rate, [1/sec]	REAL32	RO	0x00000000 (0_{dec})
9020:1C	Value After Calibration	Current measured value after calibration	REAL32	RO	0x00000000 (0dec)
9020:1D	Underrange Warning Counter	Counter for underrange warning	UINT32	RO	0x00000000 (0dec)
9020:1E	Overrange Warning Counter	Counter for overrange warning	UINT32	RO	0x00000000 (0dec)

Index 9022 RMB Info Data Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9022:0	RMB Info Data Ch.1	Max. Subindex	UINT8	RO	0x12 (18_{dec})
9022:11	Vendor calibration counter [▶ 63]	Counter for changes to the vendor adjustment data	UINT32	RO	0x00000000 (0_{dec})
9022:12	User calibration Counter [▶ 63]	Counter for changes to the user calibration data	UINT32	RO	0x00000000 (0_{dec})

Index 9040 AI Internal data UBridge Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9040:0	AI Internal Data UBridge Ch.2	Max. Subindex	UINT8	RO	0x1B (27_{dec})
9040:02	ADC raw value	ADC Raw data	INT32	RO	0x00000000 (0_{dec})
9040:03	Value After Filter 1	Current measured value after filter 1	INT32	RO	0x00000000 (0_{dec})
9040:04	Value After Interface	Current measured value after interface evaluation	REAL32	RO	0x00000000 (0_{dec})
9040:09	Value After Filter 2	Current measured value after filter 2	REAL32	RO	0x00000000 (0_{dec})
9040:0B	Value After User Scale	Current measured value according to UserScale	REAL32	RO	0x00000000 (0_{dec})
9040:0C	Actual positive peak hold	Positive drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9040:0D	Actual negative peak hold	Negative drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9040:14	Underrange Error Counter	Counter for underrange errors	UINT32	RO	0x00000000 (0_{dec})
9040:15	Overrange Error Counter	Counter for overrange errors	UINT32	RO	0x00000000 (0_{dec})
9040:16	Limit 1 Counter Low	Counter for "Limit 1 Low" events	UINT32	RO	0x00000000 (0_{dec})
9040:17	Limit 1 Counter High	Counter for "Limit 1 High" events	UINT32	RO	0x00000000 (0_{dec})
9040:18	Limit 2 Counter Low	Counter for "Limit 2 Low" events	UINT32	RO	0x00000000 (0_{dec})
9040:19	Limit 2 Counter High	Counter for "Limit 2 High" events	UINT32	RO	0x00000000 (0_{dec})
9040:1A	Tare Value	Tare value currently taken into account	REAL32	RO	0x00000000 (0_{dec})
9040:1B	Sampling rate	Current effective sampling rate, [1/sec]	REAL32	RO	0x00000000 (0_{dec})
9040:1C	Value After Calibration	Current measured value after calibration	REAL32	RO	0x00000000 (0dec)
9040:1D	Underrange Warning Counter	Counter for underrange warning	UINT32	RO	0x00000000 (0dec)
9040:1E	Overrange Warning Counter	Counter for overrange warning	UINT32	RO	0x00000000 (0dec)

Index 9042 AI Info Data UBridge Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9042:0	AI Info Data UBridge Ch.2	Max. Subindex	UINT8	RO	0x12 (18_{dec})
9042:11	Vendor calibration counter [▶ 63]	Counter for changes to the vendor adjustment data	UINT32	RO	0x00000000 (0_{dec})
9042:12	User calibration Counter [▶ 63]	Counter for changes to the user calibration data	UINT32	RO	0x00000000 (0_{dec})

Index 9050 AI Internal Data USense Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9050:0	AI Internal Data USense Ch.2	Max. Subindex	UINT8	RO	0x1B (27_{dec})
9050:02	ADC raw value	ADC Raw data	INT32	RO	0x00000000 (0_{dec})
9050:03	Value After Filter 1	Current measured value after filter 1	INT32	RO	0x00000000 (0_{dec})
9050:04	Value After Interface	Current measured value after interface evaluation	REAL32	RO	0x00000000 (0_{dec})
9050:09	Value After Filter 2	Current measured value after filter 2	REAL32	RO	0x00000000 (0_{dec})
9050:0B	Value After User Scale	Current measured value according to UserScale	REAL32	RO	0x00000000 (0_{dec})
9050:0C	Actual positive peak hold	Positive drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9050:0D	Actual negative peak hold	Negative drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9050:14	Underrange Error Counter	Counter for underrange errors	UINT32	RO	0x00000000 (0_{dec})
9050:15	Overrange Error Counter	Counter for overrange errors	UINT32	RO	0x00000000 (0_{dec})
9050:16	Limit 1 Counter Low	Counter for "Limit 1 Low" events	UINT32	RO	0x00000000 (0_{dec})
9050:17	Limit 1 Counter High	Counter for "Limit 1 High" events	UINT32	RO	0x00000000 (0_{dec})
9050:18	Limit 2 Counter Low	Counter for "Limit 2 Low" events	UINT32	RO	0x00000000 (0_{dec})
9050:19	Limit 2 Counter High	Counter for "Limit 2 High" events	UINT32	RO	0x00000000 (0_{dec})
9050:1A	Tare Value	Tare value currently taken into account	REAL32	RO	0x00000000 (0_{dec})
9050:1B	Sampling rate	Current effective sampling rate, [1/sec]	REAL32	RO	0x00000000 (0_{dec})
9050:1C	Value After Calibration	Current measured value after calibration	REAL32	RO	0x00000000 (0dec)
9050:1D	Underrange Warning Counter	Counter for underrange warning	UINT32	RO	0x00000000 (0dec)
9050:1E	Overrange Warning Counter	Counter for overrange warning	UINT32	RO	0x00000000 (0dec)

Index 9052 AI Info Data USense Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9052:0	AI Info Data USense Ch.2	Max. Subindex	UINT8	RO	0x12 (18_{dec})
9052:11	Vendor calibration counter [▶ 63]	Counter for changes to the vendor adjustment data	UINT32	RO	0x00000000 (0_{dec})
9052:12	User calibration Counter [▶ 63]	Counter for changes to the user calibration data	UINT32	RO	0x00000000 (0_{dec})

Index 9060 RMB Internal Data Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9060:0	RMB Internal Data Ch.2	Max. Subindex	UINT8	RO	0x1B (27_{dec})
9060:02	ADC raw value	ADC Raw data	INT32	RO	0x00000000 (0_{dec})
9060:03	Value After Filter 1	Current measured value after filter 1	INT32	RO	0x00000000 (0_{dec})
9060:04	Value After Interface	Current measured value after interface evaluation	REAL32	RO	0x00000000 (0_{dec})
9060:09	Value After Filter 2	Current measured value after filter 2	REAL32	RO	0x00000000 (0_{dec})
9060:0B	Value After User Scale	Current measured value according to UserScale	REAL32	RO	0x00000000 (0_{dec})
9060:0C	Actual positive peak hold	Positive drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9060:0D	Actual negative peak hold	Negative drag indicator, instantaneous value	REAL32	RO	0x00000000 (0_{dec})
9060:14	Underrange Error Counter	Counter for underrange errors	UINT32	RO	0x00000000 (0_{dec})
9060:15	Overrange Error Counter	Counter for overrange errors	UINT32	RO	0x00000000 (0_{dec})
9060:16	Limit 1 Counter Low	Counter for "Limit 1 Low" events	UINT32	RO	0x00000000 (0_{dec})
9060:17	Limit 1 Counter High	Counter for "Limit 1 High" events	UINT32	RO	0x00000000 (0_{dec})
9060:18	Limit 2 Counter Low	Counter for "Limit 2 Low" events	UINT32	RO	0x00000000 (0_{dec})
9060:19	Limit 2 Counter High	Counter for "Limit 2 High" events	UINT32	RO	0x00000000 (0_{dec})
9060:1A	Tare Value	Tare value currently taken into account	REAL32	RO	0x00000000 (0_{dec})
9060:1B	Sampling rate	Current effective sampling rate, [1/sec]	REAL32	RO	0x00000000 (0_{dec})
9060:1C	Value After Calibration	Current measured value after calibration	REAL32	RO	0x00000000 (0dec)
9060:1D	Underrange Warning Counter	Counter for underrange warning	UINT32	RO	0x00000000 (0dec)
9060:1E	Overrange Warning Counter	Counter for overrange warning	UINT32	RO	0x00000000 (0dec)

Index 9062 RMB Info Data Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
9062:0	RMB Info Data Ch.2	Max. Subindex	UINT8	RO	0x12 (18_{dec})
9062:11	Vendor calibration counter [▶ 63]	Counter for changes to the vendor adjustment data	UINT32	RO	0x00000000 (0_{dec})
9062:12	User calibration Counter [▶ 63]	Counter for changes to the user calibration data	UINT32	RO	0x00000000 (0_{dec})

Index F000 Modular device profile

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F000:0	Modular device profile	General information for the Modular Device Profiles (MDP) Organizational information on the profiles used in the device and listed in 0xF010	UINT8	RO	0x02 (2_{dec})
F000:01	Module index distance	Index distance of the objects of the individual channels	UINT16	RO	0x0010 (16_{dec})
F000:02	Maximum number of modules	Number of channels	UINT16	RO	0x0008 (8_{dec})

Index F010 Module Profile List

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F010:0	Module Profile List	Max. Subindex	UINT8	RO	0x08 (8dec)
F010:01	SubIndex 001	Profile 300	UINT32	RO	0x0000012C (300dec)
F010:02	SubIndex 002	Profile 300	UINT32	RO	0x0000012C (300dec)
F010:03	SubIndex 003	Profile 300	UINT32	RO	0x0000012C (300dec)
F010:04	SubIndex 004	Profile 370	UINT32	RO	0x00000172 (370dec)
F010:05	SubIndex 005	Profile 300	UINT32	RO	0x0000012C (300dec)
F010:06	SubIndex 006	Profile 300	UINT32	RO	0x0000012C (300dec)
F010:07	SubIndex 007	Profile 300	UINT32	RO	0x0000012C (300dec)
F010:08	SubIndex 008	Profile 370	UINT32	RO	0x00000172 (370dec)

Index F600 DEV Status

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F600:0	DEV Status	Max. Subindex	UINT8	RO	0x04 (4dec)
F600:04	Diag	New message available in the Diag messages	BOOLEAN	RO	0x00 (0dec)

Index F900 DEV Info Data

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F900:0	DEV Info Data	Max. Subindex	UINT8	RO	0x16 (22_{dec})
F900:11	Operating Time	total operating time of the device in [min]	UINT32	RO	0x00000000 (0_{dec})
F900:12	Device Temperature	current internal terminal temperature in [°C]	REAL32	RO	0x00000000 (0_{dec})
F900:13	Min. Device Temperature	minimum value ever observed by the terminal in [°C]	REAL32	RO	0x00000000 (0_{dec})
F900:14	Max. Device Temperature	maximum value ever observed by the terminal in [°C]	REAL32	RO	0x00000000 (0_{dec})
F900:15	Supply Voltage	Informative display of the power contact voltage, measurement uncertainty ±1.2 V in the range 20..29 V. Measurement is not guaranteed for voltages outside this range.	REAL32	RO	0x00000000 (0_{dec})

Index F915 LED Status

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F915:0	LED Status	Max. Subindex	UINT8	RO	0x0C (12_{dec})
F915:01	Run	"Run"-LED Status	UINT32	RO	0x00000000 (0dec)
F915:02	Ch1 steady	Status "Ch1 steady" LED	UINT32	RO	0x00000000 (0dec)
F915:03	Ch1 warning	"Ch1 warning"-LED Status	UINT32	RO	0x00000000 (0dec)
F915:04	Ch1 error	"Ch1 error"-LED Status	UINT32	RO	0x00000000 (0dec)
F915:09	Up 24 V	"Up 24 V"-LED Status	UINT32	RO	0x00000000 (0dec)
F915:0A	Ch2 steady	Status "Ch2 steady" LED	UINT32	RO	0x00000000 (0dec)
F915:0B	Ch2 warning	"Ch2 warning"-LED Status	UINT32	RO	0x00000000 (0dec)
F915:0C	Ch2 error	"Ch2 error"-LED Status	UINT32	RO	0x00000000 (0dec)

Index B030 RMB Command Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
B030:0	DEV Command	Max. Subindex	UINT8	RO	0x03 (3_{dec})
B030:01	Request	Command value, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x0000 (0_{dec})
B030:02	Status	Command state, for use see corresponding application chapter	UINT8	RW	0x00 (0_{dec})
B030:03	Response	Command response, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x00000000 (0_{dec})

Index B070 RMB Command Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
B070:0	DEV Command	Max. Subindex	UINT8	RO	0x03 (3_{dec})
B070:01	Request	Command value, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x0000 (0_{dec})
B070:02	Status	Command state, for use see corresponding application chapter	UINT8	RW	0x00 (0_{dec})
B070:03	Response	Command response, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x00000000 (0_{dec})

Index FB00 DEV Command

The command object is used for triggering an action in the terminal. The command is started by writing subindex 1 (request). Write access is disabled until the current command is completed.

Index (hex)	Name	Meaning	Data Type	Flags	Default value
FB00:0	DEV Command	Max. Subindex	UINT8	RO	0x03 (3_{dec})
FB00:01	Request	Command value, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x0000 (0_{dec})
FB00:02	Status	Command state, for use see corresponding application chapter	UINT8	RW	0x00 (0_{dec})
FB00:03	Response	Command response, for use see corresponding application chapter	OCTET-STRING [2]	RW	0x00000000 (0_{dec})

4.6.2.4 Input data

Index 6000 AI Inputs UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
6000:0	AI Inputs UBridge Ch.1	Maximum subindex	INT16	RO	0x14 (20_{dec})
6000:01	Underrange	Value below measuring range; see also chapter "Data flow"	BOOLEAN	RO	0x00 (0_{dec})
6000:02	Overrange	Measuring range exceeded; see also chapter "Data flow".	BOOLEAN	RO	0x00 (0_{dec})
6000:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: value is smaller than limit value 1 2: value is greater than limit value 1 3: value is equal to limit value 1	BIT2	RO	0x00 (0_{dec})
6000:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: value is smaller than limit value 2 2: value is greater than limit value 2 3: value is equal to limit value 2	BIT2	RO	0x00 (0_{dec})
6000:07	Error	The error bit is set if the data is invalid (overrange, underrange)	BOOLEAN	RO	0x00 (0_{dec})
6000:09	Steady state	Measured value is stable	BOOLEAN	RO	0x00 (0_{dec})
6000:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active	BOOLEAN	RO	0x00 (0_{dec})
6000:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.	BOOLEAN	RO	0x00 (0_{dec})
6000:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).	BOOLEAN	RO	0x00 (0_{dec})
6000:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.	BOOLEAN	RO	0x00 (0_{dec})
6000:11	Value	Analog date of receipt	INT16	RO	0x0000 (0_{dec})
6000:13	Value (Real32)	Analog input date (Real32)	REAL32	RO	0x00000000 (0_{dec})
6000:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.	UINT16	RO	0x0000 (0_{dec})

Index 6010 AI Inputs USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
6010:0	AI Inputs USense Ch.1	Maximum subindex	INT16	RO	0x14 (20_{dec})
6010:01	Underrange	Value below measuring range; see also chapter "Data flow"	BOOLEAN	RO	0x00 (0_{dec})
6010:02	Overrange	Measuring range exceeded; see also chapter "Data flow".	BOOLEAN	RO	0x00 (0_{dec})
6010:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: value is smaller than limit value 1 2: value is greater than limit value 1 3: value is equal to limit value 1	BIT2	RO	0x00 (0_{dec})
6010:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: value is smaller than limit value 2 2: value is greater than limit value 2 3: value is equal to limit value 2	BIT2	RO	0x00 (0_{dec})
6010:07	Error	The error bit is set if the data is invalid (overrange, underrange)	BOOLEAN	RO	0x00 (0_{dec})
6010:09	Steady state	Measured value is stable	BOOLEAN	RO	0x00 (0_{dec})
6010:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active	BOOLEAN	RO	0x00 (0_{dec})
6010:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.	BOOLEAN	RO	0x00 (0_{dec})
6010:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).	BOOLEAN	RO	0x00 (0_{dec})
6010:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.	BOOLEAN	RO	0x00 (0_{dec})
6010:11	Value	Analog date of receipt	INT16	RO	0x0000 (0_{dec})
6010:13	Value (Real32)	Analog input date (Real32)	REAL32	RO	0x00000000 (0_{dec})
6010:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.	UINT16	RO	0x0000 (0_{dec})

Index 6030 RMB Sensor Inputs Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
6030:0	RMB Sensor Inputs Ch.1	Maximum subindex	INT16	RO	0x14 (20_{dec})
6030:01	Underrange	Value below measuring range; see also chapter "Data flow"	BOOLEAN	RO	0x00 (0_{dec})
6030:02	Overrange	Measuring range exceeded; see also chapter "Data flow".	BOOLEAN	RO	0x00 (0_{dec})
6030:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: value is smaller than limit value 1 2: value is greater than limit value 1 3: value is equal to limit value 1	BIT2	RO	0x00 (0_{dec})
6030:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: value is smaller than limit value 2 2: value is greater than limit value 2 3: value is equal to limit value 2	BIT2	RO	0x00 (0_{dec})
6030:07	Error	The error bit is set if the data is invalid (overrange, underrange)	BOOLEAN	RO	0x00 (0_{dec})
6030:09	Steady state	Measured value is stable	BOOLEAN	RO	0x00 (0_{dec})
6030:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active	BOOLEAN	RO	0x00 (0_{dec})
6030:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.	BOOLEAN	RO	0x00 (0_{dec})
6030:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).	BOOLEAN	RO	0x00 (0_{dec})
6030:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.	BOOLEAN	RO	0x00 (0_{dec})
6030:11	Value	Analog date of receipt	INT16	RO	0x0000 (0_{dec})
6030:13	Value (Real32)	Analog input date (Real32)	REAL32	RO	0x00000000 (0_{dec})
6030:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.	UINT16	RO	0x0000 (0_{dec})

Index 6040 AI Inputs UBridge Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
6040:0	AI Inputs UBridge Ch.2	Maximum subindex	INT16	RO	0x14 (20_{dec})
6040:01	Underrange	Value below measuring range; see also chapter "Data flow"	BOOLEAN	RO	0x00 (0_{dec})
6040:02	Overrange	Measuring range exceeded; see also chapter "Data flow".	BOOLEAN	RO	0x00 (0_{dec})
6040:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: value is smaller than limit value 1 2: value is greater than limit value 1 3: value is equal to limit value 1	BIT2	RO	0x00 (0_{dec})
6040:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: value is smaller than limit value 2 2: value is greater than limit value 2 3: value is equal to limit value 2	BIT2	RO	0x00 (0_{dec})
6040:07	Error	The error bit is set if the data is invalid (overrange, underrange)	BOOLEAN	RO	0x00 (0_{dec})
6040:09	Steady state	Measured value is stable	BOOLEAN	RO	0x00 (0_{dec})
6040:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active	BOOLEAN	RO	0x00 (0_{dec})
6040:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.	BOOLEAN	RO	0x00 (0_{dec})
6040:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).	BOOLEAN	RO	0x00 (0_{dec})
6040:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.	BOOLEAN	RO	0x00 (0_{dec})
6040:11	Value	Analog date of receipt	INT16	RO	0x0000 (0_{dec})
6040:13	Value (Real32)	Analog input date (Real32)	REAL32	RO	0x00000000 (0_{dec})
6040:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.	UINT16	RO	0x0000 (0_{dec})

Index 6050 AI Inputs USense Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
6050:0	AI Inputs USense Ch.2	Maximum subindex	INT16	RO	0x14 (20_{dec})
6050:01	Underrange	Value below measuring range; see also chapter "Data flow"	BOOLEAN	RO	0x00 (0_{dec})
6050:02	Overrange	Measuring range exceeded; see also chapter "Data flow".	BOOLEAN	RO	0x00 (0_{dec})
6050:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: value is smaller than limit value 1 2: value is greater than limit value 1 3: value is equal to limit value 1	BIT2	RO	0x00 (0_{dec})
6050:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: value is smaller than limit value 2 2: value is greater than limit value 2 3: value is equal to limit value 2	BIT2	RO	0x00 (0_{dec})
6050:07	Error	The error bit is set if the data is invalid (overrange, underrange)	BOOLEAN	RO	0x00 (0_{dec})
6050:09	Steady state	Measured value is stable	BOOLEAN	RO	0x00 (0_{dec})
6050:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active	BOOLEAN	RO	0x00 (0_{dec})
6050:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.	BOOLEAN	RO	0x00 (0_{dec})
6050:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).	BOOLEAN	RO	0x00 (0_{dec})
6050:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.	BOOLEAN	RO	0x00 (0_{dec})
6050:11	Value	Analog date of receipt	INT16	RO	0x0000 (0_{dec})
6050:13	Value (Real32)	Analog input date (Real32)	REAL32	RO	0x00000000 (0_{dec})
6050:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.	UINT16	RO	0x0000 (0_{dec})

Index 6070 RMB Sensor Inputs Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
6070:0	RMB Sensor Inputs Ch.2	Maximum subindex	INT16	RO	0x14 (20_{dec})
6070:01	Underrange	Value below measuring range; see also chapter "Data flow"	BOOLEAN	RO	0x00 (0_{dec})
6070:02	Overrange	Measuring range exceeded; see also chapter "Data flow".	BOOLEAN	RO	0x00 (0_{dec})
6070:03	Limit 1	Limit value monitoring Limit 1 0: not active 1: value is smaller than limit value 1 2: value is greater than limit value 1 3: value is equal to limit value 1	BIT2	RO	0x00 (0_{dec})
6070:05	Limit 2	Limit value monitoring Limit 2 0: not active 1: value is smaller than limit value 2 2: value is greater than limit value 2 3: value is equal to limit value 2	BIT2	RO	0x00 (0_{dec})
6070:07	Error	The error bit is set if the data is invalid (overrange, underrange)	BOOLEAN	RO	0x00 (0_{dec})
6070:09	Steady state	Measured value is stable	BOOLEAN	RO	0x00 (0_{dec})
6070:0C	Tare Active	0: no tare active or tare is determined on falling edge. 1: Tare is active	BOOLEAN	RO	0x00 (0_{dec})
6070:0D	Warning	The bit is set if the warning thresholds configured via CoE are exceeded.	BOOLEAN	RO	0x00 (0_{dec})
6070:0F	TxPDO State	Validity of the data of the associated TxPDO (0 = valid, 1 = invalid).	BOOLEAN	RO	0x00 (0_{dec})
6070:10	TxPDO Toggle	The TxPDO toggle is toggled by the slave when the data of the associated TxPDO is updated.	BOOLEAN	RO	0x00 (0_{dec})
6070:11	Value	Analog date of receipt	INT16	RO	0x0000 (0_{dec})
6070:13	Value (Real32)	Analog input date (Real32)	REAL32	RO	0x00000000 (0_{dec})
6070:14	Input Cycle Counter	The counter is incremented each time the input data in the process image is updated.	UINT16	RO	0x0000 (0_{dec})

4.6.2.5 Output data

Index 7000 AI Outputs UBridge Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
7000:0	AI Outputs UBridge Ch.1	Maximum subindex	UINT8	RO	0x06 (6_{dec})
7000:03	Input Freeze	The measurements are no longer passed on to the filter.	BOOLEAN	RO	0x00 (0_{dec})
7000:04	Tare	Rising edge starts the determination of the tare value.	BOOLEAN	RO	0x00 (0_{dec})
7000:05	Peak hold reset	Rising edge resets the peak hold objects	BOOLEAN	RO	0x00 (0_{dec})
7000:06	Disable Tare	The tare value is not taken into account.	BOOLEAN	RO	0x00 (0_{dec})

Index 7010 AI Outputs USense Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
7010:0	AI Outputs USense Ch.1	Maximum subindex	UINT8	RO	0x06 (6_{dec})
7010:03	Input Freeze	The measurements are no longer passed on to the filter.	BOOLEAN	RO	0x00 (0_{dec})
7010:04	Tare	Rising edge starts the determination of the tare value.	BOOLEAN	RO	0x00 (0_{dec})
7010:05	Peak hold reset	Rising edge resets the peak hold objects	BOOLEAN	RO	0x00 (0_{dec})
7010:06	Disable Tare	The tare value is not taken into account.	BOOLEAN	RO	0x00 (0_{dec})

Index 7030 RMB Sensor Outputs Ch.1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
7030:0	RMB Sensor Outputs Ch.1	Maximum subindex	UINT8	RO	0x06 (6_{dec})
7030:03	Input Freeze	The measurements are no longer passed on to the filter.	BOOLEAN	RO	0x00 (0_{dec})
7030:04	Tare	Rising edge starts the determination of the tare value.	BOOLEAN	RO	0x00 (0_{dec})
7030:05	Peak hold reset	Rising edge resets the peak hold objects	BOOLEAN	RO	0x00 (0_{dec})
7030:06	Disable Tare	The tare value is not taken into account.	BOOLEAN	RO	0x00 (0_{dec})

Index 7040 AI Outputs UBridge Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
7040:0	AI Outputs UBridge Ch.2	Maximum subindex	UINT8	RO	0x06 (6_{dec})
7040:03	Input Freeze	The measurements are no longer passed on to the filter.	BOOLEAN	RO	0x00 (0_{dec})
7040:04	Tare	Rising edge starts the determination of the tare value.	BOOLEAN	RO	0x00 (0_{dec})
7040:05	Peak hold reset	Rising edge resets the peak hold objects	BOOLEAN	RO	0x00 (0_{dec})
7040:06	Disable Tare	The tare value is not taken into account.	BOOLEAN	RO	0x00 (0_{dec})

Index 7050 AI Outputs USense Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
7050:0	AI Outputs USense Ch.2	Maximum subindex	UINT8	RO	0x06 (6_{dec})
7050:03	Input Freeze	The measurements are no longer passed on to the filter.	BOOLEAN	RO	0x00 (0_{dec})
7050:04	Tare	Rising edge starts the determination of the tare value.	BOOLEAN	RO	0x00 (0_{dec})
7050:05	Peak hold reset	Rising edge resets the peak hold objects	BOOLEAN	RO	0x00 (0_{dec})
7050:06	Disable Tare	The tare value is not taken into account.	BOOLEAN	RO	0x00 (0_{dec})

Index 7070 RMB Sensor Outputs Ch.2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
7070:0	RMB Sensor Outputs Ch.2	Maximum subindex	UINT8	RO	0x06 (6_{dec})
7070:03	Input Freeze	The measurements are no longer passed on to the filter.	BOOLEAN	RO	0x00 (0_{dec})
7070:04	Tare	Rising edge starts the determination of the tare value.	BOOLEAN	RO	0x00 (0_{dec})
7070:05	Peak hold reset	Rising edge resets the peak hold objects	BOOLEAN	RO	0x00 (0_{dec})
7070:06	Disable Tare	The tare value is not taken into account.	BOOLEAN	RO	0x00 (0_{dec})

4.6.2.6 Standard objects

Index 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.	UINT32	RO	0x00001389 (5001_{dec})

Index 1008 Device name

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1008:0	Device name	Device name of the EtherCAT slave	STRING	RO	ED3362-0100

Index 1009 Hardware version

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

Index 100A Software version

Index (hex)	Name	Meaning	Data type	Flags	Default
100A:0	Software version	Firmware version of the EtherCAT slave	STRING	RO	00

Index 100B Bootloader version

Index (hex)	Name	Meaning	Data type	Flags	Default
100B:0	Bootloader version	Bootloader version	STRING	RO	n/a

Index 1018 Identity

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1018:0	Identity	Information for identifying the slave	UINT8	RO	0x04 (4_{dec})
1018:01	Vendor ID	Vendor ID of the EtherCAT slave	UINT32	RO	0x00000002 (2_{dec})
1018:02	Product code	Product code of the EtherCAT slave	UINT32	RO	0x0D221052 (220336210_{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	UINT32	RO	0x00000000 (0_{dec})
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	UINT32	RO	0x00000000 (0_{dec})

Index 10E2 Manufacturer-specific Identification Code*)

Index (hex)	Name	Meaning	Data type	Flags	Default
10E2:0	Manufacturer-specific Identification Code	Manufacturer specific Identification Code	UINT8	RO	0x01 (1_{dec})
10E2:01	SubIndex 001	reserved	STRING	RO	

Index 10F0 Backup parameter handling

Index (hex)	Name	Meaning	Data Type	Flags	Default value
10F0:0	Backup parameter handling	Information for standardized loading and saving of backup entries	UINT8	RO	0x01 (1_{dec})
10F0:01	Checksum	Checksum across all backup entries of the EtherCAT slave	UINT32	RO	0x00000000 (0_{dec})

Index 10F3 Diagnosis History

Index (hex)	Name	Meaning	Data type	Flags	Default
10F3:0	Diagnosis History	Maximum subindex	UINT8	RO	0x15 (21_{dec})
10F3:01	Maximum Messages	Maximum number of stored messages A maximum of 16 messages can be stored	UINT8	RO	0x00 (0_{dec})
10F3:02	Newest Message	Subindex of the latest message	UINT8	RO	0x00 (0_{dec})
10F3:03	Newest Acknowledged Message	Subindex of the last confirmed message	UINT8	RW	0x00 (0_{dec})
10F3:04	New Messages Available	Indicates that a new message is available	BOOLEAN	RO	0x00 (0_{dec})
10F3:05	Flags	not used	UINT16	RW	0x0000 (0_{dec})
10F3:06	Diagnosis Message 001	Message 1	OCTET-STRING[24]	RO	{0}
…	…	….	…	…	…
10F3:15	Diagnosis Message 016	Message 16	OCTET-STRING[24]	RO	{0}

Index 10F8 Timestamp Object

Index (hex)	Name	Meaning	Data type	Flags	Default
10F8:0	Timestamp Object	Timestamp Object [ns] For SM synchronous operation: Time since power-on For DC synchronous operation: copy of the DC time Time can be used by the device e.g. for timestamps of the DiagMessage	UINT64	RO	

Index 1600 AI RxPDO-Map Control UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1600:0	AI RxPDO-Map Control UBridge Channel 1	PDO Mapping RxPDO 1	UINT8	RO	0x06 (6dec)
1600:01	SubIndex 001	1. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1600:02	SubIndex 002	2. PDO mapping entry (object 0x7000 (AI Outputs UBridge Ch.1), entry 0x03 (Input Freeze))	UINT32	RO	0x7000:03, 1
1600:03	SubIndex 003	3. PDO Mapping entry (object 0x7000 (AI Outputs UBridge Ch.1), entry 0x04 (Tare))	UINT32	RO	0x7000:04, 1
1600:04	SubIndex 004	4. PDO Mapping entry (object 0x7000 (AI Outputs UBridge Ch.1), entry 0x05 (Peak Hold Reset))	UINT32	RO	0x7000:05, 1
1600:05	SubIndex 005	5. PDO Mapping entry (object 0x7000 (AI Outputs UBridge Ch.1), entry 0x06 (Disable Tare))	UINT32	RO	0x7000:06, 1
1600:06	SubIndex 006	6. PDO Mapping entry (10 bits align)	UINT32	RO	0x0000:00, 10

Index 1610 AI RxPDO-Map Control USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1610:0	AI RxPDO-Map Control USense Channel 1	PDO Mapping RxPDO 17	UINT8	RO	0x06 (6dec)
1610:01	SubIndex 001	1. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1610:02	SubIndex 002	2. PDO Mapping entry (object 0x7010 (AI Outputs USense Ch.1), entry 0x03 (Input Freeze))	UINT32	RO	0x7010:03, 1
1610:03	SubIndex 003	3. PDO Mapping entry (object 0x7010 (AI Outputs USense Ch.1), entry 0x04 (Tare))	UINT32	RO	0x7010:04, 1
1610:04	SubIndex 004	4. PDO Mapping entry (object 0x7010 (AI Outputs USense Ch.1), entry 0x05 (Peak Hold Reset))	UINT32	RO	0x7010:05, 1
1610:05	SubIndex 005	5. PDO Mapping entry (object 0x7010 (AI Outputs USense Ch.1), entry 0x06 (Disable Tare))	UINT32	RO	0x7010:06, 1
1610:06	SubIndex 006	6. PDO Mapping entry (10 bits align)	UINT32	RO	0x0000:00, 10

Index 1620 RMB RxPDO-Map Control Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1620:0	RMB RxPDO-Map Control Channel 1	PDO Mapping RxPDO 33	UINT8	RO	0x06 (6dec)
1620:01	SubIndex 001	1. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1620:02	SubIndex 002	2. PDO Mapping entry (object 0x7030 (RMB Sensor Outputs Ch.1), entry 0x03 (Input Freeze))	UINT32	RO	0x7030:03, 1
1620:03	SubIndex 003	3. PDO Mapping entry (object 0x7030 (RMB Sensor Outputs Ch.1), entry 0x04 (Tare))	UINT32	RO	0x7030:04, 1
1620:04	SubIndex 004	4. PDO Mapping entry (object 0x7030 (RMB Sensor Outputs Ch.1), entry 0x05 (Peak Hold Reset))	UINT32	RO	0x7030:05, 1
1620:05	SubIndex 005	5. PDO Mapping entry (object 0x7030 (RMB Sensor Outputs Ch.1), entry 0x06 (Disable Tare))	UINT32	RO	0x7030:06, 1
1620:06	SubIndex 006	6. PDO Mapping entry (10 bits align)	UINT32	RO	0x0000:00, 10

Index 1630 AI RxPDO-Map Control UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1630:0	AI RxPDO-Map Control UBridge Channel 2	PDO Mapping RxPDO 49	UINT8	RO	0x06 (6dec)
1630:01	SubIndex 001	1. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1630:02	SubIndex 002	2. PDO Mapping entry (object 0x7040 (AI OutputsUBridge Ch.2), entry 0x03 (Input Freeze))	UINT32	RO	0x7040:03, 1
1630:03	SubIndex 003	3. PDO Mapping entry (object 0x7040 (AI OutputsUBridge Ch.2), entry 0x04 (Tare))	UINT32	RO	0x7040:04, 1
1630:04	SubIndex 004	4. PDO Mapping entry (object 0x7040 (AI OutputsUBridge Ch.2), entry 0x05 (Peak Hold Reset))	UINT32	RO	0x7040:05, 1
1630:05	SubIndex 005	5. PDO Mapping entry (object 0x7040 (AI OutputsUBridge Ch.2), entry 0x06 (Disable Tare))	UINT32	RO	0x7040:06, 1
1630:06	SubIndex 006	6. PDO Mapping entry (10 bits align)	UINT32	RO	0x0000:00, 10

Index 1640 AI RxPDO-Map Control USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1640:0	AI RxPDO-Map Control USense Channel 2	PDO Mapping RxPDO 65	UINT8	RO	0x06 (6dec)
1640:01	SubIndex 001	1. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1640:02	SubIndex 002	2. PDO Mapping entry (object 0x7050 (AI Outputs USense Ch.2), entry 0x03 (Input Freeze))	UINT32	RO	0x7050:03, 1
1640:03	SubIndex 003	3. PDO Mapping entry (object 0x7050 (AI Outputs USense Ch.2), entry 0x04 (Tare))	UINT32	RO	0x7050:04, 1
1640:04	SubIndex 004	4. PDO Mapping entry (object 0x7050 (AI Outputs USense Ch.2), entry 0x05 (Peak Hold Reset))	UINT32	RO	0x7050:05, 1
1640:05	SubIndex 005	5. PDO Mapping entry (object 0x7050 (AI Outputs USense Ch.2), entry 0x06 (Disable Tare))	UINT32	RO	0x7050:06, 1
1640:06	SubIndex 006	6. PDO Mapping entry (10 bits align)	UINT32	RO	0x0000:00, 10

Index 1650 RMB RxPDO-Map Control Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1650:0	RMB RxPDO-Map Control Channel 2	PDO Mapping RxPDO 81	UINT8	RO	0x06 (6dec)
1650:01	SubIndex 001	1. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1650:02	SubIndex 002	2. PDO Mapping entry (object 0x7070 (RMB Sensor Outputs Ch.2), entry 0x03 (Input Freeze))	UINT32	RO	0x7070:03, 1
1650:03	SubIndex 003	3. PDO Mapping entry (object 0x7070 (RMB Sensor Outputs Ch.2), entry 0x04 (Tare))	UINT32	RO	0x7070:04, 1
1650:04	SubIndex 004	4. PDO Mapping entry (object 0x7070 (RMB Sensor Outputs Ch.2), entry 0x05 (Peak Hold Reset))	UINT32	RO	0x7070:05, 1
1650:05	SubIndex 005	5. PDO Mapping entry (object 0x7070 (RMB Sensor Outputs Ch.2), entry 0x06 (Disable Tare))	UINT32	RO	0x7070:06, 1
1650:06	SubIndex 006	6. PDO Mapping entry (10 bits align)	UINT32	RO	0x0000:00, 10

Index 1800 AI TxPDO-Par Standard (INT16) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1800:0	AI TxPDO-Par Standard (INT16) UBridge Channel	PDO Parameter TxPDO 1	UINT8	RO	0x06 (6_{dec})
1800:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 1	OCTET-STRING[6]	RO	01 1A 02 1A 03 1A

Index 1801 AI TxPDO-Par Compact (INT16) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1801:0	AI TxPDO-Par Compact (INT16) UBridge Channel 1	PDO Parameter TxPDO 2	UINT8	RO	0x06 (6_{dec})
1801:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 2	OCTET-STRING[6]	RO	00 1A 02 1A 03 1A

Index 1802 AI TxPDO-Par Standard (Real32) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1802:0	AI TxPDO-Par Standard (Real32) UBridge Channel 1	PDO Parameter TxPDO 3	UINT8	RO	0x06 (6_{dec})
1802:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 3	OCTET-STRING[6]	RO	00 1A 01 1A 03 1A

Index 1803 AI TxPDO-Par Compact (Real32) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1803:0	AI TxPDO-Par Compact (Real32) UBridge Channel 1	PDO Parameter TxPDO 4	UINT8	RO	0x06 (6_{dec})
1803:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 4	OCTET-STRING[6]	RO	00 1A 01 1A 02 1A

Index 1810 AI TxPDO-Par Standard (INT16) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1810:0	AI TxPDO-Par Standard (INT16) USense Channel 1	PDO Parameter TxPDO 17	UINT8	RO	0x06 (6_{dec})
1810:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 17	OCTET-STRING[6]	RO	11 1A 12 1A 13 1A

Index 1811 AI TxPDO-Par Compact (INT16) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1811:0	AI TxPDO-Par Compact (INT16) USense Channel 1	PDO Parameter TxPDO 18	UINT8	RO	0x06 (6_{dec})
1811:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 18	OCTET-STRING[6]	RO	10 1A 12 1A 13 1A

Index 1812 AI TxPDO-Par Standard (Real32) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1812:0	AI TxPDO-Par Standard (Real32) USense Channel 1	PDO Parameter TxPDO 19	UINT8	RO	0x06 (6_{dec})
1812:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 19	OCTET-STRING[6]	RO	10 1A 11 1A 13 1A

Index 1813 AI TxPDO-Par Compact (Real32) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1813:0	AI TxPDO-Par Compact (Real32) USense Channel 1	PDO Parameter TxPDO 20	UINT8	RO	0x06 (6_{dec})
1813:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 20	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1820 RMB TxPDO-Par Standard (INT32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1820:0	RMB TxPDO-Par Standard (INT32) Channel 1	PDO Parameter TxPDO 33	UINT8	RO	0x06 (6_{dec})
1820:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 33	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1821 RMB TxPDO-Par Compact (INT32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1821:0	RMB TxPDO-Par Compact (INT32) Channel 1	PDO Parameter TxPDO 34	UINT8	RO	0x06 (6_{dec})
1821:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 34	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1822 RMB TxPDO-Par Standard (Real32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1822:0	RMB TxPDO-Par Standard (Real32) Channel 1	PDO Parameter TxPDO 35	UINT8	RO	0x06 (6_{dec})
1822:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 35	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1823 RMB TxPDO-Par Compact (Real32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1823:0	RMB TxPDO-Par Compact (Real32) Channel 1	PDO Parameter TxPDO 36	UINT8	RO	0x06 (6_{dec})
1823:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 36	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1830 AI TxPDO-Par Standard (INT16) UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1830:0	AI TxPDO-Par Standard (INT16) UBridge Channel 2	PDO Parameter TxPDO 49	UINT8	RO	0x06 (6_{dec})
1830:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 49	OCTET-STRING[6]	RO	01 1A 02 1A 03 1A

Index 1831 AI TxPDO-Par Compact (INT16) UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1831:0	AI TxPDO-Par Compact (INT16) UBridge Channel 2	PDO Parameter TxPDO 50	UINT8	RO	0x06 (6_{dec})
1831:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 50	OCTET-STRING[6]	RO	00 1A 02 1A 03 1A

Index 1832 AI TxPDO-Par Standard (Real32) UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1832:0	AI TxPDO-Par Standard (Real32) UBridge Channel 2	PDO Parameter TxPDO 51	UINT8	RO	0x06 (6_{dec})
1832:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 35	OCTET-STRING[6]	RO	00 1A 01 1A 03 1A

Index 1833 AI TxPDO-Par Compact (Real32) UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1833:0	AI TxPDO-Par Compact (Real32) UBridge Channel 2	PDO Parameter TxPDO 52	UINT8	RO	0x06 (6_{dec})
1833:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 52	OCTET-STRING[6]	RO	00 1A 01 1A 02 1A

Index 1840 AI TxPDO-Par Standard (INT16) USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1840:0	AI TxPDO-Par Standard (INT16) USense Channel 2	PDO Parameter TxPDO 65	UINT8	RO	0x06 (6_{dec})
1840:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 65	OCTET-STRING[6]	RO	11 1A 12 1A 13 1A

Index 1841 AI TxPDO-Par Compact (INT16) USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1841:0	AI TxPDO-Par Compact (INT16) USense Channel 2	PDO Parameter TxPDO 66	UINT8	RO	0x06 (6_{dec})
1841:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 66	OCTET-STRING[6]	RO	10 1A 12 1A 13 1A

Index 1842 AI TxPDO-Par Standard (Real32) USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1842:0	AI TxPDO-Par Standard (Real32) USense Channel 2	PDO Parameter TxPDO 67	UINT8	RO	0x06 (6_{dec})
1842:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 67	OCTET-STRING[6]	RO	10 1A 11 1A 13 1A

Index 1843 AI TxPDO-Par Compact (Real32) USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1843:0	AI TxPDO-Par Compact (Real32) USense Channel 2	PDO Parameter TxPDO 68	UINT8	RO	0x06 (6_{dec})
1843:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 68	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1850 RMB TxPDO-Par Standard (INT32) Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1850:0	RMB TxPDO-Par Standard (INT32) Channel 2	PDO Parameter TxPDO 81	UINT8	RO	0x06 (6_{dec})
1850:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 81	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1851 RMB TxPDO-Par Compact (INT32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1851:0	RMB TxPDO-Par Compact (INT32) Channel 2	PDO Parameter TxPDO 82	UINT8	RO	0x06 (6_{dec})
1851:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 82	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1852 RMB TxPDO-Par Standard (Real32) Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1852:0	RMB TxPDO-Par Standard (Real32) Channel 2	PDO Parameter TxPDO 83	UINT8	RO	0x06 (6_{dec})
1852:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 83	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1853 RMB TxPDO-Par Compact (Real32) Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1853:0	RMB TxPDO-Par Compact (Real32) Channel 2	PDO Parameter TxPDO 84	UINT8	RO	0x06 (6_{dec})
1853:06	Exclude TxPDOs	Specifies the TxPDOs (index of TxPDO mapping objects) that must not be transferred together with TxPDO 84	OCTET-STRING[6]	RO	10 1A 11 1A 12 1A

Index 1A00 AI TxPDO-Map Standard (INT16) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A00:0	AI TxPDO-Map Standard (INT16) UBridge Channel 1	PDO Mapping TxPDO 1	UINT8	RO	0x0E (14dec)
1A00:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6000:01, 1
1A00:02	SubIndex 002	2. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6000:02, 1
1A00:03	SubIndex 003	3. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6000:03, 2
1A00:04	SubIndex 004	4. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6000:05, 2
1A00:05	SubIndex 005	5. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x07 (Error))	UINT32	RO	0x6000:07, 1
1A00:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A00:07	SubIndex 007	7. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6000:09, 1
1A00:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A00:09	SubIndex 009	9. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6000:0C, 1
1A00:0A	SubIndex 010	10. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6000:0D, 1
1A00:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A00:0C	SubIndex 012	12. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6000:0F, 1
1A00:0D	SubIndex 013	13. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6000:10, 1
1A00:0E	SubIndex 014	14. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x11 (Value))	UINT32	RO	0x6000:11, 16

Index 1A01 AI TxPDO-Map Compact (INT16) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A01:0	AI TxPDO-Map Compact (INT16) UBridge Channel 1	PDO Mapping TxPDO 2	UINT8	RO	0x01 (1_{dec})
1A01:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs Ch.1), entry 0x11 (Value))	UINT32	RO	0x6000:11, 16

Index 1A02 AI TxPDO-Map Standard (Real32) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A02:0	AI TxPDO-Map Standard (Real32) UBridge Channel 1	PDO Mapping TxPDO 3	UINT8	RO	0x0E (14dec)
1A02:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6000:01, 1
1A02:02	SubIndex 002	2. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6000:02, 1
1A02:03	SubIndex 003	3. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6000:03, 2
1A02:04	SubIndex 004	4. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6000:05, 2
1A02:05	SubIndex 005	5. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x07 (Error))	UINT32	RO	0x6000:07, 1
1A02:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A02:07	SubIndex 007	7. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6000:09, 1
1A02:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A02:09	SubIndex 009	9. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6000:0C, 1
1A02:0A	SubIndex 010	10. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6000:0D, 1
1A02:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A02:0C	SubIndex 012	12. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6000:0F, 1
1A02:0D	SubIndex 013	13. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6000:10, 1
1A02:0E	SubIndex 014	14. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6000:13, 32

Index 1A03 AI TxPDO-Map Compact (Real32) UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A03:0	AI TxPDO-Map Compact (Real32) UBridge Channel 1	PDO Mapping TxPDO 4	UINT8	RO	0x01 (1_{dec})
1A03:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6000:13, 32

Index 1A04 AI TxPDO-Map Cycle Counter UBridge Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A04:0	AI TxPDO-Map Cycle Counter UBridge Channel 1	PDO Mapping TxPDO 5	UINT8	RO	0x01 (1_{dec})
1A04:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs Ch.1), entry 0x14 (Input Cycle Counter))	UINT32	RO	0x6000:14, 16

Index 1A10 AI TxPDO-Map Standard (INT16) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A10:0	AI TxPDO-Map Standard (INT16) USense Channel 1	PDO Mapping TxPDO 17	UINT8	RO	0x0E (14dec)
1A10:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6010:01, 1
1A10:02	SubIndex 002	2. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6010:02, 1
1A10:03	SubIndex 003	3. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6010:03, 2
1A10:04	SubIndex 004	4. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6010:05, 2
1A10:05	SubIndex 005	5. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x07 (Error))	UINT32	RO	0x6010:07, 1
1A10:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A10:07	SubIndex 007	7. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6010:09, 1
1A10:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A10:09	SubIndex 009	9. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6010:0C, 1
1A10:0A	SubIndex 010	10. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6010:0D, 1
1A10:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A10:0C	SubIndex 012	12. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6010:0F, 1
1A10:0D	SubIndex 013	13. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6010:10, 1
1A10:0E	SubIndex 014	14. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x11 (Value))	UINT32	RO	0x6010:11, 16

Index 1A11 AI TxPDO-Map Compact (INT16) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A11:0	AI TxPDO-Map Compact (INT16) USense Channel 1	PDO Mapping TxPDO 18	UINT8	RO	0x01 (1_{dec})
1A11:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs Ch.2), entry 0x11 (Value))	UINT32	RO	0x6010:11, 16

Index 1A12 AI TxPDO-Map Standard (Real32) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A12:0	AI TxPDO-Map Standard (Real32) USense Channel 1	PDO Mapping TxPDO 19	UINT8	RO	0x0E (14dec)
1A12:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6010:01, 1
1A12:02	SubIndex 002	2. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6010:02, 1
1A12:03	SubIndex 003	3. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6010:03, 2
1A12:04	SubIndex 004	4. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6010:05, 2
1A12:05	SubIndex 005	5. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x07 (Error))	UINT32	RO	0x6010:07, 1
1A12:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A12:07	SubIndex 007	7. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6010:09, 1
1A12:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A12:09	SubIndex 009	9. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6010:0C, 1
1A12:0A	SubIndex 010	10. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6010:0D, 1
1A12:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A12:0C	SubIndex 012	12. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6010:0F, 1
1A12:0D	SubIndex 013	13. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6010:10, 1
1A12:0E	SubIndex 014	14. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6010:13, 32

Index 1A13 AI TxPDO-Map Compact (Real32) USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A13:0	AI TxPDO-Map Compact (Real32) USense Channel 1	PDO Mapping TxPDO 20	UINT8	RO	0x01 (1dec)
1A13:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6010:13, 32

Index 1A14 AI TxPDO-Map Cycle Counter USense Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A14:0	AI TxPDO-Map Cycle Counter USense Channel 1	PDO Mapping TxPDO 21	UINT8	RO	0x01 (1dec)
1A14:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x14 (Input Cycle Counter))	UINT32	RO	0x6010:14, 16

Index 1A20 RMB TxPDO-Map Standard (INT32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A20:0	RMB TxPDO-Map Standard (INT32) Channel 1	PDO Mapping TxPDO 33	UINT8	RO	0x0E (14dec)
1A20:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6030:01, 1
1A20:02	SubIndex 002	2. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6030:02, 1
1A20:03	SubIndex 003	3. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6030:03, 2
1A20:04	SubIndex 004	4. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6030:05, 2
1A20:05	SubIndex 005	5. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x07 (Error))	UINT32	RO	0x6030:07, 1
1A20:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A20:07	SubIndex 007	7. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6030:09, 1
1A20:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A20:09	SubIndex 009	9. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6030:0C, 1
1A20:0A	SubIndex 010	10. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6030:0D, 1
1A20:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A20:0C	SubIndex 012	12. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6030:0F, 1
1A20:0D	SubIndex 013	13. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6030:10, 1
1A20:0E	SubIndex 014	14. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x11 (Value))	UINT32	RO	0x6030:11, 32

Index 1A21 RMB TxPDO-Map Compact (INT32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A21:0	RMB TxPDO-Map Compact (INT32) Channel 1	PDO Mapping TxPDO 34	UINT8	RO	0x01 (1dec)
1A21:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x11 (Value))	UINT32	RO	0x6030:11, 32

Index 1A22 RMB TxPDO-Map Standard (Real32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A22:0	RMB TxPDO-Map Standard (Real32) Channel 1	PDO Mapping TxPDO 35	UINT8	RO	0x0E (14dec)
1A22:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6030:01, 1
1A22:02	SubIndex 002	2. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6030:02, 1
1A22:03	SubIndex 003	3. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6030:03, 2
1A22:04	SubIndex 004	4. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6030:05, 2
1A22:05	SubIndex 005	5. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x07 (Error))	UINT32	RO	0x6030:07, 1
1A22:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A22:07	SubIndex 007	7. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6030:09, 1
1A22:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A22:09	SubIndex 009	9. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6030:0C, 1
1A22:0A	SubIndex 010	10. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6030:0D, 1
1A22:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A22:0C	SubIndex 012	12. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6030:0F, 1
1A22:0D	SubIndex 013	13. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6030:10, 1
1A22:0E	SubIndex 014	14. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6030:13, 32

Index 1A23 RMB TxPDO-Map Compact (Real32) Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A23:0	RMB TxPDO-Map Compact (Real32) Channel 1	PDO Mapping TxPDO 36	UINT8	RO	0x01 (1dec)
1A23:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6030:13, 32

Index 1A24 RMB TxPDO-Map Cycle Counter Channel 1

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A24:0	RMB TxPDO-Map Cycle Counter Channel 1	PDO Mapping TxPDO 37	UINT8	RO	0x01 (1dec)
1A24:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x14 (Input Cycle Counter))	UINT32	RO	0x6030:14, 16

Index 1A30 AI TxPDO-Map Standard (INT16) UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A30:0	AI TxPDO-Map Standard (INT16) UBridge Channel 2	PDO Mapping TxPDO 1	UINT8	RO	0x0E (14dec)
1A30:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6000:01, 1
1A30:02	SubIndex 002	2. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6000:02, 1
1A30:03	SubIndex 003	3. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6000:03, 2
1A30:04	SubIndex 004	4. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6000:05, 2
1A30:05	SubIndex 005	5. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x07 (Error))	UINT32	RO	0x6000:07, 1
1A30:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A30:07	SubIndex 007	7. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6000:09, 1
1A30:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A30:09	SubIndex 009	9. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6000:0C, 1
1A30:0A	SubIndex 010	10. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6000:0D, 1
1A30:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A30:0C	SubIndex 012	12. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6000:0F, 1
1A30:0D	SubIndex 013	13. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6000:10, 1
1A30:0E	SubIndex 014	14. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x11 (Value))	UINT32	RO	0x6000:11, 16

Index 1A31 AI TxPDO-Map Compact (INT16) UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A31:0	AI TxPDO-Map Compact (INT16) UBridge Channel 2	PDO Mapping TxPDO 2	UINT8	RO	0x01 (1_{dec})
1A31:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs Ch.1), entry 0x11 (Value))	UINT32	RO	0x6000:11, 16

Index 1A32 AI TxPDO-Map Standard (Real32) UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A32:0	AI TxPDO-Map Standard (Real32) UBridge Channel 2	PDO Mapping TxPDO 3	UINT8	RO	0x0E (14dec)
1A32:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6000:01, 1
1A32:02	SubIndex 002	2. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6000:02, 1
1A32:03	SubIndex 003	3. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6000:03, 2
1A32:04	SubIndex 004	4. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6000:05, 2
1A32:05	SubIndex 005	5. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x07 (Error))	UINT32	RO	0x6000:07, 1
1A32:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A32:07	SubIndex 007	7. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6000:09, 1
1A32:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A32:09	SubIndex 009	9. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6000:0C, 1
1A32:0A	SubIndex 010	10. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6000:0D, 1
1A32:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A32:0C	SubIndex 012	12. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6000:0F, 1
1A32:0D	SubIndex 013	13. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6000:10, 1
1A32:0E	SubIndex 014	14. PDO Mapping entry (object 0x6000 (AI Inputs UBridge Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6000:13, 32

Index 1A33 AI TxPDO-Map Compact (Real32) UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A33:0	AI TxPDO-Map Compact (Real32) UBridge Channel 2	PDO Mapping TxPDO 4	UINT8	RO	0x01 (1_{dec})
1A33:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6000:13, 32

Index 1A34 AI TxPDO-Map Cycle Counter UBridge Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A34:0	AI TxPDO-Map Cycle Counter UBridge Channel 2	PDO Mapping TxPDO 5	UINT8	RO	0x01 (1_{dec})
1A34:01	SubIndex 001	1. PDO Mapping entry (object 0x6000 (AI Inputs Ch.1), entry 0x14 (Input Cycle Counter))	UINT32	RO	0x6000:14, 16

Index 1A40 AI TxPDO-Map Standard (INT16) USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A40:0	AI TxPDO-Map Standard (INT16) USense Channel 2	PDO Mapping TxPDO 17	UINT8	RO	0x0E (14dec)
1A40:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6010:01, 1
1A40:02	SubIndex 002	2. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6010:02, 1
1A40:03	SubIndex 003	3. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6010:03, 2
1A40:04	SubIndex 004	4. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6010:05, 2
1A40:05	SubIndex 005	5. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x07 (Error))	UINT32	RO	0x6010:07, 1
1A40:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A40:07	SubIndex 007	7. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6010:09, 1
1A40:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A40:09	SubIndex 009	9. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6010:0C, 1
1A40:0A	SubIndex 010	10. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6010:0D, 1
1A40:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A40:0C	SubIndex 012	12. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6010:0F, 1
1A40:0D	SubIndex 013	13. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6010:10, 1
1A40:0E	SubIndex 014	14. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x11 (Value))	UINT32	RO	0x6010:11, 16

Index 1A41 AI TxPDO-Map Compact (INT16) USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A41:0	AI TxPDO-Map Compact (INT16) USense Channel 2	PDO Mapping TxPDO 18	UINT8	RO	0x01 (1_{dec})
1A41:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs Ch.2), entry 0x11 (Value))	UINT32	RO	0x6010:11, 16

Index 1A42 AI TxPDO-Map Standard (Real32) USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A42:0	AI TxPDO-Map Standard (Real32) USense Channel 2	PDO Mapping TxPDO 19	UINT8	RO	0x0E (14dec)
1A42:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6010:01, 1
1A42:02	SubIndex 002	2. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6010:02, 1
1A42:03	SubIndex 003	3. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6010:03, 2
1A42:04	SubIndex 004	4. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6010:05, 2
1A42:05	SubIndex 005	5. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x07 (Error))	UINT32	RO	0x6010:07, 1
1A42:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A42:07	SubIndex 007	7. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6010:09, 1
1A42:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A42:09	SubIndex 009	9. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6010:0C, 1
1A42:0A	SubIndex 010	10. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6010:0D, 1
1A42:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A42:0C	SubIndex 012	12. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6010:0F, 1
1A42:0D	SubIndex 013	13. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6010:10, 1
1A42:0E	SubIndex 014	14. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6010:13, 32

Index 1A43 AI TxPDO-Map Compact (Real32) USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A43:0	AI TxPDO-Map Compact (Real32) USense Channel 2	PDO Mapping TxPDO 20	UINT8	RO	0x01 (1dec)
1A43:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6010:13, 32

Index 1A44 AI TxPDO-Map Cycle Counter USense Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A44:0	AI TxPDO-Map Cycle Counter USense Channel 2	PDO Mapping TxPDO 21	UINT8	RO	0x01 (1dec)
1A44:01	SubIndex 001	1. PDO Mapping entry (object 0x6010 (AI Inputs USense Ch.1), entry 0x14 (Input Cycle Counter))	UINT32	RO	0x6010:14, 16

Index 1A50 RMB TxPDO-Map Standard (INT32) Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A50:0	RMB TxPDO-Map Standard (INT32) Channel 2	PDO Mapping TxPDO 33	UINT8	RO	0x0E (14dec)
1A50:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6030:01, 1
1A50:02	SubIndex 002	2. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6030:02, 1
1A50:03	SubIndex 003	3. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6030:03, 2
1A50:04	SubIndex 004	4. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6030:05, 2
1A50:05	SubIndex 005	5. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x07 (Error))	UINT32	RO	0x6030:07, 1
1A50:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A50:07	SubIndex 007	7. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6030:09, 1
1A50:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A50:09	SubIndex 009	9. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6030:0C, 1
1A50:0A	SubIndex 010	10. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6030:0D, 1
1A50:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A50:0C	SubIndex 012	12. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6030:0F, 1
1A50:0D	SubIndex 013	13. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6030:10, 1
1A50:0E	SubIndex 014	14. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x11 (Value))	UINT32	RO	0x6030:11, 32

Index 1A51 RMB TxPDO-Map Compact (INT32) Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A51:0	RMB TxPDO-Map Compact (INT32) Channel 2	PDO Mapping TxPDO 34	UINT8	RO	0x01 (1dec)
1A51:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x11 (Value))	UINT32	RO	0x6030:11, 32

Index 1A52 RMB TxPDO-Map Standard (Real32) Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A52:0	RMB TxPDO-Map Standard (Real32) Channel 2	PDO Mapping TxPDO 35	UINT8	RO	0x0E (14dec)
1A52:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x01 (Underrange))	UINT32	RO	0x6030:01, 1
1A52:02	SubIndex 002	2. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x02 (Overrange))	UINT32	RO	0x6030:02, 1
1A52:03	SubIndex 003	3. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x03 (Limit 1))	UINT32	RO	0x6030:03, 2
1A52:04	SubIndex 004	4. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x05 (Limit 2))	UINT32	RO	0x6030:05, 2
1A52:05	SubIndex 005	5. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x07 (Error))	UINT32	RO	0x6030:07, 1
1A52:06	SubIndex 006	6. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A52:07	SubIndex 007	7. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x09 (Steady state))	UINT32	RO	0x6030:09, 1
1A52:08	SubIndex 008	8. PDO Mapping entry (2 bits align)	UINT32	RO	0x0000:00, 2
1A52:09	SubIndex 009	9. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0C (Tare Active))	UINT32	RO	0x6030:0C, 1
1A52:0A	SubIndex 010	10. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0D (Warning))	UINT32	RO	0x6030:0D, 1
1A52:0B	SubIndex 011	11. PDO Mapping entry (1 bits align)	UINT32	RO	0x0000:00, 1
1A52:0C	SubIndex 012	12. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x0F (TxPDO State))	UINT32	RO	0x6030:0F, 1
1A52:0D	SubIndex 013	13. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x10 (TxPDO Toggle))	UINT32	RO	0x6030:10, 1
1A52:0E	SubIndex 014	14. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6030:13, 32

Index 1A53 RMB TxPDO-Map Compact (Real32) Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A53:0	RMB TxPDO-Map Compact (Real32) Channel 2	PDO Mapping TxPDO 36	UINT8	RO	0x01 (1dec)
1A53:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x13 (Value (Real32)))	UINT32	RO	0x6030:13, 32

Index 1A54 RMB TxPDO-Map Cycle Counter Channel 2

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1A54:0	RMB TxPDO-Map Cycle Counter Channel 2	PDO Mapping TxPDO 37	UINT8	RO	0x01 (1dec)
1A54:01	SubIndex 001	1. PDO Mapping entry (object 0x6030 (RMB Sensor Inputs Ch.1), entry 0x14 (Input Cycle Counter))	UINT32	RO	0x6030:14, 16

Index 1C00 Sync manager type

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1C00:0	Sync manager type	Using the Sync Managers	UINT8	RO	0x04 (4_{dec})
1C00:01	SubIndex 001	Sync Manager Type Channel 1: Mailbox Write	UINT8	RO	0x01 (1_{dec})
1C00:02	SubIndex 002	Sync Manager Type Channel 2: Mailbox Read	UINT8	RO	0x02 (2_{dec})
1C00:03	SubIndex 003	Sync Manager Type Channel 3: Process Data Write (Outputs)	UINT8	RO	0x03 (3_{dec})
1C00:04	SubIndex 004	Sync Manager Type Channel 4: Process Data Read (Inputs)	UINT8	RO	0x04 (4_{dec})

Index 1C12 RxPDO assign

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1C12:0	RxPDO assign	PDO Assign Outputs	UINT8	RW	0x02 (2_{dec})
1C12:01	Subindex 001	1. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x1622 (5666_{dec})
1C12:02	Subindex 002	2. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x1632 (5682_{dec})
1C12:03	Subindex 003	3. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:04	Subindex 004	4. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:05	Subindex 005	5. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:06	Subindex 006	6. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:07	Subindex 007	7. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C12:08	Subindex 008	8. allocated RxPDO (contains the index of the associated RxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})

Index 1C13 TxPDO assign

Index (hex)	Name	Meaning	Data Type	Flags	Default value
1C13:0	TxPDO assign	PDO Assign Inputs	UINT8	RW	0x04 (4_{dec})
1C13:01	Subindex 001	1. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A02 (6658_{dec})
1C13:02	Subindex 002	2. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A12 (6674_{dec})
1C13:03	Subindex 003	3. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A20 (6688_{dec})
1C13:04	Subindex 004	4. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A30 (6704_{dec})
1C13:05	Subindex 005	5. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C13:06	Subindex 006	6. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C13:07	Subindex 007	7. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A02 (6658_{dec})
1C13:08	Subindex 008	8. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A12 (6674_{dec})
1C13:09	Subindex 009	9. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A20 (6688_{dec})
1C13:0A	Subindex 010	10. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A30 (6704_{dec})
1C13:0B	Subindex 011	11. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C13:0C	Subindex 012	12. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x0000 (0_{dec})
1C13:0D	Subindex 013	13. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A02 (6658_{dec})
1C13:0E	Subindex 014	14. allocated TxPDO (contains the index of the associated TxPDO mapping object)	UINT16	RW	0x1A12 (6674_{dec})

Index 1C32 SM output parameter

Index (hex)	Name	Meaning	Data type	Flags	Default
1C32:0	SM output parameter	Synchronization parameters for the outputs	UINT8	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	UINT16	RW	0x0000 (0_{dec})
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	UINT32	RW	0x000F4240 (1000000_{dec})
1C32:03	Shift time	Time between SYNC0 event and output of the outputs (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{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 0x1C32:08)	UINT16	RO	0x0001 (1_{dec})
1C32:05	Minimum cycle time	Minimum cycle time (in ns)	UINT32	RO	0x000186A0 (100000_{dec})
1C32:06	Calc and copy time	Minimum time between SYNC0 and SYNC1 event (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{dec})
1C32:09	Maximum delay time	Time between SYNC1 event and output of the outputs (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{dec})
1C32:0B	SM event missed counter	Number of missed SM events in OPERATIONAL (DC mode only)	UINT16	RO	0x0000 (0_{dec})
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)	UINT16	RO	0x0000 (0_{dec})
1C32:0D	Shift too short counter	Number of occasions that the interval between SYNC0 and SYNC1 event was too short (DC mode only)	UINT16	RO	0x0000 (0_{dec})
1C32:20	Sync error	The synchronization was not correct in the last cycle (outputs were output too late; DC mode only)	BOOLEAN	RO	0x00 (0_{dec})

Index 1C33 SM input parameter

Index (hex)	Name	Meaning	Data type	Flags	Default
1C33:0	SM input parameter	Synchronization parameters for the inputs	UINT8	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)	UINT16	RW	0x0000 (0_{dec})
1C33:02	Cycle time	• as 0x1C32:02 [▶ 198]	UINT32	RW	0x000F4240 (1000000_{dec})
1C33:03	Shift time	Time between SYNC0 event and reading of the inputs (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{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 0x1C32:08 [▶ 198] or 0x1C33:08)	UINT16	RO	0x0001 (1_{dec})
1C33:05	Minimum cycle time	as 0x1C32:05 [▶ 198]	UINT32	RO	0x000186A0 (100000_{dec})
1C33:06	Calc and copy time	Time between reading of the inputs and the inputs being available for the master (in ns, only DC mode)	UINT32	RO	0x00000000 (0_{dec})
1C33:07	Minimum delay time		UINT32	RO	0x00000000 (0_{dec})
1C33:09	Maximum delay time	Time between SYNC1 event and reading of the inputs (in ns, DC mode only)	UINT32	RO	0x00000000 (0_{dec})
1C33:0B	SM event missed counter	as 0x1C32:11 [▶ 198]	UINT16	RO	0x0000 (0_{dec})
1C33:0C	Cycle exceeded counter	as 0x1C32:12 [▶ 198]	UINT16	RO	0x0000 (0_{dec})
1C33:0D	Shift too short counter	as 0x1C32:13 [▶ 198]	UINT16	RO	0x0000 (0_{dec})
1C33:20	Sync error	as 0x1C32:32 [▶ 198]	BOOLEAN	RO	0x00 (0_{dec})

Index F008 Code word

Index (hex)	Name	Meaning	Data Type	Flags	Default value
F008:0	Code word	NoCoeStorage function: The input code of the code word 0x12345678 activates the NoCoeStorage function. Changes to the CoE directory are not saved if the function is active. The function is deactivated by: 1.) changing the code word or 2.) restarting the terminal.	UINT32	RW	0x00000000 (0_{dec})

Index F009 Password protection

Index (hex)	Name	Meaning	Data type	Flags	Default
F009:0	Password protection	Password protection user calibration	UINT32	RW	0x00000000 (0_{dec})

5 Appendix

5.1 Firmware compatibility

Beckhoff EtherCAT devices are delivered with the latest available firmware version. Compatibility of firmware and hardware is mandatory; not every combination ensures compatibility. The overview below shows the hardware versions on which a firmware can be operated.

Note

- It is recommended to use the newest possible firmware for the respective hardware
- Beckhoff is not under any obligation to provide customers with free firmware updates for delivered products.

NOTICE

Risk of damage to the device!

Pay attention to the instructions for firmware updates on the separate page [▶ 201].
If a device is placed in BOOTSTRAP mode for a firmware update, it does not check when downloading whether the new firmware is suitable.
This can result in damage to the device! Therefore, always make sure that the firmware is suitable for the hardware version!

ED3361-0100			
Hardware (HW)	**Firmware**	**Revision no.**	**Release date**
00	01	ED3361-0100-0016	02.2025

ED3362-0100			
Hardware (HW)	**Firmware**	**Revision no.**	**Release date**
00	01	ED3362-0100-0016	02.2025

*) This is the current compatible firmware/hardware version at the time of the preparing this documentation. Check on the Beckhoff web page whether more up-to-date documentation is available.

5.2 Firmware Update

This section describes the device update for Beckhoff EtherCAT slaves from the ED/EF, EL/ES, ELM, EM, EK, EP, EPP and ERP series. A firmware update should only be carried out after consultation with Beckhoff support.

NOTICE

Only use TwinCAT 3 software!

A firmware update of Beckhoff IO devices must only be performed with a TwinCAT 3 installation. It is recommended to build as up-to-date as possible, available for free download on the Beckhoff website.

To update the firmware, TwinCAT can be operated in the so-called FreeRun mode, a paid license is not required.

The device to be updated can usually remain in the installation location, but TwinCAT has to be operated in the FreeRun. Please make sure that EtherCAT communication is trouble-free (no LostFrames etc.).

Other EtherCAT master software, such as the EtherCAT Configurator, should not be used, as they may not support the complexities of updating firmware, EEPROM and other device components.

Storage locations

An EtherCAT slave stores operating data in up to three locations:

- Each EtherCAT slave has a device description, consisting of identity (name, product code), timing specifications, communication settings, etc.
  This device description (ESI; EtherCAT Slave Information) can be downloaded from the Beckhoff website in the download area as a zip file and used in EtherCAT masters for offline configuration, e.g. in TwinCAT.
  Above all, each EtherCAT slave carries its device description (ESI) electronically readable in a local memory chip, the so-called **ESI EEPROM**. When the slave is switched on, this description is loaded locally in the slave and informs it of its communication configuration; on the other hand, the EtherCAT master can identify the slave in this way and, among other things, set up the EtherCAT communication accordingly.

NOTICE

Application-specific writing of the ESI-EEPROM

The ESI is developed by the device manufacturer according to ETG standard and released for the corresponding product.
- Meaning for the ESI file: Modification on the application side (i.e. by the user) is not permitted.
- Meaning for the ESI EEPROM: Even if a writeability is technically given, the ESI parts in the EEPROM and possibly still existing free memory areas must not be changed beyond the normal update process. Especially for cyclic memory processes (operating hours counter etc.), dedicated memory products such as EL6080 or IPC's own NOVRAM must be used.

- Depending on functionality and performance EtherCAT slaves have one or several local controllers for processing I/O data. The corresponding program is the so-called **firmware** in *.efw format.
- In some EtherCAT slaves the EtherCAT communication may also be integrated in these controllers. In this case the controller is usually a so-called **FPGA** chip with *.rbf firmware.

Customers can access the data via the EtherCAT fieldbus and its communication mechanisms. Acyclic mailbox communication or register access to the ESC is used for updating or reading of these data.

The TwinCAT System Manager offers mechanisms for programming all three parts with new data, if the slave is set up for this purpose. Generally the slave does not check whether the new data are suitable, i.e. it may no longer be able to operate if the data are unsuitable.

Simplified update by bundle firmware

The update using so-called **bundle firmware** is more convenient: in this case the controller firmware and the ESI description are combined in a *.efw file; during the update both the firmware and the ESI are changed in the terminal. For this to happen it is necessary

- for the firmware to be in a packed format: recognizable by the file name, which also contains the revision number, e.g. ELxxxx-xxxx_REV0016_SW01.efw
- for password=1 to be entered in the download dialog. If password=0 (default setting) only the firmware update is carried out, without an ESI update.
- for the device to support this function. The function usually cannot be retrofitted; it is a component of many new developments from year of manufacture 2016.

Following the update, its success should be verified

- ESI/Revision: e.g. by means of an online scan in TwinCAT ConfigMode/FreeRun – this is a convenient way to determine the revision
- Firmware: e.g. by looking in the online CoE of the device

NOTICE

Risk of damage to the device!

✓ Note the following when downloading new device files

a) Firmware downloads to an EtherCAT device must not be interrupted

b) Flawless EtherCAT communication must be ensured. CRC errors or LostFrames must be avoided.

c) The power supply must adequately dimensioned. The signal level must meet the specification.

⇨ In the event of malfunctions during the update process the EtherCAT device may become unusable and require re-commissioning by the manufacturer.

5.2.1 Device description ESI file/XML

NOTICE

Attention regarding update of the ESI description/EEPROM

Some slaves have stored calibration and configuration data from the production in the EEPROM. These are irretrievably overwritten during an update.

The ESI device description is stored locally on the slave and loaded on start-up. Each device description has a unique identifier consisting of slave name (9 characters/digits) and a revision number (4 digits). Each slave configured in the System Manager shows its identifier in the EtherCAT tab:

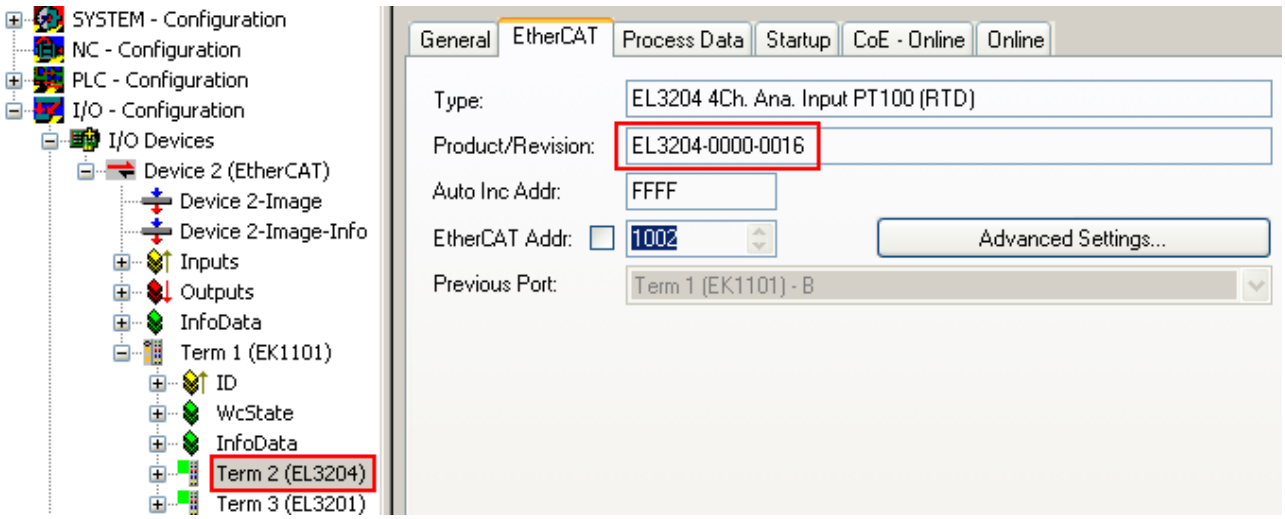


Fig. 79: Device identifier consisting of name EL3204-0000 and revision -0016

The configured identifier must be compatible with the actual device description used as hardware, i.e. the description which the slave has loaded on start-up (in this case EL3204). Normally the configured revision must be the same or lower than that actually present in the terminal network.

For further information on this, please refer to the EtherCAT system documentation.

Update of XML/ESI description

The device revision is closely linked to the firmware and hardware used. Incompatible combinations lead to malfunctions or even final shutdown of the device. Corresponding updates should only be carried out in consultation with Beckhoff support.

Display of ESI slave identifier

The simplest way to ascertain compliance of configured and actual device description is to scan the EtherCAT boxes in TwinCAT mode Config/FreeRun:

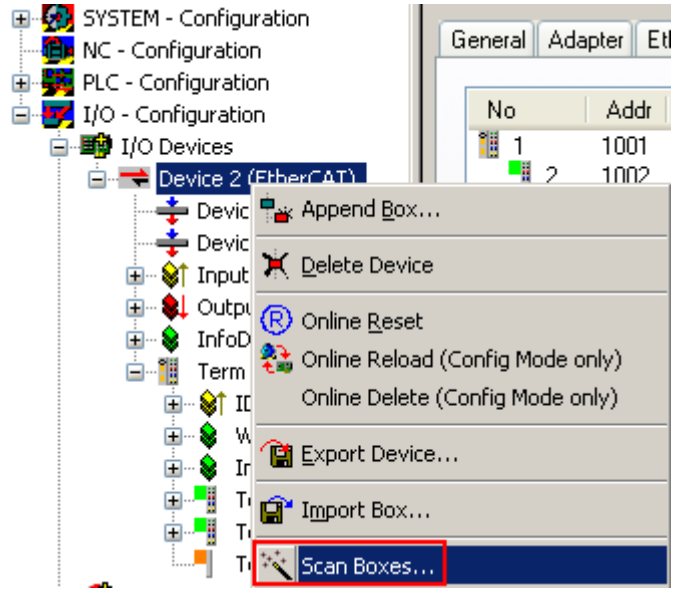


Fig. 80: Scan the subordinate field by right-clicking on the EtherCAT device

If the found field matches the configured field, the display shows

Fig. 81: Configuration is identical

otherwise a change dialog appears for entering the actual data in the configuration.

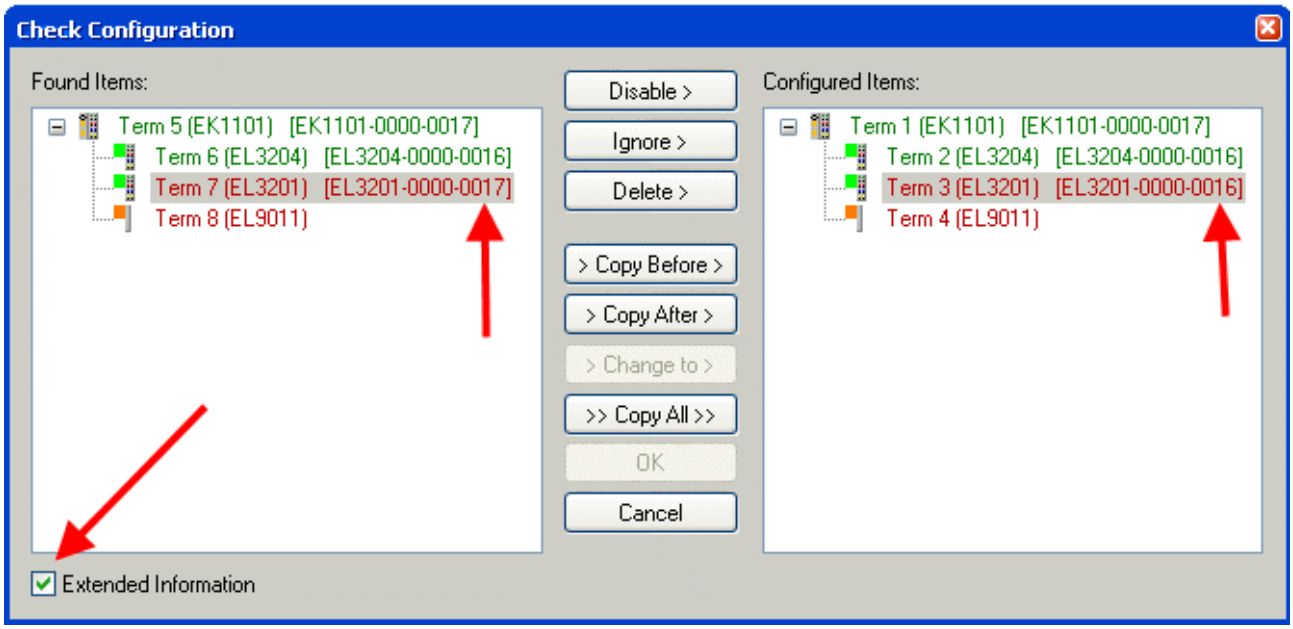


Fig. 82: Change dialog

In this example in Fig. *Change dialog*, an EL3201-0000-**0017** was found, while an EL3201-0000-**0016** was configured. In this case the configuration can be adapted with the *Copy Before* button. The *Extended Information* checkbox must be set in order to display the revision.

Changing the ESI slave identifier

The ESI/EEPROM identifier can be updated as follows under TwinCAT:

- Trouble-free EtherCAT communication must be established with the slave.
- The state of the slave is irrelevant.
- Right-clicking on the slave in the online display opens the *EEPROM Update* dialog, Fig. *EEPROM Update*

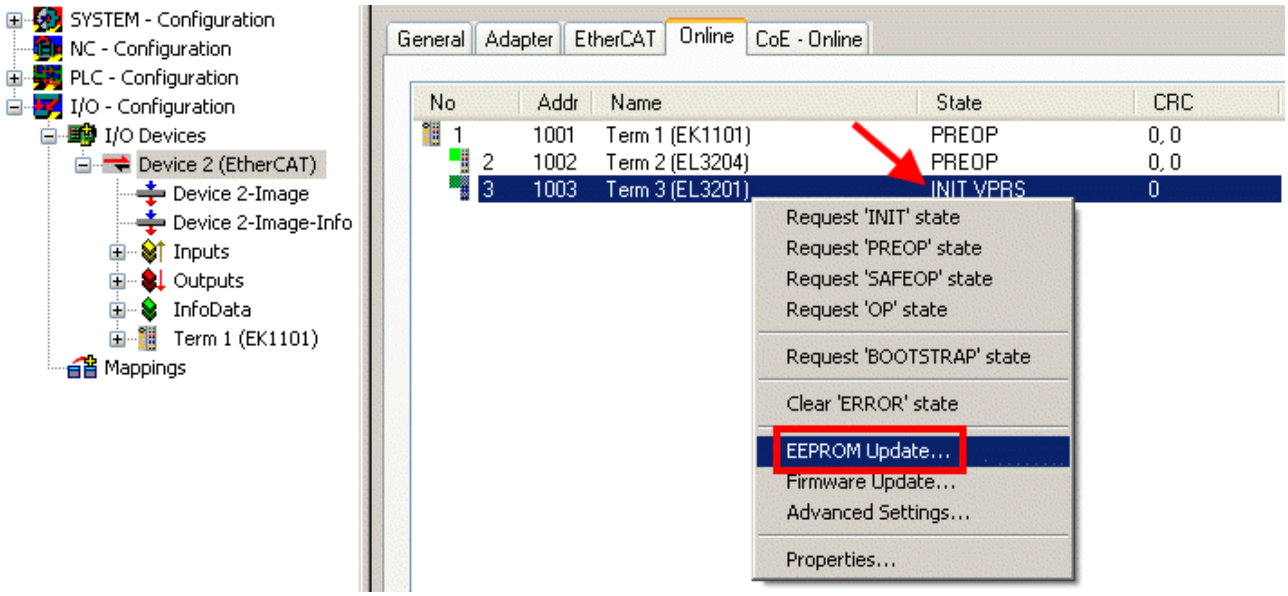


Fig. 83: EEPROM Update

The new ESI description is selected in the following dialog, see Fig. *Selecting the new ESI.* The checkbox *Show Hidden Devices* also displays older, normally hidden versions of a slave.

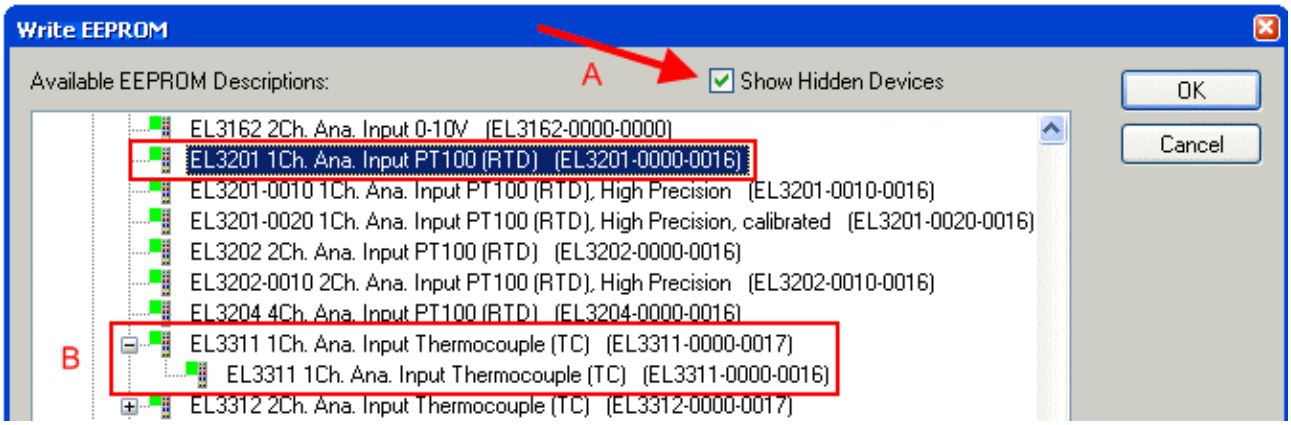


Fig. 84: Selecting the new ESI

A progress bar in the System Manager shows the progress. Data are first written, then verified.

The change only takes effect after a restart.

Most EtherCAT devices read a modified ESI description immediately or after startup from the INIT. Some communication settings such as distributed clocks are only read during power-on. The EtherCAT slave therefore has to be switched off briefly in order for the change to take effect.

5.2.2 Firmware explanation

Determining the firmware version

Determining the version via the TwinCAT System Manager

The TwinCAT System Manager shows the version of the controller firmware if the master can access the slave online. Click on the E-Bus Terminal whose controller firmware you want to check (in the example terminal 2 (EL3204)) and select the tab *CoE Online* (CAN over EtherCAT).

CoE Online and Offline CoE

Two CoE directories are available:
• **online**: This is offered in the EtherCAT slave by the controller, if the EtherCAT slave supports this. This CoE directory can only be displayed if a slave is connected and operational.
• **offline**: The EtherCAT Slave Information ESI/XML may contain the default content of the CoE. This CoE directory can only be displayed if it is included in the ESI (e.g. “Beckhoff EL5xxx.xml”).

The Advanced button must be used for switching between the two views.

In Fig. *Display of EL3204 firmware version* the firmware version of the selected EL3204 is shown as 03 in CoE entry 0x100A.

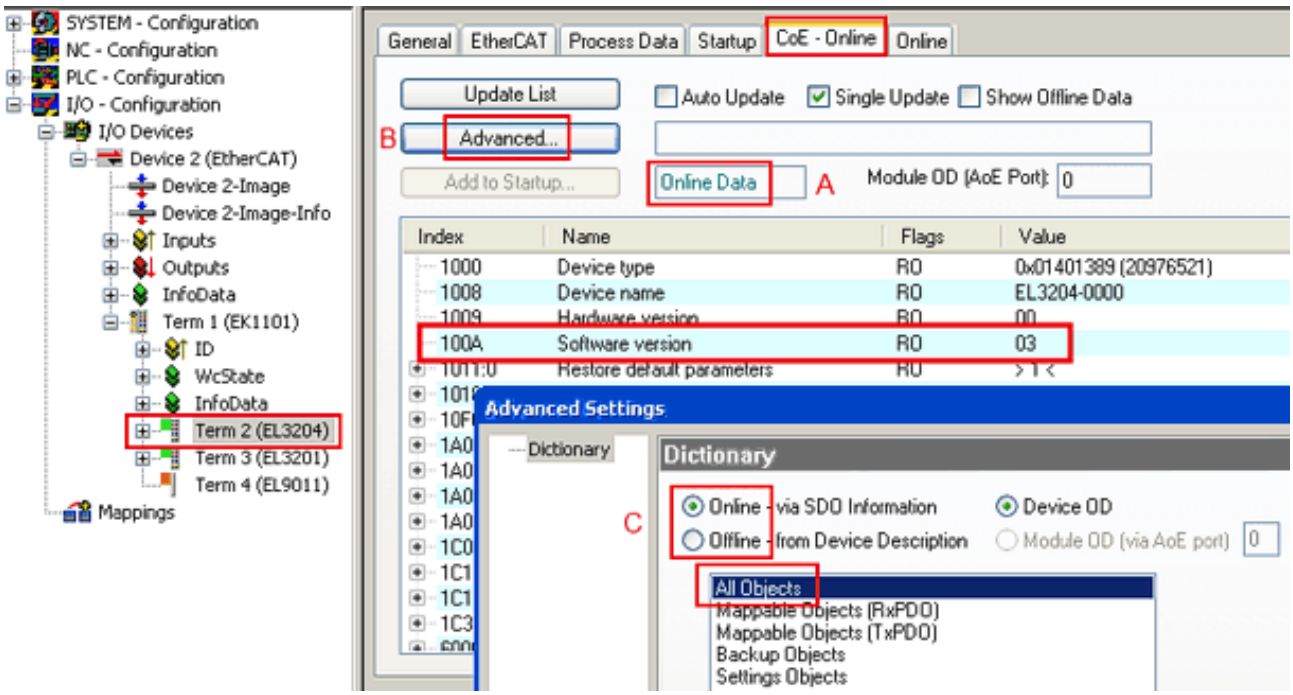


Fig. 85: Display of EL3204 firmware version

In (A) TwinCAT 2.11 shows that the Online CoE directory is currently displayed. If this is not the case, the Online directory can be loaded via the *Online* option in Advanced Settings (B) and double-clicking on *AllObjects*.

5.2.3 Updating controller firmware *.efw

CoE directory

The Online CoE directory is managed by the controller and stored in a dedicated EEPROM, which is generally not changed during a firmware update.

Switch to the *Online* tab to update the controller firmware of a slave, see Fig. *Firmware Update.*

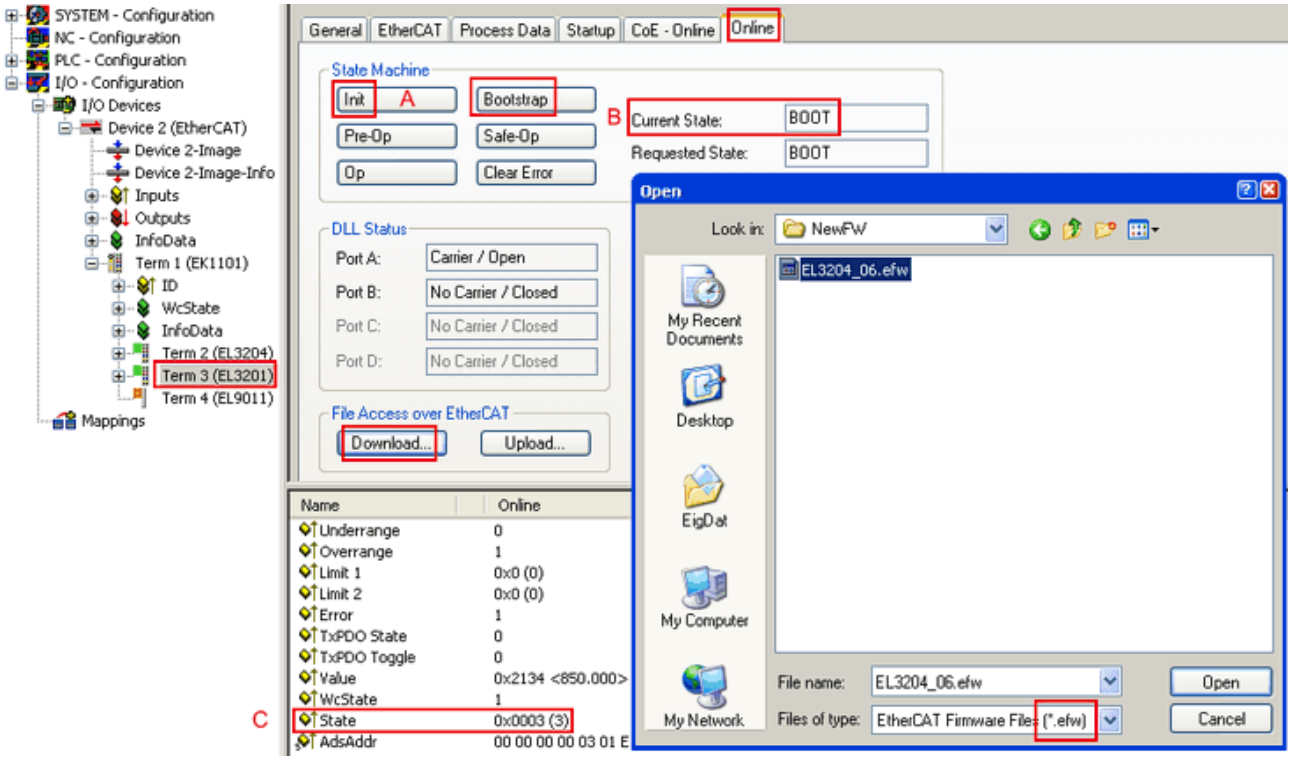
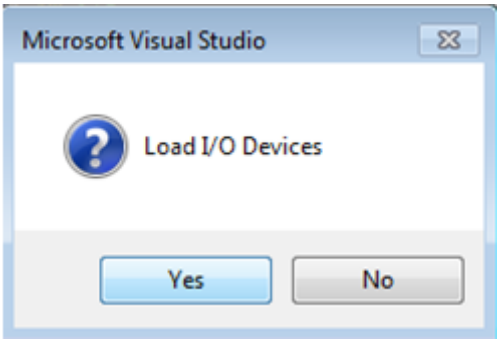
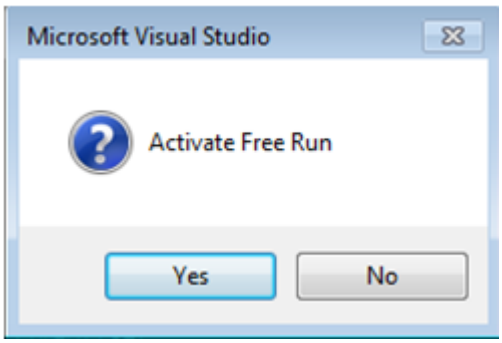


Fig. 86: Firmware Update

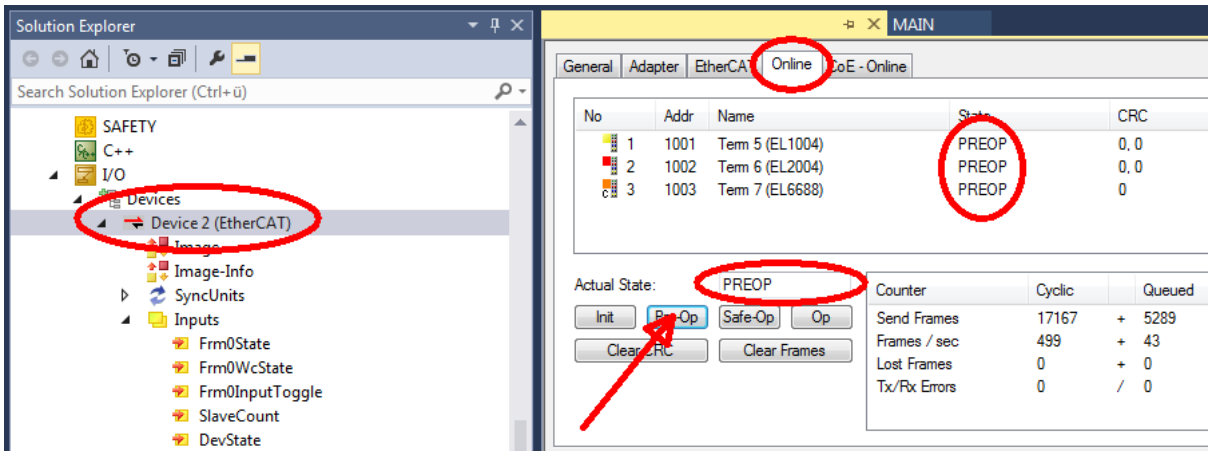
Proceed as follows, unless instructed otherwise by Beckhoff support. Valid for TwinCAT 2 and 3 as EtherCAT master.

- Switch TwinCAT system to ConfigMode/FreeRun with cycle time >= 1 ms (default in ConfigMode is 4 ms). A FW-Update during real time operation is not recommended.



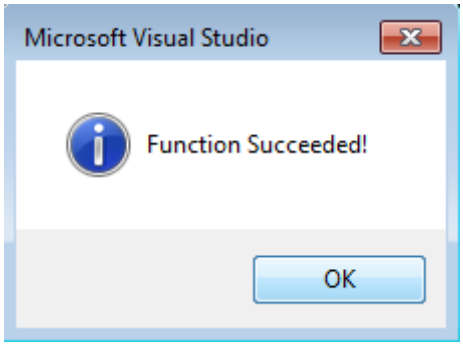


- Switch EtherCAT Master to PreOP



- Switch slave to INIT (A)
- Switch slave to BOOTSTRAP

- Check the current status (B, C)
- Download the new *efw file (wait until it ends). A password will not be necessary usually.



- After the download switch to INIT, then PreOP
- Switch off the slave briefly (don't pull under voltage!)
- Check within CoE 0x100A, if the FW status was correctly overtaken.

5.2.4 FPGA firmware *.rbf

If an FPGA chip deals with the EtherCAT communication an update may be accomplished via an *.rbf file.

- Controller firmware for processing I/O signals
- FPGA firmware for EtherCAT communication (only for terminals with FPGA)

The firmware version number included in the terminal serial number contains both firmware components. If one of these firmware components is modified this version number is updated.

Determining the version via the TwinCAT System Manager

The TwinCAT System Manager indicates the FPGA firmware version. Click on the Ethernet card of your EtherCAT strand (Device 2 in the example) and select the *Online* tab.

The *Reg:0002* column indicates the firmware version of the individual EtherCAT devices in hexadecimal and decimal representation.

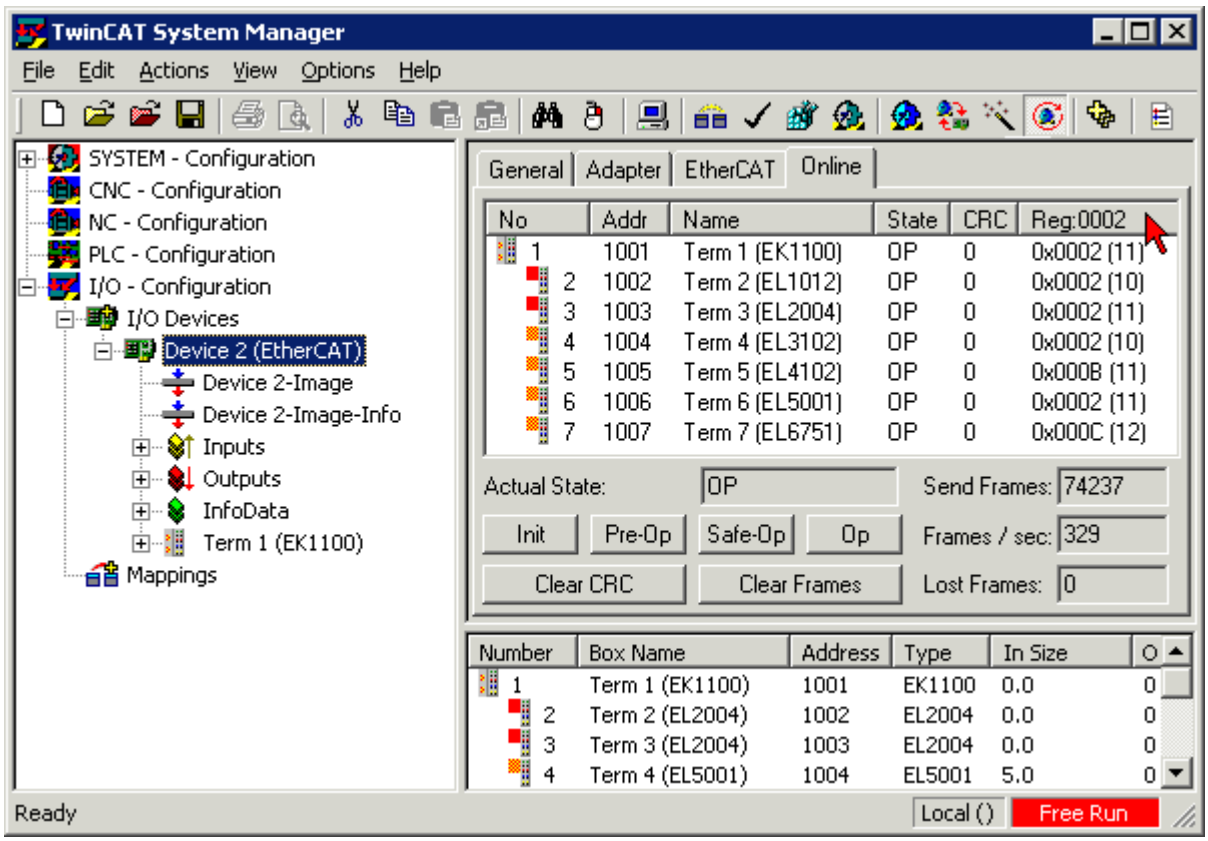


Fig. 87: FPGA firmware version definition

If the column *Reg:0002* is not displayed, right-click the table header and select *Properties* in the context menu.

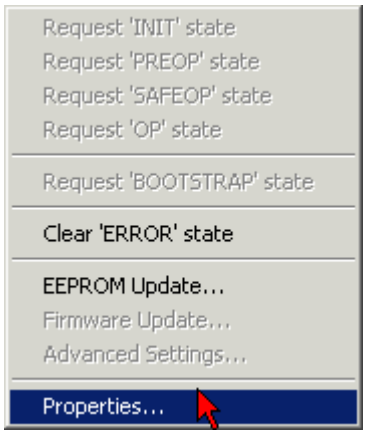


Fig. 88: Context menu *Properties*

The *Advanced Settings* dialog appears where the columns to be displayed can be selected. Under *Diagnosis/***Online View** select the *'0002 ETxxxx Build'* check box in order to activate the FPGA firmware version display.

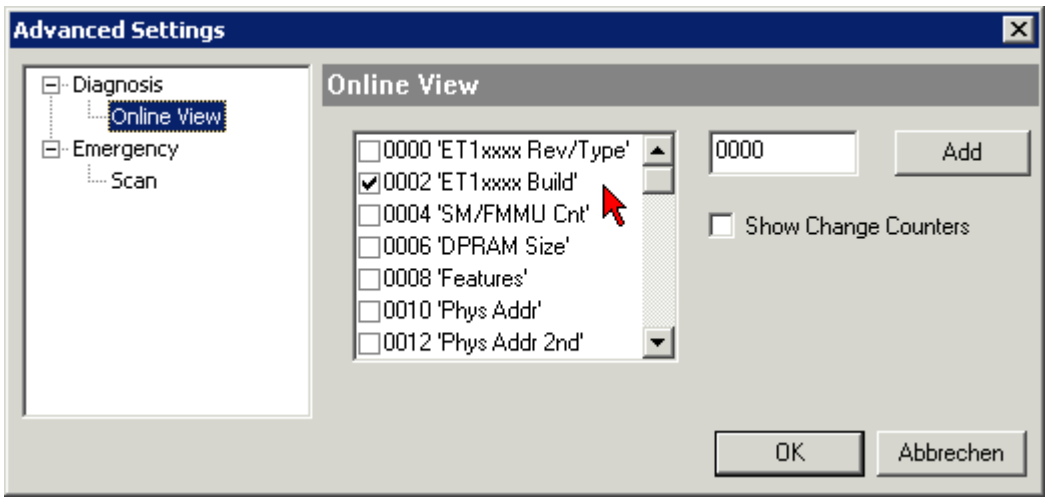


Fig. 89: Dialog *Advanced Settings*

Update

For updating the FPGA firmware

- of an EtherCAT coupler the coupler must have FPGA firmware version 11 or higher;
- of an E-Bus Terminal the terminal must have FPGA firmware version 10 or higher.

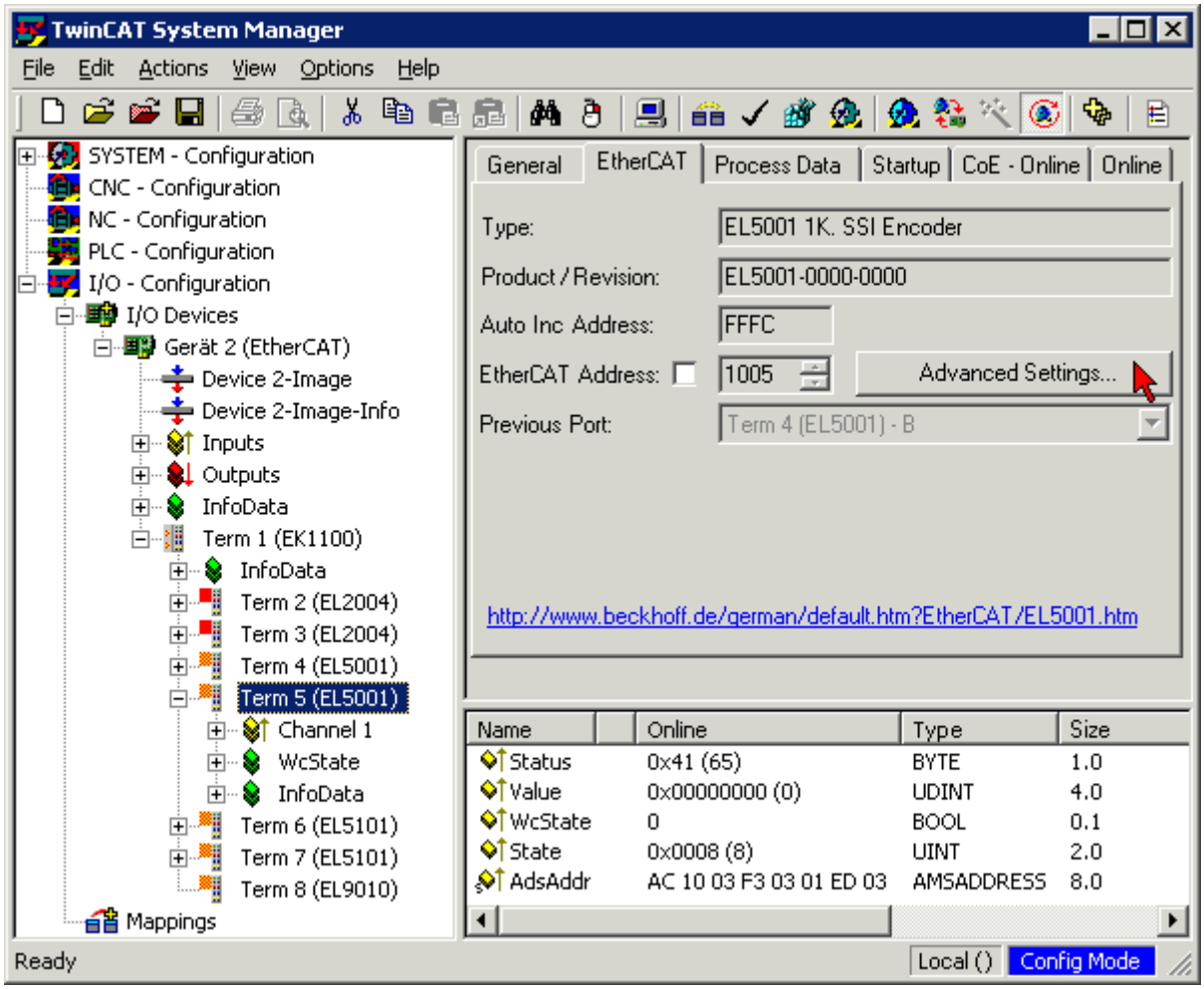
Older firmware versions can only be updated by the manufacturer!

Updating an EtherCAT device

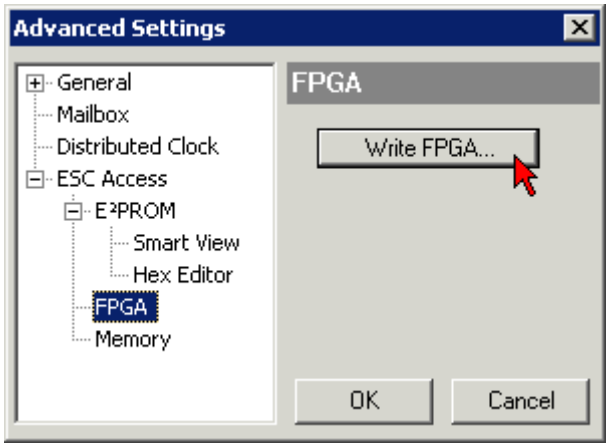
The following sequence order have to be met if no other specifications are given (e.g. by the Beckhoff support):

- Switch TwinCAT system to ConfigMode/FreeRun with cycle time >= 1 ms (default in ConfigMode is 4 ms). A FW-Update during real time operation is not recommended.

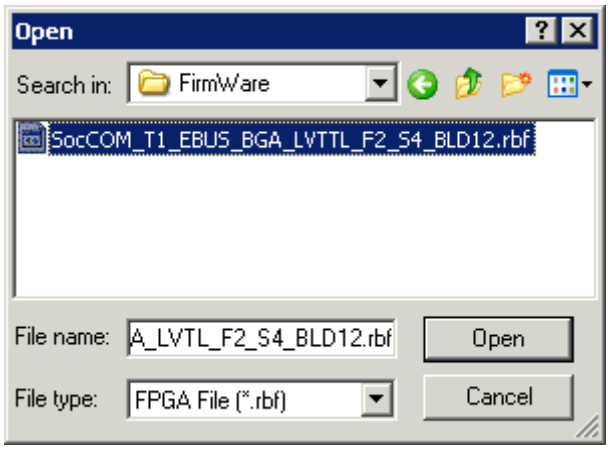
- In the TwinCAT System Manager select the terminal for which the FPGA firmware is to be updated (in the example: Terminal 5: EL5001) and
  click the *Advanced Settings* button in the *EtherCAT* tab:



- The *Advanced Settings* dialog appears. Under *ESC Access/E²PROM*/FPGA click on *Write FPGA* button:



- Select the file (*.rbf) with the new FPGA firmware, and transfer it to the EtherCAT device:



- Wait until download ends
- Switch slave current less for a short time (don't pull under voltage!). In order to activate the new FPGA firmware a restart (switching the power supply off and on again) of the EtherCAT device is required.
- Check the new FPGA status

NOTICE

Risk of damage to the device!

A download of firmware to an EtherCAT device must not be interrupted in any case! If you interrupt this process by switching off power supply or disconnecting the Ethernet link, the EtherCAT device can only be recommissioned by the manufacturer!

5.2.5 Simultaneous updating of several EtherCAT devices

The firmware and ESI descriptions of several devices can be updated simultaneously, provided the devices have the same firmware file/ESI.

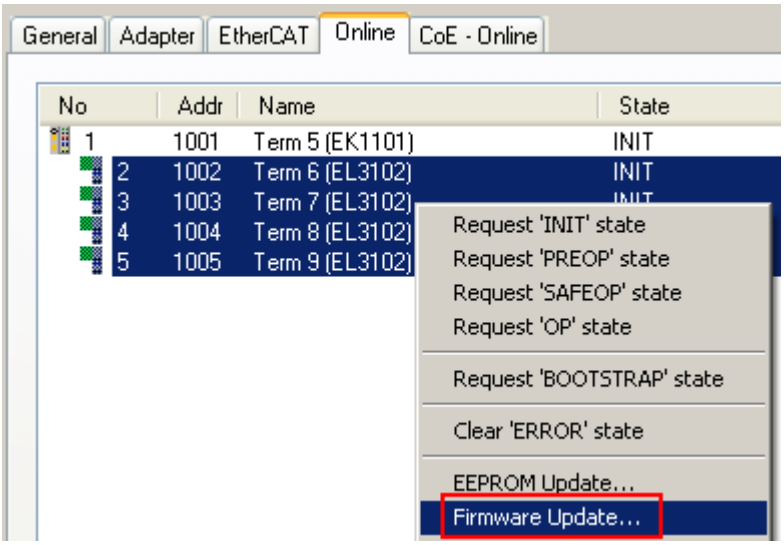


Fig. 90: Multiple selection and firmware update

Select the required slaves and carry out the firmware update in BOOTSTRAP mode as described above.

5.3 Restoring the delivery state

To restore the delivery state (factory settings) of CoE objects (object directory) for EtherCAT devices ("slaves"), the CoE object *Restore default parameters*, SubIndex 001 can be used via EtherCAT master (e.g. TwinCAT) (see Fig. *Selecting the Restore default parameters PDO*).

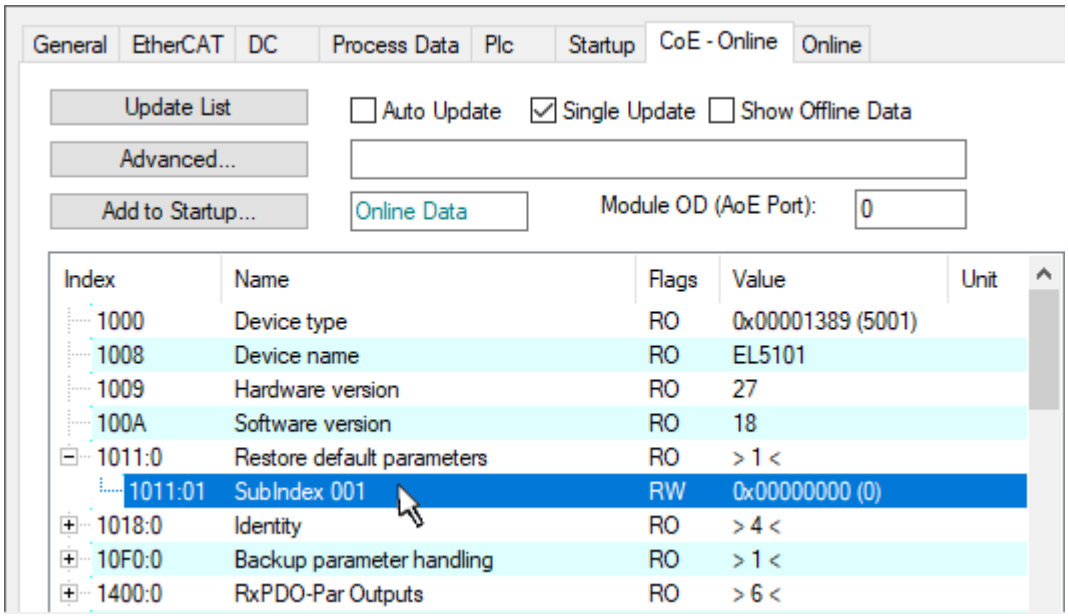


Fig. 91: Selecting the *Restore default parameters* PDO

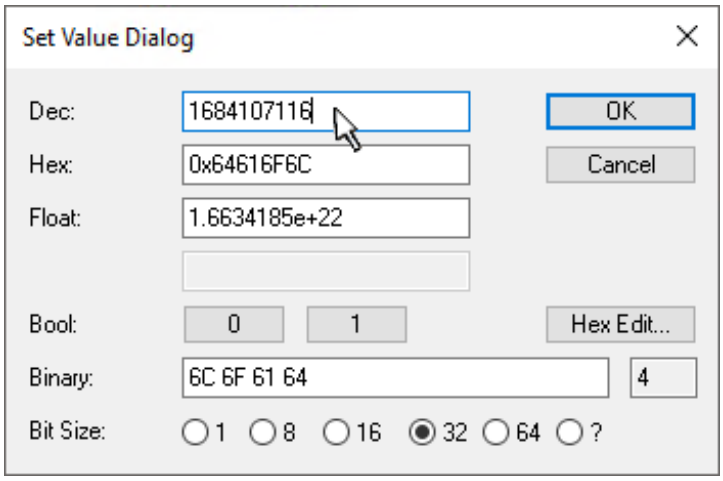


Fig. 92: Entering a restore value in the Set Value dialog

Double-click on *SubIndex 001* to enter the Set Value dialog. Enter the reset value **1684107116** in field *Dec* or the value **0x64616F6C** in field *Hex* (ASCII: "load") and confirm with *OK* (Fig. *Entering a restore value in the Set Value dialog*).

- All changeable entries in the slave are reset to the default values.
  Exception: objects write-protected via password
- Depending on the size of the object directory, this process can take from a few ms to > 1 second.
- The values can only be successfully restored if the reset is directly applied to the online CoE, i.e. to the slave. No values can be changed in the offline CoE.
- TwinCAT must be in the RUN or CONFIG/Freerun state for this; that means EtherCAT data exchange takes place. Ensure error-free EtherCAT transmission.
- No separate confirmation takes place due to the reset. A changeable object can be manipulated beforehand for the purposes of checking.
- This reset procedure can also be adopted as the first entry in the startup list of the slave, e.g. in the state transition PREOP->SAFEOP or, as in Fig. *CoE reset as a startup entry*, in SAFEOP->OP.

All backup objects are reset to the delivery state.

Alternative restore value

In some older terminals (FW creation approx. before 2007) the backup objects can be switched with an alternative restore value: Decimal value: 1819238756, Hexadecimal value: 0x6C6F6164.

An incorrect entry for the restore value has no effect.

5.4 Version identification of EtherCAT devices

5.4.1 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.

5.4.2 Version identification of EL terminals

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

Fig. 93: EL2872 with revision 0022 and serial number 01200815

5.4.3 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.

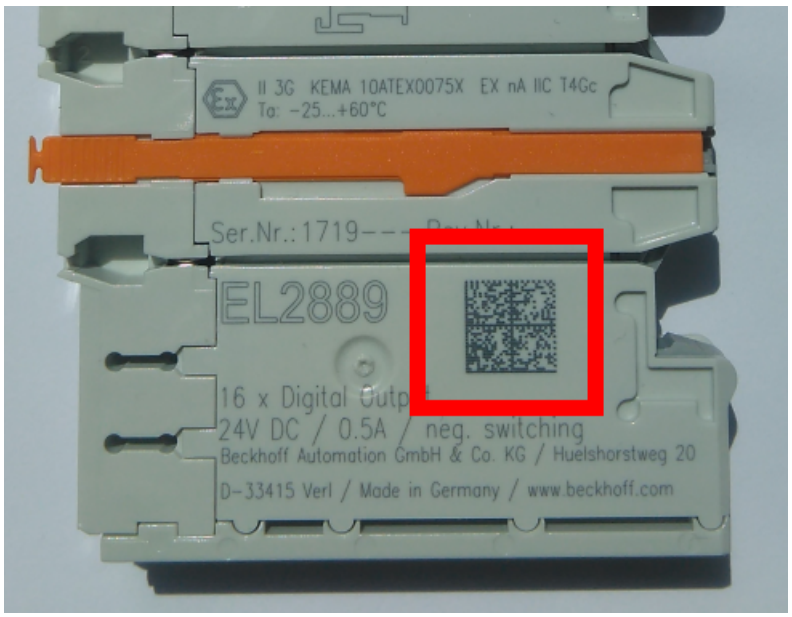


Fig. 94: BIC as data matrix code (DMC, code scheme ECC200)

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. 95: 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.

5.4.4 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.

K-bus devices (IP20, IP67)

Currently, no electronic storage or readout is planned for these devices.

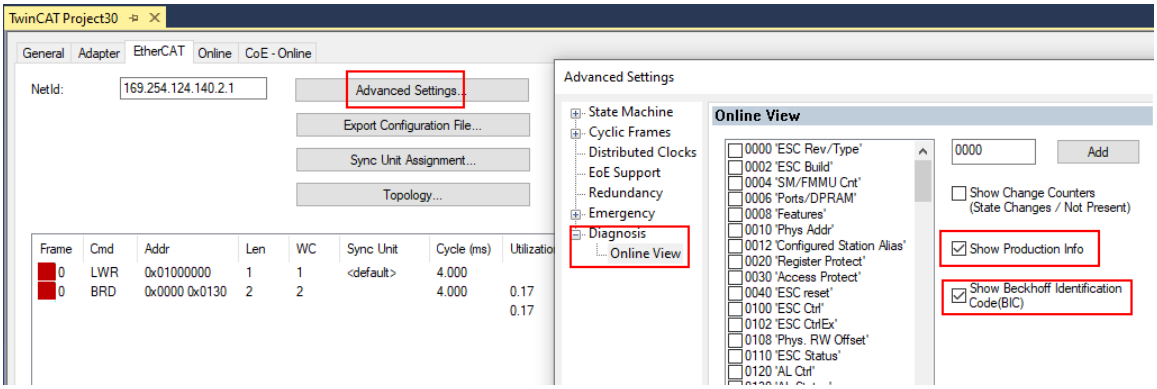
EtherCAT devices (IP20, IP67)

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.

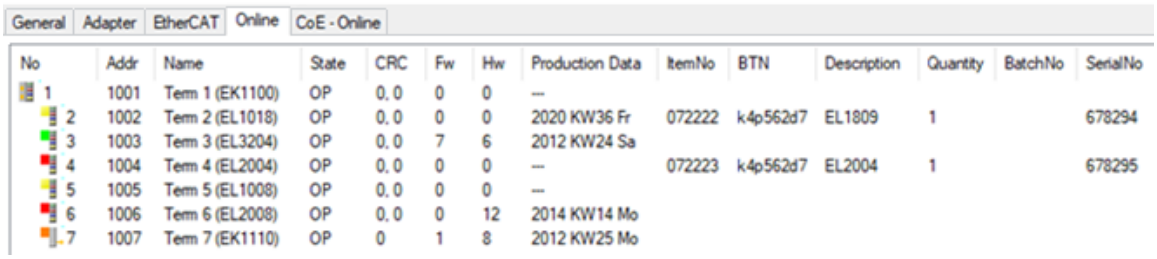
Beckhoff also stores the eBIC in the ESI-EEPROM. The eBIC was introduced into Beckhoff IO production (terminals, box modules) in 2020; as of 2023, implementation is largely complete.

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:

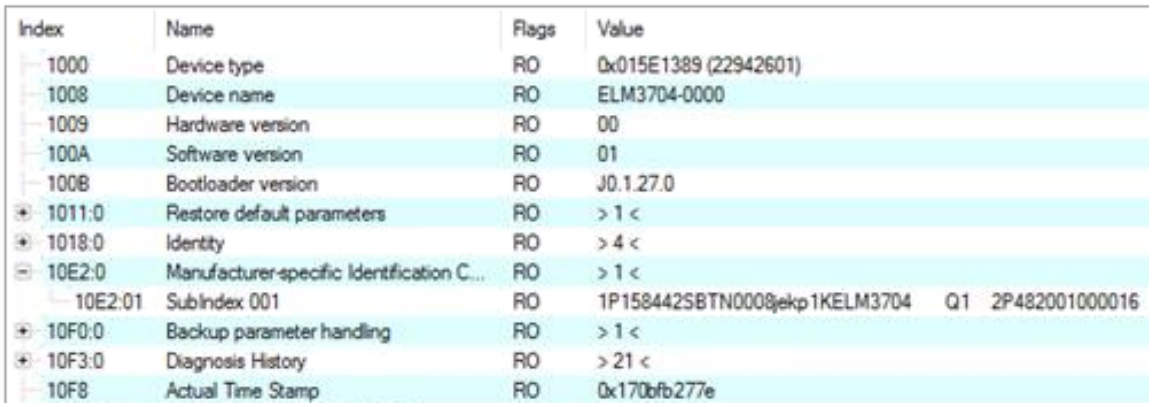


  - The BTN and its contents are then displayed:



  - 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.

PROFIBUS, PROFINET, and DeviceNet® devices

Currently, no electronic storage or readout is planned for these devices.

5.5 Documentation issue status

Version	Comment
1.0.0	• First release
0.3.0	• Addenda and corrections
0.2.0	• Addenda and corrections
0.1	• provisional documentation for EL336x-0x00

5.6 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!

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You will also find further documentation for Beckhoff components there.

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