

Documentation | EN

# EQxxxx

EtherCAT Box modules with stainless steel housing, IP69K





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# 1 Foreword

## 1.1 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

Beckhoff®, TwinCAT®, TwinCAT/BSD®, TC/BSD®, EtherCAT®, EtherCAT G®, EtherCAT G10®, EtherCAT P®, Safety over EtherCAT®, TwinSAFE®, XFC®, XTS® and XPlanar® are registered trademarks of and licensed by Beckhoff Automation GmbH. Other designations used in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owners.

### Patent Pending

The EtherCAT Technology is covered, including but not limited to the following patent applications and patents: EP1590927, EP1789857, EP1456722, EP2137893, DE102015105702 with corresponding applications or registrations in various other countries.



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## 1.2 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.

## 1.3 Documentation issue status

Version	Comment
1.2	<ul style="list-style-type: none"><li>• Links updated</li></ul>
1.1	<ul style="list-style-type: none"><li>• Dimensions updated</li><li>• UL requirements updated</li></ul>
1.0	<ul style="list-style-type: none"><li>• First release</li></ul>

### Firmware and hardware versions

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

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

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

### Syntax of the batch number (D-number)

D: WW YY FF HH

WW - week of production (calendar week)

YY - year of production

FF - firmware version

HH - hardware version

Example with D no. 29 10 02 01:

29 - week of production 29

10 - year of production 2010

02 - firmware version 02

01 - hardware version 01

Further information on this topic: [Version identification of EtherCAT devices](#) [► 21].

## 2 Product series

### 2.1 Introduction



The modules of the EQxxxx series feature “Hygienic Design” throughout. They can be used in extreme, harsh and corrosive industrial environments and are therefore ideal for applications in the food, chemical or pharmaceutical industries, which require protection class IP 69K.

The stainless steel EtherCAT Box modules cover the typical range of requirements of I/O signals: digital inputs with a filter of 3.0 ms, digital outputs with 0.5 A output current, and combi modules with freely selectable digital inputs or outputs. In addition, analog input modules for current/voltage measurement are available. Temperature measurement modules for resistance sensors or thermocouples complement the product range. The signals are connected via M12 connectors.

The modules of the EQxxxx series have an EtherCAT interface. The power supply and transfer takes place via M8 connectors or sockets.



## 2.2 Technical data

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

Technical data	Product series EQxxxx
<b>Fieldbus</b>	
Fieldbus	EtherCAT
Connection	2x M8 socket, 4-pin, green
Electrical isolation	500 V (fieldbus / IO)
Distributed Clocks	see <a href="#">Product documentation [► 10]</a> for the corresponding module from the EPxxxx series.
<b>Supply voltages</b>	
Connection	Input: 1 x M8 plug, 4-pin, black Downstream connection: 1 x M8 socket, 4-pin, black
Control voltage $U_s$	
Nominal voltage	24 V <sub>DC</sub> (-15 % / +20 %)
Sum current	max. 4 A <sup>1)</sup>
Peripheral voltage $U_p$	
Nominal voltage	24 V <sub>DC</sub> (-15 % / +20 %)
Sum current	max. 4 A <sup>1)</sup>
<b>I/O interfaces</b>	
Specifications	See <a href="#">Product documentation [► 10]</a> for the corresponding module from the EPxxxx series.
<b>Environmental conditions</b>	
Ambient temperature during operation	-25...+60°C -25...+55°C according to cURus
Ambient temperature during storage	-40...+85°C
Vibration / shock resistance	conforms to EN 60068-2-6 / EN 60068-2-27
EMC immunity / emission	conforms to EN 61000-6-2 / EN 61000-6-4
Protection class	IP69K according to EN 60529
<b>Mechanics</b>	
Housing material	Stainless steel
Installation position	variable
<b>Approvals and conformity</b>	
Approvals	CE, cURus <a href="#">[► 19]</a>

<sup>1)</sup> This value corresponds to the current carrying capacity of the connections for the supply voltages.

### Designs

Technical data	EQxxxx-0002	EQxxxx-0022
I/O connections	4 x M12 socket	8 x M12 socket
Dimensions W x H x D <sup>2)</sup>	39 x 160 x 43 mm	72 x 160 x 43 mm
Weight, typical	340 g	480 g
Mounting	2 mounting straps for M5 screws	

<sup>2)</sup> without connectors

## 2.3 Product documentation

The product documentation for the EQxxxx series is in preparation.

The modules of the EQxxxx series are based on modules of the EPxxxx series. For each module of the EQxxxx series there is a module of the EPxxxx series with the same I/O functionality.

Please refer to the product documentation for the corresponding module from the EPxxxx series for the following information:

- Technical data of the I/O interfaces
- Connections of the I/O interfaces
- Commissioning and configuration
- Distributed Clocks - support

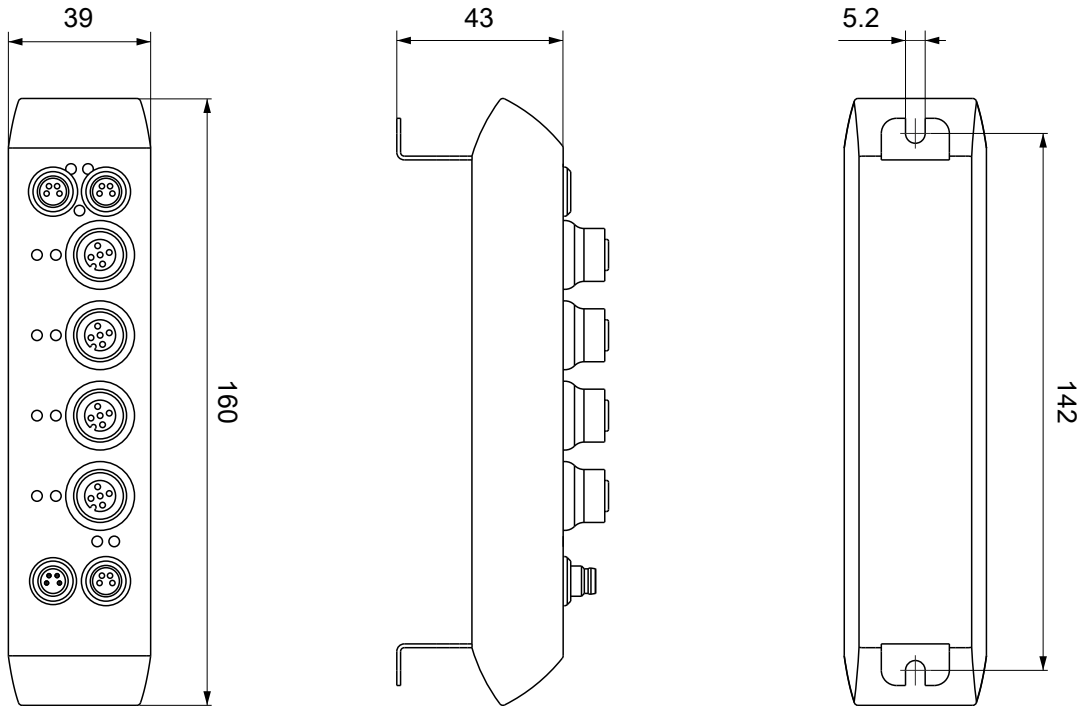
### Links to documentation for the EPxxxx series

EQxxxx	Link to the documentation (EPxxxx series)
EQ1xxx-xxxx	<a href="#">EP1xxx-xxxx</a>
EQ20xx-xxxx	<a href="#">EP20xx-xxxx</a>
EQ28xx-xxxx	<a href="#">EP28xx-xxxx</a>
EQ23xx-xxxx	<a href="#">EP23xx-xxxx</a>
EQ3174-0002	<a href="#">EP3174-0002</a>
EQ3204-0002	<a href="#">EP3204-0002</a>
EQ3314-0002	<a href="#">EP3314-0002</a>

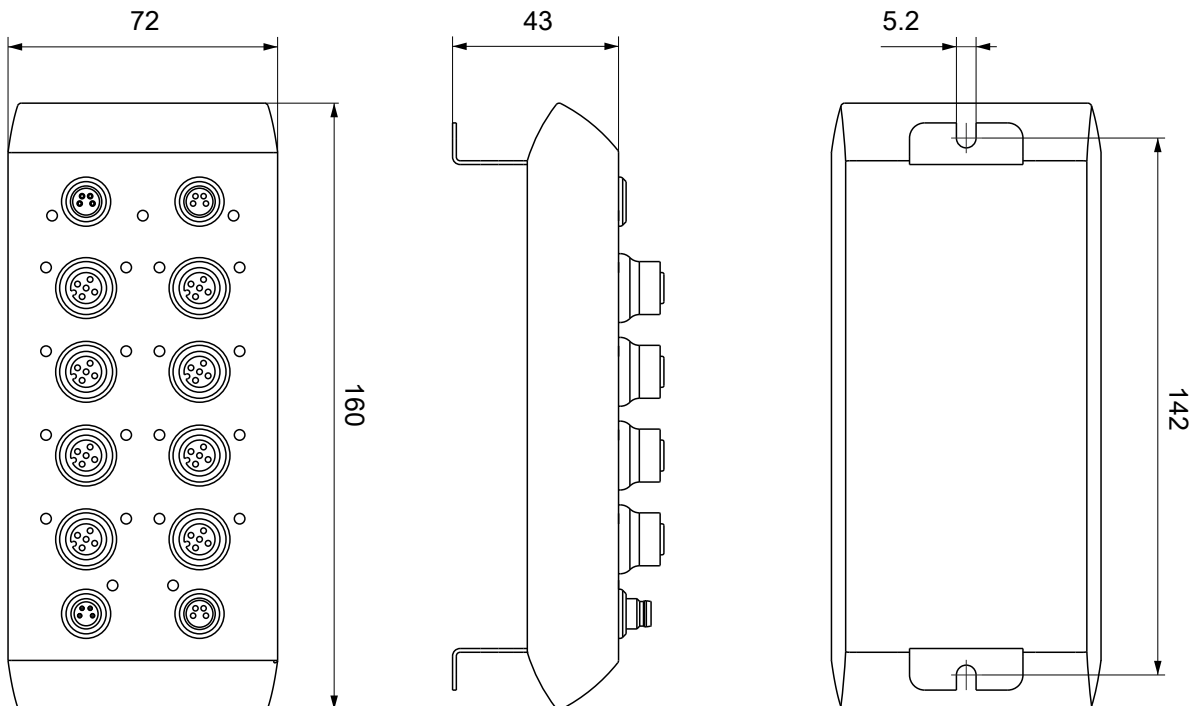
### 3 Mounting

#### 3.1 Dimensions

EQxxxx-0002



EQxxxx-0022



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

## 3.2 Mounting

### NOTICE

#### Dirt during assembly

Dirty connectors can lead to malfunctions. Protection class IP69K can only be guaranteed if all cables and connectors are connected.

- Protect the plug connectors against dirt during the assembly.

Modules of the EQxxxx series have two mounting straps at the bottom. Attach the modules to the mounting straps with two M5 screws.

## 3.3 Tightening torques for plug connectors

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

Connector diameter	Tightening torque
M8	0.4 Nm
M12	0.6 Nm

### 3.4 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 Connections

### 4.1 EtherCAT

#### 4.1.1 Connectors

**NOTICE**

**Risk of confusion: supply voltages and EtherCAT**

Defect possible through incorrect insertion.

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

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



**Connection**

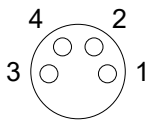


Fig. 1: M8 socket

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

<sup>1)</sup> Core colors according to EN 61918

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

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

### 4.1.2 Status LEDs



#### L/A (Link/Act)

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

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

#### Run

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

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

Description of the EtherCAT slave states

### 4.1.3 Cables

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

EtherCAT uses four wires for signal transmission.

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

Detailed recommendations for the cabling of EtherCAT devices

## 4.2 Supply voltages

The EtherCAT Box has one input for two supply voltages:

- Control voltage  $U_s$
- Peripheral voltage  $U_p$

### Redirection of the supply voltages

The IN and OUT power connections are bridged in the module (not IP204x-Bxxx and IE204x). The supply voltages  $U_s$  and  $U_p$  can thus easily be transferred from EtherCAT Box to EtherCAT Box.

#### NOTICE

#### Pay attention to the maximum permissible current!

Pay attention also for the redirection of the supply voltages  $U_s$  and  $U_p$ , the maximum permissible current for M8 connectors of 4 A must not be exceeded!

### 4.2.1 Connectors

#### NOTICE

#### Risk of confusion: supply voltages and EtherCAT

Defect possible through incorrect insertion.

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

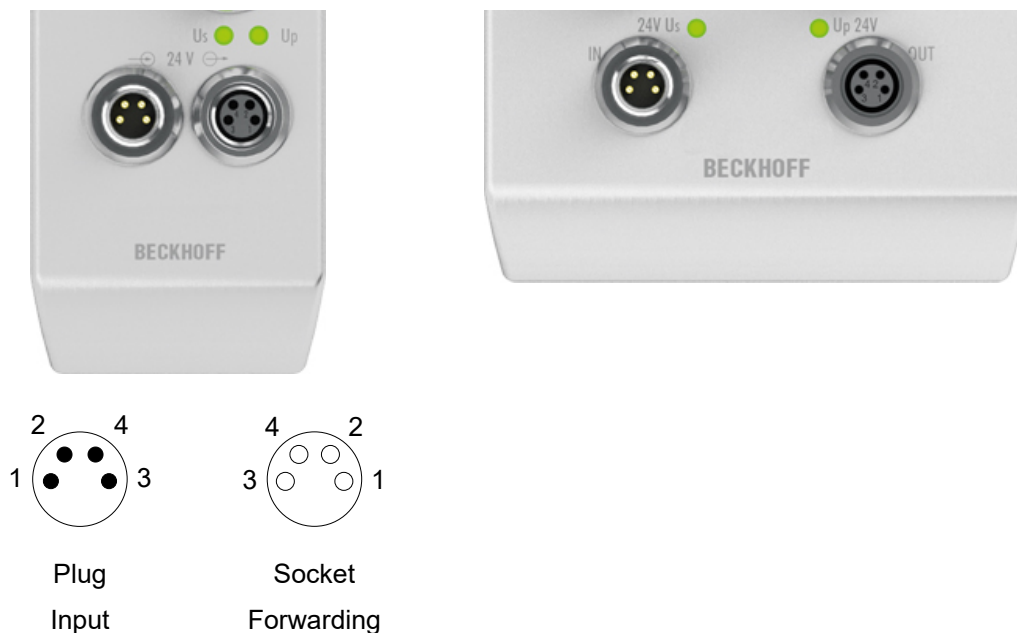


Fig. 2: M8 connector

Contact	Function	Description	Core color <sup>1)</sup>
1	$U_s$	Control voltage	Brown
2	$U_p$	Peripheral voltage	White
3	$GND_s$	GND to $U_s$	Blue
4	$GND_p$	GND to $U_p$	Black

<sup>1)</sup> The core colors apply to cables of the type: Beckhoff ZK2020-3xxx-xxxx



### 4.2.2 Status LEDs



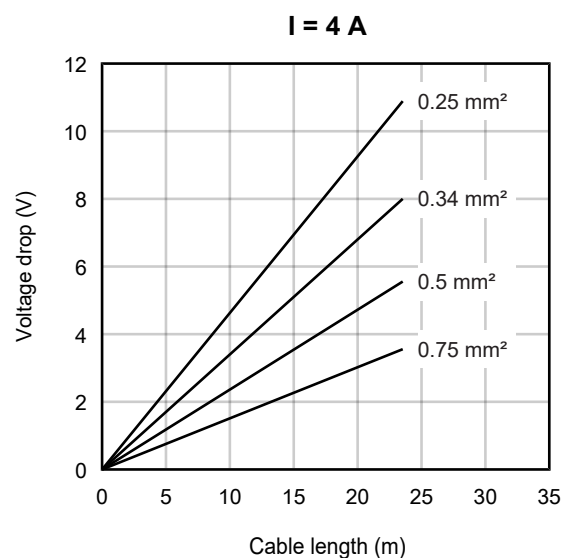
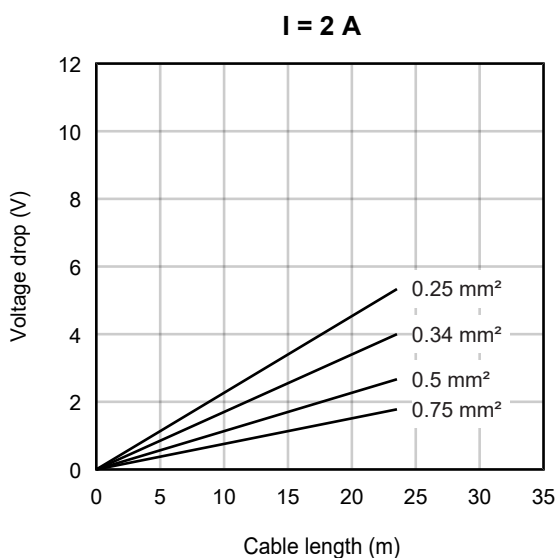
LED	Display	Meaning
U <sub>s</sub>	off	The supply voltage U <sub>s</sub> is not available
	green illuminated	The supply voltage U <sub>s</sub> is available
	red illuminated	The sensor supply was switched off due to overload <sup>1)</sup>
U <sub>p</sub>	off	The supply voltage U <sub>p</sub> is not available
	green illuminated	The supply voltage U <sub>p</sub> is available
	red illuminated	The sensor supply was switched off due to overload <sup>1)</sup>

<sup>1)</sup> It is irrelevant which of the two LEDs lights up red. The sensor supply can also be branched off from the respective other supply voltage. See "Sensor supply" in the technical data.

### 4.2.3 Conductor losses

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

#### Voltage drop on the supply line



## 4.3 I/O signal connection

This chapter is in preparation.

### NOTICE



#### See documentation for the EPxxxx series

For each module of the EQxxxx series there is a module of the EPxxxx series with the same I/O functionality.

- Please refer to the [documentation for the corresponding module from the EPxxxx series](#) [▶\_10].

## 5 UL Requirements

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

### Supply voltage

#### ⚠ CAUTION

##### CAUTION!

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

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

#### ⚠ CAUTION

##### CAUTION!

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

### Networks

#### ⚠ CAUTION

##### CAUTION!

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

### Ambient temperature range

#### ⚠ CAUTION

##### CAUTION!

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

### Marking for UL

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



Fig. 3: UL label

## 6 Commissioning and configuration

This chapter is in preparation.

### NOTICE



#### See documentation for the EPxxxx series

For each module of the EQxxxx series there is a module of the EPxxxx series with the same I/O functionality.

- Please refer to the [documentation for the corresponding module from the EPxxxx series](#) [[▶\\_10](#)].

## 7 Appendix

### 7.1 Version identification of EtherCAT devices

#### 7.1.1 General notes on marking

##### Designation

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

- family key
- type
- version
- revision

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

##### Notes

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

## 7.1.2 Version identification of IP67 modules

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

Structure of the serial number: **KK YY FF HH**

KK - week of production (CW, calendar week)

YY - year of production

FF - firmware version

HH - hardware version

Example with serial number 12 06 3A 02:

12 - production week 12

06 - production year 2006

3A - firmware version 3A

02 - hardware version 02

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

Syntax: D ww yy x y z u

D - prefix designation

ww - calendar week

yy - year

x - firmware version of the bus PCB

y - hardware version of the bus PCB

z - firmware version of the I/O PCB

u - hardware version of the I/O PCB

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

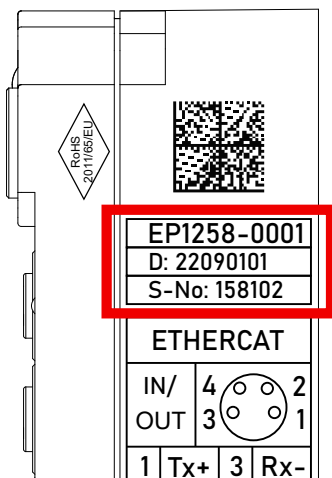


Fig. 4: EP1258-00001 IP67 EtherCAT Box with batch number/DateCode 22090101 and unique serial number 158102

### 7.1.3 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.

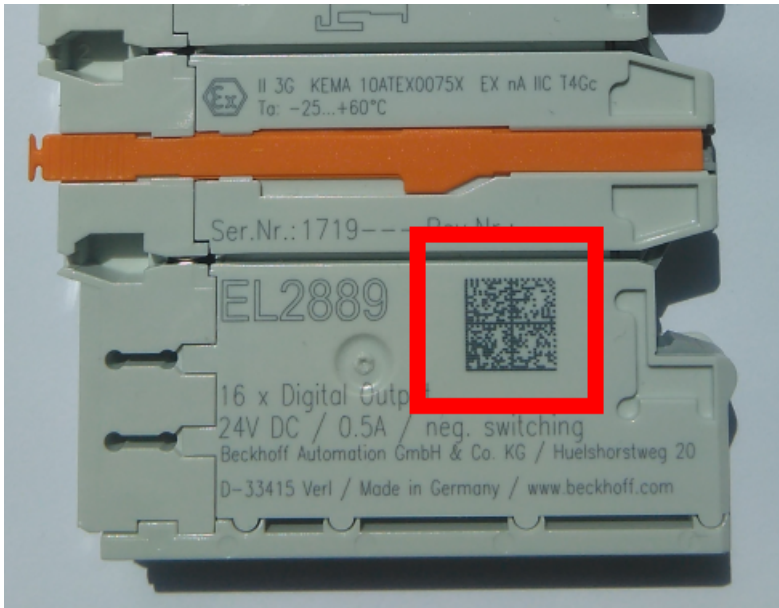


Fig. 5: BIC as data matrix code (DMC, code scheme ECC200)

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	<b>Beckhoff order number</b>	1P	8	<b>1P</b> 072222
2	Beckhoff Traceability Number (BTN)	<b>Unique serial number, see note below</b>	SBTN	12	<b>S</b> BTNk4p562d7
3	Article description	<b>Beckhoff article description, e.g. EL1008</b>	1K	32	<b>1K</b> EL1809
4	Quantity	<b>Quantity in packaging unit, e.g. 1, 10, etc.</b>	Q	6	<b>Q</b> 1
5	Batch number	Optional: Year and week of production	2P	14	<b>2P</b> 401503180016
6	ID/serial number	Optional: Present-day serial number system, e.g. with safety products	51S	12	<b>51S</b> 678294
7	Variant number	Optional: Product variant number on the basis of standard products	30P	32	<b>30P</b> 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:

**1P**072222**S**BTNk4p562d7**1K**EL1809 **Q**1 **51S**678294

Accordingly as DMC:



Fig. 6: Example DMC **1P**072222**S**BTNk4p562d7**1K**EL1809 **Q**1 **51S**678294

### BTN

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

### NOTICE

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



## 7.1.4 Electronic access to the BIC (eBIC)

### Electronic BIC (eBIC)

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

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

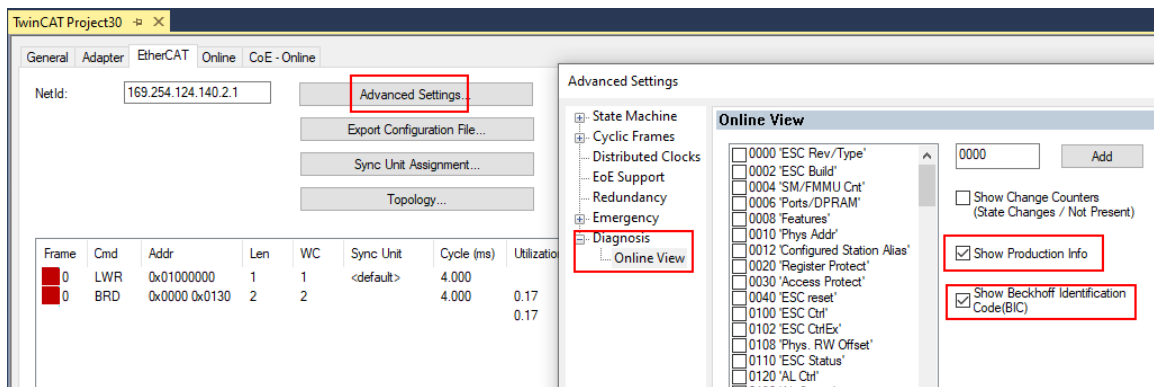
### EtherCAT devices (IP20, IP67)

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

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

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

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



- The BTN and its contents are then displayed:

No	Addr	Name	State	CRC	Fw	Hw	Production Data	ItemNo	BTN	Description	Quantity	BatchNo	SerialNo
1	1001	Term 1 (EK1100)	OP	0,0	0	0	---						
2	1002	Term 2 (EL1018)	OP	0,0	0	0	2020 KW36 Fr	072222	k4p562d7	EL1809	1		678294
3	1003	Term 3 (EL3204)	OP	0,0	7	6	2012 KW24 Sa						
4	1004	Term 4 (EL2004)	OP	0,0	0	0	---	072223	k4p562d7	EL2004	1		678295
5	1005	Term 5 (EL1008)	OP	0,0	0	0	---						
6	1006	Term 6 (EL2008)	OP	0,0	0	12	2014 KW14 Mo						
7	1007	Term 7 (EK1110)	OP	0	1	8	2012 KW25 Mo						

- 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	1P158442SBTN0008jckp1KELM3704 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\_Uilities* as of TwinCAT 3.1 build 4024.24
  - *F\_SplitBIC*: The function splits the Beckhoff Identification Code (BIC) *sBICValue* into its components using known identifiers and returns the recognized substrings in the *ST\_SplittedBIC* structure as a return value
  - *BIC\_TO\_BTN*: The function extracts the BTN from the BIC and returns it as a return value
- Note: If there is further electronic processing, the BTN is to be handled as a string(8); the identifier "SBTN" is not part of the BTN.
- Technical background
 

The new BIC information is written as an additional category in the ESI-EEPROM during device production. The structure of the ESI content is largely dictated by the ETG specifications, therefore the additional vendor-specific content is stored using a category in accordance with the ETG.2010. ID 03 tells all EtherCAT masters that they may not overwrite these data in the event of an update or restore the data after an ESI update.

The structure follows the content of the BIC, see here. The EEPROM therefore requires approx. 50..200 bytes of memory.
- Special cases
  - If multiple hierarchically arranged ESCs are installed in a device, only the top-level ESC carries the eBIC information.
  - If multiple non-hierarchically arranged ESCs are installed in a device, all ESCs carry the eBIC information.
  - If the device consists of several sub-devices which each have their own identity, but only the top-level device is accessible via EtherCAT, the eBIC of the top-level device is located in the CoE object directory 0x10E2:01 and the eBICs of the sub-devices follow in 0x10E2:nn.

## 7.2 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.

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