BECKHOFF New Automation Technology

Operating Instructions | EN

EL9930

PROFIsafe Segment End Terminal

2023-03-08 | Version: 2.0.0

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1 Notes on the documentation

1.1 Disclaimer

Beckhoff products are subject to continuous further development. We reserve the right to revise the operating instructions 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 these operating instructions.

In these operating instructions we define all permissible use cases whose properties and operating conditions we can guarantee. The use cases we define are fully tested and certified. Use cases beyond this, which are not described in these operating instructions, require the approval of Beckhoff Automation GmbH & Co KG.

1.1.1 Trademarks

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The use of other brand names or designations by third parties may lead to an infringement of the rights of the owners of the corresponding designations.

1.1.2 Patents

The EtherCAT technology is protected by patent rights through the following registrations and patents with corresponding applications and registrations in various other countries:

- EP1590927
- EP1789857
- EP1456722
- EP2137893
- DE102015105702

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH.

Safety over EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH.

1.1.3 Limitation of liability

All components in this product as described in the operating instructions are delivered in a specific configuration of hardware and software, depending on the application regulations. Modifications and changes to the hardware and/or software configuration that go beyond the documented options are prohibited and nullify the liability of Beckhoff Automation GmbH & Co. KG.

The following is excluded from the liability:

- Failure to observe these operating instructions
- Improper use
- Use of untrained personnel
- Use of unauthorized spare parts

1.1.4 Copyright

1.2 Documentation issue status

Version	Comment
2.0.0	• Foreword changed to Notes on the documentation [▶ 5] and For your safety [▶ 10] • Maintenance and cleaning [▶ 32] and Decommissioning [▶ 33] adapted • In chapter Technical data [▶ 15] link to download page of certificates added • Appendix adapted and expanded
1.2.0	• Update of the configuration of the terminal in TwinCAT
1.1.0	• Update of the configuration of the terminal in TwinCAT
1.0.0	• First released version

Currentness

Please check whether you are using the current and valid version of this document. The current version can be downloaded from the Beckhoff homepage at http://www.beckhoff.de/twinsafe. In case of doubt, please contact Technical Support (see Beckhoff Support and Service [▶ 9]).

Origin of the document

The original documentation is written in German. All other languages are derived from the German original.

Product features

Only the product properties specified in the current operating instructions are valid. Further information given on the product pages of the Beckhoff homepage, in emails or in other publications is not authoritative.

1.3 Staff qualification

These operating instructions are intended exclusively for trained specialists in control technology and automation with the relevant knowledge.

The trained specialist personnel must ensure that the applications and use of the described product meet all safety requirements. This includes all applicable and valid laws, regulations, provisions and standards.

Trained specialists

Trained specialists have extensive technical knowledge from studies, apprenticeships or technical training. Understanding of control technology and automation is available. Trained specialists can:

- Independently identify, avoid and eliminate sources of hazard.
- Apply relevant standards and directives.
- Implement specifications from accident prevention regulations.
- Evaluate, prepare and set up the workplaces.
- Evaluate, optimize and execute work independently.

1.4 Safety and instruction

Read the contents that refer to the activities you have to perform with the product. Always read the chapter For your safety [▶ 10] in the operating instructions.

Observe the warnings in the chapters so that you can handle and work with the product as intended and safely.

1.4.1 Explanation of symbols

Various symbols are used for a clear arrangement:

1. The numbering indicates an action that should be taken.
- The bullet point indicates an enumeration.

[…] The square brackets indicate cross-references to other text passages in the document.

[1] The number in square brackets indicates the numbering of a referenced document.

1.4.1.1 Pictograms

In order to make it easier for you to find text passages, pictograms and signal words are used in warning notices:

⚠ DANGER

Failure to observe will result in serious or fatal injuries.

⚠ WARNING

Failure to observe may result in serious or fatal injuries.

⚠ CAUTION

Failure to observe may result in minor or moderate injuries.

NOTE

Notes

Notes are used for important information on the product. The possible consequences of failure to observe these include:

- Malfunctions of the product
- Damage to the product
- Damage to the environment

Information

This sign indicates information, tips and notes for dealing with the product or the software.

1.5 Beckhoff Support and Service

Support

Beckhoff Support offers technical advice on the use of individual Beckhoff products and system planning. The employees support you in the programming and commissioning of sophisticated automation systems.

Hotline:	+49 5246/963-157
E-mail:	support@beckhoff.com
Web:	www.beckhoff.com/support

Training

Training in Germany takes place in our training center at the Beckhoff headquarters in Verl, at subsidiaries or, by arrangement, at the customer's premises.

Hotline:	+49 5246/963-5000
E-mail:	training@beckhoff.com
Web:	www.beckhoff.com/training

Service

The Beckhoff Service Center supports you with after-sales services such as on-site service, repair service or spare parts service.

Hotline:	+49 5246/963-460
E-mail:	service@beckhoff.com
Web:	www.beckhoff.com/service

Download area

In the download area you can obtain product information, software updates, the TwinCAT automation software, documentation and much more.

Web:	www.beckhoff.com/download

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For the addresses of our worldwide locations, please visit our website at Global Presence.

2 For your safety

Read this chapter containing general safety information. In addition, always observe the safety instructions and warnings in these operating instructions for your own safety, the safety of other persons and the safety of the product.

When working with control and automation products, many dangers can result from careless or incorrect use. Work particularly thoroughly, not under time pressure and responsibly towards other people.

2.1 Duty of care

Read entire documentation for TwinSAFE component

- TwinSAFE application manual
- EL6910 TwinSAFE logic terminal operating manual
- TwinSAFE Logic FB documentation manual

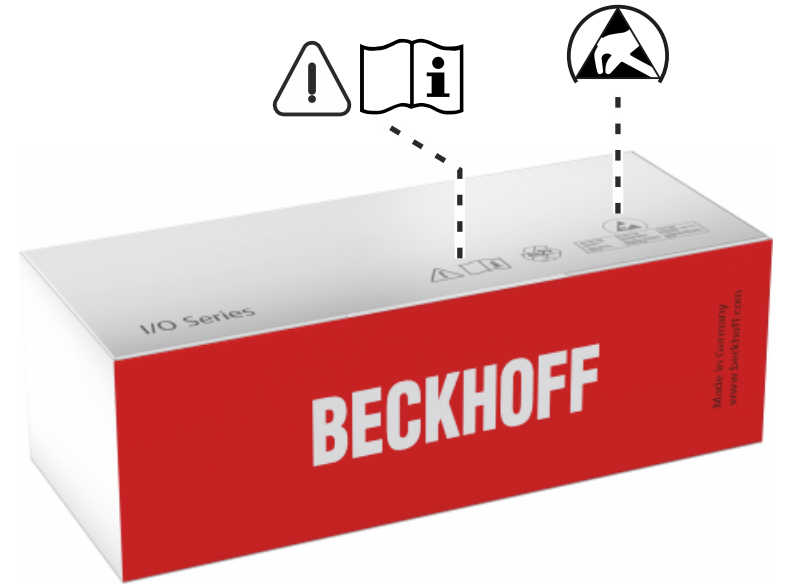
The operator must comply with all the requirements and notes specified in these operating instructions in order to fulfill his duty of care. This includes in particular that you

- comply with the provisions defined in the chapter Limitation of liability [▶ 6].
- only operate the TwinSAFE component when it is in perfect working order.
- provide the operating instructions in a legible condition and complete at the place of use of the TwinSAFE component.
- do not remove the safety markings attached to the TwinSAFE component and maintain their legibility.

No disposal in domestic waste
Products marked with a crossed-out waste bin must not be disposed of with domestic waste. The device is considered waste electrical and electronic equipment when it is disposed of. Observe the national regulations for the disposal of waste electrical and electronic equipment.

2.2 Safety image signs

On Beckhoff products you will find attached or lasered safety pictograms, which vary depending on the product. They serve to serve to ensure safety for people and to prevent damage to the products. Safety pictograms must not be removed and must be legible for the user.



Read and observe the operating instructions
Commissioning is only permitted if the operating instructions have been read and understood beforehand. This applies in particular to the safety instructions and warnings.

Electrostatic sensitive components
Work with and on the TwinSAFE component is only permitted in protected workplaces.

2.3 General safety instructions

2.3.1 Before operation

Use in machines according to the Machinery Directive

Only use the TwinSAFE component in machines that comply with the Machinery Directive. This is how you ensure safe operation.

Ensure traceability

Ensure the traceability of the TwinSAFE component via the serial number.

Use SELV/PELV power supply

Use a SELV/PELV power supply unit with an output-side voltage limit of U_{max} = 36 V_{DC} to supply the TwinSAFE component with 24 V_{DC}.

Failure to observe this will endanger the safety function of the product. Depending on the machine, death and danger to life, serious physical injury and damage to the machine may result.

Carry out commissioning test

Before commissioning, wiring faults to the sensors must be excluded. Before commissioning, carry out a commissioning test. After a successful commissioning test, you can use the TwinSAFE component for the intended safety-related task.

In case of wiring errors, the safety function of the product is at risk. Depending on the machine, death and danger to life, serious bodily injury and damage to the machine may result.

2.3.2 In operation

Interference due to emitted interference

Do not operate the following devices in the vicinity of the TwinSAFE component: for example, radio telephones, radios, transmitters or high-frequency systems.

TwinSAFE components comply with the requirements of the applicable electromagnetic compatibility standards with regard to interference emission and immunity. If you exceed the limits for emitted interference specified in the standards, the function of the TwinSAFE component may be impaired.

2.3.3 After operation

De-energize and switch off components before working on them

Check all safety-relevant equipment for functionality before working on the TwinSAFE component. Secure the working environment. Secure the machine or plant against being inadvertently started up. Observe the chapter Decommissioning [▶ 33].

3 Product description

3.1 EL9930 - PROFIsafe segment end terminal

The EL9930 EtherCAT Terminal is a standard EtherCAT Terminal. The terminal is required in order to implement permissible PROFIsafe master and slave configurations together with a TwinSAFE Logic component that supports this function. This is currently the EL6910 TwinSAFE Logic terminal, for example, which supports the PROFIsafe master and PROFIsafe slave function.

Fig. 1: EL9930 EtherCAT Terminal

The EL9930 registers itself as two EtherCAT slaves when the I/O configuration is scanned. Once as EL9930-0000 and once as EL9930-0001. Hence, it is possible to set which PROFIsafe data need to be buffered for both data directions.

The block diagram shows the communication path of the EtherCAT telegram through the EL9930.

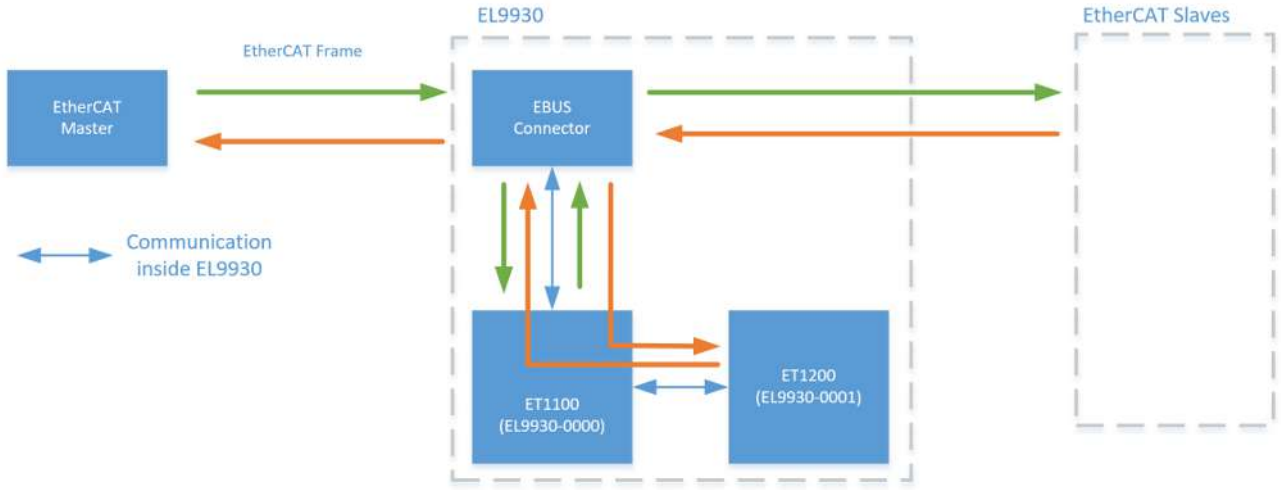


Fig. 2: EL9930 – EtherCAT communication

3.2 Technical data

The current certificates of all TwinSAFE products with the underlying standards and directives can be found at https://www.beckhoff.com/en-en/support/download-finder/certificates-approvals/.

Product designation	EL9930
Number of inputs/outputs	0
Supply voltage (SELV/PELV)	24 V_{DC} (–15% / +20%)
Current consumption via E-bus	approx. 120 mA
Power dissipation of the terminal	typically 1 W
Dimensions (W x H x D)	12 mm x 100 mm x 68 mm
Weight	app. 42 g
Input process image	Dynamic in accordance with the configuration in TwinCAT 3
Output process image	Dynamic in accordance with the configuration in TwinCAT 3
Permissible ambient temperature (operation)	-25 °C to +55 °C
Permissible ambient temperature (transport/ storage)	-40 °C to +70 °C
Permissible air humidity	5% to 95%, non-condensing
Permissible air pressure (operation/storage/ transport)	750 hPa to 1100 hPa (this corresponds to an altitude of approx. -690 m to 2450 m above sea level, assuming an international standard atmosphere)
Climate category according to EN 60721-3-3	3K3 (the deviation from 3K3 is possible only with optimal environmental conditions and also applies only to the technical data which are specified differently in this documentation)
Permissible level of contamination according to EN 60664-1	Level of contamination 2
Inadmissible operating conditions	The terminal must not be used under the following operating conditions: • under the influence of ionizing radiation (exceeding the natural background radiation) • in corrosive environments • in an environment that leads to unacceptable soiling of the Bus Terminal
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
Shocks	15 g with pulse duration 11 ms in all three axes
Protection class	IP20
Permitted operating environment	In the control cabinet or terminal box, with minimum protection class IP54 according to IEC 60529
correct installation position	see chapter Installation position and minimum distances [▶ 19]
Approvals / identification	CE

3.3 Dimensions

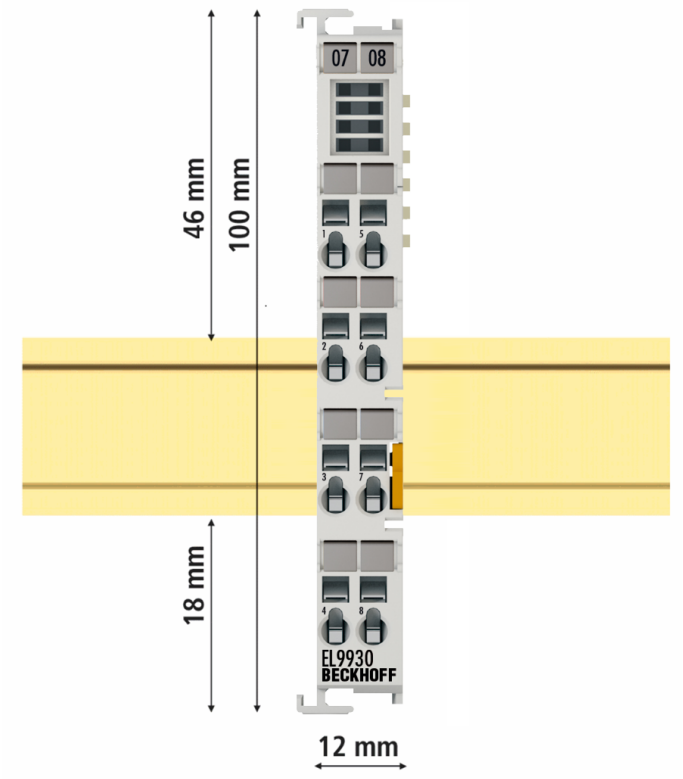


Fig. 3: EL9930 - Dimensions

Width: 12 mm (side-by-side installation)

Height: 100 mm

Depth: 68 mm

3.4 EL6930 connection

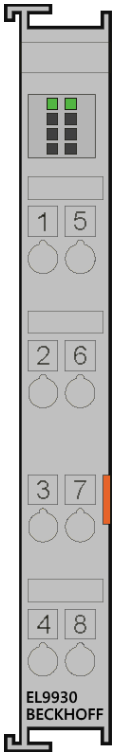


Fig. 4: EL6930 connection

Terminal point	Output	Signal
1	-	not used, no function
2		not used, no function
3	-	not used, no function
4		not used, no function
5	-	not used, no function
6		not used, no function
7	-	not used, no function
8		not used, no function
Power contact +	-	not used, no function
Power contact -	-	not used, no function

4 Operation

4.1 Installation

4.1.1 Safety instructions

Before installing and commissioning the EL components, please read the safety instructions in the foreword of this documentation.

4.1.2 Instructions for ESD protection

NOTE	
	**Devices can be destroyed by electrostatic charging!** The devices contain electrostatically sensitive components which can be damaged by improper handling. • Please ensure you are electrostatically discharged when handling the components; also avoid touching the spring contacts directly (see illustration). • Avoid contact with highly insulating materials (synthetic fibers, plastic films etc.) • When handling the components, ensure good grounding of the environment (workplace, packaging and persons) • Each bus station must be terminated on the right side with the EL9011 or EL9012 end cap to ensure the protection class and ESD protection.

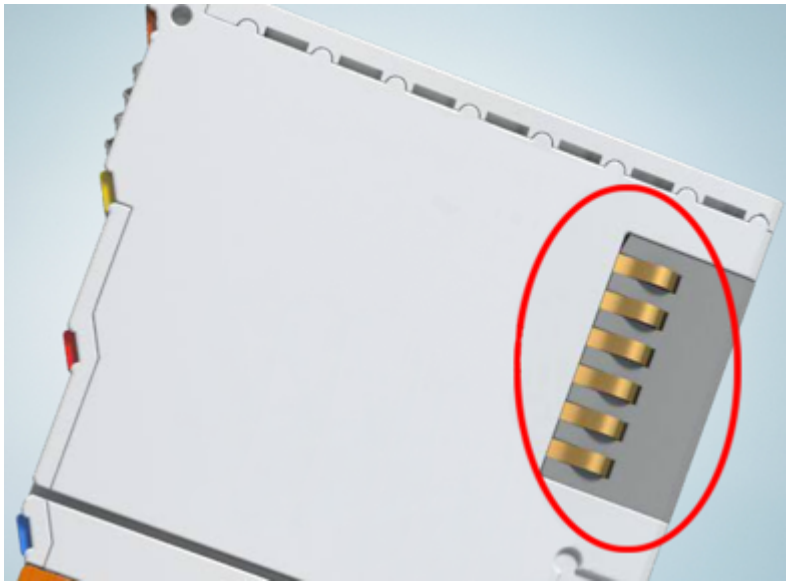


Fig. 5: Spring contacts of Beckhoff I/O components

4.1.3 Transport / storage

Use the original packaging in which the components were delivered for transporting and storing the EL components.

⚠ CAUTION

Note the specified environmental conditions

Please ensure that the EL components are only transported and stored under the specified environmental conditions (see technical data).

4.1.4 Mechanical installation

⚠ WARNING

Risk of injury!

Bring the bus system into a safe, de-energized state before starting installation, disassembly or wiring of the devices!

4.1.4.1 Control cabinet / terminal box

For operation the EL9930 terminals must be installed in a control cabinet or terminal box with a minimum protection class of IP54 according to IEC 60529.

4.1.4.2 Installation position and minimum distances

For the prescribed installation position the mounting rail is installed horizontally and the mating surfaces of the EL/KL terminals point toward the front (see illustration below). The terminals are ventilated from below, which enables optimum cooling of the electronics through convection. The direction indication “down” corresponds to the direction of positive acceleration due to gravity.

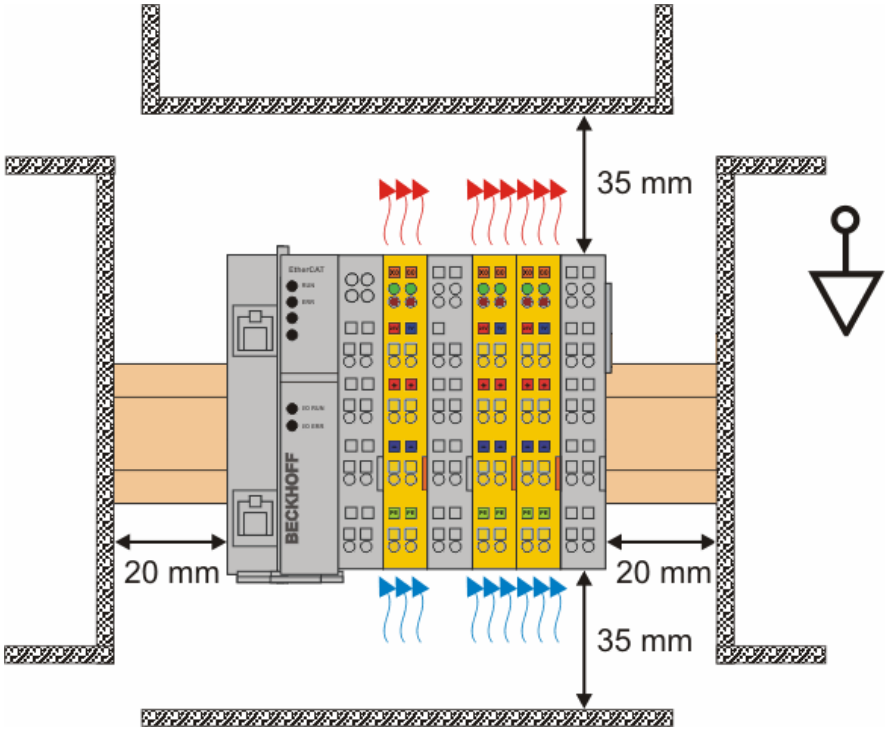


Fig. 6: Installation position and minimum distances

In order to ensure optimum convection cooling, the distances to neighboring devices and to control cabinet walls must not be smaller than those shown in the diagram.

4.1.4.3 Installation on mounting rails

⚠ 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!

Assembly

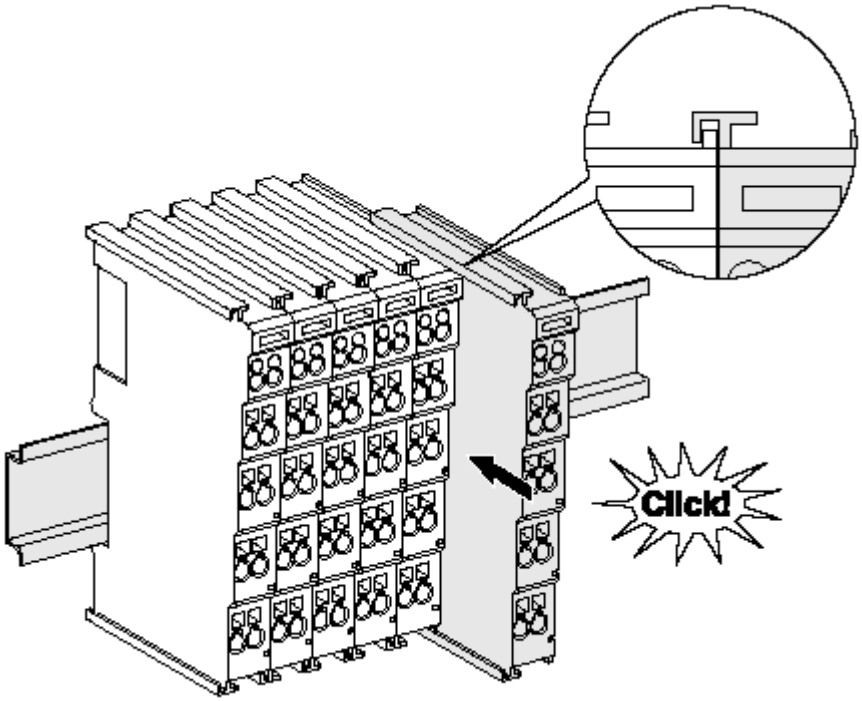


Fig. 7: Attaching on mounting rail

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).

Disassembly

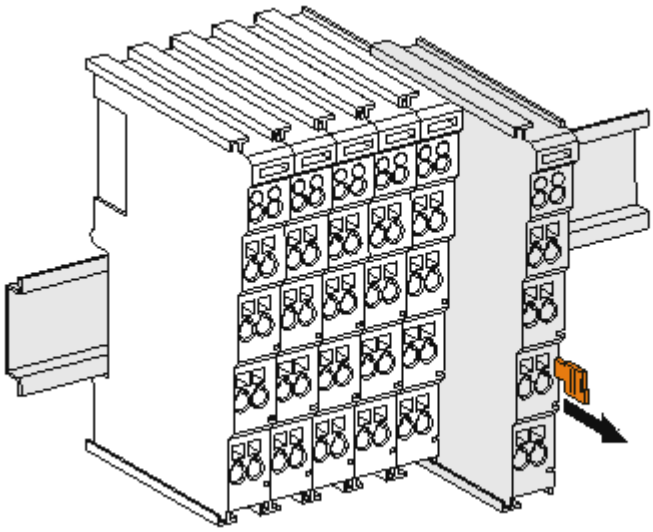


Fig. 8: Disassembling of terminal

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.

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 contacts of the K-Bus/E-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 terminals on the Bus Coupler (up to 24 V) or for higher voltages via power feed terminals.

Power Contacts

During the design of a bus terminal block, the pin assignment of the individual Bus Terminals must be taken account of, since some types (e.g. analog Bus Terminals or digital 4-channel Bus Terminals) do not or not fully loop through the power contacts. Power Feed Terminals (KL91xx, KL92xx or EL91xx, EL92xx) interrupt the power contacts and thus represent the start of a new supply rail.

4.1.5 Electrical installation

4.1.5.1 Connections within a Bus Terminal block

The electric connections between the Bus Coupler and the Bus Terminals are automatically realized by joining the components:

Spring contacts (E-bus)

The six spring contacts of the E-bus deal with the transfer of the data and the supply of the Bus Terminal electronics.

NOTE

Observe the E-bus current

Observe the maximum current that your Bus Coupler can supply to the E-bus! Use the EL9410 Power Supply Terminal if the current consumption of your terminals exceeds the maximum current that your Bus Coupler can feed to the E-bus supply.

The EL9930 has no further contacts such as power contacts or PE contacts.

4.1.5.2 Overvoltage protection

If protection against overvoltage is necessary in your plant, provide a surge filter for the voltage supply to the Bus Terminal blocks and the TwinSAFE terminals.

4.2 Configuration of the terminal in TwinCAT

4.2.1 Configuration requirements

Version 3.1 Build 4024 or higher of the TwinCAT automation software is required for configuring the EL9930. The current version is available for download from the Beckhoff website (www.beckhoff.de).

TwinCAT support

The EL9930 cannot be used under TwinCAT 2.

4.2.2 Adding an EtherCAT coupler

See TwinCAT 3 automation software documentation.

4.2.3 Adding an EtherCAT Terminal

See TwinCAT 3 automation software documentation.

4.2.4 Inserting an EL9930

An EL9930-0000 or EL9930-0001 terminal is inserted in exactly the same way as any other EtherCAT Terminal from Beckhoff. In the list, open *System Terminals* and select the EL9930-0000 or EL9930-0001.

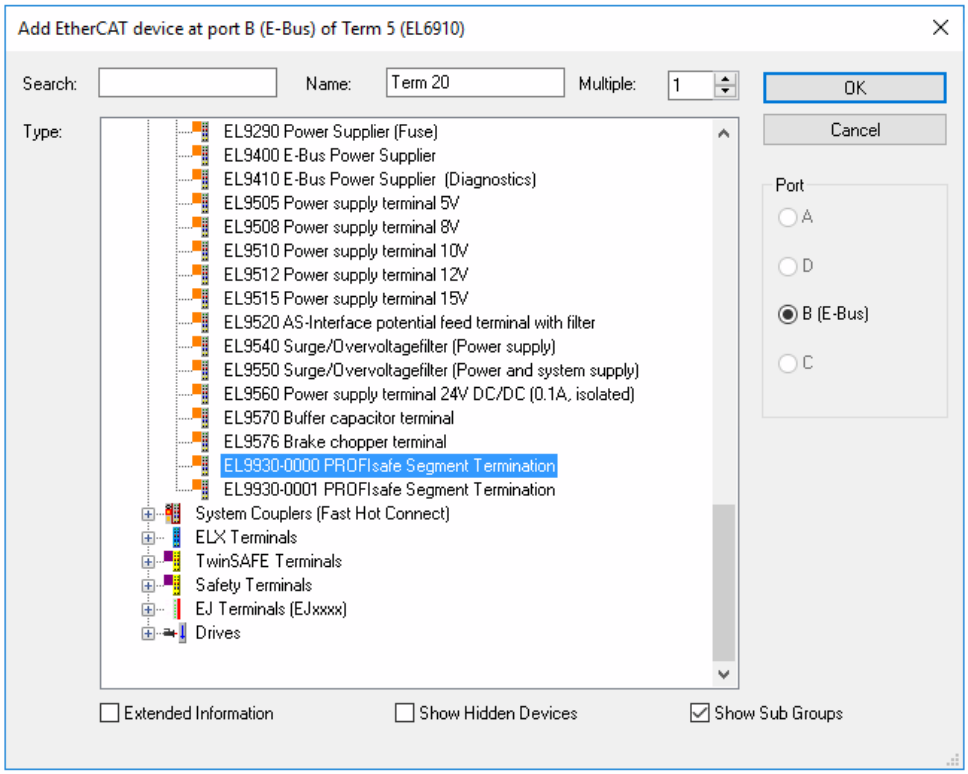


Fig. 9: Inserting an EL9930

4.2.5 Settings in TwinCAT

Scan or create the IO configuration

Each EL9930 registers itself twice in the configuration in TwinCAT:

- once as EL9930-0000 (primary, shown in figure as EL9930)
- once as EL9930-0001 (secondary).

The reason for this is that both the forward and backward direction of the EtherCAT telegram have to be regarded for the ending of the PROFIsafe segment on account of the functional principle of EtherCAT. The representation EL9930-0001 (secondary) is a virtual node in the I/O configuration (no real component). Both instances must be placed correctly so that the PROFIsafe segment is limited in accordance with the PROFIsafe policy (see illustration below). The primary and secondary instance must be at the same level in the I/O tree, while the elements between these instances must be configured as a subtree of the primary instance.

By using the scan function in TwinCAT 3, you can ensure that the integration of the two instances of each EL9930 in the I/O tree is executed correctly.

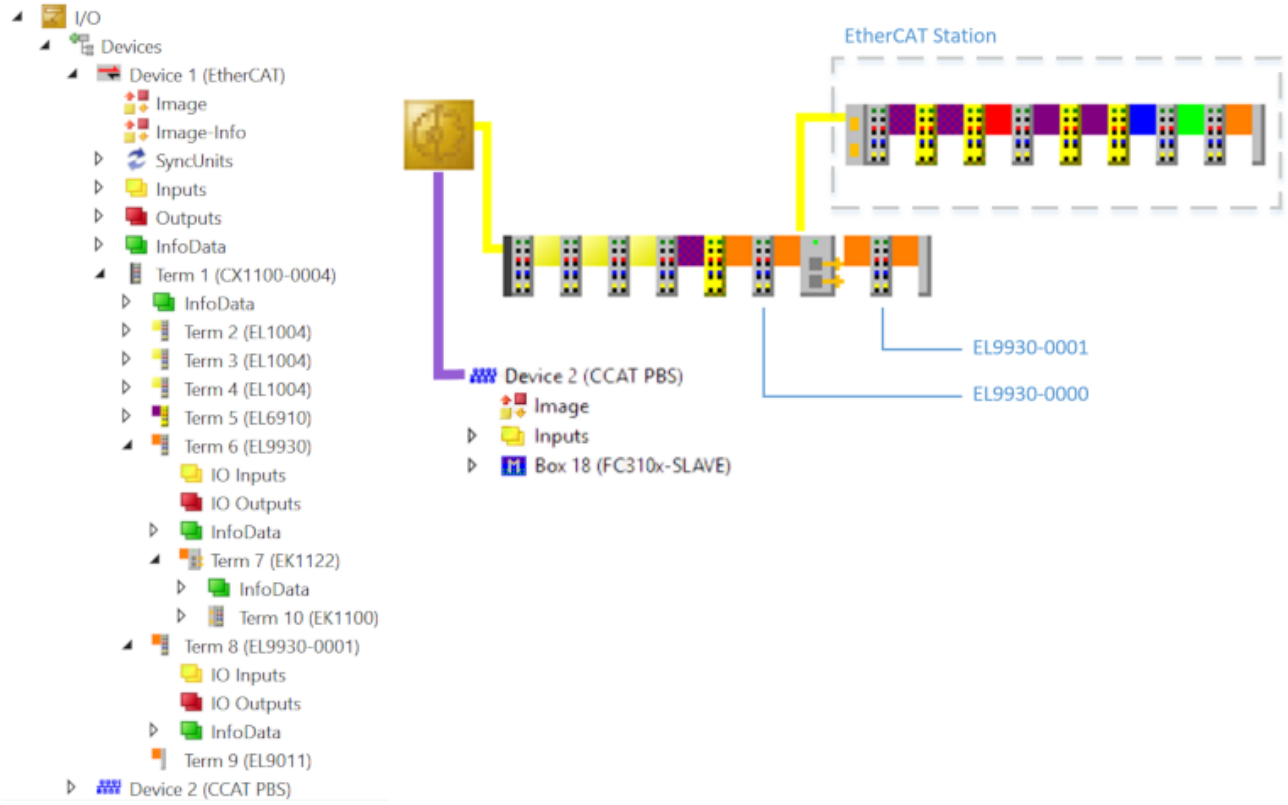


Fig. 10: Representation of the EL9930 in TwinCAT

Alias Device

To connect the EL6910 with a PROFIsafe device, a corresponding *Alias Device* must be created and the desired telegram length configured.

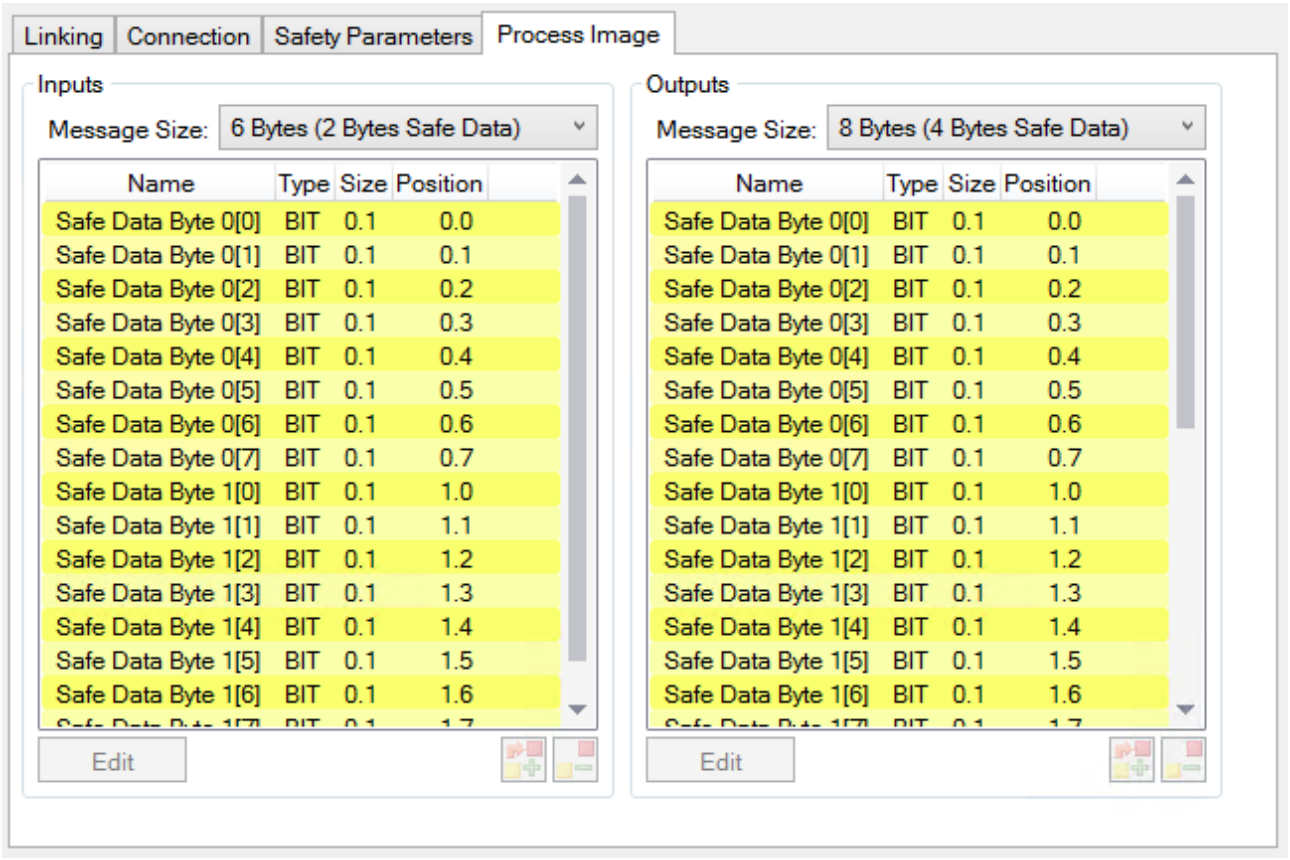


Fig. 11: Process Image - Custom PROFIsafe Connection

For the further configuration of the EL9930-000x, the target system must be assigned to an EL6910 in the safety project.

Creation of the IO image of the EL9930-000x

The configuration of the IO image of the EL9930-000x is done via the configuration of the EL6910 in the I/O tree (underneath the *EtherCAT* node.) If a PROFIsafe connection has been configured for the EL6910, the device has an extra tab called PROFIsafe, where the support of the EL9930 components must be activated by checking the checkbox *Enable EL9930 Support* . Subsequently, the automatic generation of the remaining configuration can be initiated via the button *Create EL9930 variables.* As a result, the process image of the EL9930 instances is generated on the one hand, while the configuration of the Sync Units necessary for successful use of the EL9930 architecture is automatically generated on the other. The EL6910s, the EL9930-0000s and the EL9930-0001s must be located in the same Sync Unit (in the figure __PROFISAFE__).

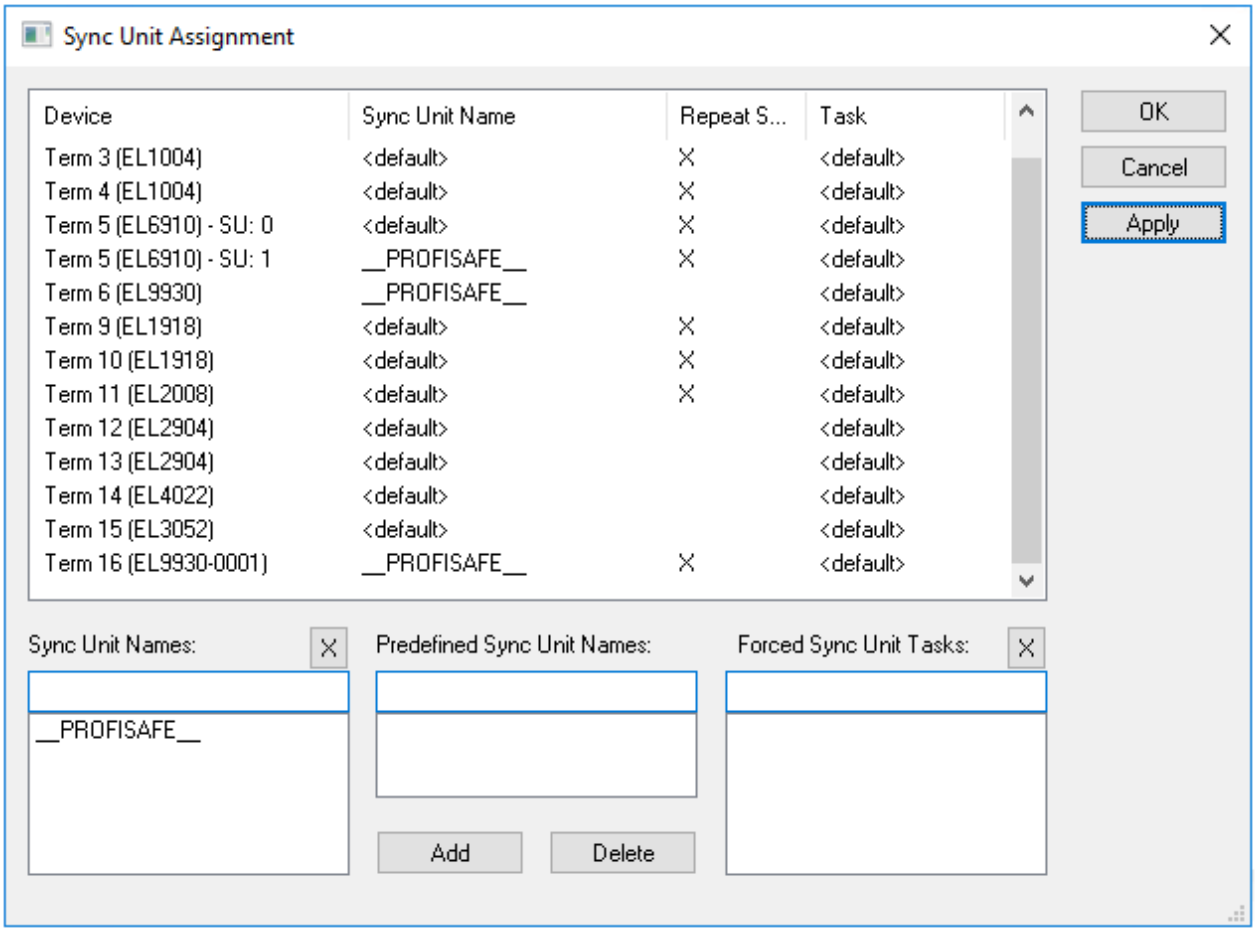


Fig. 12: Configuration of the Sync Unit

After these steps, the configuration of the EL9930 is complete.

4.3 Diagnostic LEDs

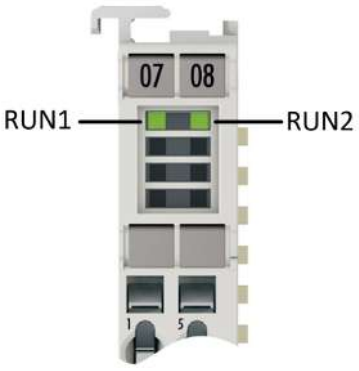


Fig. 13: Diagnostic LEDs of the EL9930

The EL9930 has two RUN LEDs.

LED	Description
RUN1	The left RUN LED indicates the EtherCAT status of the EL9930-0000.
RUN2	The right RUN LED indicates the EtherCAT status of the EL9930-0001.

LED display	EtherCAT status	Description
off	INIT / BOOTSTRAP	Initialization of the terminal or BOOTSTRAP mode.

LED display	EtherCAT status	Description
flashing	PreOP	Function for mailbox communication and different default settings set.
single flash	SafeOP	Verification of the Sync Manager channels and the distributed clocks. The outputs remain in safe state.
on	OP	Normal operating state; mailbox and process data communication is possible.

5 PROFIsafe configurations

PROFIsafe telegram only via E-bus and PROFINET/PROFIBUS

On account of the PROFIsafe policy, the use of PROFIsafe is permitted only via the PROFIBUS and PROFINET fieldbuses or via a backplane bus, in this case for example the E-bus. The use of PROFIsafe via other fieldbuses is impermissible for reasons connected with patent law. This must be ensured through the use of the EL9930 segment end terminal.

The following Siemens AG patents are relevant according to the PROFIsafe profile:
- EP1267270-A2 Method for data transfer
- WO00/045562-A1 Method and device for determining the reliability of data carriers
- WO99/049373-A1 Shortened data message of an automation system
- EP1686732 Method and system for transmitting protocol data units
- EP1802019 Identification of errors in data transmission
- EP1921525-A1 Method for operation of a safety-related system
- EP13172092.2 Method and system for detection of errors

5.1 PROFIsafe configurations without EL9930

The use of the EL9930 is not necessary for the following configurations, because the PROFIsafe telegram leaves the E-bus only via PROFIBUS or PROFINET. The PROFIsafe policy is thus not violated.

CX controller with PROFIBUS/PROFINET interface

The PROFIsafe telegram is transmitted to the TwinCAT runtime only via the E-bus and is then sent to the PROFIsafe device via the fieldbus interface integrated in the CX controller.

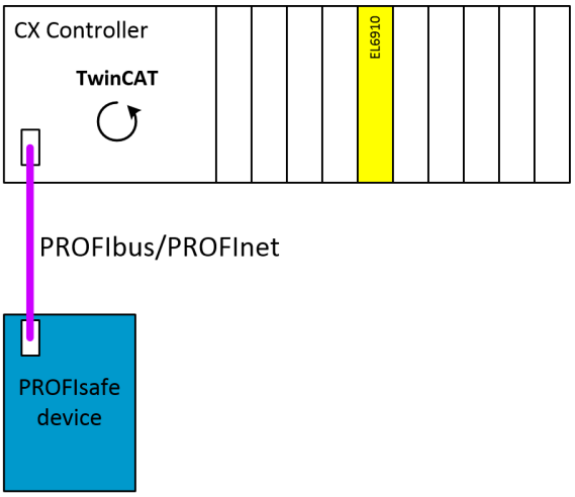


Fig. 14: Valid PROFIsafe configuration - example 1

CX controller with PROFIBUS/PROFINET interface and EtherCAT network

The PROFIsafe telegram is transmitted to the TwinCAT runtime only via the E-bus and is then sent to the PROFIsafe device via the fieldbus interface integrated in the CX controller. An extension via a further EtherCAT interface integrated in the CX controller is easily possible as long as no PROFIsafe devices are present on it.

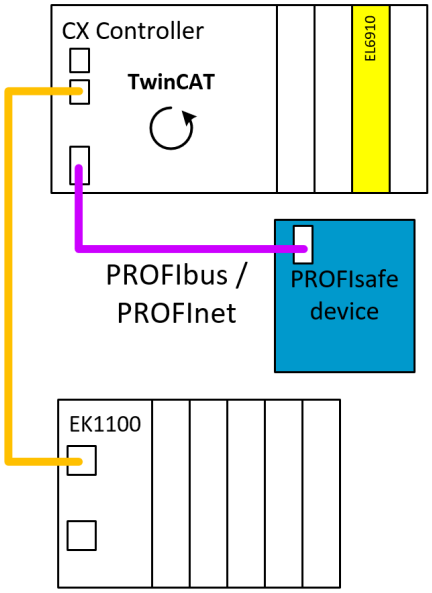


Fig. 15: Valid PROFIsafe configuration - example 2

CX controller with PROFIBUS/PROFINET-EtherCAT Terminal

The PROFIsafe telegram is transmitted to the TwinCAT runtime only via the E-bus and is then sent to the fieldbus master EtherCAT Terminal and to the PROFIsafe device via the E-bus. An extension via a further EtherCAT interface integrated in the CX controller is easily possible as long as no PROFIsafe devices are present on it.

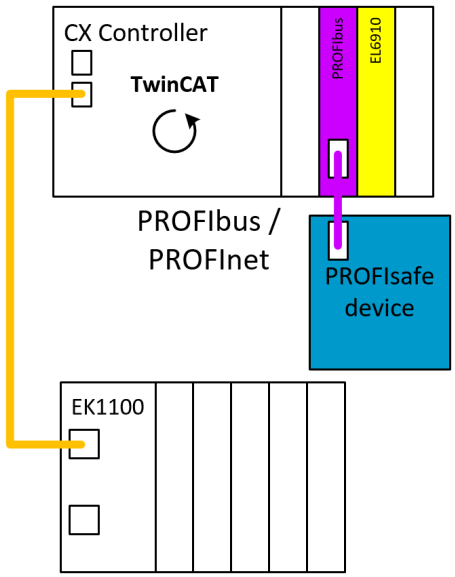


Fig. 16: Valid PROFIsafe configuration - example 3

5.2 PROFIsafe configurations with EL9930

The use of the EL9930 is necessary for the following configurations, because the PROFIsafe telegram would also be transmitted via a fieldbus that is not PROFIBUS or PROFINET. Before leaving the E-bus on EtherCAT, the telegram must be filtered out and copied again into the telegram to the PROFIBUS/ PROFINET master. If this is done in this way the PROFIsafe policy is not violated.

TwinCAT IPC with PROFIBUS/PROFINET-EtherCAT Terminal

Without the use of the EL9930, the transmission of the PROFIsafe data from the EL6910 to the TwinCAT PC would take place in the following example via the E-bus and EtherCAT. The TwinCAT PC would copy the data in the process image and then send them with the next I/O update via EtherCAT and E-bus to the PROFIBUS/PROFINET master.

By using the EL9930 between the EK1100 and the EL6920, the PROFIsafe telegram is secured in the EL9930 and set to 0 in the telegram. In the data direction to the PROFIBUS/PROFINET master the telegram is filled with the secured value and forwarded to the PROFIsafe device.

No further EL9930 needs to be plugged in behind the PROFIBUS/PROFINET master as the station ends here. The other EK1100 is configured on a second EtherCAT master, therefore it doesn't need to be considered.

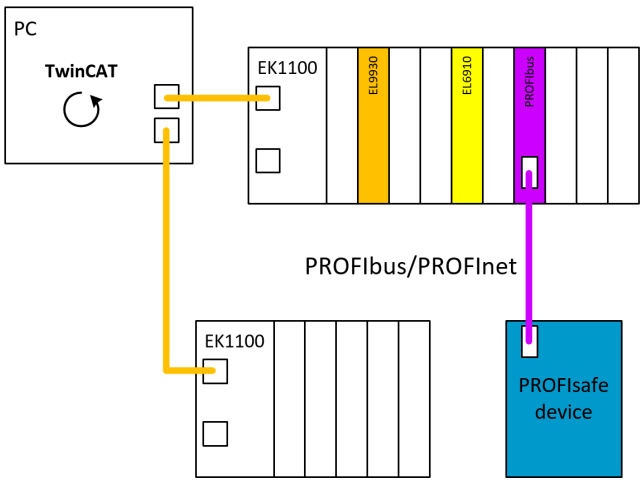


Fig. 17: Valid PROFIsafe configuration with EL9930 - example 1

In this application, unlike the previous example, an EL9930 must also be plugged in behind the PROFIBUS/PROFINET master terminal and configured. The EtherCAT telegram leaves the station via an EK1100 to the next EK1100 station.

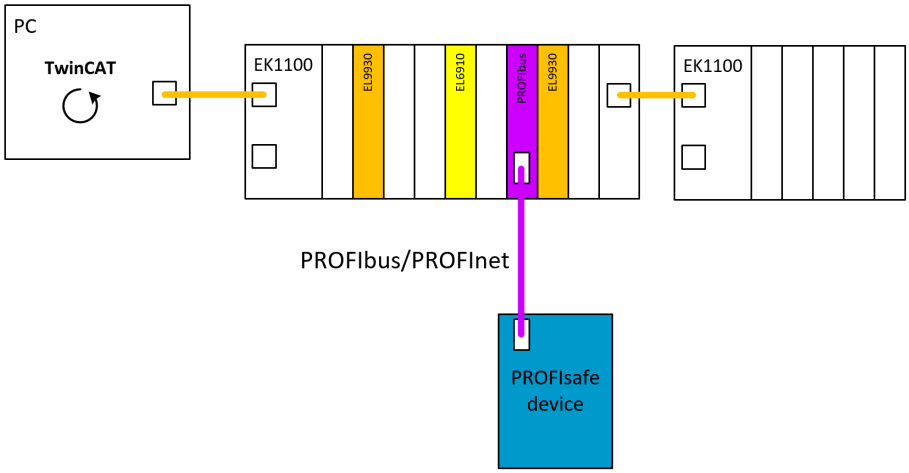


Fig. 18: Valid PROFIsafe configuration with EL9930 - example 2

In this application an EL9930 must also be plugged in behind the PROFIBUS/PROFINET master terminal and configured, as the EtherCAT telegram still leaves the station to the downstream EK1100 via an EtherCAT cable.

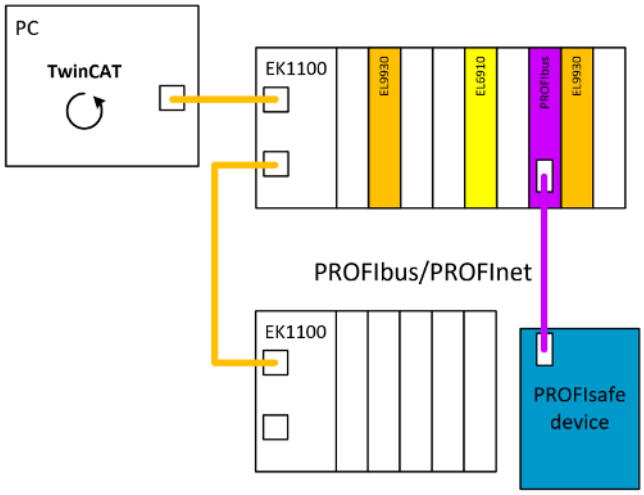


Fig. 19: Valid PROFIsafe configuration with EL9930 - example 3

CX controller with extension via EK1100

If, in the case of a CX controller with a PROFIBUS/PROFINET interface, the E-bus employed is extended by an EK1100 coupler, an EL9930 must be used behind the EL6910 and in front of the EK1100, as otherwise the PROFIsafe telegram would leave the E-bus via EtherCAT.

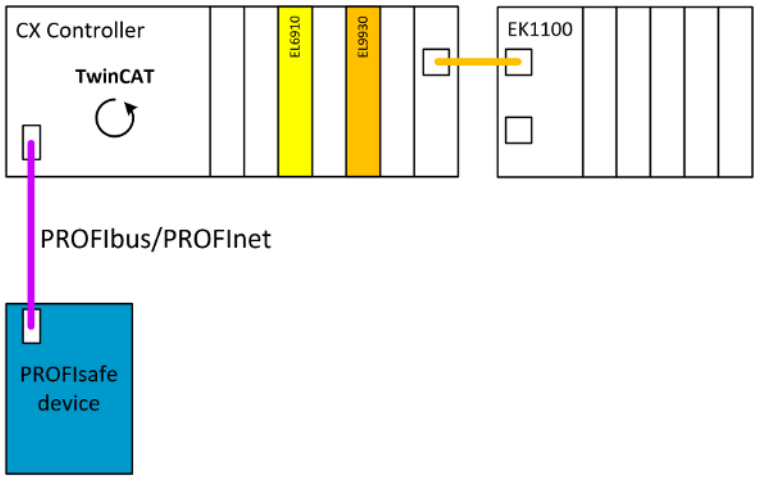


Fig. 20: Valid PROFIsafe configuration - example 4

6 Maintenance and cleaning

Cleaning by the manufacturer only

Do not operate the TwinSAFE component if it is impermissibly dirty according to protection class IP20. Send impermissibly dirty TwinSAFE components to the manufacturer for cleaning.

TwinSAFE components are basically maintenance-free.

7 Decommissioning

7.1 Disposal

NOTE

Correct disposal

Observe the applicable national laws and guidelines for disposal.

Incorrect disposal may result in environmental damage.

Remove the TwinSAFE component for disposal.

Depending on your application and the products used, make sure that the respective components are disposed of properly:

Cast iron and metal

Hand over cast iron and metal parts to scrap metal recycling.

Cardboard, wood and polystyrene

Dispose of packaging materials made of cardboard, wood or Styrofoam in accordance with regulations.

Plastic and hard plastic

You can recycle parts made of plastic and hard plastic via the waste management center or reuse them in accordance with the component regulations and markings.

Oils and lubricants

Dispose of oils and lubricants in separate containers. Hand over containers to the waste oil collection point.

Batteries and accumulators

Batteries and accumulators may also be marked with the crossed-out wheeled garbage can symbol. You must separate these components from waste. You are legally obliged to return used batteries and accumulators within the EU. Outside the validity of the EU Directive 2006/66/EC, observe the respective regulations.

7.1.1 Returning to the vendor

In accordance with the WEEE-2012/19/EU directives, you can return used devices and accessories for professional disposal. The transport costs are borne by the sender.

Send the used devices with the note "For disposal" to:

Beckhoff Automation GmbH & Co. KG
Gebäude „Service“
Stahlstraße 31
D-33415 Verl

In addition, you have the option to contact a local certified specialist company for the disposal of used electrical and electronic appliances. Dispose of the old components in accordance with the regulations applicable in your country.

8 Appendix

8.1 Volatility

If there are requirements concerning the volatility of products in your application, for example of the U.S. Department of Defense or similar authorities or security organizations, the following process applies:

The product has both volatile and non-volatile components. Volatile components lose their data immediately after removing power. Non-volatile components keep the data even after loss of power.

If there is customer specific data saved on the product, it cannot be ensured that this data might not be restored through for example forensic measures, even after the data is deleted through the provided tool chain. If this data is confidential, the scrapping of the product after usage is recommended to protect this data.

8.2 Focus of certificates

The most decisive document for certified components of the TwinSAFE department is the EC type examination certificate. The document contains both the test coverage and the regarded component and component family.

The current certificates of all TwinSAFE components with the underlying standards and directives can be found at https://www.beckhoff.com/en-en/support/download-finder/certificates-approvals/.

If the document refers only to the first four figures of a product (ELxxxx), the certificate is valid for all available variants of the component (ELxxxx-abcd). This is applicable for all components like EtherCAT Terminals, EtherCAT Boxes, EtherCAT plug-in modules and Bus Terminals.

◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFIC

Product Service

EC-Type Examination Certificate

No. M6A 062386 0055 Rev. 01

Holder of Certificate:	**Beckhoff Automation GmbH & Co. KG** Hülshorstweg 20 33415 Verl GERMANY
Product:	**Safety components**
Model(s):	**EL1918**
Parameters:	Supply voltage: 24VDC (-15%/+20%) Ambient temperature: -25°C...+55°C Protection class: IP20

This EC Type Examination Certificate is issued according to Article 12(3) b or 12(4) a of Council Directive 2006/42/EC relating to machinery. It confirms that the listed Annex-IV equipment complies with the principal protection requirements of the directive. It refers only to the sample submitted to TÜV SÜD Product Service GmbH for testing and certification. For details see: www.tuvsud.com/ps-cert

Test report no.: BV99670C

If you regard the example EL1918 in the picture, the certificate is valid for both the EL1918 and the available variant EL1918-2200.

Table of figures

More Information:
www.beckhoff.com/EL9930

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