BECKHOFF New Automation Technology

Manual | EN

IP65-EtherCAT Push-button extension

C9900-M900 and C9900-M998

2025-07-30 | Version: 1.1

Table of contents

1 Foreword

1.1 Notes on the documentation

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

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

Disclaimer

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

Trademarks

Beckhoff®, ATRO®, EtherCAT®, EtherCAT G®, EtherCAT G10®, EtherCAT P®, MX-System®, Safety over EtherCAT®, TC/BSD®, TwinCAT®, TwinCAT/BSD®, TwinSAFE®, XFC®, XPlanar®, and XTS® are registered and licensed trademarks of Beckhoff Automation GmbH.
If third parties make use of the designations or trademarks contained in this publication for their own purposes, this could infringe upon the rights of the owners of the said designations.

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

Copyright

Third-party trademarks

Trademarks of third parties may be used in this documentation. You can find the trademark notices here: https://www.beckhoff.com/trademarks.

1.2 For your safety

Safety regulations

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

Exclusion of liability

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

Personnel qualification

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

Signal words

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

Personal injury warnings

⚠ DANGER

Hazard with high risk of death or serious injury.

⚠ WARNING

Hazard with medium risk of death or serious injury.

⚠ CAUTION

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

Warning of damage to property or environment

NOTICE

The environment, equipment, or data may be damaged.

Information on handling the product

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

1.3 Notes on information security

The products of Beckhoff Automation GmbH & Co. KG (Beckhoff), insofar as they can be accessed online, are equipped with security functions that support the secure operation of plants, systems, machines and networks. Despite the security functions, the creation, implementation and constant updating of a holistic security concept for the operation are necessary to protect the respective plant, system, machine and networks against cyber threats. The products sold by Beckhoff are only part of the overall security concept. The customer is responsible for preventing unauthorized access by third parties to its equipment, systems, machines and networks. The latter should be connected to the corporate network or the Internet only if appropriate protective measures have been set up.

In addition, the recommendations from Beckhoff regarding appropriate protective measures should be observed. Further information regarding information security and industrial security can be found in our https://www.beckhoff.com/secguide.

Beckhoff products and solutions undergo continuous further development. This also applies to security functions. In light of this continuous further development, Beckhoff expressly recommends that the products are kept up to date at all times and that updates are installed for the products once they have been made available. Using outdated or unsupported product versions can increase the risk of cyber threats.

To stay informed about information security for Beckhoff products, subscribe to the RSS feed at https://www.beckhoff.com/secinfo.

2 Transport and unpacking

Note the specified transport and storage conditions (see Chapter 6 Technical data).

Despite the robust design of the unit, the components are sensitive to strong vibrations and impacts. During transport the device must therefore be protected from mechanical stress. Appropriate packaging of the device, such as the original packaging, can improve the vibration resistance during transport.

NOTICE

Hardware damage due to condensation

Unfavorable weather conditions during transport can cause damage to the device.

- Protect the device against moisture (condensation) during transport in cold weather or in case of extreme temperature fluctuations.
- Do not put the device into operation until it has slowly adjusted to the room temperature.
- Should condensation occur, wait for about 12 hours before switching the device on.

3 Product description

3.1 Product overview

The C9900-Mxxx IP65 EtherCAT push-button modules are decentralized button input modules designed for individual installation on the machine.

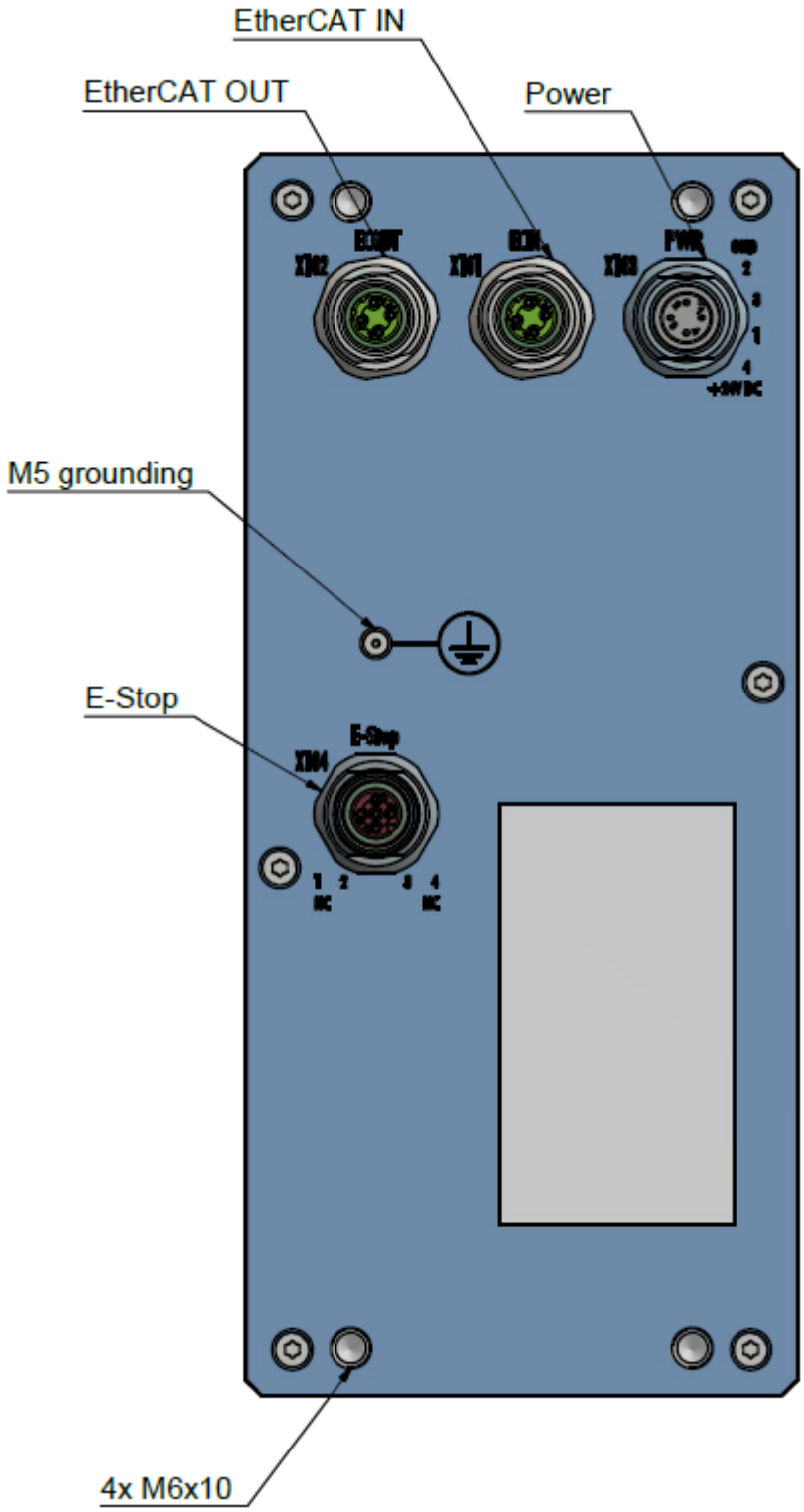
The advantage of these IP65-rated modules is that actions or status indications are visible directly on the module. Each light ring (C9900-M900) on the buttons can be activated in red, green, blue, or white. This allows the operator to immediately infer feedback messages from a color change or flashing, for example.

The short-stroke keys of the **C9900-M900** are located behind an embossed front laminate and can be labeled ex factory. Mounting the push-in strips - C9900-M900 [▶ 18]

The illuminated push buttons on the **C9900-M998** module are equipped with exchangeable bezels and can thus easily be labeled. Mounting labels C9900-M998 [▶ 18].

All connections on the rear side are easily accessible M12 screw connections that can be connected to other EtherCAT devices at distances of up to 100 m using pre-assembled cables. Each module has four M6 threaded holes in the rear panel for mounting. A mounting plate C9900-M340 is optionally available.Options [▶ 13]

3.2 Connections



3.2.1 Power supply

The button modules are supplied with a nominal voltage of 24 V. The power supply is connected via a 4-pin M12 socket (X103). The round connector has an IP67 protection rating.

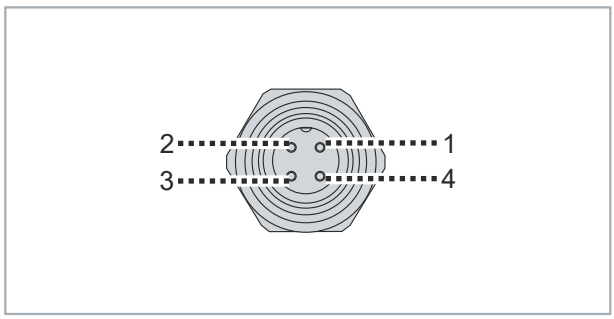


Fig. 1: Power supply pin numbering

Table 1: Voltage socket pin assignment

Pin	Signal
1	+24 V DC
2	GND
3	GND
4	+24 V DC

3.2.2 EtherCAT in/out

The button modules feature both an EtherCAT input (X101) and an EtherCAT output (X102). In both cases, the EtherCAT connection is made through a 4-pin M12 socket. The round connector has an IP67 protection rating.

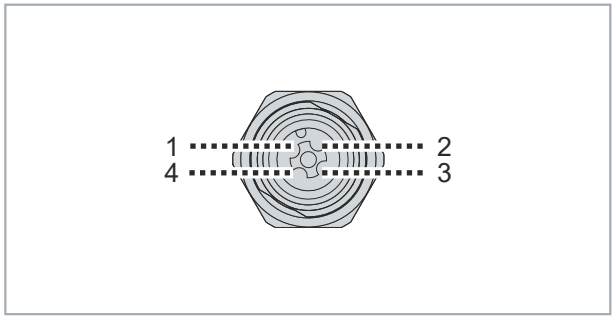


Fig. 2: EtherCAT in/out pin numbering

Table 2: EtherCAT in/out pin assignment

Pin	Signal
1	TX +
2	RX +
3	TX -
4	RX -

3.2.3 Emergency stop connection

Some of the button modules feature an emergency stop. It is connected via a 5-pin socket.

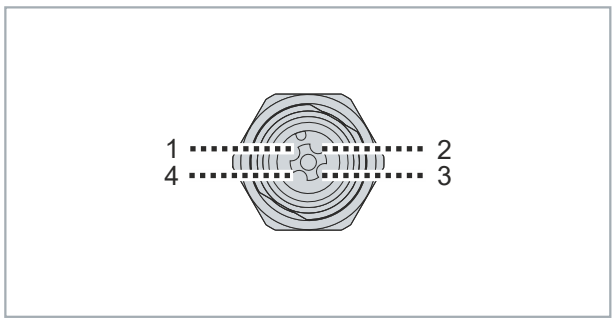


Fig. 3: Emergency stop pin numbering

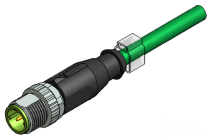
Table 3: Emergency stop pin assignment

Pin	Signal
1	NC 1 (normally closed contact)
2	NC 1 (normally closed contact)
3	NC 2 (normally closed contact)
4	NC 2 (normally closed contact)

3.3 Connection cable

3.3.1 M12 EtherCAT cable for (highly) flexible applications

Accessories	Description
ZK1090-6xxx-xxxx	"See Beckhoff I/O price list"



3.4 Accessories

3.4.1 Torque wrench

Accessories	Description
ZB8800	Torque wrench for M8 cables
ZB8800-0001	M12 ratchet attachment
ZB8800-0002	M8 ratchet attachment

3.5 Options

Options	Description
C9900-M340 	Stainless steel mounting plate 90° for EtherCAT button module C9900-M900 or C9900-M998. Offers the option of mounting an EtherCAT button module C9900-M900 or C9900-M998 at an angle of 90°. Four 6.5 mm through holes with a spacing of 40 x 150 mm for mounting.

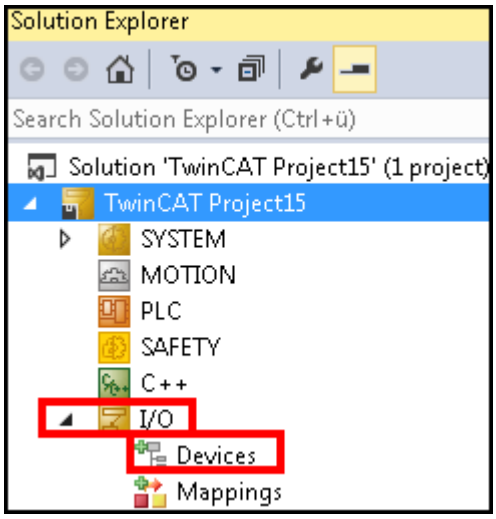
C9900-M998 options	Description
C9900-Z260	Transparent foil for individual labeling - type Rafi FS+, diameter: 22.3 mm - 1 sheet DIN A4, 54 pieces
C9900-Z255	button cap, blue, for individual fitting - type Rafi FS+, diameter: 22.3 mm - 5 pieces
C9900-Z256	button cap, yellow, for individual fitting - type Rafi FS+, diameter: 22.3 mm - 5 pieces
C9900-Z257	button cap, green, for individual fitting - type Rafi FS+, diameter: 22.3 mm - 5 pieces
C9900-Z258	button cap, red, for individual fitting - type Rafi FS+, diameter: 22.3 mm - 5 pieces
C9900-Z259	button cap, clear, for individual fitting - type Rafi FS+, diameter: 22.3 mm - 5 pieces

3.6 TwinCAT System Manager

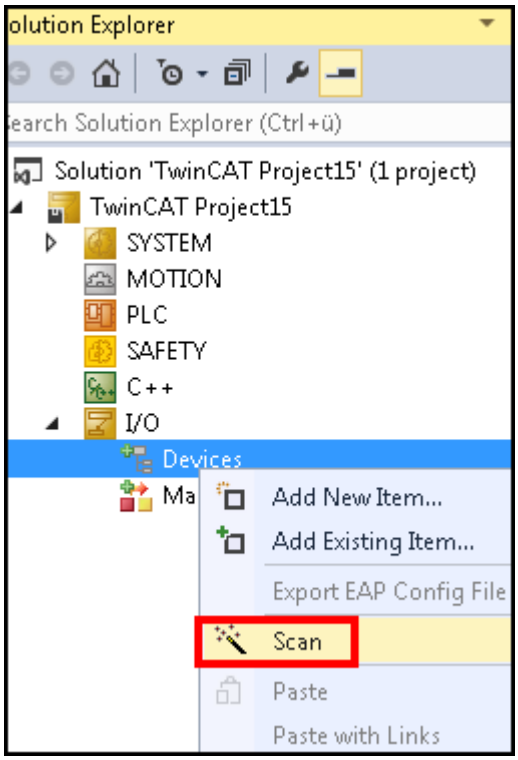
All button outputs (red, green and blue) must be set to high (1) in order to activate the light ring in white. Before you can use the device it must first be created in the TwinCAT System Manager.

Proceed as follows:

1. Click at the top in the menu on **File > New > Project** and create a new **TwinCAT XAE Project.**

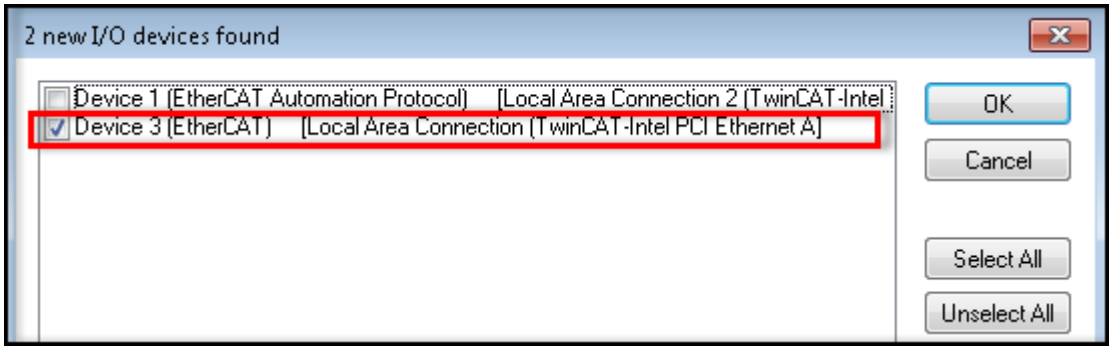


2. In the tree view on the left, click on **I/O** and then right-click on **Device**.
3. In the context menu click on **Scan**.

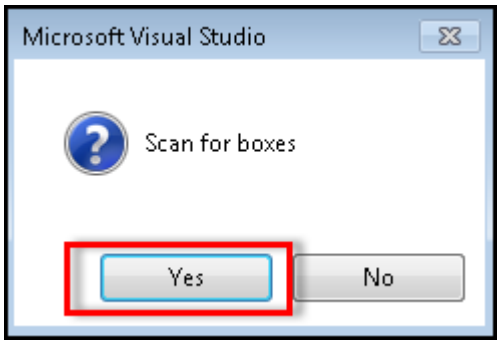


The **New I/O Devices** window appears. All available devices are displayed.

4. Select the devices you want to use and confirm the selection with **OK**.

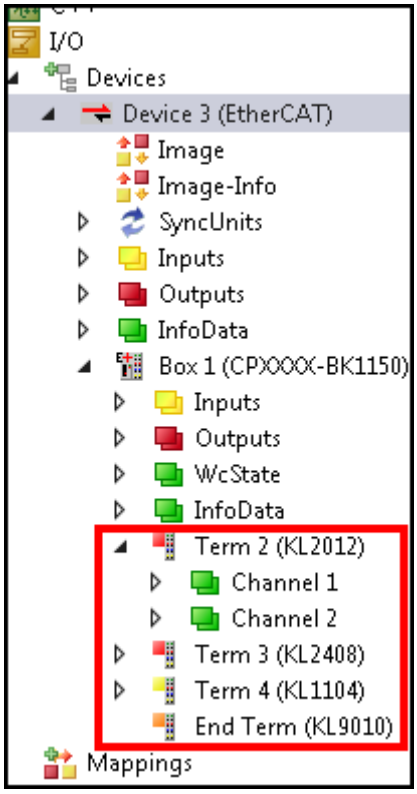
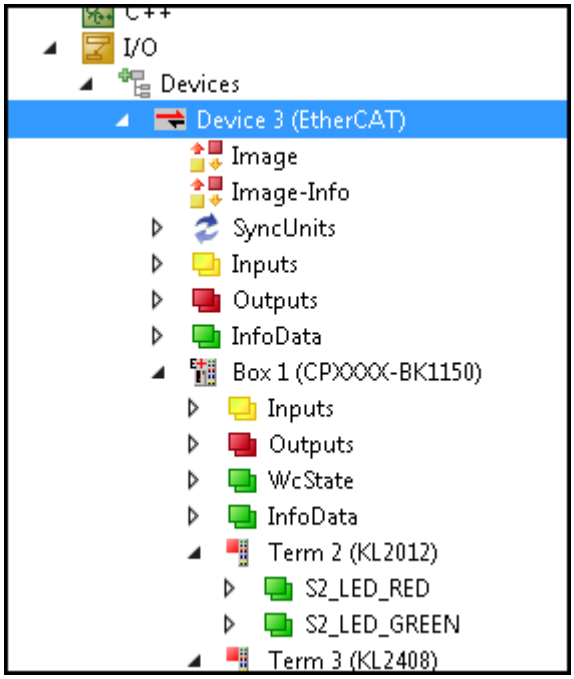


5. Confirm the request with **Yes**, in order to look for boxes.

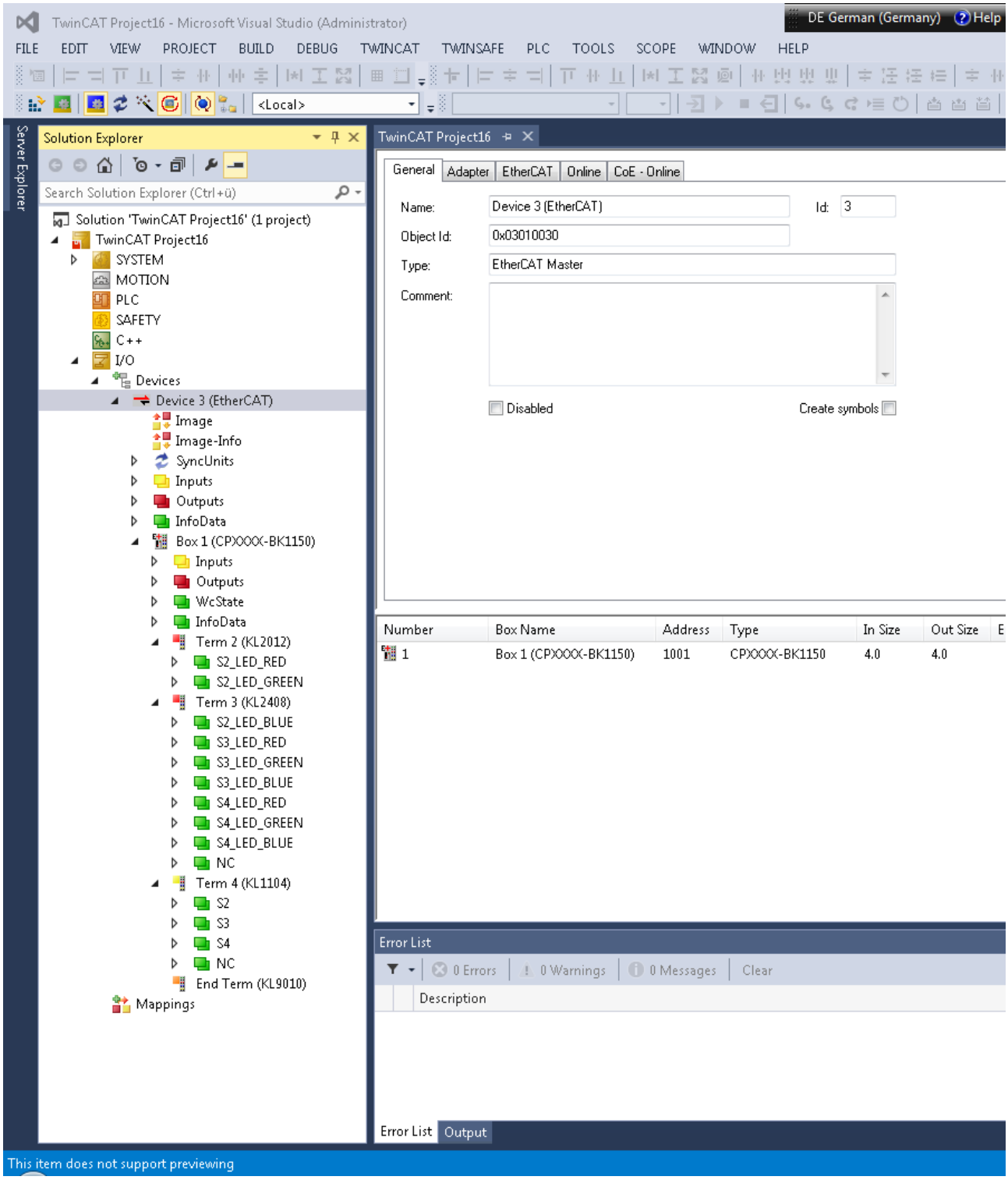


6. Confirm the request whether to enable **FreeRun** with **Yes**.

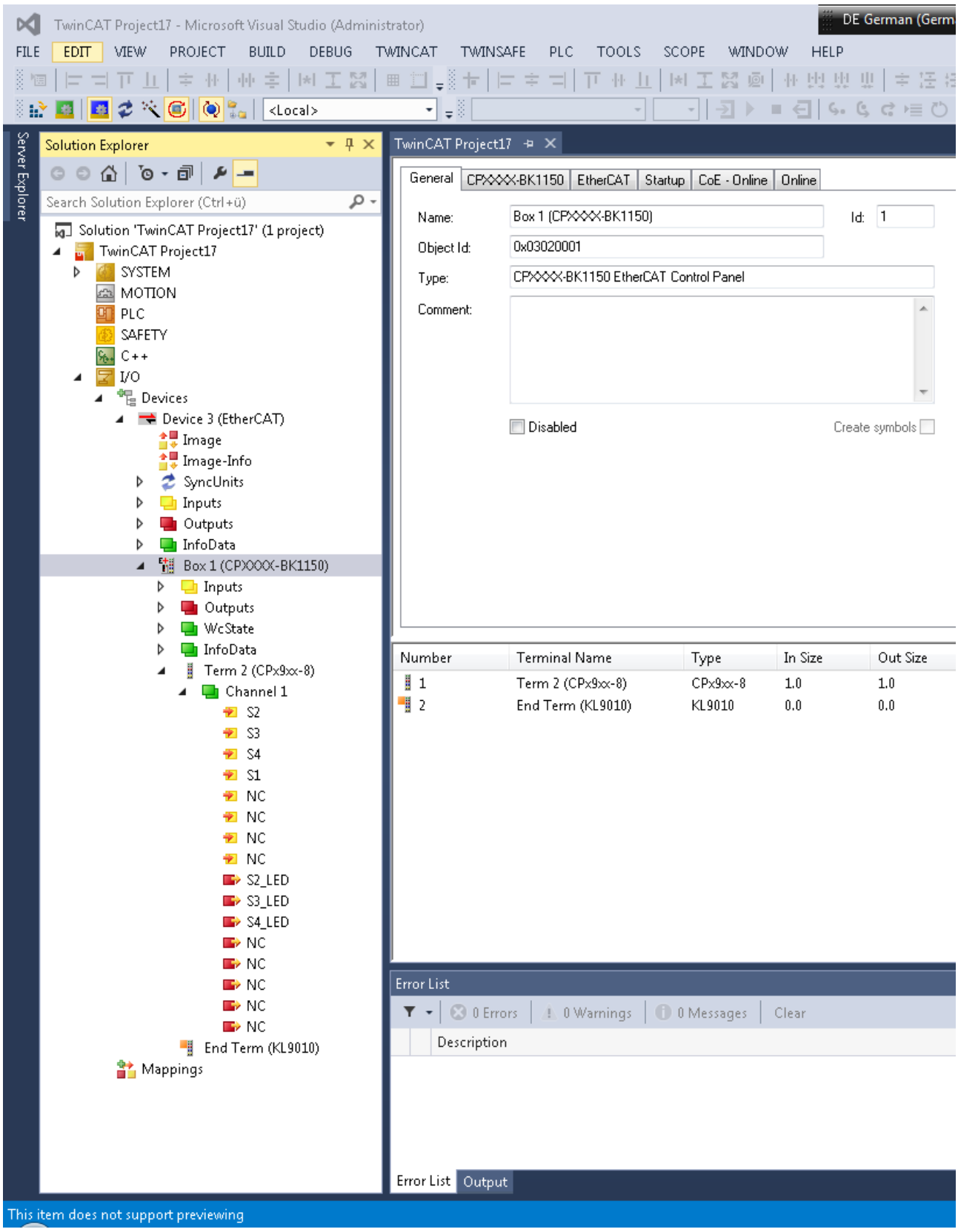
⇨ The device is inserted as a box in the tree view and displayed with the respective inputs and outputs (e.g. Term 2 to 5). Label the inputs and outputs (Term 2 to 5) as follows.

Term label after activating FreeRun	Term label after processing
	

3.6.1 C9900-M900



3.6.2 C9900-M998



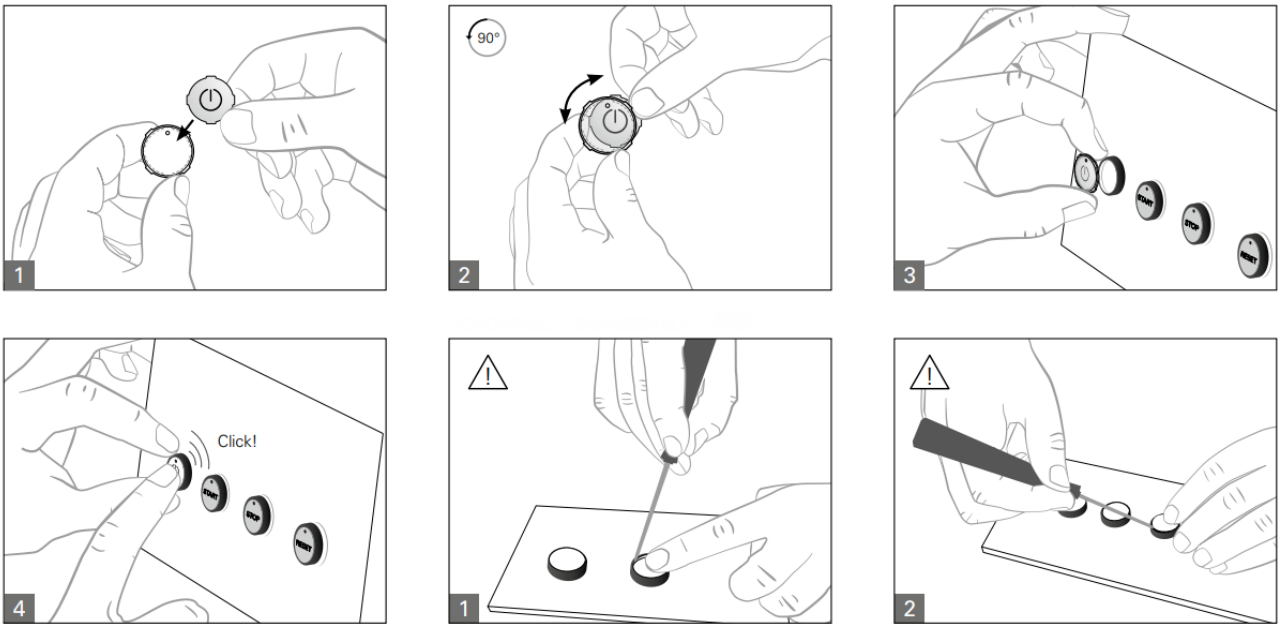
4 Mounting

4.1 Mounting the push-in strips - C9900-M900

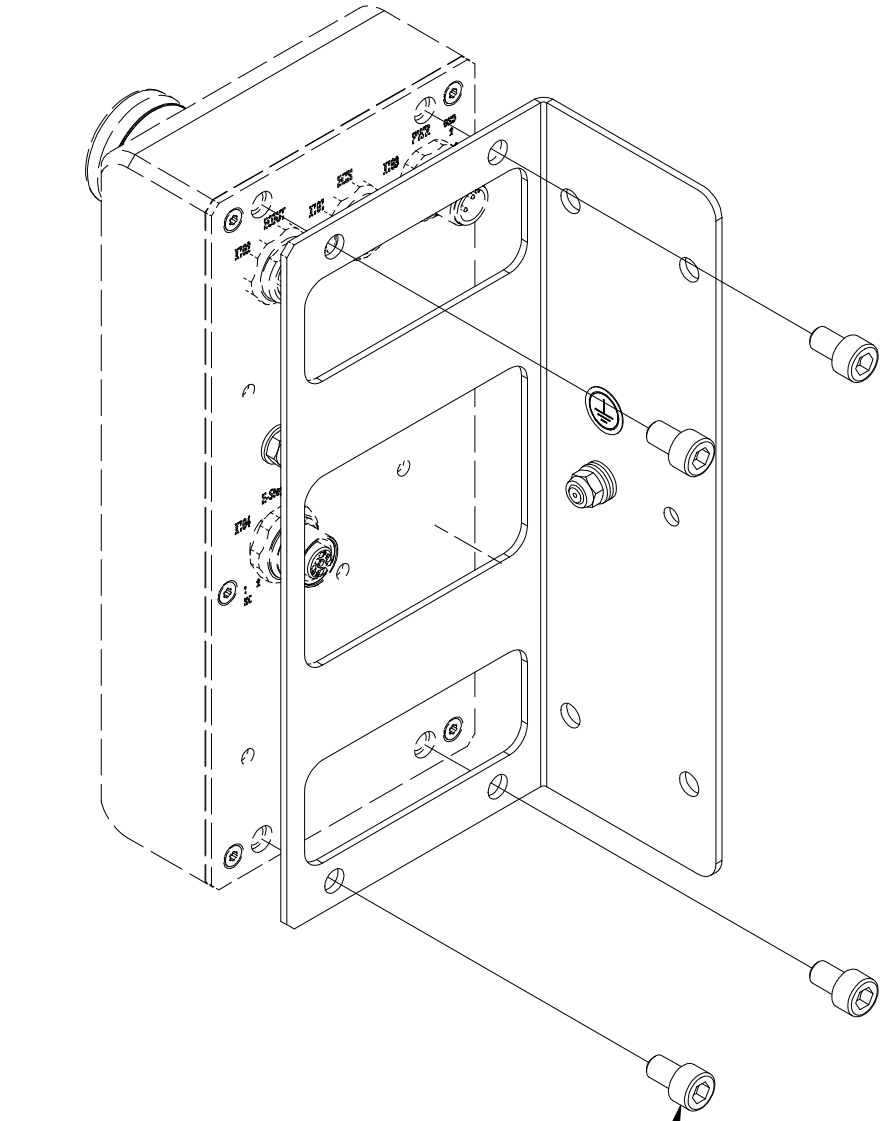
C9900-M900 push-in strips

Customer-specific labeling can be carried out in the factory on request. Subsequent mounting of the push-in strips is not possible.

4.2 Mounting labels C9900-M998

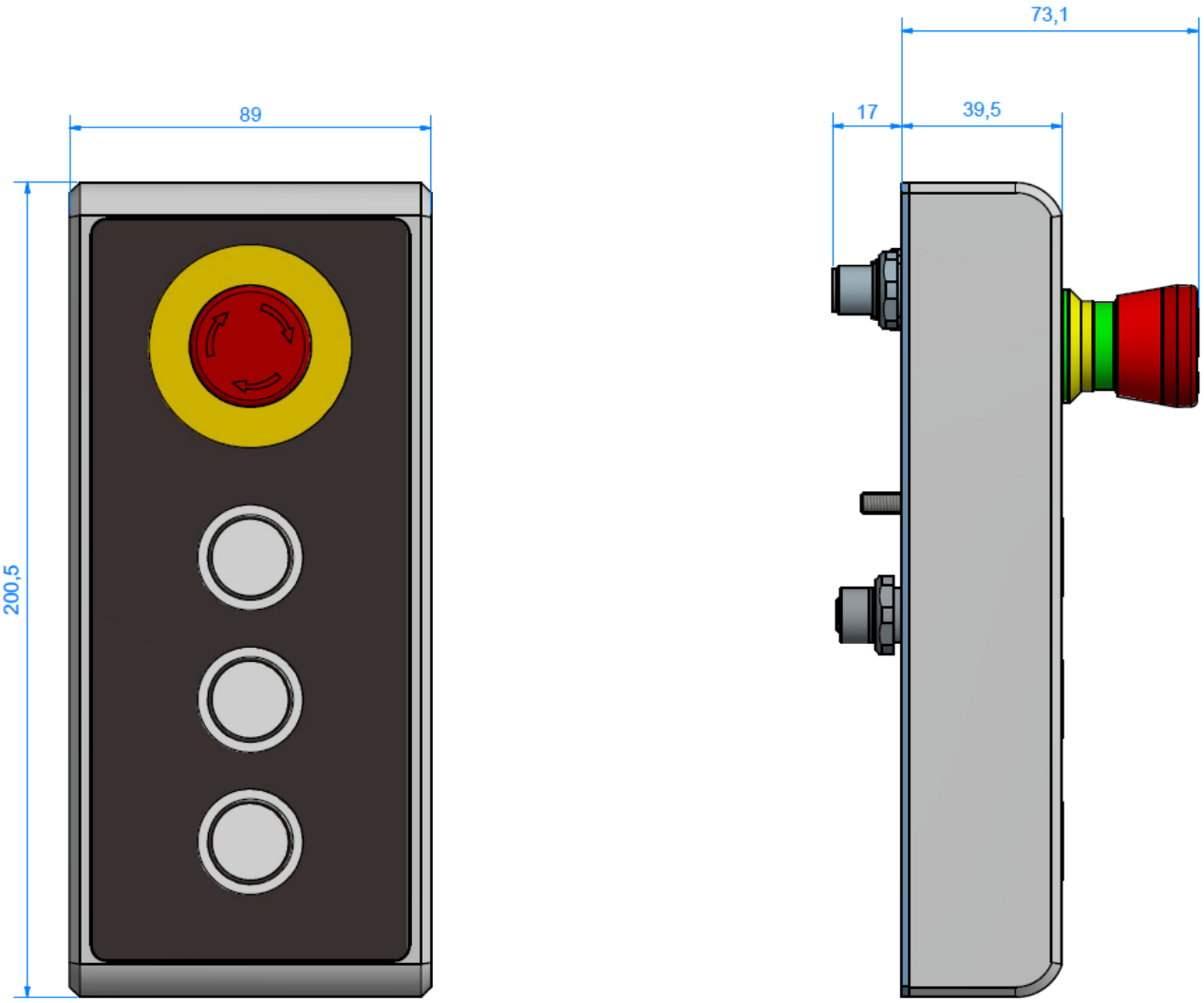


4.3 Assembling the mounting plate

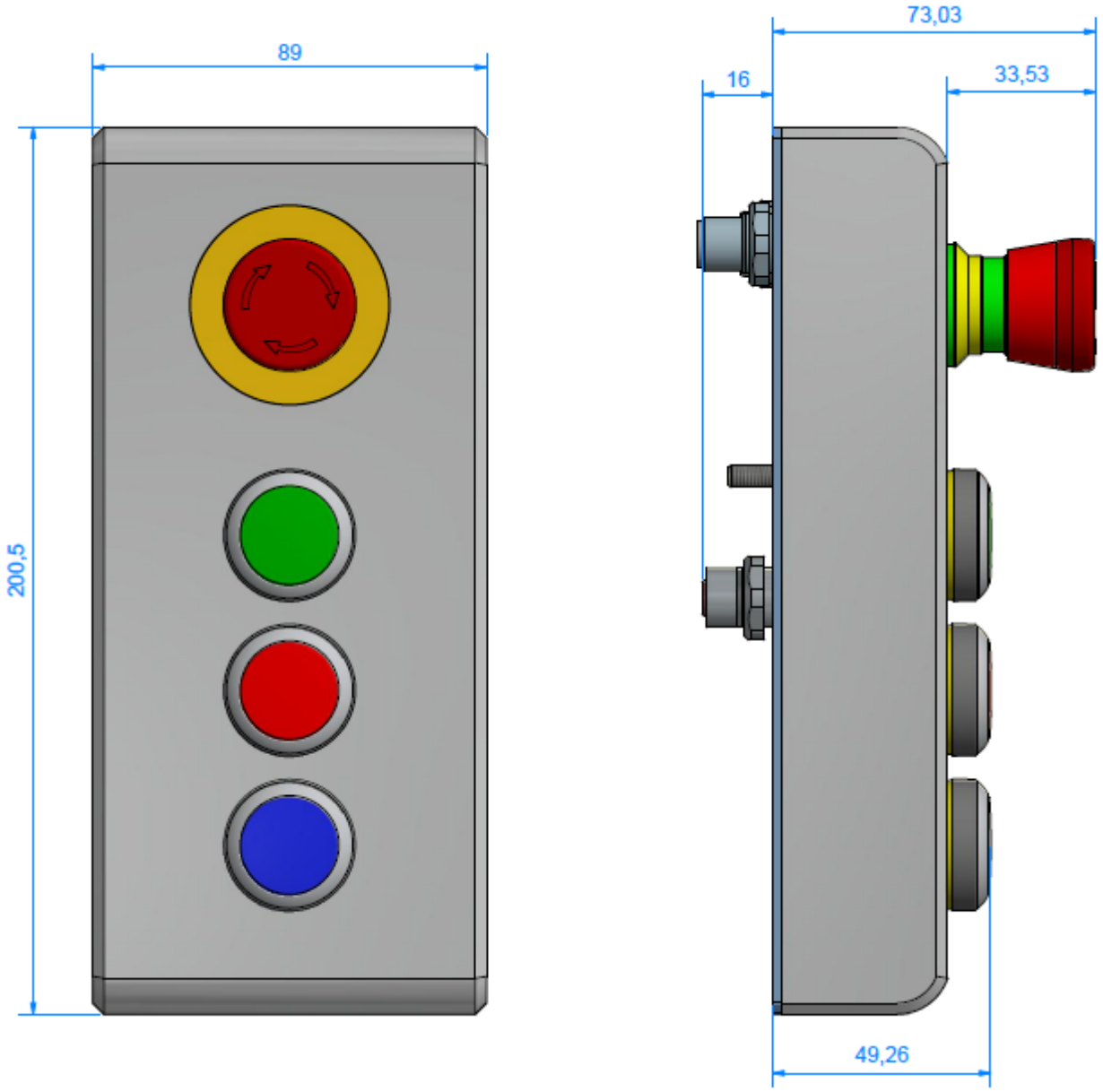


5 Dimensions

5.1 C9900-M900



5.2 C9900-M998



6 Technical data

⚠ DANGER

Risk of explosion!

The button modules must not be used in potentially explosive atmospheres!

Properties	Description		
Dimensions	See chapter --- FEHLENDER LINK ---		
Ordering information	C9900-M900	- 1 x emergency stop (Rafix 22FS+) - 3 x short-stroke keys	
	C9900-M998	- 1 x emergency stop (Rafix 22FS+) - 3x illuminated push-buttons (Rafix 22FS+)	
Interfaces	**M12 socket, 4-pin, D-coded**		
	EtherCAT In		EtherCAT Out
	M12 socket, 4-pin, A-coded		
	Emergency stop (except C9900-M995)		
	M12 plug, 4-pin, A-coded		
	Power supply		
Max. cable length	100 m (100BASE-Tx) for EtherCAT In/ Out		
Data transfer rate	100MBit		
Data transfer medium	Industrial Ethernet cable, shielded, at least CAT.5		
C9900-M900 LED ring lighting of the keys	Red, green, blue, white		
C9900-M998 Colors of the Rafi illuminated push-buttons	Green, red, blue		
Emergency stop type	1.30.273.511/0030 Rafix 22FS+		
	The emergency stop is reset by rotating.		
Switching elements (emergency stop)	1.20.126.414/0000		1 x make contact / 2 x break contact
	Min. operating voltage AC / DC		5 V
	Max. operating voltage AC / DC		35 V
	Min. operating current AC / DC		1 mA
	Max. operating current AC / DC		100 mA
	Switching capacity max.		250 mW
Illuminated push-buttons	Rafi 22FS+		1 x make contact via EtherCAT
Short-stroke keys	Rafi Micon 5		1 x make contact via EtherCAT
Electrical properties	Power supply		24 V DC (-15% / +20%)
	Power consumption		Max. 7.2 W
	Voltage range		20.4- 28.8 VDC
	Current consumption		Max. 300 mA (at rated voltage)
Protection class	IP65		
Weight	C9900-M900		approx.1100 g
	C9900-M998		approx.1150 g
Operating temperature	Operation		0...50°C
	Storage		-20 °C to +60 °C
	Transport		-20 °C to +60 °C
Permissible relative air humidity	95%, no condensation		
Certification	CE		

7 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.

Download finder

Our download finder contains all the files that we offer you for downloading. You will find application reports, technical documentation, technical drawings, configuration files and much more.

The downloads are available in various formats.

Beckhoff's branch offices and representatives

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

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

You will also find further documentation for Beckhoff components there.

Beckhoff Support

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

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

Hotline:	+49 5246 963-157
e-mail:	support@beckhoff.com

Beckhoff Service

The Beckhoff Service Center supports you in all matters of after-sales service:

- on-site service
- repair service
- spare parts service
- hotline service

Hotline:	+49 5246 963-460
e-mail:	service@beckhoff.com

Beckhoff Headquarters

Beckhoff Automation GmbH & Co. KG

Huelshorstweg 20
33415 Verl
Germany

Phone:	+49 5246 963-0
e-mail:	info@beckhoff.com
web:	www.beckhoff.com

Trademark statements

Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl
Germany
Phone: +49 5246 9630
info@beckhoff.com
www.beckhoff.com