BECKHOFF New Automation Technology

Documentation | EN

EP9208-1035

Distribution box

2021-08-03 | Version: 1.1

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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.
It is the duty of the technical personnel to use the documentation published at the respective time of each installation and commissioning.

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.

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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.

Description of instructions

In this documentation the following instructions are used.
These instructions must be read carefully and followed without fail!

⚠ DANGER

Serious risk of injury!

Failure to follow this safety instruction directly endangers the life and health of persons.

⚠ WARNING

Risk of injury!

Failure to follow this safety instruction endangers the life and health of persons.

⚠ CAUTION

Personal injuries!

Failure to follow this safety instruction can lead to injuries to persons.

NOTE

Damage to environment/equipment or data loss

Failure to follow this instruction can lead to environmental damage, equipment damage or data loss.

Tip or pointer

This symbol indicates information that contributes to better understanding.

1.3 Documentation Issue Status

Version	Comment
1.1	• Figures updated
1.0	• First release

Firmware and hardware versions

This documentation refers to the 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.

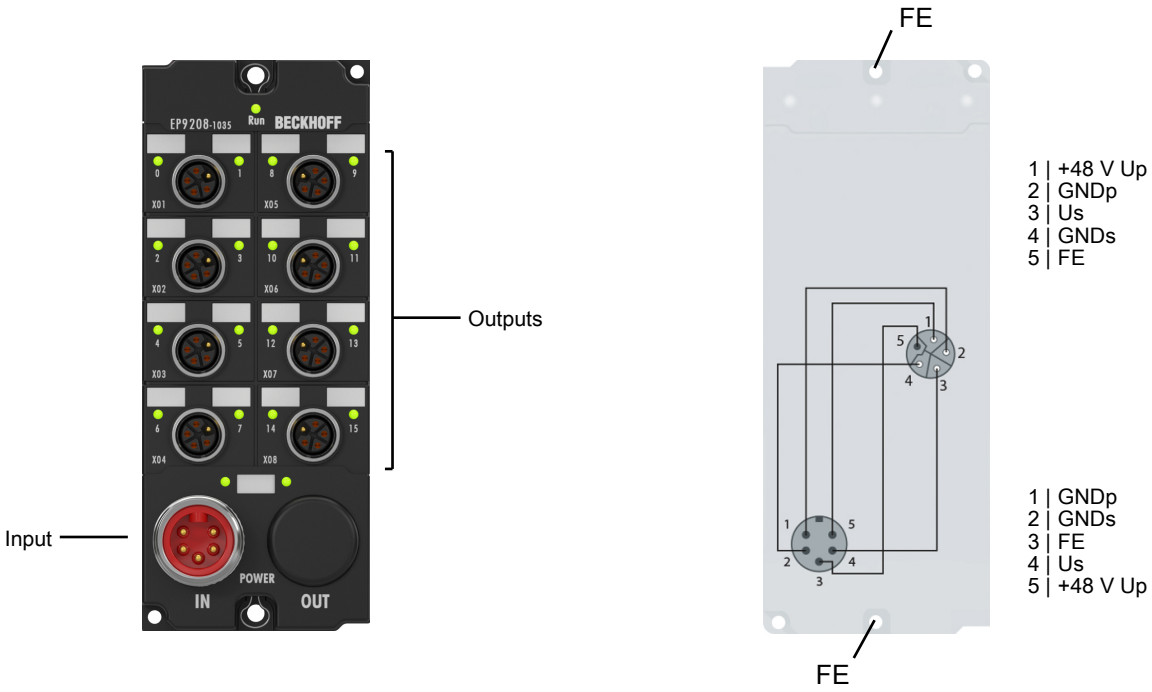
The hardware version (delivery state) can be found in the batch number (D-number) printed on the side of the box.

Syntax of the batch number (D-number)

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

2 Product overview

2.1 Introduction



The EP9208-1035 EtherCAT Box is a fully passive distribution box. It is supplied via a 7/8" connector. The eight outputs are executed as M12 sockets with L-coding according to EN 61076; the EP9208-1035 is thus suitable for carrying currents up to 16 A at 24 V_{DC}/48 V_{DC} on each of two channels per socket. The sockets and the supply each have an LED to display the channels. The input and outputs of the EP9208-1035 are connected directly with no intermediately connected electronics. The supply of power to smart servo drives, such as the AMI812x with integrated output stage, is implemented very simply with the EP9208-1035.

Quick links

Technical data [▶ 9]
Connections [▶ 13]

2.2 Technical data

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

Input X60	
Connection	7/8" plug, 5-pin
Rated voltage U_S	max. 48 V_{DC}
Sum current $I_{S,sum}$	max. 16 A at 40 °C
Rated voltage U_P	max. 48 V_{DC}
Sum current $I_{P,sum}$	max. 16 A at 40 °C

Outputs X01…X08	
Number	8
Connections	M12 sockets, 5-pin, L-coded
Output current $I_{S,out}$ per output	max. 16 A [1)]
Output current $I_{P,out}$ per output	max. 16 A [1)]

Housing data	
Dimensions W x H x D	60 mm x 150 mm x 26,5 mm (without connectors)
Weight	approx. 440 g
Material	PA6 (polyamide)
Installation position	variable

[1)] Observe the maximum sum current of the input: $I_{S,sum}$, $I_{P,sum}$

Environmental conditions	
Ambient temperature during operation	-25…+60 °C
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	IP65, IP66, IP67 conforms to EN 60529

Approvals	
Approvals	CE, UL in preparation

2.3 Scope of supply

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

- 1 EP9208-1035

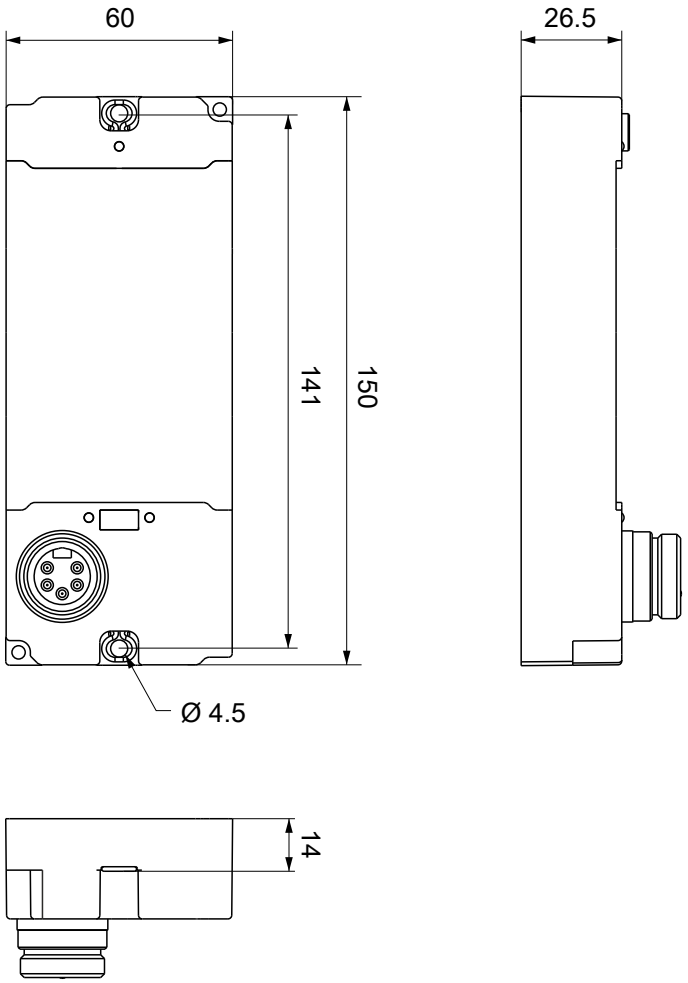
Pre-assembled protective caps do not ensure IP67 protection

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

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

3 Assembly

3.1 Dimensions



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

Housing features

Housing material	PA6 (polyamide)
Sealing compound	polyurethane
Mounting	two fastening holes Ø 4.5 mm for M4
Metal parts	brass, nickel-plated
Contacts	CuZn, gold-plated
Power feed through	max. 16 A at 40°C (according to IEC 60512-3)
Installation position	variable
Protection class	IP65, IP66, IP67 (conforms to EN 60529) when screwed together
Dimensions (H x W x D)	approx. 150 x 60 x 26.5 mm (without connectors)

3.2 Fixing

NOTE

Dirt during assembly

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

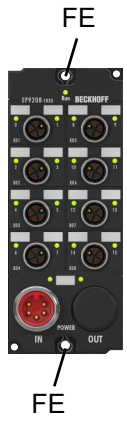
- Protect the plug connectors against dirt during the assembly.

Mount the module with two M4 screws in the centrally located fastening holes.

3.3 Functional earth (FE)

The fastening holes [▶ 12] also serve as connections for the functional earth (FE).

Make sure that the box is earthed with low impedance via both fastening screws. You can achieve this, for example, by mounting the box on a grounded machine bed.



4 Connections

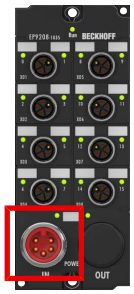
4.1 Input X60

NOTE

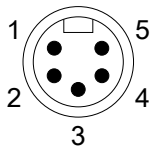
No internal fuses

Defect or cable fire possible in case of short-circuit.

- Protect each of the voltages before the input with a 16 A fuse.



You can connect two voltages to the input: U_S and U_P. The voltages are electrically isolated in the device. They are forwarded unchanged to the eight outputs [▶ 14].

7/8“ connector	Pin	Symbol
	1	GND_P
	2	GND_S
	3	FE
	4	+24 V_{DC} U_S
	5	+48 V_{DC} U_P

Ground the core "FE" at the other end of the cable.
The pin "FE" is directly connected to the Functional earth (FE) [▶ 12].

Status LEDs [▶ 15] indicate the states of the input voltages.

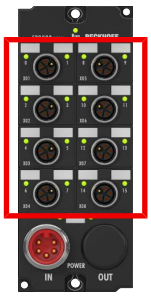
4.2 Outputs X01 to X08

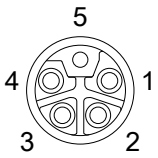
NOTE

The maximum sum current must not be exceeded

Defect or cable fire possible in case of overcurrent.

- Make sure that the sum of the output currents does not exceed the Technical data [▶ 9] of the input:
  $I_{S,sum}$ = 16 A from U_S
  $I_{P,sum}$ = 16 A from U_P
- See examples of Sum current calculation [▶ 14]



M12 socket, L-coded	Pin	Symbol
	1	+48 V_{DC} U_P
	2	GND_P
	3	+24 V_{DC} U_S
	4	GND_S
	5	FE

The pin "FE" is directly connected to the Functional earth (FE) [▶ 12].

Status LEDs [▶ 15] indicate the states of the input voltages.

Seal unused connectors with protective caps. See chapter Accessories [▶ 17].

4.2.1 Sum current calculation

Example scenario 1

The following currents flow from each output:

- I_S = 1 A
- I_P = 2 A

The sum currents are thus:

- $I_{S,sum}$ = 8 x 1 A = 8 A
- $I_{P,sum}$ = 8 x 2 A = 16 A

The sum current $I_{P,sum}$ of 16 A is fully utilized. Additional current must not be drawn from U_P at any of the outputs.

Example scenario 2

The following current flows from one output: I_S = 16 A.

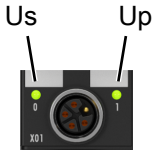
The sum current $I_{S,sum}$ of 16 A is fully utilized. Additional current must not be drawn from U_S at any of the outputs.

5 Diagnostics

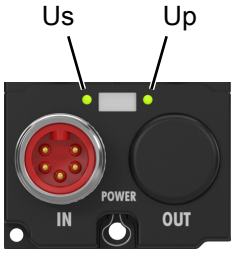
5.1 Status LEDs

There are several status LEDs for each voltage:

- one LED adjacent to each output



- one LED at the input



A status LED lights up if the corresponding voltage is present and correctly connected.

The status LEDs for U_S and U_P may not light up with equal brightness. This may be the case if the voltages U_S and U_P are different.
This behavior is normal and does not impair the function of the box.

Fault correction

Possible causes if a status LED does not light up:

- The voltage is not connected.
- The voltage polarity is reversed.
- The voltage is too low.
  Comment: Within the specifications [▶ 9], you can safely operate the EP9208-1035 even with voltages that are so low that the LEDs do not light up.

6 Appendix

6.1 General operating conditions

Protection degrees (IP-Code)

The standard IEC 60529 (DIN EN 60529) defines the degrees of protection in different classes.

1. Number: dust protection and touch guard	Definition
0	Non-protected
1	Protected against access to hazardous parts with the back of a hand. Protected against solid foreign objects of Ø 50 mm
2	Protected against access to hazardous parts with a finger. Protected against solid foreign objects of Ø 12.5 mm.
3	Protected against access to hazardous parts with a tool. Protected against solid foreign objects Ø 2.5 mm.
4	Protected against access to hazardous parts with a wire. Protected against solid foreign objects Ø 1 mm.
5	Protected against access to hazardous parts with a wire. Dust-protected. Intrusion of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the device or to impair safety.
6	Protected against access to hazardous parts with a wire. Dust-tight. No intrusion of dust.

2. Number: water* protection	Definition
0	Non-protected
1	Protected against water drops
2	Protected against water drops when enclosure tilted up to 15°.
3	Protected against spraying water. Water sprayed at an angle up to 60° on either side of the vertical shall have no harmful effects.
4	Protected against splashing water. Water splashed against the disclosure from any direction shall have no harmful effects
5	Protected against water jets
6	Protected against powerful water jets
7	Protected against the effects of temporary immersion in water. Intrusion of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water for 30 min. in 1 m depth.

*) These protection classes define only protection against water!

Chemical Resistance

The Resistance relates to the Housing of the IP 67 modules and the used metal parts. In the table below you will find some typical resistance.

Character	Resistance
Steam	at temperatures >100°C: not resistant
Sodium base liquor (ph-Value > 12)	at room temperature: resistant > 40°C: not resistant
Acetic acid	not resistant
Argon (technical clean)	resistant

Key

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

6.2 Accessories

Protective caps for connectors

Ordering information	Description
ZS5000-0020	Protective cap for M12 sockets, IP67 (50 pcs.)

Labelling material

Ordering information	Description
ZS5100-0000	Inscription labels, unprinted, 4 strips of 10
ZS5000-xxxx	Printed inscription labels on enquiry

Cables

A complete overview of pre-assembled cables for fieldbus components can be found here.

Ordering information	Description	Link
ZK203x-xxxx-xxxx	Power cable 7/8 ", 5-pin	Website

Tools

Ordering information	Description
ZB8801-0000	Torque wrench for plugs, 0.4…1.0 Nm
ZB8801-0002	Torque cable key for M12 / wrench size 13 for ZB8801-0000

Further accessories

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

6.3 Support and Service

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You will also find further documentation for Beckhoff components there.

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- and extensive training program for Beckhoff system components

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e-mail:	support@beckhoff.com

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