

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Selected official pages for procurement and maintenance review

PRODUCT BRAND

Siemens

PRODUCT MODEL

6ES7131-0BL00-0XB0

ET 200B Digital Input Module. Relevant section pages: 35, 38, 106, 107, 108, 109, 110, 111. Adjacent model text on shared pages is outside this product reference.

OFFICIAL SOURCE

ET 200B Distributed I/O Station; Edition 04, EWA 4NEB 812 6089-02c

Siemens original documentation and product reference

The original chapter covers two timing versions. This reference is for -0BL00 with a 3 ms input delay, not the -0BL10 0.2 ms version. Sensor supply remains limited to 1 A despite the terminal-block 2.5 A fuse.

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SIEMENS

SIMATIC

ET 200B Distributed I/O Station

Manual

EWA 4NEB 812 6089-02c

Edition 04

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Safety Guidelines

This manual contains notices which you should observe to ensure your own personal safety, as well as to protect the product and connected equipment. These notices are highlighted in the manual by a warning triangle and are marked as follows according to the level of danger:



Danger

indicates that death, severe personal injury or substantial property damage **will** result if proper precautions are not taken.



Warning

indicates that death, severe personal injury or substantial property damage **can** result if proper precautions are not taken.



Caution

indicates that minor personal injury or property damage can result if proper precautions are not taken.

Note

draws your attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

Qualified Personnel

The device/system may only be set up and operated in conjunction with this manual.

Only **qualified personnel** should be allowed to install and work on this equipment. Qualified persons are defined as persons who are authorized to commission, to ground, and to tag circuits, equipment, and systems in accordance with established safety practices and standards.

Correct Usage

Note the following:



Warning

This device and its components may only be used for the applications described in the catalog or the technical description, and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

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We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are welcomed.

Technical data subject to change.
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Preface

Purpose of the Manual

The information contained in this manual will allow you:

- To install, wire and start up the ET 200B distributed I/O station.
- To find module characteristics and technical specifications quickly and easily.

Contents of the Manual

The following explains the structure of the contents of the manual:

What is the ET 200B?	→	Chap. 1
Which control and display elements does the ET 200B have?	→	Chap. 2
How is the ET 200B installed?	→	Chap. 3
How do I configure and parameterize the ET 200B?	→	Chap. 4
Faults?	→	Chap. 5
Technical Specifications?	→	Chap. 6, 7, 8
Which type files do I need?	→	Appendix A
How are configuration and parameterization telegrams structured?	→	Appendix B, C

Scope of the Manual

This manual describes all the ET 200B modules which can be accessed with the **PROFIBUS-DP** bus protocol. These ET 200B modules all have order numbers starting with 6ES7 (see Section F.1).

This manual is valid for operation of the ET 200B with:

- IM 308-B master interface module and COM ET 200 V4.x
- IM 308-C master interface module and COM ET 200 WINDOWS
- S7/M7-DP master with PROFIBUS-DP interface and STEP 7
- other PROFIBUS-DP masters from Siemens and other vendors.

Electronic Manuals

You can also order the documentation for the ET 200B distributed I/O station as an electronic manual on CD-ROM.

Other Requisite Manuals

In addition to this manual, you will also need the manual for the DP master used (see Appendix F.2).

Setting the Coding Slide Switch

In order to prevent the wrong electronics block being plugged in, the terminal block has a coding slide switch (see Section 2.1, Figure 2-1, 1).

The coding switch can be engaged in 6 settings. Each setting is assigned to a module class of the ET 200B distributed I/O station:

Table 3-1 Assignment of the Electronics Blocks to the Coding Slide Switch

Setting	Module Class
1	24 V digital modules
2	24 V special modules
3	Analog modules
4	Reserved
5	Reserved
6	230 V digital modules

Setting the Station Number

Any station number from 00 to 99 can be set with the aid of a tool such as a screwdriver (see Section 2.1, Figure 2-1, 10):

- Station numbers 3 to 99 are permissible when operating with the IM308-B master interface.
- Station numbers 1 to 99 are permissible when operating with the IM 308-C master interface or with the S7/M7 DP master.

The station number becomes valid only after a STOP/RUN transition of the ET 200B slave station.

Setting the Coding Plug

The coding plus of the TB8 provide the means of setting the defaults for analog value measurement and analog value output for each channel in the case of analog modules (see Section 2-1, Figure 2-2, 7).

The coding plugs enable you to set the input or output circuitry of the TB8 to suit the measured value sensor or load connected and the desired measuring or output method.

The possible settings for the coding plugs are: "A", "B", "C" and "D".

The relationships between the various settings of the coding plugs and the measurement/output method and the measured value sensors and loads are detailed in the sections dealing with the individual electronics blocks (see Sections 8.4 through 8.6). The procedure for changing the settings of the coding plugs is described below.

3.2 Installing the Electronics Block

Engaging the Electronics Block on the Terminal Block

After coding the terminal block via the coding slide switch, you can engage the electronics block on the terminal block:



Warning

Avoid electrical destruction of the electronics block.

Always set the STOP/RUN switch of the terminal block to the “STOP” position before engaging the electronics block on the terminal block!

The TB6/DC terminal block has no STOP/RUN switch. Always switch off the external power supply before attempting to engage an electronics block (120/230 V AC) onto the TB6/DC.

1. Engage the electronics block on the terminal block (1).
2. Press the electronics block onto the terminal block (2).
3. Secure the electronics block by tightening the screws (3).

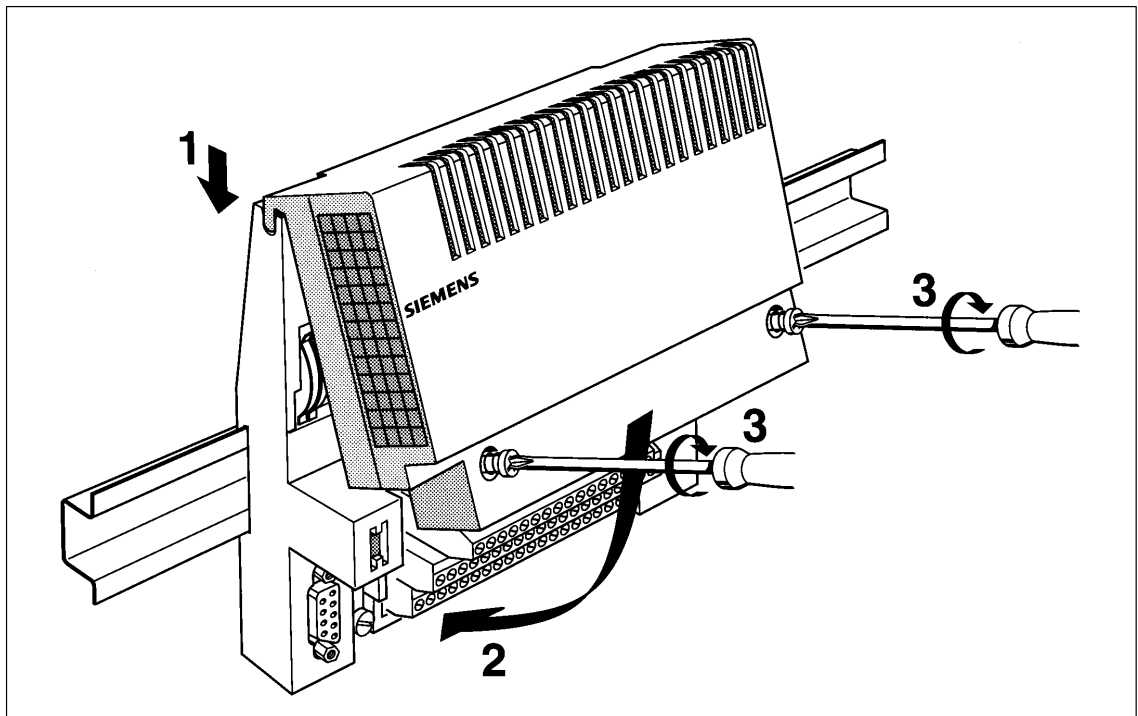


Figure 3-8 Engaging the Electronics Block on the Terminal Block

7.3.2 Electronics Blocks ET 200B-32DI (6ES7 131-0BL00-0XB0) and ET 200B-32DI 0.2ms (6ES7 131-0BL10-0XB0)

- Characteristics** The ET 200B-32DI and ET 200B-32DI 0.2ms electronics blocks have the following characteristics:
- 32 inputs, non-floating
 - Input voltage: 24 V DC
 - Input delay:
6ES7 131-0BL00-0XB0 → 3 ms
6ES7 131-0BL10-0XB0 → 0.2 ms
 - Suitable for switches and 2/3-wire proximity switches (BEROs).
 - Possible terminal blocks: TB2/DC, TB2-4/DC, TB4/DC, TB4M/DC

Dimensional Drawing Dimensional drawing for ET 200B-32DI (6ES7 131-0BL00-0XB0) and ET 200B-32DI 0.2ms (6ES7 131-0BL10-0XB0):

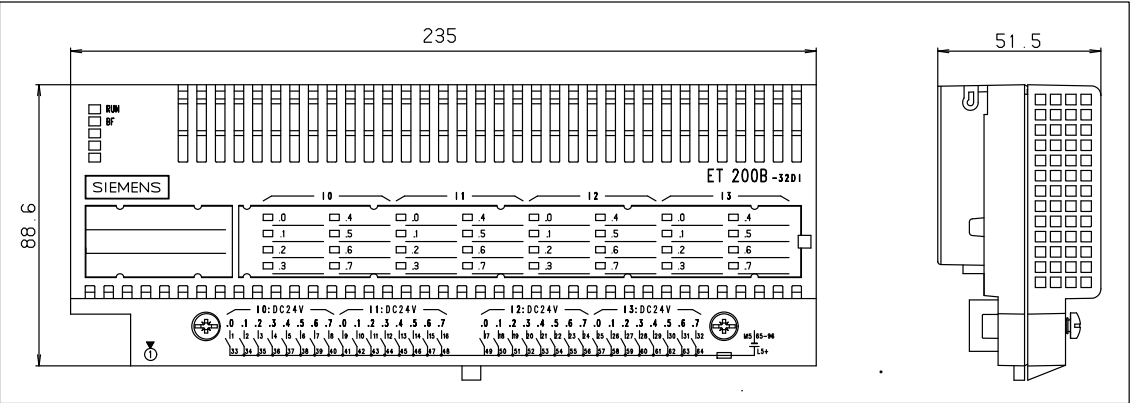


Figure 7-22 Dimensional Drawing: ET 200B-32DI (6ES7 131-0BL00-0XB0) and ET 200B-32DI 0.2ms (6ES7 131-0BL10-0XB0)

Terminal Numbering Figure 7-23 is an enlargement of the terminal numbering printed on the ET 200B-32DI.

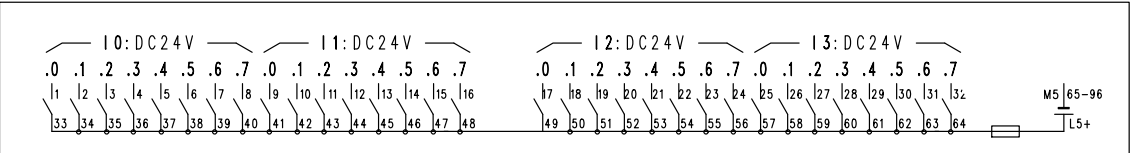


Figure 7-23 Connection Diagram: ET 200B-32DI (6ES7 131-0BL00-0XB0) and ET 200B-32DI 0.2ms (6ES7 131-0BL10-0XB0)

Block Diagram

Simplified diagram of potential for the ET 200B-32DI or
ET 200B-32DI 0.2 ms and TB2/DC or TB4/DC:

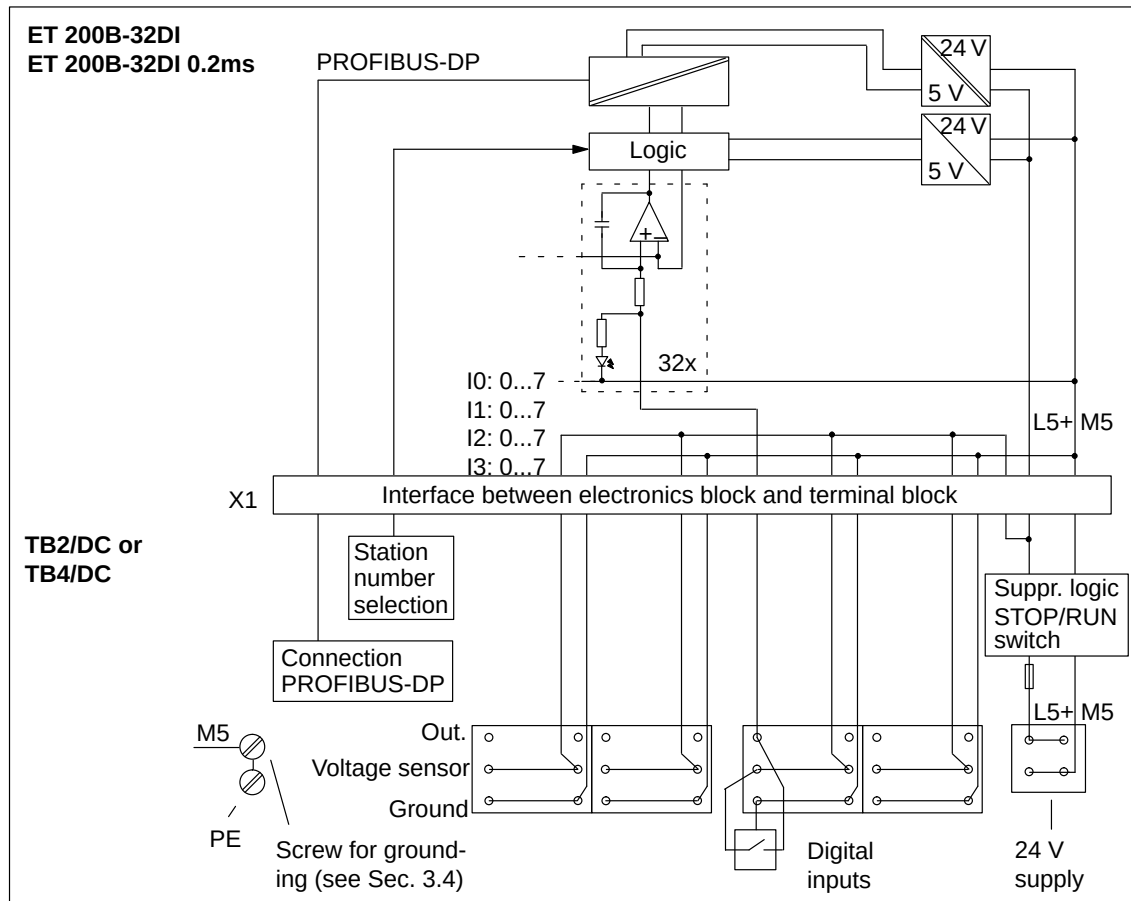


Figure 7-24 Block Diagram: ET 200B-32DI (6ES7 131-0BL00-0XB0) or ET 200B-32DI 0.2ms (6ES7 131-0BL10-0XB0) and TB2/DC or TB4/DC

Block Diagram

Simplified diagram of the potential for the ET 200B-32DI or ET 200B-32DI 0.2 ms and TB2-4/DC:

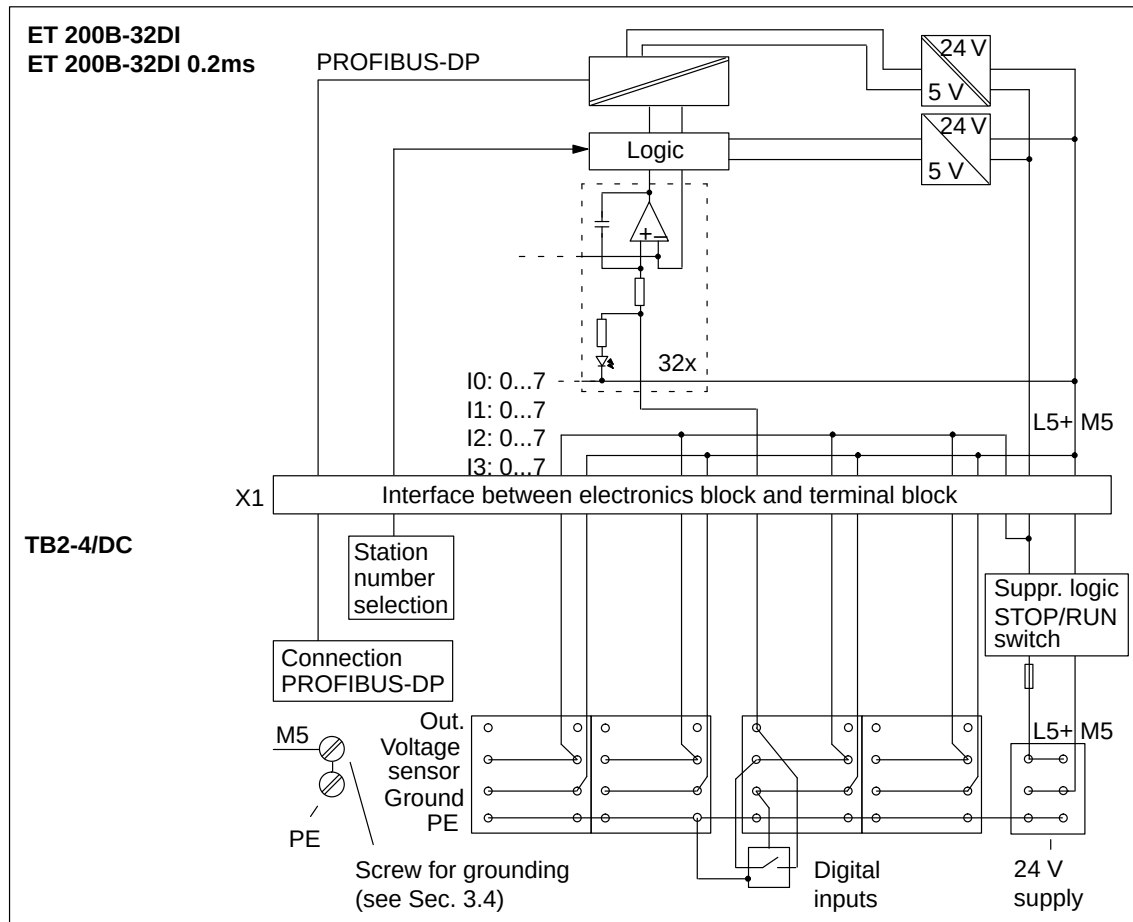


Figure 7-25 Block Diagram: ET 200B-32DI (6ES7 131-0BL00-0XB0) or ET 200B-32DI 0.2ms (6ES7 131-0BL10-0XB0) and TB2-4/DC

Pin Assignment

The table below shows the pin assignment of the terminal blocks for ET 200B-32DI and ET 200B-32DI 0.2 ms. For the sake of clarity, the table also shows the terminal numbering of the terminal blocks, taking the TB2-4/DC by way of example.

Table 7-4 Pin Assignment of Terminal Blocks TB2/DC, TB2-4/DC, TB4/DC and TB4M/DC for ET 200B-32DI (6ES7 131-0BL00-0XB0) and ET 200B-32DI 0.2ms (6ES7 131-0BL10-0XB0)

Terminal numbering TB2-4/DC

The diagram illustrates the terminal block TB2-4/DC. It features two rows of 16 terminals each. The top row is numbered 1 to 16, and the bottom row is numbered 33 to 48. A side view shows the terminal block with a 24V sensor voltage input connected to L5+.

Terminal tier 1		Terminal tier 2		Terminal tier 3		Terminal tier 4 ¹	
1	I0: Input .0	33	24 V (sensor voltage, internally jumpered, connected to L5+)	65	Ground (sensor voltage, internally jumpered, connected to M5)	⊕	PE (internally jumpered, but not connected to PE screw)
2	I0: Input .1	34		66		⊕	
3	I0: Input .2	35		67		⊕	
4	I0: Input .3	36		68		⊕	
5	I0: Input .4	37		69		⊕	
6	I0: Input .5	38		70		⊕	
7	I0: Input .6	39		71		⊕	
8	I0: Input .7	40		72		⊕	
9	I1: Input .0	41		73		⊕	
10	I1: Input .1	42		74		⊕	
11	I1: Input .2	43		75		⊕	
12	I1: Input .3	44		76		⊕	
13	I1: Input .4	45		77		⊕	
14	I1: Input .5	46		78		⊕	
15	I1: Input .6	47		79		⊕	
16	I1: Input .7	48		80		⊕	
17	I2: Input .0	49		81		⊕	
18	I2: Input .1	50		82		⊕	
19	I2: Input .2	51		83		⊕	
20	I2: Input .3	52		84		⊕	
21	I2: Input .4	53		85		⊕	
22	I2: Input .5	54		86		⊕	
23	I2: Input .6	55		87		⊕	

Table 7-4 Pin Assignment of Terminal Blocks TB2/DC, TB2-4/DC, TB4/DC and TB4M/DC for ET 200B-32DI (6ES7 131-0BL00-0XB0) and ET 200B-32DI 0.2ms (6ES7 131-0BL10-0XB0), continued

Terminal tier 1		Terminal tier 2		Terminal tier 3		Terminal tier 4 ¹	
24	I2: Input .7	56	24 V (sensor voltage, internally jumpered, connected to L5+)	88	Ground (sensor voltage, internally jumpered, connected to M5)		PE (internally jumpered, but not connected to PE screw)
25	I3: Input .0	57		89			
26	I3: Input .1	58		90			
27	I3: Input .2	59		91			
28	I3: Input .3	60		92			
29	I3: Input .4	61		93			
30	I3: Input .5	62		94			
31	I3: Input .6	63		95			
32	I3: Input .7	64		96			
–		L5+	Voltage supply, internal logic and sensor voltage 24 V	M5	Ground connection, internal logic and sensor voltage		PE (internally jumpered, but not connected to PE screw)
–		L5+	Voltage supply, internal logic and sensor voltage 24 V	M5	Ground connection, internal logic and sensor voltage		

¹ TB2-4/DC only; in the TB4M/DC tier 4 is available for additional ground connections (see Section 7.2.7)

Important Note on Wiring

The following notes are important as regards the wiring of the ET 200B-32DI and ET 200B-32DI 0.2 ms:

- The terminals for PE on the 4-tier terminal block are not connected to the PE connection of terminal block TB2-4/DC.
- L5+ and terminals 33 ... 64 are interconnected, as are M5 and terminals 65 ... 96.
- The two L5+ terminals are also internally interconnected.

Fuse

The 24 V sensor supply is protected by fuse F1 (2.5 A) in the terminal blocks. Nevertheless, make sure that the current does not exceed the specifications in the technical data for the electronics block.

Technical Data

The technical data of electronics blocks ET 200B-32DI and ET 200B-32DI 0.2 ms is listed in the tables below.

Technical specifications		Inputs	
Baud rates* for 6ES7 131-0BL10-0XB0 and 6ES7 131-0BL00-0BL0	9.6/19.2/93.75/187.5/500/ 1500/3000/6000/ 12000 kbaud	Number of inputs	32
Bus protocol for 6ES7 131-0BL10-0XB0 and 6ES7 131-0BL00-0XB0	PROFIBUS-DP	Galvanic isolation to inter- nal electronic circuits	No
FREEZE capability for 6ES7 131-0BL10-0XB0 and 6ES7 131-0BL00-0XB0	Yes	Input voltage	
		• Rated value	24 V DC
		• For "0" signal	– 30 V to 5 V
		• For "1" signal	13 V to 30 V
Galvanic isolation to SI- NEC L2-DP	Yes	Input current for "1" signal	Typ. 4 mA for 24 V Min. 2 mA
Power losses	Typ. 4.8 W	Delay of inputs for 6ES7 131-0BL00-0XB0	3 ms
Weight (EB and TB)	Approx. 800 g (28 oz.)	Delay of inputs for 6ES7 131-0BL10-0XB0	0.2 ms
Dimensions (EB and TB: W x H x D)	235 x 130 x 60 mm (9.17 x 5.07 x 2.34 in.)	Connection of 2-wire BERO	Possible
		• Quiescent current	≤ 1.5 mA
		Connection of mechanical switches	Possible
		Cable length of sensors	
		• Unshielded	Max. 100 m (328 ft.)
Diagnostics functions		* In operation with the IM 308-B, the maximum baud rate is 1500 kbaud.	
Voltage monitoring	Green "RUN" LED		
Bus monitoring SI- NEC L2-DP	Red "BF" LED		
Status of inputs	Green LEDs		
Supply voltage for inputs, sensor supply and internal logic			
Supply logic (L5+)			
• Rated value	24 V DC		
• Permissible range	18.5 to 30.2 V		
• Value for $t < 0.5$ s	35 V		
Current consumption from L5+			
• Logic	Typ. 70 mA		
• Sensors	Max. 1 A		
I^2t (for inrush current)	≤ 0.05 A ² s		