Sensorbar EB203/EB206/EB209/EB212
Installation instructions, Edition 10/2020 EN

1 Introduction

These installation instructions contain important information that should be followed when installing the EB203/EB206/EB209/EB212 Sensorbar.

- ► Read all the instructions carefully before installing and commissioning the Sensorbar to avoid possible risks and mistakes.
- ► Keep the installation instructions in a safe place for future reference.

2 Safety instructions

These instructions contain notes that you must follow for your own personal safety and to avoid injury and damage to property. They are highlighted by warning triangles and are shown as follows according to the level of danger.

2.1 Hazard classification

⚠ DANGER

The signal word designates a hazard with a **high** degree of risk which, if it is not avoided, will result in death or severe injury.

⚠ WARNING

The signal word designates a hazard with a **medium** degree of risk which, if it is not avoided, will result in death or severe injury.

⚠ CAUTION

The signal word designates a hazard with a **low** degree of risk which, if it is not avoided, could result in minor or moderate injury.

NOTICE

The signal word designates important information about the product or indicates a part of the manual that requires particular attention.

2.2 Notes on installation

⚠ WARNING

- ► **Follow ALL danger and warning instructions and notes on precautionary measures.**
- ► **Read section 2 „Safety instructions“ carefully.**

2.3 Notes on operational safety

⚠ DANGER

Danger of death by electric shock.

Only safety extra low voltages (SELV) may be connected to the Sensorbar. Nevertheless, live conductors that are routed through the current sensors to the circuit breaker carry potentially fatal voltages.

- ► Install the Sensorbar only in approved enclosures or distribution boards so that the connections for the outer and neutral conductors are located behind a cover or guard to prevent accidental contact.
  The enclosure or distribution board must be accessible only with a key or suitable tool in order to limit access to authorised personnel. Before starting any installation or maintenance work, switch off the power to the distribution board and secure it to prevent it being switched on again accidentally.
- ► All installation and maintenance work on this unit must be carried out by trained and authorised electricians.
- ► Install the Sensorbar only in a dry environment.
- ► Protect the Sensorbar against moisture and wet conditions.

⚠ WARNING

- ► Always run data and mains cables separately or in separate conduits.
  Refer to EN 50174-2.

NOTICE

- ► Protect the Sensorbar against damage by transient overvoltages by installing additional overvoltage protection elements conforming to SPD type 1 (coarse protection) and SPD type 2 (medium protection) upstream of the Energy Manager.
- ► Make sure that the Energy Manager that powers the Sensorbar can be isolated from the supply, e.g. with a type C2 or B6 circuit breaker. This must be identified as the isolating unit for the Energy Manager and must be easily accessible.
- ► The Sensorbar requires no maintenance.

3 Target group

The activities described in this manual must only be carried out by electricians with the following qualifications:

— Training in the installation and commissioning of electrical devices
— Training in electrical hazards and the local safety requirements
— Knowledge of the relevant standards and directives

4 Description

The Sensorbar is used to measure currents in AC mains networks. The measured data is sent via the RS485 bus to the Energy Manager, where it is analysed. The Energy Manager also supplies the 9 V DC voltage to the Sensorbar. There are four versions of the Sensorbar available - with three (EB203), six (EB206), nine (EB209) or twelve (EB212) slots for the current sensors. The current sensors are seated directly on the circuit breakers and record the momentary current intensity. The conductors to be measured are routed through the round openings in the current sensors to the circuit breaker terminals.
Up to eight Sensorbars can be connected to an Energy Manager unit. Sensorbar EB212 with twelve current sensors can be used to measure the currents from up to 96 conductors and send them to the Energy Manager. Each Sensorbar has a unique Modbus address in the range from 1 to 247.

5 Intended use

The Sensorbar may only be operated when it is installed in the distributor box and the protective covers are attached.
The Sensorbar is approved only for use in dry interior areas.
Only use the Sensorbar as specified in the documentation provided. Any other usage may result in injury or damage to property.
For safety reasons, no changes may be made to the Sensorbar unless they are expressly approved for the product by TQ-Systems GmbH.
Any use of the product other than as described in the Intended use section shall be regarded as contrary to the intended use. Unauthorised changes, conversions or repairs and opening of the product are prohibited. The enclosed documentation is part of the product and must be read, followed and then retained in a place that is accessible at all times.

6 Environmentally-friendly disposal

The Sensorbar must not be disposed of in the residual waste bin.

► Dispose of the Sensorbar in accordance with the electronic waste disposal regulations that apply on site.

7 Contact

If you have technical problems, please contact your service engineer or installation engineer.

TQ-Systems GmbH | TQ-Automation
Gut Delling | Mühlstr. 2
82229 Seefeld | Germany
Phone +49 8153 9308-0 | Fax +49 8153 4223
info@tq-automation.com
www.tq-automation.com

8 Items supplied

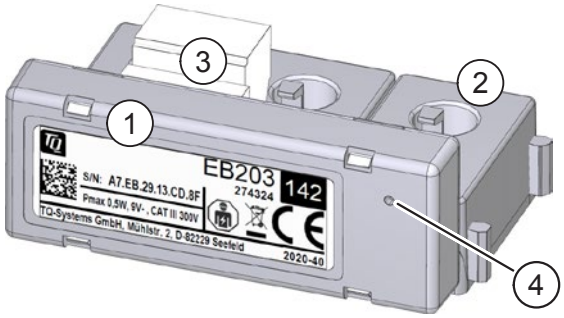


Fig. 1: Items supplied with the Sensorbar, example of EB203

Item	Designation	Item no.	Quantity
1	Sensorbar by type: EB203 for 3 current sensors EB206 for 6 current sensors EB209 for 9 current sensors EB212 for 12 current sensors	 274324 274323 274320 274318	1x
2	Current sensor	276129	3x (EB203) 6x (EB206) 9x (EB209) 12x (EB212)
3	Molex connector 39500	275520	1x
–	Installation instructions		1x

9 Technical data

Electrical connections	
Supply voltage VCC	9 V DC
Supply current	Max. 20 mA
Power consumption	Max. 0.5 W
Nominal voltage/wire insulation	300 V RMS
Overvoltage category	CAT III 300 V
Working voltage rated value	250 V AC
Current rated value	63 A
Transient overvoltage rated value	4000 V
Fieldbus	
RS485 cable length	Max. 10 m
Modbus address range	1 to 247
Line connections	
Fieldbus connection cross section	0.25 mm² to 1.5 mm²
Power cable connection cross section as per DIN 57100 part 523/VDE 0100 part 523.6-81	1.5 mm² to 10 mm²
Enclosure protection	
IP code	IP2X
Ambient conditions	
Ambient temperature — Operation — Storage/transportation	 -25 °C ... +55 °C -25 °C ... +70 °C
Relative humidity (non-condensing)	50 % to 95 %
Air pressure during operation	790 hPa to 1070 hPa

10 LED on the Sensorbar (see item 4 in Fig. 1)

— Off: Sensorbar is not powered → Test connections or activate Modbus RTU function in the Web front-end
— Blue steady light: Sensorbar is ready-to-operate
— Blue flashing: Communication between EM and Sensorbar

11 Installation

⚠ DANGER

Danger of death by electric shock.

► Before starting any installation or maintenance work, switch off the power to the distribution board and secure it to prevent it being switched on again accidentally.
► Make sure that all conductors are voltage-free.

11.1 Tools and equipment required

— Screwdriver, insulated
— Cable ties
— AlphaWire 2466C standard cable (recommended) or alternatively a CAT5e cable

11.2 Link current sensors

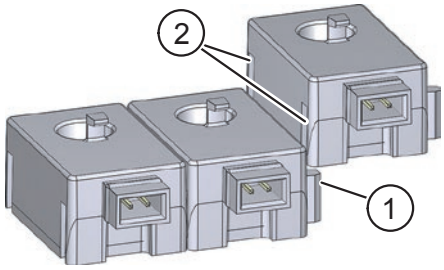


Fig. 2: Link current sensors

► Link the current sensors to one another by sliding the grooves (item 2 in Fig. 2) onto the tongues (item 1 in Fig. 2).

11.3 Install current sensors

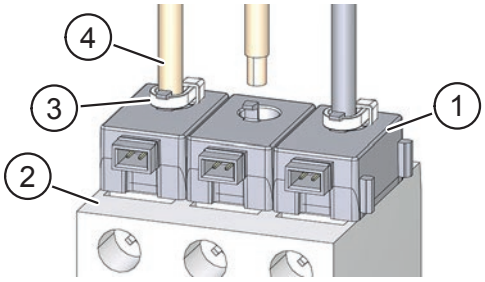
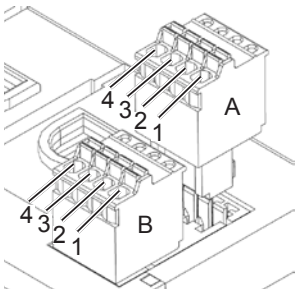


Fig. 3: Install current sensors

► Position the linked current sensors (item 1 in Fig. 3) on the top of the circuit breaker (item 2 in Fig. 3) so that the openings in the current sensors line up with the conductor openings on the circuit breaker.
► Push the conductors (item 4 in Fig. 3) through the openings in the current sensors and fix the conductors to the terminals on the circuit breaker.
► Fix the two outer conductors to the tongues on the current sensors using cable ties (item 3 in Fig. 3).

11.4 Connect Sensorbars to Energy Manager



Pin	Identification	Description
1A, 1B	VCC	Voltage output, 9 V ± 10 %, max. 280 mA
2A, 2B	GND	Ground
3A, 3B	A	RS485 A
4A, 4B	B	RS485 B

Fig. 4: Connection diagram for RS485 connector

► Connect the Sensorbar and Energy Manager connectors to the standard cable 2466C. Fig. 4 / Fig. 5 show the wire assignment.

11.5 Attach Sensorbar to current sensors

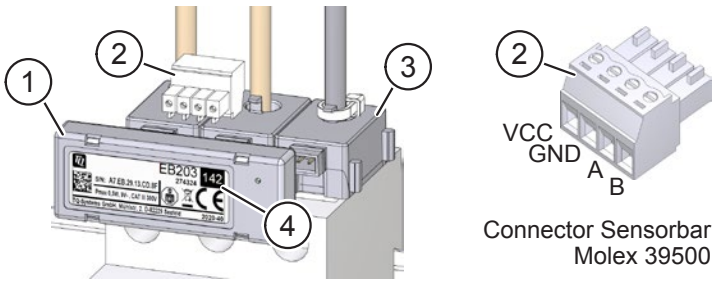


Fig. 5: Attach Sensorbar to current sensors

► Attach the Sensorbar (item 1 in Fig. 5) to the linked current sensors (item 3 in Fig. 5) and the Molex connector (item 2 in Fig. 5).

NOTICE

After installation, the Energy Manager software performs a bus scan and signals any addresses that have been assigned more than once.

► Please note that all interconnected Sensorbars must have different addresses (item 4 in Fig. 5).

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