RFID117-L1

For use in combination with charge controllers used in electric vehicle charging stations, wall boxes and street light charging points

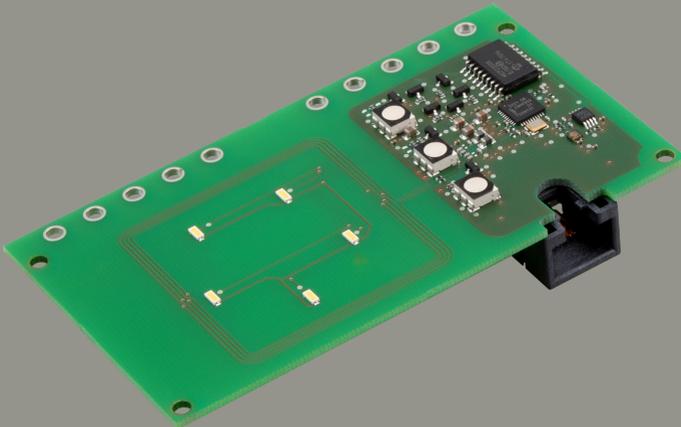
Illustration similar

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1   General information

1.1   How to use the manual

ADVICE
This manual is intended for qualified personnel working in electrical engineering and electronics! Part of the device documentation in addition to this manual is the enclosed supplement 'Safety instructions for Bender products'.

ADVICE
Read the operating manual before mounting, connecting and commissioning the device. Keep the manual within easy reach for future reference.

1.2   Indication of important instructions and information

DANGER
Indicates a high risk of danger that will result in death or serious injury if not avoided.

WARNING
Indicates a medium risk of danger that can lead to death or serious injury if not avoided.

CAUTION
Indicates a low-level risk that can result in minor or moderate injury or damage to property if not avoided.

ADVICE
Indicates important facts that do not result in immediate injuries. They can lead to malfunctions if the device is handled incorrectly.

i *Information can help to optimise the use of the product.*

1.3   Signs and symbols

Disposal   Protect from moisture   Protect from dust

Temperature range   Recycling   RoHS directives

1.4   Service and Support

Information and contact details about customer service, repair service or field service for Bender devices are available on the following website: Fast assistance | Bender GmbH & Co. KG.

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1.5 Training courses and seminars

Regular face-to-face or online seminars for customers and other interested parties:

www.bender.de > know-how > seminars.

1.6 Delivery conditions

The conditions of sale and delivery set out by Bender GmbH & Co. KG apply. These can be obtained in printed or electronic format.

The following applies to software products:

ZVEI:
Die Elektroindustrie

'Software clause in respect of the licensing of standard software as part of deliveries, modifications and changes to general delivery conditions for products and services in the electrical industry'

1.7 Inspection, transport and storage

Check the shipping and device packaging for transport damage and scope of delivery. In the event of complaints, the company must be notified immediately, see 'www.bender.de > service & support.'.

The following must be observed when storing the devices:

1.8 Warranty and liability

Warranty and liability claims for personal injury and property damage are excluded in the case of:

- Improper use of the device.
- Incorrect mounting, commissioning, operation and maintenance of the device.
- Failure to observe the instructions in this operating manual regarding transport, commissioning, operation and maintenance of the device.
- Unauthorised changes to the device made by parties other than the manufacturer.
- Non-observance of technical data.
- Repairs carried out incorrectly.
- The use of accessories or spare parts that are not provided, approved or recommended by the manufacturer.
- Catastrophes caused by external influences and force majeure.
- Mounting and installation with device combinations not approved or recommended by the manufacturer.

This operating manual and the enclosed safety instructions must be observed by all persons working with the device. Furthermore, the rules and regulations that apply for accident prevention at the place of use must be observed.

1.9   Disposal of Bender devices

Abide by the national regulations and laws governing the disposal of this device.

For more information on the disposal of Bender devices, refer to

www.bender.de > service & support.

1.10   Safety

If the device is used outside the Federal Republic of Germany, the applicable local standards and regulations must be complied with. In Europe, the European standard EN 50110 applies.

⚠ **DANGER**   *Risk of fatal injury due to electric shock!*
Touching live parts of the system carries the risk of:

- Risk of electrocution due to electric shock
- Damage to the electrical installation
- Destruction of the device

Before installing the device and before working on its connections, make sure that the installation has been de-energised. The rules for working on electrical systems must be observed.

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2   Device-specific safety instructions

⚠ **ADVICE**
The RFID module complies with the relevant harmonized standards to ensure that the requirements of the Radio Equipment Directive (see the chapter "Declarations of Conformity", page 11) are met. It is the responsibility of the distributor of the complete system to ensure conformity with this and any additional legal requirements.

⚠ **WARNING** *Very bright RGB LEDs*
Vision impairment!
Care must be taken to avoid looking directly into the RGB LEDs.

⚠ **WARNING** *Electromagnetic waves and fields*
Health hazards!
The device emits electromagnetic waves and fields for radio communication when in operation. Care must be taken to avoid a continuous proximity of less than 20 cm to body parts.

3 Function

3.1 Intended use

The RFID module must only be used in combination with charge controllers from Bender GmbH & Co. KG. The module is a separate PCB which facilitates user interaction with the charging system.

Any other use or a use that goes beyond this constitutes improper use.

ℹ *This document is intended to be used together with the operating manuals for the charge controllers used, which can be downloaded here: https://www.bender.de/en/service-support/download-area/*

3.2 Functional description

The RFID module is used in combination with the charge controller within a charging system to authorize charging transactions.

The RFID frequency is 13.56 MHz. The PN532 Near Field Communication (NFC) controller used for contactless communication supports nearly all RFID/NFC communication media operating on this frequency. Currently only passive tags with a UID are read. Further functionality is possible upon request.
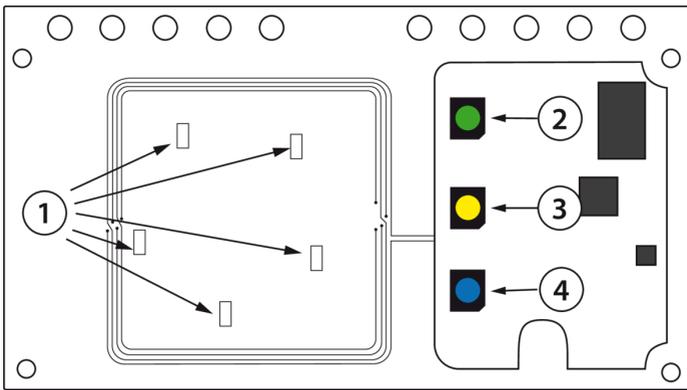
3.3 LED status

Illustration similar

LED		Status
1	Lights up in parallel to 3	• Authorization process is running • The signalisation of the current authorisation by circular light patterns
2	continuously lighting	• Charging system is free • No vehicle is connected
	slow flashing	• Charging system is free • Vehicle is connected

LED		Status
3	continuously lighting	• Charging system is reserved • No vehicle is connected
	slow flashing	• Charging system is reserved • Vehicle is connected
	fast flashing	• Charging system is exchanging data with the backend • Waiting for an authorisation
4	slow flashing	• Charging has been authorised • Vehicle is charging
	fast flashing	• Charging has been authorised • Vehicle is not yet connected or has just been disconnected from the charging system
2, 3, 4*	fast flashing	• Authorization has been rejected. • Fault in the charging system. • The backend is not available

* Measures for fault correction can be consulted in the manual of the charge controller.

3.4   Operation

The charging is initiated by holding a valid RFID card close to the reader on the RFID module. The status of the LEDs changes. Charging can be terminated when the RFID card is again held in front of the charging system.

3.5   RJ45 connector pin assignment

Pin number	Description
1	I2C (not used for the RFID functionality)
2	I2C (not used for the RFID functionality)
3	GND
4	RX PN532
5	TX PN532
6	3.3 V
7	5 V (not used for the RFID functionality)
8	GND

4   Dimensions and mounting

Dimensions
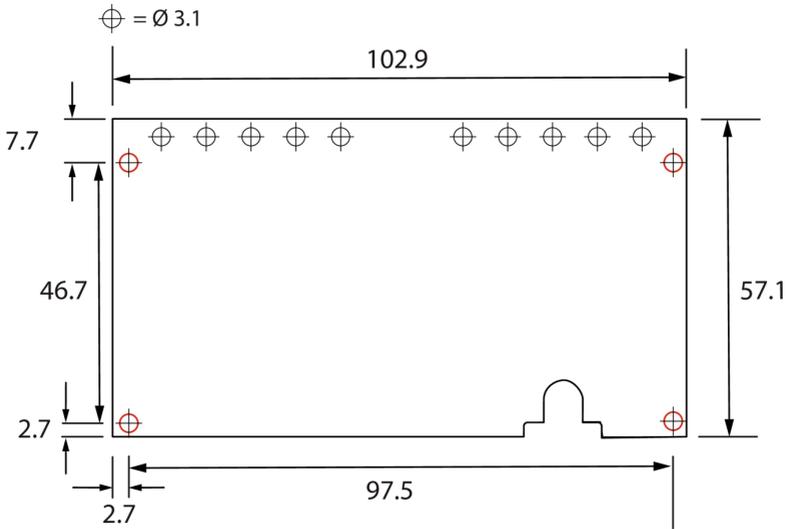
Dimensions in mm; Tolerance acc. to ISO 2768-m

ℹ️ *Red markings: possible attachment points*

Mounting

The RFID module is installed under a semi-transparent part of the charging system housing. It must be placed at a distance of **at least 20 mm** from any significant metal surface or metal parts to ensure optimum RFID reading performance.

The module is connected to the charge controller, which is the main component of the charging system, using a standard RJ45 cable.

⚠️ **CAUTION**   *Electrostatic discharge!*
Damage to device
Electrostatic discharge (ESD) can damage electronic components. Precautions for handling electrostatically sensitive components in accordance with DIN EN 61340-5-1 and DIN IEC/TR 61340-5-2 must be observed.

5 Technical Data

5.1 Tabular data

Insulation coordination acc. to IEC 60664-1/ IEC 60664-3

Rated voltage	12.5 V
Pollution degree	2
Rated impulse withstand voltage	800 V
Rated insulation voltage	12.5 V
Altitude	≤ 2000 m AMSL

Rated voltage/rated current

Rated voltage	DC 3.3 / 5 V
Rated voltage tolerance	± 5 %
Rated current	140 / 64 mA

Frequency / Transmitting power

Radio frequency	13.56 MHz
Max. transmitting power*	42 dBµA/m

* at a distance of 10 m

Environment / EMC

Operating temperature	-30 … +70 °C
Climatic conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3K23 (except condensation, water and formation of ice)
Transport (IEC 60721-3-2)	2K11
Long-term storage (IEC 60721-3-1)	1K21
Mechanical conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3M11
Transport (IEC 60721-3-2)	2M4
Long-term storage (IEC 60721-3-1)	1M12

Connection

Charge controller connection	RJ45 cable*
Maximum cable length	< 2 m

* Type: CAT 5e Class D, RF/UTP, twisted pair patch cable, AWG 26/7

Other

Protection class	IP00
Max. RFID reading distance	100 mm
Weight	25 g

5.2 Standards and approvals

The RFID module has been developed in compliance with:
- ISO 14443A/MIFARE
- For additional standards, see the chapter ""Declarations of Conformity", page 11"

CE   UK CA

Use in the EU and other countries

ℹ️ *The conformity with the relevant EU directives permits operation of the device exclusively in countries of the European Economic Area.*

The conformity with the relevant UKCA directives permits operation of the device exclusively in the United Kingdom.

5.3 Declarations of Conformity

EU Declaration of Conformity

Hereby, Bender GmbH & Co. KG declares that the device covered by the Radio Directive complies with Directive 2014/53/EU. The full text of the EU Declaration of Conformity is available at the following Internet address:

https://www.bender.de/fileadmin/content/Products/CE/CEKO_RFID11x.pdf

UK Declaration of Conformity

Hereby, Bender GmbH & Co. KG declares that this device is in compliance with Radio Equipment Regulations 2017 (S.I. 2017/1206). The full text of the UK declaration of conformity is available at the following internet address:

https://www.bender.de/fileadmin/content/Products/UKCA/UKCA_RFID11x.pdf

5.4 Ordering information

Type	Part number	Manual number
RFID117-L1*	B94060117	D00422

*   RJ45 cable included (length, 500 mm)