



RFID110-L1



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



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Photos: Bender archives

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1. Important information

1.1 How to use this manual



*This manual is intended for **qualified personnel** working in electrical engineering and electronics!*

Always keep this manual within easy reach for future reference.



*This symbol denotes information intended to assist the user in making **optimum use** of the product.*

1.2 Technical support: service and support

Technical support by phone or e-mail for all Bender products.

- Questions concerning specific customer applications
- Commissioning
- Troubleshooting

Telephone: +49 6401 807-760*
Fax: +49 6401 807-259
In Germany only: 0700BenderHelp (Tel. and Fax)
E-mail: support@bender-service.de

*Available from 7.00 a.m. to 8.00 p.m. 365 days a year (CET/UTC+1)

1.3 Delivery conditions

Bender sale and delivery conditions apply. These can be obtained from Bender in printed or electronic format.

1.4 Inspection, transport and storage

Inspect the dispatch and equipment packaging for damage, and compare the contents of the package with the delivery documents. In the event of damage in transit, please contact Bender immediately. The devices must only be stored in areas where they are protected from dust, damp, and spray and dripping water, and in which the specified storage temperatures can be ensured.

1.5 Disposal

Abide by the national regulations and laws governing the disposal of this device. Ask your supplier if you are not sure how to dispose of the old equipment.

For more information on the disposal of Bender devices, refer to our homepage at www.bender.de -> Service & support.

1.6 Intended use

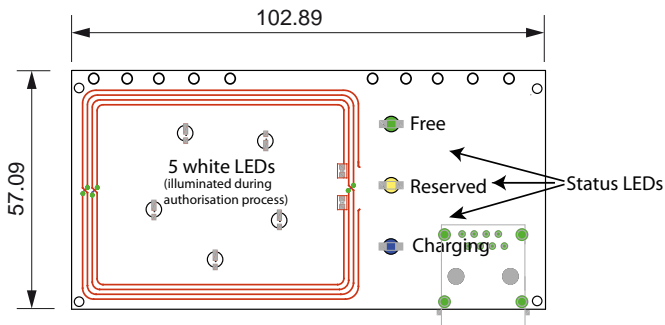
This manual provides a description of an RFID module, which can only be used in combination with Bender charge controllers. The charge controller is designed for use in electric vehicle (EV) charging stations, wall boxes and street light charging points. This document should be used together with the charge controller operating manual(s), which can be downloaded from: www.bender.de/manuals.

The RFID module is a separate PCB which facilitates user interaction with the charging system and is designed according to ISO14443A/MIFARE. It can be connected to the charge controller, the main component of a charging system, using a standard **RJ45 cable**.

Charging is initiated by holding a valid RFID card, which is registered to a backend system, close to the reader on the RFID module. Charging starts when the contactor in the charging system is switched on to provide power flow. In offline operation, the charge controller can optionally allow charging without authorization or it can authorize users based on RFID and a local white list of authorized RFID cards.

2. RFID module

The RFID module, shown below, contains an antenna, antenna illumination and status LEDs.



Note: Tolerance acc. to ISO 2768 - m

All dimensions in mm

It is a separate PCB that should ideally be placed under a semi-transparent part of the charging system housing.



The RFID module 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.



CAUTION

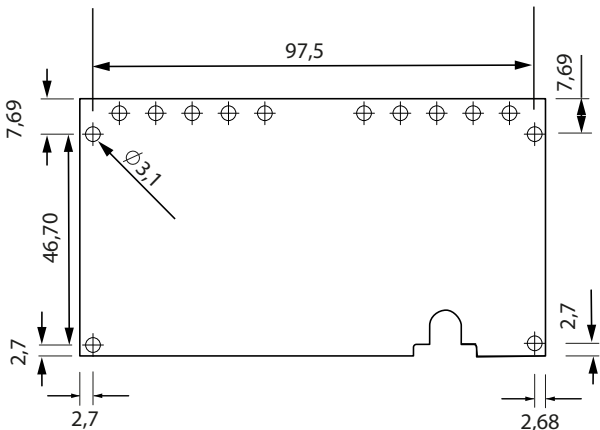
Electrostatic discharge (ESD) can damage electronic components. Observe the precautions for handling electrostatically sensitive components in accordance with DIN EN 61340-5-1 and DIN EN 61340-5-2.

The **RFID frequency is 13.56 MHz**. Bender uses the PN532 Near Field Communication (NFC) controller for contactless communication, which supports virtually all RFID/NFC communication means on this frequency. Currently only passive tags with a UID are read. Further functionality is possible upon request.



*The RJ45 cable delivered has a length of 50 cm.
However, cable lengths of < 3 m are possible.*

2.1 Dimensions for mounting



All dimensions in mm

2.2 RFID status LEDs

As well as the RFID antenna, the RFID module contains several LEDs: three status LEDs, one each in green (Free), yellow (Reserved) and blue (Charging), and 5 white LEDs set in a circular arrangement. The status of the LEDs changes when charging is initiated by holding a valid RFID card close to the reader on the RFID module.

- **Green LED (Free):**

- A continuously lighting LED indicates that the charging system is free and that no vehicle is connected.
- A slow flashing LED indicates that the charging system is free and that a vehicle is connected.

- **Yellow LED (Reserved):**

- A continuously lighting LED indicates that the charging system is reserved and that no vehicle is connected.
- A slow flashing LED indicates that the charging system is reserved and that a vehicle is connected.
- A fast flashing LED indicates that the charging system is exchanging data with the backend and is waiting for an authorisation.

The white LEDs are illuminated during the authorisation process, i.e. in parallel to the yellow LED, and show the current authorisation using circular light patterns.

- **Blue LED (Charging):**

- A slow flashing LED indicates that charging has been authorised and that a vehicle is charging.
- A fast flashing LED indicates that charging has been authorised, and that the vehicle is not yet connected or has just been disconnected from the charging system.

- Fast flashing LEDs (green, yellow and blue) is an indication of one of the following:

- Authorization has been rejected.
- There is a fault in the charging system.
- The backend is not available.

Consult the charging system manual on what measures can be taken.

2.3 Operation

The status of the LEDs changes when charging is initiated by holding a valid RFID card close to the reader on the RFID module.

Charging can be terminated when the RFID card is again held in front of the charging system.

2.4 Integration

The RFID module is integrated solely in conjunction with Bender charge controllers under professional installation. In most cases these charge controllers implement the functionality of an electric vehicle charging system in which the RFID module is used to authorize charging transactions.

2.4.1 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

2.4.2 Host labelling requirements:

The RFID module is provided with a special label which contains all necessary information. The use of the RFID module in combination with a special host may, depending on the circumstances, require additional documentation if:

- The module's Federal Communications Commission (FCC) ID is not visible when installed in the host
- Or the host is such that end users cannot easily access it (using standard methods) in order to make its FCC ID visible.

In the above two cases, an additional permanent label is then required which may state one of the following:

- "Contains RFID module FCC ID: 2AHQO-RFID"
- "Contains FCC ID: 2AHQO-RFID"

2.5 User information

2.5.1 FCC and ISED statements:

FCC § 15.19

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

2.5.2 Canada RSS-GEN § 8.4

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. l'appareil ne doit pas produire de brouillage;
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

FCC § 15.21 (Warning statement)

[Any] changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

3. Technical data

3.1 Tabular data

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

Rated voltage	12.5 V
Overvoltage category	III
Pollution degree	3
Rated impulse withstand voltage.....	800 V
Rated insulation voltage	12.5 V
Altitude.....	≤ 2000 m AMSL

Nominal voltage/nominal current

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

Frequency

Radio frequency	13.56 MHz
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Environment/EMC

Operating temperature	-30... +70 °C
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Climatic conditions acc. to IEC 60721:

Stationary use (IEC 60721-3-3)	3K5 (except condensation, water and formation of ice)
Transport (IEC 60721-3-2)	2K2
Long-term storage (IEC 60721-3-1)	1K2

Mechanical conditions acc. to IEC 60721:

Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Long-term storage (IEC 60721-3-1)	1M3

Connection

Connection to charge controller	via RJ45 cable
Maximum cable length.....	< 3 m

Other

Protection class	IP00
Maximum read distance	100 mm
Weight.....	25 g

3.2 Standards, approvals, certifications

The RFID110-L1 module has been developed in compliance with:

- ISO 14443A/MIFARE
- EN 50364: 2010
- EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011 + AC: 2011 + A2: 2013
- EN 61851-1: 2011
- EN 61851-22: 2002
- ETSI EN 301 489-1 V2.1.1: 2017
- ETSI EN 301 489-3 V2.1.1 Final Draft: 2017
- EN 300 330 V2.1.1: 2017
- FCC ID: 2AHQO-RFID (FCC Part 15.207/15.209)
- IC: 21240-RFID (ICES 003/RSS 210/RSS Gen)

3.3 Ordering information

Type	Art. No.
RFID110-L1(RJ45 cable (length 500 mm) included)	B94060110

3.4 Declaration of conformity

Bender GmbH & Co. KG
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EG-Konformitätserklärung EC-Declaration of Conformity

Hersteller:
Manufacturer:

Bender GmbH & Co. KG

erklärt in alleiniger Verantwortung, dass das Produkt
declare under our sole responsibility that the product

Produktbezeichnung
Product name:

RFID11x (siehe Anlage)
RFID11x (see annex)

auf das sich diese Erklärung bezieht, mit den Vorschriften
 folgender Europäischen Richtlinien übereinstimmt.
*to which this declaration relates, is in conformity with the
 following European directives.*

Richtlinien:
Directives:

2011/65/EU RoHS-Richtlinie *RoHS directive*
2014/53/EU RED-Richtlinie *RED directive*

Zur Beurteilung der Konformität wurden folgende Normen herangezogen:
The assessment of this product has been based on the following standards:


Angewandte Normen / *Applied standards:*

EN 50364	:2010,	EN 50581	:2012
EN 60950-1	:2006 ... A2:2013,	EN 61851-1	:2011
EN 61851-22	:2002		
ETSI EN 300 330	V2.1.1 :2017		
ETSI EN 301 489-1	V2.1.1 :2017		
ETSI EN 301 489-3	V2.1.1 Final Draft: 2017		

Ort, Datum:
place, date:

Grünberg, den 06.03.2018

Unterschrift:
signature:


 (Winfried Möll)
 (Geschäftsführer Technologie / CTO)

Anmerkung:

Die Anlagen sind Bestandteil dieser EG-Konformitätserklärung.
 *Evtl. Normen Einschränkungen sind gerätespezifisch in der Typenliste gekennzeichnet.

Remark:

*The annexes are part of this declaration.
 Limitation of standards are marked with a sign in the attached type list.

Anlage - Typenliste der EG-Konformitätserklärung RFID11x*Annex - Typelist of EC-declaration RFID11x*

Produktgruppe <i>Product group</i>	Art.-Nr. <i>Art.-no.</i>	Gerätebezeichnung <i>Device type</i>
CC61x	B94060110	RFID110-L1
RFID	B94060114	RFID114 ohne LEDs



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