Annex no. 5

Functional Description / User Manual

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BARCODING RFID AND BEYOND
R MOROZ LTD

RML-HFMR102

Installation Manual

Note

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Composition of the information in this document has been done to the best of our knowledge. RFID Canada does not guarantee the correctness and completeness of the details given in this manual and may not be held liable for damages ensuing of incorrect or incomplete information. Since, despite all our efforts, errors may not be completely avoided, we are always grateful for your useful tips.

The instructions given in this manual are based on advantageous boundary conditions. RFID Canada does not give any guarantee promise for perfect function in cross environments.

RFID Canada call explicit attention that devices which are subject of this document are not designed with components and testing methods for a level of reliability suitable for use in or in connection with surgical implants or as critical components in any life support systems whose failure to perform can reasonably be expected to cause significant injury to a human. To avoid damage, injury, or death, the user or application designer must take reasonably prudent steps to protect against system failures.

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This manual is to be used with the complete system consisting of reader, specified antennas, cables and power supply.

Contents

1 Safety Instructions / Warning - Read before start-up !

- The device may only be used for the purpose intended by the manufacturer.
- The operation manual should be kept readily available at all times for each user.

This manual is to be used with the complete system consisting of reader, specified antennas, cables and power supply.

- Unauthorized changes and the use of spare parts and additional devices which have not been sold or recommended by the manufacturer may cause fire, electric shocks or injuries. Such unauthorized measures shall exclude the manufacturer of any liability.
- The liability-prescriptions of the manufacturer in the issue valid at the time of purchase are valid for the device. The manufacturer shall not be held legally responsible for inaccuracies, errors, or omissions in the manual or automatically set parameters for a device or for an incorrect application of a device.
- Repairs may only be undertaken by the manufacturer.
- Installation, operation, and maintenance procedures should only be carried out by qualified personnel.
- Use of the device and its installation must be in accordance with national legal requirements and local electrical codes .
- When working on devices the valid safety regulations must be observed.
- Before touching the device, the power supply must always be interrupted. Make sure that the device is without voltage by measuring. The fading of an operation control (LED) is no indicator for an interrupted power supply or the device being out of voltage!
- Special advice for wearers of cardiac pacemakers:
  Although this device doesn't exceed the valid limits for electromagnetic fields you should keep a minimum distance of 25 cm between the device and your cardiac pacemaker and not stay in the immediate proximity of the device’s antenna for any length of time.

- This product requires professional installation by trained qualified personnel.
- This product is custom manufactured by R. Moroz Limited only.
- This product is installed by R. Moroz LTD trained staff or distributed by R. Moroz Ltd. to authorized system integrators only.
- The manufacturing and distribution process is fully controlled by R. Moroz Ltd.
- R. Moroz Ltd. grants authorization only to system integrators that have trained professional installers on staff and make on going commitment to maintaining trained installation staff.
- R. Moroz Ltd. grants authorization only to dealers that formally commit to controlling the installation process according to the installation instructions and by professional trained staff.
- The intended use of this product is generally not for the general public. It is generally for industry/commercial use. This device will be used in non-residential environments.

2 Performance Features of the readers

The Reader RML-HFMR102 is designed for reading passive data carriers, so-called „Smart Labels“ at an operating frequency of 13.56 MHz.

The RML-HFMR102 is suitable for all applications in which moderate reading distances are required. Also required is an external antenna connected to the Reader.

An anti-collision function enables simultaneous reading of up to 30 transponders per second.

The Reader electronics is contained in a plastic housing having an IP30 enclosure rating.

2.1 Available Reader types

The following reader types are currently available:

Reader type	Description
RML-HFMR102-A	Housing version with asynchronous RS232 interface
RML-HFMRM102-A	Module version with asynchronous RS232 interface
RML-HFMR102-B	Housing version with asynchronous RS485 interface
RML-HFMR102-PoE	Housing version with LAN interface and Power over Ethernet
RML-HFMR102-USB	Housing version with USB-interface
RML-HFMRM102-USB	Module version with USB- interface

Table 1: Reader types

2.2 Optional accessories

Optional Accessories are listed in the attachment.

3 Assembly and Wiring

3.1 Housing versions

The Reader is designed for an office environment.

Notes:

- ***The distance between two readers of the same type should not fall below 4m.***
- ***Before any installation the intended position of the reader should be tested for it´s suitability.***

3.1.1 Dimensions

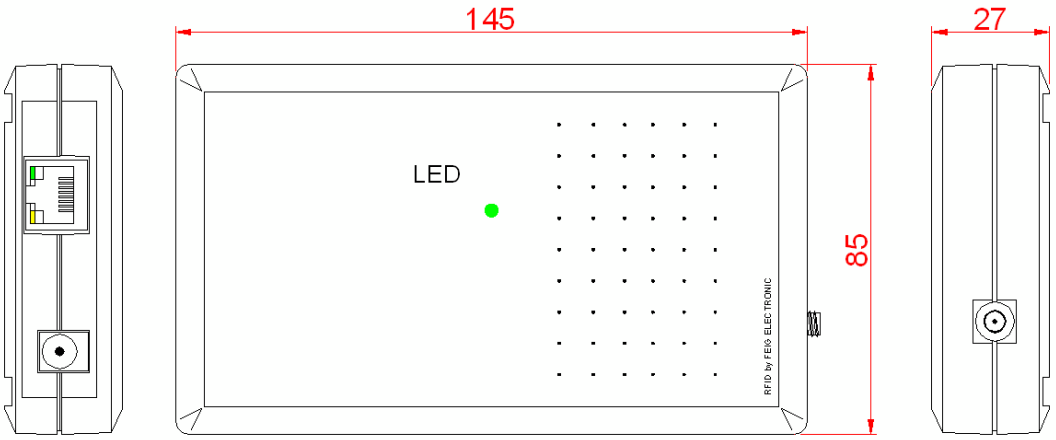


Figure 1: Dimensions of the housing version (all dimensions are in mm)

3.2 Module version

This reader version has been designed for mounting in other equipment.

Notes:

- ***The distance between two readers of the same type should not fall below 4m.***
- ***Before any installation the intended position of the reader should be tested for it´s suitability.***

3.2.1 Dimensions

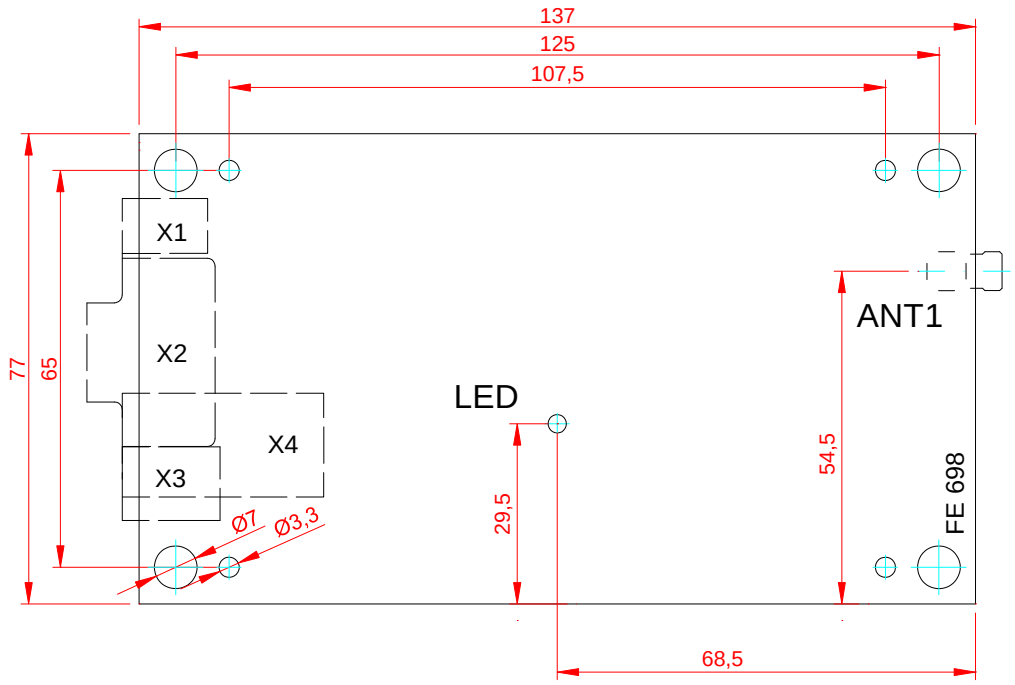


Figure 2: Dimensions of the module version (all dimensions in mm)

4 Connections

Depending on the reader variant different connectors are available. Figure 3: Connection overview displays the arrangement and the Table 2: Connectors shows which connector can be used for the different interface cable.

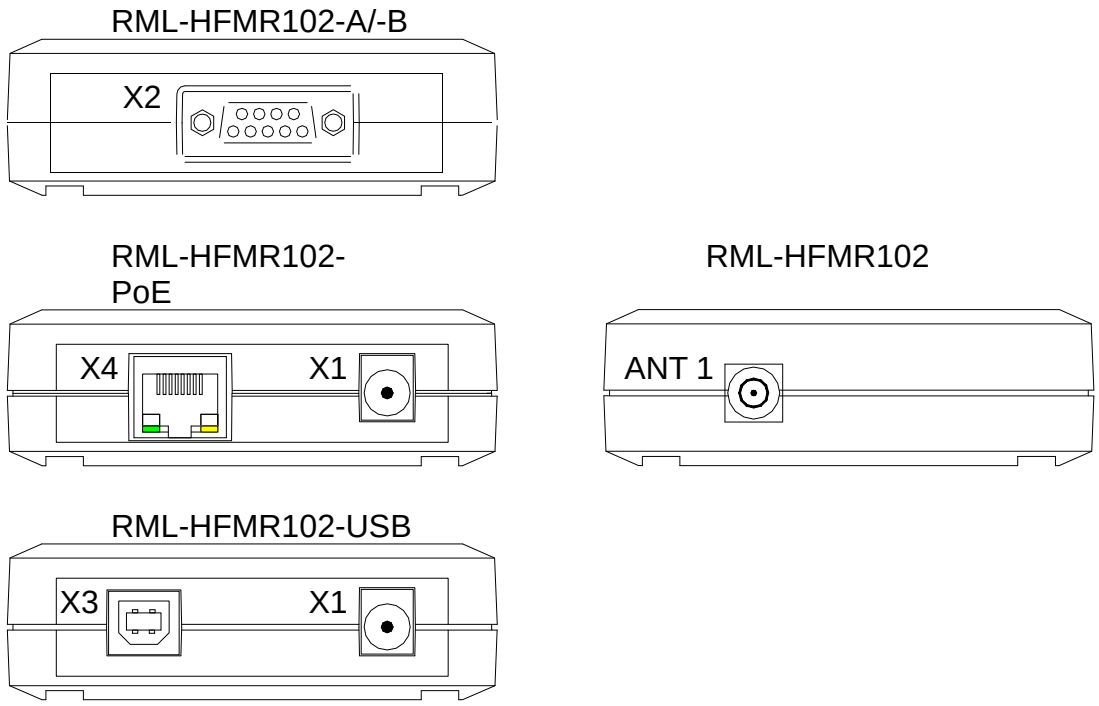


Figure 3: Connection overview

Connector	Description
ANT 1	Antenna terminal ANT 1 (Impedance 50Ohm)
X1	Power supply 12 - 24VDC
X2	RS232 / 485 Interface
X3	USB Interface
X4	10/100Tbase Ethernet interface with RJ-45 (PoE)

Table 2: Connectors

4.1 Antenna terminal ANT 1

A SMA socket is provided on the circuit board for connecting the external antenna.

The maximum tightening torque for the SMA socket is 0.45 Nm.

Caution:
Higher tightening torque will damage the connector.

Terminal	Description
X4	Connecting the external antenna (input impedance 50Ω)

Table 3: Connecting the external antenna

Note:

- ***The input impedance for the antenna must be calibrated to a value of 50 Ω ± (15 Ω ∠ 15°).***
- ***The antenna is to be used at a minimum distance of 20cm to any metal parts. Otherwise there is a danger that the reader will be damaged..***
- ***The optimum operating Q factor of the antenna should be in a range of QB = 10...20. To determine the operating Q the antenna must be supplied with a 50 Ohm source such as a network analyzer or frequency generator.***
- ***When connecting an antenna, ensure that it does not exceed the permissible limits prescribed by the national regulations for radio frequency devices.***

4.1.1 DC Voltage supply on antenna connector ANT1

The reader is able to provide a DC voltage on the antenna output ANT1. With this DC voltage a external LED can be supported for example.

Note:

- ***This DC voltage (7.5V± 1V) is designed for low current (max. 5mA) only.***
- ***Only antennas can be used which are designed for DC voltage and do not short cut DC voltages.***
- ***For the connection of other devices (e.g. VSWR-Meter) it is necessary to check if DC voltage is allowed.***
- ***This DC voltage is not sufficient for powering the ID ISC.DAT tuning board.***

4.2 Power supply

4.2.1 Power supply via X1

Connect the 12-24 V DC/⎓ supply voltage to socket X1 on the circuit board.

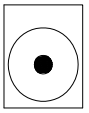
Terminal	Name	Description	X 1
X1 / inside	Vcc	Vcc – supply voltage (+)	
X1 / outside	GND	Ground – supply voltage (-)	

Table 4: Connecting the supply voltage

Note:

- ***Reversing the polarity of the supply voltage may destroy the device.***
- ***The unit has to supplied by specified Power supply, only***

Power supply recommendations:

To take full advantage of the Reader performance, you must use a sufficiently regulated and low-noise power supply. When using a switching power supply, be sure that its internal switching frequency is less than 300 kHz. See also: Accessories

	Part No.	Description.
		Power Supply 95 - 265V AC Input Voltage, (North American Plug), with angular DC Plug 2,5mm*5.5mm Output: 12 V DC/ ⎓ 700mA Ambient Operating Temperature: 0°C to +40°C

Table 5: Recommended power supply

Note:
The power supply is supplied with a DC/⎓ plug 2.5mm x 5.5mm. This is compatible with the readers socket X1.

4.2.2 Power supply via PoE (Power over Ethernet) on X4 (RML-HFMR102-PoE)

Optional the reader (only MR102-PoE) can be powered via the LAN connector on X4 with the use of a PoE “Power over Ethernet“ power supply according to IEEE802.3af*, Class2 (6,49 Watt). The DC supply can be achieved via the free pin’s 4,5 and 7,8 (Midspan-Power). Also a “Phantom Powering” (Inline-Power) via the signal pin’s 1,2,3,and 6 is possible.

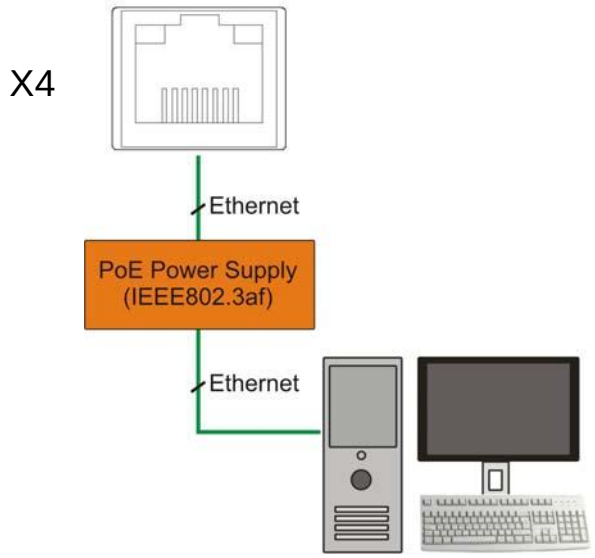


Figure 4: LAN and PoE connection

Note:

- ***It must be ensured that the reader is supplied with 42,5 V DC (48 V DC – cable losses) at least.***
- ***The maximum cable distance for Ethernet is 100m.***
- ***A connection of the PoE Port X4 to devices at outside building installation (e.g. connected to the outside plants) is not allowed.***
- ***It is recommended to use a shielded twisted pair STP CAT5 cable.***

* For detailed technical information regarding the 802.3af standard, please refer to the most recent edition of the corresponding IEEE specification.

	Name	Description
	ID NET.PoEI13W-A	Power over Ethernet Supply 100-240V AC (North American Plug), Output: 48V DC/ ⎓ 0.5A

Table 6: Recommended PoE Power Supply

4.3 Power supply and interface connection on X2 (RML CAB.RS-DB)

For the power supply connection and the connection of the asynchronous interface RS232 / 485 the reader provides a 9-pin D-Subminiature female connector.
(See also Connections).

X2	Interface + Power supply
2	TxD / B-
3	RxD / A+
5	GND
7	GND
9	Vcc
1;4;6;8	n.c.

Table 7: Connection assignment of the connector X2

For this reader a serial cable with integrated DC connector is available.

Description
RML CAB.RS-DB

Table 8: Serial data cable

4.3.1 RS232 Interface (RML-HFMR102-A)

Interface parameter can be configured via software protocol (e.g. ISOStart)

4.3.2 RS485 Interface (RML-HFMR102-B)

Interface parameter can be configured via software protocol (e.g. ISOStart)

For bus operation the Reader can be assigned a bus address using software.

Addresses are assigned by the host computer. Using the software, addresses “0” to “254” can be assigned to the Reader.

Note:

- ***Since all Readers are factory set with Address 0, you must connect and configure them one after the other.***
- ***If a termination of the RS485 bus is necessary it must be done externally.***

4.4 Ethernet-Interface on X2 (10/100Tbase)

The Reader has an integrated 10 / 100 base-T network port for an RJ-45. Connection is made on X2 and has an automatic “Crossover Detection” according to the 100BASE-T Standard.

With structured cabling CAT 5 cables should be used. This ensures a reliable operation at 10 Mbps or 100 Mbps.

The prerequisite for using TCP/IP protocol is that each device has a unique address on the network. All Readers have a factory set IP address. Interface parameter can be configured via software protocol (e.g. ISOStart).

Network	Address
IP-Address	192.168.10.10
Subnet-Mask	255.255.255.0
Port	10001
DHCP	OFF

Table 9: Standard factory configuration of the Ethernet connection

Note:

- ***The reader provides a DHCP able TCP/IP interface.***
- ***It is recommended to use a shielded twisted pair STP CAT5 cable.***

4.5 USB – Interface X3 (Host communication)

There is a USB-socket X3 on board for the connection of the USB-Interface. The pinout is standardized. The data rate is reduced to 12 Mbit (USB full speed). A standard USB-cable can be used.

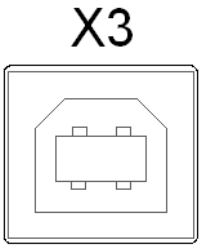


Figure 5: USB interface for the host communication

Note:
The length of the USB-cable can be a max. of 5 meter. It isn’t allowed to use longer cables!

5 Control and display elements LED

5.1 LED

The Reader's LED can be configured through software.

The following Table 10 shows the default setting.

Abbreviation	Description
LED green	"RUN " - Turns on when the Reader is ready
LED red	„LABEL“ - Turns on when a transponder is detected. - Flashes if RF-Warning (red – green alternating with 8Hz) (Temperature alarm, short circuit on antenna output)
LED orange	„INITIALIZING“ - Flashes during Reader initialization after power-up.

Table 10: Default configuration of the LEDs

6 Technical Data

Mechanical Data

• **Housing**	ABS plastic Enclosed
• **Dimensions (W x H x D)**	85 x 145 x 27 mm / 3.35 x 5.71 x 1.06 in.
• **Weight**	200 g / 0.44 lbs
• **Degree of Protection**	IP 30
• **Color**	similar RAL 9018 (papyrus white)

Electrical Data

• **Supply voltage**	
– RML-HFMR102-A/-B/-USB	12 …24V DC/⎓
– RML-HFMR102-PoE	12 …24V DC/⎓ or PoE
• **Power consumption**	max. 9 W
• **Operating frequency**	13,56 MHz
• **Transmitting power**	1.2 W ± 1 dB
• **Antenna connection**	SMA female (50Ω)
• **Antenna DC voltage**	7.5V DC ± 1V (5mA) on antenna output *(e.g. for support of external LED)*
• **Interfaces**	
– RML-HFMR102-A	RS232
– RML-HFMR102-B	RS485
– RML-HFMR102-PoE	Ethernet (TCP/IP)
– RML-HFMR102-USB	USB 2.0
• **Features**	- Short circuit detection (antenna) - Temperature control - Support of external multiplexer ID ISC.ANT.MUX (in Host Mode)

Functional Properties

• **Protocol Modes**	- FEIG ISO HOST - Scan Mode
• **Supported transponders**	- ISO15693, ISO18000-3 Mode 1 (EM HF ISO Chips, Fujitsu HF ISO Chips, KSW Sensor Chips, IDS Sensor Chips, Infineon my-d, NXP I-Code, STM LRI ISO Chips, TI Tag-it) - NXP I Code 1
• **Address setting for interface**	Software (0- 254 Addresses)
• **Visual indicators**	1 LED (multicolor – red / green)

Ambient Conditions

• **Temperature range**	
- Operation	-25°C to +55°C / -13°F to +131°F -25°C to +45°C / -13°F to +113°F (-PoE)
- Storage	-25°C to +85°C / -13°F to +185°F
• **Humidity**	5 – 95% non condensing
• **Vibration**	EN 60068-2-6 10 Hz to 150 Hz : 0,075 mm / 1 g
• **Shock**	EN 60068-2-27 Acceleration : 30 g

Applicable Norms

• **Radio approval**	
- USA	FCC 47 CFR Part 15
- Canada	IC RSS-GEN, RSS-210
• **EMC**	EN 300 489
• **Safety**	
- Low-Voltage	UL 60950-1
- Human Exposure	EN 50364

7 Radio Approvals

Intentionally Blank

Intentionally Blank

7.3 USA (FCC) and Canada (IC)

7.3.1 Radio approvals

Product names:	**RML-HFMR102-A, RML-HFMRM102-A, RML-HFMR102-B, RML-HFMR102-USB, RML-HFMRM102-USB, RML-HFMR102-PoE**
Reader name:	**RML-HFMR102**
FCC ID: **IC:**	**WVF-HFMR102** **6686A-HFMR102**
Notice for USA and Canada	This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions. (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Unauthorized modifications may void the authority granted under Federal communications Commission Rules permitting the operation of this device. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. 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, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Warning: Changes or modification made to this equipment not expressly approved by RFID Canada may void the FCC authorization to operate this equipment.

8 UL Approval - USA and Canada

The following UL label position is on the back side of the reader.

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Model: RML-HFMR102-A 1-877-476-6760
IC: 6686A-HFMR102
FCC ID: WVF-HFMR102

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareil conforme à la section 15 des règles FCC: (1) cet artifice peut ne pas provoquer l'interférence et (2) cet artifice doit accepter n'importe quelle interférence qui peut provoquer l'opération indésirable de l'artifice. Pour réduire l'interférence radio potentielle à dautres utilisateurs, le type d'antenne et son augmentation devraient être si choisis qu'istropically équivalent a brillé le pouvoir n'est pas plus que cela permis pour la communication réussie.

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Model: RML-HFMRM102-A 1-877-476-6760
IC: 6686A-HFMR102
FCC ID: WVF-HFMR102

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Model: RML-HFMR102-B 1-877-476-6760
IC: 6686A-HFMR102
FCC ID: WVF-HFMR102

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareil conforme à la section 15 des règles FCC: (1) cet artifice peut ne pas provoquer l'interférence et (2) cet artifice doit accepter n'importe quelle interférence qui peut provoquer l'opération indésirable de l'artifice. Pour réduire l'interférence radio potentielle à dautres utilisateurs, le type d'antenne et son augmentation devraient être si choisis qu'istropically équivalent a brillé le pouvoir n'est pas plus que cela permis pour la communication réussie.

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Model: RML-HFMR102-POE 1-877-476-6760
IC: 6686A-HFMR102
FCC ID: WVF-HFMR102

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareil conforme à la section 15 des règles FCC: (1) cet artifice peut ne pas provoquer l'interférence et (2) cet artifice doit accepter n'importe quelle interférence qui peut provoquer l'opération indésirable de l'artifice. Pour réduire l'interférence radio potentielle à dautres utilisateurs, le type d'antenne et son augmentation devraient être si choisis qu'istropically équivalent a brillé le pouvoir n'est pas plus que cela permis pour la communication réussie.

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Model: RML-HFMR102 1-877-476-6760
IC: 6686A-HFMR102
FCC ID: WVF-HFMR102

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Model: RML-HFMR102-USB 1-877-476-6760
IC: 6686A-HFMR102
FCC ID: WVF-HFMR102

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareil conforme à la section 15 des règles FCC: (1) cet artifice peut ne pas provoquer l'interférence et (2) cet artifice doit accepter n'importe quelle interférence qui peut provoquer l'opération indésirable de l'artifice. Pour réduire l'interférence radio potentielle à dautres utilisateurs, le type d'antenne et son augmentation devraient être si choisis qu'istropically équivalent a brillé le pouvoir n'est pas plus que cela permis pour la communication réussie.

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Model: RML-HFMRM102-USB 1-877-476-6760
IC: 6686A-HFMR102
FCC ID: WVF-HFMR102

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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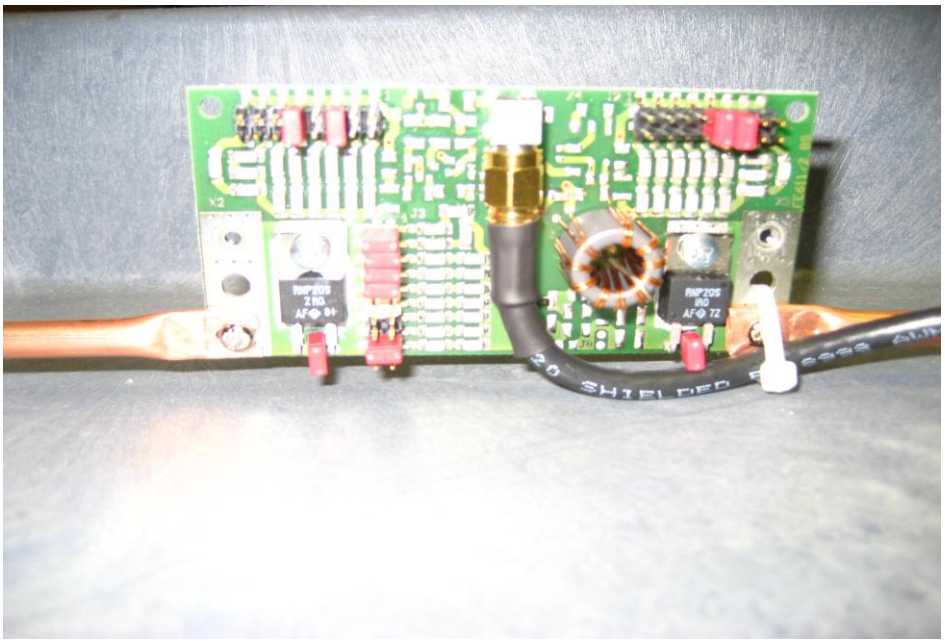
9 Annex

9.1 Accessories

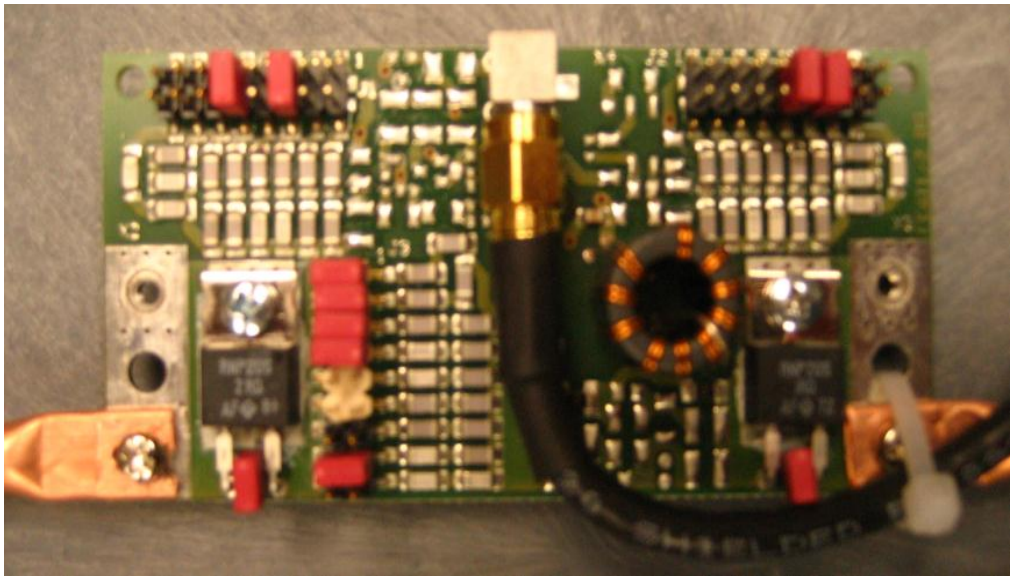
RML-HFANT500/500-B			Antenna 490 mm x 490 mm Copper Tube with manual tuning board
ID ISC.MAT-B			Manual Tuning Board
CAB-CX-3244			Antenna Cable - Coax 3.244m
74270115			Torrid
RML-HF-MR-101			MODIFIED Midrange Reader w/ RS-232 Interface for the custom antennas
RML CAB.RS-RJ			Modified RS232/485 Interface Cable for the RML-HF-MR-101 with RJ-45 Connector
RML-HF-FTR101			High Frequency Filter - Modified w/12" cable
RML CAB.RS-DB			Modified RS232/485 Interface Cable for the RML-HF-MR-101 with db9 Connector
RML-ANT-500/315			Antenna 500 mm x 315 mm Copper Tube with manual tuning board

Table 11: Accessories

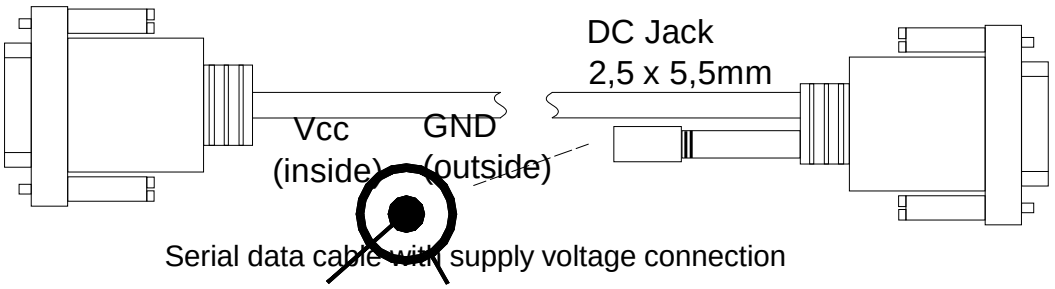


Manual Antenna Tuning board (ID ISC.ANT.MAT-B)
Installed on loop antenna

Both RML-HFANT500/500-B and RML-HFANT500/300-B antennas use Feig's manual tuning board. Make sure the tuning board used is Feig's ID ISC.ANT.MAT-**B** board; otherwise, the system will not be compliant with Industry Canada and FCC certifications.



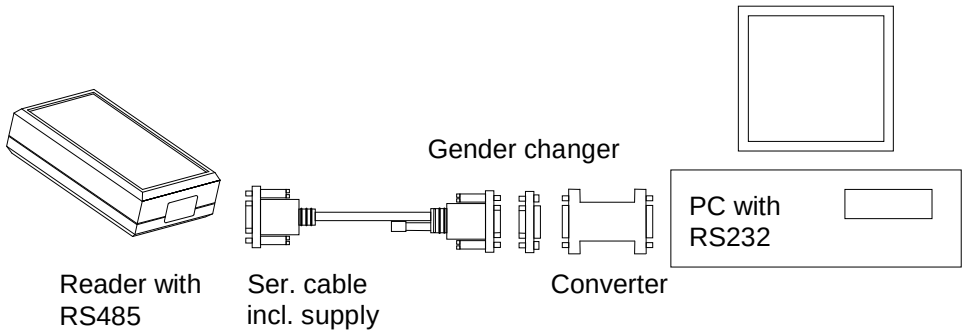
Manual Antenna Tuning board (ID ISC.ANT.MAT-B



Serial data cable with supply voltage connection

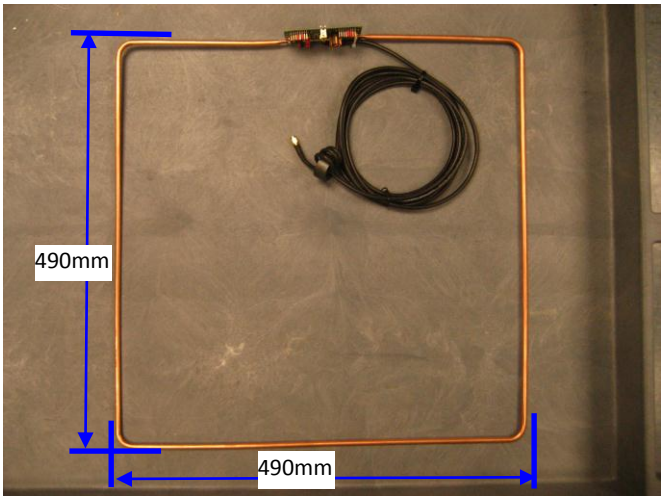
9.1.3 RS232/RS485 Converter

The converter is a 2-channel RS232 to RS485 converter. No external power is required if two RS232 output handshake lines (RTS and DTR) are available. The supplied gender changer is installed on the RS485 side.

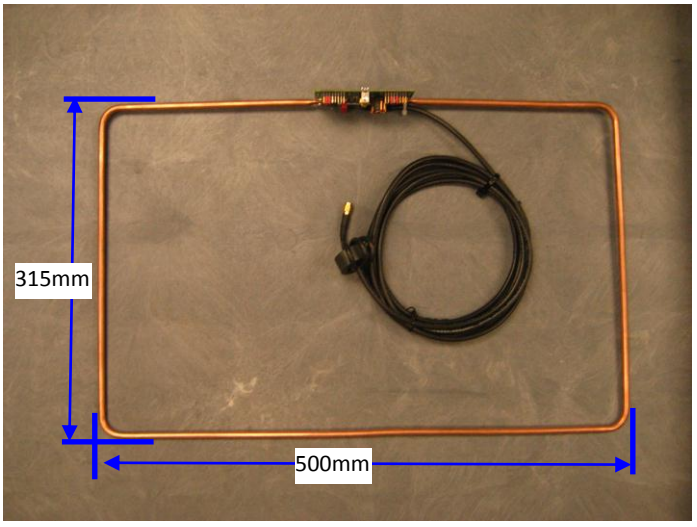


Example: converter circuit

9.1.4 Antenna



RML-HFANT500/500-B



RML-HFANT500/300-B

DEUTSCH

Umgebungsbedingungen

- **Temperaturbereich**
  - **- Betrieb** -25...+55°C
  - **- Lagerung** -25...+85°C
- **Relative Luftfeuchtigkeit** 5 bis 95% nicht betauend

Angewendete Normen

- **Zulassung Funk**
  - **- Europa** - EN 300 330
  - **- USA** - FCC 47 CFR Part 15
  - **- Kanada** - RSS-Gen Issue 1, RSS-210
- **EMV** EN 301 489
- **Sicherheit**
  - **- Niederspannung** EN 60950
  - **- Human Exposure** EN 50364

6.1 Zulassung

6.1.1 Europa (CE)

Die Funkanlage entspricht, bei bestimmungsgemäßer Verwendung den grundlegenden Anforderungen des Artikels 3 und den übrigen einschlägigen Bestimmungen der R&TTE Richtlinie 1999/5/EG vom März 99.

CE

Equipment Classification gemäß ETSI EN 301 489: Class 2

6.1.2 USA und Kanada

Product names:	**ID ISC.SPAD102-USB, ID ISC.SPAD102-PoE**
Reader name:	**ID ISC.MR102**
FCC ID: **IC:**	**PJMMR102** **6633A-MR102**
Notice for USA and Canada	This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions. (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Unauthorized modifications may void the authority granted under Federal communications Commission Rules permitting the operation of this device. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. 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, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Warning: Changes or modification made to this equipment not expressly approved by FEIG ELECTRONIC GmbH may void the FCC authorization to operate this equipment.

ENGLISH

Note

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With the edition of this document, all previous editions become void. Indications made in this manual may be changed without previous notice.

Composition of the information in this document has been done to the best of our knowledge. FEIG ELECTRONIC GmbH does not guarantee the correctness and completeness of the details given in this manual and may not be held liable for damages ensuing from incorrect or incomplete information. Since, despite all our efforts, errors may not be completely avoided, we are always grateful for your useful tips.

The instructions given in this manual are based on advantageous boundary conditions. FEIG ELECTRONIC GmbH does not give any guarantee promise for perfect function in cross environments.

FEIG call explicit attention that devices which are subject of this document are not designed with components and testing methods for a level of reliability suitable for use in or in connection with surgical implants or as critical components in any life support systems whose failure to perform can reasonably be expected to cause significant injury to a human. To avoid damage, injury, or death, the user or application designer must take reasonably prudent steps to protect against system failures.

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Content

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7 Safety Instructions / Warning - Read before start-up !

- The device may only be used for the intended purpose designed by for the manufacturer.
- The operation manual should be conveniently kept available at all times for each user.
- Unauthorized changes and the use of spare parts and additional devices which have not been sold or recommended by the manufacturer may cause fire, electric shocks or injuries. Such unauthorized measures shall exclude any liability by the manufacturer.
- The liability-prescriptions of the manufacturer in the issue valid at the time of purchase are valid for the device. The manufacturer shall not be held legally responsible for inaccuracies, errors, or omissions in the manual or automatically set parameters for a device or for an incorrect application of a device.
- Repairs may only be executed by the manufacturer.
- Installation, operation, and maintenance procedures should only be carried out by qualified personnel.
- Use of the device and its installation must be in accordance with national legal requirements and local electrical codes .
- When working on devices the valid safety regulations must be observed.

Special advice for carriers of cardiac pacemakers:

Although this device doesn't exceed the valid limits for electromagnetic fields you should keep a minimum distance of 25 cm between the device and your cardiac pacemaker and not stay in an immediate proximity of the device respective the antenna for some time.

8 Performance Features

The Shielded Pad Reader ID ISC.SPAD102 is designed for reading passive data carriers, so-called „Smart Labels“ at an operating frequency of 13.56 MHz with a maximum output power of 1,5 W. The ID ISC.SPAD102 is suitable for all applications in which moderate reading distances are required. A shielded antenna and a reader is integrated in a plastic housing.

Due to the shielding the communication with the transponder is widely limited on the top area oft the antenna.

The possibility to place the antenna ID ISC.SPAD102 directly on metal without changing the antenna parameter is a second essential advantage of this antenna.

An anti-collision function enables simultaneous reading of up to 30 transponders per second.

The antenna may be used for detecting both product or persons. The preferred orientation of a Smart Label is parallel to the antenna surface. The maximum range is achieved over the center of the antenna surface.

8.1 Order Reference

The following variants are available currently:

Table 8-1: Order reference Shielded Pad-Reader

Order No.	Name	Description
3756.000.00	ID ISC.SPAD102-USB	Shielded Pad Reader with USB Interface
3513.000.00	ID ISC.SPAD102-PoE	Shielded Pad Reader with Ethernet Interface (PoE)

8.2 Scope of delivery

Within the scope of delivery the reader ID ISC.SPAD102 came including connection cable assembly and mounting instruction.

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9 Assembly and Wiring

The antenna is intended for the indoor use on a plane surface (desktop) or for the mounting behind or under a mounting plate (non-conductive).

For the operation on a plane surface rubber bumper are mounted on the backside of the antenna.

The mounting behind or under a mounting plate can take place via domes, which are suggested with bore holes on the backside of the antenna housing.

9.1 Dimensions

The dimensions and the mounting holes of the shielded pad antenna are shown in the following picture.

All dimensions are shown in mm (inch):

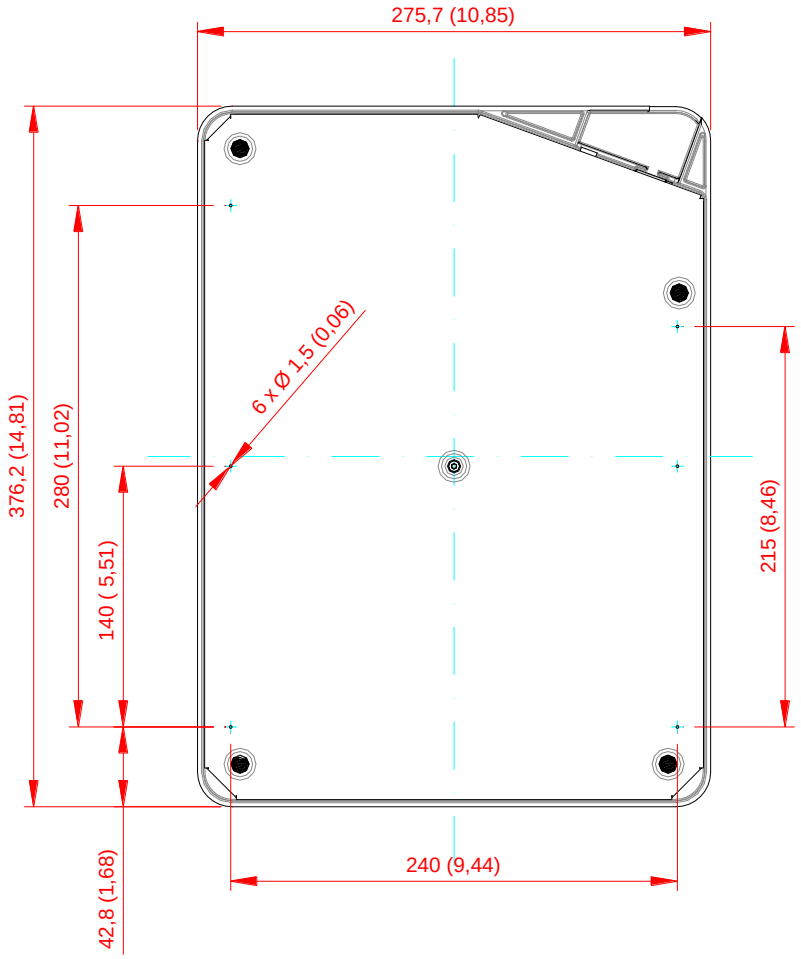

Figure 1: Dimensions of the antenna and positions of mounting holes (backside)

9.2 Mounting under a desktop

For the mounting under a desktop or a mounting plate the mounting holes (max. 4mm) must be drilled. The position of the mounting holes are suggested via 1,5mm drill holes in the housing backside of the antenna (see figure 1). Drill holes on a different place can destroy the antenna.

10 Connections

10.1 Power supply

10.1.1 Power supply via X1

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Connect the 12-24 V DC/⎓ supply voltage to socket X1 on the circuit board.

Table 10-1: Connecting the supply voltage

Terminal	Name	Description	X 1
X1 / inside	VDC ⎓	Vcc – supply voltage (+)	
X1 / outside	GND	Ground – supply voltage (-)	

***Note**:*

Reversing the polarity of the supply voltage may destroy the device.

Power supply recommendations :

To take full advantage of the Reader performance, you must use a sufficiently regulated and low-noise power supply. When using a switching power supply, be sure that its internal switching frequency is less than 300 kHz.

Table 10-2: Recommended power supply:

Feig Article No	Part No.	Description.
1688.002.00	ID NET.12V-B	Power Supply Unit 12 V

10.1.2 Power supply via PoE (Power over Ethernet) on X4 (ID ISC.SPAD102-PoE)

Optional the reader (only MR102-PoE) can be powered via the LAN connector on X4 with the use of a PoE „Power over Ethernet“ power supply according to IEEE802.3af*, Class2 (6,49 Watt). The DC supply can be achieved via the free pin’s 4,5 and 7,8 (Midspan-Power). Also a “Phantom Powering” (Inline-Power) via the signal pin’s 1,2,3,and 6 is possible.

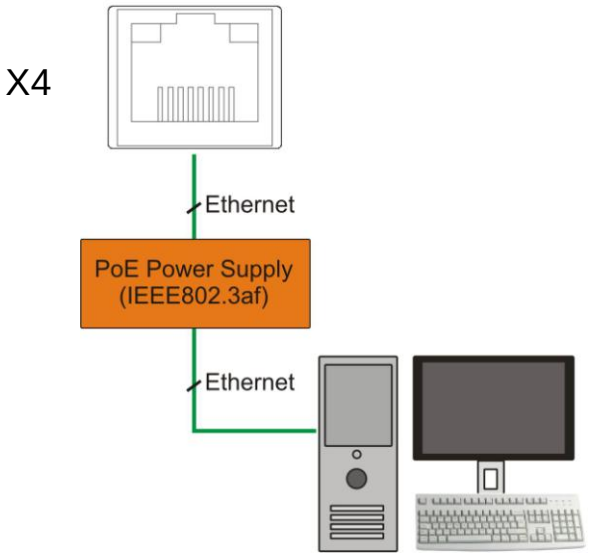

Figure 2: LAN and PoE connection

Note:

- ***It must be ensured that the reader is supplied with 42,5 V DC (48 V DC – cable losses) at least.***
- ***The maximum cable distance for Ethernet is 100m.***

* For detailed technical information regarding the 802.3af standard, please refer to the most recent edition of the corresponding IEEE specification.

Table 10-3: Recommended PoE Power Supply

Article No.	Name	Description
0000.000.00	ID NET.PoE	Power over Ethernet Supply

10.2 Interfaces

10.2.1 USB-Interface (ID ISC.SPAD102-USB)

There is a USB-socket X3 on board for the connection of the USB-Interface. The pinout is standardized. The data rate is reduced to 12 Mbit (USB full speed). A standard USB-cable can be used..

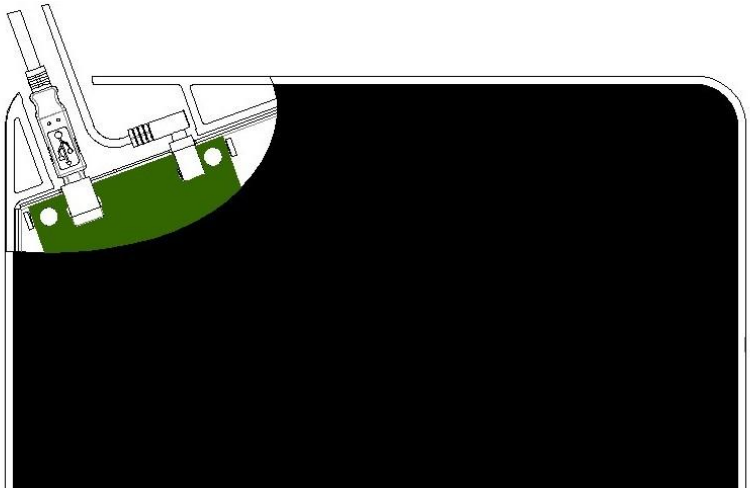

Figure 3: USB-Interface for host communication

Note:
The length of the USB-cable can be a max. of 5 meter. It isn't allowed to use longer cables!

10.2.2 Ethernet-Interface (ID ISC.SPAD102-PoE)

The Reader has an integrated 10 / 100 base-T network port for an RJ-45. Connection is made on X2 and has an automatic “Crossover Detection” according to the 100BASE-T Standard.

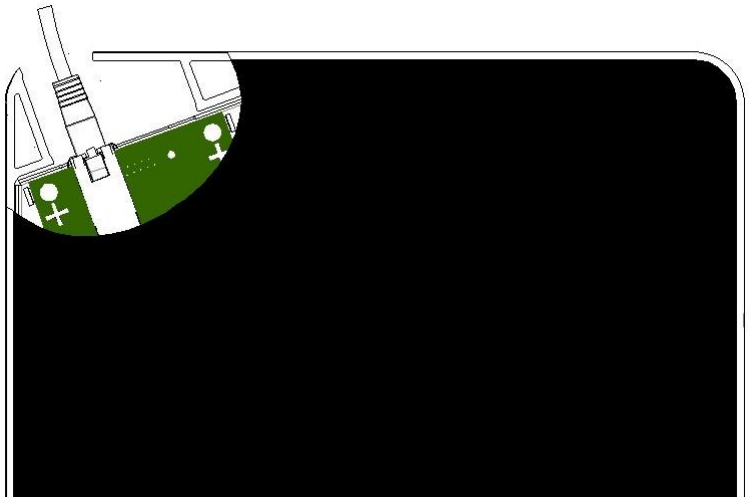

Abbildung 5: Anschluss Ethernet-Schnittstelle

With structured cabling CAT 5 cables should be used. This ensures a reliable operation at 10 Mbps or 100 Mbps.

The prerequisite for using TCP/IP protocol is that each device has a unique address on the network. All Readers have a factory set IP address. Interface parameter can be configured via software protocol

Table 10-4: Standard factory configuration of the Ethernet connection

Network	Address
IP-Address	192.168.10.10
Subnet-Mask	255.255.255.0
Port	10001
DHCP	OFF

Note:

The reader provides a DHCP able TCP/IP interface.

11 Display (LED)

The blue LED indicates the operating status of the Shielded Pad-Readers:

Table 11-1: LED-Display

LED-Signal	Description
LED flashes after power on	Reader software will be booted
LED on	RF power 13,56 MHz switched on
LED flash	Reading transponder
LED off	RF power 13,56 MHz switched off

12 Technical Data

Mechanical Data

- **Housing**
  - **Upper Part** - Plastic ABS
  - **Cover Plate** - Acryl glass
  - **Lower Part** - Galvanized metal sheet
- **Dimension (W x H x D)** 376 x 276 x 26,8 mm³ (14,8 x 10,87 x 1,06 inch³)
- **Weight** ca. 2,0 kg
- **Protection class** IP 30
- **Color**
  - **Housing** - similar RAL 9003 (white)
  - **Cover Plate** - Transparent, black Screen back printed

Electrical Data

- **Power supply** - 12..24 VDC⎓ ± 15 %
  - PoE (ID ISC.SPAD102-PoE only)
- **Power consumption** max. 6 VA
- **Operating frequency** 13,56 MHz
- **Transmitting power** 1,5 W ± 1 dB
- **Interface** - Ethernet (TCP/IP) (ID ISC.SPAD102-PoE)
  - USB (ID ISC.SPAD102-USB)
- **Protocol Modes** - ISO Host Mode
  - Scan Mode
  - Notification Mode
- **Supported Transponder** ISO15693, ISO18000-3 Mode 1 (EM HF ISO Chips, Fujitsu HF ISO Chips, KSW Sensor Chips, IDS Sensor Chips, Infineon my-d, NXP I-Code, STM LRI ISO Chips, TI Tag-it)
- **Visual indicators** LED blue (Operating status)

Ambient Conditions

- **Temperature range**
  - **- Operation** -25°C to +55°C / -13°F to +131°F
  - **- Storage** -25°C to +85°C / -13°F to +185°F
- **Humidity** 5 – 95% non condensing

Applicable Norms

- **Radio approval**
  - **- Europe** - EN 300 330
  - **- USA** - FCC 47 CFR Part 15
  - **- Canada** - RSS-Gen Issue 1, RSS-210
- **EMC** EN 301 489
- **Safety**
  - **- Low-Voltage** EN 60950
  - **- Human Exposure** EN 50364

12.1 Approvals

12.1.1 Europe (CE)

This RF equipment is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC dated March 99.

CE

Equipment Classification according to ETSI EN 300 330 and ETSI EN 301 489: Class 2

12.1.2 USA (FCC) and Canada (IC)

Product names:	**ID ISC.SPAD102-USB, ID ISC.SPAD102-PoE**
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