Annex no. 5

User Manual

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OBID®
OBID i-scan® UHF

INTEGRATION

ID ISC.MRMU102-A

Module Version

FEIG ELECTRONIC

Note

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General information's regarding this document

- The sign "☞" indicates extensions or changes of this manual compared with the former issue.
- If bits within one byte are filled with "-", these bit spaces are reserved for future extensions or for internal testing- and manufacturing-functions. These bit spaces must not be changed, as this may cause faulty operation of the reader.
- The following figure formats are used:
  0...9: for decimal figures
  0x00...0xFF: for hexadecimal figures,
  b0...1 for binary figures.
- The hexadecimal value in brackets "[ ]" marks a control byte (command).

Contents

1. 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.

2. Performance Features of the Reader

The Reader ID ISC.MRMU102 is designed for reading of passive data carriers, so-called „Smart Labels“ at an operating frequency in the UHF band between 860 MHz and 960 MHz. Transponders according to EPC Class1 Gen2 are supported. Optional an Upgrade Code for the reading of ISO 18000-6-C transponders is available. The reader is designed for application with small tag population.

The reader module is equipped with 3 SMA connectors for conduction of external antennas (ANT1 – ANT3). Additional an integrated antenna (ANT4) is available.

For Host communication the reader provides an asynchronous RS232 interface and an USB interface.

The reader is designed for use in applications with small tag populations. Maximum 10 tags at the same time into the antenna field can be processed.

2.1. Available Reader Types

The following reader types are currently available:

Table 1: Available Reader Types

Reader type	Description
ID ISC.MRMU102-A	Module version with asynchronous RS232- and USB-Interface; 3 SMA connectors for external antennas; 1 integrated antenna;

2.2. Optional Accessories

Optional Accessories are listed in the appendix.

3. Assembly and Wiring

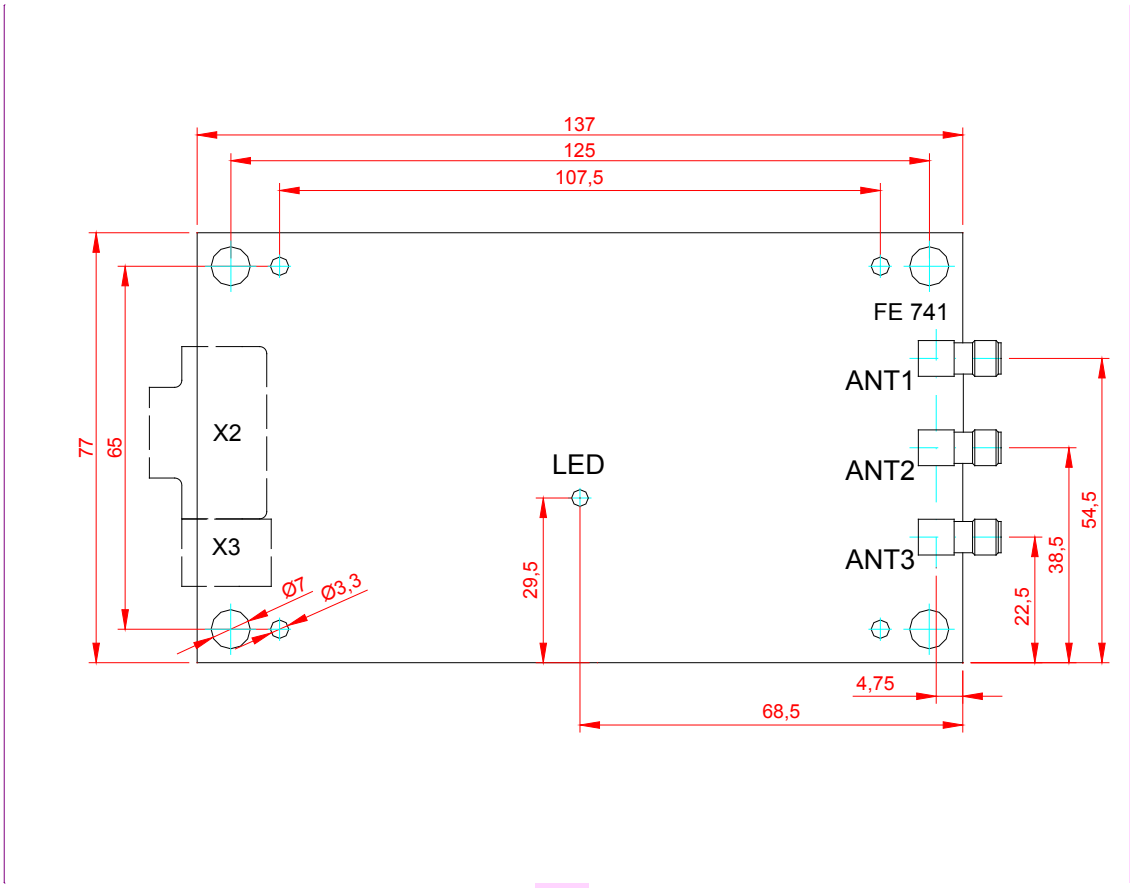
3.1. Module Versions

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

NOTE:

Before any installation the intended position of the reader should be tested for its suitability.

3.1.1. Dimensions



[DB1]

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

4. Connections

The module version of the reader is equipped with an asynchronous RS232 Interface (X2) and a USB Interface (X3). The Table 2: Connectors shows which connector can be used for the different interface cable.

Table 2: Connectors

Connector	Description
ANT 1-3	External Antenna ANT 1 - 3
ANT 4	Internal Antenna ANT 4
X1	Power Supply via Connector X1
X2	RS232 Interface on Connector X2
X3	USB Interface on Connector X3

4.1. Antenna Terminals

4.1.1. External Antenna ANT 1 - 3

Three SMA sockets are provided on the circuit board for connecting of the external antennas.

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

CAUTION:

Higher tightening torque will damage the connector.

Table 3: Connecting an external antenna

Terminal	Description
ANT 1-3	Connecting the external antenna (input impedance 50Ω)

NOTE:

When connecting an antenna, ensure that it does not exceed the permissible limits prescribed by the national regulations for radio frequency devices.

4.1.2. Internal Antenna ANT 4

Additionally the reader is equipped with an internal antenna (ANT4). The internal antenna supports far field transponders as well as near field transponders. The internal antenna is located in the bottom left corner of the housing and is marked with an antenna symbol. The maximum read range of the antenna in combination with a far field transponder is approx. 40 cm. In combination with a near field transponder the maximum read range is approx. 5 cm.

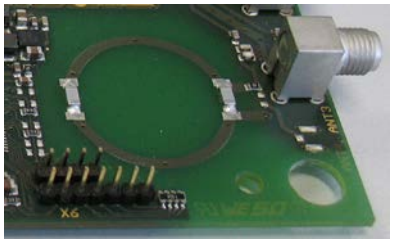


Figure 2: Position of the internal antenna

4.2. Power Supply via Connector X1

The reader needs to be supplied by an external voltage of 12 V DC to 24 V DC. Connect the 12 - 24 V DC/⎓ supply voltage to socket X1 on the circuit board.

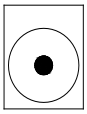
Terminal	Name	Description	X 1
X1 / inside	Vcc	Vcc – supply voltage (+)	
X1 / outside	GND	Ground – supply voltage (-)	

Table 4: Connecting the supply voltage

NOTE:

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

The unit has to supplied by a listed NEC Class 2/LPS Power supply, only

NOTE:

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

4.3. RS232 Interface on Connector X2

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

Table 5: Connection assignment of the connector X2

X2	Interface
2	TxD
3	RxD
5	GND
7	GND
1;4;6;8;9	n.c.

For this reader a serial cable is available.

Table 6: Serial Data Cable

Feig Part No.	Description
1690.000.00	ID CAB.RS-A

Interface parameter can be configured via software protocol (e.g. ISOStart). Further information can be found in the System Manual H10410-Xe-ID-B.pdf of the reader.

4.2. USB Interface on Connector X3

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.

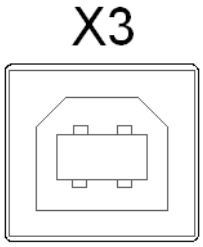


Figure 3: USB interface for host communication

NOTE:

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

The reader must be powered with a external power supply even if it is connected to a "high powered port".

5. Control and Display Elements

5.1. LED

The Reader's LED can be configured through software.

The following Table 8: Default Configuration of the LEDs shows the default setting.

Table 7: Default Configuration of the LEDs

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.

6. Technical Data

MECHANICAL DATA

Housing	-
Dimension (W x H x D)	137 mm x 77 mm x 17 mm
Weight	60 g
Protection Class	-
Colour	-

ELECTRICAL DATA

Power Supply	12 V DC – 24 V DC
Power Consumption	max. 7 W
Operating Frequency	860 MHz to 960 MHz
RF-Power	max. 500 mW ± 1,5 dB
Antenna Connector	3 x SMA female(50 Ω) 1 x integrated Antenna (ANT4)
Interfaces	USB (Full Speed) RS232

FUNCTIONAL PROPERTIES

Protocol Modes	FEIG ISO HOST (Advanced Protocol Frame) Buffered Read Mode Scan Mode (RS232, USB: HID Mode)
Supported Transponder Types	EPC Class 1 Generation 2 ISO 18000-6-C (Upgrade Code required)
Signaller	1 LED (multi-colour red and green)

Further Features	Anticollision (max. 10 Transponders) RSSI Temperature Monitoring*

AMBIENT CONDITIONS

Temperature Range	
• Operation	-25 °C to +55 °C
• Storage	-25 °C to +85 °C
Humidity	5 % to 95 % non-condensing

APPLICABLE STANDARDS

Radio Regulation	
• Europe	EN 302 208
• USA	FCC 47 CFR Part 15
• Canada	IC RSS-Gen, RSS-210
EMC	EN 301 489
Vibration	EN 60068-2-6 10 Hz bis 150 Hz: 0,075 mm / 1 g
Shock	EN 60068-2-27 Accelleration 30 g

* Caution: Overheating of the device may result in performance losses. It is recommended to activate the RF of the reader only if there is a transponder in the detection range of an antenna.

7. Radio Approvals

7.1. Europe (CE)

When used according to regulation, this radio equipment conforms with the basic requirements of Article 3 and the other relevant provisions of the R&TTE Guideline 1999/E6 dated March 99.

CE

Equipment Classification according to ETSI EN 301 489: Class 2

7.2. Declaration of Conformity

Declaration of Conformity

in accordance with the
Radio and Telecommunication Terminal Equipment Act (FTEG)
and
Directive 1999/5/EC (R&TTE Directive)

Product Manufacturer	:	**FEIG ELECTRONIC GmbH** Lange Strasse 4 D-35781 Weilburg Germany Phone: +49 6471 3109 0
Product Designation	:	**ID ISC.MRMU102-A** **ID ISC.MRU102-PoE** **ID ISC.MRU102-USB**
Product Description	:	RFID Reader
Radio equipment, Equipment class (R&TTE)	:	Class 1

FEIG ELECTRONIC GmbH declares that the radio equipment complies with the essential requirements of §3 and the other relevant provisions of the FTEG (Article 3 of the R&TTE Directive), when used for its intended purpose.

Standards applied :

Health and safety requirements pursuant to FTEG § 3 (1) 1 and R&TTE Article 3(1) a)	EN 60950-1:2011 EN 50364:2010
Protection requirements concerning electromagnetic compatibility § 3 (1) 2. (Article 3(1) b))	ETSI EN 301 489-1 V1.8.1 ETSI EN 301 489-3 V1.4.1
Measures for the efficient use of the radio frequency spectrum pursuant to § 3 (2) (Article 3(2))	ETSI EN 302 208-1 V1.3.1 ETSI EN 302 208-2 V1.3.1

Weilburg, 29.05.2012
Place & date of issue

Markus Desch
Name and signature

This declaration attests to conformity with the named Directives but does not represent assurance of properties. The safety guidelines in the accompanying product documentation must be observed.

7.3. USA (FCC) and Canada (IC)

7.3.1. USA (FCC) and Canada (IC) warning notices

Product name:	**ID ISC.MRMU102-A**
Reader name:	**ID ISC.MRMU102-A**
FCC ID: **IC:**	**PJMMRU102** **6633A-MRM102**
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.

7.3.2. Label Information Reader Module ID ISC.MRMU102-A

The following information has to be mounted outside on the housing of the reader module.

Contains FCC ID PJMMRU102
Contains IC: 6633A-MRU102

7.3.3. USA (FCC) and Canada (IC) approved antennas

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with maximum permission gain and required antenna impedance for each antenna type indicated. Antenna types, not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne 'énoncé ci-dessus et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

Following antennas are approved by FCC according FCC Part 15 and IC Canada according RS210

- ID ISC.ANT.U170/170 –FCC (4.0 dBic)
- ID ISC.ANT.U270/270-FCC (9.0 dBic)
- ID ISC.ANT.U600/270-FCC (11,0 dBic)
- Integrated antenna (- 7dBic)

ANNEX A - Accessories

The following accessories are available for the Reader.

Article No.	Part No.	Description
1688.002.00	ID NET.12V-B-EU	Power Supply 95 - 265V AC Input Voltage, (Continental European Plug), with angular DC Plug 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Ambient Operating Temperature: 0°C to +40°C
3886.000.00	ID NET.12V-B-GB	Power Supply 95 - 265V AC Input Voltage, (GB/UK Plug), with angular DC Plug 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Ambient Operating Temperature: 0°C to +40°C
3887.000.00	ID NET.12V-B-US	Power Supply 95 - 265V AC Input Voltage, (US Plug), with angular DC Plug 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Ambient Operating Temperature: 0°C to +40°C
1686.000.00	ID CAB.USB-A	USB-cable 2,5m
1690.000.00	ID CAB.RS-A	Serial data cable

Table 8: Accessories

OBID i-scan® UHF

MONTAGE
INSTALLATION

ID ISC.MRU102-PoE
ID ISC.MRU102-USB

Gehäuse-Variante

Housed Version

preliminary
public (B)
2012-03-22
M20110-1de-ID-B.doc

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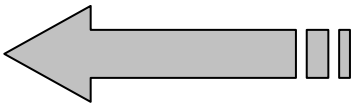
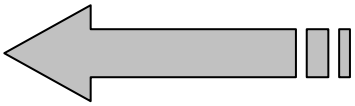
DEUTSCH



Deutsche Version ab Seite 3

ENGLISH



English version from page 23

Hinweis

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Inhalt

1 Sicherheits- und Warnhinweise - vor Inbetriebnahme unbedingt lesen

- Das Gerät darf nur für den vom Hersteller vorgesehenen Zweck verwendet werden.
- Die Bedienungsanleitung ist zugriffsfähig aufzubewahren und jedem Benutzer auszuhändigen.
- Unzulässige Veränderungen und die Verwendung von Ersatzteilen und Zusatzeinrichtungen, die nicht vom Hersteller des Gerätes verkauft oder empfohlen werden, können Brände, elektrische Schläge und Verletzungen verursachen. Solche Maßnahmen führen daher zu einem Ausschluß der Haftung und der Hersteller übernimmt keine Gewährleistung.
- Für das Gerät gelten die Gewährleistungsbestimmungen des Herstellers in der zum Zeitpunkt des Kaufs gültigen Fassung. Für eine ungeeignete, falsche manuelle oder automatische Einstellung von Parametern für ein Gerät bzw. ungeeignete Verwendung eines Gerätes wird keine Haftung übernommen.
- Reparaturen dürfen nur vom Hersteller durchgeführt werden.
- Anschluß-, Inbetriebnahme-, Wartungs-, und sonstige Arbeiten am Gerät dürfen nur von Elektrofachkräften mit einschlägiger Ausbildung erfolgen.
- Alle Arbeiten am Gerät und dessen Aufstellung müssen in Übereinstimmung mit den nationalen elektrischen Bestimmungen und den örtlichen Vorschriften durchgeführt werden.
- Beim Arbeiten an dem Gerät müssen die jeweils gültigen Sicherheitsvorschriften beachtet werden.
- Besonderer Hinweis für Träger von Herzschrittmachern:
  Obwohl dieses Gerät die zulässigen Grenzwerte für elektromagnetische Felder nicht überschreitet, sollten Sie einen Mindestabstand von 25 cm zwischen dem Gerät und Ihrem Herzschrittmacher einhalten und sich nicht für längere Zeit in unmittelbarer Nähe des Geräts bzw. der Antenne aufhalten.

2 Leistungsmerkmale der Readerfamilie ID ISC.MRU102

Der Reader ist für das Lesen von passiven Datenträgern, sogenannten „Smart Labels“, mit einer Betriebsfrequenz im UHF Bereich zwischen 860 MHz und 960 MHz entwickelt. Es werden Transponder nach EPC Class1 Gen2 unterstützt. Optional kann eine Freischaltung zum Lesen von Transpondern nach ISO 18000-6-C erfolgen. Der Leser ist konzipiert für Anwendungen mit geringer Transponderdichte.

Der Reader verfügt über einen externen Antennenanschluss über eine SMA Buchse (ANT1) und eine interne Antenne (ANT 4). Die interne Antenne ist sowohl zum Lesen von Fernfeld- als auch zum Lesen von Nahfeld-Transpondern geeignet.

Der Leser ist für die Nutzung in Applikationen mit geringer Transponderdichte konzipiert. Er ist in der Lage maximal 10 Transponder, die sich gleichzeitig im Antennenfeld befinden, zu verarbeiten.

Es stehen zwei unterschiedliche Gerätevarianten zur Verfügung. Je nach Variante kann eine Anbindung an ein Host-System über die Ethernet- oder die USB-Schnittstelle erfolgen.

2.1 Verfügbare Readertypen

Folgende Reader sind z.Z. verfügbar:

Readertyp	Beschreibung
ID ISC.MRU102-PoE	Gehäusevariante mit LAN Schnittstelle und Power over Ethernet
ID ISC.MRU102-USB	Gehäusevariante mit USB-Schnittstelle

Tabelle 1: Readertypen

2.2 Verfügbares Zubehör

optionales Zubehör ist im Anhang aufgeführt:

3 Montage

3.1 Gehäusevariante

Der Reader ist für Anwendungen im Innenbereich konzipiert. Eine Wandmontage ist mit dem optional erhältlichen Wandmontagesatz möglich.
(Siehe Anhang Wandmontagesatz ID ISC.MS.MR/PR-A)

Hinweise:

- ***Vor der endgültigen Installation sollte der geplante Installationsort auf seine Tauglichkeit geprüft werden.***

3.2 Abmessungen

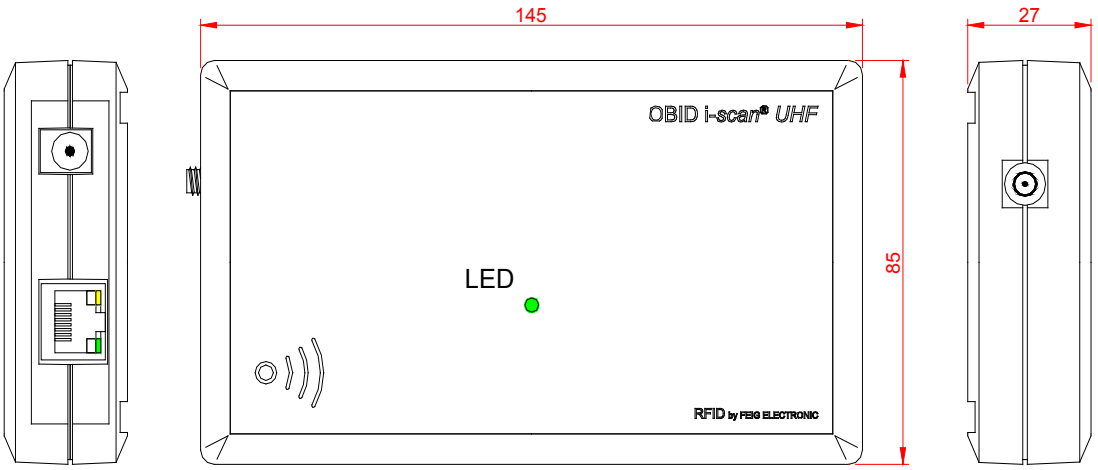


Abbildung 1: Abmessungen der Gehäusevariante (alle Maße in mm)

4 Anschlüsse

Je nach Variante des Readers stehen unterschiedliche Anschlussklemmen zur Verfügung. Abbildung 3: Anschlussübersicht zeigt die Anordnung und in Tabelle 2: Anschlussklemmen ist dargestellt, welche Anschlüsse für die einzelnen Schnittstellenkabel verwendet werden sollen.

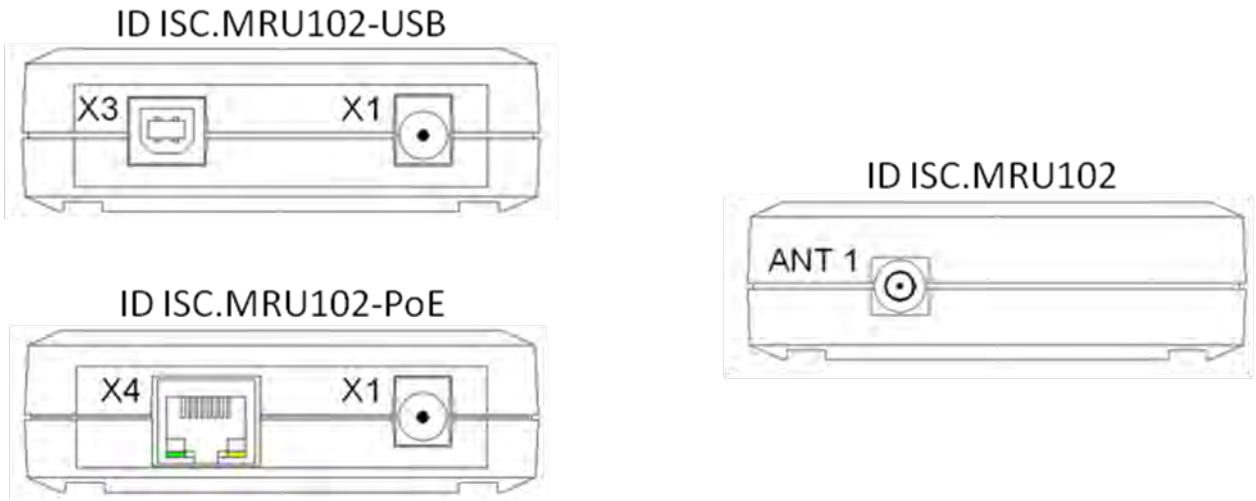


Abbildung 2: Anschlussübersicht

Anschluss	Beschreibung
ANT 1	Anschluss einer externen Antenne (Eingangsimpedanz 50Ω)
X1	Versorgungsspannung 12 - 24VDC
X3	USB Schnittstelle
X4	10/100Tbase Netzwerkschnittstelle mit RJ-45 (PoE)

Tabelle 2: Anschlussklemmen

4.1 Antennenanschluss ANT 1

Zum Anschluss der externen Antenne befindet sich auf der Leiterplatte eine SMA-Buchse (ANT1). Das maximale Anzugsdrehmoment der SMA-Buchsen beträgt 0,45 Nm.

Achtung:

- ***Höhere Anzugsdrehmomente führen zur Zerstörung des Steckers.***

Klemme	Beschreibung
ANT 1	Anschluss der externen Antenne (Eingangsimpedanz 50 Ω)

Tabelle 3: Anschluss der externen Antenne

Hinweise:

- ***Beim Anschluss einer Antenne ist darauf zu achten, dass diese die zulässigen Grenzwerte der nationalen Vorschriften bezüglich Funkanlagen nicht überschreitet.***

4.2 Interne Antenne ANT 4

Der Reader verfügt zusätzlich über eine bereits integrierte Antenne (ANT4). Die integrierte Antenne ist sowohl zur Kommunikation mit Fernfeld- als auch mit Nahfeldtranspondern geeignet. Die Antenne befindet sich in der unteren linken Ecke des Gehäuses und ist durch ein entsprechendes Symbol gekennzeichnet. Die maximal mögliche Lesereichweite mit einem Fernfeldtransponder beträgt ca. 40 cm. Mit einem Nahfeldtransponder können Lesereichweiten von maximal 5 cm erzielt werden.

Abbildung 3: Position der internen Antenne

4.3 Versorgungsspannung

4.3.1 Spannungsversorgung über X1

Die Versorgungsspannung von 12 - 24 V DC ist an der Buchse X1 der Leiterplatte anzuschließen.

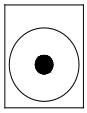
Buchse	Kurzzeichen	Beschreibung	X 1
X1 / Innen	Vcc	Vcc – Versorgungsspannung (+)	
X1 / Außen	GND	Ground – Versorgungsspannung (-)	

Tabelle 4: Anschluss der Versorgungsspannung

Hinweis:

- ***Eine Verpolung der Versorgungsspannung kann zur Zerstörung des Gerätes führen.***
- ***Das Gerät sollte nur durch ein gelistetes NEC Class 2/LPS Netzteil versorgt werden.***

Netzteilempfehlungen :

Zur Ausnutzung der vollständigen Leistungsfähigkeit des Readers sollte auf eine ausreichend stabilisierte und rauscharme Spannungsversorgung geachtet werden. Bei der Verwendung eines Schaltnetzteils ist darauf zu achten, dass die interne Schaltfrequenz des Netzteils unterhalb von 300 kHz liegt.(Siehe: Zubehör)

Feig Artikel Nr.	Bezeichnung	Beschreibung
1688.002.00	ID NET.12V-B-EU	Netzteil 95 - 265V AC Eingangsspannung, mit abgewinkelten DC Stecker 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Umgebungstemperatur: 0°C bis +40°C
3886.000.00	ID NET.12V-B-GB	
3887.000.00	ID NET.12V-B-US	

Tabelle 5: Empfohlenes Netzteil

Hinweis:

- ***Das Netzteil wird mit einem DC-Stecker 2,5mm*5,5mm geliefert. Dieser ist passend für die Buchse X1 des Readers.***

4.3.2 Versorgungsspannung über PoE (Power over Ethernet) (ID ISC.MRU102-PoE)

Alternativ kann die PoE Variante über den LAN-Anschluss X4 mit Hilfe eines „Power over Ethernet"-Netzteil gem. IEEE802.3af*, Class2 (6,49 Watt) versorgt werden. Die DC Speisung kann über die freien Pin's 4,5 und 7,8 erfolgen (Midspan-Power), als auch eine „Phantomspeisung" über die Signalverbindung 1,2,3 und 6 ist möglich (Inline-Power).

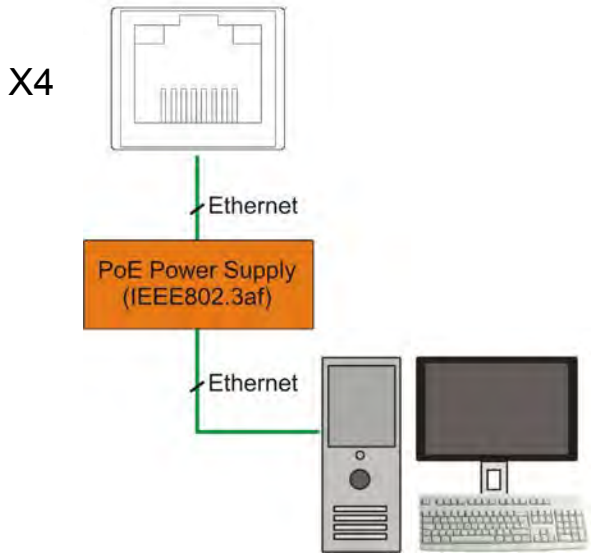


Abbildung 4: LAN und PoE Anschluss

Hinweis

- ***Es ist sicherzustellen das der Reader mit mindestens 42,5 V (48 VDC – Leitungsverluste) versorgt wird.***
- ***Die max. Leitungslänge für Ethernet ist 100m.***
- ***Es wird empfohlen ein abgeschirmtes STP (shielded twisted pair) CAT5 Kabel zu verwenden.***

* Detaillierte technische Informationen zu dem Standard 802.3af können der aktuellen Version der entsprechenden IEEE Spezifikation entnommen werden.

PoE-.Netzteilempfehlung:

Feig Artikel Nr.	Bezeichnung	Beschreibung
3842.000.00	ID NET.PoEI13W-A	Power over Ethernet Netzteil 100-240V AC (Continental European Plug), Output: 48V DC/⎓; 0,5A

Tabelle 6: Empfohlenes PoE-Netzteil

4.4 Ethernet-Schnittstelle an X2 (10/100Tbase)

Der Reader verfügt über eine integrierte 10/100 base-T Netzwerkschnittstelle mit Standard RJ-45-Anschluss. Der Anschluss erfolgt über X2 und hat eine automatische „Crossover Detection“ entsprechend dem 1000BASE-T Standard.

Bei einer strukturierten Verkabelung sollten mindestens Kabel der Kategorie CAT5 verwendet werden. Dies garantiert einen problemlosen Betrieb bei 10 Mbps oder 100 Mbps.

Vorraussetzung für den Einsatz des TCP/IP-Protokolls ist, dass jedes Gerät am Netzwerk über eine eigene IP-Adresse verfügt. Alle Reader verfügen über eine werksseitig voreingestellte IP-Adresse. Die Übertragungsparameter können per Softwareprotokoll konfiguriert werden.

Netzwerk	Adresse
IP-Adresse	192.168.10.10
Subnet-Mask	255.255.255.0
Port	10001
DHCP	AUS

Tabelle 7: Werkskonfiguration der Ethernet-Schnittstelle

Hinweis:

- ***Der Reader verfügt über eine DHCP-fähige TCP/IP Schnittstelle.***
- ***Es wird empfohlen ein <u>abgeschirmtes</u> STP (shielded twisted pair) CAT5 Kabel zu verwenden.***

4.5 USB – Schnittstelle X3 (Host Kommunikation)

Der Anschluss der USB-Schnittstelle erfolgt über die Buchse X3. Die Belegung ist genormt. Die Daten-rate des Readers ist auf 12 Mbit beschränkt (USB Full Speed). Es kann ein Standard-USB-Kabel verwendet werden.

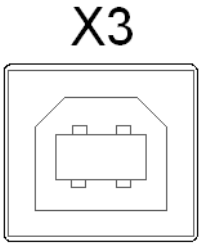


Abbildung 5: USB-Schnittstelle für Host Kommunikation

Hinweis:

- ***Die maximale Länge des USB-Kabels darf 5 m betragen. Längere Kabel sind nicht erlaubt.***
- ***Auch bei Verwendung der USB-Schnittstelle an einem „High Powered Port“ muss der Reader mit einem externen Netzteil versorgt werden.***

5 Bedien und Anzeigeelemente

5.1 LED

Die LED des Readers kann per Software konfiguriert werden.

Die folgende Tabelle 8 zeigt die Werkseinstellung.

Kurzzeichen	Beschreibung
LED grün	"RUN " - Leuchtet, wenn der Reader betriebsbereit ist.
LED rot	„TRANSPONDER“ - Leuchtet, wenn ein Transponder erkannt wird. - Blinkt bei RF-Warning (rot - grün abwechselnd mit 8Hz) (Temperaturalarm, Kurzschluss am Antennenausgang)
LED orange	„INITIALISIERUNG“ - Blinkt während der Reader-Initialisierung nach dem Einschalten.

Tabelle 8: Standard-Konfiguration der LED

6 Technische Daten

Mechanische Daten

• **Gehäuse**	Kunststoff ABS geschlossen
• **Abmessungen (B x H x T)**	145 mm x 85 mm x 27 mm
• **Gewicht**	200 g
• **Schutzart**	IP 30
• **Farbe**	ähnlich RAL 9018 (Papyrusweiß)

Elektrische Daten

• **Spannungsversorgung**	
– ID ISC.MRU102-USB	12 V DC bis 24 V DC
– ID ISC.MRU102-PoE	12 V DC bis 24 V DC oder PoE
• **Leistungsaufnahme**	max. 7 W
• **Betriebsfrequenz**	860 MHz bis 960 MHz
• **Sendeleistung**	max. 500 mW ± 1,5 dB
• **Antennenanschluss**	1 x SMA Buchse (50Ω) 1 x interne Antenne (ANT4)
• **Schnittstellen**	
– ID ISC.MRU102-PoE	Ethernet (TCP/IP)
– ID ISC.MRU102-USB	USB (Full Speed)
• **Sonstiges**	Anticollision, RSSI, Temperaturüberwachung*

Funktionelle Eigenschaften

• **Protokoll Modi**	FEIG ISO HOST (Advanced Protocol Frame) Scan Mode (nur ID ISC.MRU102-USB, HID Mode) Notification Mode (nur ID ISC.MRU102-PoE)
• **Unterstützte Transponder**	EPC Class1 Gen2 ISO 18000-6-C (Freischaltcode erforderlich)
• **Signalgeber optisch**	1 LED (mehrfarbig – rot / grün)

* Achtung: Eine Überhitzung des Gerätes kann zu Leistungseinbußen führen. Um dies auszuschließen wird empfohlen die RF des Lesers nur dann zu aktivieren, wenn sich ein Transponder im Erfassungsbereich einer Antenne befindet.

Umgebungsbedingungen

• **Temperaturbereich**	
- Betrieb	-25 °C bis +55 °C (-USB) -25 °C bis +45 °C (-PoE)
- Lagerung	-25 °C bis +85 °C
• **Relative Luftfeuchtigkeit**	5 % bis 95 % nicht betauend

Angewendete Normen

• **Zulassung Funk**	
- Europa	EN 302 208
- USA	FCC 47 CFR Part 15
- Kanada	IC RSS-Gen, RSS-210
• **EMV**	EN 301 489
• **Vibration**	EN60068-2-6 10 Hz bis 150 Hz : 0,075 mm / 1 g
• **Schock**	EN60068-2-27 Beschleunigung : 30 g

7 Funk Zulassungen

7.1 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 1999.

CE

Equipment Classification gemäß ETSI EN 301 489: Class 2

7.2 Declaration of Conformity

8 Anhang

8.1 Zubehör

Zu dem Reader ist folgendes Zubehör zu erhalten.

Artikel Nr.	Bezeichnung	Beschreibung
1688.002.00	ID NET.12V-B-EU	Netzteil 95 - 265V AC Eingangsspannung, (Continental European Plug), mit abgewinkelten DC Stecker 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Umgebungstemperatur: 0°C bis +40°C
3886.000.00	ID NET.12V-B-GB	Netzteil 95 - 265V AC Eingangsspannung, (GB/UK Plug), mit abgewinkelten DC Stecker 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Umgebungstemperatur: 0°C bis +40°C
3887.000.00	ID NET.12V-B-US	Netzteil 95 - 265V AC Eingangsspannung, (US Plug), mit abgewinkelten DC Stecker 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Umgebungstemperatur: 0°C bis +40°C
3842.000.00	ID NET.PoEI13W-A	Power over Ethernet Netzteil 100-240V AC (Continental European Plug), Output: 48V DC/⎓; 0,5A
1686.000.00	ID CAB.USB-A	USB-Kabel 2,5m
1691.000.01	ID ISC.MS.MR/PR-A	Wandmontagesatz für ID ISC.MR102

Tabelle 9: Zubehör

8.1.1 Wandmontagesatz ID ISC.MS.MR/PR-A

Mit Hilfe des Wandmontagesatzes kann der Reader auf einer ebenen Fläche befestigt werden.

- Die Schrauben auf der Rückseite des Readers entfernen.
- Die einzelnen Wandhalter mit denen im Montagesatz beigefügten Schrauben befestigen.

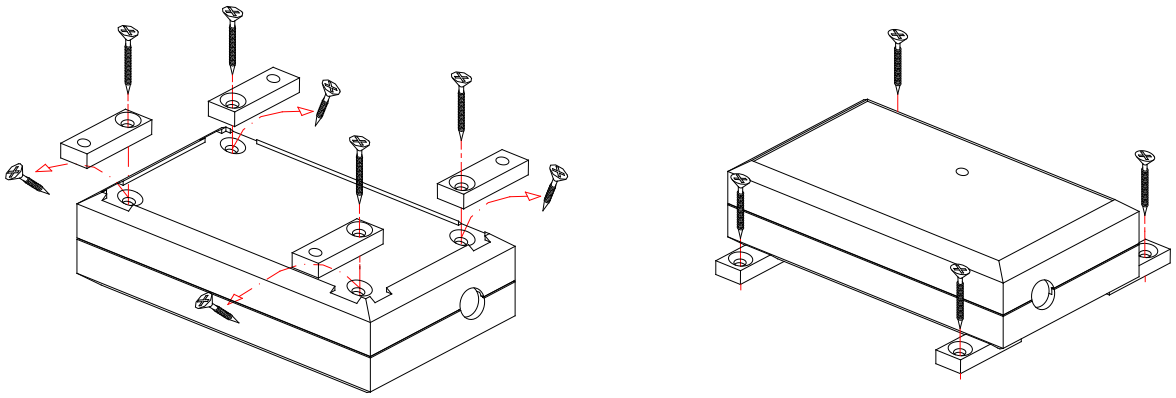


Abbildung 6: Montage Wandhalter

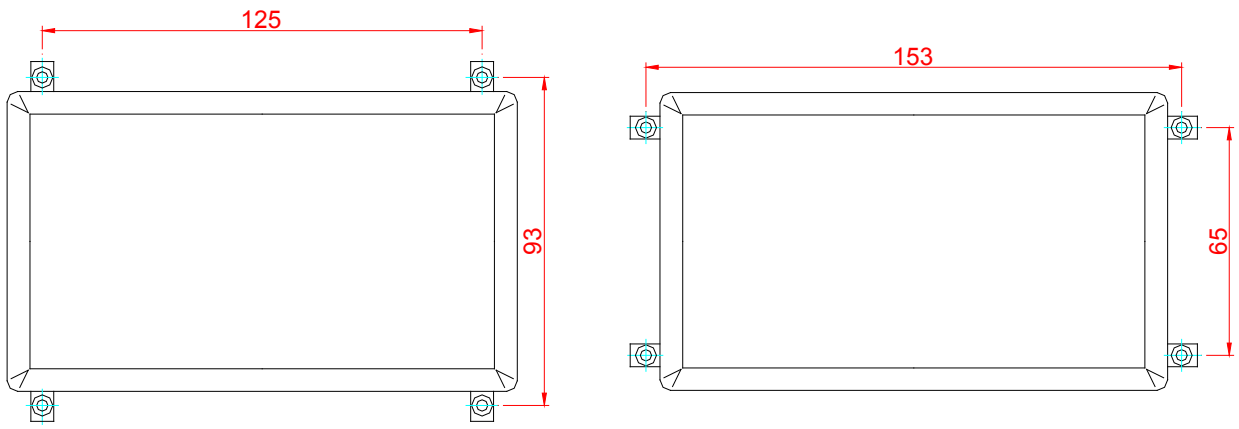


Abbildung 7: Montage - Bohrmaße (alle Maße in mm)

Note

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Contents

9 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.
- 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 from 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.

10 Performance Features of the readers

The Reader ID ISC.MRU102 is designed for reading of passive data carriers, so-called „Smart Labels“ at an operating frequency in the UHF band between 860 MHz and 960 MHz. Transponders according to EPC Class1 Gen2 are supported. Optional an Upgrade Code for the reading of ISO 18000-6-C transponders is available. The reader is designed for application with small tag population.

The reader is equipped with 1 SMA connector for conduction of an external antenna (ANT1). Additional an integrated antenna (ANT4) is available.

The reader is designed for use in applications with small tag populations. Maximum 10 tags at the same time into the antenna field can be processed.

The reader is available in two different versions. Depending on the used version a connection to the Host-System can either be made via the USB or the Ethernet Interface.

10.1 Available Reader types

The following reader types are currently available:

Reader type	Description
ID ISC.MRU102-PoE	Housed version with LAN Interface and Power over Ethernet (PoE)
ID ISC.MRU102-USB	Housed version with USB Interface

Table 1: Reader types

10.2 Optional accessories

Optional Accessories are listed in the attachment.

11 Assembly and Wiring

11.1 Housed versions

The Reader is designed for an office environment. It can be wall-mounted, in this case the wall-mount kit should be ordered separately.
(see Appendix: Wall mounting kit ID ISC.MS.MR/PR-A)

Notes:

- ***Before any installation the intended position of the reader should be tested for its suitability.***

11.1.1 Dimensions

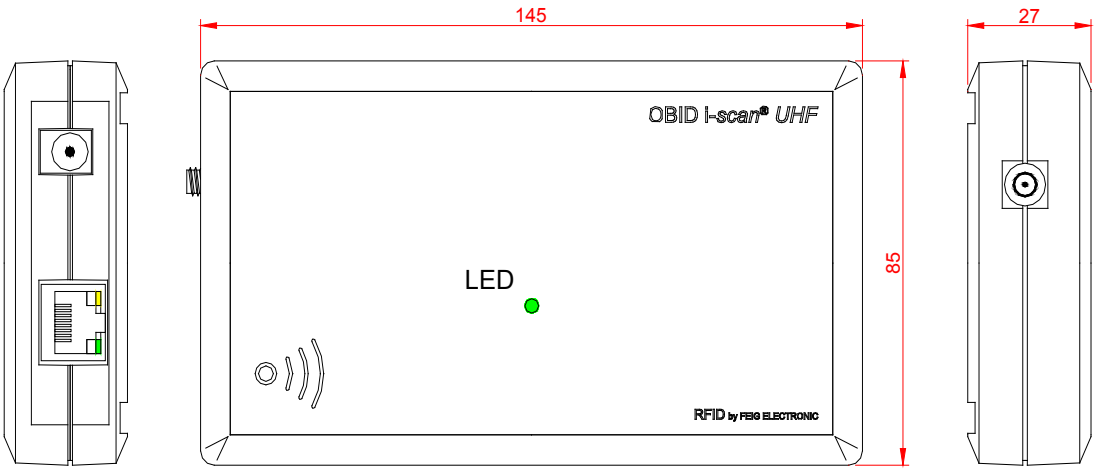


Figure 1: Dimensions of the housing version (all dimensions are in mm)

12 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.

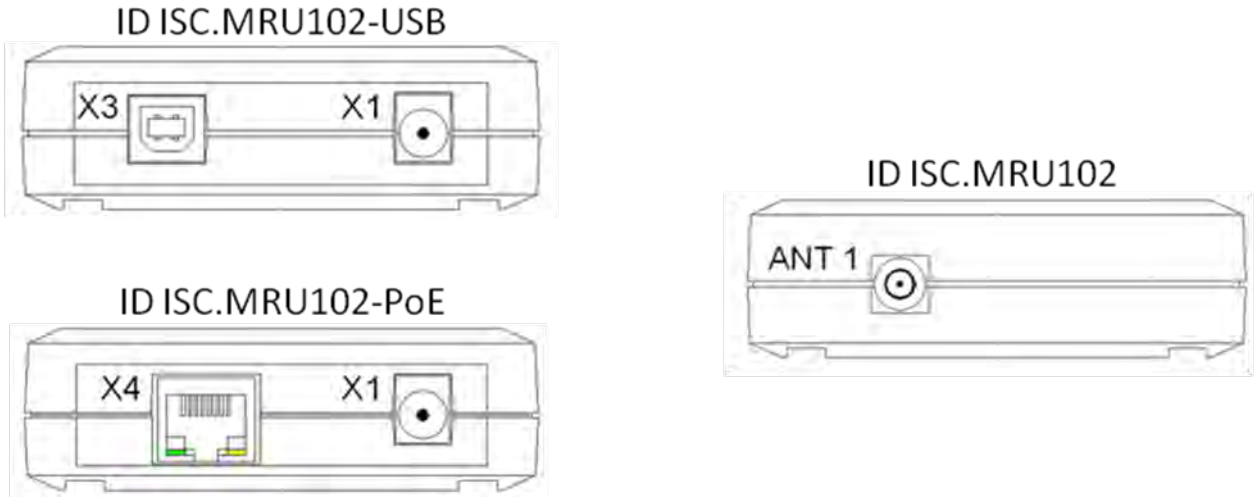


Figure 2: Connection overview

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

Table 2: Connectors

12.1 Antenna Terminal ANT 1

A SMA socket (ANT1) 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
ANT1	Connecting the external antenna (input impedance 50Ω)

Table 3: Connecting the external antenna

Note:

- ***When connecting an antenna, ensure that it does not exceed the permissible limits pre-scribed by the national regulations for radio frequency devices.***

12.2 Internal Antenna ANT4

Additionally the reader is equipped with an internal antenna (ANT4). The internal antenna supports far field transponders as well as near field transponders. The internal antenna is located in the bottom left corner of the housing and is marked with an antenna symbol. The maximum read range of the antenna in combination with a far field transponder is approx. 40 cm. In combination with a near field transponder the maximum read range is approx. 5 cm.

Figure 3: Position of the internal antenna

12.3 Power supply

12.3.1 Power supply via X1

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

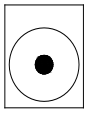
Terminal	Name	Description	X 1
X1 / inside	Vcc	Vcc – supply voltage (+)	
X1 / outside	GND	Ground – supply voltage (-)	

Table 4: Connecting the supply voltage

Note:

- ***Reversing the polarity of the supply voltage may destroy the device.***
- ***The unit has to supplied by a listed NEC Class 2/LPS 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

Feig Article No	Part No.	Description.
1688.002.00	ID NET.12V-B-EU	Power Supply 95 - 265V AC Input Voltage, with angular DC Plug 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Ambient Operating Temperature: 0°C to +40°C
3886.000.00	ID NET.12V-B-GB	
3887.000.00	ID NET.12V-B-US	

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.***

12.3.2 Power supply via PoE (Power over Ethernet) on X4 (ID ISC.MRU102-PoE)

Optional the reader (only MRU102-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.

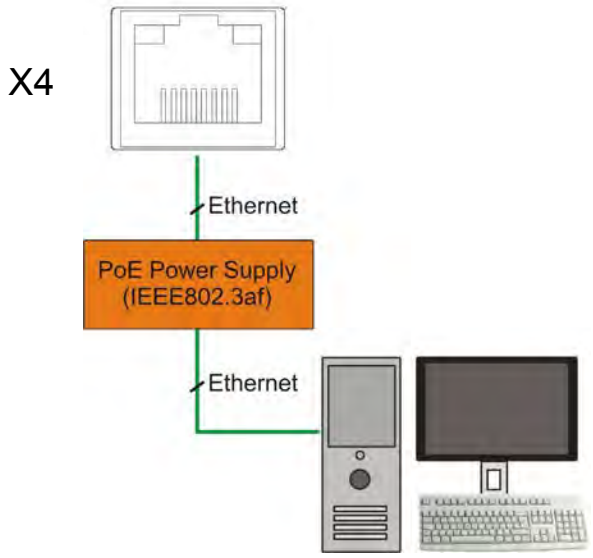


Figure 4: LAN and PoE connection

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.

PoE - power supply recommendations:

Article No.	Name	Description
3842.000.00	ID NET.PoEI13W-A	Power over Ethernet Supply 100-240V AC (Continental European Plug), Output: 48V DC/⎓; 0,5A

Table 6: Recommended PoE Power Supply

12.4 Ethernet-Interface on X4 (10/100Tbase)

The Reader has an integrated 10 / 100 base-T network port for an RJ-45. Connection is made on X4 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 7: 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.***

12.5 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.

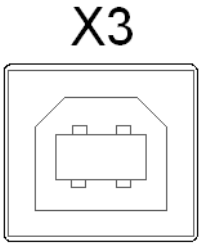


Figure 5: USB interface for host communication

Note:

- ***The length of the USB-cable can be a max. of 5 meter. It isn't allowed to use longer cables!***
- ***The reader must be powered with a external power supply even if it is connected to a "high powered port".***

13 Control and display elements LED

13.1 LED

The Reader's LED can be configured through software.

The following Table 8 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 8: Default configuration of the LEDs

14 Technical Data

Mechanical Data

• **Housing**	ABS plastic, enclosed
• **Dimensions (W x H x D)**	145 mm x 85 mm x 27 mm
• **Weight**	200 g
• **Degree of Protection**	IP 30
• **Color**	similar RAL 9018 (papyrus white)

Electrical Data

• **Supply voltage**	
– ID ISC.MRU102-USB	12 V DC to 24V DC
– ID ISC.MRU102-PoE	12 V DC to 24V DC or PoE
• **Power consumption**	max. 7 W
• **Operating frequency**	860 MHz to 960 MHz
• **Transmitting power**	max. 500 mW ± 1,5 dB
• **Antenna connection**	1 x SMA female (50Ω) 1 x internal antenna
• **Interfaces**	
– ID ISC.MRU102-PoE	Ethernet (TCP/IP)
– ID ISC.MRU102-USB	USB (Full Speed)
• **Features**	Anticollision RSSI Temperature control*

Functional Properties

• **Protocol Modes**	FEIG ISO HOST (Advanced Protocol Frame) Scan Mode (only ID ISC.MRU102-USB, HID Mode) Notification Mode (only ID ISC.MRU102-PoE)
• **Supported transponders**	EPC Class1 Gen2 ISO 18000-6-C (Upgrade Code required)
• **Visual indicators**	1 LED (multicolor – red / green)

* Caution: Overheating of the device may result in performance losses. It is recommended to activate the RF of the reader only if there is a transponder in the detection range of an antenna.

Ambient Conditions

• **Temperature range**	
- Operation	-25 °C to +55 °C (-USB) -25 °C to +45 °C (-PoE)
- Storage	-25 °C to +85 °C
• **Humidity**	5 % to 95 % non condensing

Applicable Norms

• **Radio approval**	
- Europe	EN 302 208
- USA	FCC 47 CFR Part 15
- Canada	IC RSS-GEN, RSS-210
• **EMC**	EN 301 489
• **Vibration**	EN 60068-2-6 10 Hz to 150 Hz : 0,075 mm / 1 g
• **Shock**	EN 60068-2-27 Acceleration : 30 g

15 Radio Approvals

15.1 Europe (CE)

When used according to regulation, this radio equipment conforms with the basic requirements of Article 3 and the other relevant provisions of the R&TTE Guideline 1999/E6 dated March 99.

CE

Equipment Classification according to ETSI EN 301 489: Class 2

15.2. USA (FCC) and Canada (IC)

15.2.1 USA (FCC) and Canada (IC) warning notices

Product name:	**ID ISC.MRU102-USB** **ID ISC.MRU102-PoE**
Reader name:	**ID ISC.MRU102-USB** **ID ISC.MRU102-PoE**
FCC ID	**PJMMRU102** **6633A-MRM102**
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 appli- cables aux appareils radio exempts de licence. L'exploitation est auto- risée 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 fonc- tionnement.

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

15.2.2 Label Information Reader Module ID ISC.MRMU102-A

The following information has to be mounted outside on the housing of the reader module.

Contains FCC ID PJMMRU102
Contains IC: 6633A-MRU102

15.2.3 USA (FCC) and Canada (IC) approved antennas

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with maximum permission gain and required antenna impedance for each antenna type indicated. Antenna types, not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne 'énoncé ci-dessus et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

Following antennas are approved by FCC according FCC Part 15 and IC Canada according RS210

- ID ISC.ANT.U170/170 –FCC (4.0 dBic)
- ID ISC.ANT.U270/270-FCC (9.0 dBic)
- ID ISC.ANT.U600/270-FCC (11,0 dBic)
- Integrated antenna (- 7dBic)

16 Annex

16.1 Accessories

The following accessories are available for the Reader.

Article No.	Part No.	Description
1688.002.00	ID NET.12V-B-EU	Power Supply 95 - 265V AC Input Voltage, (Continental European Plug), with angular DC Plug 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Ambient Operating Temperature: 0°C to +40°C
3886.000.00	ID NET.12V-B-GB	Power Supply 95 - 265V AC Input Voltage, (GB/UK Plug), with angular DC Plug 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Ambient Operating Temperature: 0°C to +40°C
3887.000.00	ID NET.12V-B-US	Power Supply 95 - 265V AC Input Voltage, (US Plug), with angular DC Plug 2,5mm*5,5mm Output: 12 V DC/⎓; 700mA Ambient Operating Temperature: 0°C to +40°C
3842.000.00	ID NET.PoEI13W-A	Power over Ethernet Supply 100-240V AC (Continental European Plug), Output: 48V DC/⎓; 0,5A
1686.000.00	ID CAB.USB-A	USB-cable 2,5m
1691.000.01	ID ISC.MS.MR/PR-A	Wall mounting kit for ID ISC.MR102

Table 9: Accessories

16.1.1 Wall mounting kit ID ISC.MS.MR/PR-A

The wall mounting kit can be used to attach the Reader to a flat surface.

- Remove the screws from the back side of the Reader.
- Attach the individual wall hangers using the screws supplied with the mounting kit.

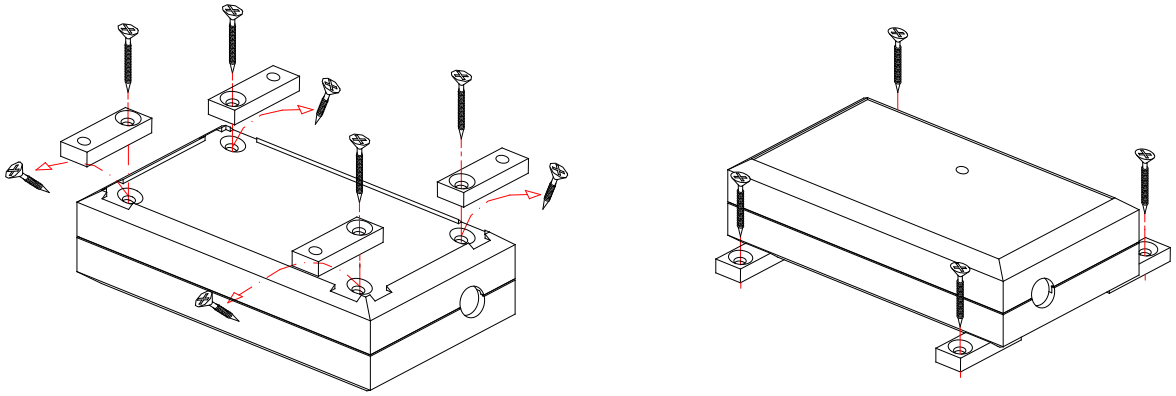


Figure 6: Mounting wall hangers

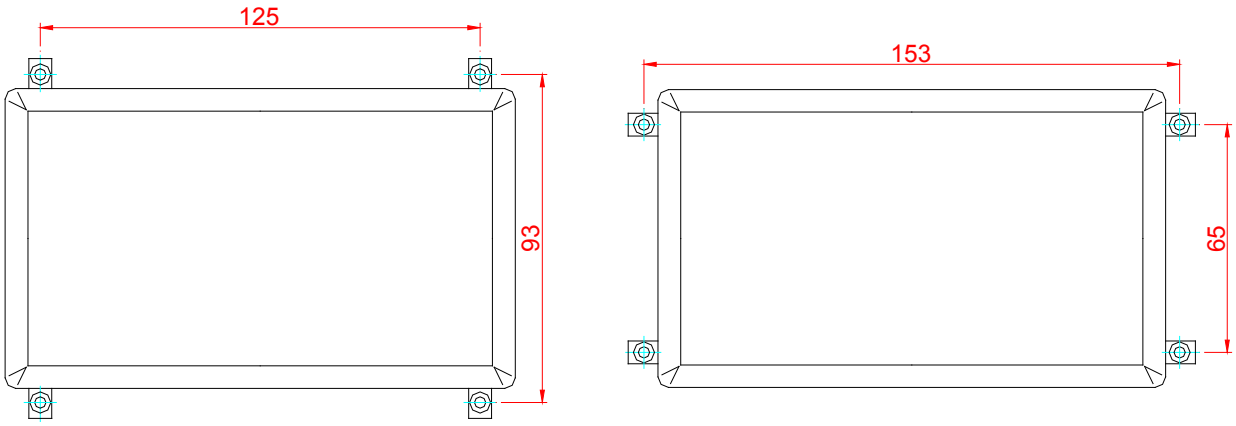


Figure 7: Mounting drill dimensioning (all dimensions in mm)