

# ID ISC.M02.M8



## Note

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## Content

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<b>ID ISC.M02.M8</b>	<b>1</b>
<b>1 Safety Instructions / Warning - Read before start-up !</b>	<b>4</b>
<b>2 Performance Characteristics of the ID ISC.M02.M8 Reader Module</b>	<b>5</b>
2.1 Performance Characteristics .....	5
2.2 Available module .....	5
2.3 Available Accessories .....	5
<b>3 Installation and wiring</b>	<b>6</b>
3.1 Dimensions .....	6
3.2 Wiring.....	7
3.2.1 Supply voltage .....	7
3.2.2 RS232-LVTTL-Interface (3,3V) .....	8
3.2.3 Connection of the external antennas .....	9
3.3 Installation notes .....	10
3.3.1 Mounting .....	10
3.3.2 Influence .....	10
3.3.3 EMC effects on cables.....	11
3.3.4 EMC effects from magnetic fields .....	11
<b>4 Technical Data</b>	<b>12</b>
<b>51. Approvals</b>	<b>14</b>
5.11.1. Europa (CE) .....	14
5.21.2. USA (FCC) and Canada (IC) .....	15

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

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- 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.
- Unauthorised 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 unauthorised 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.
- The reader module is a limited module. The HF Reader IC has no internal shielding. The module is designed for installation in electronic devices. (e.g. printers, terminals, hand scanners, etc.) Care must be taken to ensure that no switching power supply, oscillator or high current lines are routed directly along the module. Or located under the module. Only the antennas, mentioned in the manual, may be used. The cable length to the antenna is limited to 1m. Take care that the PCB design in the host environment is EMC compliant.
- 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 external antenna and your cardiac pacemaker and not stay in an immediate proximity of the device respective the antenna for some time.

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## 2 Performance Characteristics of the ID ISC.M02.M8 Reader Module

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### 2.1 Performance Characteristics

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The ID ISC.M02.M8 reader module is designed for reading and writing passive transponders, so-called "Smart Labels", with an operating frequency of 13.56 MHz according to the ISO15693 standard. It is suitable for any application in which short read ranges and small reader dimensions are required.

The module has an integrated antenna multiplexer. Up to 8 external antennas can be connected.

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### 2.2 Available module

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The following reader types are available:

Module type	Description
ID ISC.M02.M8	1 x Reader module ID ISC.M02.M8

Table 1: Available module version

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### 2.3 Available Accessories

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Tab. 1 Available Accessories and spare parts

Part Number	Part name	Description
3674.000.00	ID ISC.ANT40/30-U.FL-A	50 Ohm Antenna with U.FL-connector for the connection to the ID CPR60 Dimensions: 40 mm x 30 mm

### 3 Installation and wiring

#### 3.1 Dimensions

Fig. 1 shows the dimensions of the ID ISC.M02.M8 Reader Module in mm.

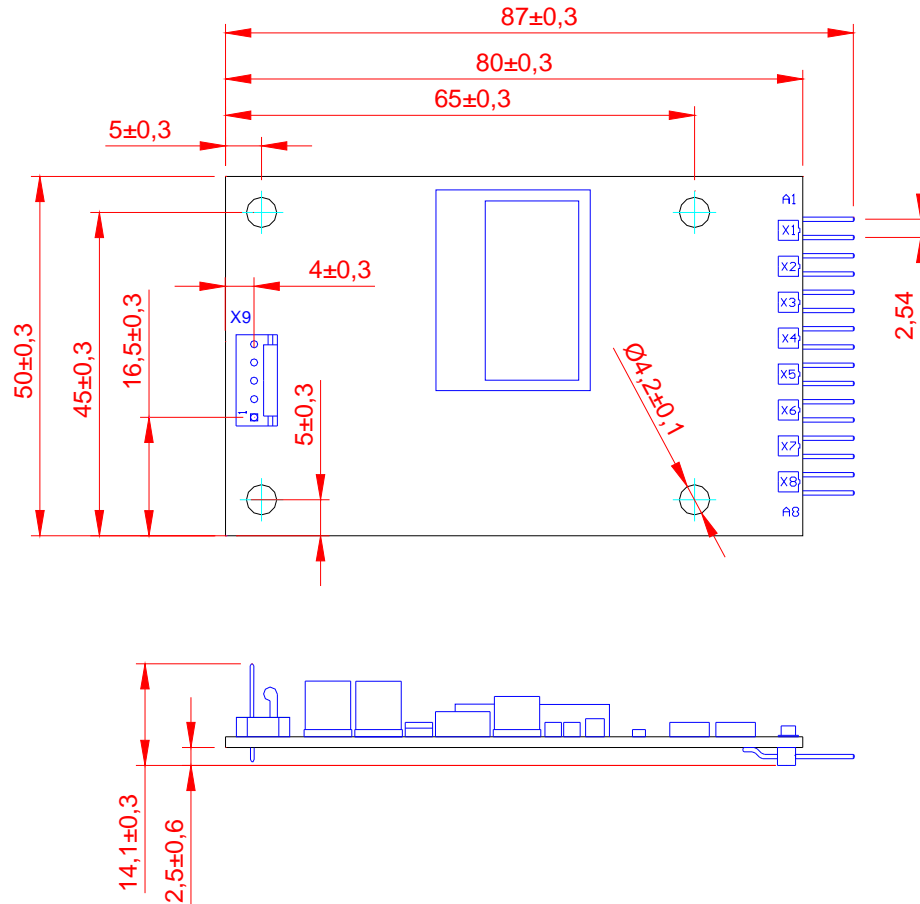


Fig. 1: Dimension of the Readermodul ID ISC.M02.M8

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## 3.2 Wiring

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[Figure 1](#) and [Table 2](#) show the pin assignments for Terminal X9. The pin connector is designed for flat cable connection using a 5 pin multipoint socket connector type MTA 100 company AMP.

X9 Pin-No.	Function	Description
1	GND **	GND
2	TxD	RS232-LVTTL – Send data
3	Vin *	+ 24VDC
4	RxD	RS232-LVTTL – Receive data
5	GND **	GND
* Use only regulated DC power supplies !		

Table 2: Pin Assignment of the multipoint connector X9

**Note:**

- ***A wrong polarity of the DC voltage will destroy the reader***

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### 3.2.1 Supply voltage

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The reader ID ISC.M02.M8 has to be supplied by a limited power supply (e.g. NEC Class 2/LPS power supply) according to IEC EN 60950, only.

If switching power supplies are used with the module, be sure that there is adequate filtering.

Noise from the power supply can result in a reduction of the read/write range of the module.

The cable length from the power supply should be as short as possible, and should in any case not exceed 1 m.

**Note:**

- ***A wrong polarity of the DC voltage will destroy the reader***
- ***Supply voltages outside the specifications may destroy the device.***

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### 3.2.2 RS232-LVTTL-Interface (3,3V)

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The length of the cable to the RS232 LVTTL interface should be kept as short as possible, and must in any case not exceed 1 m.

The transmission parameters for the interface can be software-configured.

Table 3 shows the standard parameters for the RS232 interface.

Parameter	Default Setting
Baudrate	38400 bit/s
Number of Data bits	8
Parity	Even
Number of Stop bits	1

Table 3 Default parameter of the RS232 LVTTL



### 3.2.3 Connection of the external antennas

Up to 8 external antennas can be connected.

For the connection of the external antennas 8 antenna connectors (X1..X8 respectively A1..A8) are available.

The connector type is U.FL-R-SMT from the company Hirose. .

Alternatively a 16pin connector can be used for the connection of the antennas.

Figure 1 shows the pin assignment.

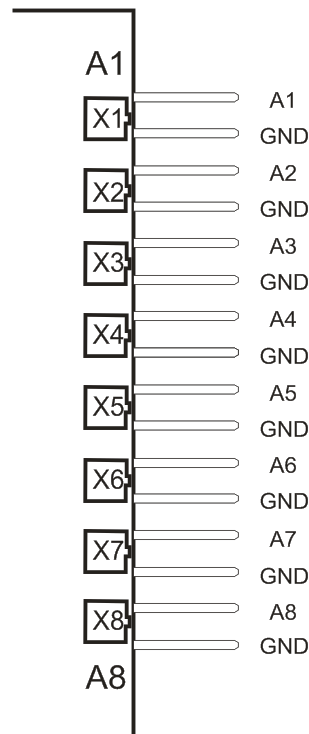


Figure 1: Antenna connector's

**Note:**

- ***A coaxial cable, U.FL-LP-088, is used to connect the antenna. The antenna cable should be no longer than 1 m. The use of other cable length are possible after consulting the manufacturer.***
- ***The input impedance for the antenna must be calibrated to a value of  $50 \Omega \pm (3 \Omega \angle 3^\circ)$ .***
- ***A not correct tuned antenna can destroy the reader.***
- ***The optimum working quality of the antenna should be in a range of  $QB = 10...20$ . For measuring the working quality the antenna must be connected with a  $50 \Omega$ -source, e.g. a network analyzer or a frequency generator***
- ***When connecting an antenna, ensure that it does not exceed the permissible limits prescribed by the national regulations for radio frequency devices.***
- ***The ultraminiatur coax connector can be used for up to about 20 connection cycles. For the disconnection the „Extraction Tool“ must be use according to the recommendation from the manufacturer.***

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### 3.3 Installation notes

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The reader module has been designed for the installation in a device.

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#### 3.3.1 Mounting

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- The reader module can be mounted by using 4mm (M4) screws.
- Component side: the maximum head diameter should not increase more than 8mm.
- Preferred no metallic screws should be used (DIN7985).
- Alternatively internal hexagon screws can be used (DIN 912).
- Component underside: conductive materials can have a diameter of 6mm. Non-conductive materials can have a diameter of up to 10mm.
- The mounting orientation of the reader module is arbitrary. The component side on the top is the preferred orientation.
- Check the planned mounting place first for suitability.

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#### 3.3.2 Influence

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Be aware of the following possible environmental factors when installing the module into another device :

- Effects from nearby metal objects
  - ⇒ Detuning of the integrated antenna
  - ⇒ Impaired propagation of the antenna's magnetic field
- EMC effects on cables
  - ⇒ Impaired communication between reader and transponder
- EMC effects from magnetic fields
  - ⇒ Impaired communication between reader and transponder

### 3.3.3 EMC effects on cables

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In spite of the internal EMC filters inside the reader, high levels of noise on the supply voltage can result in impairment of the communication between the reader and transponder.

When installing an reader module into another device, be sure therefore that a clean, noise-free power supply is used.

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### 3.3.4 EMC effects from magnetic fields

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Since in this type of RFID-Technology the communication between the reader and transponder takes place by modulation of a magnetic field, alternating magnetic fields in the vicinity of the antenna can have a negative impact on its function.

Sources of such magnetic interference fields include coils within a primary or secondary switching power supply.

When determining the position of the reader and antenna within a device, check the device for any possible sources of interference as described above. If necessary, use shielding to suppress such interference.

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## 4 Technical Data

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### Mechanical Data

- **Housing** without housing
- **Dimensions (W x H x D)** 87 x 50 x 14,1 mm (3.43 x 1.97 x 0.56 inch)
- **Weight** 24 g
- **Connector** 5 Pin multipin connector Type MTA 100 AMP

### Electrical Data

- **Supply voltage** 24V DC  $\pm$  10%
- **Current draw** max. 100mA
- **Power consumption** max. 2 Watt
- **Operating frequency** 13,56 MHz
- **Transmitting power** 200mW  $\pm$  1dB
- **Antenna connection** up to 8 external Antennas (50Ohm)  
(Connection: U.FL-R-SMT or multipin)
- **Interface** RS232 – Level LVTTTL (3,3V)

### Functional Properties

- **Protocol Modes** - FEIG ISO HOST
- **Supported transponders**
  - ISO15693
- **EEPROM (for parameters)** 1kB (10.000 write cycles)
- **FLASH** 64 kB (Firmware Update via interface possible)

**Ambient Conditions**

- **Temperature range**
  - Operation -20°C to +70°C (-4°F to 158°F)
  - Storage -40°C to +85°C (-40°F to 185°F)
- **Humidity** 5 – 95% non condensing

**Applicable Norms**

• <b>Radio approval</b>	<b>Europa</b>	EN 300 330
	<b>USA</b>	FCC 47 CFR Part 15
	<b>Kanada</b>	IC RSS-210
• <b>EMC</b>		EN 301 489
• <b>Safety</b>		EN 60950
		EN 50364
• <b>Waste and Hazardous Substances</b>		WEEE - 2002/96/EC
		RoHS - 2011/65/EC

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**5 1. Approvals**

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**5.1 1.1. Europa (CE)**

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Hereby, FEIG ELECTRONIC GmbH declares that the radio equipment type ID CPR60 is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

<http://www.feig.de/en/downloads-support/declarations-of-conformity.html>



Performance Classification according to ETSI EN 301 489: Class 2

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**5.2 1.2. USA (FCC) and Canada (IC)**


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<b>Product name:</b>	<b>ID ISC.M02.M8</b>
<b>FCC ID:</b>	<b>PJMM02M8</b>
<b>IC:</b>	<b>6633A-M02M8</b>
<b>Notice for USA and Canada</b>	<p>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.</p> <p>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 :</p> <p>(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.</p>

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

**Installation with FCC / IC Approval:**

The reader module was tested according to the standard FCC - Title 47 CFR Part 15 §207, §209 and §225 and the ISED standard RSS 210 Issue 10 and RSS Gen Issue 5 . The module is conform to the listed limits in the standards.

In normal operation the RF exposure is far below the limits of OET Bulletin 65.

This module is approved for installation into fixed and/or mobile host platforms and must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC/ISED multi-transmitter guidelines. End users must be provided with transmitter operating conditions for satisfying RF Exposure compliance.

The manufacturer is obliged to include a notice "Contains FCC ID: PJMM02M8 an IC: 6633A-M02M8" at the user manual and on the product label.

The manufacturer is obliged to test the terminal device together with the reader module according to the national FCC requirements according to 47 CFR Part15 §209 and §225

For this purpose the reader module must be set to normal operation, ScanMode. The Scan mode is switched with on by SW command: Transparent Command - ISO 14443A [ReqA] HEX: 02 00 0A FF 00 30 02 01

The manufacturer is obliged to test the terminal device together **with** the reader module according to the national FCC requirements according to 47 CFR Part15 §209 and §225 For this purpose the reader module must be set to normal operation, ScanMode. The Scan mode is switched with on by SW command: Transparent Command - ISO 14443A [ReqA] HEX: 02 00 0A FF 00 30 02 01

The manufacturer is obliged to test the terminal equipment **without** RF transmitter, according to the national FCC requirements according to 47 CFR Part 15 Subpart B. For this purpose, the HF transmitter of the reader module must be switched off. The HF transmitter is switched off by the SW command: Transparent Command - HF Off HEX: 02 00 0A FF 00 04 01 00

FCC-/IC-NOTICE: To comply with FCC Part 15 Rules in the United States / with IC Radio Standards in Canada, the system must be professionally installed to ensure compliance with the Part 15 certification / IC certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States / Canada.