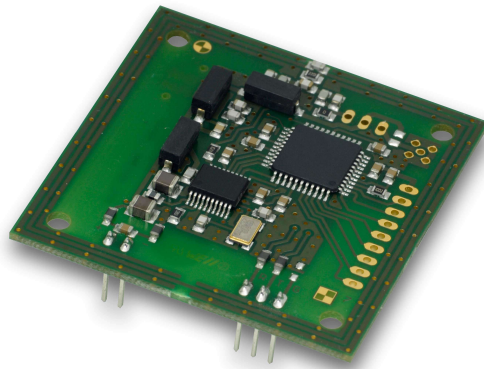


Technical Documentation

for metraTec QR15 HF RFID Module (FCC Version)



Date: October 2010

Version: 1.5

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1. General Information / Security Advice

1.1. Notes on the Use of this Documentation

This user manual and integration guide uses different symbols to point out potentially dangerous situations. The following signs and symbols are used throughout the document.



ATTENTION

Declares a potentially hazardous situation. If this is not avoided, the product or something in its surrounding could be damaged.



NOTES

Declares notes for the user as well as other useful information, where no harmful or dangerous situations can be expected.

1.2. Export Restriction

The QR15 HF RFID Module contains components that underly US export restrictions. It is therefore forbidden to export the product to countries that are on the US trade embargo list.

1.3. Further Documentation

While this documentation explains the electrical and mechanical characteristics of the QR15 module, it might be useful to also read the metraTec Protocol Guide, which explains the ASCII protocols used to control the module in full detail.

Source: <http://www.metratec.com> → Support → Downloads → Documentation

2. Product Description

The QR15 HF RFID Module is an easy to use RFID module which can be integrated into your electronics without big effort. This allows you to equip your product with RFID functionality without designing your own RF board. Thanks to the tested and extremely flexible firmware you can read and write data to any tag that follows the ISO 15693 standard in no time. Even special features, e.g. sensor tags, can be used without firmware modifications. With its internal antenna a read range of up to 80mm is possible.

Thanks to the quick firmware, the module is perfect for applications in printers and similar devices where high reading and writing speed is needed.

2.1. Intended Use

The QR15 HF RFID Module reads RFID tags that comply to the ISO 15693 standard on a short range of 30-80 mm. Custom tag commands can be used without firmware changes if the tags follow the ISO 15693 standard with regard to the air interface. For transponders that use the ISO 14443A or Mifare standard, please use our QR14 RFID Module.

2.2. Technical Specification

Power Supply	5V DC, 100 mA
Communication	5V UART
Antenna Connector	Internal Antenna
Transmit frequency	13.56 MHz
RF output power	250 mW
Supported RFID Protocol	ISO 15693
Temperature Range	-20°C to +70°C
Dimensions	51 x 51 mm (2" x 2")

2.3. Module Building Blocks

The QR15 module consists of four building blocks, each of them carrying out one of the following functions:

- *UART-communication and power supply* – host communication via 5V UART and 5V power supply are connected to the host board via pin
- *Microcontroller* – the heart of the QR15 running the metraTec firmware

- *RF Frontend* – generates the signal transmitted to the tag and evaluates the Tag response
- *Internal antenna* – the internal 50mm x 50mm antenna can achieve reading distances up to 80mm

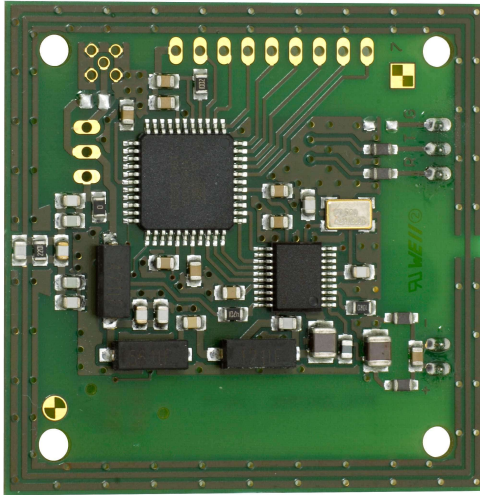


Fig. 1: QR15 Module (FCC Version)

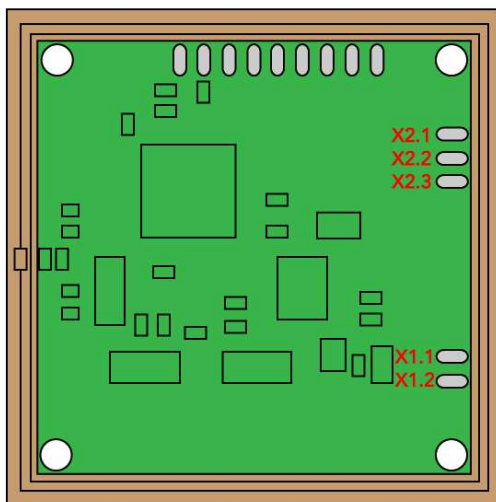


Fig. 2: Pin headers and jumper on the QR15 (FCC Version)

2.4. Scope of Delivery

The QR15 HF RFID Module comes with the following parts:

- QR15 HF RFID Module
- Documentation, Drivers and Demo Software are available via download from metraTec's website

2.5. Accessories

The following accessories and modules are available to extend and evaluate the functionality of the QR15 HF RFID Module:

- MUX4 Multiplexer Module
- QR14 HF Module for ISO14443A/Mifare protocols
- different RFID tags suitable for almost every application

3. Power Supply and Power Consumption

The module does not feature a power supply nor reverse polarity protection. It is the task of the host board to supply a well filtered 5V DC supply in order to achieve an optimum RFID performance.

Pin	Pin Function
X1.1	GND
X1.2	5V DC

Tab. 1: Power Supply Pins

Power supply voltage	5V DC
Current consumption RF on	100 mA
Current consumption RF off	20 mA
GPIO voltage level	5V

Tab. 2: DC characteristics

RFID systems require a very high level supply quality. Use linear regulators with high precision and high control speed whenever possible. When using switching power supplies make sure the switching speed is above 500 kHz and use an EMC optimized layout as well as shielded inductors.

4. Communication

Das QR15 HF RFID Module communicates with its host using a 5V UART connection. This enables direct connection to a host microcontroller. There is a range of circuits available to convert the 5V UART Signal to RS232, RS422/485 or to USB or Ethernet. Please contact metraTec if you need advice on such converter circuits.

Pin	Pin Function
X2.1	GND
X2.2	Tx
X2.3	Rx

Tab. 3: UART Pin connections

The UART commands used to control the QR15 Module are described in the metraTec Protocol Guide. This guide comprises a detailed description of all commands, response formats and examples. As this protocol is shared among several metraTec products the guide is available in a separate document.

Please see: www.metratec.com --> Support --> Downloads --> Documents

5. Certification

5.1. FCC (USA)

The QR15 HF RFID Module complies with Part 15 of the FCC Rules. To fulfill all FCC requirements the Original Equipment Manufacturer (OEM) must comply with the following regulations:

- The OEM must make sure that the end device is labeled according to FCC requirements. This means that the end device must have a clearly visible label on the outside of the product with at least the following content:

Contains FCC ID: YUH-QR15HL

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.

- The OEM must test the final product to comply with FCC regulations regarding unintentional radiators (FCC section 15.107 and 15.109) before declaring FCC compliance of his own product.



ATTENTION

Changes or modifications not expressly approved by metraTec could void the user's authority to operate the equipment.

5.2. IC (Canada)

Labeling requirements for Industry Canada (IC) are similar to those of the FCC. A clearly visible label on the outside of the final product must display at least the following text:

Contains Model QR15 RFID Module, IC: 9278A-QR15HL

The OEM is responsible for its product to comply with IC ICES-003 & FCC Part 15, Sub. B - Unintentional Radiators. ICES-003 is the same as FCC Part 15 Sub. B and Industry Canada accepts FCC test report or CISPR 22 test report for compliance with ICES-003.

6. Version History

<i>Version</i>	<i>Change</i>	<i>Changed by</i>	<i>Date</i>
1.0	created	KD	11.03.2009
1.1	Small corrections	KD	20.08.2009
1.2	Power Consumption added	KD	22.10.2009
1.3	Translation to English, some corrections	TM	05.10.2010
1.4	FCC Notice added	KD	13.10.2010
1.5	FCC and IC Labeling Requirement added	KD	18.10.2010

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We are constantly improving our products.

Changes in function, form, features can happen without prior notice.