




# PEPPERL FUCHS 70152029 HF RFID Reader Module User Manual

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PEPPERL FUCHS 70152029 HF RFID Reader Module



**Module Integration Guide**

HF RFID Reader Module #70152029 PH RADIO MODULE IQR3-FP FCC ID:  
**IREIQR3FP IC ID: 7037A-IQR3FP**

CONFIDENTIAL acc. to ISO Only valid as long as released in EDM!

**General Description**

**Module description**

The HF RFID Reader Module is a flexible read/write module with a high distance detection range. It has an integrated coil antenna (magnetic near field) and can read up to 20 tags simultaneously, increasing productivity. The module provides a simple interface for host products.

**Module features**

- Flexible HF read/write module with high distance detection range
- Integrated coil antenna (magnetic near field)
- Multi-tag reading of up to 20 tags ensures increased productivity
- Provides simple interface for host products

**Qualified personnel**

Only appropriately trained and qualified personnel may carry out the mounting, installation, commissioning, operation, maintenance, and dismounting of the product. The personnel must have read and understood the instruction manual and further documentation. Prior to using the product make yourself familiar with it. Read the document carefully.

**Environmental conditions**

Operating or storing the module outside the specified range may damage the module. To reach full temperature range, a potting will be needed for end product, which allows better cooling of electronic.

	Absolute maximum rating	Operation temperature (with non-transmission periods)	Operation temperature (Continuous transmission mode)	Storage temperature
Table 1 Environmental operating conditions				

## Module components

The radio module consists of 2 assembled PCBs with electronic components and an integrated coil antenna. On the electronics PCB, multiple shields are used to cover RF-sensitive parts. The host system is connected via a 2x8Pin connector. Additional LEDs may be connected to the module for visualization of module state.

## Interfacing of module

The interfacing of the module is made in the host product, which provides the typical 24V supply to the module. Also, the digital interface of RFID reader is interfaced via serial interface at CMOS Levels. The housing of the module is designed to be able to contain the host product as well and a variable amount of external connectors.

## Module Integration Guide for #70152029

- **scale:** response
- DF.MSH
- Date: 2023-03-31 14-4772A
- Sheet 1 of 11

Released EDM checkout 2023-MRZ-31

## Change History

CONFIDENTIAL acc. to ISO Only valid as long as released in EDM!

- Mannheim template: FTM-0027B
- DF.MSH
- date: 2023-03-31 14-4772A
- sheet 2 of 11

Released EDM checkout 2023-MRZ-31

## Product Usage Instructions

1. Make sure that only appropriately trained and qualified personnel carry out the mounting, installation, commissioning, operation, maintenance, and dismounting of the product.
2. Prior to using the product, make yourself familiar with it. Read the instruction manual and further documentation carefully.
3. Operate or store the module within the specified range to avoid damage to the module and incorrect operation of desired module functionality.
4. If you need to use the module outside the specified range, use potting for the end product, which allows better cooling of the electronic to reach the full temperature range.
5. Connect the host system via a 2x8Pin connector to provide a typical 24V supply to the module and interface the digital interface of the RFID reader via the serial interface at CMOS Levels.
6. The housing of the module is designed to be able to contain the host product as well and a variable amount of external connectors.

## General Description

### Module description

The module operates in the 13.56MHz HF frequency range and is optimized for use in industrial applications involving high distances. The device reads and writes passive tags in line with ISO 15693. The module can be used in the United States and Canada. The module is compliant with the relevant transmission regulations. The user can add LEDs to monitor the status of the module. The module has a typical detection range of around 30cm. This range is determined by the tag used and can be adjusted by configuring the transmission power. Other range influencing factors include the transponder size, the setup and installation of the specific application and the surrounding materials, particularly metal. For the actual read and write distances under real conditions, the combination of module and tag must be tested in the desired application. The radio module can be interfaced to various industrial busses by host product.

### Module features

- Flexible HF read/write module with high distance detection range
- Integrated coil antenna (magnetic near field)
- Multi-tag reading of up to 20 tags ensures increased productivity
- Provides simple interface for host products

### Qualified personnel

Only appropriately trained and qualified personnel may carry out the mounting, installation, commissioning, operation, maintenance, and dismounting of the product. The personnel must have read and understood the instruction manual and further documentation. Prior to using the product make yourself familiar with it. Read the document carefully.

### Environmental conditions

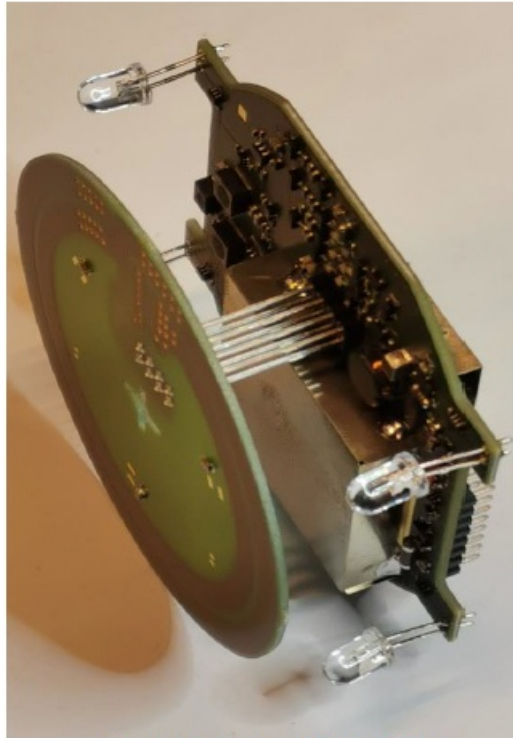
Operating or storing the module outside the specified range may damage the module. Also, this could lead to incorrect operation of desired module functionality. To reach full temperature range potting will be needed for end product, which allows better cooling of electronics.

**Table 1 Environmental operating conditions**

Absolute maximum rating	Value
Operation temperature (with non-transmission periods)	-25 ... +70°C
Operation temperature (Continuous transmission mode)	-25 ... +55°C
Storage temperature	-40 ... +85°C

### Module components

The radio module consists of 2 assembled PCBs with electronic components and an integrated coil antenna. On the electronics, PCB is multiple shields used to cover RF-sensitive parts. The host system is connected via a 2x8Pin connector. Additional LEDs may be connected to the module for visualization of the module state.



*Figure 1 stack up of radio module*

### **Interfacing of module**

The interfacing of the module is made in the host product, which provides the typical 24V supply to the module. Also, the digital interface of the RFID reader is interfaced via a serial interface at CMOS Levels. The housing of the module is designed to be able to contain the host product as well as a variable amount of external connectors.

### **Labeling**

**#70152029**  
**FCC ID: IREIQR3FP**  
**IC ID: 7037A-IQR3FP**  
**PMN: IQR3FP**  
**HVIN: IQR3FP**

*Figure 2 labeling of module*

The labeling of the module is applied on the shielding of the module.

### **Mounting module inside the host**

#### **1. PCB outline of module for host integration**

A 3D model of the module can be requested by the module integrator under a non-disclosure agreement.

#### **2. Position of the host interface connector**

A 3D model of the module containing position of the interface connector can be requested by the module integrator under a non-disclosure agreement.

### **Electrical characteristics**

#### **Maximum Ratings**

#### **Table 2 Electrical operating conditions**

maximum ratings	Value
Supply voltage	typical 24V DC, range of 8 ... 33V DC (absolute maximum)
All digital interfacing signals	3.3V LVCMOS

### Pin definition

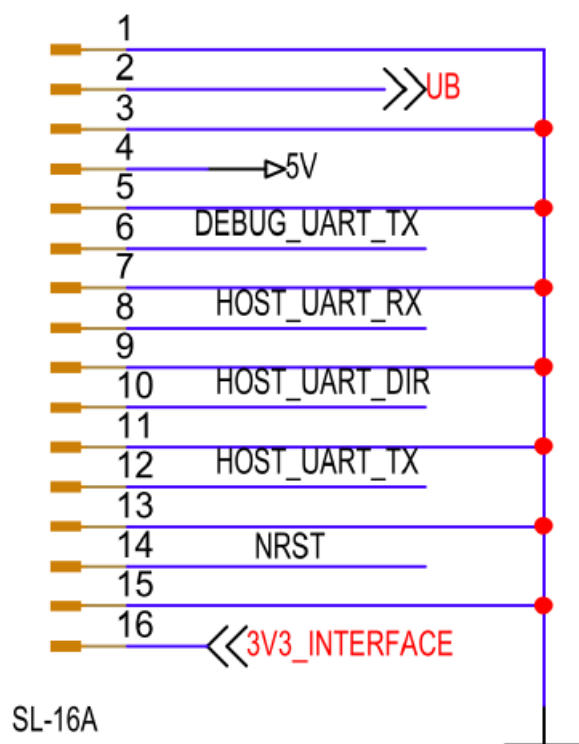


Figure 3 Pinning of module to host connection

Table 3 Pinning of module to host connection

Pin	Usage radio module	Direction	Usage host	Level
1	GROUND	Bidirectional	GROUND	
2	Supply voltage into module	To module	Provide supply here	8 ... 33V DC
3	GROUND	Bidirectional	GROUND	
4	5V supply output	To host	max 100mA supply for host	5V
5	GROUND	Bidirectional	GROUND	

6	Reserved		DO NOT CONNECT	
7	GROUND	Bidirectional	GROUND	
8	UART	To module	Serial data from host to module	3.3V LVCMOS
9	GROUND	Bidirectional	GROUND	
10	UART direction	To host	Low = RX/ High = TX is active	3.3V LVCMOS
11	GROUND	Bidirectional	GROUND	
12	UART	To host	Serial data from module to host	3.3V LVCMOS
13	GROUND	Bidirectional	GROUND	
14	RESET input	To module	Pull to low level, to reset module	3.3V LVCMOS
15	GROUND	Bidirectional	GROUND	
16	3V3 supply output	To host	max 50mA supply for host	3.3V

### Supply voltage

The nominal power supply voltage is 24 VDC; the voltage range is 8 ... 33 VDC (absolute maximum).

Supply must be SELV (Safety Extra Low Voltage).

The current consumption is  $\leq 700\text{mA}$  at a nominal voltage 24 VDC.

The average power consumption is  $\leq 5\text{W}$ .

### Data Interface

UART interface is used for module configuration and RFID data transfer.

### ESD sensitivity

The digital interfacing signals must be protected against electrostatic discharge on the host side if made available to the end user.

### Firmware characteristics

### Description of air interface

For detailed information about the air interface protocol please refer to ISO15693-3 and ISO15693-2.

### Indicator Elements

The module has the option to connect 4 LEDs. The basic indicators denote:

- **Green LED:** Power on
- **Blue LED:** Transmission mode
- **Yellow LED:** Read/write operation successful
- **Red LED:** Error state

### Available UART commands and parameters

The full command and parameter set can be requested under a non-disclosure agreement.

### Special test modes needed for certification

For certification, firmware including test modes can be requested by test laboratory under a non-disclosure agreement. This firmware will not be available for end user.

## FCC Regulatory Information

### User Guide Requirements

### FCC Information

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.

**Caution:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

### Note

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.

### FCC Notice

To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

### FCC Exposure Information

This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

### Warning!

Malfunctions with pacemakers



This device does not exceed the permissible limits for electromagnetic fields. Maintain a minimum distance of 30 cm between the device and your pacemaker. Inadequate distance from the transmitter antenna can result in inhibitions, reprogramming, or incorrect stimulation pulses.

**Labeling Requirements**  
**Contains FCC ID:** IREIQR3FP

**Approved Antennas**  
Only module internal antenna can be used.

**IC Regulatory Information**

**User Guide Requirements**

**IC Information**  
This device complies with Industry Canada license-exempt RSS standard(s) and with part 15 of the FCC Rules. Operation is subject to the following two conditions:

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

**IC Exposure Information**

This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.  
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**Warning!**  
**Malfunctions with pacemakers**  
This device does not exceed the permissible limits for electromagnetic fields. Maintain a minimum distance of 30 cm between the device and your pacemaker. Inadequate distance from the transmitter antenna can result in inhibitions, reprogramming, or incorrect stimulation pulses.

**Labeling Requirements**  
**Contains IC:** 7037A-IQR3FP

**Approved Antennas**  
Only the module’s internal antenna can be used.

**Change History**

Version	Date	Author	Remarks
14-4772	2023-01-03	Martin Schmitt	Initial released version
14-4772A	2023-03-31	Martin Schmitt	Updated exposure Information

Documents / Resources

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