

UHF RFID Reader Module

- RM100 -



Quick Start Guide

Version 1.0

Introducing the RM100 UHF RFID Reader Module

Unitech's RM100 is a high-performance UHF RFID reader module based on the Impinj R2000 chip. It is compliant with EPC C1 Gen2 / ISO 18000-6C.

RM100 has one (IpeX) antenna connector. It also supports dense reader mode (DRM), anti-collision, and Listen-Before-Talk (LBT) features. RM100 has a long operating distance of up to 9 meters when its adjustable TX power is set to 33 dBm with a 4 dBi antenna.

RM100 is small (55 mm x 35 mm x 4.3 mm) and ideal for adding UHF RFID read/write capabilities to a wide range of products and solutions, such as RFID handheld PDA, label printers, and stationary readers.

RM100 uses Serial and USB interfaces to connect to an external processor board or PC host.

Features



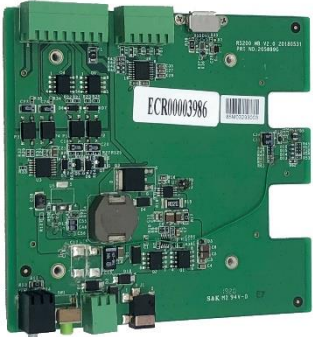

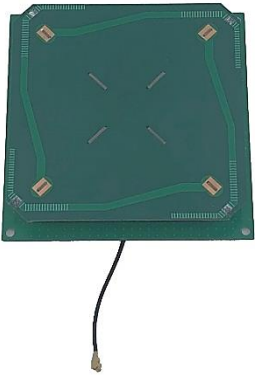
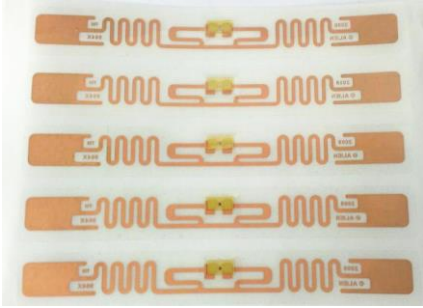
- Compliant with EPC C1 Gen2 / ISO 18000-6C
- Supporting Dense Reader Mode (DRM) and Listen-Before-Talk (LBT) features
- One (IpeX) antenna connector
- Adjustable transmit output level control from 10 dBm to 33 dBm in 0.1 dB step
- Maximum tag read rate of over 750 tags per second
- Maximum tag read distance of 27 feet (9 m) with 4 dBi antenna

Specifications

Protocol	
RFID	EPCglobal Gen 2 (ISO 18000-6C), DRM
Architecture	
RFID ASIC	IMPINJ R2000
Processor	ATMEL AT91SAM7S-256
Power	
Voltage	5V VDC
Interface	
Connector	20-pin (HRS-DF12 SMT connector)
UART	Baud rates: 9,600 to 460,800 bps, Logic levels: 3.3 / 5 V
USB	USB 2.0 Full Speed (12 Mbps)
GPIO	2 GPIO pins, Logic levels: 3.3 / 5 V
API Interface	Impinj
RF	
Antenna Connector	1 IpeX connector
TX power	Adjustable from 10 dBm to 33 dBm @ +/-1.0 dBm accuracy
Frequency Stability	±20 ppm
Harmonic performance	under 35.0dBc
Modulation Depth	90% nominal
Data Encoding	FM0 or Miller code
Bit Rate	Supports uplink data rates of up to 640 Kbps
Performance	
Tag Read Rate	Over 750 tags/second
Inventory Reliability	Through anti-collision
Tag Read Distance	27 feet (9m) with a 4 dBi antenna (36 dBm EIRP)
Environmental Compliance	
Temperature Range	Operating: -20 to +60 degree C, Storage: -30 to + 85 degree C
Humidity	10% ~ 85% Non-condensing
Electrostatic Discharge	10 KV to antenna conductor with the antenna attached
Physical	
Dimensions	55 mm L X 35 mm W X 4.3 mm H

Package Content

Check the package before connecting and operating the RM100. If one or more items in this package are lost, contact your local dealer.

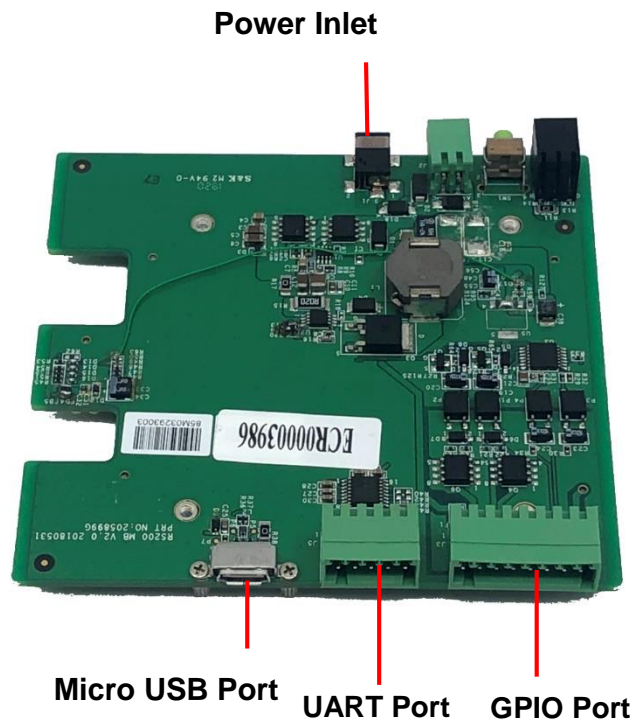
	
<p>RM100 UHF RFID Reader Module</p>	<p>Power Adaptor</p>
	
<p>Interface board</p>	<p>USB Cable</p>
	
<p>Antenna</p>	<p>RFID Tag</p>

Note:

1. Length of antenna cable 60+/-2mm
2. Antenna cable is sealed on antenna board and can not be removed.

Tour of the RM100 UHF RFID Reader Module

This section describes the main components and features of the interface board.



Installing the IndyTool

First of all, install the IndyTool before connecting the interface board to a PC. It is possible for multiple versions of IndyTool to co-exist on a single system, so long as a unique install path is used for each, such as the default installation directory.

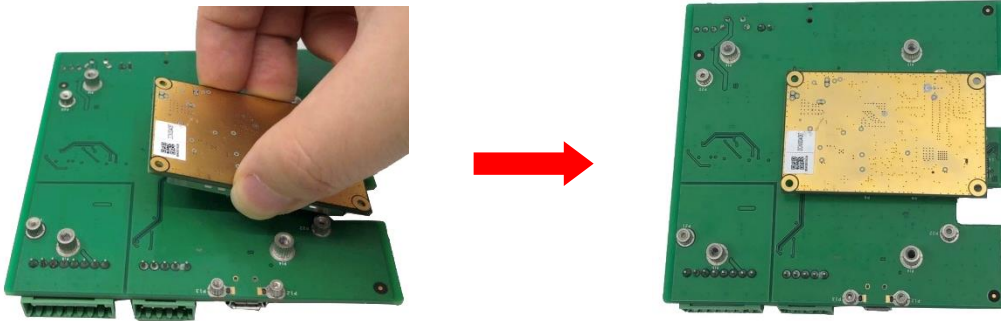
Installation Procedure

1. Double click the IndyTool installer file, IndyTool v2.6.msi, to launch the installation wizard.
2. When prompted, designate the desired installation directory. The default is: [Program Files]\IMPINJ\IndyTool v2.6
3. Installation includes the C++ runtime libraries and adds a desktop shortcut to the IndyTool application.
4. To Start the IndyTool application:
 - a. Double click the desktop shortcut, or
 - b. Use the Start Menu. For example, if installed to the default directory:
Click Start, select All Programs, IMPINJ, Impinj IndyTool v2.6, and click IndyTool.
 - c. Open the IndyTool installation folder and double click IndyTool.exe.

Connecting the RM100 to a PC

Before operating the Indy tool software for development of the RFID device, follow the steps made below to connect the RM100 to a PC.

1. Install the Indy tool on your PC.
2. Mount the UHF RFID Module onto the interface board.



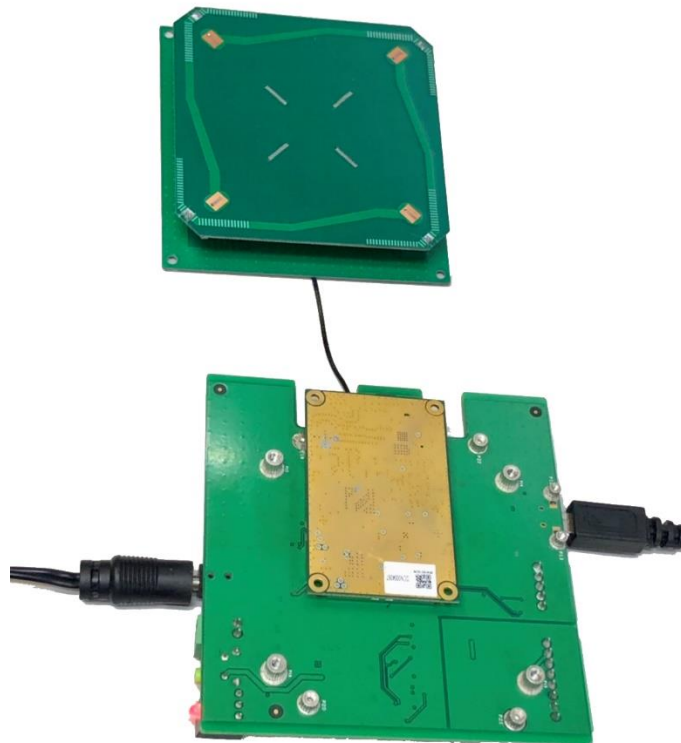
3. Connect the interface board to a PC by using a micro USB cable.



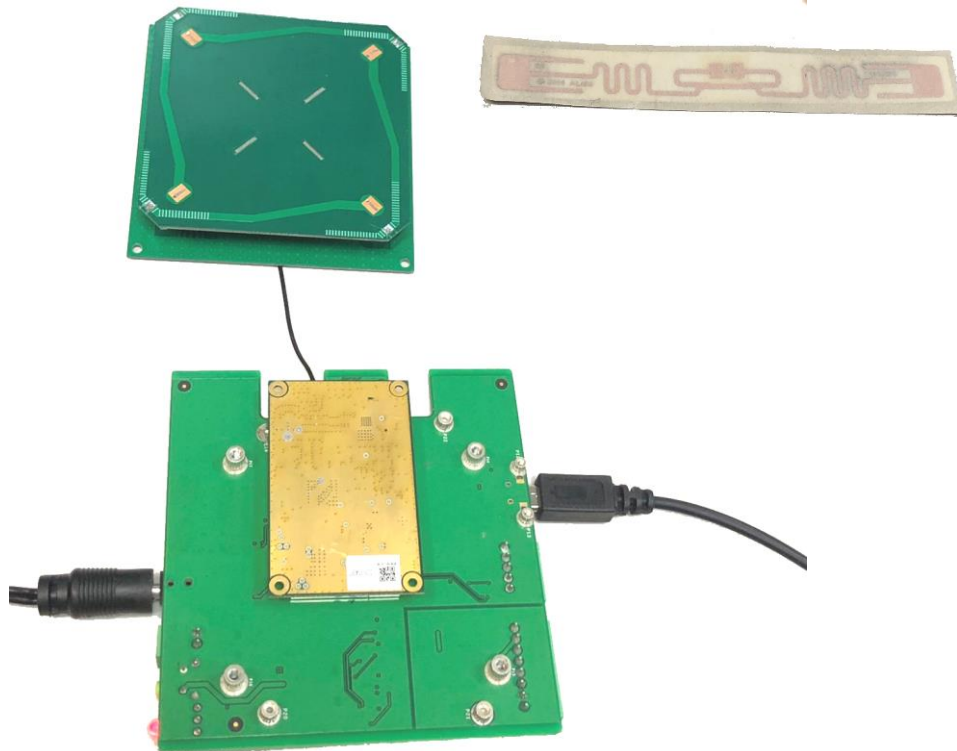
4. Insert the power connector into the power inlet on the interface board, and then plug the power adapter into an electrical socket.



5. Insert the connector of antenna into the antenna port of the RM100 UHF RFIDReader Module.



- Open the IndyTool. Click **Start** to scan RFID tags by using the RM100 UHF RFID Reader module.



Connect

Disconnect Reset Cancel Abort

Help

Command GPIO NV Mem Macros Sensors Mac Error Calibration

Register Access Tag Access Script Profile Inventory Tx Control

Inventory

Single Cycle **Start** Stop

Note: Inventory options must be preconfigured via MAC registers

Logical Antenna 0

Set Antenna 0 Power (dBm) 30.0

Test Frequency

Set 915.25 Div 24 (FCC) Div 60 (ETSI)

Info

Summary Statistics Configuration Tag Data

Options

TagFocus FastID

Activated Reader [impinjserialnum01] via USB

Status Window Remaining Status Options

Clear Save Skip 0 Packet Options

State Idle

Inv, 91, -41.0, 129, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 91, -41.0, 128, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 78, -51.0, 107, 0, 0, 0, 3000, 3005FB63AC1F3841EC880467, F29E
Inv, 81, -48.8, 111, 0, 0, 0, 3000, 3005FB63AC1F3841EC880467, F29E
Inv, 91, -41.0, 129, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 92, -40.3, 135, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 81, -48.8, 110, 0, 0, 0, 3000, 3005FB63AC1F3841EC880467, F29E
Inv, 91, -41.0, 128, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 92, -40.3, 134, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
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Inv, 92, -40.3, 130, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
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Inv, 91, -41.0, 130, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 91, -41.0, 129, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 91, -41.0, 128, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 91, -41.0, 129, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 92, -40.3, 134, 0, 0, 0, 3000, E2003411B802011718302423, CCDD
Inv, 81, -48.8, 109, 0, 0, 0, 3000, 3005FB63AC1F3841EC880467, F29E

Command End (Status = 0000)

Singulation Rate = 82.80 tags/sec (167 tags in 2.02 sec, 2 Unique, 0 Unique TID)

Inventory Success

FCC 警語置於使用者手冊

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- . Reorient or relocate the receiving antenna.
- . Increase the separation between the equipment and receiver.
- . Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- . Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in visible area with the following: "Contains FCC ID: HLERM100U"

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End Product Manual Information

The user manual for end users must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter." 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.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or colocation with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization. This device is intended only for OEM integrators under the following conditions: The antenna must be installed such that 20 cm is maintained between the antenna and users. As long as a condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).