

INDY Impinj R2000 UHF RFID reader module specification

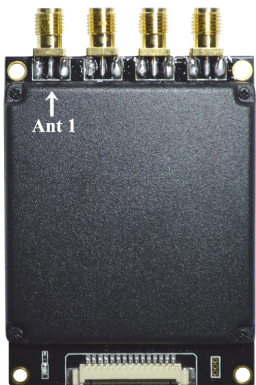


Table one: overview of the module

Module P/N	YR901
Photograph	
RF Channel	four channels
RF connector	SMA
Antenna connection mode	Can't be configured to transceiver separation mode
Interface connector	Molex 53261-1571
RF connector material	Brass (gold plating)
PCB material	Rogers FR4 (gold plating)
RF Shield Material	Aluminum alloy

Table two: the connector PIN feet definition

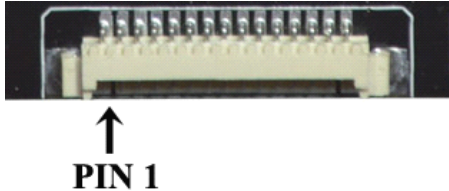
		
PIN	Definition	Description
1	GND	Connect to ground together
2	GND	
3	3.7V – 5V DC	Connect to power together
4	3.7V – 5V DC	
5	GPIO 3	Output
6	GPIO 4	Output
7	GPIO 1	Input
8	Buzzer	Already driven, output current > 50mA
9	UART_RXD	TTL compatible
10	UART_TXD	
11	USB_DM	For test only
12	USB_DP	
13	GPIO 2	Input
14	EN	High level enables module
15	GPIO 5	RS-485 direction control

Table 3: Key Feature List

	Feature	Description
1	Based on Indy R2000 chip	RF transceiver is Impinj Indy R2000.
2	High performance anti-collision algorithm	The best algorithm in this industry. It provides the highest efficiency.
3	Optimized anti-collision algorithm for small tag quantity applications	Better tag response time. Optimized for small tag quantity applications.
4	Dual CPU architecture	1, Main CPU is responsible for tag inventory, assistant CPU is responsible for data management. Inventory and data transfer are parallel and simultaneous. This feature improves the total performance significantly. 2, Assistant CPU is responsible for generating real random number. 3, Assistant CPU is responsible for system operating surveillance.
5	Fast four antenna switch inventory	1, High speed inventory therefore antennas could be switched rapidly. 2, The minimum inventory duration for an antenna is 30 mS. 3, Every antenna's inventory duration is configurable.
		1, Buffer mode and real time mode.

6	Two inventory modes	2, In buffer mode, inventoried tag will be stored and filtered in buffer. This mode provides low redundant tag data. 3, In real time mode, inventoried tag will send there data in real time. This mode allows user to get tag's data instantly.
7	Hardware system halt detection	Hardware CPU status surveillance. Run for 24hours X 365 days without system halt.
8	Low operation voltage	The lowest operating supply voltage is 3.7V. Can be powered by lithium battery.
9	Low power consumption	Maximum out power only needs 1.3A +/-10%. Current.
10	PA health surveillance	1, PA status surveillance. 2, Make sure PA never works under saturated state. 3, PA is protected for long term operation.
11	18000-6B full compatible	100% 18000-6B compatible. Can be switched rapidly between protocols.
12	18000-6B large data read/write	1, Read 216 bytes in one time takes less than 500mS. 2, Write 216 bytes in one time takes less than 3.5 seconds. 3, Can also read/write data with various lengths. 4, Extremely stable (approximate 100% success rate).
13	Antenna connection detection	1, Detect antenna connection. 2, RF receiver is protected by it. 3, Can be cancelled by command.
14	Bistatic antenna configuration	Bistatic antenna configuration improves receive sensitivity by 13dB.
15	High power LED driver	Can output 50mA output current to drive a high power LED.
16	Excellent on board power system	1, 8 independent power supplies on board. Every unit is supplied independently. 2, Each power supply has soft start function. Improves the stability of the power supply system.
17	Multi point temperature surveillance	High precision temperature detection. Multi point surveillance.
18	Redundant output power control	Make sure output power is fine adjusted. Two identical power control systems as backups for each other.
19	Simple user interface	Serial communication interface. Simple, convenient and effective for easy integration.
20	Excellent thermal dissipation	1, All high power components have heat sink structures. 2, Large heat sink couple area. 3, Solid thermal couple marital which never be dry.

Figure 1: YR901 evaluation Board



Figure 2: YR901 evaluation Board

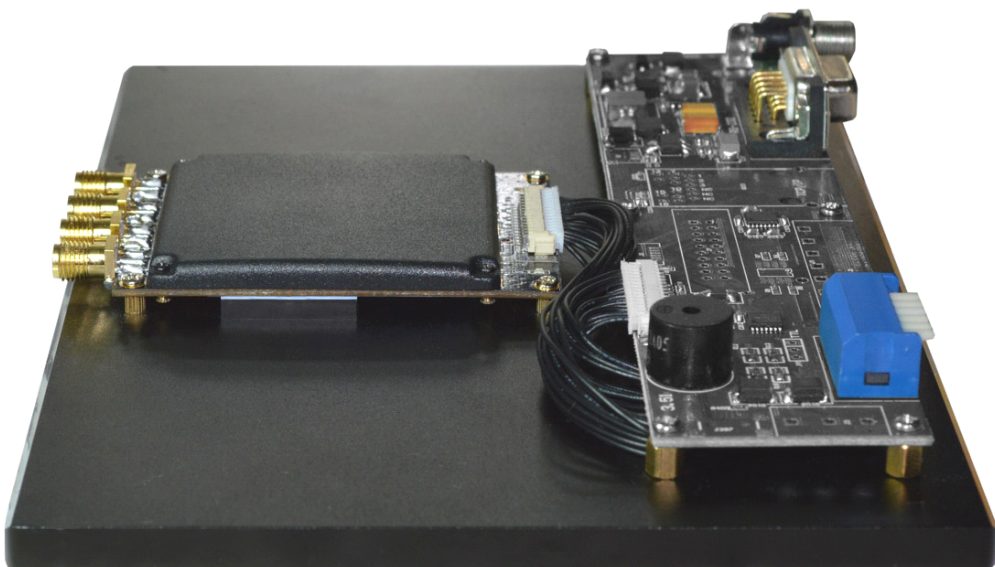
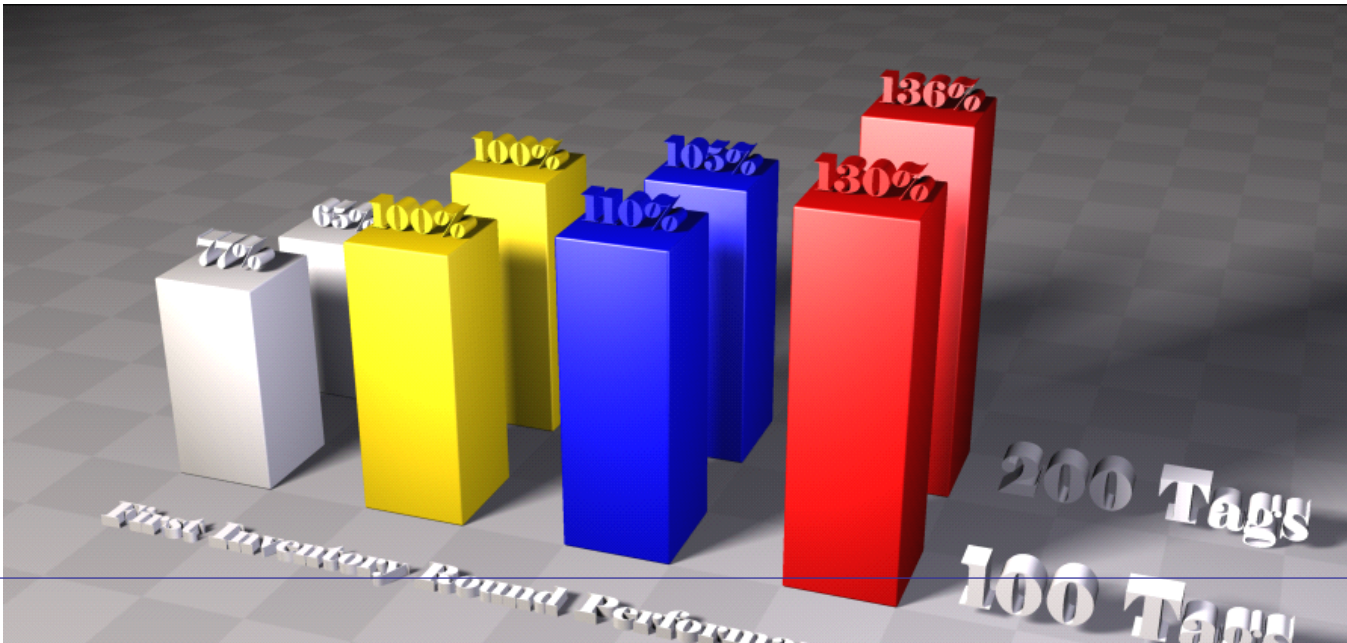


Figure 3: Anti-Collision Algorithm Comparison



Explain

- ◆ Figure 5 is tested in real applications (takes Impinj dynamic Q algorithm as the reference which is marked with 100%) .
- ◆ The chart shows the comparison for the first round inventory performance.
- ◆ It is tested on the same hardware platform.

Table 4: Anti-Collision Algorithm Description

	Algorithm name	Description
	Standard fixed Q algorithm	<ul style="list-style-type: none"> ◆ Standard 18000-6C algorithm. ◆ The performance is reduced significantly when tag quantity gets larger. ◆ The efficiency is not high when tag quantity is small.
	Impinj dynamic Q algorithm	<ul style="list-style-type: none"> ◆ The algorithm of Impinj. ◆ It has a good efficiency for various tag quantities. ◆ It sacrifices some performance for the sake of compatibility.
	I-Search dynamic Q algorithm V1.0	<ul style="list-style-type: none"> ◆ Based on Impinj dynamic Q algorithm. ◆ The performance is optimized. ◆ It's the algorithm for firmware version 6.6 or below.
	I-Search dynamic Q algorithm V2.0	<ul style="list-style-type: none"> ◆ Based on Impinj dynamic Q algorithm. ◆ Brand new data structure, the performance is significantly improved. ◆ It's the algorithm for firmware version 6.7 or above. ◆ When tag quantity increases, it outworks other algorithms more.

Table 5: Electrical Characteristics

Operating Voltage	3.7V – 5 V
Standby Mode Current	<50mA(EN pin set high)
Sleep Mode Current	<100uA (EN pin set low)
Operating Current	1.2A +/-10%
Operating temperature	- 20 °C - + 55 °C
Storage temperature	- 20 °C - + 85 °C
Humidity	< 95% (+ 25 °C)
Air Interface Protocol	EPCglobal UHF Class 1 Gen 2 / ISO 18000-6C ISO 18000-6B
Spectrum Range	860Mhz – 960Mhz
Supported regions	US, Canada and other regions following U.S. FCC Europe and other regions following ETSI EN 302 208 with & without LBT regulations Mainland China Japan Korea Malaysia

	Taiwan
Output Power	20 – 33dBm
Output Power precision	+/- 1dB
Output Power Flatness	+/- 0.2dB
Receive Sensitivity	< -85 dBm
Peak Inventory Speed	> 700 tags/sec
Tag Buffer Size	1000 tags @ 96bit EPC
Tag RSSI	Supported
Antenna Detector	Supported
Ambient Temp Monitor	Supported
Working Mode	Single/DRM
Host Communication	TTL Uart
GPIO	2 inputs; 2 outputs
Max Uart Baud Rate	115200 bps
Heat Dissipation	Air cooling

Attention

- ◆ When the ambient temp detector detects that the temperature is over 60°C, please stop inventory/read/write operation till it is cooler.
- ◆ Please connect a metal cooler to the module for full duty operation.
- ◆ The absolute max rating of power supply voltage is +5V DC. Higher voltage can cause permanent damage.
- ◆ When output power is set above 30dBm, power consumption and heat generation increase significantly, please make sure if it's necessary.

YR901 Dimensions

Figure 6: Size and hole position

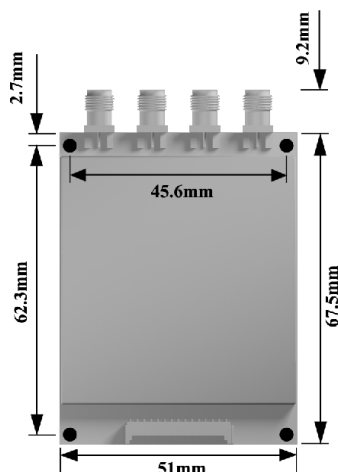


Figure 7: Hole diameter and shield position

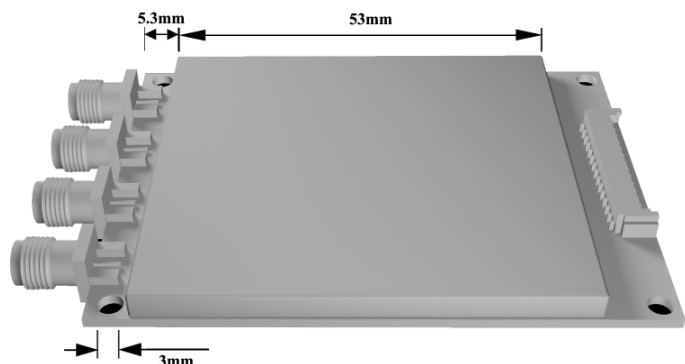


Figure 8: High point and RF connector space

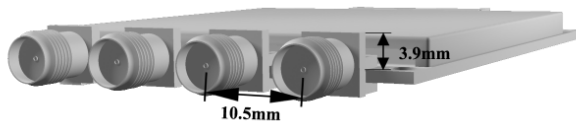
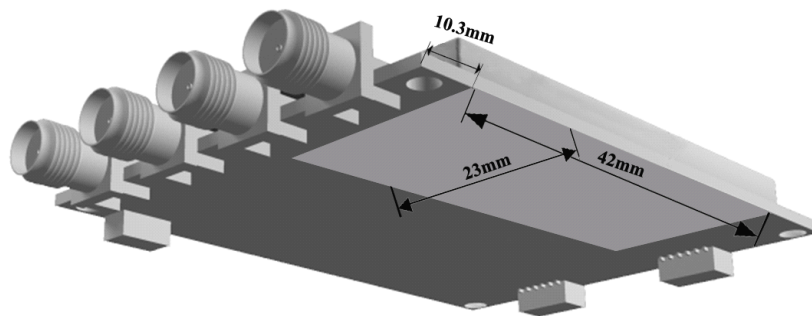


Figure 9: Low point and PCB thickness



Figure 10: Cooling pad position



Attention

- ◆ Above pictures are 3D drawings, not photographs.
- ◆ These dimensions are for reference only.