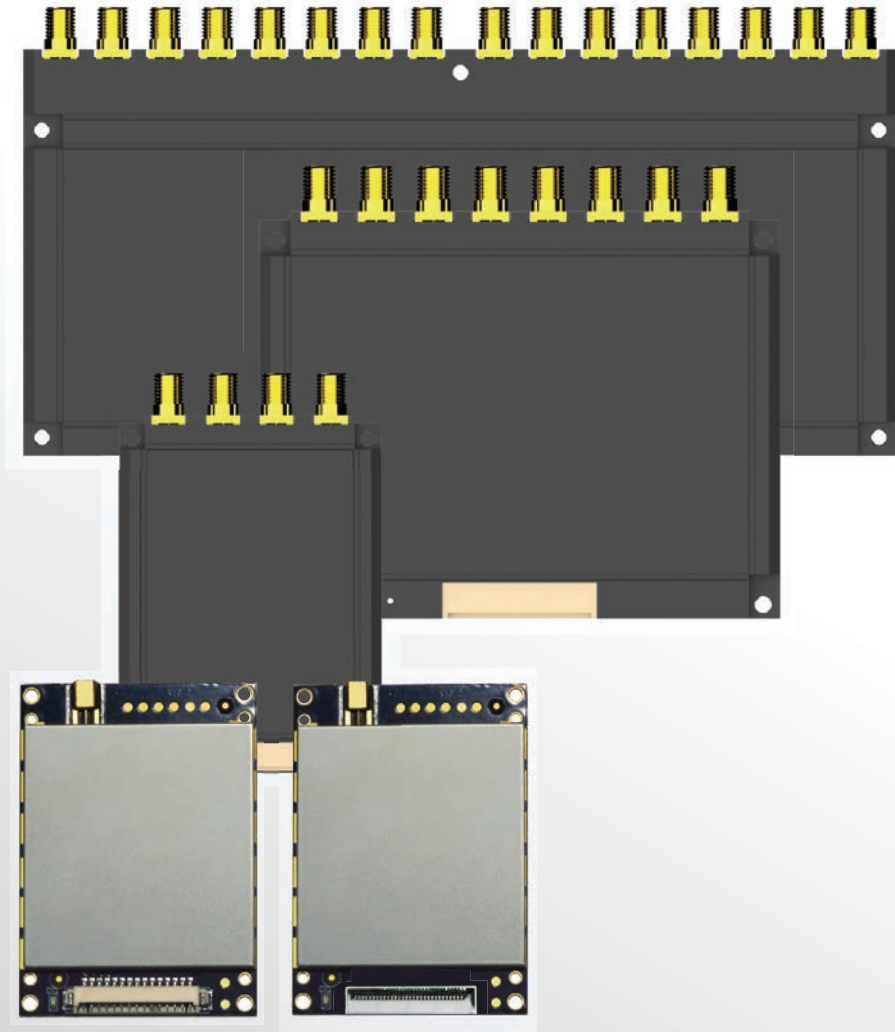


# Indy R2000 Series


UHF RFID Module



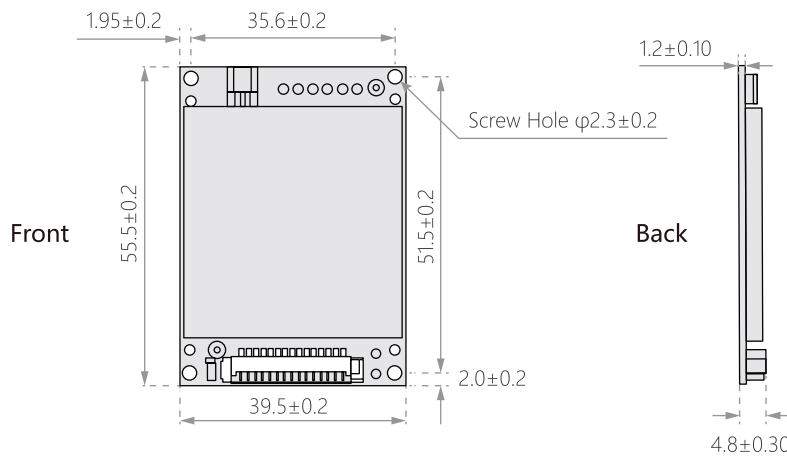
Conic and Classic Model  
Industry classic since 2011



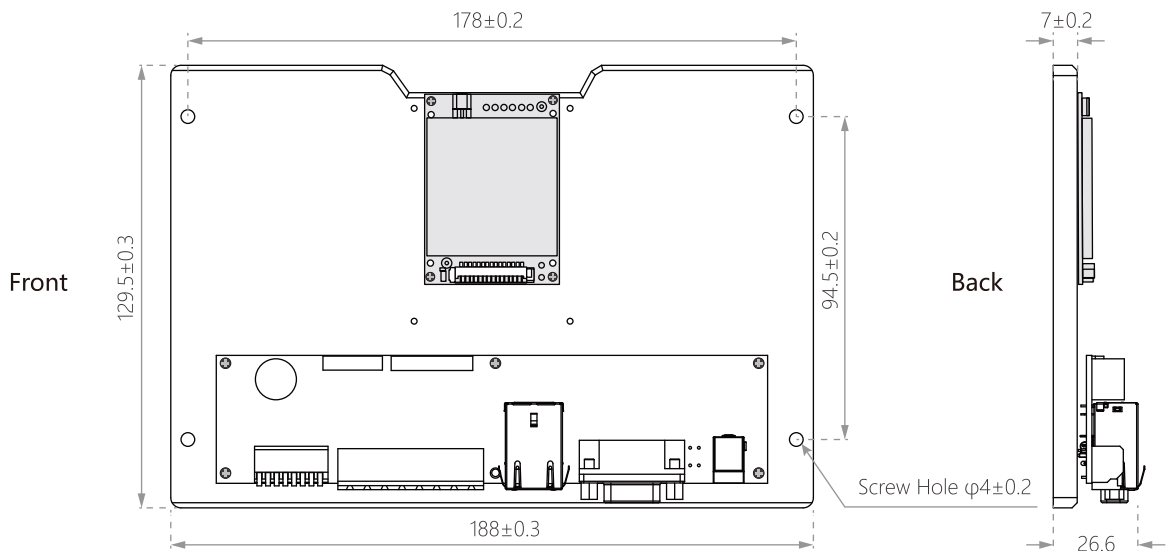
### 1. Product View

<b>HD5</b>		· RF Channel :	Single Channel
		· RF Connector :	MMCX
		· Antenna Connection Mode:	Single Antenna
		· Interface Connector :	Molex 53261-1571
		· RF Connectors Material :	Gold-plated brass
		· PCB Material :	Rogers FR4 gold-plated
		· Shield Material :	Cupronickel

### 2. Module Dimensions (unit: mm)




### 3. Kit Dimensions (unit: mm)

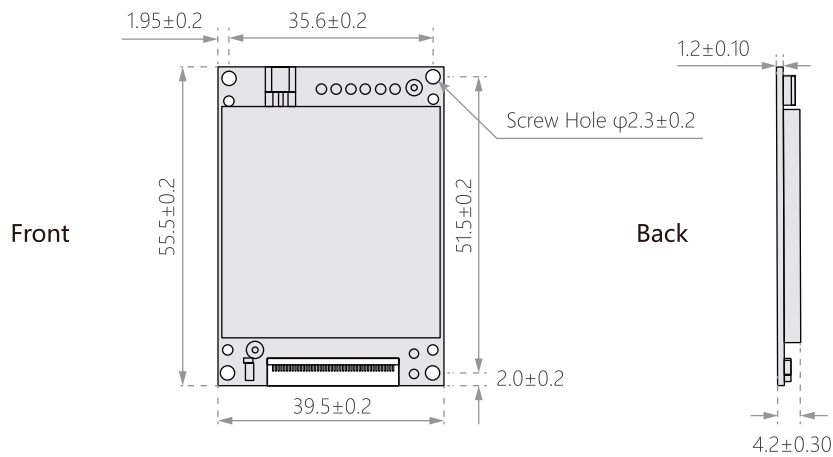


Note: Dimensional drawings are three-dimensional renderings, not physical.

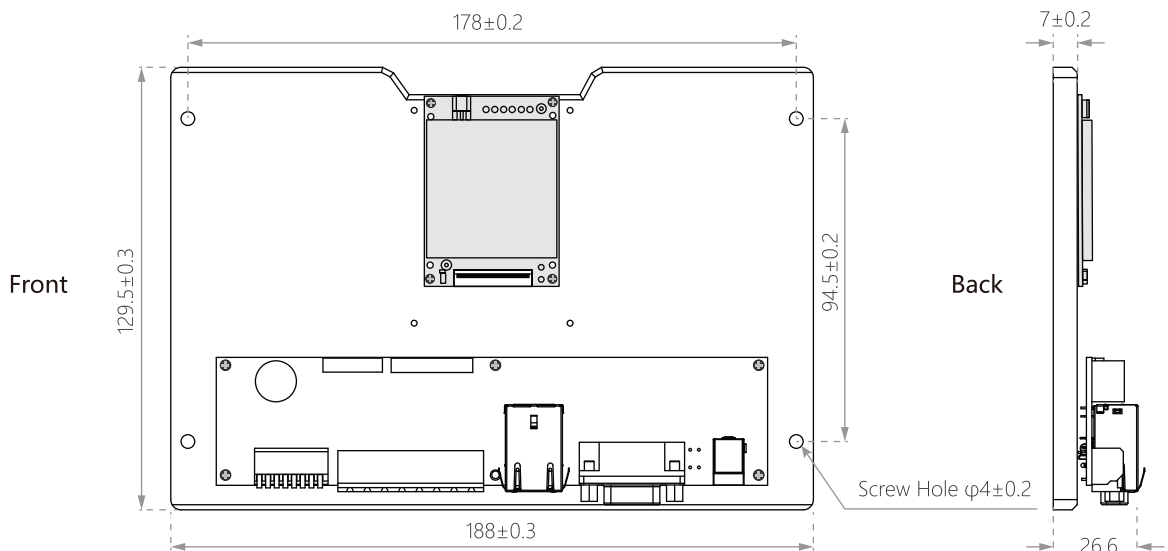
## 1. Product View

<b>HD5-FPC</b>		<ul style="list-style-type: none"> <li>· RF Channel : Single Channel</li> <li>· RF Connector : MMCX</li> <li>· Antenna Connection Mode: Single Antenna</li> <li>· Interface Connector : FH34SRJ-30S-0.5SH (50)</li> <li>· RF Connectors Material : Gold-plated brass</li> <li>· PCB Material : Rogers FR4 gold-plated</li> <li>· Shield Material : Cupronickel</li> </ul>
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## 2. Module Dimensions (unit: mm)



## 3. Kit Dimensions (unit: mm)

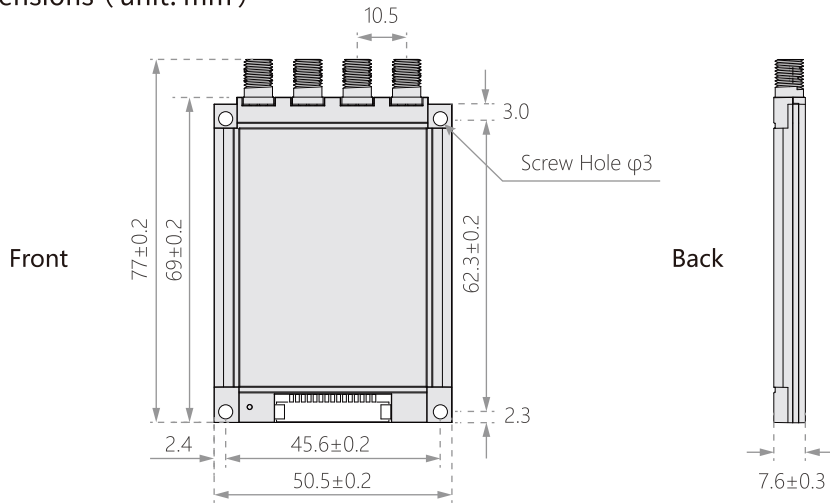


Note: Dimensional drawings are three-dimensional renderings, not physical.

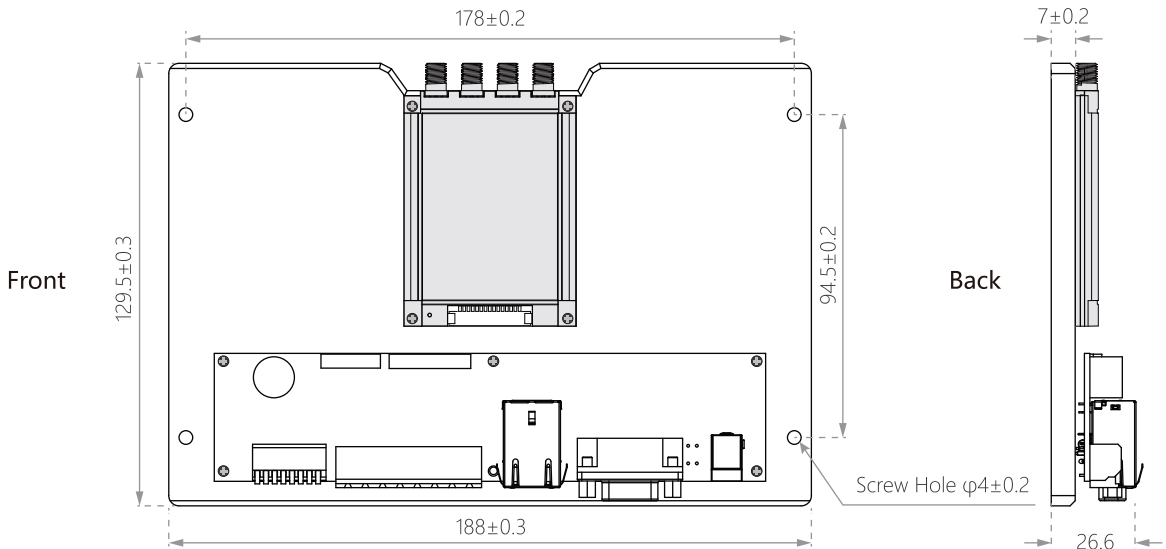
### 1. Product View

<b>R600</b>		<ul style="list-style-type: none"> <li>· RF Channel : Four channels</li> <li>· RF Connector : SMA</li> <li>· Antenna Connection Mode: Four Antenna</li> <li>· Interface Connector : Molex 53261-1571</li> <li>· RF Connectors Material : Gold-plated brass</li> <li>· PCB Material : Rogers FR4 gold-plated</li> <li>· Shield Material : Aluminum</li> </ul>

### 2. Module Dimensions (unit: mm)



### 3. Kit Dimensions (unit: mm)

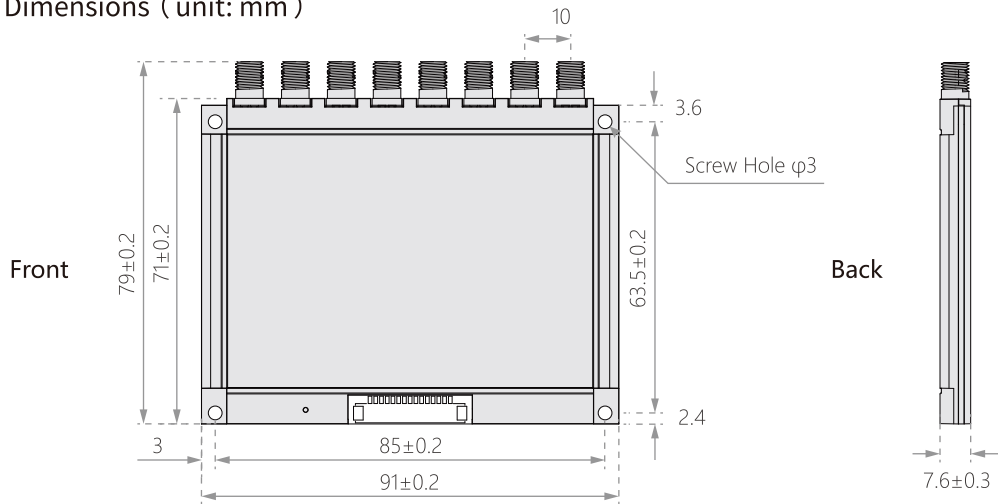


Note: Dimensional drawings are three-dimensional renderings, not physical.

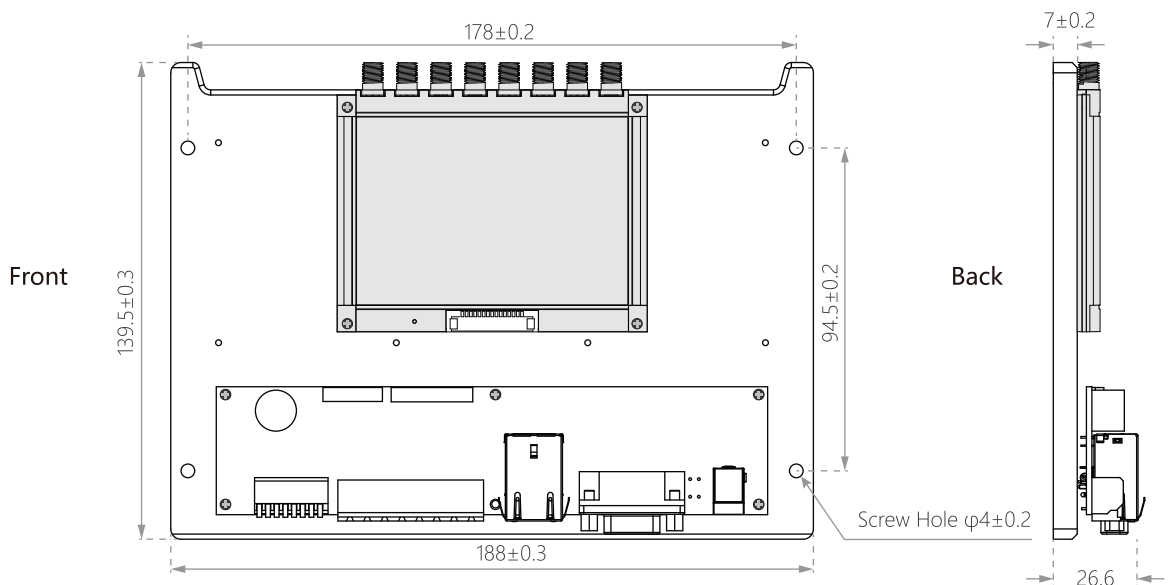
## 1. Product View

<b>R800</b>		· RF Channel :	Eight Channels
		· RF Connector :	SMA
		· Antenna Connection Mode:	Eight Antenna
		· Interface Connector :	Molex 53261-1571
		· RF Connectors Material :	Gold-plated brass
		· PCB Material :	Rogers FR4 gold-plated
· Shield Material :	Aluminum		

## 2. Module Dimensions (unit: mm)



## 3. Kit Dimensions (unit: mm)

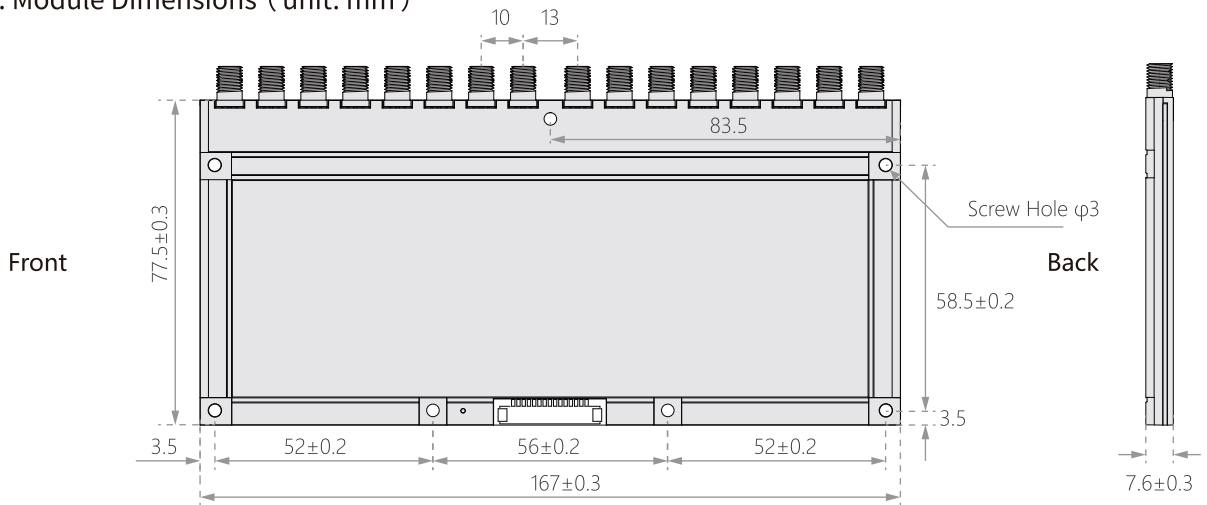


Note: Dimensional drawings are three-dimensional renderings, not physical.

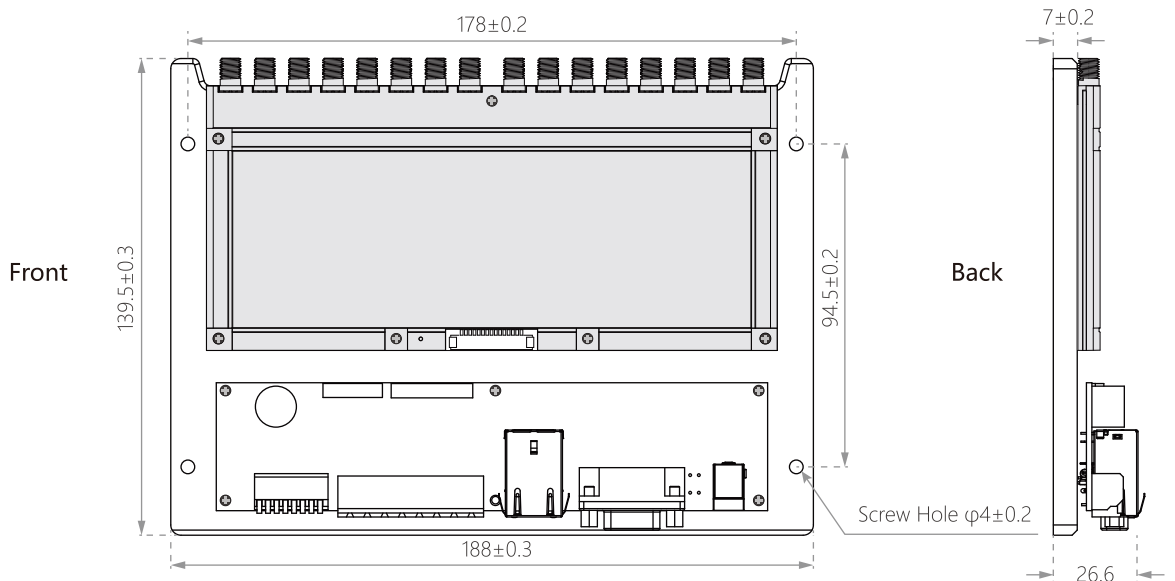
### 1. Product View

<b>R900</b>		<ul style="list-style-type: none"> <li>RF Channel : Sixteen channels</li> <li>RF Connector : SMA</li> <li>Antenna Connection Mode: Sixteen Antenna</li> <li>Interface Connector : Molex 53261-1571</li> <li>RF Connectors Material : Gold-plated brass</li> <li>PCB Material : Rogers FR4 gold-plated</li> <li>Shield Material : Aluminum</li> </ul>
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### 2. Module Dimensions (unit: mm)

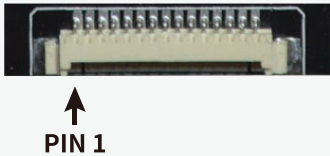


### 3. Kit Dimensions (unit: mm)



Note: Dimensional drawings are three-dimensional renderings, not physical.

#### 4. PIN Connector PinAssignments

PIN Connector PinAssignments		
 <p>FPC connector (15Pin , Space between PINs 0.5mm)</p>		
PIN	Interface	Instruction
1	GND	Meanwhile grounding
2	GND	
3	4.5V – 5.5V DC	Meanwhile connect power, Recommended input voltage 4.6V
4	4.5V – 5.5V DC	
5	GPIO 3	Output
6	GPIO 4	Output
7	GPIO 1	Input
8	Beeper	Has driven with > 50mA output current
9	UART_RXD	TTL level
10	UART_TXD	
11	USB_DM	For testing
12	USB_DP	
13	GPIO 2	Input
14	EN	High level enable
15	GPIO 5	RS-485 direction control

## PIN Connector PinAssignments



↑  
**PIN 1**

FPC connector (30Pin , Space between PINs 0.5mm)

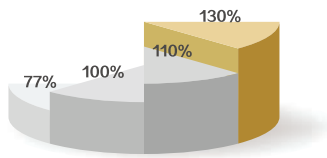
PIN	Interface	Description
1	GND	GROUNDING
2	GND	
3	GND	
4	GND	
5	GND	
6	4.5V – 5.5V DC	Meanwhile connect power, Recommended input voltage 4.6V
7	4.5V – 5.5V DC	
8	4.5V – 5.5V DC	
9	4.5V – 5.5V DC	
10	4.5V – 5.5V DC	
11	4.5V – 5.5V DC	
12	4.5V – 5.5V DC	
13	4.5V – 5.5V DC	
14	4.5V – 5.5V DC	
15	4.5V – 5.5V DC	
16	GND	GROUNDING
17	GND	
18	GND	
19	GND	
20	GND	
21	UART_RXD	TTL Level
22	UART_TXD	
23	EN	High Level Enable
24	GPIO1	INPUT
25	Beeper	DRIVEN WITH CURRENT > 50mA
26	GPIO3	OUTPUT
27	GPIO4	OUTPUT
28	GPIO5	RS-485 Directional Control
29	GND	GROUNDING
30	GND	



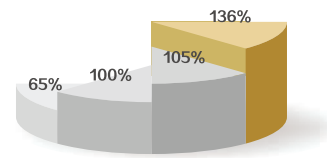
## 5. Key Features

	Feature	Descriptions
1	Impinj R2000 Built-in	<ul style="list-style-type: none"> <li>• Impinj Indy R2000 chip as RF transceiver.</li> </ul>
2	Anti-collision Algorithm	<ul style="list-style-type: none"> <li>• Unique I - Search multi-tag identification algorithm providing the highest efficiency.</li> </ul>
3	Optimized Algorithm for Tags with Small Volume	<ul style="list-style-type: none"> <li>• Optimized applications for reading small volume tags with better response time.</li> </ul>
4	Dual CPU Architecture	<ul style="list-style-type: none"> <li>• Main CPU: tag inventory; Assistant CPU: data management.</li> </ul>
		<ul style="list-style-type: none"> <li>• Tag inventory and data transfer are parallel and simultaneous.</li> </ul>
5	Fast Antenna Switch Inventory (For M-2800 and M-2900)	<ul style="list-style-type: none"> <li>• Every antenna's inventory duration is configurable (Minimum duration: 30 ms).</li> </ul>
		<ul style="list-style-type: none"> <li>• Polling from ANT 1 to the last antenna.</li> </ul>
6	Two Modes for Inventory	<ul style="list-style-type: none"> <li>• Buffer mode and Real-time mode.</li> </ul>
		<ul style="list-style-type: none"> <li>• Tags will be stored as buffer under buffer mode.</li> </ul>
		<ul style="list-style-type: none"> <li>• Tags will send data under real-time mode. This mode allows user to get tag data instantly.</li> </ul>
7	Hardware System Halt Detection	<ul style="list-style-type: none"> <li>• Hardware CPU status surveillance.</li> </ul>
		<ul style="list-style-type: none"> <li>• Run for 24 hours X 365 days without system halt.</li> </ul>
8	PA Health Surveillance	<ul style="list-style-type: none"> <li>• PA status surveillance.</li> </ul>
		<ul style="list-style-type: none"> <li>• Make sure PA never works under saturated state. Protect it for long term operation.</li> </ul>
9	18000-6B/6C Full Compatible	<ul style="list-style-type: none"> <li>• It can be switched rapidly between 18000-6B and 18000-6C tag.</li> </ul>
10	18000-6B Large Data Read/Write	<ul style="list-style-type: none"> <li>• Read 216 bytes in one time takes less than 500ms.</li> </ul>
		<ul style="list-style-type: none"> <li>• Write 216 bytes in one time takes less than 3.5 seconds.</li> </ul>
		<ul style="list-style-type: none"> <li>• It can read/write data with different lengths.</li> </ul>
11	Antenna Connection Detection	<ul style="list-style-type: none"> <li>• Detect antenna connection status.</li> </ul>
		<ul style="list-style-type: none"> <li>• Protective for RF receiver.</li> </ul>
		<ul style="list-style-type: none"> <li>• It can be canceled by command.</li> </ul>
12	Temperature Sensor	<ul style="list-style-type: none"> <li>• Multi-point surveillance for accurate operating system temperature.</li> </ul>
13	Power Output Correction	<ul style="list-style-type: none"> <li>• Dual modules making sure output power can be finely adjusted.</li> </ul>
		<ul style="list-style-type: none"> <li>• Dual modules working and keeping correction unless they are both damaged.</li> </ul>
14	Excellent Cooling Design	<ul style="list-style-type: none"> <li>• Heat dissipation and large cooling surface design.</li> </ul>
		<ul style="list-style-type: none"> <li>• Thermal coupling interfaces using high-thermal conductivity solid materials which ensure stable performance under high temperature.</li> </ul>

## 6. Anti-Collision Algorithm Comparison



100 Tags



200 Tags

- Notes**
- 1.) The test is on same hardware platform in real applications (Taking Impinj dynamic Q algorithm as the reference which is marked with 100%).
  - 2.) The chart shows the comparison for the first round inventory performance.
  - 3.) It is tested on the same hardware platform.

Algorithm	Description
Standard fixed Q algorithm	<ul style="list-style-type: none"> <li>• Standard 18000-6C algorithm.</li> <li>• The performance is reduced significantly when tag quantity gets larger.</li> <li>• The efficiency is not high when tag quantity is small.</li> </ul>
Impinj dynamic Q algorithm	<ul style="list-style-type: none"> <li>• The algorithm of Impinj.</li> <li>• It has a good efficiency for various tag quantities.</li> <li>• It sacrifices some performance for the sake of compatibility.</li> </ul>
I-Search dynamic Q algorithm V1.0	<ul style="list-style-type: none"> <li>• Based on Impinj dynamic Q algorithm.</li> <li>• The performance is optimized.</li> <li>• It's the algorithm for firmware version 6.6 or below.</li> </ul>
I-Search dynamic Q algorithm V2.0	<ul style="list-style-type: none"> <li>• Based on Impinj dynamic Q algorithm.</li> <li>• It's a brand new data structure, the performance of which is significantly improved for firmware version 6.7 or above.</li> <li>• The improvement of performance can be easily sensed after the first round of inventory especially when the tag volume increases.</li> </ul>

## 7. Electrical Characteristics

Electrical Characteristics				
Operating Voltage	4.5V – 5.5V DC			
Standby Mode Current	50mA ( EN high level )			
Sleep Mode Current	<100uA ( EN high level )			
Operating Current	Conditions	Min	Type	Max
	@5V( 33dbm Output , Multi-tag , 25°C )	300mA	1.3A+-10%	2.5A
Operating Temperature	-20°C ~ +65°C			
Storage Temperature	-40°C ~ +85°C			
Humidity	5%RH - 95%RH (non -condensing)			
Air Interface Protocol	EPCglobal UHF Class 1 Gen 2 / ISO 18000-6C ISO 18000-6B			
Spectrum Range	902~928MHz , 865~868MHz <span style="color: #FFD700;">Optional ✓</span>			
Supported Regions	US, Canada and other regions following U.S. FCC			
	Europe and other regions following ETSI EN 302 208			
	China , Korea , Malaysia			
Output Power	3 – 33dBm			
Output Power Precision	+/- 1dB			
Output Power Flatness	+/- 0.2dB			
Receive Sensitivity	< -85 dBm			
Peak Inventory Speed	> 700 tags/sec			
Tag Buffer Capacity	1000 tags @ 96 bit EPC			
Tag RSSI	Supported			
Antenna Detector	Supported			
Ambient Temp Monitor	Supported			
Working Mode	Single/DRM			
Host Communication	Uart 3.3V			
GPIO	2 inputs & 2 outputs			
Max Baud Rate	115200 bps( Default and recommended ) , 38400 bps			
Heat Dissipation	External radiator			

### Note :

- When the temperature, measured by the ambient temperature measurement function, exceeds 60°C, please do not keep the device working at full capacity.
- Please connect the device to heat sink when it continuously work at full load.
- Supply voltage must not exceed 5V, otherwise it will damage the internal protection circuit.
- Be cautious if set RF output power over 30dBm, as the peak current and internal temperature will increase significantly.