



IDRO900RWe

User Manual

September 23th, 2024
Ver. 24092301

UHF RFID Reader
Visible RFID Reader & Tag
Visible Light Communication System
2.4 GHz Active RFID Reader & Tag

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1. Revision History

IDRO Co., Ltd. IDRO900RWe Reader/Writer document history



1. Revision History

Document Number	Description	Revision Date
2024082301	Initial release	September 23th 2024

2. About This Guide



2. About This Guide

2.1 Overview

This document is intended for individuals looking to set up and operate the IDRo900RWe USB Type RFID Reader. The IDRO900RWe offers a complete solution using the ISO18000-6C/EPC Gen2 protocol application.

It is particularly suitable for writing data to tag EPC, User, and, Reserved memory. Additionally, it features smart design, Simplicity, and Low Cost.

The recognition distance is more than 1.5m for passive tags, and the maximum reading speed is approximately 300 tags per second.

This document includes specifications for the IDRO900RWe's interface, functions, performance, mechanical properties, and packaging.

2.2 Composition

This guide covers the IDRO900RWe series of UHF RFID readers.

[TABLE 2.2.1] IDRO900RWe Reader Part Number

Part Number	Description
IDRO900RWe	✓ WORLD WIDE

2.3 Chapter Explanation

The topics covered in this guide are as follows:

- [Chapter 3, Getting Started](#) – Provides a brief overview of the hardware and software for the IDRO900RWe RFID Reader.
- [Chapter 4, RFID System Diagram and Block Diagram](#) – This chapter provides information on the system diagram and block diagram of the IDRO900RWe RFID Reader.
- [Chapter 5, RFID Reader Part Number](#) - This chapter provides information on the part number of the IDRO900RWe RFID Reader.
- [Chapter 6, RFID Reader Components](#) – This chapter provides information on the components of the IDRO900RWe RFID Reader.
- [Chapter 7, RFID Reader Electrical Characteristics](#) – This chapter provides information on the electrical characteristics of the IDRO900RWe RFID Reader.

- [Chapter 8, RFID Reader Mechanical Characteristics](#) – This chapter provides detailed mechanical specification of the IDRO900RWe RFID Reader, including the dimensions of the reader.
- [Chapter 9, RFID Reader Precautions](#)– This chapter provides information on the precautions for the IDRO900RWe RFID Reader.
- [Appendix A, RFID Reader Frequency](#) – This appendix provides information on channel and frequency details for the IDRO RFID Reader across different countries.

2. 4 Related Documentation and Software

The following document provides additional information on the IDRO900RWe RFID Reader.

- IDRO Regulatory Guide
- IDRO Reader API Document
- IDRO Reader Protocol Document
- Reader@Express & User's Manual for Reader@Express (IDRO Reader Operation Program)

2. 5 Service Information

If there is an issue with the equipment, please contact the IDRO Sales team.

Contact information can be found on the following website: www.idro.co.kr.

When contacting the IDRO sales team, please provide the following information:

- Device serial number
- Model name or product name
- Software version information

IDRO will respond to emails, phone calls or faxes within the time frame specified in the service agreement.

If the issue cannot be resolved with support from IDRO, the equipment can be returned for service, and specific instruction will be provides.

IDRO is not responsible for any damage or misdelivery occurring during shipment. If the product was purchased from an IDRO business partner, please contact the business partner for support.

3. Getting Started

This section provides a brief overview of the hardware and software of the IDRO900RWe RFID Reader.



3. Getting Started

3.1 RFID Reader Hardware

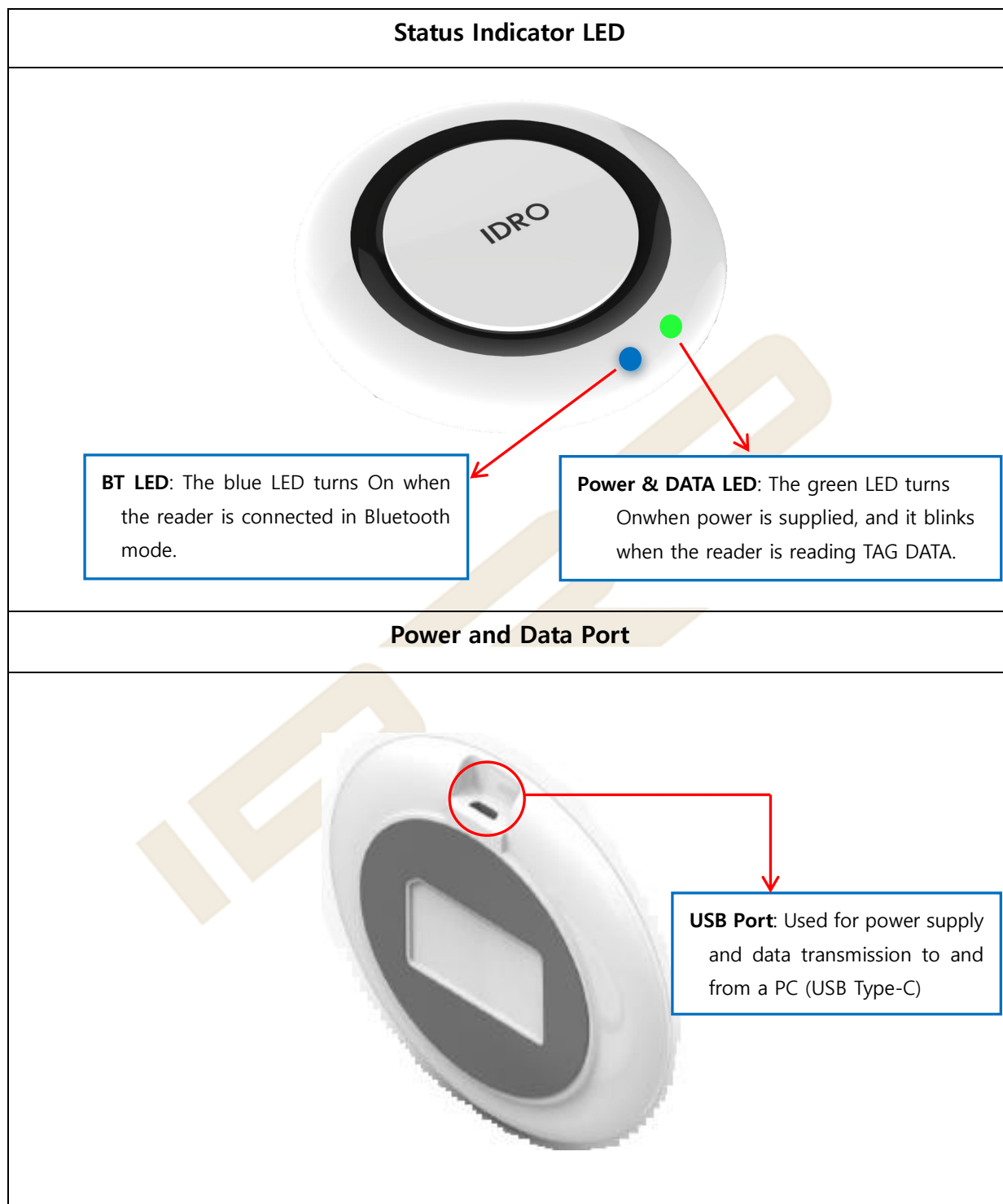
The IDRO900Rwe RFID Reader operates in the UHF RFID frequency band of 860~930MHz.

The product name and description are shown in Figure 3.1.1 below.

It includes a Green LED for power and data indication and a Blue LED to display connection status in Bluetooth mode.

Power is supplied via a USB Type-C connector.





[Figure 3.1.1] IDRO900RWe RFID Reader Name and Description

3. 2 RFID Reader Software

The IDRO900RWe is delivered with a software application that can be used to configure and control the RFID Reader.

3. 2. 1 Reader@Express

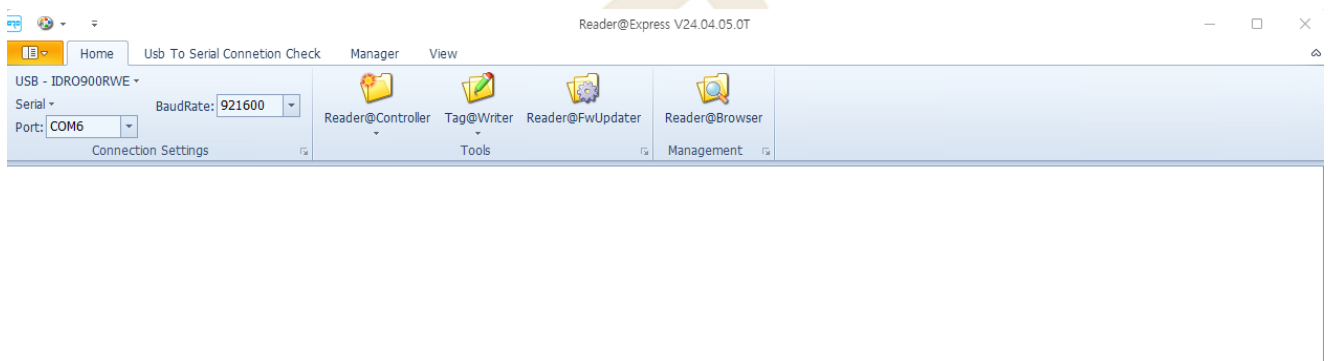
Reader@Express is an RFID Reader application that provides access to the RFID Reader.

By entering the Serial Port of the RFID Reader into a web browser, it allows for the modification and manipulation of the RFID Reader via the USB Type-C port.

This application enables the modification of communication and operational parameters of the RFID Reader. It also provides functionalities to read tags, review tag data, and perform diagnostics.

The application is primarily used for the configuration and management of the installed RFID Reader.

For more details, refer to the "**User's manual for Reader@Express.**"



[Figure 3.2.1] IDRO900RWe Reader@Express

4. RFID Reader System Configuration Diagram and Block Diagram

This section describe the system configuration and block diagram of the IDRO900RWe RFID Reader.



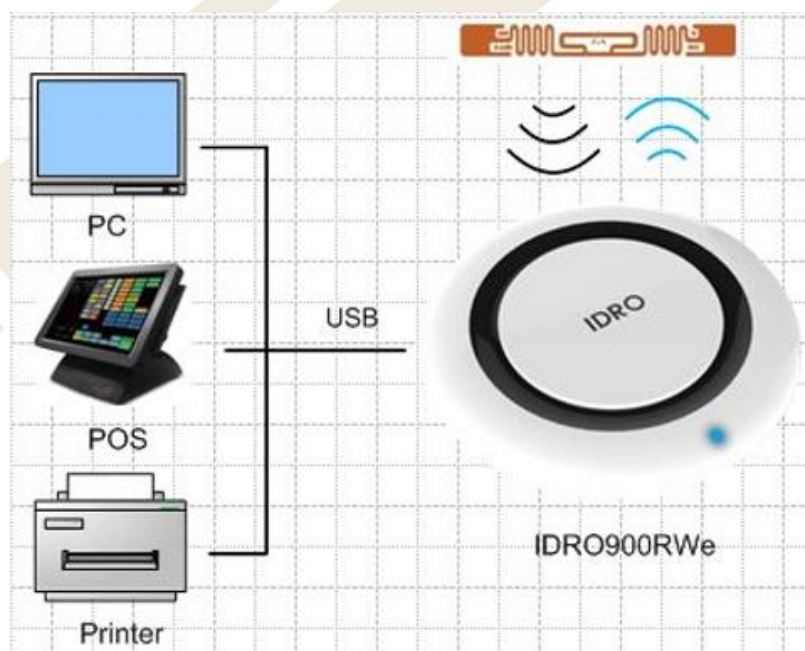
4. RFID Reader Installation

4.1 System Configuration Diagram

The IDRO900RWe reader can be applied in the following areas:

- . Target Application
- . RFID Printers / Tag Encoders
- . USB Readers
- . POS
- . Industrial automation

The system configuration of the IDRO900RWe is illustrated in Figure 4.1.1 below.



[Figure 4.1.1] IDRO900RWe System Configuration

4. 2 Block Diagram

The system block diagram of the IDRO900RWe reader is shown in Figure 4.2.1 below.

This diagram illustrates the detailed block structure within the RFID IDRO900RWe product.



[Figure 4.2.1] IDRO900RWe Detailed System Block Diagram

To control the IDRO900RWe from the HOST for embedded applications, power is supplied via USB, and RFID data transmission is possible through wired USB ports and wireless transmission via Bluetooth.

- The IDRO900RWe requires USB_VCC (typical: 5V) and GND for power supply.
- The IDRO900RWe needs connections for USB_D+/D- for wired data communication with the host.
- The IDRO900RWe requires a Bluetooth connection for wireless data communication with the host.

5. RFID Reader Part Number

This section describes the Part Number Information for the IDRO900RWe RFID Reader.

5. RFID Reader Part Number

5. 1 RFID Reader Part Number

This chapter provides information of the Part Number Information for the IDRO900RWe RFID Reader.

Part number : I D R O 9 0 0 RW e - K R
① ② ③ ④ ⑤

- ① : IDRO Co., Ltd
- ② : 900MHz Frequency Band
- ③ : Reader & Writer
- ④ : Impinj Ex10 series solution
- ⑤ : Global band (WW : Global Band, JC: JAPAN1W & CHINA)

- For changes to the Global band, please refer to Section 7.
- For other countries, please contact the IDRO sales department.

6. RFID Reader Components

This section describes the components included with the IDRO900RWe RFID Reader.



6. RFID Reader Components

6. 1 Components

The components included with the IDRO900RWe RFID Reader are listed in [Table 5.1] below.

[Table 5.1] IDRO900RWe RFID Reader Components

Items	Pictures
RFID Reader (IDRO900Rwe)	
USB Cable (Length: 1m)	
Reader Software & User Document	

NOTE

The photos of the components above may differ from the actual products.

The specifications of the USB cable provided with the product may change depending on circumstance.

7. Electrical Characteristics of RFID Reader

This section provides information about the electrical characteristics of the IDRO900RWe RFID Reader.



7. Electrical Characteristics

7. 1 Absolute Maximum Rating

Stresses beyond those listed in Table 5-1 may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Table 7-1: Absolute Maximum Ratings

Parameter	Min.	Max.	Unit	Comments
Supply voltage		6	V	
Storage temperature	-30	+100	°C	
Humidity		95	%RH	
ESD immunity (Air discharge) (Contact discharge)		±8 ±4	kV kV	EN6100-4-2

7. 2 Operating Conditions

Table 7-2: Operating Conditions

Parameter	Min.	Max.	Unit	Conditions
Supply voltage (VCC)	4.2	5.5	V	Recommend voltage : 5V
Temperature	-20	+60	°C	

7. 3 Reader Radio Specifications

VCC=5V, typical values at 25°C, unless otherwise noted.

Table 7-3: Reader Radio Specifications

Parameter	Min.	Typ.	Max.	Unit	Conditions
Supply Current (Active mode)			1150	mA	Transmit Power : +30dBm Tag reading mode
Supply Current (Active mode)			1050	mA	Transmit Power : +30dBm Conduction test mode
Supply Current (Standby mode)			38	mA	

RX input impedance		50		Ω	
RX sensitivity		-68		dBm	
TX Power	+5		+30	dBm	
Frequency	860		960	MHz	See section 8
Channel bandwidth			200	kHz	
Channel Dwell time			0.4	Sec.	
Carrier sensing time	5			ms	Case in Japan
Carrier sensing level		-74		dBm	Case in Japan
Transmission time			4	Sec.	Case in Japan

7. 4 Bluetooth RF Specifications

Table 7-4: Bluetooth Specifications

RF	Specification	Condition	Min	Typ	Max	Unit
Transmitter	Output transmit power	CH0		7.68		dBm
		CH39		6.51		dBm
		CH78		5.78		dBm
	Transmit power density			-1.13		dBm
	Transmit power control (power step)	CH0	2.92		4.04	dB
		CH39	2.34		4.06	dB
		CH78	2.45		4.19	dB
	Frequency Range $f_l > 2400, f_h < 2483.50$		2401.417		2483.5	MHz
	-20dB bandwidth for modulation ($f_h - f_l \leq 1\text{MHz}$)	CH0		0.914		MHz
		CH39		0.914		MHz
		CH78		0.906		MHz
	Adjacent channel transmit power	+/-2MHz		-45.61		dBm
		+/-3MHz		-55.12		dBm
		+/-4MHz		-48.83		dBm
Receiver	Sensitivity at 0.1% BER for all Basic rate packet type	CH0		-86		dBm
		CH39		-87		dBm
		CH78		-86		dBm

7. 5 Reader Digital Interface Specifications

VCC=5V, typical values at 25°C, unless otherwise noted.

Table 7-5 : Reader Digital Interface Specifications

Parameter	Min.	Typ.	Max.	Unit	Conditions
UART					
Baud rate		115.2		kbps	
Parity		None			
Flow control		None			

Table 7-6 : USB Connector Specifications

Parameter	Descriptions
USB Connector type	Micro-USB Socket
Part Number	HI05-AG0272
Manufacturer	HJI&C

7. 6 Physical Dimension

Table 7-7 : Physical Dimension Specifications

Parameter	Descriptions
SIZE	Ø96mm × 14.8mm
Weight	85g

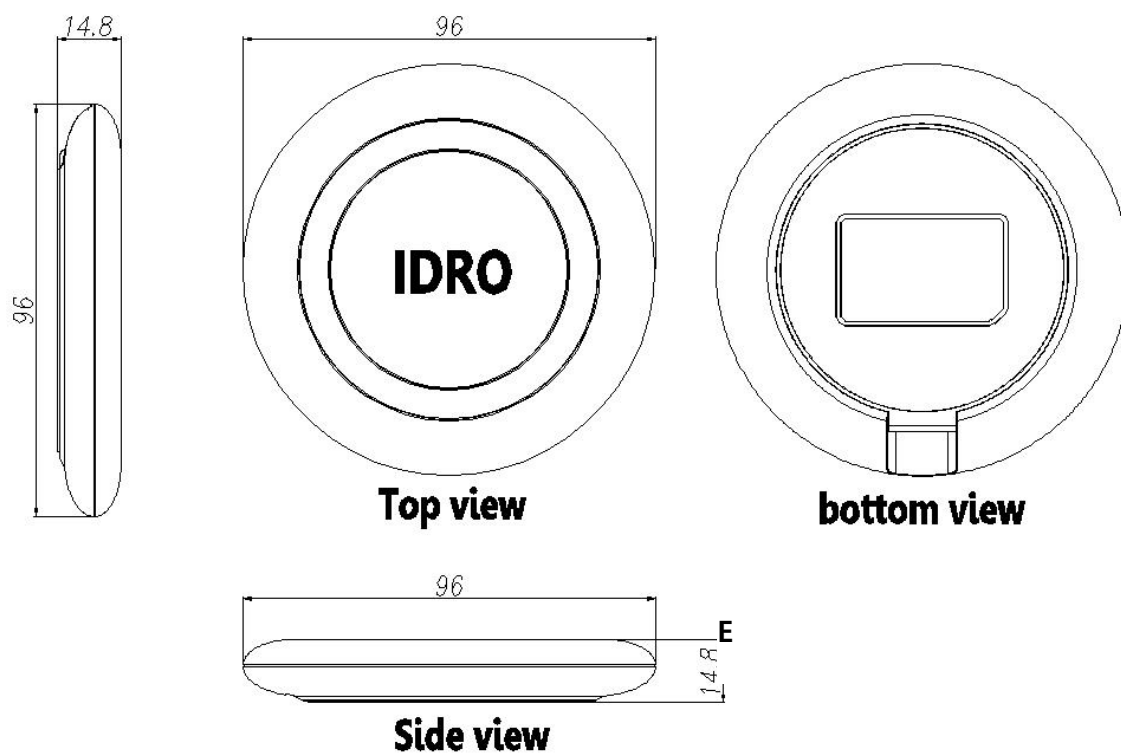
8. Mechanical Characteristics of RFID Reader

This section provides information about the mechanical characteristics of the IDRO900RWe RFID Reader.



8. Mechanical Characteristics

8. 1 Drawing and Dimension



9. Precaution for RFID Reader

This section provides information about the precaution for the DRO900FE RFID Reader.



9. Precaution for RFID Reader

9. 1 Reader Precautions

- (1) Ensure power is supplied according to the product's rated power specifications to prevent fire and damage to the product.
- (2) Do not drop or subject the device to impact, as this can cause damage.
- (3) Avoid installing in high humidity areas to prevent product damage and the risk of electric shock. Use within the humidity levels specified in the user manual.
- (4) Do not use the product in liquid states, such as a water, oil, or organic solvents, as this may damage the components and circuits.
- (5) Ensure that no metallic objects are present in front of the product's antenna direction to avoid performance degradation.
- (6) Avoid sudden temperature changes, as they can lead to decreased performance.
- (7) Do not disassemble or attempt internal repairs. This may cause damage and electric shock, making future service impossible. Repairs should only be performed by IDRO Co., Ltd. or authorized service centers designed by IDRO.

Appendix A

RFID Reader Frequency

This section provides information about the channels and frequency of the IDRO900RWe RFID Reader.

Appendix A. RFID Reader Frequency

Channel number & Frequency table

Table A-1: Part number vs Region information

Part Number	Global band	Remark
IDRO900RWe	KOREA	Available after changing country at the Reader@Express program.
	NORTHAMERICA	
	TAIWAN	
	BRAZILE	
	MALAYSIA	
	INDONESIA	
	ISRAEL	
	AUSTRALIA	
	NEWZEALAND	
	PHILIPPINES	
	HONGKONG	
	SINGAPORE	
	THAILAND	
	VIETNAM	
	URUGUAY	
	SOUTH AFRICA	
	EURO	Available after changing country at the Reader@Express program.
	INDIA	
	MOROCCO	
	CHINA	
	JAPAN(1W)	JAPAN(1W) only

- Contact IDRO Co., Ltd for other countries not in above table A-1.

These tables show each countries frequency channel Allocation status of IDRO

KOREA	
CHANNEL No.	Frequency (MHz)
0	917.3
1	917.9
2	918.5
3	919.1
4	919.7
5	920.3

EURO	
CHANNEL No.	Frequency (MHz)
0	865.7
1	866.3
2	866.9
3	867.5

NORTH AMERICA	
CHANNEL No.	Frequency (MHz)
0	902.75
1	903.25
2	903.75
3	904.25
4	904.75
5	905.25
6	905.75
7	906.25
8	906.75
9	907.25
10	907.75
11	908.25
12	908.75
13	909.25
14	909.75
15	910.25
16	910.75
17	911.25
18	911.75
19	912.25
20	912.75
21	913.25
22	913.75
23	914.25
24	914.75
25	915.25
26	915.75

27	916.25
28	916.75
29	917.25
30	917.75
31	918.25
32	918.75
33	919.25
34	919.75
35	920.25
36	920.75
37	921.25
38	921.75
39	922.25
40	922.75
41	923.25
42	923.75
43	924.25
44	924.75
45	925.25
46	925.75
47	926.25
48	926.75
49	927.25

CHINA	
CHANNEL No.	Frequency (MHz)
0	920.625
1	920.875
2	921.125
3	921.375
4	921.625
5	921.875
6	922.125
7	922.375
8	922.625
9	922.875
10	923.125
11	923.375
12	923.625
13	923.875
14	924.125
15	924.375

JAPAN(1W)	
CHANNEL No.	Frequency (MHz)
0	916.8
1	918.0
2	919.2

3	920.4
4	920.6
5	920.8

JAPAN(250mW)	
CHANNEL No.	Frequency (MHz)
0	916.8
1	918.0
2	919.2
3	920.4
4	920.6
5	920.8
6	921.0
7	921.2
8	921.4
9	921.6
10	921.8
11	922.0
12	922.2
13	922.4
14	922.6
15	922.8
16	923.0
17	923.2
18	923.4

TAIWAN	
CHANNEL No.	Frequency (MHz)
0	922.25
1	922.75
2	923.25
3	923.75
4	924.25
5	924.75
6	925.25
7	925.75
8	926.25
9	926.75
10	927.25
11	927.75

BRAZILE	
CHANNEL No.	Frequency (MHz)
0	902.75
1	903.25
2	903.75
3	904.25

4	904.75
5	905.25
6	905.75
7	906.25
8	906.75
9	907.25
10	915.25
11	915.75
12	916.25
13	916.75
14	917.25
15	917.75
16	918.25
17	918.75
18	919.25
19	919.75
20	920.25
21	920.75
22	921.25
23	921.75
24	922.25
25	922.75
26	923.25
27	923.75
28	924.25
29	924.75
30	925.25
31	925.75
32	926.25
33	926.75
34	927.25

MALAYSIA	
CHANNEL No.	Frequency (MHz)
0	919.25
1	919.75
2	920.25
3	920.75
4	921.25
5	921.75
6	922.25
7	922.75

INDIA	
CHANNEL No.	Frequency (MHz)
0	865.1
1	865.7
2	866.3

3	866.9
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INDONESIA	
CHANNEL No.	Frequency (MHz)
0	923.25
1	923.75
2	924.25
3	924.75

ISRAEL	
CHANNEL No.	Frequency (MHz)
0	916.25

AUSTRALIA	
CHANNEL No.	Frequency (MHz)
0	920.25
1	920.75
2	921.25
3	921.75
4	922.25
5	922.75
6	923.25
7	923.75
8	924.25
9	924.75
10	925.25
11	925.75

NEW ZEALAND	
CHANNEL No.	Frequency (MHz)
0	922.25
1	922.75
2	923.25
3	923.75
4	924.25
5	924.75
6	925.25
7	925.75
8	926.25
9	926.75
10	927.25

PHILIPPINES	
CHANNEL No.	Frequency (MHz)
0	918.25
1	918.75
2	919.25
3	919.75

HONGKONG SINGAPORE, THAILAND, VIETNAM	
CHANNEL No.	Frequency (MHz)
0	920.25
1	920.75
2	921.25
3	921.75
4	922.25
5	922.75
6	923.25
7	923.75
8	924.25
9	924.75

URUGUAY	
CHANNEL No.	Frequency (MHz)
0	916.25
1	916.75
2	917.25
3	917.75
4	918.25
5	918.75
6	919.25
7	919.75
8	920.25
9	920.75
10	921.25
11	921.75
12	922.25
13	922.75
14	923.25
15	923.75
16	924.25
17	924.75

18	925.25
19	925.75
20	926.25
21	926.75
22	927.25

SOUTH AFRICA	
CHANNEL No.	Frequency (MHz)
0	915.6
1	915.8
2	916.0
3	916.2
4	916.4
5	916.6
6	916.8
7	917.0
8	917.2
9	917.4
10	917.6
11	917.8
12	918.0
13	918.2
14	918.4
15	918.6
16	918.8

MOROCCO	
CHANNEL No.	Frequency (MHz)
0	867.7
1	867.9

FCC Information to User

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 or more 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.

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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:**FCC RF Radiation Exposure Statement:**

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

► Contains FCC ID: **2APDI-BCM-DC100-XS**



UHF RFID Reader
Visible RFID Reader & Tag
Visible Light Communication System
2.4 GHz Active RFID Reader & Tag

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