



User Manual of HF120 RFID Reader

Welcome to be user of Hopeland RFID products. Thanks for choosing Hopeland's integrated RFID Reader HF120. We believe our device will bring convenience for your work.



Catalogue

1. Technical Specification.....	5
1.1 Feature.....	5
1.2 Technical.....	5
1.2.1 Main function.....	5
1.2.2 Technical parameter.....	5
1.2.3 Operational environment.....	6
2. Sketch map.....	7
2.1 Physical construction.....	7
2.2 Weight.....	7
2.3 Interface chart.....	7
2.3.1 Power supply & communication Interface description.....	8
2.3.2 I/O aviation port chart.....	9
2.3.3 LED panel description.....	10
2.4 External cable connection description.....	11
2.4.1 Power supply & communication cable description.....	11
2.4.2 I/O control interface cable description.....	11
2.4.4 External antenna description (optional).....	13
2.4.4 Network connection chart.....	14
3. Installing.....	16
3.1 Precautions.....	16
3.2 Installation conditions.....	16
3.3 Device connection.....	16
3.3.1 Connected to power adapter.....	16
3.3.2 Connect an external antenna and RF cable.....	16

- 3.3.2 Connected with PC..... 17
- 3.4 How to install the reader..... 17
- 3.5 Installation steps.....17
 - 3.5.1 Vertical pole installation..... 17
 - 3.5.2 Horizontal pole installation..... 18
- 3.6 Acceptance..... 19
 - 3.6.1 Acceptance of structure..... 19
 - 3.6.2 Performance acceptance..... 19
- 4. Common failures.....20**
 - 4.1 Daily maintenance.....20
 - 4.2 Common failure analysis and solution.....20
- 5. Package.....22**
 - 5.1 Package..... 22
 - 5.2 Accessories.....22
 - 5.3 Storage environment..... 23
- 6. After-sale service.....24**

1. Technical Specification

1.1 Feature

HF120 is a high performance RFID reader which integrating reader & antenna. It complies with ISO18000-6C/6B protocols, The work frequency includes China standard dual frequency 920MHz ~ 925MHz and 840MHz ~ 845MHz, FCC 902MHz ~ 928MHz and ETSI 865MHz ~ 868MHz.

Output power from 0 ~ 33dBm optional, with long identification distance, fast reading speed, high accurate rate, strong anti-interference ability, good protection performance and easy installation.

1.2 Technical

1.2.1 Main function

- Protocol: support ISO18000-6C/6B standard
- Built-in LINUX operating system
- Multiple communication port: Ethernet, RS232, RS485, Wiegand
- Support tag data filtering
- Support RSSI: the intensity of the perceived signal
- Adjustable RF output power
- Optional working mode: constant frequency / frequency hopping
- Supports antenna detection function
- Supports online and remote upgrade
- I/O interface: 2 port optocoupler input, 2 port relay output and Wiegand output

1.2.2 Technical parameter

- Working frequency: GB 920MHz ~ 925MHz, GB 840MHz ~ 845MHz,
FCC 902MHz ~ 928MHz, ETSI 865MHz ~ 868MHz
- Output power (port): 33dBm ± 1dB (MAX)

- Power adjustment: 1 dB step-by-step
- Reading distance: 0 ~15meters (depending on tags, antennas and environment)
- Channel bandwidth: <200 KHz
- Integrated circular antenna VSWR: $\leq 1.4:1$
- Integrated circular antenna gain: $\geq 8\text{dBi}$
- RS232 serial communication rate: 115200bps (default), 19200 bps, 9600bps
- RS485 interface communication rate: 115200bps (default), 19200 bps, 9600bps
- Support: Wiegand 26, 34, 66 interfaces
- Power adapter: AC input 100V ~ 240V, 50Hz ~ 60Hz

DC output: 24V/2.5A

- High protection grade: IP65

1.2.3 Operational environment

- Working environment: $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- Relative Humidity: 5%RH ~ 90%RH (+25°C)

2. Sketch map

2.1 Physical construction

- Physical size: 290mm*290mm*115mm(accessories not included)

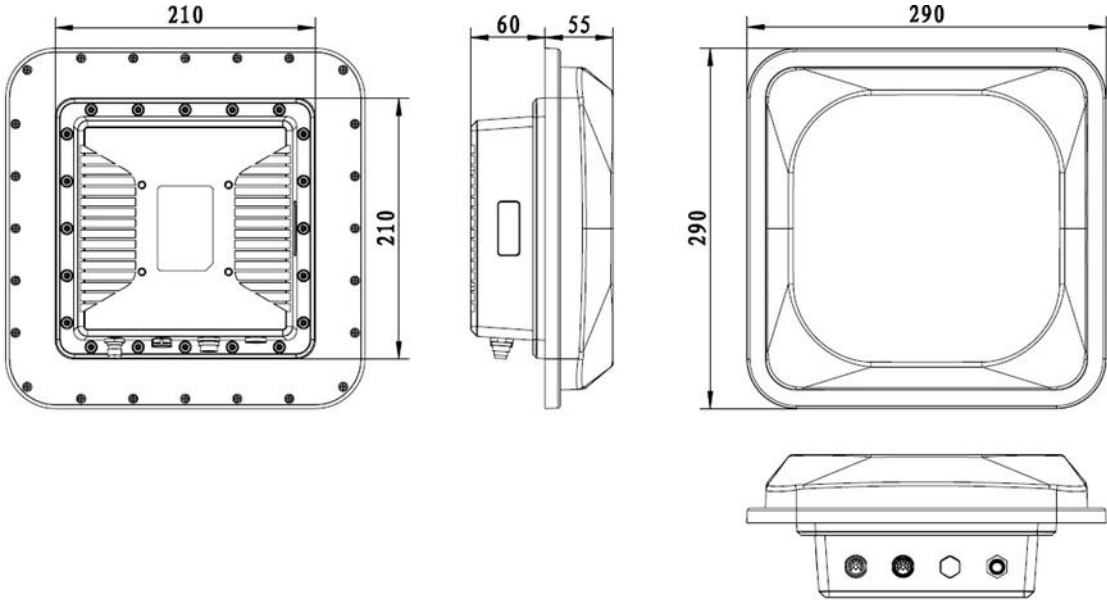


Image 2-1 Structure diagram

2.2 Weight

- Main body: 2.5kg (accessories excluded)

2.3 Interface chart

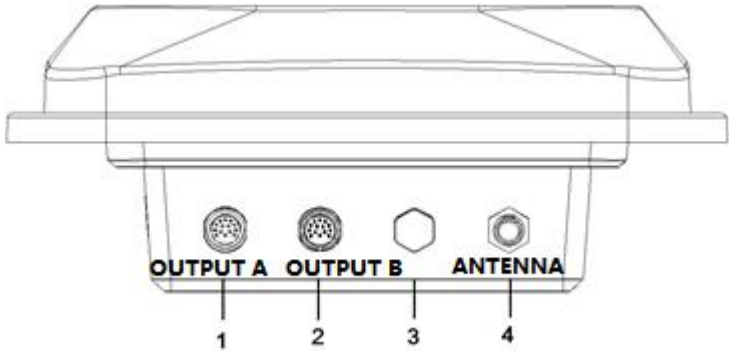
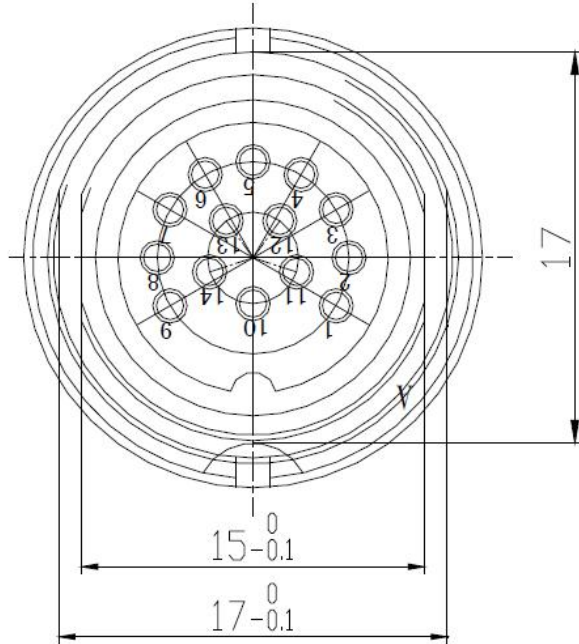


Image2-2/I/O & communication interface

- 1 — power & communication port
- 2 — I/O control interface
- 3 — Ventilation valve

4 — external antenna port

2.3.1 Power supply & communication Interface description



Picture 2-3 Power supply & communication interface aviation connector pin number chart

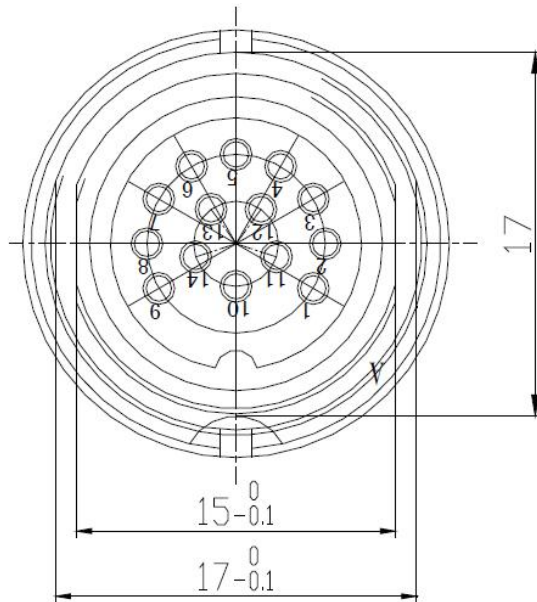
Aviation plug signal definitions

Chart 2-1 Power & communication interface signal definition

PIN	Description	PIN definition
9	Power supply GND	PGND
8	Power supply GND	PGND
7	24V power positive	+24V
6	24V power positive	+24V
5	NC	NC
4	NC	NC
3	NC	NC
2	Network wire	TD-
1	Network wire	TD+

14	Signal Ground	PGND
13	Network wire	RD-
12	Network wire	RD+
11	RS232 receiving RXD	RX
10	RS232 receiving RXD	TX

2.3.2 I/O aviation port chart



Picture2-4 I/O interface aviation connector pin number chart

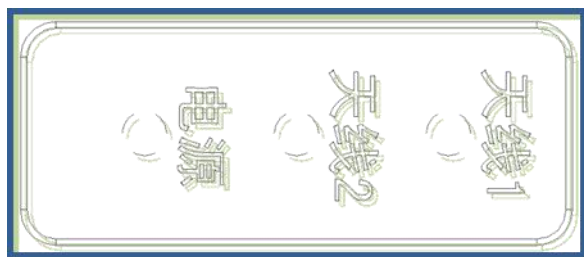
I/O aviation port definition as per in chart 2-2:

Chart 2-2 I/O port signal function definition

PIN No.	Description	PIN definition
9	Relay 1 output port	R1
8	Relay 1 output port	L1
7	Relay 2 output port	R2
6	Relay 2 output port	L2

5	Optocoupler 1 external signal input anode	IN1
4	Optocoupler 2 external signal input anode	IN2
3	Optocoupler external signal input ground	IGND
2	Wiegand output 0	WG0
1	Wiegand output 1	WG1
14	GND	AGND
13	RS485 signal	485+
12	RS485 signal	485-
11	GND	AGND
10	GND	AGND

2.3.3 LED panel description



Picture 2-5 LED panel chart

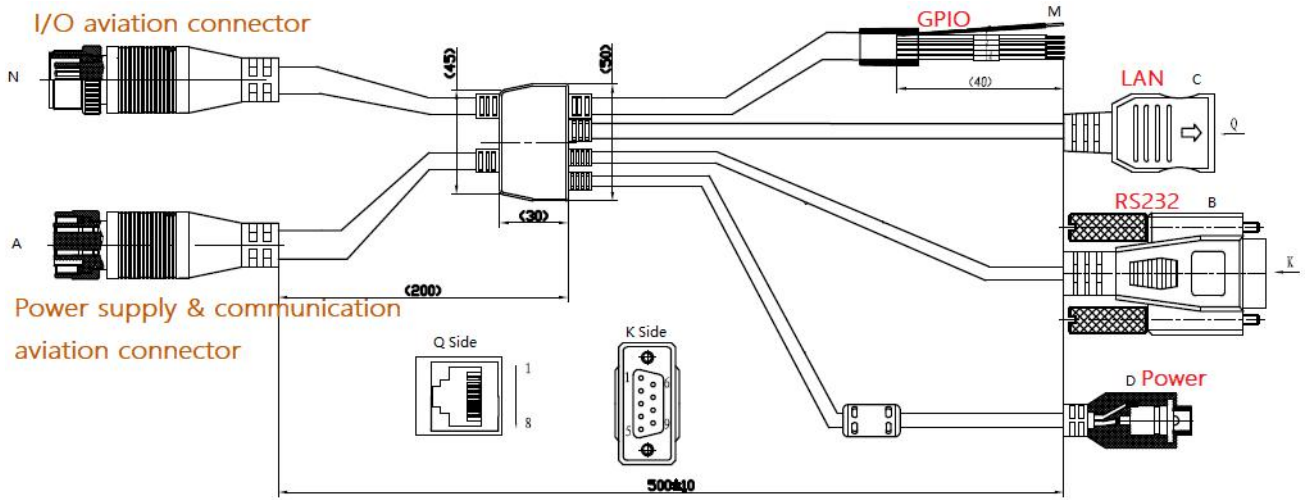
LED panel description as per in chart 2-3:

Chart 2-3 LED definition description

LED Mark No.	Description	Status description
天线1 (ANT1)	Antenna 1 indicator	Indicates built-in antenna is working
天线2 (ANT2)	Antenna 2 indicator	Indicates external antenna is working
电源 (PWR)	Read/write card status	Keep bright indicates power supply working normally Flickering means the reader is reading tags

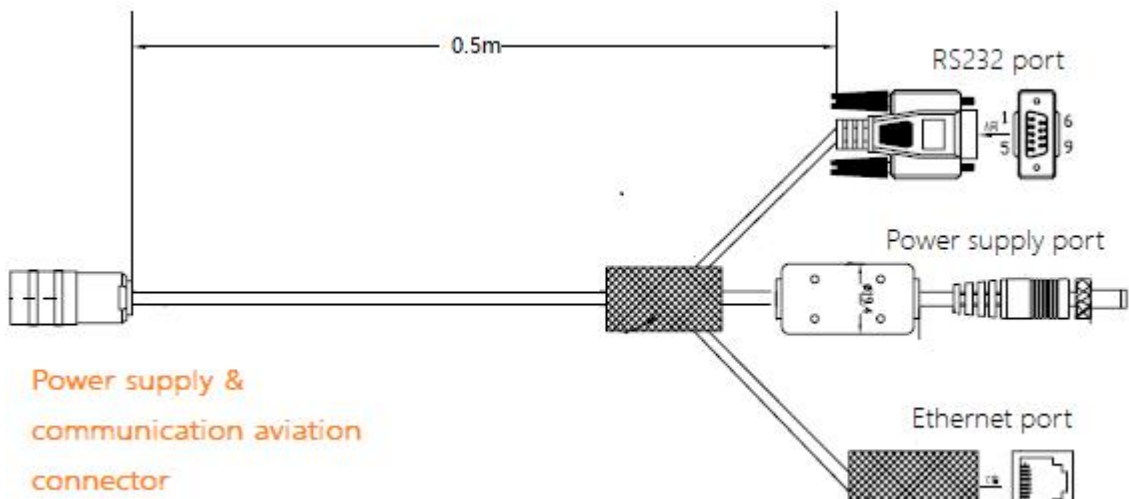
2.4 External cable connection description

abridged general view



2.4.1 Power supply & communication cable description

Cable Specifications: Black insulated skin with metal screening net, 14 inner core wire, outer diameter 7.8mm, main cable length is 500mm, the aviation connector connected with the reader Power and communication interface "OUTPUT A". The 14-core main line is divided into three different signals: serial cable, DC power cord and network interface cable for power supply and data transmission.



Picture2-6 Power and communication interface wire decomposition

2.4.2 I/O control interface cable description

Cable Specifications: Black insulating skin with metal screening net, 14 inner core wire, outer diameter 7.8mm, aviation connector is connected with reader I / O control interface“OUTPUT B”, The 14-core main line provides two-way optocoupler input , two pair relay output, Wiegand output, 485 signal line. Mainly used for input trigger reading, peripherals switch control,upload card data, and communication functions, see Table 2-4 I / O control aviation seat definition table.

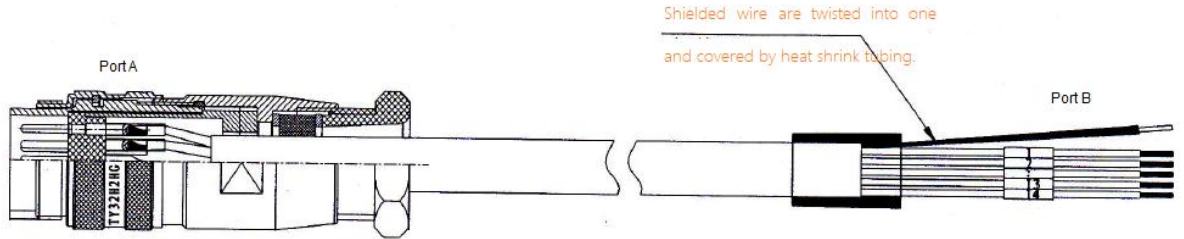


Chart 2-8 I / O control interface cable chart

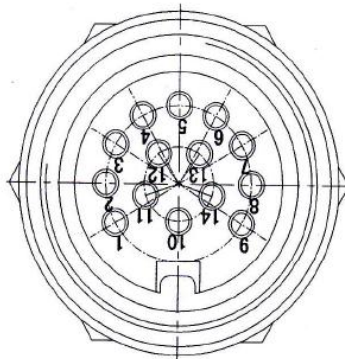


Chart 2-9 I/O control aviation seat illustration

The other end of the cable are bare and tinned lines, can distinguish the functions defined by the color of the lines.

Chart 2-4 I/O control aviation seat definition table

Pin number of aviation connector	PIN description	color for reference only	Marking number
14	Ground	Green-White	14
13	RS485A signal	Green	13
12	RS485B signal	Black-White	12

11	Ground	Black	11
10	Ground	Gray	10
9	Relay #1 output	Red-White	9
8	Relay #1 output	Red	8
7	Relay #2 output	Purple-White	7
6	Relay #2 output	Purple	6
5	Optocoupler 1 external signal input	Yellow-White	5
4	Optocoupler 2 external signal input	Yellow	4
3	Optocoupler external ground input	Blue-White	3
2	Wiegand output 0	Blue	2
1	Wiegand output 1	Gray-White	1

2.4.3 External RF cable description (optional)



Picture 2-10 RF cable schematic chart

The connector between RF cable& reader is TNC male, the connector between RF cable & antenna is SMA male connector (depending on antenna connector as well). Try to keep the cable length within 5meters, impedance50Ω, the insertion loss less than 2dB. Of course, you can choose a high-performance cable, appropriately increase the length, but keep the insertion loss less than 2dB. Note: Too long RF cable or cable poor connection will cause high signal attenuation & poor reader performance.

2.4.4 External antenna description (optional)

This reader has a integrated circular antenna. User can also connect one more external antenna. It is

recommended to use the external antenna provided by our company.



Picture 2-11 Circular antenna

Antenna performance parameters:

Work frequency: 902~928 or 860~865 MHz

VSWR: $\leq 1.3:1$

Gain: 9dBi

Polarization: Circular Right or left

Input impedance: 50 Ohm

Antenna Connection: N / SMA

Mechanical size: 255mm*255mm*33mm

Color: White

Working temperature: -40°C~70°C

2.4.4 Network connection chart

Network interface used for long-distance high-speed connection (less than 80 m), can be connected with the switcher or router through the network cable, or directly connected with the PC network interface, refer to below picture.

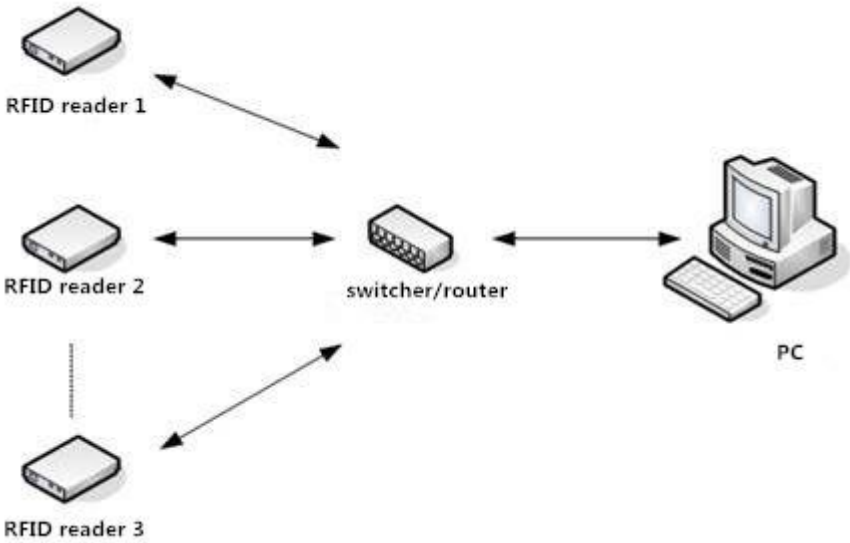


Image 2-12 Network application connection diagram

3. Installing

3.1 Precautions

To ensure the normal and stable operation of the device and your personal property and safety, please carefully read the following notes before install CL7206C reader and writer:

1. Firstly, check whether the power socket is connected to the ground, and to see whether the local power supply voltage is in accordance with the applicable voltage range of the reader;

2. Check the device and the external connection if is closely connected;

3. Pay attention to the type selection and the length limit of the network cable and the serial cable:

Network cable connects directly, no longer than 80 meters

Serial cable connects directly, no longer than 10 meters

4. When installing several readers, the antenna position and the antenna spacing should be appropriate to avoid interference with each other.

3.2 Installation conditions

Before installing the reader, please check carefully whether the product is in good condition and the accessories are complete. If there is any parts missing or damage, please contact the supplier in time.

3.3 Device connection

3.3.1 Connected to power adapter

- ☆ Insert the power cord into the AC power supply socket and plug another end into the power connector of the device and tighten.
- ☆ Turn on and wait about 20 seconds, the system initialization process is completed and is standby state.

3.3.2 Connect an external antenna and RF cable

☆The reader housing has a TNC-type coaxial connector for connecting an external antenna, select low consumption RF cable, connectors should be tightened (Ensure to be waterproof when install outdoors);

☆ The reader antenna angle or tilt need to adjust to the best position through the actual test according to the specific application.

3.3.2 Connected with PC

☆ RS232 interface is for short distance communication (less than 10m), through the DB9 connector and the PC serial port connection to realize the communication of PC and the device,

☆RJ45 network port used for long distance communication (less than 80m), connect PC with extend network cable.

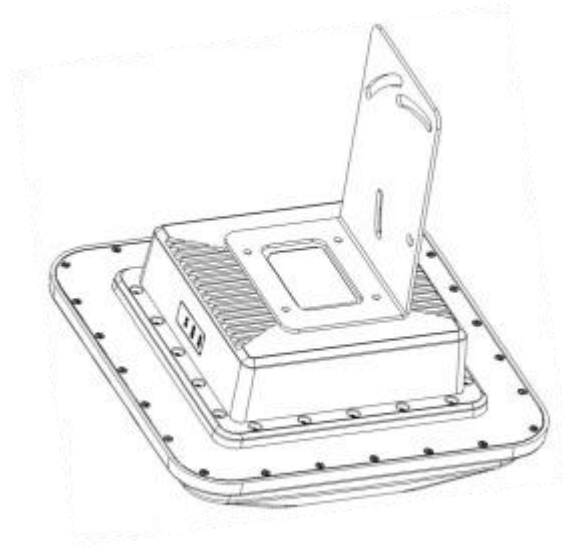
3.4 How to install the reader

The reading and writing range of the reader depends on the onsite application, the tilt angle of the antenna is adjusted to achieve the best reading and writing performance.

3.5 Installation steps

3.5.1 Vertical pole installation

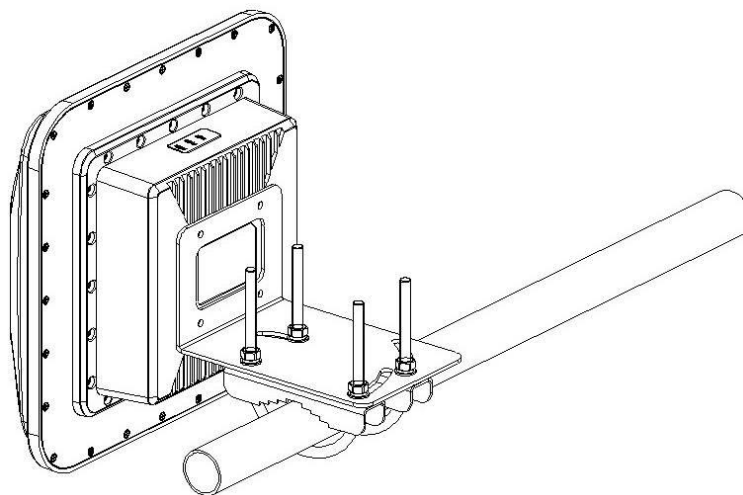
1>Align the L-shaped mounting bracket with the hole at the bottom of the reader housing and tighten with 4 inner hexagon cylinder head combination screws. Shown in picture 3-1:



Picture3- 1 wall installation

2>Two u-bolts and two toothed mounting brackets are used to fasten the device to the horizontal bar through the L-shaped support. As per illustrated in picture 5-2.

Note: This installation method is suitable for 50mm ~ 100mm diameter vertical pole.



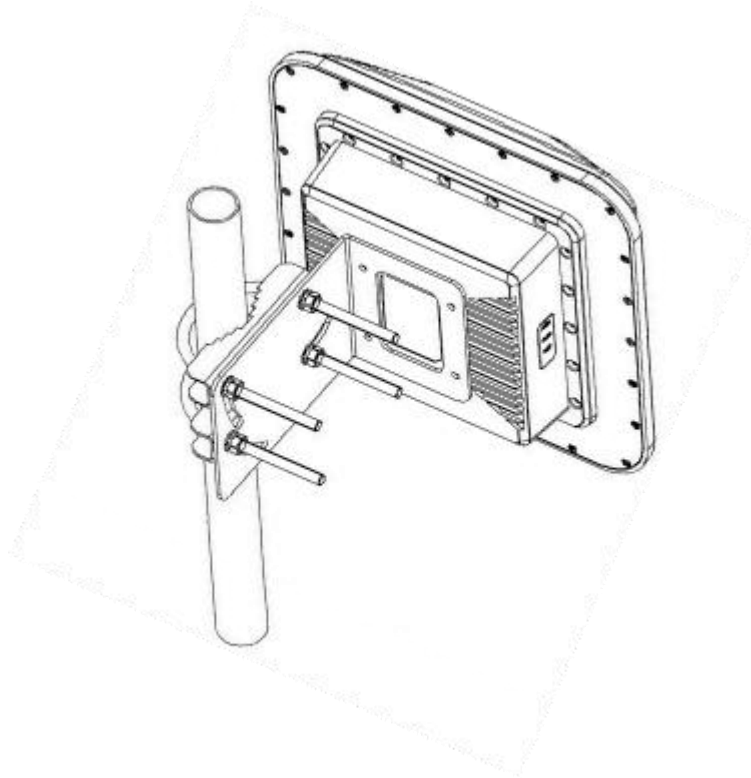
Picture3- 2 Vertical pole installation

3.5.2 Horizontal pole installation

1>Align the L-shaped mounting bracket with the hole at the bottom of the reader housing and tighten with 4 inner hexagon cylinder head combination screws. Refer to picture in 5-3:

2>Two u-bolts and two toothed mounting brackets are used to fix the device to a vertical bar through the L-shaped support. As per illustrated in picture 5-3.

Note: This installation method is suitable for 50mm ~ 100mm diameter vertical pole.



Picture3- 3 Vertical pole installation

3.6 Acceptance

3.6.1 Acceptance of structure

- Whether reader is fixed firmly, without loose
- Whether the cable connected firmly
- Whether the screws are tighten

3.6.2 Performance acceptance

- Whether the reader is working properly
- Whether the read and write range is reasonable

4. Common failures

4.1 Daily maintenance

The routine maintenance of CL7206Busage:

☆To check whether the tightening of RF connector

☆To check if the screw fixed reader and antenna is loose

☆To check whether the RF cable joints appear outsourcing breaking the shielding layer

☆To check if the reader power line connection is reliable

4.2 Common failure analysis and solution

Power supply system failures:

Check whether the power adapter is normal, and the AC supply voltage is between 100V ~ 240V.

The panel indicator light failed when power on:

Check whether the communication is normal; please contact customer service if it's not normal.

The serial port unable to connect:

Check if the serial cable is not connected or connected unstable.

Check if the serial port connect baud rate of the reader is correct

Check if the selected COM port is right.

The network port cannot connect:

Factory set the default IP address: 192.168.1.116 when CL7206B reader device ex-factory, ensure the IP address of the PC and reader in the same network segment, such as "192.168.1.XXX" then you can connect to the reader, if you forget the IP address of the device, you can reset the reader's IP address through the serial port.

The reader can't read the tag

Check if the setting of antenna number is correct

Check if the label is damaged

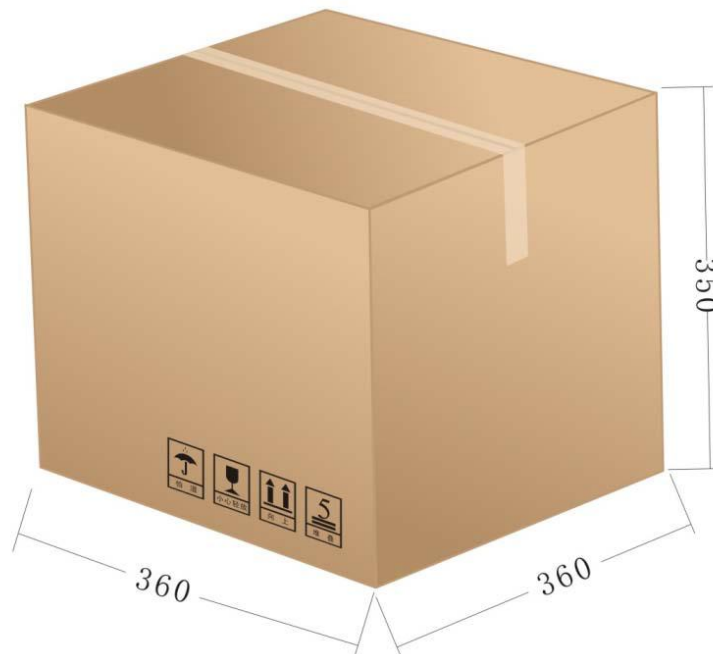
Check if the label is placed in the reader's valid reading and writing range.

Check if the electromagnetic interference between the reader and the other device.

For the problem users cannot be solved, please contact customer service.

5. Package

5.1 Package



Imag6-1 Carton box size

Carton box size:360 mm×360 mm×350mm

5.2 Accessories

In order to facilitate the storage and transportation in near future, the packing box and the packing material should be kept properly after unpack.

Besides of the device in the box, accessories equipped with the reader are also included in, please check the product packing list to confirm whether the product and accessories are complete, if any discrepancies or damage, please contact with the after-sale service in time.

The specific list of accessories as shown in table 6-1

Table 6-1 Packing Accessories list

NO.	Name	Material Code	Qty	Unit	Remark
1	CL7206B integrated RFID Reader	_____	1	set	Included
2	Customized aviation cable (one divides into three)	20351000000552	1	Set	Included
3	Customized aviation external IO cable.	20351000000551	1	Pcs	Included
4	Power adapter 24V/2.5A	20109000000324	1	Pcs	Included
5	AC power cable	20350000000195	1	Pcs	Included
6	Network cable	20350000000188	1	Pcs	Included
7	RS232 cable	20351000000478	1	Pcs	Included
8	Inner hexagon cylinder head combination screw	20400000000519	4	Pcs	Included
9	L-shaped mounting bracket	20411000013135	1	Pcs	Optional
10	u-bolt and toothed mounting bracket	20411000013136	2	Pcs	Included
11	9dBi circularly polarized antenna	20351000000035	1	Pcs	Optional
12	Coaxial RF Feeder Cable BRL-07 SMA-K--TNC-J	20351000000038	1	Pcs	Optional
13	Warranty card	20420000001651	1	pcs	Included
14	Certificate of approval	20420000001650	1	pcs	Included

5.3 Storage environment

CL7206B fixed reader should be stored in below conditions:

☆Environment temperature: -40°C ~ +85°C

☆Relative humidity: 5% RH ~ 95%RH

6. After-sale service

Letter to Customers

Since our aim is to continuously improve our products for better user experience, we may modify the product characteristics, composition and design of circuits without given notifications. Thus the real product may be not in accordance with this manual. Generally, we will provide timely amendments to this manual. If it's not provided timely, please consult our service department.

Shenzhen Hopeland Technologies Co., Ltd.

Email: support@hopelandrfid.com

Tell: +86-755 36901035

Website: <http://www.hopelandrfid.com>

Address: Clou Buliding, Baoshen Road, Hi-tech Park North, Nanshan District, 518057, Shenzhen, China

Guarantee card of Shenzhen Hopeland Technology Co.,Ltd

Product Name		Model No.	
Product Code		Level	
Description of troubles			
User's name		Postcode	
Contact person		Contact no.	

Address of factory: Block 3 of CLOU Electronics Industrial Park, Baolong Industrial City, Longgang District ,Shenzhen, Guangdong, China

Customer service centre: +86-755 36901035

Warranty Description: In order to offer users better service, our company provide warranty card with each device, please keep it to enjoy the service.

1, Products can replace free under conditions within one month after sale, in the precondition of normal operation without repairing.

2, Freemaintenance won't be given under the following circumstance:

- ① The damage of the terminal caused by high voltage of the power grid.
- ② The damage caused by misuse or operated improperly.
- ③ The damage caused by excessive vibration when user delivering.

3, The software of this product can be upgraded freely, users can be training in our company for free.

4, Will be charge appropriately if the user don't have a warranty card.

5, Users will need to fill out the warranty card for repair service, and sent back to Hopeland