



Turn on the value of data

HF100/Sharp 100

User Manual



Welcome to become user of Hopeland RFID products.

Thank you for choosing the multi-port reader Sharp 340/380,

hope to bring convenience for your work



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1. Technical Specifications

1.1 Features

Sharp HF100 is a high performance integrated UHF RFID reader, it supports 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 ~ 35dBm optional, with long identification distance, fast reading speed, high accurate rate, strong anti-interference ability, good protection performance and easy installation.

1.2 Main Functions And Technical Performance

1.2.1 Product Features

- ✧ Support protocol: ISO18000-6B/C EPC C1G2
- ✧ Built-in Linux OS
- ✧ Rich communication interfaces:RJ-45, RS232, RS-485, Wiegand interface
- ✧ Support tag data filtering
- ✧ RSSI support: the strength of the signal can be sensed.
- ✧ Adjustable RF output power
- ✧ Working mode: fixed frequency/frequency hopping optional
- ✧ Support for tag caching, breakpoint continuation
- ✧ Support antenna detection function
- ✧ Support online upgrade
- ✧ I/O interface: 2 optocoupler inputs, 2 relay outputs (drive capacity: DC 30V/ 2A, AC 125V/0.3A)
- ✧ Support web management Platform

1.2.2 Performance Parameters

- ✧ Working frequency: GB:920MHz~925MHz, FCC,902MHz~928MHz, ETSI, 865MHz~868MHz
- ✧ RF output power (port): 35dBm \pm 1dB(MAX)
- ✧ Output power adjustment: 1 dB step
- ✧ Reading distance: 0m~40m (related to factors such as transmitting power, antenna type, tag type and application environment)
- ✧ Channel occupied bandwidth: <200KHz
- ✧ RS232 interface communication rate: 115200bps(default),19200 bps,9600bps
- ✧ RS485 interface communication rate: 115200bps(default),19200 bps,9600bps
- ✧ Support weigand format 26,34,66
- ✧ AC-DC power adapter: AC input 100V~240V,50Hz~60Hz DC output 24V/2.5A
- ✧ POE: IEEE802.3af/at/bt standard (optional)
- ✧ High protection level: IP67

1.2.3 Environmental Parameters

- ✧ Working temperature: -25℃~ +70℃
- ✧ Working humidity: 5%~90%RH (+25℃)

2. Sketch map

2.1 Physical construction

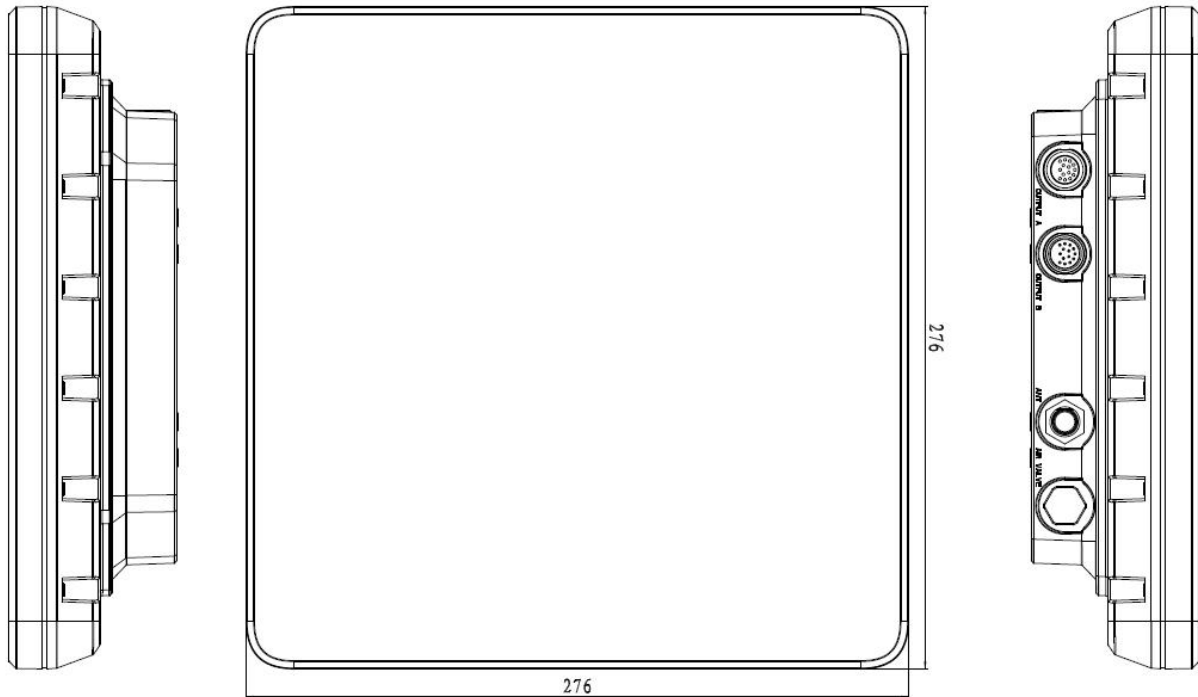


Figure 2-1 Structure diagram of Sharp 100 reader

Sharp 100 Reader Volume Parameter is:

276mm×276mm×70mm

2.2 Net Weight

HF100: 1.76kg

2.3 Interface Diagram

2.3.1 Power, Communication and I/O Interfaces



Figure 2-2 Schematic diagram of reader LED indicator panel

LED indicator panel description is shown in Table 2-1

Table 2-1 LED indicator description

LED name	LED Description	Detailed Description
ANT1	Antenna 1 indicator	Indicates that the built-in antenna is working
ANT2	Antenna 2 indicator	Indicates that the external antenna is working
PWR	Power status indicator	Long light indicates normal power supply
4G	4G connection status	The light is off, there is no such function (HF100 does not have this function)
WIFI	WIFI connection status	Always on, WiFi network is connected; off, no function; flashing, not connected (optional function)
BT	Bluetooth connection status	Always on means Bluetooth device is connected; light off, no function; flashing, not connected (optional function)
Hidden light strip	Hidden under the front of the antenna, reading status and running status indicator	Hidden when tag reading is stopped or no tag is read, orange colour is displayed when a tag is read (the light bar lights up for 1 second and goes out for 500ms when a tag is read), the light bar is always on when the baseband is abnormal or the application is abnormal.

2.4 I/O interface and communication schematic diagram

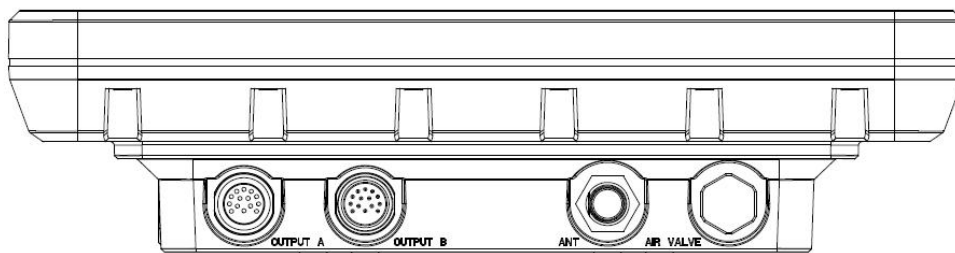


Figure 2-2 Reader I/O and communication interface panel schematic diagram

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

- 3 — Ventilation valve
- 4 — external antenna port

2.5 Diagram of external connection cables

2.5.1 Output A(power and communication interface) cable instruction

Cable specification: black insulated outer skin with metal shielding mesh, 14 inner cores, outside diameter 7.8mm, main cable length 4m, each branch cable length 1m. as shown in Figure 2-3, the aviation plug is connected to the reader output A. The 14 core main line branches into three different signals: serial line, DC power line and network port line, used for power supply and data transmission.

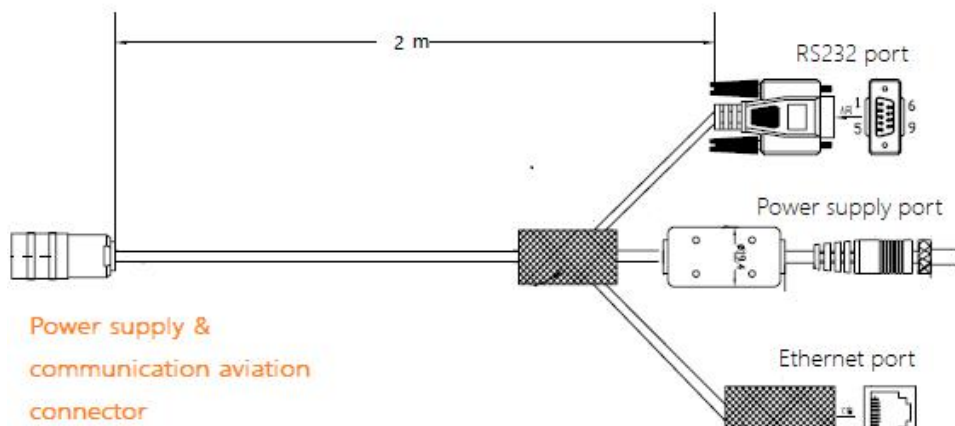


Figure 2-3 Power and communication interface cable decomposition

2.5.2 Output B(I/O control interface) cable instruction

Cable specification: black insulated outer skin with metal shield mesh, 14 inner cores, outside diameter 7.8mm, main cable length 2m, as shown in Figure 2-4, the aviation plug is connected to the reader output B. The 14 core main cable provides 2 way optocoupler input, 2 way relay output, Wiegand output and RS485 communication, see Table 2-2 for details.

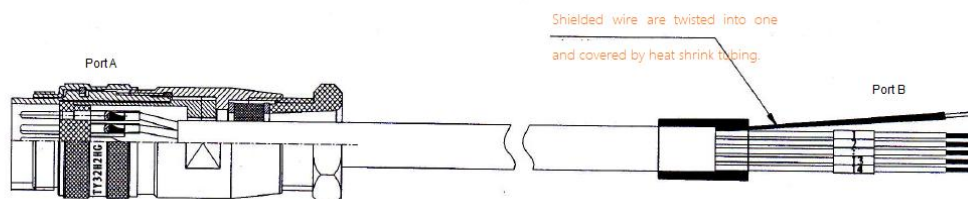


Figure 2-4 I/O control interface cable decomposition

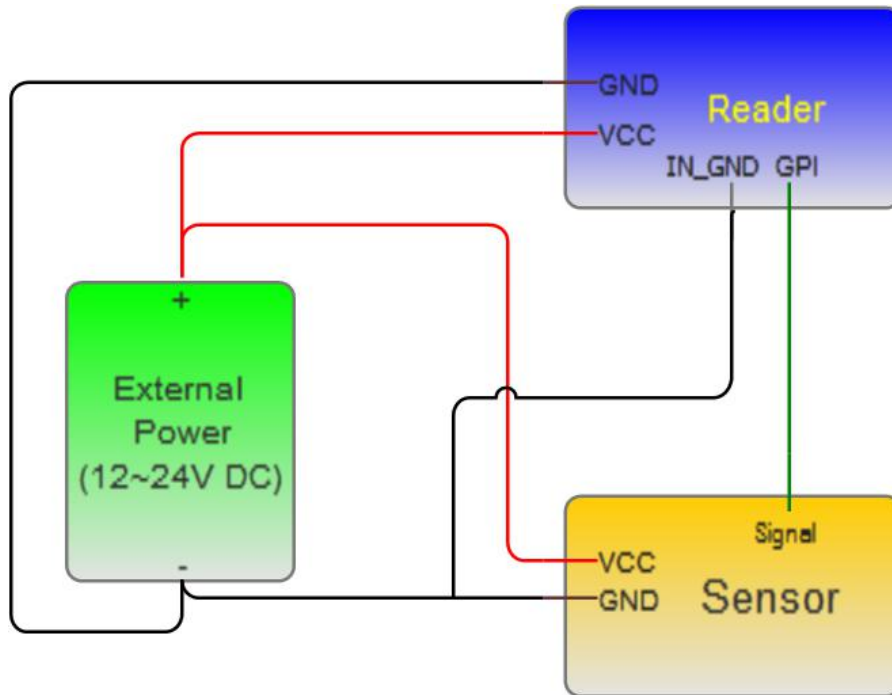
The other end of the cable are bare and tinned lines, can distinguish the functions defined by the Pin ID of the lines.

Table 2-2 I/O control cable interface definition

Pin ID	Pin Description
14	Relay 1# output; DC_MAX: 30V, 2A; AC_MAX: 125V, 0.3A; logic '0' indicates open circuit, logic '1' indicates closed, default is open circuit.
13	Relay 1# output; DC_MAX: 30V, 2A; AC_MAX: 125V, 0.3A; logic '0' indicates open circuit, logic '1' indicates closed, default is open circuit.
12	Relay 2# output; DC_MAX: 30V, 2A; AC_MAX: 125V, 0.3A; logic '0' indicates open circuit, logic '1' indicates closed, default is open circuit.
11	Relay 2# output; DC_MAX: 30V, 2A; AC_MAX: 125V, 0.3A; logic '0' indicates open circuit, logic '1' indicates closed, default is open circuit.
10	Optocoupler 1# input, DC, 0~24V, higher than 1V is high level, lower than 1V is low level
9	Optocoupler 2# input, DC, 0~24V, higher than 1V is high level, lower than 1V is low level
8	Optocoupler input ground, reader optocoupler external input signal ground
7	Wiegand data 0 signal, the default state is high level
6	Wiegand data 1 signal, the default state is high level
5	Ground
4	Ground
3	RS485 A signal
2	RS485 B signal
1	Ground

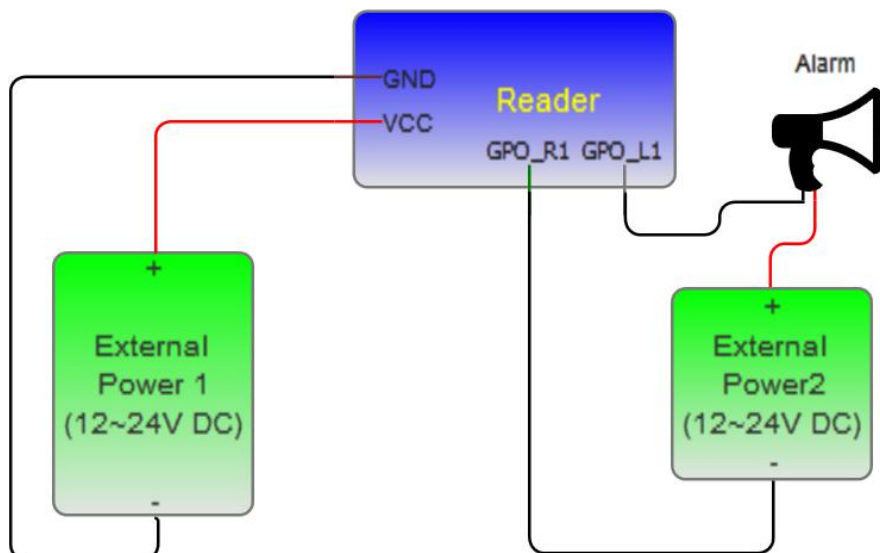
GPI Usage Example:

Infrared sensor type selection: Choose PNP NO type, which means that the infrared is normally low, when the object is detected, the signal line outputs a positive voltage signal.



GPO Usage Example:

Relay type GPO: GPO is equivalent to a switch, logic '0' means open circuit, logic '1' means closed, default is open circuit state. You can connect the alarm light, buzzer, etc. to the GPO for use. The usage is shown in the following figure.

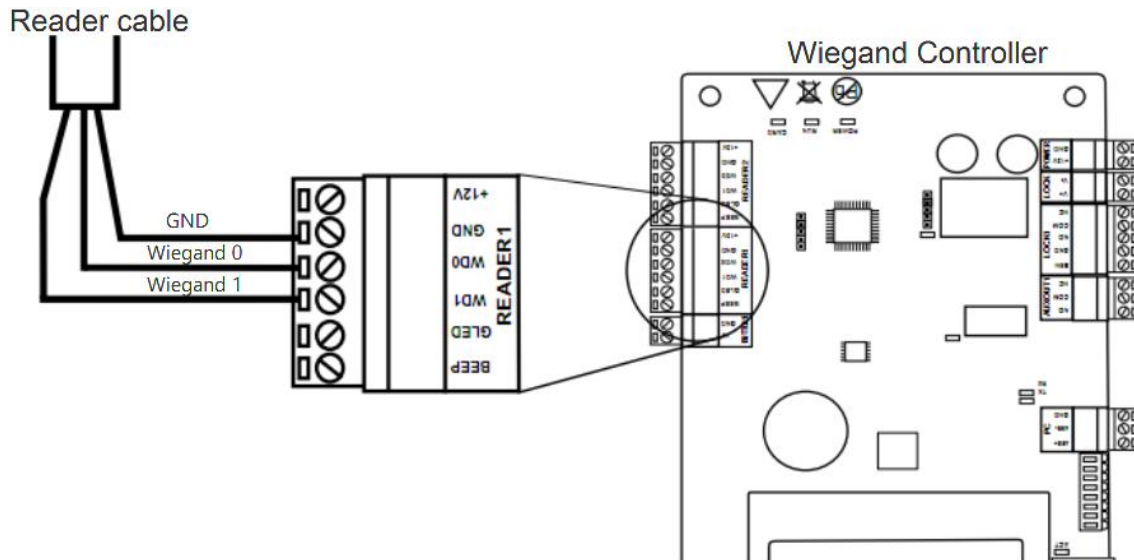


Wiegand Connection Instructions:

Connect reader Wiegand 0 to Wiegand 0 of controller,

Connect reader Wiegand 1 to Wiegand 1 of controller,

Connect reader GND to Wiegand controller GND



2.5.3 Coaxial RF Feeder Cable (optional)



Figure 2-3 schematic diagram of feeder line

RF cable TNC(Reverse polarity, internal thread, inner pin) connector connect with reader antenna TNC connector, RF cable SMA connector connect with external circular polarization antenna's SMA connector, cable maximum length is 5m, impedance 50Ω, insertion loss is less than 2dB, high-performance cable can also be selected, and the length can be increased appropriately, insertion loss is less than 2dB.

Note: Poor contact of cable connector or an ultra-long RF cable can cause excessive attenuation of the transmitted signal and received echo signal, resulting in deterioration of read/write performance.

2.5.4 Network Connection Diagram

The network interface is used for long-distance high-speed connection (not greater than 80 m). It can be connected to a switch or router via a network cable or it can be directly connected to a PC network interface. The specific connection is shown in Figure 2-4:

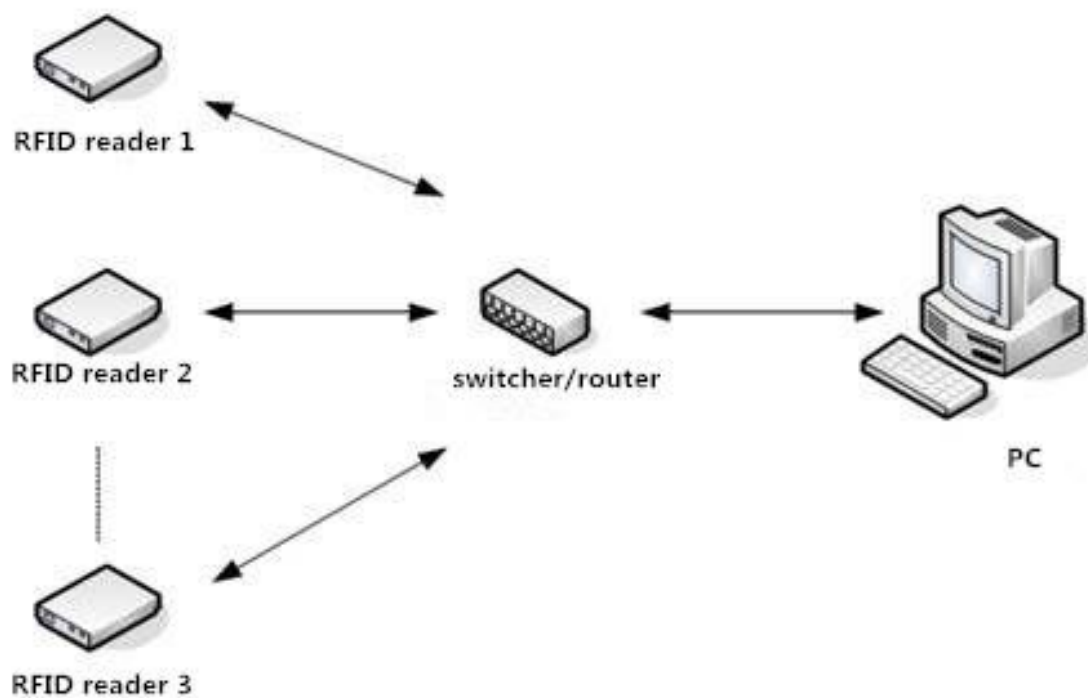
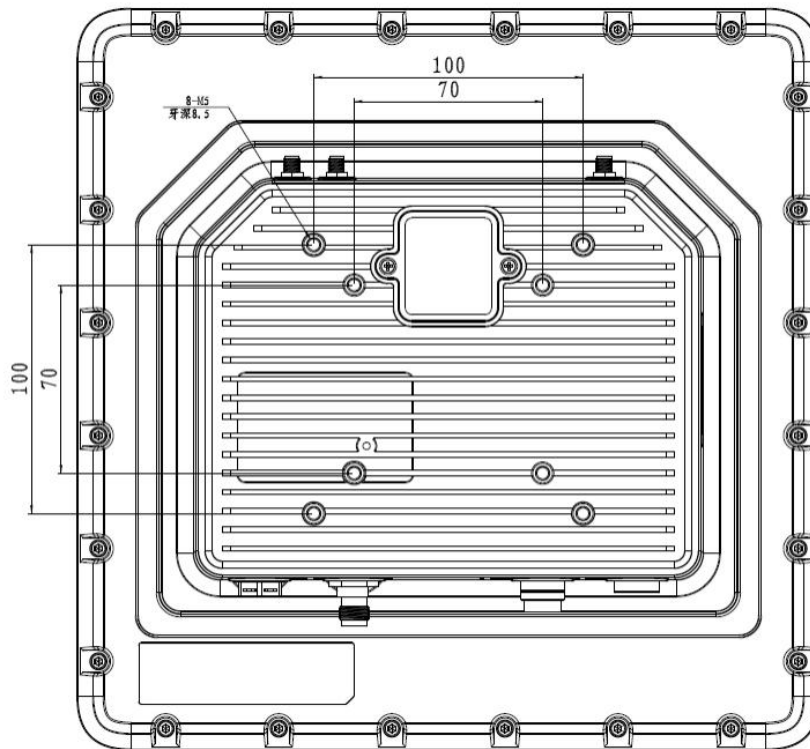


Figure 2-4 Network application connection diagram

3. Installation Instructions



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 HH340/380 reader.

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 Connect Power Adapter Or PoE Switch

a. Connect Power Adapter

- ✧ Plug the power cord into the AC power supply outlet and then plug the other end of the power cord into the power connector of the reader and fasten it.
- ✧ Power on the reader, wait for about 10 seconds, the system completes the initialization process and enters the standby state.

b. Connect PoE Switch

A complete PoE system includes two parts: Power Sourcing Equipment (PSE) and Powered Device (PD). PoE switches are PSE devices, and readers are PD devices. According to the power consumption required by the reader, it belongs to 802.3at class 4 or 802.3bt class 5 devices.

Choose the PoE switch according to the maximum output power of the reader that needs to be used in the actual project.

0dBm to +35.0dBm (PoE++)

0dBm to +33dBm (PoE+)

PD Classes:

IEEE802.3af(PoE) include Class 0~3, IEEE802.3at (PoE+)include Class 4,
IEEE802.3bt(POE++) include Class 5 ~ 8

Class	PD available power	Class	PD available power
0	13W	5	40W
1	3.84W	6	51W
2	6.49W	7	62W
3	13W	8	71W
4	25.5W		

PoE protocols supported by various network cables:

	PoE(AF)	PoE+(AT)	PoE++(BT)
CAT 5E	√	√	
CAT 6	√	√	
CAT 6A UTP	√	√	
CAT 6A FTP	√	√	
CAT 7 S/FTP	√	√	√
CAT 7A S/FTP	√	√	√
CAT 8.2 S/FTP	√	√	√

3.3.2 Connect External Antenna and RF Cable

The reader built with four/eight TNC coaxial cable connectors for connecting external antennas, 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.

3.3.3 Connect to PC

- ✧ The reader is supplied with different dedicated connection cables for the network, USB and power interfaces.
- ✧ USB interface is used for short-distance communication (not greater than 2m), directly connected to the PC USB interface through a USB TYPE-C cable to realize the

communication between the PC and the reader;

- ✧ The RJ45 network port is used for long-distance communication (not greater than 80m), and an extended network cable can be used to connect to a PC.

3.4 Install Reader

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

3.5 Acceptance

The acceptance criteria are mainly given from two aspects: structure and performance.

3.5.1 Structural Acceptance

- ✧ Whether the reader is fixed firmly without looseness;
- ✧ Whether the cables are connected firmly;
- ✧ Whether the screws are tightened.

3.5.2 Performance Acceptance

- ✧ Whether the reader is working normally;
- ✧ Whether the reading range is reasonable.

4. Web page Operation Instructions

4.1 System Login

4.1.1 Login

It is recommended to use Google Chrome to log in. When logging in, please enter the URL of the reader in the address bar, such as: `http://192.168.1.116/`. The login interface is shown in Figure 4.1.1. Enter the username and password, and click the "GO" button to log in. (The default administrator account is admin, and the password is admin)

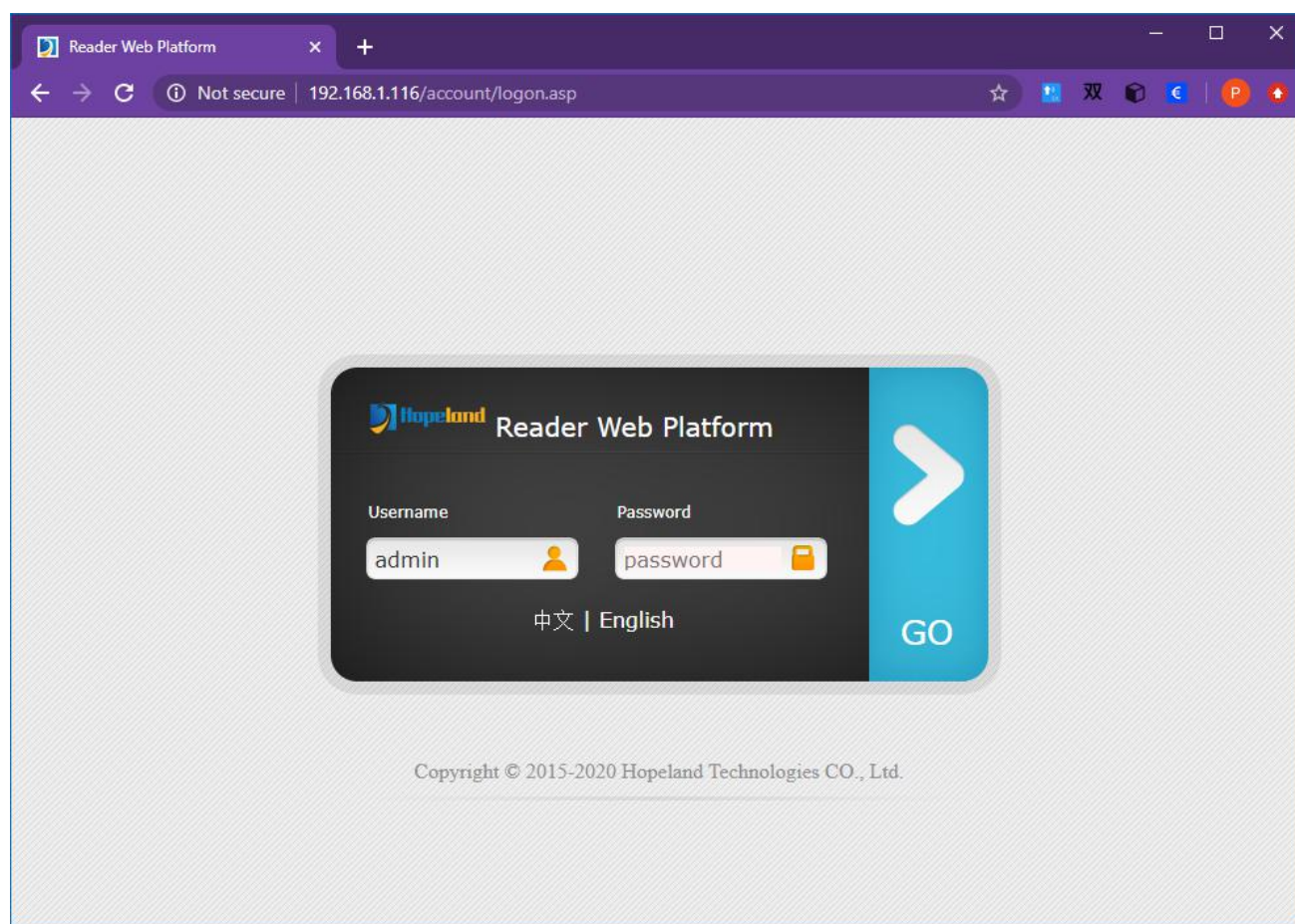


Figure 4.1.1

4.1.2 System Navigation

After login successfully, the system is shown in Figure 4.1.2, the left side of the system is menu navigation, with the functions of parameter configuration and system management; the right side of the system is the current function page, and the default content is the antenna configuration.

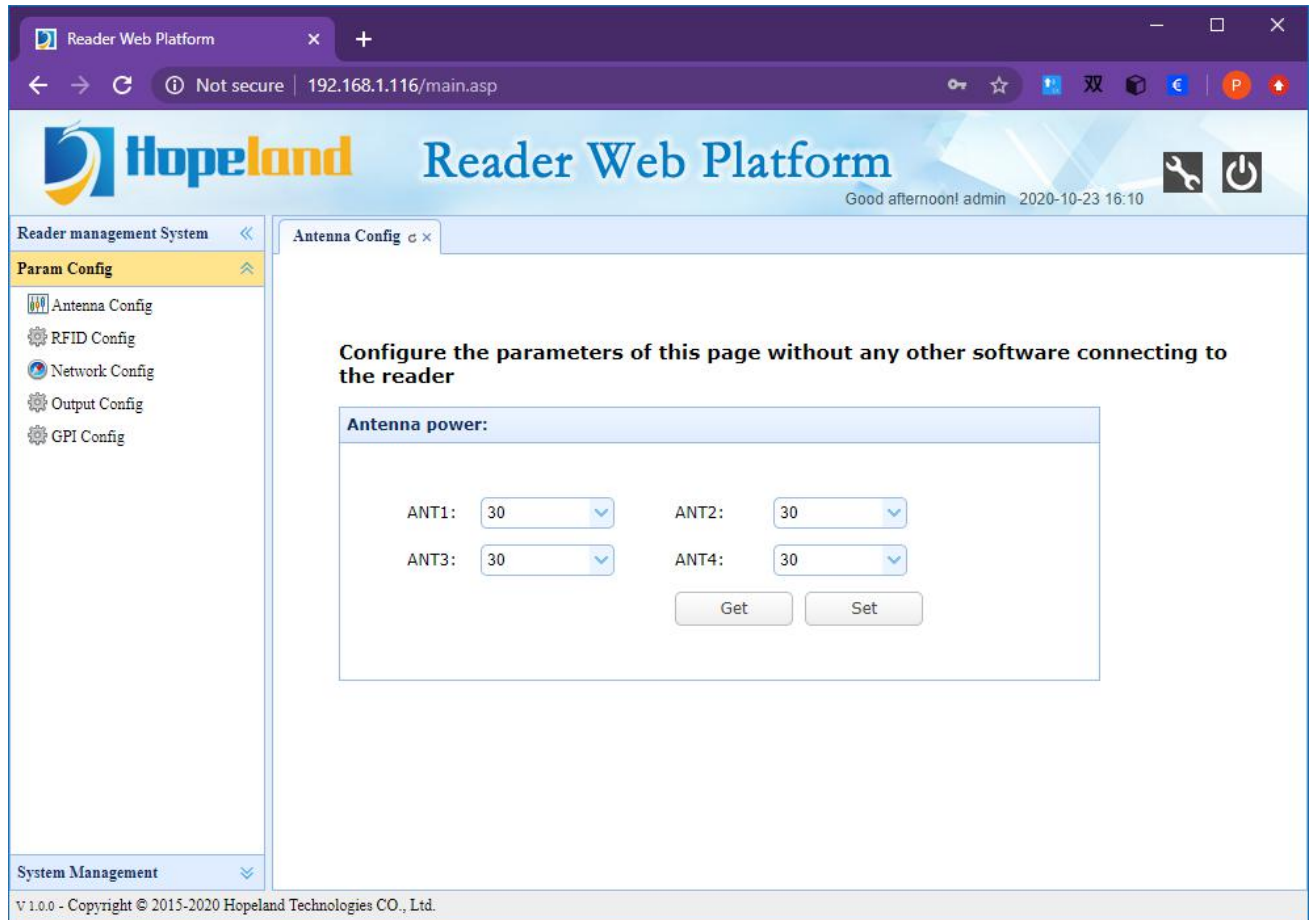


Figure 4.1.2

4.2 Parameter Configuration

The parameter configuration menu contains antenna configuration, RFID configuration, network configuration, output configuration and GPI configuration.

4.2.1 Antenna Configuration

Click Param Config-->Antenna Config under the left navigation to enter the antenna configuration page, which is shown in Figure 4.2.1.1.

In the antenna configuration page, you can set the antenna port RF output power, click the corresponding drop-down list to select the power you want to set and click the Set button, the prompt box of successful configuration will pop up.

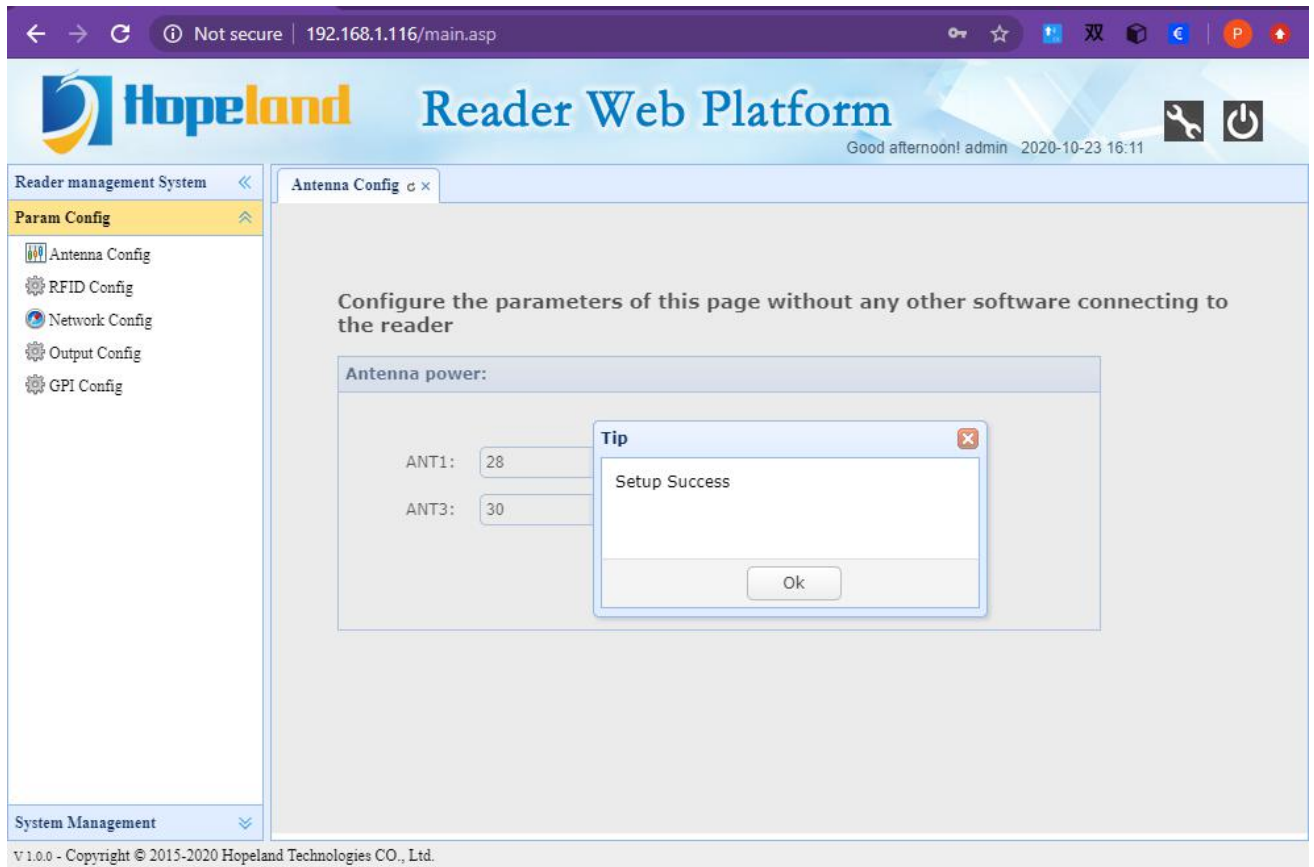


Figure 4.2.1.1

4.2.2 RFID Configuration

Click Param Config-->RFID Config under the left navigation to enter the RFID configuration page, which is shown in Figure 4.2.2.1.

In the RFID configuration page, you can set the frequency range, frequency point list and baseband parameters of the device. The frequency point list is not selectable when the auto option of the frequency hopping is selected. If the reader does not support certain frequency ranges, setting these frequency ranges will fail

You can also set the tag upload filtering parameters, including the duplicate tag upload filtering time and RSSI threshold parameters.

Filter time: The same tag data will be uploaded only once within the specified duplicate tag filter time.

RSSI Threshold: If the RSSI value returned by the tag is lower than the threshold, the tag data will not be uploaded and the tag data will be discarded.

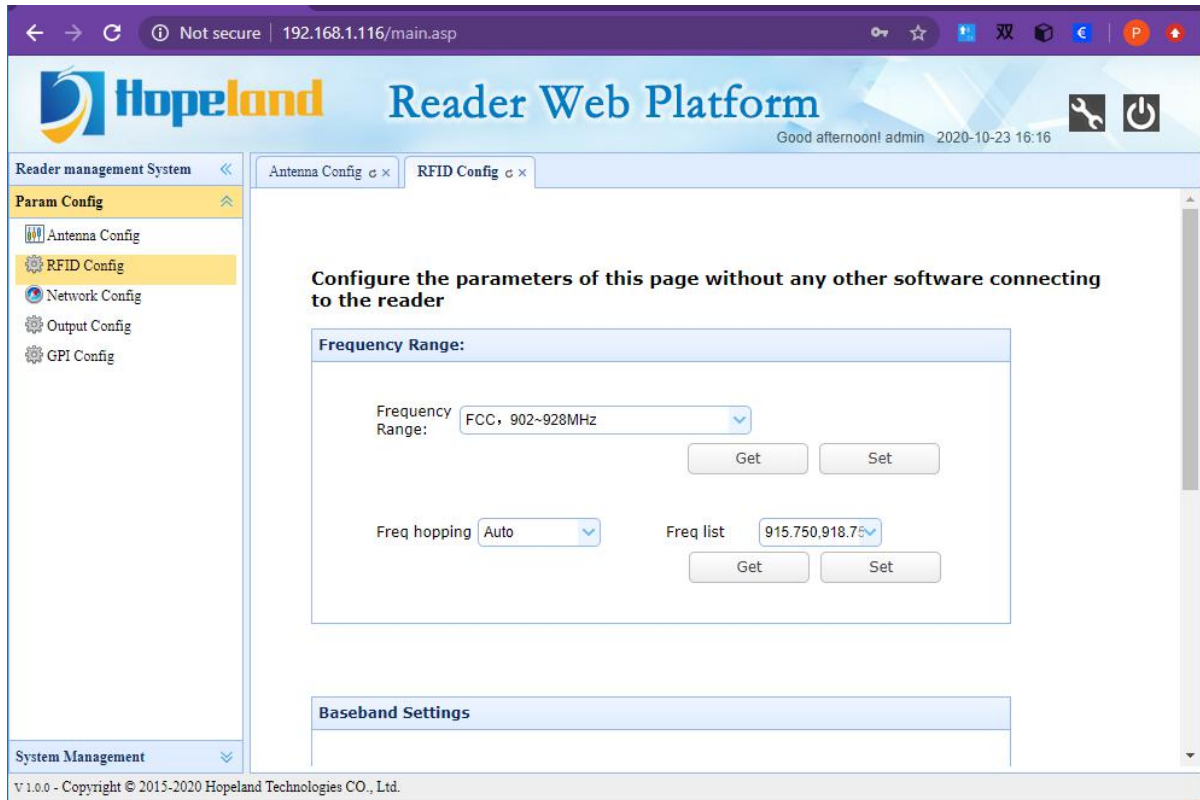


Figure 4.2.2.1

4.2.3 Network Configuration

Click Param Config-->Network Config under the left navigation to enter the Network configuration page, which is shown in Figure 4.2.3.1.

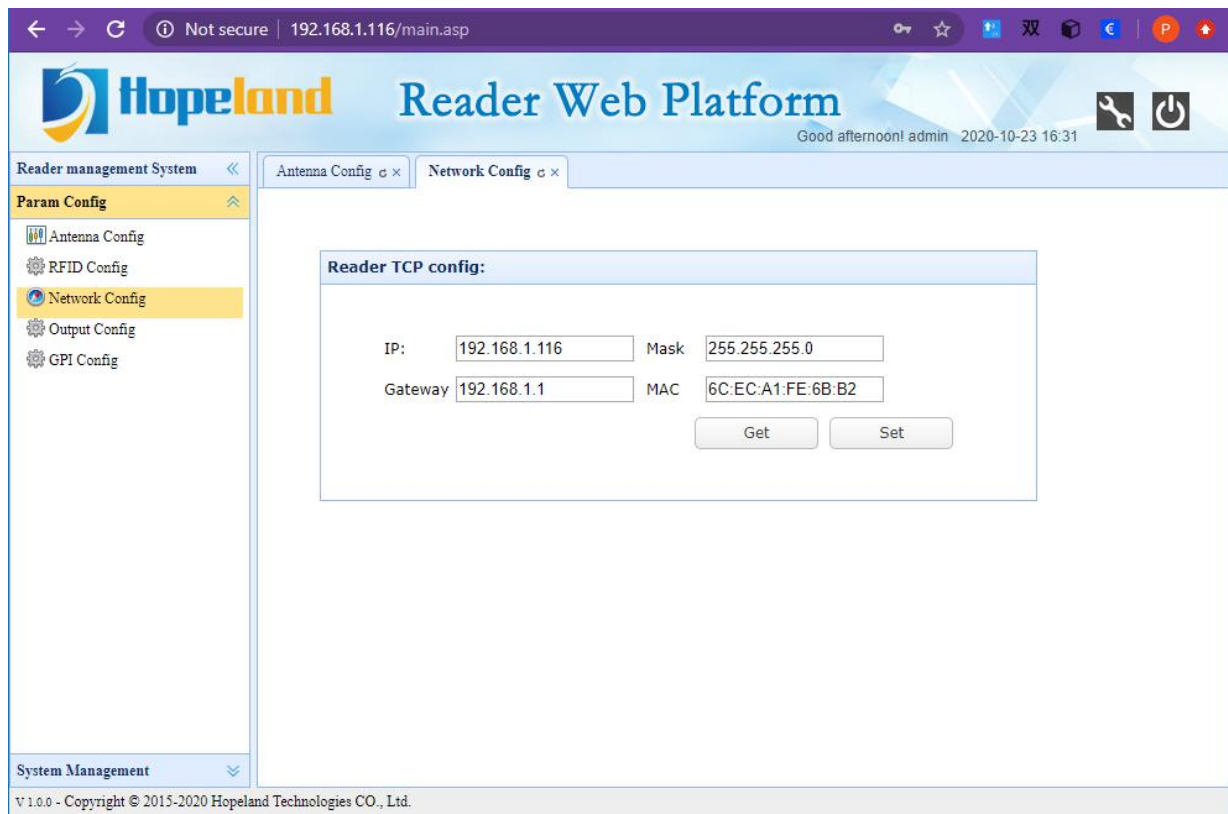


Figure 4.2.3.1

4.2.4 Output Configuration

Click Param Config-->Output Config under the left navigation to enter the output configuration page, which is shown in Figure 4.2.4.1. In this interface, you can customize the data output format, specify the UDP host address and port number, and set wiegand parameters.

The output switch has three options, off, current link output, and UDP, select the current link output if you want to receive custom tag data over the serial port, or select the UDP option if you want to receive custom label data over the network.

Selecting either Current Link Out or UDP means that the custom output data function is enabled.

Note: If the custom output data function is turned on, you will not see any tag data when you use the demo software to test the tag reading, because the tag data at this time is no longer a standard data format, if you want to use the demo software to test the tag reading function, please turn off the custom output data function first.

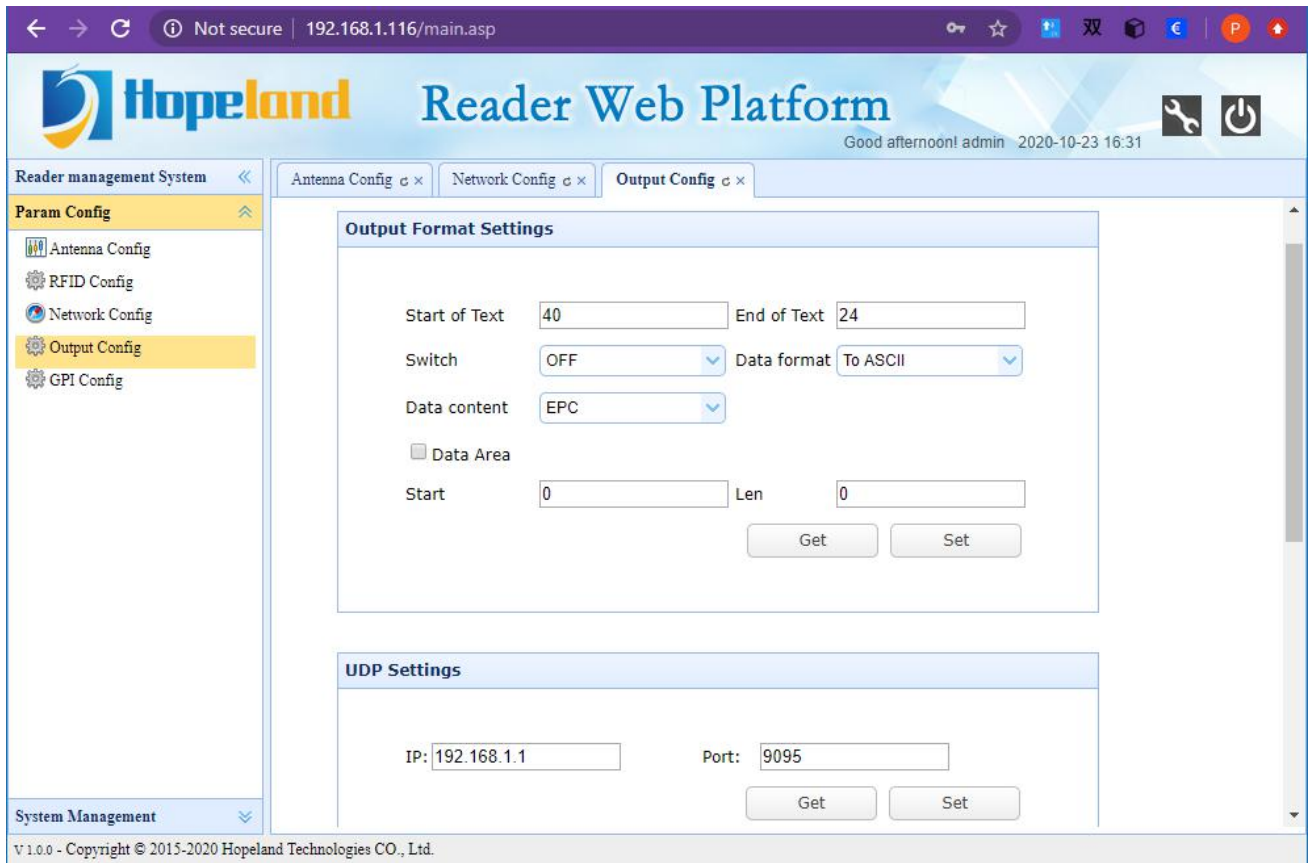


Figure 4.2.4.1

4.2.5 GPI Configuration

Click Param Config-->GPI Config under the left navigation to enter the GPI configuration page, which is shown in Figure 4.2.5.1.

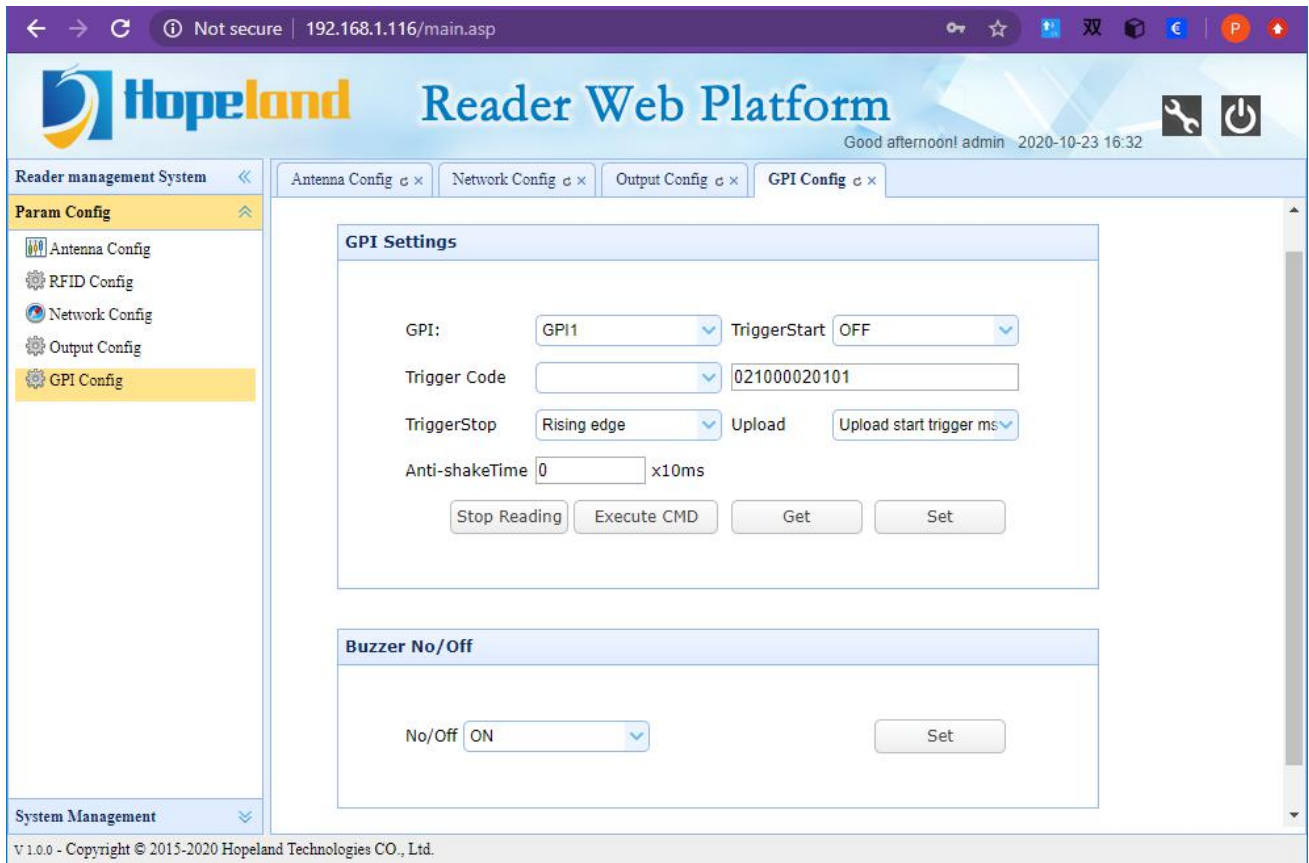


Figure 4.2.5.1

4.2.6 Web Parameter Configuration Example

Assuming an application scenario, this application scenario requires the reader to automatically read tags when the reader is turned on, and the custom tag data is transmitted to the port of the IP address of the designated computer host via UDP at an upload interval of one second. The parameters that need to be configured are as follows:

Repeat tag upload interval

As shown in Figure 4.2.6.1, set RepeatTime to 100x10ms, then the same tag be read multiple times in one second but only uploaded once.

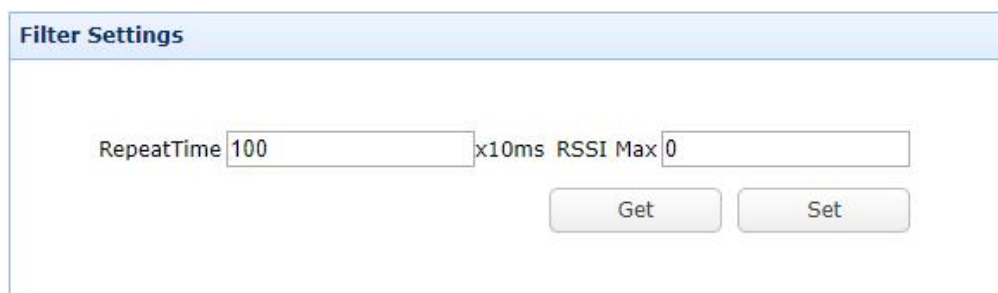
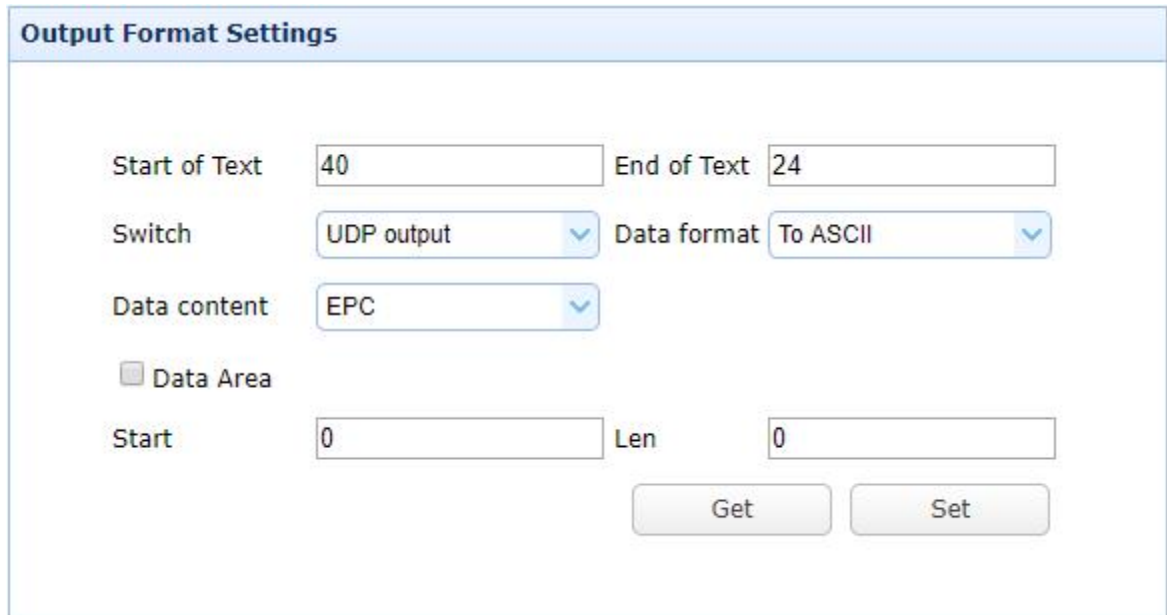


Figure 4.2.6.1

Set custom data format



Output Format Settings

Start of Text: 40 End of Text: 24

Switch: UDP output Data format: To ASCII

Data content: EPC

☐ Data Area

Start: 0 Len: 0

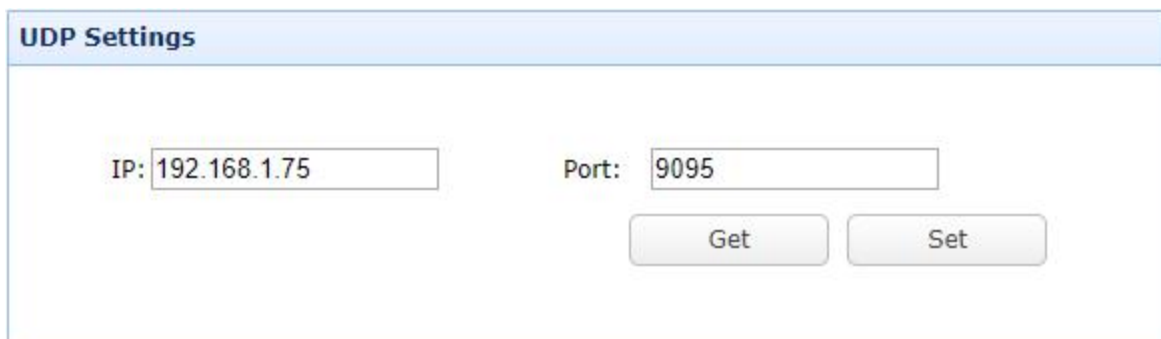
Get Set

Figure 4.2.6.2

Assuming the tag EPC is ABCDED123515D4BB5E580000, then the format of the data output is:

	Head	Tag ID	End
Hex numbers	@	ABCD123515D4BB5E580000	\$
ASCII chars	40	41 42 43 44 45 44 31 32 33 35 31 35 44 24 34 42 42 35 45 35 38 30 30 30 30	

Set the computer IP address and port number used to receive data



UDP Settings

IP: 192.168.1.75 Port: 9095

Get Set

Figure 4.2.6.3

Set GPI to realize automatic tag reading

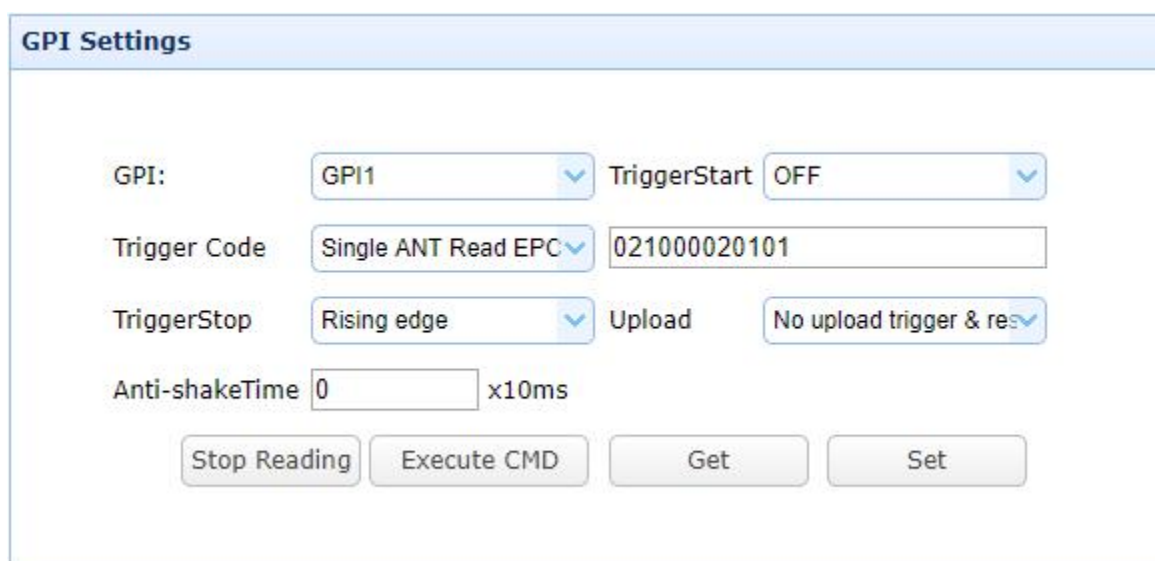


Figure 4.2.6.4

GPI: GPI1

TriggerStart: Low level //We specially designed to realize automatic tag reading by setting the trigger start condition of the reader's GPI1 to low level. In this way, no external sensor is needed, and the reader can automatically execute the preset tag reading command (trigger code)after powering on.

Trigger Code: 021000020101 // Antenna 1 continuously reads EPC, that is, the tag read command executed automatically by the reader after powering on.

Trigger Stop: OFF, that is, do not stop reading, and keep the reader always reading tags.

Upload: Upload when the conditions are met. This parameter does not affect the automatic tag reading function.

After click Execute CMD or restart the reader, the reader starts to read tags and uploads the data to the port of the specified IP address.

Note: When the reader is in the tag reading state, some parameters cannot be configured. If you want to configure other parameters, you need to stop reading first.

Use TCP TEST tool to verify receiving the custom data from the reader:

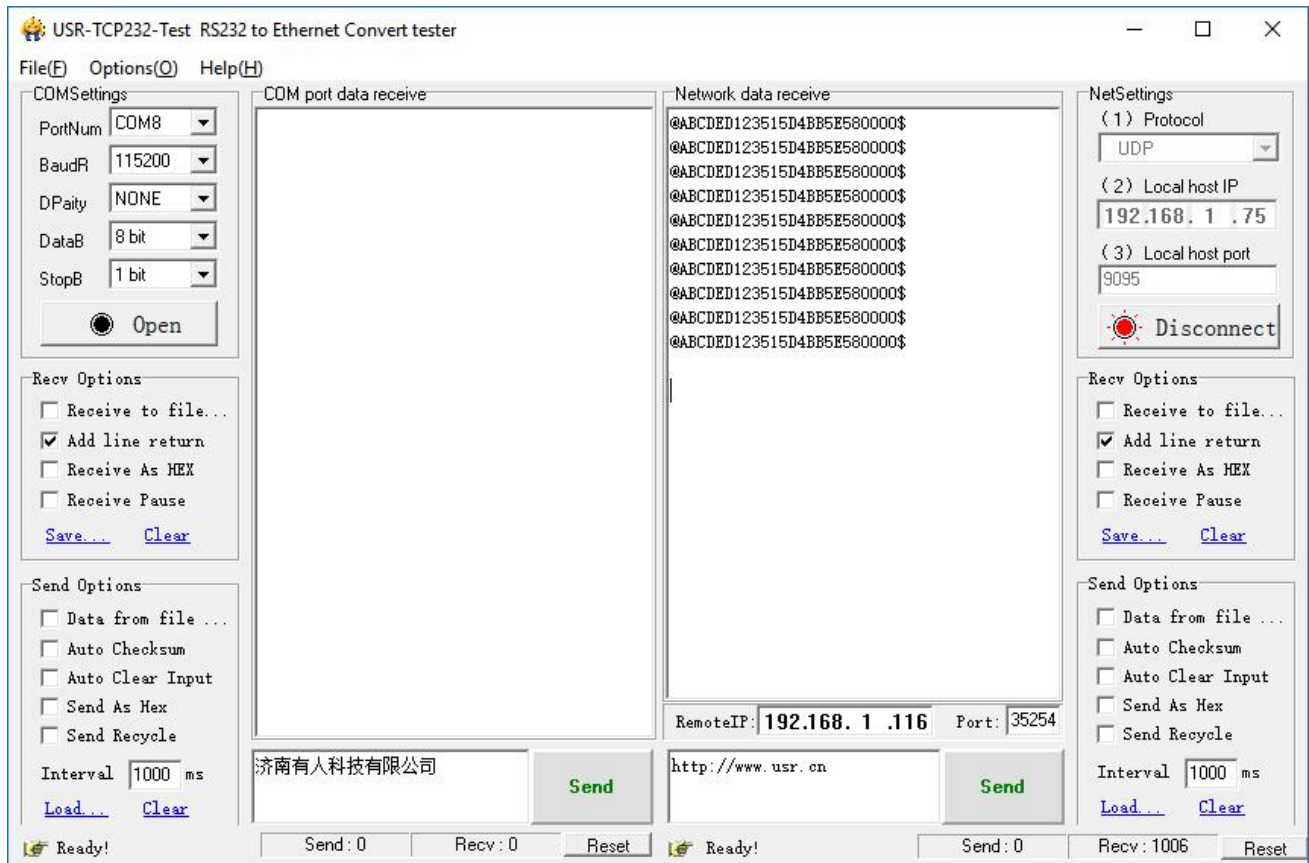
The TCP TEST tool network settings on the computer receiving the data are as follows.

Protocol type: UDP

Local host IP: the host address set in the reader

Local host port: the port number of the host IP address set in the reader

Click the “Listening” button to start the port listening of the TCP TEST tool software, and the tag data will be displayed in real time.



4.3 System Management

The system management menu includes system management and password modification.

4.3.1 System Management

Click System Management-->System Management under the left navigation to enter the system management page, which contains three functional modules: clock synchronization, application software upgrade, and baseband software upgrade. The page is shown in Figure 4.3.1.1.

System management page can view and synchronize system clock, view application version and upgrade application, view baseband software version and upgrade baseband software

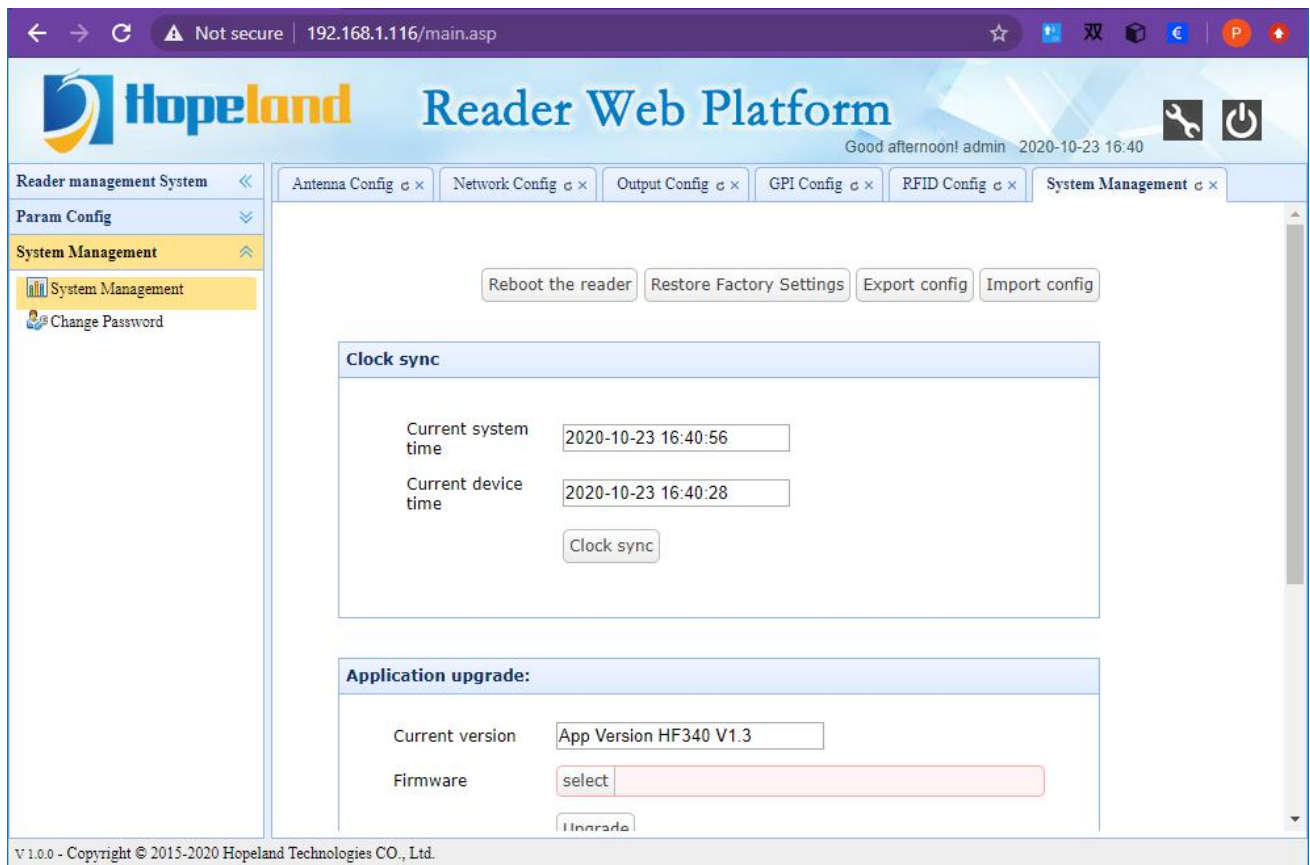
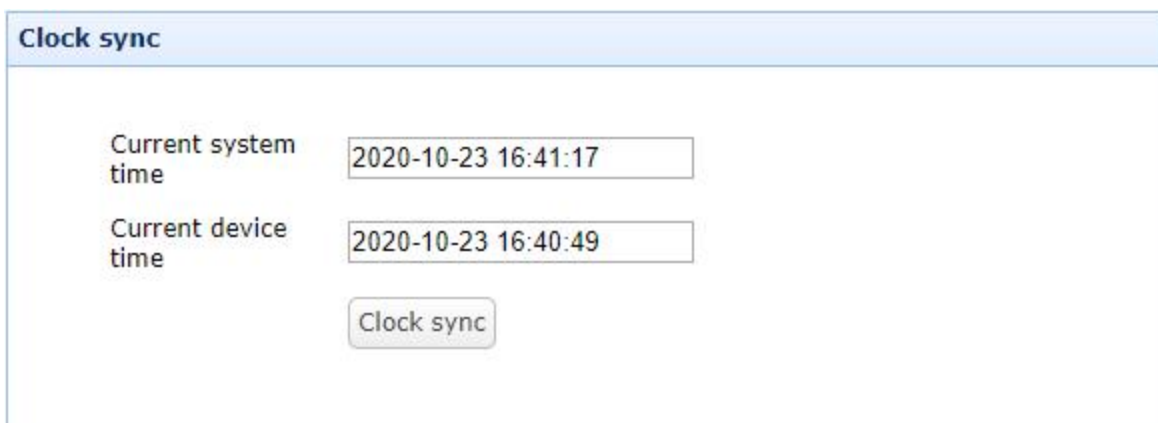


Figure 4.3.1.1

4.3.1.1 Clock Sync

Used to query the reader system clock and synchronize the current computer system clock to the reader



4.3.1.2 Application Upgrade

Click the select button to enter the file selection

Application upgrade:

Current version

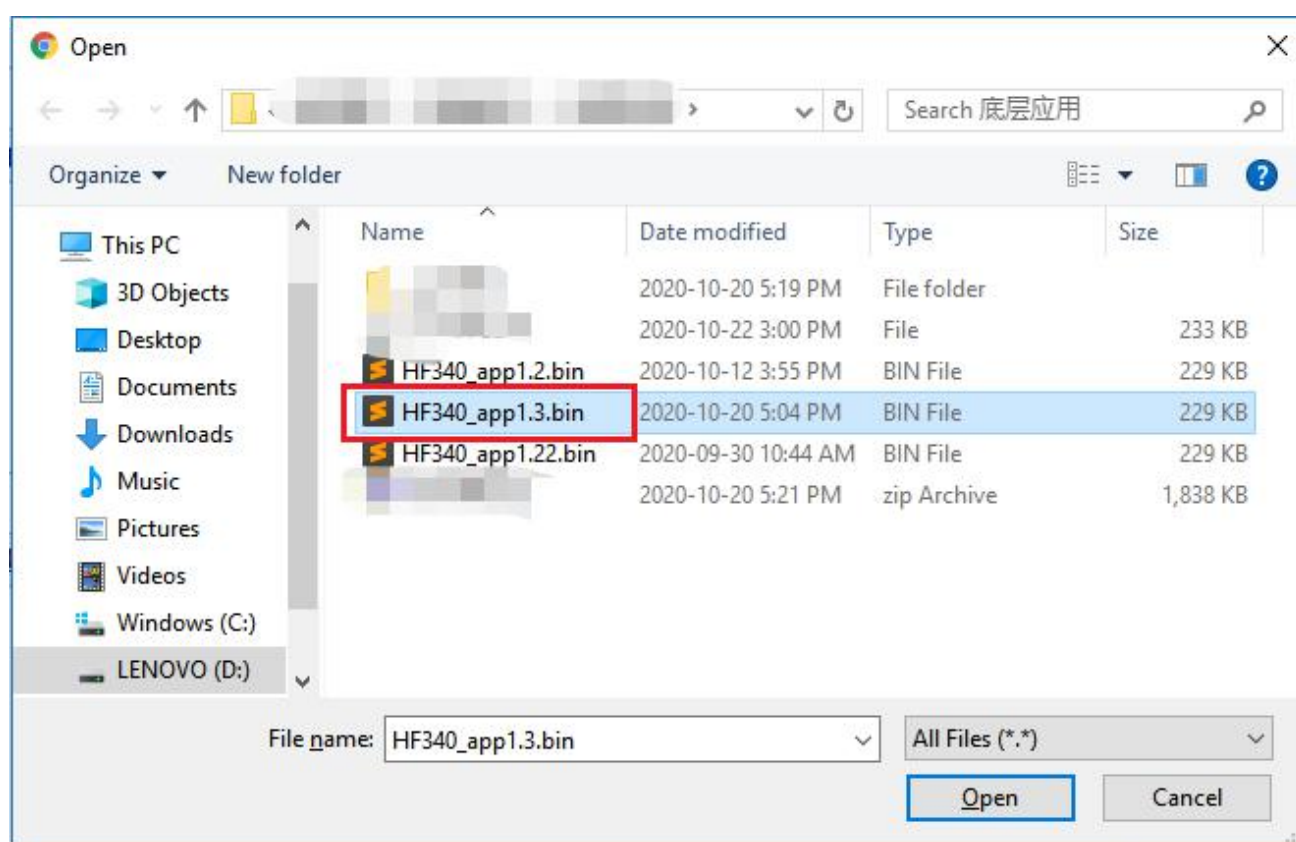
App Version HF340 V1.3

Firmware

select

Upgrade

Select the upgrade file



Click Upgrade

Application upgrade:

Current version

App Version HF340 V1.3

Firmware

select

HF340_app.bin

Upgrade

Wait for the upgrade to complete

Application upgrade:

Current version

App Version H

Firmware

select

HF340

Upgrade

Tip

Success. Please reboot the reader manually to take effect.

Ok

Take effect after restart

4.3.1.3 Baseband Upgrade

The baseband upgrade time is slightly longer than the application software, the upgrade steps are the same as the application software upgrade

Click the select button to enter the file selection

Baseband upgrade:

Current version

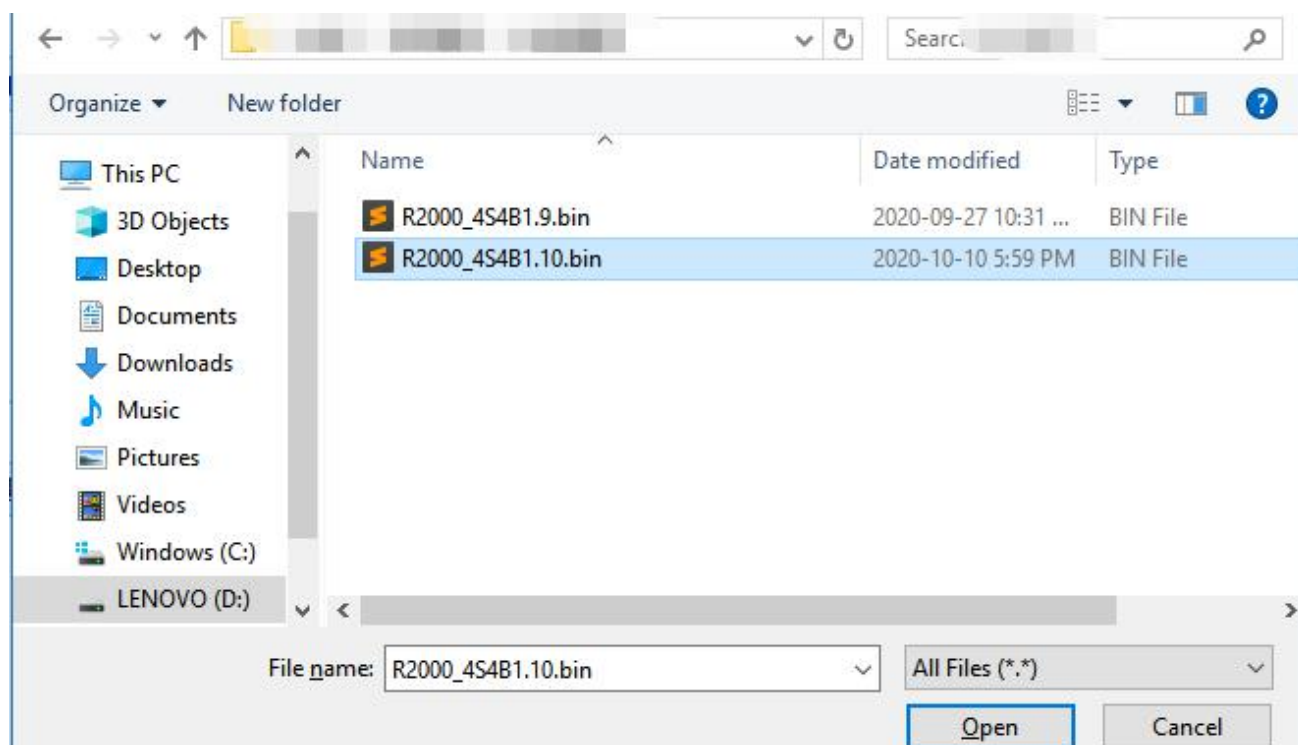
Baseband Version 0.1.10

Firmware

select

Upgrade

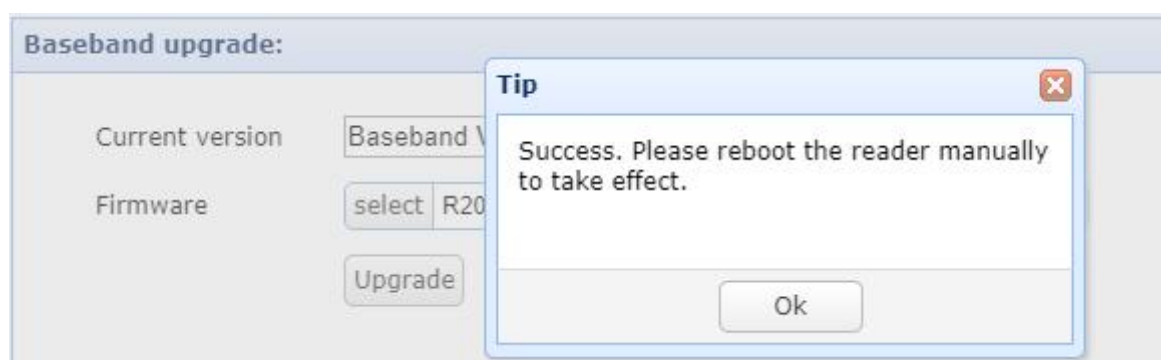
Select baseband software file



Click the upgrade button



Wait for the upgrade to complete



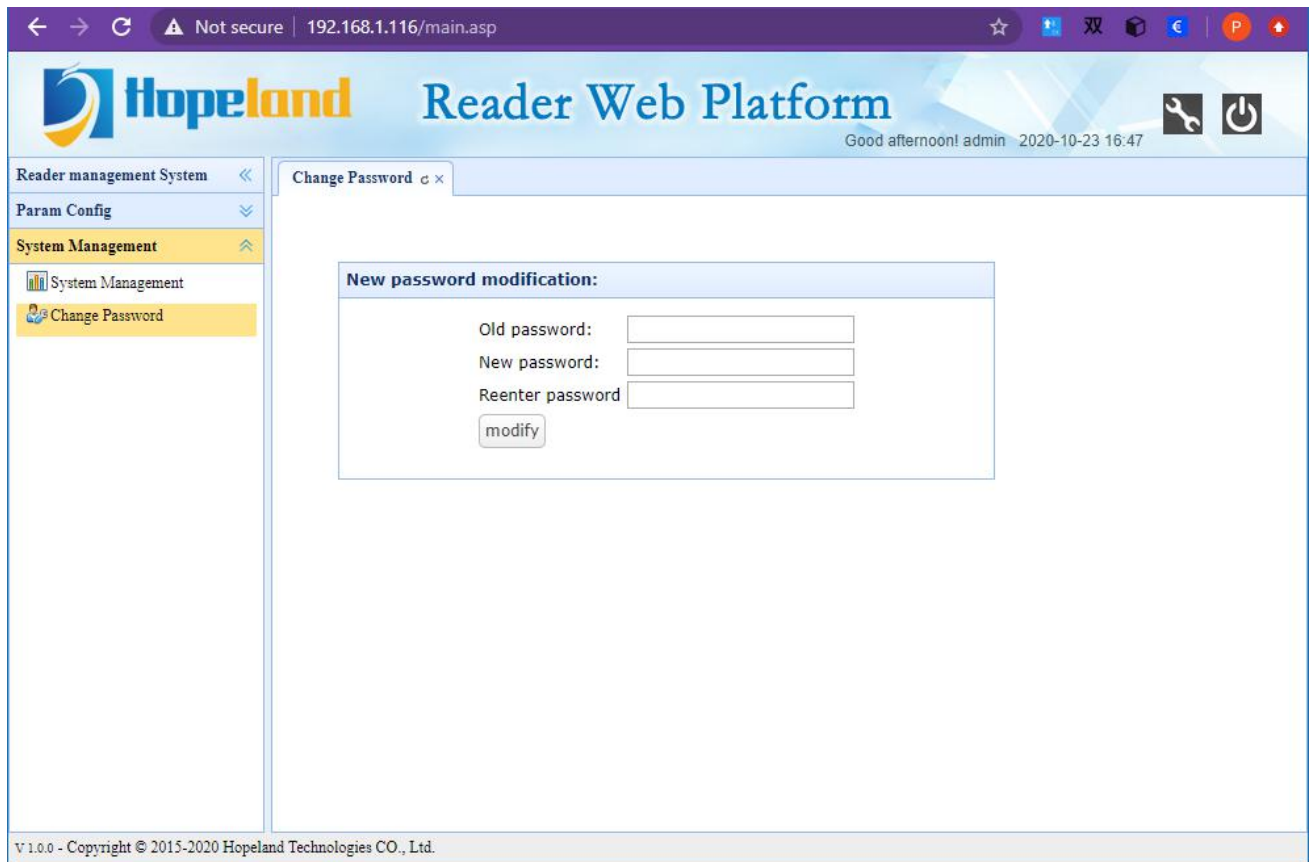
Take effect after restart

4.3.2 Change Password

Click System Management-->Change Password under the left navigation to enter the password modification page, which is used to modify the web login password. The page is shown in Figure 4.3.2.1.

Username: admin

Initial password: admin



The screenshot shows a web browser window with the address bar displaying "192.168.1.116/main.asp". The page title is "Reader Web Platform". The left navigation menu includes "Reader management System", "Param Config", "System Management", "System Management", and "Change Password". The main content area is titled "Change Password" and contains a "New password modification:" section with three input fields for "Old password:", "New password:", and "Reenter password:", followed by a "modify" button. The footer text reads "V 1.0.0 - Copyright © 2015-2020 Hopeland Technologies CO., Ltd.".

Figure 4.3.2.1

5. Common Failures

5.1 Daily Maintenance

Daily maintenance of Sharp 100 reader during use:

- ✧ Check whether the RF connector is tightened
- ✧ Check whether the screws fixing the reader and antenna are loose
- ✧ Check whether the outer shielding layer is disconnected at the RF cable connector
- ✧ Check whether the power cord of the reader is connected firmly

5.2 Common Failure Analysis And Solution

✧ **Power supply system failure:**

Check whether the power supply of the power adapter is normal and whether the AC power supply voltage is between 100V and 240V

✧ **After power on, the panel indicator does not light up:**

Confirm whether the communication is normal, if not, please contact after-sales service.

✧ **The serial port cannot be connected:**

The serial port cable is not connected or not firmly connected

Whether the serial port connection baud rate of the reader is correct

Is the selected COM port correct?

✧ **The network port cannot be connected:**

The default IP address of the Sharp 340/380 reader is set at the factory: 192.168.1.116. Make sure that the IP address of the PC and the IP address of the reader are in the same network segment, such as "192.168.1.XXX". Connect with the reader, if you forget the IP address of the reader, you can reset the IP address of the reader through the serial port connection or pressing reset button for 10 seconds.

✧ **The reader cannot read tags**

- Check if the antenna number is set correctly
- Check if the tag is damaged
- Check whether the tag placement position is within the effective reading and writing range of the reader
- Check whether there is electromagnetic interference between readers or other devices
- For problems that users cannot solve by themselves, please contact after-sales service.

6. Packaging Accessories and Storage

6.1 Package

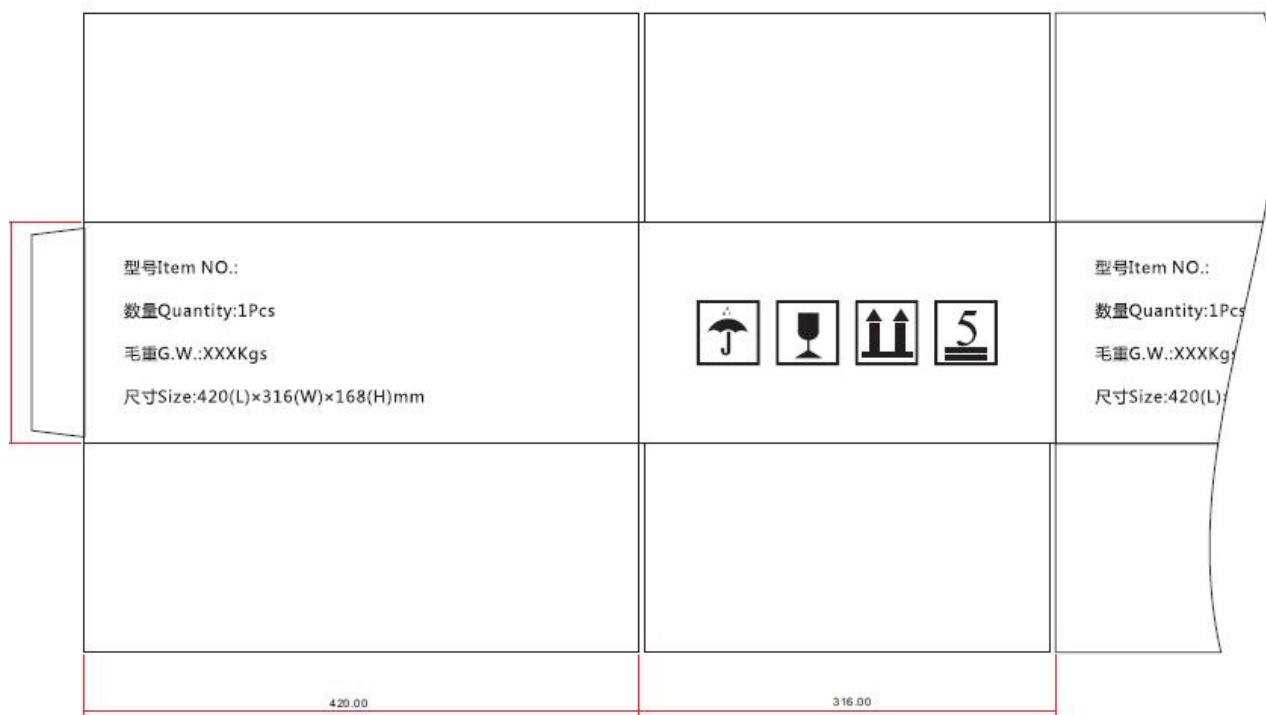


Figure 6-1 Package dimensions

Carton box size: 420mm*316mm*168mm

6.2 Accessories

In order to facilitate future storage and transportation, after unpacking the Shine 340/380 reader, properly store the box and packaging materials. In addition to the reader, the box also includes the accessories required for the use of the product. Please confirm whether the product and accessories are complete according to the product packing list. If there is any discrepancy or damage, please contact the after-sales service in time. The specific packing list is shown in Table 6-1:

Table 6-1 Packing list

No	Name	Unit	Quantity	Remarks
1	Sharp 100	1	Set	Included
2	Power adapter 24V/2.5A	1	Pcs	Included

3	AC power cord	1	Pcs	Included
4	LAN Cable	1	Pcs	Included
5	Customized aviation cable of power and communication	1	Pcs	Included
6	Customized aviation external IO cable	1	Pcs	Included
7	warranty card	1	Pcs	Included
8	Certificate of approval	1	Pcs	Included
9	Installation kit	1	Set	Included

6.3 Storage Requirements

Sharp 340/380 reader should be stored in below conditions:

- ✧ Environmental temperature: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- ✧ Relative humidity: 5% RH \sim 90%RH

7. 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.

Guarantee card of Shenzhen Hopeland Technologies Co., Ltd

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

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. Free maintenance won't be given under the following circumstance:
 - ✧ The damage of the terminal caused by high voltage of the power grid.
 - ✧ The damage caused by misuse or operated improperly.
 - ✧ 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 doesn't have a warranty card.
5. Users will need to fill out the warranty card for repair service, and sent back to Hopeland.