

# HF2211

## Serial Server Device User Manual

V 1.1



### Overview of Characteristic

- ✧ MIPS MCU with 4MB Flash and 8MB SRAM. Run on eCos
- ✧ Support TCP/IP/Telnet /Modbus TCP Protocol
- ✧ Support RS232/RS422/RS485 to Ethernet/Wi-Fi Conversion, Serial Speed Upto 460800 bps
- ✧ Support STA/AP/AP+STA Mode
- ✧ Support Router or Bridge Network Working Mode.
- ✧ Support 10/100M Ethernet Auto-Negotiation
- ✧ Support Easy Configuration Through a Web Interface or PC IOTService Tool
- ✧ Support Security Protocol Such As SSL/AES/DES3
- ✧ Support Web OTA Wirelss Upgrade
- ✧ Wide DC Input 5~36VDC or 9~50VDC
- ✧ Size: 95 x 65 x 25 mm (L x W x H)
- ✧ FCC/CE/RoHS Certificated

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## HISTORY

<b>Ed. V1.0</b>	08-03-2017	First Version
<b>Ed. V1.1</b>	06-07-2017	Update to 1.09j version. IOTService Update to 2.07e.

# 1. PRODUCT OVERVIEW

## 1.1. General Description

The HF2211 provides RS232/RS485/RS422 interface to Ethernet/Wi-Fi connectivity to web enable any device. The HF2211 integrate TCP/IP controller, memory, 10/100M Ethernet transceiver, high-speed serial port and integrates a fully developed TCP/IP network stack and ECos OS. The HF2211 also includes an embedded web server used to remotely configure, monitor, or troubleshoot the attached device.

The HF2211 using highly integrated hardware and software platform, It has been optimized for all kinds of applications in the industrial control, smart grid, personal medical application and remote control that have lower data rates, and transmit or receive data on an infrequent basis.

The HF2211 integrates all serial to Ethernet functionality with 95 x 65 x 25mm size..

## 1.2. Device Features

- MIPS MCU with 4MB Flash and 8MB SRAM
- Support ECos Operation System
- Support TCP/IP、UDP、DHCP、DNS、HTTP Server/Client、ARP、BOOTP、AutoIP、ICMP、Telnet、FTP、TFTP、uPNP、NTP、ModbusTCP Protocol
- Support Serial to 10/100M Ethernet Conversion, Serial Speed Upto 460800 bps
- Support 10/100M Ethernet Auto-Negotiation
- Support STA/AP/AP+STA Wireless Working Mode
- Support Easy Configuration Through a Web Interface
- Support Security Protocol Such As SSL/AES/DES3
- Support Web Wireless Upgrade
- Wide 5~36VDC or 9~50VDC Power Supply
- Size: 95 x 65 x 25mm (L x W x H)
- FCC/CE/RoHS Certificated



### 1.3. Device Parameters

Table 1. HF2211 Technical Specifications

Item	Parameters
<b>System Information</b>	
Processor/Frequency	MIPS/320MHz
Flash/SDRAM	4MB/8MB
Operating System	ECos
<b>Ethernet Port</b>	
Port Number	1 RJ45
Interface Standard	10/100 Base-T Auto-Negotiation
Protection	8KV Isolation
Transformer	Integrated
Network Protocol	IP, TCP, UDP, DHCP, DNS, HTTP Server/Client, ARP, BOOTP, AutoIP, ICMP, Web socket, Telnet, FTP,TFTP, uPNP, NTP, SNMP,Modbus TCP
Security Protocol	SSL v3 AES 128Bit DES3
IPV6 Support	Plan to Support
<b>Wi-Fi Interface</b>	
Standard	802.11 b/g/n
Frequency	2.412GHz-2.484GHz
Network Mode	STA/AP/STA+AP
Security	WEP/WPAPSK/WPA2PSK
Encryption	WEP64/WEP128/TKIP/ AES
Tx Power	802.11b: +20dBm(Max.) 802.11g: +18dBm(Max.) 802.11n: +15dBm(Max.)
Rx Sensitive	802.11b: -89dBm 802.11g: -81dBm 802.11n: -71dBm
Antenna	3dBi Stick Antenna
<b>Serial Port</b>	
Port Number	1 RS232/RS485/RS422
Interface Standard	RS232: DB9 RS485/RS422: 5.08mm connector Support one channel of RS232/RS422/RS485.
Data Bits	8
Stop Bit	1,2
Check Bit	None,Even,Odd,Space,Mark
Baud Rate	TTL: 600 bps~460800 bps
Flow Control	No Flow control Hardware RTS/CTS、DSR/DTR Software Xon/ Xoff flow control
<b>Software</b>	

Web Pages	Http Web Configuration Customization of HTTP Web Pages
Configuration	Web CLI XML import Telnet IOTService PC Software
Firmware Upgrade	Web
SDK For Dev.	Plan to Provide
<b>Basic Parameter</b>	
Size	95 x 65 x 25 mm
Operating Temp.	-45 ~ 70°C
Storage Temp.	-45 ~ 105°C, 5 ~ 95% RH (no condensation)
Input Voltage	5~36VDC or 9~50VDC
Working Current	~200mA
Power	<700mW
<b>Other Information</b>	
Certificate	CE, FCC, RoHS

## 1.4. Key Application

The HF2211 device connects serial device to Ethernet networks using the TCP/IP protocol:

- Remote equipment monitoring
- Asset tracking and telemetry
- Security Application
- Industrial sensors and controls
- Medical devices
- ATM machines
- Data collection devices
- Universal Power Supply (UPS) management units
- Telecommunications equipment
- Data display devices
- Handheld instruments
- Modems
- Time/attendance clocks and terminals

## 2. HARDWARE INTRODUCTION

The HF2211 unit is a complete solution for serial port device connecting to network. This powerful device supports a 10/100BASE-T Ethernet connection, a reliable and proven operating system stored in flash memory, an embedded web server, a full TCP/IP protocol stack, and standards-based (AES) encryption.

Through Ethernet cable connect router with HF2211 serial server for data transfer, which makes the data transformation very simple. HF2211 meet EMC Class B security level, It can pass every countries relevant certification test



Figure 1. HF2211 Appearance

## 2.1. Pins Definition

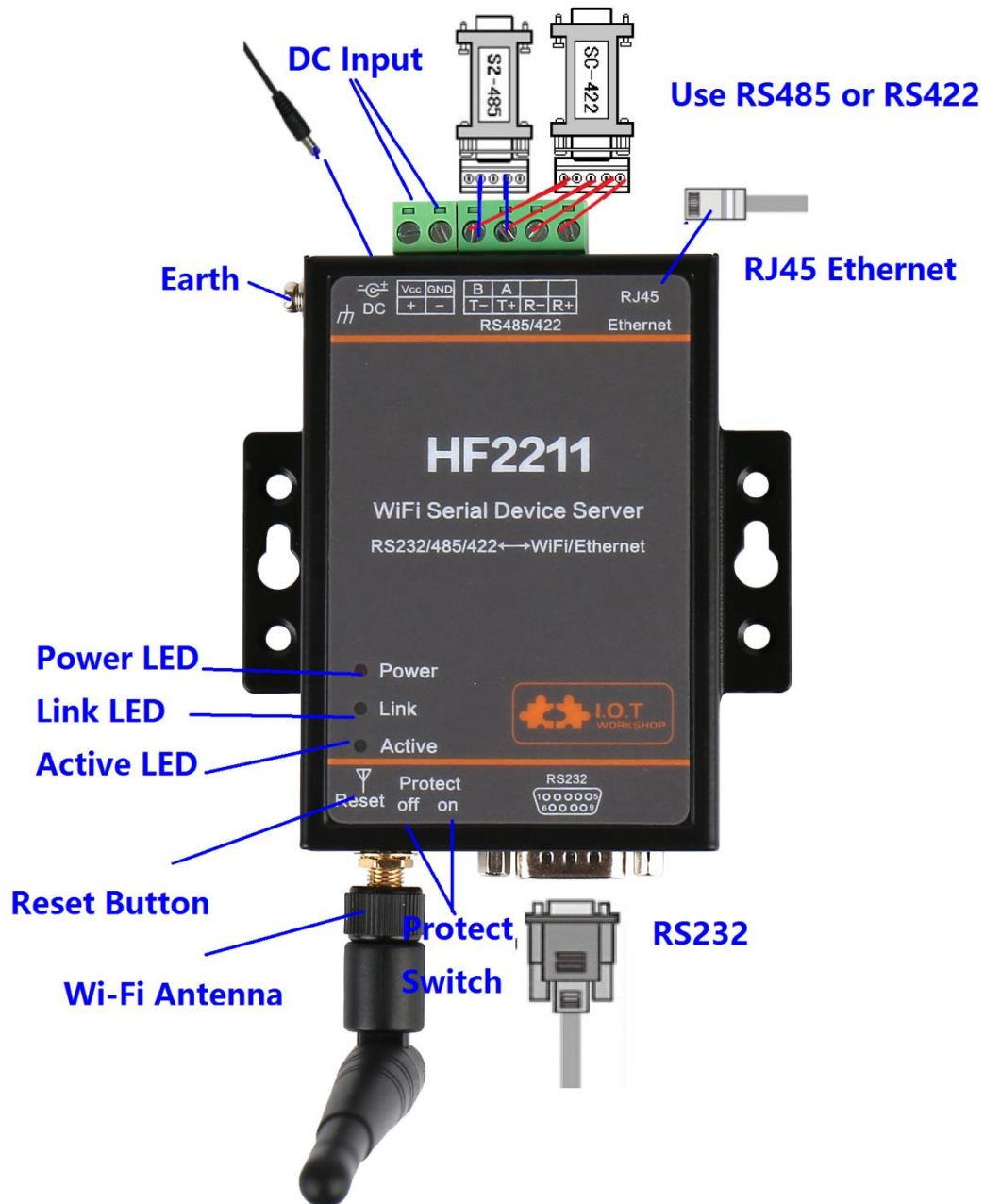


Figure 2. HF2211 Interface

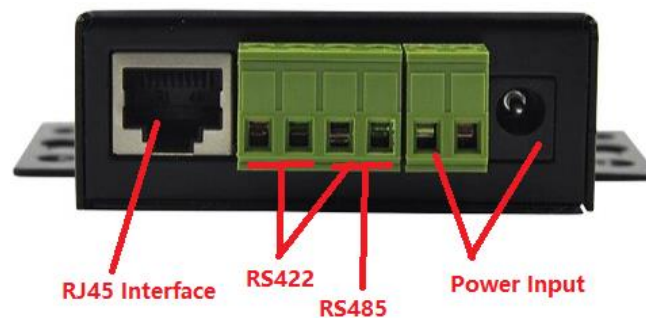


Figure 3. HF2211 Side View

Table 2. HF2211 Interface Definition

Function	Name	Description
External Interface	RJ45 Ethernet	10/100M Ethernet
	SMA	Antenna SMA Interface
	RS232	RS232 Communication
	RS485/RS422	RS485/RS422 Communicaton
	Earth	Protect Earth
	DC Input	DC Power 5~36V Input or 9~50VDC
LED Indicator	Power	Internal Power Supply Indicator On : Power is OK Off : Power is NG
	Link	Connection Indicator On: Ethernet connection or Wi-Fi STA connection is OK Off: No Ethernet connection
	Active	Data transfer Indicator On : Data is transferring. Off : No data transfer
Button	Reset	Restore to factory setting Long press this button for 3seconds and loose it to restore parameters to factory setting. Note : This button of early product is just restart. The hardware has been modified to factory setting now.
Switch	Protect	Device parameter protect On: Enable protect, working parameter can not be modified. Off: Disable protect.

## 2.2. RS232 Interface

Device serial port is male(needle), RS232 voltage level(can connect to PC directly), Pin Order is consistent with PC COM port. Use cross Cable connected with PC(2-3 cross, 7-8 cross, 5-5 direct, 7-8 no connection), see the following table for pin definition.



Figure 4. RS232 Pin Definition(Male/Needle Type)

Table 3. RS232 Interface

Pin Number	Name	Description
2	RXD	Receive Data
3	TXD	Send Data
5	GND	GND
7	RTS	Request to Send
8	CTS	Clear to Send

## 2.3. RS485 Interface

RS485 use two wire links, A(DATA+), B(DATA-). Connect A(+) to A(+), B(-) to B(-) for communication.

The RS485 interface support maximum 32 485 device, special hardware version can support max 255 device. The cable maximum length is 1200 meters. Need to add 120Ohm terminal resistor for over 300 meters.

## 2.4. RS422 Interface

RS422 interface use T+/T-/R+/R-, cross connect to device as the following picture.

Name	Description
TX+	Transfer Data+
TX-	Transfer Data-
RX+	Receive Data+
RX-	Receive Data-

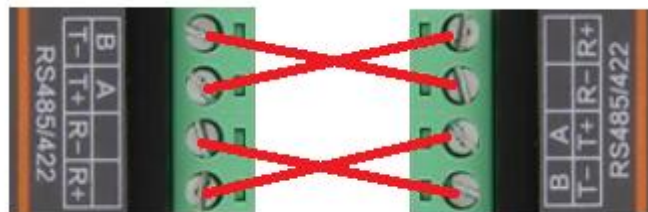


Figure 5. HF2211 RS422 Connection

## 2.5. RJ45 Interface

Ethernet port is 10M/100M adaptive, support AUTO MDI/MDIX which means it support direct connecting to PC with Ethernet cable.

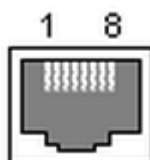


Figure 6. RJ45 Pin Definition

Table 4. RJ45 Interface

Pin Number	Name	Description
1	TX+	Transfer Data+
2	TX-	Transfer Data-
3	RX+	Receive Data+
4	PHY-VCC	Transformer Tap Voltage
5	PHY-VCC	Transformer Tap Voltage
6	RX-	Receive Data-
7	N.C.	None Connect
8	N.C.	None Connect

## 2.6. Mechanical Size

The dimensions of HF2211 are defined as following picture (mm):



Figure 7. HF2211 Mechanical Dimension

## 2.7. Rail Mounting

We support to provide rail for mounting as the following picture.

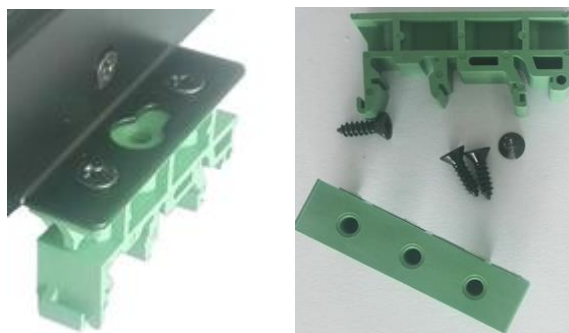


Figure 8. HF2211 Rail

## 2.8. Order Information

Base on customer detailed requirement, HF2211 provide different configuration version, Details as below:



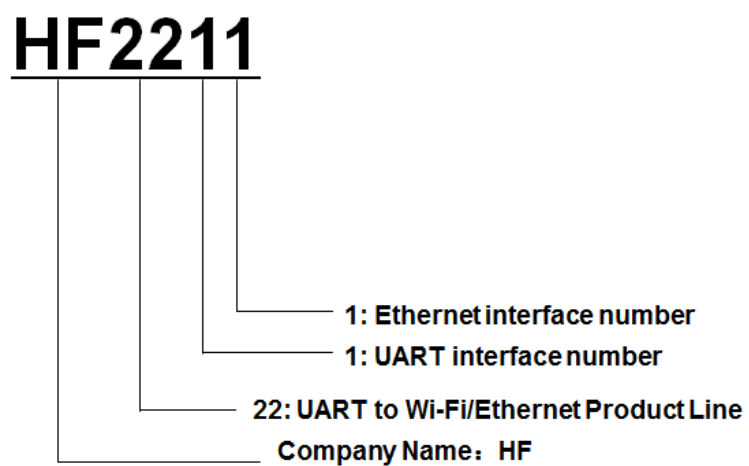


Figure 9. HF2211 Product Order Information

## 2.9. Package Information

1 \* HF2211

1 \* 12V/1A DC adapter

1 \* RS232 cable

1 \* Ethernet cable

1 \* SMA Antenna

## 3. FUNCTIONAL DESCRIPTION

The HF2211 has the following feature:

- Connect customer's device with PC or server via TCP/UDP/Telnet.
- Contain a HTTP web server allow user to configure through browser with PC or phone.
- Have multi-programmable I/O pins used to monitor or control device directly.

### 3.1. Basic Network Protocol

The HF2211 device uses the IP address for network communications. If uses the TCP to assure that no data is lost or duplicated. If use UDP to assure that data can be fast and effective to Destination address.

Supported protocols include:

- ARP, UDP, TCP, ICMP, DHCP, Telnet, DHCP, HTTP Server/Client Web socket
- Telnet command configuration, Web server configuration
- Security Protocol: TLS, AES, DES3 encryption

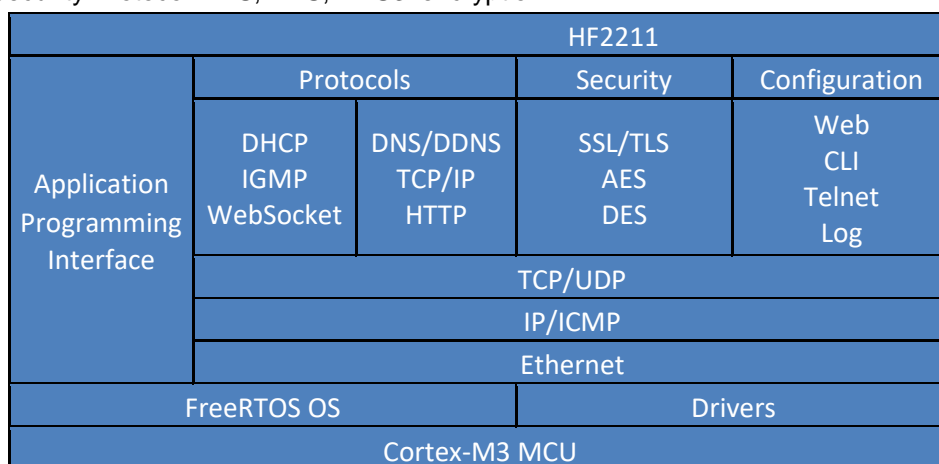


Figure 10. HF2211 Software Protocol Structure

### 3.2. Wireless Network

HF2211 can be set as a wireless STA and AP as well. And logically, it supports two wireless interfaces, one is used as STA and the other is AP. Other STA devices can join into the wireless network through AP interface. So the it can provide flexible networking method and network topology. Functions is as follow:

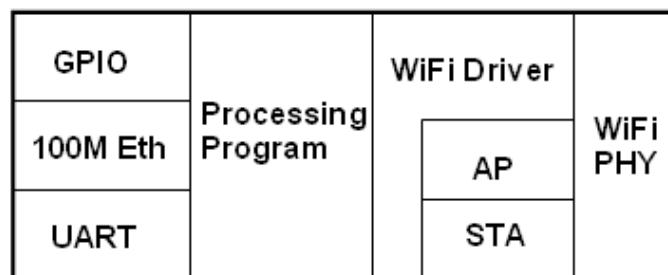


Figure 11. HF2211 Function Structure

## &lt;Introductions&gt;

AP: Wireless access point which is the central joint. Usually, wireless router is a AP, other STA devices can connect with AP to join the network.

STA: Wireless station which is terminal of a wireless network. Such as laptop and pad etc.

**3.2.1. AP Network**

HF2211 can construct a wireless network as AP. All the STA devices will consider the AP as the centre of the wireless network. The mutual communication can be transponded by AP, shown as follow:



Figure 12. General AP Network

### 3.2.2. STA Wireless Network

Take the following picture as example. When router works in AP mode, HF2211 connects to the user's devices by RS232/RS485 interface. In this topology, the whole wireless network can be easily stretched.



Figure 13. STA Application

### 3.2.3. AP+STA Wireless Network

HF2211 can support AP+STA method. It can support AP and STA interface at the same time. Shown as follow:



Figure 14. AP+STA Wireless Network

In this picture, HF2211 open the AP+STA function and the STA interface can be connected to the remote server by the router. Similarly, the AP interface can also be used. Phone/PAD can be connected to the AP interface and to control the serial devices or set itself.

Through AP+STA function, it is convenient to use Phone/PAD to monitor the user' s devices and not change its original settings.

Through AP+STA function, it is convenient to configure the product.And it solves the problem that the formal product can only configure by serial port.

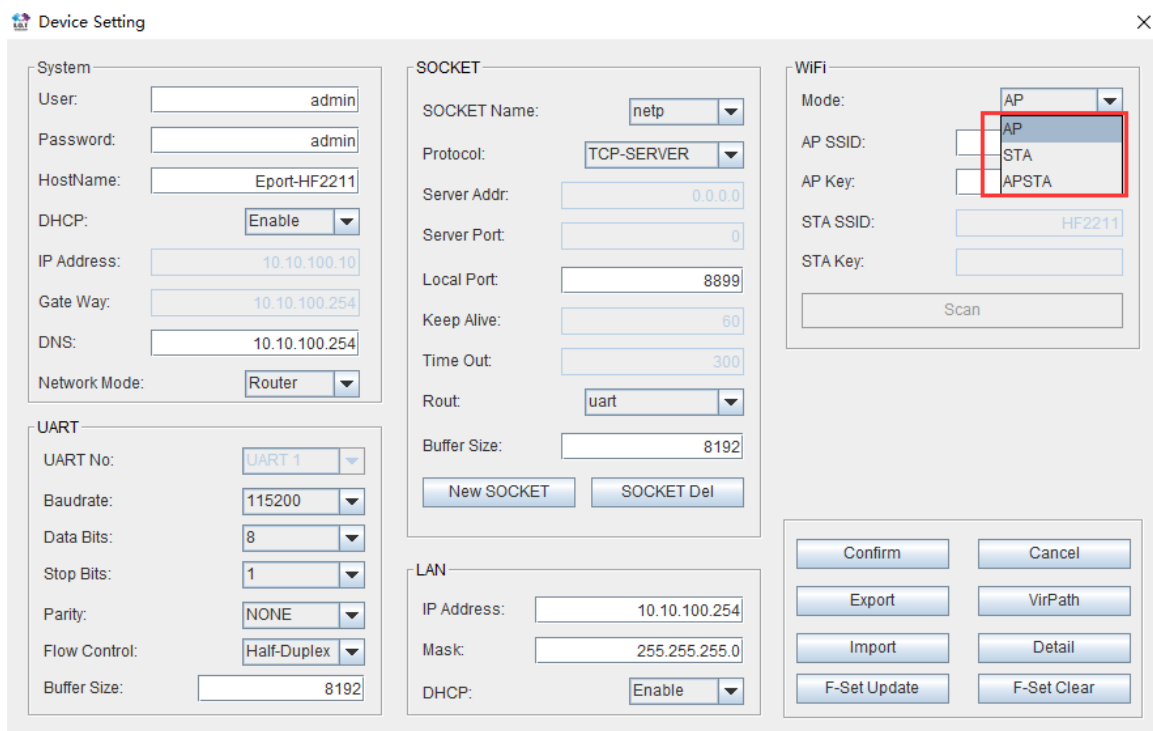
Notes that:

When the AP+STA function is opened, the STA interface needs to connect to other router. Otherwise, STA interface will endlessly scan the router information nearby. When it is scanning, it will bring bad effects to the AP interface, like losing data etc.

AP and STA parts must set to the different sub-network for the product working as APSTA mode.

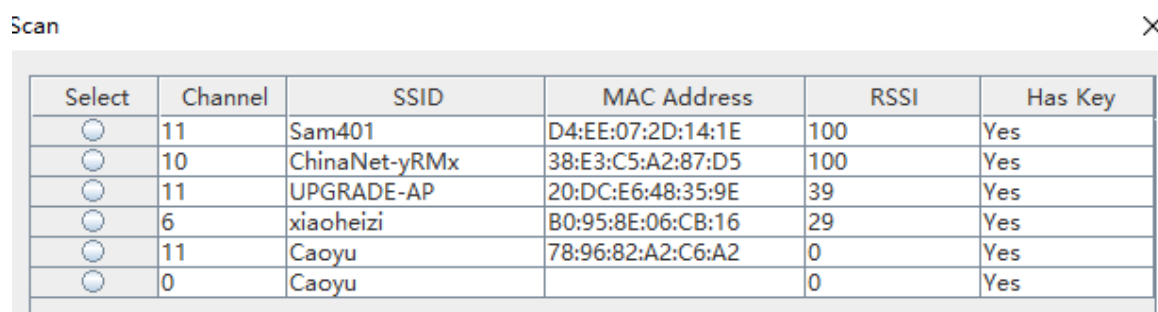
### 3.2.5. IOTService Software

Open the IOTService after connect to the AP hotspot generated by HF2211 or connect to Product Ethernet port to PC, then configure the parameter.



The screenshot shows the 'Device Setting' window with the 'WiFi' tab selected. The 'Mode' dropdown is set to 'AP+STA'. The 'AP SSID' is empty, 'AP Key' is empty, 'STA SSID' is 'HF2211', and 'STA Key' is empty. A red box highlights the 'Mode' dropdown menu.

Figure 16. Configure Wi-Fi Parameter



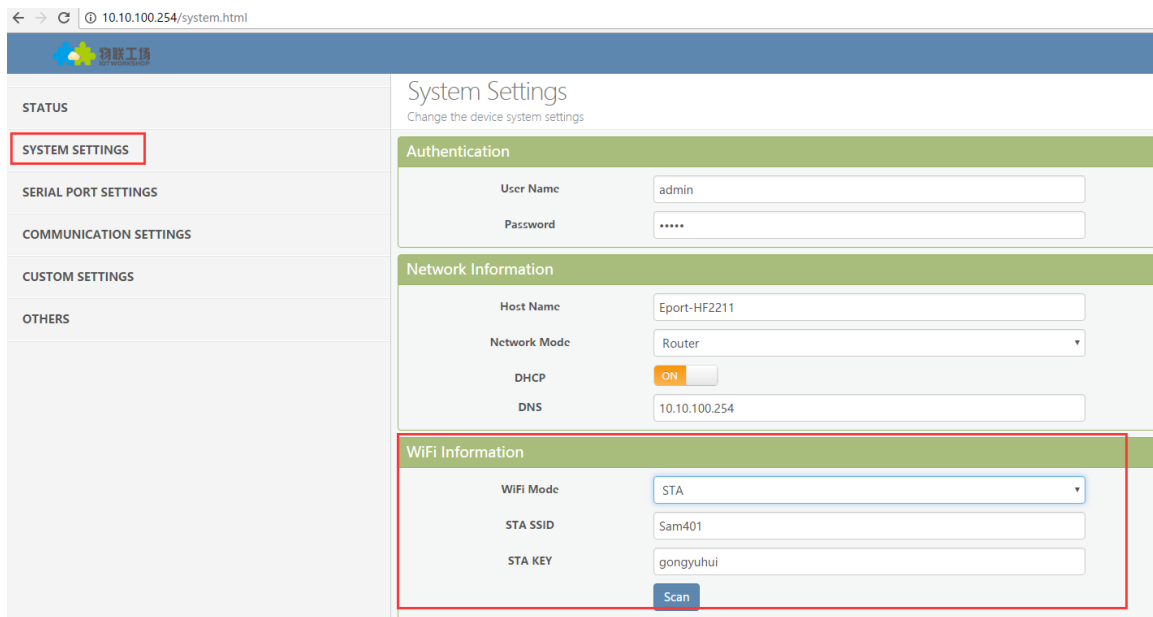
The screenshot shows the 'Scan' window with a table of detected Wi-Fi networks. The table has columns: Select, Channel, SSID, MAC Address, RSSI, and Has Key.

Select	Channel	SSID	MAC Address	RSSI	Has Key
<input type="radio"/>	11	Sam401	D4:EE:07:2D:14:1E	100	Yes
<input type="radio"/>	10	ChinaNet-yRMx	38:E3:C5:A2:87:D5	100	Yes
<input type="radio"/>	11	UPGRADE-AP	20:DC:E6:48:35:9E	39	Yes
<input type="radio"/>	6	xiaoheizi	B0:95:8E:06:CB:16	29	Yes
<input type="radio"/>	11	Caoyu	78:96:82:A2:C6:A2	0	Yes
<input type="radio"/>	0	Caoyu		0	Yes

Figure 17. STA Scan Parameter

### 3.2.6. Webpage Configuration

Use PC to connect with HF2211 through its AP hotspot or Ethernet connection. Input the default IP(10.10.100.254, default username and password: admin/admin) to login the webpage to configure the parameter.



← → 10.10.100.254/system.html

**System Settings**  
Change the device system settings

**Authentication**

User Name: admin  
Password: \*\*\*\*\*

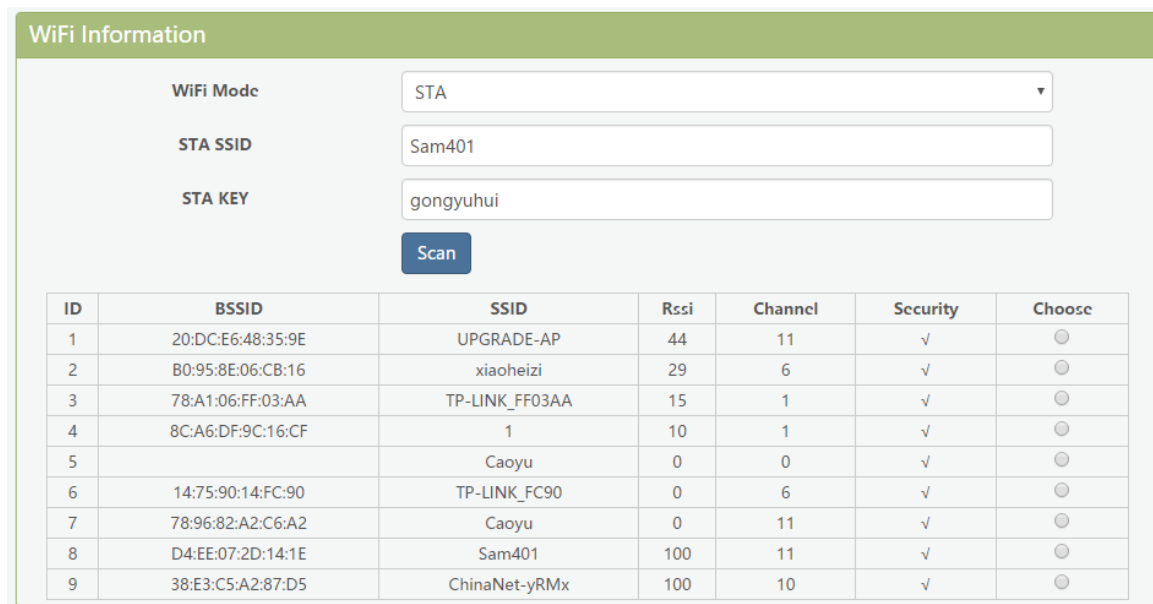
**Network Information**

Host Name: Eport-HF2211  
Network Mode: Router  
DHCP: ON  
DNS: 10.10.100.254

**WiFi Information**

WiFi Mode: STA  
STA SSID: Sam401  
STA KEY: gongyuhui  
Scan

Figure 18. Configure the Wi-Fi Parameter



**WiFi Information**

WiFi Mode: STA  
STA SSID: Sam401  
STA KEY: gongyuhui  
Scan

ID	BSSID	SSID	Rssi	Channel	Security	Choose
1	20:DC:E6:48:35:9E	UPGRADE-AP	44	11	√	<input type="radio"/>
2	B0:95:8E:06:CB:16	xiaoheizi	29	6	√	<input type="radio"/>
3	78:A1:06:FF:03:AA	TP-LINK_FF03AA	15	1	√	<input type="radio"/>
4	8C:A6:DF:9C:16:CF	1	10	1	√	<input type="radio"/>
5		Caoyu	0	0	√	<input type="radio"/>
6	14:75:90:14:FC:90	TP-LINK_FC90	0	6	√	<input type="radio"/>
7	78:96:82:A2:C6:A2	Caoyu	0	11	√	<input type="radio"/>
8	D4:EE:07:2D:14:1E	Sam401	100	11	√	<input type="radio"/>
9	38:E3:C5:A2:87:D5	ChinaNet-yRMx	100	10	√	<input type="radio"/>

Figure 19. STA Scan

### 3.3. Ethernet Interface Function

HF2211 provides with a 100M Ethernet interface. Through the 100M Ethernet interface, user can achieve the connection among WIFI, serial port and Ethernet port.

#### 3.3.1. Ethernet Port with Wi-Fi

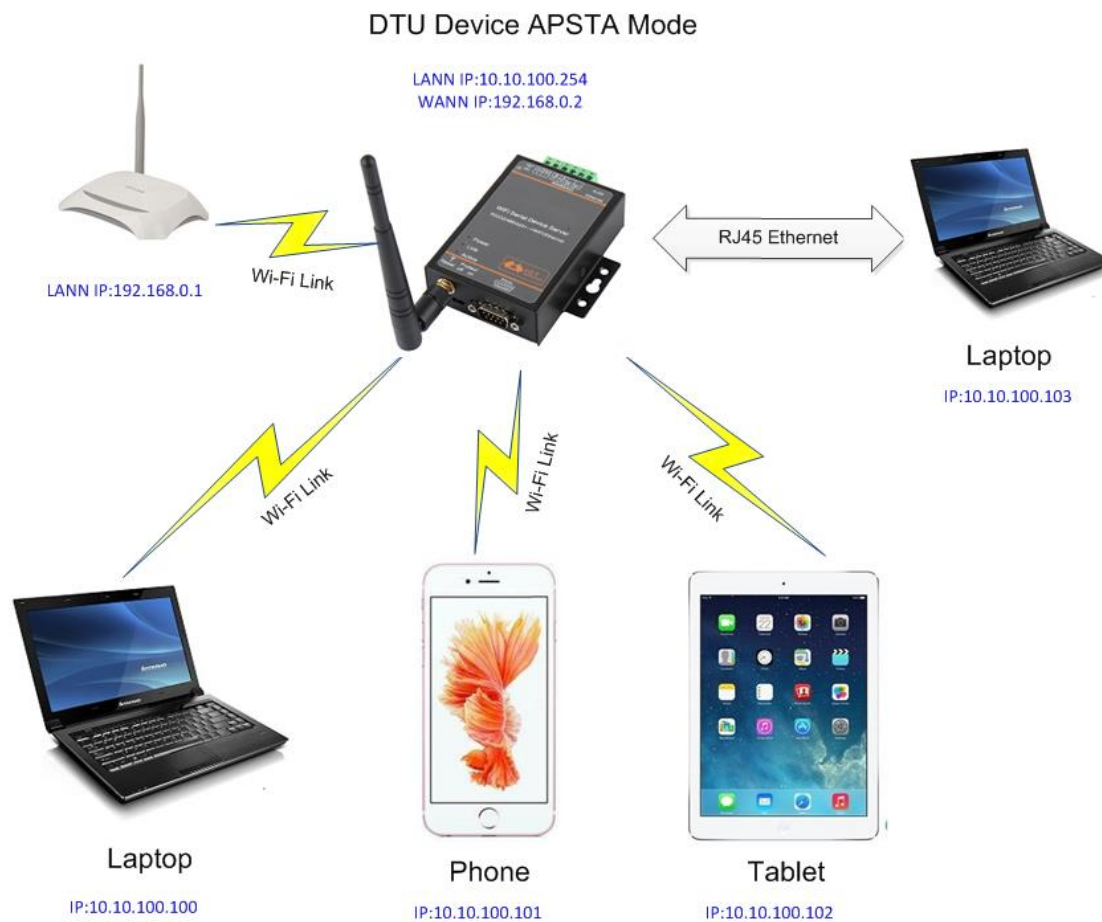
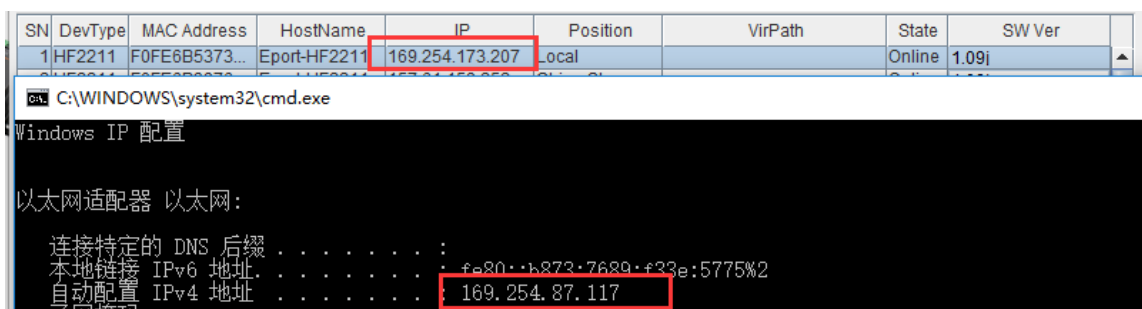


Figure 20. Ethernet Interface Function

HF2211 servers as APSTA and generate a central network. The IP addresses of all the devices and module's are in the same network segment.

Note:

If product works in AP mode, then the Ethernet is working as WANN mode, PC will use Auto-IP to set its IP when connect via Ethernet. Better to change via Wi-Fi, then the PC and other devices are all in same subnetwork.(10.10.100.xxx)





### 3.3.2. Ethernet Interface Function(Router)



Figure 21. Ethernet Interface Function(Router)

The HF2211 device Ethernet interface work in router mode. When connect to router, it will get IP address from router(as picture 192.168.1.100). The product itself generate a subnet(10.10.100.254 default). The device from the Ethernet interface is assigned with IP address by module (10.10.100.101 ).Then the device and the PC1 are in the same subnet for network communication. A connection fro PC1 to PC2, but PC2 cannot actively connect to PC1.

Device Setting

System

User: admin

Password: admin

HostName: Eport-HF2211

DHCP: Enable

IP Address: 10.10.100.10

Gate Way: 10.10.100.254

DNS: 10.10.100.254

Network Mode: Router

UART

UART No:

Baudrate: 115200

Data Bits: 8

Stop Bits: 1

Parity: NONE

Flow Control: Half-Duplex

Buffer Size: 8192

SOCKET

SOCKET Name: netp

Protocol: TCP-SERVER

Server Addr: 0.0.0.0

Server Port: 0

Local Port: 8899

Keep Alive: 60

Time Out: 300

Rout: uart

Buffer Size: 8192

New SOCKET

SOCKET Del

WiFi

Mode: AP

AP SSID: HF2211\_73C0

AP Key:

STA SSID: HF2211

STA Key:

Scan

LAN

IP Address: 10.10.100.254

Mask: 255.255.255.0

DHCP: Enable

Confirm

Cancel

Export

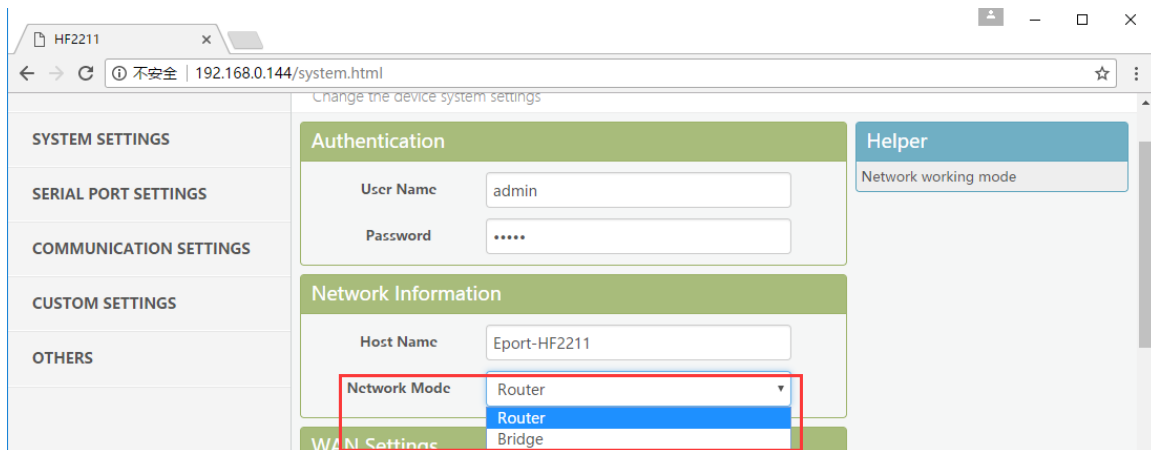
VirPath

Import

Detail

F-Set Update

F-Set Clear



### 3.3.3. Ethernet Port Function(Bridge)

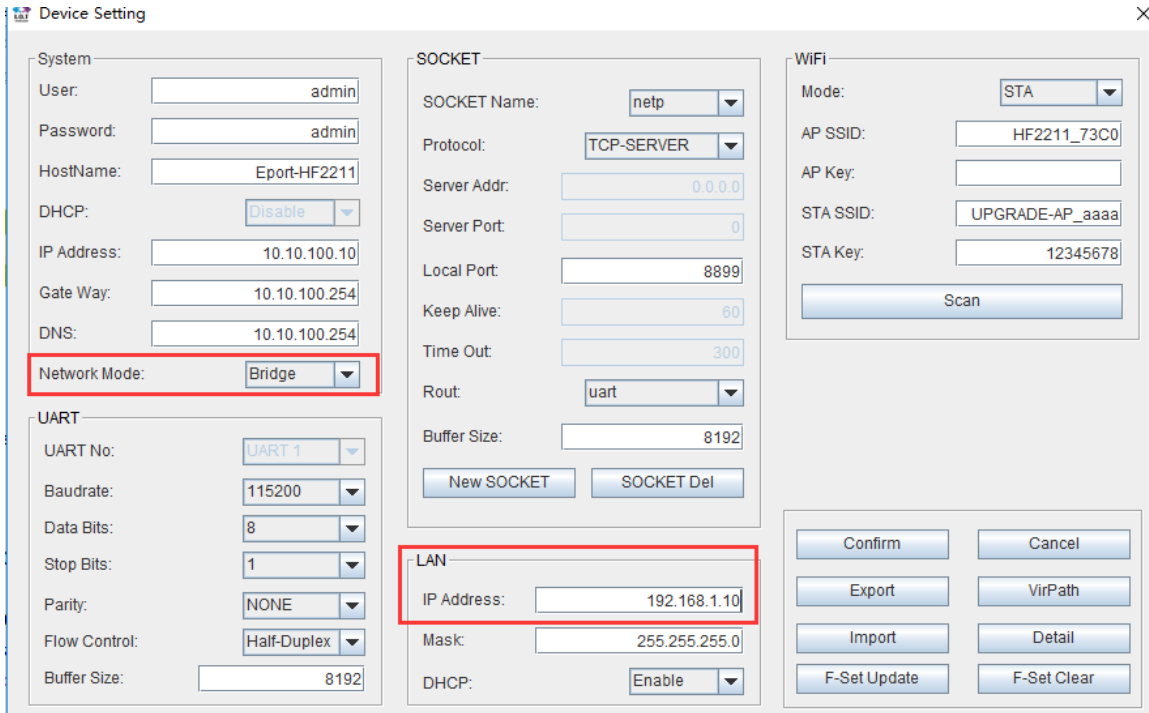


Figure 22. Ethernet Port Function(Bridge)

The HF2211 device Ethernet interface work in router mode. When connect to router, it will get IP address from router(as picture 192.168.1.101). AT the whole network, the product is like an invisible device. PC1 ad PC2 can communicated mutually without any constraint. But if product needs to connect with other devices, it needs set LAN IP address(192.168.1.10 as picture)

Notes:

Webpage, IOTService, or Cli command to set working mode, by default is router mode. **It need reboot when change its working mode.**



**Device Setting**

**System**

User: admin  
 Password: admin  
 HostName: Eport-HF2211  
 DHCP: Disable  
 IP Address: 10.10.100.10  
 Gate Way: 10.10.100.254  
 DNS: 10.10.100.254  
**Network Mode: Bridge**

**SOCKET**

SOCKET Name: netp  
 Protocol: TCP-SERVER  
 Server Addr: 0.0.0.0  
 Server Port: 0  
 Local Port: 8899  
 Keep Alive: 60  
 Time Out: 300  
 Rout: uart  
 Buffer Size: 8192  
 New SOCKET SOCKET Del

**WIFI**

Mode: STA  
 AP SSID: HF2211\_73C0  
 AP Key:  
 STA SSID: UPGRADE-AP\_aaaa  
 STA Key: 12345678  
 Scan

**UART**

UART No: UART 1  
 Baudrate: 115200  
 Data Bits: 8  
 Stop Bits: 1  
 Parity: NONE  
 Flow Control: Half-Duplex  
 Buffer Size: 8192

**LAN**

**IP Address: 192.168.1.10**  
 Mask: 255.255.255.0  
 DHCP: Enable

Confirm Cancel  
 Export VirPath  
 Import Detail  
 F-Set Update F-Set Clear

## 3.4. Working Mode

### 3.4.1. Transparent Transmission Mode

The HF2211 Device support transparent transmission mode of serial interface, In this mode, User only need to set some necessary parameter(network communication parameter). After power on, the device can auto connect to default socket setting(TCP/UDP). Use web page or PC IOTService software to set commucation parameter.

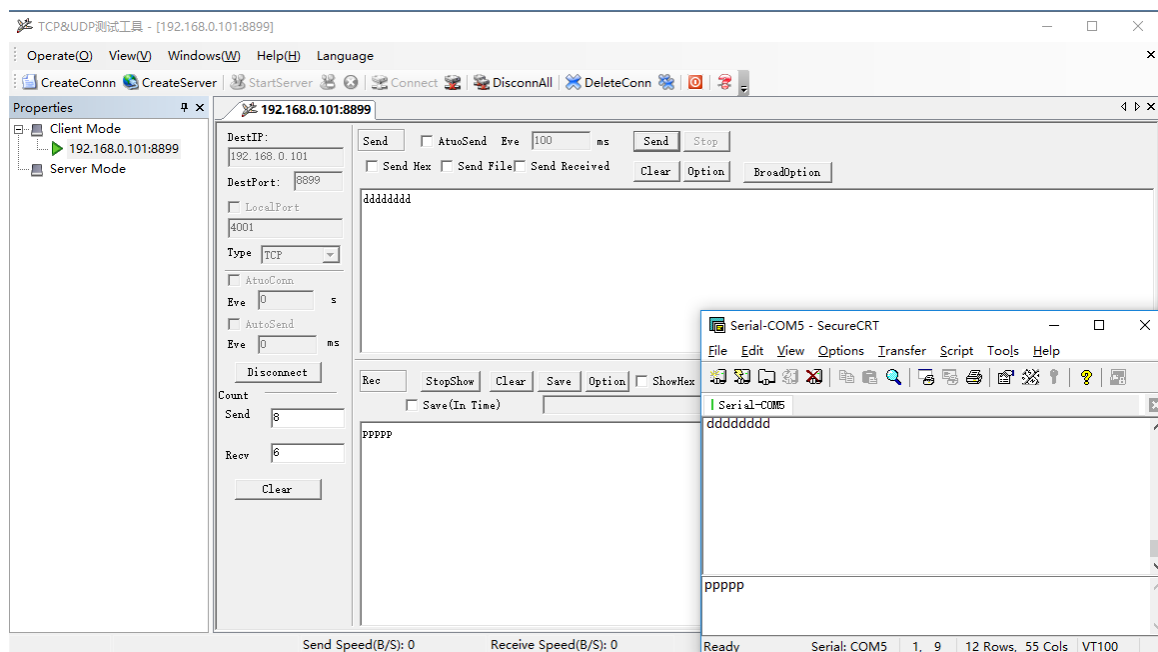


Figure 23. Transparent data transmission example

### 3.4.2. TCP Server

Transparent transmission mode support TCP Server、TCP Client、UDP Server、UDP Client communication application, UDP Server is special function, Details see following Cli instruction. There is a default tcp server socket created. The Socket can be modified to work at one of the above working mode. When Socket works as TCP server, It will support multiple TCP connection(max 5 TCP client). Multiple TCP connection will work in below structure:

Upload data flow: All the different TCP connection or the Client's data will be continuously transmitter to UART.

Download data flow: All data received from UART will be copied and broadcast to every TCP client.

Detailed multiple TCP connection structure drawing as below:

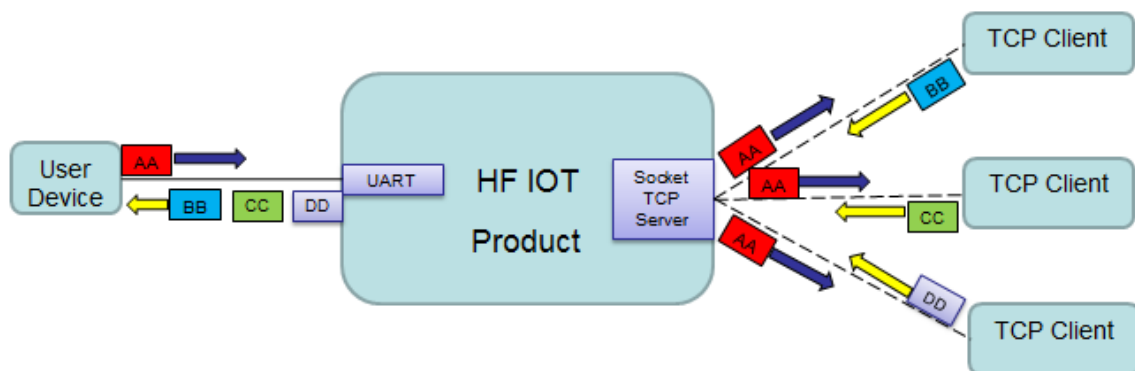


Figure 24. TCP Server data transmission example

The device support max 5 Socket channel, each socket can work individual at TCP/UDP, Multi Socket simultaneous communication of data stream is as following.

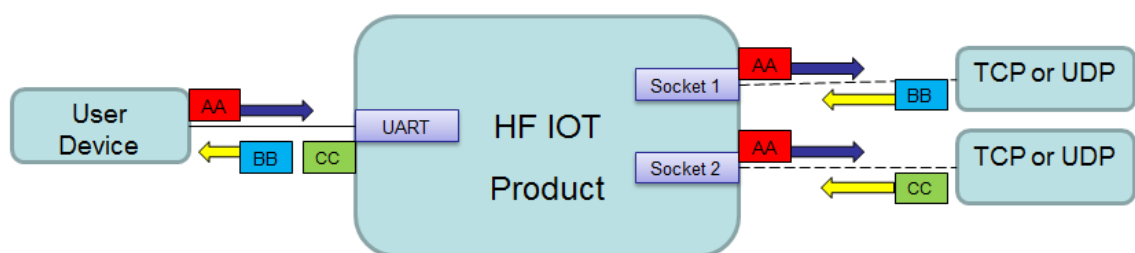


Figure 25. Multi Socket data transmission example

Multi Socket can be created through software configure or webpage configure. The below set up 3 socket channel.

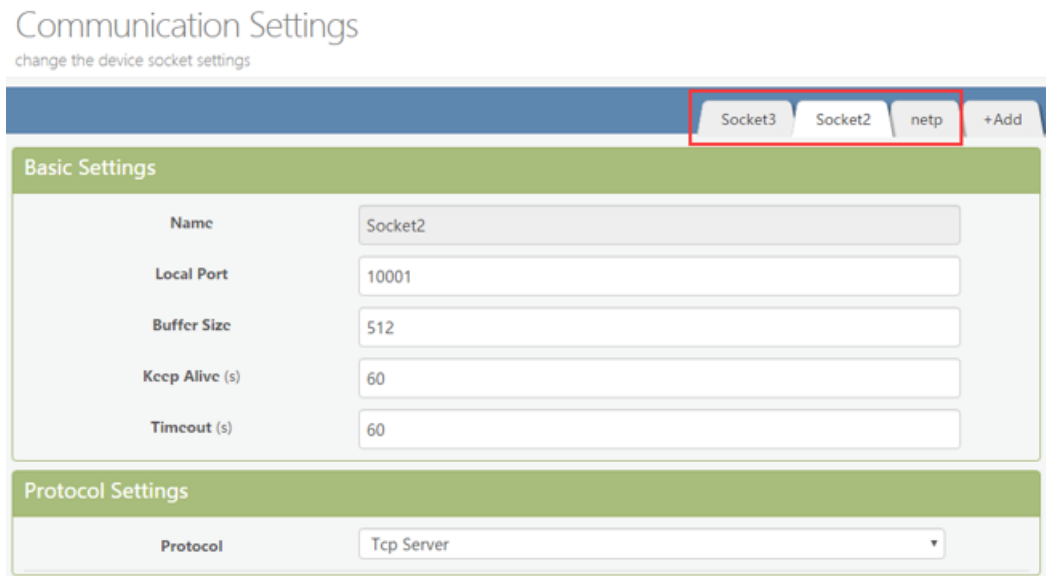


Figure 26. Webpage set up multi Socket channel

### 3.4.3. HTTP Mode

HF2211 device support sending data in HTTP format to HTTP server(Set product working mode by IOTService software or webpage). When device socket works in HTTP mode, All received UART data will automatically transform to HTTP format(add HTTP header) and transmit to HTTP server. For the received HTTP data from HTTP server, will automatically remove HTTP header and only output the data packet to UART.

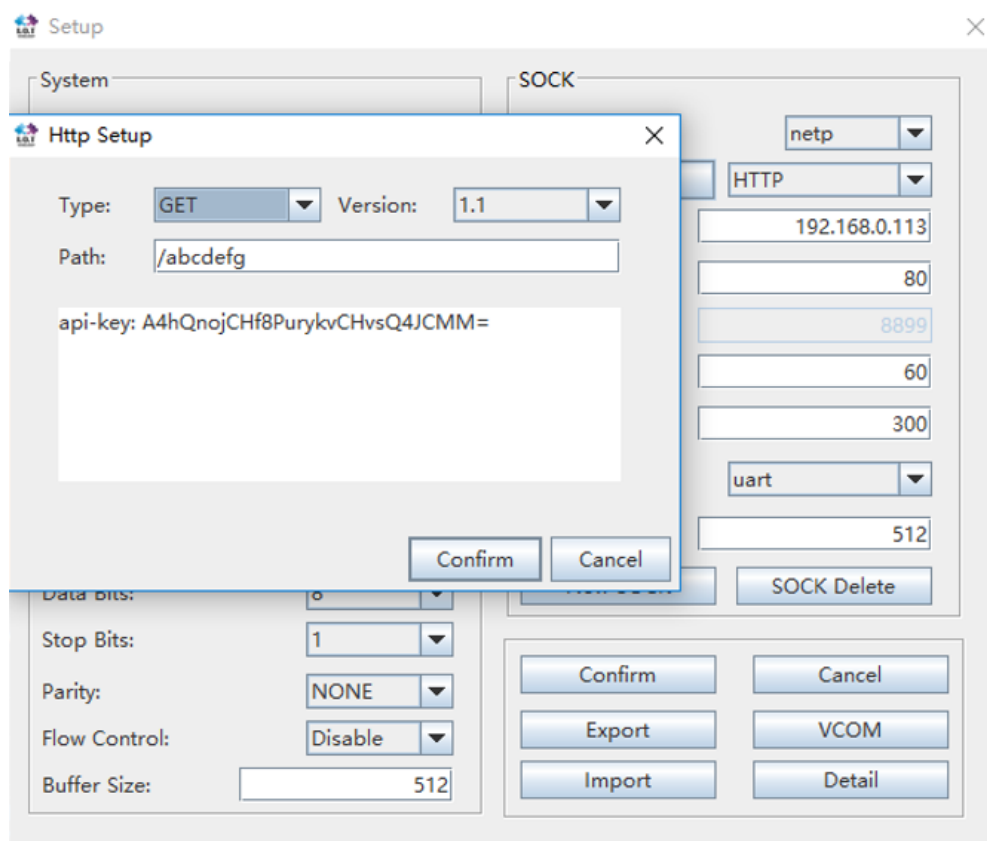
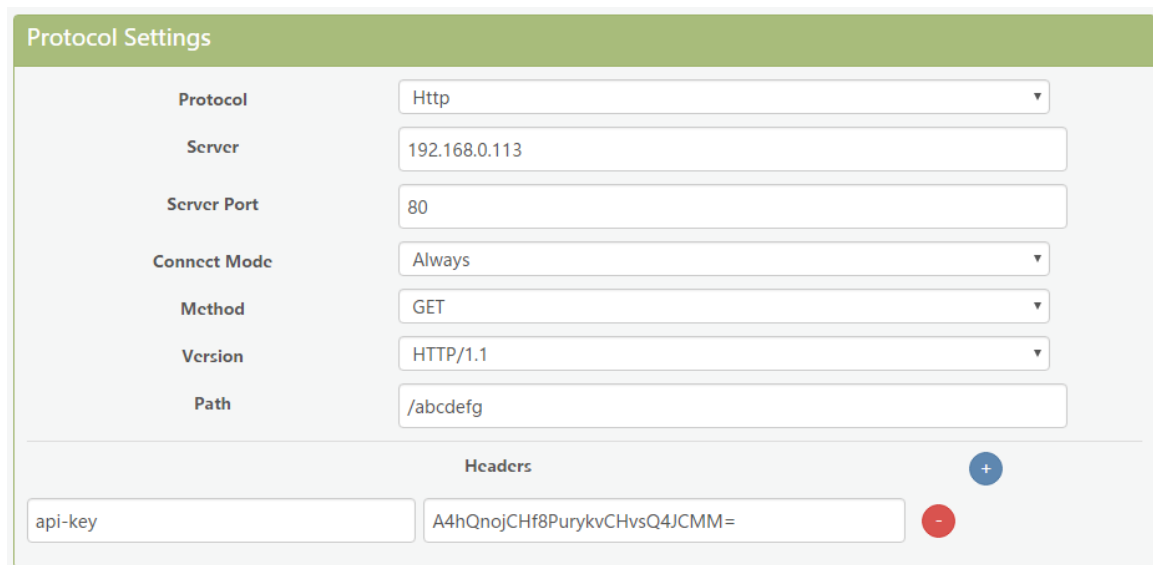


Figure 27. IOT Manager Software Configure



**Protocol Settings**

Protocol	Http
Server	192.168.0.113
Server Port	80
Connect Mode	Always
Method	GET
Version	HTTP/1.1
Path	/abcdefg

**Headers**

api-key	A4hQnojCHf8PurykvCHvsQ4JCMM=
---------	------------------------------

Figure 28. Web Page Configure

HF2211 UART received“pppp”data, send below data to HTTP Server.

GET /abcdefg HTTP/1.1

api-key: A4hQnojCHf8PurykvCHvsQ4JCMM=

pppp

HTTP Server send below data, HF2211 serial output“abcde”

GET /abcdefg HTTP/1.1

api-key: A4hQnojCHf8PurykvCHvsQ4JCMM=

abcde

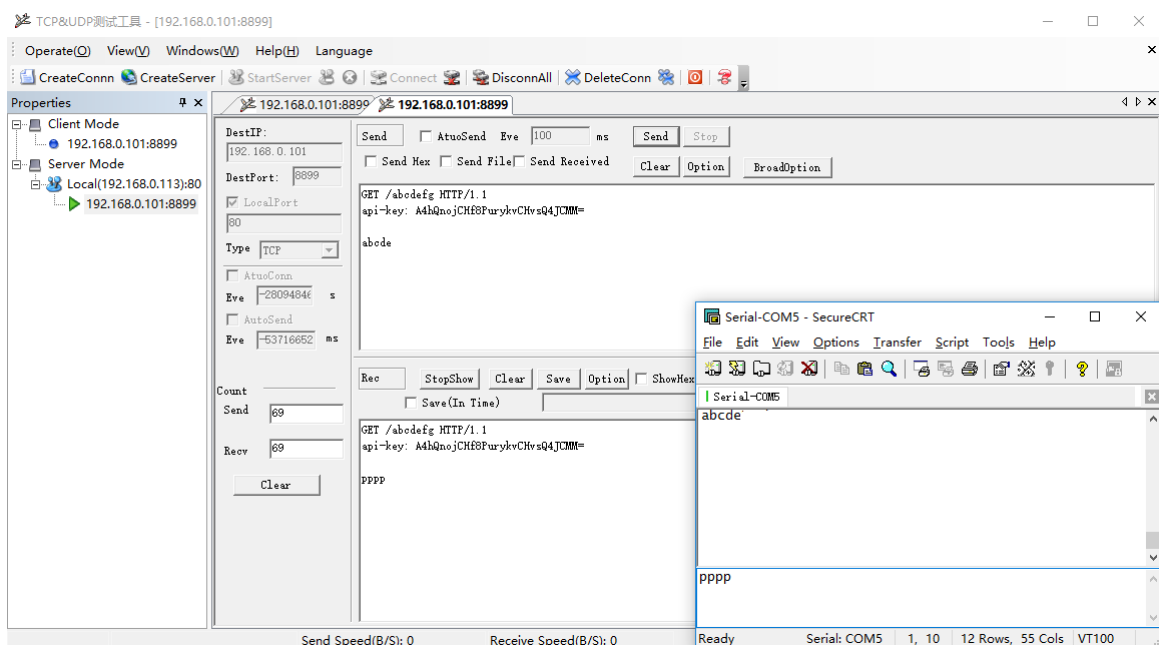


Figure 29. HTTP transmit example

### 3.4.4. Telnetd Mode

When device work in Telnetd mode, UART port can connect to user device console port(some gateway and switch device may have this console port to set parameters of its working mode). May use HF2211 to config user device via Telnetd mode.

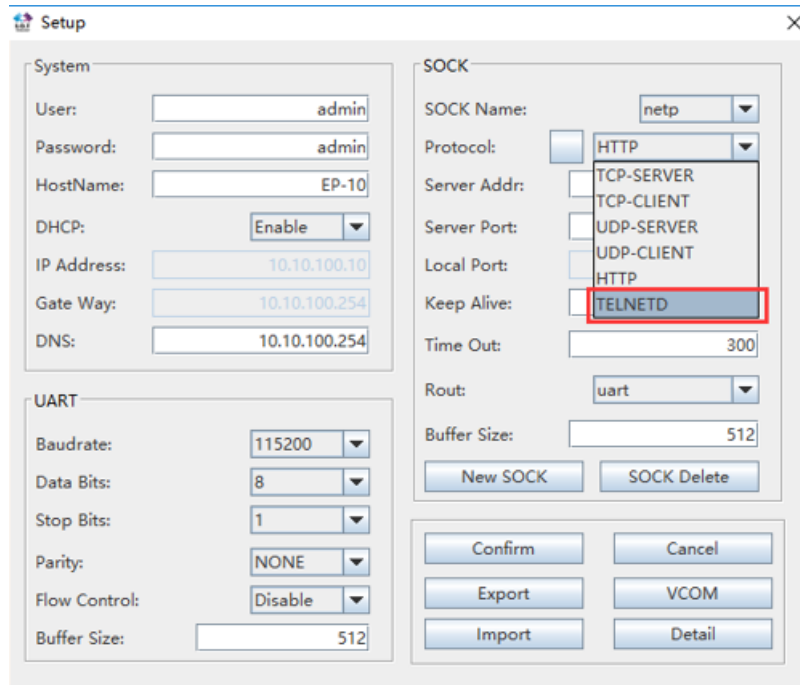


Figure 30. IOTService Software Configure Protocol

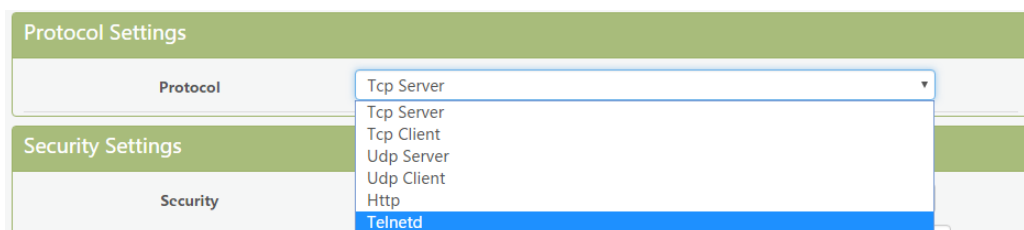


Figure 31. Web page configure protocol

Connect device UART to user device console port(The example use NC916) and create Telnet connection. Then It can directly configure user device.

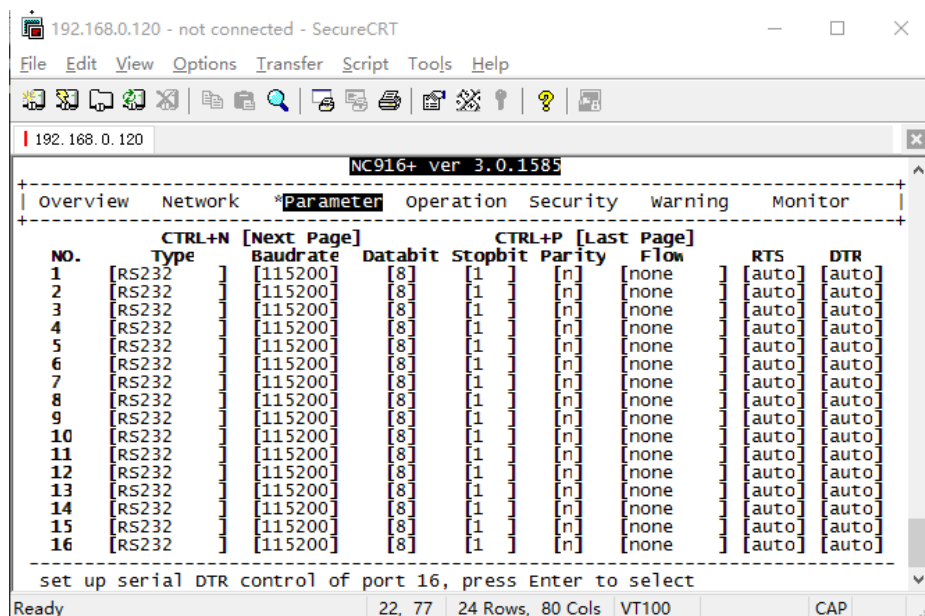


Figure 32. Telnet details example

### 3.5. AES/DES3/TLS Data Encryption

To improve device security and ensure the data won't be cracked and illegal used, The HF2211 device can do encryption to UART data before transmit to network.

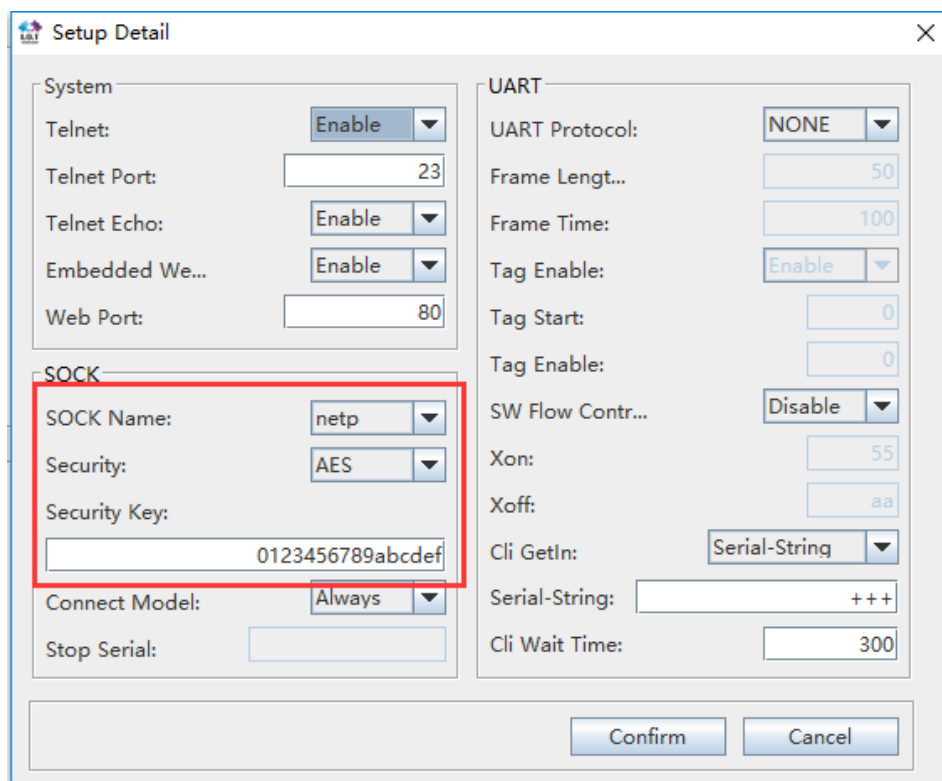


Figure 33. IOTService Software Configure Encryption





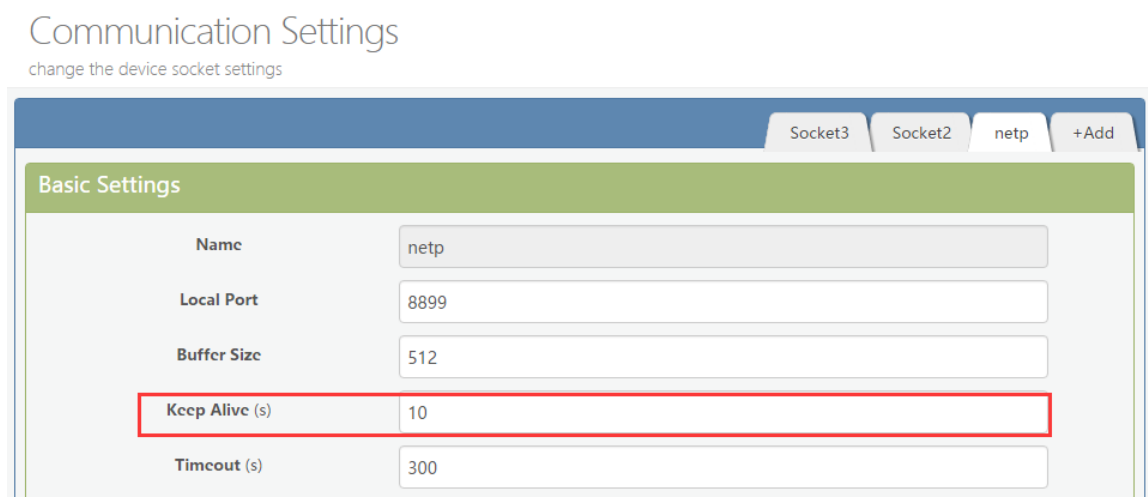
The image shows a 'Security Settings' web page. It has a green header bar with the title 'Security Settings'. Below the header, there are two rows of settings. The first row is labeled 'Security' and has a dropdown menu with 'AES' selected. The second row is labeled 'Security Key' and has a text input field containing '0123456789abcdef'.

Security Settings	
Security	AES
Security Key	0123456789abcdef

Figure 34. Web Page Configure Encryption

### 3.6. Keepalive

When TCP connection between device and server became abnormal. The device will check the obnormal status and reconnect to server ( when the device working in TCP Client Mode), When the device working in TCP Server, It will break the TCP client and wait for next connection.



The image shows a 'Communication Settings' web page. At the top, it says 'Communication Settings' and 'change the device socket settings'. Below this is a tabbed interface with tabs for 'Socket3', 'Socket2', 'netp', and '+Add'. The 'netp' tab is selected. Under the 'netp' tab, there is a 'Basic Settings' section. It contains five rows of settings: 'Name' (netp), 'Local Port' (8899), 'Buffer Size' (512), 'Keep Alive (s)' (10), and 'Timeout (s)' (300). The 'Keep Alive (s)' row is highlighted with a red border.

Basic Settings	
Name	netp
Local Port	8899
Buffer Size	512
Keep Alive (s)	10
Timeout (s)	300

Figure 35. Web Page Config Keepalive

### 3.7. Timeout

The device will break the TCP connection after some time(default is 300 seconds and it can be modified)if there is no data packet received from Destination TCP target . It will reconnect to server(When device works in TCP Client mode). When device working in TCP Server, It will disconnect with TCP Clie. This mechanism can effectively restore TCP abnormal connection.If set it to "0", this function will be close.



The screenshot shows the 'Basic Settings' section of a web interface. It contains five input fields: 'Name' (netp), 'Local Port' (8899), 'Buffer Size' (512), 'Keep Alive (s)' (10), and 'Timeout (s)' (300). The 'Timeout (s)' field is highlighted with a red border.

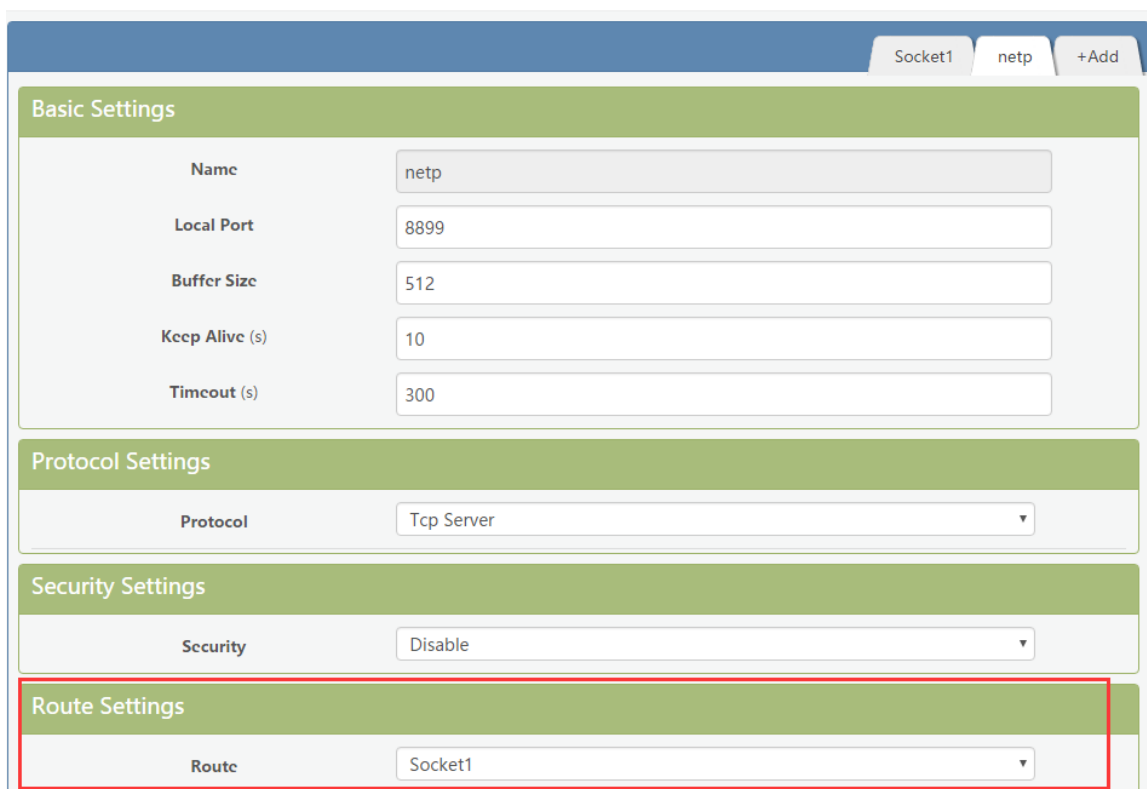
Field	Value
Name	netp
Local Port	8899
Buffer Size	512
Keep Alive (s)	10
Timeout (s)	300

Figure 36. Web Page Configure Timeout

### 3.8. Route Setup

The data received from Socket channel can be set to another socket channel. (Default: socket Destination channel is UART, It also can be other Socket channel, Or take the Socket as log print usage)

The below example shows the default netp Socket channel route setting to Socket1, Socket1 configure as TCP Server mode and route setting to UART. So the netp Socket channel received UART data will output to Socket1, and Socket1 channel will output to serial output.



The screenshot shows the 'Route Settings' section of a web interface. It contains a dropdown menu for 'Route' set to 'Socket1'. The 'Route Settings' section is highlighted with a red border.

Field	Value
Route	Socket1

Figure 37. Route function setup example

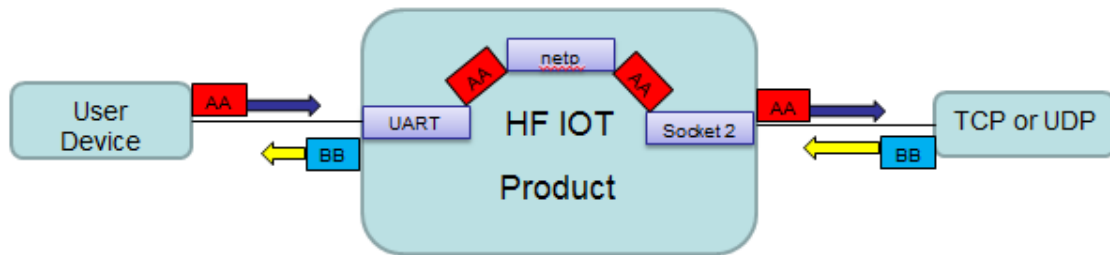


Figure 38. Route Function Data Flow Example

### 3.9. UART Frame Scheme

#### 3.9.1. UART Free-Frame

HF2211 support UART Free-Frame function, If user select to open this function, Module will check the intervals between any two bytes when receiving UART data, If the interval time exceed the setting value, It will think it as the end of one frame, Or it will receive data until greater than internal buffer bytes( Default: 512, the largest 1400 bytes), then transfer to Socket Channel.

Module default UART Free-Frame interval time is 50ms, it will packaged into another frame if received UART data interval time is greater than 50ms. User also can set this interval time to minimum 10ms through Cli command and webpage.

If interval time is set to 10ms and customer MCU cannot send next byte within 10ms, The serial data will be break into two frame.

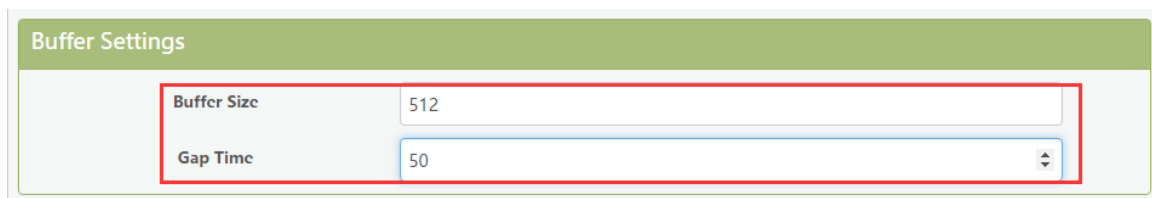


Figure 39. UART free-frame function

#### 3.9.2. UART Auto-Frame

HF2211 support UART Auto-Frame function, If user select to open this function, setting frame trigger length and auto frame trigger time parameters, Then the product will auto framing the data which received from UART port and transmitting to the network as pre-defined data structure.

Auto-Frame trigger length: The fixed data length that product used to transmitting to the network.

Auto-Frame trigger time: After the trigger time, If UART port received data can't reach auto-frame trigger length, Then product will transmitting available data to network and bypass the auto-frame trigger length condition.

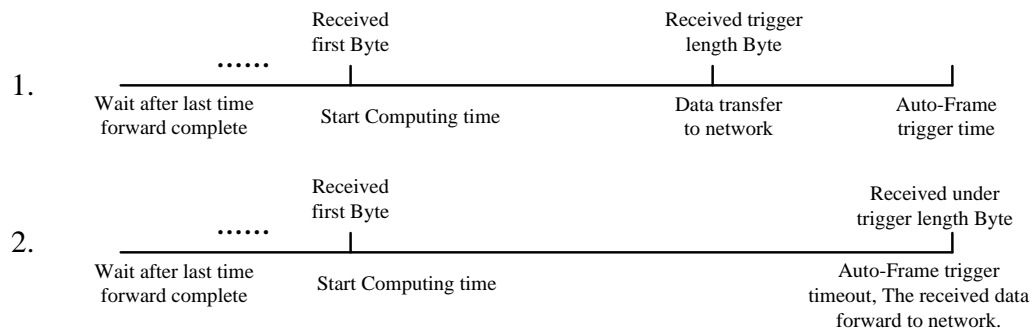
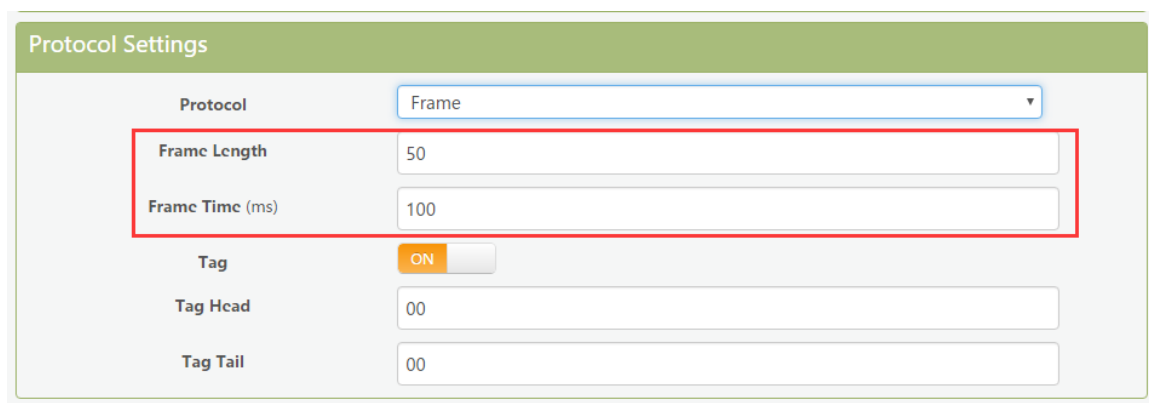


Figure 40. UART Auto-Frame Function



**Protocol Settings**

Protocol: Frame

Frame Length: 50

Frame Time (ms): 100

Tag: ON

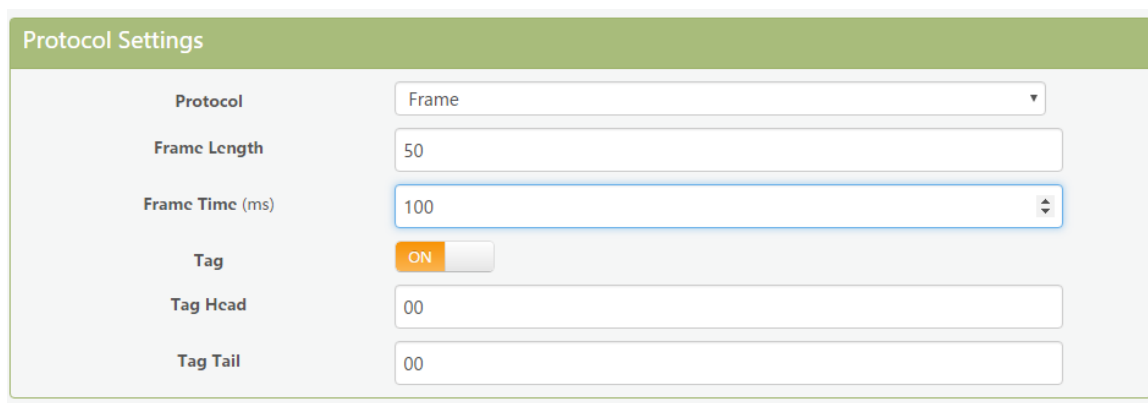
Tag Head: 00

Tag Tail: 00

Figure 41. UART Auto-Frame Function

### 3.9.3. Tag Function

Eport E10 support lable function, If user select to open this function, The UART port will send all suitable one frame data to network.



**Protocol Settings**

Protocol: Frame

Frame Length: 50

Frame Time (ms): 100

Tag: ON

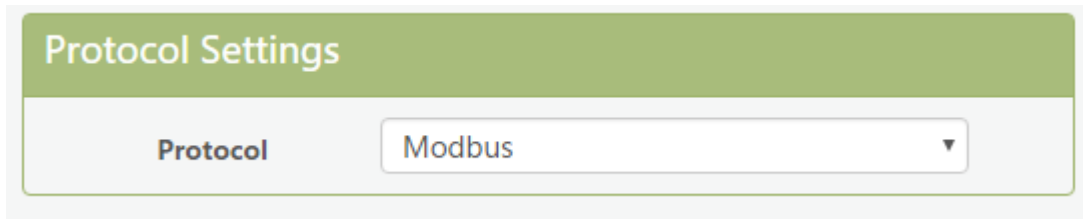
Tag Head: 00

Tag Tail: 00

Figure 42. UART Auto-Frame Tag Function

## 3.10. Modbus Protocol

HF2211 support ModbusRTU to ModbusTCP and ModbusTCP to ModbusRTU. It's very convenient to connect with Modbus device. Modbus protocol setting as below:

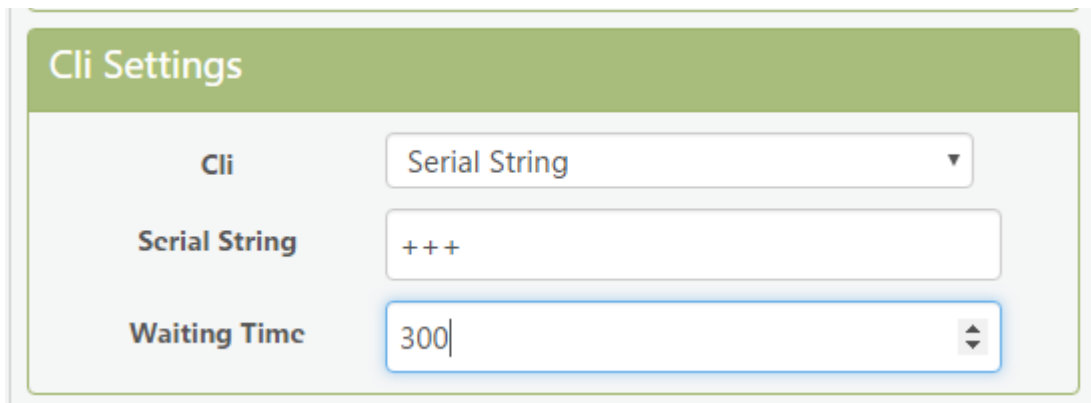


Protocol Settings	
Protocol	Modbus ▼

Figure 43. UART Modbus Function

### 3.11. Cli Command

Cli command is used for setting module configure parameters. Detailed command function and setting is in next chapter, Cli command can be set through UART port or Telnet function (Appendix C), The waiting time of below picture means use timeout time. If it exceed default 300s when no Cli command is input, it will exit Cli command mode. When the HF2211 receive continuous UART data of “+++”, it will enter into Cli command. ( The device working in transparent transmission mode by default) May also set the device working in Cli command mode by default or disable this function .

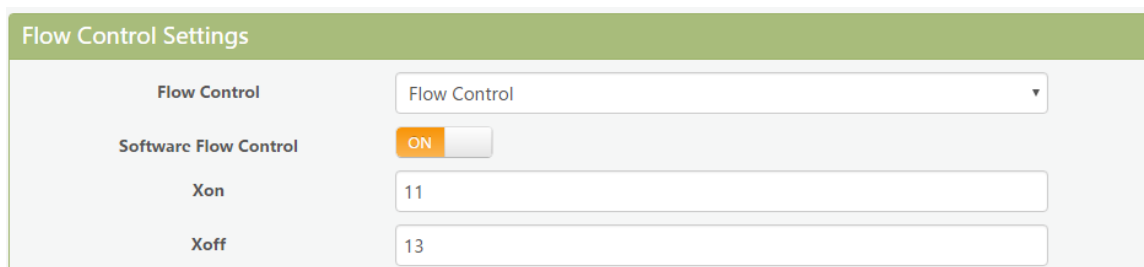


Cli Settings	
Cli	Serial String ▼
Serial String	+++
Waiting Time	300

Figure 44. Cli Command Setting

### 3.12. UART Flow Control and RS485 Function

HF2211 support software and hardware UART flow control. If use hardware follow control, must use RS232 interface. If use software follow control, then It allowed the device output UART data after receive single UART 0x11 data(Default: value can be modified). It will stop output UART data after receive single UART 0x13 data(Default: value can be modified).



Flow Control Settings	
Flow Control	Flow Control ▼
Software Flow Control	<input checked="" type="checkbox"/> ON
Xon	11
Xoff	13

Figure 45. UART Flow Control

If set to “Half Duplex”, the product enable RS485 interface. **The flow control by default is set as “Disable”, it need to use RS485, set it to “Half Duplex” as the following picture.**

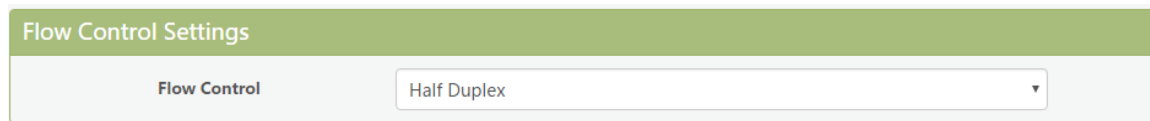


Figure 46. UART Half Duplex Function

### 3.13. Firmware Upgrade

HF2211 support OTA(over the air) firmware upgrade. User can use webpage to upgrade its firmware, whether external or internal webpage(192.168.0.101/hide. Internal webpage can be used for upgrade external webpage). Please check below example. IP address is assigned by router.



Figure 47. External web page

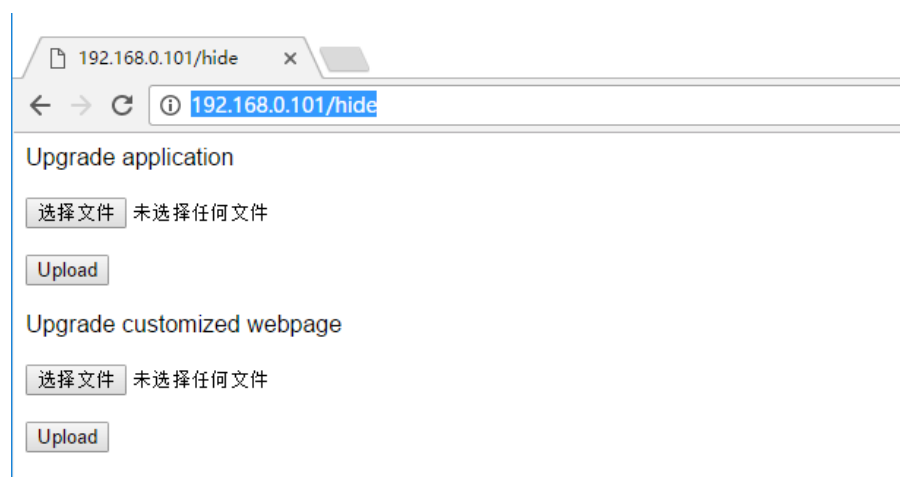
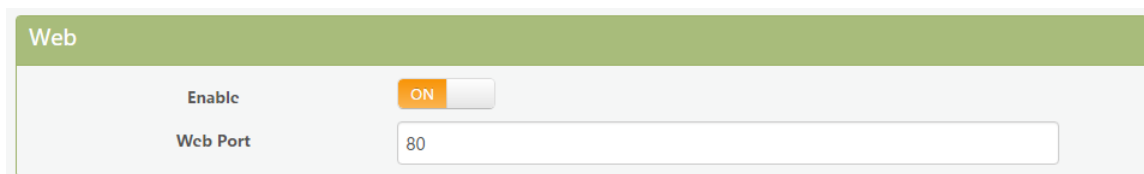


Figure 48. Internal web page

### 3.14. Web Page Function

Web page function can be enabled or disabled.



The interface shows a 'Web' section with two settings: 'Enable' and 'Web Port'. The 'Enable' setting is a toggle switch currently set to 'ON'. The 'Web Port' setting is a text input field containing the value '80'.

Figure 49. Web Page Function Setting

### 3.15. Auto-IP Function

Connect device Ethernet with PC, the device will use default auto IP. The PC may use this IP to config the device or transfer data(PC will need about 15 seconds to use default 169.254.xxx.xxx IP, then this communication can be created). As the following example, 169.254.173.207(If occur IP conflict, it will use other ip instead)

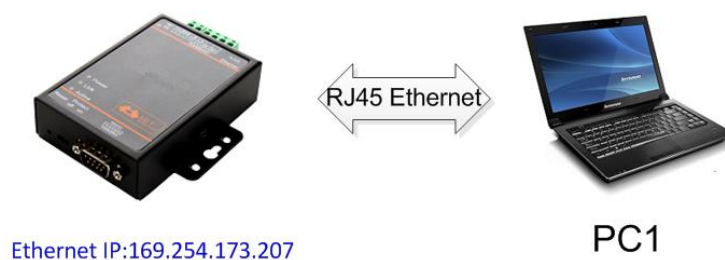
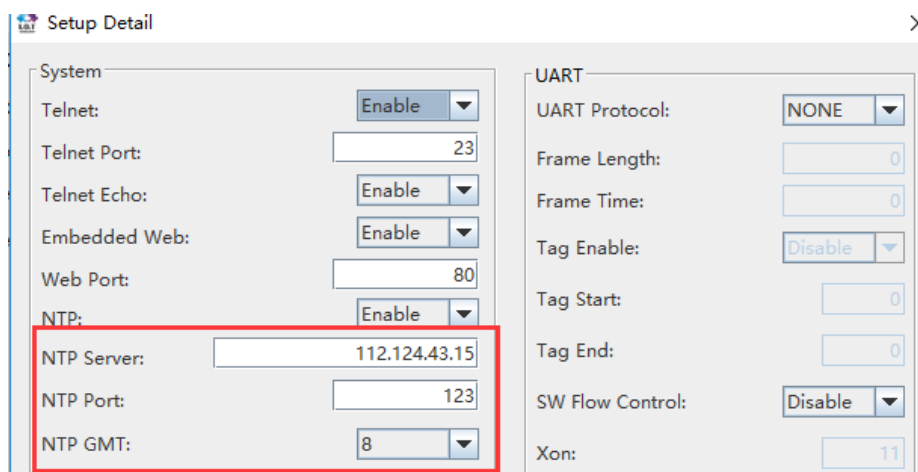


Figure 50. AUTO-IP Connection

### 3.16. NTP Function

Support NTP function(default is disabled). Support set NTP server, port, time zone information, more detailed usage see application document of "UART Fast Config".(112.124.43.15 is High-Flying test NTP server)



The 'Setup Detail' window is shown with two panes. The left pane is titled 'System' and contains settings for Telnet, Embedded Web, and NTP. The NTP section is highlighted with a red box and includes: 'NTP Server: 112.124.43.15', 'NTP Port: 123', and 'NTP GMT: 8'. The right pane is titled 'UART' and contains settings for UART Protocol, Frame Length, Frame Time, Tag Enable, Tag Start, Tag End, SW Flow Control, and Xon.

Figure 51. IOTService Tools NTP Setting

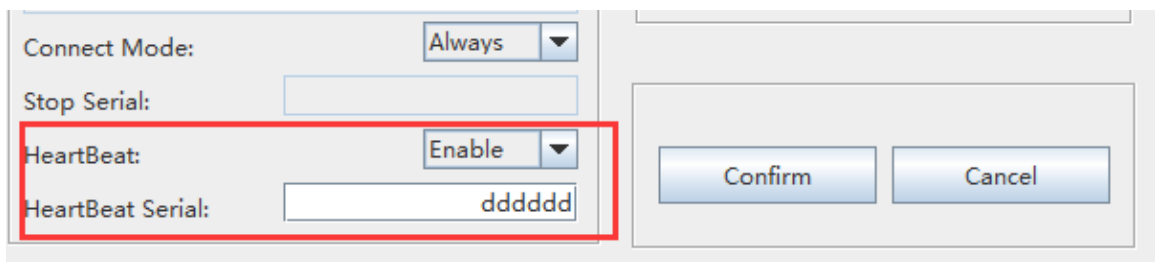
```
-----
EPORT>SYS NTP
Enable
Server:112.124.43.15
Port:123
GMT:8
EPORT>Show

===System State===
Product ID:HF5111B
Software Version:V1.07c
Config Protected:OFF
System time:2017-1-23 13:48:38 Mon
Up Time: 0-Day 2:44:32
Total Free Memory: 32880
MAX Block Size:31164
```

Figure 52. Cli Command NTP Setting and Query

### 3.17. Heartbeat Function

Support heartbeat function, can set the heartbeat time and content(heartbeat time is the same as keepalive setting), if the product does not receive data from TCP server within heartbeat time, it will send heartbeat to server. The heartbeat function can only be enabled when socket is set as TCP client.



The image shows a configuration window for the Heartbeat Function. It has a light gray background. On the left, there are four labels with corresponding input fields or dropdowns: 'Connect Mode:' with a dropdown menu showing 'Always'; 'Stop Serial:' with an empty text box; 'HeartBeat:' with a dropdown menu showing 'Enable'; and 'HeartBeat Serial:' with a text box containing 'ddddd'. A red rectangular box highlights the 'HeartBeat:' and 'HeartBeat Serial:' fields. On the right side of the window, there are two buttons: 'Confirm' and 'Cancel'.

Figure 53. Heartbeat Function

### 3.18. UART Fast Config

Product support Cli command to config its parameters, but also support special HEX format UART data for fast config, see application manual for detailed usage.

### 3.19. Other Function

The HF2211 device parameters can be exported and loaded into other equipment..



## Others

change the device other settings

Backup/Restore Configuration	
Backup	<button>Backup</button>
Restore	<button>+ Choose File</button>

Upgrade	
Firmware	<button>+ Choose File</button>

Reload/Restart	
Reload Options	<input type="checkbox"/> SYS <input type="checkbox"/> UART <input type="checkbox"/> SOCK
Restart	<button>Restart</button>

Figure 54. Other Function

## 4. CLI COMMAND NOTES

### 4.1. Working Mode

The device will enter into default transparent transmission mode after powered on. User can switch to Cli command mode through special UART data. Module default UART parameters are as below:

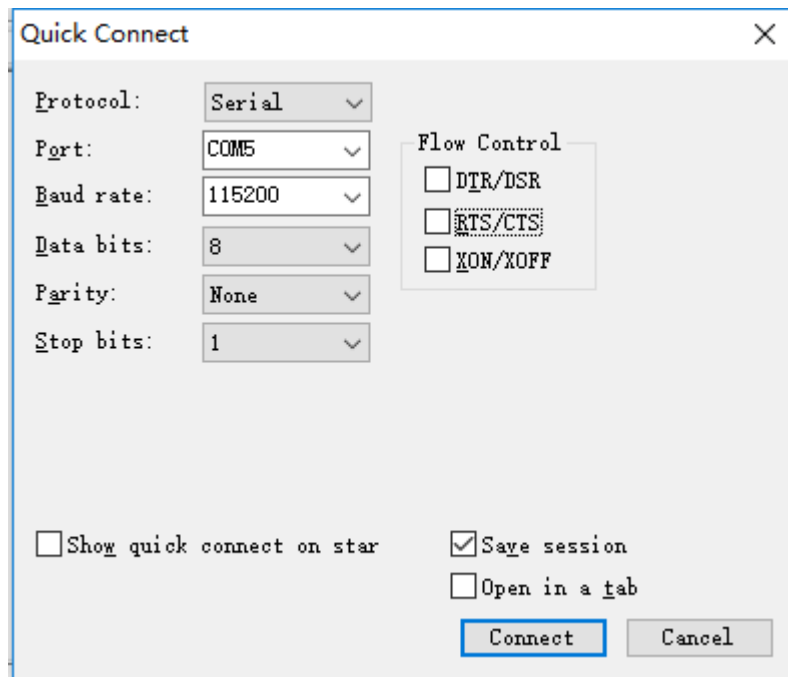


Figure 55. HF2211 Default: UART Parameters

In Command mode, User can use UART port to set module through Cli command.

#### Notes:

We recommend to use SecureCRT for UART debug tools.

#### 4.1.1. Switch Transparent Transmission Mode to Cli Command Mode

##### Steps:

- Input “+++” via UART tools, the device will output “EPORT>” after received “+++”. Then the device already enters into Cli command mode.

#### Notes:

“+++” should be in one frame. Other data is not allowed before or after “+++”

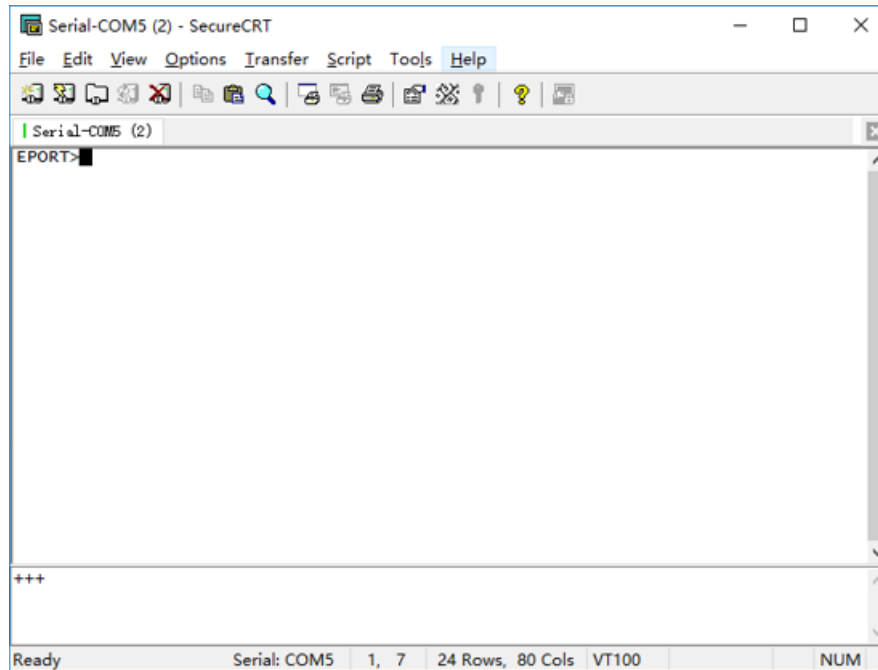


Figure 56. Switch Transparent Transmission Mode to Cli Command Mode

**<Notes>:**

In Cli command mode, users can set or query parameters. Cli command details see next chapter

## 4.2. Cli Command Overview

Cli command can be input through terminal (SecureCRT or other UART tools) or by user device MCU programming. As below picture, we use SecureCRT tool. Press "Tab" key, it will list current available Cli command or directory. If input first character and then press "Tab" key, it will show the Cli command fit with the first character.

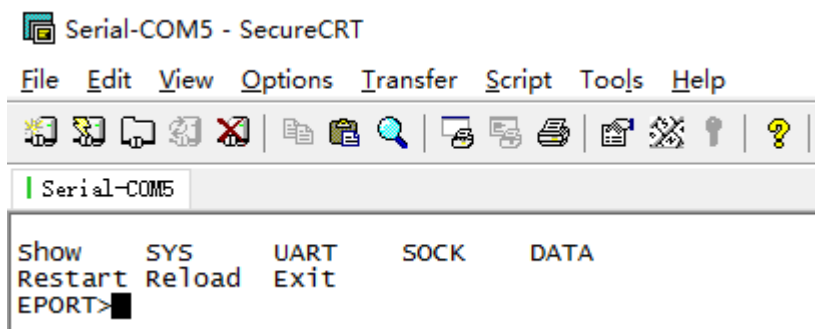


Figure 57. Cli Command Root Directory

SYS	Version		
	Auth	user	
		password	
		quit	
	Network	Show	
		DHCP	Enable
			Disable
		DNS	
		HostName	
		Quit	
		Telnet	Enable
	Disable		
	Web	Enable	port number
		Disable	
	MAC		
	JCMD	Enable	
		Disable	
	NTP	Enable	NTP Server Address
			NTP Server port
			GMT
		Disable	
	Quit		

Figure 58. Cli Command SYS Tree

UART	Show	
	Baudrate	
	Databits	
	Stopbits	
	Parity	
	Buf	BufSize
		GapTime
		Quit
	FlowCtrl	FlowCtrl
		Half-Duplex
		Disable
	SWFlowCtrl	Enable
		Disable
	Cli-Getin	Disable
		Serial-String
		Always
	Cli-WaitTime	
	Proto	NONE
		Modbus
		Frame
	Frame	FrameLen
		FrameTime
		Tag
		Quit
	Edit	
	Clean	
	Quit	

Figure 59. Cli Command UART Tree

SOCK	Show		
	New	Name	
		Proto	TCP-SERVER
			TCP-CLIENT
			UDP-SERVER
			UDP-CLIENT
			HTTP
			Telneted
		Server	
		ServerPort	
		LocalPort	
		BufSize	
		KeepAlive	
		Timeout	
		HeartBeat	
		Security	Disable
			TLS
			AES
			DES
		ConnectMode	Always
			Burst
		Rout	uart
			log
			netp
	netp	Show	
		Name	
		Proto	TCP-SERVER
			TCP-CLIENT
			UDP-SERVER
			UDP-CLIENT
			HTTP
			Telneted
		Server	
		ServerPort	
		LocalPort	
		BufSize	
		KeepAlive	
		Timeout	
		HeartBeat	
		Security	Disable
			AES
			DES
			TLS
		ConnectMode	Always
			Burst
		Rout	uart
			log
			netp
		Save	
		Clean	
		Del	
		Quit	
	Quit		

Figure 60. Cli Command SOCK Tree

DATA	Str
	Hex
	Quit
FwUpgrade	
Restart	
Reload	
Exit	

Figure 61. Cli Other Command

#### 4.2.1. Cli Command Format

Cli command is in ASCII format. The usage is similar to Linux terminal. Command format as following:

➤ Format Notes

- < >: Cli command name or directory.
- [ ]: Cli command parameters.

➤ Command Message

**<CMD> [para-2 para-3 para-4...]<CR>**

- <CMD>: Main directory or command name;
- [para-n] : command parameters. If have multiple directory, it can also can be the son directory. As below example;

```
EPORT>SYS Auth
User          Password      Quit
```

- <CR>: Command Terminator, "Enter" key, HEX data: 0x0a or 0x0d

#### <Notes>

If the input command not existed, UART will output again "EPORT>" to allow next command input. The Cli command is case sensitive.

```
EPORT>sys
EPORT>SYS
EPORT/SYS>
```

If need enter into son directory, press "space" key between the directories.

```
EPORT>SYS Auth
EPORT/SYS/Auth>
```

If need to display all the directory or commands in the current directory, press "Tab" key to query.

```
EPORT/SYS>
Auth      Network Telnet  web      Ipv6
MAC       JCMD      Quit
```

If need to display current command parameter, press Tab key to query.

```
EPORT/SYS/Network>DHCP
Enable  Disable
```

##### 4.2.1.1. Show Command

- Function: Show all system information, including the system running status, Network status, UART status and socket status.
- Format:
  - ◆ Query

**Show [SYS/UART/SOCK]**

- Parameter:
  - Show all information if no parameters. Parameter can be one of the following:
    - ◆ SYS: System running status
    - ◆ UART: UART status
    - ◆ SOCK: Socket status

```

EPORT>Show

===System State===
Product ID:E-10
Software Version:V1.04
Up Time: 0-Day 0:21:39
Total Free Memory: 48400
MAX Block Size:46816

===NETWORK===
MAC:ACCF23FF4771
Ip Address:192.168.0.106
Gateway:192.168.0.1

===UART Status===
Config:115200,8,1,NONE,NONE
State:In CLI
Recv Bytes:26   Recv Frames:24
Send Bytes:0    Send Frames:0
Failed Bytes:0  Failed Frames:0

===SOCK Status===
SOCK Name:netp
State:Server Created
Client IP:
Recv Bytes:0    Recv Frames:0
Send Bytes:0    Send Frames:0
Failed Bytes:0  Failed Frames:0

```

## 4.2.1.2. SYS Directory

- Function: Display/Set all system related information
- Format:
  - ◆ Tab Query

```

EPORT/SYS>
Version Auth   Network Telnet  web
NTP         MAC      JCMD      Quit

```

## 4.2.1.3. SYS/Auth Directory

- Function: Display/Set web or Telnet Cli command login directory. (see appendix for detail)
- Format:
  - ◆ Tab Query

```

EPORT/SYS/Auth>
User           Password      Quit

```

## 4.2.1.4. SYS/Auth/User Command

- Function: Display/Set web or Telnet Cli command login user name. (function see appendix)
- Format:
  - ◆ Query
    - <User>
  - ◆ Set
    - <User> [value]
- Parameter:
  - Setting is valid immediately.
    - ◆ User: Login user name. Default: **admin**

- ◆ value: set value. Length range 1~29 characters

#### 4.2.1.5. SYS/Auth/Password Command

- Function: Display/Set web or Telnet Cli command login password(function see appendix)
- Format:
  - ◆ Query  
`<Password>`
  - ◆ Set  
`<Password> [value]`
- Parameter:
  - Setting is valid immediately
  - ◆ Password: Login password. Default: **admin**
  - ◆ value: set value. Length range 1~29 characters

#### 4.2.1.6. SYS/Network Directory

- Function: Display/Set related network information.
- Format:
  - ◆ Tab Query

EPORT/SYS/Network>				
Show	DHCP	DNS	HostName	Quit

#### 4.2.1.7. SYS/Network/Show Command

- Function: Display network related information
- Format:
  - ◆ Query  
`<Show>`

#### 4.2.1.8. SYS/Network/DHCP Command

- Function: Display/Set DHCP Client function
- Format:
  - ◆ Query  
`<DHCP>`
  - ◆ Set  
`<DHCP> [Enable/Disable]`
- Parameter:
  - Setting is valid after reboot.
  - ◆ Enable: Enable DHCP function. The device will get DHCP IP from router when Ethernet port is connected to router LANN port. Default: **Enable**.
  - ◆ Disable: Disable DHCP function. Allocate device static IP address according to the hit of inputting IP and gateway address.

#### 4.2.1.9. SYS/Network/DNS Command

- Command: Display/Set DNS IP address.
- Format:
  - ◆ Query



**<DNS>**

- ◆ Set

**<DNS> [IP]**

- Parameter:  
When DHCP function is Disabled, this setting is valid. Setting is valid after reboot.
  - ◆ IP Address: DNS server address. Default: **10.10.100.254**.

## 4.2.1.10. SYS/Network/Mode Command

- Command: Display/Set working mode.
- Format:
  - ◆ Query

**<Mode>**

- ◆ Set

**<Mode> [Router/Bridge]**

- Parameter:  
Setting is valid after reboot.
  - ◆ Router: Router mode, Default value.
  - ◆ Bridge: Bridge mode.

## 4.2.1.11. SYS/Network/Hostname Instruction

- Function: Display/Set Hostname.
- Format:
  - ◆ Query

**<Hostname>**

- ◆ Set

**<Hostname> [name]**

- Parameter:  
Hostname is the name which show in router DHCP client list. Setting is valid immediately.
  - ◆ Name Address: Hostname, length range: 1~30 characters. Default: **HF2211**.

## 4.2.1.12. SYS/Telnet Instruction

- Function: Display/Set Telnet function.
- Format:
  - ◆ Query

**<Telnet>**

- ◆ Set

**<Telnet> [Enable/Disable]**

- Parameter:  
See appendix for detailed Telnet function usage. Telnet is used for remote send Cli command or transmit data, Setting is valid after reboot.
  - ◆ Enable: Enable Telnet function. Default: **Enable**.
    - Input Port Numbver: Telnet Port Number. Default: **23**
    - Input Echo Mode: Enable/Disable Cli command echo function. Default: **Enable**

- ◆ Disable: Disable Telnet function.

#### 4.2.1.13. SYS/Web Instruction

- Function: Display/Set Web config function.

- Format:

- ◆ Query

**<Web>**

- ◆ Set

**<Web> [Enable/Disable]**

- Parameter:

Webpage is used for config module working parameters. Setting is valid after reboot.

- ◆ Enable: Enable Web config function. Default: **Enable**.

- Input Port Number: Web Port Number. Default: **80**

- ◆ Disable: Disable Web config function

#### 4.2.1.14. SYS/MAC Instruction

- Function: Display/Set MAC address.

- Format:

- ◆ Query

**<MAC>**

- ◆ Set

**<MAC> [8888 value]**

- Parameter:

Global unique MAC Address. It is not allowed to modify it.

- ◆ value: MAC address value.

#### 4.2.1.15. SYS/JCMD Instruction

- Function: Display/Set Jason command function.

- Format:

- ◆ Query

**<JCMD>**

- ◆ Set

**<JCMD> [Enable/Disable]**

- Parameter:

Jason command is used for config module. IOTManage software use this mechanism. If disable JCMD function, IOTManage is no longer valid. Setting is valid after reboot.

- ◆ Enable: Enable JCMD function. Default: **Enable**.

- ◆ Disable: Disable JCMD function.

#### 4.2.1.16. SYS/NTP Instruction

- Function: Display/Set NTP function.

- Format:

- ◆ Query

**<NTP>**

- ◆ Set

**<NTP> [Enable/Disable]**

- Parameter:  
NTP is used for product to get and output real time. See uart fast config application manual to fast query. Setting is valid immediately.
  - ◆ Enable: Enable NTP Function.
    - NTP Server Address: NTP Server address, domain name or IP address
    - NTP Server Port: port number, Default:123, Range;0~127
    - GMT: Time zone, default is 0, Range:-12~12.
  - ◆ Disable: Disable NTP Function, Default value.

## 4.2.1.17. UART Directory

- Function: Display/Set UART information directory.
- Format:
  - ◆ Tab key query

EPORT/UART>	Baudrate	Databits	Stopbits	Parity
Show	FlowCtrl	SwFlowCtrl	Cli-GetIn	Cli-waitTime
Buf	Frame	Edit	Clean	Quit
Proto				

## 4.2.1.18. UART/Show Instruction

- Function: Display UART information function.
- Format:
  - ◆ Query

**<Show>**

## 4.2.1.19. UART/Baudrate Instruction

- Function: Display/Set UART baud rate function.
- Format:
  - ◆ Query

**<Baudrate>**

- ◆ Set

**<Baudrate> [value]**

- Parameter:  
Setting is valid immediately.
  - ◆ Value: Default: **115200**. Can choose 2400, 4800, 9600, 38400, 57600, 115200, 230400, 460800

## 4.2.1.20. UART/Databits Instruction

- Function: Display/Set UART data bits function.
- Format:
  - ◆ Query

**<Databits>**

- ◆ Set

**<Databits> [value]**

- Parameter:  
Setting is valid immediately.

- ◆ Value: Default: **8bits**. Can choose 8.

#### 4.2.1.21. UART/Stopbits Instruction

- Function: Display/Set UART stop bits function.
- Format:
  - ◆ Query  
**<Stopbits>**
  - ◆ Set  
**<Stopbits> [value]**
- Parameter:
  - Setting is valid immediately.
  - ◆ Value: Default: **1bits**. Can choose 1, 1.5, 2.

#### 4.2.1.22. UART/Parity Instruction

- Function: Display/Set UART parity function.
- Format:
  - ◆ Query  
**<Parity>**
  - ◆ Set  
**<Parity> [value]**
- Parameter:
  - Setting is valid immediately.
  - ◆ Value: Default: **None**. Can choose NONE, EVEN, ODD.

#### 4.2.1.23. UART/Buf Directory

- Function: Display/Set UART Buffer directory.
- Format:
  - ◆ Tab key query

```
EPORT/UART/BuF>
BufSize GapTime_Quit
```

#### 4.2.1.24. UART/Buf/BuFSIZE Instruction

- Function: Display/Set UART buffer size function.
- Format:
  - ◆ Query  
**<Bufsize>**
  - ◆ Set  
**<Bufsize> [value]**
- Parameter:
  - Buffer is used for cache UART received data. If the received data of one frame is larger than buffer size. The data frame will be break into two packet send to network. Setting is valid after reboot.
  - ◆ Value: Default: **512**. Length range: 32~1400 bytes.

## 4.2.1.25. UART/Buf/GapTime Instruction

- Function: Display/Set UART free frame gap time.
- Format:
  - ◆ Query  
**<GapTime>**
  - ◆ Set  
**<GapTime> [value]**
- Parameter:
 

GapTime is used for setting UART free frame time gap. If the received data gap time is more than setting value, the data packet will be breaked into two frame.

  - ◆ Value: Default: **50ms**. Length Range: 10~1000ms.

## 4.2.1.26. UART/Buf/FlowCtrl Command

- Function: Display/Set UART flow control function.
- Format:
  - ◆ Query  
**<FlowCtrl>**
  - ◆ Set  
**<FlowCtrl> [Enable/Disable]**
- Parameter:
 

Flow control includes software flow control and hardware flow control. Software flow control priority is higher than hardware. If enable software flow control, the hardware flow control pin(CTS/RTS) will be useless. Software flow control use special UART data for control. Hardware flow control use CTS/RTS pin control. Setting is valid immediately.

  - ◆ Flow Control: Flow control function.
  - ◆ Half-Duplex: Enable RS485 half-duplex function, UART0\_RTS is used for RS485 chip control function.
  - ◆ Disable: Flow control function. Default: **Disable**.

## 4.2.1.27. UART/Buf/SWFlowCtrl Command

- Function: Display/Set UART software flow control function.
- Format:
  - ◆ Query  
**<SWFlowCtrl>**
  - ◆ Set  
**<SWFlowCtrl> [Enable/Disable]**
- Parameter:
 

Enable software flow control function. The device UART can output data After UART received Xon single-byte enable data. When UART received Xoff single-byte disable data. It will disable the device UART output data.

  - ◆ Enable: Enable software flow control function, When in enable status, it allow UART data output when bootup by default.
    - Xon: Enable UART output data. Default: **0x11**.
    - Xoff: Disable UART output data. Default: **0x13**.

- ◆ Disable: disable software flow control function. Default: **Disable**.

#### 4.2.1.28. UART/Cli-Getin Command

- Function: Display/Set Cli command function
- Format:
  - ◆ Query
  - <Cli-Getin>**
  - ◆ Set
  - <Cli-Getin> [Serial-String/Always/Disable]**
- Parameter:
 

Set Cli command parameters. Setting is valid immediately.

  - ◆ Serial-String: Enable specific data to enter into Cli command mode.
    - [Input Serial String]: Default: **+++**, Range 1~10 bytes. Also can input hex format data. The HEX data are separated by Spaces, Like **【30 31 32 33 34】**, When it received string data "01234", then It can enter into Cli command.
  - ◆ Always: Always work in Cli command mode when device power on.
  - ◆ Disable: Disable Cli command mode. UART and Telnet both can't use Cli Command.

#### 4.2.1.29. UART/Cli-WaitTime Command

- Function: Display/Set Cli command wait time
- ◆ Format
  - <Cli-WaitTime>**
  - ◆ Set
  - <Cli-WaitTime> [timeout]**
- Parameter:
 

Set Cli command mode timeout exit time. If there is no Cli command sent for the waittime, It will exit Cli command mode to transparent transmission, Setting is valid immediately.

  - ◆ timeout: Default: **300s**, Range 0: Disable WaitTime function, 1~300s.

#### 4.2.1.30. UART/Proto command

- Function: Display/Set UART protocol function
- Format:
  - ◆ Query
  - <Proto>**
  - ◆ Set
  - <Proto> [NONE/Modbus/Frame]**
- Parameter:
 

Setting is valid immediately.

  - ◆ NONE: Default: **None**, transparent transmission, the received UART data will be directly sent to network.
  - ◆ Modbus: Modbus RTU to Modbus TCP.

- ◆ Frame: Enable auto-frame function. Relevant parameters are set in Frame command.

#### 4.2.1.31. UART/Frame Directory

- Function: Display/Set UART frame directory.
- Format:
  - ◆ Tab key query

PORT/UART/Frame>			
FrameLen	FrameTime	Tag	Quit

#### 4.2.1.32. UART/Frame/FrameLen Command

- Function: Display/Set UART auto-frame frame length
- Format:
  - ◆ Query  
**<FrameLen>**
  - ◆ Set  
**<FrameLen> [value]**
- Parameter:
 

Set UART auto-frame length, Setting is valid immediately.

  - ◆ value: Default: **8**, Range: 8~1400.

#### 4.2.1.33. UART/Frame/FrameTime Command

- Function: Display/Set UART auto-frame time
- Format:
  - ◆ Query  
**<FrameTime>**
  - ◆ Set  
**<FrameTime> [value]**
- Parameter:
 

Set UART auto-frame time, Setting is valid immediately.

  - ◆ value: Default: **100ms**, Range: 100~10000.

#### 4.2.1.34. UART/Frame/Tag Command

- Function: Display/Set UART auto-frame Tag
- Format:
  - ◆ Query  
**<Tag>**
  - ◆ Set  
**<Tag> [Enable/Disable]**
- Parameter:
 

Set UART auto-frame tag. Only transmit data from tag head to tag tail. Filter the other datas. Setting is valid immediately.

  - ◆ Enable: Enable auto-frame tag function.
    - TagHead: LabelHead. Default: **0x55**, Single byte data.
    - TagTail: LabelTail. Default: **0xAA**, Single byte data.

- ◆ Disable: Default: Value.

#### 4.2.1.35. UART/Edit Command

- Function: Set UART parameter
- Format:
  - ◆ Set

**<Edit> [baudrate databits stopbits parity]**

- Parameter:
 

Set all UART communication parameter including baud rate, data bit, stop bit and parity.

#### 4.2.1.36. UART/Clean Command

- Function: Clear UART transmit-receive data information
- Format:
  - ◆ Set

**<Clean>**

- Parameter:
 

Clear the UART data count(Data packet/Frame/Error packet and so on) shown in webpage.

#### 4.2.1.37. SOCK Directory

- Function: Display/Set Socket channel directory.
- Format:
  - ◆ Tab key query

```
EPORT/SOCK>
Show      New      netp      UDP      quit
```

Netp and UDP are created socket channel. Itsupport maximum 5 Sockets.

#### 4.2.1.38. SOCK/Show Command

- Function: Display Socket information function.
- Format:
  - ◆ Query

**<Show>**

#### 4.2.1.39. SOCK/New Command

- Function: Set new Socket information
- Format:
  - ◆ Set

**<New> [name]**

- Parameter:
 

There is a default socket created(netp). It support max 5 socket channel. Every channel can be set as TCP/UDP/HTTP and so on. Setting is valid immediately.

  - ◆ Name: Socket name. Range 1~19 characters.
    - Input Sock Proto: Choose one communication method of the following.
      - TCP-SERVER: TCP Server Mode. It support max 5 TCP Client connection.



- TCP-CLIENT: TCP Client Mode. It is used for connecting server.
- UDP-SERVER: UDP Server Mode. Special function. Product will record the last received UDP package source IP and Port information. The received UART data will be send to this IP and port, not the setting Destination .
- UDP-CLIENT: UDP Client Mode.
- HTTP: HTTP Protocol transmission. The received UART data will transform to HTTP format and it will remove the HTTP header information and only output the HTTP data to UART.
- TELNETD: Telnetd Mode. Use Telnet to config the UART Console equipment.
- TLS: **Function is reserved. We will update it soon.**

#### TCP Server Mode:

- Input Local Port[0]: Set local port, Range 1~65535, 0 is random port. For TCP Server and UDP application, set it to a fixed 1~65535(TCP port 80 is used for its webpage). For TCP Client application, usually set it to 0.
- Input Buffer size[512]: Set Buffer size. Default: 512 bytes, Range:1~1400.
- Input KeepAlive[60]: Set TCP keepalive, Heartbeat time, Defalut 60s, Range: >=0.
- Input Timeout[300]: Set TCP timeout, If exceed settet time and don't received any network data package, It will break TCP connection. If working in TCP client mode, it will reconnect immediately. If it work in TCP server mode, the TCP client need to create the connction. Set this value to 0 is to close the function. The function is used for TCP to restore abnormal connection. Recommend to enable. Default: 300s, Range 0~600.
- Input Sock Security[Disable]: Security options, Used for data special encryption. Default: disable no encryption.
  - Disable: No encryption
  - TLS: TLS1.2 encryption, only support in TCP client mode.
  - AES: AES encryption, TCP/UDP all support this.
  - DES3: DES3 encryption, TCP/UDP all support this.
    - ◆ Input key: AES or DES3 key. For AES encryption, the key is fixed 16 bytes length, the IV value is the same as key. For DES3 encryption, the key is fixed 24 bytes length, the IV value the first 8 Bytes of key. The key can be ASCII or Hex format data. Hex format data need to use "space" character as separator, ex, "01 02 03..."
- Input Rout[uart]: Set the Socket channel output, Can choose UART and other created Socket or use as Log print using.

#### TCP Client Mode ( Only list out difference)

- Input Server Address: Set server IPv4 address or domain name.
- Input Server Port: Set server port
- Input Local Port[0]: Same as above
- Input Buffer size[512]: Same as above
- Input KeepAlive[60]: Same as above

- Input Timeout[300]: Same as above.
- Input Sock Security[Disable]: Same as above
- Set HeartBeat[Disable]: Set Heartbeat function, default is Disable
- Input HeartBeat Serial[F0FE6B1C3D35]: Set Heartbeat content, default is MAC address
- Input Connect Mode[Always]: Set TCP Client connection mode
  - Always: TCP persistent connection. If TCP break, it will reconnect immediately.
  - Burst: It will establish connection once UART received data. If set stop function, It will disconnect after network received stop data.
    - ◆ Input Stop Serial: Set Burst Mode Stop bits. It can be ASCII or Hex format data, Hex format data need use space as separator , 1~10 bytes.
- Input Rout[uart]: Same as above

#### UDP Server/ UDP Client

##### HTTP Mode

- Input HTTP type[POST]: HTTP request type. Default: POST. Can choose POST or GET.
- Input HTTP path[/]: HTTP request path, Need start by"/". The longest byte is 63 bytes.
- Input HTTP version[1.0]: HTTP Protocol Version. Default: 1.0, Can choose 1.0 or 1.1
- Input HTTP parameters: Add HTTP head information, end by "Enter" key. If want to end the input, direct input "Enter" key. All HTTP header data length should be less than 250 bytes.

#### 4.2.1.40. SOCK/netp directory

- Function: Display/Set Socket netp channel directory.
- Format:
  - ◆ Tab key query

EPORT/SOCK/netp>				
Show	Name	Proto	Server	ServerPort
LocalPort	BufSize	KeepAlive	Timeout	Security
HeartBeat	ConnectMode	Rout	Save	Clean
Del	Quit			

Every created Socket channel can be modified through name. The above command function is the same as New Socket command description

#### 4.2.1.41. SOCK/netp/clean Command

- Function: Clear netp channel data packets information
- Format:
  - ◆ Set
- Parameter:
  - <Clean>

The network data packets information can be checked from webpage. The command will reset the data count.

#### 4.2.1.42. DATA Directory

- Function: Display/Set Cli command mode communication
- Format:
  - ◆ Tab Query

```
EPORT/DATA-Str>
Hex      Quit
```

Default: data sent in ASCII format. Also can change to send by HEX, The command is used for Cli command mode to transfer data.

#### 4.2.1.43. Restart Command

- Function: Restart instruction.
- Format:
  - ◆ Set

**<Restart>**

#### 4.2.1.44. Reload Instruction

- Function: Restore Factory setting instruction.
- Format:
  - ◆ Set

**Reload [SYS/UART/SOCK]**

- Parameter:
 

Reload to factory setting, if add the following parameters, it will only restore corresponding parameters. Parameter can including one of the below three:

  - ◆ SYS: Restore system setting relevant paramter
  - ◆ UART: Restore UART setting relevant paramter
  - ◆ SOCK: Restore Socket relevant paramter

#### 4.2.1.45. WIFI Catalog

- Function: Display/Set WIFI function
- Format:
  - ◆ Tab query

```
EPORT>WIFI
EPORT/WIFI>
Show      Mode      Status  Scan      Quit
```

#### 4.2.1.46. WIFI/Show Command

- Function: Display WIFI status
- Format:
  - ◆ Tab query

```
EPORT/WIFI>Show  
  
===WIFI Status===  
Mode:AP  
AP SSID:DDDD  
Connected  
  
STA SSID:Sam401  
Disconnected
```

#### 4.2.1.47. WIFI/Mode Command

- Function: Display/Set WIFI work mode.
- Format:
  - ◆ Query  
**<Mode>**
  - ◆ Set  
**<Mode> [AP/STA/APSTA]**
- Parameter:  
Set WIFI work mode. Valid after restart.
  - ◆ AP mode: Default, AP mode
    - Input AP SSID: Input the name of AP, 1~31 characters
    - Input AP Key: Input the password of AP, no password default, 8~63 characters.
  - ◆ STA: STA mode
    - Input STA SSID: Input the name of router, 1~31 character
    - Input STA Key: Input the password of router
  - ◆ APSTA: (reserved)

#### 4.2.1.48. WIFI/Status Command

- Function: Same as Show command.

#### 4.2.1.49. WIFI/Scan Command

- Function: Search the AP nearby.
- Format:
  - ◆ Query  
**<Query>**

```
EPORT/WIFI>Scan
CH,SSID,BSSID,RSSI
11,Caoyu,78:96:82:A2:C6:A2,10
11,Sam401,D4:EE:07:2D:14:1E,100
11,UPGRADE-AP,20:DC:E6:48:35:9E,39
10,ChinaNet-yRMx,38:E3:C5:A2:87:D5,100
6,xiaohuizi,B0:95:8E:06:CB:16,34
6,Caoyu,AA:25:93:B8:45:E2,5
6,Caoyu,D0:C7:C0:24:6C:40,20
1,TP-LINK_FF03AA,78:A1:06:FF:03:AA,15
```

#### 4.2.1.50. Exit Command

- Function: Exit Cli command mode
  - Format:
    - ◆ Set
- <Exit>**

#### 4.2.1.51. Quit Command

- Function: Quit the current and go the father Cli command directory.
  - Format:
    - ◆ Set
- <Quit>**

#### 4.2.1.52. FwUpgrade Instruction

- Function: Upgrade product firmware.
  - Format:
    - ◆ Set
- FwUpgrade [url]**
- Parameter:
 

Do upgrade function, if upgrade success, it will feedback "Upgrade OK", if fail, output "Upgrade FAIL", reboot to run with new firmware if success

    - ◆ url: firmware url resources, Ex: http://192.168.0.101/mfw.bin

# APPENDIX A:REFERENCES

## A.1. Test Tools

IOTService Configure Software:

<http://gb.hi-flying.com/downloadsfront.do?method=picker&flag=all&id=8c366199-b599-47a4-8d9c-20fa0b68bfcf&fileId=89&v=0.zip>

Overview of Characteristic	Parameters	Documents	Order Information
Data Sheet			
Title	Description	Version	Time
<a href="#">HF5111B User Manual</a>	HF5111B User Manual	1.0	2016.11.16
<a href="#">Eport&amp;HF51 Series Function and Cli Command</a>	Eport&HF51 Series Function and Cli Command	1.0	2016.10.21
<a href="#">Eport&amp;HF51 Series Application Manual</a>	Eport&HF51 Series Application Manual	1.0	2016.08.31
<a href="#">IOTManager Config Tools</a>	IOTManager Config Tools	2.5	2017.01.20

UART、Network Test software:

[http://www.hi-flying.com/download\\_list\\_dc/&downloadcategoryid=14&isMode=false&comp\\_stats=comp-FrontDownloadsCategory\\_show01-1376450727769.html](http://www.hi-flying.com/download_list_dc/&downloadcategoryid=14&isMode=false&comp_stats=comp-FrontDownloadsCategory_show01-1376450727769.html)

## A.2. Quick Start Manual

See our product application on website:

[http://www.hi-flying.com/products\\_detail/productId=95.html](http://www.hi-flying.com/products_detail/productId=95.html)

# APPENDIX B: TELNET COMMUNICATION FUNCTION

## B.1. Telnet Use Scene:

- a) Remote management device
- b) Remote management uart equipment

## B.2. Telnet Features:

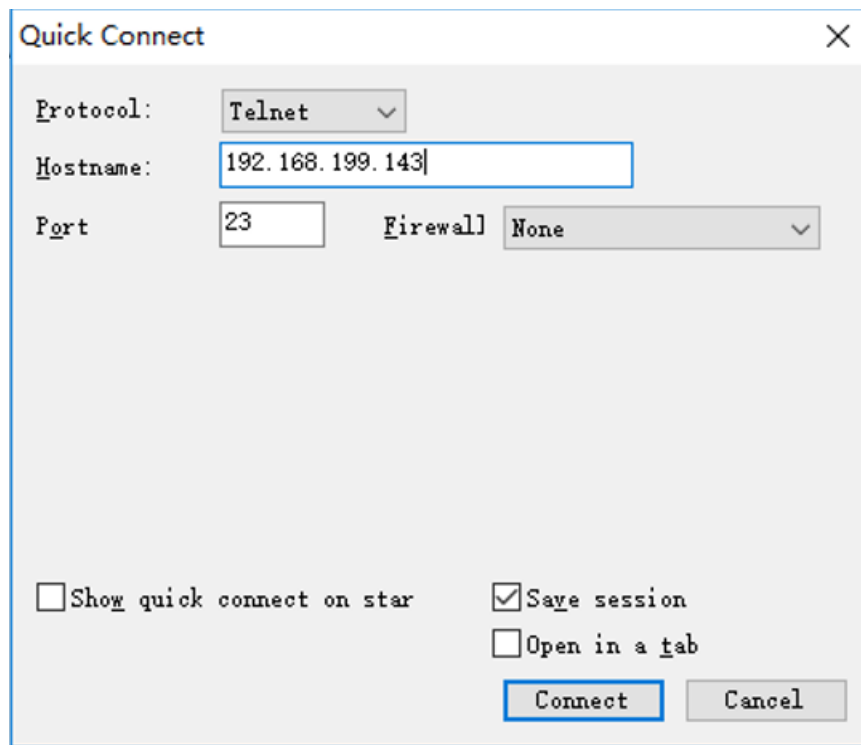
- a) Telnet support echo mode,
- b) Telnet only support one Client port.
- c) Telnet port number is 23
- d) Telnet connected with TCP, If Client port don't transmit data in 300s, It will auto disconnect.

## B.3. Telnet Usage:

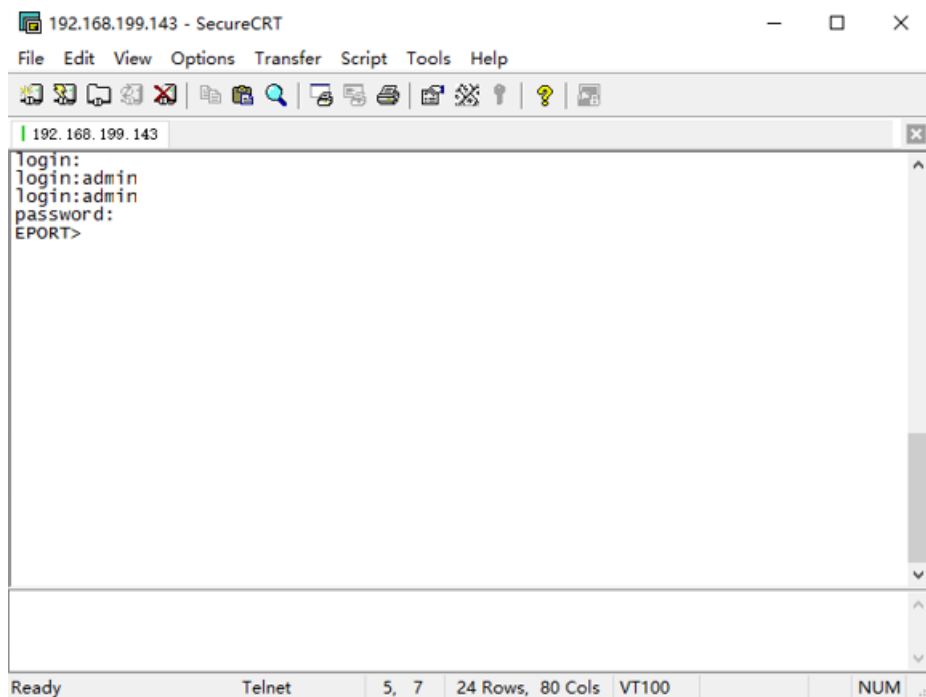
Telnet function default as ON, If can't connect, Pls use webpage or configuration to check the function is on or off.

Telnet	
Enable	<input checked="" type="checkbox"/>
Telnet Port	<input type="text" value="23"/>
Echo	<input checked="" type="checkbox"/>

- a) Configure Secure CRT module and connect parameter, Equipment need to connect with LAN, Can use equipment LAN IP to access , If need remote to access the equipment, It need router have public IP address as port and mapped to internal website, Then can remote access equipment.

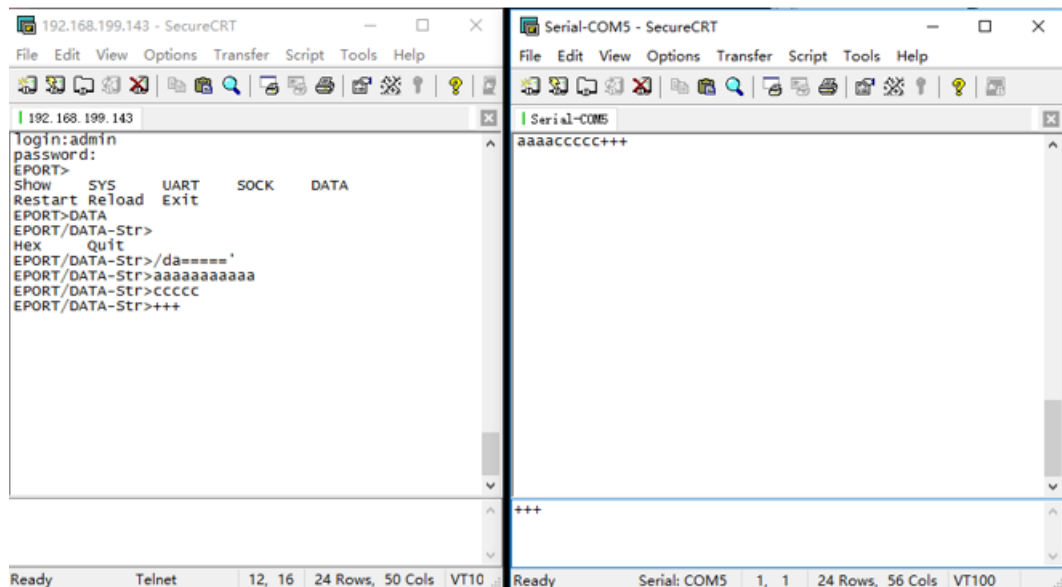


b) Use webpage account and password login in module, Then interface will show "EPORT>" .



c) Later use are same as UART cli command, And can realise Telnet data with UART data transparent transmission application.,

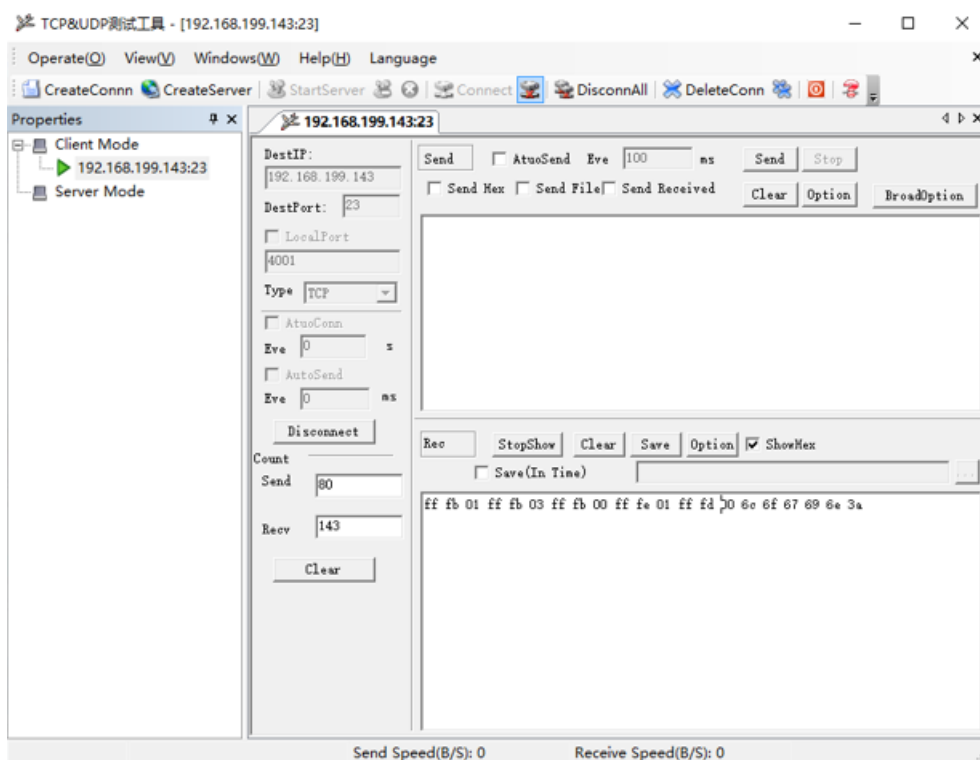




### Telnet Software implementation principle:

Step 1 Establish TCP connection with module

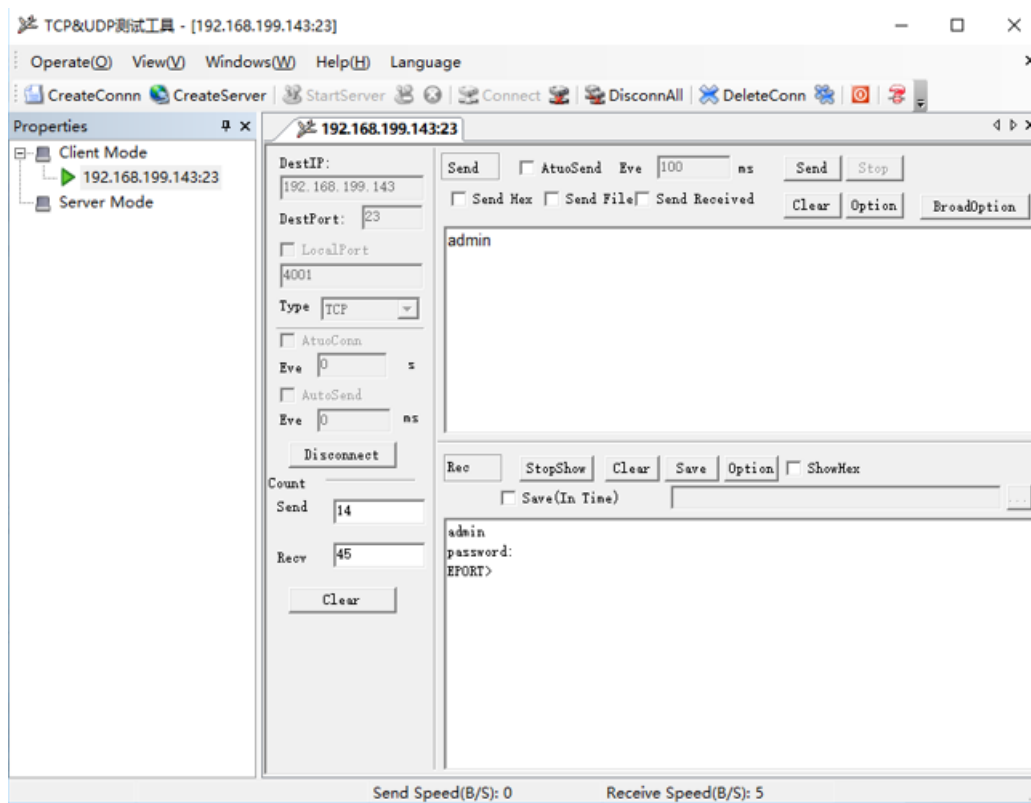
Step 2 Module send "login", Client port send user name(need end with Enter key,Tools can type Ctrl+Enter)



Step 3 Module send 0xFF 0xFB 0x01 Close telnet input display.

Step 4 Module send password, Client port send login password

## Step 5 Module send 0xFF 0xFC 0x01 Open telnet input display



Step 6 It can send and receive Cli command After Enter into Cli command mode.

## APPENDIX C: CONTACT INFORMATION

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Area,Shanghai,China,201203

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Support: support@iotworkshop.com

Service: service@iotworkshop.com

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For more information about IOTworkshop modules, applications, and solutions, please visit our web  
site [www.iotworkshop.com](http://www.iotworkshop.com)

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