Elfin-EW1X

RS232/RS485 to Wi-Fi

User Manual

V 1.3

Overview of Characteristic

- ✧ **Support 802.11bgn Wireless Standard**
- ✧ **Support TCP/UDP/Telnet /Modbus TCP Protocol**
- ✧ **Support RS232/RS485 to Wi-Fi Conversion, Serial Speed Up to 230400 bps**
- ✧ **Support STA/AP/AP+STA Mode**
- ✧ **Support SmartLink V8 Smart Config (Provide APP)**

- **Support Easy Configuration Through Web Interface or PC IOTService Tool**
- **Support Security Protocol Such As TLS/AES/DES3**
- **Support Webpage OTA Wirelss Upgrade**
- **Support Internal PCB Antenna**
- **Wide DC Input**
  - **Elfin-EW10, Elfin-EW11, Elfin-EW10-0, Elfin-EW11-0: 5~18VDC**
  - **Elfin-EW10A-0, Elfin-EW11A-0, Elfin-EW10A-0, Elfin-EW11A-0: 5~36VDC**
- **Size: 61 x 26 x 17.8 mm (L x W x H)**
- **FCC/CE/SRRC/IC Certificated**

TABLE OF CONTENTS TABLE OF CONTENTS

TABLE OF CONTENTS TABLE OF CONTENTS 3
LIST OF FIGURES 4
LIST OF TABLES 5
HISTORY 5
1. PRODUCT OVERVIEW 6
1.1. General Description 6
1.2. Device Paremeters 6
1.3. Key Application 7
2. HARDWARE INTRODUCTION 8
2.1. Elfin-EW10 Pins Definition 8
2.2. Elfin-EW11 Pins Definition 9
2.3. RS232 Interface 10
2.4. RS485 Interface 10
2.5. Mechanical Size 11
2.6. RJ45 8PIN Connector 11
2.7. RJ45 4PIN Connector 12
2.8. EW10 Interface Conversion Cable 14
2.9. EW11 Interface Conversion Cable 15
2.10. Fixed Bracket 16
2.11. Rail Bracket 16
2.12. Bracket 16
2.13. Product Installation 18
2.14. EVK 18
2.15. Order Information 19
3. NETWORK STRUCTURE 20
3.1. Wireless Network 20
3.1.1. AP Network 20
3.1.2. STA Wireless Network 21
3.1.3. AP+STA Wireless Network 21
3.1.4. IOTService Software 23
3.1.5. Webpage Configuration 23
4. FUNCTION DESCRIPTION 25
APPENDIX A: CONTACT INFORMATION 26

LIST OF FIGURES

Figure 1. Elfin-EW10 Appearance....8
Figure 2. Elfin-EW11 Appearance....8
Figure 3. Elfin-EW10 RJ45 Interface Pin....9
Figure 4. Elfin-EW11 RJ45 Interface Pin....9
Figure 5. Elfin-EW1X Mechanical Dimension....11
Figure 6. RJ45 8PIN Connector....11
Figure 7. EW10 +8PIN Connector....12
Figure 8. EW11+8PIN Connector....12
Figure 9. RJ45 4PIN Connector....12
Figure 10. EW10 +4PIN Connector....13
Figure 11. EW11+4PIN Connector....13
Figure 12. Interface Conversion Cable....14
Figure 13. Cable Manufacture Guide....15
Figure 14. Interface Conversion Cable....15
Figure 15. Fixed Bracket....16
Figure 16. Rail Bracket....16
Figure 17. Bracket Size....16
Figure 18. Bracket Install Picture....17
Figure 19. Product Installation....18
Figure 20. EVK Package....19
Figure 21. Elfin-EW1X Product Order Information....19
Figure 22. General AP Network....20
Figure 23. STA Application....21
Figure 24. AP+STA Wireless Network....22
Figure 25. Configure Wi-Fi Parameter....23
Figure 26. STA Scan Parameter....23
Figure 27. Configure the Wi-Fi Parameter....24
Figure 28. STA Scan....24

LIST OF TABLES

Table1. Elfin-EW1X Technical Specifications.....6
Table2. Elfin-EW10 Interface Definition.....9
Table3. Elfin-EW11 Interface Definition.....9

HISTORY

Ed. V1.0	07-04-2018	First Version
Ed. V1.1	09-18-2018	Fix LED description. Add more attachedment description.
Ed. V1.2	04-19-2019	Update baud rate, add accessories and external antenna.

1. PRODUCT OVERVIEW

1.1. General Description

The Elfin-EW1X provides RS232/RS485 interface to Wi-Fi connectivity. The Elfin-EW1X integrate TCP/IP controller, memory, high-speed serial port and integrates a fully developed TCP/IP network stack and mbed OS. Elfin-EW1X also support remotely configure, monitor with IOTService.

The Elfin-EW1X 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 Elfin-EW1X integrates all serial to Wi-Fi functionality with 61 x 26 x 17.8mm size.

1.2. Device Paremeters

Table1. Elfin-EW1X Technical Specifications

Item	Parameters
System Information	
Processor/Frequency	160MHz
Flash/SDRAM	2MB/352KB
Operating System	mbed
Network Protocol	
Network Protocol	IP，TCP，UDP，DHCP，DNS，HTTP Server/Client，ARP, BOOTP, AutoIP，ICMP，Web socket, Telnet, uPNP, NTP, Modbus TCP
Security Protocol	TLS v1.2 AES 128Bit DES3
Wi-Fi Interface	
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: +18dBm (Max.) 802.11g: +16dBm (Max.) 802.11n: +15dBm (Max.)
Rx Sensitive	802.11b: -89dBm 802.11g: -81dBm 802.11n: -71dBm
Antenna	Internal:PCB
Serial Port	
Port Number	EW10:1 RS232 EW11:1 RS485
Data Bits	7,8

Stop Bit	1,2
Check Bit	None, Even, Odd
Baud Rate	TTL: 300 bps~230400 bps
Flow Control	No Flow Control Software Xon/ Xoff flow control
Software	
Web Pages	Http Web Configuration Customization of HTTP Web Pages
Configuration	Web CLI XML import Telnet IOTService PC Software
Basic Parameter	
Size	61 x 26 x 17.8 mm
Operating Temp.	-40 ~ 85°C
Storage Temp.	-45 ~ 105°C, 5 ~ 95% RH（no condensation）
Input Voltage	Elfin-EW10, Elfin-EW11, Elfin-EW10-0, Elfin-EW11-0: 5~18VDC Elfin-EW10A-0, Elfin-EW11A-0, Elfin-EW10A-0, Elfin-EW11A-0: 5~36VDC
Working Current	~200mA
Power	<700mW

1.3. Key Application

The Elfin-EW1X device connects serial device to 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 Elfin-EW1X unit is a complete solution for serial port device connecting to network. This powerful device supports 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.
Elfin-EW1X serial server for data transfer via Wi-Fi, which makes the data transformation very simple.

Figure 1. Elfin-EW10 Appearance

Figure 2. Elfin-EW11 Appearance

2.1. Elfin-EW10 Pins Definition

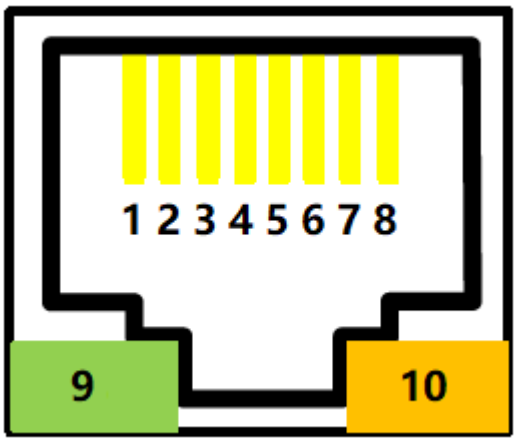


Figure 3. Elfin-EW10 RJ45 Interface Pin

Table2. Elfin-EW10 Interface Definition

Pin	Description	Net Name	Signal Type	Comment
1	GPIO	GPIO	IO	Reserved
2	GPIO	GPIO	IO	Reserved
3	GPIO	GPIO	IO	Reserved
4	Restore to Factory	nReload	I	**Default pulled-high.** **Detailed functions see <Notes>**
5	UART1_TXD	UART1_TXD	O	RS232 Voltage
6	UART1_RXD	UART1_RXD	I	RS232 Voltage
7	Power VCC	VCC	Power	5～18VDC
8	Power GND	GND	Power	
9	**Green LED** Net Status	Net	O	Boot On: Power is OK. 0.1s Off -> 0.1s On: SmartLink Config Mode 0.3s Off -> 3s On: STA mode connect to router or AP mode being connected by other STA. 0.3s Off ->0.3s On: No Wi-Fi Connection
10	**Amber LED** Data Transfer	Active	O	Off: No data transfer 0.3s Off -> 0.9s On: UART TX Output 0.3s Off -> 0.3s On: UART RX Receive On: UART bidirection.

2.2. Elfin-EW11 Pins Definition

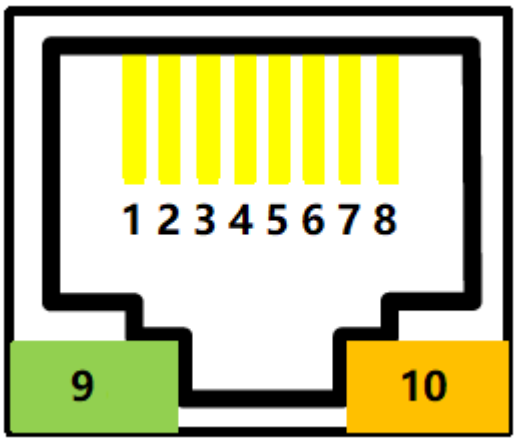


Figure 4. Elfin-EW11 RJ45 Interface Pin

Table3. Elfin-EW11 Interface Definition

Pin	Description	Net Name	Signal Type	Comment
1	Debug TX	UART2_TXD	O	TTL voltage

Pin	Description	Net Name	Signal Type	Comment
2	Debug RX	UART2_RXD	I	TTL voltage
3	GPIO	GPIO	IO	Reserved
4	Restore to Factory	nReload	I	**Default pulled-high.** **Detailed functions see <Notes>**
5	UART1_TXD	RS485_A+	IO	RS485 A+
6	UART1_RXD	RS485_B-	IO	RS485 B-
7	Power VCC	VCC	Power	5～18VDC
8	Power GND	GND	Power	
9	**Green LED** Net Status	Net	O	Boot On: Power is OK. 0.1s Off -> 0.1s On: SmartLink Config Mode 0.3s Off -> 3s On: STA mode connect to router or AP mode being connected by other STA. 0.3s Off ->0.3s On: No Wi-Fi Connection
10	**Amber LED** Data Transfer	Active	O	Off: No data transfer 0.3s Off -> 0.9s On: UART TX Output 0.3s Off -> 0.3s On: UART RX Receive On: UART bidirection.

<Notes>

I — Input; O — Output; I/O: Digital I/O; Power—Power Supply

nReload Pin (Button) function:

1. **After module is powered up, short press this button (0.2< "Low" <1.5s) and loose to make the module go into "SmartLink" config mode, waiting for APP to set password and other information. (See Appendix to download SmartLink APP)**
2. **After module is powered up, long press this button ("Low" > 4s) and loose to make the module recover to factory setting.**

UART1 Debug :

1. **Is used for debug log or firmware program. Baud Rate is 921600.**

2.3. RS232 Interface

Device RS232 does not support hardware flow control. The physical voltage is about ±7V.

2.4. RS485 Interface

RS485 use two wire links, A(DATA+), B(DATA-). Connect A(+) to A(+), B(-) to B(-) for communication. Suggest to connect GND together when interference is very severe.

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

2.5. Mechanical Size

The dimensions of Elfin-EW1X are defined as following picture (mm):

Figure 5. Elfin-EW1X Mechanical Dimension

2.6. RJ45 8PIN Connector

Figure 6. RJ45 8PIN Connector

Figure 7. EW10 +8PIN Connector

Figure 8. EW11+8PIN Connector

2.7. RJ45 4PIN Connector

Figure 9. RJ45 4PIN Connector

Figure 10. EW10 +4PIN Connector

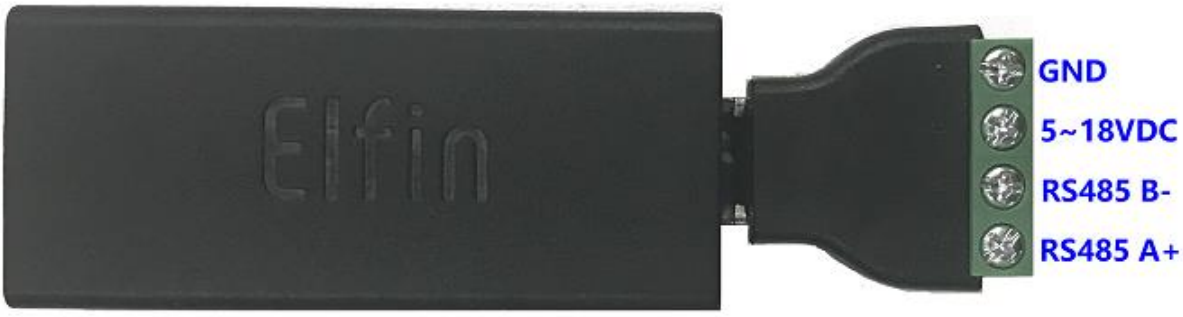


Figure 11. EW11+4PIN Connector

2.8. EW10 Interface Conversion Cable

Figure 12. Interface Conversion Cable

May also make cable according to the following picture.

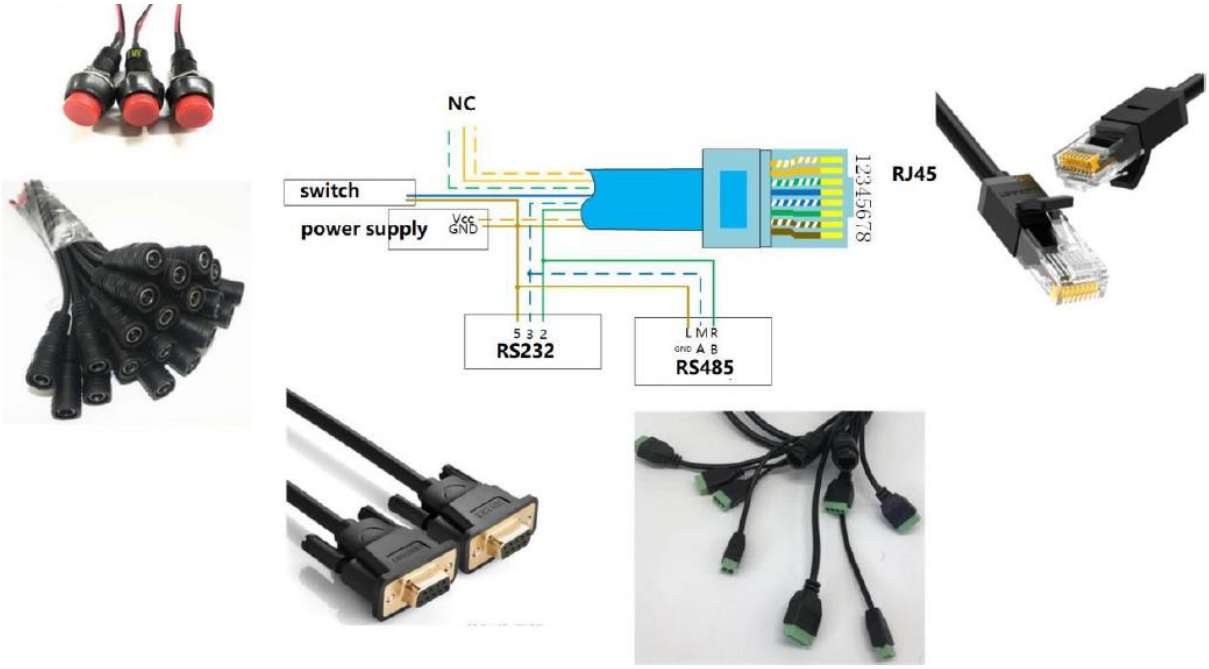


Figure 13. Cable Manufacture Guide

2.9. EW11 Interface Conversion Cable

Figure 14. Interface Conversion Cable

2.10. Fixed Bracket

Figure 15. Fixed Bracket

2.11. Rail Bracket

Figure 16. Rail Bracket

2.12. Bracket

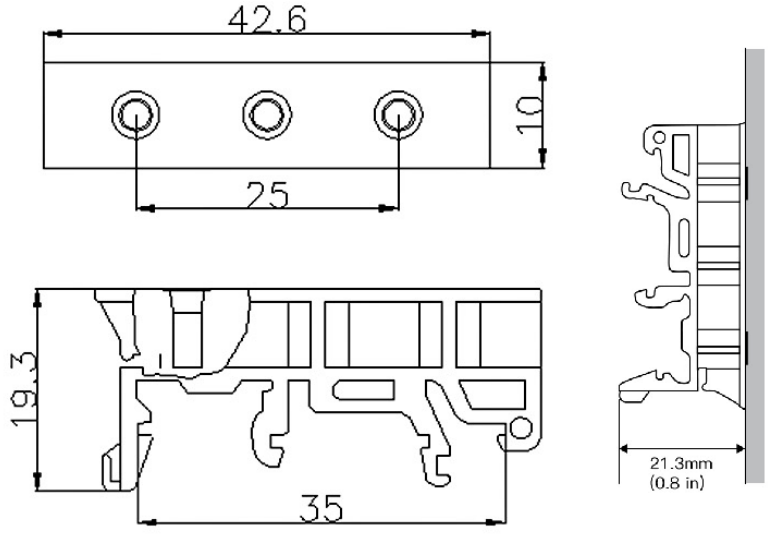


Figure 17. Bracket Size

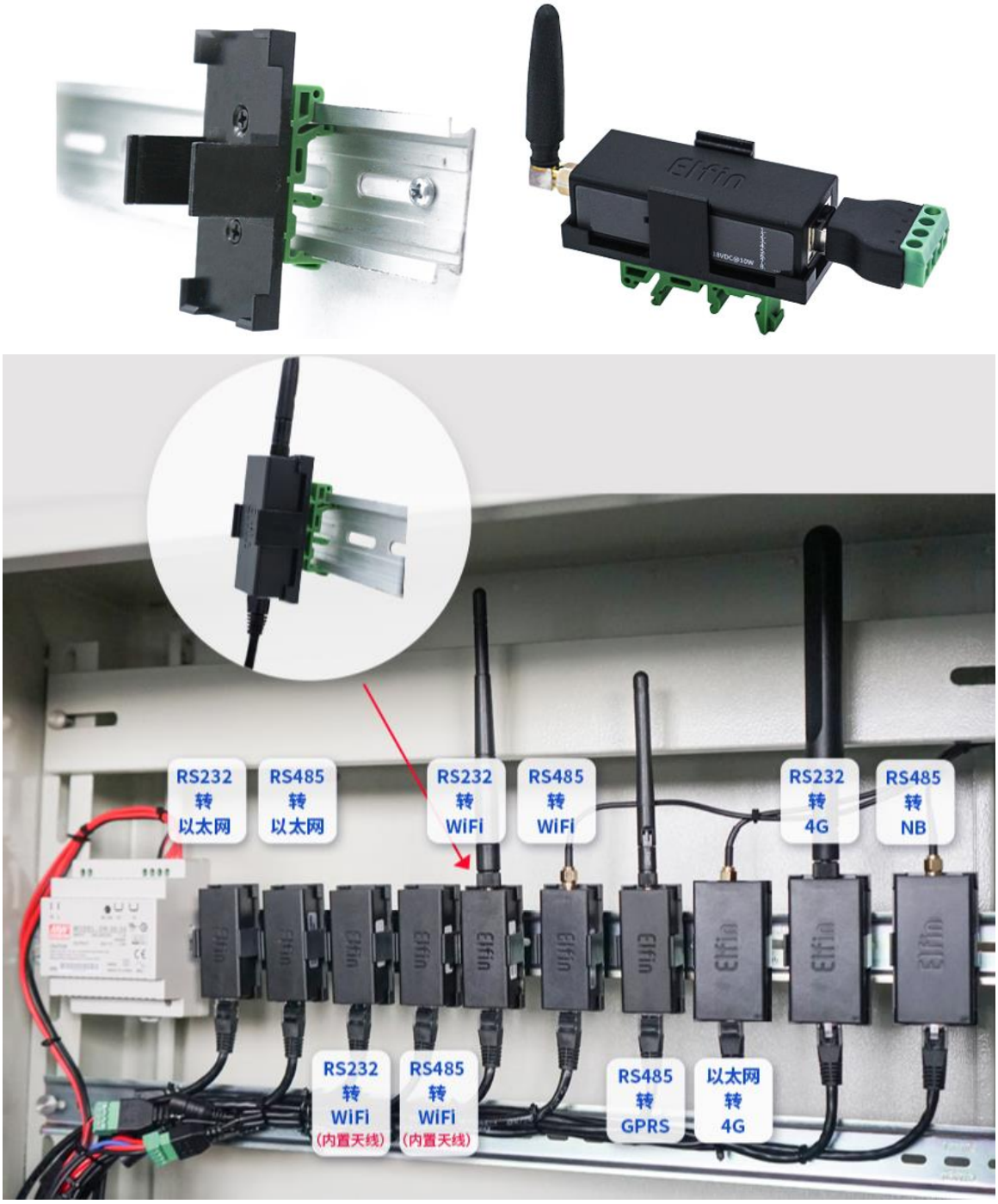


Figure 18. Bracket Install Picture

2.13. Product Installation

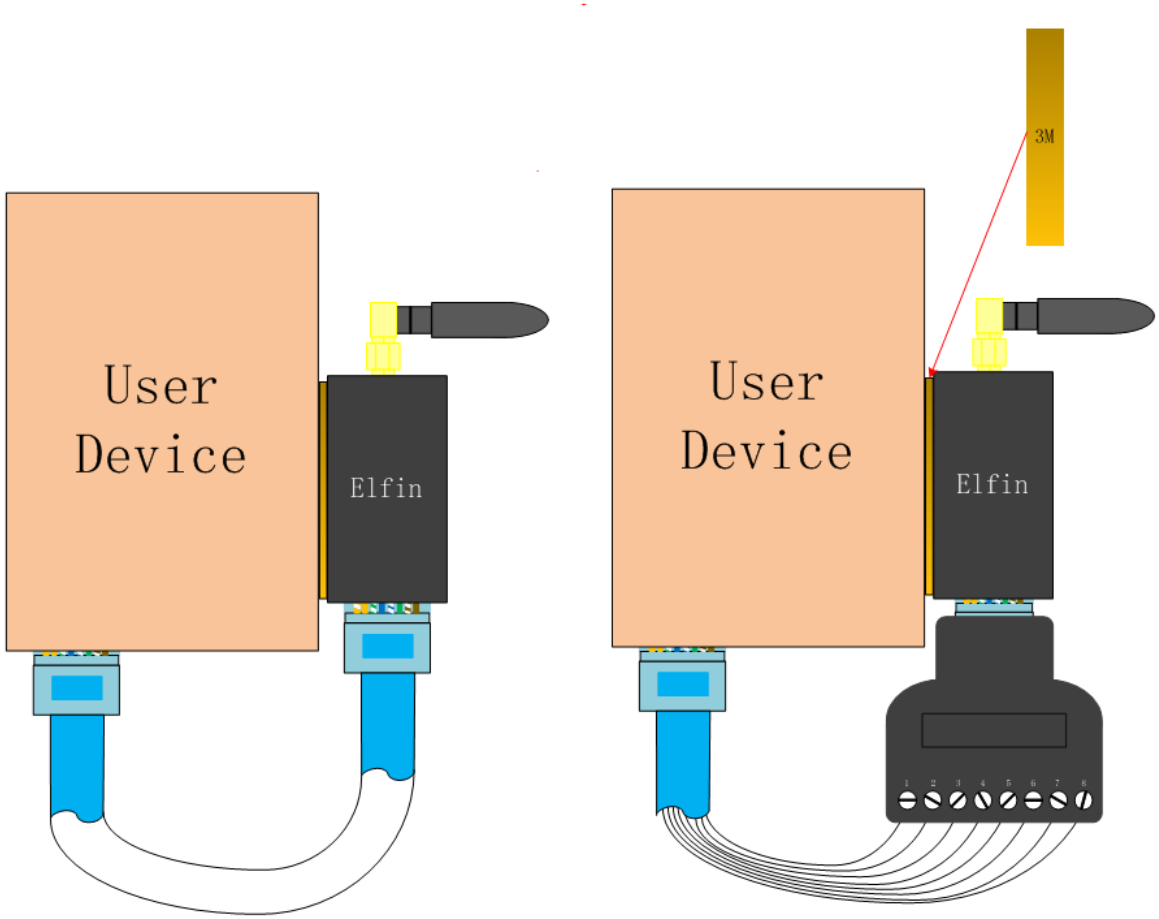


Figure 19. Product Installation

2.14. EVK

EVK indluce one Elfin device, one RJ45 Connector and one screw driver.

Figure 20. EVK Package

2.15. Order Information

Base on customer detailed requirement, Elfin-EW1X provide different configuration version, Details as below:

Function / Model	Power Input	Type	Antenna	UART	UART Number
Elfin-EW10	5~18VDC	Wi-Fi	Internal	RS232	1
Elfin-EW11	5~18VDC	Wi-Fi	Internal	RS485	1
Elfin-EW10-0	5~18VDC	Wi-Fi	External SMA	RS232	1
Elfin-EW11-0	5~18VDC	Wi-Fi	External SMA	RS485	1
Elfin-EW10A	5~36VDC	Wi-Fi	Internal	RS232	1
Elfin-EW11A	5~36VDC	Wi-Fi	Internal	RS485	1
Elfin-EW10A-0	5~36VDC	Wi-Fi	Extermal SMA	RS232	1
Elfin-EW11A-0	5~36VDC	Wi-Fi	External SMA	RS485	1

Figure 21. Elfin-EW1X Product Order Information

3. NETWORK STRUCTURE

3.1. Wireless Network

Product 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.

<Introductions>

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.

3.1.1. 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 22. General AP Network

3.1.2. 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.

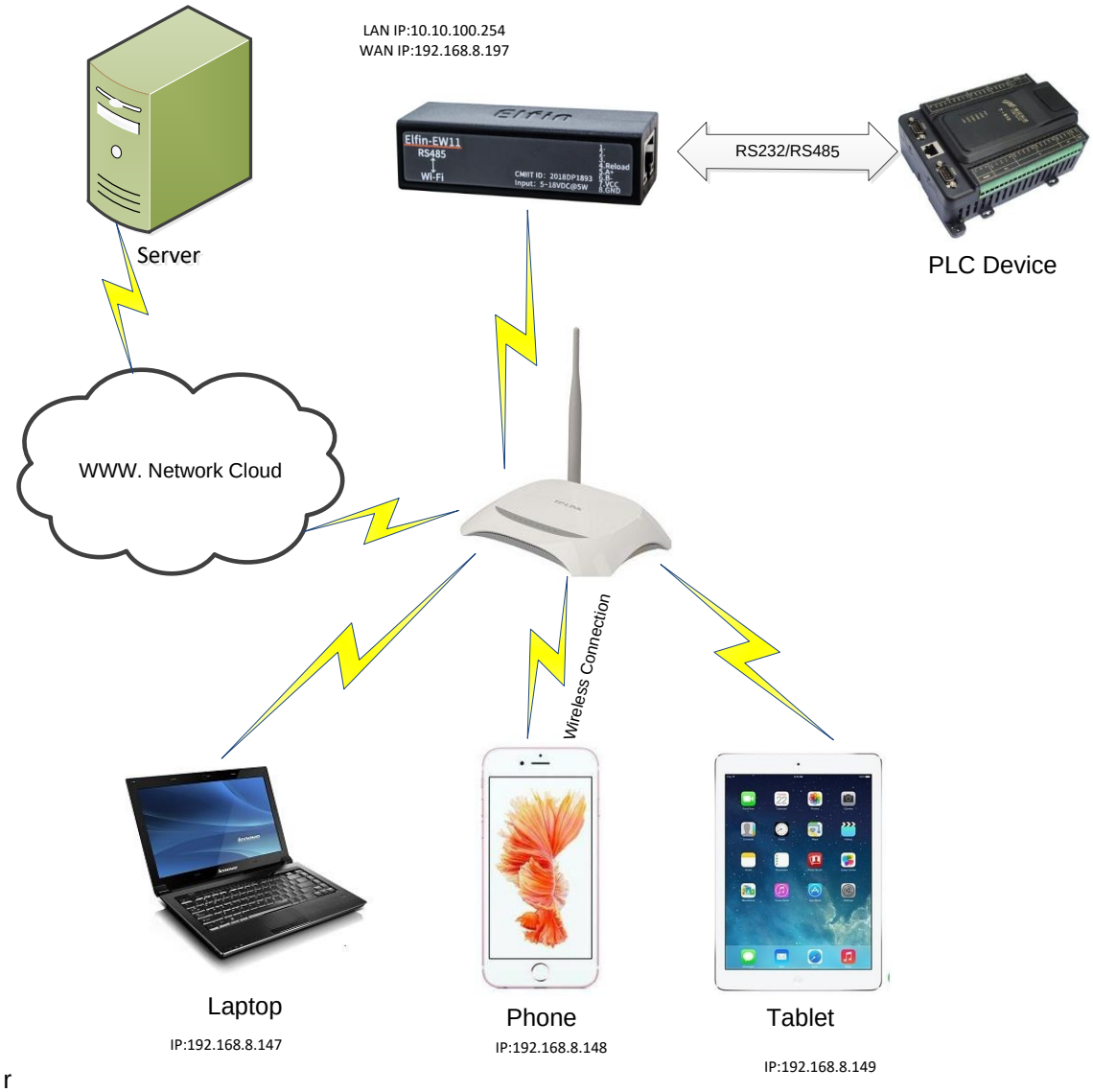


Figure 23. STA Application

3.1.3. AP+STA Wireless Network

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

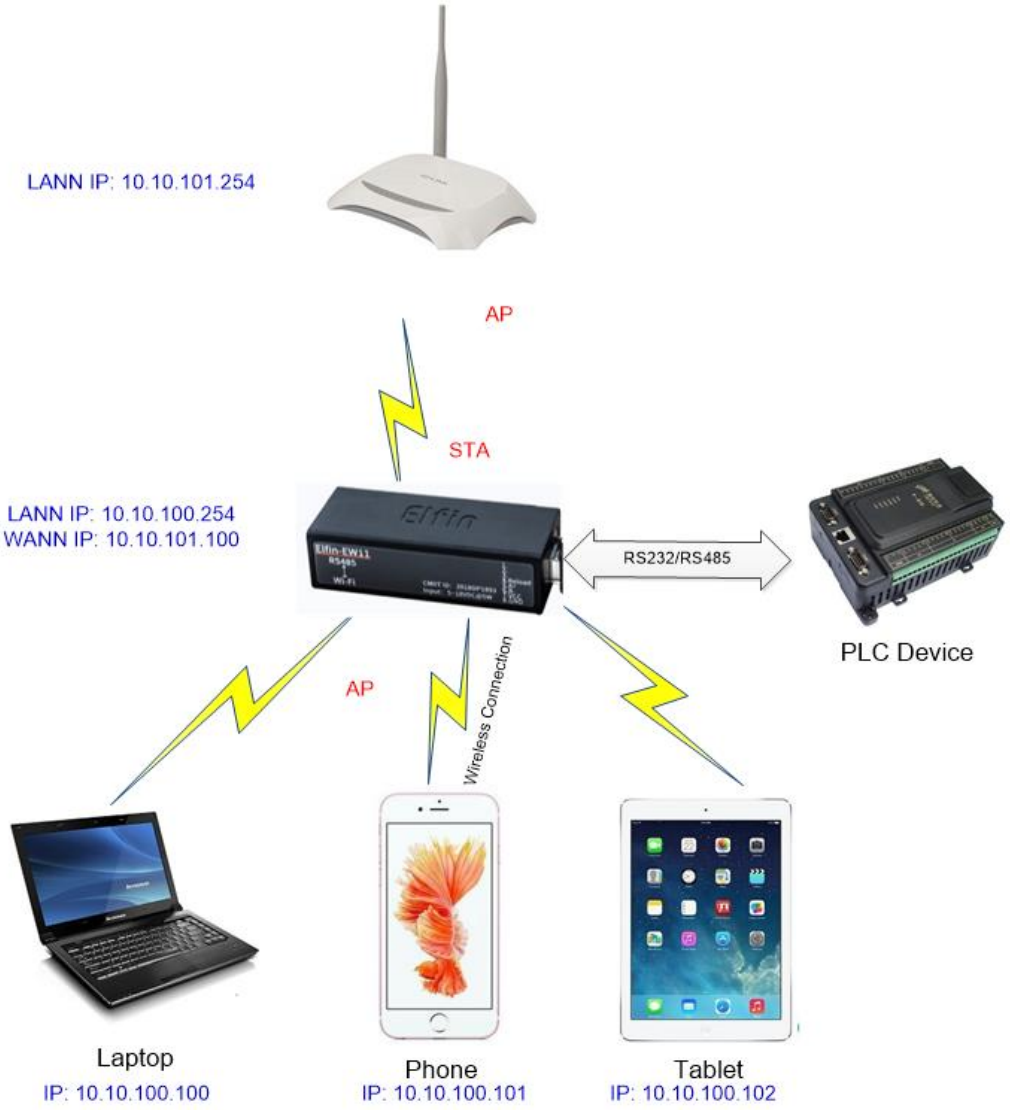


Figure 24. AP+STA Wireless Network

In this picture, 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.

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.

Does not support Wi-Fi repeater function that means device works in AP+STA(STA connects to router), PC connects to device AP, but can not access to internet (If need this router function, use HF2211/HF2221)

3.1.4. 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.

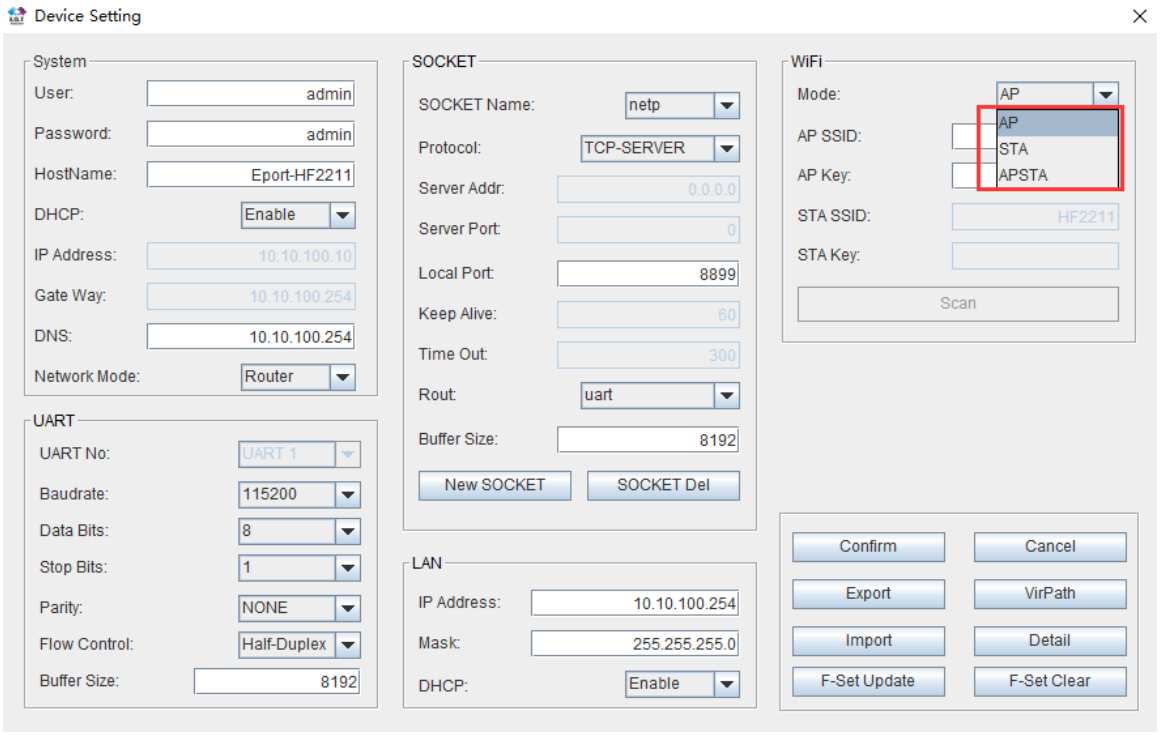
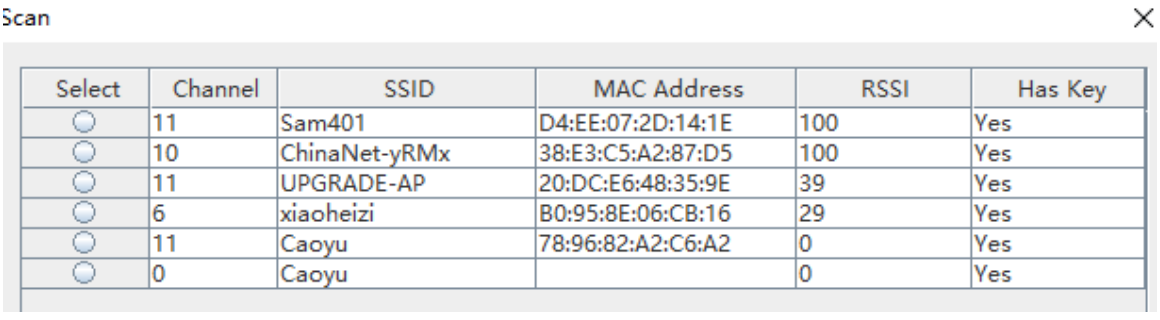


Figure 25. Configure Wi-Fi Parameter



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

Figure 26. STA Scan Parameter

3.1.5. 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.

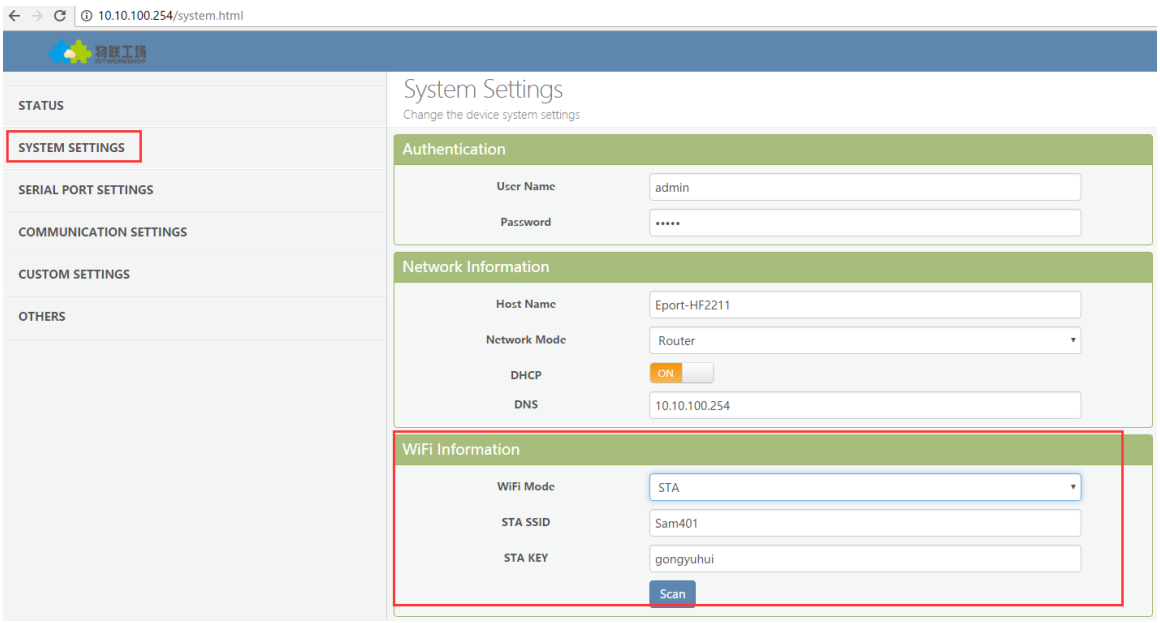
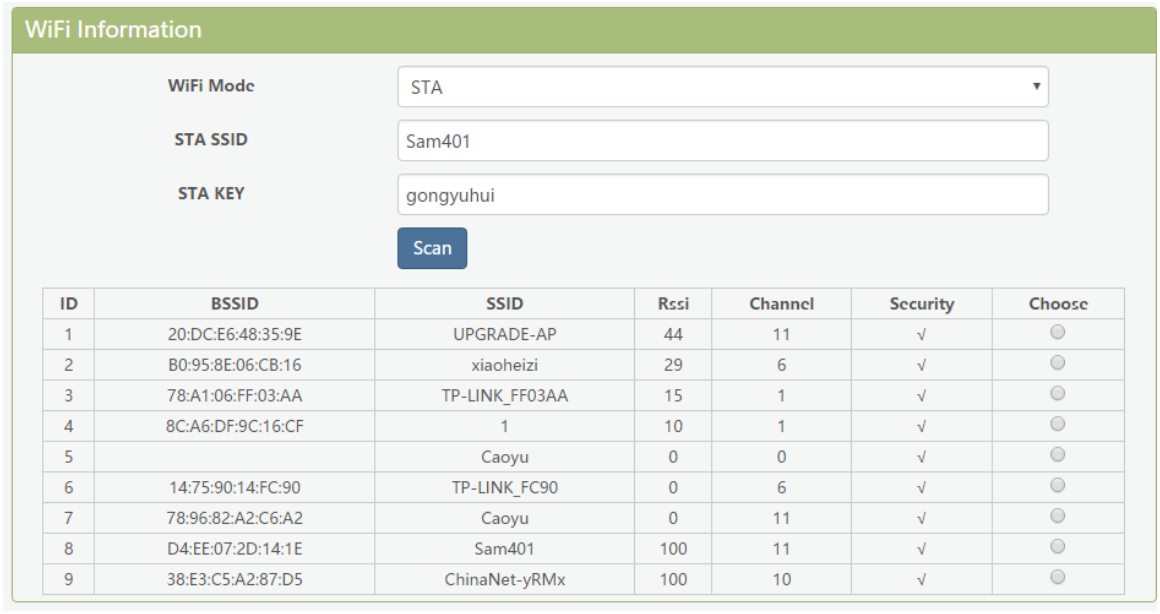


Figure 27. Configure the Wi-Fi Parameter



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

Figure 28. STA Scan

4. FUNCTION DESCRIPTION

Refer to “IOT_Device_Series_Software_Funtion” document for more detailed function.

APPENDIX A: CONTACT INFORMATION

Address: Room 1002,Building 1,No.3000,Longdong Avenue,Pudong New Area,Shanghai,China,201203

Web: www.iotworkshop.com or www.hi-flying.com

Contact:

Sales: sales@iotworkshop.com

Support: support@iotworkshop.com

Service: service@iotworkshop.com

Business: business@iotworkshop.com

---------- **----------**

For more information about IOTworkshop modules, applications, and solutions, please visit our web site www.iotworkshop.com

<END OF DOCUMENT>

HF2211S_EW1X_PW1X
Operation Guide

This document applies to the following series of products, please refer to the user manual for product hardware description.

	Elfin-EW10 Elfin-EW10-0
	Elfin-EW11 Elfin-EW11-0
	HF2211S
	Protoss-PW11

1. INTRODUCTION 3

1.1. ELFIN-EW1X EVK 3
1.2. ELFIN-EW10 4PIN CONNECTOR 3
1.3. ELFIN-EW11 4PIN CONNECTOR 4
1.4. ELFIN-EW10 8PIN CONNECTOR 4
1.5. ELFIN-EW11 8PIN CONNECTOR 4
1.6. ELFIN-EW10/EW11 RJ45 CABLE 4
1.7. EW10 INTERFACE CONVERSION CABLE 5
1.8. EW11 INTERFACE CONVERSION CABLE 6
1.9. HF2211S HARDWARE 6
1.10. PROTOSS-PW11 HARDWARE 7

2. HARDWARE INTRODUCTION 8

2.1. POWER SUPPLY 8
2.2. POWER SUPPLY 8
2.3. INTERFACE CONNECTION 8

3. INITIAL SETUP 9

3.1. WEBPAGE SET 9
3.2. IOTSERVICE SET 13

4. SERIAL PORT SETTINGS 16

4.1. SERIAL PORT TOOL SECURECRT 16
4.2. SETTING SERIAL PORT PARAMETERS 16
4.3. CLI INSTRUCTION MODE 16

5. TEST EXAMPLE 19

5.1. AP WIRELESS NETWORKING 19
5.2. TCP SERVER TEST IN AP MODE 20
5.3. STA WIRELESS NETWORKING 24
5.4. TCP SERVER TEST IN STA MODE 27
5.5. STA TCP CLIENT TEST 29
5.6. STA HTTP CLIENT TEST 31
5.7. STA MQTT CLIENT TEST 34
5.8. FIRMWARE UPGRADE 36
5.9. RESTORE TO FACTORY SETTING 37
5.10. MORE APPLICATION CASE 37

APPENDIX A:REFERENCES 38

A.1. TEST TOOLS 38
A.2. SMARTLINK V8 38

1. INTRODUCTION

Elfin-EW1X, HF2211S, Protoss-PW1X products software function is the same (integrate our HF-LPT230 module, talk to our sales if need modules only), but with different hardware interface and size. Here has a brief description of these products' hardware, and take EW for example of software introduction.

All tools can be download at following link:

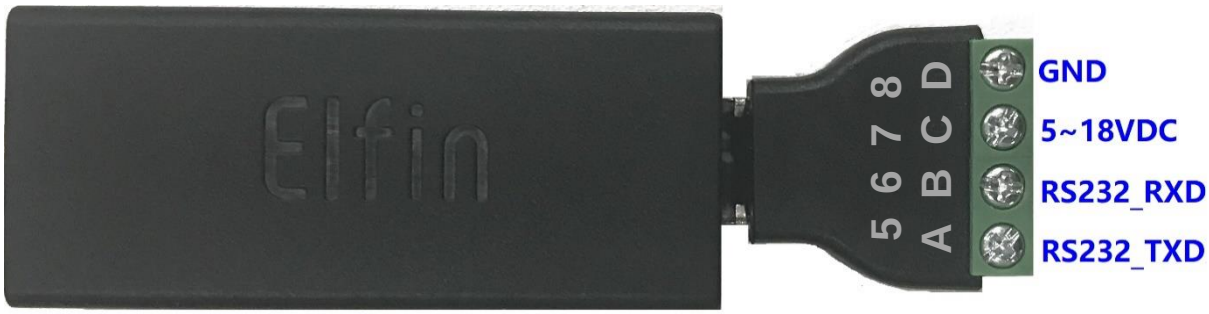
http://www.hi-flying.com/index.php?route=download/category&path=1_4

1.1. Elfin-EW1X EVK

Elfin-EW10/Elfin-EW10-0 is RS232 interface and Elfin-EW11/Elfin-EW11-0 is RS485 interface. The EVK include the following attachment.

- Elfin-E1WX products
- Screw driver
- RJ45 connecter(4PIN or 8PIN)

1.2. Elfin-EW10 4PIN Connector



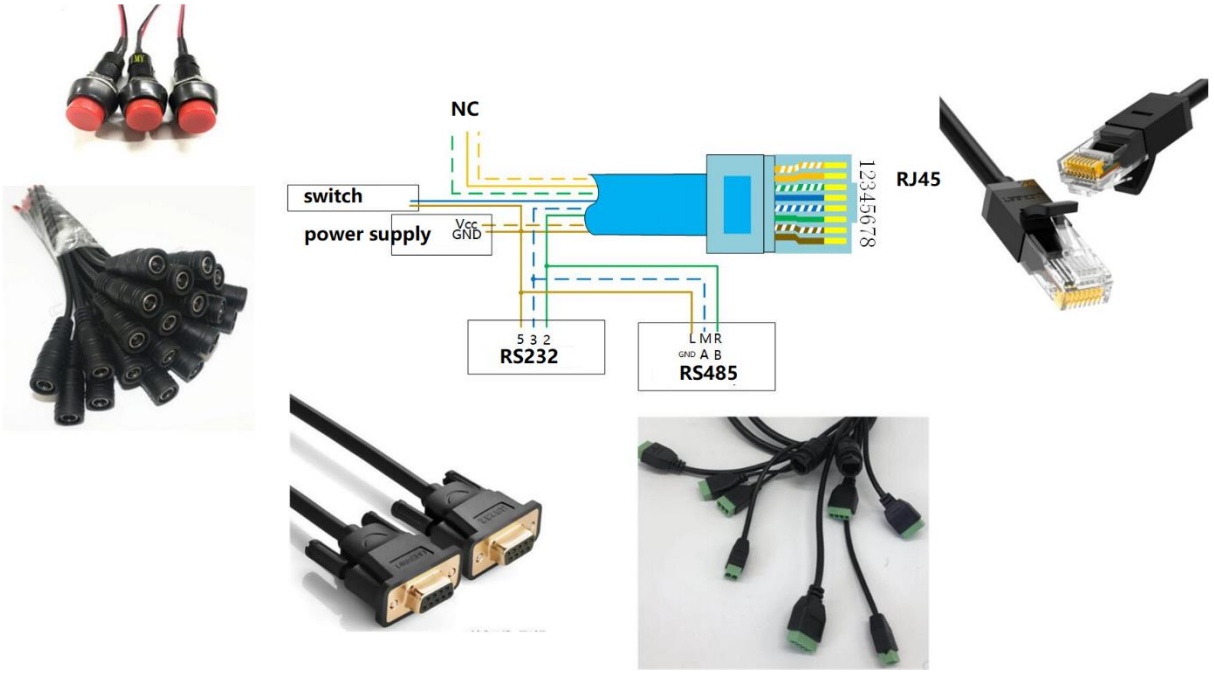
1.3. Elfin-EW11 4PIN Connector

1.4. Elfin-EW10 8PIN Connector

1.5. Elfin-EW11 8PIN Connector

1.6. Elfin-EW10/EW11 RJ45 Cable

The RJ45 cable can be done as following picture.



1.7. EW10 Interface Conversion Cable

1.8. EW11 Interface Conversion Cable

1.9. HF2211S Hardware

1.10. Protoss-PW11 Hardware

2. HARDWARE INTRODUCTION

2.1. Power Supply

- **EW1X**

DC 5~18VDC@5W.

Note: USB is not enough for power supply.

- **HF2211S**

DC 5~36VDC@1A。

- **PW1X**

-H AC Version, 100~240VAC

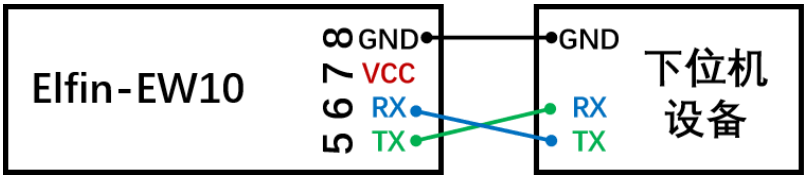
-M DC Version, 9~48VDC@1A

2.2. Power Supply

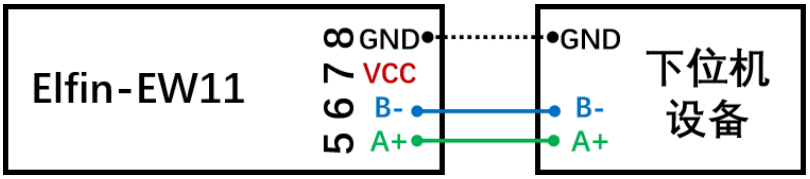
See products user manual.

2.3. Interface Connection

Elfin-EW10 is RS232, 7V voltage, need to connect with Pin5(TX), Pin6(RX) and Pin8(GND).



Elfin-EW11 is RS485, use Pin5(A+), Pin6(B-), GND also can be connected in some extreme condition.



3. INITIAL SETUP

HF Products provide multiple methods to config, webpage and IOTService tools.
Webpage is easy to use, but only for local setup and can not manage multiple device, recommend to use IOTService tools.

3.1. Webpage Set

Power on product:

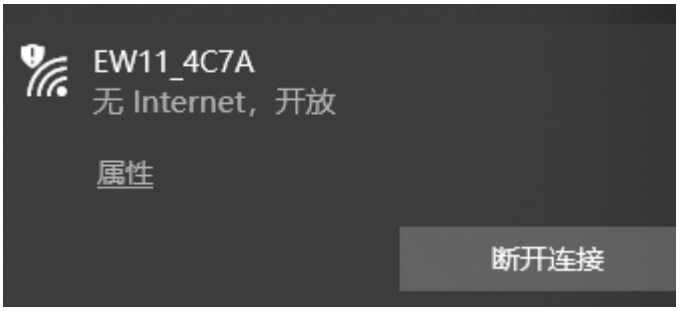
- EW1X green LED will be repeat flash on 0.3s, then off 0.3s, indicate it works normally.
- HF2211S Link LED will be repeat flash on 0.3s, then off 0.3s, indicate it works normally.
- PW1X Net LED will be repeat flash on 0.3s, then off 0.3s, indicate it works normally.

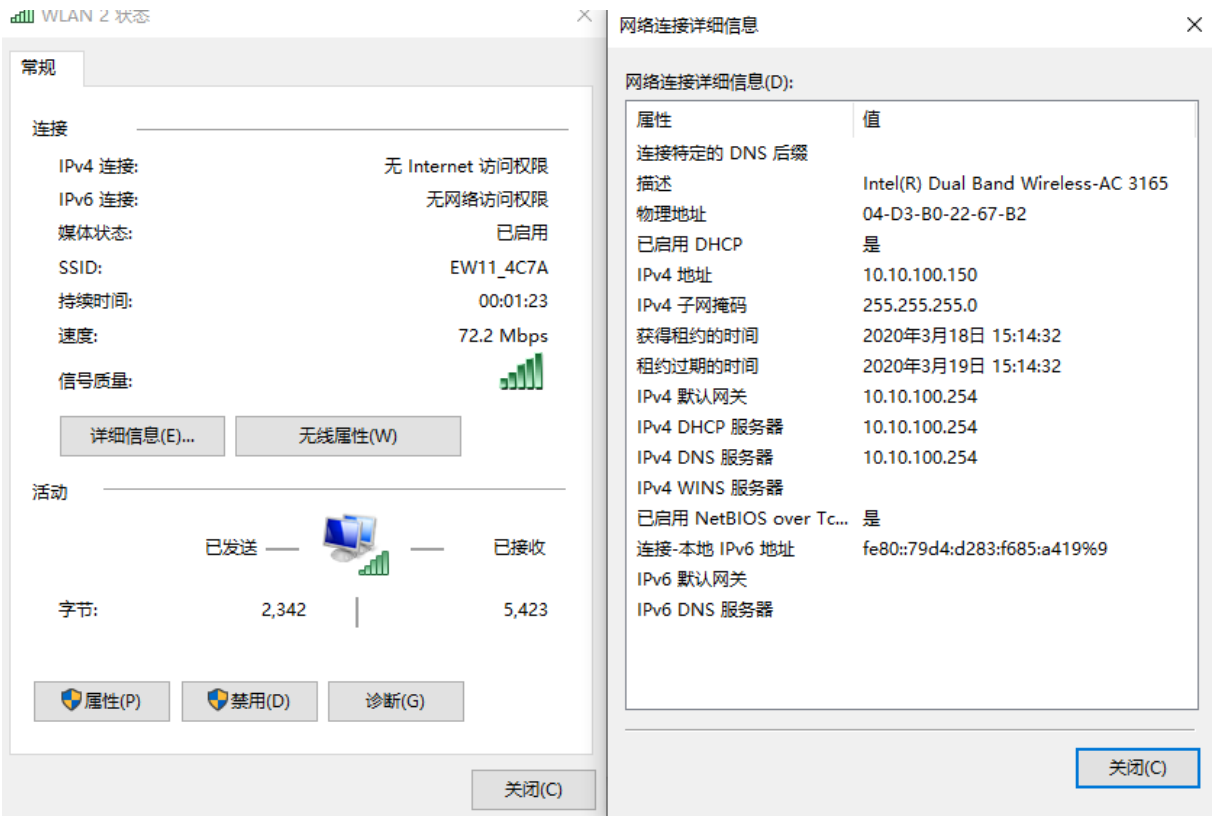
PC Wi-Fi to search AP, different products with different SSID, XXXX is the end 4 characters of MAC.

- EW1X SSID is EW10_XXXX or EW11_XXXX.
- HF2211S SSID is HF2211S_XXXX
- PW1X SSID is PW11_XXXX

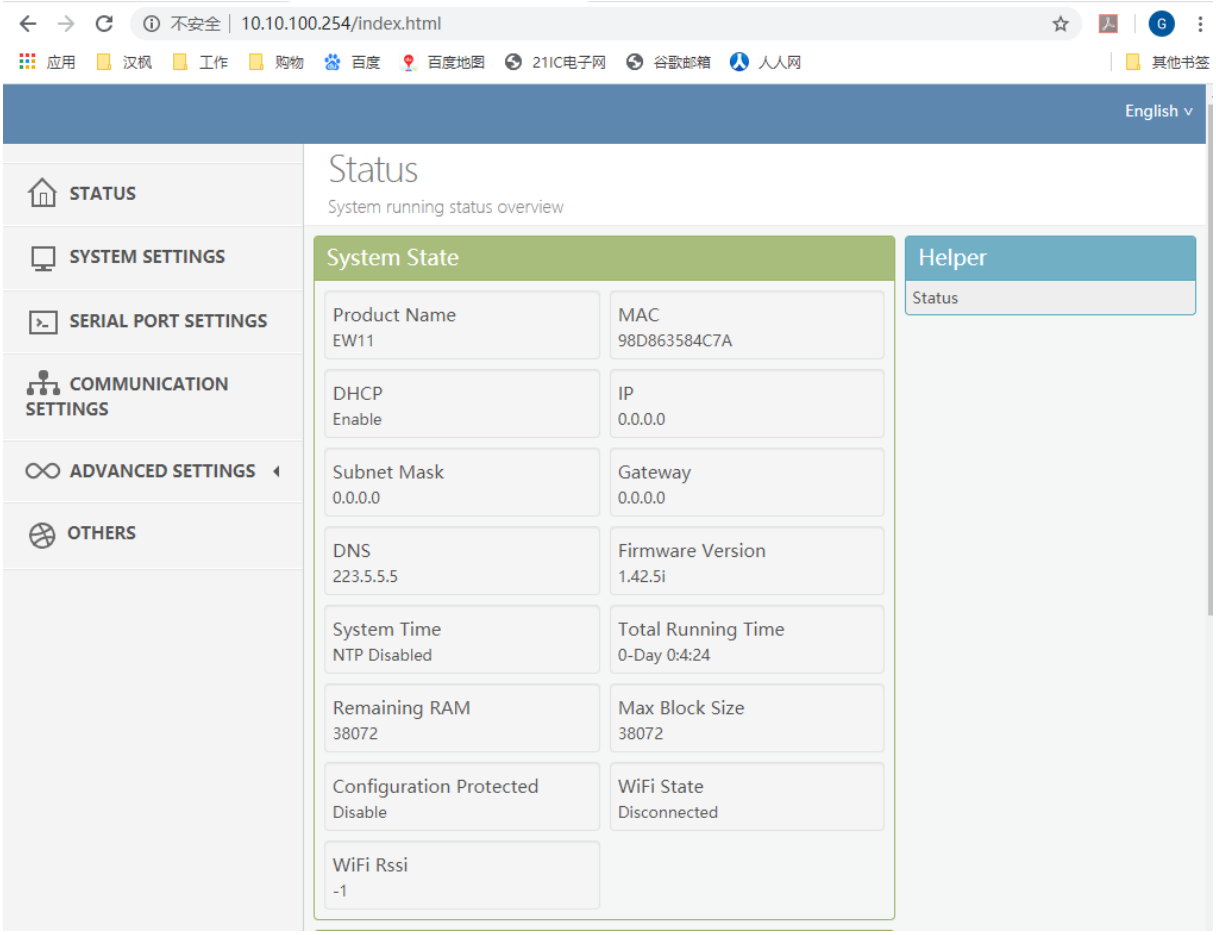
Set PC IP with Auto DHCP.

PC Wi-Fi connect to products and got IP as following picture

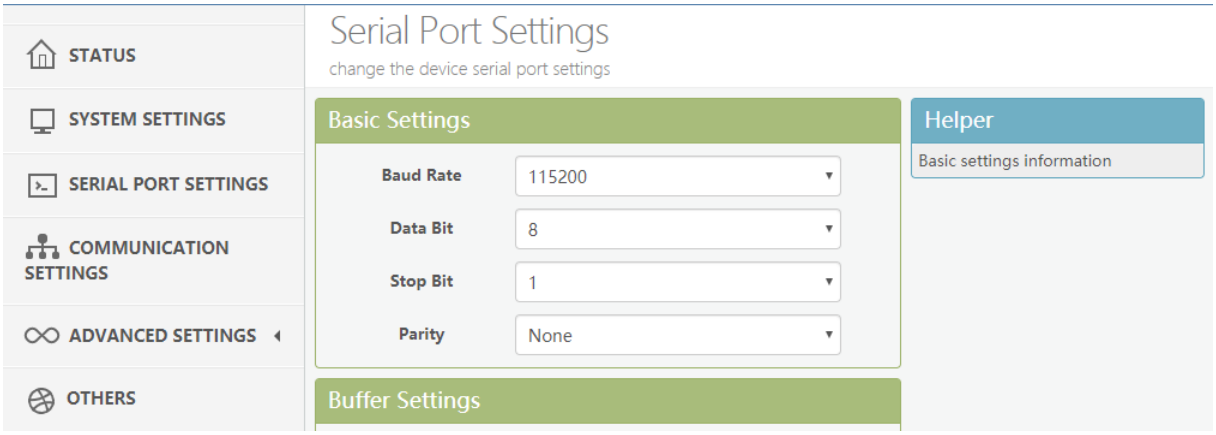




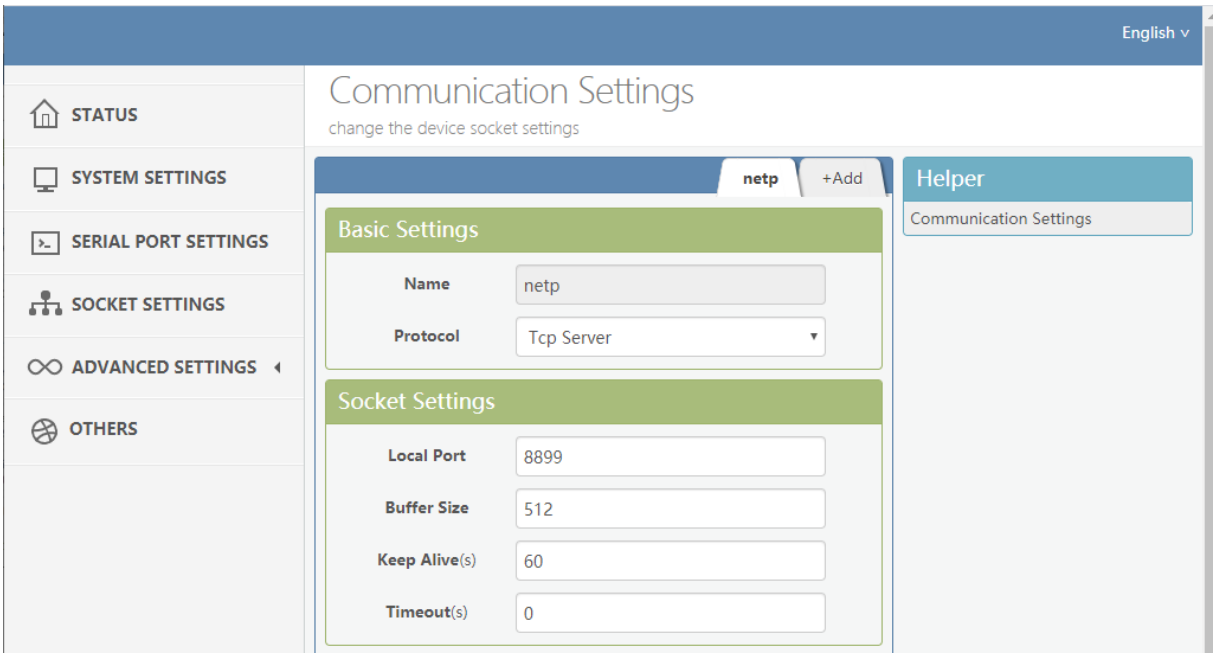
Brower input 10.10.100.254, input default user name and password with admin/admin to login in. The main page is as following.



Default UART parameters is as following.

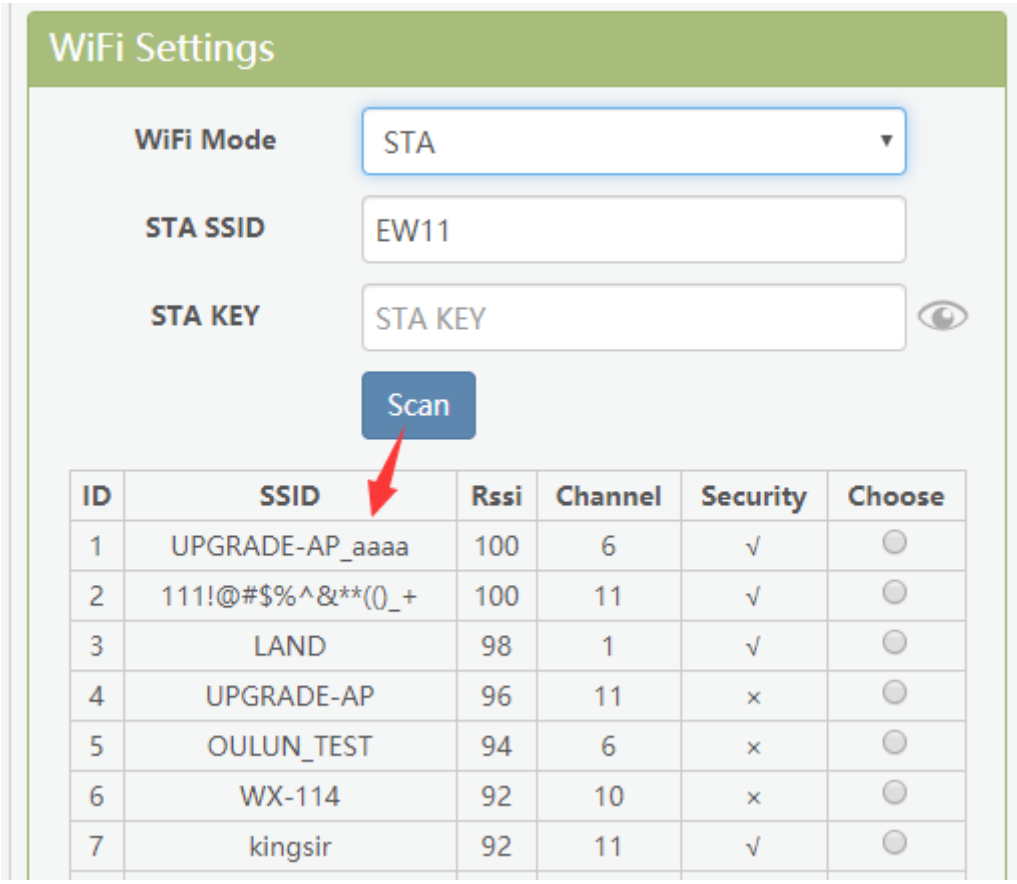


Default socket parameters is as following.



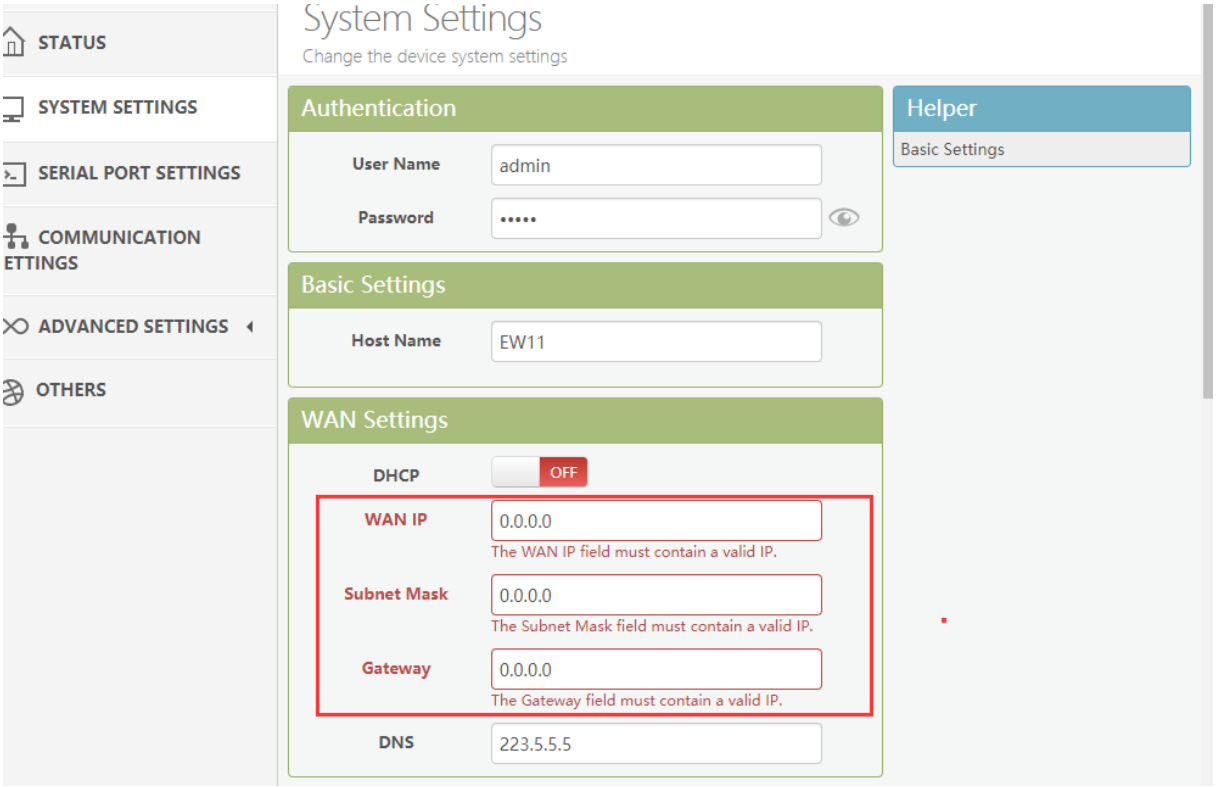
Products by default works as AP mode, if need to set it connect to router, set it to STA or AP+STA working mode as following. Select the scanned list and input the router password.

Note: setting is valid after reboot.

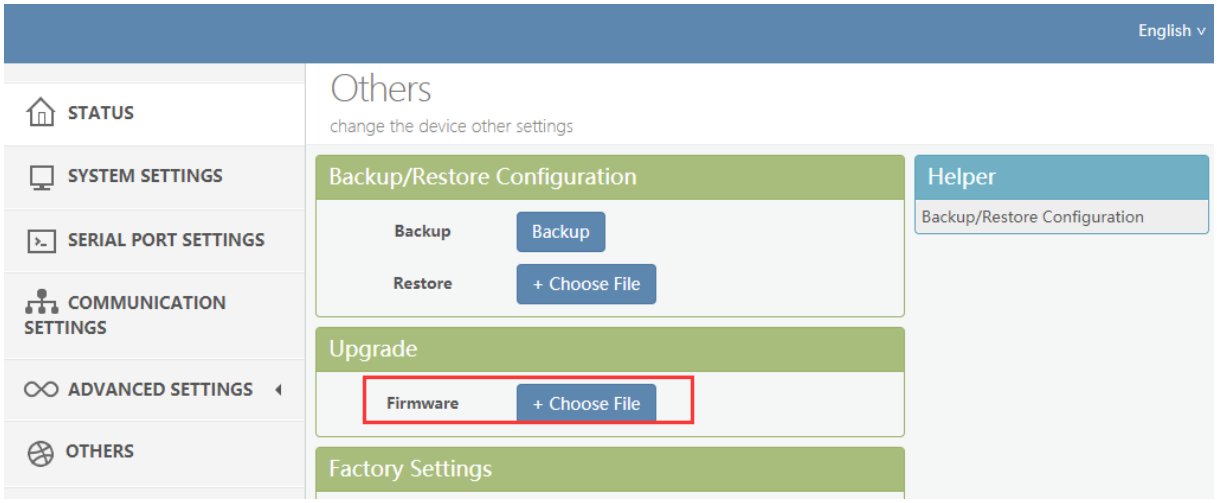


If need static IP in STA mode, set DHCP to off and input static IP.

Note: setting is valid after reboot.



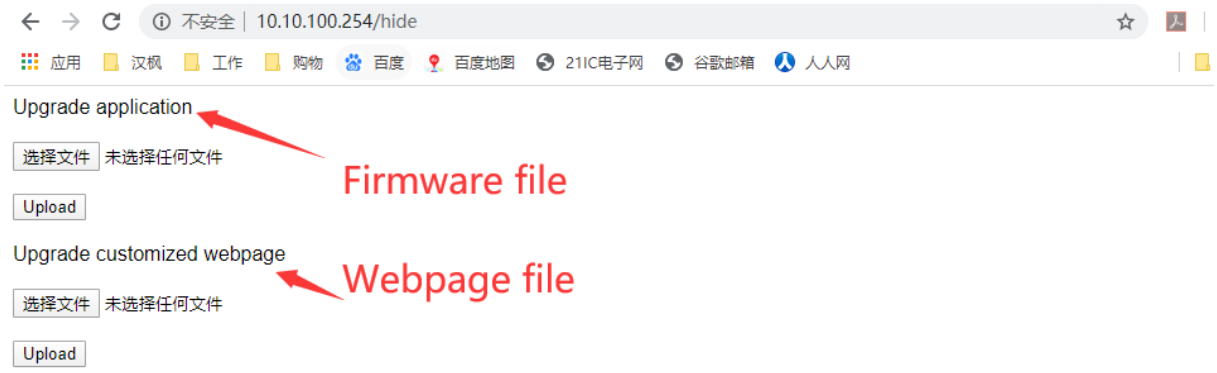
If upgrade firmware at the following position.



There is another internal webpage for upgrade the firmware and webpage (external config webpage as above, this source code is open at our website for customer to chagne). Login with IP/hide.

Webpage source file:

http://www.hi-flying.com/download-center-1/application-notes-1/download-item-iot-device-webpage-source-code



3.2. IOTService Set

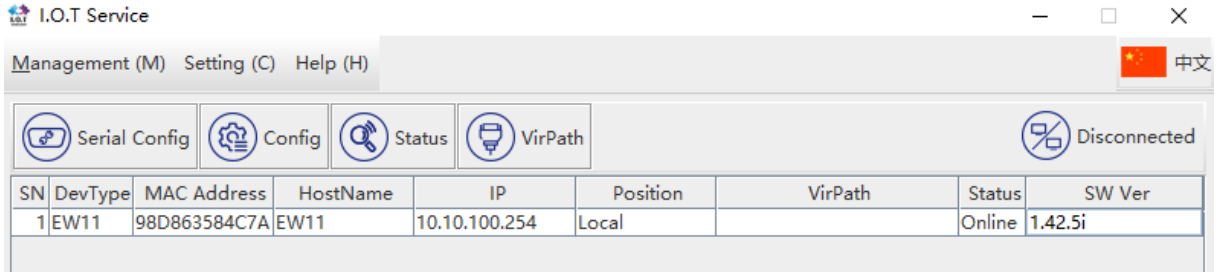
IOTService is simple to manage the products, config and even communicate with it.

Download address:

http://www.hi-flying.com/download-center-1/applications-1/download-item-iotservice

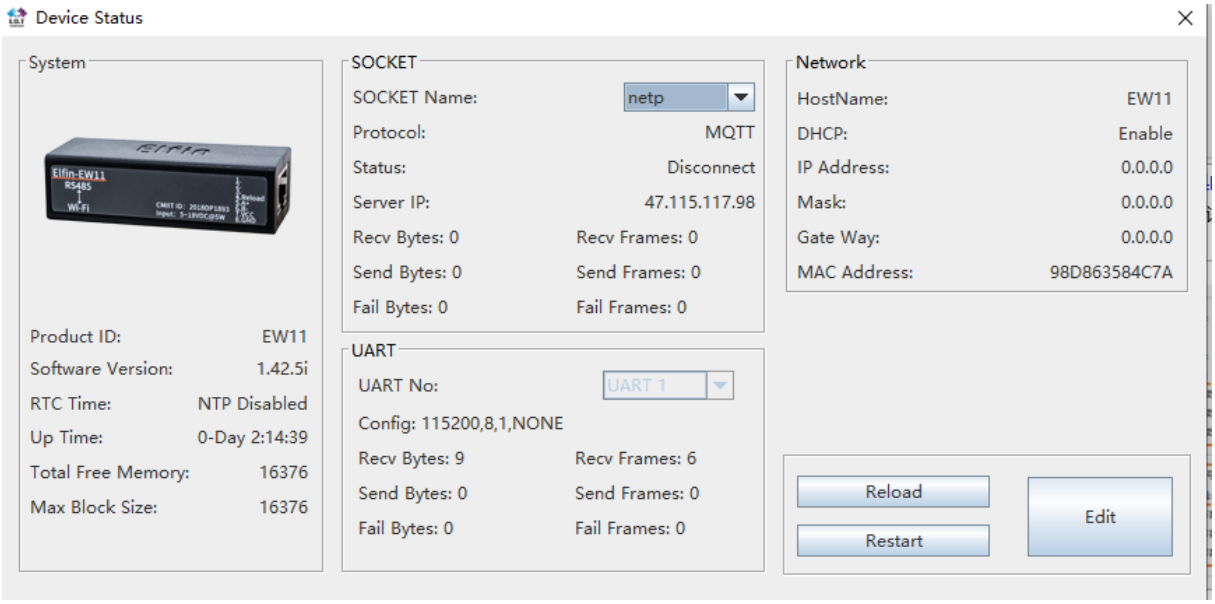
Install IOTService and register account in the IOTBridge cloud(http://bridge.iotworkshop.com/) according to that tools doc.

PC connect to products AP(Same as previous chapter), and open tools, The device will be shown in IOTService.



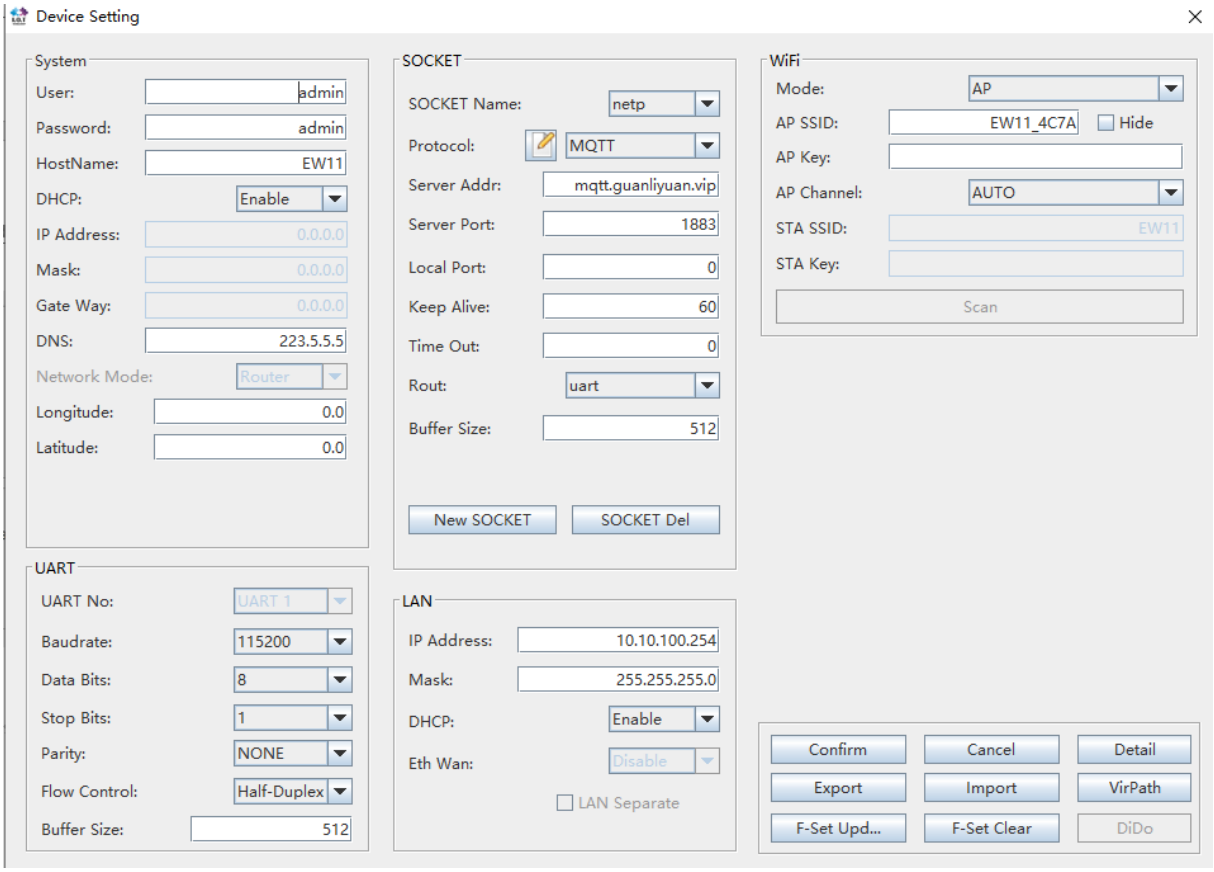
Note: See IOTService doc for more detailed usage, here just simply use it.

Double click the product list to see the device status.

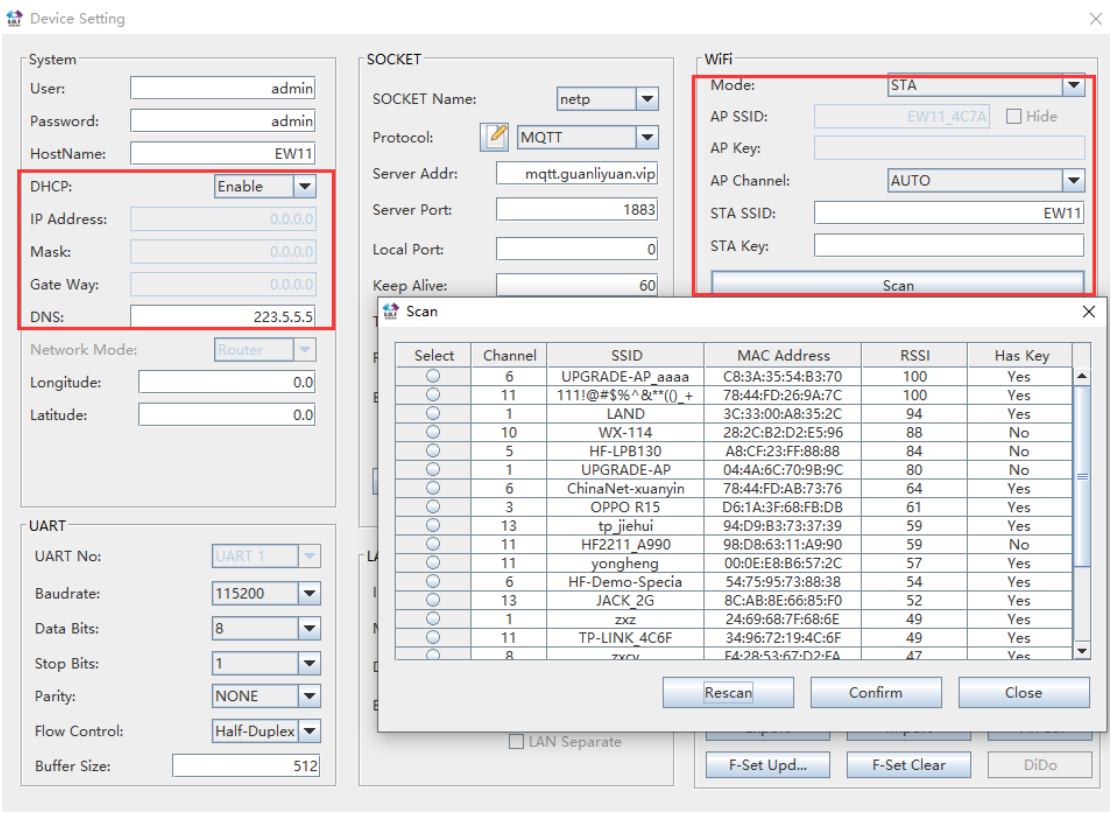


Click Edit to change product setting.

Note: some setting need reboot to be valid. Better do restart operation after setting.



Set to STA or AP+STA mode to make products connects to router, and may also set static IP.


Device Setting
System
User: admin
Password: admin
HostName: EW11
DHCP: Enable
IP Address: 0.0.0.0
Mask: 0.0.0.0
Gate Way: 0.0.0.0
DNS: 223.5.5.5
Network Mode: Router
Longitude: 0.0
Latitude: 0.0
UART
UART No: UART 1
Baudrate: 115200
Data Bits: 8
Stop Bits: 1
Parity: NONE
Flow Control: Half-Duplex
Buffer Size: 512
SOCKET
SOCKET Name: netp
Protocol: MQTT
Server Addr: mqtt.guanliyuan.vip
Server Port: 1883
Local Port: 0
Keep Alive: 60
LAN Separate
WiFi
Mode: STA
AP SSID: EW11_4C7A Hide
AP Key:
AP Channel: AUTO
STA SSID: EW11
STA Key:
Scan
F-Set Upd...
F-Set Clear
DiDo
Scan
Select Channel SSID MAC Address RSSI Has Key
6 UPGRADE-AP_aaaa C8:3A:35:54:B3:70 100 Yes
11 111!@#$%^&**(()_+ 78:44:FD:26:9A:7C 100 Yes
1 LAND 3C:33:00:A8:35:2C 94 Yes
10 WX-114 28:2C:B2:D2:E5:96 88 No
5 HF-LPB130 A8:CF:23:FF:88:88 84 No
1 UPGRADE-AP 04:4A:6C:70:9B:9C 80 No
6 ChinaNet-xuanyin 78:44:FD:AB:73:76 64 Yes
3 OPPO R15 D6:1A:3F:68:FB:DB 61 Yes
13 tp_jiehui 94:D9:B3:73:37:39 59 Yes
11 HF2211_A990 98:D8:63:11:A9:90 59 No
11 yongheng 00:0E:E8:B6:57:2C 57 Yes
6 HF-Demo-Specia 54:75:95:73:88:38 54 Yes
13 JACK_2G 8C:AB:8E:66:85:F0 52 Yes
1 zxz 24:69:68:7F:68:6E 49 Yes
11 TP-LINK_4C6F 34:96:72:19:4C:6F 49 Yes
Rescan
Confirm
Close

4. SERIAL PORT SETTINGS

4.1. Serial Port Tool SecureCRT

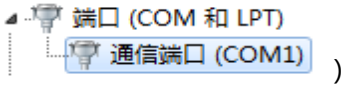
Open SecureCRT find an executable program, click Open.

Click the Quick Connect button to create a connection.

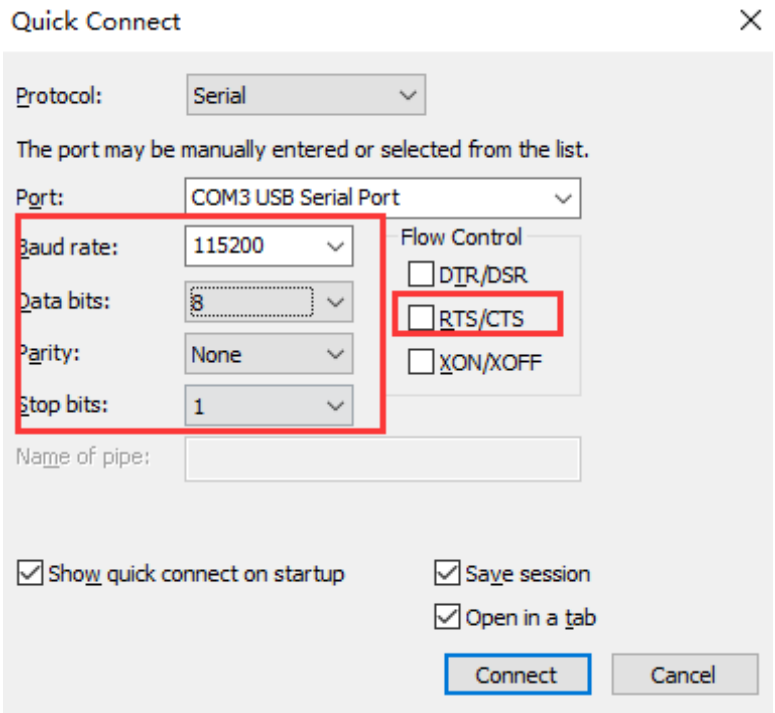
4.2. Setting Serial Port Parameters

Protocol：Serial

Port: The port that the computer is actually connected to (see "My Computer"-> "Device Manager"-> "Ports (COM and LPT)", as shown in the figure.



)



Note: The default serial port data of the device is as shown in the figure above. Users can modify the working parameters of the product by using IOTService.

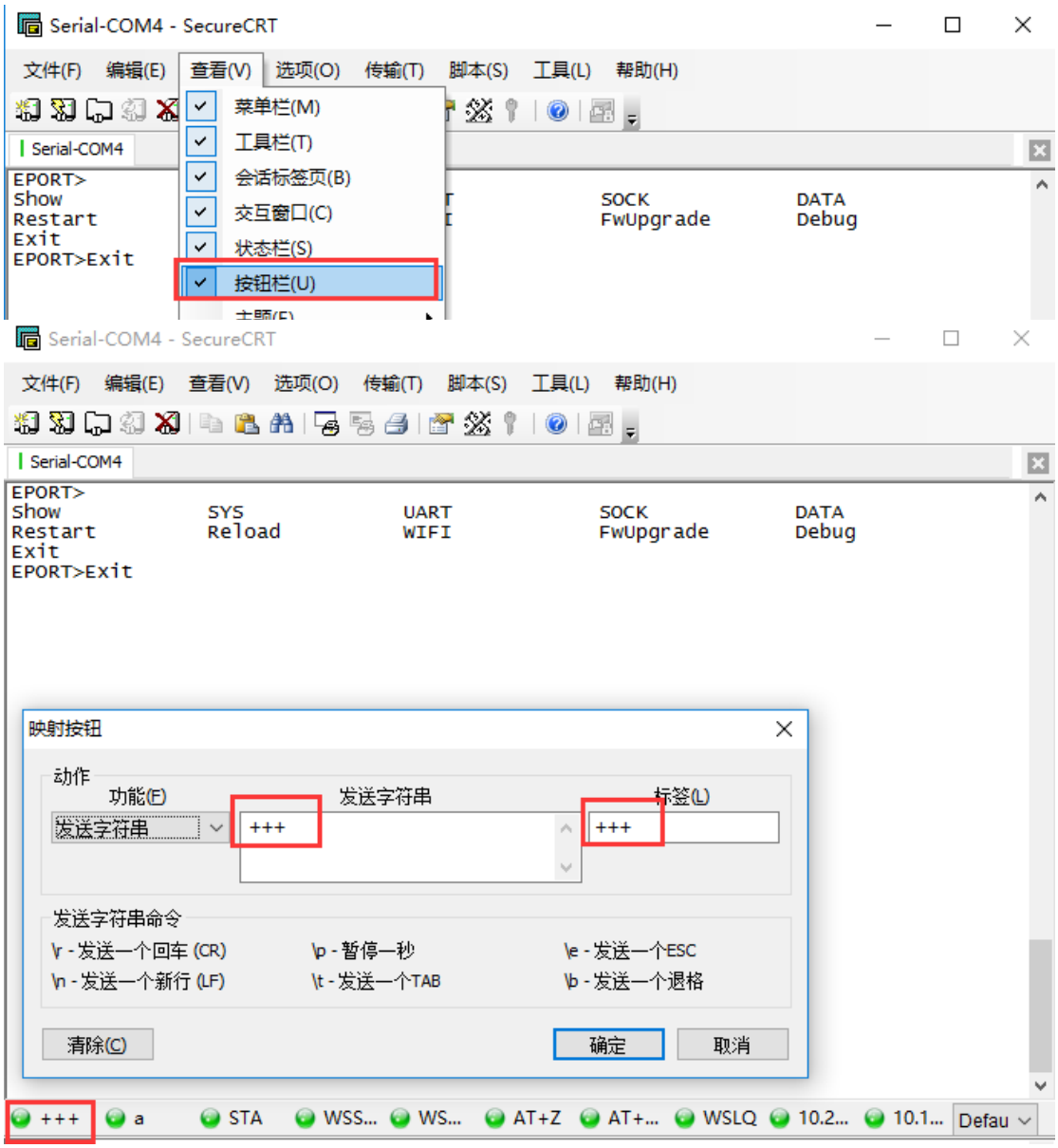
4.3. Cli Instruction Mode

Data transmission needs to be in the transparent transmission mode (the default transparent transmission mode upon power-on). If you need to enter the Cli command mode for configuration, you can do as follows.

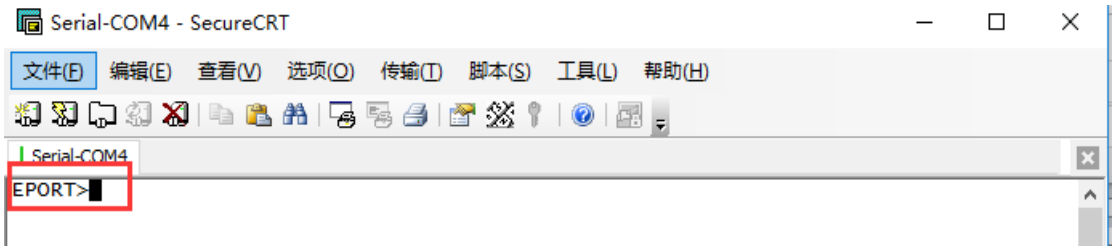
- Serial port mode.

Set the parameters of the SecureCRT serial port software according to the above.

Add "+++" button command to the button bar.



Click the button to send the corresponding data. When the interface displays "EPORT>", you have entered the CLI command mode.

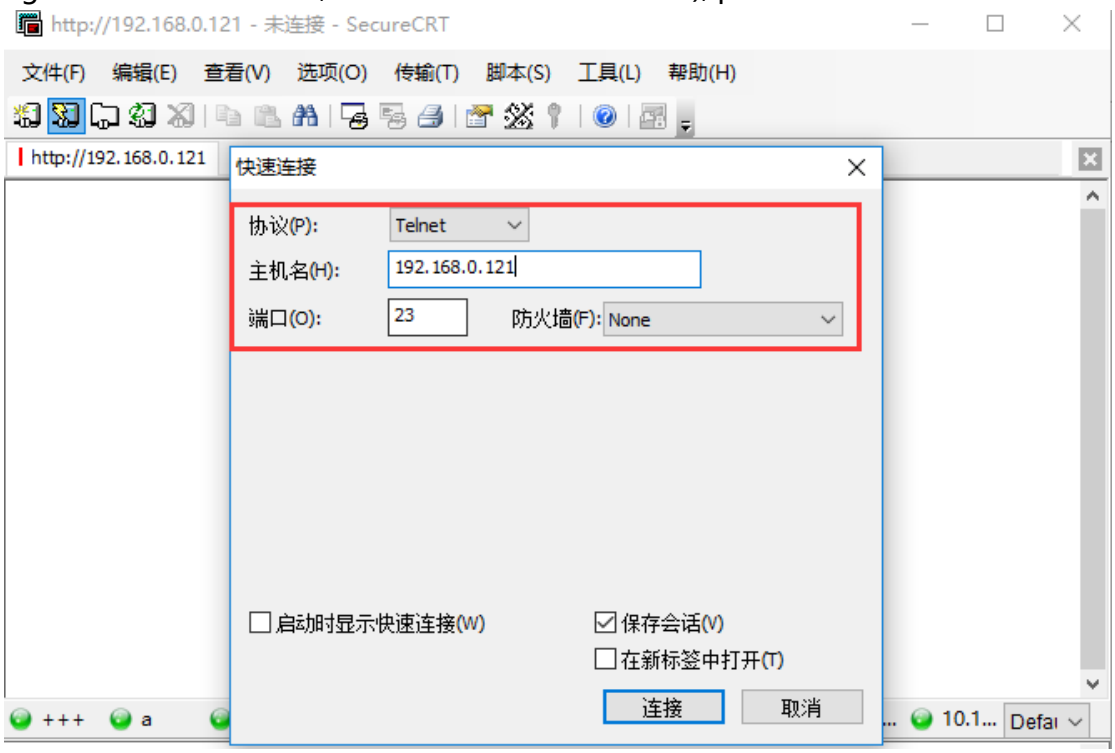


Note:

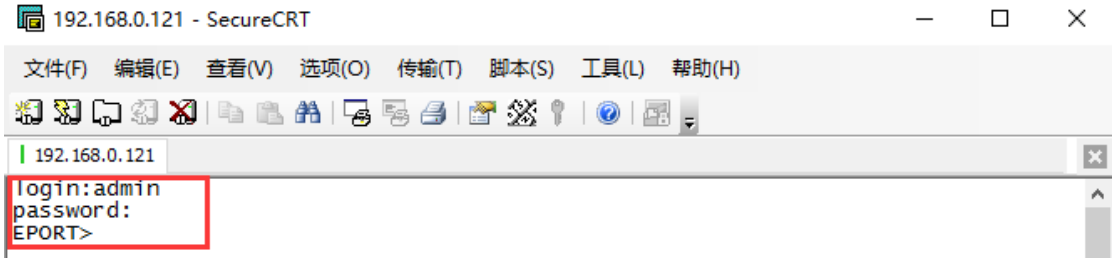
Any serial tool can do this. Sending "+++" must be a continuous package of data, and there can be no other data before and after (such as carriage return and line feed).

- Telnet mode.

Step 1: Enter the IP address of the device (the IP address can be obtained by searching through the IOTService tool, which will be detailed later), port 23.



Step 2: The default login name and password are both admin, then "EPORT>" is displayed, and you have logged in to the Cli command mode.

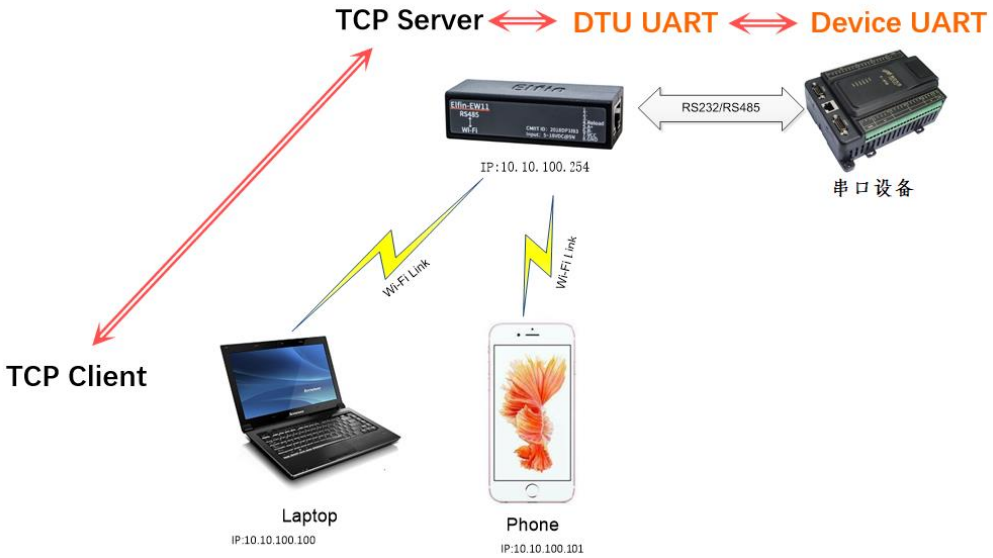


5. TEST EXAMPLE

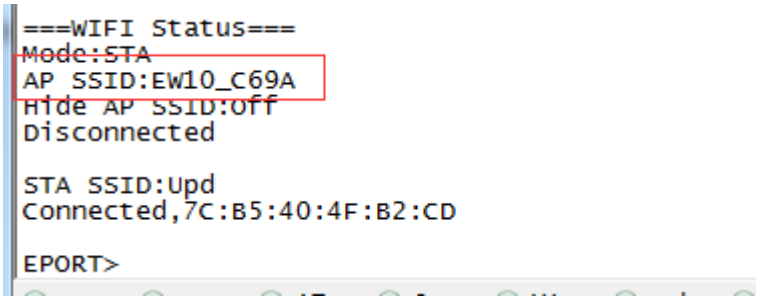
Elfin-EW1X use TCP/IP protocol for communication. There is two main parameters one for IP address and another for port number.

5.1. AP Wireless Networking

Product works in AP mode. All other STA devices connect to product AP. (Product AP does not support route function, so the STA can not transfer data to each other) The structure is t shown as below:

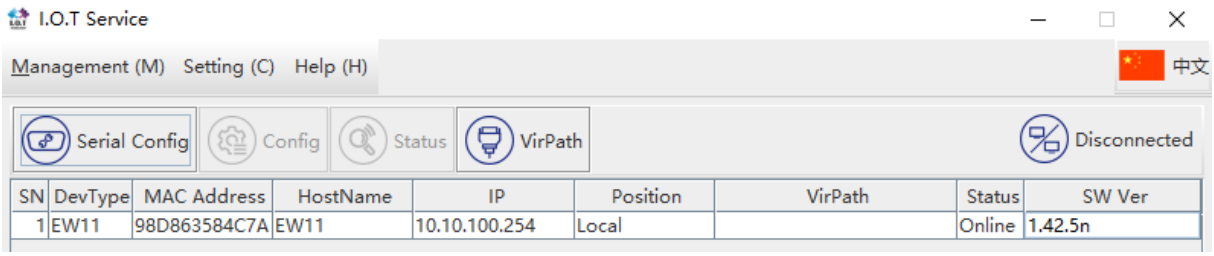


Step 1: The product default AP SSID is "EW1X_+MAC(last 4 characters)". It can also search by cli "Show" command. Figure is as below:



Step 2: Set PC IP to DHCP or static IP with (10.10.100.XXX, subnet:255.255.2550.0, gateway:10.10.100.254), PC connect to product AP as following picture.

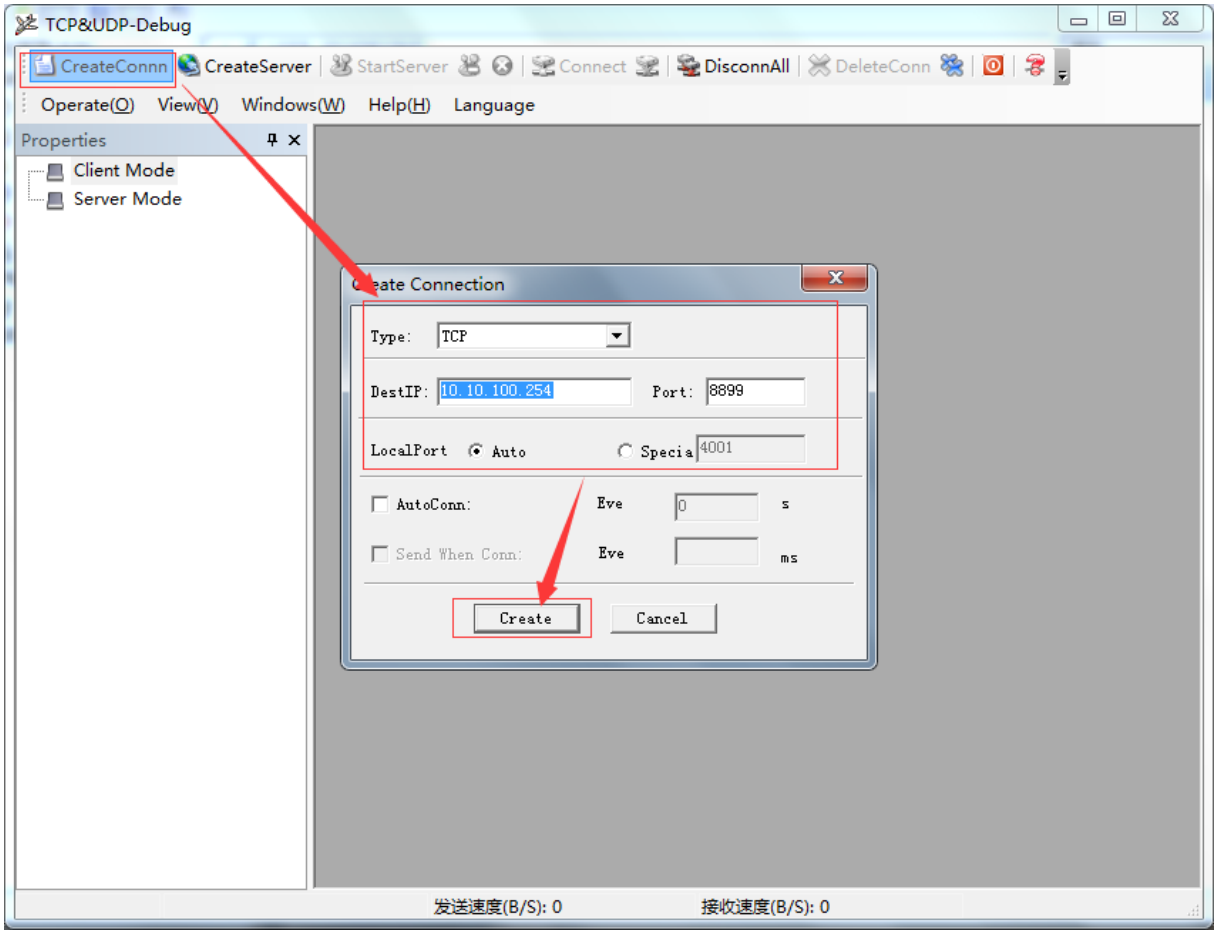
Step 3：Open IOTService and find the device. The device will allocate IP address to the STA connected. STA device IP address will be like 10.10.100.XXX.

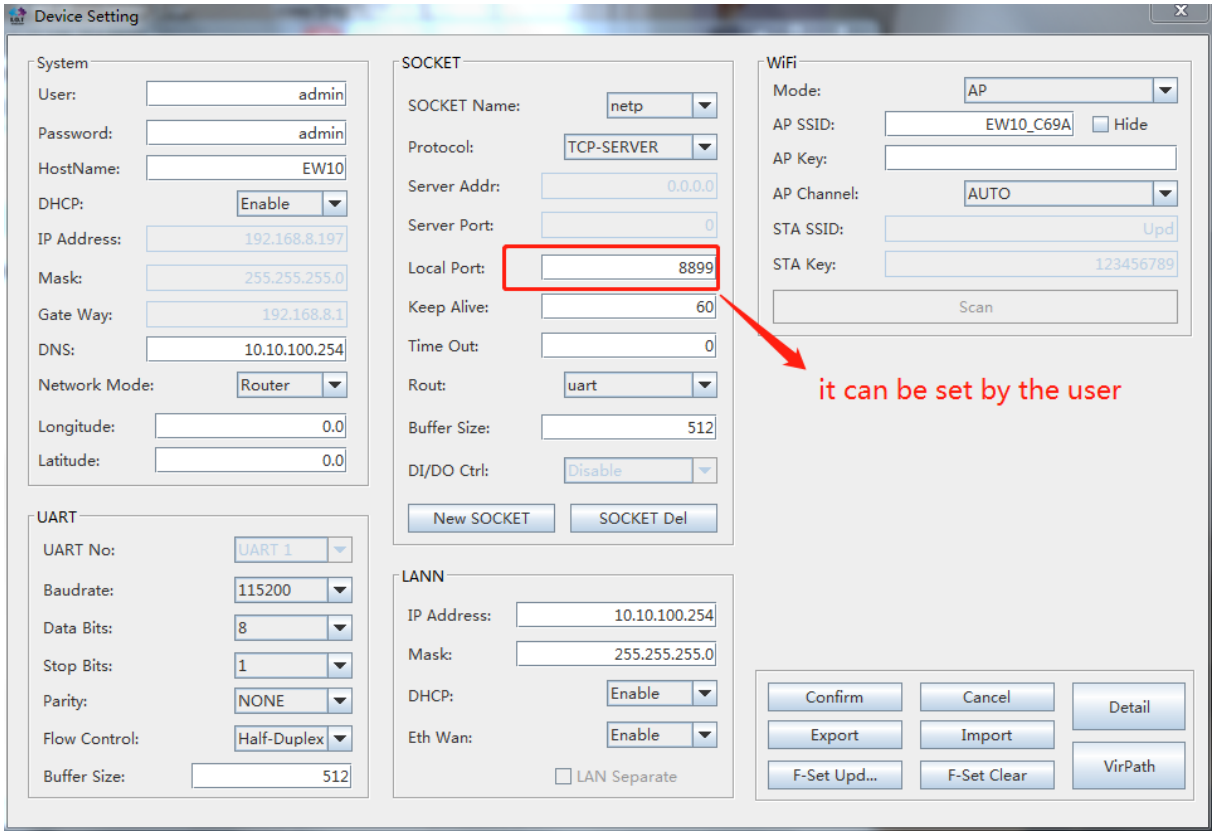


5.2. TCP Server Test in AP Mode

Step 1：Open TCP&UDP test tool and generate TCP connection as following steps. Device has already created a TCP Server (port 8899) for use. TCP&UDP test tool can be downloaded from our website:

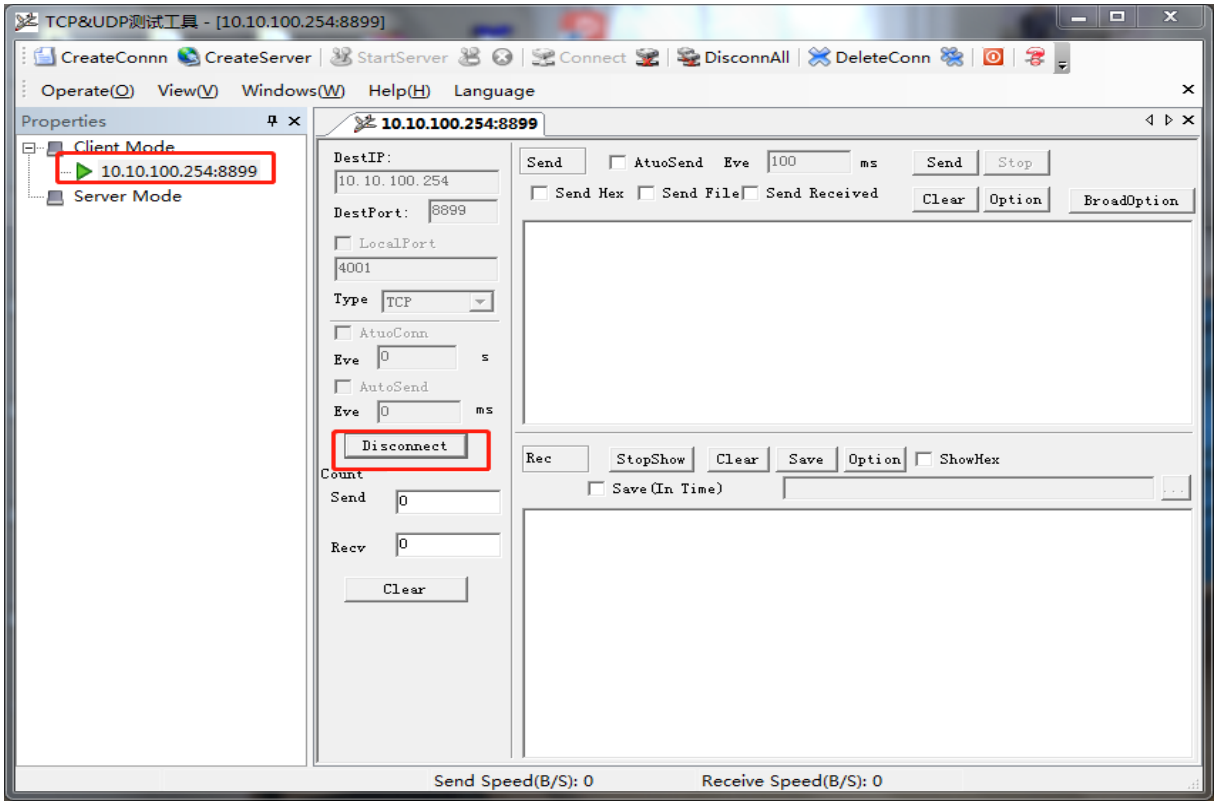
- DestIP：IP address of device which can be found by IOTService.
- Port：Port of TCP Server which can be found by IOTService or set by users own.


TCP&UDP-Debug
CreateConnn
CreateServer
StartServer
Connect
DisconnAll
DeleteConn
Operate(O)
View(V)
Windows(W)
Help(H)
Language
Properties
Client Mode
Server Mode
Type:
TCP
DestIP:
10.10.100.254
Port:
8899
LocalPort
Auto
Specia
4001
AutoConn:
Eve
0
s
Send When Conn:
Eve
ms
Create
Cancel
发送速度(B/S): 0
接收速度(B/S): 0

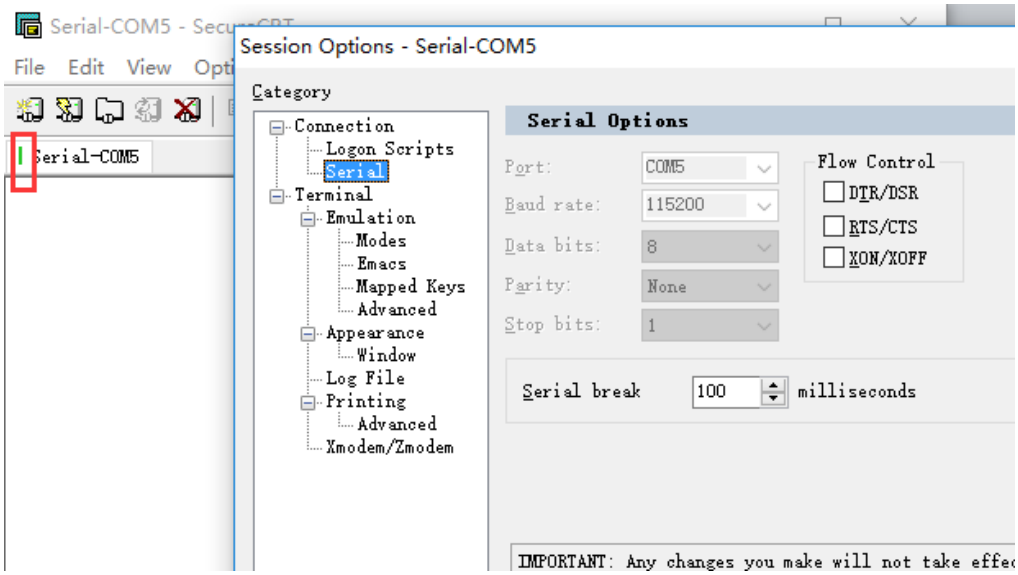

Device Setting
System
User:
admin
Password:
admin
HostName:
EW10
DHCP:
Enable
IP Address:
192.168.8.197
Mask:
255.255.255.0
Gate Way:
192.168.8.1
DNS:
10.10.100.254
Network Mode:
Router
Longitude:
0.0
Latitude:
0.0
UART
UART No:
UART 1
Baudrate:
115200
Data Bits:
8
Stop Bits:
1
Parity:
NONE
Flow Control:
Half-Duplex
Buffer Size:
512
SOCKET
SOCKET Name:
netp
Protocol:
TCP-SERVER
Server Addr:
0.0.0.0
Server Port:
0
Local Port:
8899
Keep Alive:
60
Time Out:
0
Rout:
uart
Buffer Size:
512
DI/DO Ctrl:
Disable
New SOCKET
SOCKET Del
LANN
IP Address:
10.10.100.254
Mask:
255.255.255.0
DHCP:
Enable
Eth Wan:
Enable
LAN Separate
WiFi
Mode:
AP
AP SSID:
EW10_C69A
Hide
AP Key:
AP Channel:
AUTO
STA SSID:
Upd
STA Key:
123456789
Scan
it can be set by the user
Confirm
Cancel
Detail
Export
Import
F-Set Upd...
F-Set Clear
VirPath

Step 2：Click Connection to generate TCP connection

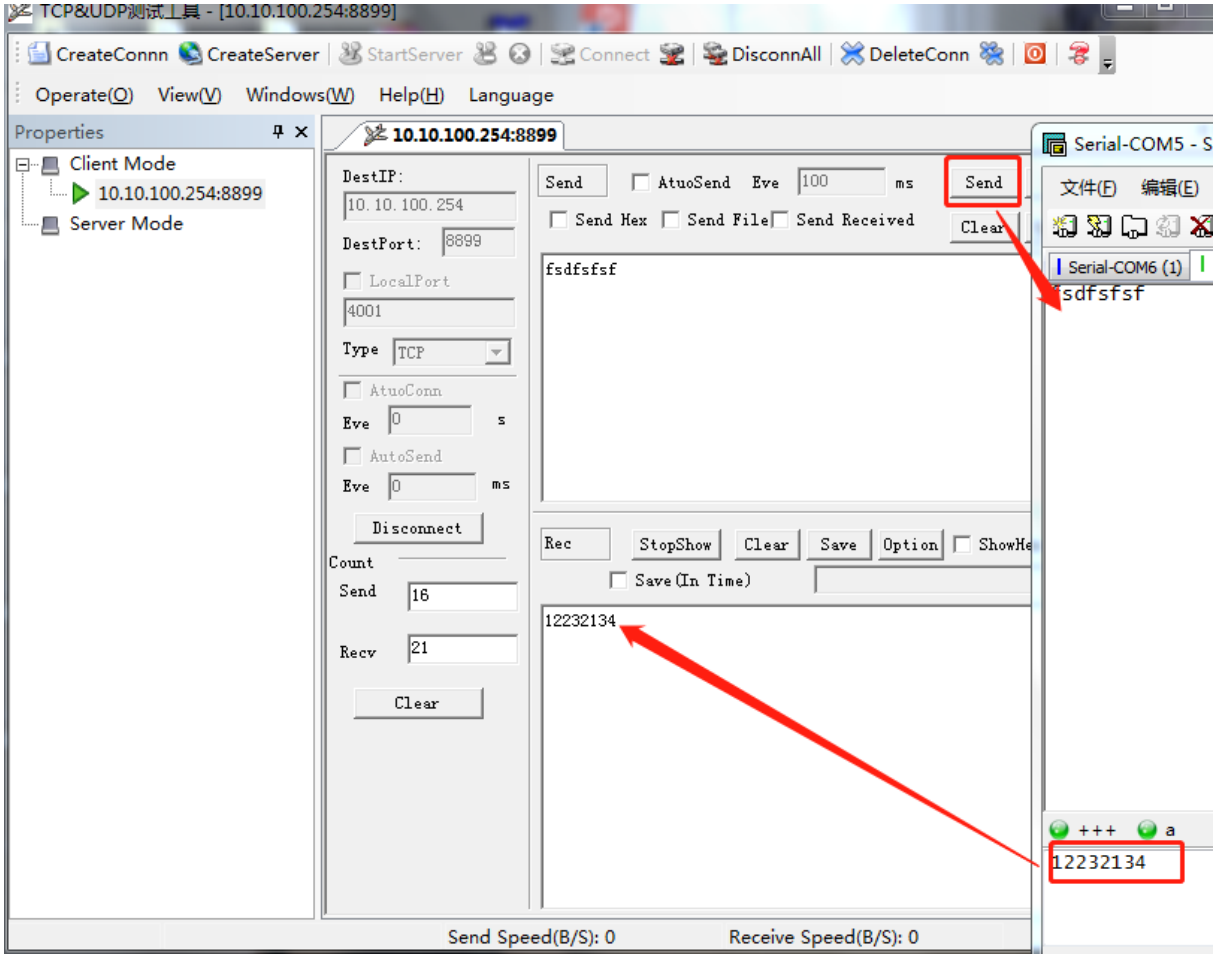
- After successful connection, the left turns to be green arrow, yellow if fails.



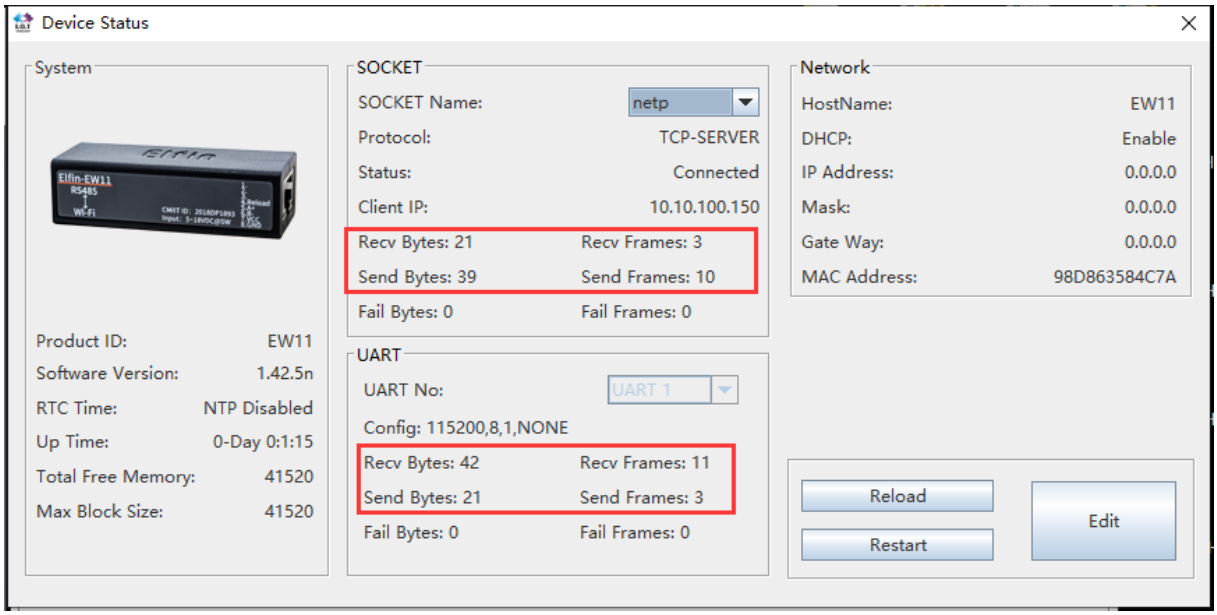
Step 3：Open serial tool according to following parameters (115200 baud rates as default)



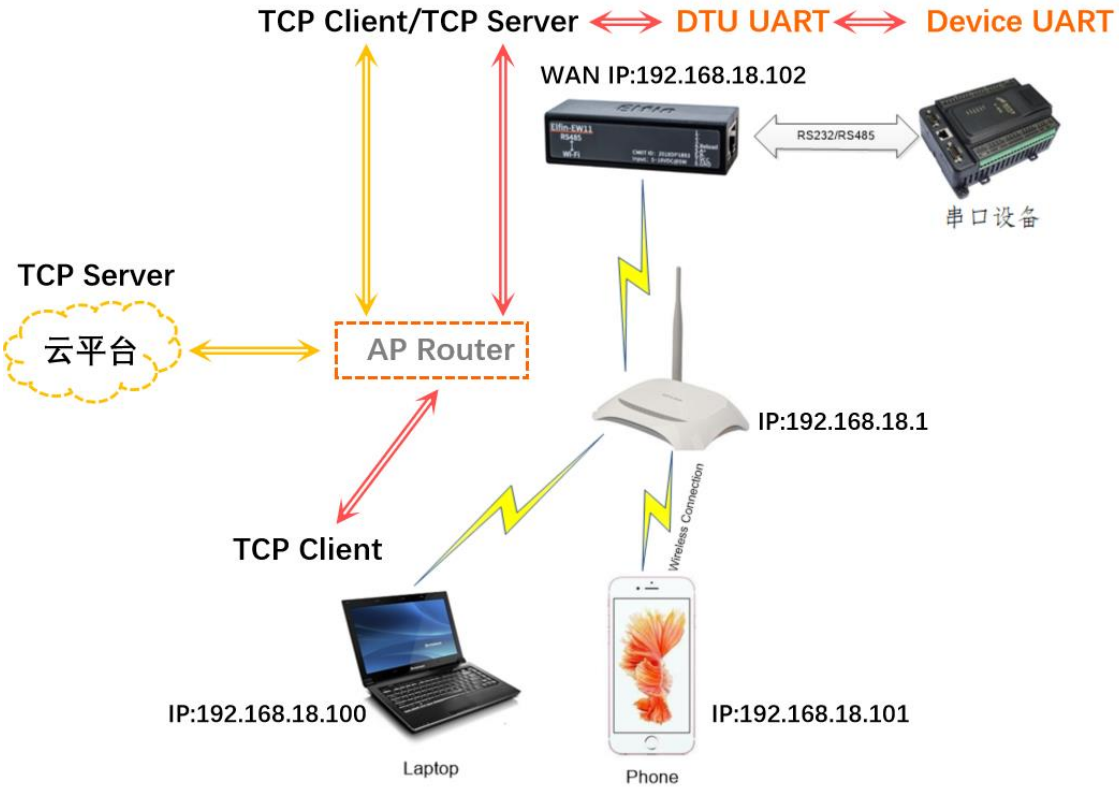
Step 4：Data transmission between TCP and UART is as following.



Step 4：Data count in following status.

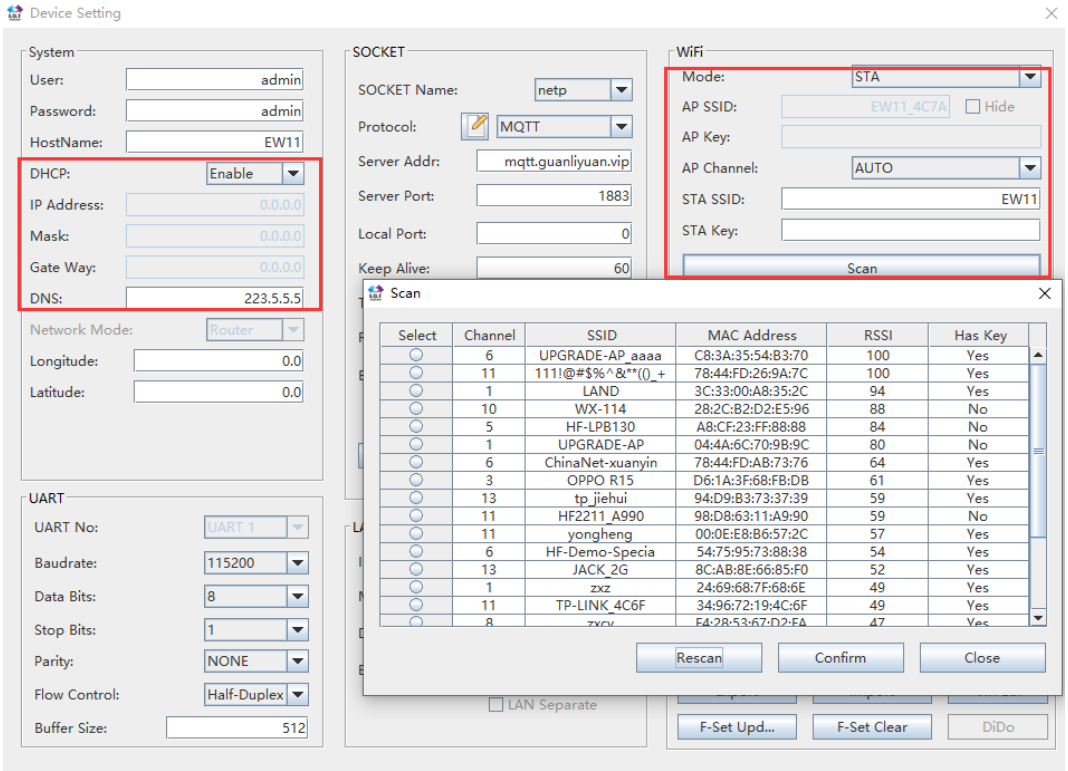


5.3. STA Wireless Networking

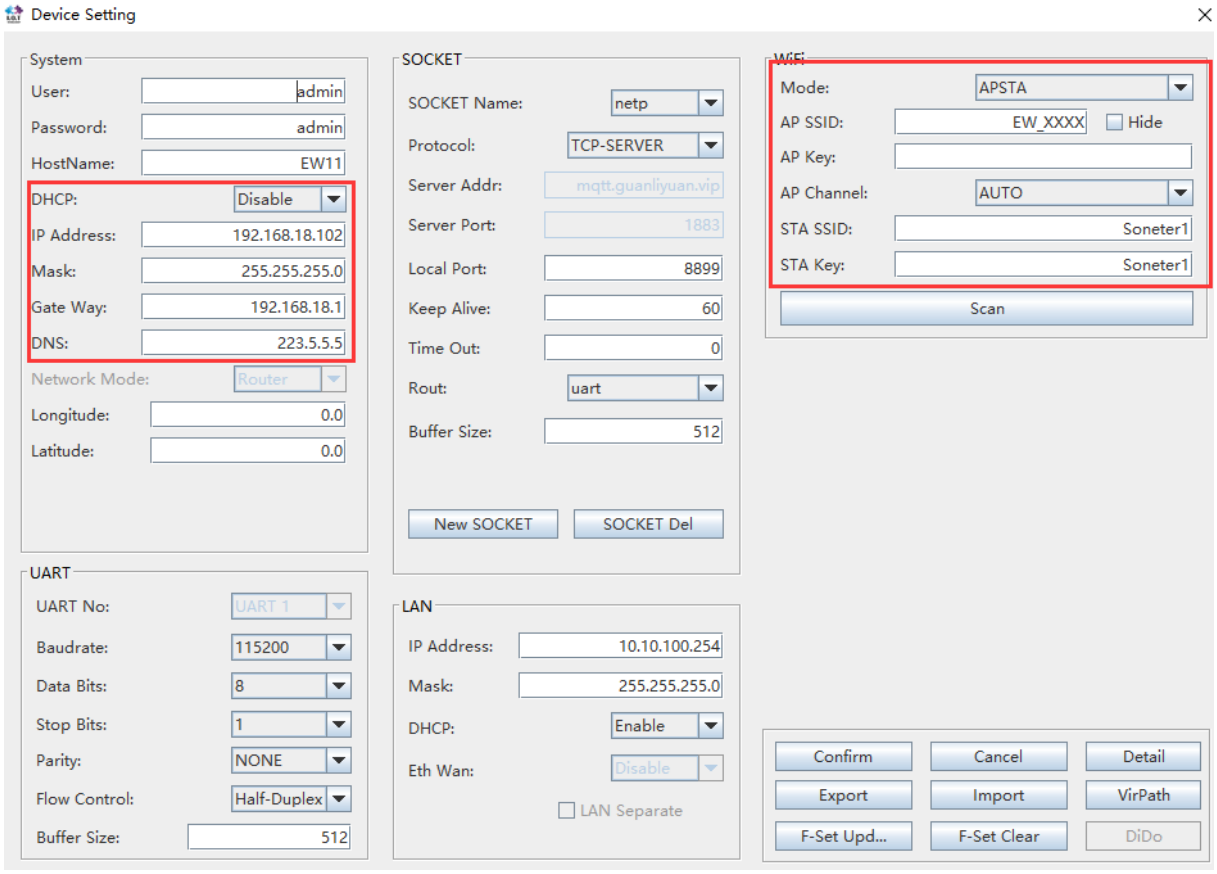


Elfin-EW1X is AP mode by default. If need to work in STA mode connecting to router. There are following ways. Recommend to set to STA mode only ,if AP is not used in mass application ,for test stage, may set to APSTA for convenience

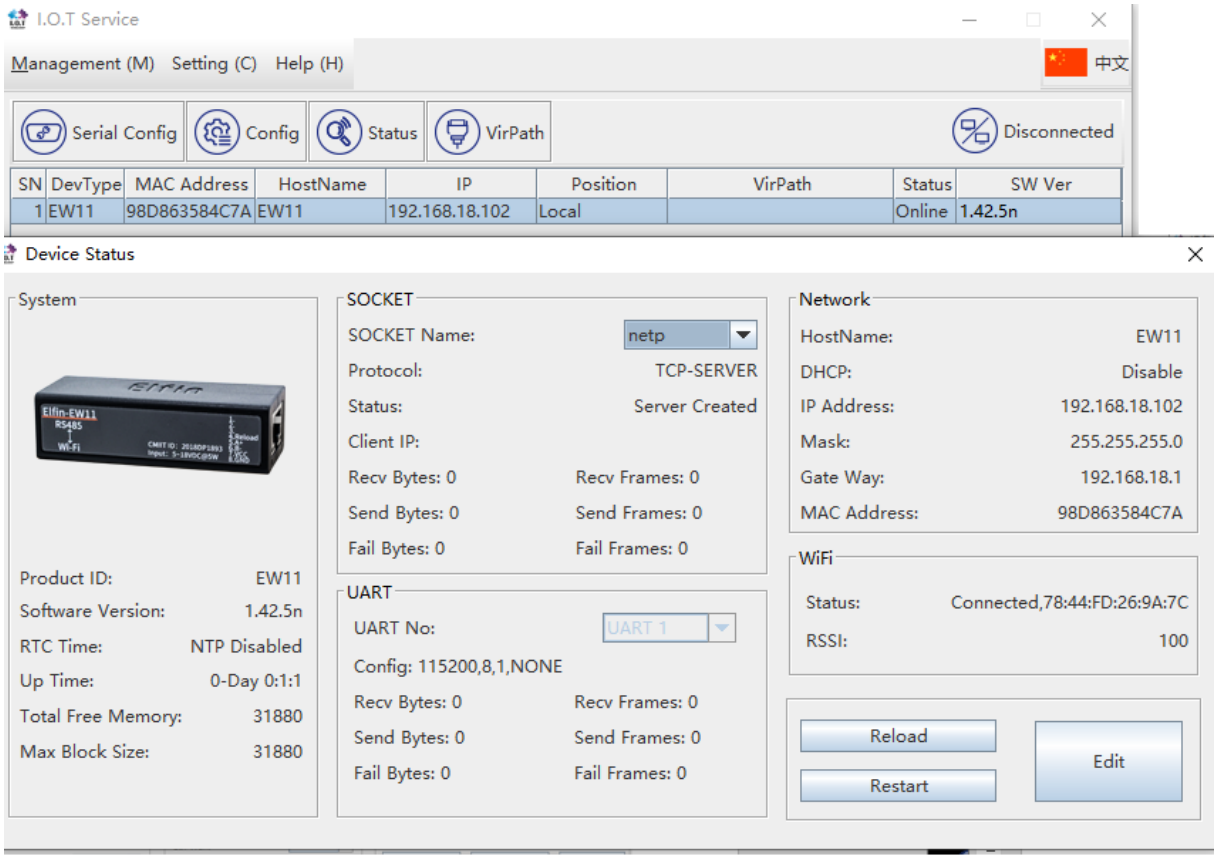
- PC Wi-Fi connect to product AP, open IOTService tools to config.



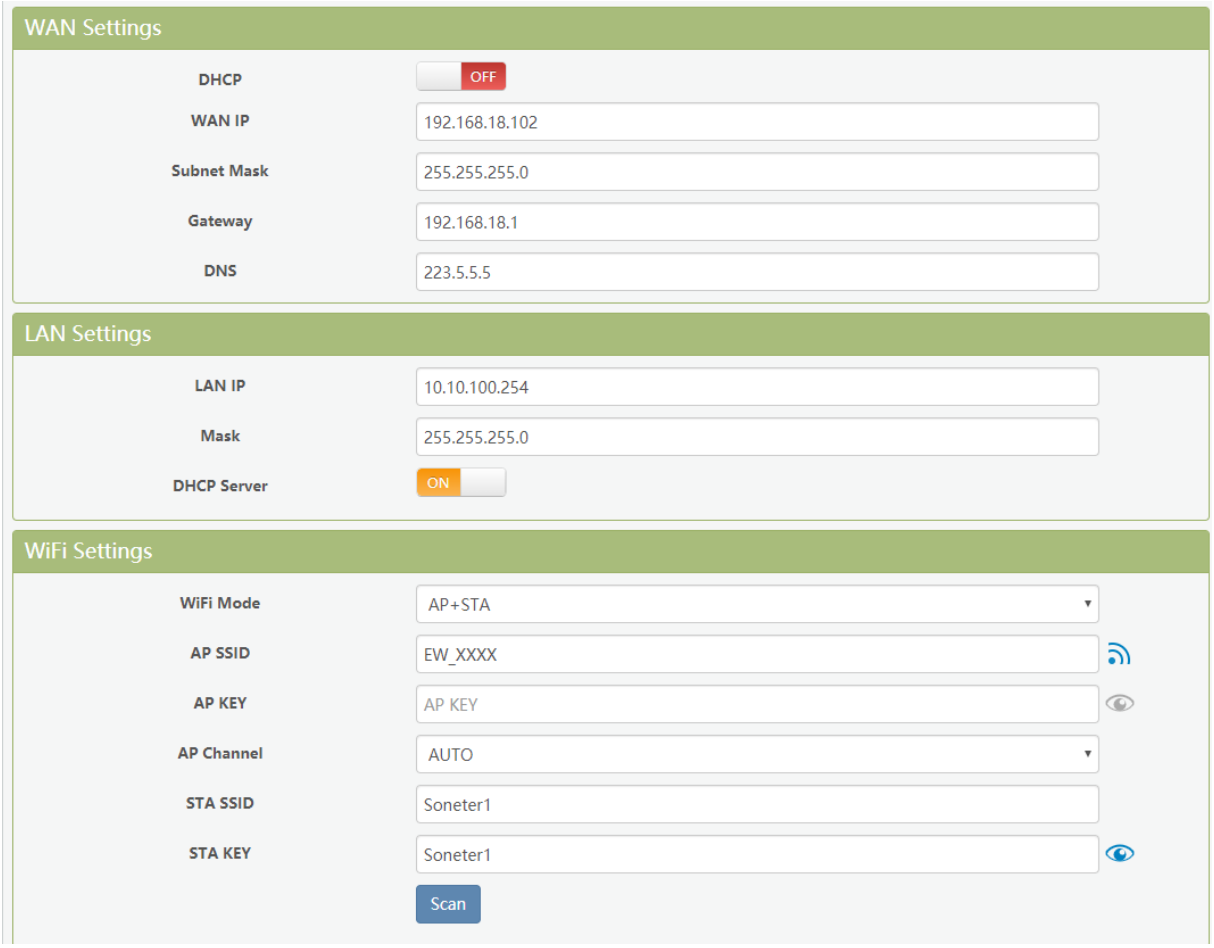
Reboot after setting.



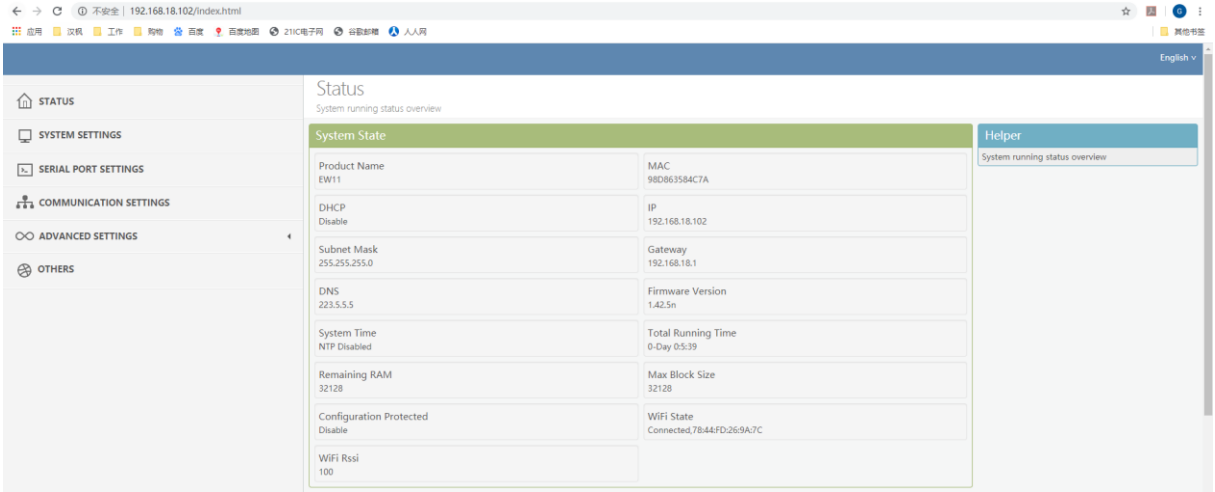
PC also connect to the same router, and it will find the device with products STA WAN IP.



- PC Wi-Fi connect to product AP, login with 10.10.100.254, user and password input admin/admin, open its webpage to config.

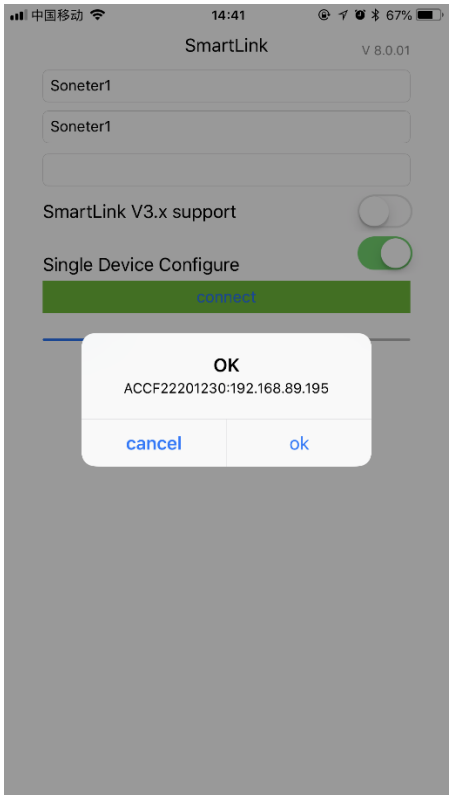


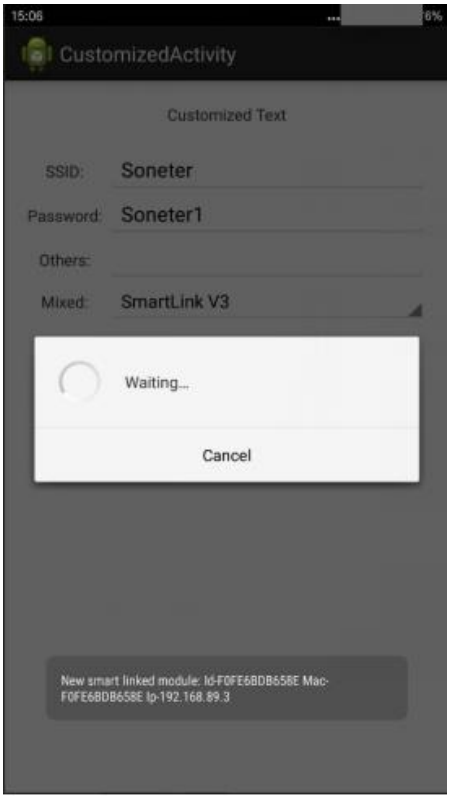
After reboot, PC connect to router, and login with the product static IP to confirm connection. If any problem, reconfig the product with its AP.



- SmartLinkV8 APP to config, smart phone connect to Router. Set product Reload pin to low for some time(0.2s < time < 1.5s) to make it in Smartlink config mode(green LED will be in fast flash status). See appendix Smartlink V8 APP for detail. The following is the final device find step for IOS and Android. After the Smartlink config successed,

the product works in STA mode and connect to router.





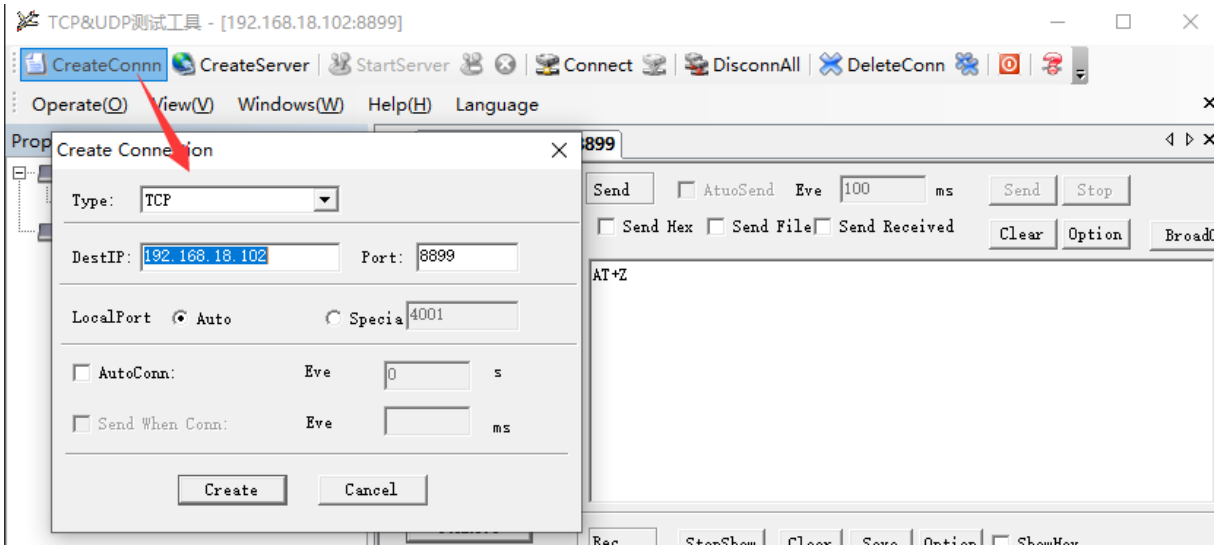
Note: This method is very easy to config, but may encounter failure sometimes. Do as following to try again.

- Check if phone connect to 2.4G router SSID.
- Set router 2.4G Wi-Fi to 802.11bg

5.4. TCP Server Test in STA Mode

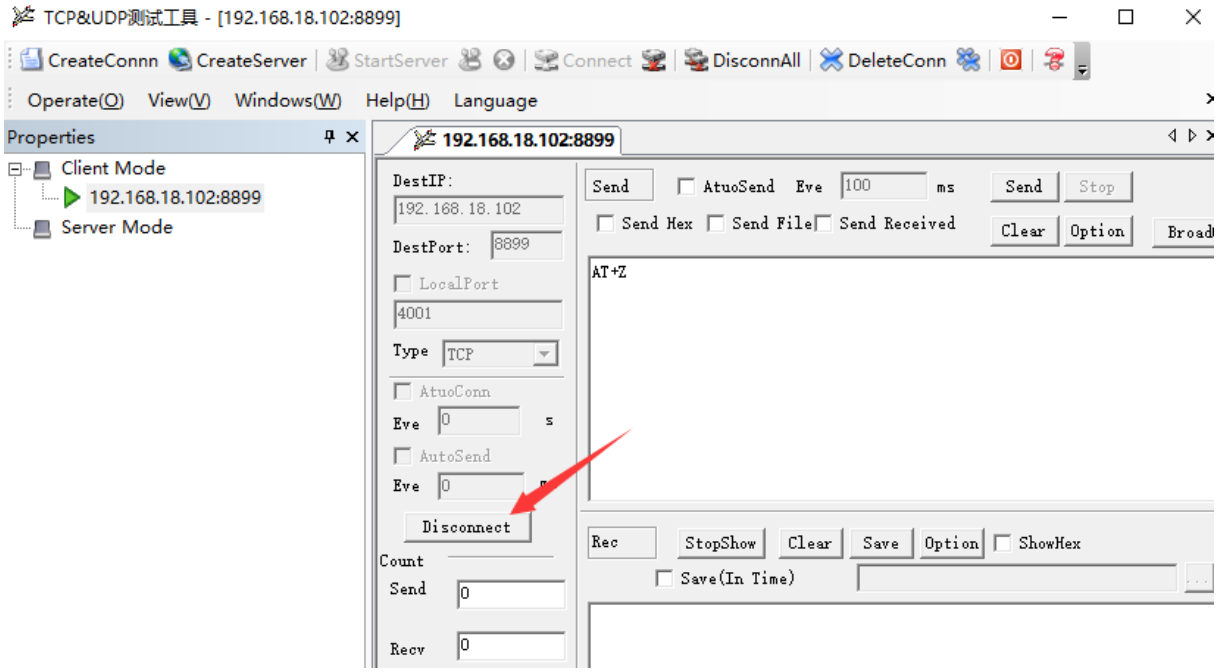
Open TCP&UDP test tool and generate TCP connection as following steps. Device has already created a TCP Server(port 8899) for use. TCP&UDP test tool can be downloaded from the website:

- DestIP：Destination IP address.
- Port：Destination Port.

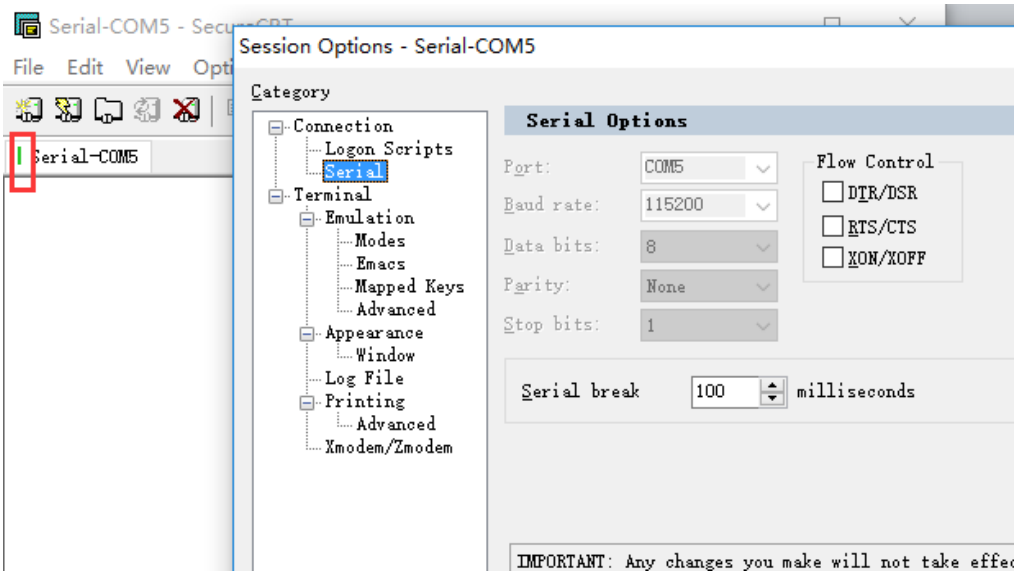


Click Connect to create TCP connection

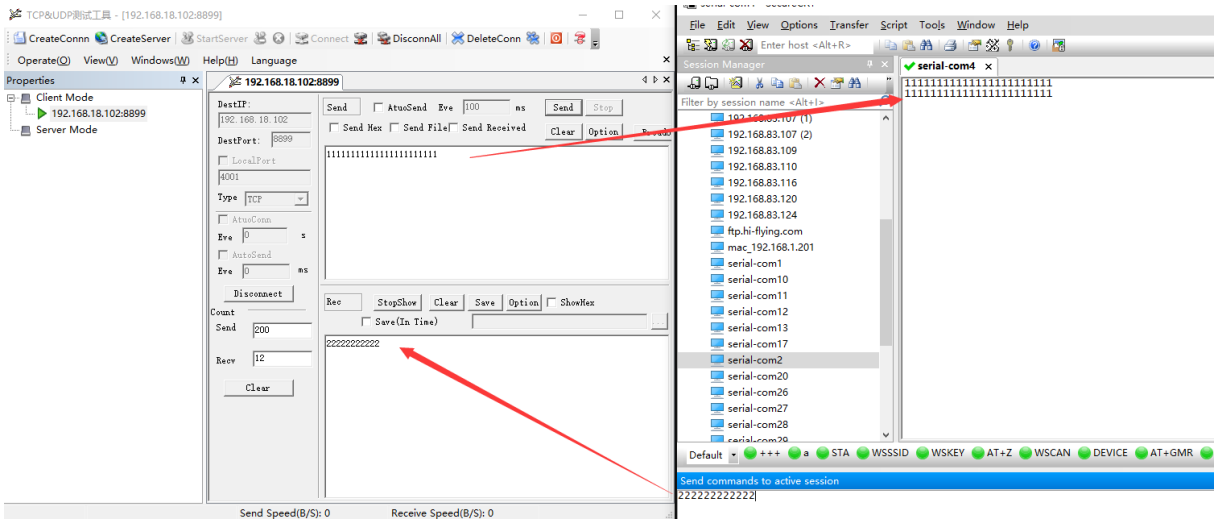
- After successful connection, the left turns to be green arrow.



Open serial tool according to following parameters (115200 baud rate as default)



Data transmission between TCP and serial port.



5.5. STA TCP Client Test

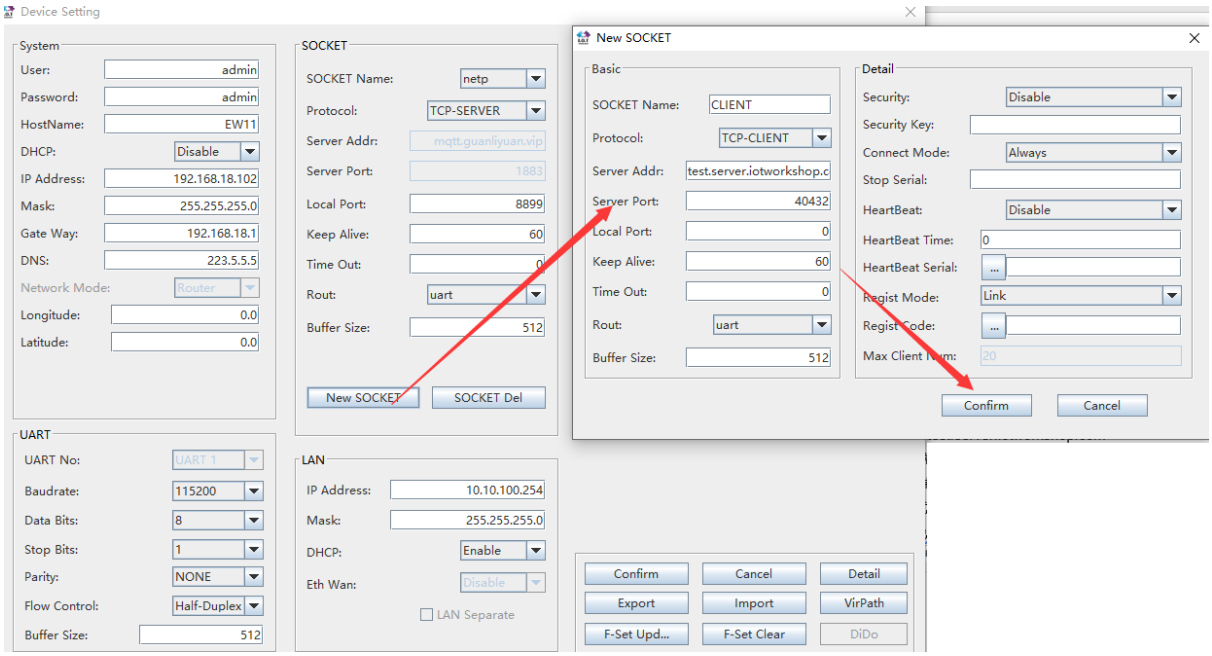
Products support 3 channel sockets, default netp socket works as TCP Server, here create another socket working as TCP client.

HF test server: test.server.iotworkshop.com

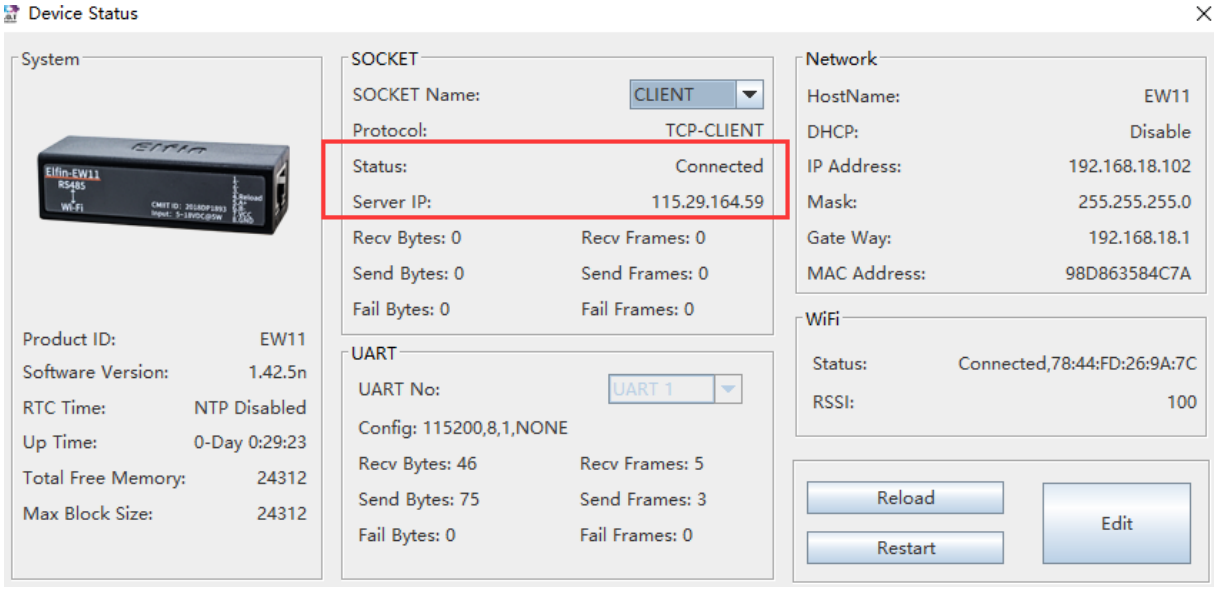
TCP Port: 40432

UDP Port: 40431

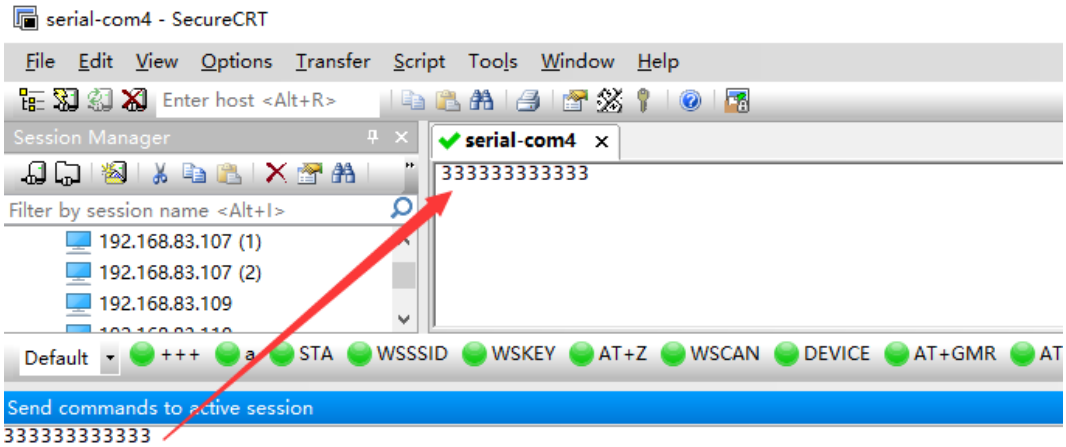
Our test server will send back the received data.

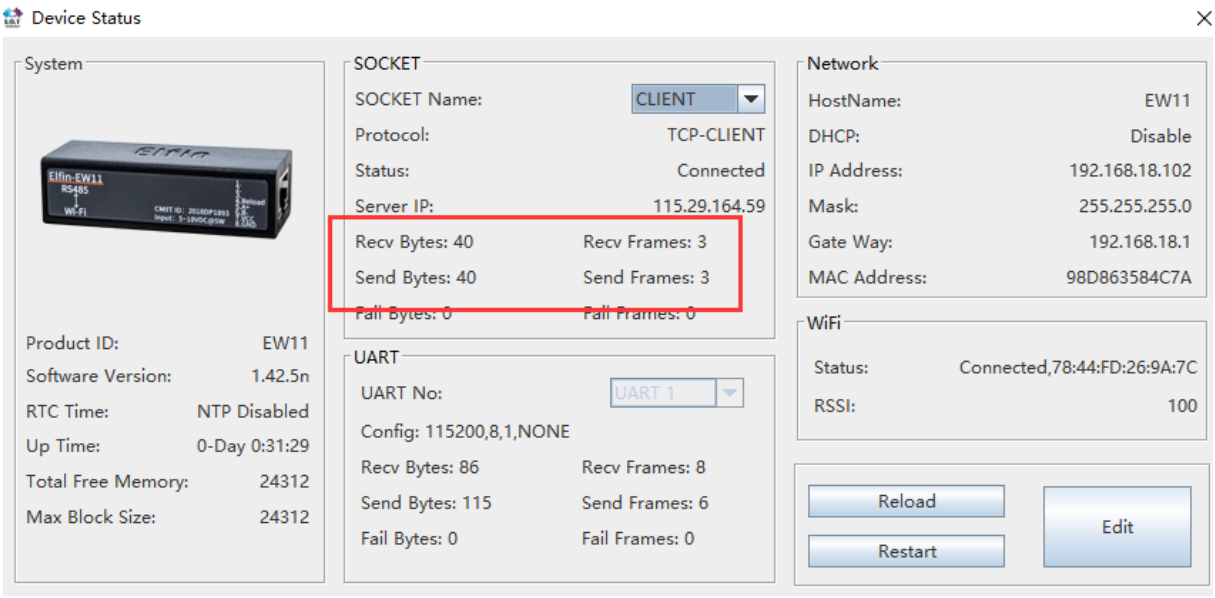


It shows connected.



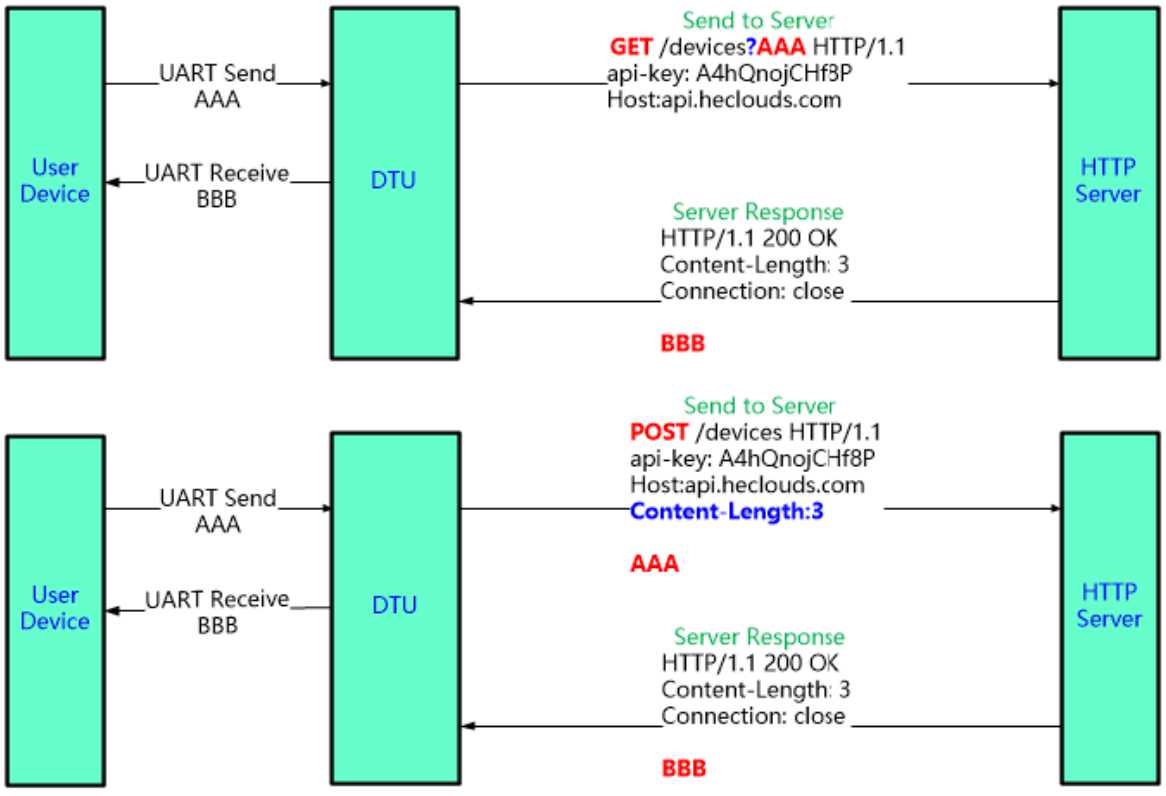
UART received "333333333333" and send to server, the server sent back the packet, so the UART tools shows the received data.





5.6. STA HTTP Client Test

HTTP data flow is as following.



- **HTTP GET Test:**

Test server address: 115.29.164.59

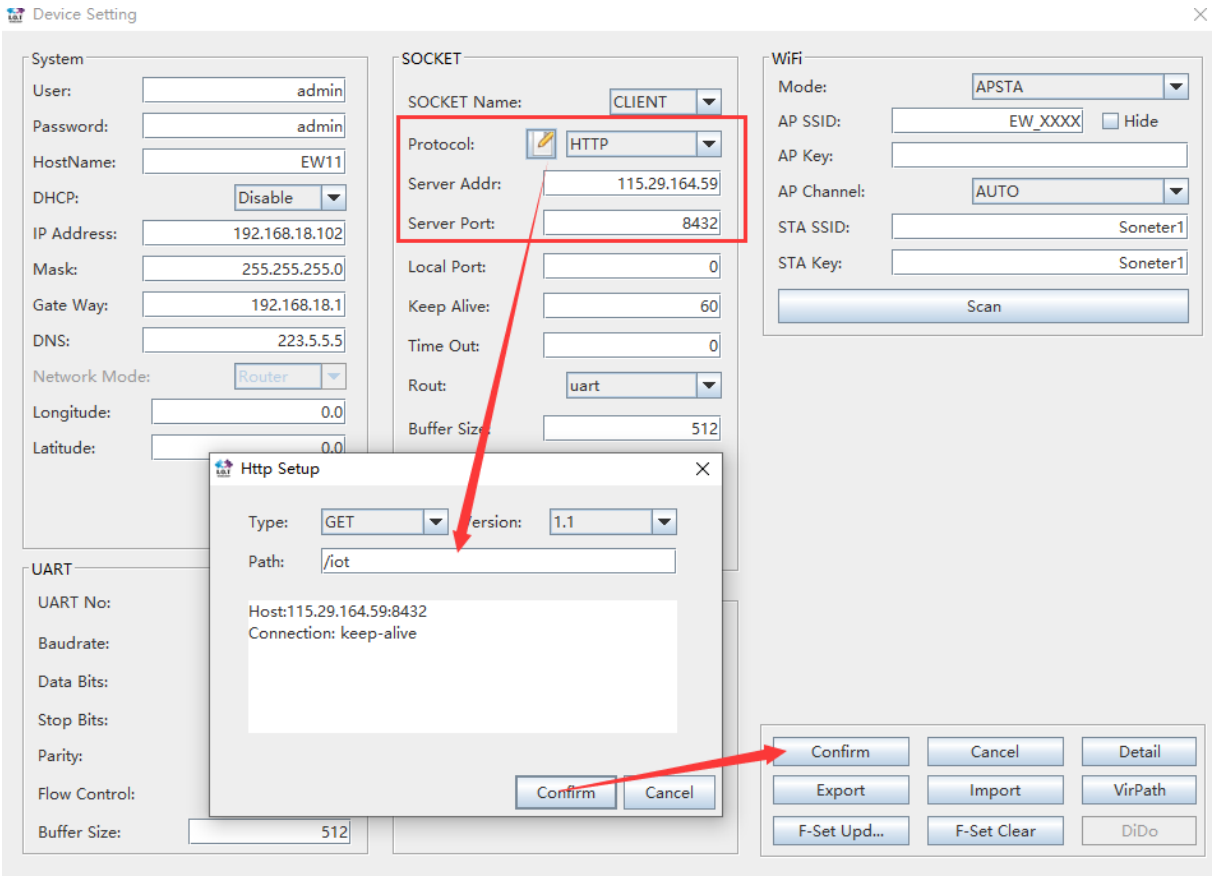
Test server port: 8432

Path: /iot

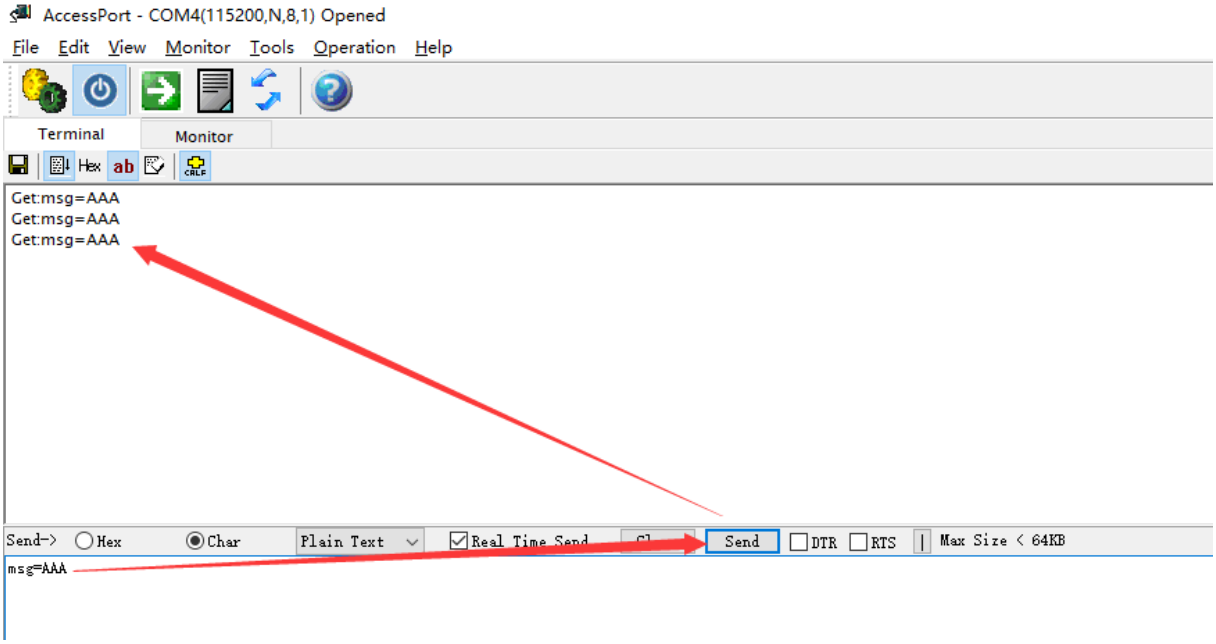
Header:

Host:115.29.164.59:8432
Connection: keep-alive

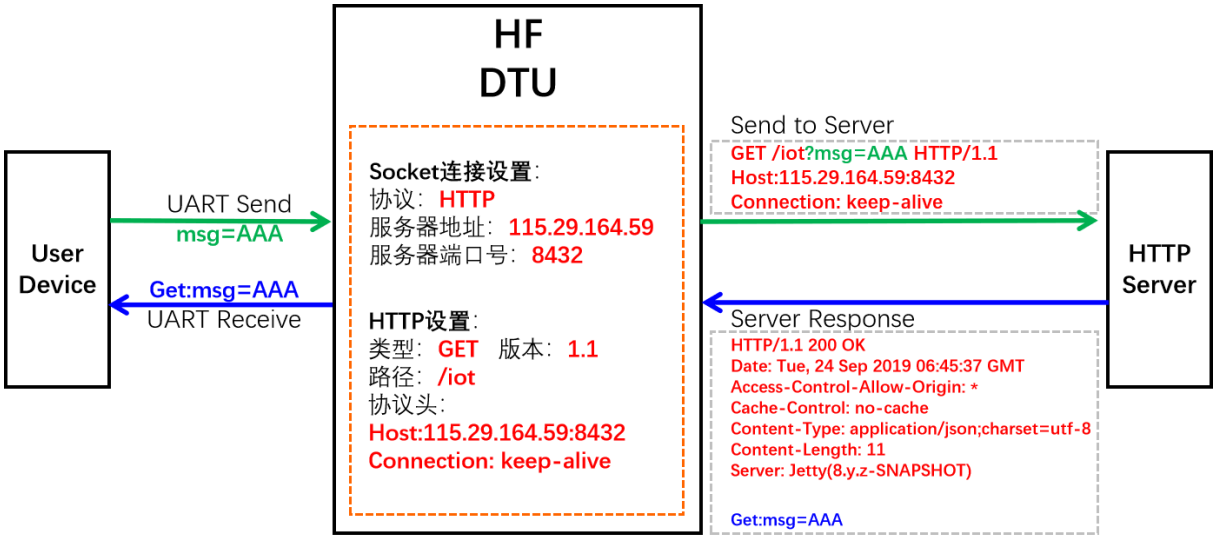
Products setting as following.



Server response back and products UART output packet. It filter the HTTP response header and only output the header.

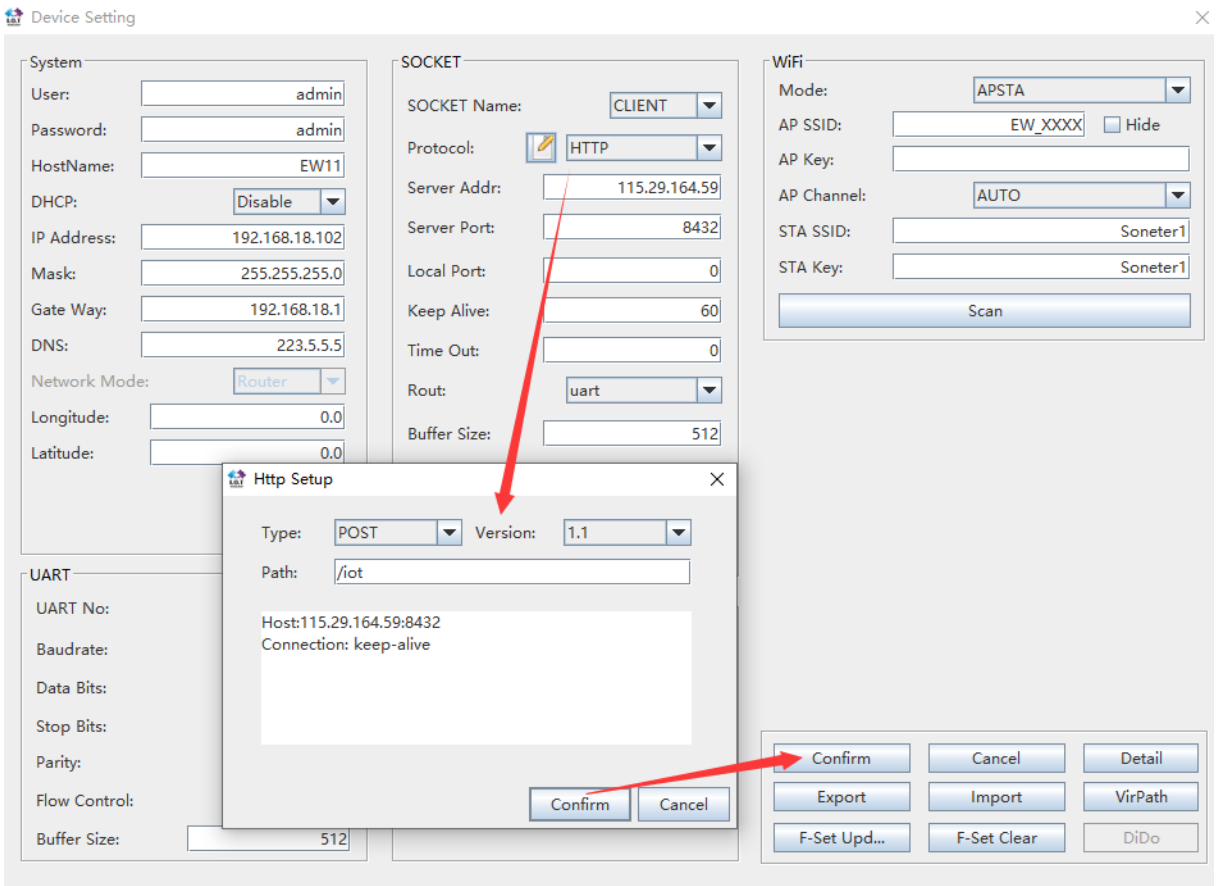


Data flow is as following.

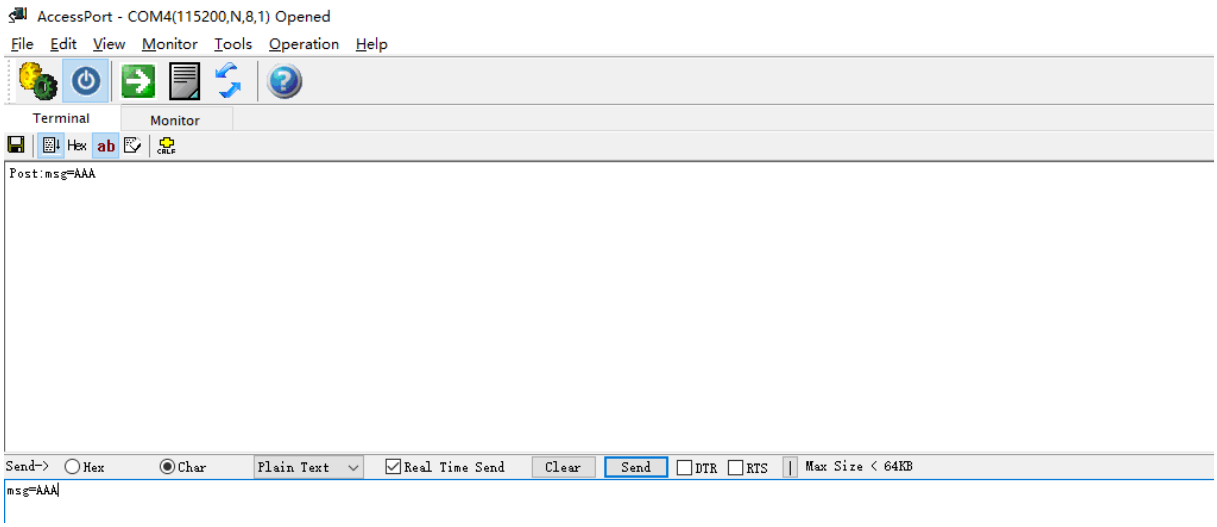


- **HTTP POST Test:**

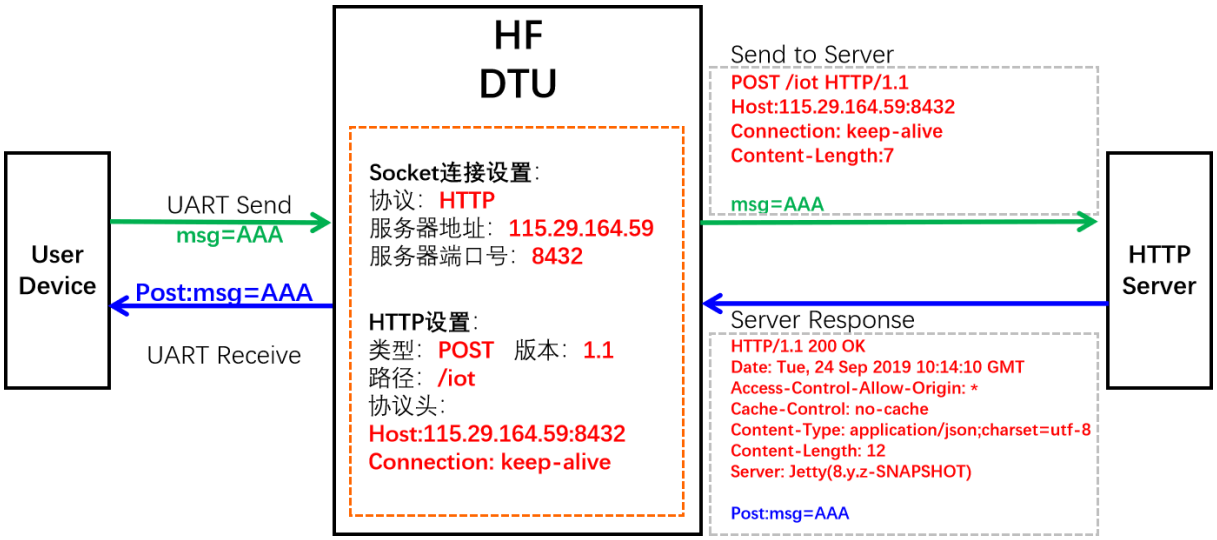
Test server address: 115.29.164.59
Test server port: 8432
Path: /iot
Header:
Host:115.29.164.59:8432
Connection: keep-alive
Products setting as following.



Server response back and products UART output packet. It filter the HTTP response header and only output the header.



Data flow is as following.

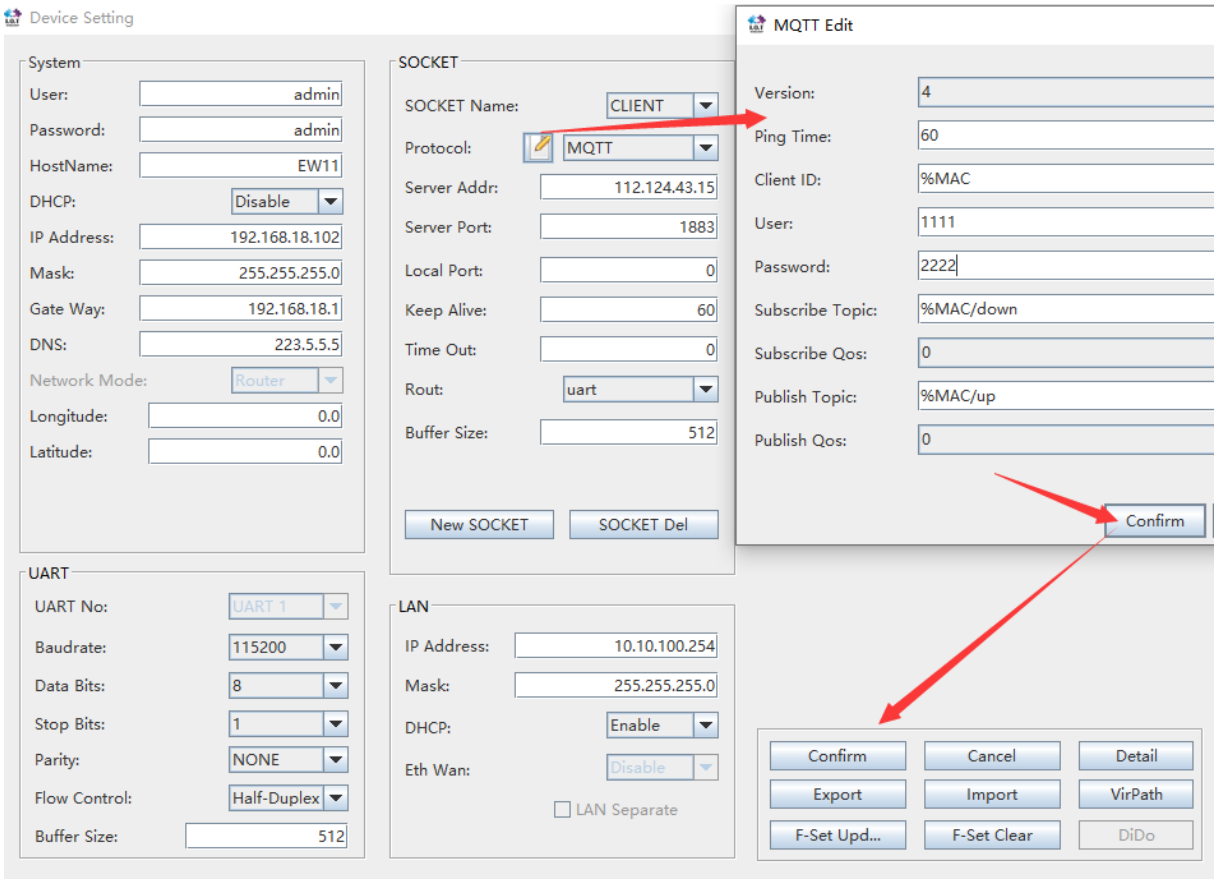


5.7. STA MQTT Client Test

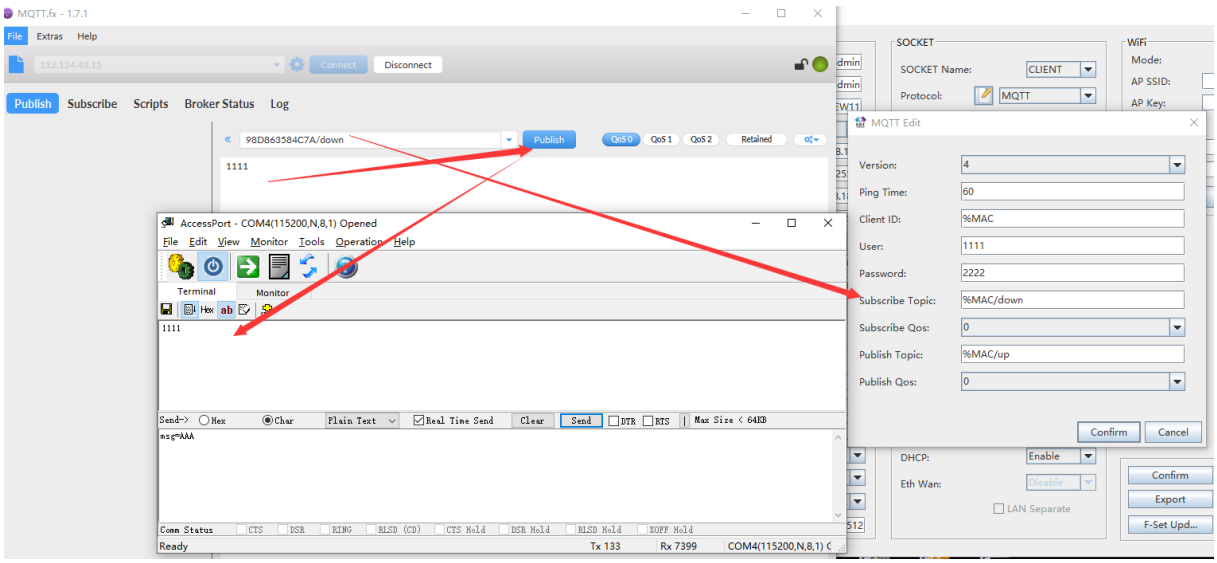
Test server address: 112.124.43.15

Test server port: 1883

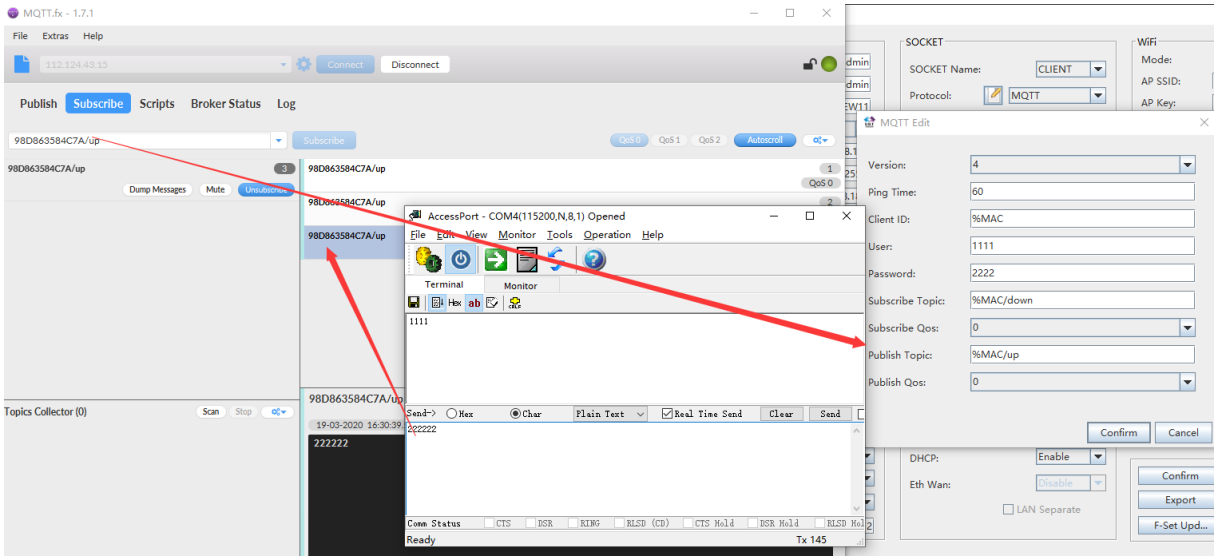
Device setting is as following.



Use MQTT.fx tools to test, set publish topic to the device Subscribe Topic and the publish data will be sent to device UART.



Set tools subscribe topic to the device publish topic and the send UART data, the MQTT.fx tools got the packet.



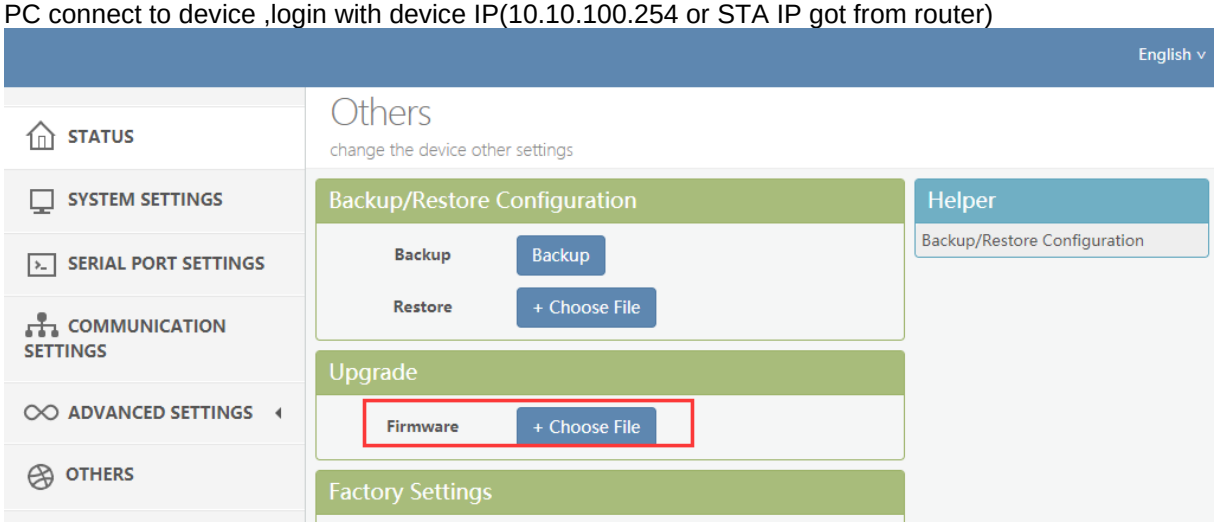
5.8. Firmware Upgrade

Firmware download address:

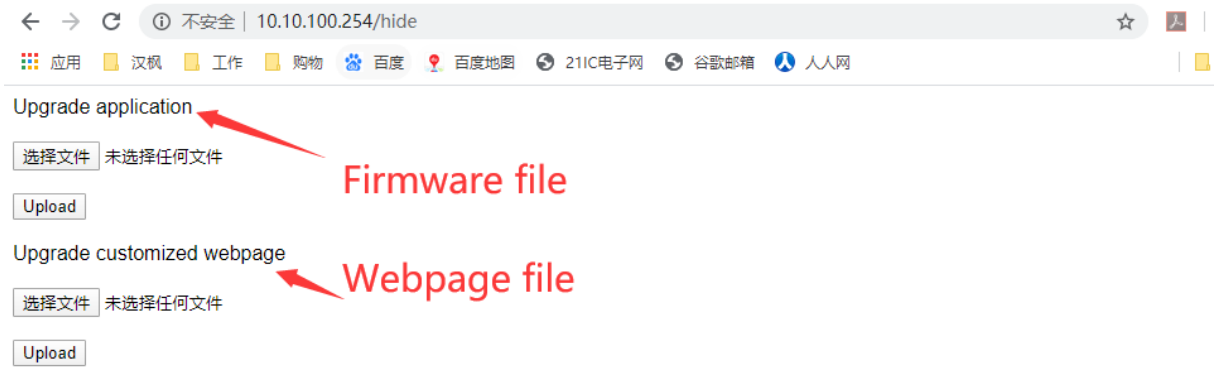
http://www.hi-flying.com/index.php?route=download/category&path=1_3

- **Webpage Local Upgrade:**

PC connect to device ,login with device IP(10.10.100.254 or STA IP got from router)



There is another internal webpage for upgrade the firmware and webpage (external config webpage as above, this source code is open at our website for customer to chagne). Login with IP/hide.



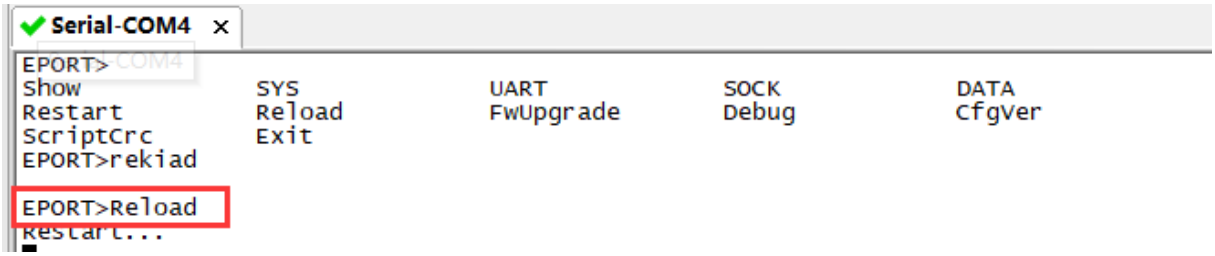
- **IOTService Remote Upgrade:**

Refer to IOTService doc for remote upgrade.

5.9. Restore to Factory Setting

If device works in STA mode and not yet connect to router AP, do the following operation to recover and reconfig.

- **UART Cli command to reload**



- **nReload button to restore to factory setting.**

nReload Pin (Button) function:

1. After module is powered up, short press this button (0.2< "Low" <1.5s) and loose to make the module go into "SmartLink" config mode, waiting for APP to set password and other information. (See Appendix to download SmartLink APP).
2. After module is powered up, long press this button ("Low" > 4s) and loose to make the module recover to factory setting.

5.10. More Application Case

See following for more.

http://www.hi-flying.com/download-center-1/application-notes-1/download-item-industry-products-application-manual-20180415

APPENDIX A:REFERENCES

A.1. Test Tools

IOTService Configure Software:
http://www.hi-flying.com/index.php?route=download/category&path=1_4

A.2. Smartlink V8

http://www.hi-flying.com/download-center-1/applications-1/download-item-smartlink-v8