User Manual and Test Guide

IOTService Tool

2019-06-04

CONTENT

History:

2016-08-30 First Version

2017-01-20 Update to IOTService 2.5 Version

2017-04-20 Update IOTService to IOTService. Version 2.0.06

2017-06-15 Update IOTService. Version 2.0.07e

2017-08-22 Update IOTService. Version 2.0.10

2017-12-06 Update IOTService. Version 2.1.01

2018-03-05 Update IOTService. Version 2.3.0.0 ,Add D2D Function.

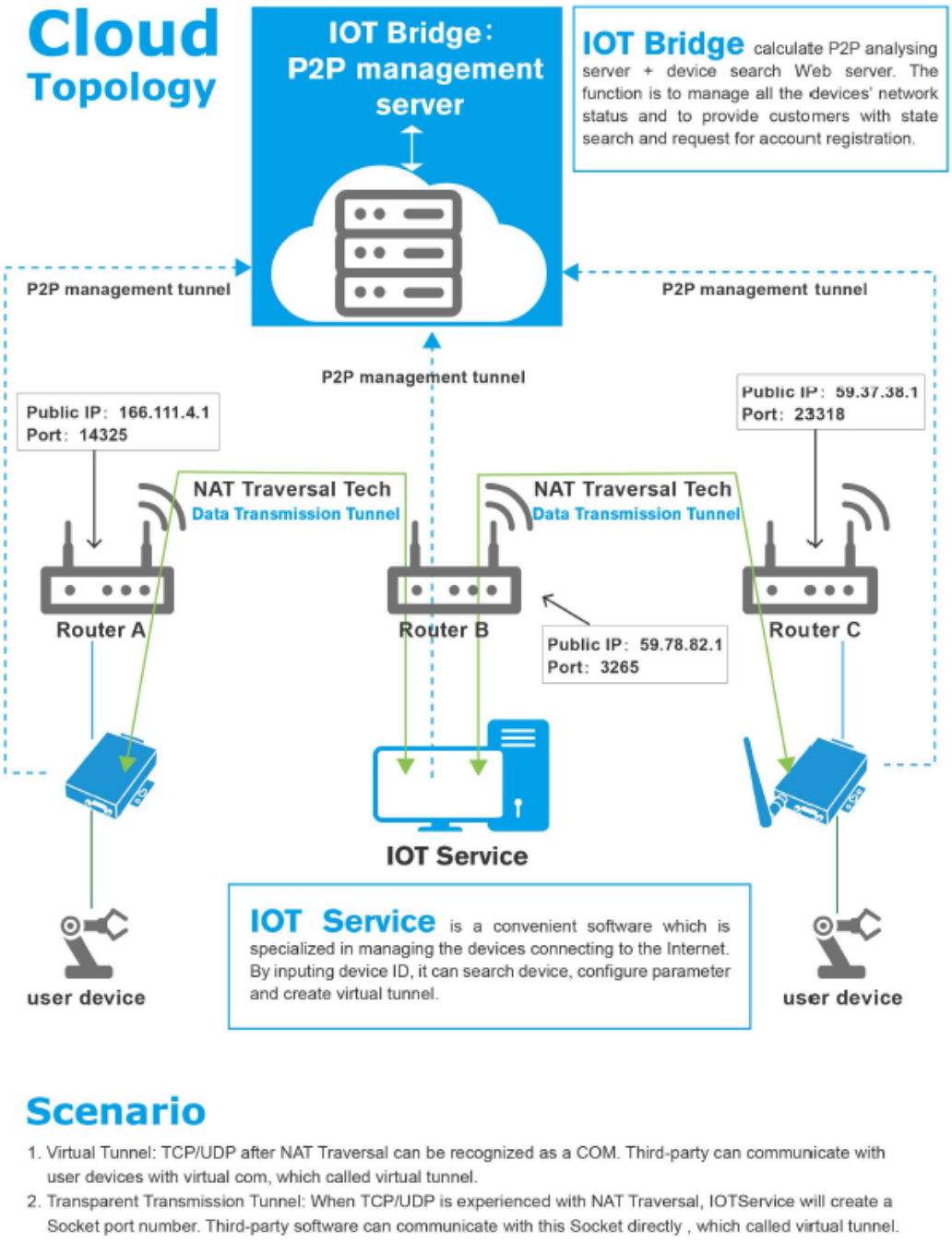
2018-03-05 Update IOTService. Version 2.3.0.07f ,Add HF2411, HF2111A new type.

2019-06-04 Update IOTService. Version 2.3.44.

1. IOTSERVICE INTRODUCTION

IOTService is a management tools for our serial server devices. Add the feature of our IOTBridge cloud for remote device setting and data transfer.

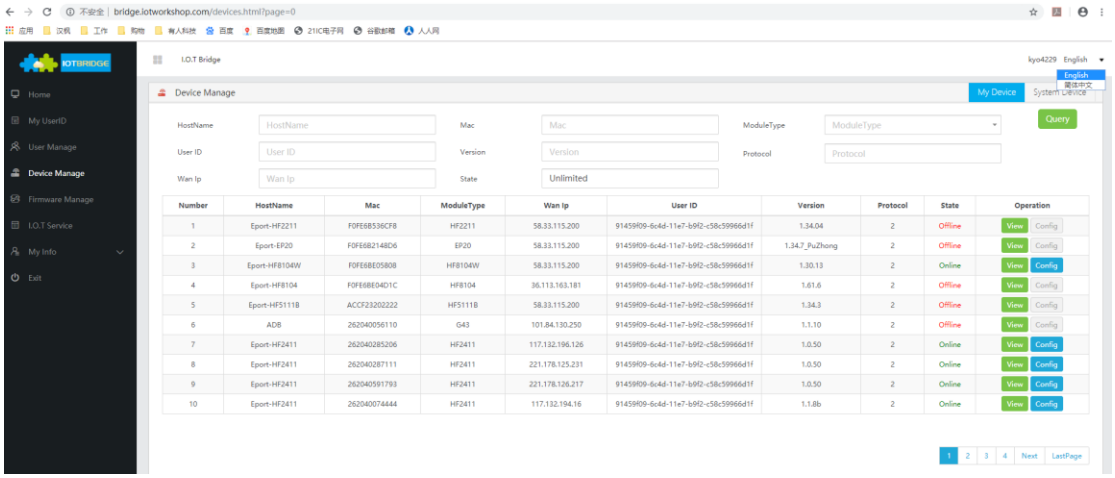
IOTBridge cloud use UDP/P2P/NAT to make the IOTService software remote setting and control devices. The detailed structure is as following picture.



Scenario

1. Virtual Tunnel: TCP/UDP after NAT Traversal can be recognized as a COM. Third-party can communicate with user devices with virtual com, which called virtual tunnel.
2. Transparent Transmission Tunnel: When TCP/UDP is experienced with NAT Traversal, IOTService will create a Socket port number. Third-party software can communicate with this Socket directly , which called virtual tunnel.

IOTBridge website(http://bridge.iotworkshop.com) can see all the user device, to check its status and config parameters.



IOTService is tools for config HF IOT Device. (Except HF2111, it use IOTSerial Tools) create virtual com, remote monitor device, OTA upgrade function. It is used for the following product

Ethernet IOT

FreeRTOS Embedded Network Device
[Eport-E20-PIN] [Eport-E20]
[Eport-E30]

Linux Embedded Network Device
[Eport Pro-EP20-PIN]
[Eport Pro-EP20]

Ethernet Serial Server
[HF5111A] [HF5111B]

Multiple Port Ethernet Serial Server
[HF5142A] [HF5142B]

Wi-Fi IOT

Wi-Fi Serial Module
[Wport-W20] [Wport-W10]

Wi-Fi Serial Server
[HF2211] [DTU-H100]

Multiple Port Wi-Fi Serial Server
[HF2221]

Wifi router (rail)
[HF8104W]

GPRS IOT

GPRS Serial Server
[HF2111A]

4G IOT

4G Serial Server
[HF2411]

4G+WIFI+GPS Serial Server Device
[HF2421G]

4G+WIFI Serial Server
[HF2421]

Rail 4G Router
[HF8102] [HF8104]

Elfin IOT

4G_LTE
[Elfin-EG4X]

GPRS
[Elfin-EG1X]

Wi-Fi
[Elfin-EW1X]

Ethernet
[Elfin-EE1X]

IO Control

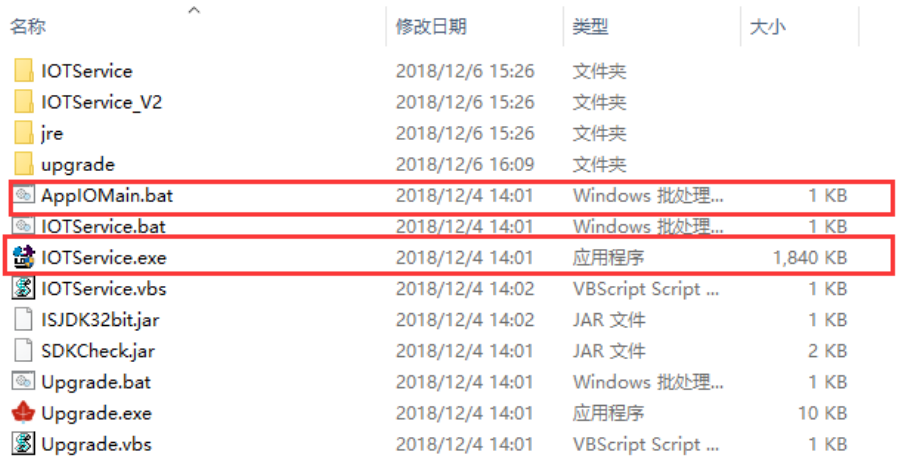
Wi-Fi IO
[HF6208]

Ethernet IO
[HF6508]

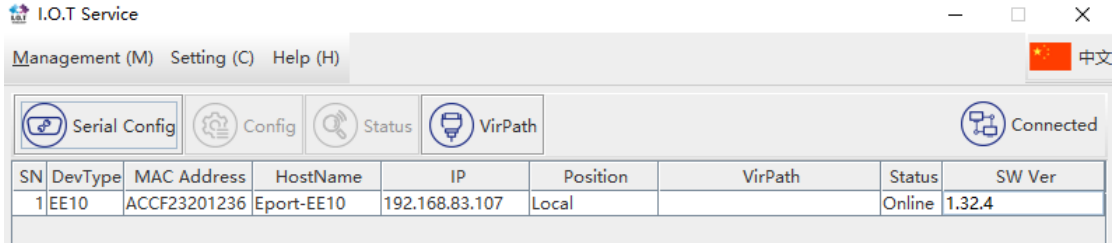
2. IOTSERVICE INSTALLATION

Step 1:Download the IOTService tool as the following link.
http://www.hi-flying.com/download-center-1/applications-1/download-item-iotservice
Step 2:Install IOTService tool according to the PC OS(x64 for 64 bit Windows OS, x86 for 32 bit Windows OS). **If already installed old version, please uninstall and reboot, then install this new version.**

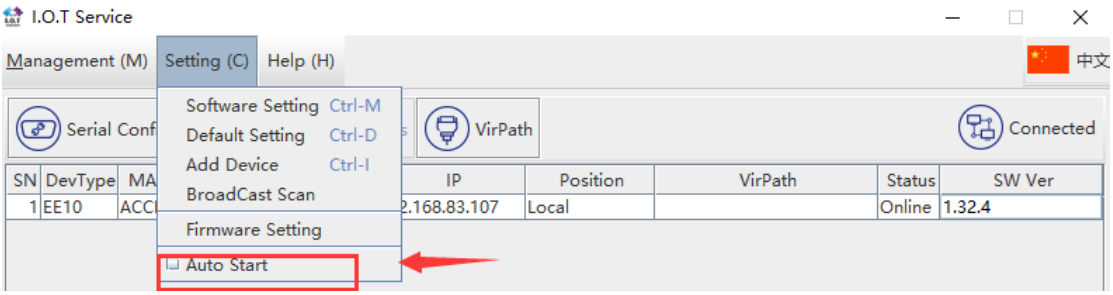
Step 3:After installation, there is a folder for IOTService under the installation path.



Click IOTService icon  and start the tool after installation.
Step 4:The tool will show the following UI.



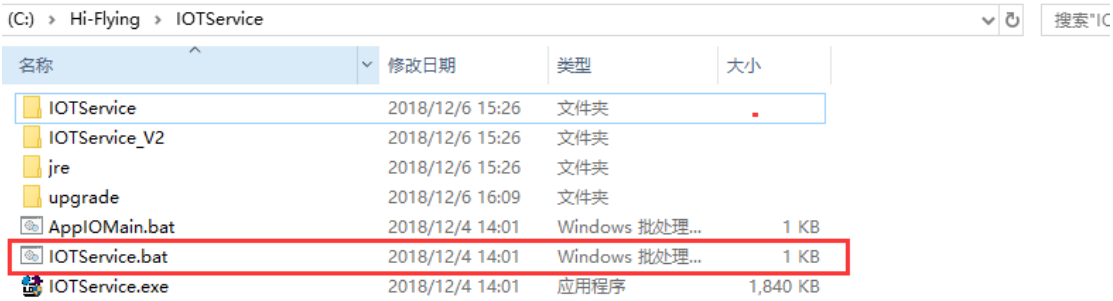
Step 5:Enable Auto Start when needed. (May fail in some OS, pleae google to find soluction about make program auto start)



Notes:

This tools need JRE environment and will automatically install it.

Run following IOTService.bat to send us the log information if encounter tools problem, note this startup method does not support virtual com function.



This tools some function need administrator permission and close firewall, suggest to do as following.


自定义设置
控制面板 › 所有控制面板项 › Windows Defender 防火墙 › 自定义设置
自定义各类网络的设置
你可以修改使用的每种类型的网络的防火墙设置。
专用网络设置
启用 Windows Defender 防火墙
阻止所有传入连接，包括位于允许应用列表中的应用
Windows Defender 防火墙阻止新应用时通知我
关闭 Windows Defender 防火墙(不推荐)
公用网络设置
启用 Windows Defender 防火墙
阻止所有传入连接，包括位于允许应用列表中的应用
Windows Defender 防火墙阻止新应用时通知我
关闭 Windows Defender 防火墙(不推荐)

3. PRODUCT CONNECTION

3.1. Elfin-EE10 Device Connection

Connect the EE10 Ethernet to router LAN, and connect RS232 to PC.

3.2. Serial Port Configuration

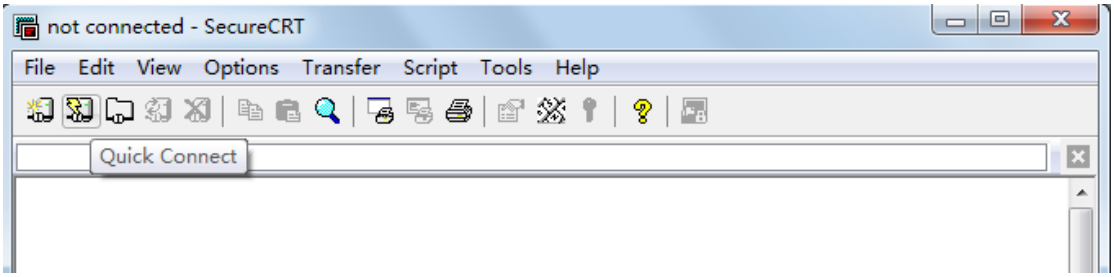
3.3.1. Serial port tool:SecureCRT

Download address:

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

Unzip the file and find the following icon, 

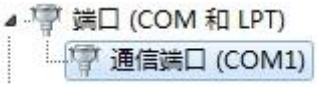
Open and click quick connect button  to create connection.



3.3.2. Serial Parameter Configuration

Protocol:Serial

Port:Check PC device management, port number should be shown like this figure



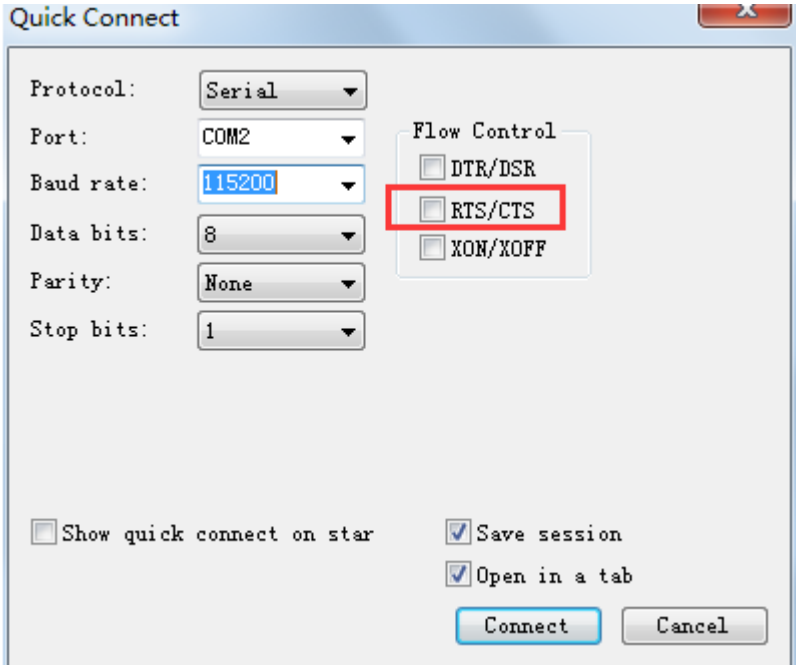
Baud rate:115200

Data bit:8

Parity check:None

Stop bit:1

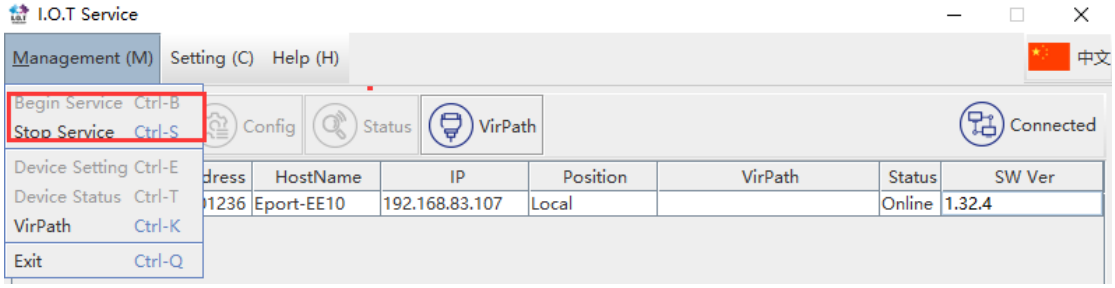
Flow control:NONE(Please remove "√" in front of RTS/CTS)



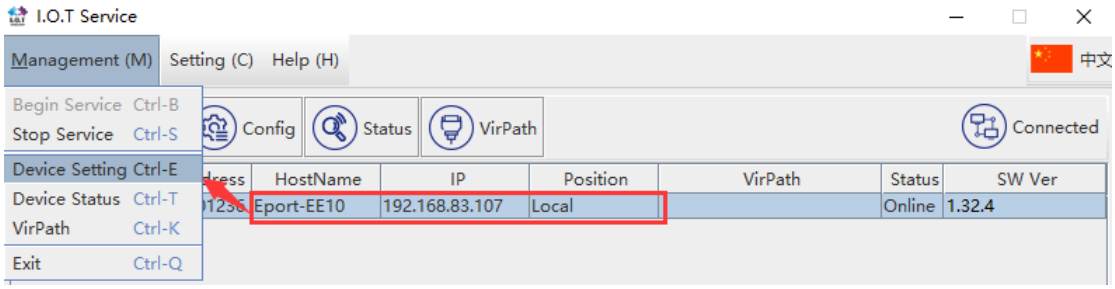
4. IOTSERVICE INTRODUCTION

4.1. Main Page Introduction

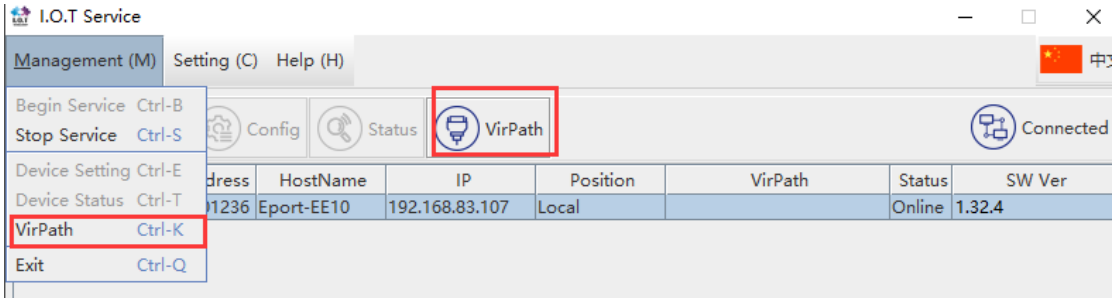
■ When it starts, it will show the scanned products in the local area network or remote device in user account. The scan service can be begun or stopped.



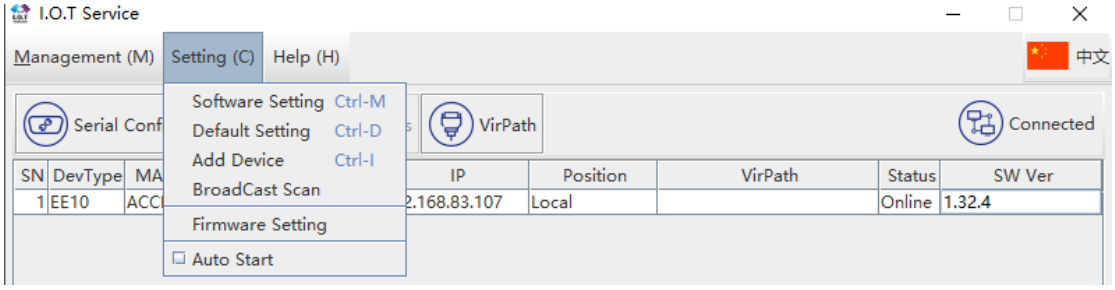
■ Check or set the selected device parameters(or double click the selected device)

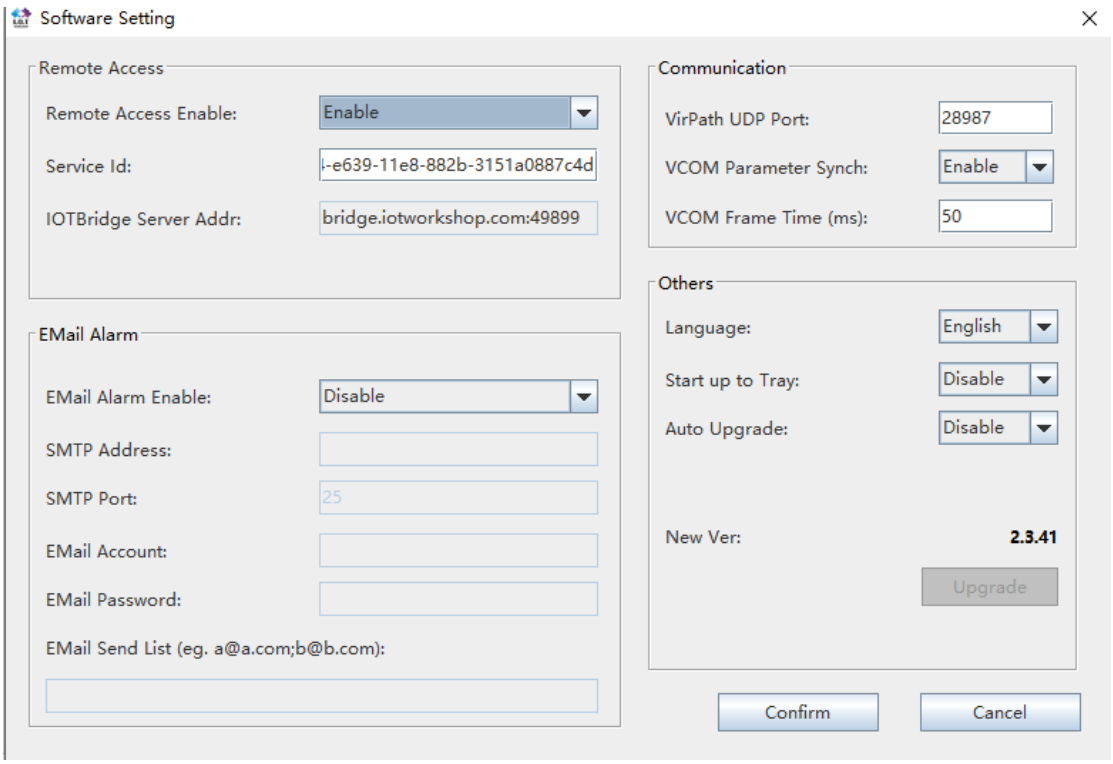


■ VirPath:Virtual serial setting and virtual throughput function. See examples for more detailed usage.

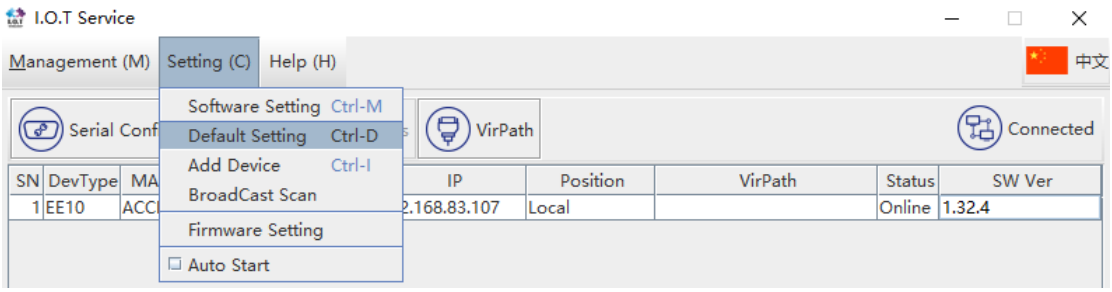


■ Setting:Tool setting.

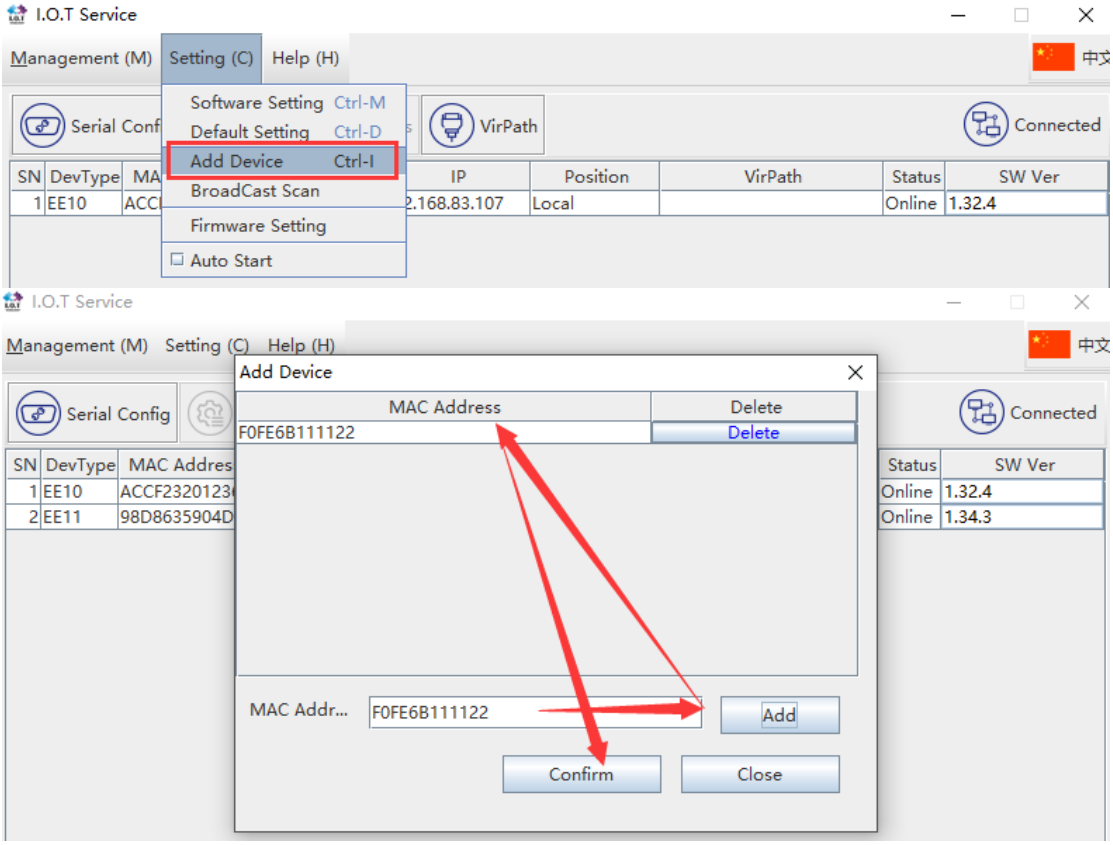




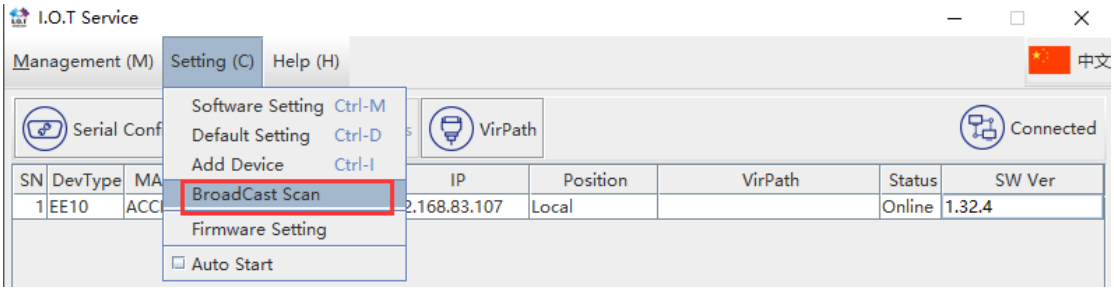
- Remote Access Enable:Enable/Disable our remotely control function, IOTBridge server is used for P2P device management and data transfer if enable.
  - Service Id: This id is used for IOTBridge to distinguish different user device. Recommend to write write User Id in device side, it will automatically bound device to account, otherwise, need manually bound. See IOTBridge chapter for details to get Service Id and User Id.
  - IOTBridge Server Addr:Show IOTBridge server information.
- Communication:Virtual Path Communication relevant setting. Normally keep default.
- Email Alarm:Alarm when device offline.
- Others:Other settings.
  - Language:Chinese or English.
  - Start up to Tray:Minimize to pallets at startup
  - Auto Upgrade:Auto upgrade.
  - Upgrade:click to upgrade when tools have new version.
- Default Setting:Restore tool setting to default.

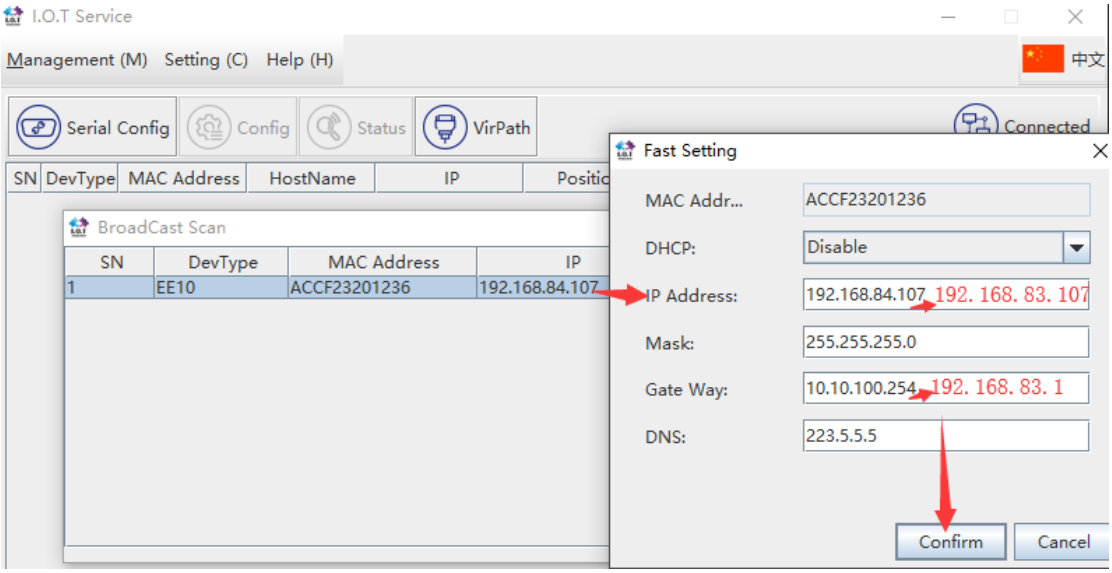


■ Add Device:Add remote device under Service Id(The User Id should first be written via Cli SYS/UserID command), if IOTService locally scan find device, it will be added automatically.

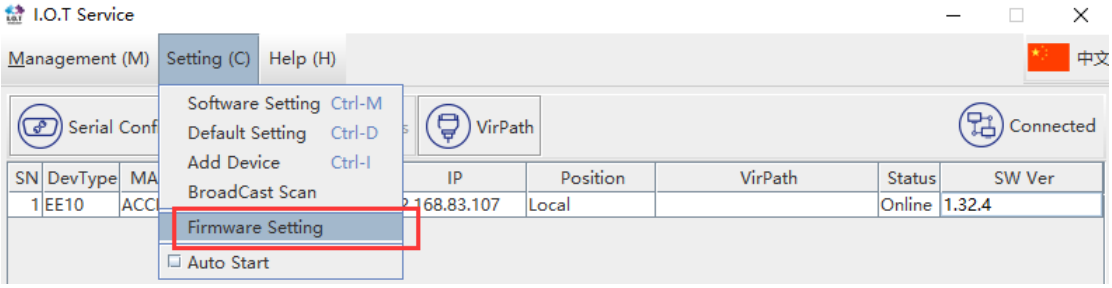


■ BroadCast Scan:Send 255.255.255.255 broadcast packet to search device. This is useful when forgot device static IP. Ex, in subnet mask 255.255.255.0 device set to 192.168.84.XXX, but router is 192.168.83.XX, use this broadcast scan to search device and modify device IP to 192.168.83.XXX, then the device will show in the IOTService main page.

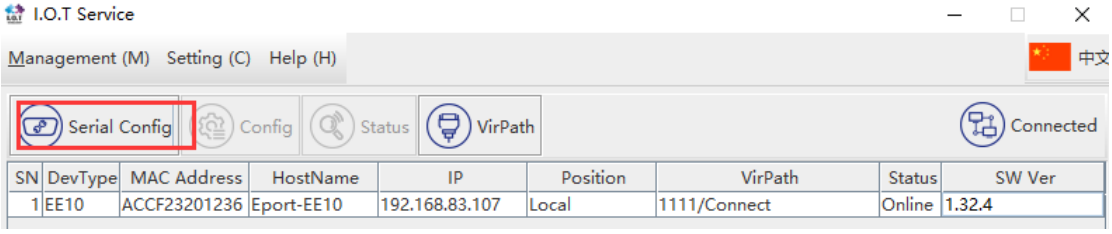


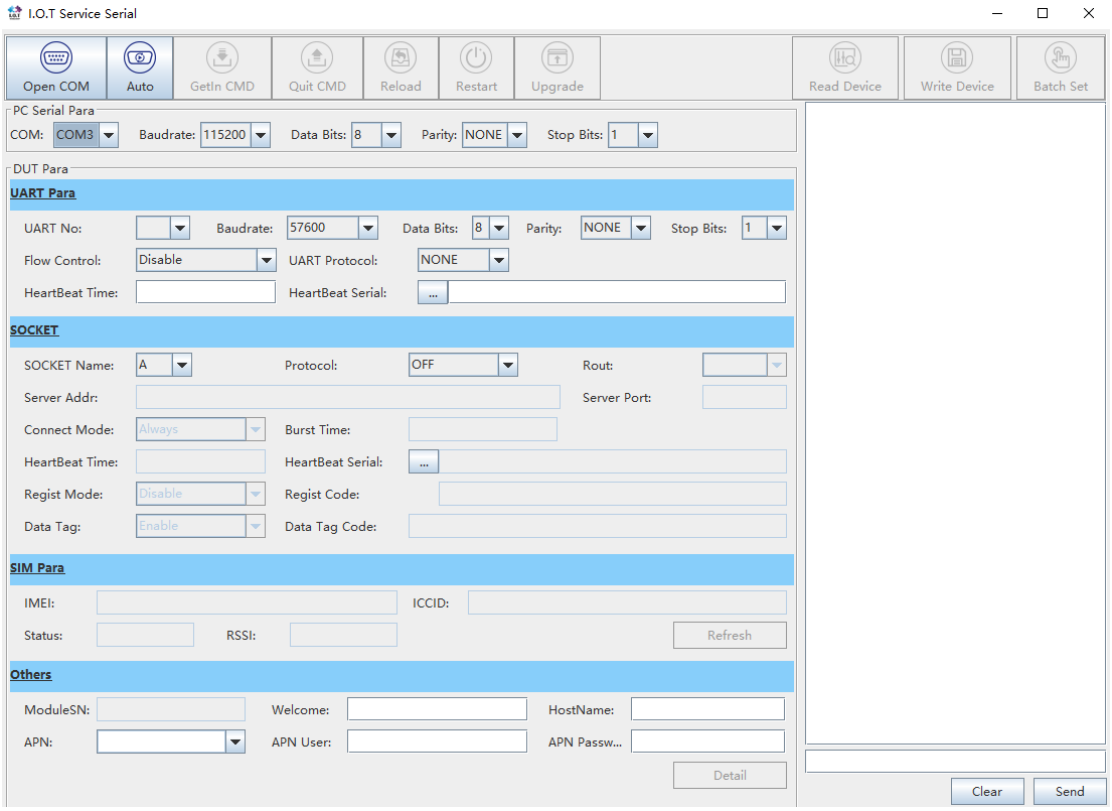


- Firware Setting:OTA upgrade device, more details in the following chapter.

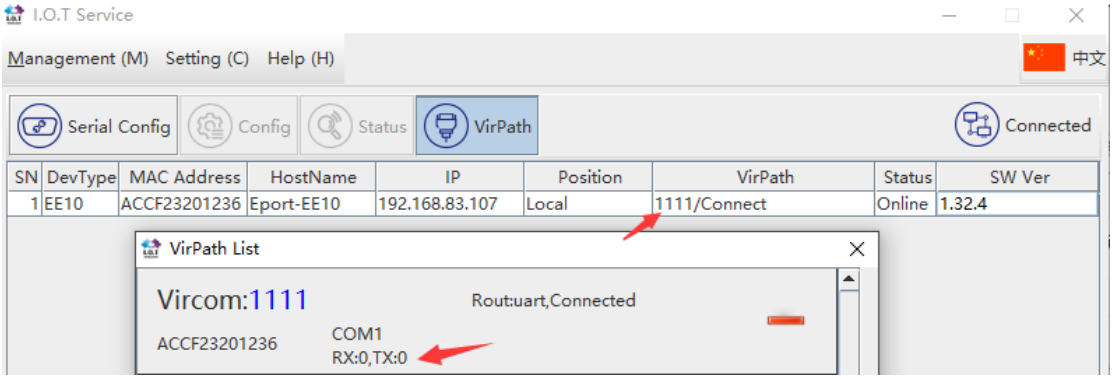


- Serial Config:Config device via UART, **only support AT command device(G10, G11, G12, EG10, EG11, EG40, EG41, G43, HF2111A, HF2411). Cli command device is not supported to use this method.**

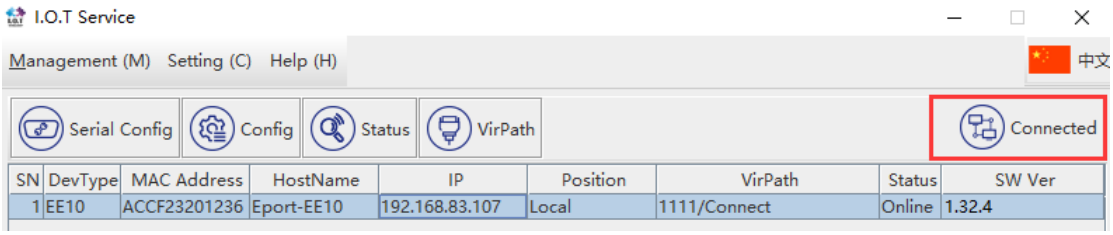




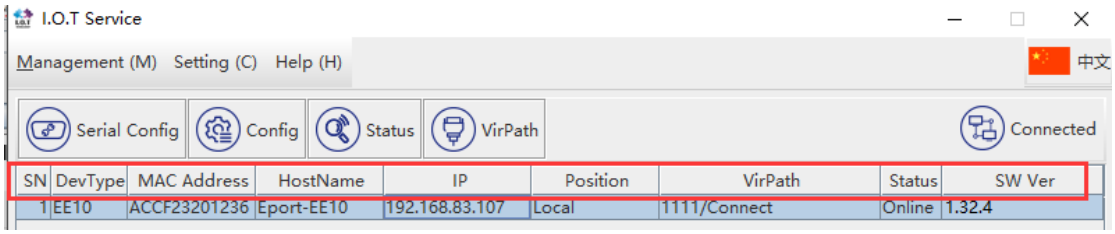
- VirPath:The virtual channel, virtual serial port information. Show status.



- Connected:the status of connecting to our IOTBridge server.

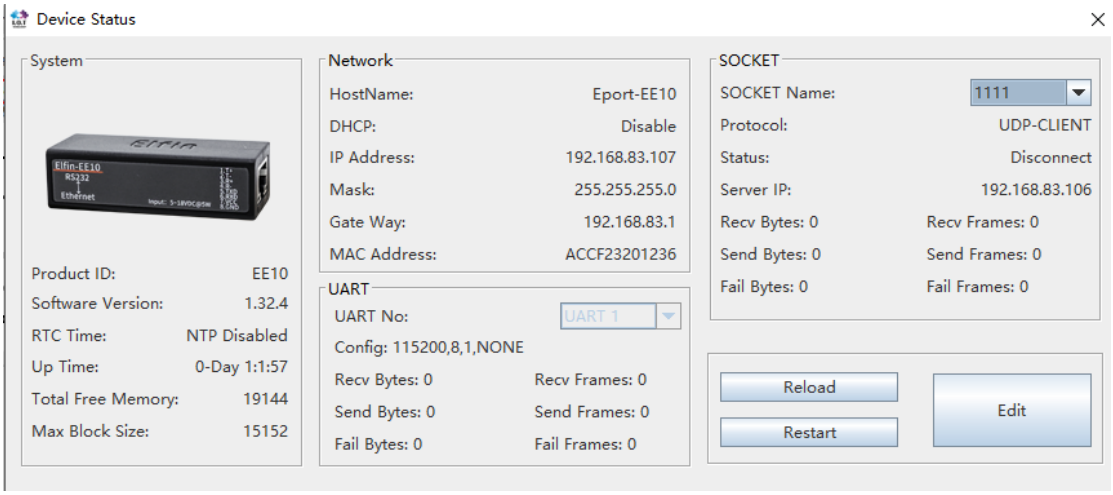


- DeviceType:device name. This name can be changed by cli command (SYS/CustomerId)
- Position:Show device position.
- VirPath:Show virtual path status.

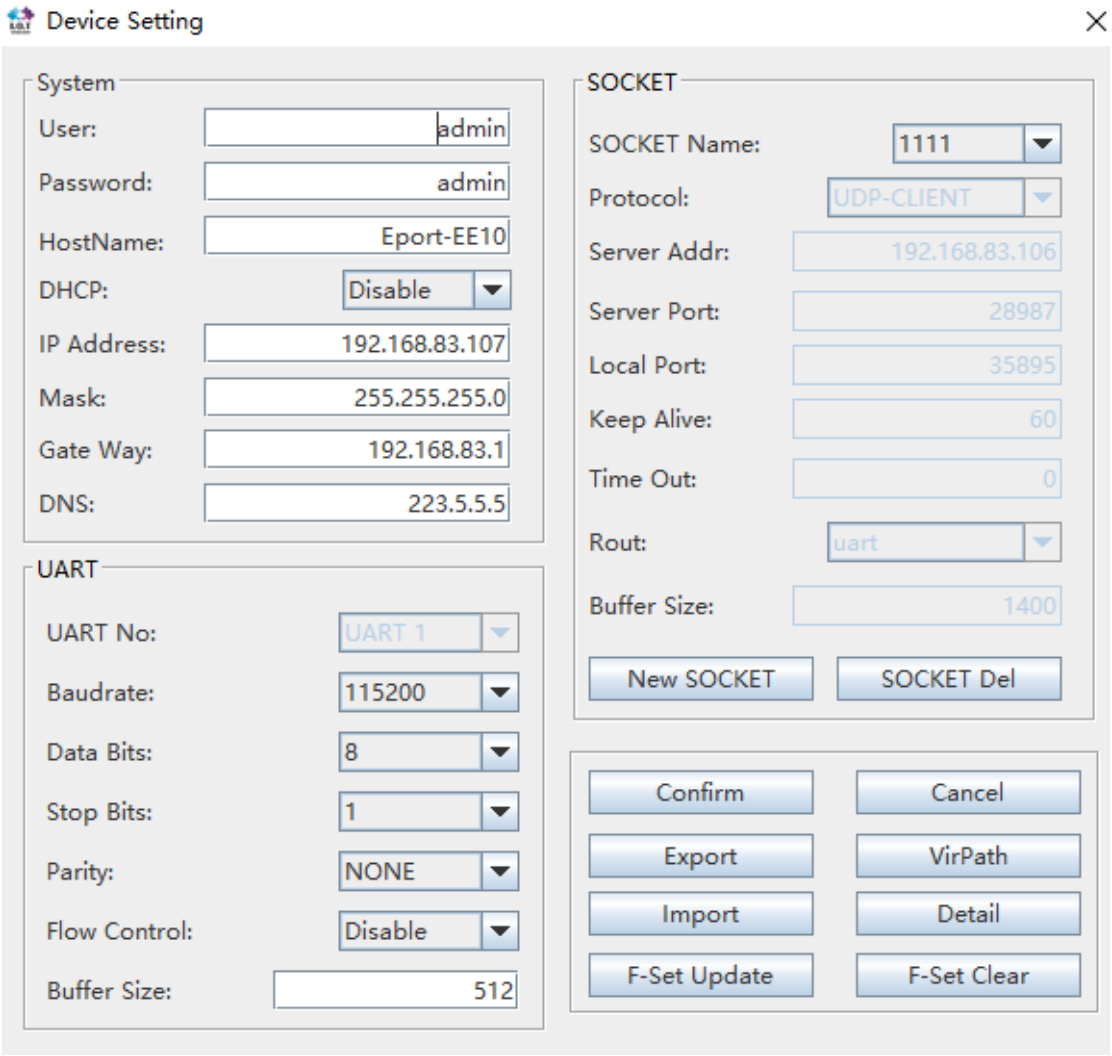


4.2. Device Status Interface

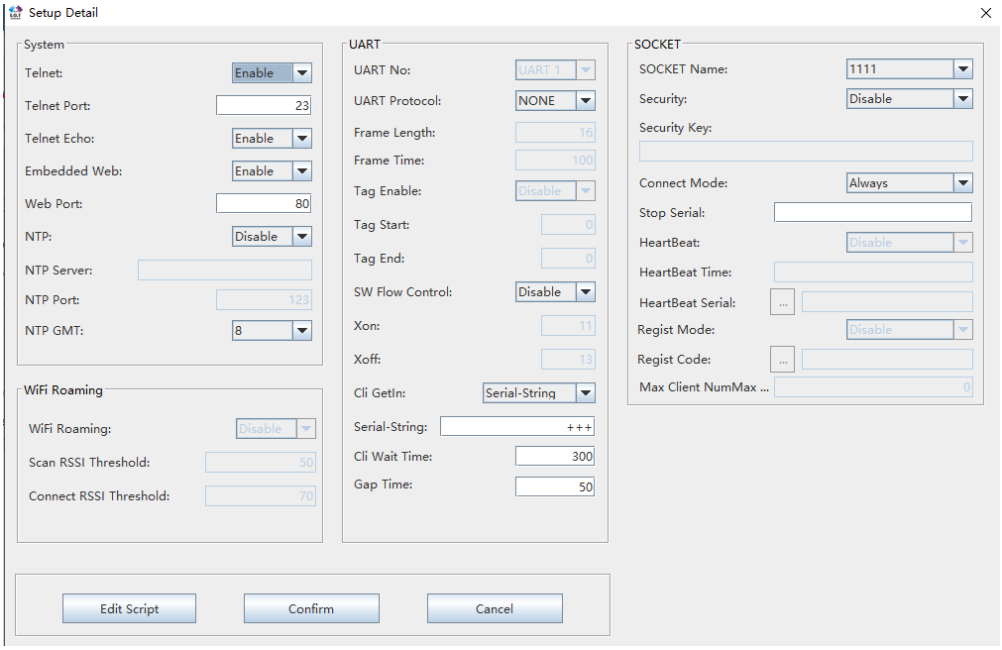
- Device Status:Indicates the device information, including software version, network, serial port and socket communication status.
  - Reload button:Restore parameter to the factory parameter.
  - Restart button:Restart product
  - Edit button:Enter into parameter setting interface



4.3. Edit Page

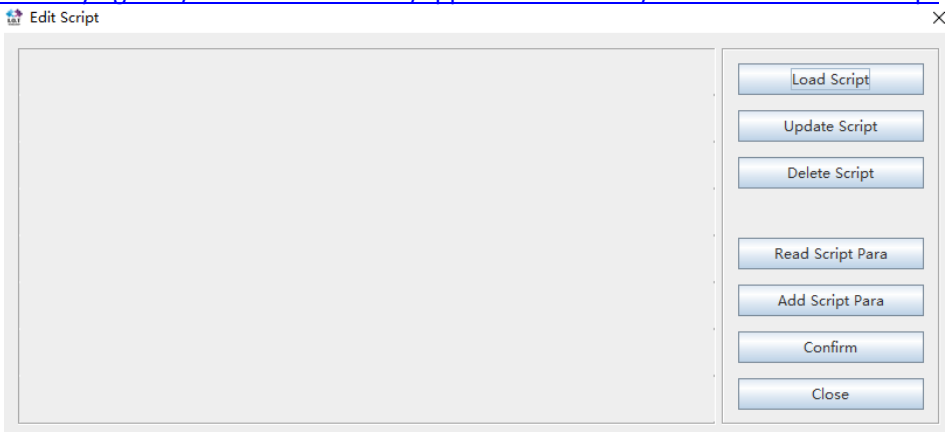


- New SOCKET: Create new SOCKET.
- SOCKET Del: Delete current SOCKET
- Confirm: Confirm modified parameter
- Cancel: Exit edit page
- Export: Export current config file. This file can be used to config another device.
- Import: Import config file.
- VirPath: Set virtual path function, the following chapter will describe this function.
- Detail: More advanced parameter settings.



- Edit Script: HIS script function. See following for more detail.

http://www.hi-flying.com/download-center-1/application-notes-1/download-item-his-script



◆ F-Set Update: Set the current parameters as factory setting, when do reload operation, restore to this saved setting.

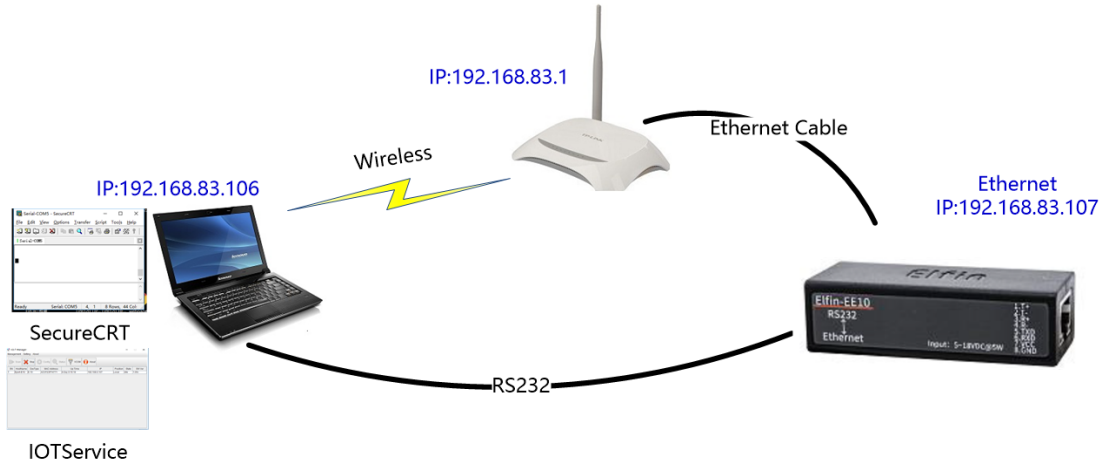
◆ F-Set Clear: Clear the factory setting, when do reload operation, restore to the default factory setting.

Notes:.

Some device has hardware protect DIP switch(HF5111A/HF5111B/HF2211), when the protect DIP switch is set to "on", then some setting of the tools is forbidden.

4.4. Test CASE

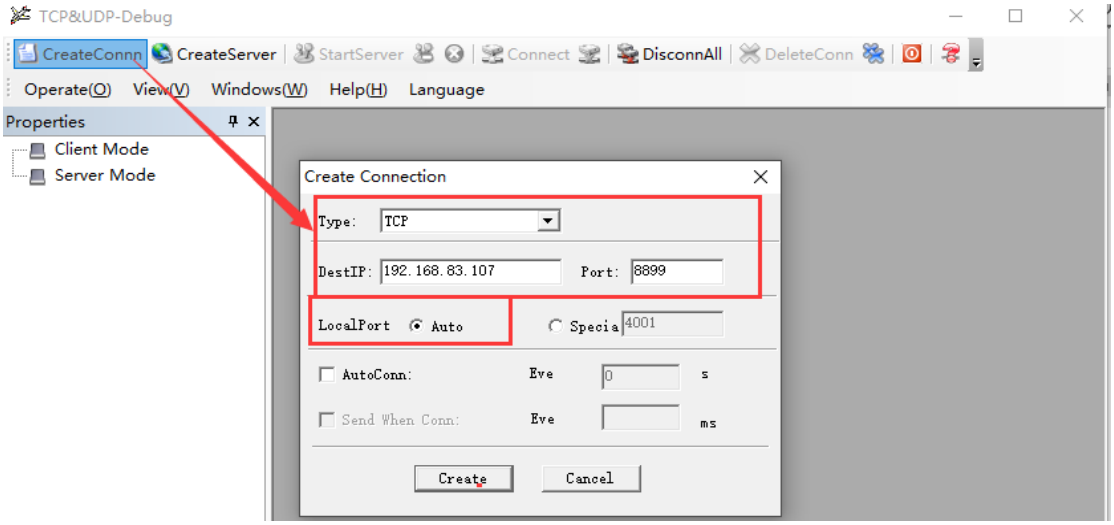
4.4.1. EVK Test Topology



4.4.2. TCP Server Test

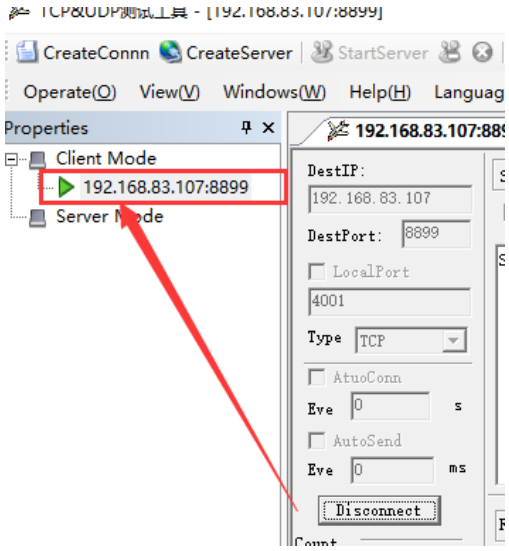
Step 1: Open TCP&UDP test tool and build TCP connection as following steps.

- Products provides with a built TCP server (Port 8899)
- TCP&UDP test tool can be downloaded from website:
  - http://www.hi-flying.com/index.php?route=download/category&path=1_4
- DestIP: Destination IP address
- Port: Destination Port

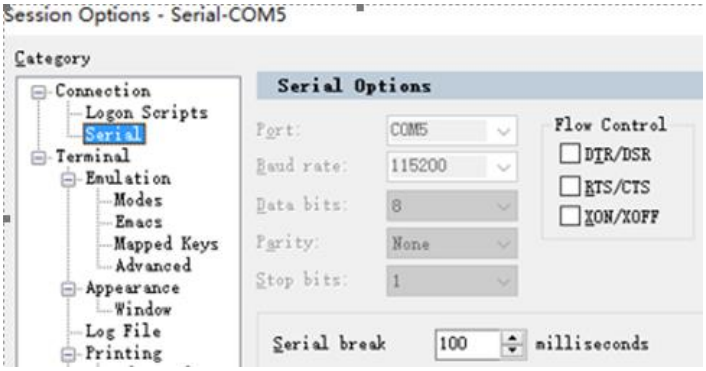


Step 2: Click Connect to build TCP connection.

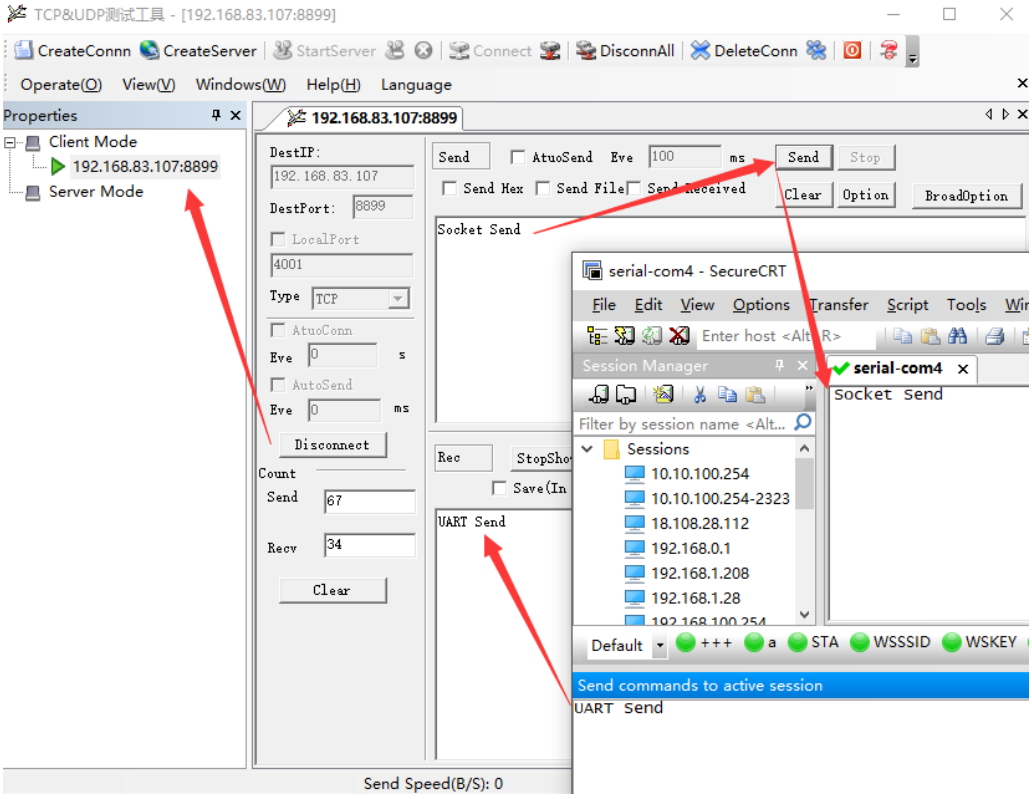
- After build successfully, the left arrow will turn to green.



Step 3: Open the serial port as following parameters (115200 baud rate default)



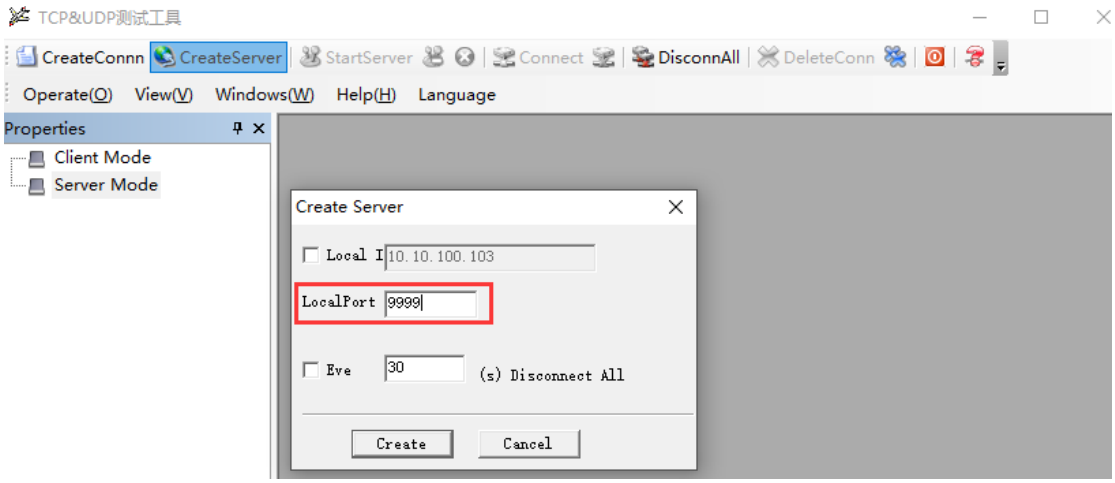
Step 4: Transmit data between TCP tool and serial port tool.



4.4.3. TCP Client Test

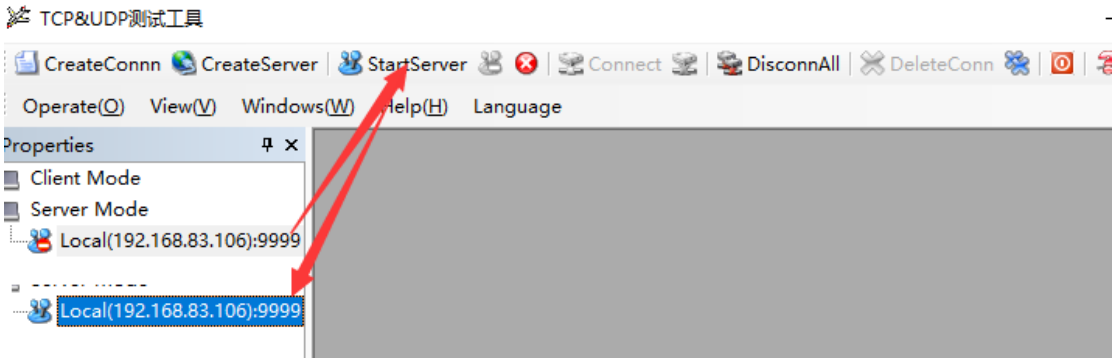
Step 1: Open TCP&UDP test tool and build TCP connection as following steps.

- Local IP: PC IP address. Do not select it, tool will automatically recognize PC IP.
- Local Port: TCP Server port number



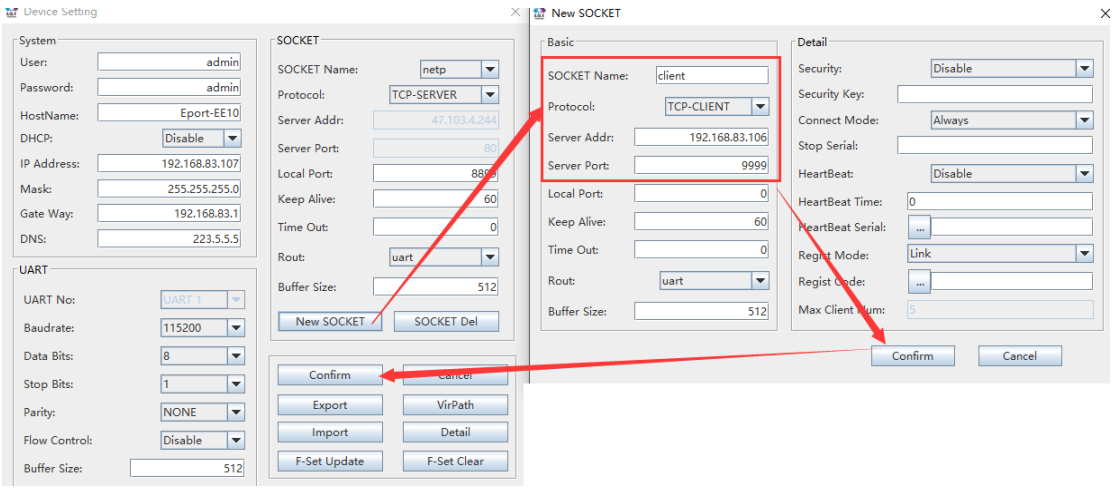
Step 2: Click StartServer to launch PC TCP Server function

- After created successfully, the icon has the following changes.

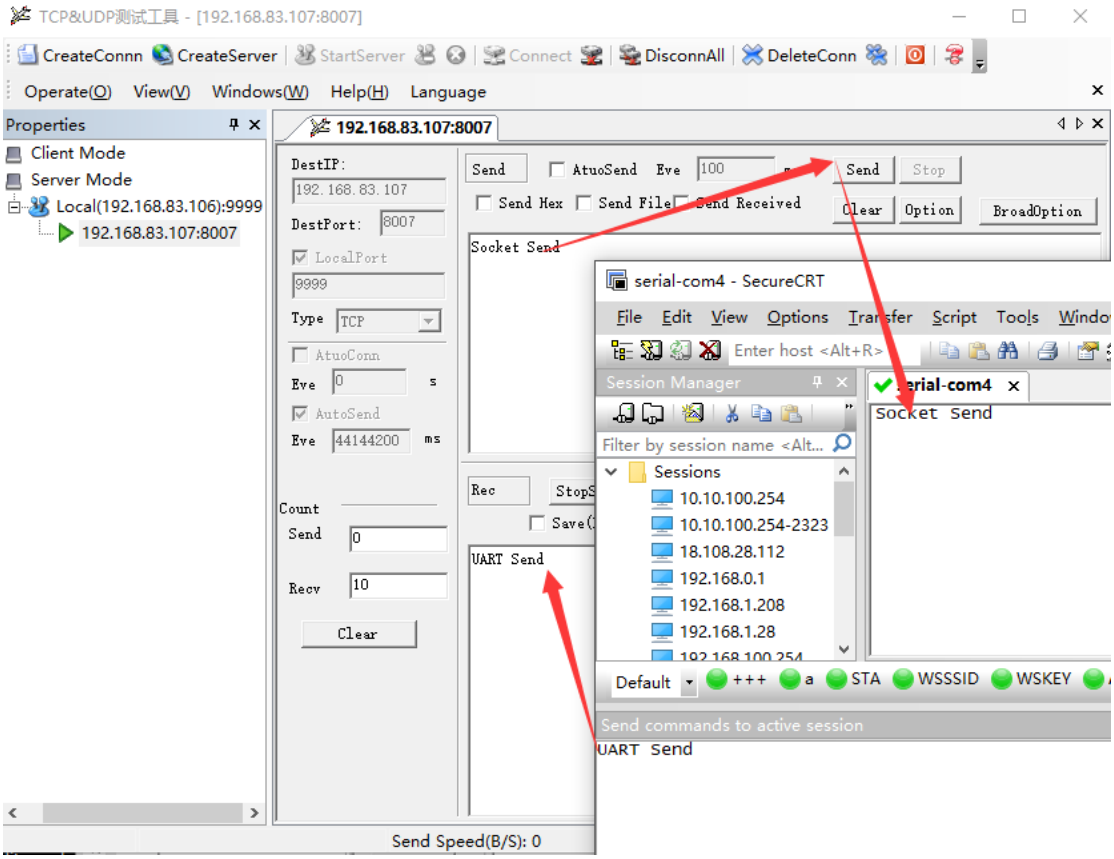


Step 3:Open IOTService tool and create socket to connect tool as following step.

- Socket Name: Socket name can be set randomly (differ from other sockets), maximum 5 sockets.
- Protocol: Select TCP-Client
- Server Addr: Server IP address, fill in the above PC IP
- Server Port: Server port number, fill in the above PC port (9999)

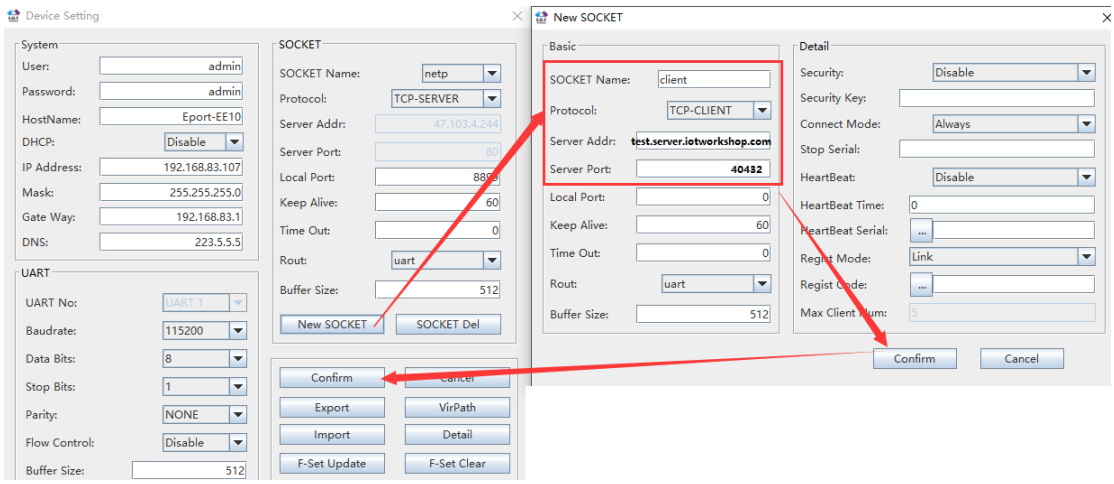


Step 4: Transmit data between TCP tool and serial port tool

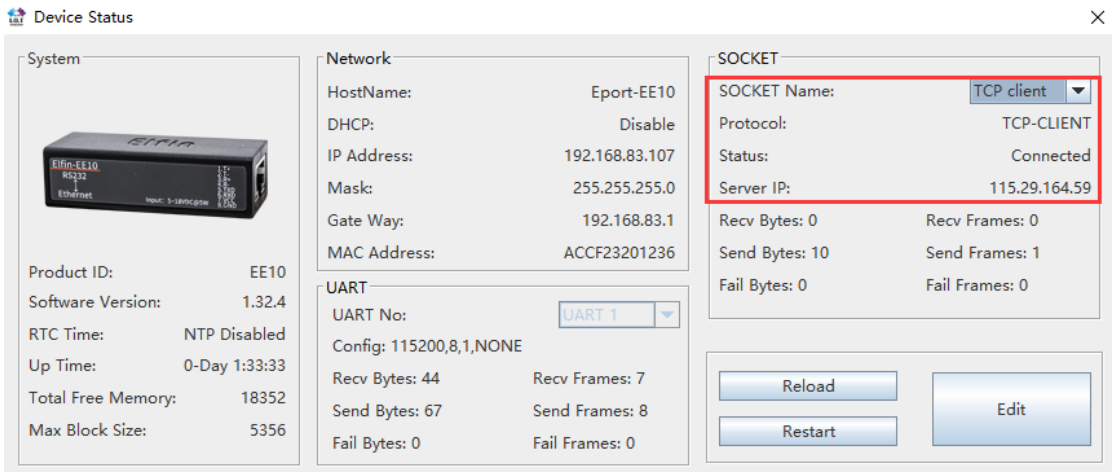


4.4.4. TCP Client Connect to Remote Test Server

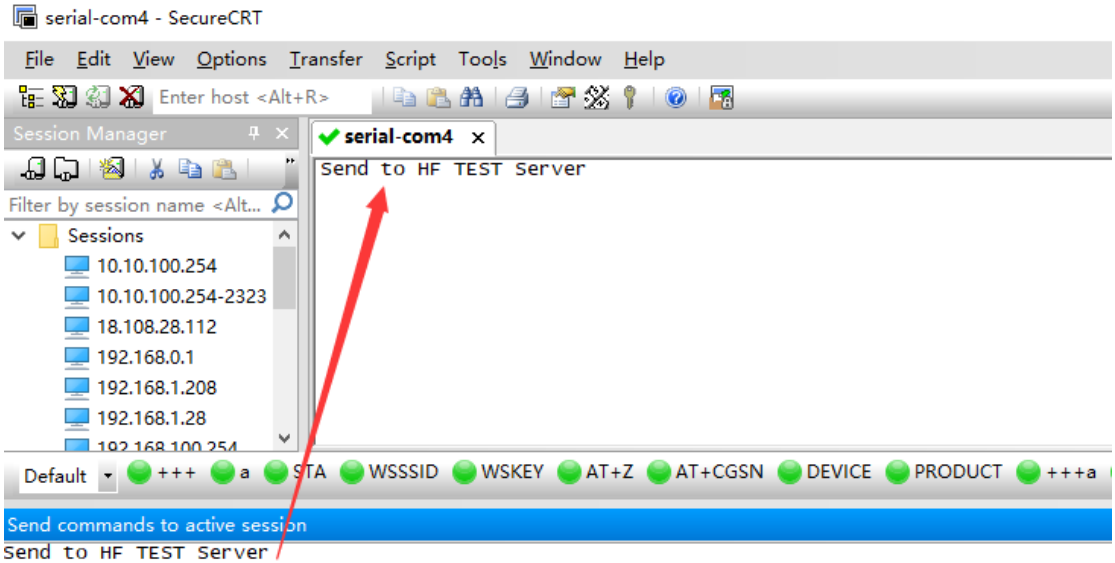
Step 1: Open IOTService and create TCP client socket, HF test server: test.server.iotworkshop.com,TCP port: 404325, UDP port: 40431



Step 2: Device status page to confirm if server is connected



Step 3: Serial port sends "Send to HF TEST Server" and the server will respond with the same data. The UART tools shows the server feedback packet.

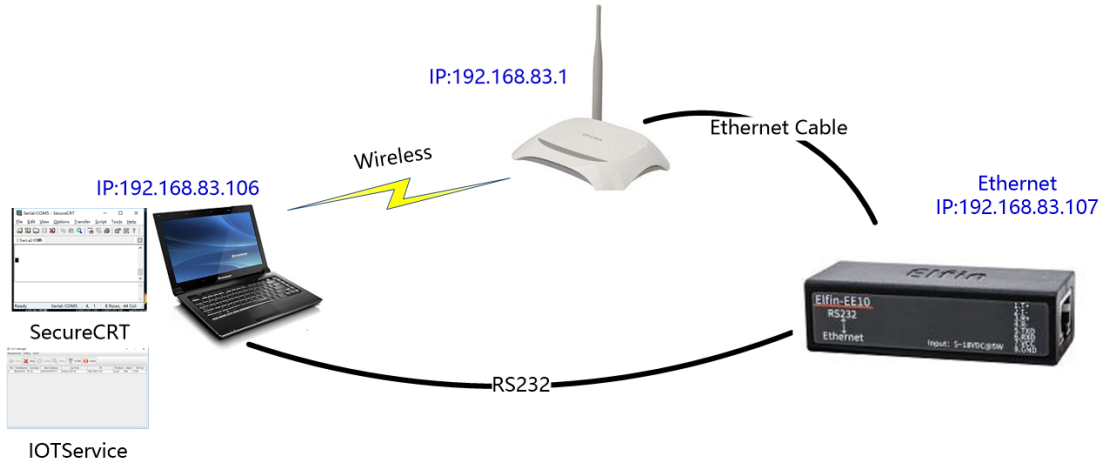


4.5. VIRTUAL Path Function

The virtual path uses the serial port or the network way to transfer the data locally or remotely. The two methods are introduced.

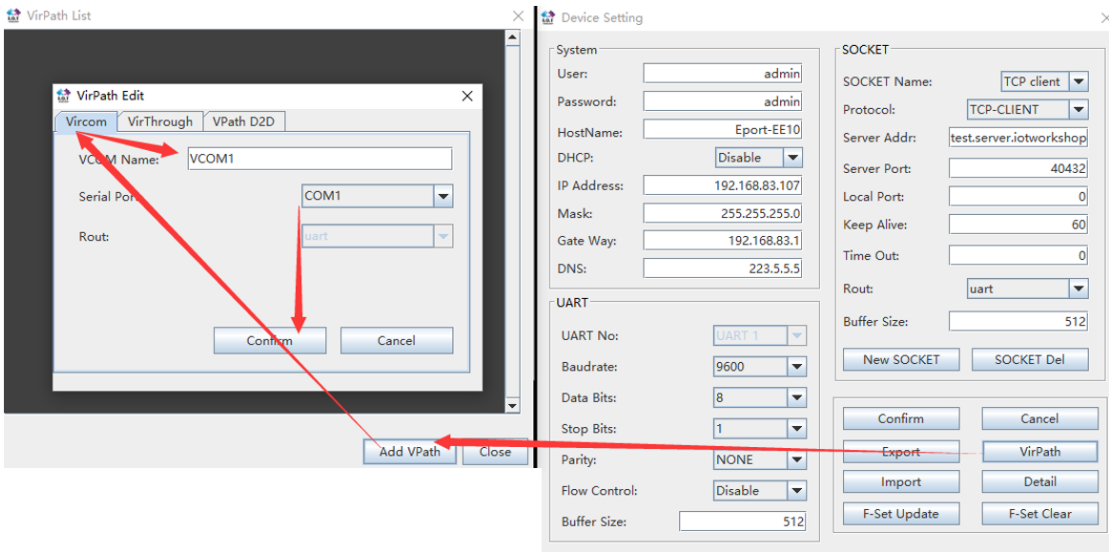
4.5.1. Virtual Com Local Network Communication

Virtual com is used for communication from PC COM to device COM. Use the following topology for test.

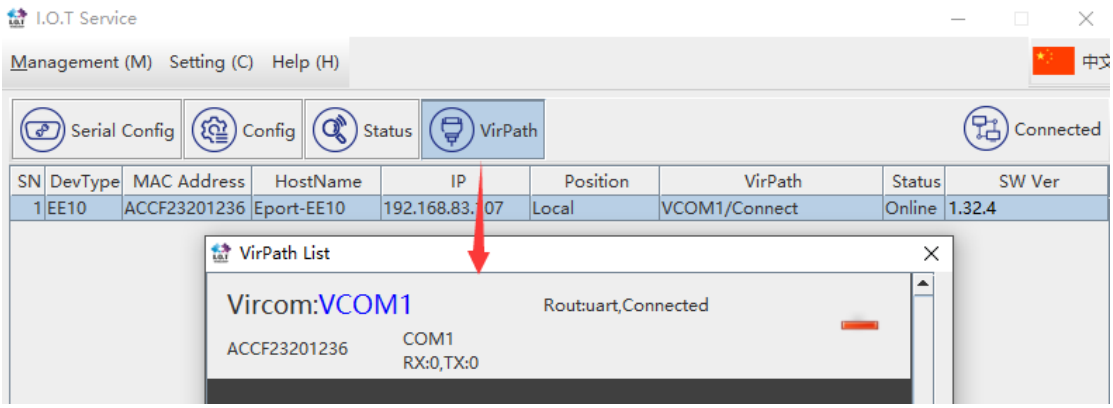


Step 1: Open IOTService Tool and create virtual com as follows:

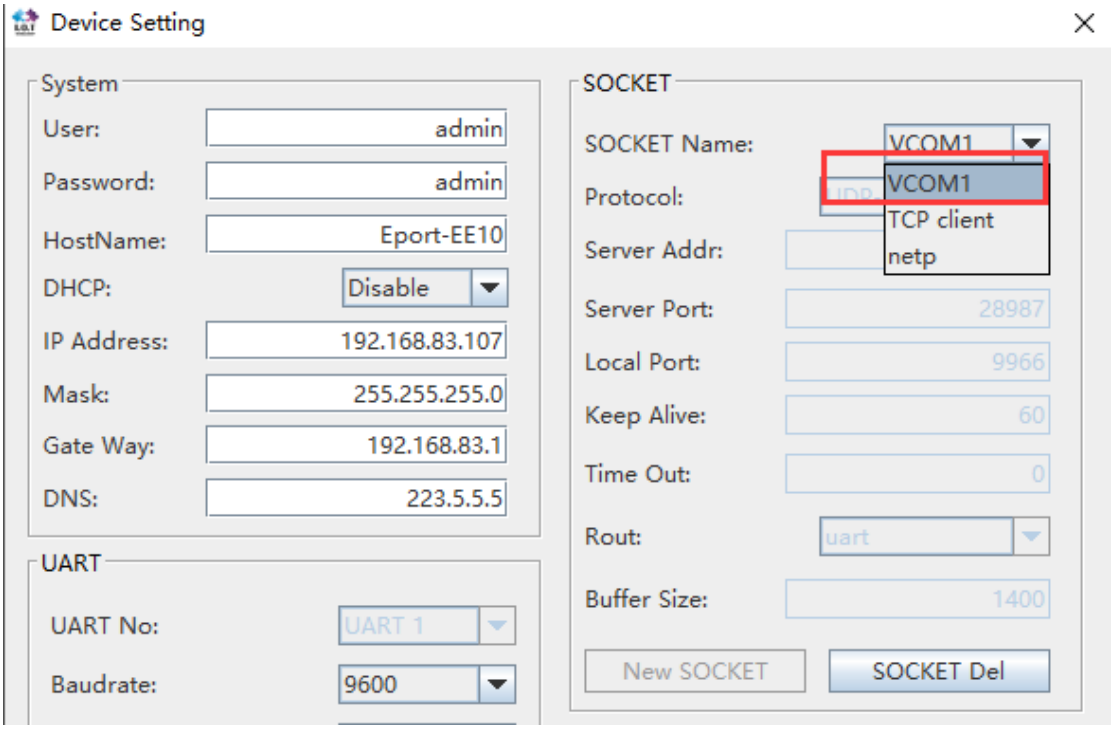
- Add Vpath: Add the virtual path.
- VCOM Name: Virtual COM name. it should be unique.
- Serial Port: Virtual COM serial number.
- Rout: The data transfer route after receiving from virtual COM, usually is sent to hardware uart, but can also be set to other created socket.



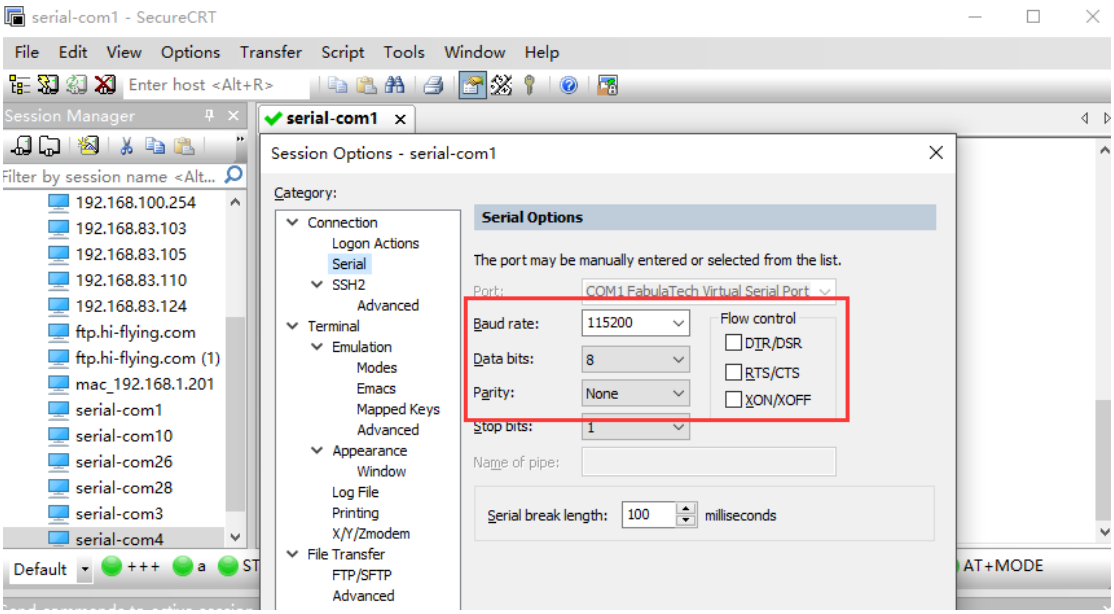
Step 2: Check status in the VirPath menu. It shows connection status and data transfer status. Click the red button to delete the virtual COM.



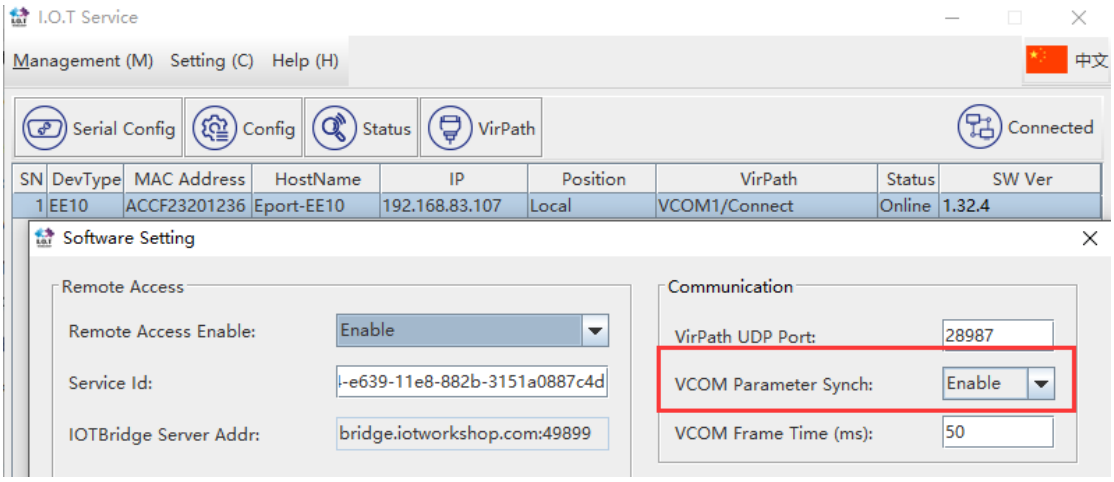
The virtual COM will occupy one Socket resource.



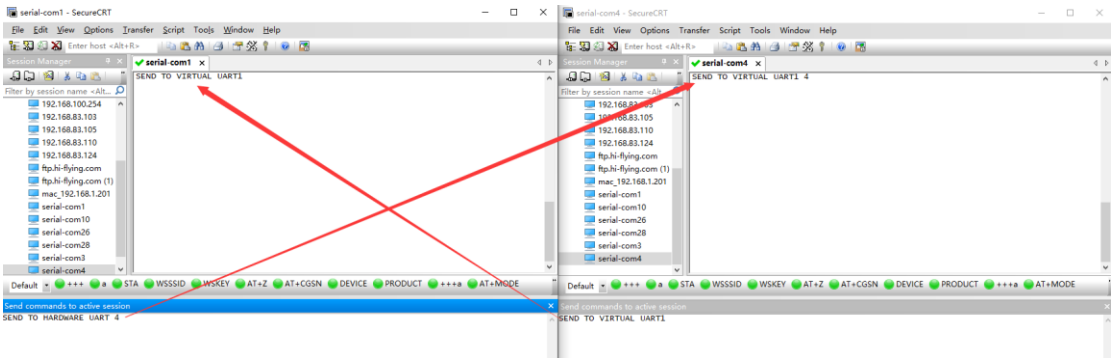
Step 3: Open serial port tool and set virtual port baud rate.



Device supports VCOM parameter synchronize function, if virtual COM UART parameters changed, the hardware device baud rate also changed. This function can be disabled.

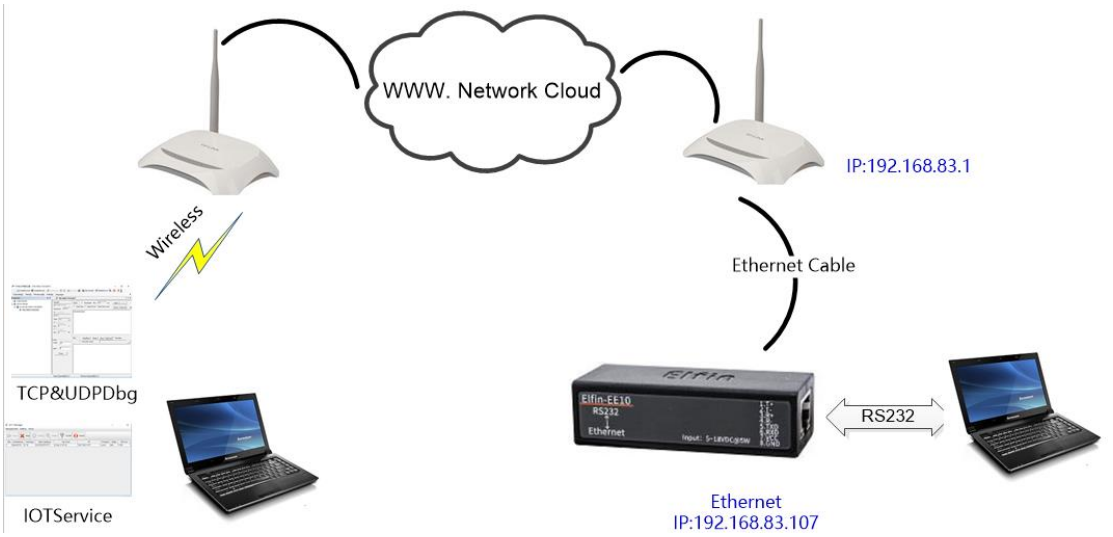


Step 4:Send and receive data

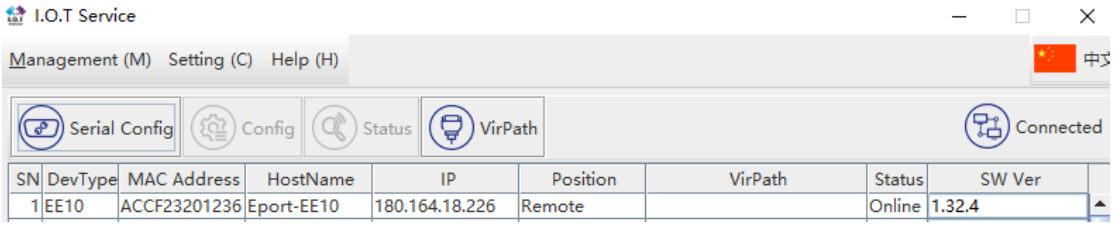


4.5.2. Virtual COM Remote Communication

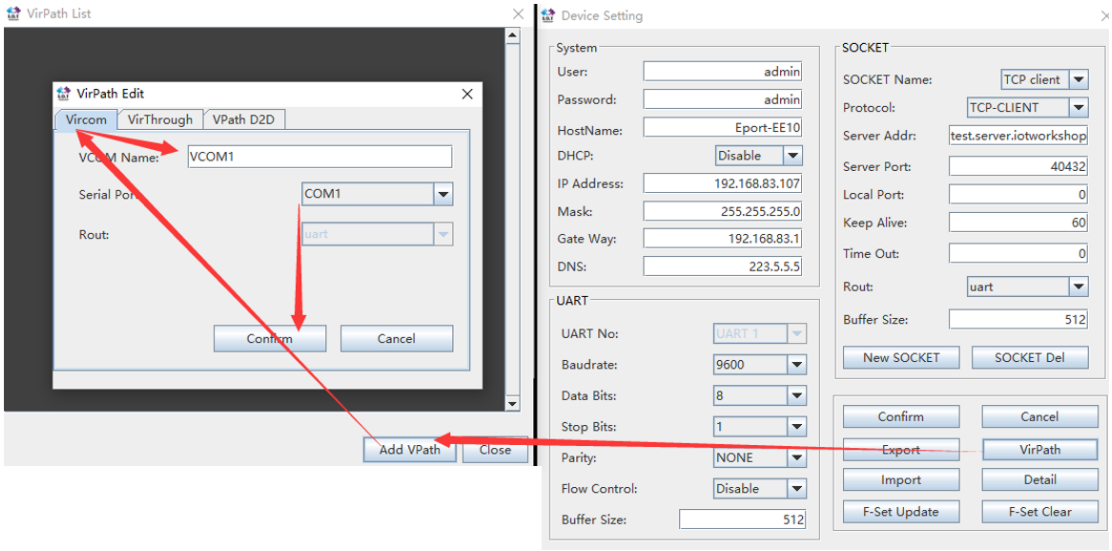
The following device is in the remote environment and UART connect to PC, the two PC can also send/receive packet to each other via virtual COM.



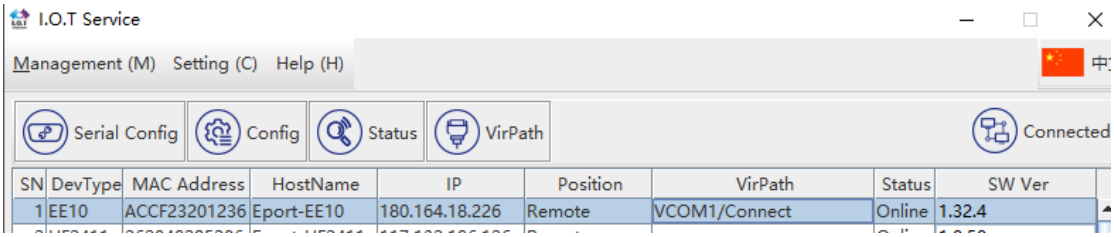
Step 1: Bound device to IOTBridge account. Refer to IOTBridge chapter for detail.



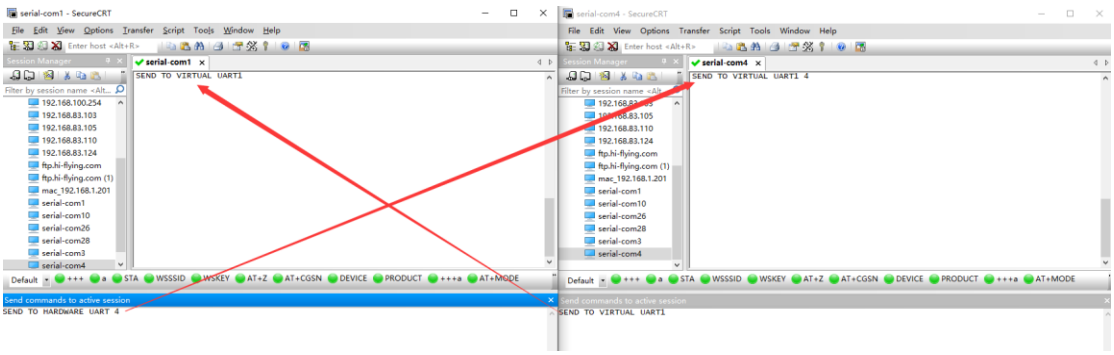
Step 4:Create Virtual Com. The setting is the same as previous.



Step 3: It show VCOM1/Connect, means virtual COM works OK.

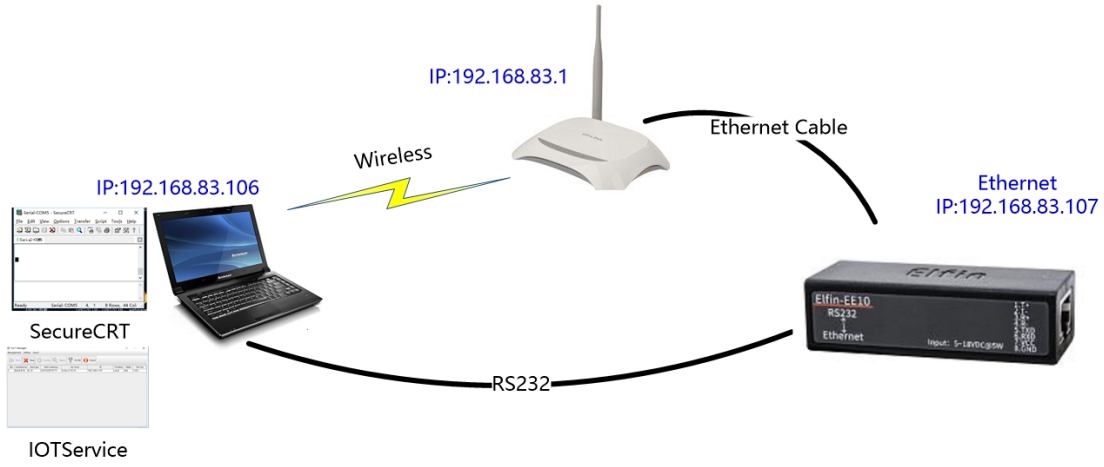


Step 4: Sending and receiving serial port data



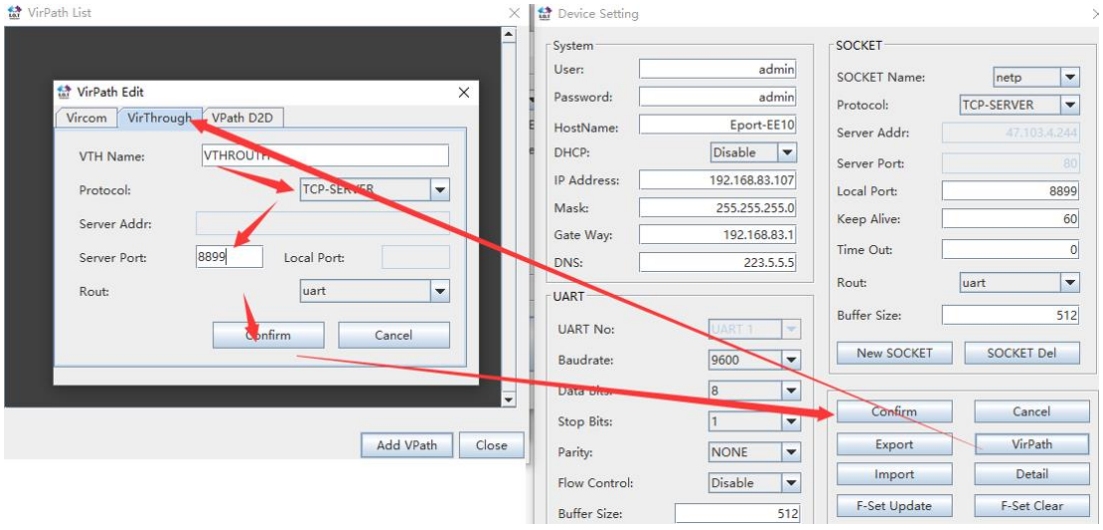
4.5.3. Virtual Through Local Communication

Virtual Through can use TCP or UDP method to transfer data with device. (While virtual COM use serial COM)

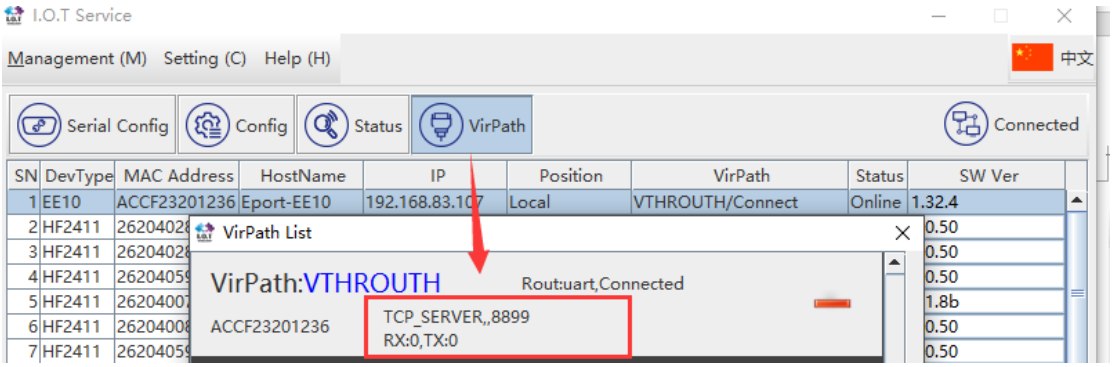


Step 1: Open IOTService tools, follow the following steps to create virtual through path.

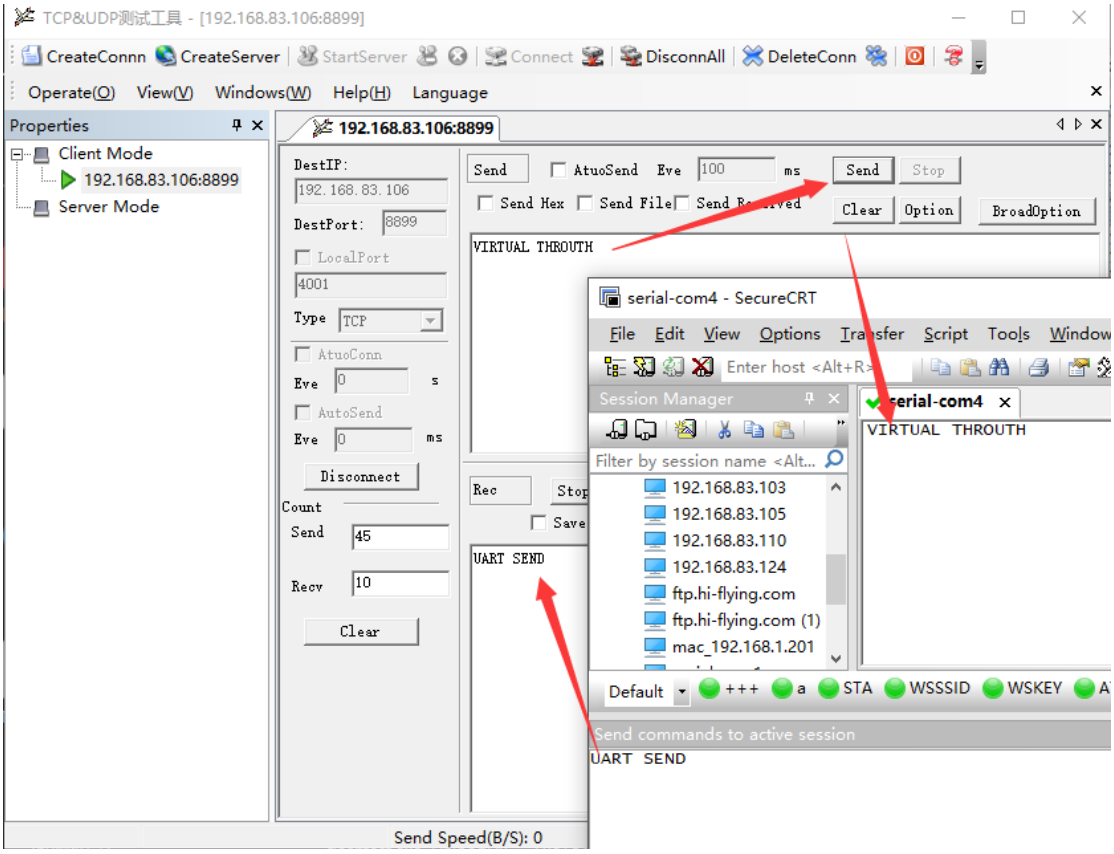
- VTH Name: The name of virtual through, must be unique.
- Protocol: TCP Server, TCP Client or UDP.
- Server Addr: PC itself IP for TCP Server. Destination IP for TCP Client and UDP.
- Server Port: Server Port.
- Rout: Packet destination route, usually is UART, can also set to other Socket created in device.



Step 2: Check the created Virtual Through information. It created it TCP Server with port number 8899.

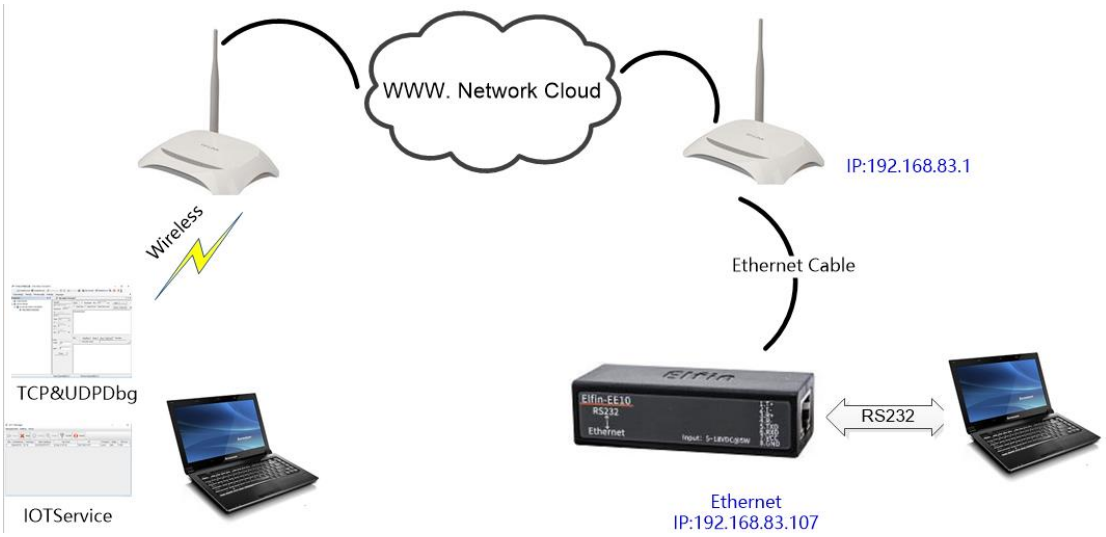


Step 3: PC create a TCP client, connect Virtual Through, set destination PC IP and port 8899, then send packet to UART.

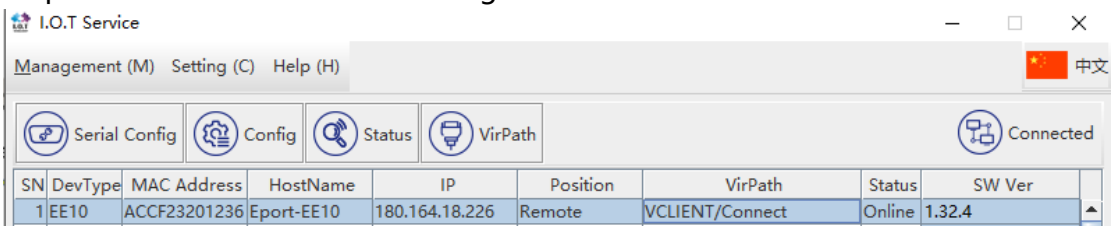


4.5.4. Virtual Through Remote Communication

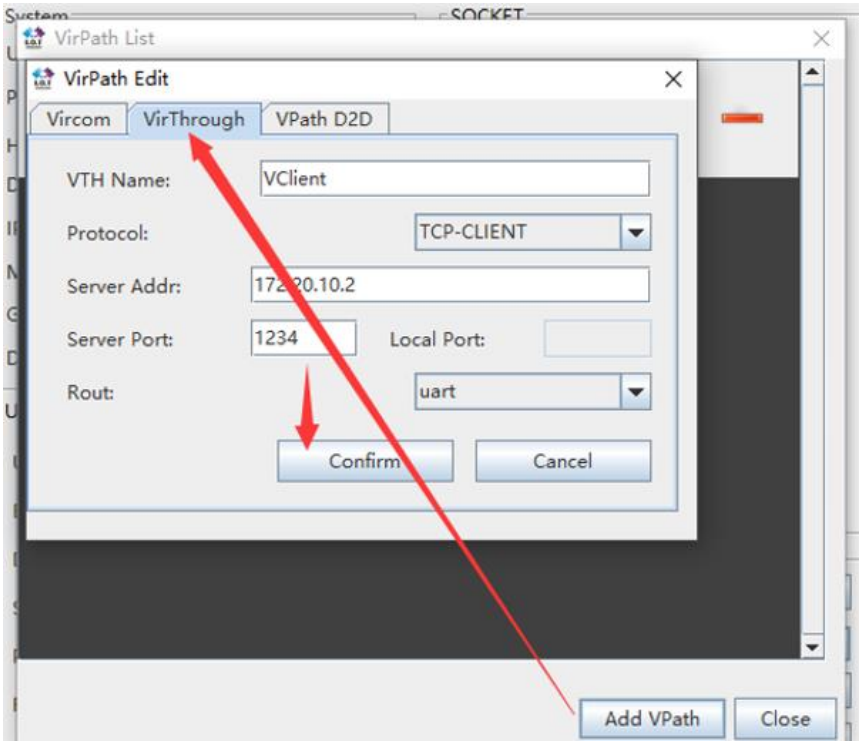
The following test case is in remote environment, the PC can create virtual through path to transfer data with remote PC.

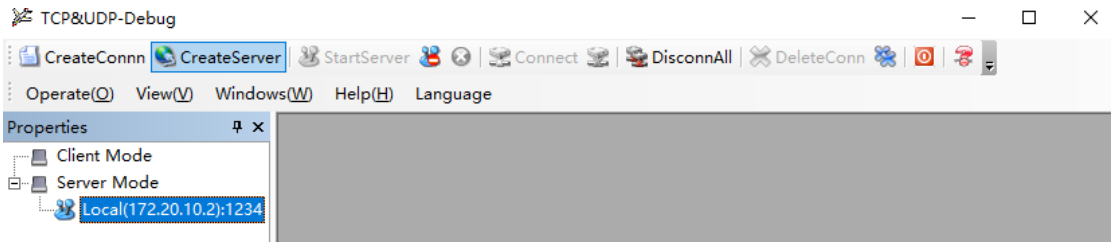


Step 1: Bound the device to IOTBrdige account.

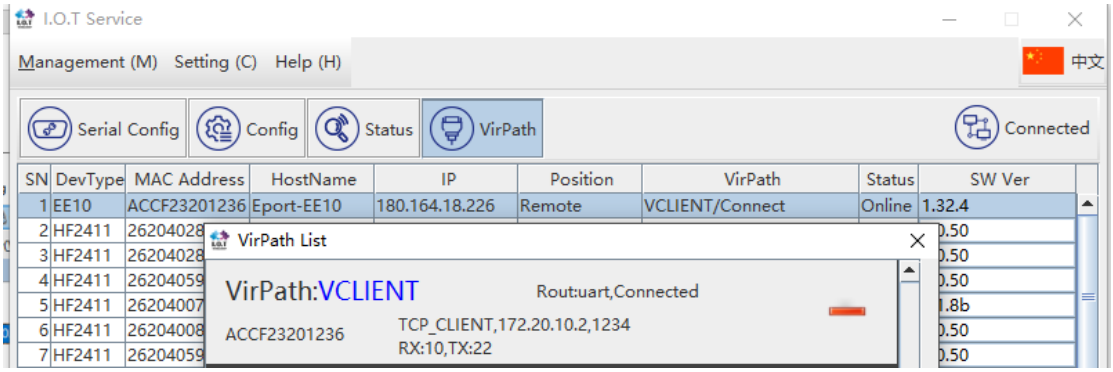


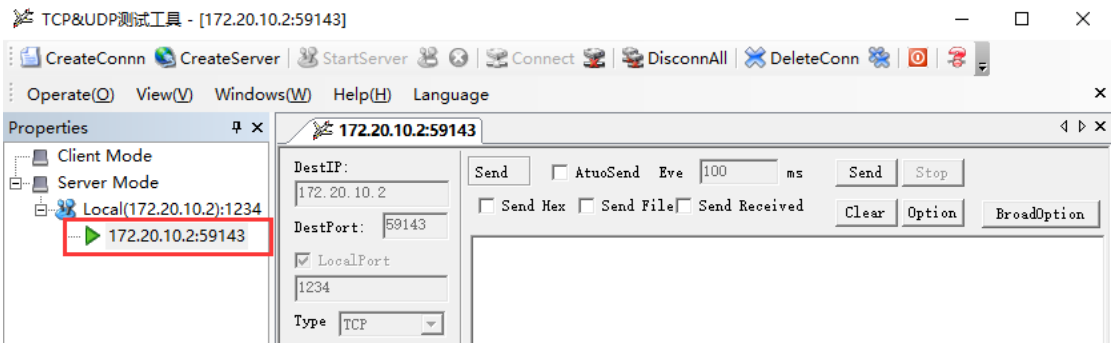
Step 2: Create the Virtual Through Path as following . Create a TCP Client and fill in the TCP Server information created by the TCP&UDP tools (PC IP 172.20.10.2 and port 1234)



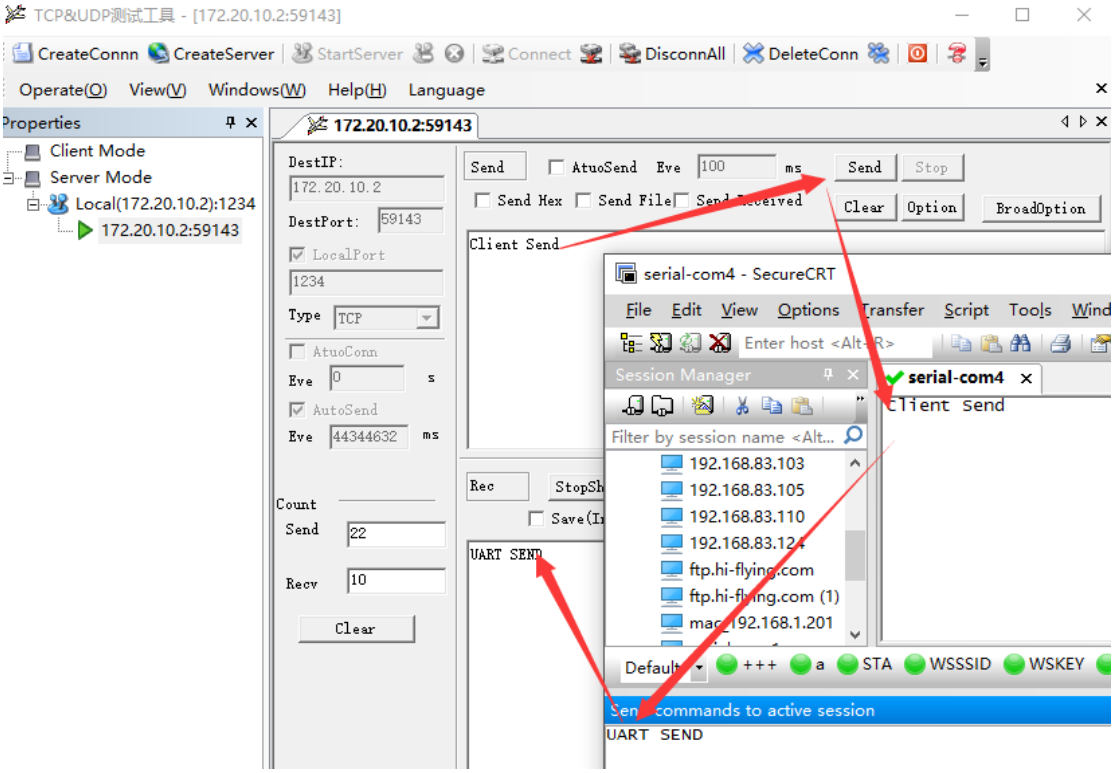


Step 3: Check Virtual Path Status.



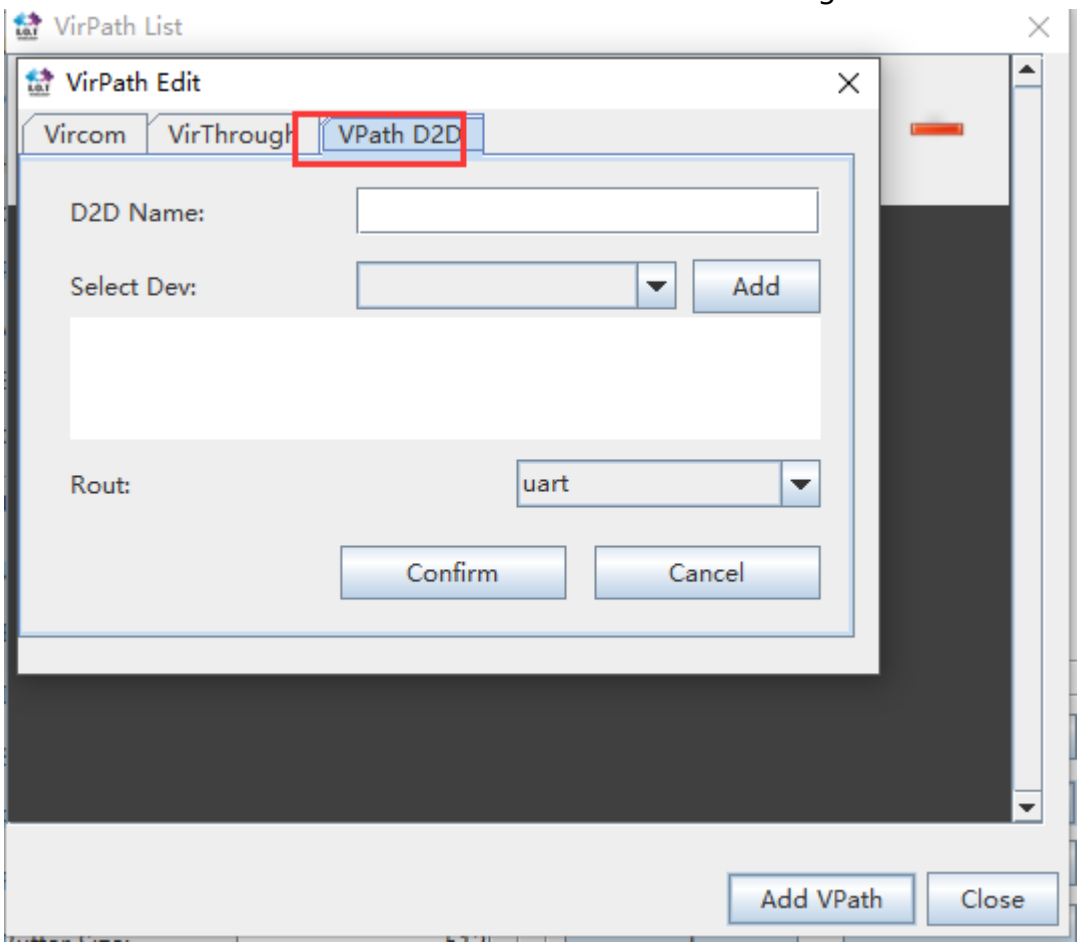


Step 4: Data transfer.



4.6. D2D Function

D2D is the used for device to device transmission via IOTBridge.

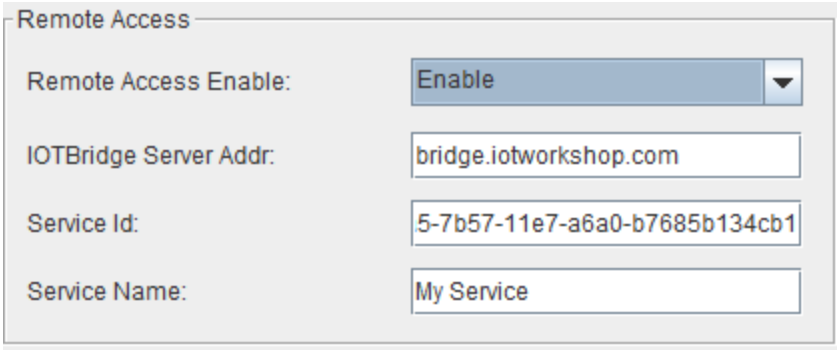


See following for this test case.

http://www.hi-flying.com/download-center-1/application-notes-1/download-item-industry-products-application-manual-20190528

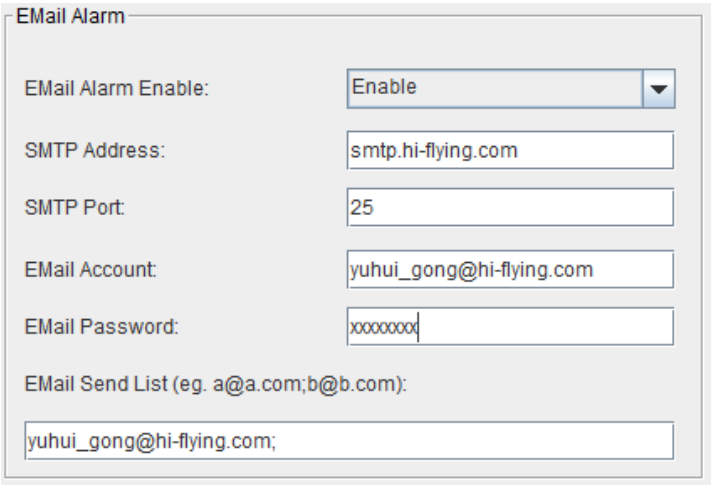
5. IOTBRIDGE ALARM FUNCTION

5.1. Set IOTBridge Parameters

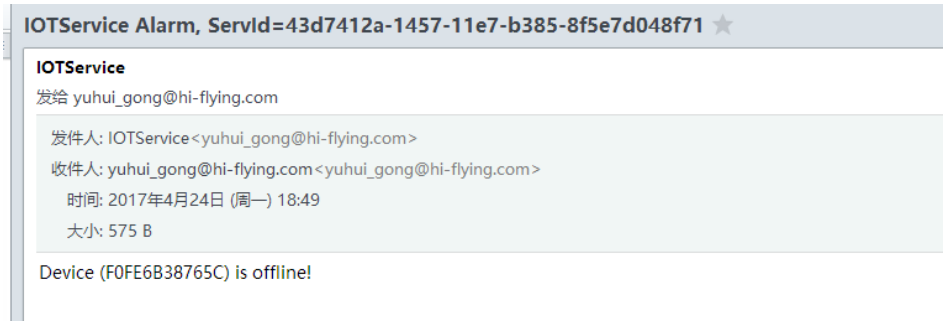


5.2. Set Mail Information

When IOTBridge find device is off line, it will auto send mail to the mail address.



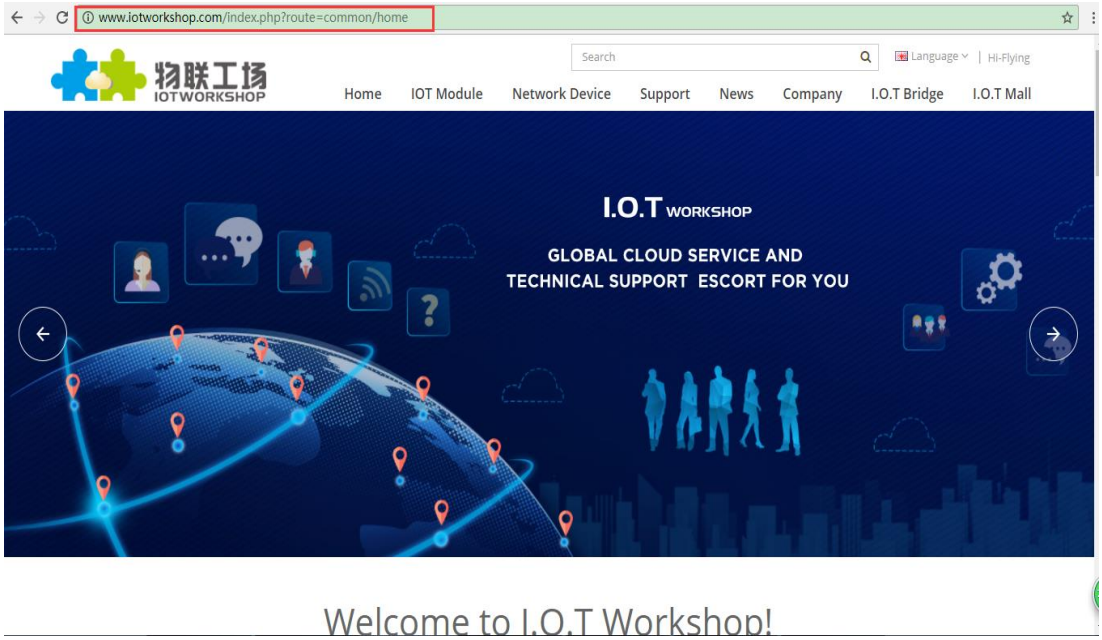
Example:



6. IOTBRIDGE CLOUD

IOT Bridge cloud is for customer to check device status in its account and used for remote setting and data transfer with IOTService tools. The user guide is as following.

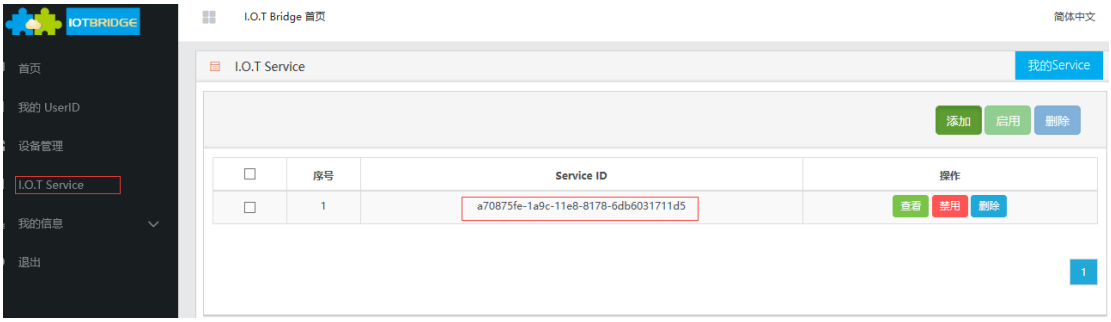
Step 1:Open https://www.iotworkshop.com/



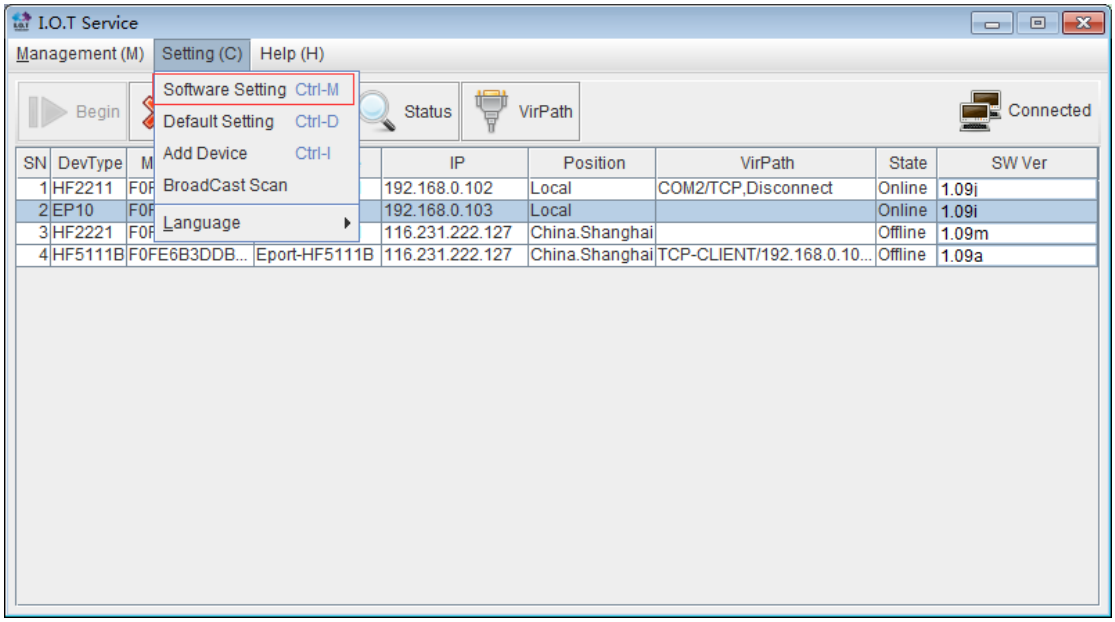
Step 2: Open I.O.T bridge and fill in the account information

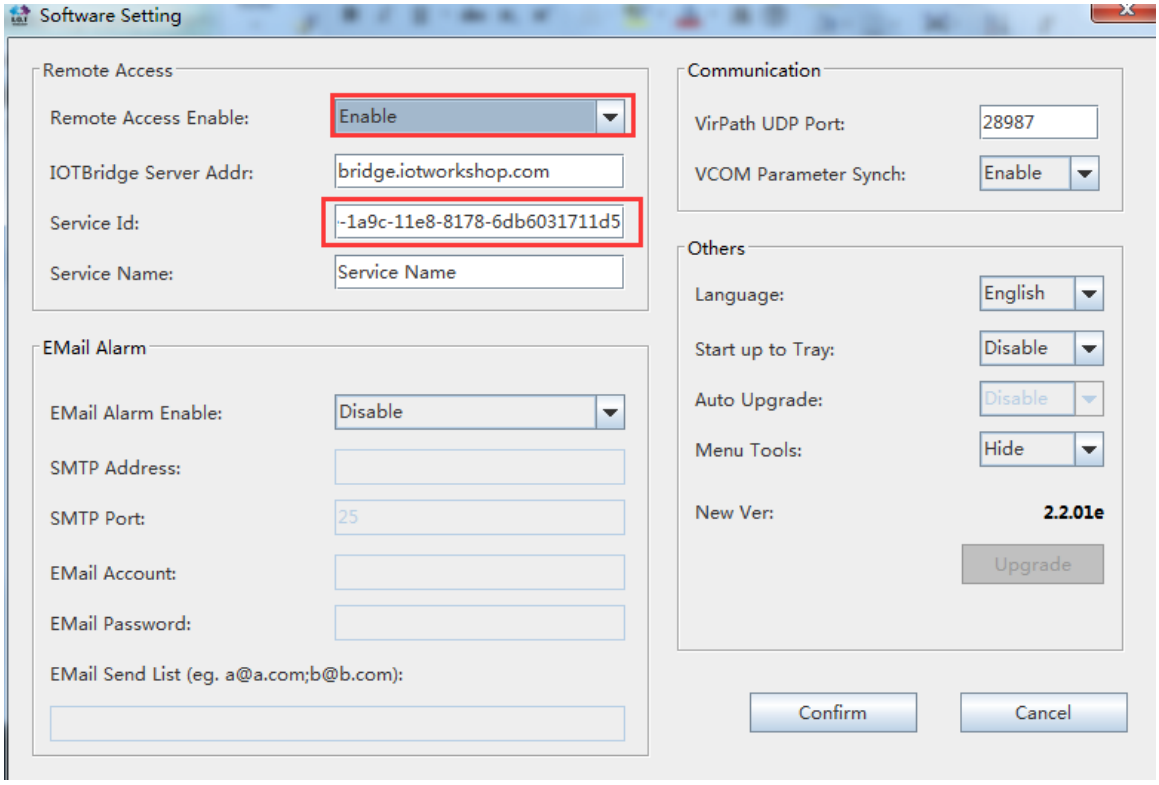
Step 3: Fill in the personal information.

Step 4: After register success, fill in the account information(Service Id) in the IOTService tool.

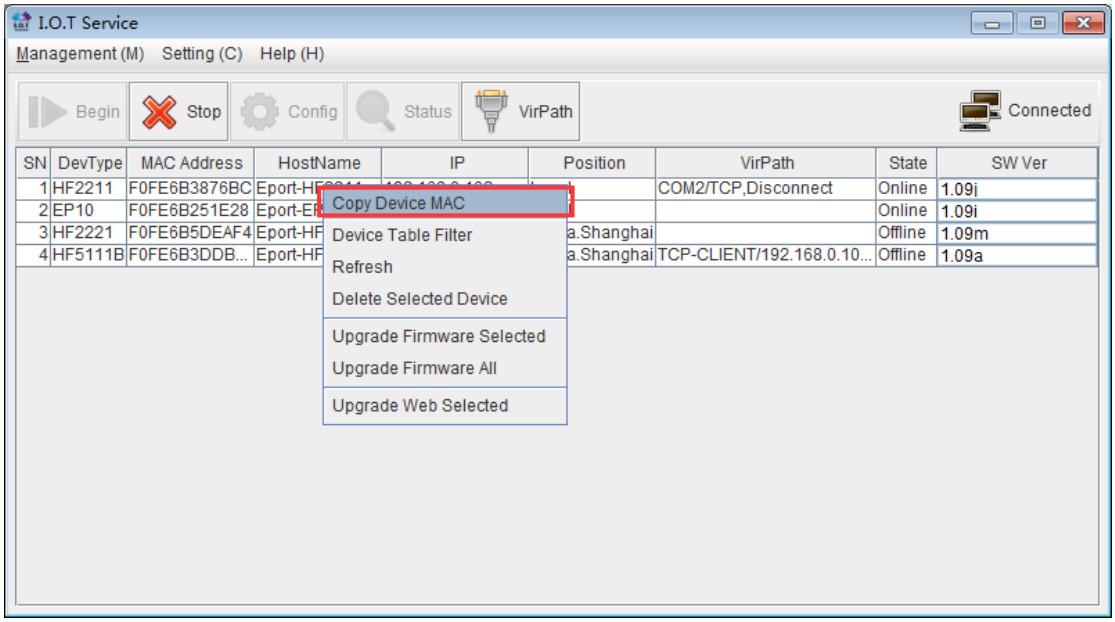


Step 5 : Fill Service Id in IOTService.

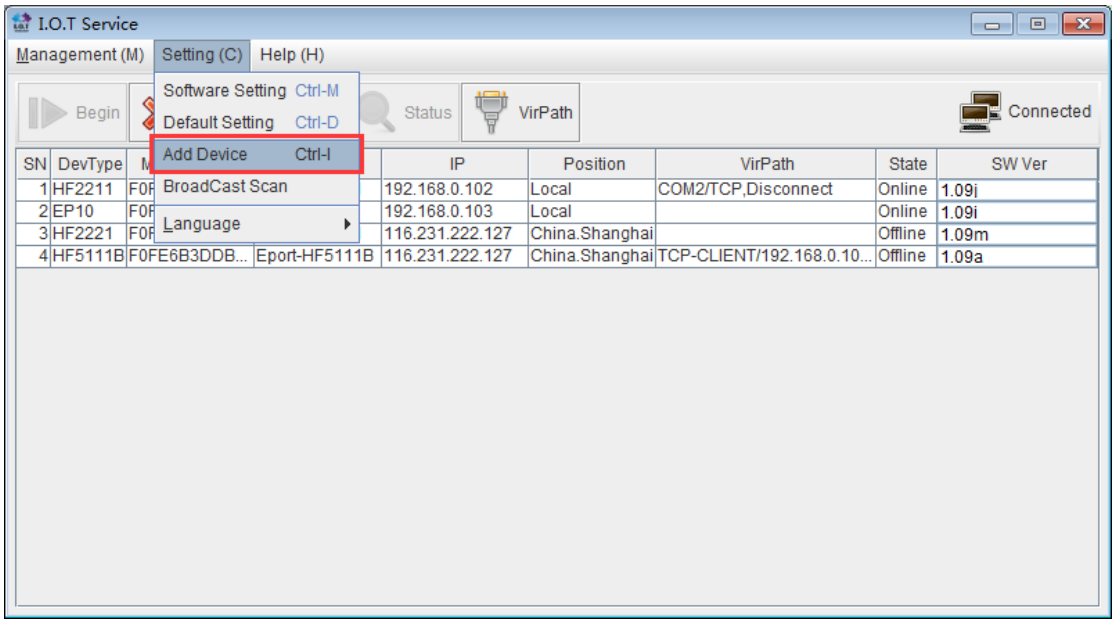


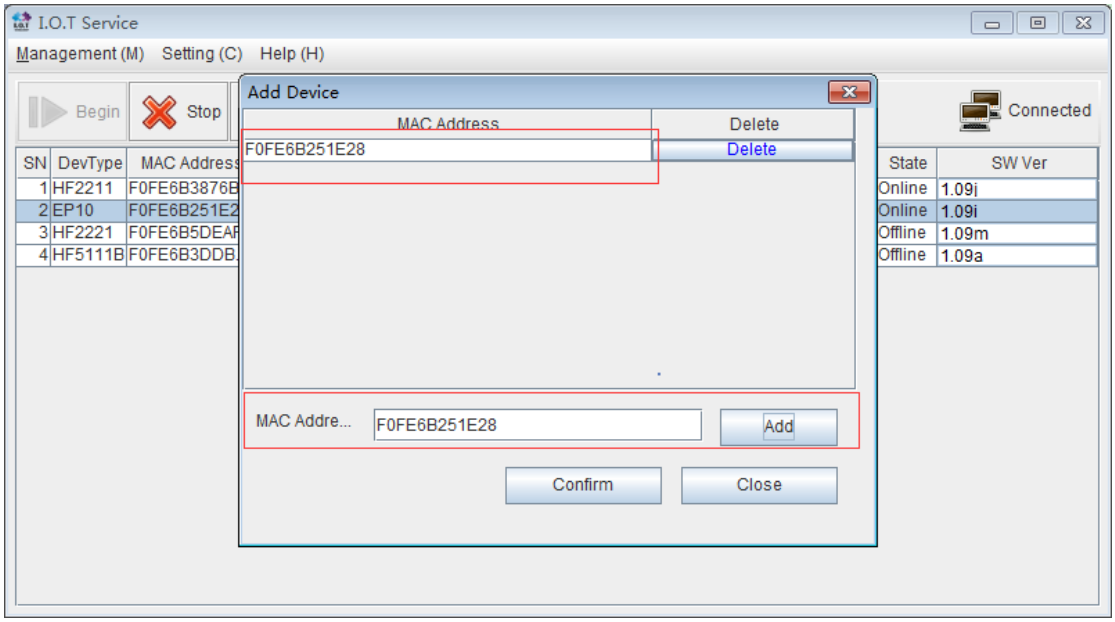


Step 6 :Copy device mac.

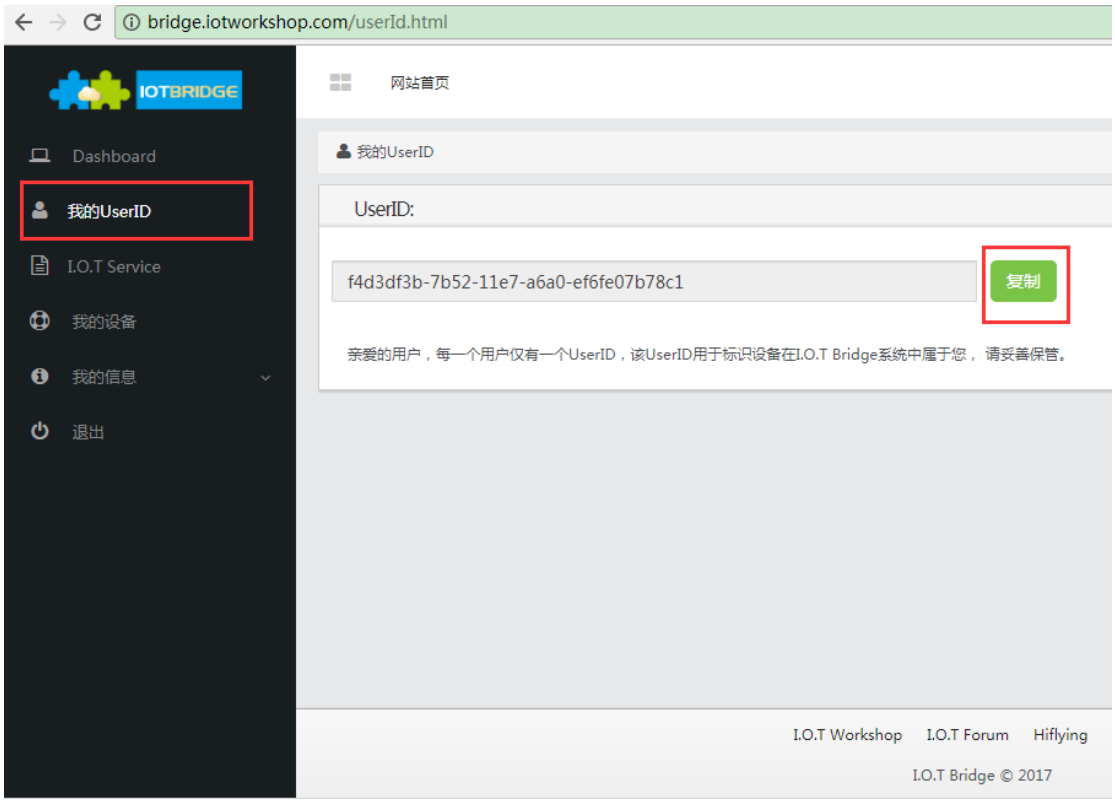


Step 7 :Ad device into IOTService.

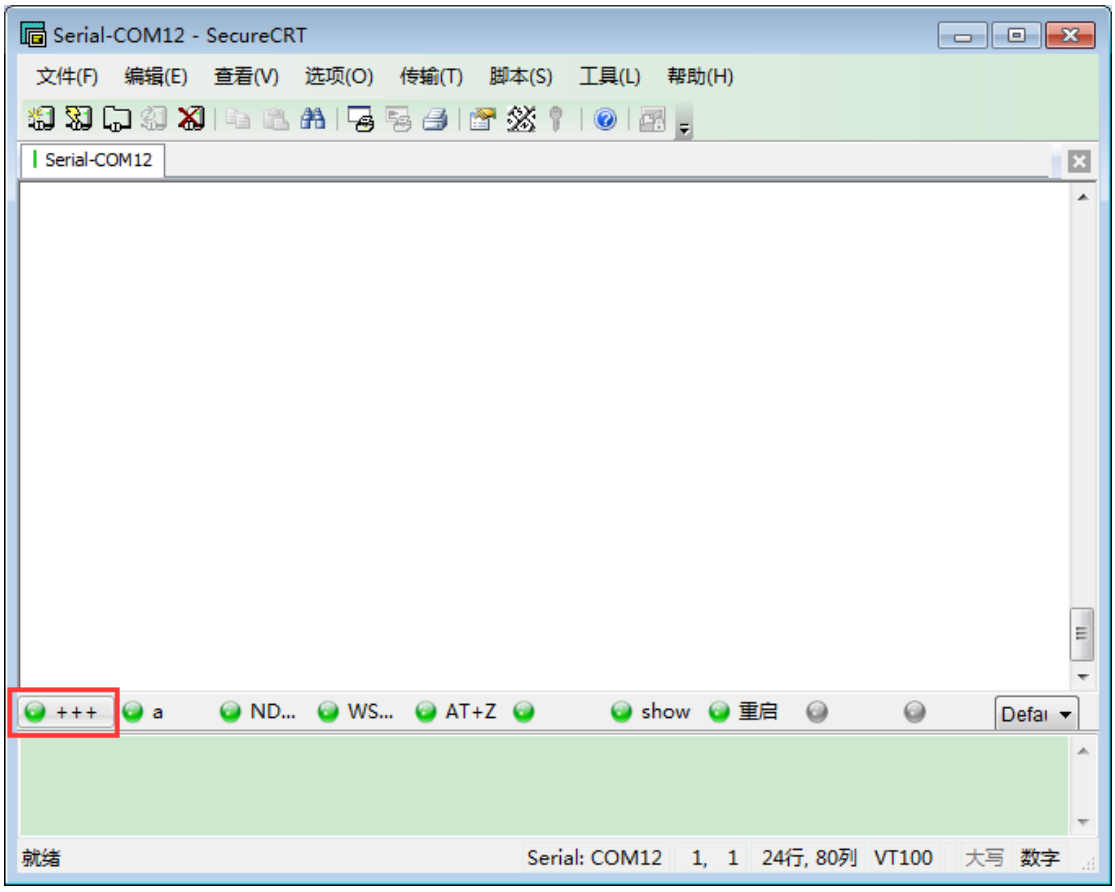


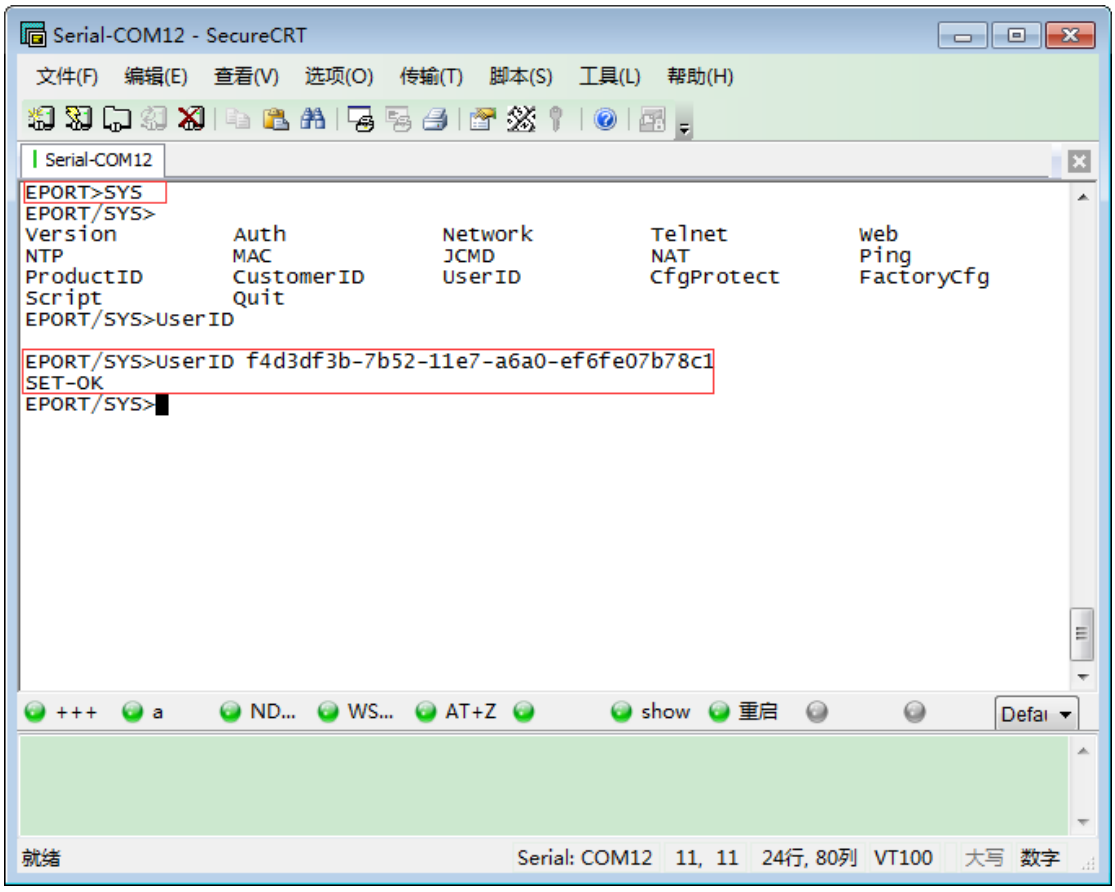


Step 8 :Copy User ID.

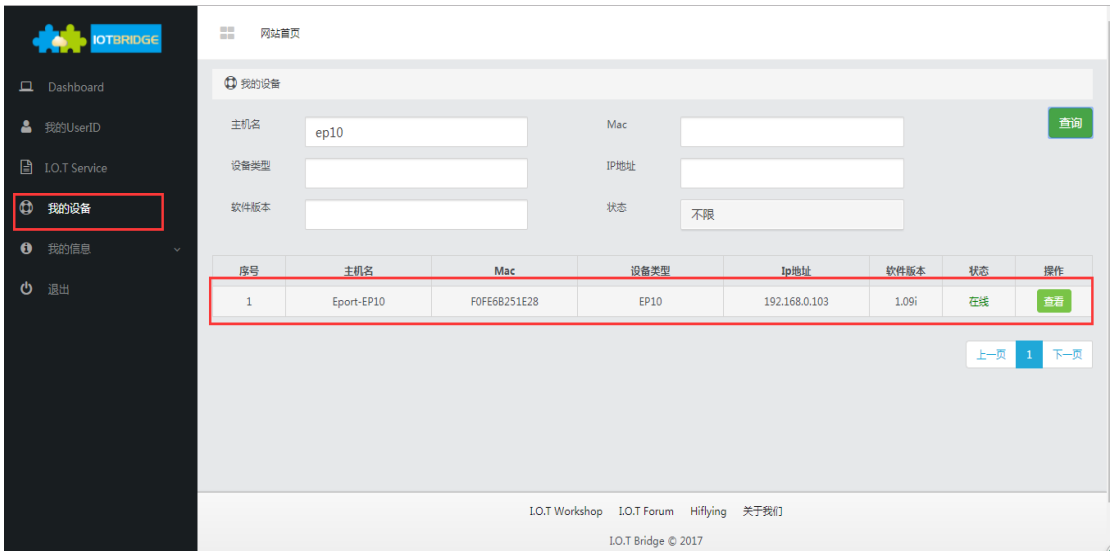


Step 9 :Fill User Id into device, see user manual to enter Cli command mode.

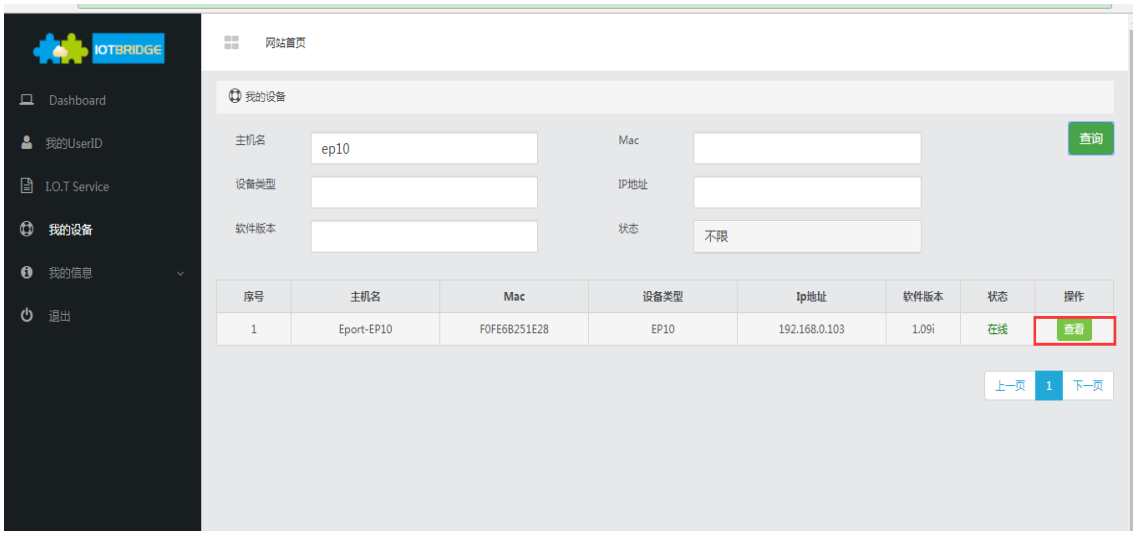

Serial-COM12 - SecureCRT
文件(F) 编辑(E) 查看(V) 选项(O) 传输(T) 脚本(S) 工具(L) 帮助(H)
Serial-COM12
+++
a
ND...
WS...
AT+Z
show
重启
就绪
Serial: COM12 1, 1 24行, 80列 VT100 大写 数字


Serial-COM12 - SecureCRT
文件(F) 编辑(E) 查看(V) 选项(O) 传输(T) 脚本(S) 工具(L) 帮助(H)
Serial-COM12
EPORT>SYS
EPORT/SYS>
Version Auth Network Telnet Web
NTP MAC JCMD NAT Ping
ProductID CustomerID UserID CfgProtect FactoryCfg
Script Quit
EPORT/SYS>UserID
EPORT/SYS>UserID f4d3df3b-7b52-11e7-a6a0-ef6fe07b78c1
SET-OK
EPORT/SYS>
+++
a
ND...
WS...
AT+Z
show
重启
就绪
Serial: COM12 11, 11 24行, 80列 VT100 大写 数字

Step 11 :The device will be shown in IOTBridge website.

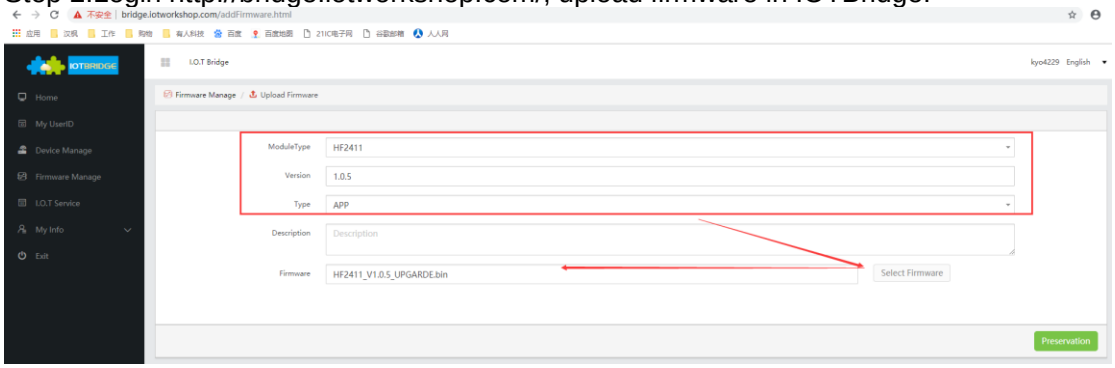


Step 12:Check detailed information

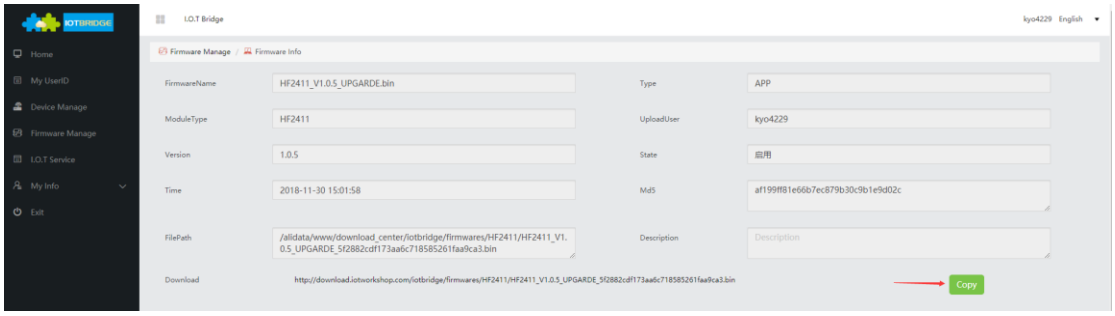


7. OTA UPGRADE

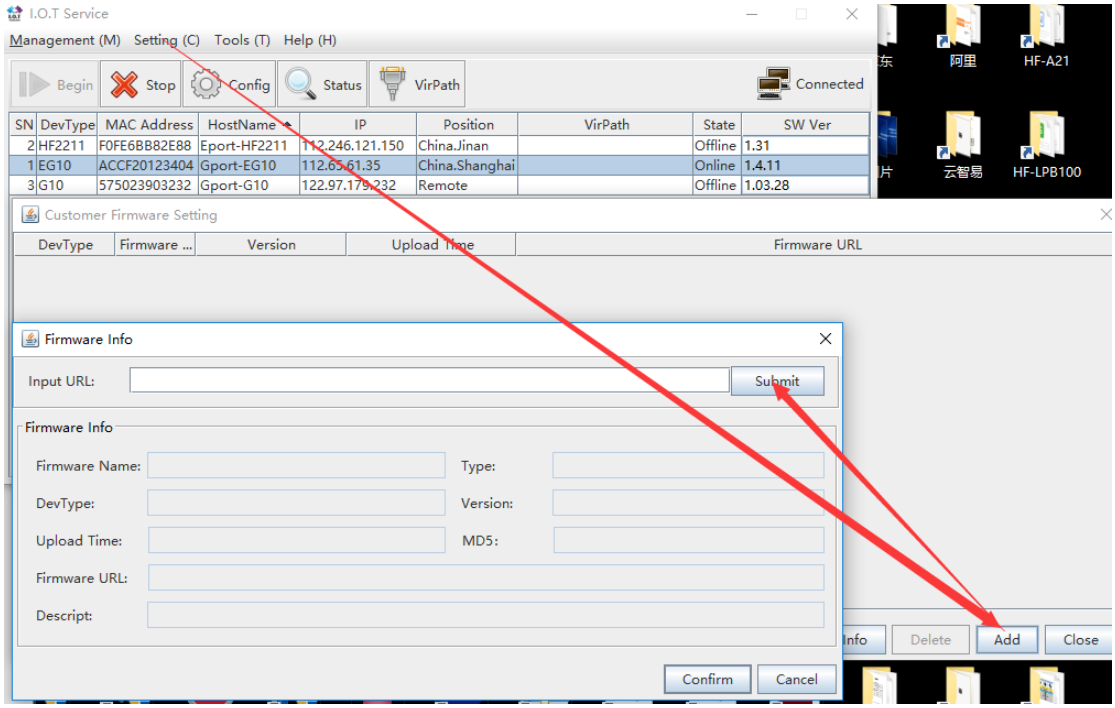
Step 1:Remote upgrade is using our IOTBridge cloud, download firmware from our IOTBridge. Bound device to account as the previous steps.
Step 2:Login http://bridge.iotworkshop.com/, upload firmware in IOTBridge.

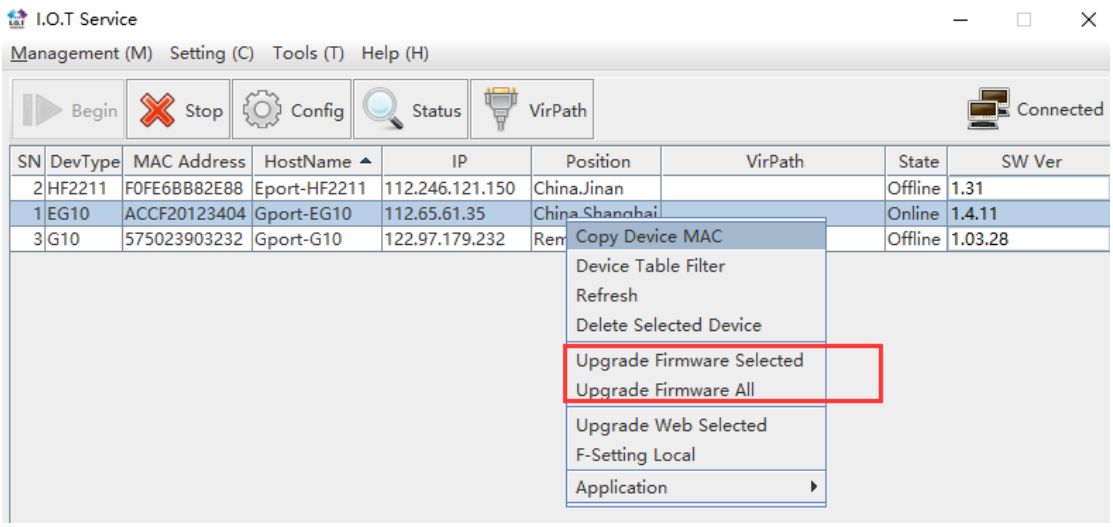


Step 3:Copy the download link as following.



Step 4:Copy the download link into the IOTService tools. And do upgrade operation.




I.O.T Service
Management (M)
Setting (C)
Tools (T)
Help (H)
Begin
Stop
Config
Status
VirPath
Connected
SN
DevType
MAC Address
HostName
IP
Position
VirPath
State
SW Ver
2
HF2211
F0FE6BB82E88
Eport-HF2211
112.246.121.150
China.Jinan
Offline
1.31
1
EG10
ACCF20123404
Gport-EG10
112.65.61.35
Online
1.4.11
3
G10
575023903232
Gport-G10
122.97.179.232
Offline
1.03.28
Copy Device MAC
Device Table Filter
Refresh
Delete Selected Device
Upgrade Firmware Selected
Upgrade Firmware All
Upgrade Web Selected
F-Setting Local
Application

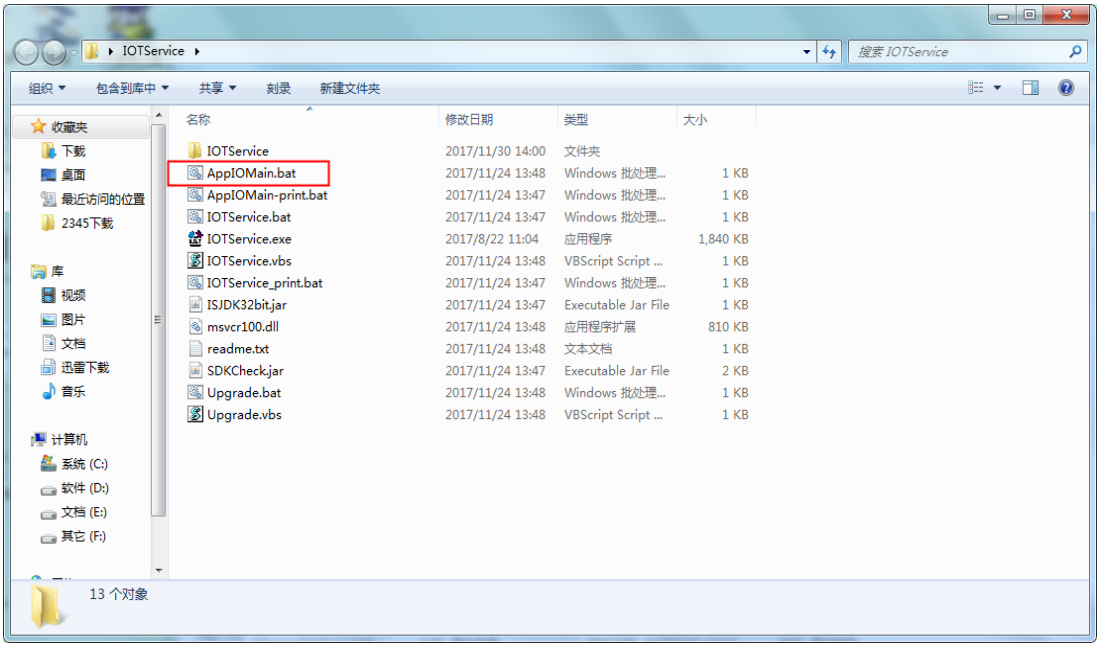
8. IO CONTROL TOOLS INTRODUCED

The IO Control Tool is a software for remote IO controller modules that allows users to easily set up, control, and view remotely.

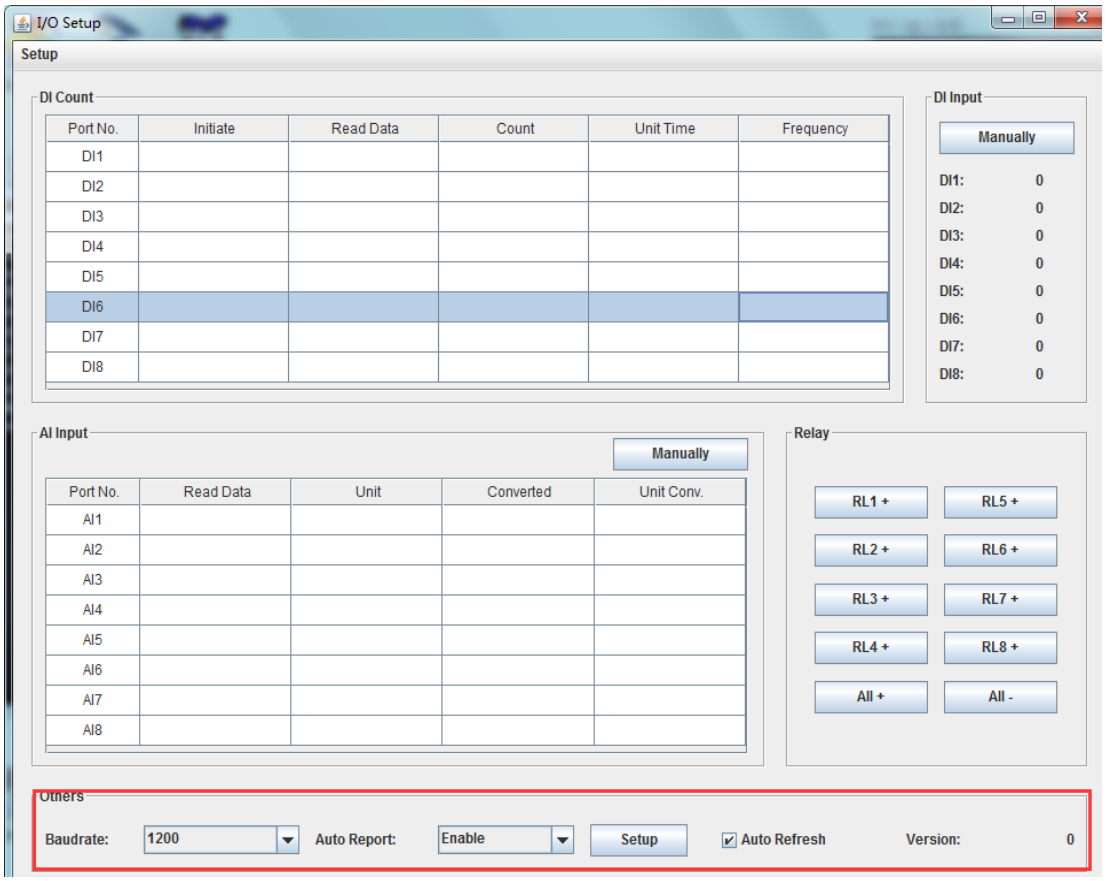
The list of currently supported products is as follows, the following HF6208 products is an example.

Product Type	HF6108	HF6208	HF6508
Product Name			

This tool location is located in the IOTService folder under the IOTService installation path for AppIOMain. Double-click to use.



IO control tool interface is shown as below.



Note:The settings under the red line box in the IO tool interface are not set for the time being, and their functions are reserved.

- I / OSetup:IO settings. In this interface can monitor IO port.
- Manually:Acquire manually, you can refresh the data.
- Setup:Setup for making connection settings and device settings.

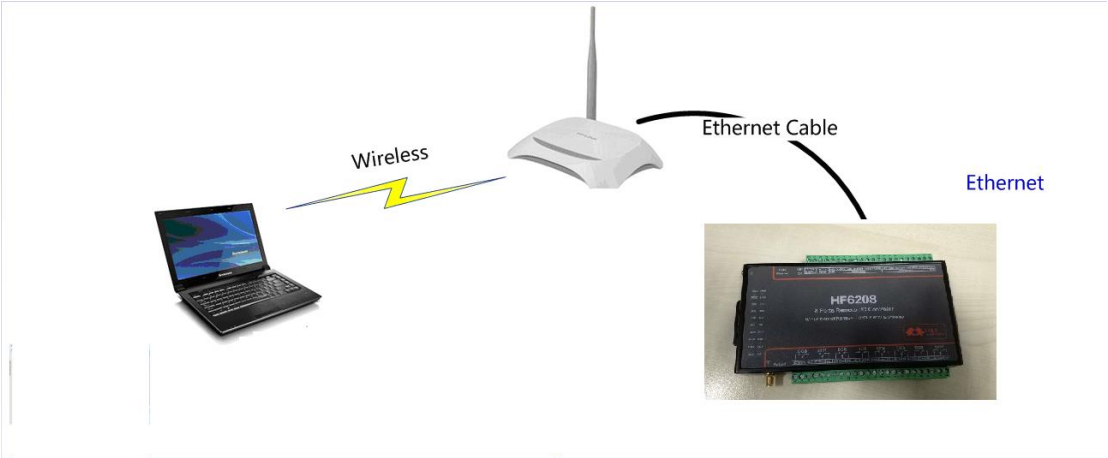
Test Cases

The test to HF6208 as an example.

Introduction of HF6208

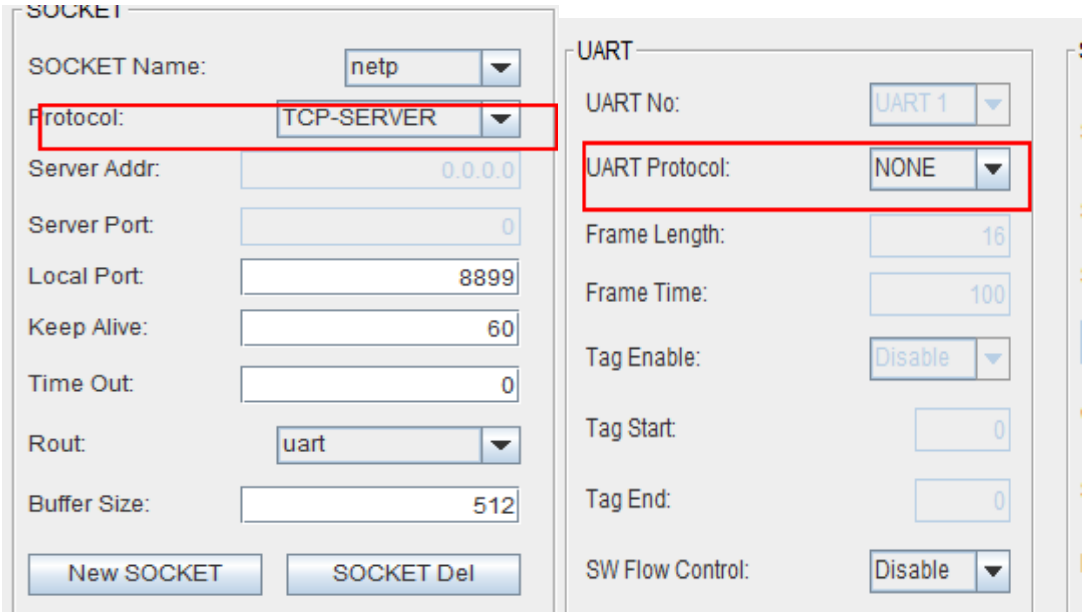
The HF6208 is a remote IO control product with eight relay switches (DO), eight DI inputs and eight AI inputs, a standard Ethernet port RJ45, and an RS485 serial port.

Test Topology



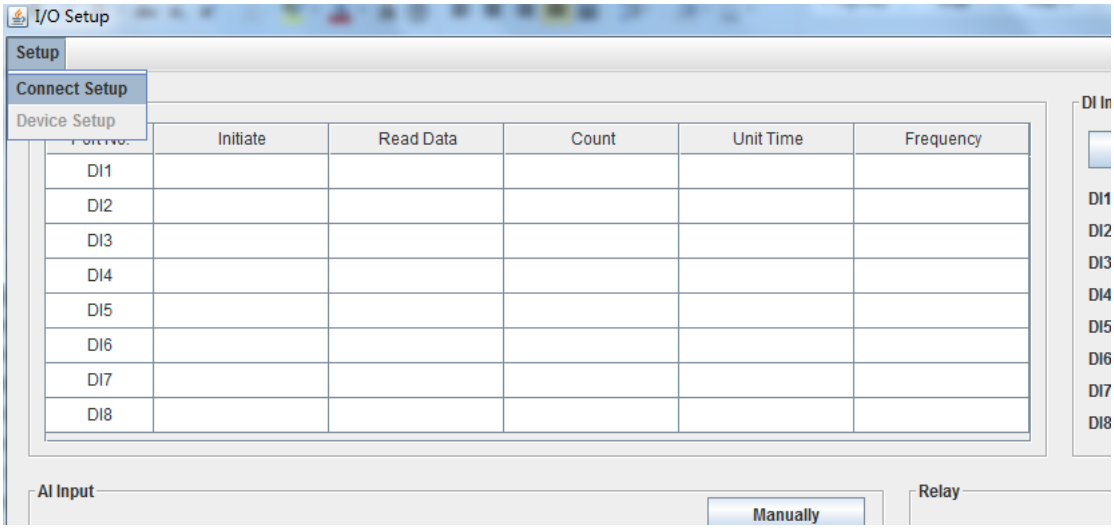
IO Control Tools

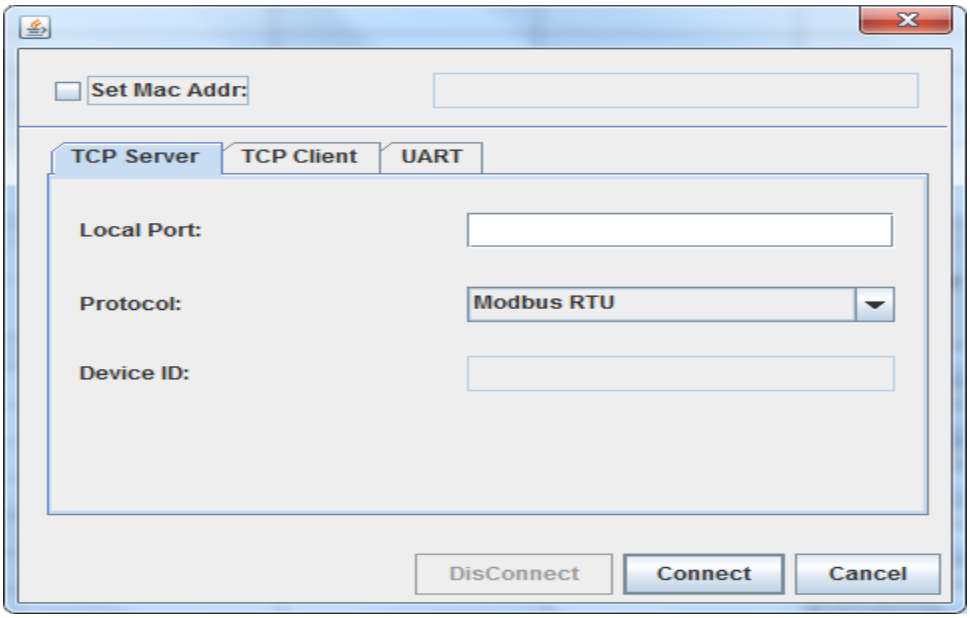
The first to use IOTService tool HF6208 set to TCP server mode, working mode for transparent mode (HF6208 manual has a detailed introduction)



The following describes the IO tool as a client, the device as a server and the port number is 8899.

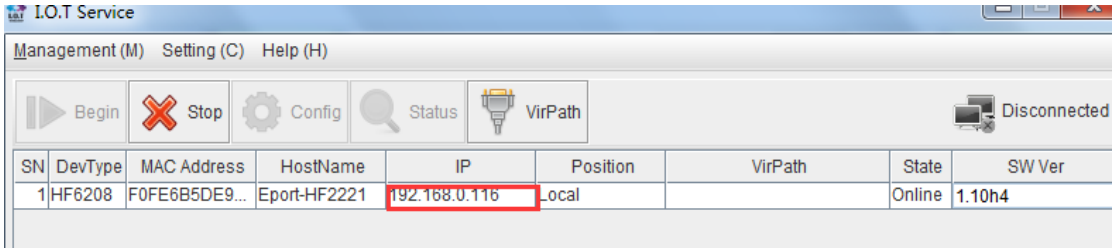
Step 1 :Open the IO control tool (located in IOTService folder under the path named APPIOMain), and then click Settings -> then click on the connection settings will pop up a window to set the connection.

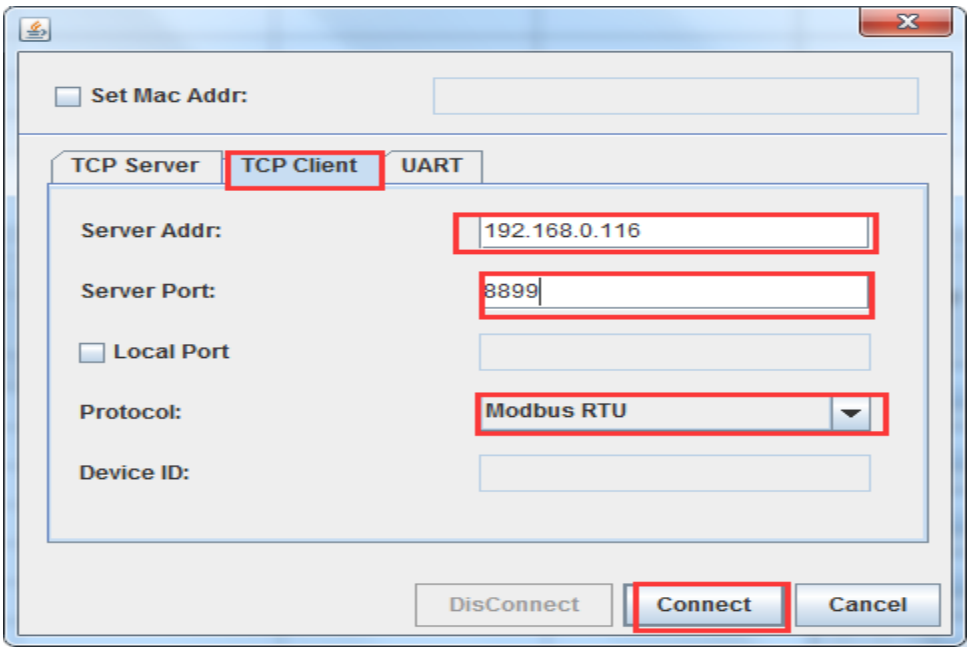


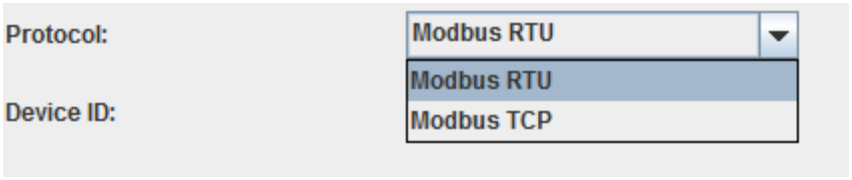


Note:The above setting MAC address can not be set, this function has not been realized.

Step 2: Click TCPClient and fill in the server IP and port number, and the choice of the agreement, then click connect. Server address can be obtained through iotservice tools.

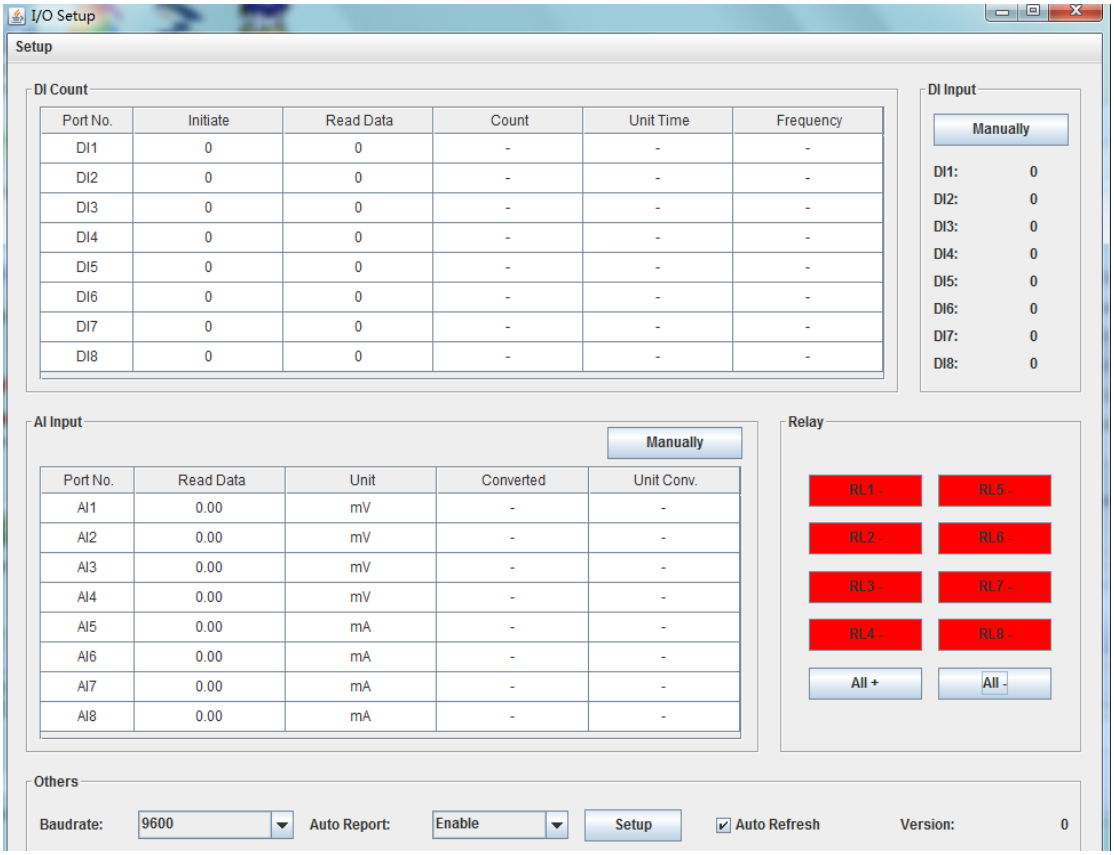




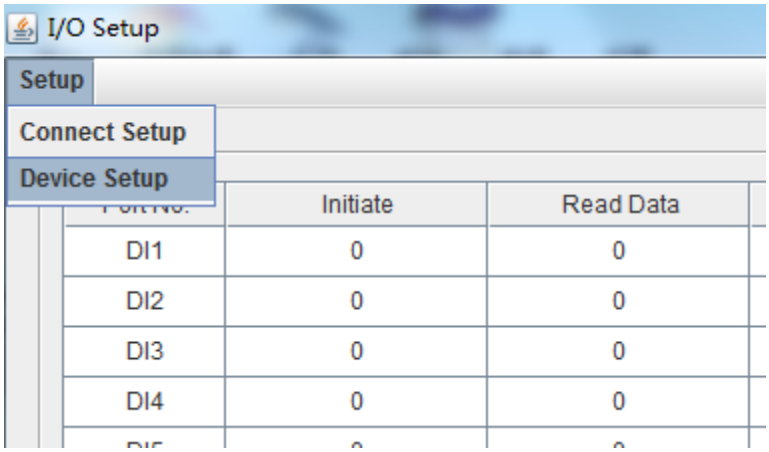


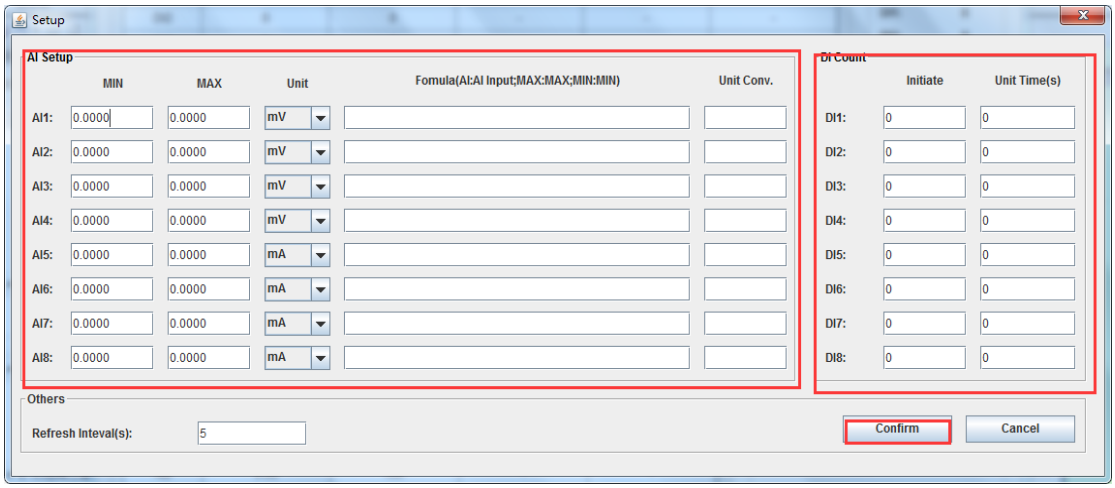
Note:The choice of protocol is to choose according to the set communication mode. In chapter 3 above, there are two kinds of communication modes that are transparent transmission mode and the other one is modbus protocol to transmit data. If the device is working under transparent transmission mode and the protocol should select Modbus RTU. If the device is Modbus protocol to transfer data, the protocol selection is Modbus TCP protocol.

Step 3:After the connection is successful, the following interface will appear. In the interface, we can see DI count, DI input, AI input and control of the relay.

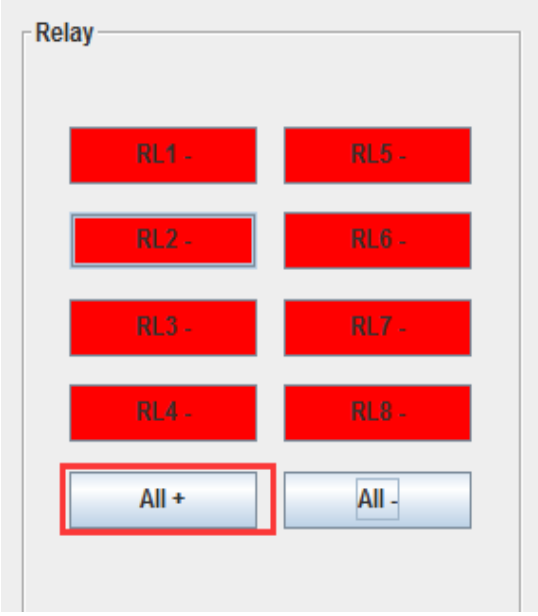


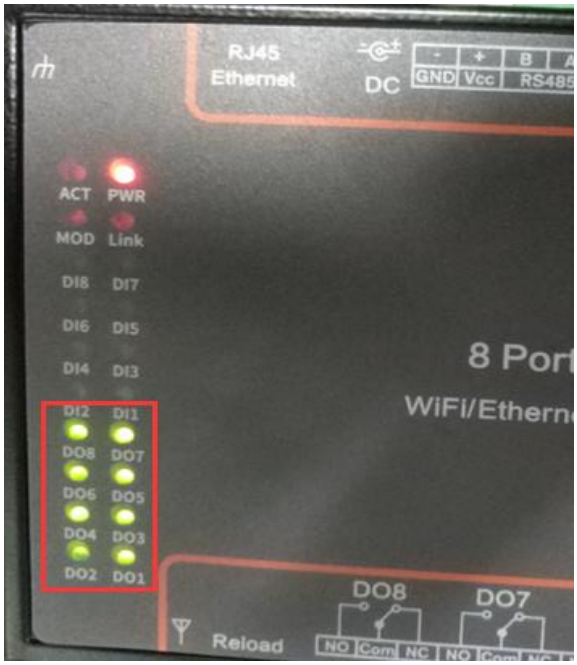
Step 4:After the connection between IO tool and device succeeds, the corresponding AI and DI initial settings of the device can be customized according to user requirements as shown in the following figure. Here you can set the maximum and minimum AI , and can also set the formula to convert. DI's initial value and unit time can also be set.



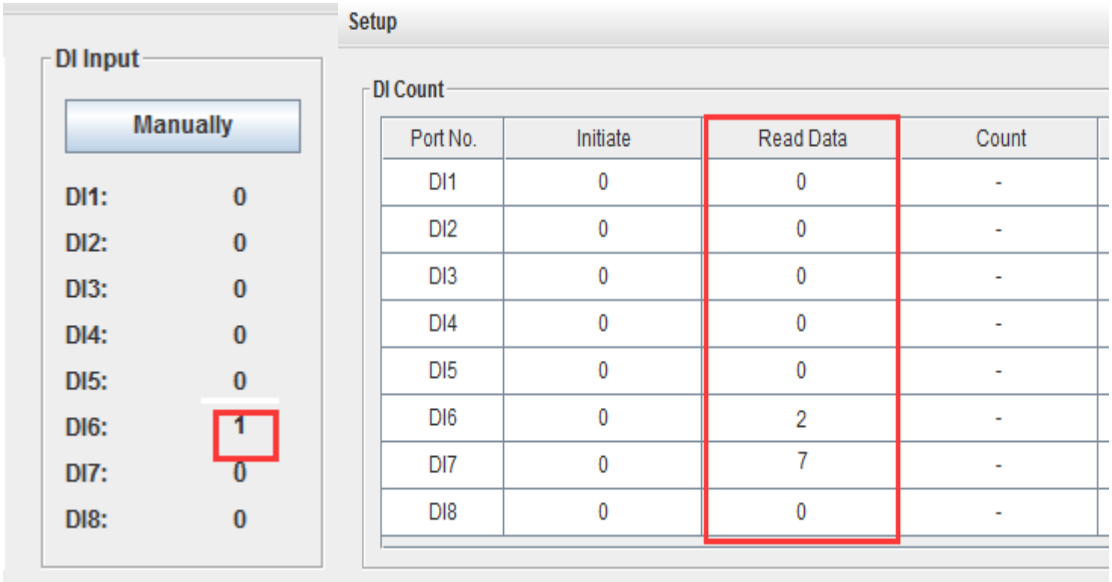


Step 5: When the connection is successful, a simple test can be performed. Click the button in the following figure to control the relay. Corresponding indicators are also displayed on the device. The picture below is the full click effect.





Step 6: DI test. Follow-up is just a test case, not as a practical application. Devices DO1 and DO2 can be connected to DI6 and DI7, and then the DI6 and DI7 input states can be checked by controlling relays RL1 and RL2. The result is shown below. The digital inputs represent the various DI access states. DI has two cases of access, dry contacts and wet contacts. Dry contact logic 0 is left floating, 1 is grounded. Wet contact logic 0 indicates access 0 ~ 3V power supply, wet contact 1 means access 5 ~ 40V power supply. The current value (Read Data) for the device access and disconnect the number of times. The current value (Read Data is counted from the initial value, the initial value can be set.



Step 7: The module comes with a 5V voltage, 5V voltage received AI 1, the test results as shown below. AI data needs to be manually acquired, AI (1-4) is the voltage value, AI (5-8) is the current value。