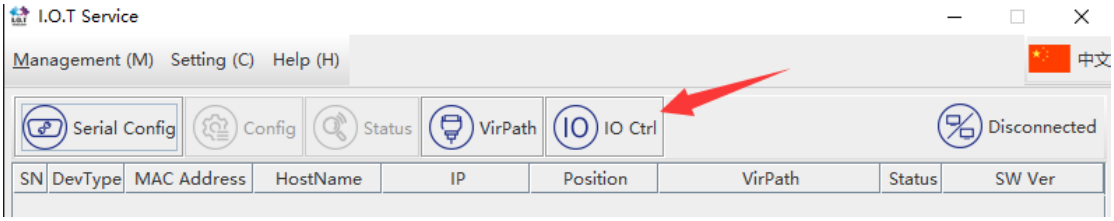
User Manual and Test Guide

IOTService Tool

Update List 2.4.24:

1、Add HF6508, HF6408, HF6208 Type IO test tools

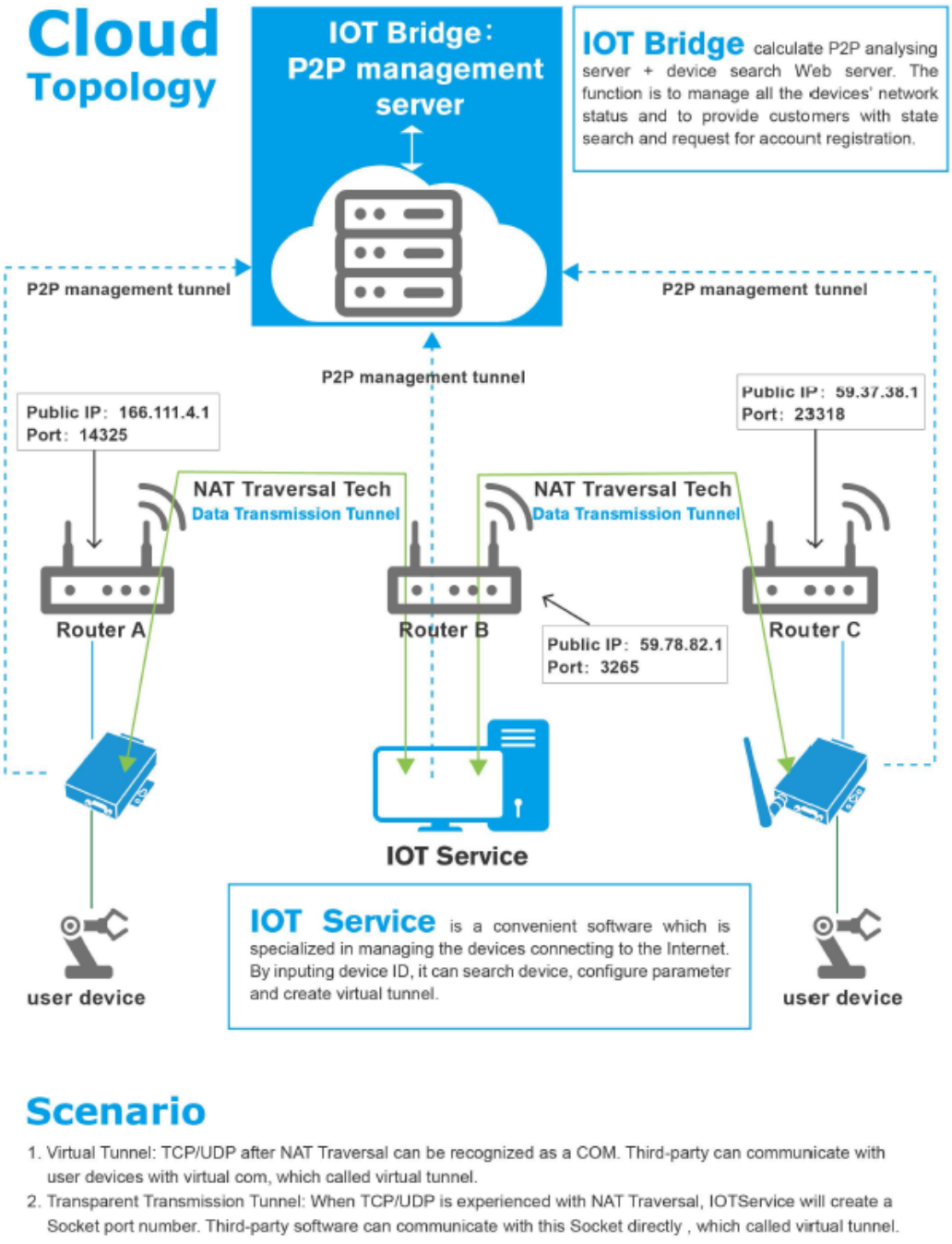


CONTENT

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.

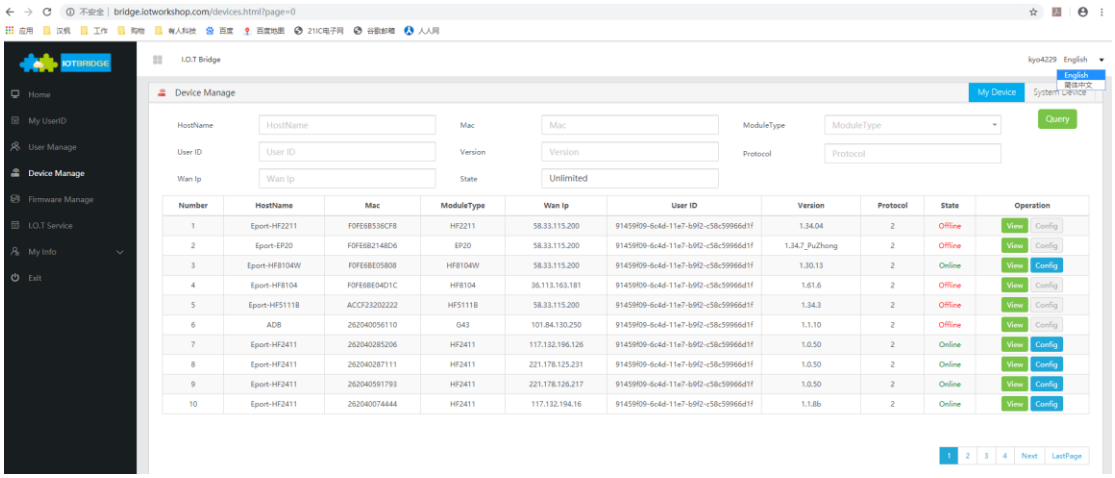
IOTBridge cloud use UDP/P2P/NAT to make the IOTService software remote setting and control devices. The detailed structure is as following picture.



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]

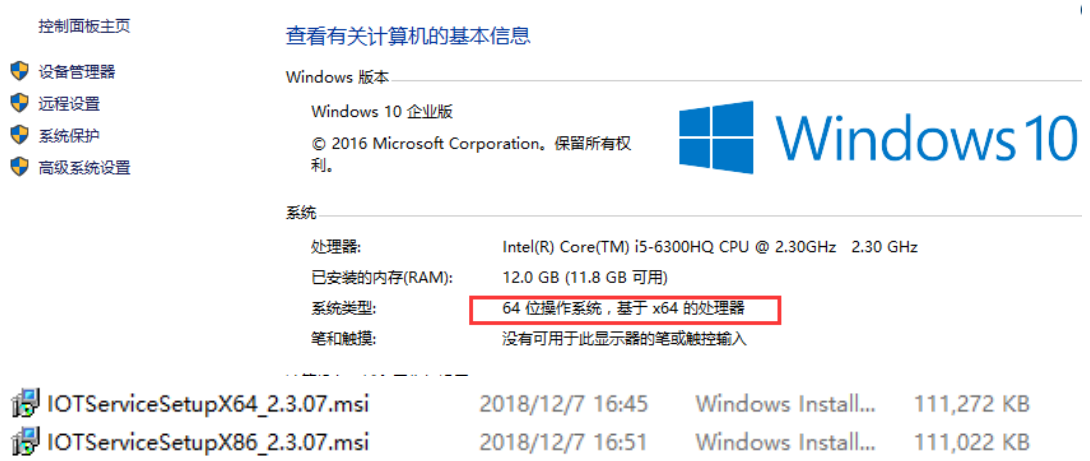
IO Control

Wi-Fi IO
[HF6208]

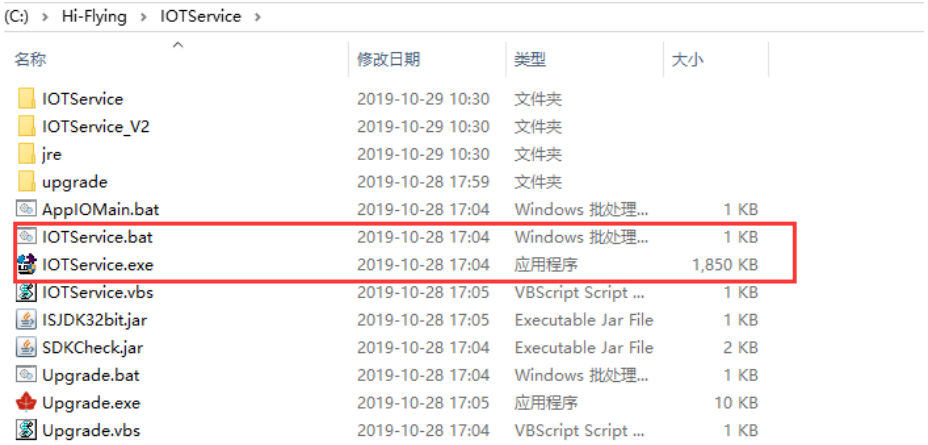
Ethernet IO
[HF6508]

2. IOTSERVICE INSTALLATION

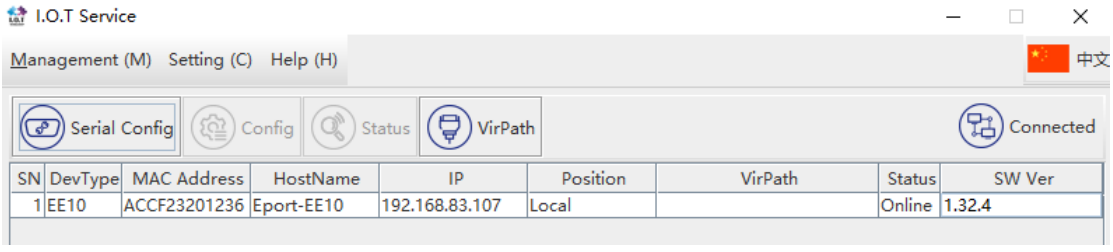
Step 1:Download the IOTService tool as the following link.
http://www.hi-flying.com/download-center-1/applications-1/download-item-iotservice
Step 2:Install IOTService tool according to the PC OS(x64 for 64 bit Windows OS, x86 for 32 bit Windows OS). **If already installed old version, please uninstall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



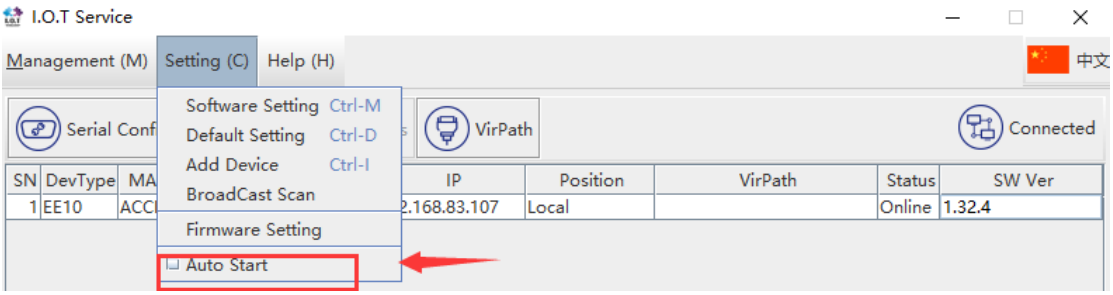
Step 3:After installation, there is a folder for IOTService under the installation path.



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



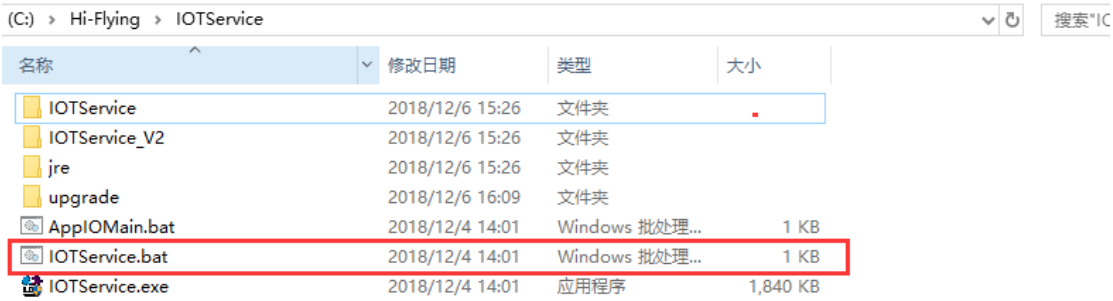
Step 5:Enable Auto Start when needed. (May fail in some OS, pleae google to find soluction about make program auto start)



Notes:

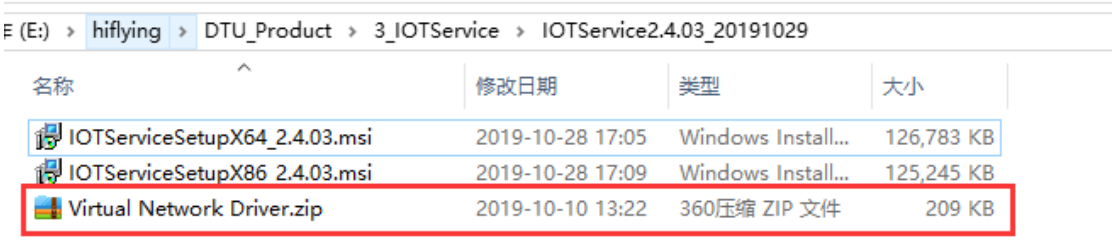
This tools need JRE environment and will automatically install it.

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.

If using virtual Network function, install the following driver. This function only support for HF9624, other products do not need to install this.



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

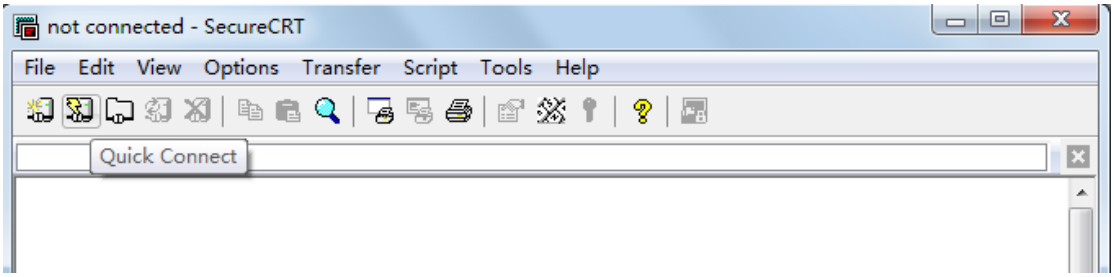
3.3.1. Serial port tool:SecureCRT

Download address:

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

Unzip the file and find the following icon, 

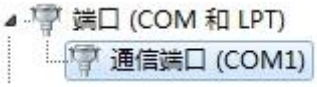
Open and click quick connect button  to create connection.



3.3.2. Serial Parameter Configuration

Protocol:Serial

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



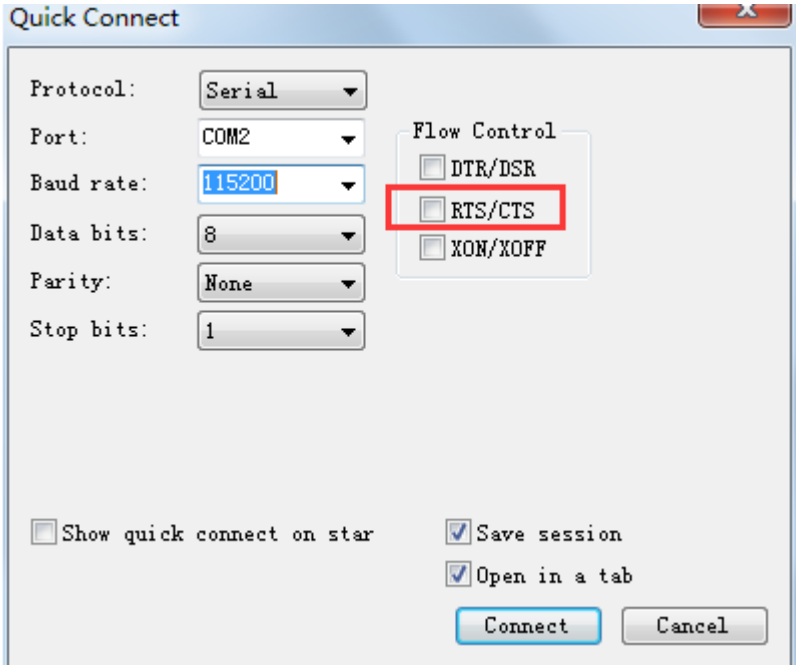
Baud rate:115200

Data bit:8

Parity check:None

Stop bit:1

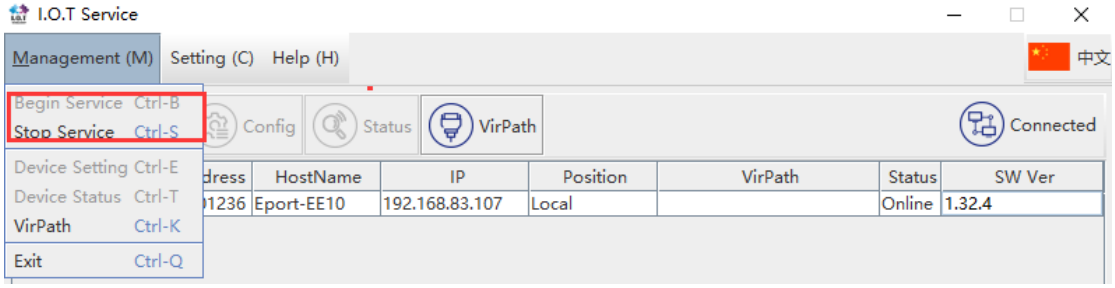
Flow control:NONE(Please remove "√" in front of RTS/CTS)



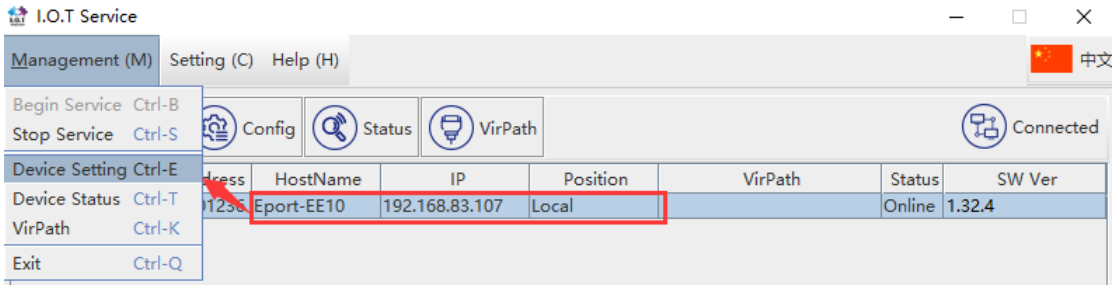
4. IOTSERVICE INTRODUCTION

4.1. Main Page Introduction

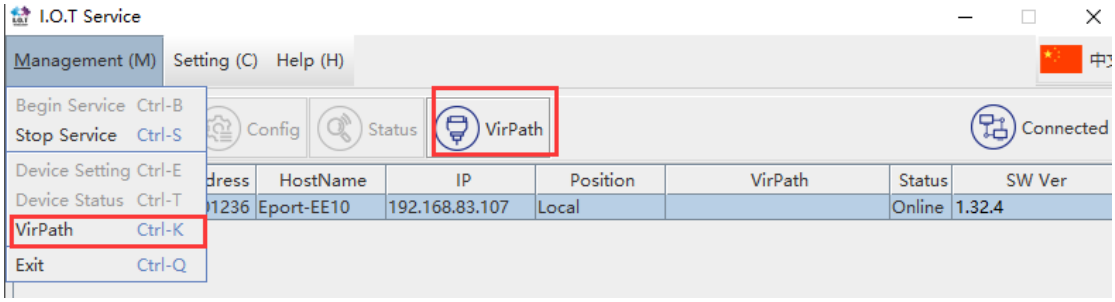
■ When it starts, it will show the scanned products in the local area network or remote device in user account. The scan service can be begun or stopped.



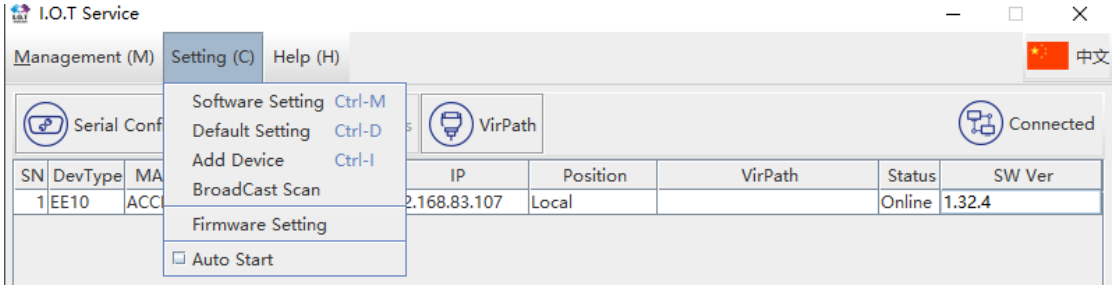
■ Check or set the selected device parameters(or double click the selected device)

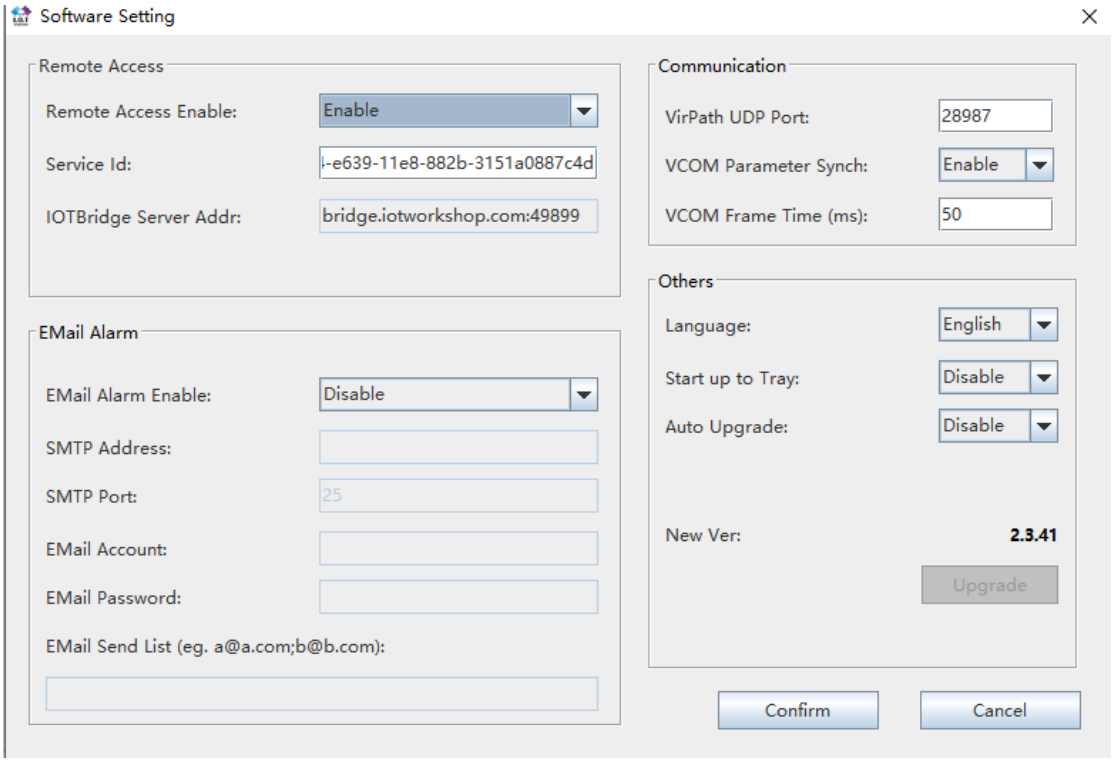


■ VirPath:Virtual serial setting and virtual throughput function. See examples for more detailed usage.

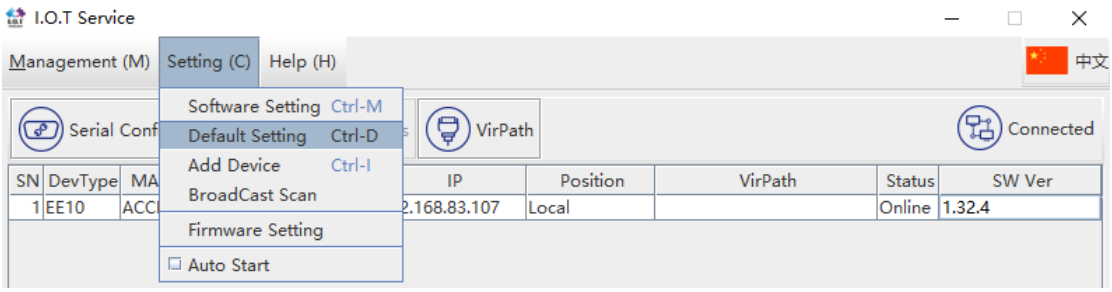


■ Setting:Tool setting.

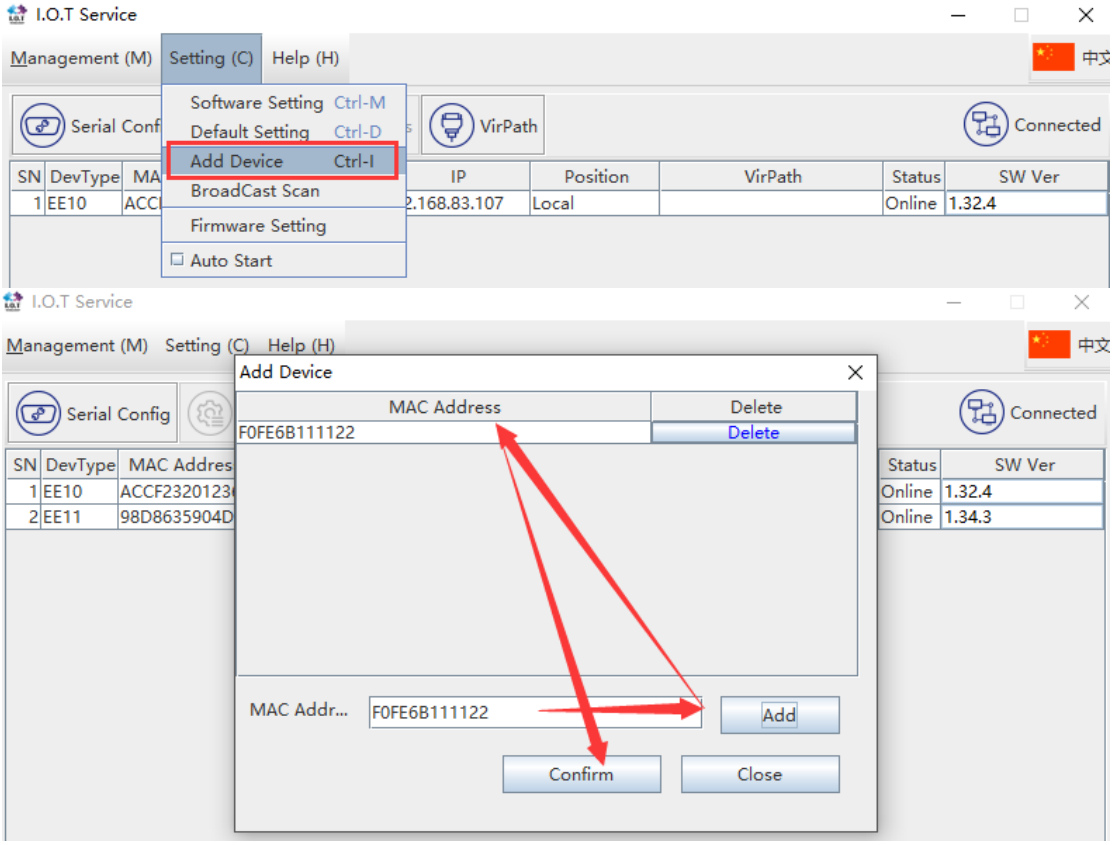




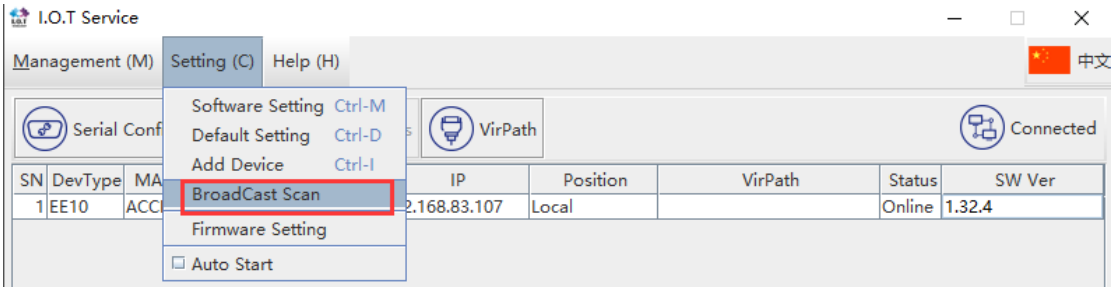
- Remote Access Enable:Enable/Disable our remotely control function, IOTBridge server is used for P2P device management and data transfer if enable.
  - Service Id: This id is used for IOTBridge to distinguish different user device. Recommend to write write User Id in device side, it will automatically 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.

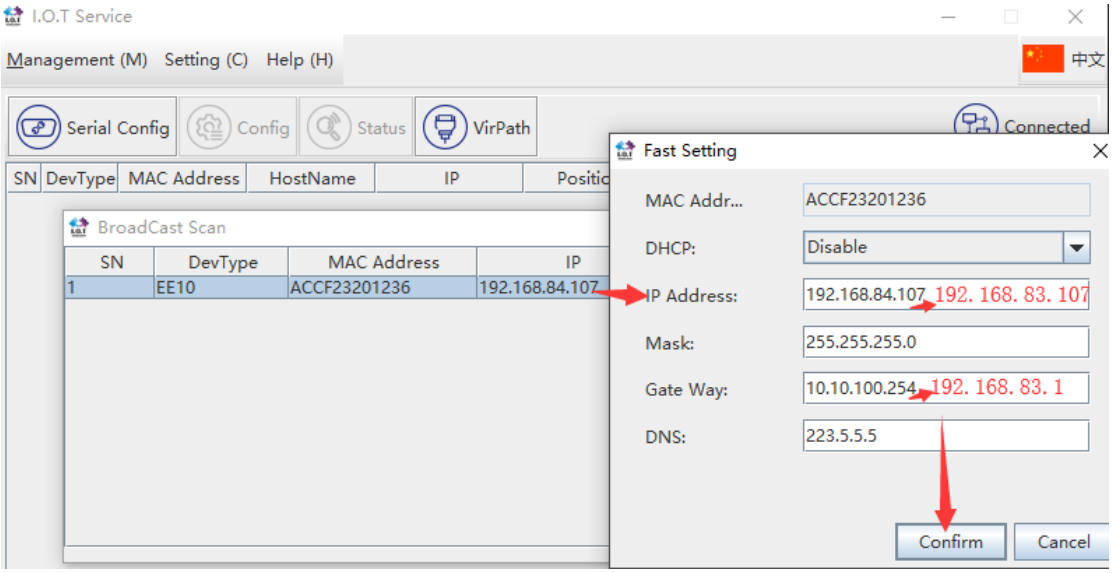


■ Add Device:Add remote device under Service Id(The User Id should first be written via Cli SYS/UserID command), if IOTService locally scan find device, it will be added automatically.

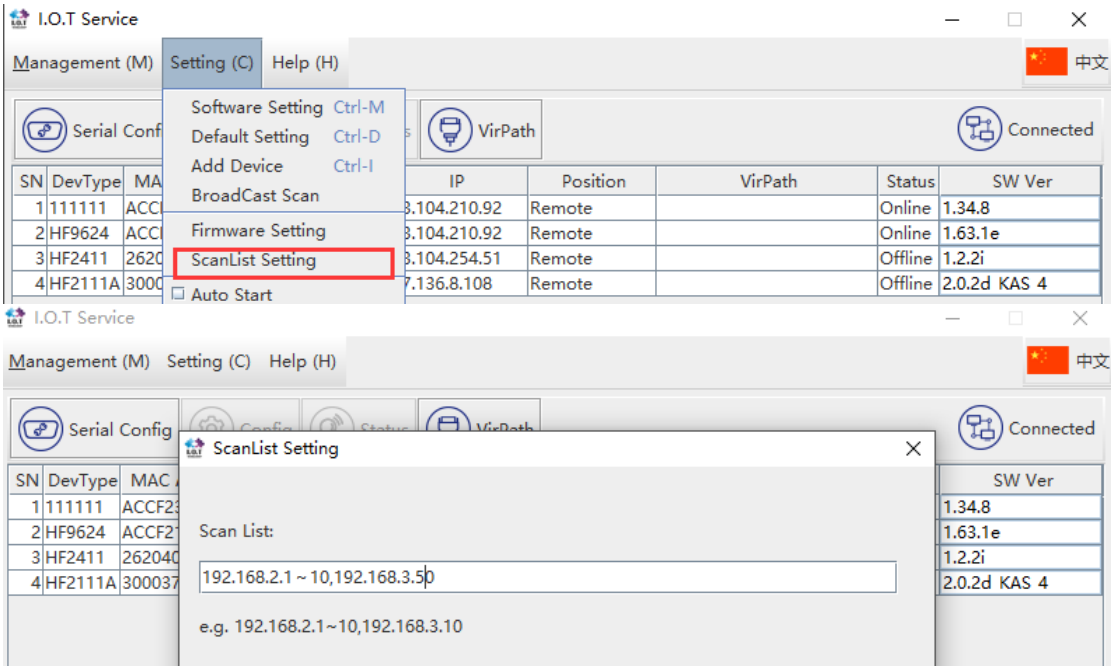


■ BroadCast Scan:Send 255.255.255.255 broadcast packet to search device. This is useful when forgot device static IP. Ex, in subnet mask 255.255.255.0 device set to 192.168.84.XXX, but router is 192.168.83.XX, use this broadcast scan to search device and modify device IP to 192.168.83.XXX, then the device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

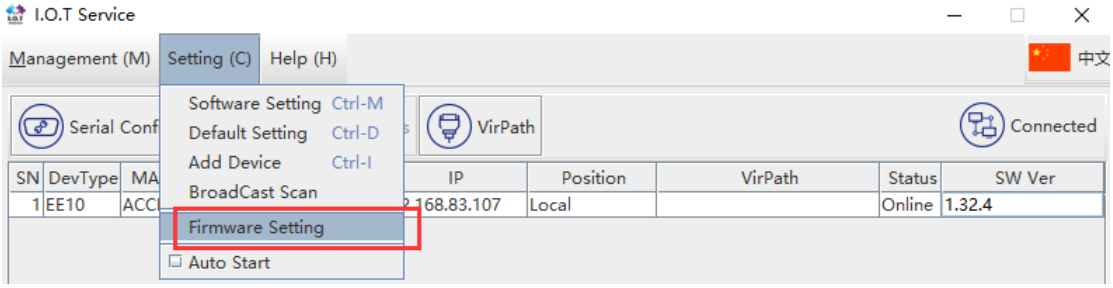




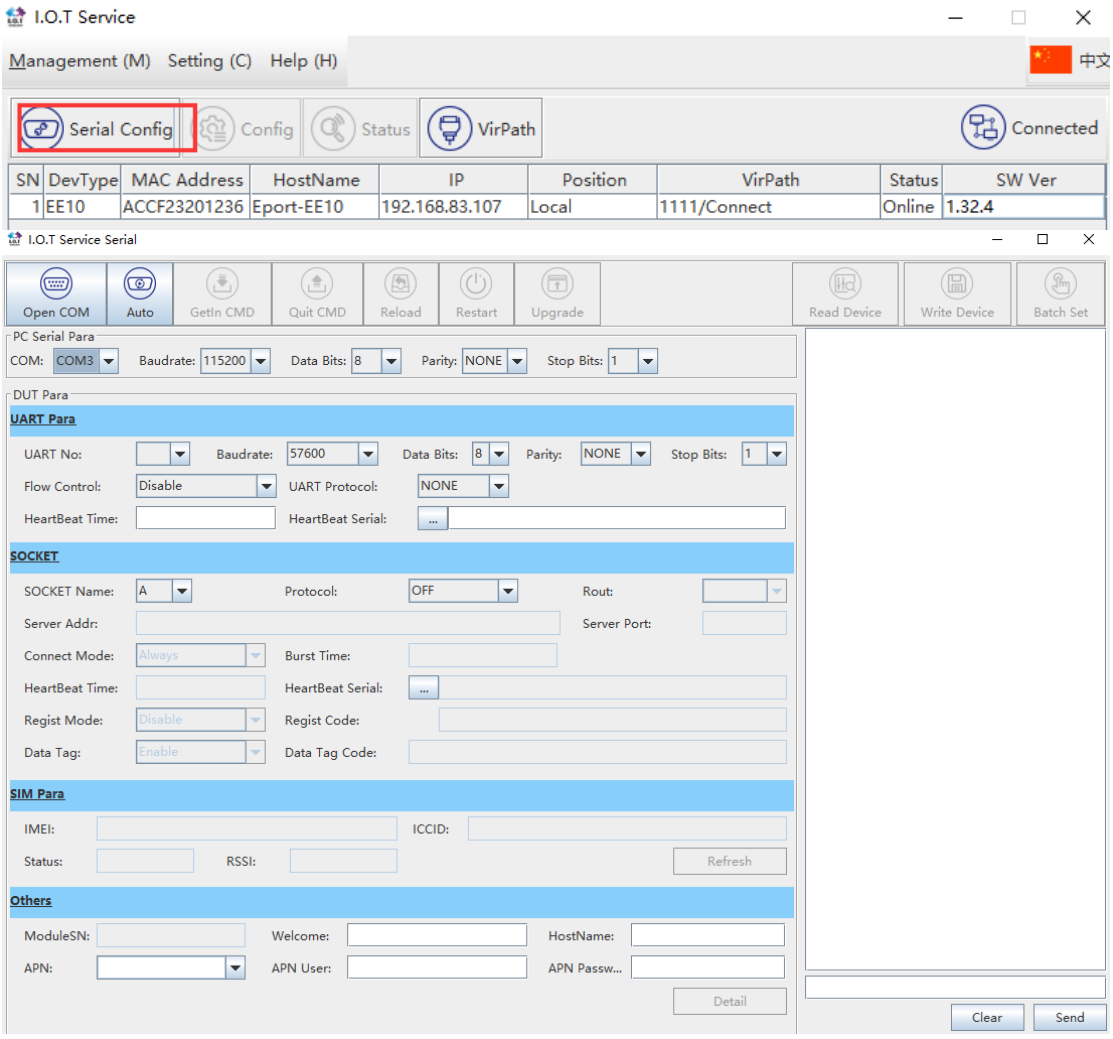
■ Scan List: If there is multiple router connected, PC and device may not in the same LAN, use this function for single scan.



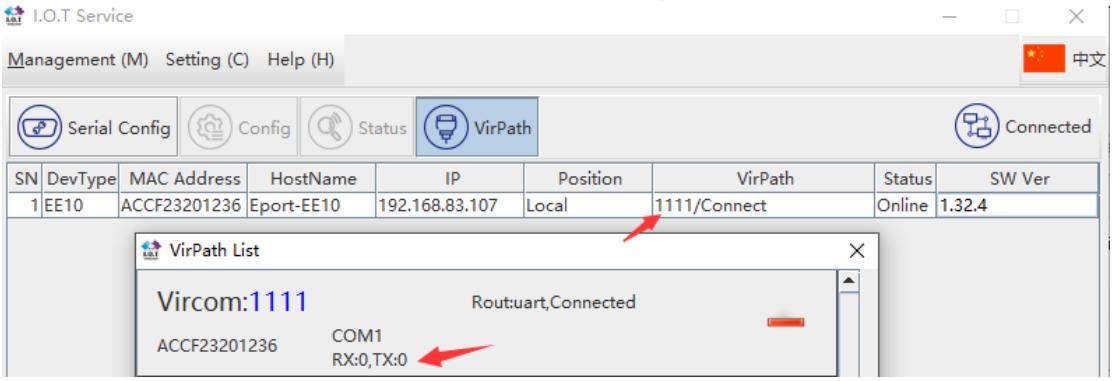
■ Firware Setting:OTA upgrade device, more details in the following chapter.



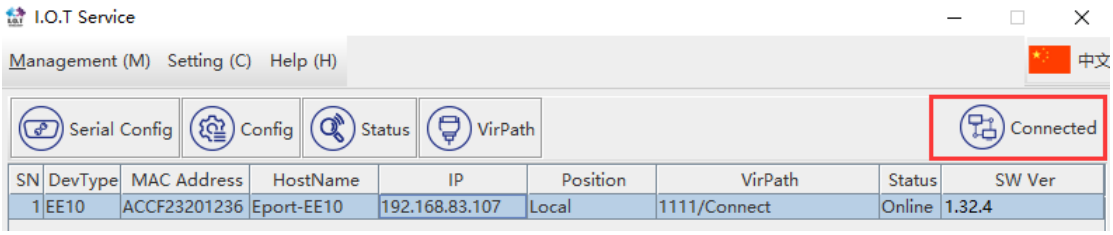
■ Serial Config:Config device via UART, **only support AT command device(G10, G11, G12, EG10, EG11, EG40, EG41, G43, HF2111A, HF2411). Cli command device is not supported to use this.**



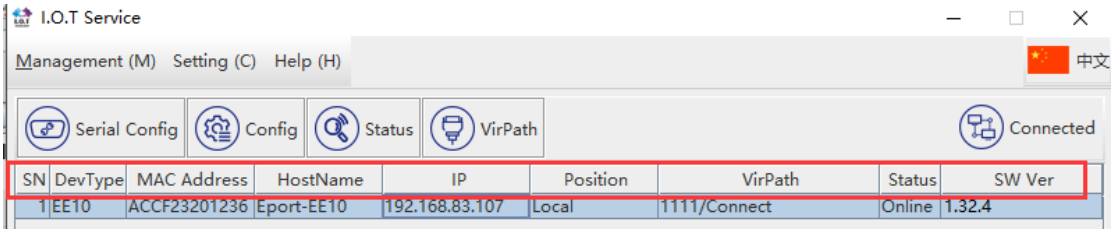
- VirPath:The virtual channel, virtual serial port information. Show status.



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

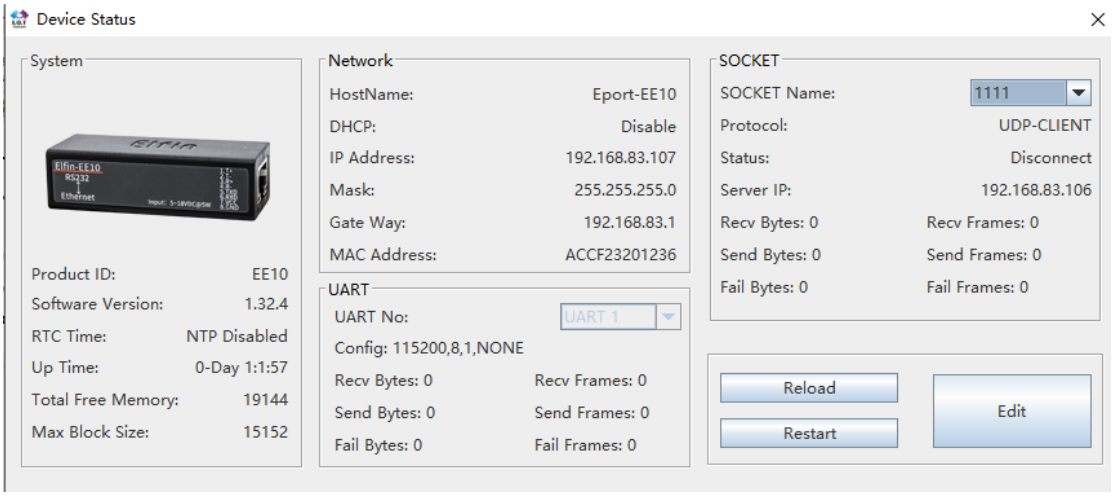


- DeviceType:device name. This name can be changed by cli command (SYS/CustomerId)
- Position:Show device position.
- VirPath:Show virtual path status.

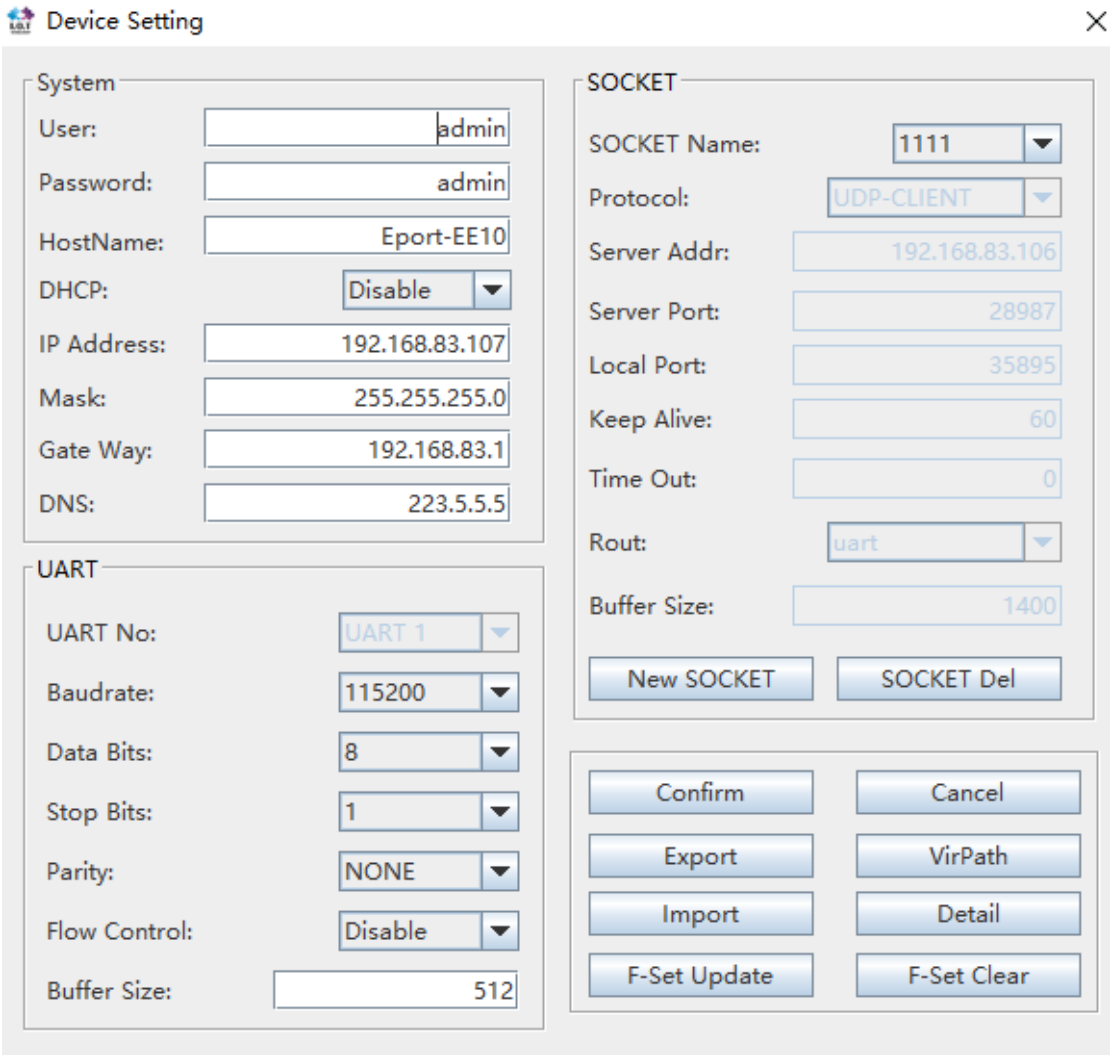


4.2. Device Status Interface

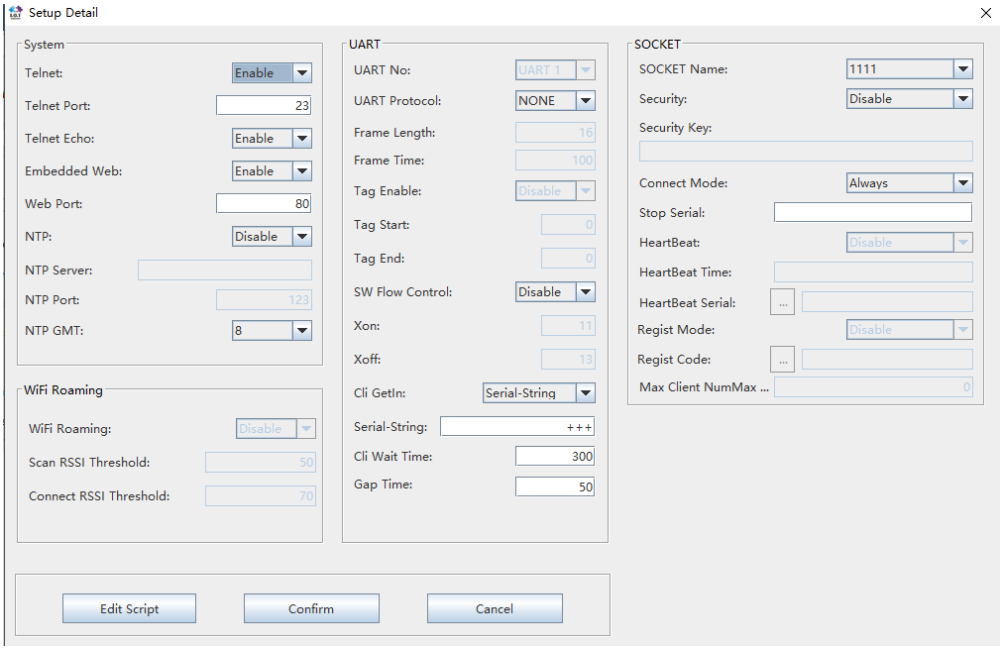
- Device Status:Indicates the device information, including software version, network, serial port and socket communication status.
  - Reload button:Restore parameter to the factory parameter.
  - Restart button:Restart product
  - Edit button:Enter into parameter setting interface



4.3. Edit Page

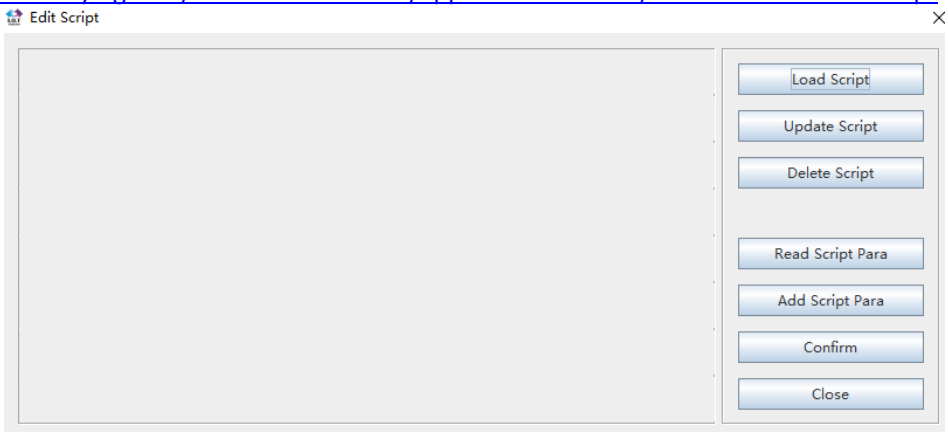


- New SOCKET: Create new SOCKET.
- SOCKET Del: Delete current SOCKET
- Confirm: Confirm modified parameter
- Cancel: Exit edit page
- Export: Export current config file. This file can be used to config another device.
- Import: Import config file.
- VirPath: Set virtual path function, the following chapter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

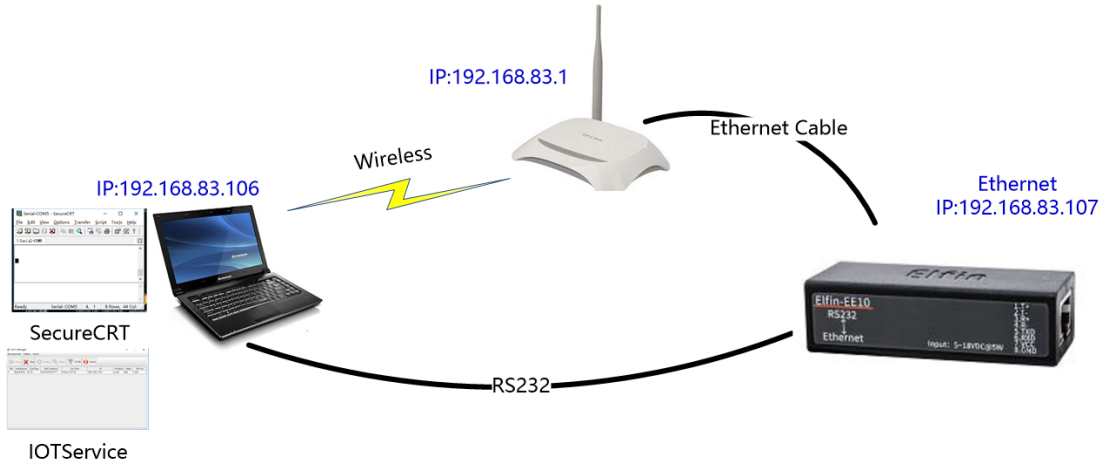
◆ F-Set Clear: Clear the factory setting, when do reload operation, restore to the default factory setting.

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

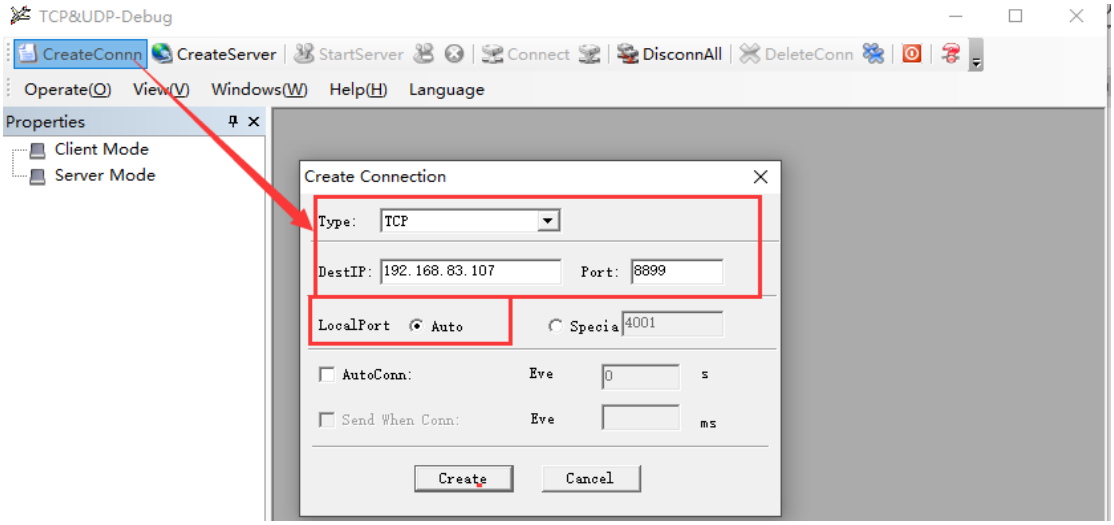
4.4.1. EVK Test Topology



4.4.2. TCP Server Test

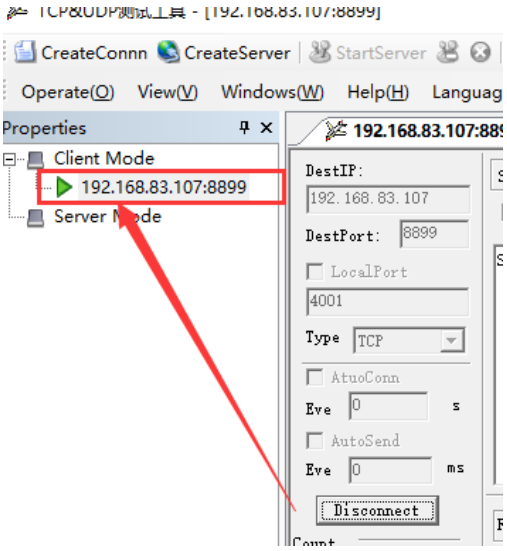
Step 1: Open TCP&UDP test tool and build TCP connection as following steps.

- 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

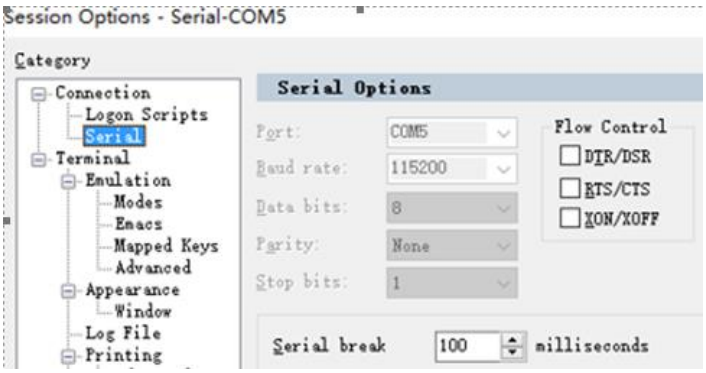


Step 2: Click Connect to build TCP connection.

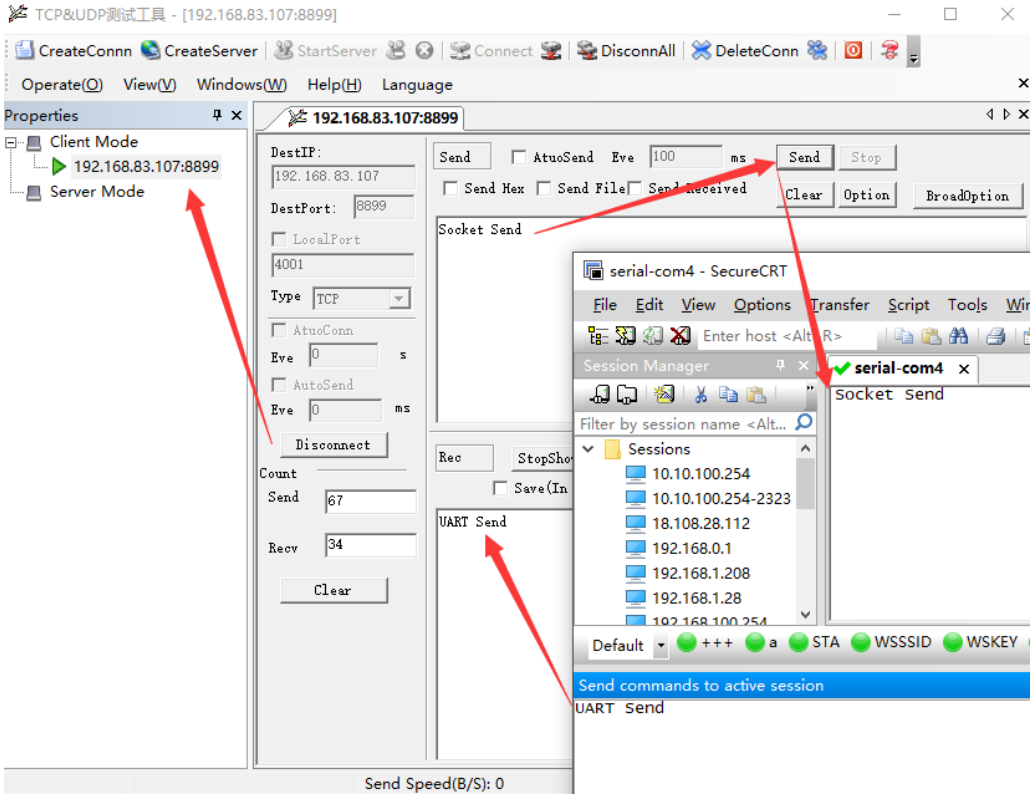
- After build successfully, the left arrow will turn to green.



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



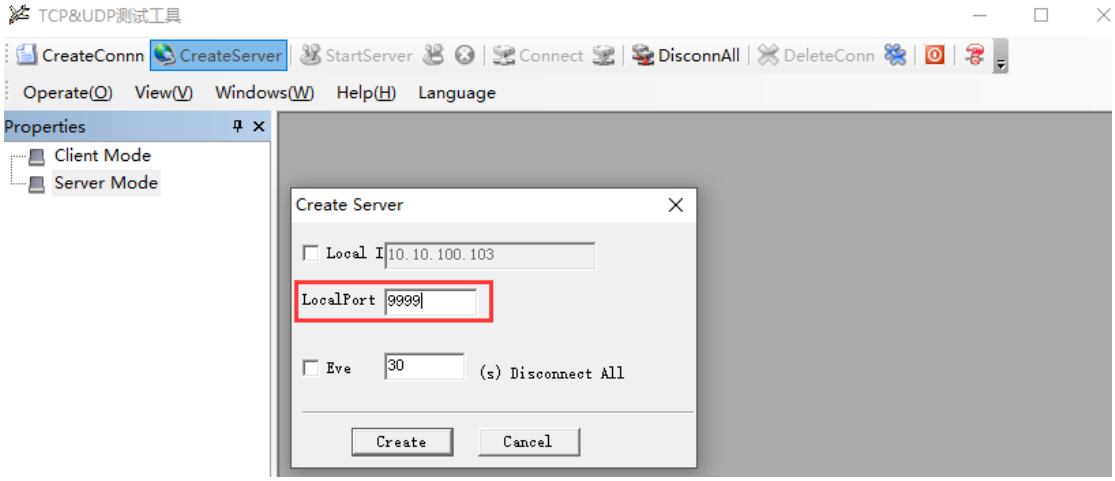
Step 4: Transmit data between TCP tool and serial port tool.



4.4.3. TCP Client Test

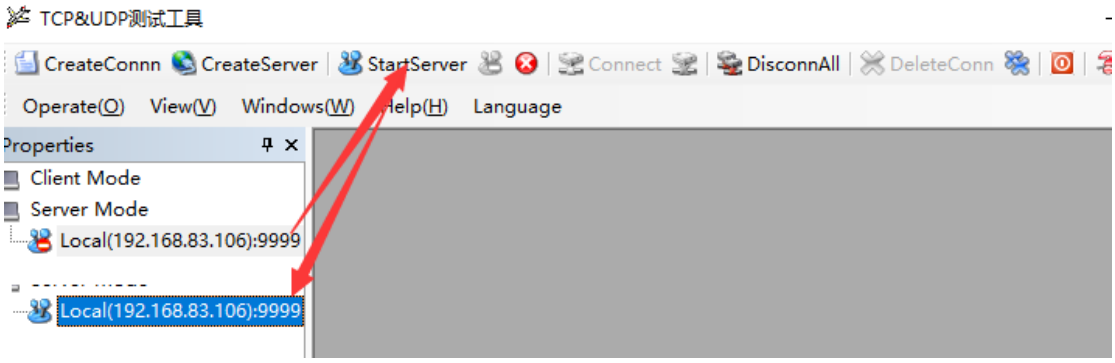
Step 1: Open TCP&UDP test tool and build TCP connection as following steps.

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



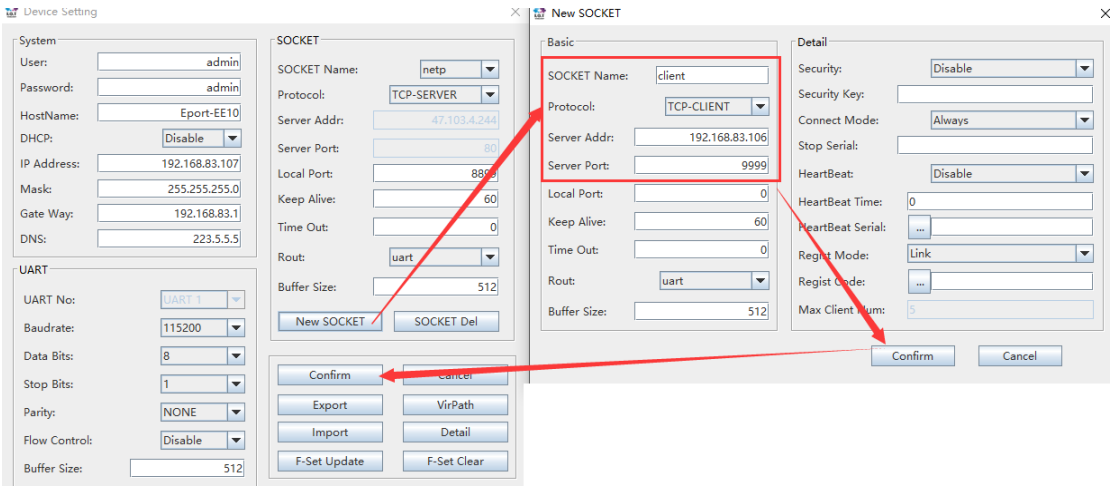
Step 2: Click StartServer to launch PC TCP Server function

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

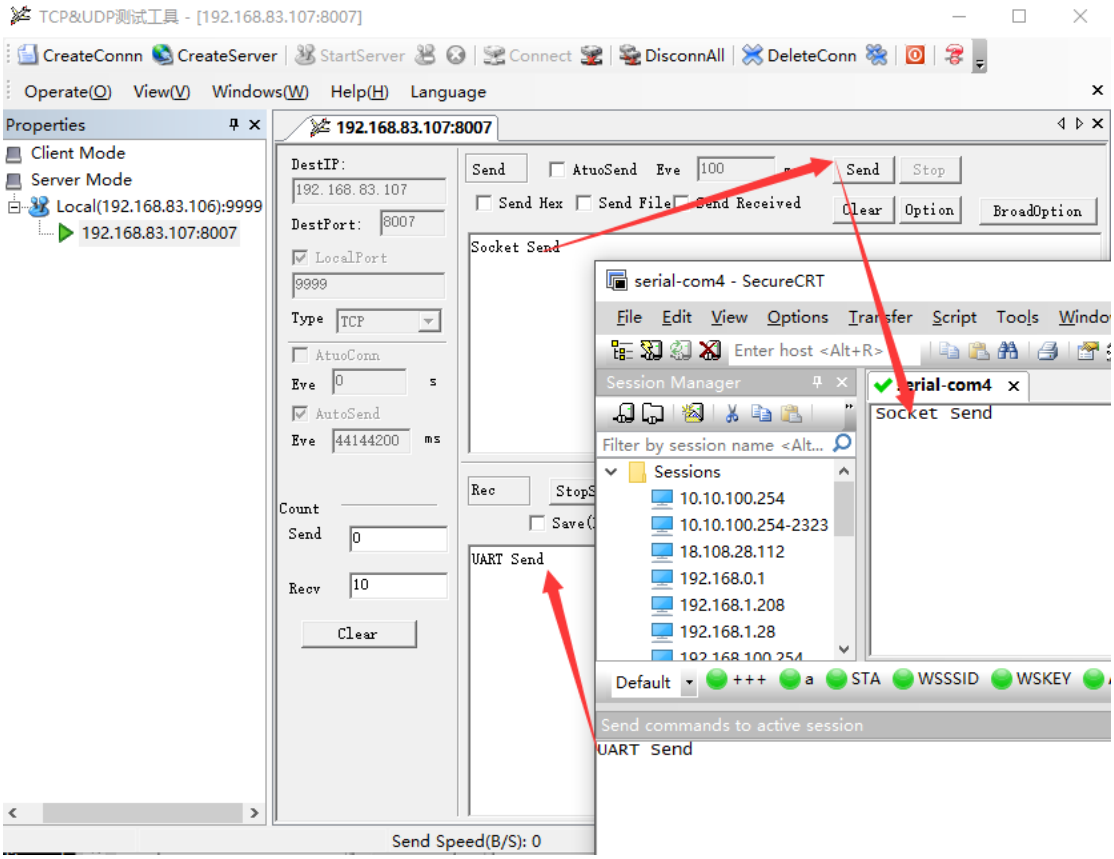


Step 3:Open IOTService tool and create socket to connect tool as following step.

- 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)

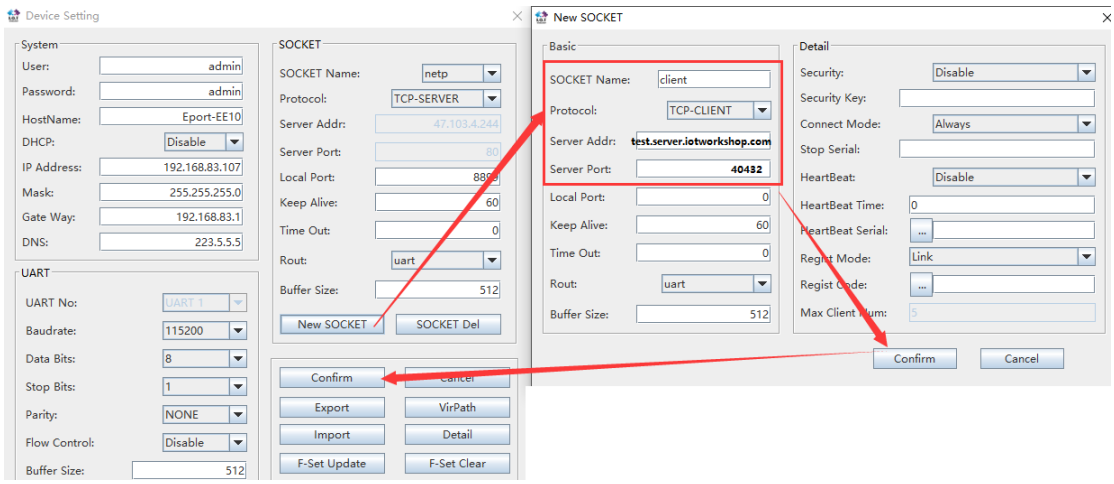


Step 4: Transmit data between TCP tool and serial port tool

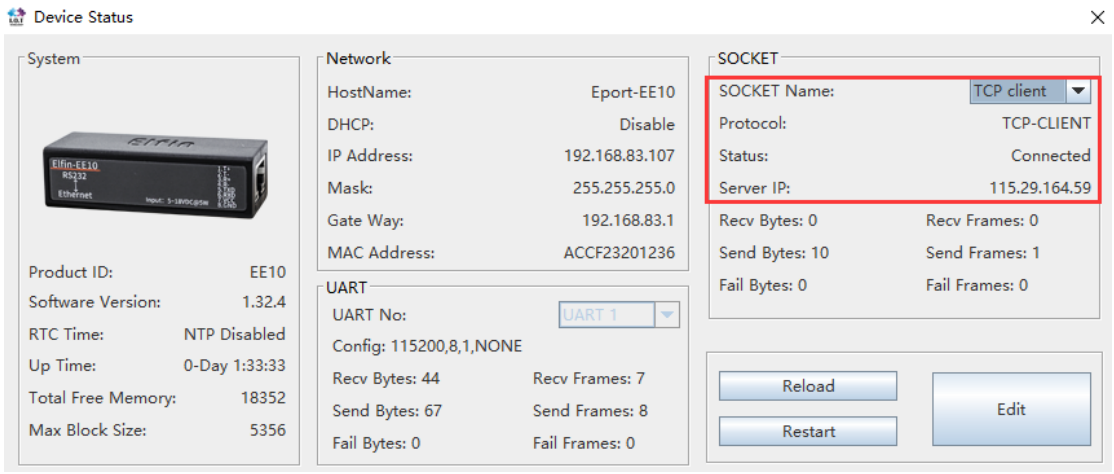


4.4.4. TCP Client Connect to Remote Test Server

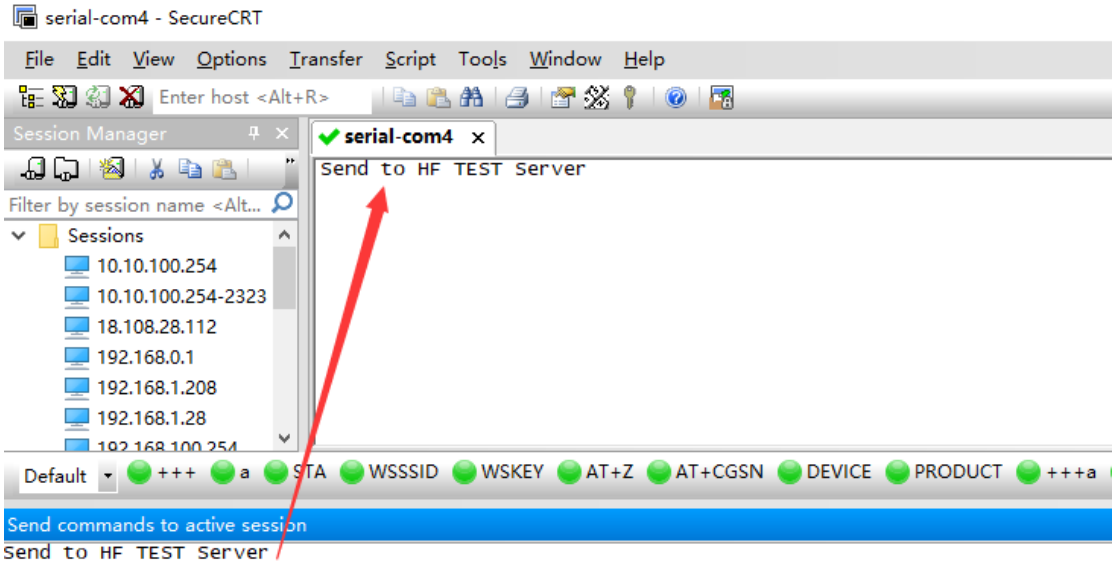
Step 1: Open IOTService and create TCP client socket, HF test server: test.server.iotworkshop.com,TCP port: 404325, UDP port: 40431



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.

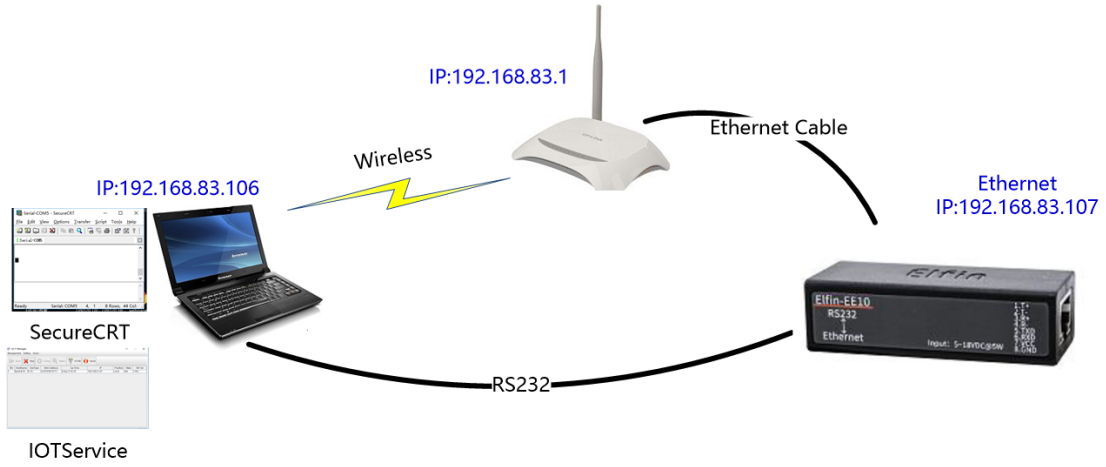


4.5. VIRTUAL Path Function

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

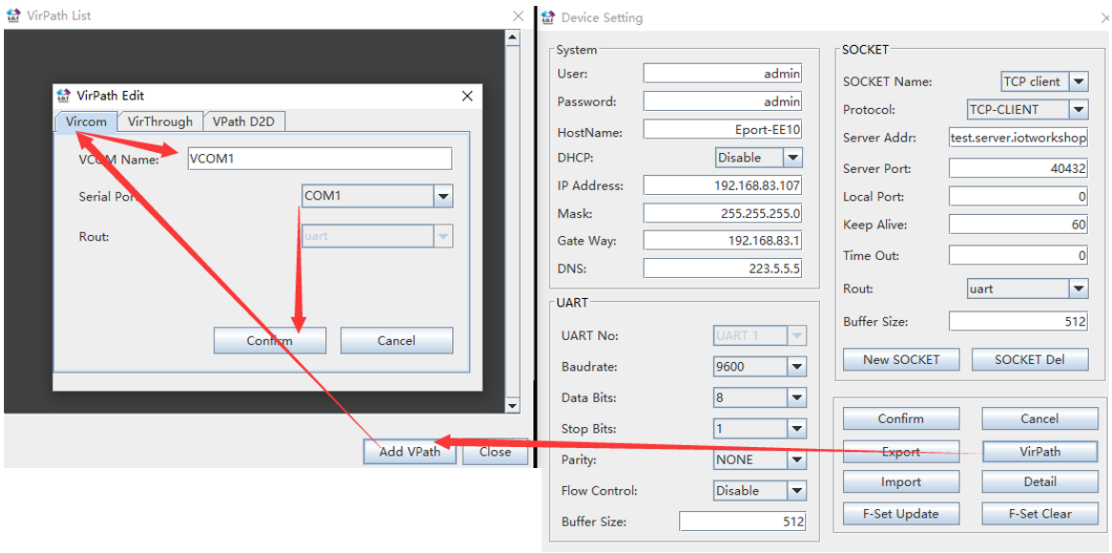
4.5.1. Virtual Com Local Network Communication

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

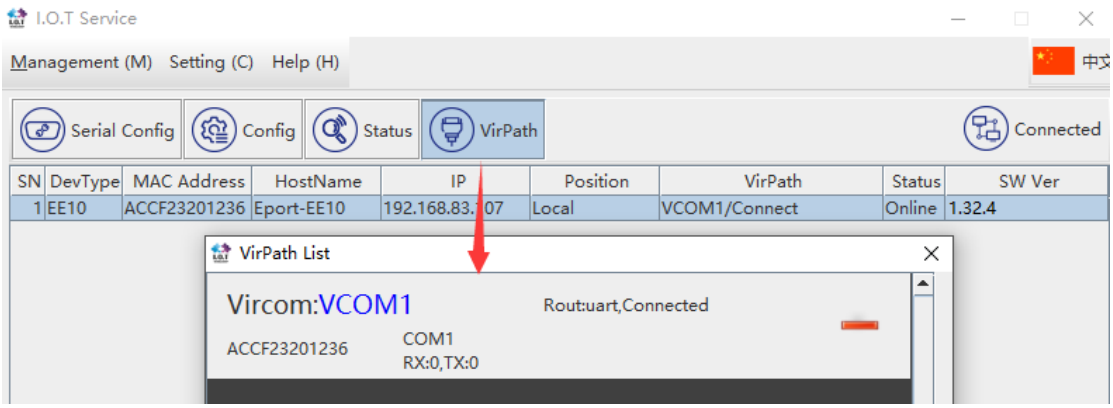


Step 1: Open IOTService Tool and create virtual com as follows:

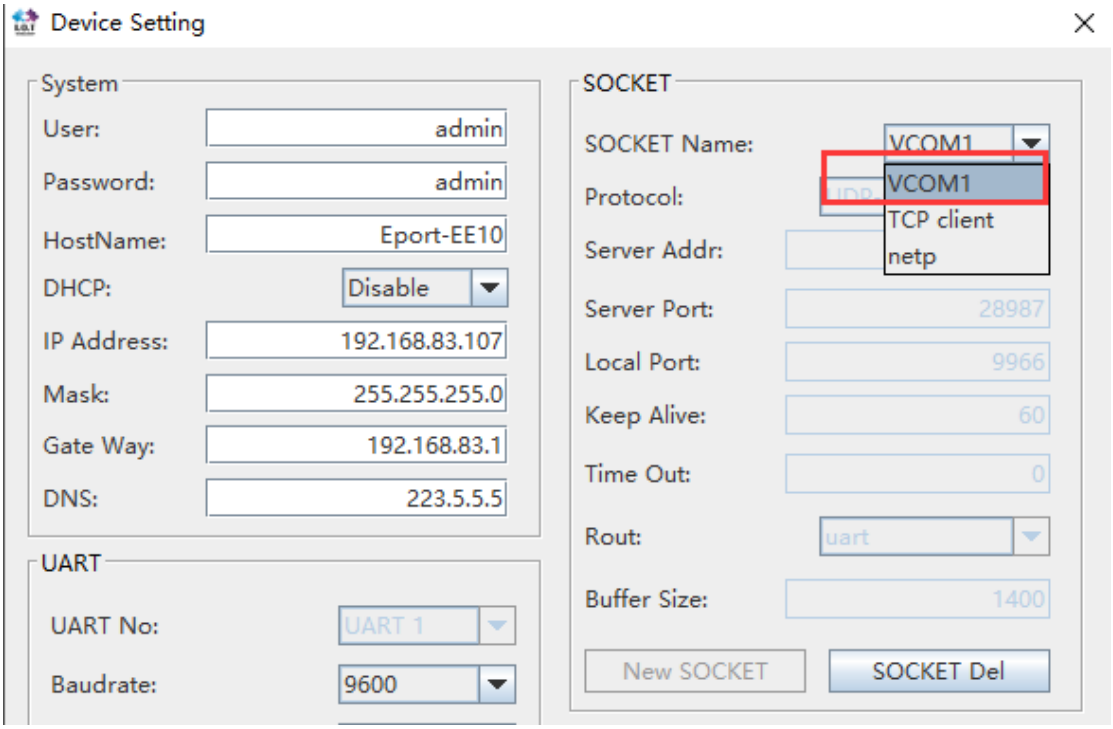
- Add Vpath: Add the virtual path.
- VCOM Name: Virtual COM name. it should be unique.
- Serial Port: Virtual COM serial number.
- Rout: The data transfer route after receiving from virtual COM, usually is sent to hardware uart, but can also be set to other created socket.



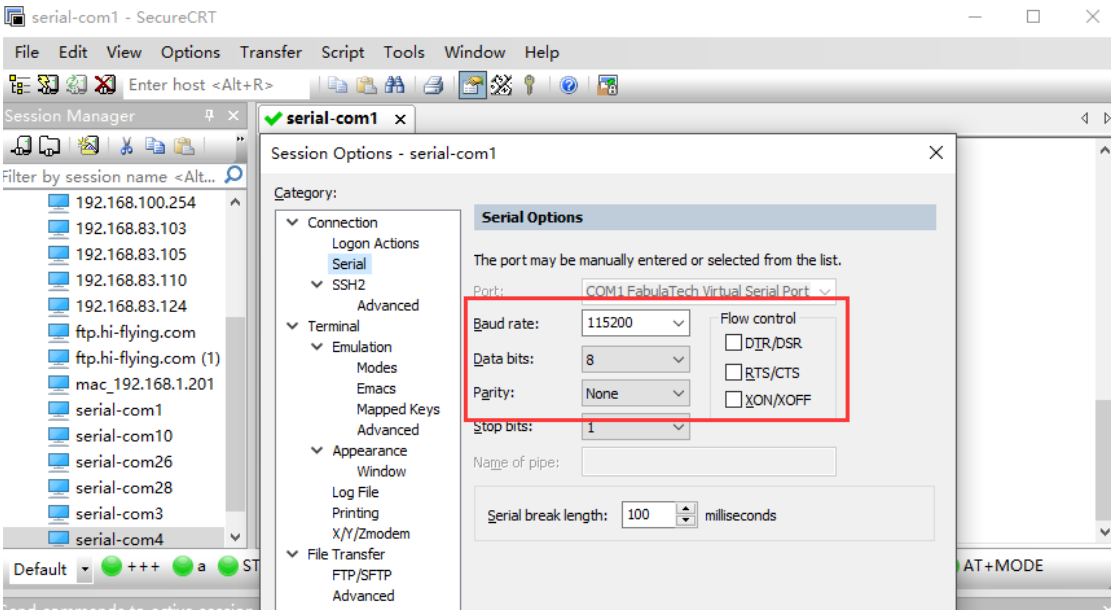
Step 2: Check status in the VirPath menu. It shows connection status and data transfer status. Click the red button to delete the virtual COM.



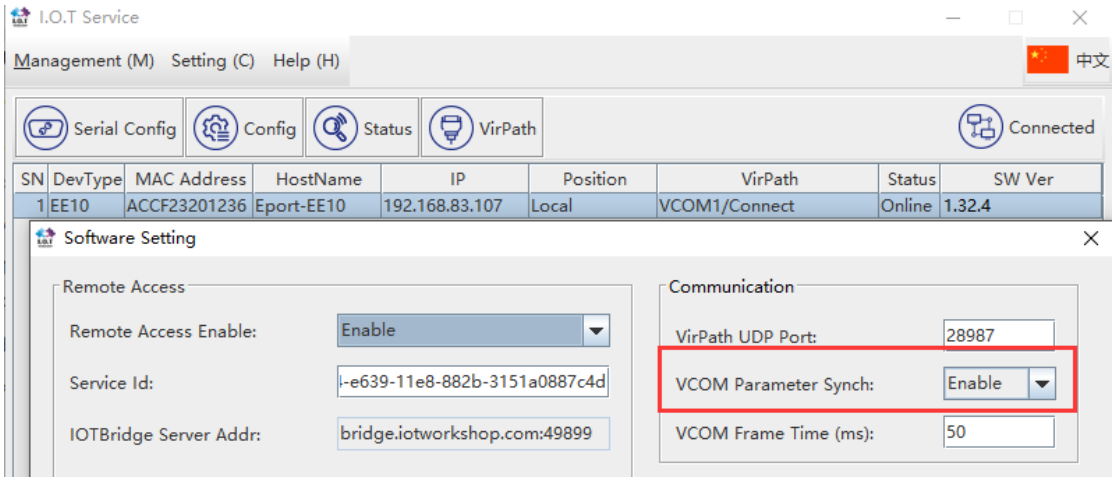
The virtual COM will occupy one Socket resource.



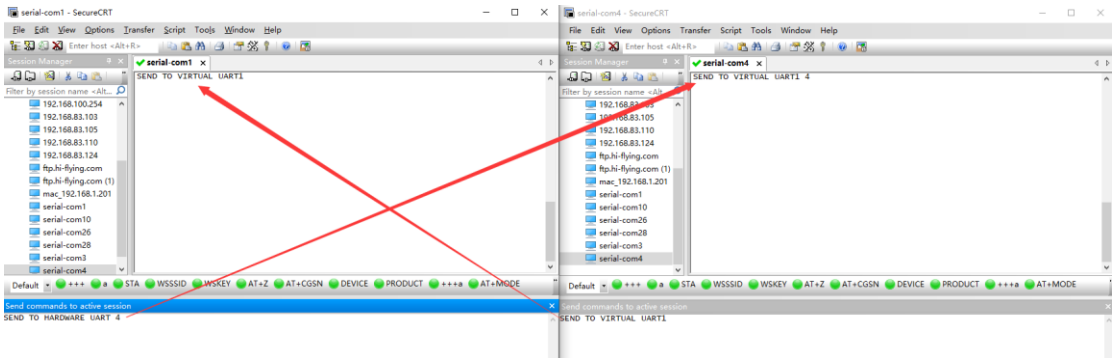
Step 3: Open serial port tool and set virtual port baud rate.



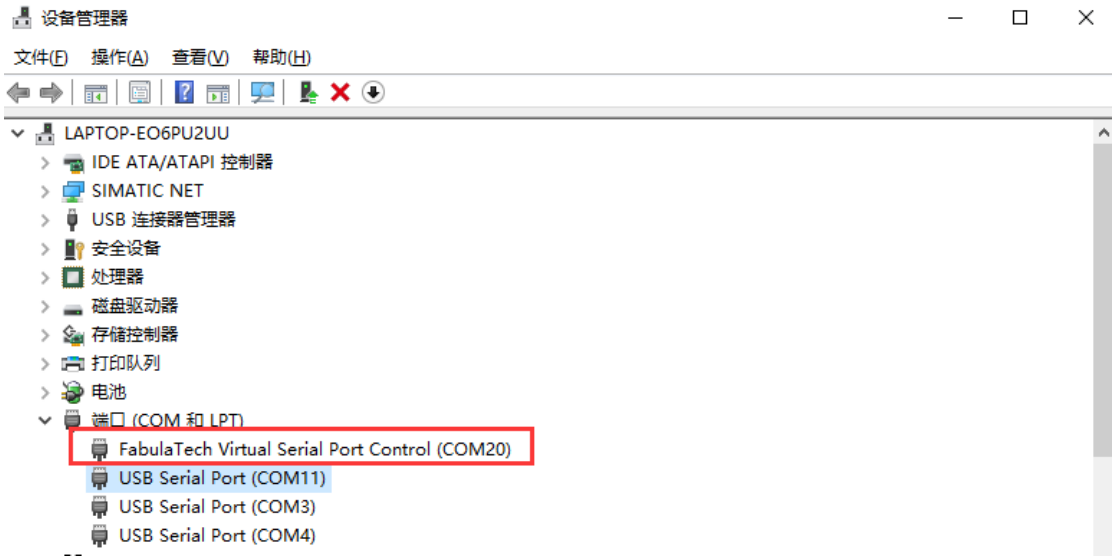
Device supports VCOM parameter synchronize function, if virtual COM UART parameters changed, the hardware device baud rate also changed. This function can be disabled.



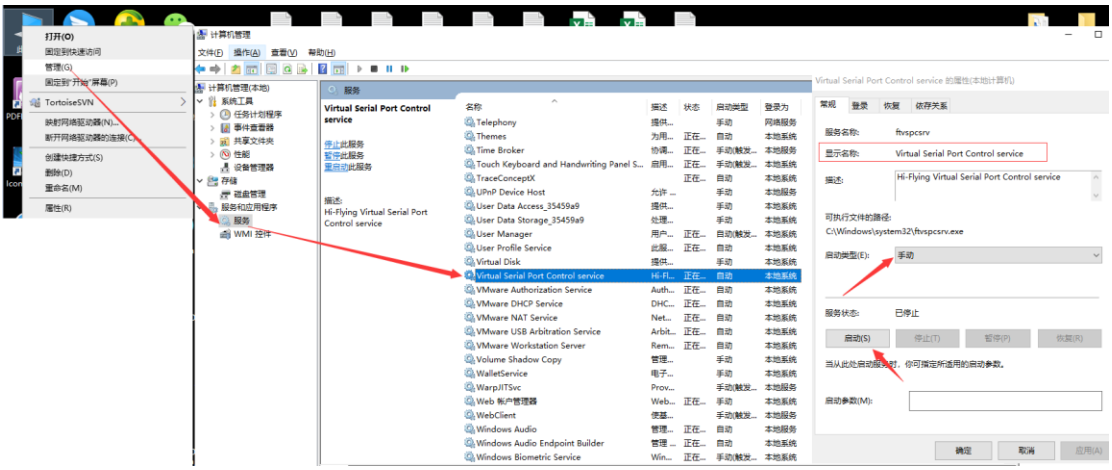
Step 4:Send and receive data



Note: If the virtual COM does not work, chck the COM status. If not shown in the list.

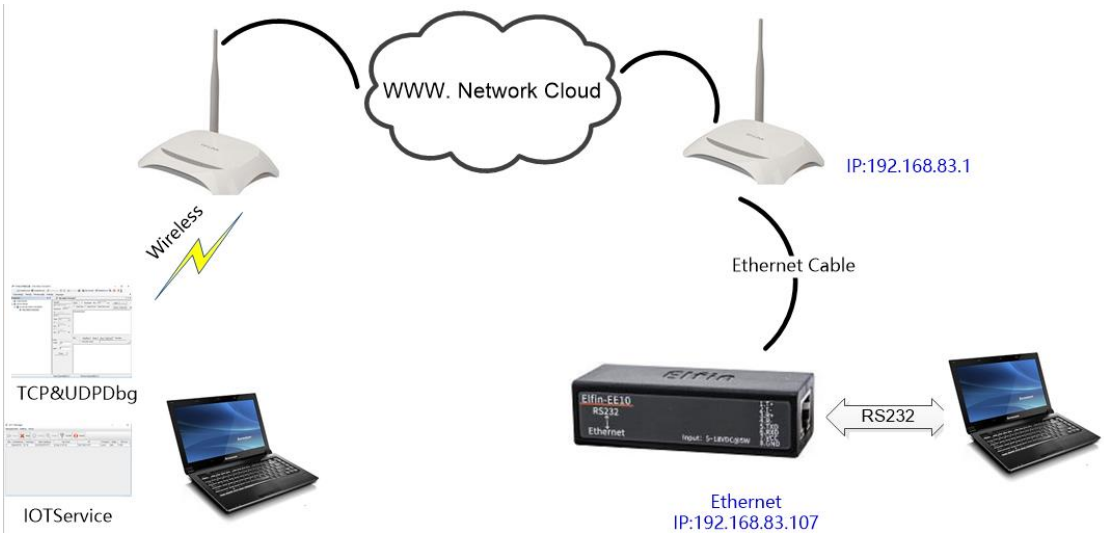


Enable it in the service as following picture.

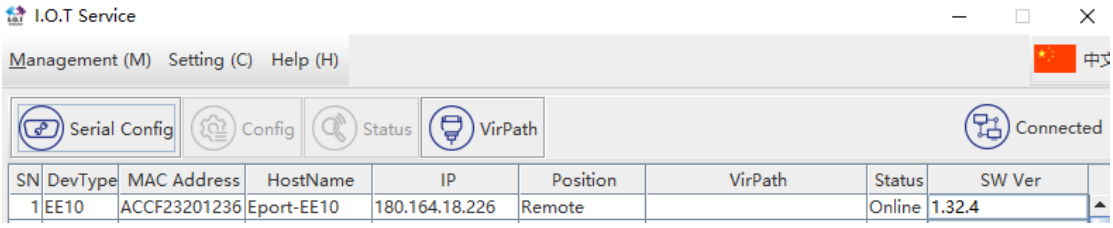


4.5.2. Virtual COM Remote Communication

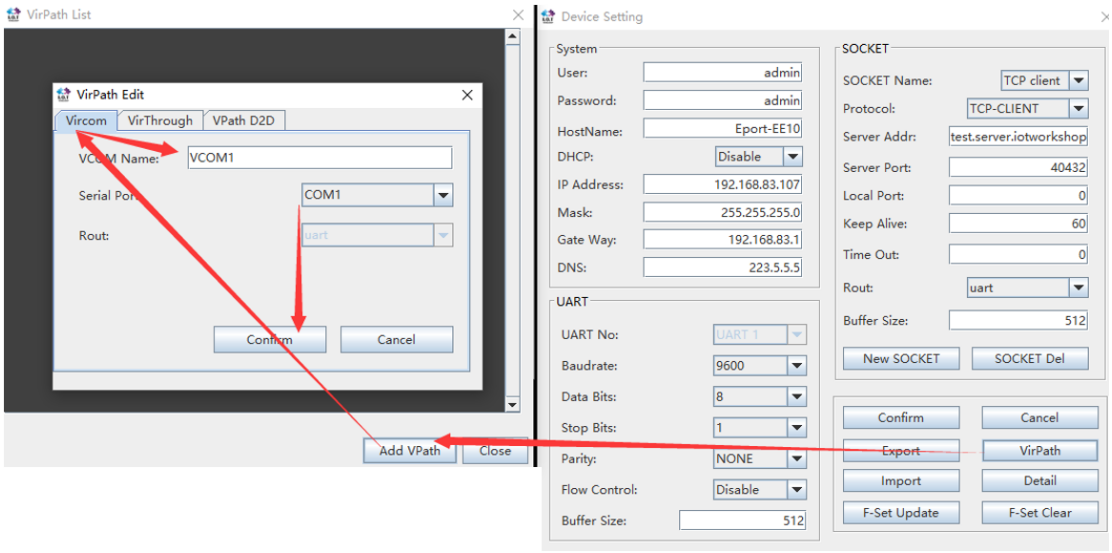
The following device is in the remote environment and UART connect to PC, the two PC can also send/receive packet to each other via virtual COM.



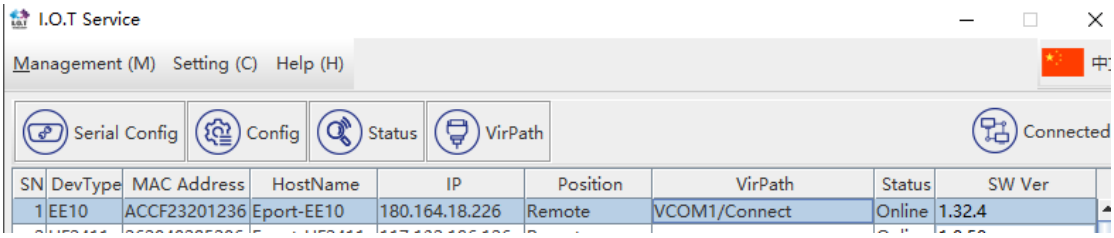
Step 1: Bound device to IOTBridge account. Refer to IOTBridge chapter for detail.



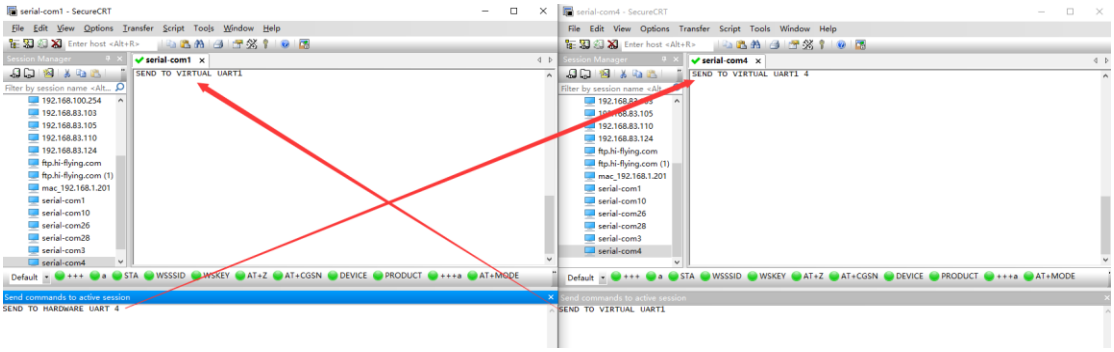
Step 4:Create Virtual Com. The setting is the same as previous.



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

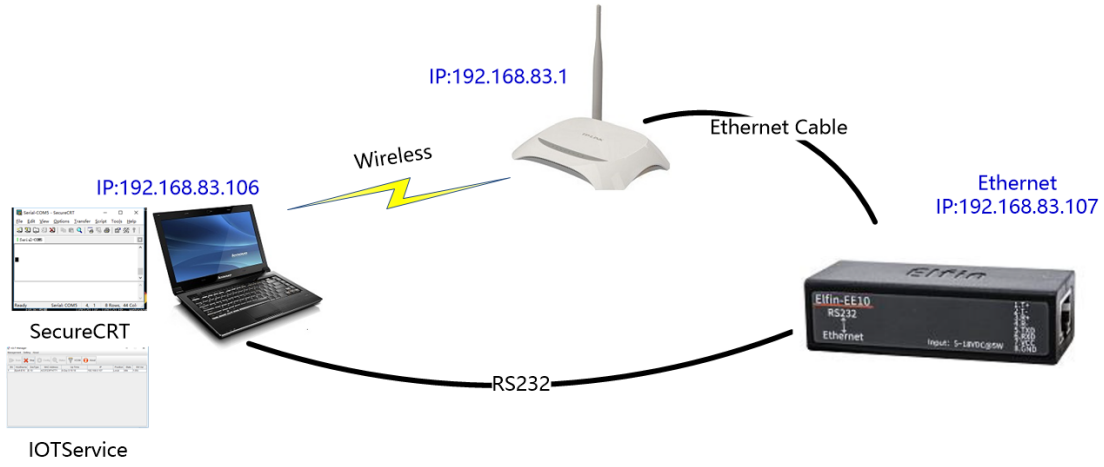


Step 4: Sending and receiving serial port data



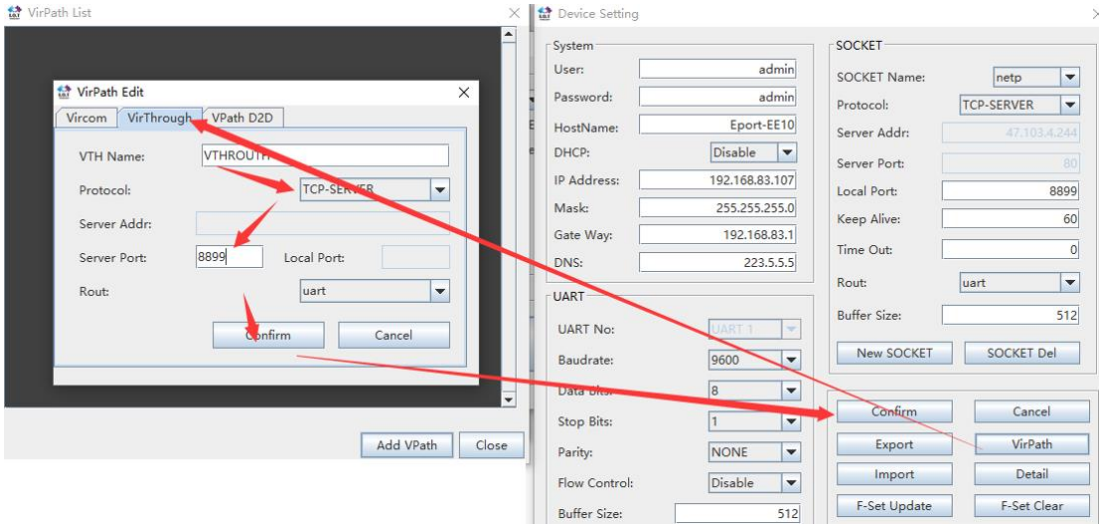
4.5.3. Virtual Through Local Communication

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

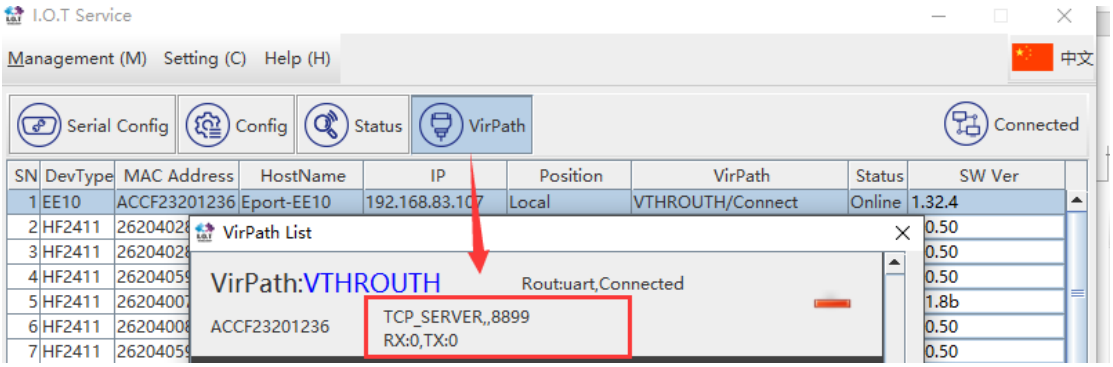


Step 1: Open IOTService tools, follow the following steps to create virtual through path.

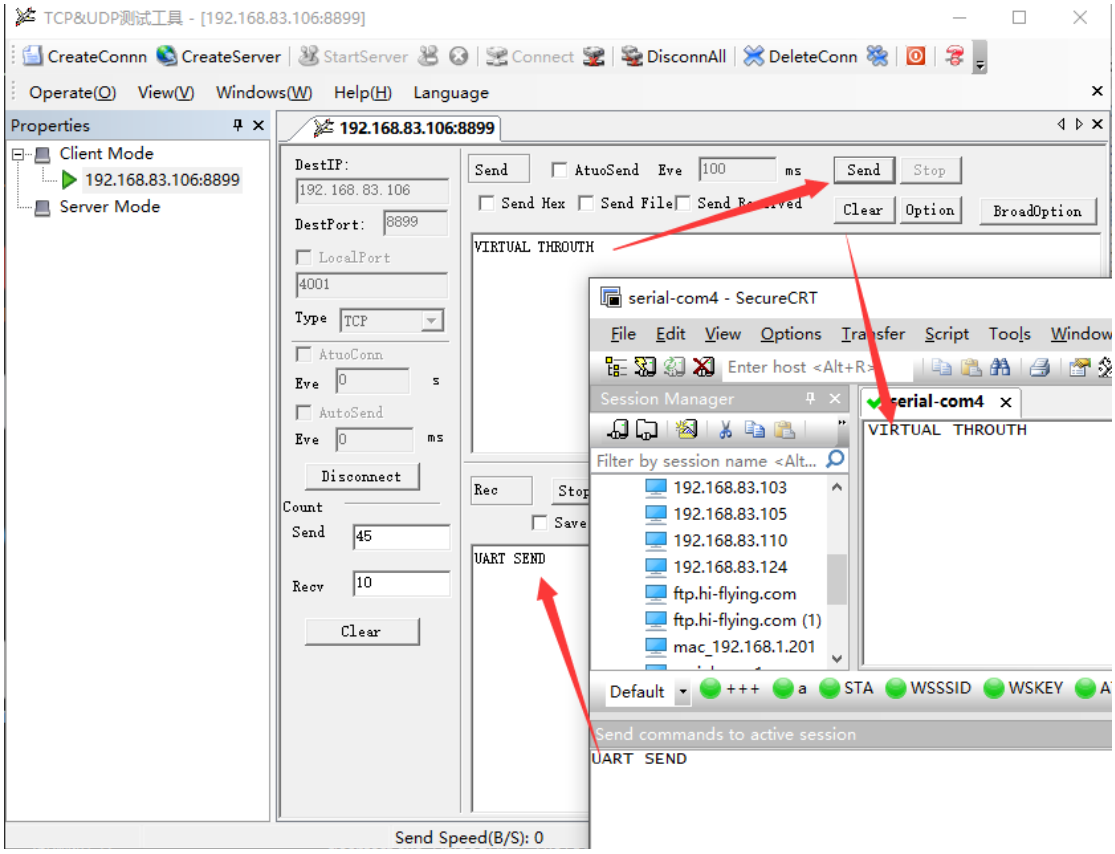
- VTH Name: The name of virtual through, must be unique.
- Protocol: TCP Server, TCP Client or UDP.
- Server Addr: PC itself IP for TCP Server. Destination IP for TCP Client and UDP.
- Server Port: Server Port.
- Rout: Packet destination route, usually is UART, can also set to other Socket created in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



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

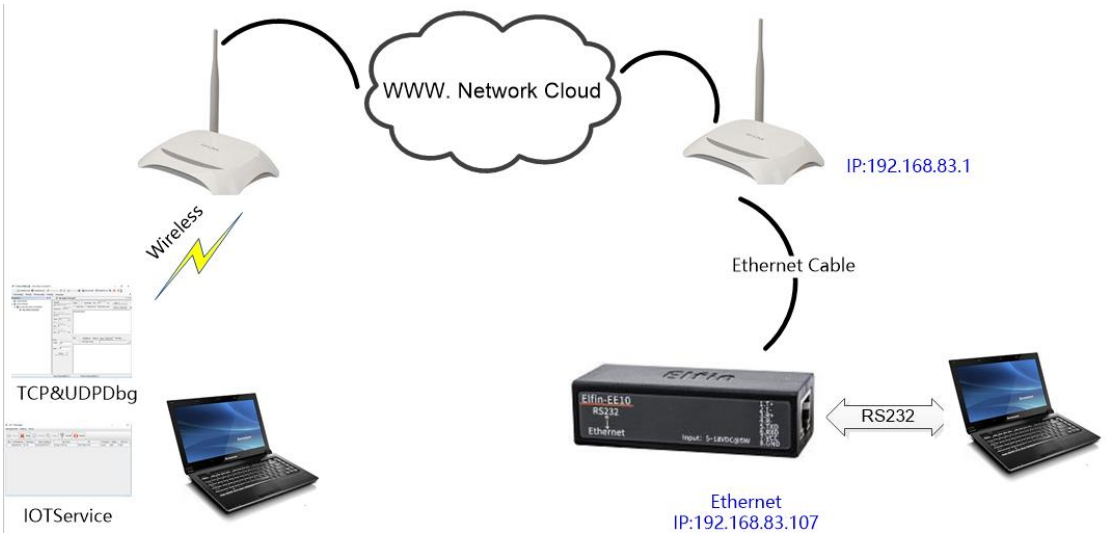


Step 3: PC create a TCP client, connect Virtual Through, set destination PC IP and port 8899, then send packet to UART.

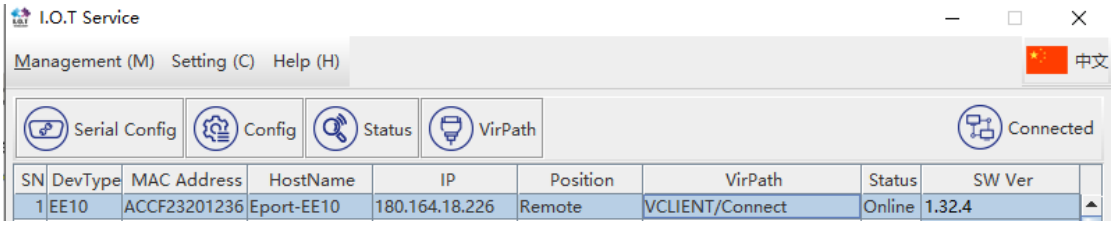


4.5.4. Virtual Through Remote Communication

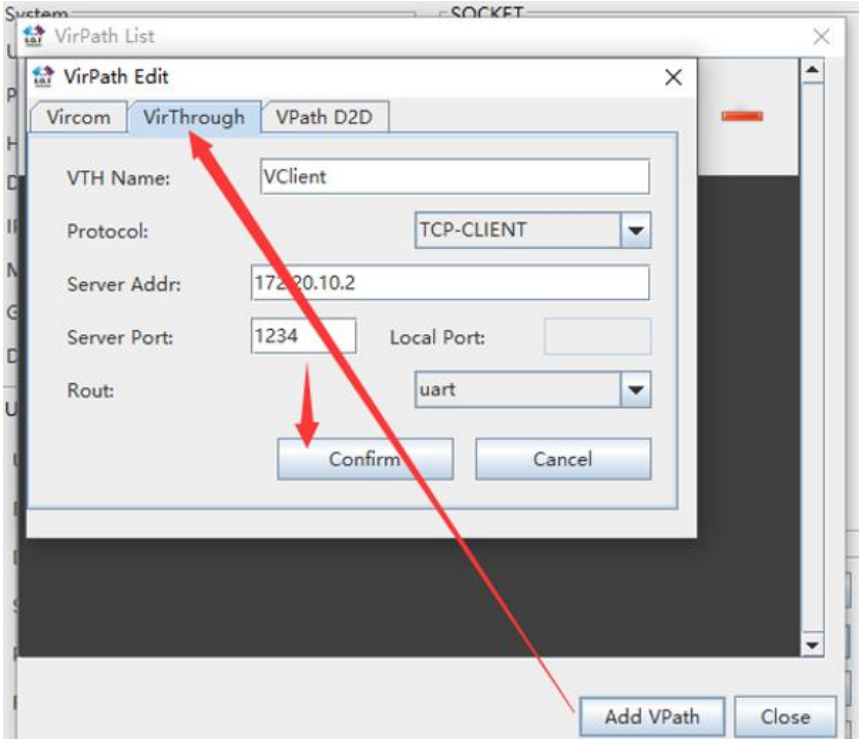
The following test case is in remote environment, the PC can create virtual through path to transfer data with remote PC.

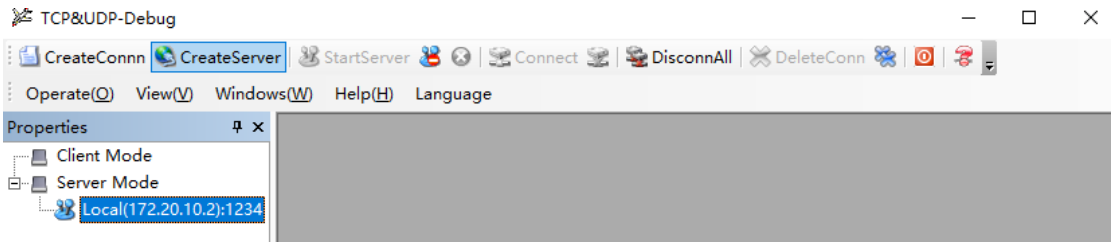


Step 1: Bound the device to IOTBrdige account.

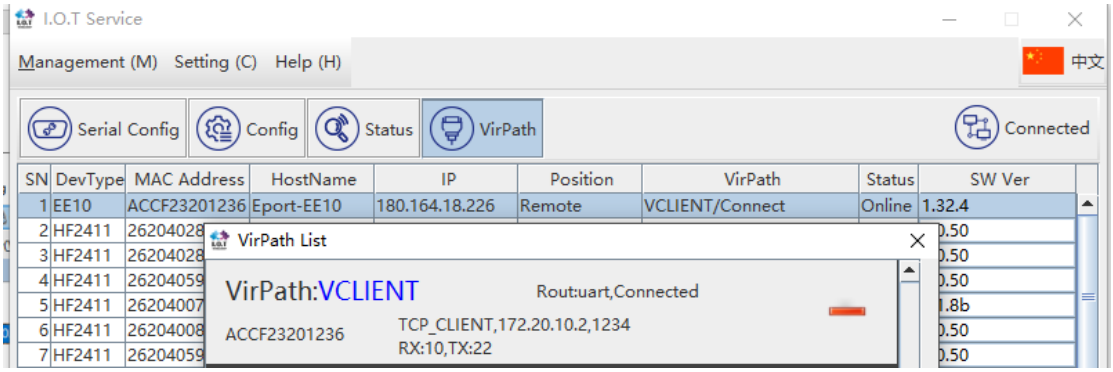


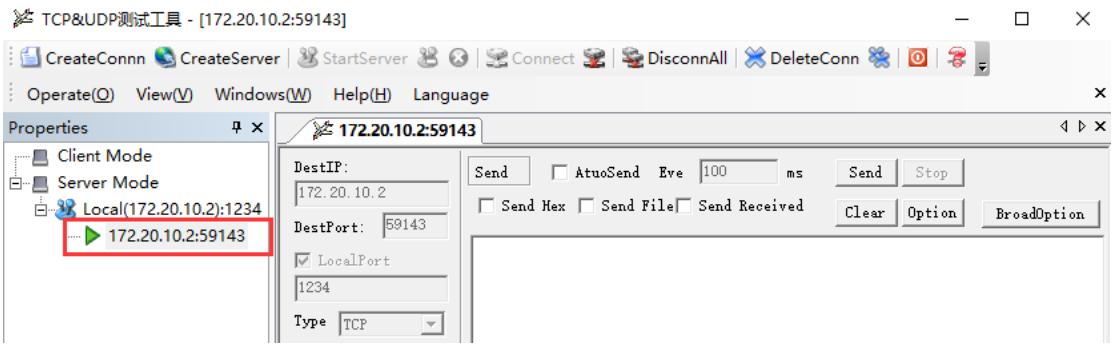
Step 2: Create the Virtual Through Path as following . Create a TCP Client and fill in the TCP Server information created by the TCP&UDP tools (PC IP 172.20.10.2 and port 1234)



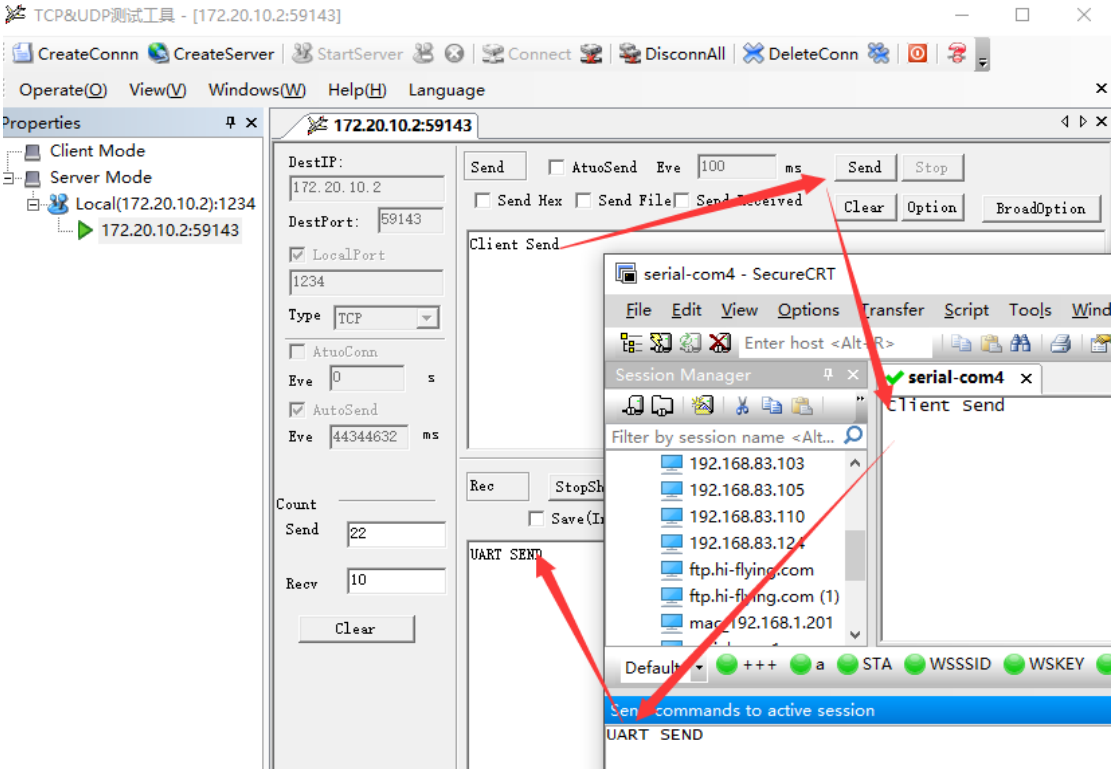


Step 3: Check Virtual Path Status.



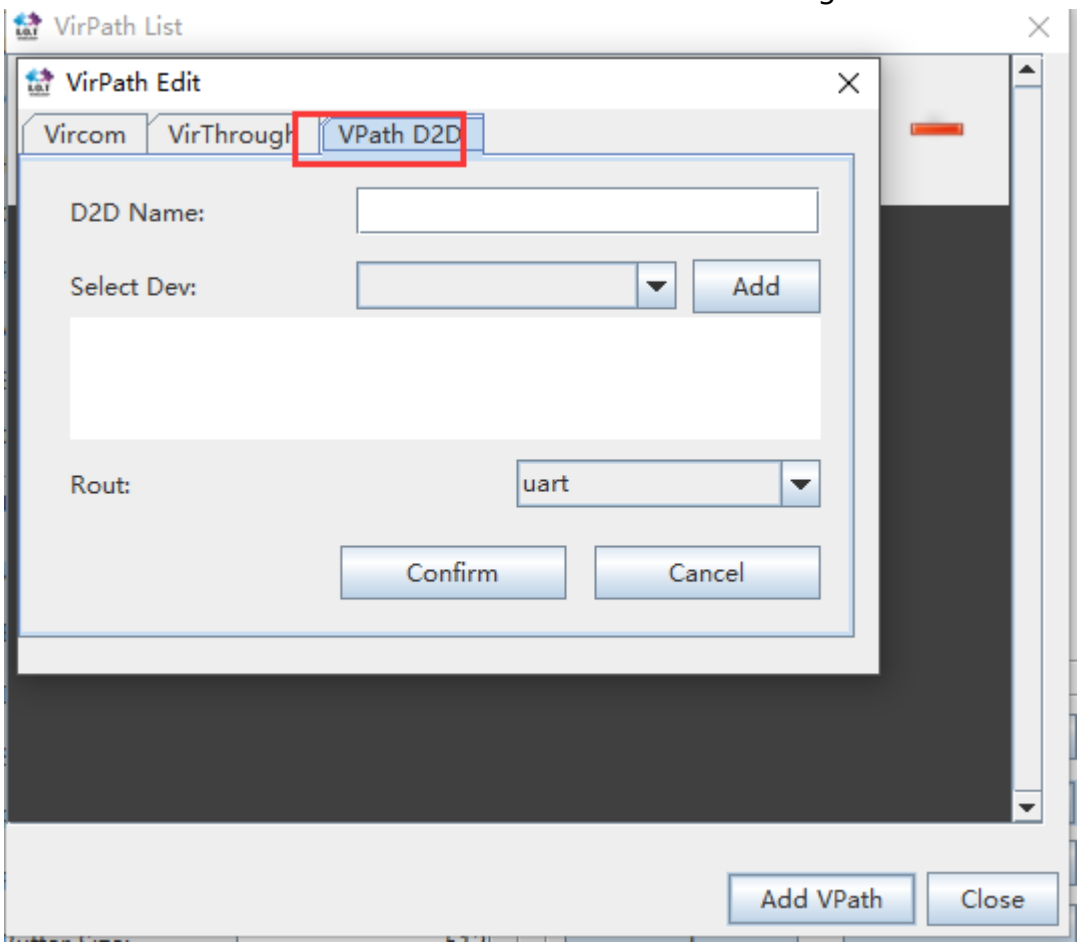


Step 4: Data transfer.



4.6. D2D Function

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

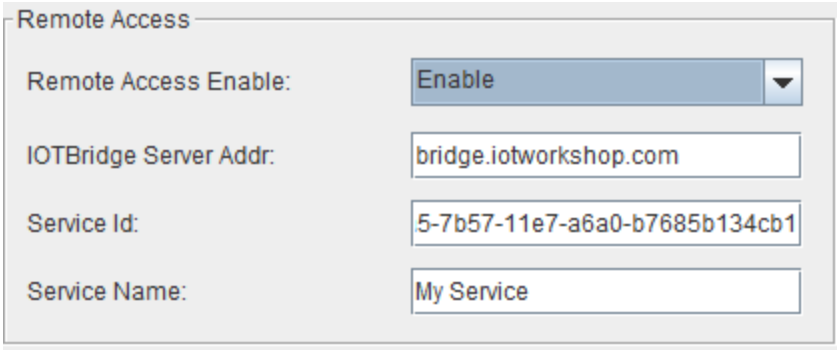


See following for this test case.

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

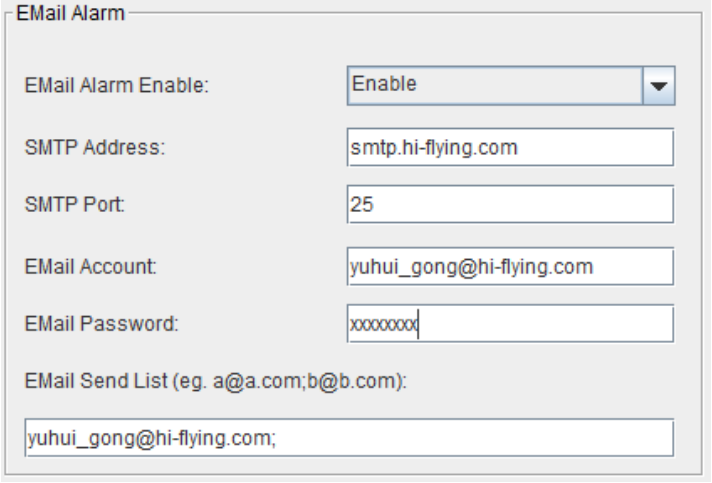
5. IOTBRIDGE ALARM FUNCTION

5.1. Set IOTBridge Parameters

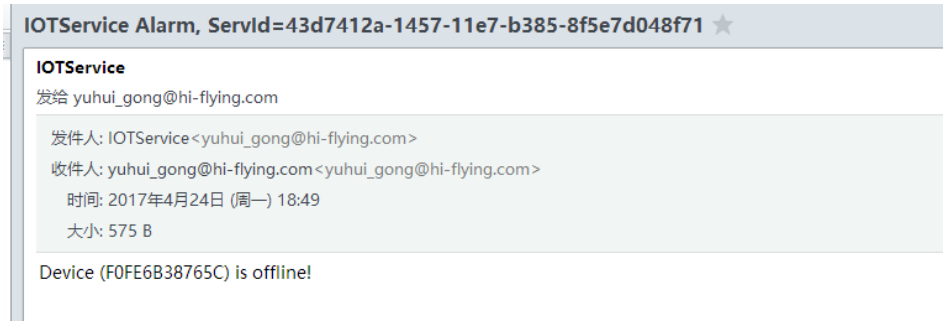


5.2. Set Mail Information

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



Example:

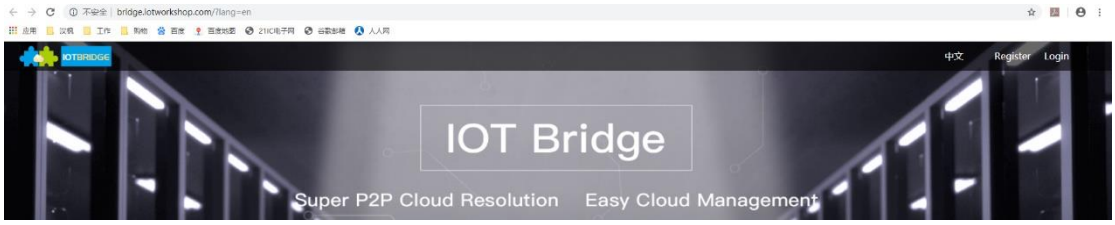


6. IOTBRIDGE CLOUD

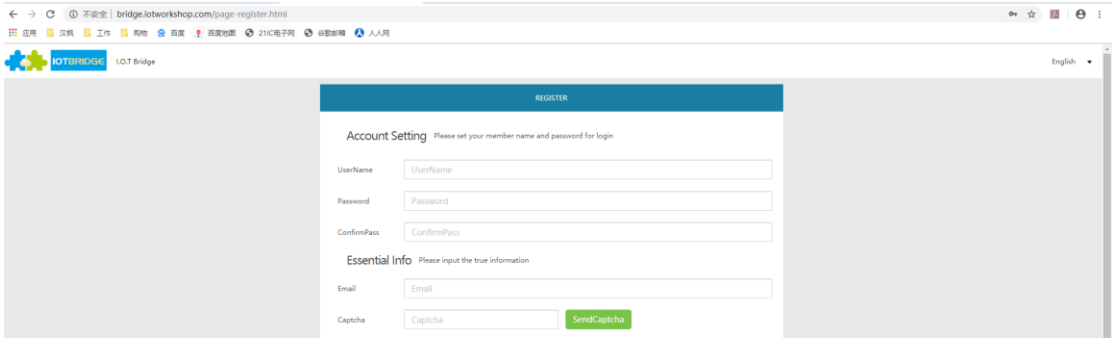
IOT Bridge cloud is for customer to check device status in its account and used for remote setting and data transfer with IOTService tools. The user guide is as following.

Step 1:Open http://www.hi-flying.com/, click Cloud to login

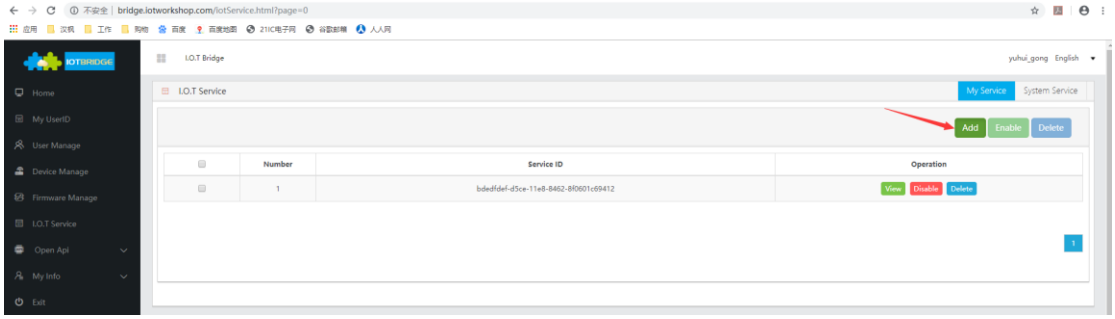
Step 2: Open I.O.T bridge and fill in the account information



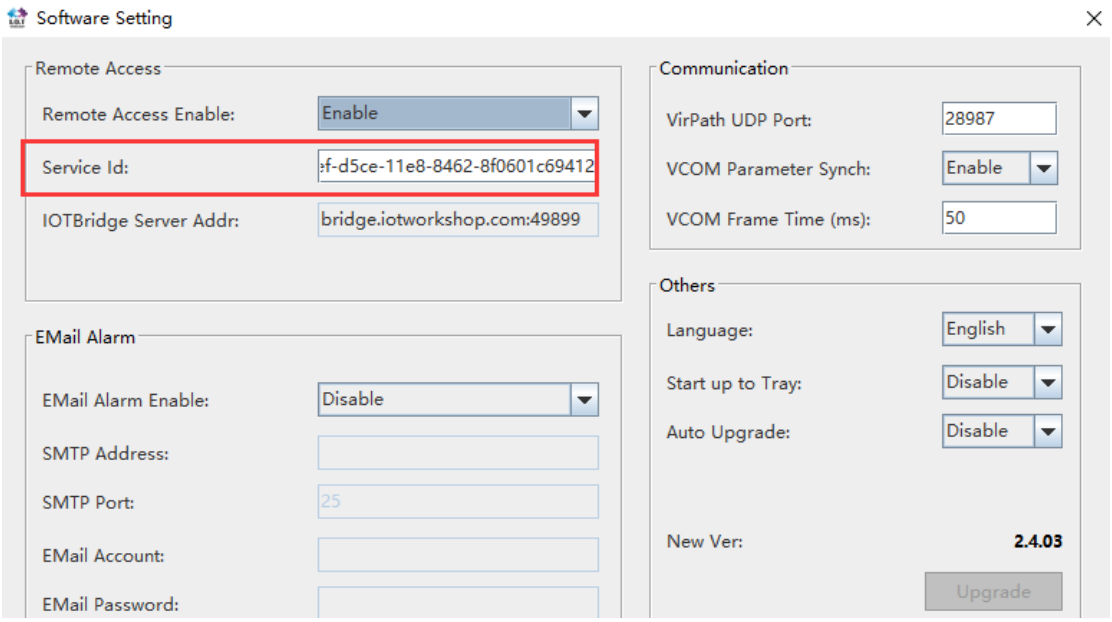
Step 3: Fill in the personal information.



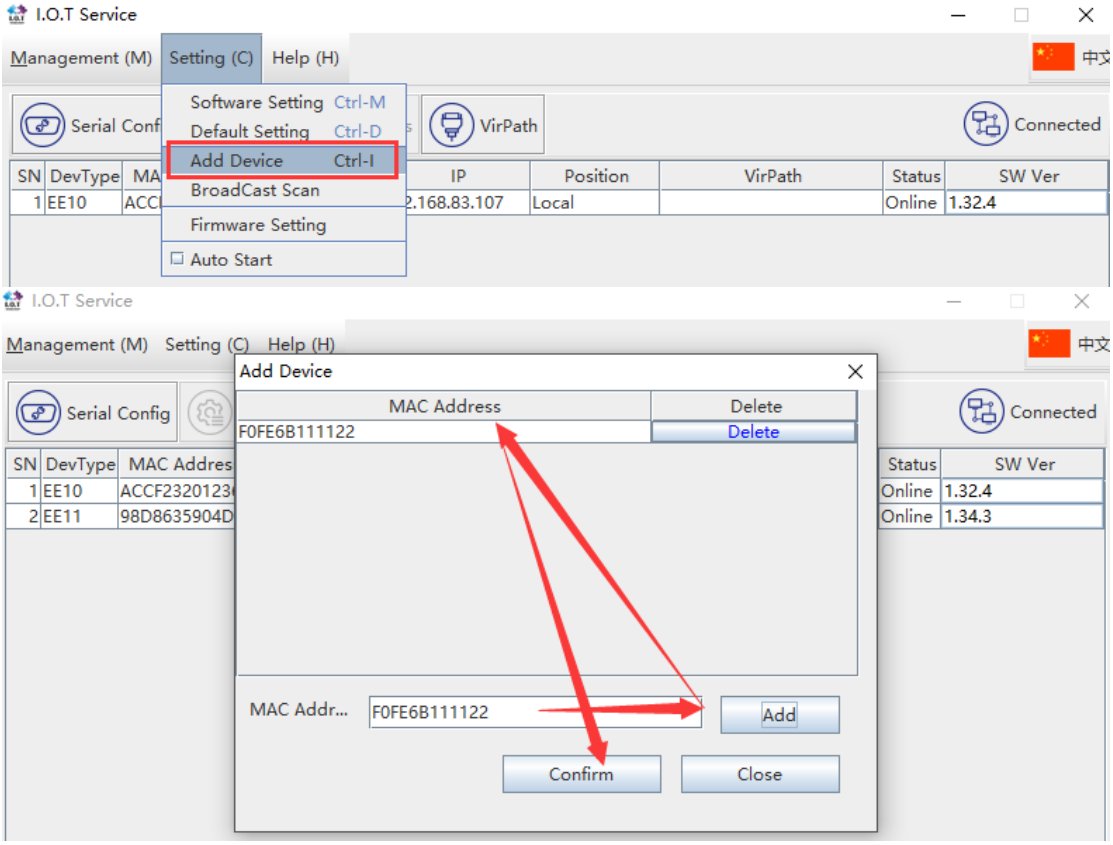
Step 4: After login, add a Service ID, this Service ID is used for IOTService tools.



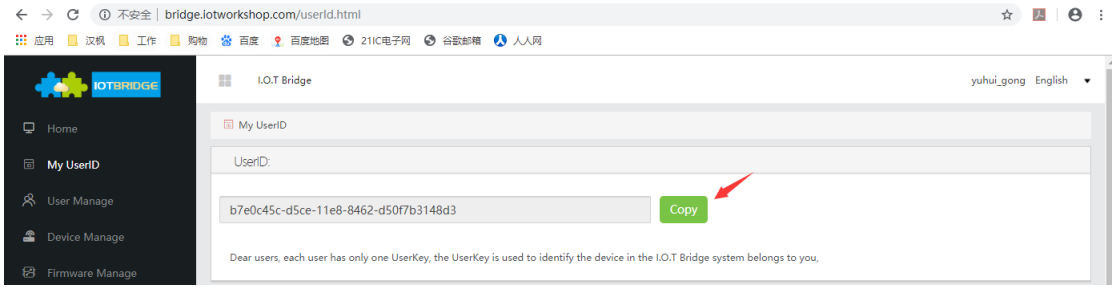
Step 5: Fill Service ID in IOTService.



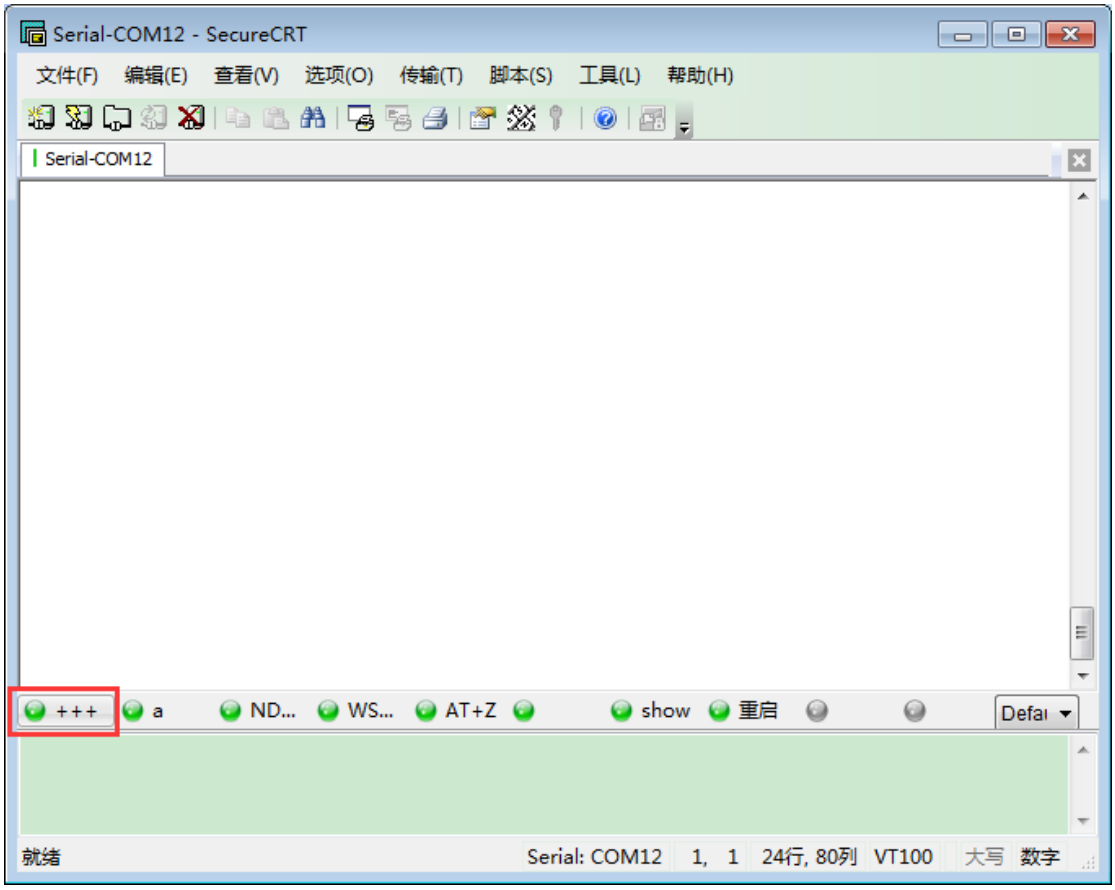
Step 6: Add device into IOTService. **The device must be online once before. If not, better to fill in the UserID at device side, it will automatically bound to account if got online.**



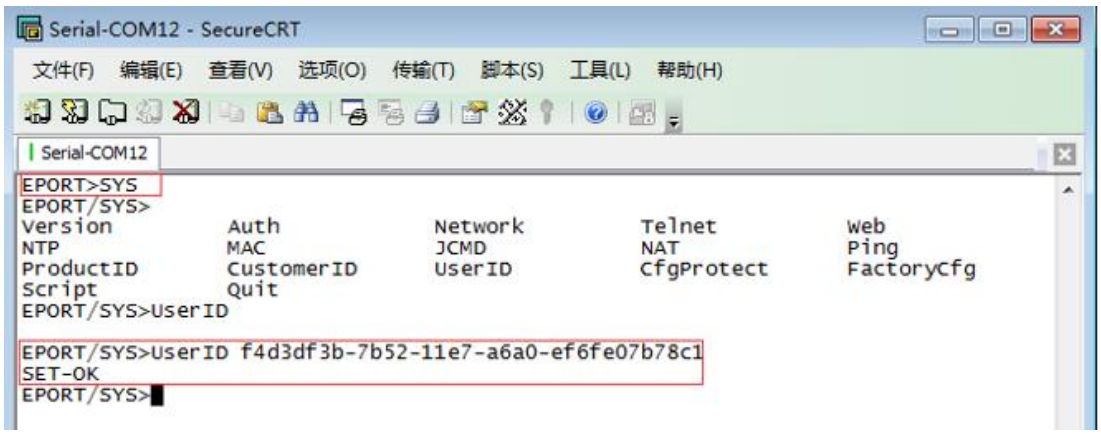
Step 7: For once online device, the device already bound to account after Step 6, UserID does not need to be written in. For mass production, better use this way to bound. Give this information to us, we can also support to write it before shipment. Copy User ID.



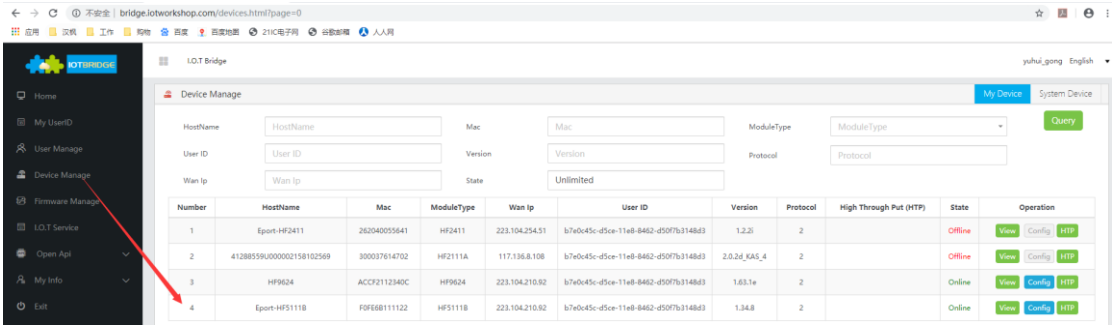
UART send "+++" to enter CLI command mode.



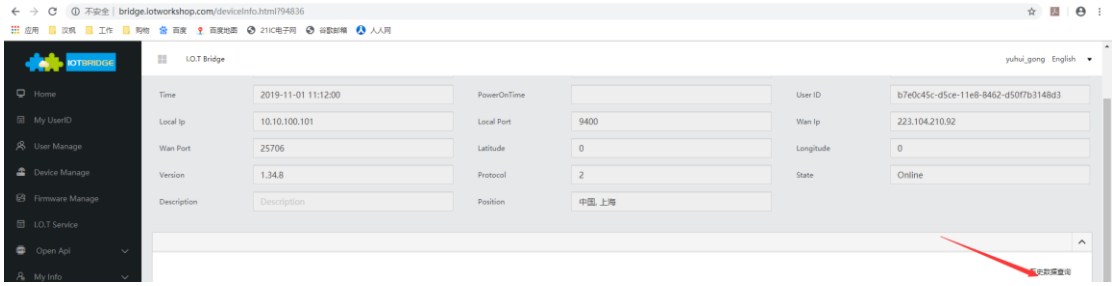
Input "SYS" to enter SYS directory, and then input UserID XXXX to fill User ID into device. (Note case sensitive)



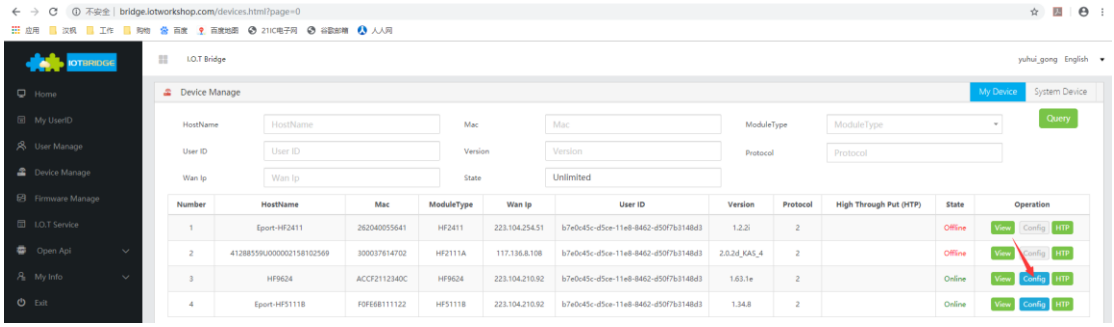
Step 8 :The device will be shown in IOTBridge website.



Click the following check device online history information

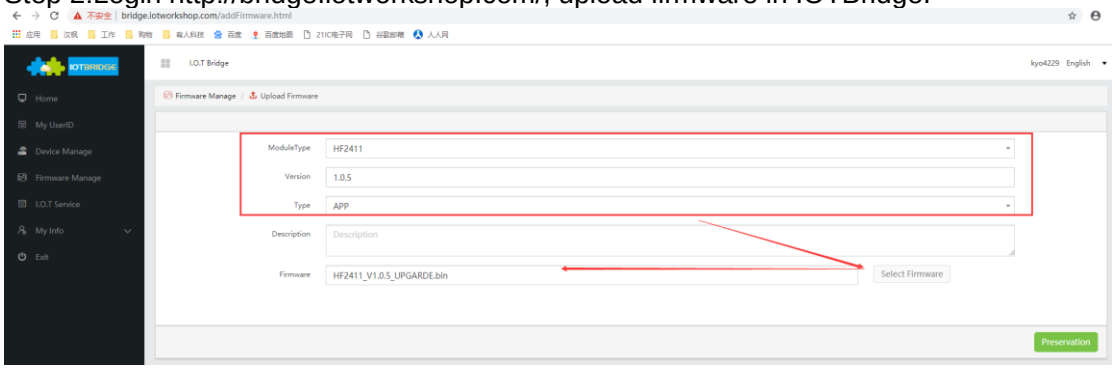


Click the Config to config device, same UI with local device webpage.

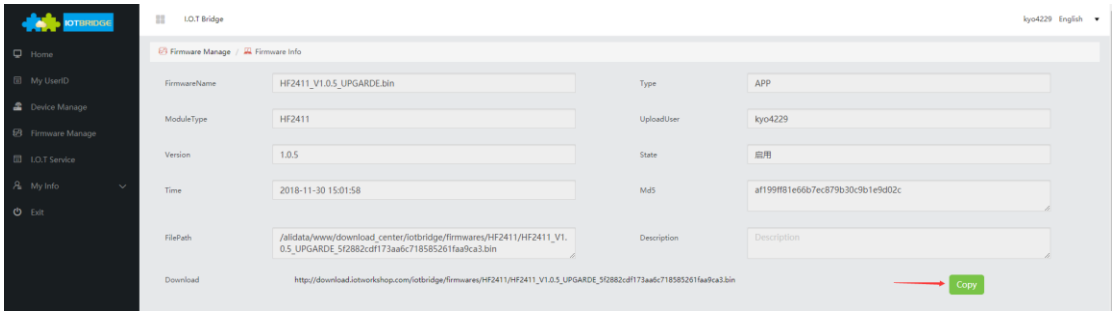


7. OTA UPGRADE

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.