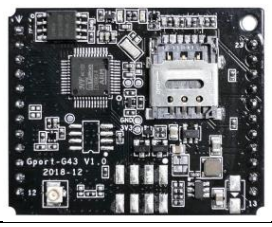
4G_2G_NB DTU Products

Operation Guide

This document is applicable for the following product, see corresponding product user manual for hardware description.

4G Products		Protoss-PG41
		Elfin-EG40 Elfin-EG41
		HF2411
		Gport-G43

2G Products		Protoss-PG11
		Elfin-EG10, Elfin-EG11
		HF2111A
		Gport-G10、 Gport-G11、 Gport-G12
NB-IoT		HF2611

1. 4G PRODUCT

The PG41/HF2411/G43/EG41 support LTE-TDD, LTE-FDD, WCDMA, TD-SCDMA, GPRS full network. 4G network support maximum download data rate 150Mbps, upload data rate 50Mbps.

The PG41/HF2411/G43/EG41 support TCPIP protocol, with its UART interface, it make traditional UART device easy connecting to IOT.

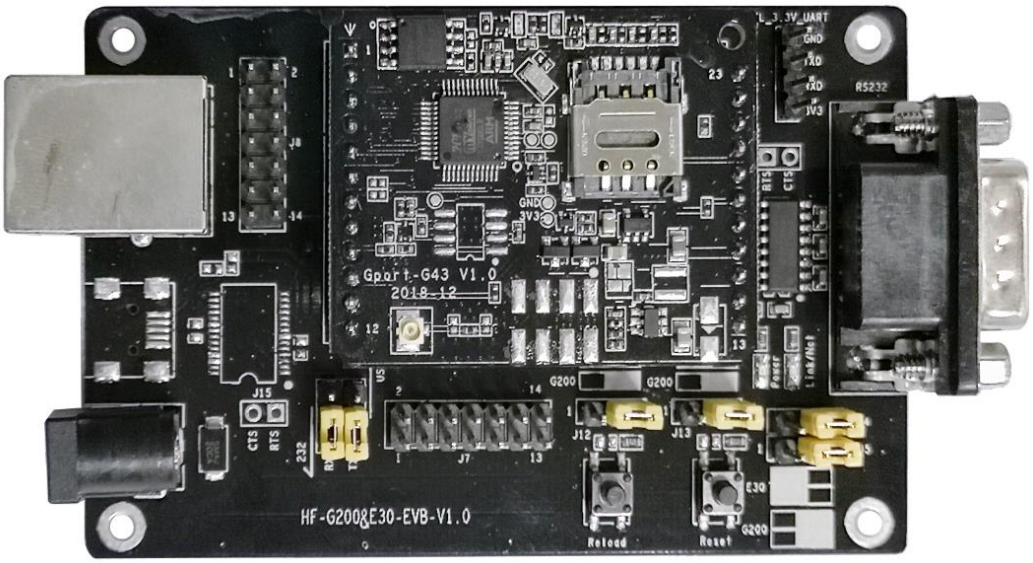
HF2611 support NB-IoT Band3/Band5/Band8.

1.1. Protoss-PG41

1.2. HF2411&HF2611

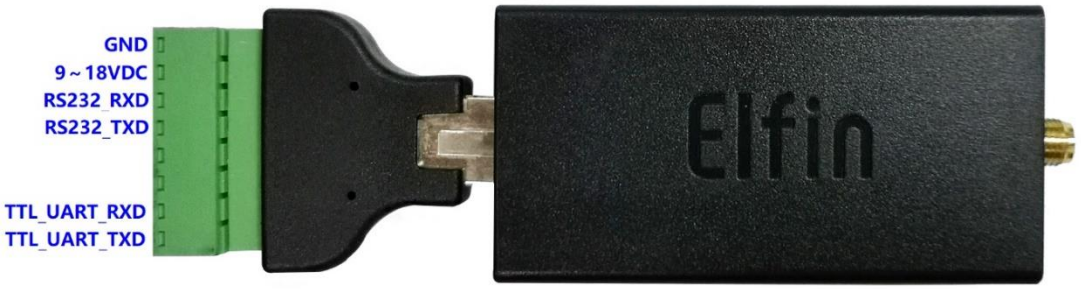
1.3. Gport-G43 EVK

Insert SIM card and use 9~12VDC adapter to power supply the EVK.



1.4. Elfin-EG40

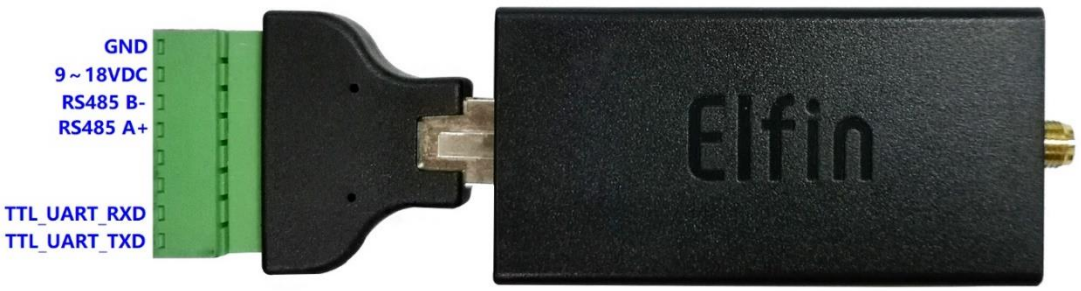
8PIN Header



4PIN Header

1.5. Elfin-EG41

8PIN Header



4PIN Header

1.6. EG40 Cable

1.7. EG41 Cable

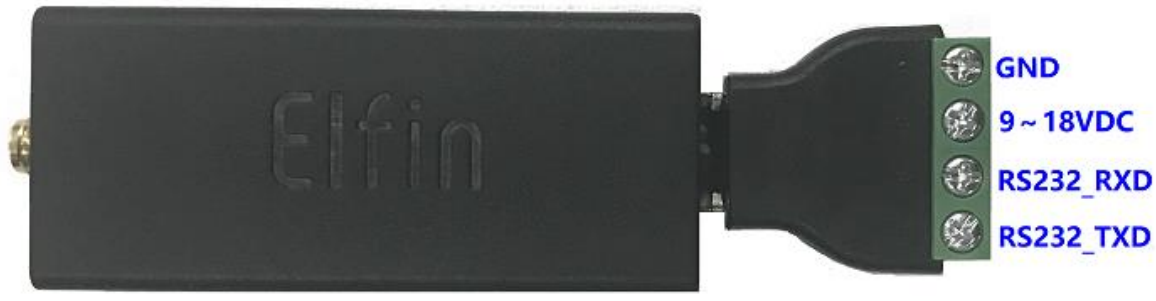
2. 2G PRODUCT

The PG11, EG1X, HF2111A, G10, G11, G12 support GPRS 2G network.

The PG11, EG1X, HF2111A use G11 for its core module.

2.1. Protoss-PG11

2.2. Elfin-EG10 4PIN Connector



2.3. Elfin-EG11 4PIN Connector

2.4. Elfin-EG10 8PIN Connector

2.5. Elfin-EG11 8PIN Connector

2.6. EG10 Interface Conversion Cable

Figure 1. Interface Conversion Cable

2.7. EG11 Interface Conversion Cable

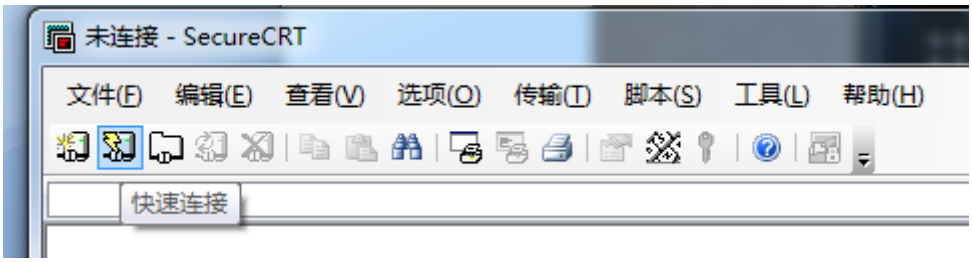
Figure 2. Interface Conversion Cable

3. SERIAL SETTING

3.1. Serial Tool SecureCRT

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

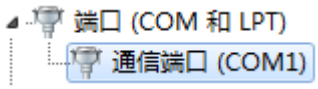
Decompress file and find executable program, then open. Click quick start button  to create connection.



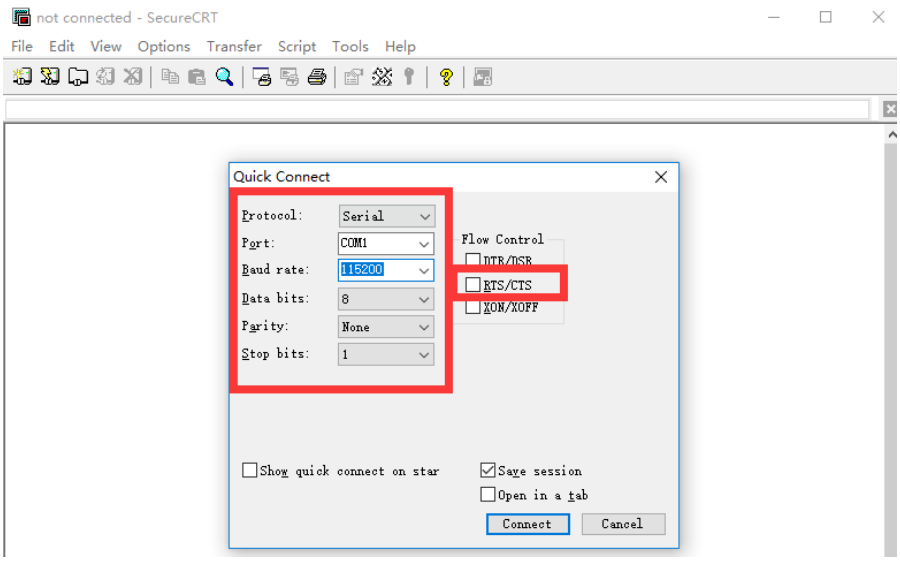
3.2. Configure Serial Parameter

Protocol: Serial

Port: Actual connection port(search by “My PC”->”Device Manager”->”Port(COM and LPT)”. As figure:



)



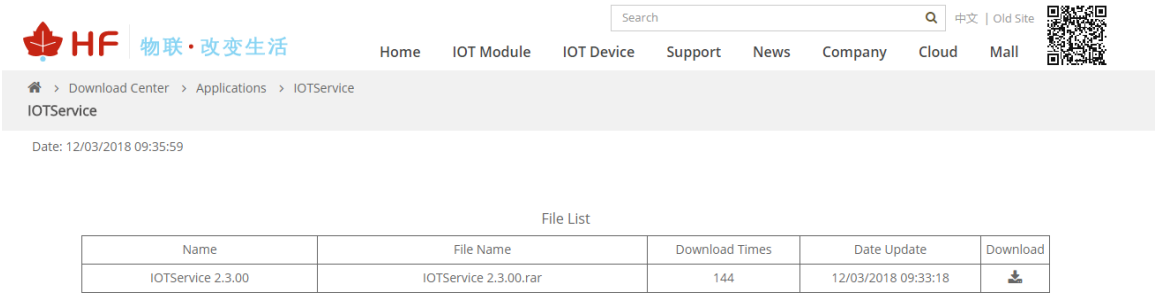
Notes: The default serial data is as above and user can modify device working parameter by IOTService.

4. TEST EXAMPLE

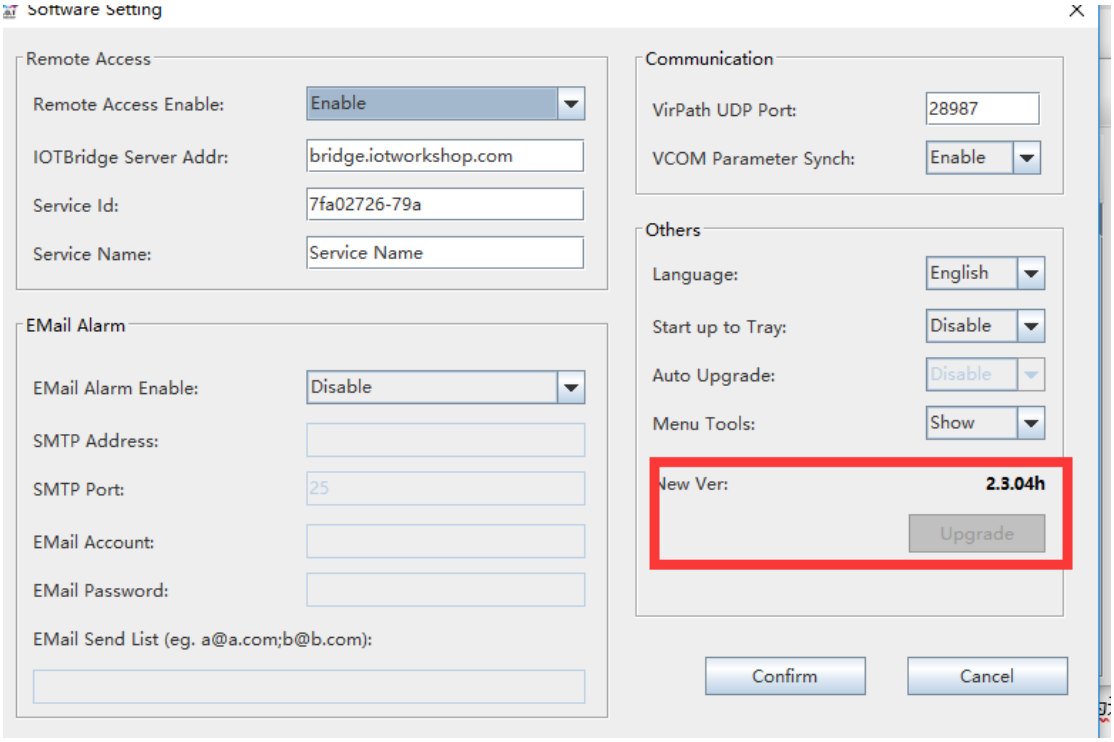
4.1. IOTService Tools

IOTService is used for config the module parameters by UART or remotely. Make module easy to use and check status. The download address is as following.

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

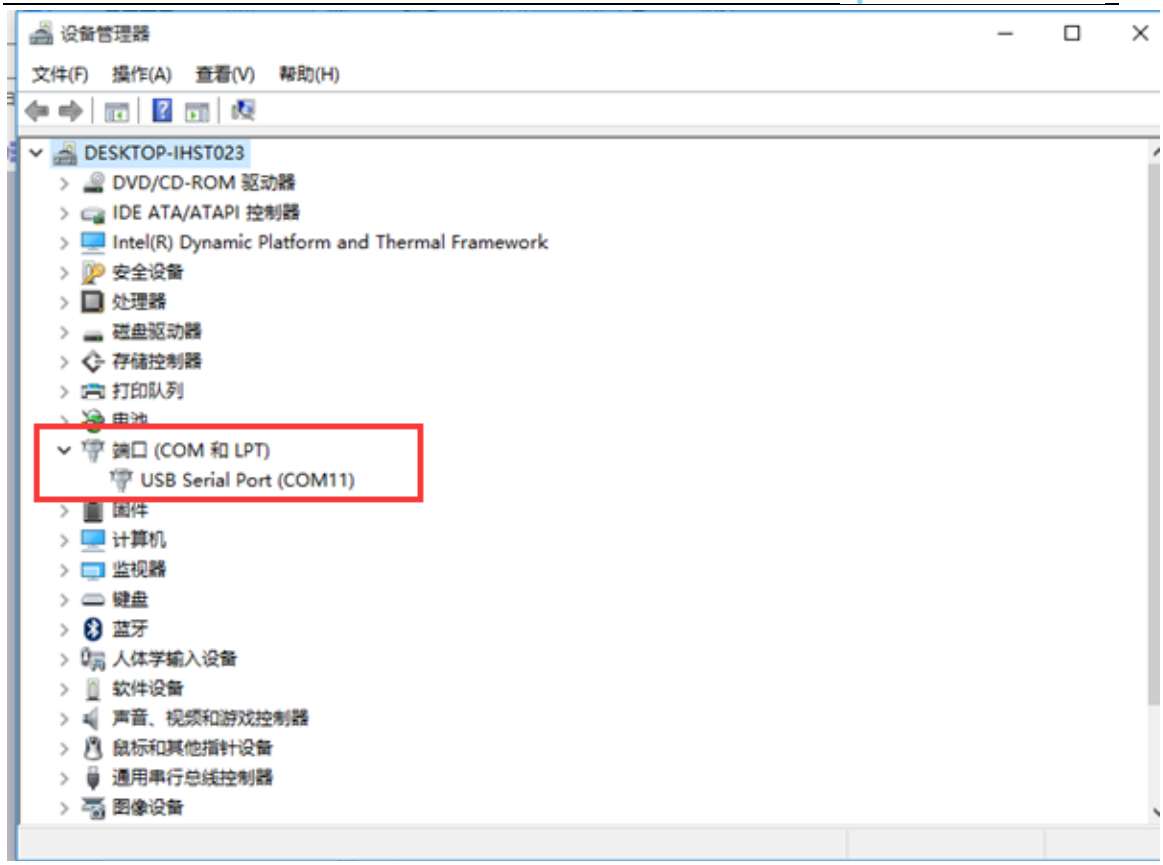


After download, click the following to update to latest version.

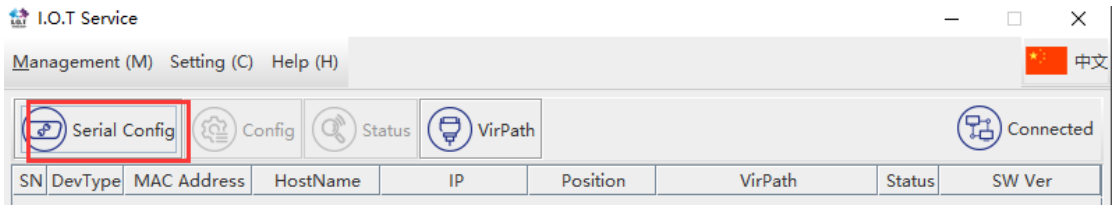


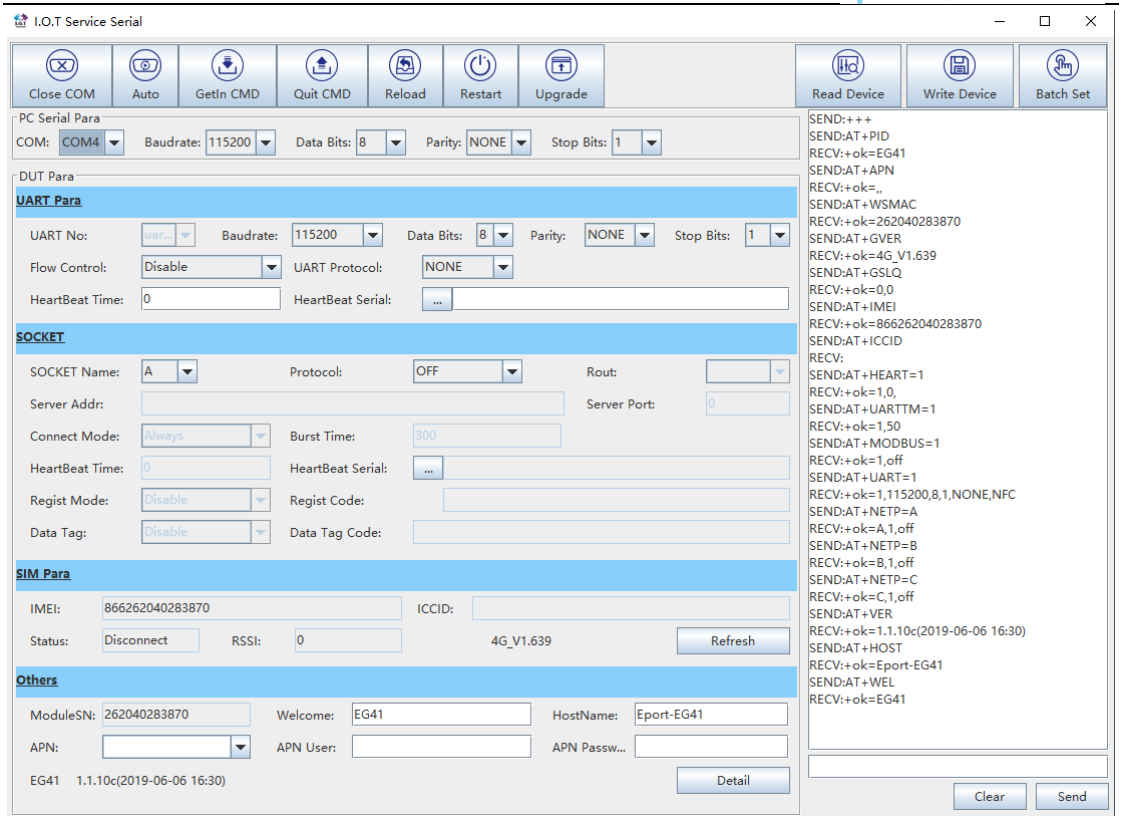
4.2. IOTService Introduction

Step1: PC connect to device UART. Note that RS232/RS485/TTL UART is different.



Step 2: Open IOTService UART tools





Main Menu:

Auto: Auto detect device UART parameters.

GetIn CMD: Enter AT command mode.

Quit CMD: Quit AT command mode.

Reload: Reload product, restore parameters to default.

Restart: Reset product

Upgrade: Upgrade product.

Read Device: Read product parameters.

Write Device: Write modified product parameters

Batch Set: For massproduction parameters setting.

UART Information:

UART No: UART number, for multiple UART product.

UART Protoco: UART protocol, Modbus TCP to RTU function.

HeartBeat Time: UART HeartBeat time

HeartBeat Serial: UART HeartBeat content.

Socket Function:

SOCKET Name: Socket name, choose A/B/C.

Protocol: Protocol, TCP/UDP/HTTP

Connect Mode: short or long connection.

Burst Time: When in long connection ,it is AT+TCPTO reconnection time. When for short conection, it is connection keep time.

Rout: UART channel

HeartBeat Time: HeartBeat time

HeartBeat Serial: HeartBeat content, support wildcard character.

Regist Mode: Register Mode

Regist Code: Register Content, support wildcard character.

Data Tag: Used for multiple data socket distinguishing.

SIM Information:

IMEI: Product IMEI

ICCID: Product ICCID

State: Product GPRS Status

RSSI: Product GPRS signal strength

Others:

Module SN: Product MAC

Welcome: Bootup information.

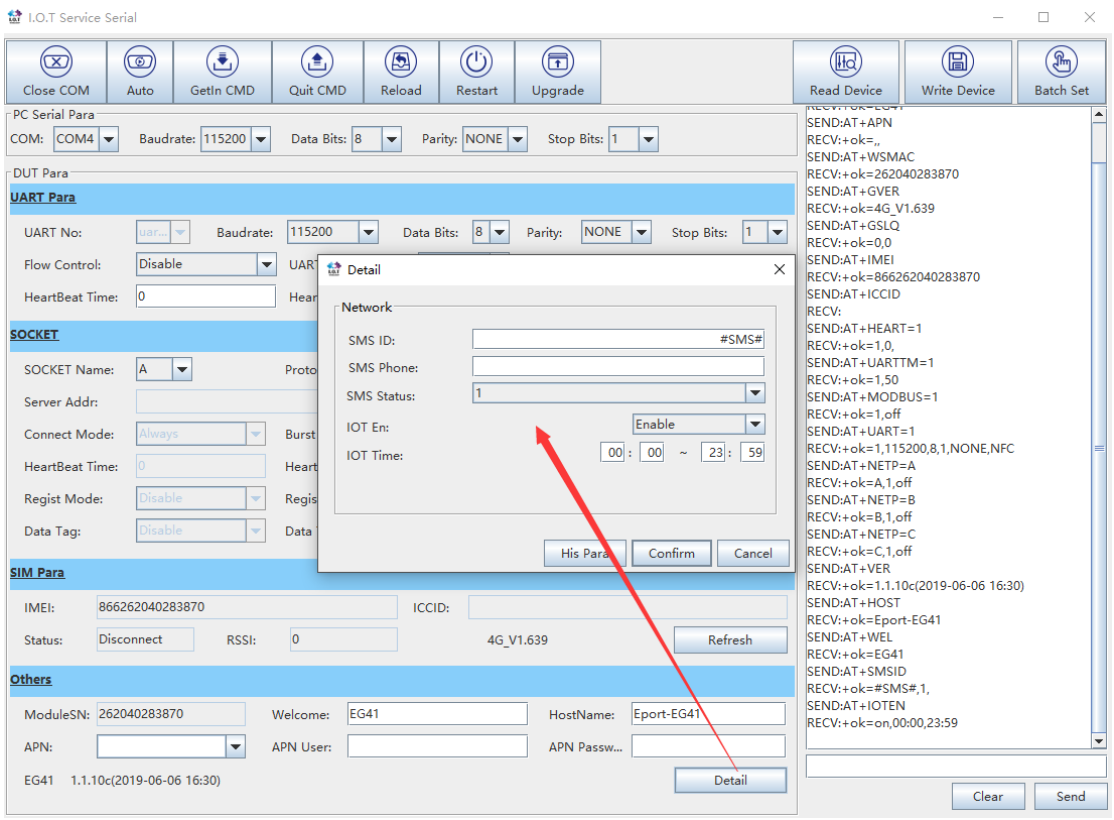
HostName: Product name shown in IOTBridge.

Detail:

SMS: Short message function.

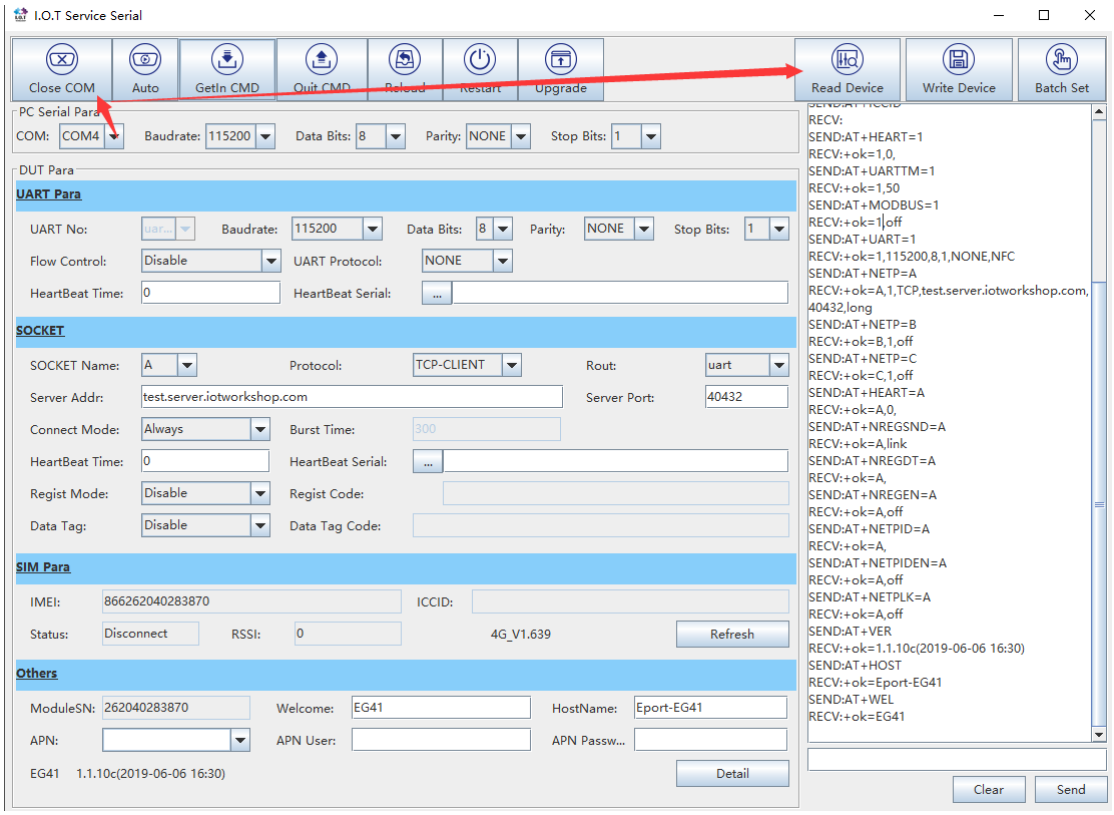
IOT En: Enable/Disable IOTBridge.

IOT Time: IOTBridge Enable time. Save data flow


I.O.T Service Serial
Close COM
Auto
GetIn CMD
Quit CMD
Reload
Restart
Upgrade
Read Device
Write Device
Batch Set
PC Serial Para
COM: COM4
Baudrate: 115200
Data Bits: 8
Parity: NONE
Stop Bits: 1
DUT Para
UART Para
UART No:
Baudrate: 115200
Data Bits: 8
Parity: NONE
Stop Bits: 1
Flow Control: Disable
HeartBeat Time: 0
SOCKET
SOCKET Name: A
Server Addr:
Connect Mode: Always
HeartBeat Time: 0
Regist Mode: Disable
Data Tag: Disable
SIM Para
IMEI: 866262040283870
ICCID:
Status: Disconnect
RSSI: 0
4G_V1.639
Refresh
Others
ModuleSN: 262040283870
Welcome: EG41
HostName: Eport-EG41
APN:
APN User:
APN Passw...
EG41 1.1.10c(2019-06-06 16:30)
Detail
Detail
Network
SMS ID: #SMS#
SMS Phone:
SMS Status: 1
IOT En: Enable
IOT Time: 00 : 00 ~ 23 : 59
His Para
Confirm
Cancel
SEND:AT+APN
RECV:+ok=,,
SEND:AT+WSMAC
RECV:+ok=262040283870
SEND:AT+GVER
RECV:+ok=4G_V1.639
SEND:AT+GSLQ
RECV:+ok=0,0
SEND:AT+IMEI
RECV:+ok=866262040283870
SEND:AT+ICCID
RECV:
SEND:AT+HEART=1
RECV:+ok=1,0,
SEND:AT+UARTTM=1
RECV:+ok=1,50
SEND:AT+MODBUS=1
RECV:+ok=1,off
SEND:AT+UART=1
RECV:+ok=1,115200,8,1,NONE,NFC
SEND:AT+NETP=A
RECV:+ok=A,1,off
SEND:AT+NETP=B
RECV:+ok=B,1,off
SEND:AT+NETP=C
RECV:+ok=C,1,off
SEND:AT+VER
RECV:+ok=1.1.10c(2019-06-06 16:30)
SEND:AT+HOST
RECV:+ok=Eport-EG41
SEND:AT+WEL
RECV:+ok=EG41
SEND:AT+SMSID
RECV:+ok=#SMS#,1,
SEND:AT+IOTEN
RECV:+ok=on,00:00,23:59
Clear
Send

4.3. Test Case One: IOTService UART Config

Step 1: Open UART and do as following to read product parameters.

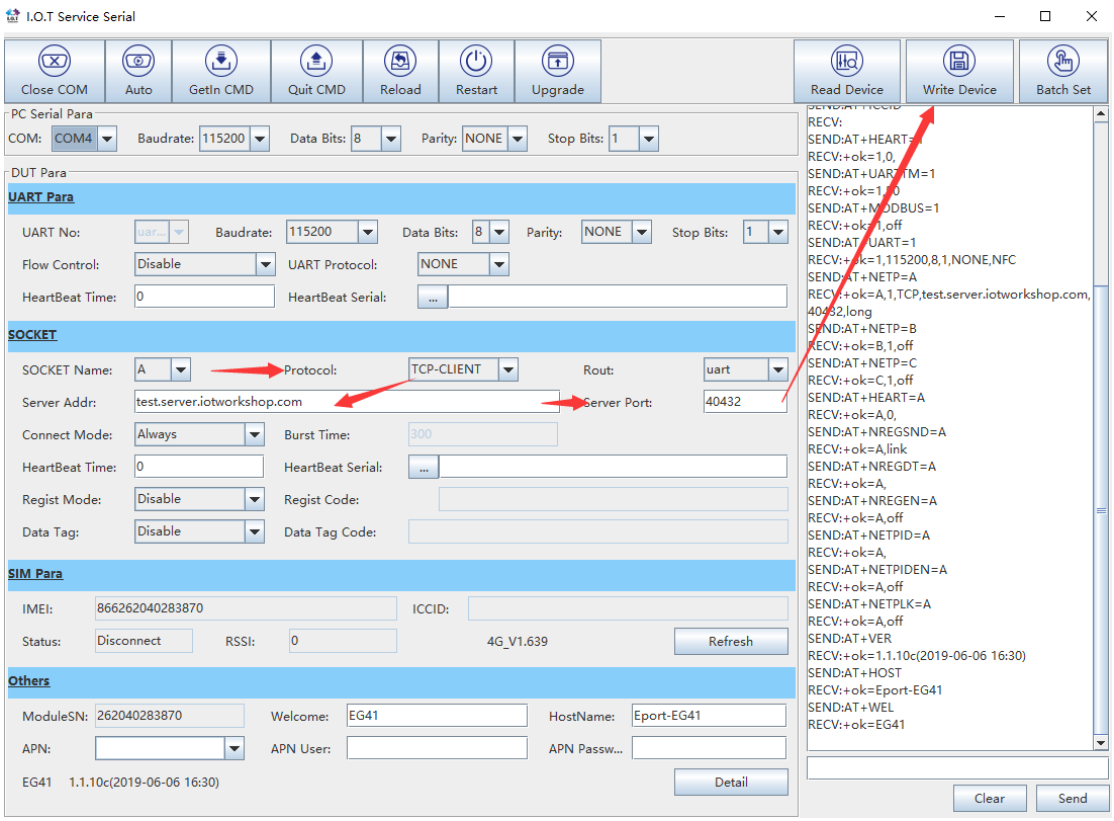


Step 2: The tools show the module parameters. Click 【Write Device】to change parameter. The following set Socket A to our test server. and reboot

Test Server: test.server.iotworkshop.com

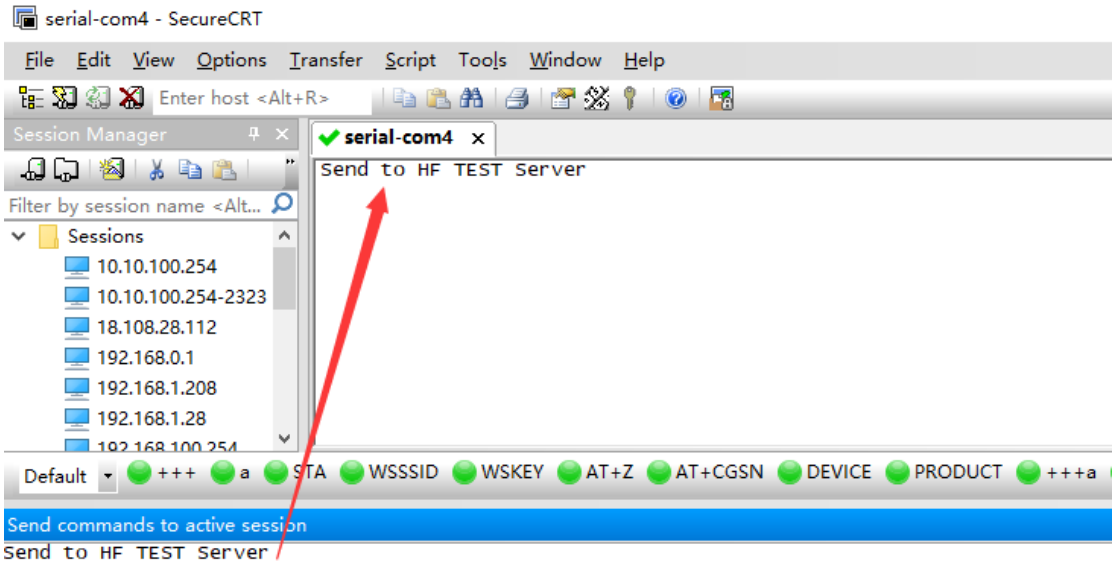
TCP Port: 40432

UDP Port: 40431



Note: Default UART is 115200,8,N,1.

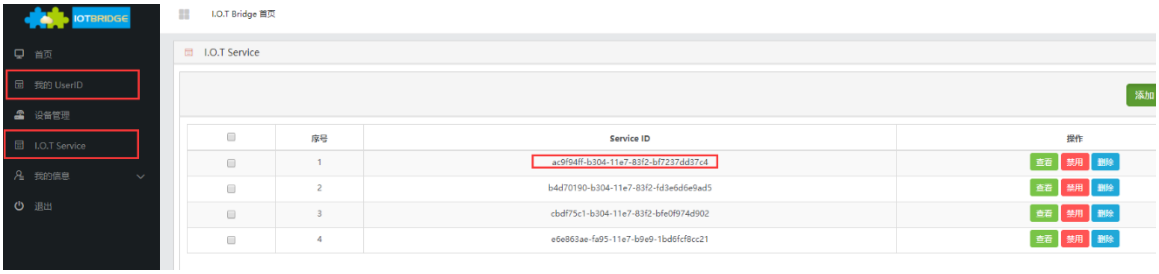
Step 3: Wait for network connection OK, then send UART data, the server will response the received data. The product is in throughput mode by power on, if want to send AT command, need to send “+++” and then “a” to enter command mode, AT+ENTM to change back throughput mod.e.



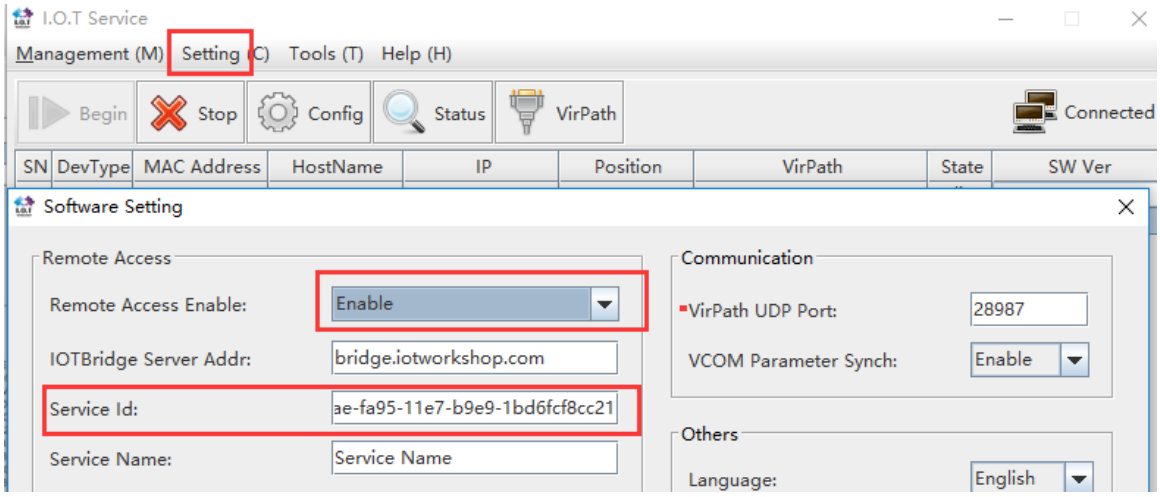
4.4. Test Case Two: IOTService Network Config

Step 1: Login IOTBridge(http: //bridge.iotworkshop.com/) to register account.

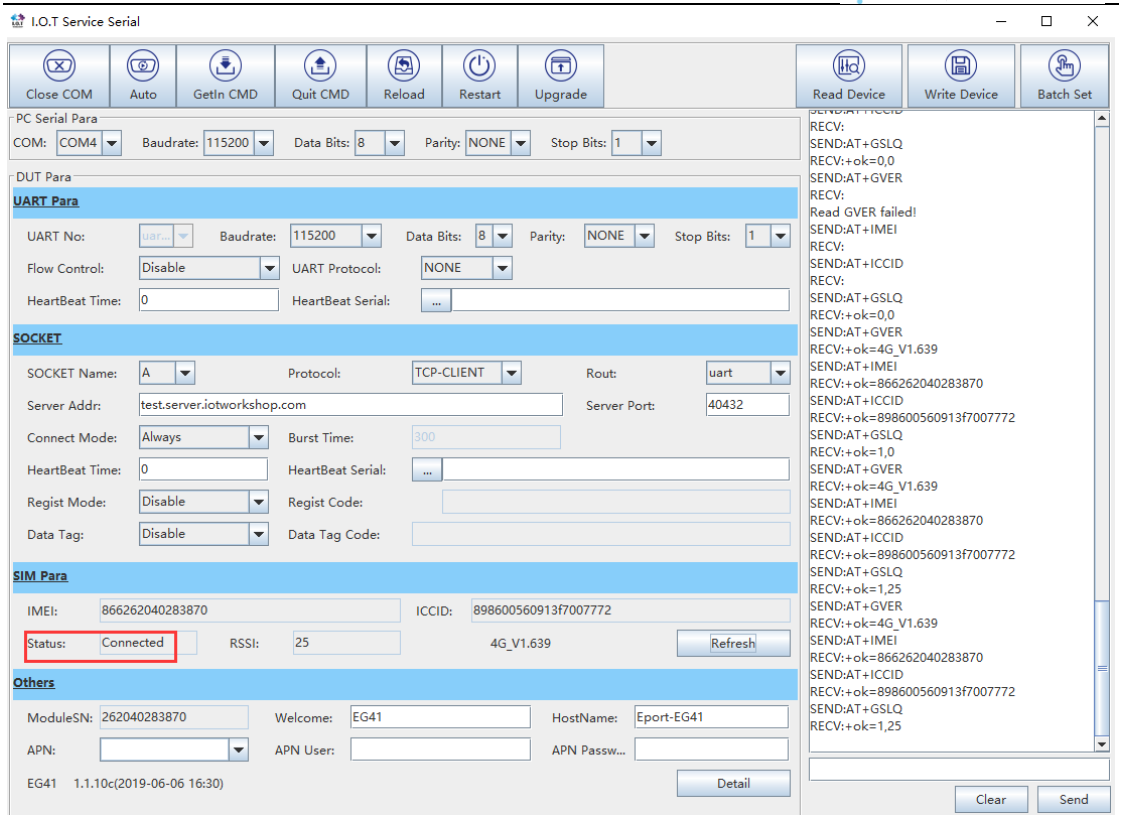
Step 2: Get UserId(device side)and ServiceId(IOTService side)



Step 3: Input ServiceId in IOTService.

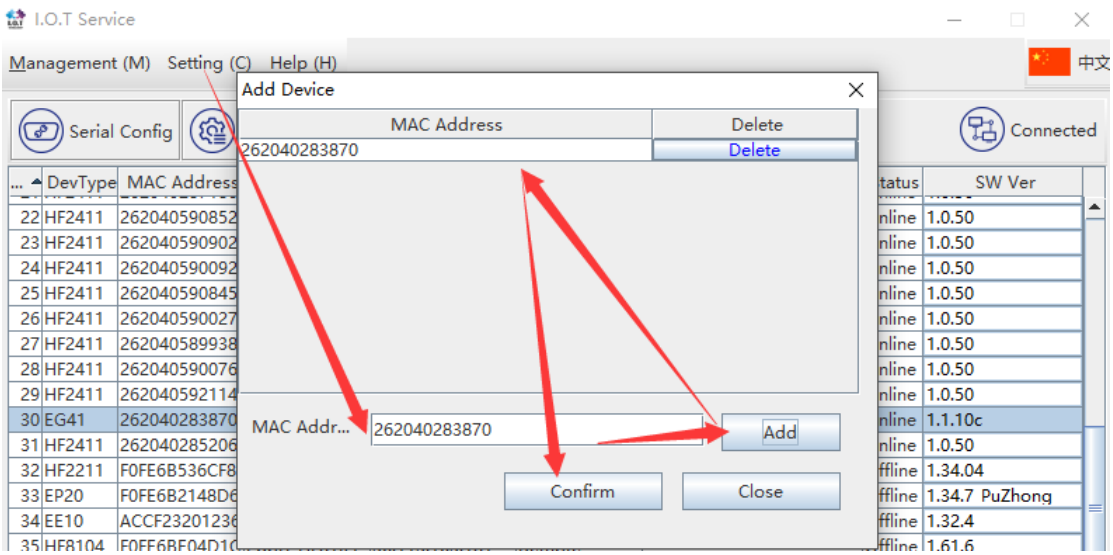


Step 4: Insert SIM card and power on device, wait for device connects to network. The UART tools also shows the network status.

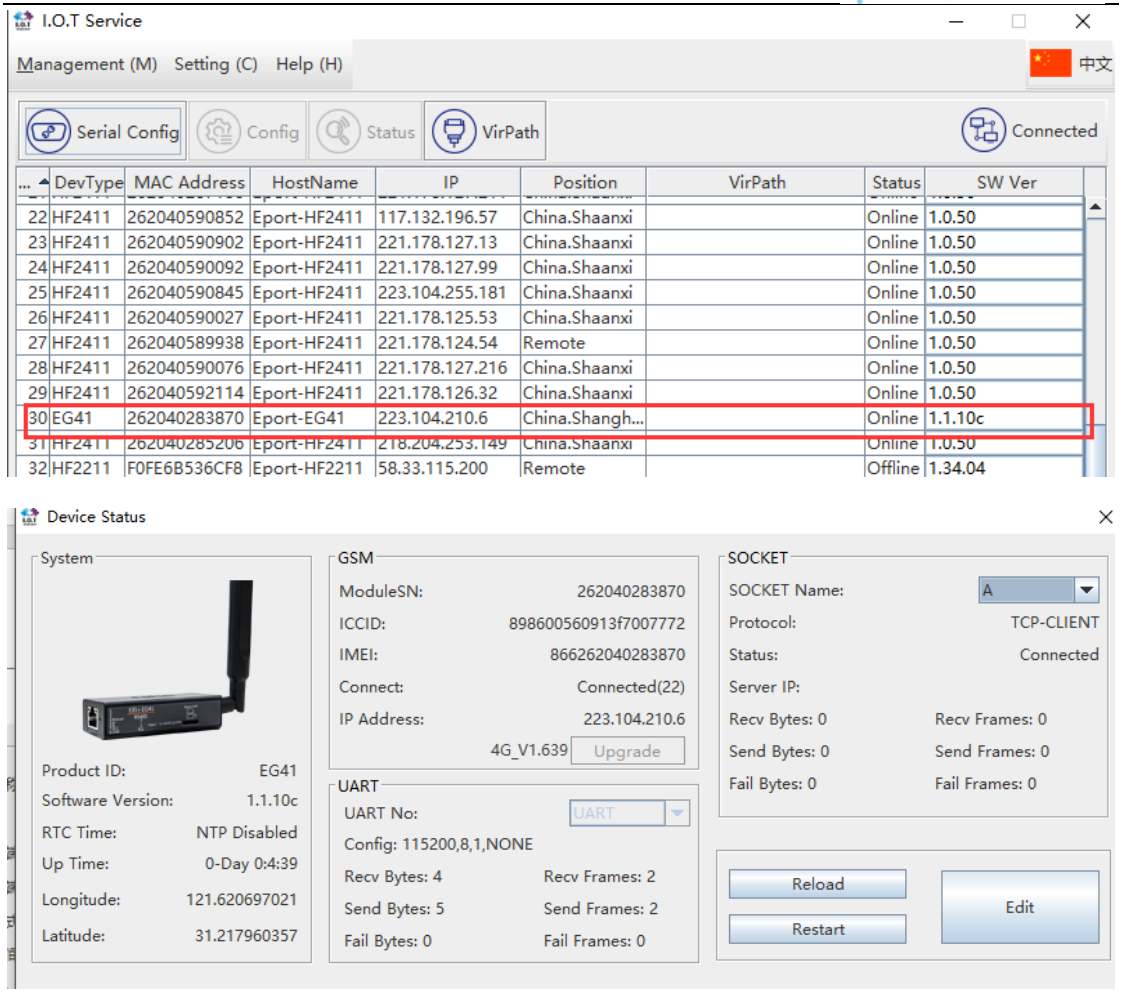


Step 5: Add MAC in the tools to bound account. (AT+WSMAC to get MAC address, usually it is the latter 12 character of the IMEI), recommend to use AT+IOTUID command to write UserId into the device. Prevent bounded by the other vicious customer.

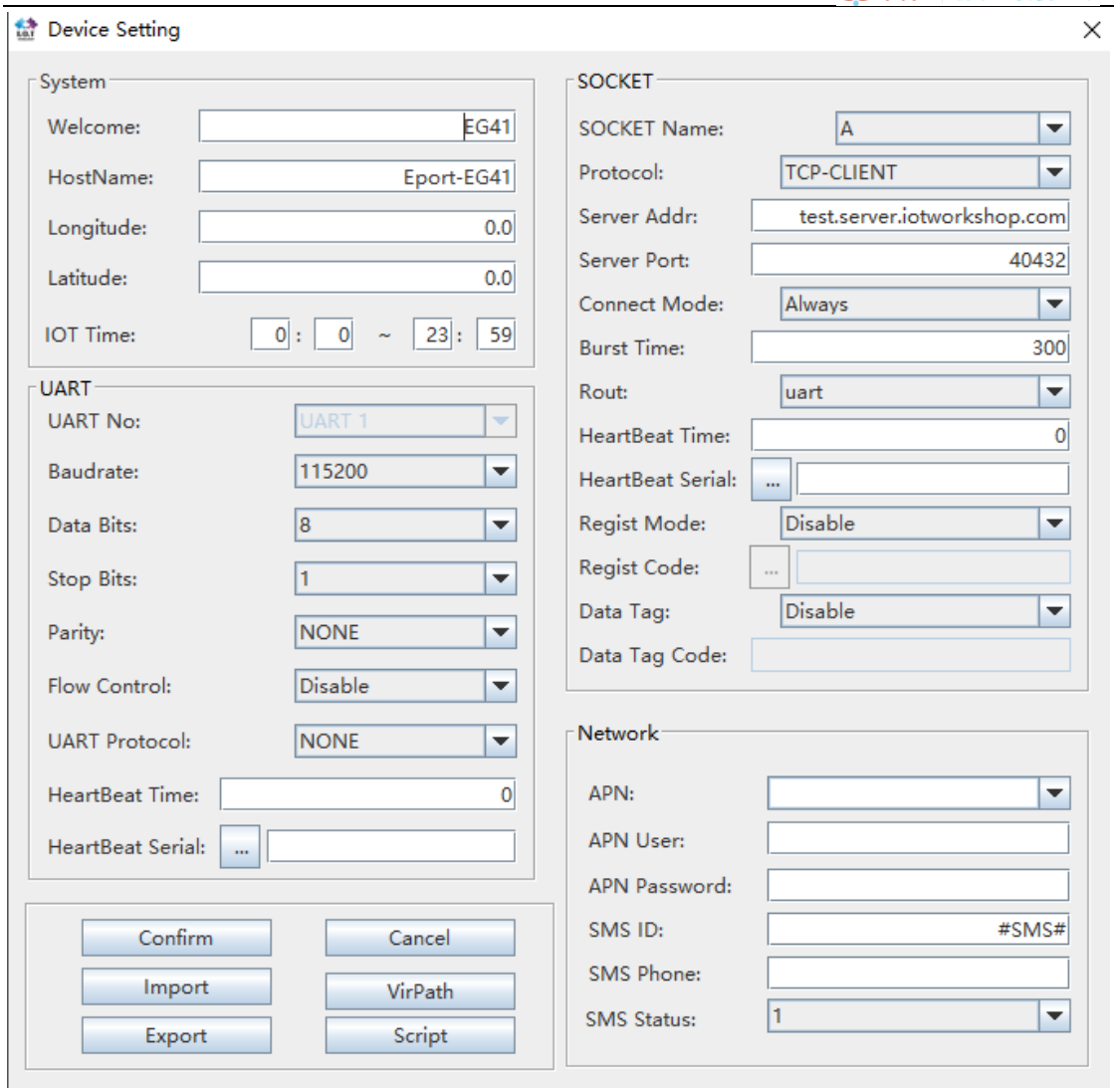
Note:HF2611 only enable the IOTBridge remote device management function at 10:00 to 10:30 in order to save data flow. Other products enable all day by default. This time can be changed via IOTService UART config.



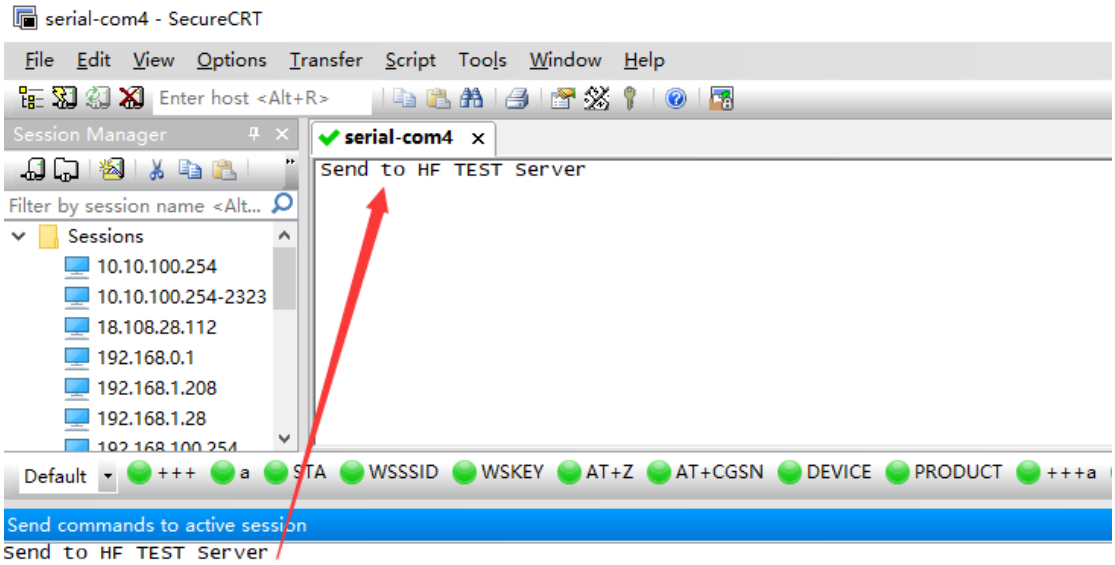
Step 6: Double click device entering the config page.



Step 7: Can modify the parameters.

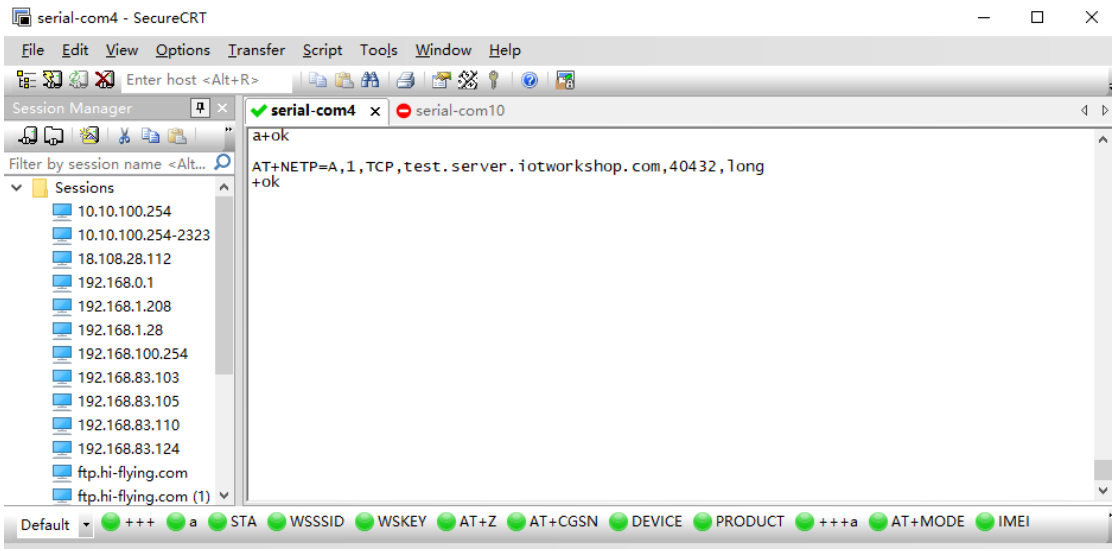


Step 8: Use our test server to check device function.



4.5. Test Case Three: Throughput Via SecureCRT

Step 1: Open SecureCRT(Baudrate default:115200)，Input “+++” (device will response with “a”)and then “a” (device will response with “+ok”) to enter AT command mode.

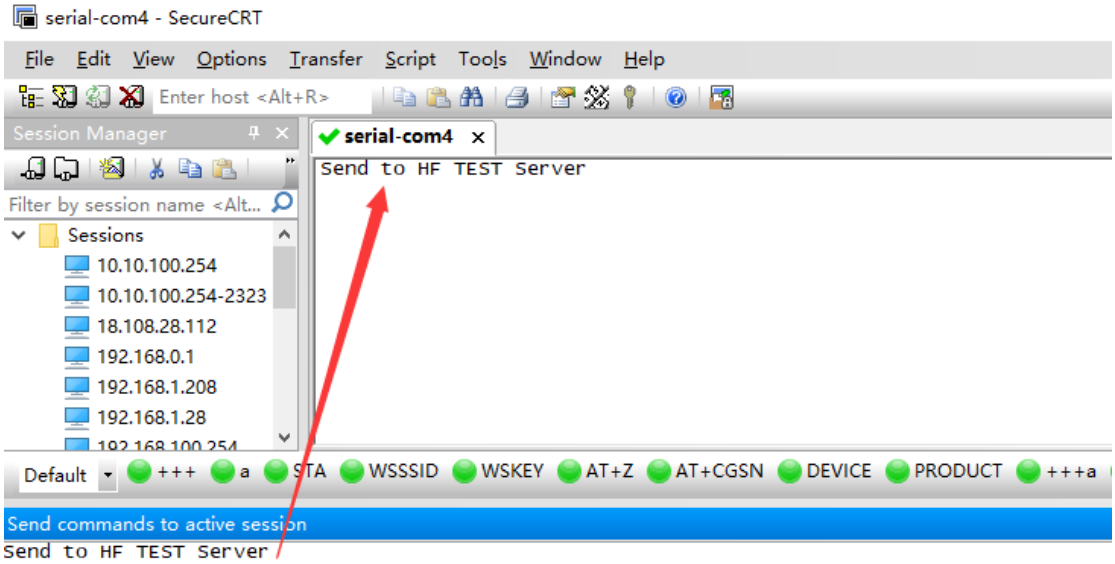


AT+UART to query or change setting.

Step 2: Input “AT+NETP=A,1,TCP,test.server.iotworkshop.com,40432,long” to set socket A, and “AT+Z” to reboot.

```
AT+NETP=A,1,TCP,test.server.iotworkshop.com,40432,long
+ok
```

Step 3: Wait for network connecting OK. Then send UART data to device, the test server will response with data in defined format(Protocol type, port number and data as following picture).



4.6. Test Case Four: Heartbeat and Resister Packet

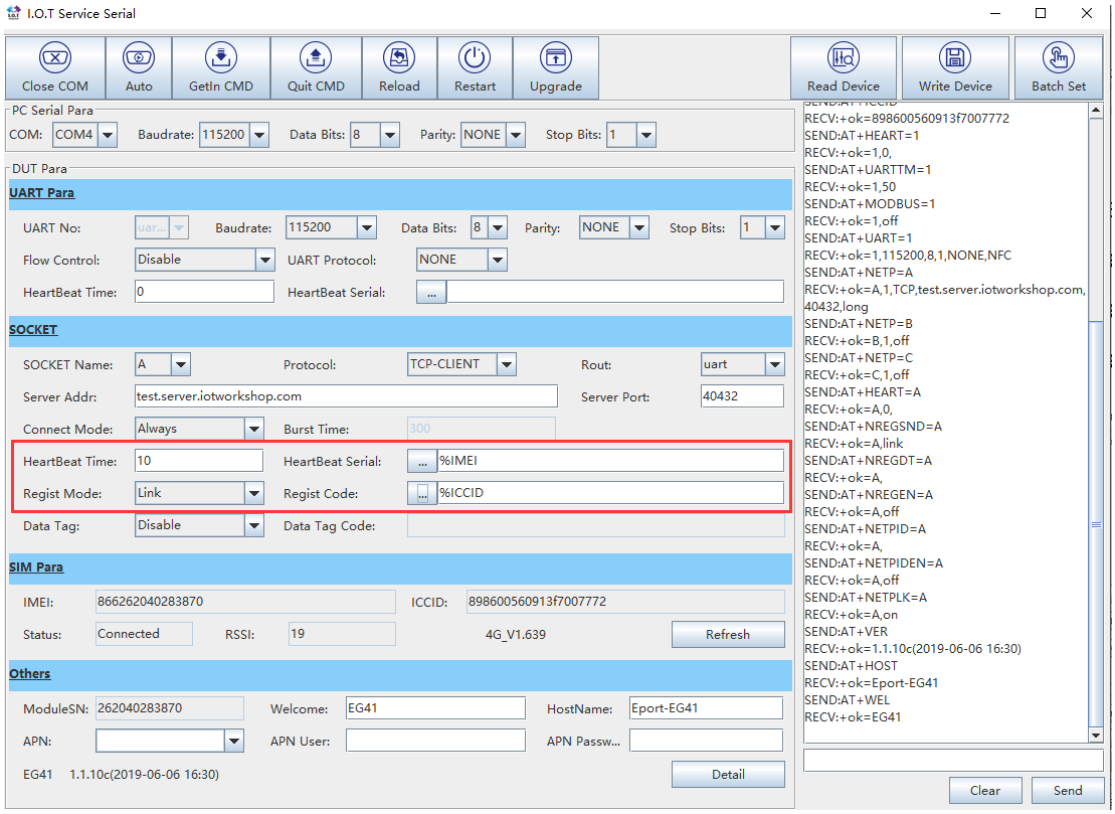
Step 1: Set the parameter as following..

AT+HEART=A,10,%IMEI //Enable heartbeat for 10 seconds upload its IMEI.

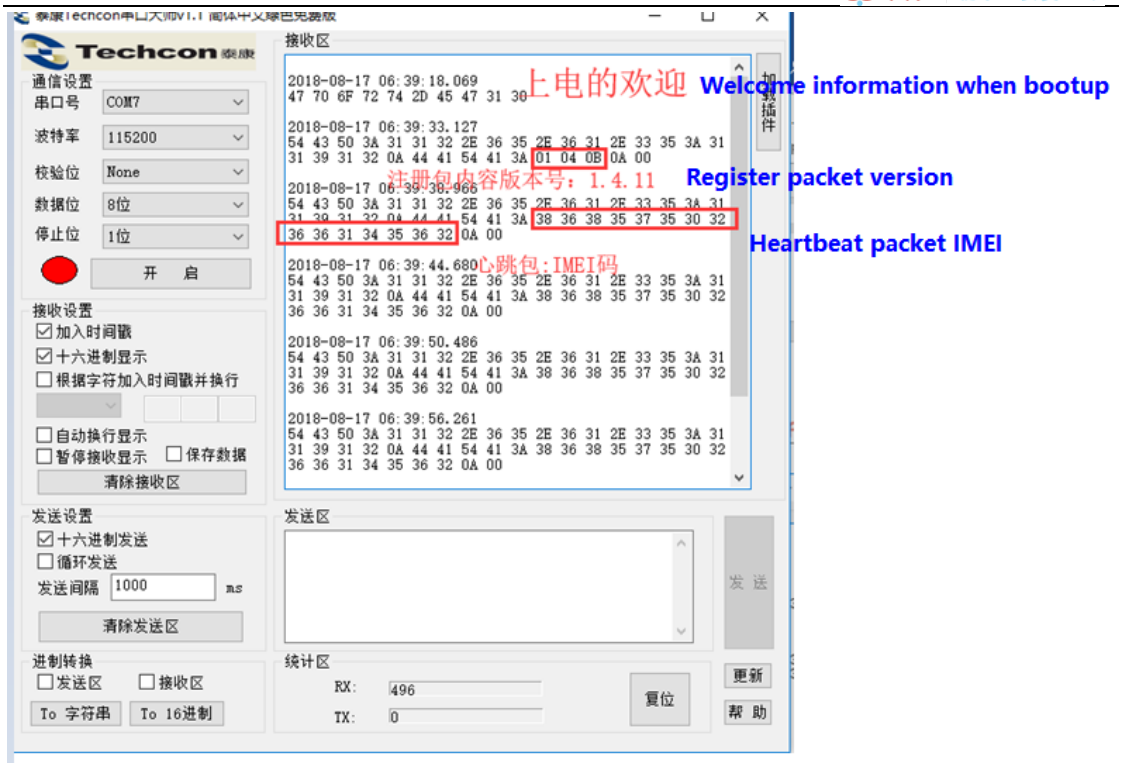
AT+NREGEN=A,on //Enable Register Packet

AT+NREGSND=A,link //Send Register packet when connection established.

AT+NREGDT=A,%VER //Register content is software version



Step 2: Reboot it. The device will output UART data as following.



Example 1:

Register Code Requirement: FFFFFFFFFA+IMEI+0F

Setting Parameter: %FF%FF%FF%FF%FA%IMEI%0F

Upload real data: FF FF FF FF FA 38 36 38 35 37 35 30 32 36 36 31 34 35 36 32 0F

Example 2:

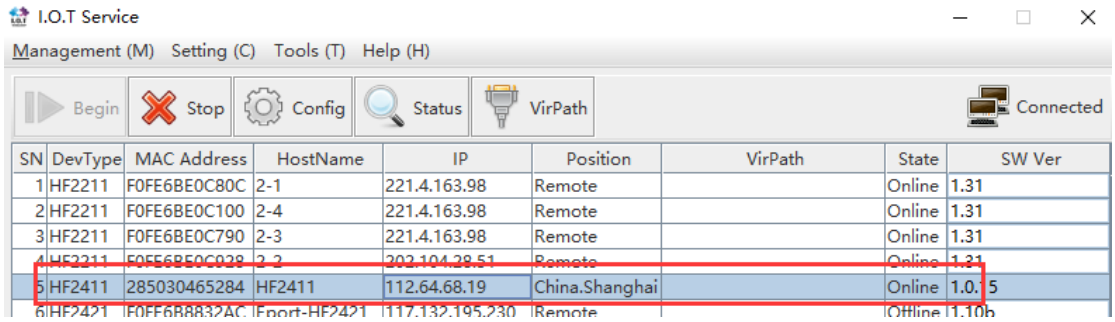
Heartbeat Content: %TIME;%HOST;%DATE;%IMEI;%IMSI;%GPS;

Upload real data::

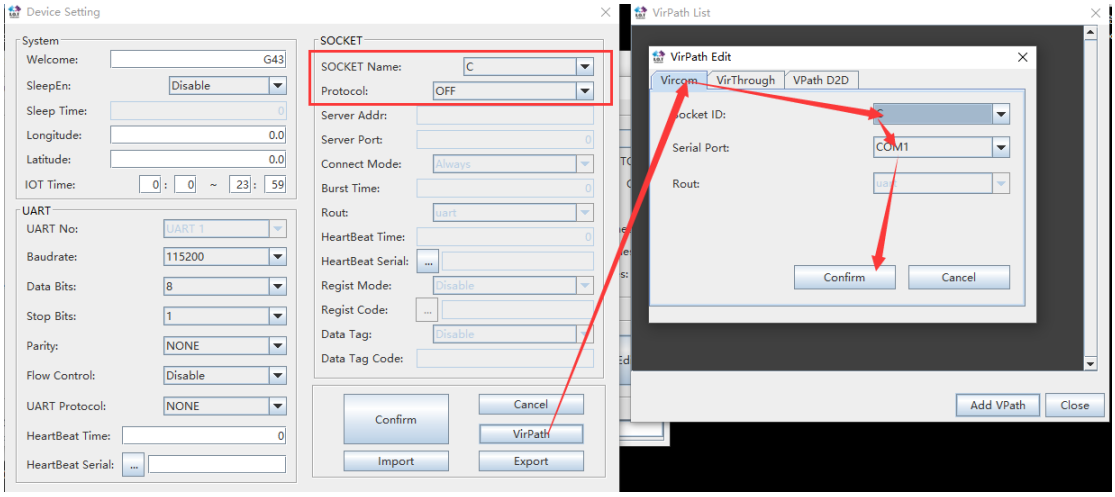
165036;Eport-HF2411;20190211;862285030465284;460011352509105;121.623046,31.221429;

4.7. Test Case Five: Virtual COM

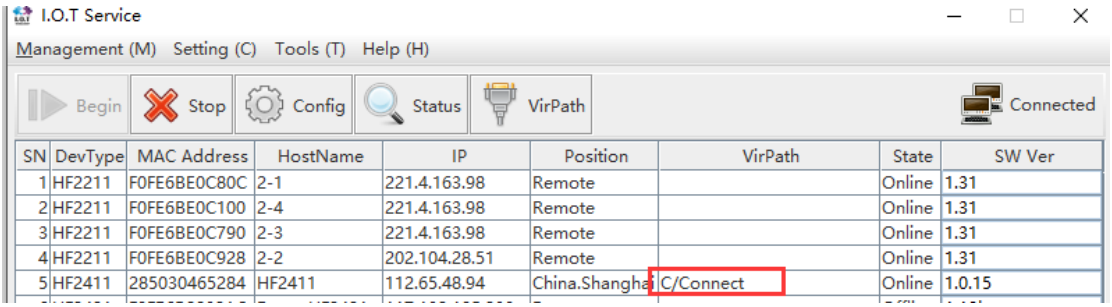
Step 1: Add device to IOTService according to Case Two.



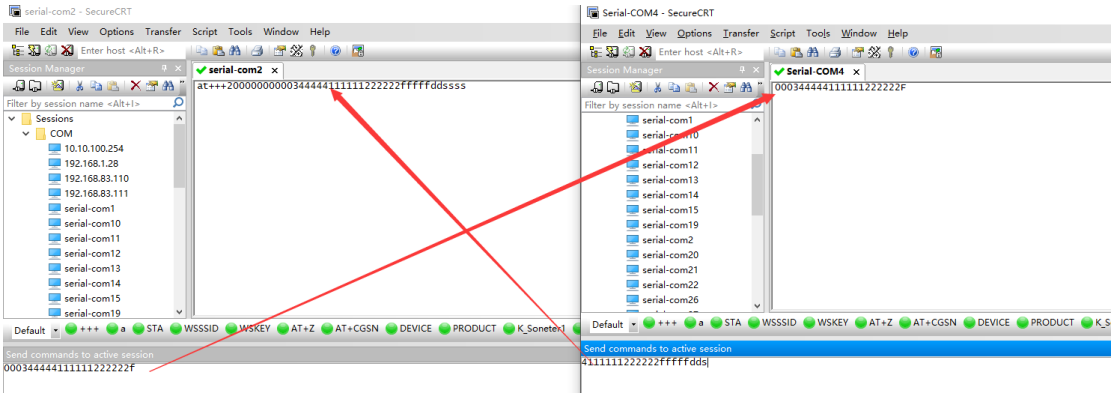
Step 2：Click into the config page, fill the Vircom Socket ID with C(A/B/C all can be used for virtual COM, must choose off socket to use for virtual COM).



Step 3：Wait for VirtualCom Connect.



Step 4：Use virtual com to communicate.

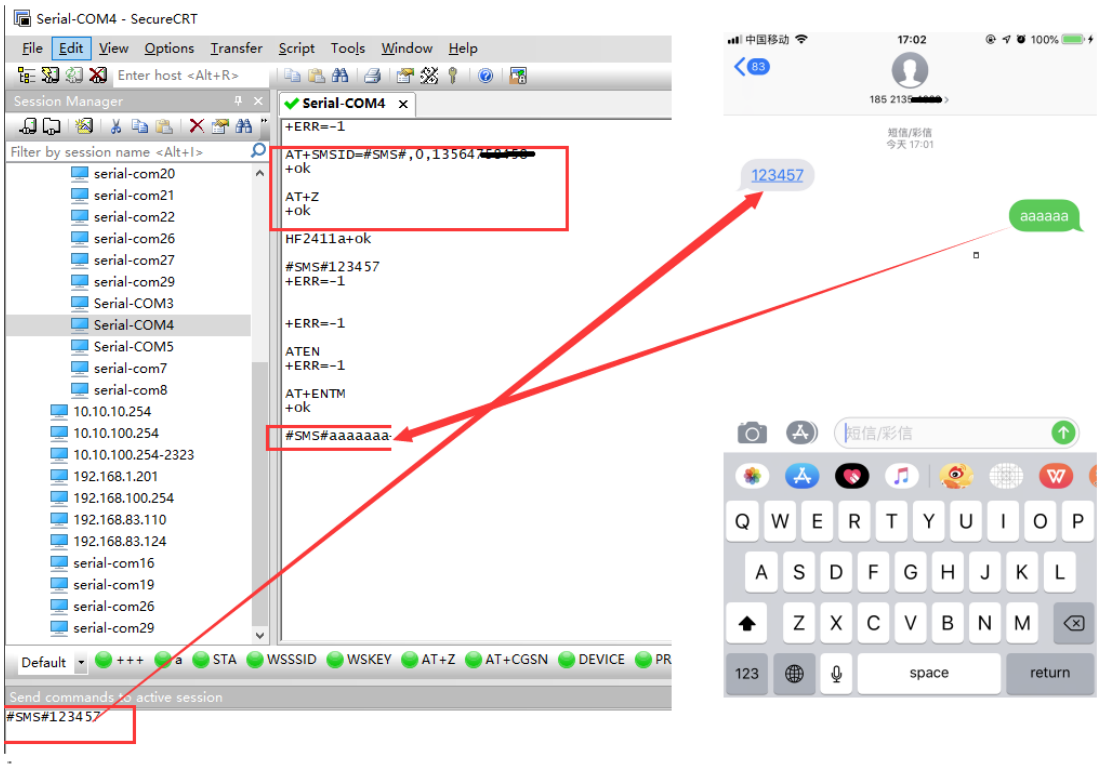


4.8. Test Case Six: SMS Throughput

Step 1: Enter AT command mode, and set SMS parameters.
AT+SMSID=#SMS#,0,135647584XX.

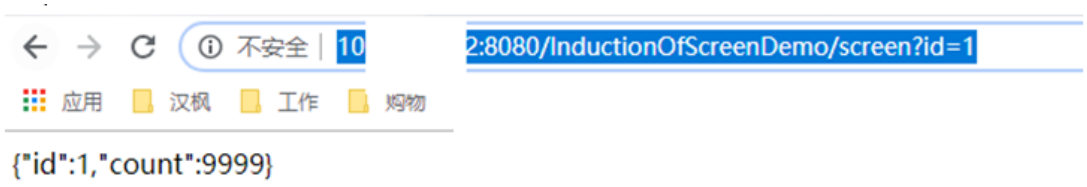
Step 2: Reboot and wait for network connected, UART send "#SMS#123457" to module, the phone will receive the SMS data "123457".

Step 3: Phone send "aaaaaa", product will send out "#SMS#aaaaaa"

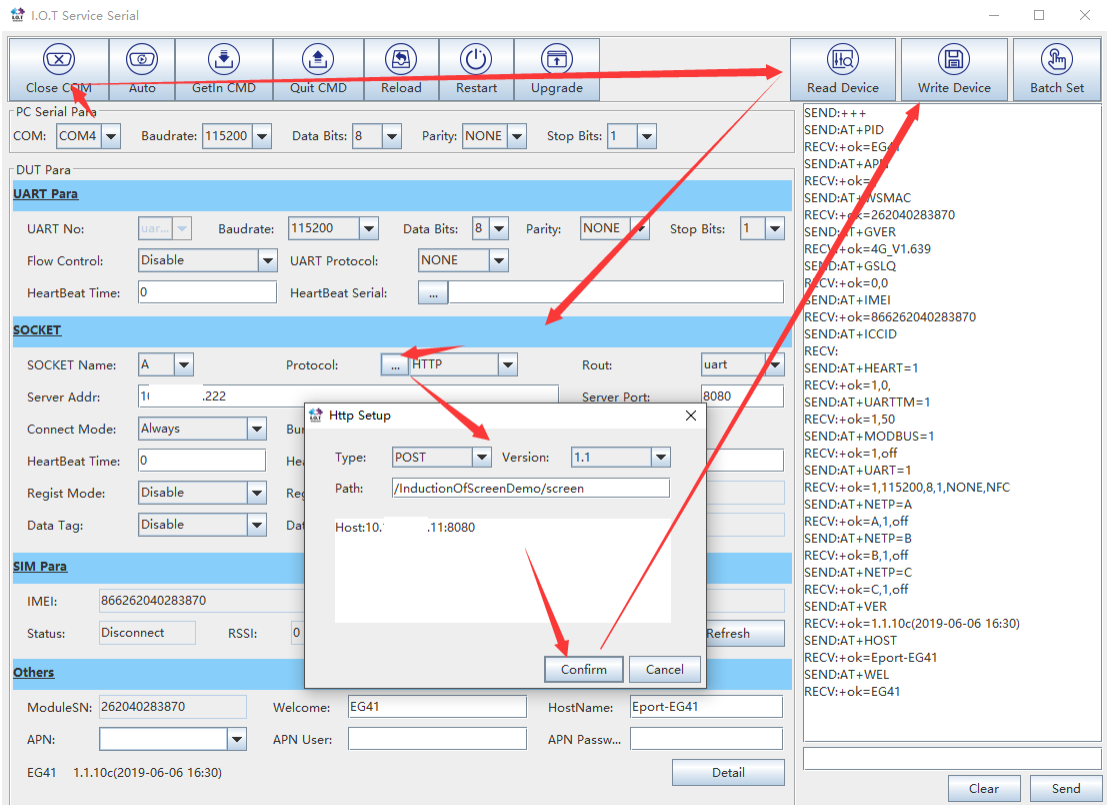


4.9. Test Case Seven: HTTP Request

Step 1: Browser open http://XX.XX.XX.2:8080/InductionOfScreenDemo/screen?id=1, got the response as following：



Step 2：Input the HTTP parameters as the following steps.



Protocol: HTTP

Server Addr: Server address, IP or domain name.

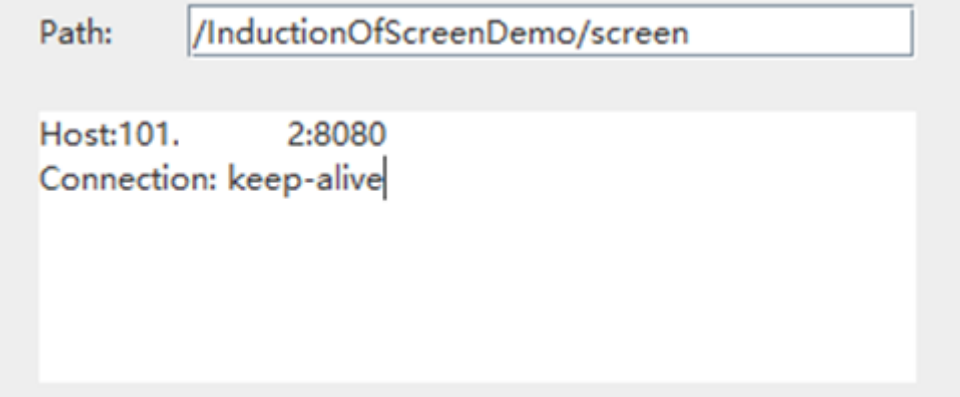
Server Port: Server port.

Type: HTTP Type, GET or POST.

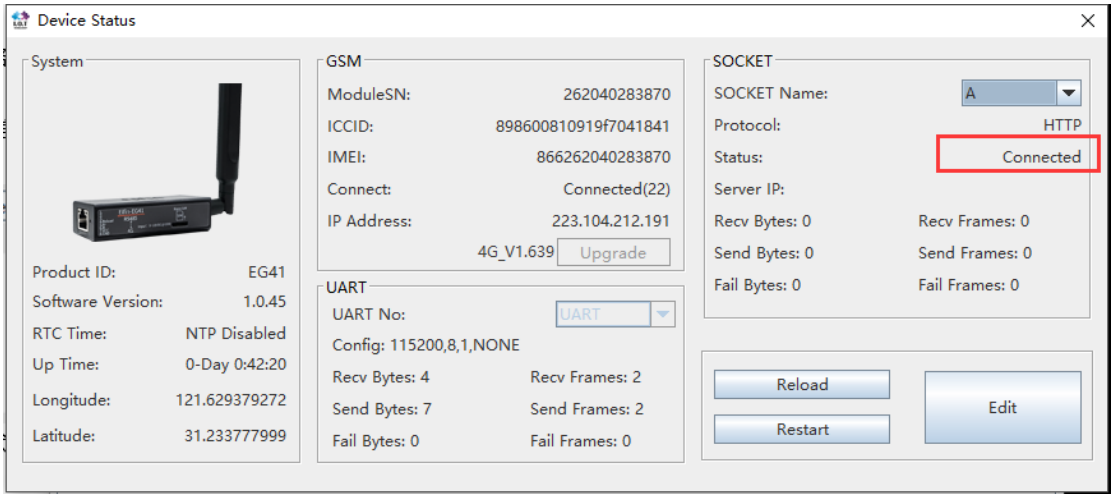
Version: HTTP Version, 1.1.

Path: HTTP path

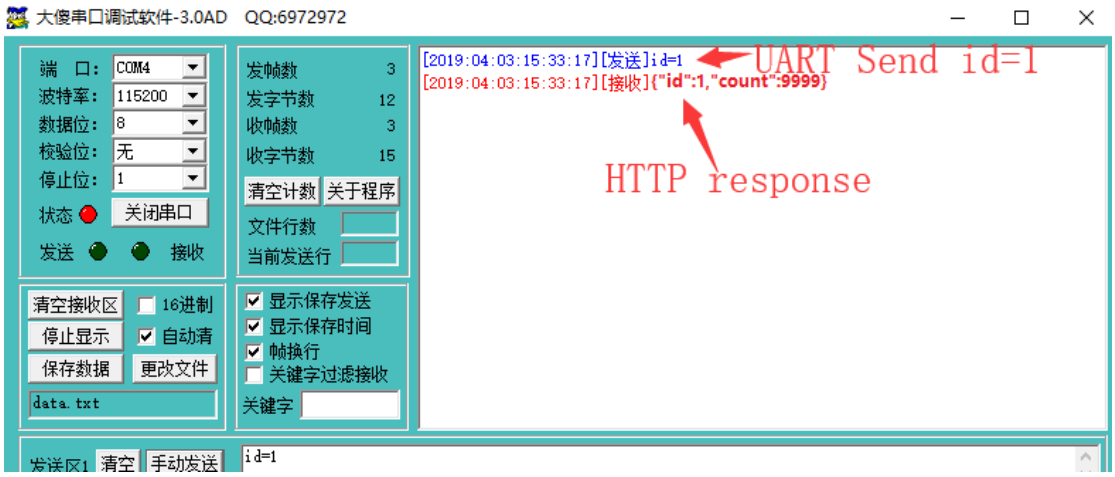
HTTP header input: Input HTTP header. Usually is Host information.



Step 3: Reboot and wait for SOCKA connection.



Step 4: UART send data id=1, and got response of the server.



Note:

Refer to “4G_2G DTU products function” for more detail.

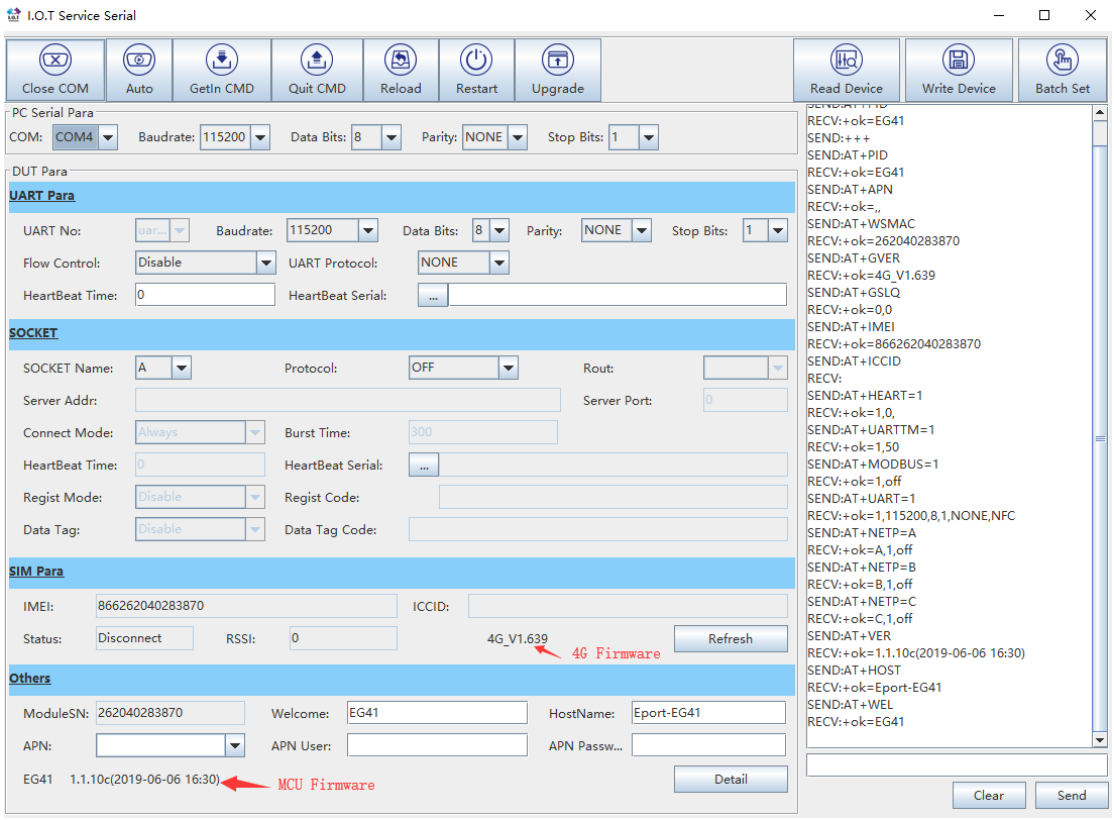
4.10. SMS AT Command

All AT command support using SMS to set. AT+Z do reboot operation, so it won’t response.


中国移动
17:30
100%
83
185 2135
AT+NETP=1
+ERR=-2
AT+NETP=A
+ok=A,1,off
AT+Z

4.11. UART Upgrade

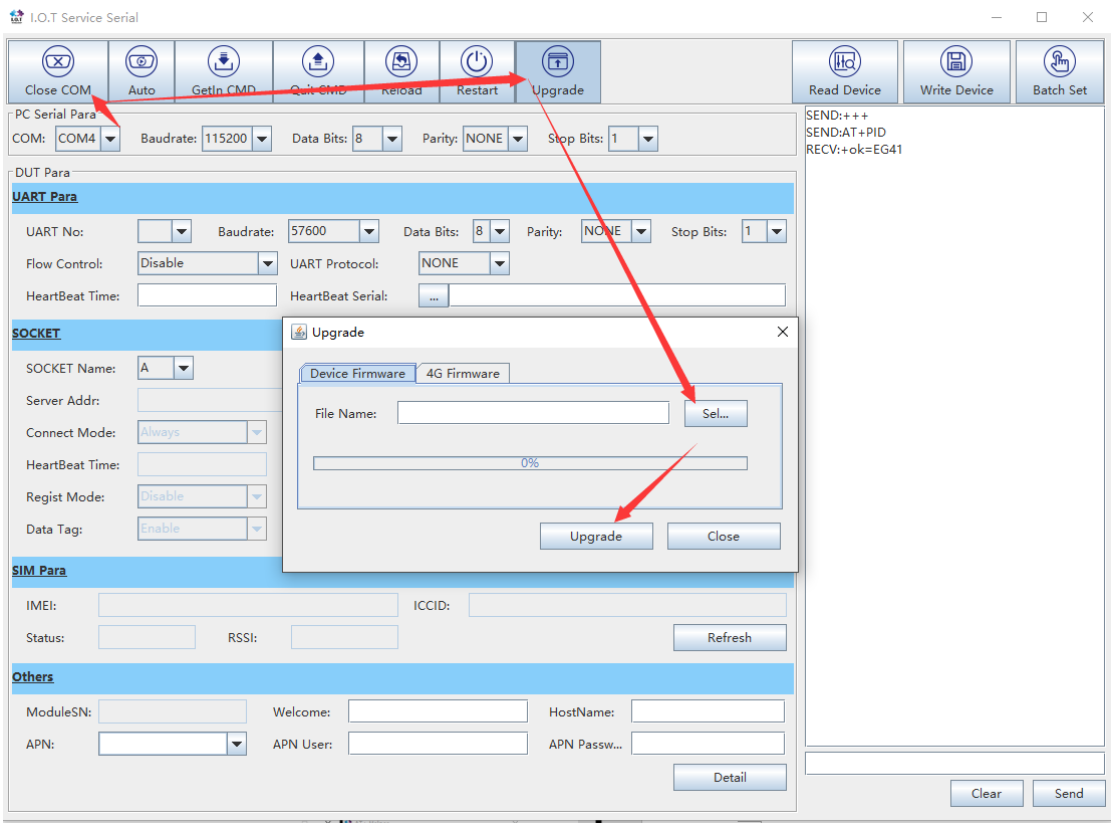
There is MCU firmware and 4G core module firmware. Get the latest firmware from the following link.



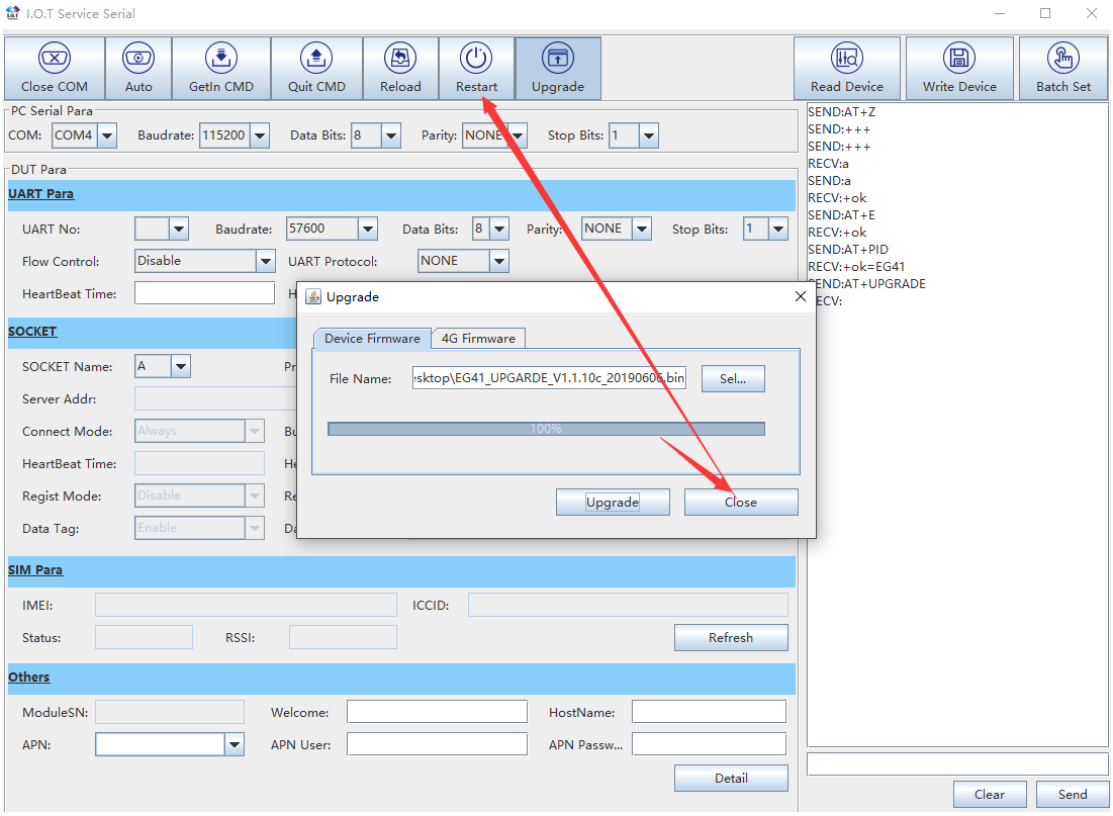
http://www.hi-flying.com/download-center-1/firmware-1/download-item-hf2411-firmware-v1-0-11

4.11.1. MCU Firmware

Load the firmware.



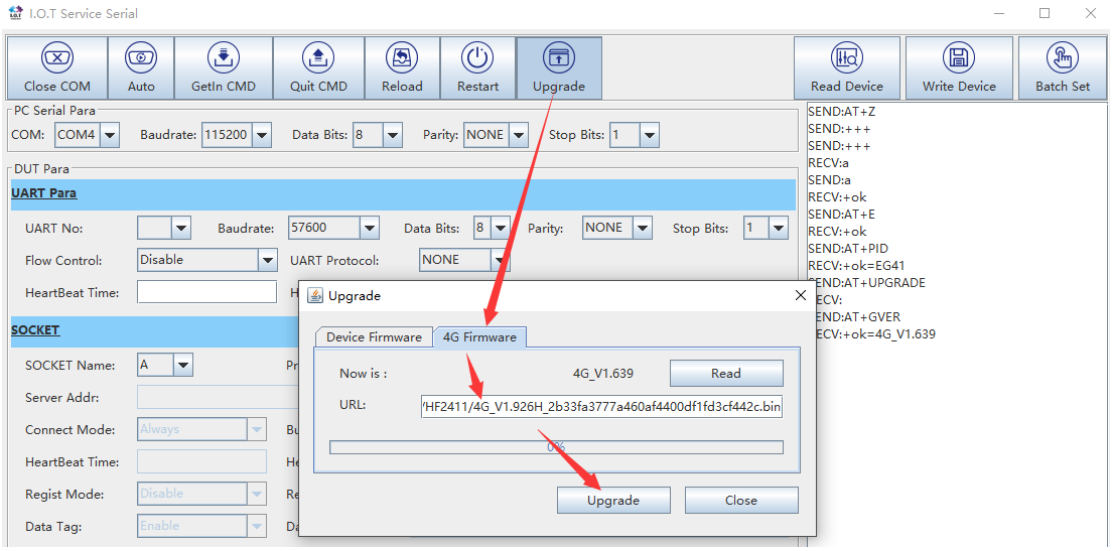
Reboot after upgrade success.



4.11.2. 4G Firmware(Only 4G Product)

After the device connect to network(Show connected), input the 4G download address(Get the latest download address from our website.). The firmware size is about 5MB, it takes about 2 minutes to upgrade.W

http://download.iotworkshop.com/iotbridge/firmwares/HF2411/4G_V1.926H_2b33fa3777a460af4400df1fd3cf442c.bin



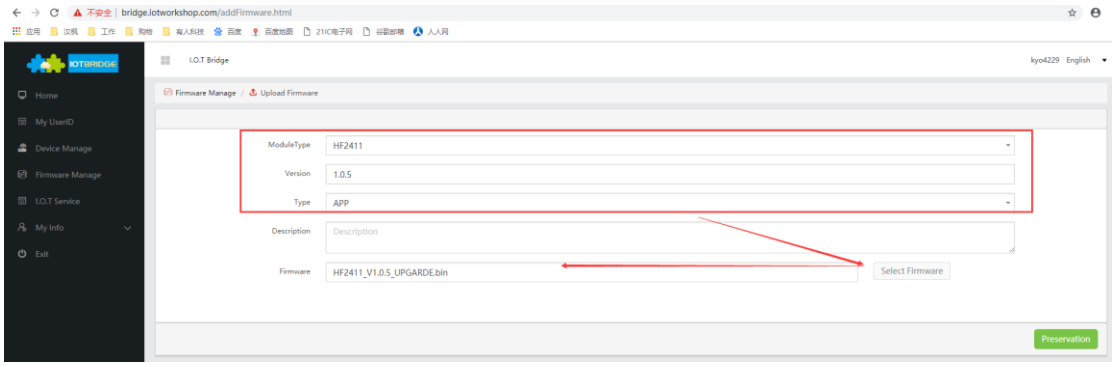
4.12. Remote OTA Upgrade

Currently only support MCU remote OTA update, later will support 4G upgrade

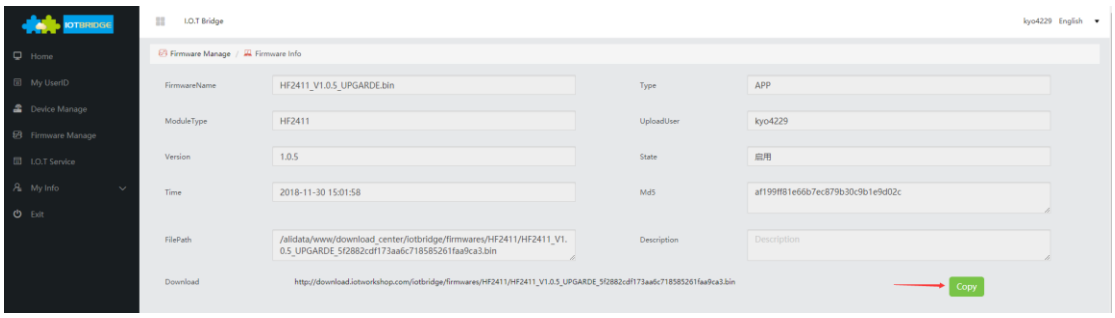
Step 1: Remote upgrade is using our IOTBridge cloud, download firmware from our IOTBridge. Bound device to account as the previous steps.

4.12.1. MCU Firmware

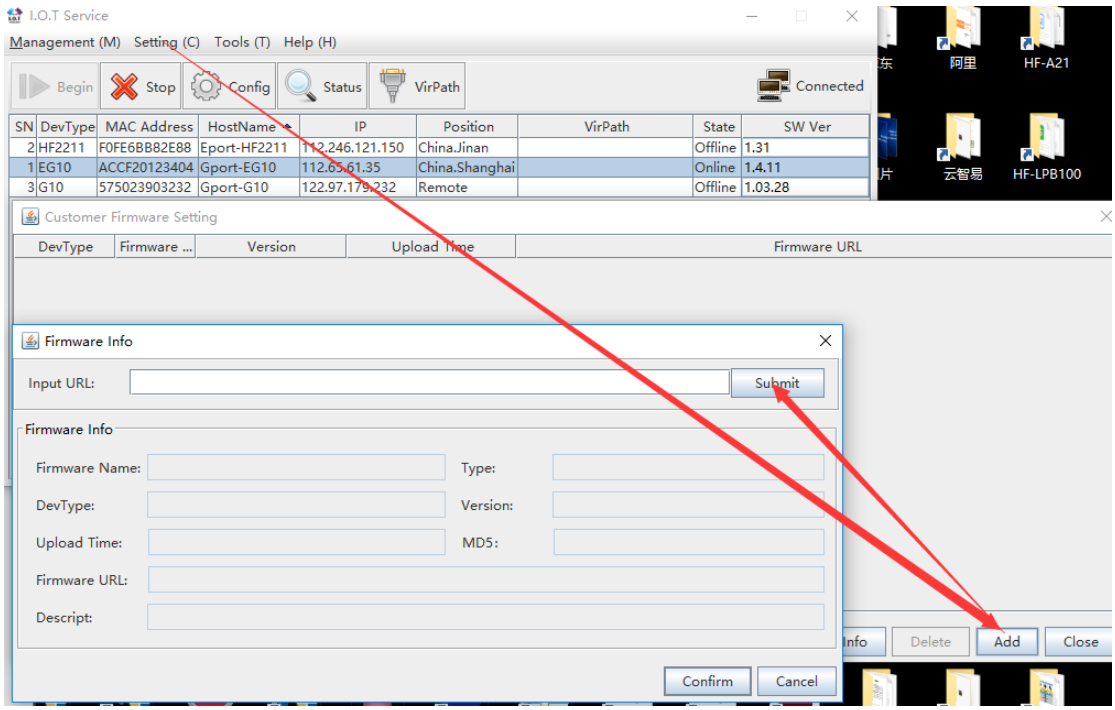
Step 2: Login http: //bridge.iotworkshop.com/, upload firmware in IOTBridge.

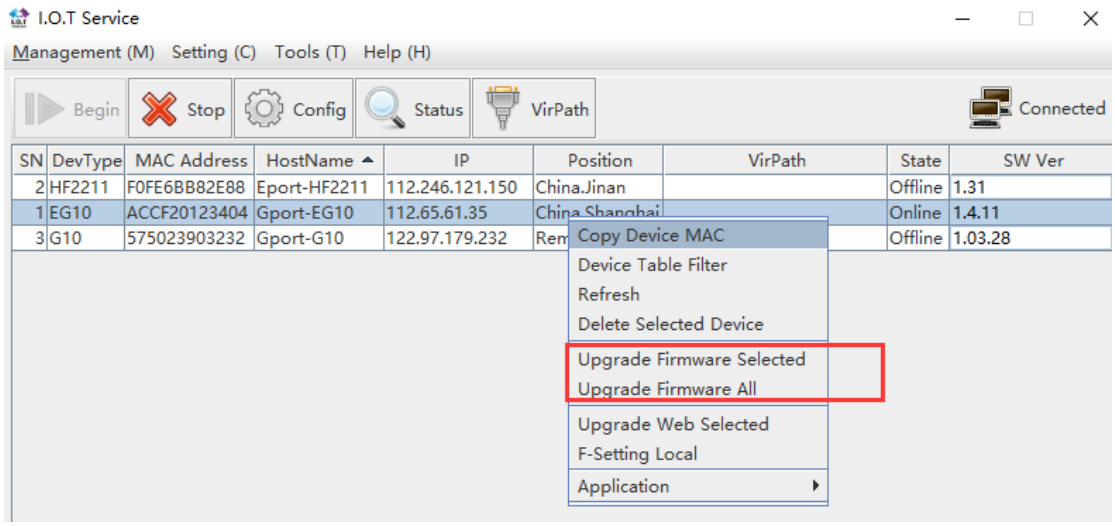


Step 3: Copy the download link as following.



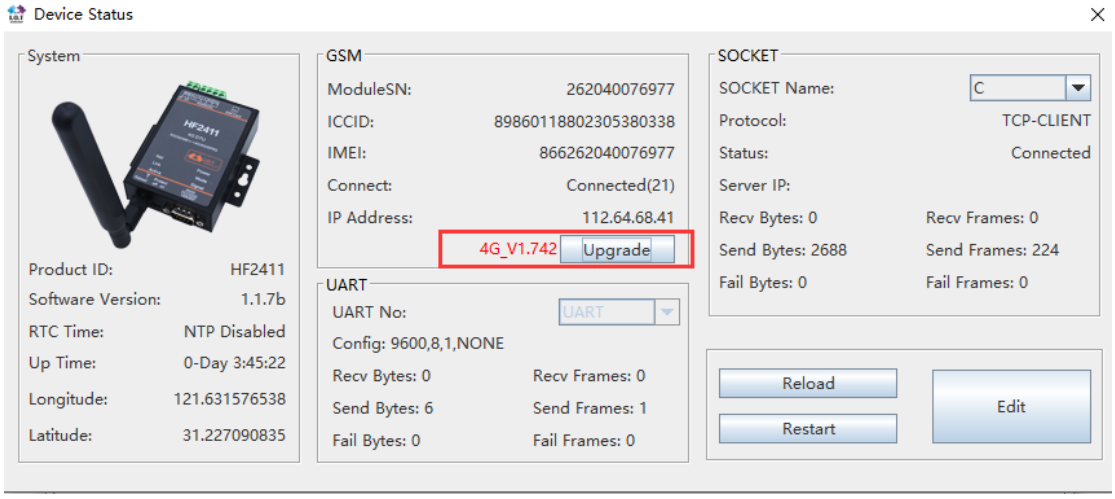
Step 4: Copy the download link into the IOTService tools. And do upgrade operation.



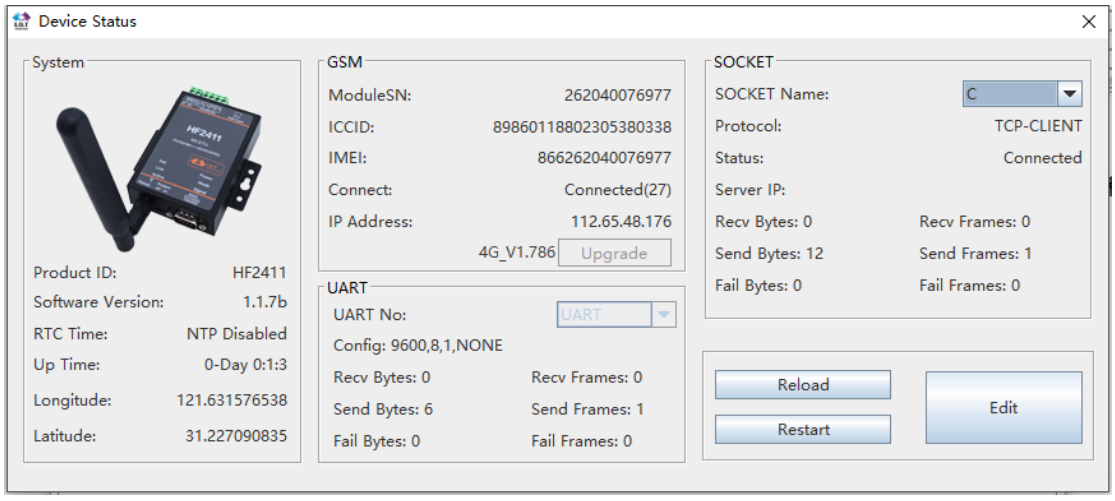


4.12.2. 4G Firmware(Only 4G Product)

Step 1: Add device to account, and click the 【Upgrade】 button. It will take about 2minutes to upgrade. Ater upgrade success, it will restart.

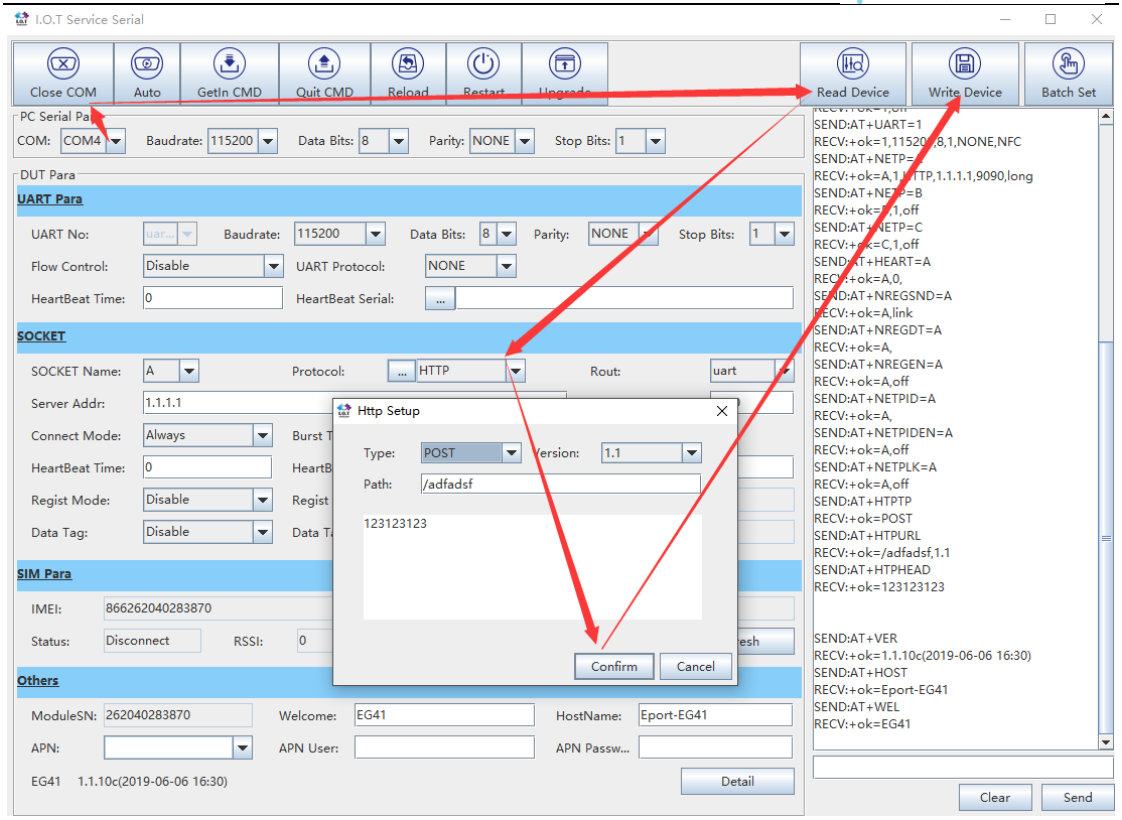


Step 2: Check the software version.

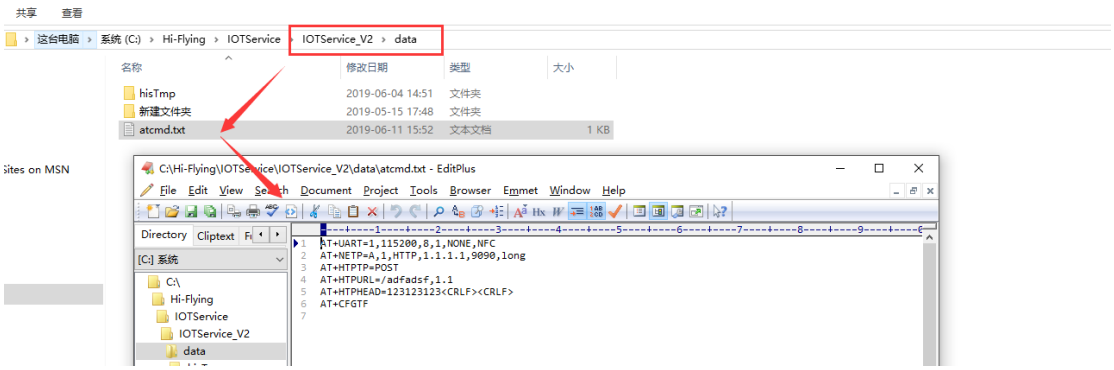


4.13. Massproduction Config

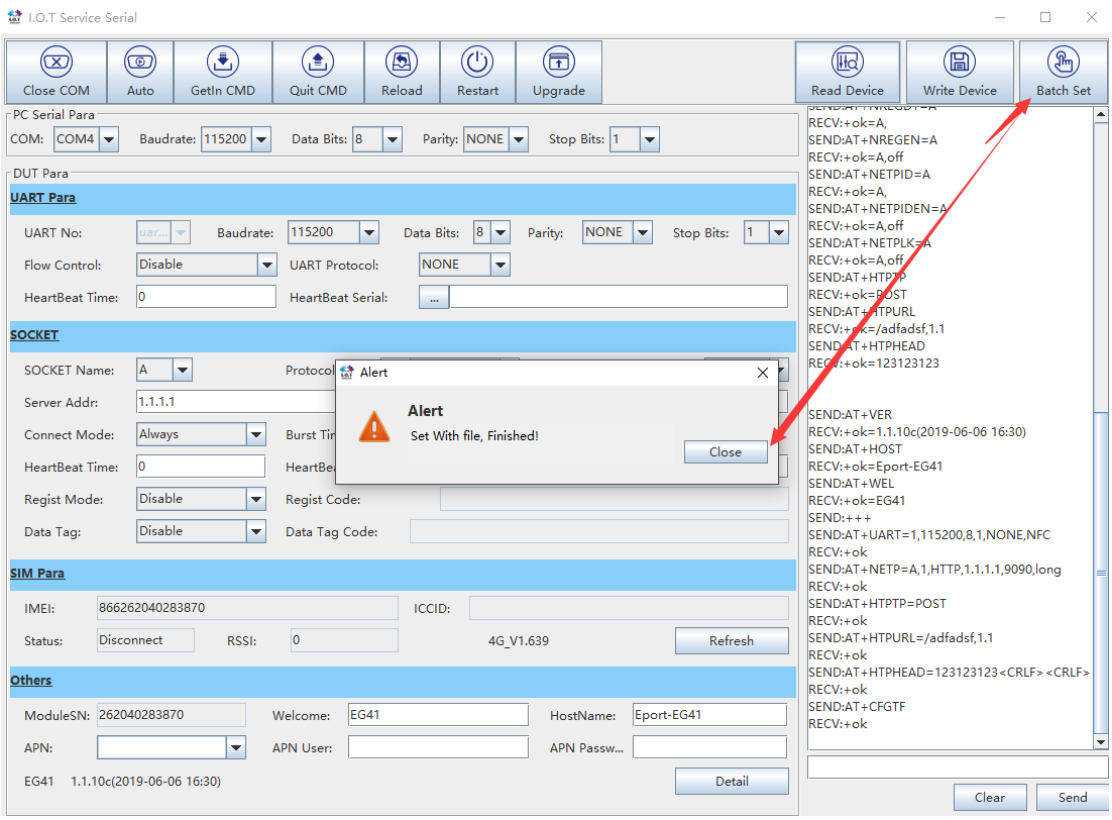
Step 1: Config the first product.



Step 2: The config information will be saved in the following file. This file can be used for massproduction product config. May also direct modify this file.



Step 3: Click【Batch Set】 for fast config multiple products.



4.14. Data Collect Gateway and More Function

Products support collect packet and upload to server, see more application notes in the following link.

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

APPENDIX A: REFERENCES

A.1. Test Tools

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