



# PG46\_EG46

## Operation Guide

### V 1.0

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

 <p>The image shows the Elfin-EG46 module, a black rectangular device. It features a Linux logo, a SIM slot labeled 'Nano SIM', and text indicating 'RS485&amp;Ethernet' and '4G'. It also specifies 'Input: 9-18VDC@10W' and lists pin functions: 1.T+, 2.T-, 3.R+, 4.R-, 5.A+, 6.A-, 7.VCC, 8.GND.</p>	Elfin-EG46
 <p>The image shows the Protoss-PG46 module, a white rectangular device. It features a SIM slot labeled 'Nano SIM', a 'Reload' button, a 'Reset' button, and three status LEDs labeled 'Active' (green), 'Link' (green), and 'Power' (red).</p>	Protoss-PG46

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# 1. PG46\_EG46 INTRODUCTION

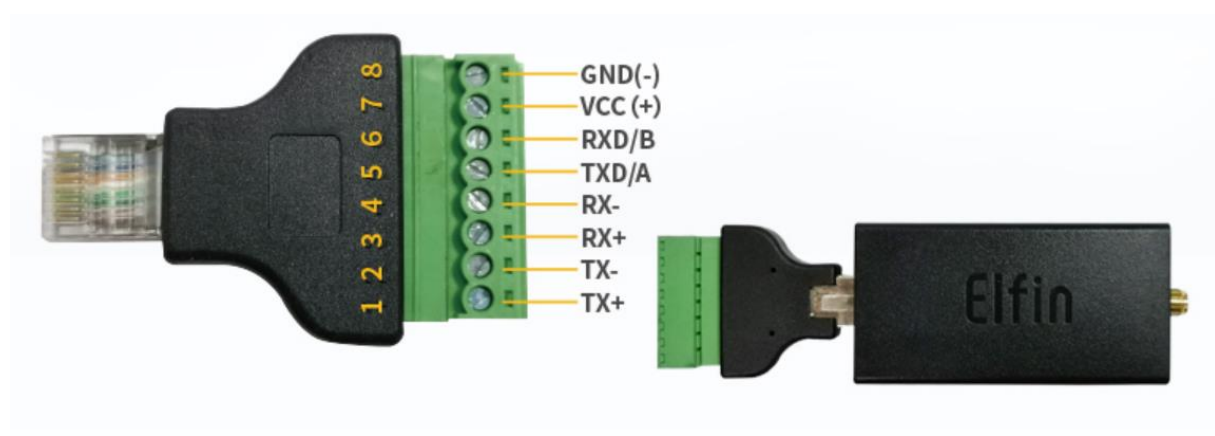
Protoss-PG46 and Elfin-EG46 are the same software platform, so function is the same, just the product hardware interface is different.

EG46 accessories include the following:

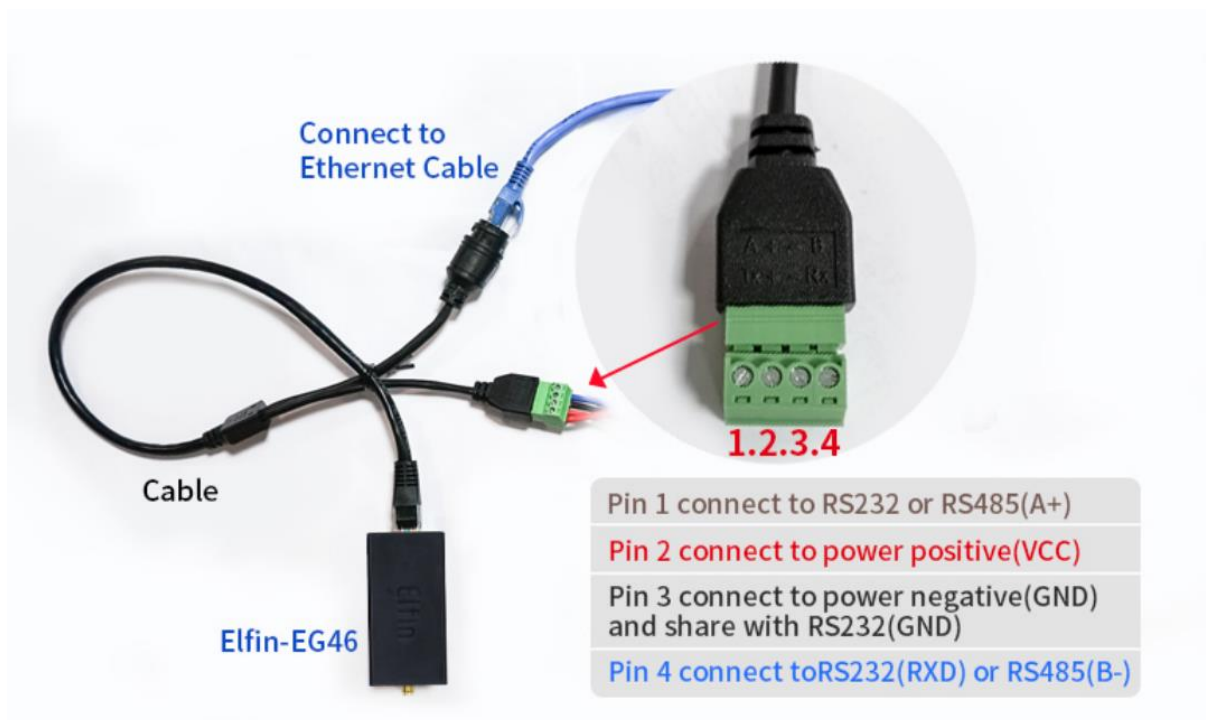
## Accessories Drawing



### 1.1. EG46 CONNECT TO 8PIN TERMINAL



## 1.2. EG46 INTERFACE CONVERSION CABLE



## 1.3. SIM CARD INSERTION ICON



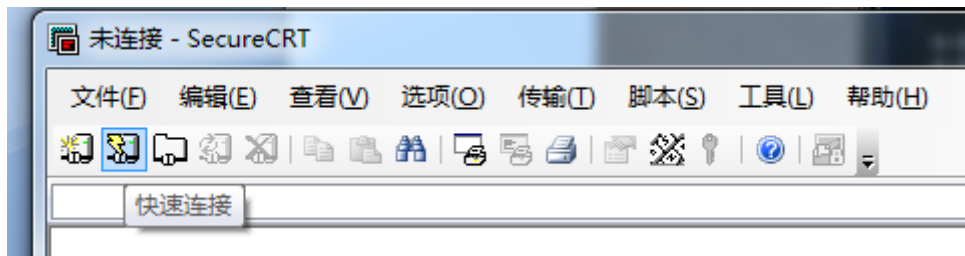
## 2. SERIAL PORT SETTING

### 2.1. SERIAL PORT TOOL SECURECRT

Download address: [http://www.hi-flying.com/index.php?route=download/category&path=1\\_4](http://www.hi-flying.com/index.php?route=download/category&path=1_4)

Unzip the folder, open the SecureCRT executable program, and click Open.

Click the Quick Connect button to create a connection.

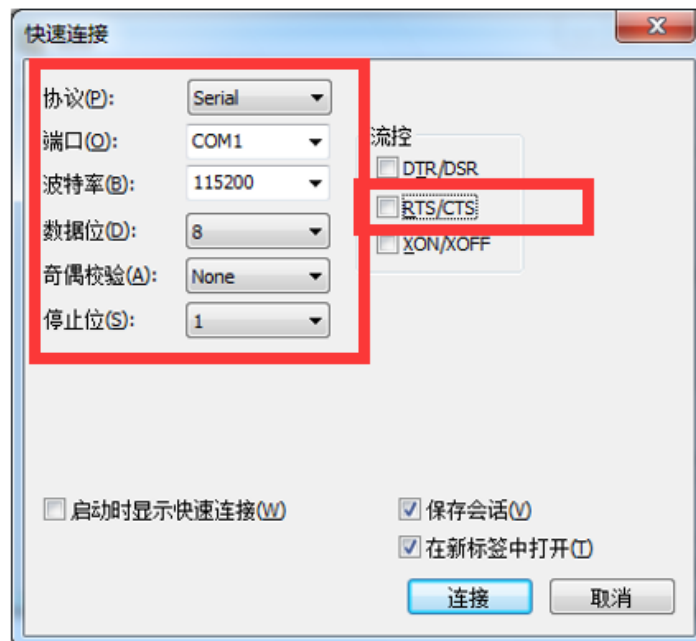
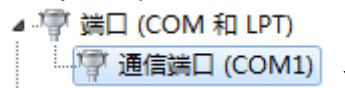


### 2.2. SETTING SERIAL PORT PARAMETERS

Protocol: Serial

Port: The port that the computer is actually connected to (see "My Computer"-> "Device

Manager"-> "Ports (COM and LPT)", as shown in the figure.



Note: The factory serial port parameters of the product are as shown in the figure above. The user can modify the working parameters of the product by using IOT Service Tool.

## 3. FUNCTIONS TEST

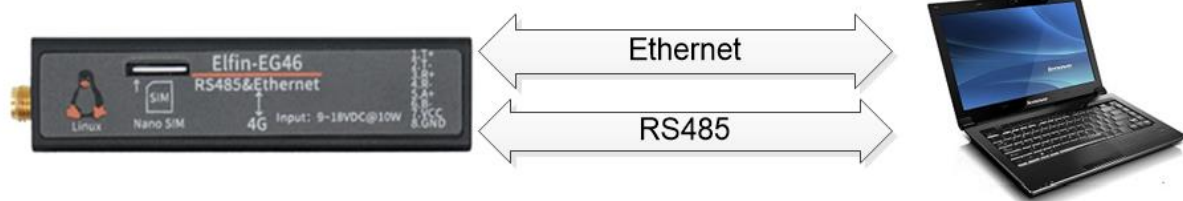
This article uses the following examples for test instructions.

Related tools can be downloaded from:

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

### 3.1. NETWORK PORT DIRECT CONNECTION MODE

EG46 Ethernet defaults to LAN port mode, IP address 10.10.100.254, PC can be directly connected to the Ethernet for parameter configuration or data transmission communication. For specific Ethernet wiring, please check the product hardware definition or use the interface conversion cable provided by High Flying. The USB to RS485 adapter is connected to the PC.



Ethernet LAN IP: 10.10.100.254

IP: 10.10.100.173

Step 1: After the PC network cable is directly connected to the EG46, wait for the product to automatically assign an IP address to the PC, as shown in the figure below, you can query the PC's IP address.

```
C:\Users\Lenovo>ipconfig

Windows IP 配置

无线局域网适配器 本地连接* 2:

    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

无线局域网适配器 本地连接* 14:

    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

以太网适配器 以太网:

    连接特定的 DNS 后缀 . . . . . :
    本地链接 IPv6 地址. . . . . : fe80::6d8c:c9a7:2e1a:d984%27
    IPv4 地址 . . . . . : 10.10.100.173
    子网掩码 . . . . . : 255.255.255.0
    默认网关. . . . . : 10.10.100.254
```

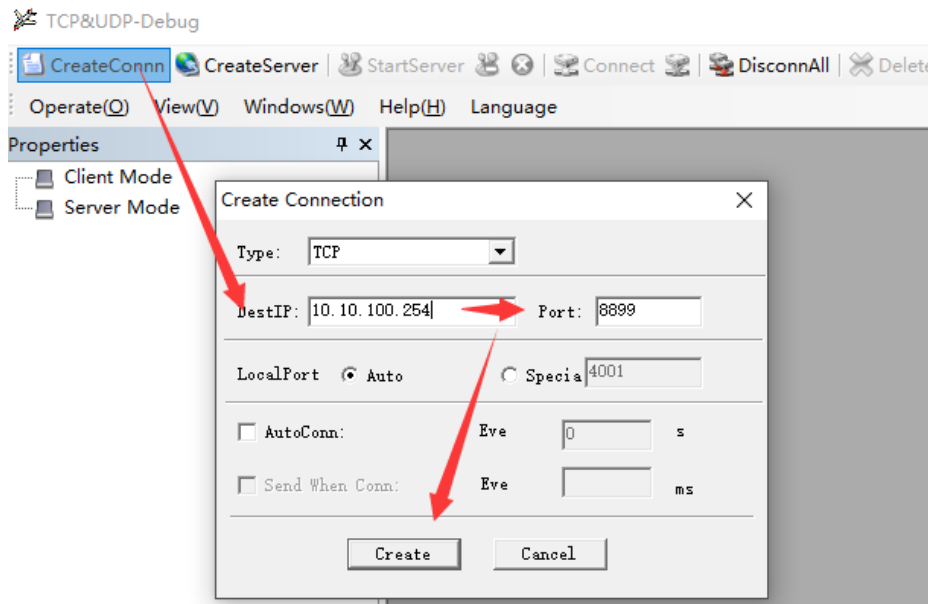
Step 2: Open the IOTService and discover the device.



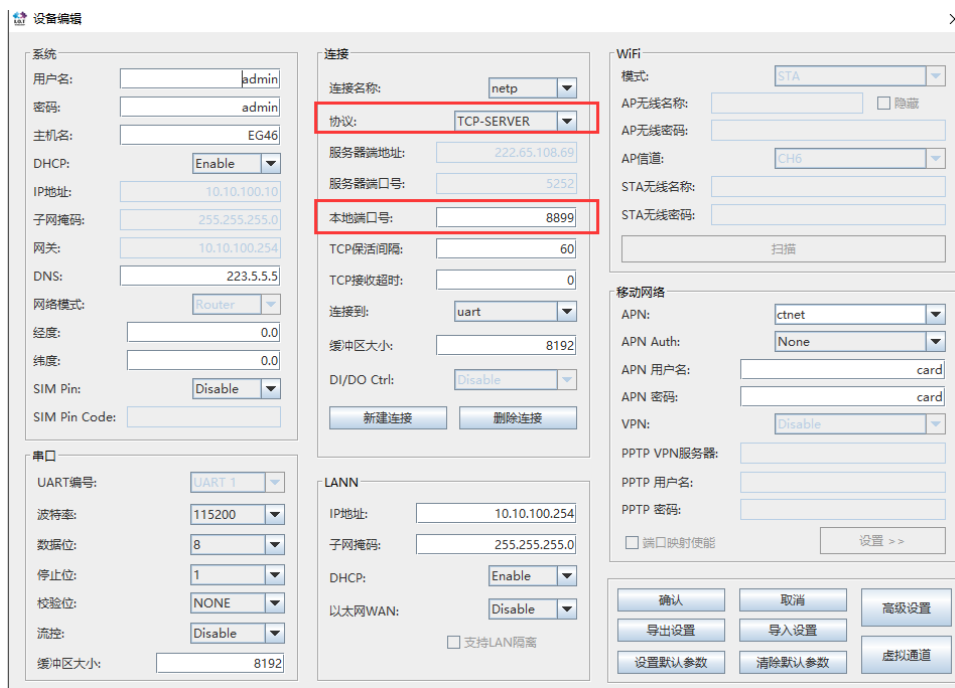
### 3.2. TCP SERVER TEST IN NETWORK PORT DIRECT CONNECTION MODE

Step 1: Open the TCP & UDP test tool, and use the tool to establish a TCP Client to connect to the TCP Server of the product. (TCP & UDP test tool can be downloaded from the official website).

- DestIP: IP address of the product.
- Port: The port number of the product TCP Server. The default is 8899, which can also be set by the user.

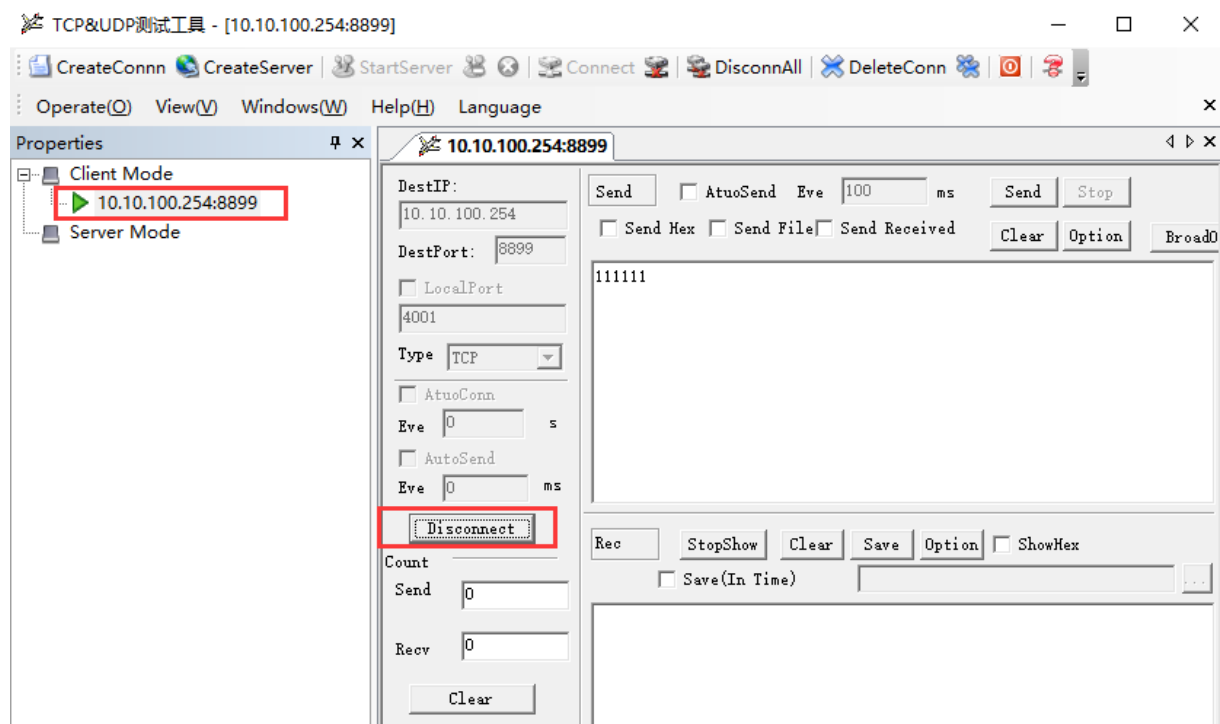


- A TCP Server (default port 8899, which can be modified) has been created for the product by default.

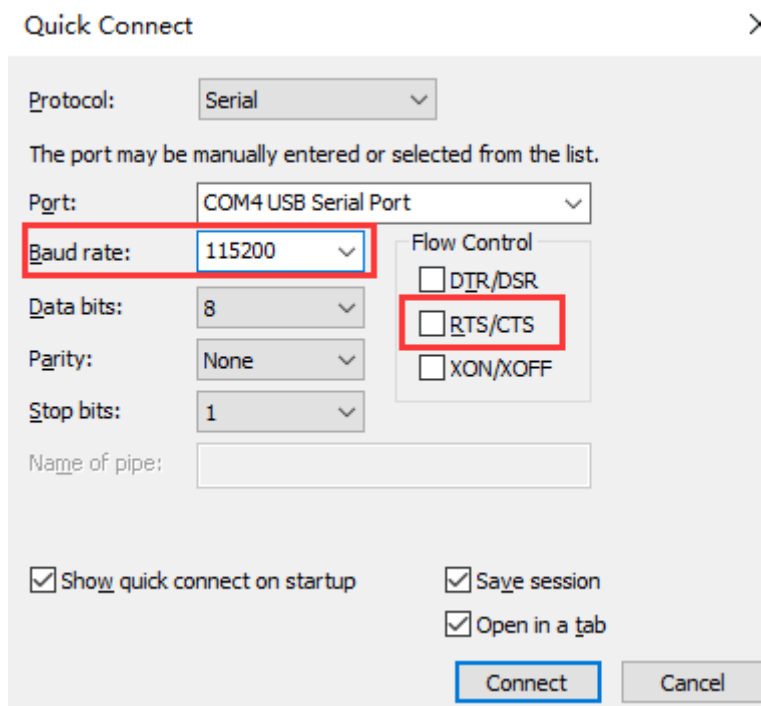


Step 2: Click the Connect button to establish a TCP connection.

- After the connection is successfully established, the left side becomes a green arrow, and if the connection fails, a yellow arrow.

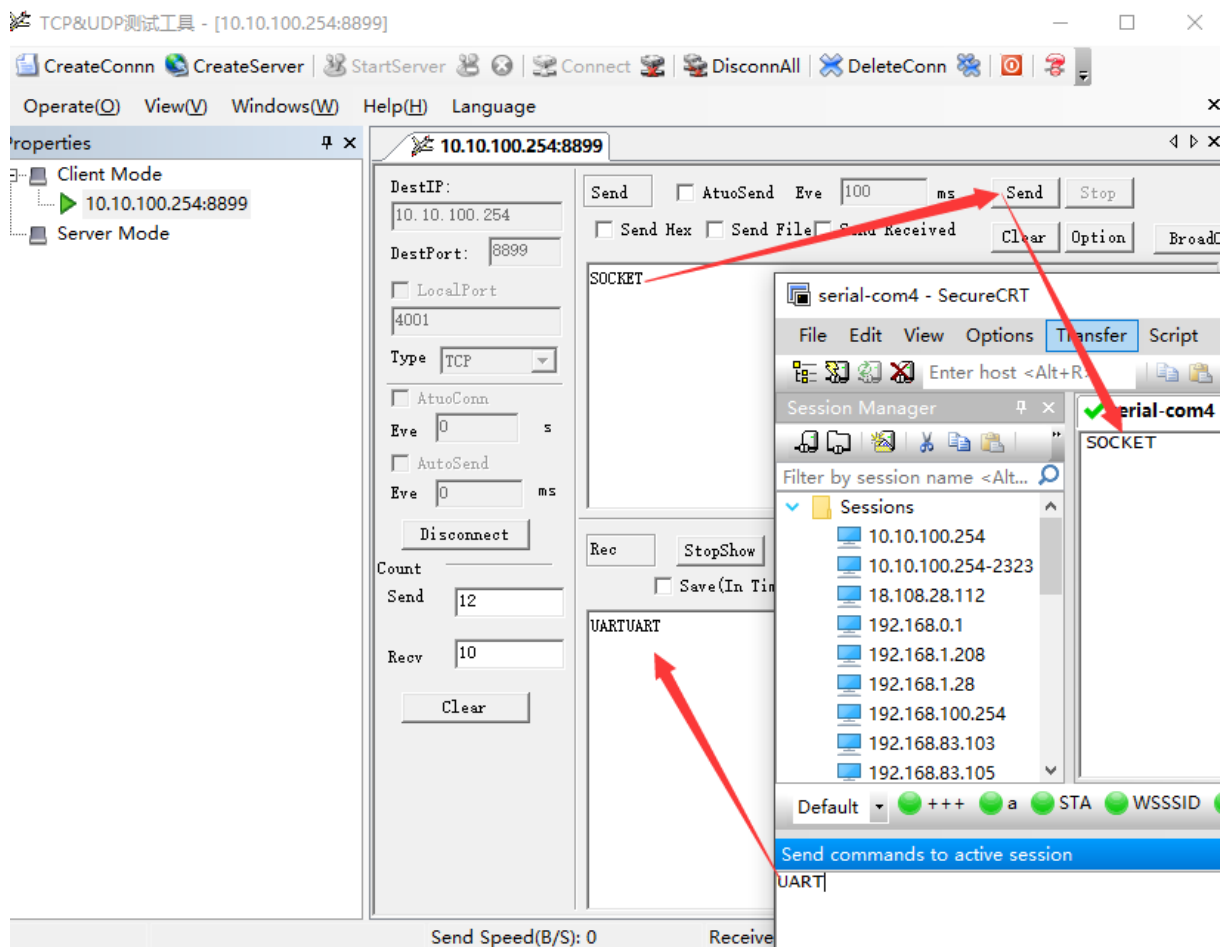


Step 3: After connecting the computer's serial port to the device, open the serial port tool with the following parameters (default 115200 baud rate).

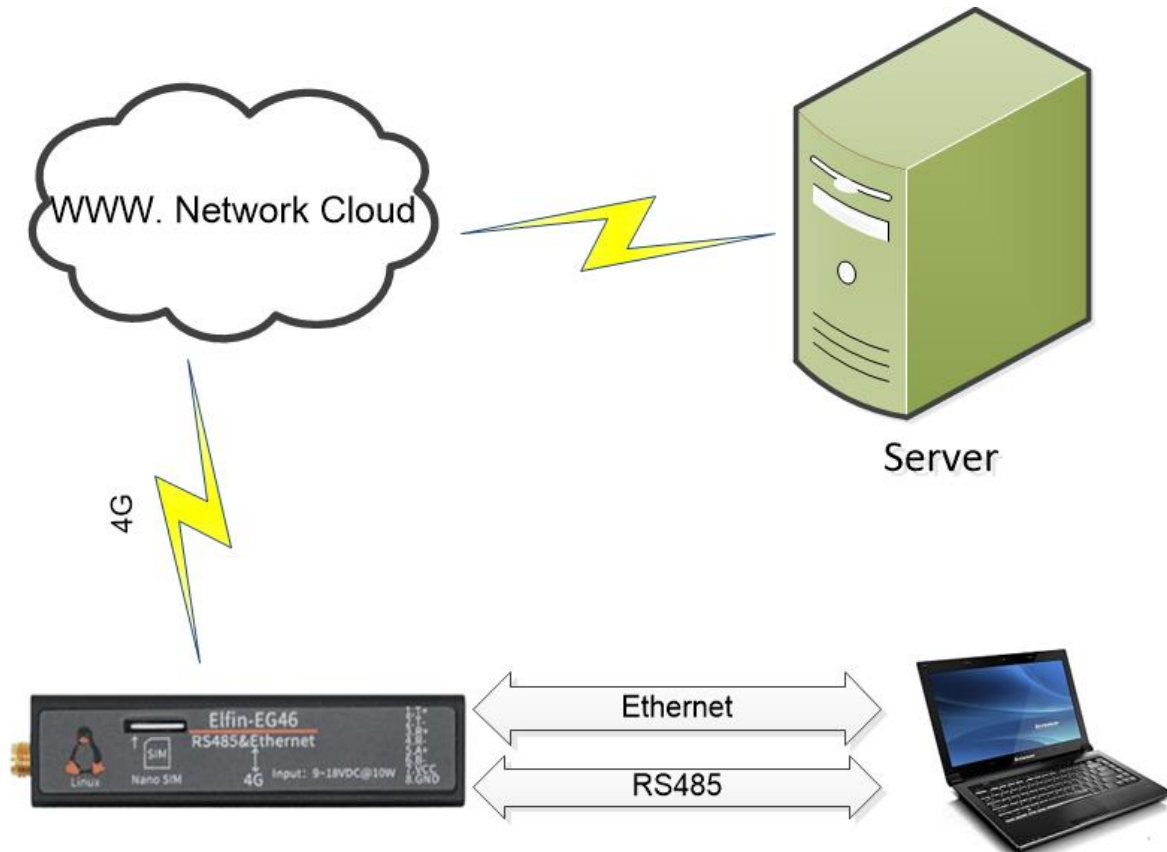


Step 4: Data is transmitted between TCP and the serial port.





### 3.3. TCP CLIENT TEST IN 4G MODE



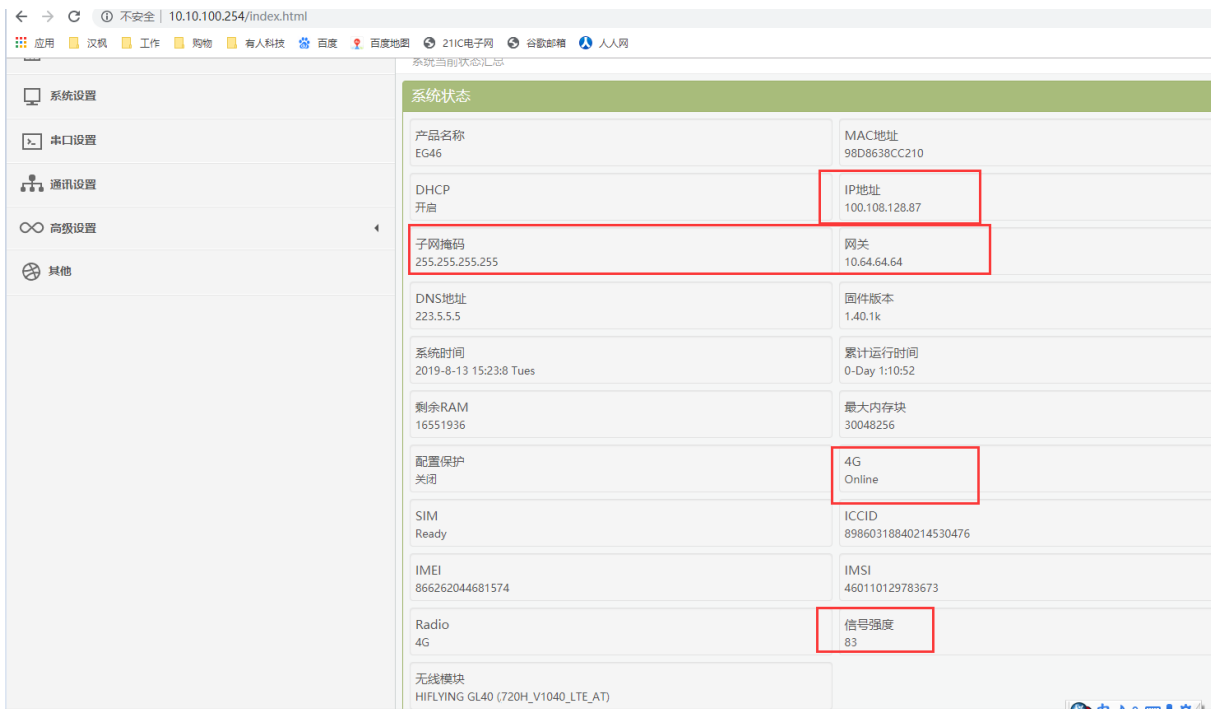
Ethernet LAN IP: 10.10.100.254

IP:10.10.100.173

Step 1: The PC is directly connected to the Elfin-EG46 network port, open the IOTService tool, and check the device status. The following figure shows that 4G has obtained an IP address, the strength is 83, and it is working properly.



Ability to access the product configuration page using the 10.10.100.254 IP address (default account: admin / admin)

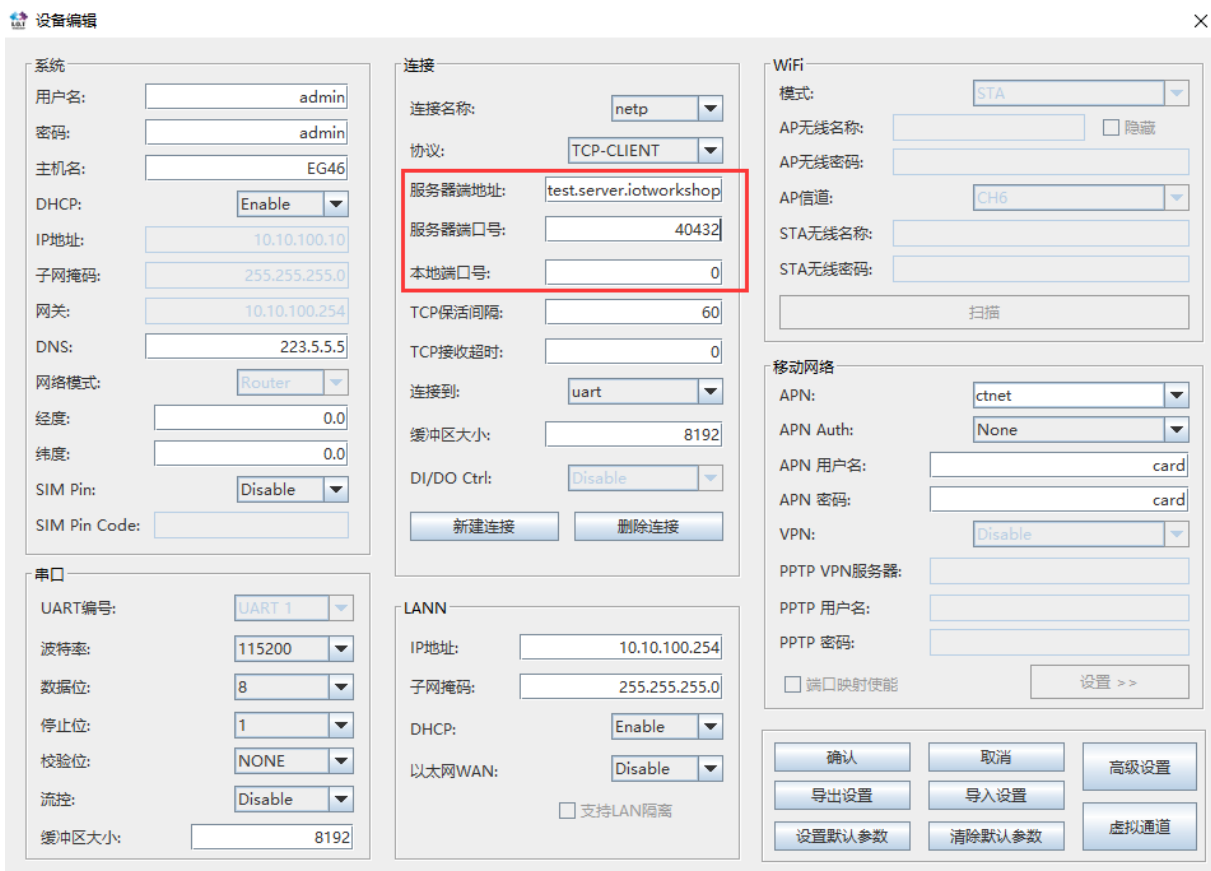


Step 2: Modify the device communication method, establish a TCP Client to connect to the High Flying test server, and the test server will directly reply to the received data.

High Flying test server: test.server.iotworkshop.com

TCP port: 40432

UDP port: 40431



Home page to check the connection status.



**系统**

设备类型: EG46  
 软件版本: 1.40.1k  
 实时时间: 2019-8-13 15:54:44 Tues  
 ICCID: 89860318840214530476  
 IMEI: 866262044681574  
 IMSI: 460110129783673  
 4G状态: 4G 66

**连接**

连接名称: netp  
 协议: TCP-CLIENT  
**设备状态: Connected**  
**服务器IP: 115.29.164.59**  
 接收字节数: 12      接收帧数: 2  
 发送字节数: 10      发送帧数: 2  
 失败字节数: 1      失败帧数: 1

**网络**

主机名: EG46  
 DHCP: Enable  
 IP地址: 100.108.128.87  
 子网掩码: 255.255.255.255  
 网关: 10.64.64.64  
 MAC地址: 98D8638CC210

**串口**

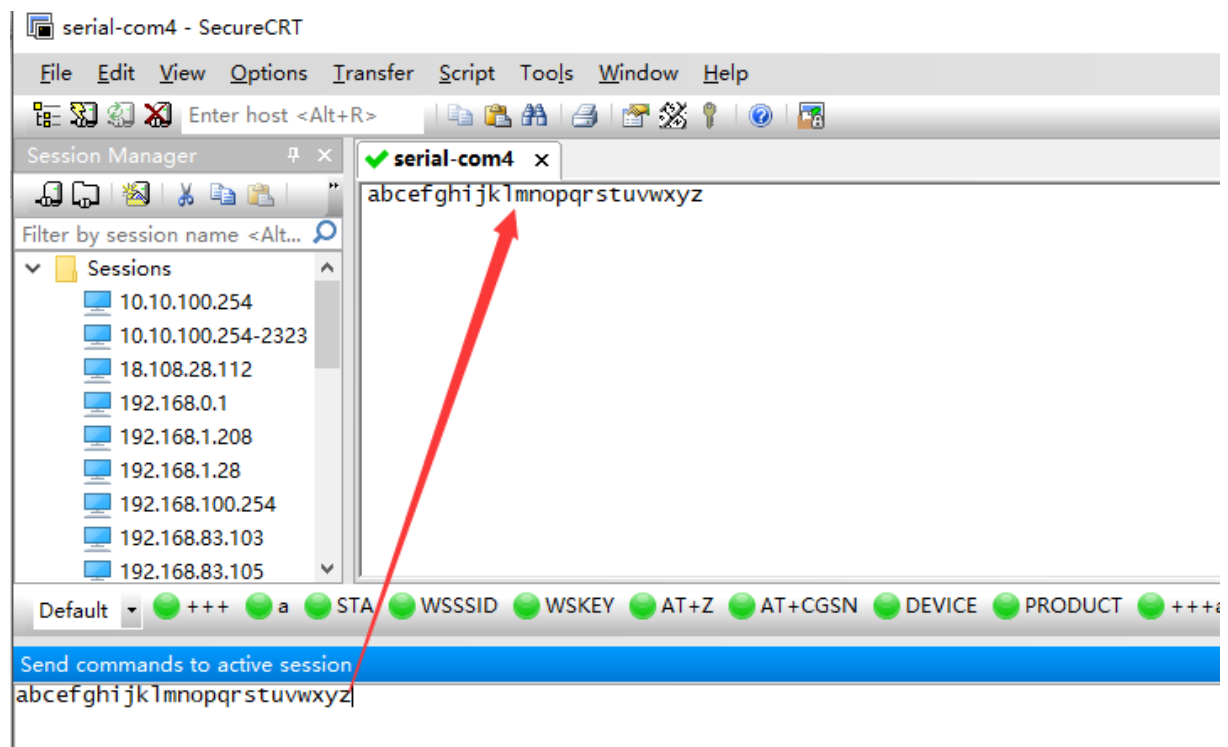
UART编号: UART 1  
 设备编辑: 115200,8,1,NONE  
 接收字节数: 14      接收帧数: 4  
 发送字节数: 12      发送帧数: 2  
 失败字节数: 0      失败帧数: 0

**WiFi**

状态:  
 信号强度: 0

恢复出厂设置      设备编辑  
 重新启动

Step 3: Send data through the serial port, you can see that the same data is received, and at the same time, the tool can view the statistics of the number of bytes sent and received.





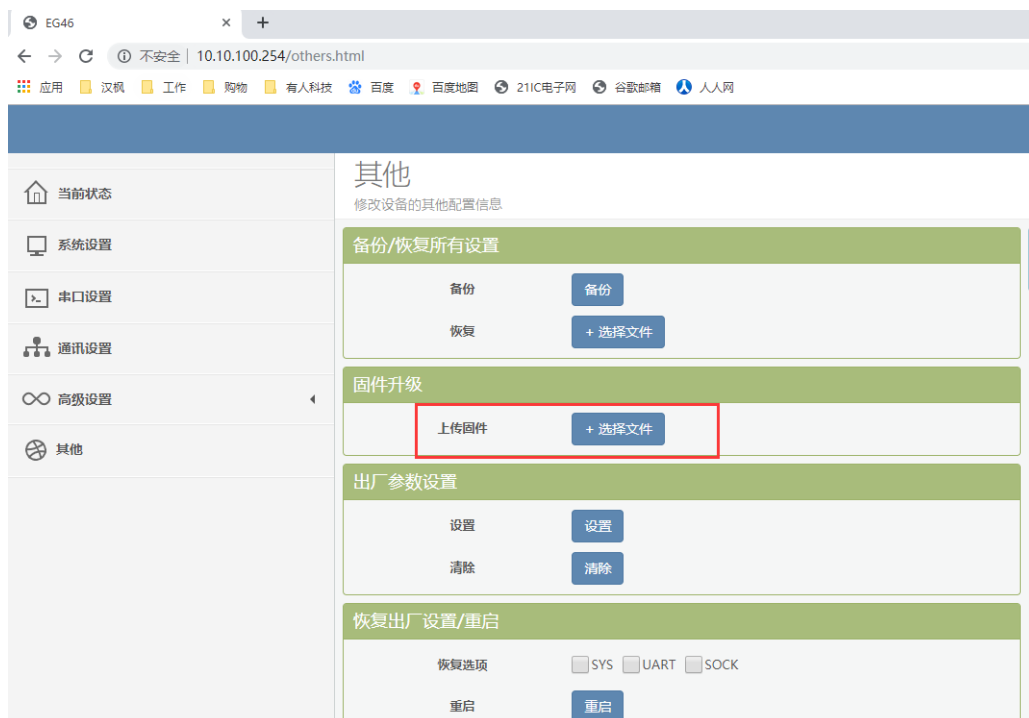
### 3.4. UPGRADE FUNCTION

The product supports LAN, remote upgrade firmware, upgrade web configuration page, as detailed below.

#### 3.4.1. LAN APPLICATION UPGRADE

Log in to the product web page (10.10.100.254) on the LAN, and click Firmware Upgrade to upgrade the application.

**Note:** Do not power off during the upgrade process, which will cause the product to malfunction abnormally. Subsequent software versions will be updated to support the firmware backup function.

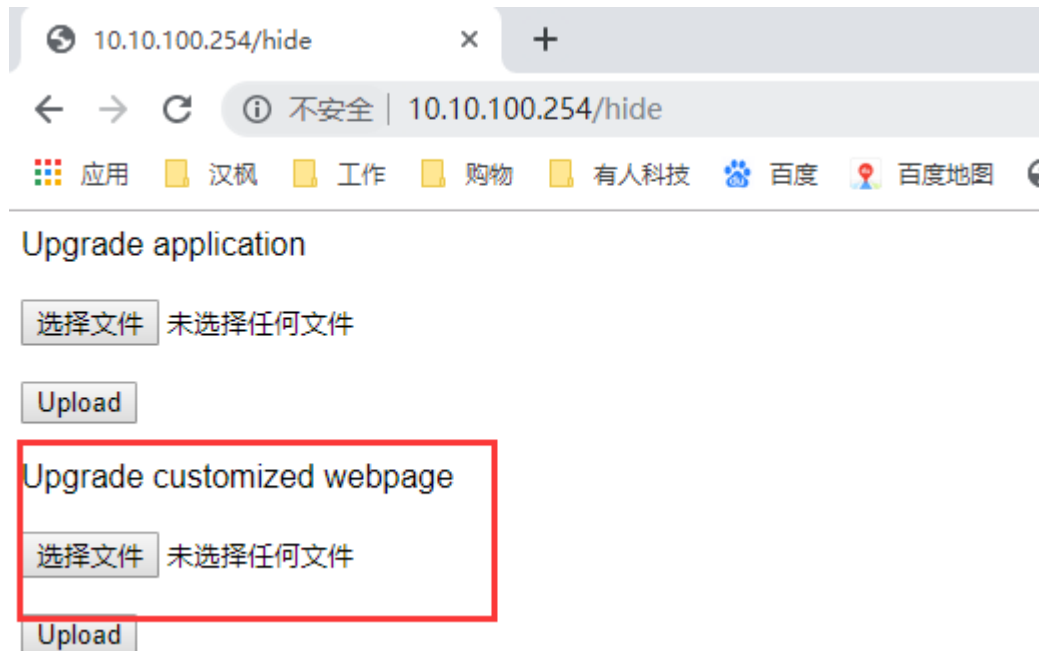


### 3.4.2. LAN WEB CONFIGURATION PAGE UPGRADE

Log in to the product's internal webpage (10.10.100.254/hide) on the LAN, Upgrade application can upgrade the application, and Upgrade customized webpage can upgrade the web configuration page.

The source code of the configuration webpage can be downloaded from the following address. You can use this source code to add functions such as displaying the logo on the webpage.

<http://www.hi-flying.com/download-center-1/application-notes-1>

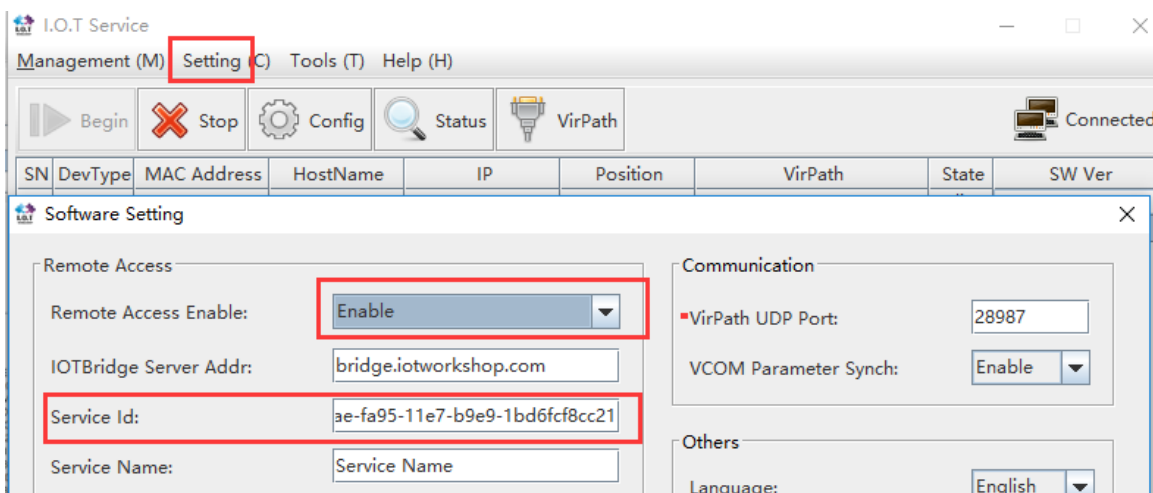


### 3.4.3. ROMOTE APPLICATION UPGRADE

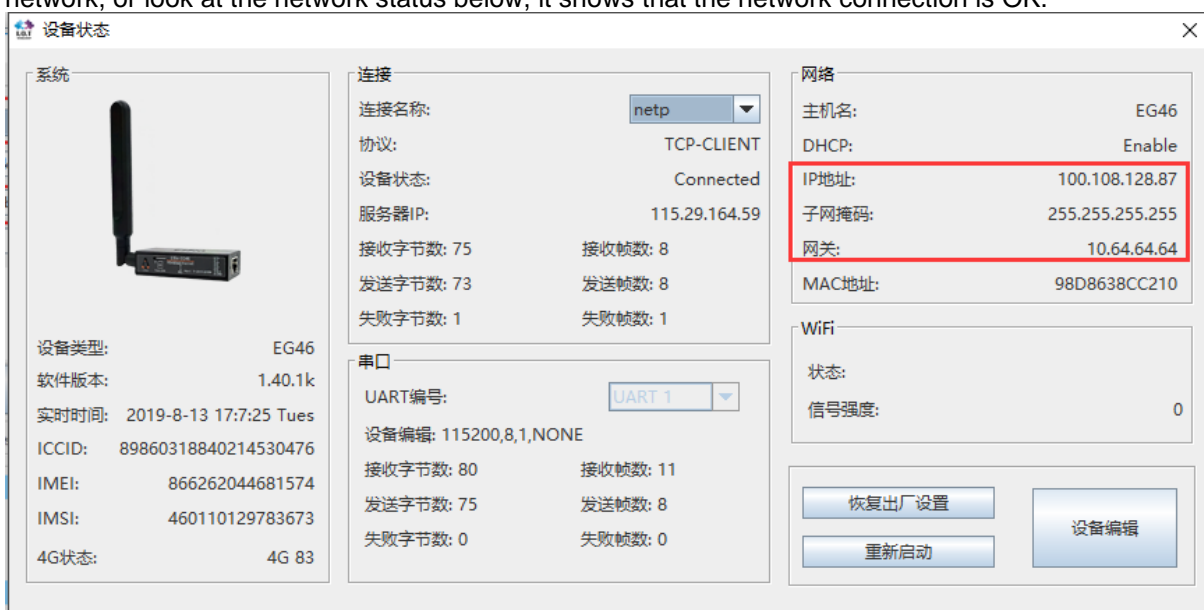
Log in to High Flying's IOTBridge website (<http://bridge.iotworkshop.com/>) to register for an account, or enter through High Flying's official website.



Fill in this value in the tool.



After inserting the SIM card, power on the device, wait until the product is registered to the network, or look at the network status below, it shows that the network connection is OK.

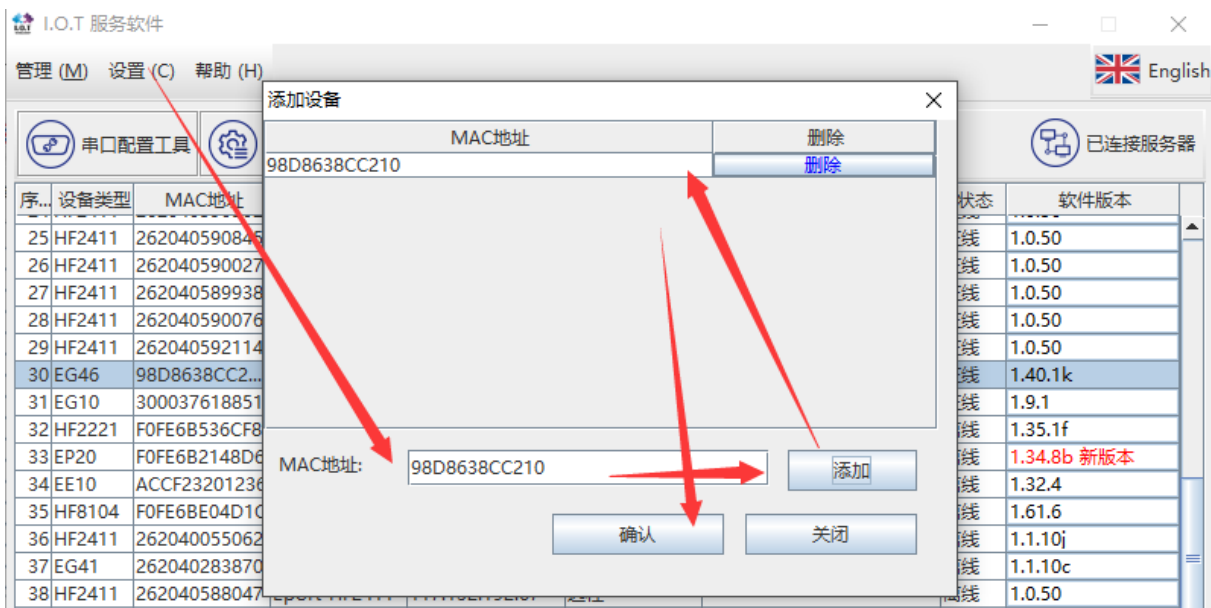


Add the module MAC address to the tool for binding. It is recommended to use the Cli command to write the UserId obtained from IOTBridge to the device to prevent the device from being maliciously bound by other accounts.

```

EPORT/SYS>User ID
366a5a10-b981-11e9-bab2-399652492e20

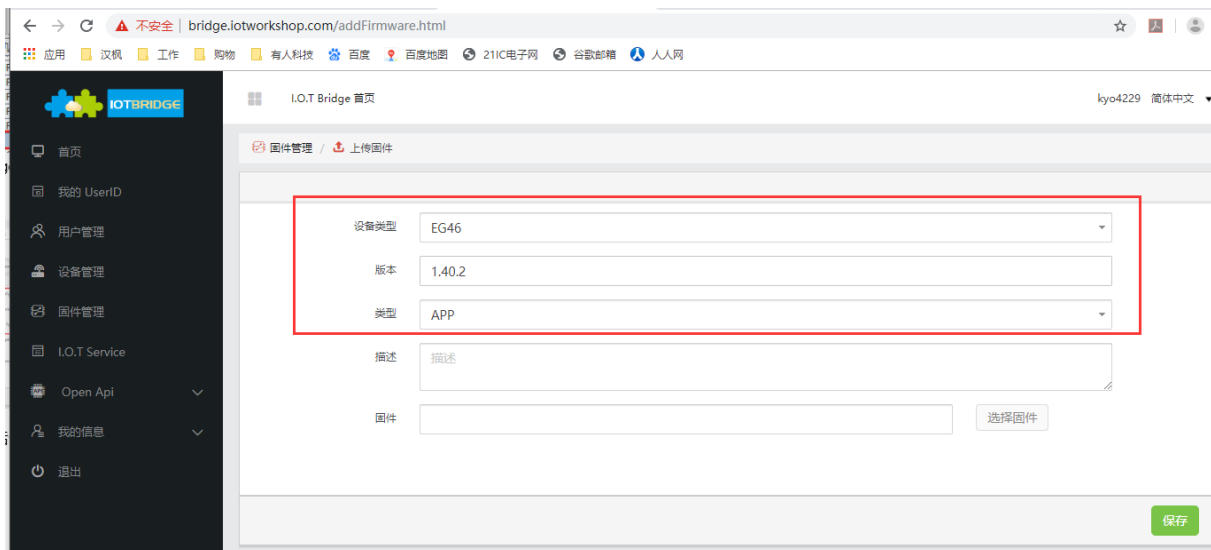
```



The computer is switched to connect to the router. In the external network environment, you can also remotely view the device status.

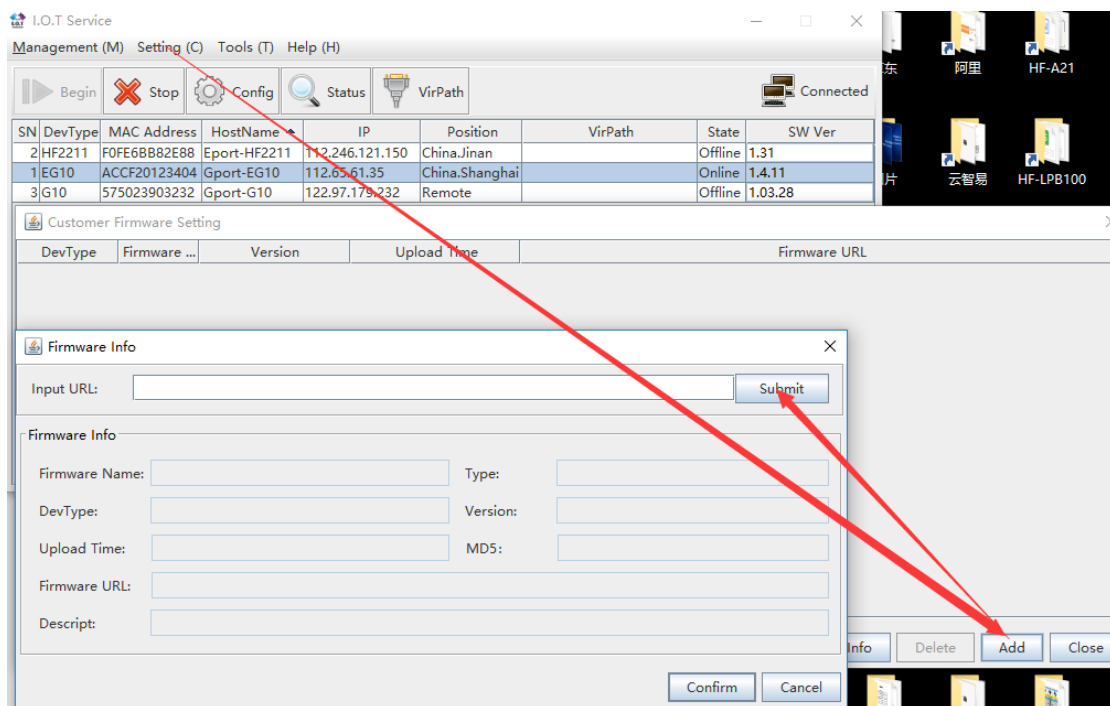
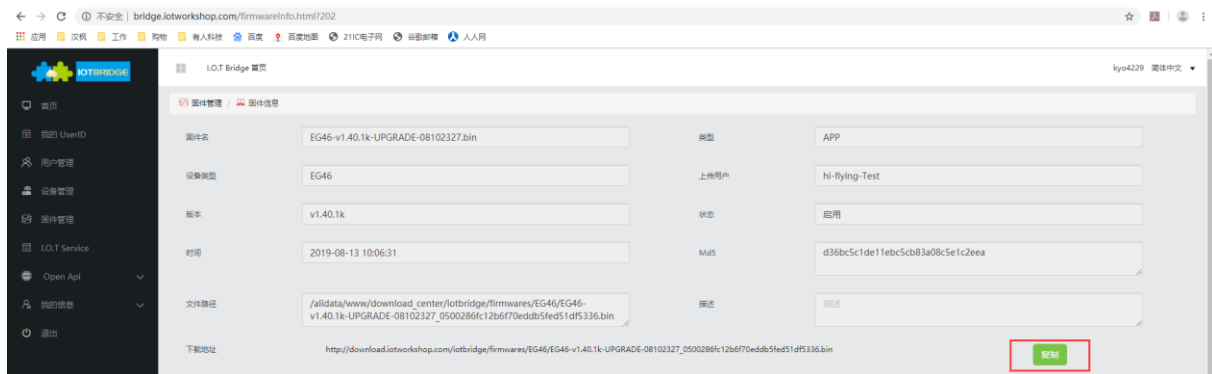


Log in to <http://bridge.iotworkshop.com/>, and load the updated OTA firmware (strictly fill in the figure below, type APP)



After uploading, get and copy the download link address from the background.





I.O.T 服务软件

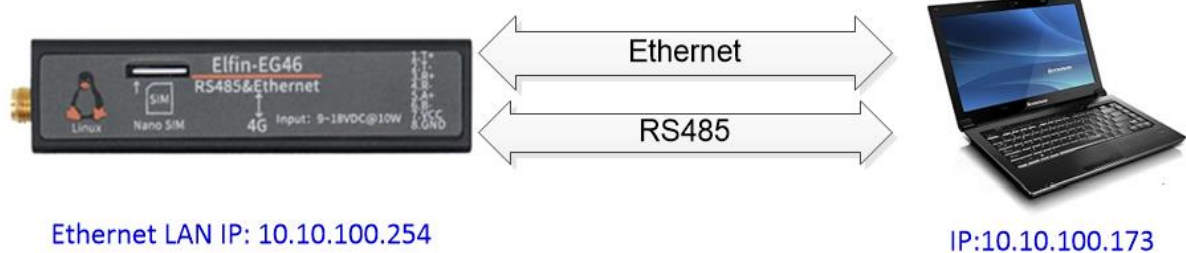
管理 (M) 设置 (C) 帮助 (H)

串口配置工具 设备编辑 设备状态 虚拟通道 已连接服务器

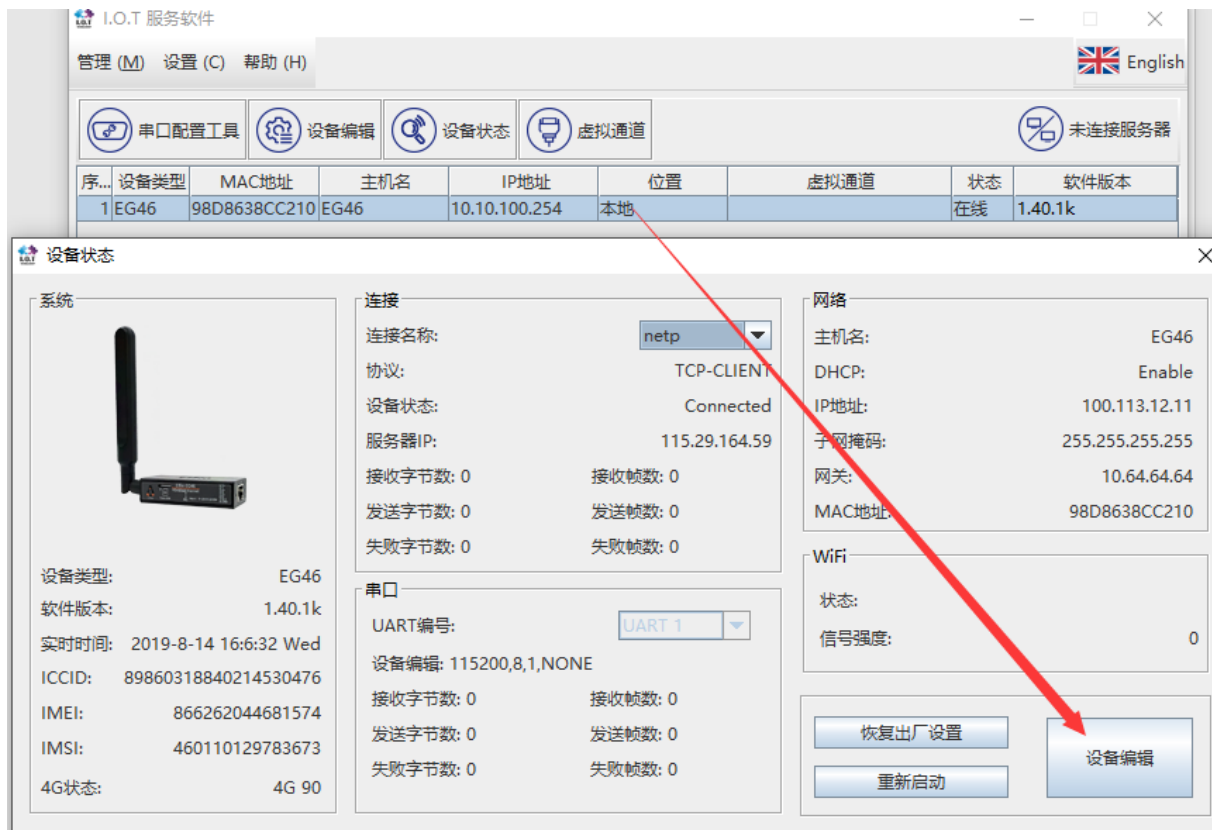
序...	设备类型	MAC地址	主机名	IP地址	位置	虚拟通道	状态	软件版本
25	HF2411	262040590027	Eport-HF2411	221.178.125.219	远程		在线	1.0.50
26	HF2411	262040589938	Eport-HF2411	218.204.253.49	远程		在线	1.0.50
27	HF2411	262040590076	Eport-HF2411	221.178.126.11	中国,西安市		在线	1.0.50
28	HF2411	262040592114	Eport-HF2411	221.178.126.196	远程		在线	1.0.50
29	EG46	98D8638CC2...	EG46	101.84.60.229	远程		在线	1.40.1k
30	EG10	300037618851	Gport-EG10	112.64.68.94	远程	复制MAC到剪贴板	在线	1.9.1
31	HF2411	262040588047	Eport-HF2411	117.132.194.57	远程	设备列表过滤	在线	1.0.50
32	HF2221	F0FE6B536CF8	Eport-HF2211	222.65.108.69	中国	刷新列表	离线	1.35.1f
33	EP20	F0FE6B2148D6	Eport-EP20	101.93.66.44	中国	删除已选设备	离线	1.34.8b 新版本
34	EE10	ACCF23201236	Eport-EE10	222.65.108.69	中国	升级选择设备的程序	离线	1.32.4
35	HF8104	F0FE6BE04D1C	Eport-HF8104	36.113.163.181	中国	升级所有设备的程序	离线	1.61.6
36	HF2411	262040055062	Eport-HF2411	112.64.119.150	中国	升级选择设备的网页	离线	1.1.10j
37	EG41	262040283870	Eport-EG41	223.104.210.6	远程	本地设备保存出厂参数	离线	1.1.10c
38	HF2411	262040590092	Eport-HF2411	223.104.255.70	中国	应用程序	离线	1.0.50
39	EG11	300037623794	Gport-EG11	112.65.61.255	远程		离线	1.7.6
40	HF5111B	ACCF23202222	Eport-HF511...	222.65.108.69	中国		离线	1.34.7

### 3.5. MODBUS MASTER POLLING FUNCTION

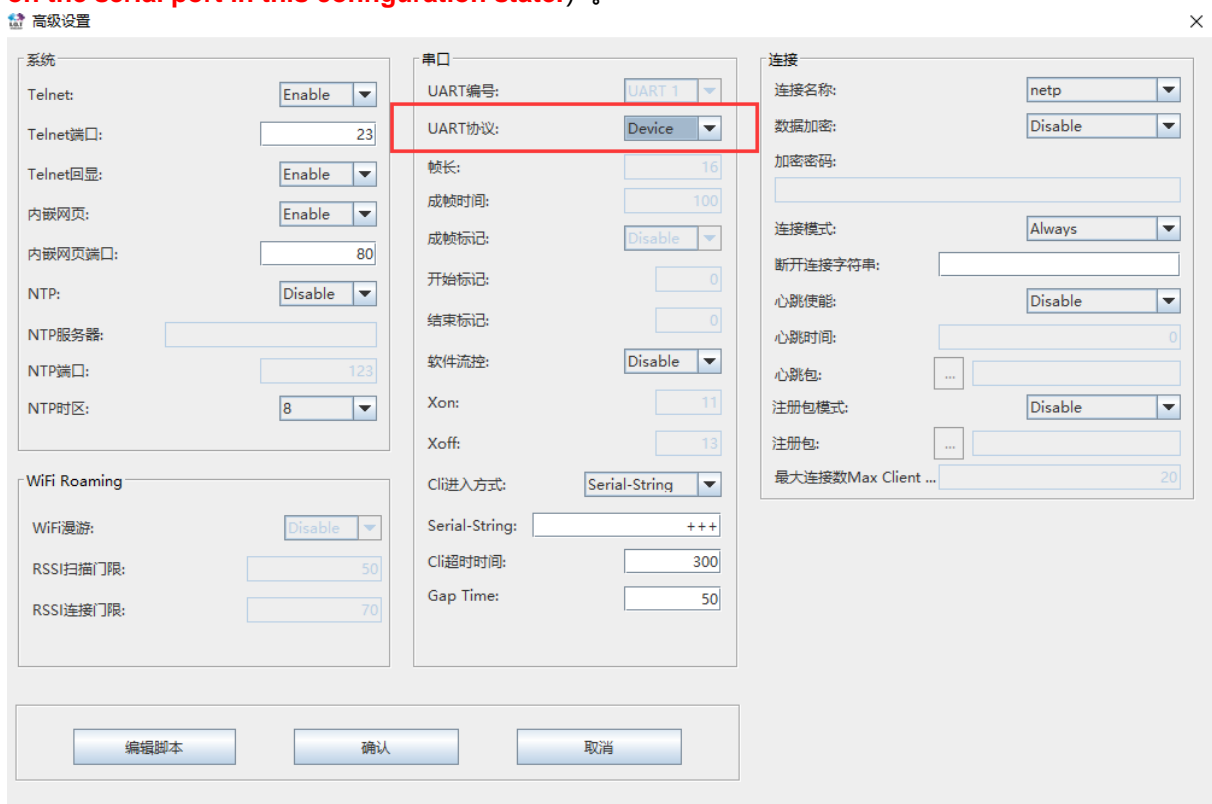
PC network cable and serial cable connected to EG46



Open the IOTService tool and click Edit.



Modify the serial protocol to device (modbus master function, **the cli command cannot be used on the serial port in this configuration state.**) .



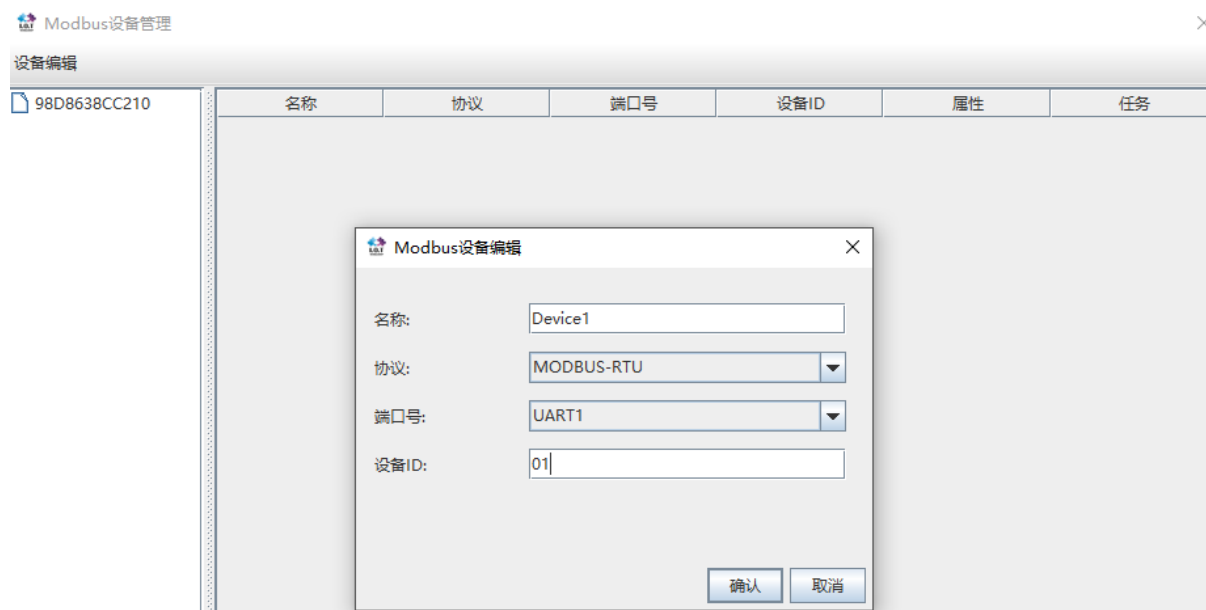
Right click on the device information to enter the modbus setting page.



Right-click EG46 and select Add Device.

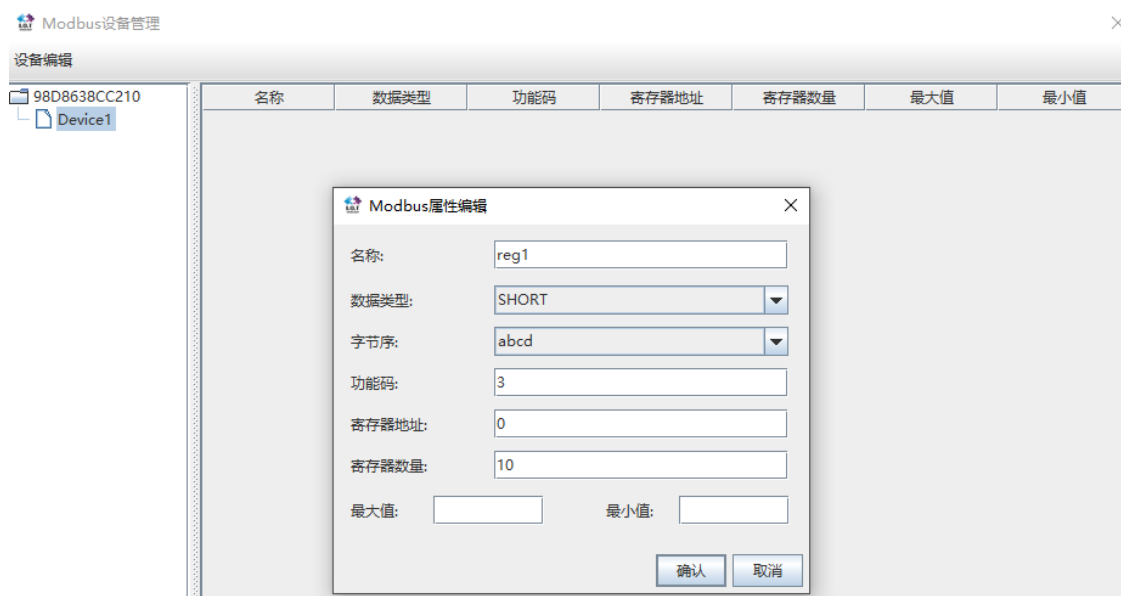
- Name: Modbus slave device name
- Protocol: Modbus slave device protocol type
- Port number: serial port number (EG46 only has one serial port, fill in UART1)
- Device ID: Modbus slave device address



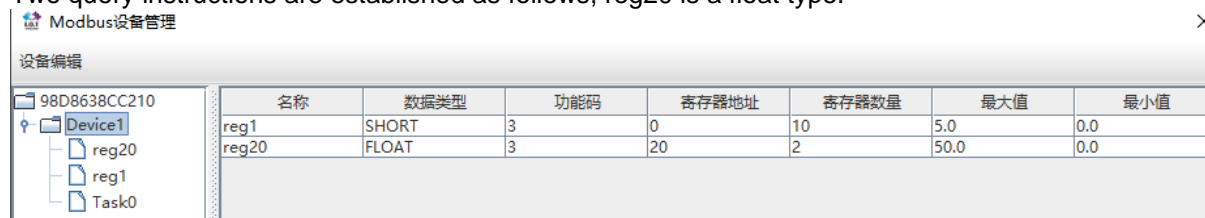


Right-click the created Device and select Add Attribute.

- Name: The name used when data is reported. When polling multiple register numbers, data without a name is automatically reported under the regXX name.
- Data type: short, bool or float, which affects data reporting.
  - bool: report as false or true
- short: The data is a short integer with a 2-byte length as a register value.
- float: The data is in floating point, and the length of 4 bytes is used as a register value.
- Byte order: The byte order of the data, whether the high order or low order comes first.
  - abcd: big-endian mode
  - badc: big-endian mode and swap byte order.
  - dcba: little-endian mode
  - cdab: little-endian mode and swap byte order.
- Function code: Function code when modbus polling.
- Register address: Modbus polling register start address
- Number of registers: The number of modbus polling registers.
- Maximum value: The maximum value of data allowed in the float data type.
- Minimum value: The minimum allowable data value under the float data type.

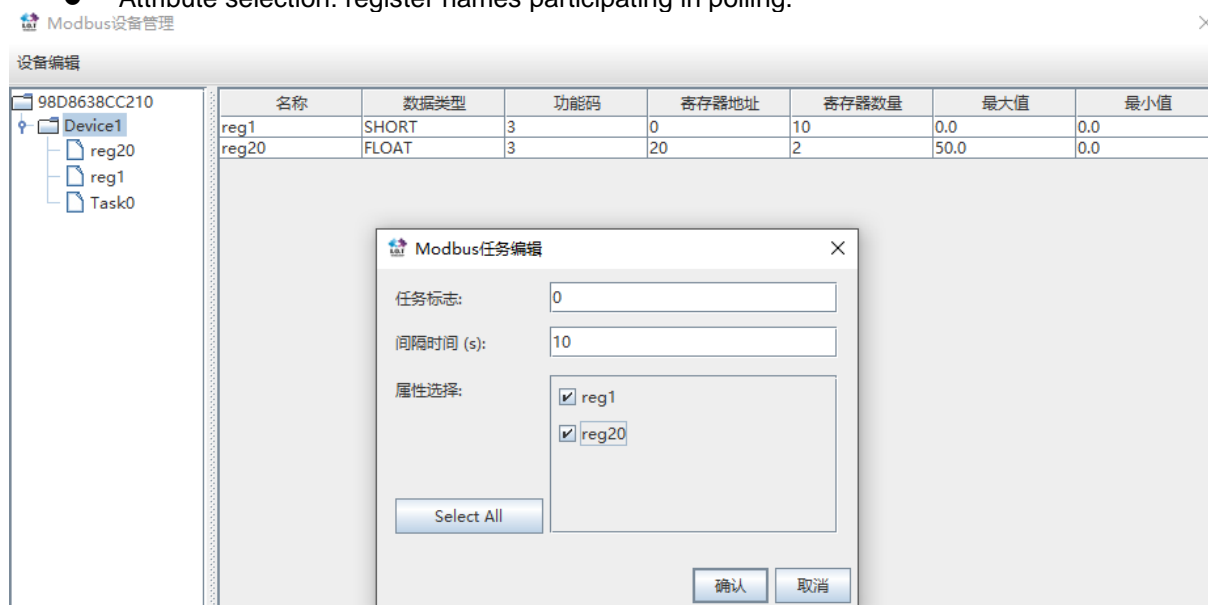


Two query instructions are established as follows, reg20 is a float type.

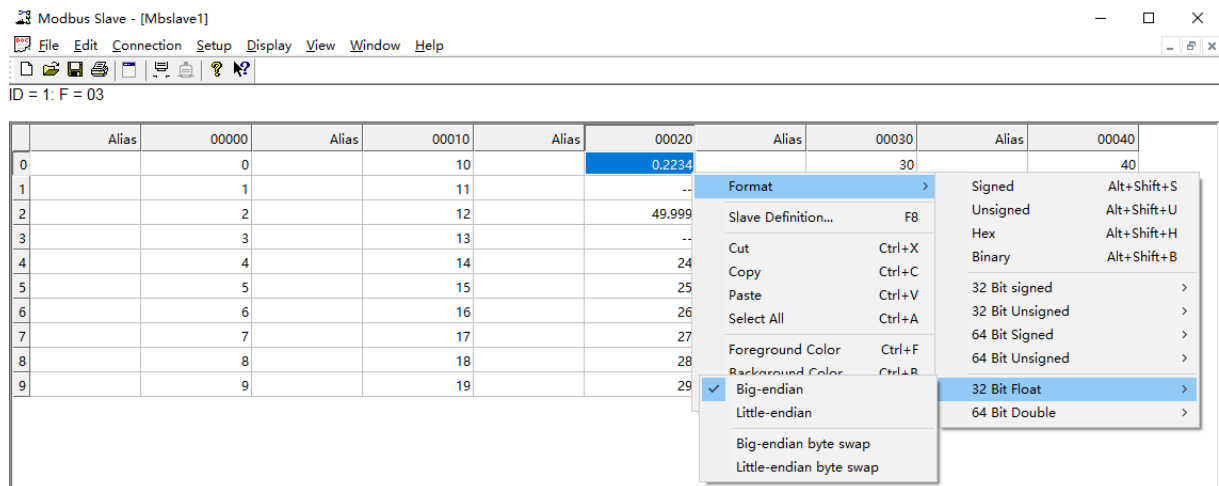


Create a task, set the collection time and collection range, and restart the device after the task is created to take effect.

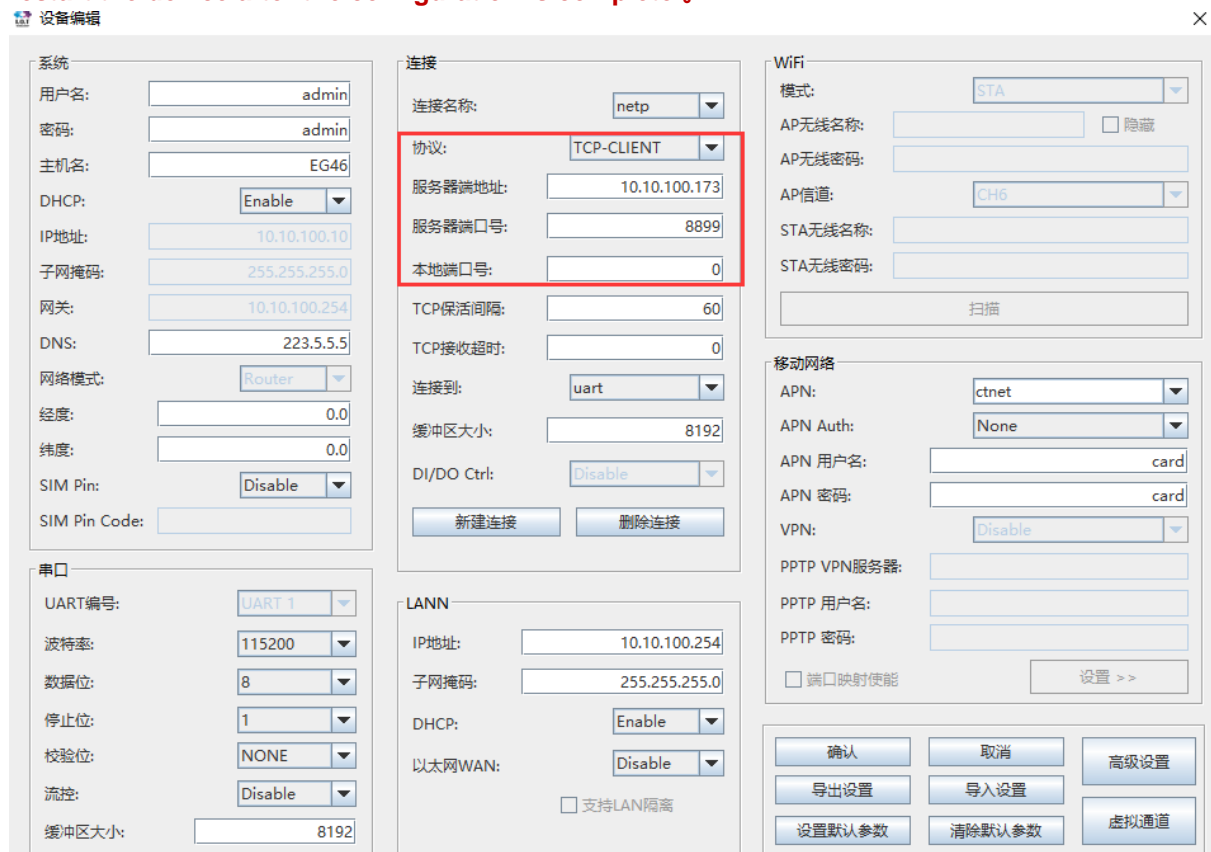
- Task tag: task id name
- Interval time: complete one polling cycle.
- Attribute selection: register names participating in polling.



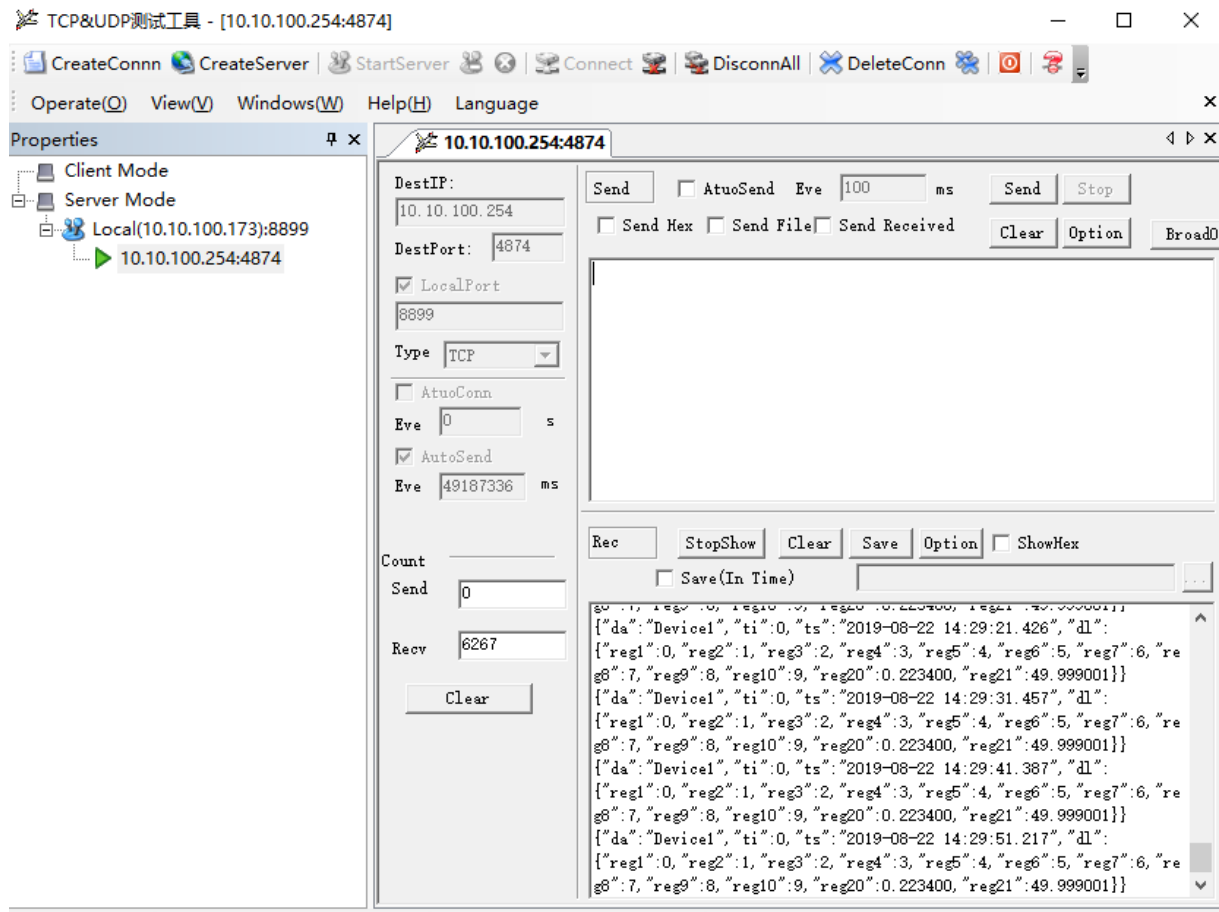
Open the modbus slave software on the PC and simulate the modbus device, as shown in the figure below, with the address set to 1, function code 3, and the register value set as shown in the figure below.



After the above configuration, the serial port is set up, and then data reporting can be set. TCP, HTTP, MQTT and other methods can be used. The following example uses TCP Client to connect to a PC to view the data reported after polling. The aircraft software establishes TCP Server, port 8899, 10.10.100.173 is the PC IP address, and restart the device after the configuration is complete, **and restart the device after the configuration is complete.**



From the PC side, you can see the message sent by the device after polling.



The interaction process is explained as follows:

According to the configuration of the serial port in the above example, the product automatically initiates polling data every 10 seconds, and two instructions are issued in a single poll

Instruction 1: modbus address 1, function code 3, register start address 0, length 10.

Device polling instruction: **01 03 00 00 00 0A C5 CD**

modbus Slave reply: 01 03 14 00 00 00 01 00 02 00 03 00 04 00 05 00 06 00 07 00 08 00 09 CD 51

Instruction 2: modbus address 1, function code 3, register start address 20, length 4.

Device polling instruction: **01 03 00 14 00 04 04 0D**

modbus Slave reply: 01 03 08 3E 64 C2 F8 42 47 FE FA E7 F1

For the received data, the data is parsed according to the floating point number or short type in the configuration, and the configuration information is reported.

```
{
  "da": "Device1",           //device name
  "ti": 0,                   //task tag
  "ts": "2019-08-22 14:14:05.409", //time stamp
  "dl": {
    "reg1": 0,               //register name, short type.
    "reg2": 1,
    "reg3": 2,
    "reg4": 3,
    "reg5": 4,
    "reg6": 5,
```



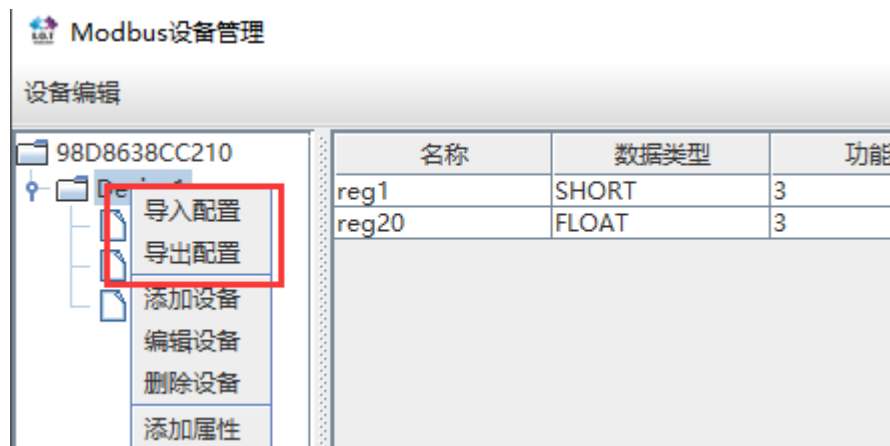
```

    "reg7": 6,
    "reg8": 7,
    "reg9": 8,
    "reg10": 9,
    "reg20": 0.223400,           //Register name, floating point type.
    "reg21": 49.999001
}

```

Remarks:

- 1、 Support the creation of multiple modbus slave devices.
- 2、 Support several data points.
- 3、 Support batch import and export of configuration information, directly import parameters, and complete parameter configuration with one click.



### 3.6. VIRTUAL SERIAL PORT, VIRTUAL CHANNEL FUNCTION

See the IOTService tool documentation for details on function usage.

### 3.7. HIS SCRIPT FUNCTION

See the HIS script documentation for the function usage details.

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

### 3.8. OTHER FUNCTIONS

For details on MQTT, WebSocket, Modbus TCP to RTU and other applications, please refer to the following documents.

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

