4G_2G_NB DTU

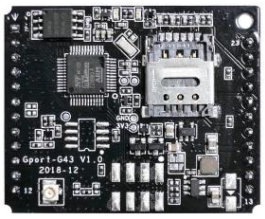
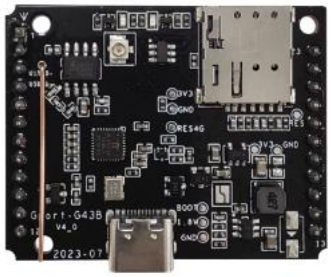
Products Function

V 2.1

This document applies to the following series of products. Please refer to the product manual for product hardware instructions.

4G Products		Protoss-PG41
		Protoss-PG4XB
		HF2411

		Elfin-EG40 Elfin-EG41
		Elfin-EG4XB
		Meta-MG41 Meta-MG42
		Meta-MG4XB-CC

		Meta-MG4XB
		Gport-G43
		Gport-G43B
2G Products		Protoss-PG11

		HF2111A
		Elfin-EG10, Elfin-EG11
		Gport-G10、Gport-G11、Gport-G12
NB-IOT		HF2611

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V 1.0 01-24-2018. First Version

V 1.1 01-25-2018. Correction section AT command description

V 1.2 03-22-2018. Add AT+LOCATE commend

V 1.3 07-25-2018. Add EG model

V 1.4 11-28-2018. Add HF2411, HF2111A type. Add AT+HTPXX series command

V 1.5 12-10-2018. Add AT+CMDPW, AT+TCPTO command

V 1.6 12-19-2018. Add AT+GOTA, AT+GVER command. Add Gport-G43 Type

V 1.7 02-01-2019. Add AT+APN,AT+SMSID,AT+HOST

V 1.8 04-29-2019. Update MQTT, websocket, Ali-IOT

V 1.9 09-04-2019. Update HF2611

V 2.0 02-19-2020. Update PG11, PG41

V 2.1 10-10-2023. Update PG41B, EG41B,G43B,MG41A,MG41B

1. FUNCTION DESCRIPTION

The products to which this document applies have the following characteristics.

- Connect the device to a PC or other server by establishing TCP/UDP or Telnet to support up to 3 socket communications.
- One or Two independent serial ports work.
- Support IOTService to remotely modify module working parameters.

1.1. Basic Network Protocol

The products use IP address for network communication. Transmit by TCP, the data can be ensured without loss or duplication, and reach the communication destination address accurately. And transmit by UDP, the data can be transmitted to the destination address quickly and efficiently.

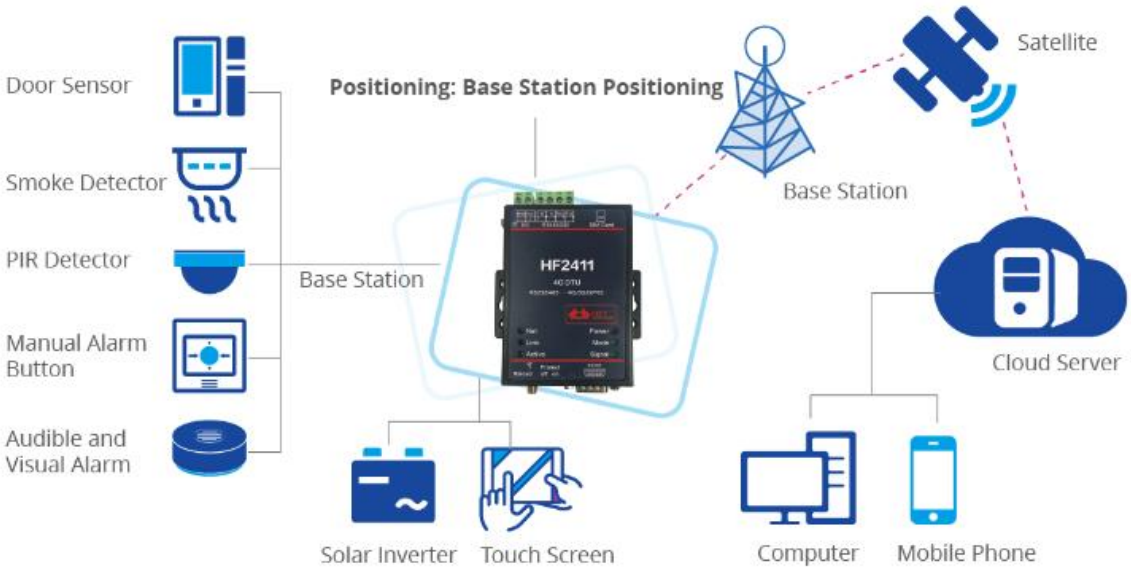


Figure 1. Network Application

1.2. Working Mode

1.2.1. Transparent Throughput Mode

The device supports a serial interface for transparent throughput mode. In this mode, the user only needs to set some necessary parameters (network communication parameters). After power-on, the device can automatically connect to the default network and server. Use the IOTService software to set communication parameters.

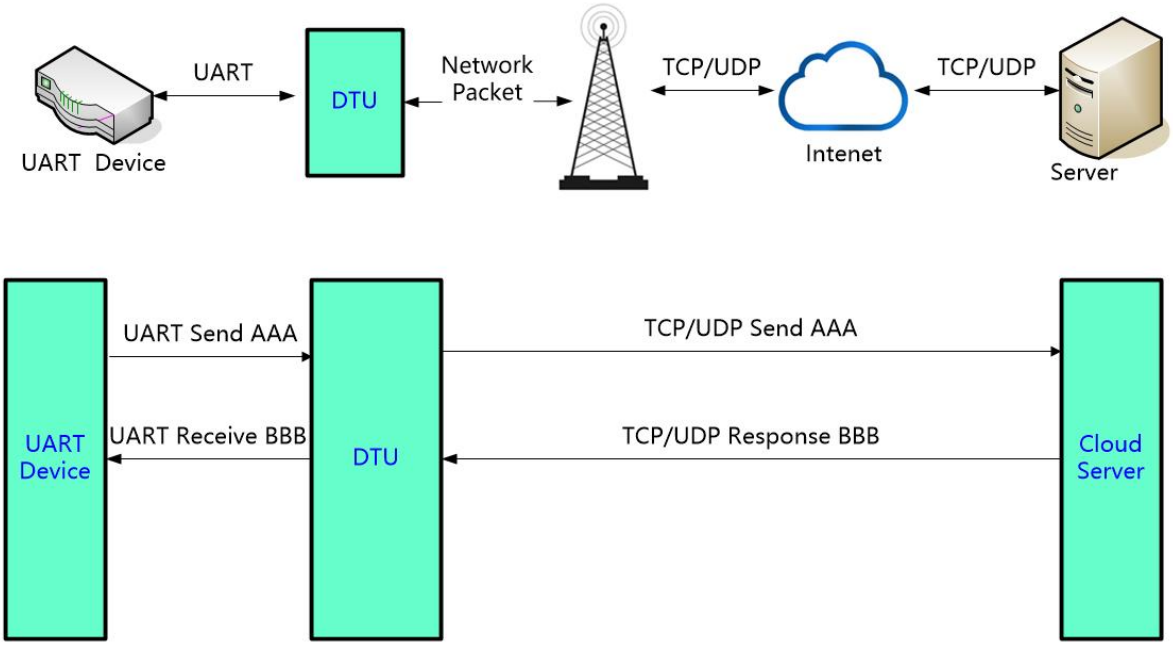


Figure 2. Transparent Throughput Mode

Under this mode, the user's serial device can send data to the specified server on the network through this module. The module can also receive data from the server and forward the information to the serial device.

The user does not need to pay attention to the data conversion process between the serial port data and the network data packet, and the data transparent communication between the serial port device and the network server can be realized by simple parameter setting.

This module supports 3 socket connections, which are SOCKA, SOCKB, and SOCKC, which are independent of each other. Each socket supports TCP client or UDP client.

For TCP connections, users can set the communication method for long or short connections. A short connection means that the connection is initiated when the serial port data is received, and the connection is automatically disconnected after a certain period of time. The server resources are greatly saved, but the connection process takes a certain amount of time, causing data transmission delay, and the server cannot actively send data to the device. Long connection means that data can be sent and received at any time, but it takes up server connection resources.

Hi-Flying test server: test.server.iotworkshop.com, TCP port: 40432, UDP port: 40431, our server response with the received data. Customer can use our server for communication test.

The data transmission case is as follows:

1、 Reboot device after setting the following communication parameters command.

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

Figure 3. AT+NETP Setting Case

2、Waiting for the network LED shows register to the network. After sending the UART data, the server replies with the IP address, port number and received data, as shown below:

Figure 4. Transparent Data Example

1.2.2. SMS Throughput Mode

In this mode, the UART data can be sent to and receive from short message. Only GSM network support this.

AT+SMSID command to set SMS parameters

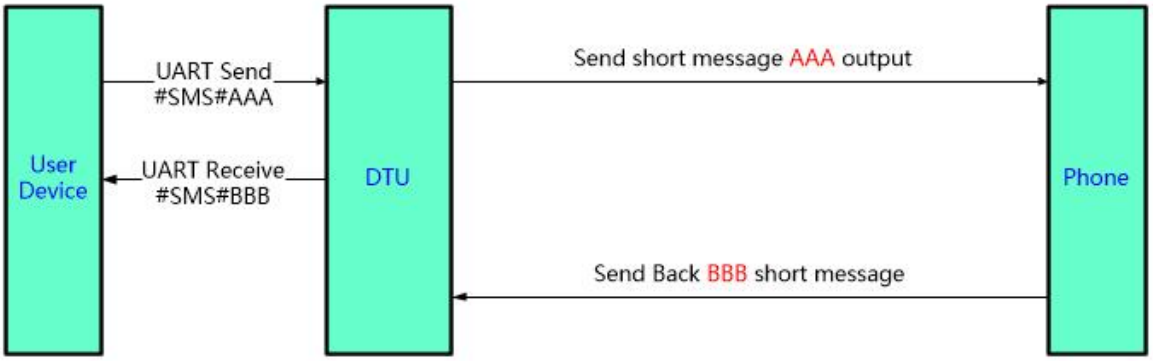


Figure 5. Transparent Transmission Mode Registration Packet Function Transmission

1.2.3. SOCKA HTTP Mode

SOCKA channel support HTTP protocol. Under this mode, the user's terminal device can send request data to the specified HTTP server through this module. The module will receive the data from

the HTTP server, parses the data and sends the results to the serial device. The user does not need to pay attention to the data conversion process between the serial port data and the network data packet, and the data request of the serial port device to the HTTP server can be realized by simple parameter setting.

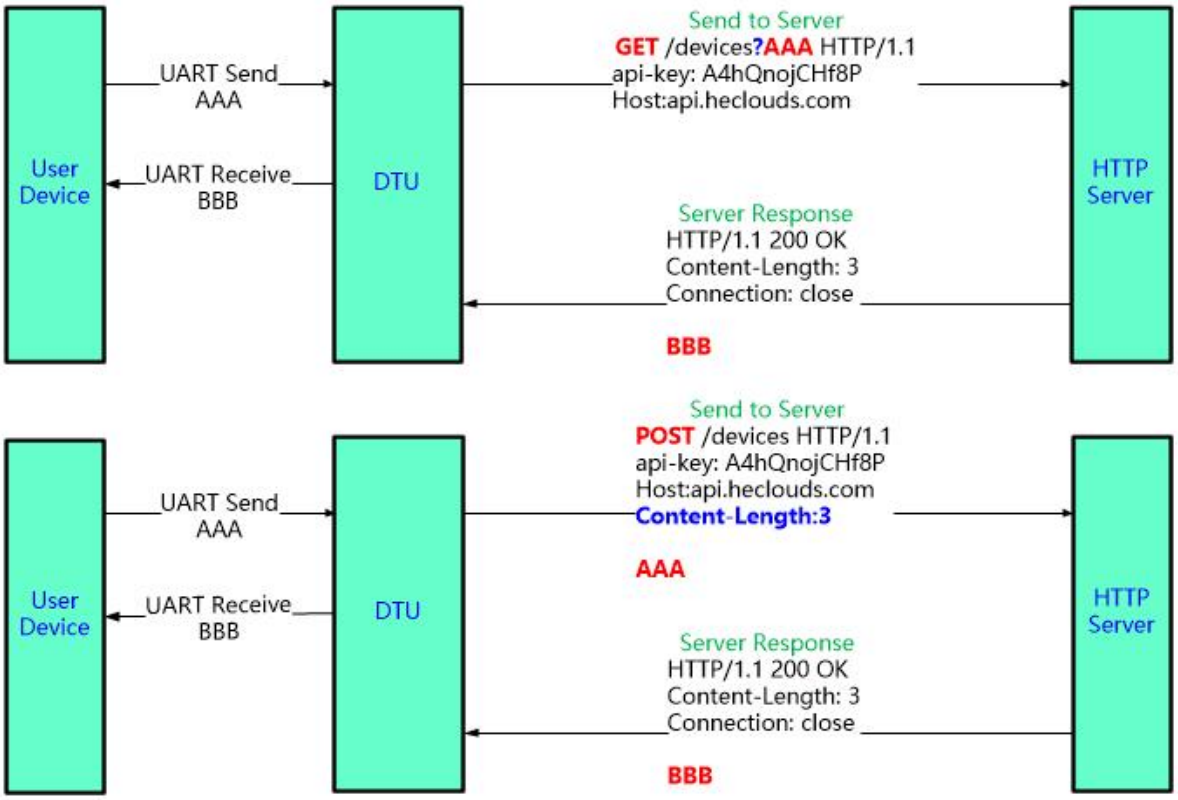


Figure 6. HTTP Mode Transmission

For GET request, the received UART packet AAA will put after the HTTP path (auto add “?” between path and parameters), for POST request, packet is put in the content (auto add Content-Length header information).

Product will send the below data to HTTP Server when UART receive “pppp” data for GET request.

```
GET /1111?pppp HTTP/1.1
Host: 192.168.83.107
```

Product will output “DDDDD” when get response from the HTTP server.

```
HTTP/1.1 200 OK
Server: nginx
Content-Length: 5

DDDDD
```

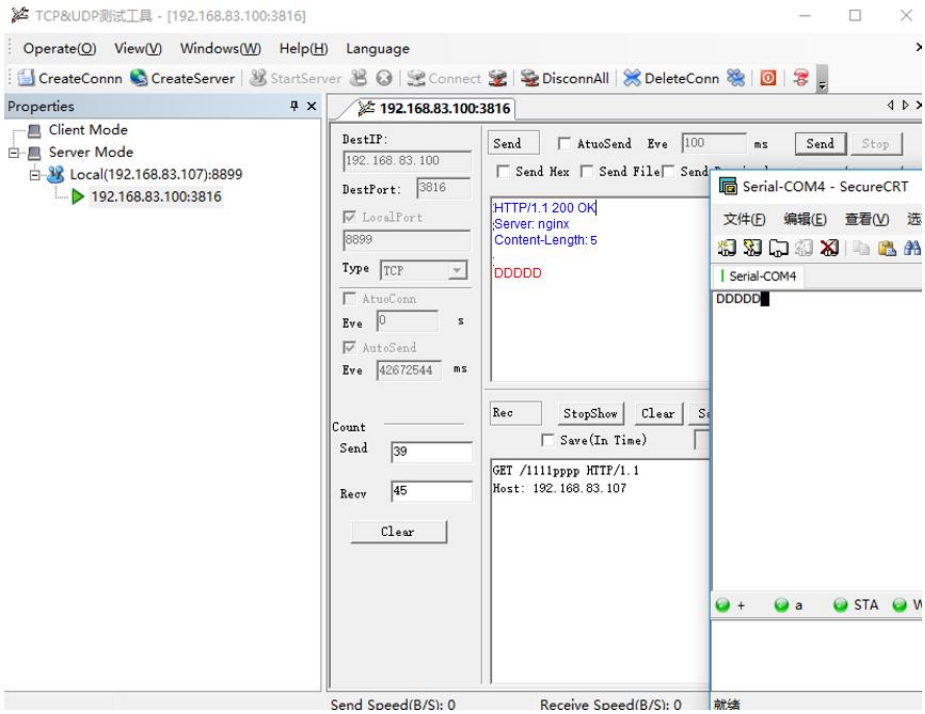


Figure 7. HTTP GET Request Example

Product will send the below data to HTTP Server when UART receive “pppp” data for POST request.

POST /1111 HTTP/1.1

Host: 192.168.83.107

Content-Length:4

pppp

Product will output “DDDD” when get response from the HTTP server.

HTTP/1.1 200 OK

Content-Length: 4

Connection: close

DDDD

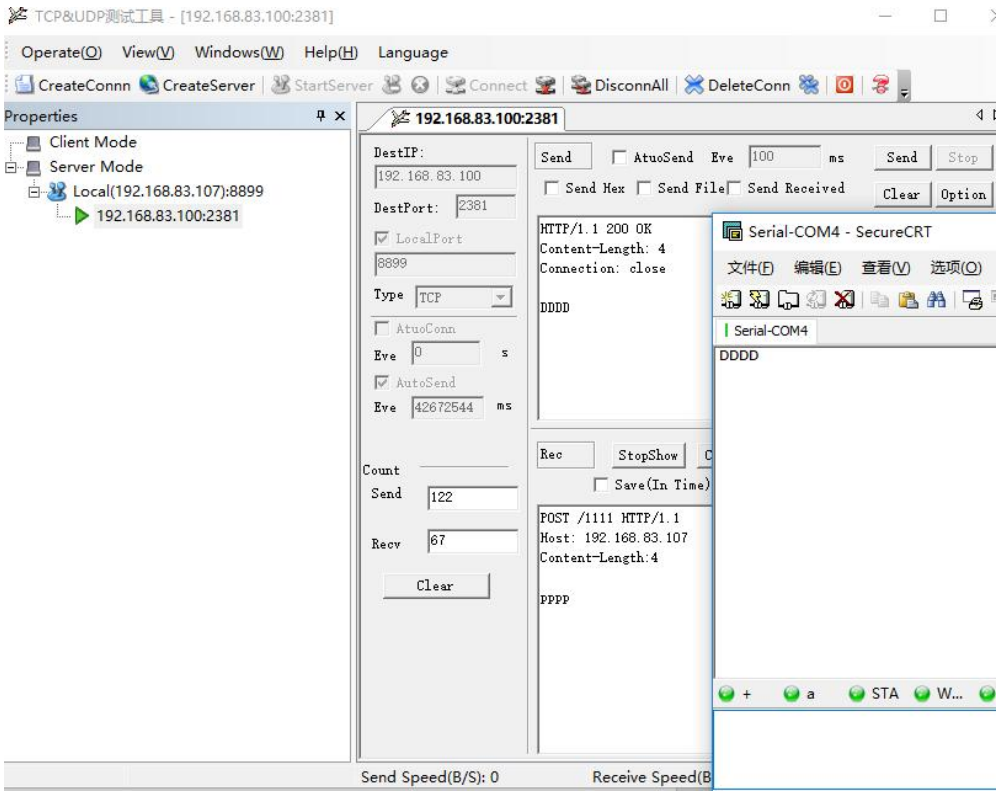


Figure 8. HTTP POST Request Example

The HTTP header information is configured by IOTService tool as follows.

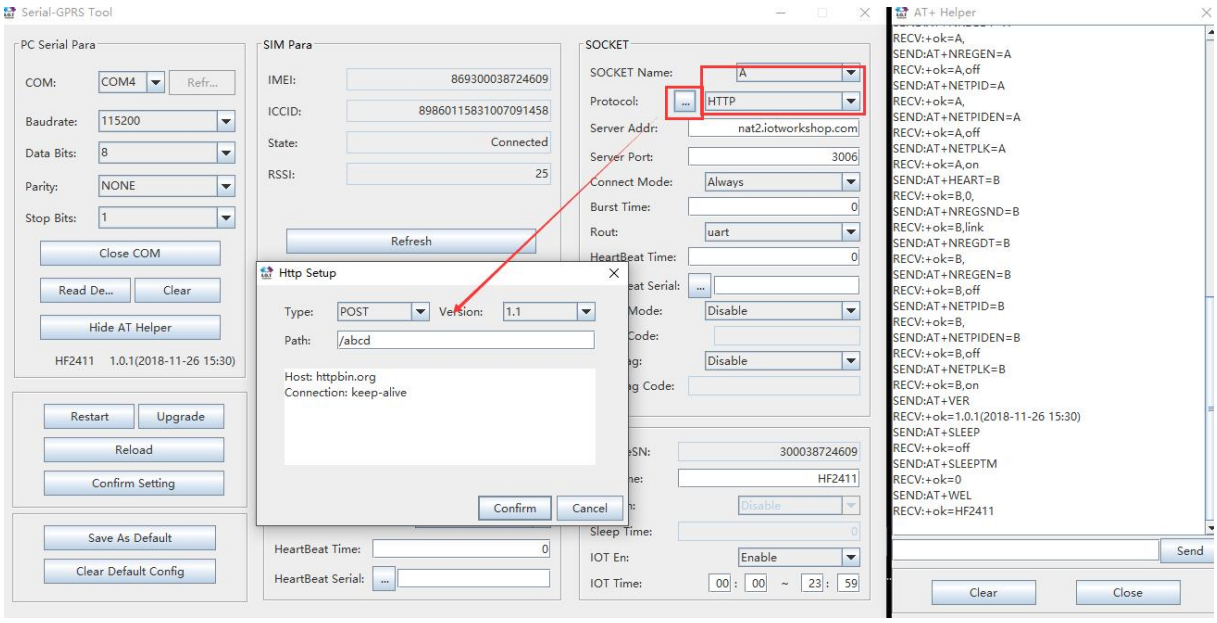


Figure 9. IOTService UART Set HTTP Parameter

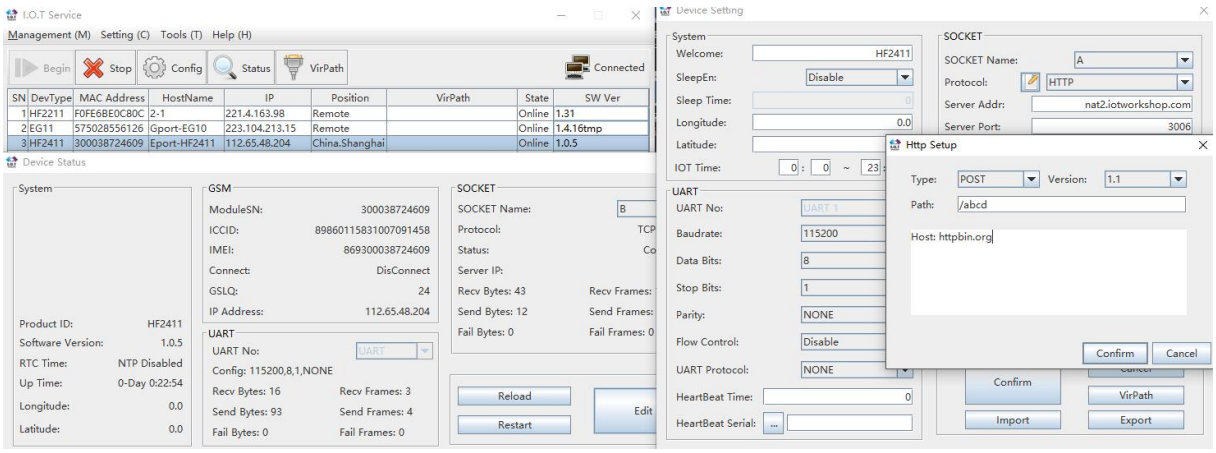


Figure 10. IOTService Remote Set HTTP Parameter

1.2.4. SOCKA WebSocket Mode

Device support WebSocket Client send data to WebSocket Server. (Use IOTService or Webpage to config). When in WebSocket Mode, device side will auto add WebSocket protocol header to server when receive UART data. And remove the protocol header and send the content to UART.

More WebSocket Case refer to following link.

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

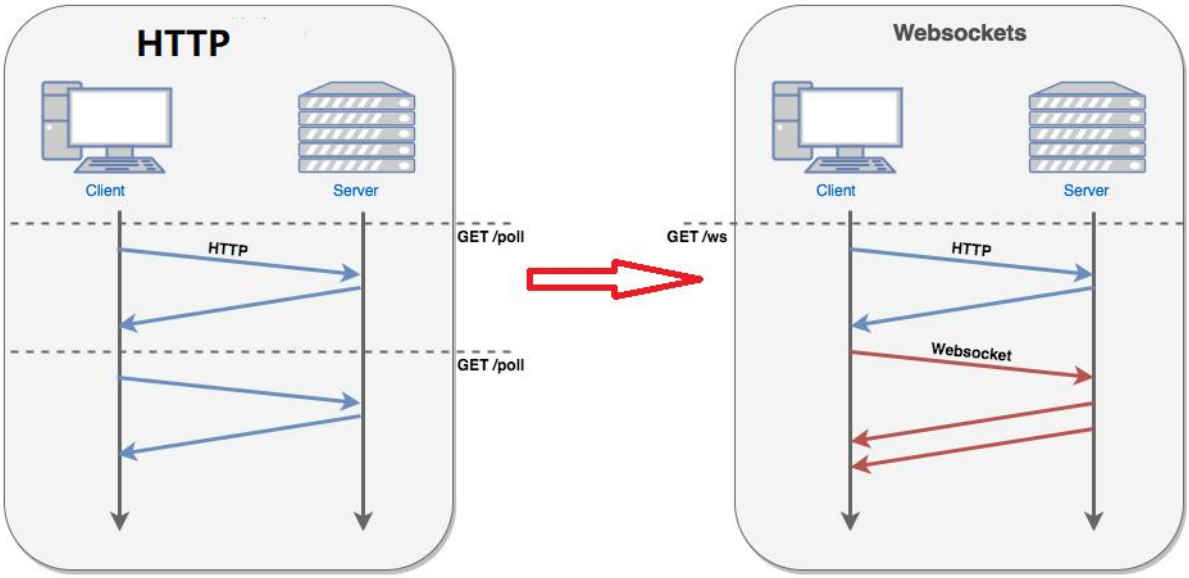


Figure 11. Websocket Basic Concept

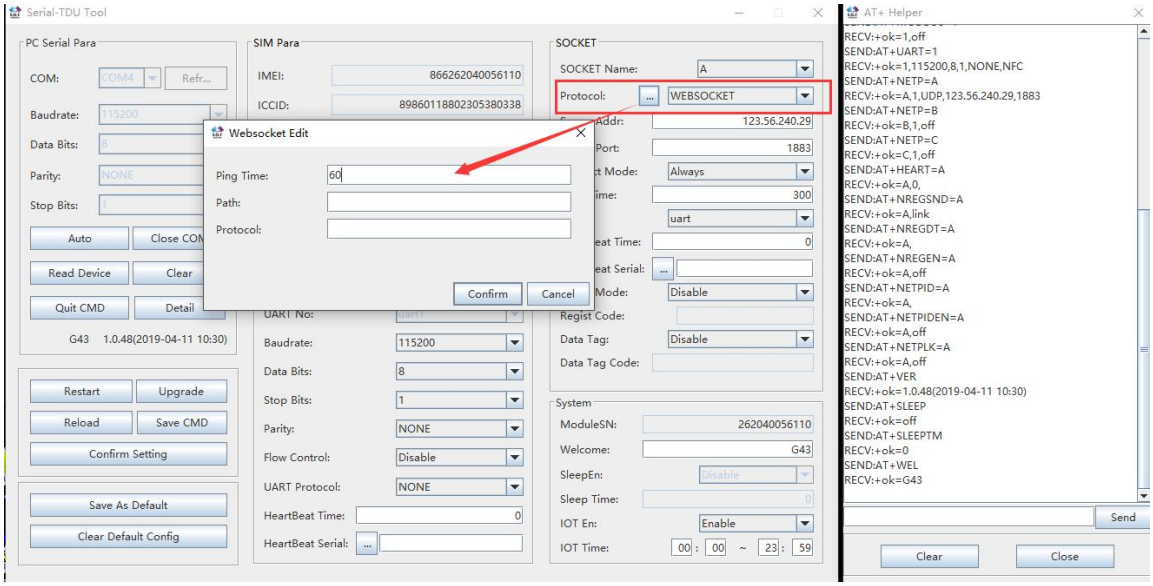


Figure 12. IOTService Tools UART Config

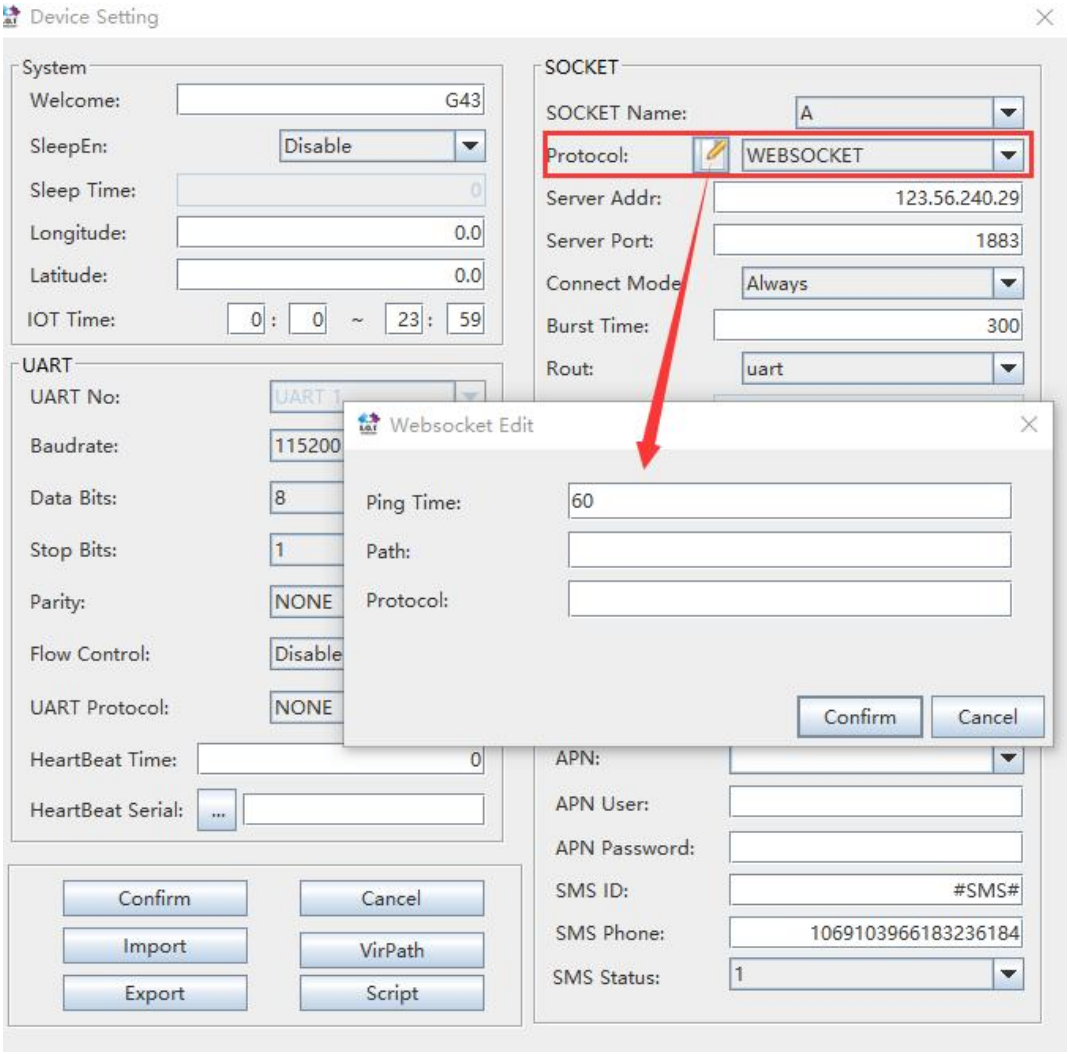


Figure 13. IOTService Network Config

1.2.5. SOCKA MQTT Mode

Device support MQTT Client send data to MQTT Server. (Use IOTService or Webpage to config).

More MQTT Case refer to following link.

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

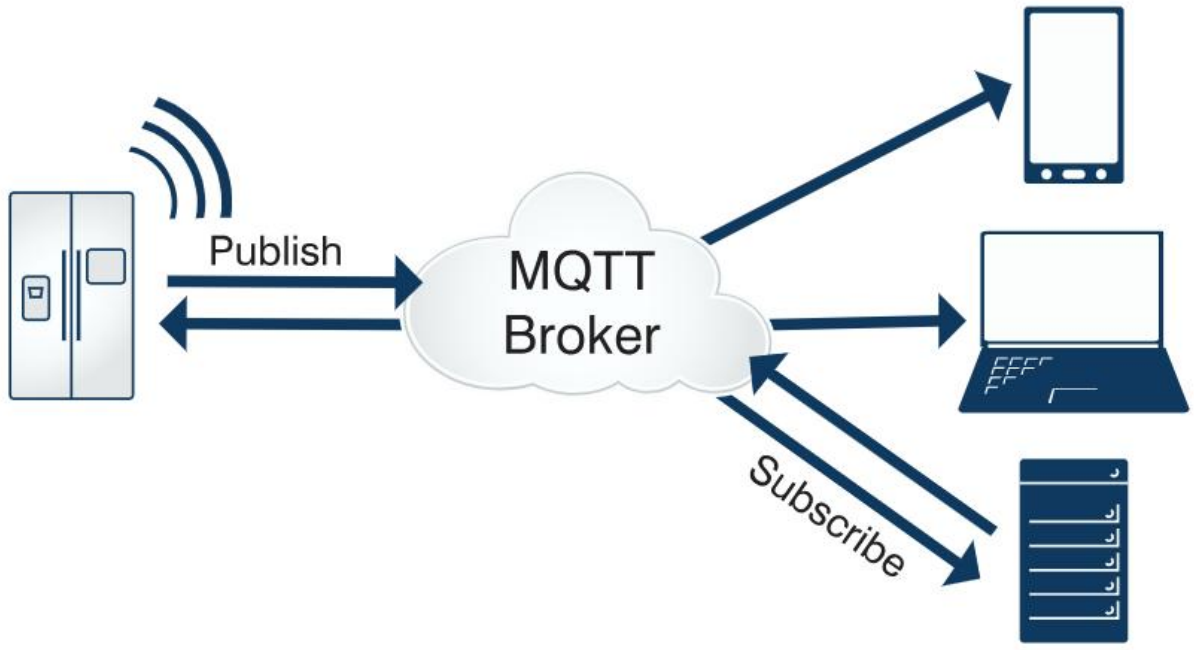


Figure 14. MQTT Concept

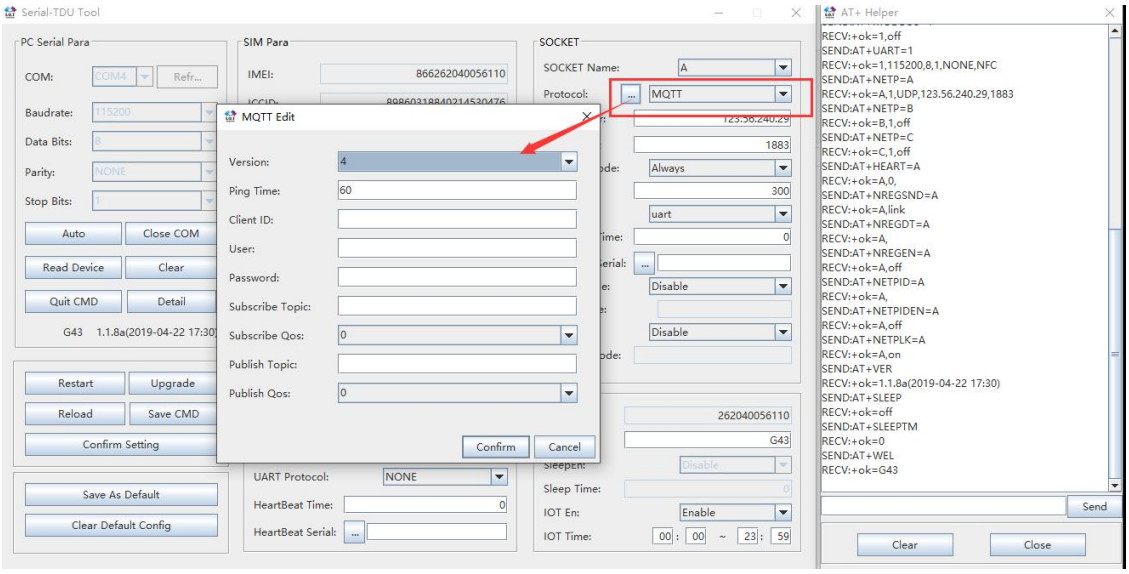


Figure 15. IOTService Tools UART Config

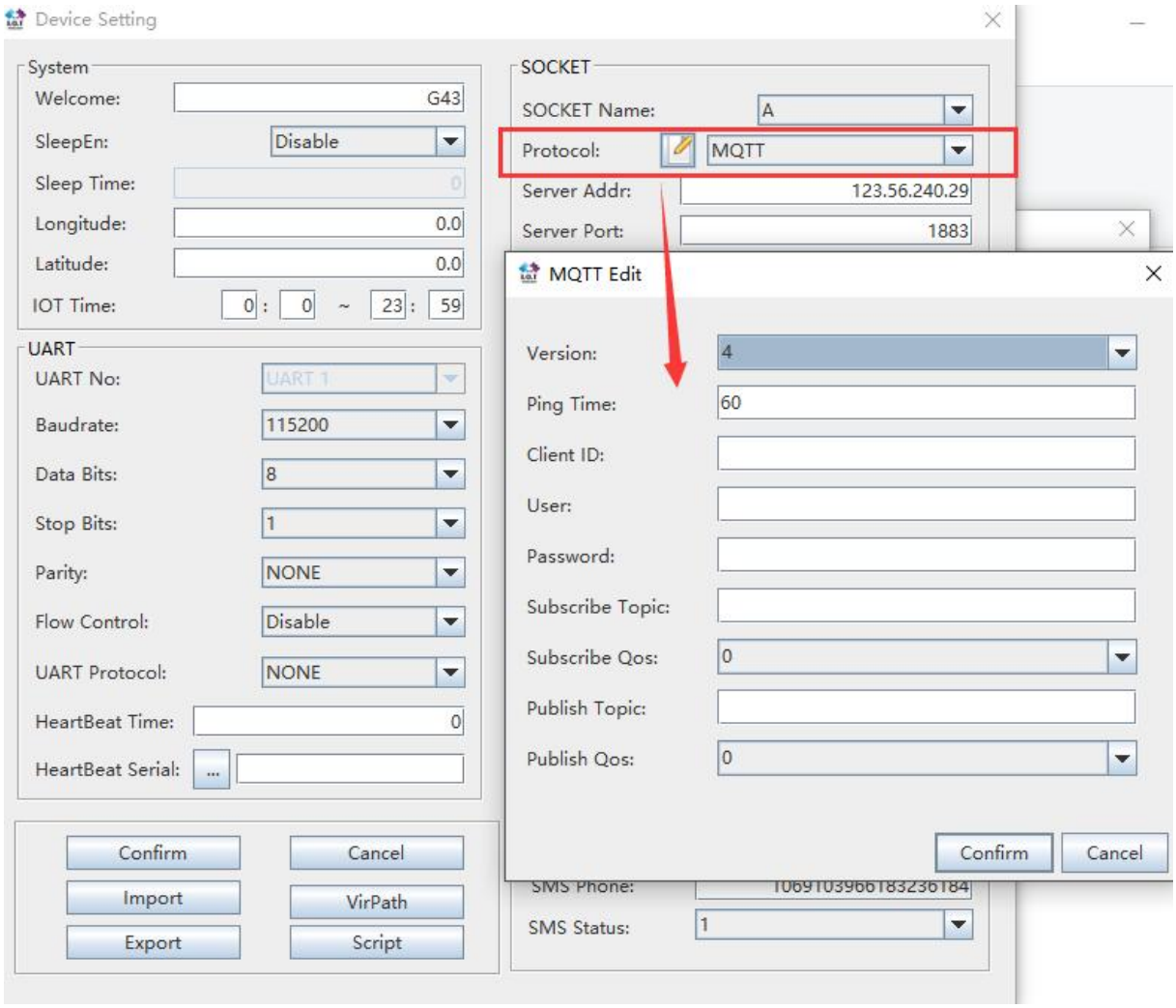


Figure 16. IOTService Tools Network Config

1.3. Registration Package Function

Under the transparent transmission mode, the registration package function can be enabled. When the connection is established (TCP only) or the serial port data is received, the content of the registration package is automatically added to the server, and the content of the registration package can be used with the version number, ICCID, IMEI, etc. Details refer to AT+NREGDT command.

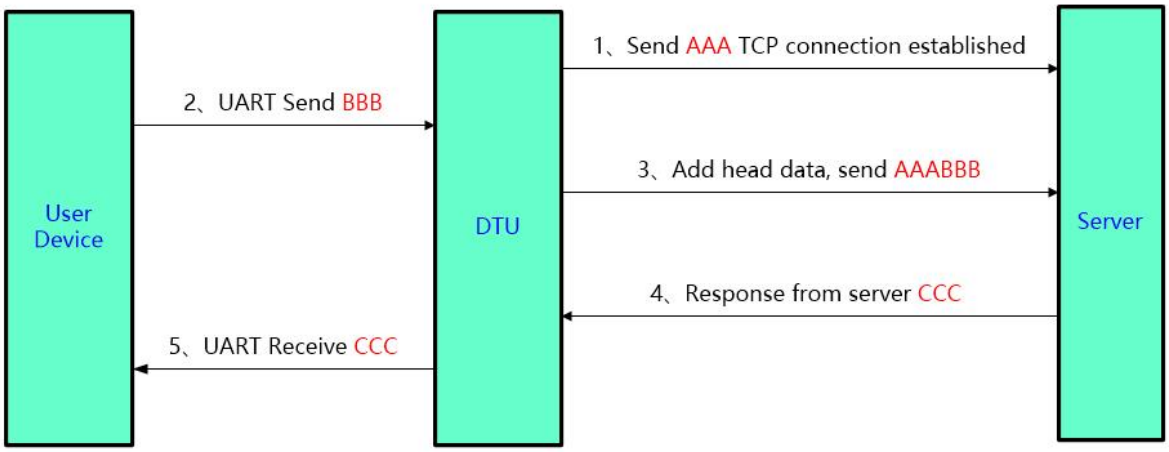


Figure 17. Transparent Transmission Mode Registration Packet Function Transmission

The example of registration package function is as follows: The following commands respectively enable the registration function of Socket A, set the content of the registration package to version number + signal strength + ABCD, enable the registration package when establishing connection and sending data.

```
AT+NREGEN=A,on
+ok

AT+NREGDT=A,%VER%GSLQABCD
+ok

AT+NREGSND=A,both
+ok
```

Figure 18. Transparent Transmission Mode Registration Package Function Example

1.4. Heartbeat Package Function

In the transparent transmission mode, the heartbeat packet function can be enabled, and the module periodically sends heartbeat data to the server or the serial port. For details, refer to the AT+HEART command. The main purpose of sending to the network is for the server to detect the device link alive.

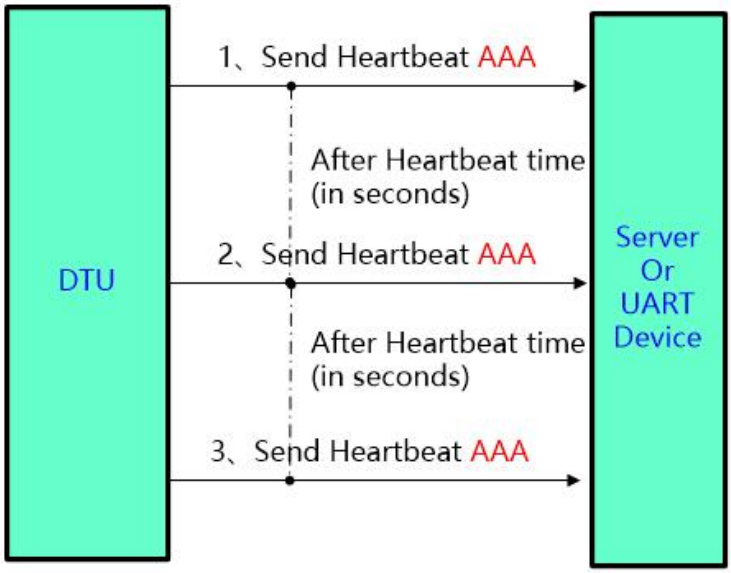


Figure 19. Transparent Transmission Mode Heartbeat Packet Function Transmission

1.5. Multi-Socket Communication Function

The module supports max 3 sockets for simultaneous communication, and each channel can set serial port channels. In the multi- TCP link connection mode, data from TCP will be forwarded one by one to the serial port. The data coming from the serial port will be copied into multiple copies and forwarded on each TCP link. The specific operation is as follows:

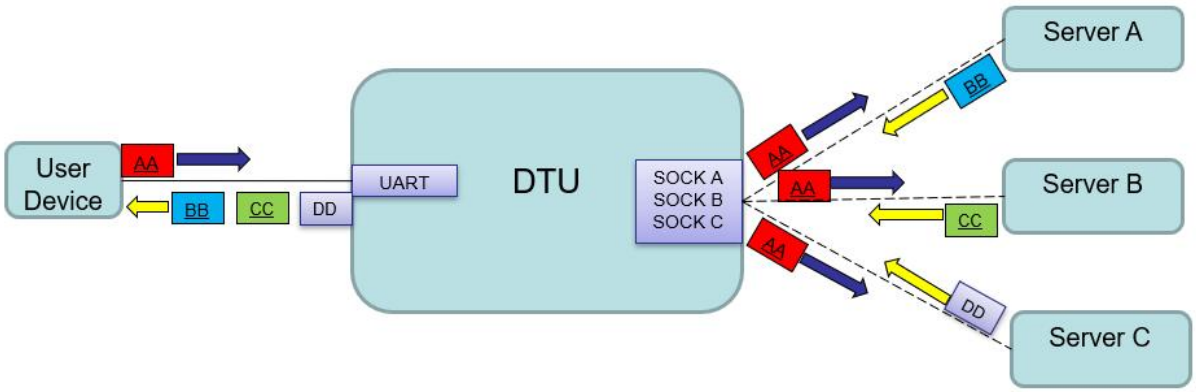


Figure 20. Multi-Socket Communication Transmission

1.6. Multi-Socket Data Differentiation Function

In the multi-Socket application process, user can specify the serial port data to be sent to a specific Socket channel. The data received by the Socket will also be added with the channel tag, so that the serial port can determine which channel sends the data. For details, see: AT+NETPIDEN and AT+NETPID command. For 2G and NB-IOT network, send UART frame more than 300ms, 4G product does not have such limit.

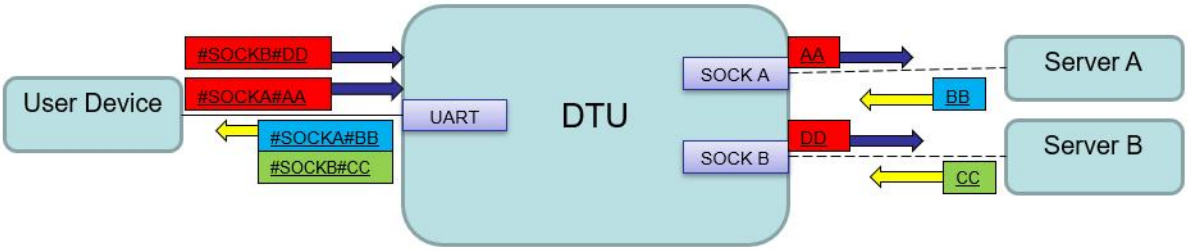


Figure 21. Specify Socket Channel Communication Transmission

1.7. Serial Frame Scheme

When the DTU receives data from the UART, it constantly checks the interval between two adjacent bytes. If the interval is greater than a certain value, then one frame is considered to have ended, otherwise the data is received until the buffer byte (512 bytes). The module determines that the Socket channel is forwarded after the end of one frame on the serial port.

The default 2-byte interval of the module is 200ms, that is, when the interval is greater than 200ms, one frame ends.

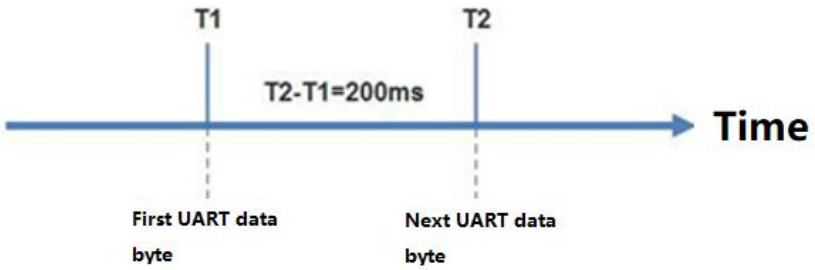


Figure 22. Serial Frame Scheme

1.8. Firmware Updates

DTU supports firmware upgrade through serial port and network mode.

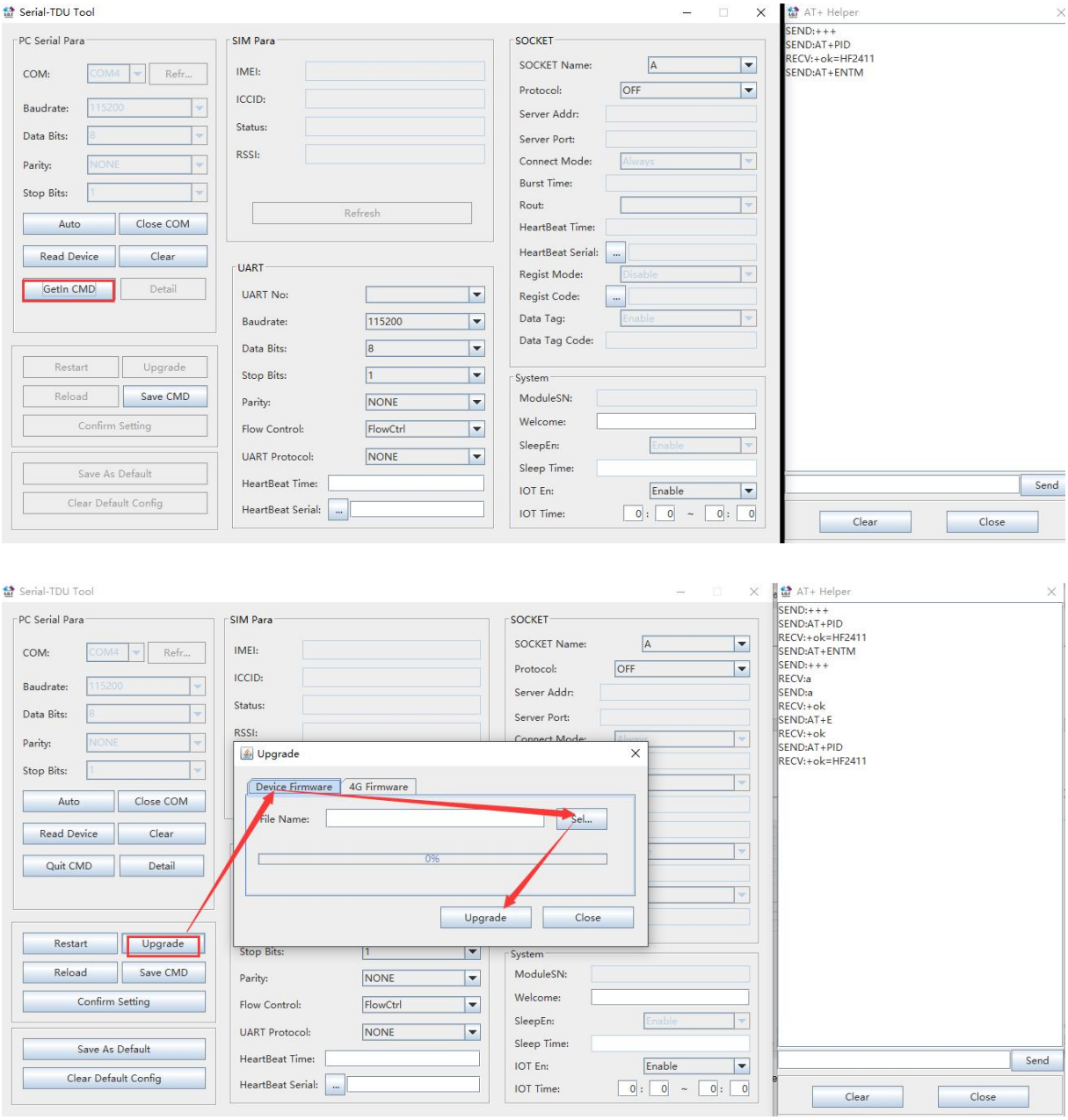


Figure 23. IOTService Serial Port Update

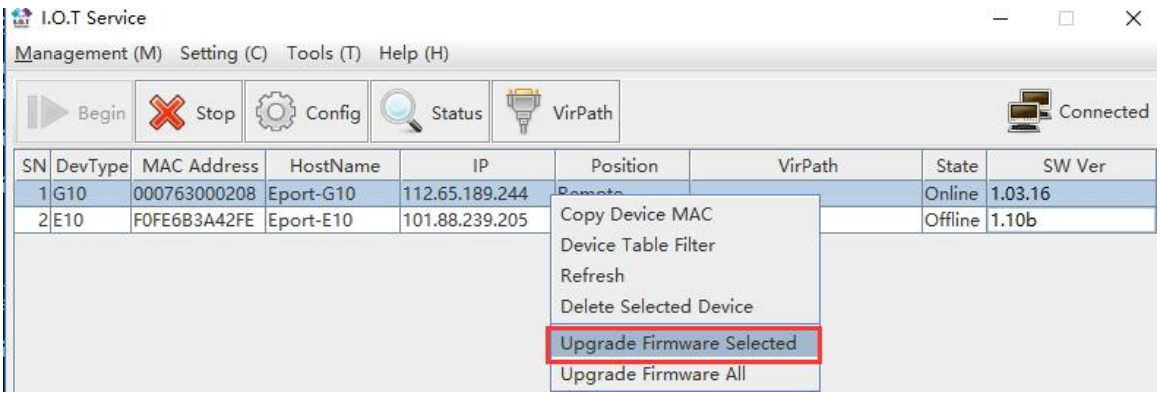


Figure 24. IOTService Network MethodUpgrade

1.9. IOTService Software

DTU enables the High Flying's IOTBridge cloud management function by default. Through the IOTBridge cloud platform, the IOTService configuration tool can be configured in a network configuration (this will consume a certain amount of traffic. If it is enabled 24 hours, it can be configured at any time, and the traffic consumption is about 30MB/ Month), you can choose to turn off this feature or set only a specific time period to save to save traffic.

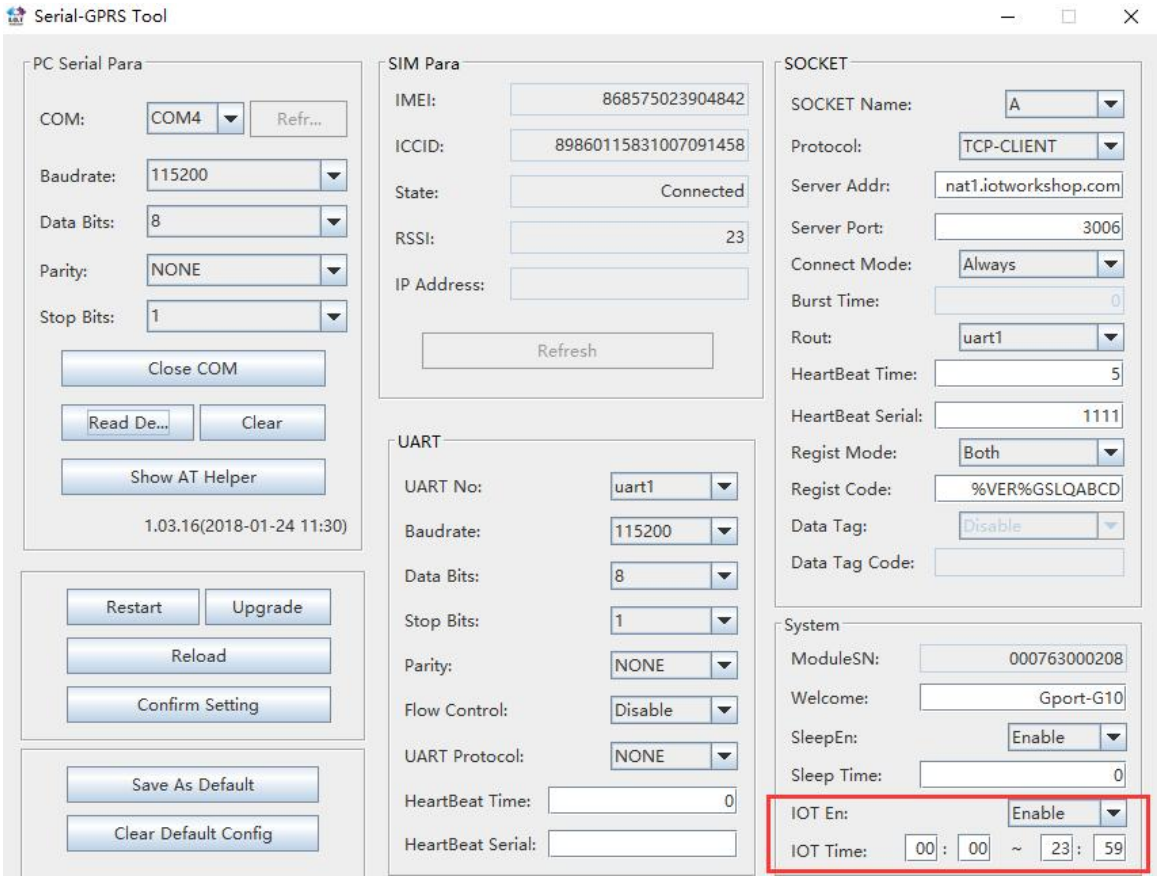
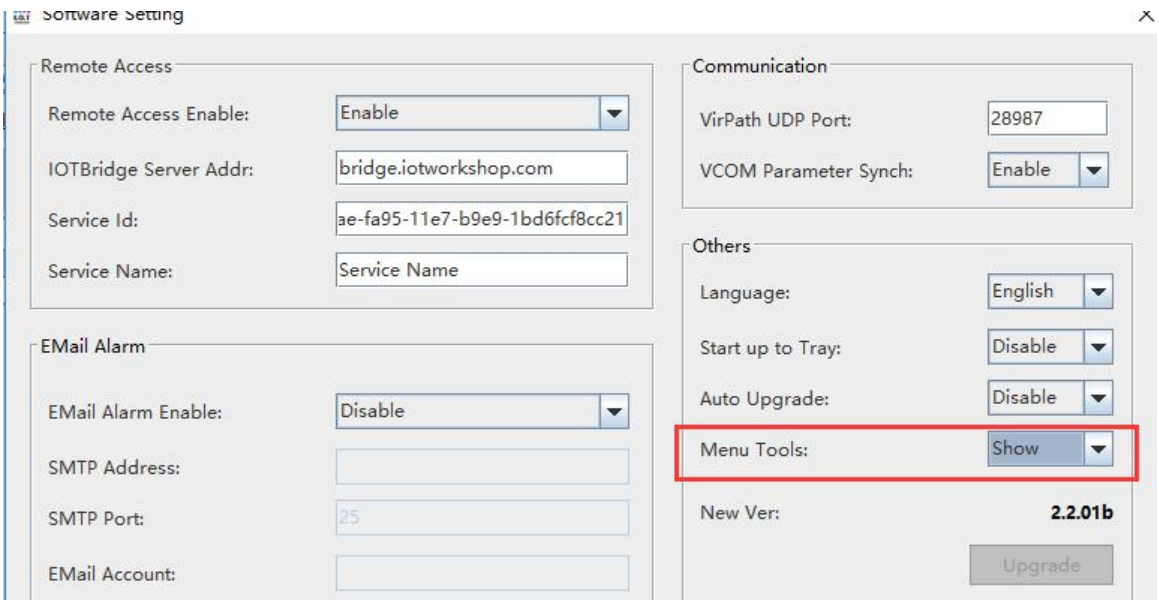


Figure 25. IOTBridge Industrial Cloud Function

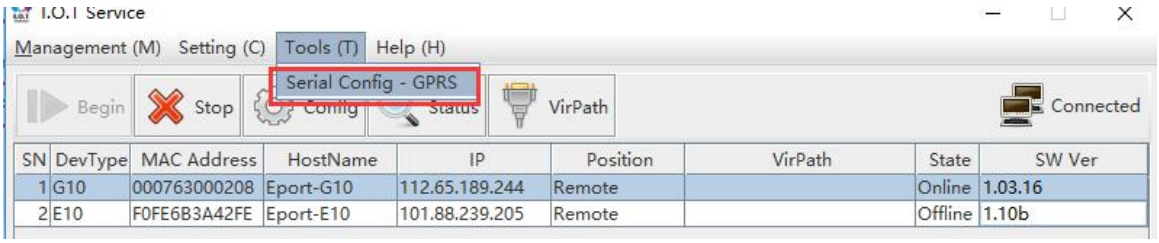
The following describes the IOTService tool to configure the DTU by serial port and network.

1.9.1 IOTService Serial Port Configuration

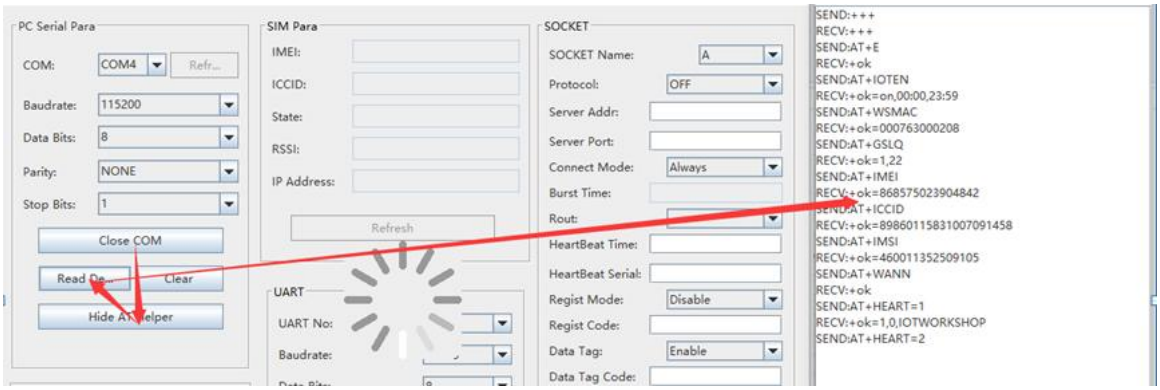
1）Display the serial port tool.



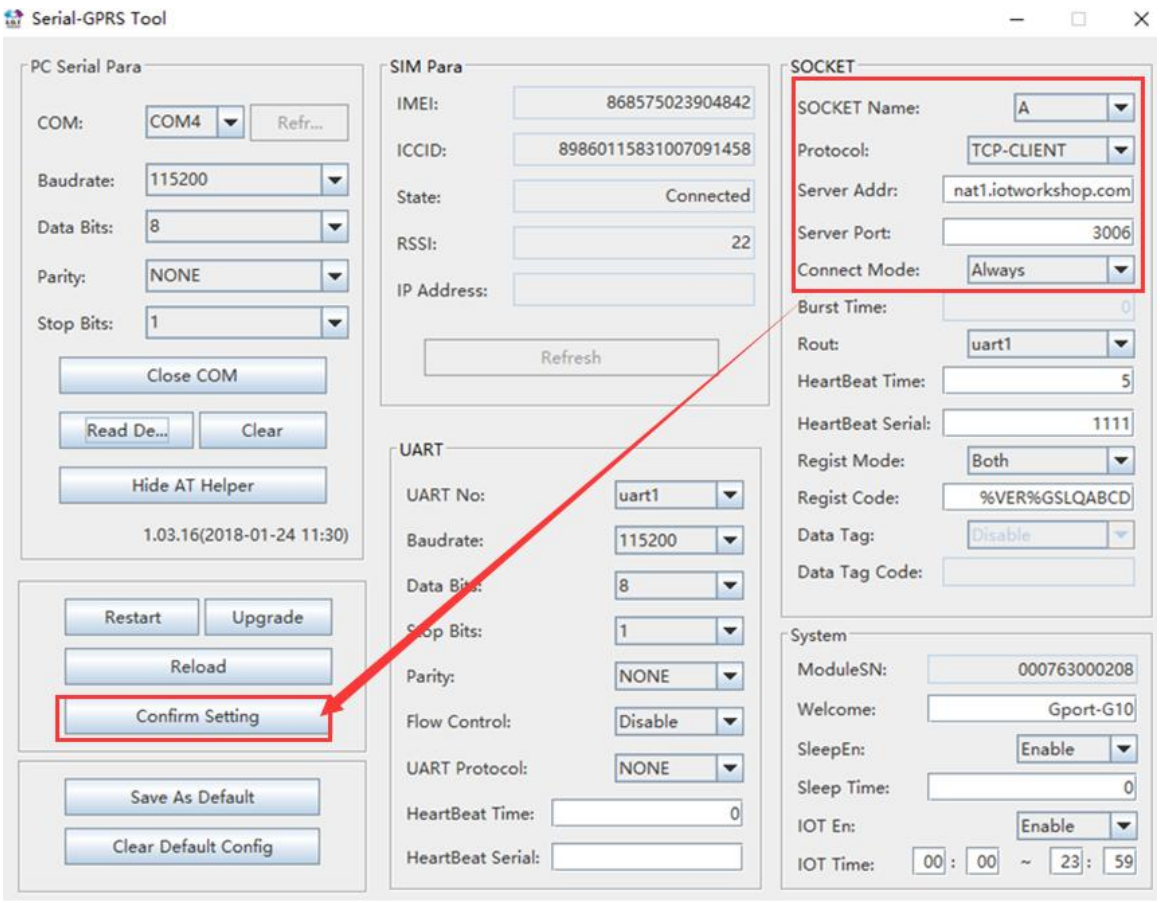
2）Open the serial port tool.



3）Open the serial port according to the current device serial port parameters, click to read the parameters, and the sidebar will display the AT command of the reading process.



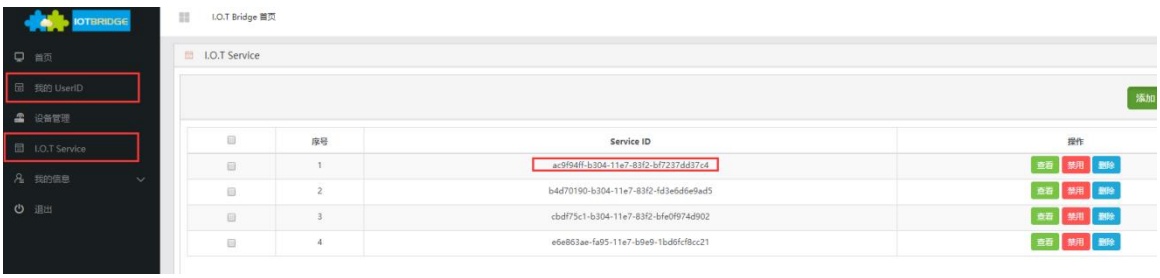
4）After reading, the interface displays the working status of the current module. If you need to modify the parameters, click Confirm Setting to modify it. Save it as factory parameter and restore it to the currently saved parameters when you restore the factory parameters. It is recommended to save it after setting.



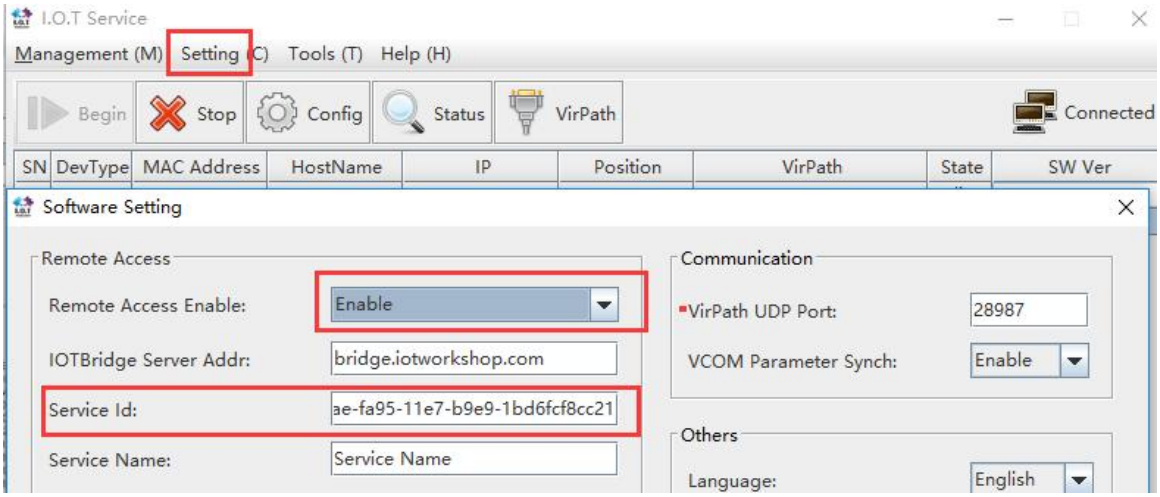
1.9.2 IOTService Network Mode Configuration

1）Logging into the High Flying's IOTBridge website (http://bridge.iotworkshop.com/) to register for an account, or enter through High Flying's official website.

2）After the registration, you can get the UserId (for the device) and the ServiceId (for the IOTService tool).

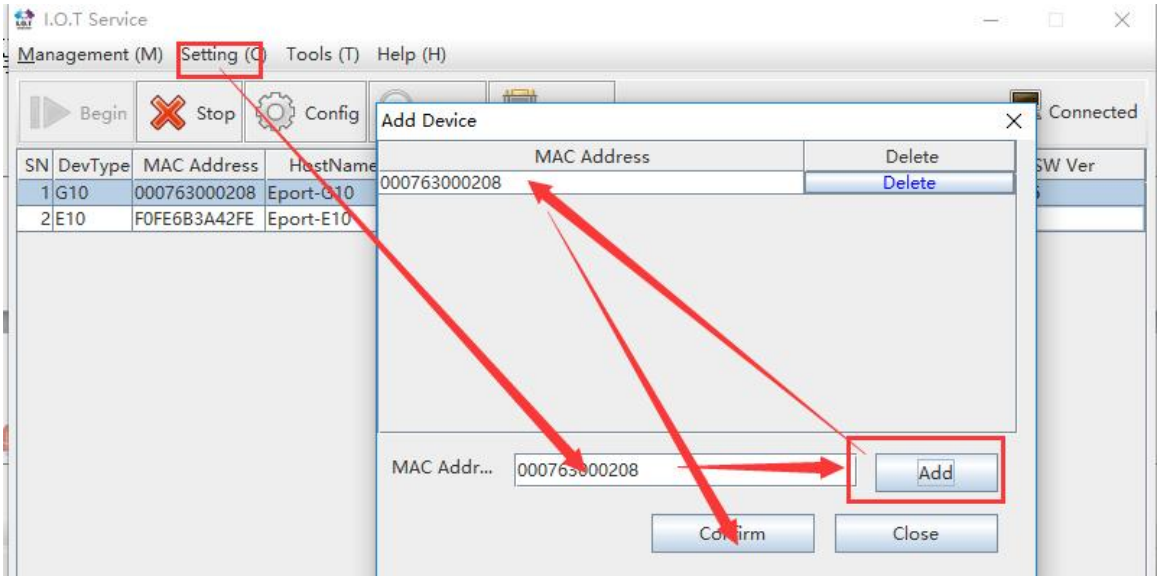


3）After the registration, you can get the UserId (for the device) and the ServiceId (for the IOTService tool), fill in this value in the tool.

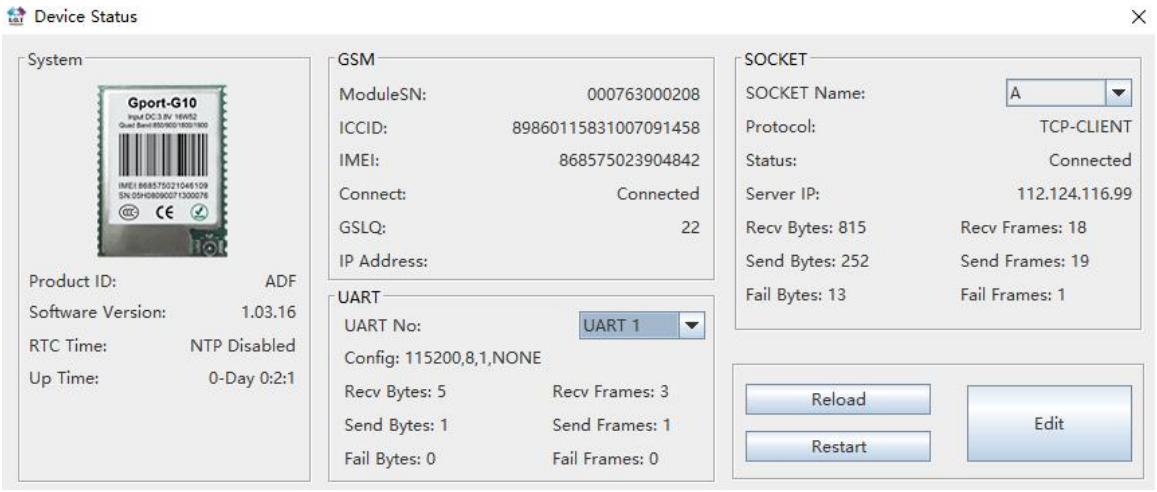


4）Insert the SIM card, power on the device, and wait until DTU register to the network.

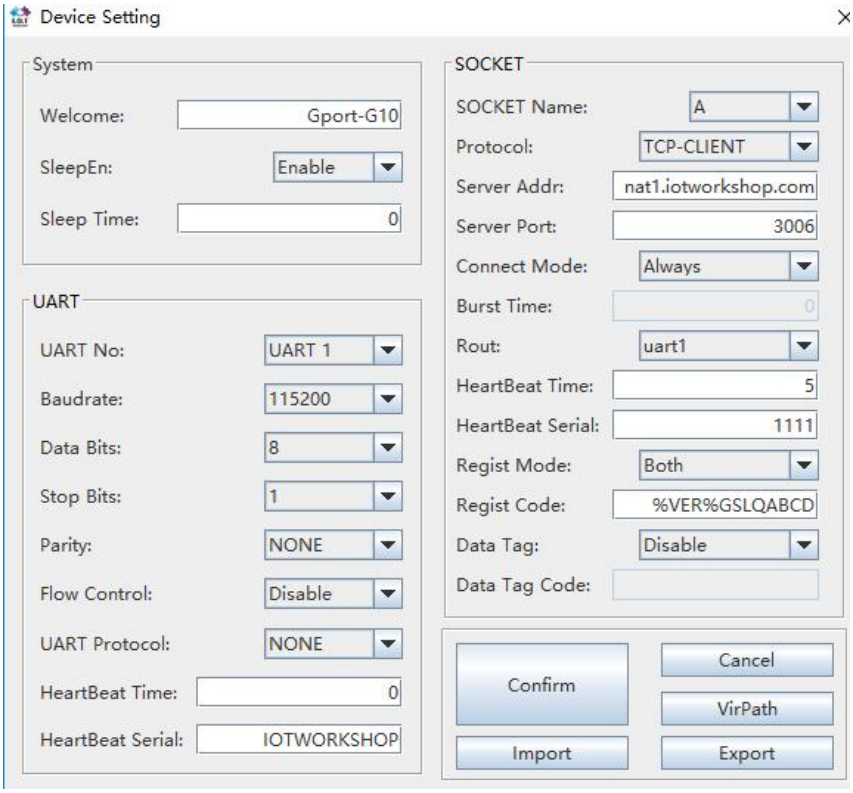
5）Add the module MAC address to the tool for binding (the MAC address can be obtained through AT+WSMAC, usually we use back 12 characters of IMEI). **It is recommended to use the AT+IOTUID command to write the UserId obtained on the IOTBridge to the device to prevent the device from being maliciously bound by other accounts.**



6）Double-click on the online device to enter the configuration status page.



7）Click Edit to modify the device operating parameters.



1.10. Modbus Protocol

DTU supports ModbusRTU to ModbusTCP for easy connection to Modbus slave devices. The Modbus protocol setting is as below:

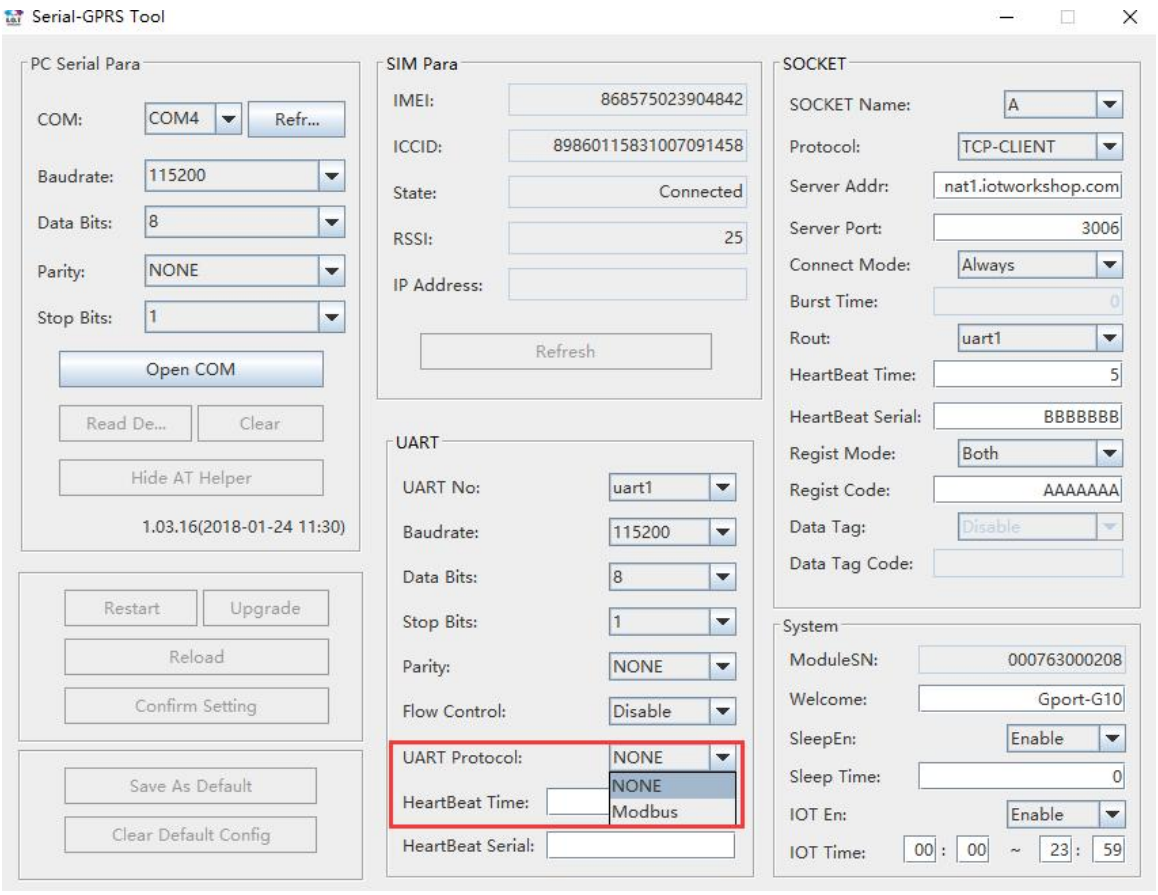


Figure 26.Serial Port Modbus Function

1.11. NTP Function

When the IOTBridge function is enabled, the module can obtain the NTP time. Through the AT+NTIME command, the user device can obtain the real time.

1.12. Virtual Serial Port Function

The virtual serial port function requires the device to enable the IOTBridge service, which requires a certain amount of traffic. The virtual serial port supports the serial port parameter adaptive function (the module baud rate changes with the change of the virtual serial port parameters, and there is no need to manually modify the module working parameters). Virtual COM will use one socket channel, set it to either SOCK A, SOCK B or SOCK C.

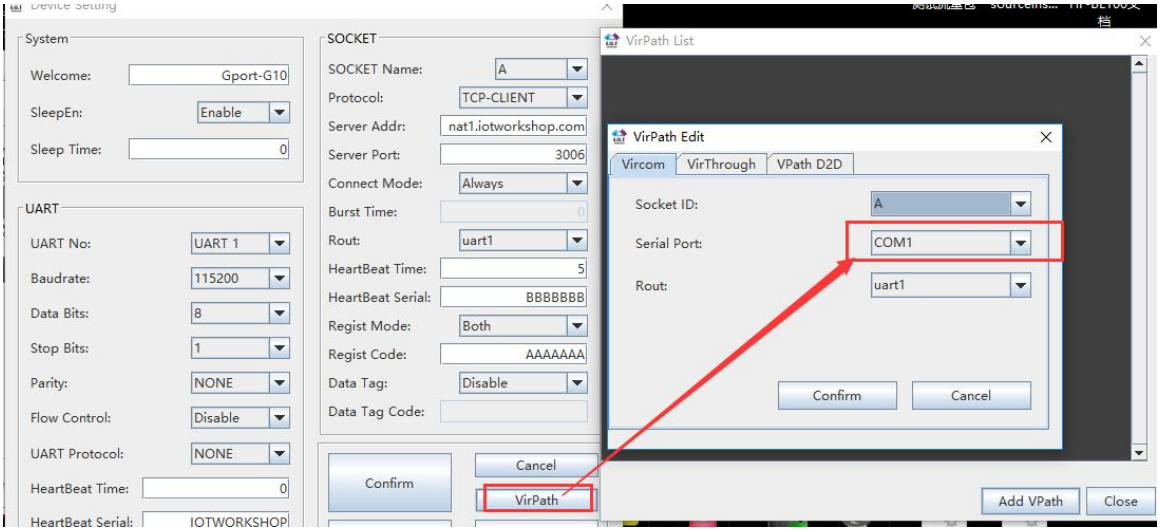


Figure 27. Virtual Serial Port Function

1.13. HIS Script Funciton(Only 4G and NB Products Support)

Hi-flying I.O.T script(HF IOT Script, short fot HIS). It is used for data transfer of IOT industrial device. When download the script in to the industrial device, the following functions can be achieved.

- Automatically send data to UART or Socket at regular time, which can be recognized as Modbus primary station.
- After receive data from UART or Socket, data will transferred based on script.

See following link for more about HIS Script.

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

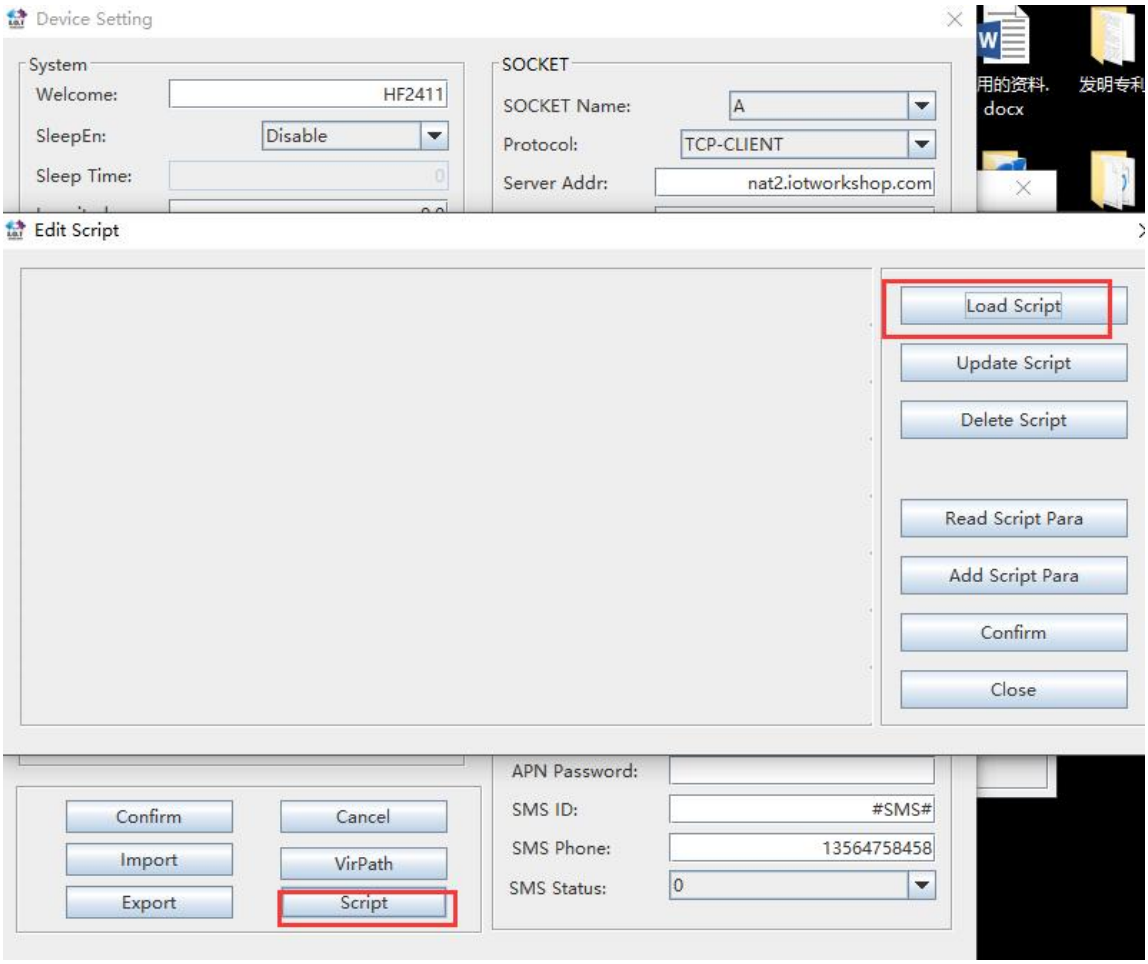


Figure 1. Scirpt Funciton

1.14. GPIO Control(Only G43 Support)

Module PIN5, PIN8, PIN9, PIN10 is input with pull-up resistor when bootup. Socket A/B/C send the following JSON command to control the GPIO status.

1) Read PIN

- Send: {"Type":"get"}
- Receive: {"Type":"get","PL":{"PIN5":1,"PIN8":1,"PIN9":0,"PIN10":1}}

2) Set GPIO output high

- Send: {"Type":"set","PL":{"PIN5":1,"PIN8":1,"PIN9":1,"PIN10":1}}
- Receive: {"Type":"report","PL":{"PIN5":1,"PIN8":1,"PIN9":1,"PIN10":1}}

Read status:

- Send: {"Type":"get"}

- Receive: {"Type":"get","PL":{"PIN5":1,"PIN8":1,"PIN9":1,"PIN10":1}}

3) Set GPIO output low

- Send: {"Type":"set","PL":{"PIN5":0,"PIN8":0,"PIN9":0,"PIN10":0}}
- Receive: {"Type":"report","PL":{"PIN5":0,"PIN8":0,"PIN9":0,"PIN10":0}}

Read status:

- Send: {"Type":"get"}
- Receive: {"Type":"get","PL":{"PIN5":0,"PIN8":0,"PIN9":0,"PIN10":0}}

2. AT INSTRUCTION INTRODUCTION

2.1. Working Mode

After the product is powered on, it enters the default mode, that is, the transparent transmission mode. The user can switch the working mode to the AT command line mode through the serial port specific data. The default UART port parameters of the module are configured as follows:

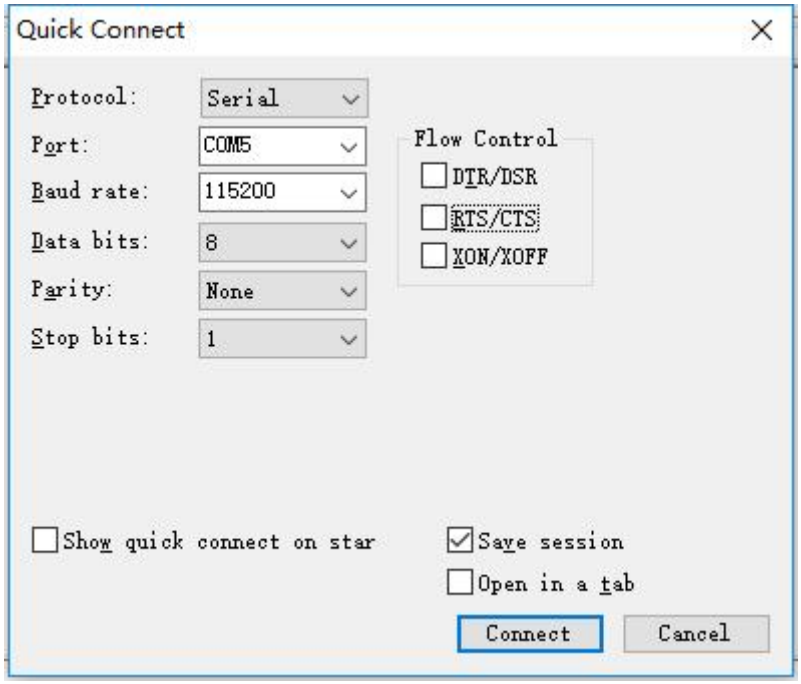


Figure 2. Default UART Parameters

In the command line mode, the user can use the UART port to set the module through the AT command.

<Notes>: The AT command debugging tool recommends using the SecureCRT software tool (other serial tools are also available, but not convenient for SecureCRT). The following instructions use the SecureCRT tool.

2.1.1. Switching to Command Mode

Switching from transparent mode to command mode is divided into 2 steps:

- **Enter "+++" on the serial port, and the module will return a confirmation code "a" after receiving "+++";**

- **Enter the confirmation code “a” on the serial port. After receiving the confirmation code, the module returns “+ok” to confirm and enter the command mode.**

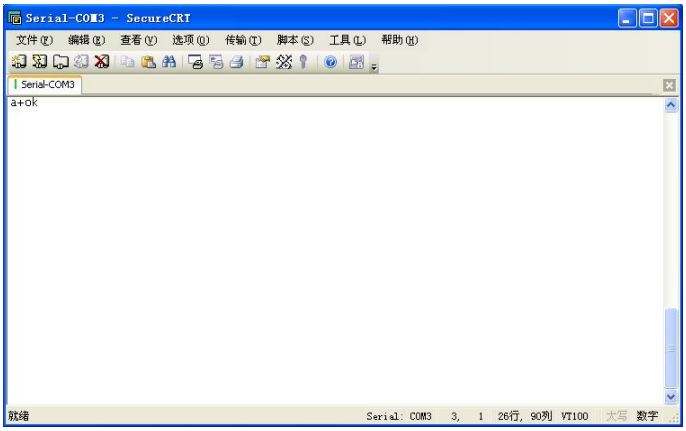
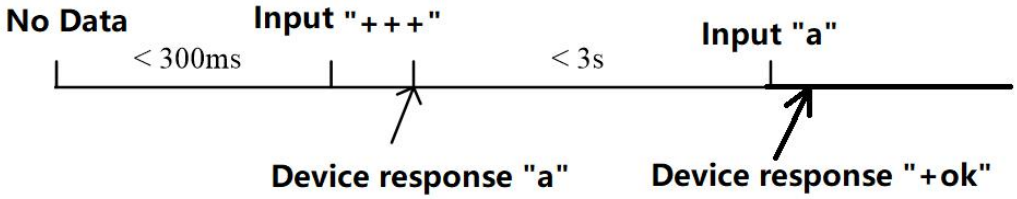


Figure 3. Switching to Command Mode

<Notes>:

When you enter "+++" and the confirmation code "a", the serial port is not echoed, as shown in the figure above.

Entering "+++" and "a" needs to be completed within a certain period of time to reduce the probability of entering the command mode by mistake during normal operation. Specific requirements are as follows:

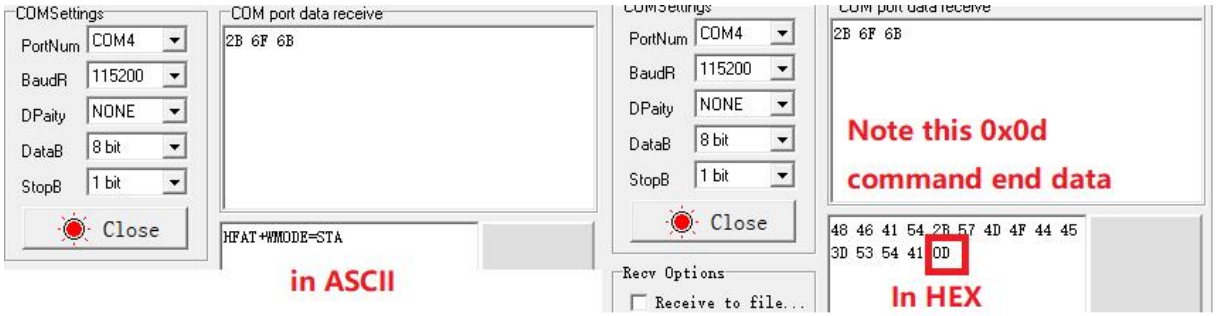


In the command mode, the module can be set or queried by the AT+ command under the UART port, and the operation can be restarted, or the AT+ command can be used to return to the transparent transmission mode. The AT+ instruction is detailed in the next section.

2.2. Send AT Command in Transparent Transmission Mode

After set AT+CMDPW command value, the module support response AT command for special data format as “prefix”+”AT comman”+”\r”, it is very useful for query some status in transparent transmission mode. It saves the steps of changing to AT command mode.

The following example, we first set AT+CMDPW=HF, then send the following data in transparent mode, and get the AT command response. This data won’t be sent to socket.



2.3. Socket AT Command

Socket A/B/C also support AT command, add prefix “+++” before AT command such as “+++AT+VER”

2.4. SMS AT Command

The SMS AT command refers to sending [AT+] by SMS to query and set parameters.

2.5. Overview of the AT Instruction Set

The AT+ command can be input directly through a serial port debugger such as a Hyper Terminal, or it can be programmed. As shown in the figure below, through the SecureCRT tool, AT+H is a help command that lists all the instructions and instructions (some commands are not implemented, which is subject to the description of this document).

```
AT+H
+ok
    AT+H:show help
    AT+PING: General PING command.
    AT+ENTM: Goto Through MOde.
    AT+WSMAC: Set/Get Module MAC Address.
    AT+SRST:Soft Reset the Module.
    AT+SMEM:show system memory stat
    AT+GSMAT: Send internal at command.
    AT+Z: Reset the Module.
    AT+WEL: Set/Get welcome message.
    AT+SLEEP: Set/Get sleep mode.
    AT+SLEEPTM: Set/Get enter sleep mode time.
    AT+VER:Get application version.
    AT+APPVER:Get user application version.
    AT+RELD: Reload the default setting and reboot.
    AT+FCLR: Clear Fsetting.
    AT+CFGRD: Get current system config.
    AT+CFGTF: Save Current Config to Default Config.
    AT+UART: Set/Get the UART0/UART1 Parameters.
    AT+UARTTM: Set/Get the UART frame interval.
    AT+MODBUS: Enable/Disable the UART MODBUS.
```

Figure 4. AT Instruction Set

2.5.1. Instruction Syntax Format

The AT+ instruction uses an ASCII-based command line. The format of the instruction is as follows:

- Format Description
  - < >: Indicates the part that must be included
  - [ ]: Indicates an optional part
- Command Message

  AT+<CMD>[op][para-1,para-2,para-3,para-4…]<CR>
  - AT+：Command message prefix
  - CMD：Instruction string;
  - [op] ：Instruction operator, specified as parameter setting or query
    - "=" : Indicates parameter setting
    - "NULL" : Indicates the query
  - [para-n]: Input when parameter setting, such as query is not required
  - <CR>: Terminator, carriage return, ASCII code 0x0a or 0x0d

<Notes>：

When user enter a command, the "AT+<CMD>" character is automatically echoed to uppercase and the parameter portion remains unchanged.

- Response Massage

  +<RSP>[op] [para-1,para-2,para-3,para-4…]<CR><LF><CR><LF>
  - + : Response message prefix;
  - RSP: Respons string, including:
    - “ok” : Indicate success
    - “ERR”: Indicate failure
  - [op] ： =
  - [para-n] : Return parameters when querying or error code when error occurs
  - <CR>: ASCII code 0x0d；
  - <LF>: ASCII code 0x0a；
- Error Code

Table1. Error Code Description

Error Code	Notes
-1	Invalid command format
-2	Invalid command
-3	Invalid operator
-4	Invalid parameter
-5	Operation not allowed

2.5.2. AT Instruction Set

Table2. List of AT+ Instruction Set

Instruction	Description
<null>	Null
Management Instruction Set	
H	Help
E	Open/Close Show Back Function
CMDPW	Set/Query AT command prefix character for sending AT command in throughput mode.
WEL	Set / Query Boot Welcome Message
HOST	Set/Query hostname in the IOTService
ENTM	Enter Transparent Mode
VER	Query Software Version
GVER	Query GPRS software version(Only 4G product support)
APPVER	Query Custom Software Version Number
RELD	Restore User Default Parameters, Automatically Restart
CFGTF	Save the Current Parameter as the User Default Parameter
FCLR	Restore Factory Parameters, Automatically Restart
SRST	Software Restart
Z	Hard Restart
UART Instruction Set	
UART	Set/Query Serial Port Parameters
UARTTM	Set/Query the Two-Frame Time Interval When the Serial Port Receives Data.
MODBUS	Set/Query Modbus TCP to Modbus RTU Function
Network Instruction Set	
NETP	Set/Query Network Protocol Parameters, the Settings Will Take Effect After Reset
NETPLK	Set/Query Communication Channel TCP Connection Status
TCPTO	Set/Query socket TCP timeout
NETPIDEN	Set/Query Whether Display From Which Communication Channel the Data Comes From, and the Setting Will Take Effect After Reset.
NETPID	Set/Query the Communication Channel Number Tag Value.
DATA	Set/Query Channel Send/Receive the Number of Bytes
NREGEN	Set/Query Communication Channel Number Registration Package Function
NREGDT	Set/Query Communication Channel Number Registration Package Custom Data
NREGSND	Set/Query the Transmission Method of the Communication Channel Number Registration Package
HEART	Set/Query Communication Channel Number Heartbeat Packet Data
HTPTP	Set/query HTTP request type
HTPURL	Set/query HTTP url resources and version
HTPHEAD	Set/query HTTP header.
WEBSOCKET	Set/query WebSocket content.
MQTOPIC	Set/query MQTT topic content
MQLOGIN	Set/query MQTT login content
MQID	Set/query MQTT client id content

Instruction	Description
LOCATE	Set/Query Latitude and Longitude.
UPGRADE	Application Firmware Upgrade Via Serial Port or Network
GOTA	4G core module firmware upgrade
Network Testing Instruction Set	
GETIP	Query the IP Address of the Specified Domain Name
PING	Query Whether the Address is Reachable
GPRS Status	
GSLQ	Query GPRS Signal Strength
GSMST	Query GSM Status
Module Information Query Set	
ICCID	Query Module ICCID Code
IMEI	Query IMEI Code
IMSI	Query SIM Card's IMSI Number
Upgrade Instruction Set	
UPURL	Set / Query the URL Address of the Remote Upgrade
Other Instruction Set	
APN	Set/Query APN information.
NTIME	Query NTP Real Time Function
IOTEN	Set/Query IOTBrdige Function
IOTUID	Set/Query IOTBrdige's UserID
PID	Query Module Model for Configuring Tool to Identify Device
PCID	Set/Query the Module Users' Defined Name for Display in the Configuration Tool
NDBGL	Open/Close Debug Information Output
SCRIPT	HIS script operation.

2.5.2.1. AT+H

- Function: Help .
- Format:

AT+H<CR>
+ok=<command help><CR><LF><CR><LF>

- Parameter
  - command help：Command help instruction.

2.5.2.2. AT+E

- Function: Open/Close show back function.
- Format:
  - Query Operation:

AT+E<CR>
+ok=<status><CR><LF><CR><LF>

  - Set Operation:

AT+E=<status><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - status：Echo status
    - on：Open echo, default【on】
    - off：Close echo

2.5.2.3. AT+CMDPW

- Function: Set/Query AT command prefix character for sending AT command in throughput mode. Setting is valid after reset;

- Format:
  - Query Operation

AT+CMDPW<CR>
+ok=<data><CR><LF><CR><LF>

  - Set Operation

AT+CMDPW=<data><CR>
ok<CR><LF><CR><LF>

- Parameters:
  - mode: Default is blank for disable t 是 his function. The maximum is 20 chacter length, once has been set, the AT command in transparent transmission mode function is enabled (AT+H and AT+WSCAN are not supported). Do restore to factory operation to disable and clear the setting.

When set this value to “HF”, then can get response of “+ok=STA”(Hex: 2B 6F 6B 3D 53 54 41) for send “HFAT+WMODE\r”(Hex: 48 46 41 54 2B 57 4D 4F 44 45 0D, AT command should end with 0D or 0A).

2.5.2.4. AT+WEL

- Function: Set/Query boot welcome message.
- Format:
  - Query Operation:

AT+WEL<CR>
+ok=<message><CR><LF><CR><LF>

  - Set Operation:

AT+WEL=<message><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - message： Welcome message, default is product type such as 【Gport-G10】; If it is 【off】, means this function be closed, max 10 bytes.

2.5.2.5. AT+HOST

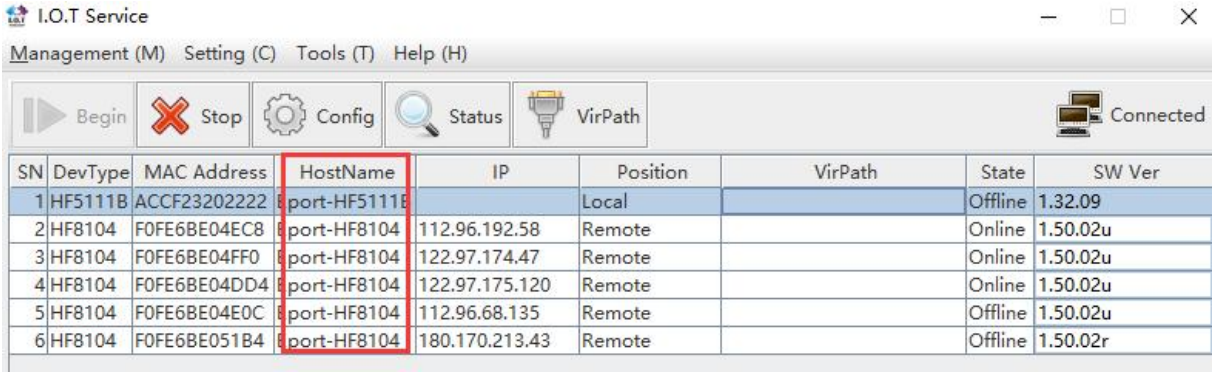
- Function: Set/Query hostname in the IOTService.
- Format:
  - Query Operation:

AT+HOST<CR>
+ok=<message><CR><LF><CR><LF>

  - Set Operation:

AT+HOST=<message><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - message： Hostname message, default is 【Eport-HF2411】 ,max 30 bytes length.



SN	DevType	MAC Address	HostName	IP	Position	VirPath	State	SW Ver
1	HF5111B	ACCF23202222	Eport-HF5111B		Local		Offline	1.32.09
2	HF8104	F0FE6BE04EC8	Eport-HF8104	112.96.192.58	Remote		Online	1.50.02u
3	HF8104	F0FE6BE04FF0	Eport-HF8104	122.97.174.47	Remote		Online	1.50.02u
4	HF8104	F0FE6BE04DD4	Eport-HF8104	122.97.175.120	Remote		Online	1.50.02u
5	HF8104	F0FE6BE04E0C	Eport-HF8104	112.96.68.135	Remote		Offline	1.50.02u
6	HF8104	F0FE6BE051B4	Eport-HF8104	180.170.213.43	Remote		Offline	1.50.02r

2.5.2.6. AT+ENTM

- Function: Enter the transparent mode.
- Format:

AT+ENTM<CR>
+ok<CR><LF><CR><LF>

After the command is executed correctly, the module switches from command mode to transparent transmission mode.

2.5.2.7. AT+VER

- Function: Query software version.
- Format:

AT+VER<CR>
+ok=<ver><CR><LF><CR><LF>

- Parameter:
  - ver: The product software version number: three bytes, the big version number, the small version number, the test version number.

2.5.2.8. AT+GVER

- Function: Query GPRS software version(Only 4G product support)
- Format:

AT+VER<CR>
+ok=<ver><CR><LF><CR><LF>

- Parameter:
  - ver: The GPRS software version number, it will return +ERR=-2 before the GPRS initialization finished.

```
AT+GVER
+ok=4G_V1.575
```

2.5.2.9. AT+APPVER

- Function: Query custom software version number
- Format:

AT+APPVER<CR>
+ok=<ver><CR><LF><CR><LF>

- Parameter:
  - ver: Products' custom software version number.

2.5.2.10. AT+RELD

- Function: Restore user default parameters, automatically restart
- Format:

AT+RELD<CR>
+ok<CR><LF><CR><LF>

2.5.2.11. AT+CFGTF

- Function: Save the Current Parameter as the User Default Parameter.

AT+CFGTF<CR>
+ok<CR><LF><CR><LF>

2.5.2.12. AT+FCLR

- Function: Restore factory parameters, automatically restart
- Format:

AT+FCLR<CR>
+ok=rebooting...<CR><LF><CR><LF>

2.5.2.13. AT+SRST

- Function: Software restart.
- Format:

AT+Z<CR>
+ok<CR><LF><CR><LF>

The IO control state can be maintained. For general applications, use a hard restart..

2.5.2.14. AT+Z

- Function: Hard restar
- t.
- Format:

AT+Z<CR>
+ok<CR><LF><CR><LF>

The IO control state is initialized.

2.5.2.15. AT+UART

- Function: Set/query the serial port operation, and the settings will take effect after reset.
- Format:
  - Query Operation:

AT+UART=<id><CR>
+ok=<id,baudrate,data_bits,stop_bit,parity,flowctrl><CR><LF><CR><LF>

  - Set Operation:

AT+UART=<id,baudrate,data_bits,stop_bit,parity,flowctrl><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id：Serial port number
    - 1: Port 1
    - 2: Port 2 (G10, G11, G12 support)
  - baudrate: Baud rate, default【115200】。
    - 600, 1200,2400,4800,9600,19200,38400,57600,115200,230400,460800
  - data_bits: Date bit, default【8】
    - 7,8
  - stop_bits: Stop bit, default【1】
    - 1,2
  - parity: Check bit, default【NONE】
    - NONE
    - EVEN
    - ODD
  - flowctrl: Hardware flow control (CTSRTS), only serial port 1 supports hard flow control, default【NFC】
    - NFC: No hardware flow control
    - FC: Hardware flow control (EG1X, EG43 don't support)
    - HD: Half-duplex mode for RS485.

Note: The supported parameters may be differed for different product, see product user manual for details.

2.5.2.16. AT+UARTTM

- Function: Set/Query the Two-Frame Time Interval When the Serial Port Receives Data.
- Format:
  - Query Operation:

AT+UARTTM=<id><CR>
+ok=<id,interval><CR><LF><CR><LF>

  - Set Operation:

AT+UARTTM=<id,interval><CR>

+ok<CR><LF><CR><LF>

- Parameter:
  - id：Serial port number
    - 1: Port 1
    - 2: Port 2 (G10, G11, G12 support)
  - interval: Serial port division interval, default 【10】ms, range 10~1000ms

2.5.2.17. AT+MODBUS

- Function: Set/query Modbus TCP to Modbus RTU function.
- Format:
  - Query Operation:

AT+MODBUS=<id><CR>
+ok=<id><status><CR><LF><CR><LF>

  - Set Operation:

AT+MODBUS=<id><status><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Serial port number
    - 1: Port 1
    - 2: Port 2 (G10, G11, G12 support)
  - status: Modbus RTU to TCP function
    - on: Enable
    - off: Disable, default【off】

2.5.2.18. AT+SMSID

- Function: Set/query SMS parameters, the settings will take effect after reset.
- Format:
  - Query Operation:

AT+SMSID<CR>
+ok=<id,status[,number]><CR><LF><CR><LF>

  - Set Operation:

AT+SMSID=<id,status[,number]><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: SMS identifier, default is "#SMS#", add this identifier at the beginning of UART data, the packet will then sent to SMS, not to socket.
  - status: SMS function mode
    - 0: Disable SMS number update, always sent to the set number.
    - 1: Enable SMS number update, default is 1. If receive SMS from phone, it will auto update the number, the next received packet will send to this update number.
  - number: phone number.

2.5.2.19. AT+NETP

- Function: Set/Query network protocol parameters, the settings will take effect after reset
- Format:
  - Query Operation:

AT+NETP=<id><CR>
+ok=<id,uart,protocol,IP[,port,mode,time]><CR><LF><CR><LF>

  - Set Operation:

AT+NETP=<id,uart,protocol,IP[,port,mode,time]><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Communication channel number, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.

- C: Socket C channel.
- uart: Serial port number, to which the data is sent after receiving the communication channel, including the following parameters.
  - 1: Port 1, default 【1】
  - 2: Port 2, (G10, G11, G12 support)
- protocol: Protocol type, including the following parameters.
  - Off: off status, 5 channels default to【off】。
  - TCP: TCP mode.
  - UDP: UDP mode.
  - HTTP: HTTP mode, only Socket A support this
  - WEBSOCKET: WebSocket mode, only Socket A support this
  - MQTT: MQTT mode, only Socket A support this
- iP: Target IP address, support domain name, max 99 bytes, default 【nat2.iotworkshop.com】
- port: Protocol port number, decimal number, 1 to 65535, default【3006】.
- mode: TCP connection type. This parameter is available only in TCP or HTTP mode. The default 【long】, includes the following parameters.
  - Long: Long connection.
  - Short: Short connection. connection is established when data is sent, and time is disconnected when there is no data.
- time: TCP short connection disconnection delay time, this parameter is only available under short connection, the range is 1~100 seconds, the default is 【3】seconds.

Commend example:

1、 SOCKA is set to TCP communication
   a) Long connection: AT+NETP=A,1,TCP,nat2.iotworkshop.com,3006,long
   b) Short connection: AT+NETP=A,1,TCP,nat2.iotworkshop.com,3006,short,3
2、 SOCKA is set to WebSocket, MQTT
   a) AT+NETP=A,1,WEBSOCKET,123.56.240.XX,1883
   b) AT+NETP=A,1,MQTT,123.56.240.XX,1883
3、 SOCKB is set to UDP communication
   a) AT+NETP=B,1,UDP,nat2.iotworkshop.com,3008

2.5.2.20. AT+NETPLK

- Function: Set/query communication channel TCP connection status
- Format:
  - Query Operation:

AT+NETPLK=<id><CR>
+ok=<id,status><CR><LF><CR><LF>

  - Set Operation:

AT+NETPLK=<id,value><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Communication channel number, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.
    - C: Socket C channel.
  - status: Connection status.
    - On: Connected
    - Off: Not connected, default【off】
  - value: Manually open/close TCP connection.
    - on: Start TCP connection
    - off: Close TCP connection

2.5.2.21. AT+TCPTO

- Function: Set/Query socket TCP timeout; Setting is valid after reset.

- Format:
  - Query Operation:

AT+TCPTO=<id><CR>
+ok=<id,time><CR><LF><CR><LF>

  - Set Operation:

AT+TCPTO=<id,time><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Communication channel number, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.
    - C: Socket C channel.
  - time: TCP timeout value.
    - 0: Turn off this function
    - 1~600: Seconds of time out, default【300】

Module begin to count time when TCP channel don't receive any data, clear time counter when TCP channel receive any data. If the time counter reaches the TCPTO, the tcp channel will be break and reconnect the TCP server instantly.

2.5.2.22. AT+NETPIDEN

- Function: Set/query whether display from which communication channel the data comes from, and the setting will take effect after reset.
- Format:
  - Query Operation:

AT+NETPIDEN=<id><CR>
+ok=<id,status><CR><LF><CR><LF>

  - Set Operation:

AT+NETPIDEN=<id,status><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Communication channel number, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.
    - C: Socket C channel.
  - status: Status values, including the following parameters.
    - on: Enable.
    - off: Close, default【off】.

Under enabled status, increase the communication channel number tag value in the received data header, such as receiving data【abc】, and the actual serial port output 【#SOCKA#abc】.

Under serial port transmission mode, user must increase the communication channel number tag value in the header, so that the data will only be sent to the specified channel. For example, you need to send data 【abc】 to the SOCKA channel, and the actual serial port needs to send 【#SOCKA#abc】.

Under disabling mode, the data output by the serial port does not distinguish the communication channel number, and the data received by the serial port is sent to all communication channels pointing to the serial port number.

2.5.2.23. AT+NETPID

- Function: Set/query the communication channel number tag value.
- Format:
  - Query Operation:

AT+NETPID=<id><CR>
+ok=<id,value><CR><LF><CR><LF>

  - Set Operation:

AT+NETPID=<id,value><CR>
+ok<CR><LF><CR><LF>

- Parameter:

- id: Communication channel number, including the following parameters.
  - A: Socket A channel.
  - B: Socket B channel.
  - C: Socket C channel.
- value: Communication channel number mark, SOCKA default【#SOCKA#】, SOCKB default【#SOCKB#】, and so on, up to 10 characters.

2.5.2.24. AT+NETPENC

- Function: Set/query the communication channel number tag value.
- Format:
  - Query Operation:

AT+NETPENC=<id><CR>
+ok=<id,value[,key]><CR><LF><CR><LF>

  - Set Operation:

AT+NETPID=<id,value[,key]><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Communication channel number, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.
    - C: Socket C channel.
  - value: Encryption.
    - Disable: Disable encryption, default
    - AES: AES encryption
    - DES3: DES encryption.
  - key: key value, 16 characters for AES, AES vector is same as AES key, 24 characters for DES3.

2.5.2.25. AT+DATA

- Function: Set/Query Channel Send/Receive the Number of Bytes
- Format:
  - Query Operation:

AT+DATA=<id><CR>
+ok=<id,send_num,recv_num><CR><LF><CR><LF>

- Parameter:
  - id: Communication channel number, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.
    - C: Socket C channel.
    - 1: Port 1
    - 2: Port 2 (G10, G11, G12 support)
  - send_num: Total number of bytes sent
  - recv_num: Total number of bytes received

This command is used to query the total number of bytes sent/received after the channel is established. The value is cleared after the product is restarted.

2.5.2.26. AT+NREGEN

- Function: Set/Query Communication Channel Number Registration Package Function
- Format:
  - Query Operation:

AT+NREGEN=<id><CR>
+ok=<id,status><CR><LF><CR><LF>

  - Set Operation:

AT+NREGEN=<id,status><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Communication channel number, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.
    - C: Socket C channel.
  - status: Status value, including the following parameter.
    - on: Enable.
    - off: Close, default【off】.

2.5.2.27. AT+NREGDT

- Function: Set/query communication channel number registration package function
- Format:
  - Query Operation:

AT+NREGDT=<id><CR>
+ok=<id,value><CR><LF><CR><LF>

  - Set Operation:

AT+NREGDT=<id,value><CR>
+ok<CR><LF><CR><LF>

- Parameter :
  - id: Communication channel number, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.
    - C: Socket C channel.
  - value: Custom data, up to 40bytes, % wildcard has special function, as an escape character, Use % to send data in HEX format(Ex. %25), it also support special strings as following.
    - %ICCID: ICCID, AXCII format, Ex：89860115831007091458
    - %IMEI: IMEI, ASCII format, Ex: 862285030465284
    - %HIMEI: IMEI, HEX format Ex: 86 22 85 03 04 65 28 40, usually IMEI is 15 characters length, so add suffix 0 in last.
    - %GPS: location information upload, See AT+ LOCATE for detail, ASCII format, Ex: 21.623046,31.221429。
    - %IMSI: IMSI, ASCII format, Ex: 460011352509105
    - %VER: Software version, 3 bytes, HEX format, Ex: 01 00 03 (stands for 1.0.03)
    - %GSLQ: GPRS status, 2 bytes, the first for GPRS status, the second for GPRS signal strength, HEX format, Ex: 01 16
    - %DATE: year, month, day time, YYYYMMDD, ASCII format, Ex: 20190211
    - %TIME: Hour, minute, and second time. HHMMSS, range : 000000~235959， ASCII format, Ex: 165036
    - %HOST: Hostname, set by AT+HOST, ASCII format, Ex: Eport-HF2411

There are several ways to match custom data, such as:

The contents of the registration package are ASCII code 【ABCDEFG】, AT+NREGDT=A, ABCDEFG
The contents of the registration package are hexadecimal 【0x01 0x02 0x03 0x04 0x05】, AT+NREGDT=A,%01%02%03%04%05
The content of the registration package is version number + signal strength + data 【0x00 0x01 0x02 0x00 0x10 ABCD】, AT+NREGDT=A, %VER%GSLQABCD
The content of the registration package is IMEI+ data【355837089512343 0x00 0x01 0x02 0x03】AT+NREGDT=A,%IMEI%00%01%02%03

2.5.2.28. AT+NREGSND

- Function: Set/Query the Transmission Method of the Communication Channel Number Registration Package
- Format:
  - Query Operation:

AT+NREGSND=<id><CR>

+ok=<id,type><CR><LF><CR><LF>

- Set Operation:

AT+NREGSND=<id,type><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Communication channel number, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.
    - C: Socket C channel.
  - type: Sending method, including
    - link: Send when the connection is established, default【link】
    - data: The registration packet as the header of each packet of data
    - both: Support both methods at the same time

2.5.2.29. AT+HEART

- Function: Set/query communication channel number heartbeat packet data
- Format:
  - Query Operation:

AT+HEART=<id><CR>
+ok=<id,time,mode,type,value><CR><LF><CR><LF>

  - Set Operation:

AT+HEART=<id,time,mode,type,value><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: channel number, send heartbeat packets to a specific channel, including the following parameters.
    - A: Socket A channel.
    - B: Socket B channel.
    - C: Socket C channel.
    - D: Socket D channel.
    - E: Socket E channel.
    - 1: Serial port 1 channel.
    - 2: Serial port 2 channel. (G10, G11, G12 support)
  - time: Heartbeat interval, default【0】seconds, disable heartbeat function, range 1~65535.
  - data: Custom data, up to 38 bytes, support escape characters, please refer to AT+NREGDT command for details.

2.5.2.30. AT+HTPTP

- Function: Set/query HTTP request type. Only valid for Socket A for HTTP mode, setting will take effect after reset.
- Format:
  - Query Operation:

AT+HTPTP<CR>
+ok=<type><CR><LF><CR><LF>

  - Set Operation:

AT+HTPTP=<type><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - type: HTTP request type
    - GET: GET request
    - POST: POST request

2.5.2.31. AT+HTPURL

- Function: Set/query HTTP url resources and version. Only valid for Socket A for HTTP mode, setting will take effect after reset.
- Format:
  - Query Operation:

AT+HTPURL<CR>
+ok=<path,version><CR><LF><CR><LF>

  - Set Operation:

AT+HTPURL=<path,version><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - path: url resource, 50 characters length maximum, default: /abcd
  - version: HTTP protocol version, 1.0 or 1.1 default: 1.1

2.5.2.32. AT+HTPHEAD

- Function: Set/query HTTP header. Only valid for Socket A for HTTP mode, setting will take effect after reset.
- Format:
  - Query Operation:

AT+HTPHEAD<CR>
+ok=<header><CR><LF><CR><LF>

  - Set Operation:

AT+HTPURL=<header><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - header: HTTP header, for new line in header use “<CRLF><CRLF>”. 180 characters maximum. Default: "Content-type:text/html;charset=utf-8<CRLF><CRLF>"

```
AT+HTPHEAD=Host:1.1.1.1<CRLF><CRLF>
+ok
```

2.5.2.33. AT+WEBSOCKET

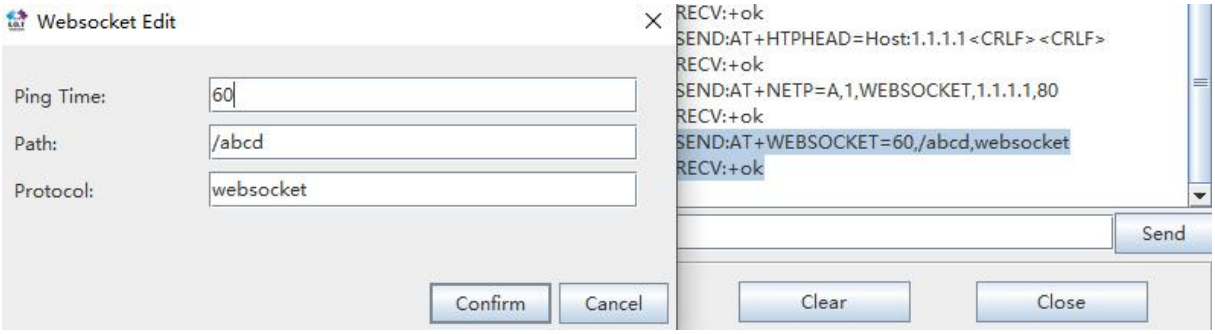
- Function: Set/query WebSocket content. Only valid for Socket A for WebSocket mode, setting will take effect after reset.
- Format:
  - Query Operation:

AT+WEBSOCKET<CR>
+ok=<ping,path,protocol><CR><LF><CR><LF>

  - Set Operation:

AT+WEBSOCKET=<ping,path,protocol><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - ping: WebSocket ping time, unit: seconds, 0: Disable,depends on Server side to set or disable.
  - path: WebSocket Path header
  - protocol: WebSocket protocol, depends on the server requirement.



2.5.2.34. AT+MQTOPIC

- Function: Set/query MQTT topic content. Only valid for Socket A for MQTT mode, setting will take effect after reset.
- Format:
  - Query Operation:

AT+MQTOPIC<CR>
+ok=<publish,subscribe><CR><LF><CR><LF>

  - Set Operation:

AT+MQTOPIC=<publish,subscribe><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - publish: publish topic, max 128 characters, default %IMEI/up.
  - subscribe: subscribe topic, max 128 characters, default %IMEI/down

2.5.2.35. AT+MQLOGIN

- Function: Set/query MQTT login content. Only valid for Socket A for MQTT mode, setting will take effect after reset.
- Format:
  - Query Operation:

AT+MQLOGIN<CR>
+ok=<user,password><CR><LF><CR><LF>

  - Set Operation:

AT+MQLOGIN=<user,password><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - user: login user, max 128 characters.
  - login: login password, max 128 characters.

2.5.2.36. AT+MQID

- Function: Set/query MQTT login content. Only valid for Socket A for MQTT mode, setting will take effect after reset.
- Format:
  - Query Operation:

AT+MQID<CR>
+ok=<id><CR><LF><CR><LF>

  - Set Operation:

AT+MQID=<id><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Client ID, must be different for each device, max 128 characters, recommend to use IMEI, MAC for this Client ID. Default use %IMEI, use IMEI for this ID.

Due to ",=?" is used for AT command special split character, so if Cloient ID include this, need to do transformation, use \\hex format data. See following example.

ClientId: "ts1234|securemode=3,signmethod=hmacsha1,timestamp=789|"

AT+MQID=ts1234|securemode\\3D3\\2Csignmethod\\3Dhmacsha1\\2Ctimestamp\\3D789|

2.5.2.37. AT+LOCATE

- Function: Query/set latitude and longitude.
- Format:
  - Query Operation:

AT+LOCATE=<type><CR>
+ok=<type,longitude,latitude><CR><LF><CR><LF>

  - Set Operation:

AT+LOCATE<CR>
+ok=<type,longitude,latitude><CR><LF><CR><LF>

- Parameter:
  - type: Latitude and longitude type.
    - 0: Set the latitude and longitude manually.
    - 1: GPRS base station location information.
    - 2: GPS positioning information (G12 only).
  - longitude: East longitude.
  - latitude: North latitude.

The heartbeat packet or registration package supports the %GPS wild card, and reports to the network channel. The positioning information reporting priority is prioritized by GPS positioning. When the GPS is not located, the manual input is subject to the standard. If there is no manual input, the base station is positioned as the last.

2.5.2.38. AT+UPGRADE

- Function: Application firmware upgrade via serial port or network.
- Format:
  - Set Operation:

AT+UPGRADE<CR>
+ok=<state><CR><LF><CR><LF>
AT+UPGRADE=[url]<CR>
+ok=<state><CR><LF><CR><LF>

- Parameter:
  - state: The result of the upgrade, the download success prompt 【Upgrade OK!】, the download failure prompt 【Upgrade Fail!】
  - url: URL download path for upgrade files. For example: http://node-cn.iotworkshop.com/a.bin

The command supports serial port or network upgrade. When using the serial port mode, after using the AT+UPGRADE command, switch the tool to 115200 baud rate. After receiving the "Ready CCCCCC.....", select the UPGRDE.bin file. transmission.

2.5.2.39. AT+GOTA

- Function: 4G core module firmware upgrade. (Only 4G product support)
- Format:
  - Set Operation:

AT+GOTA=<url><CR>
+ok

- Parameter:
  - url: Upgrade url address.

Ex: AT+GOTA=http://download.iotworkshop.com/iotbridge/firmwares/4GLTE/4G_V1.575_7ed2afca1cf4919f40346f3f23403594.bin
There is upgrade status information.

```
AT+GOTA=http://download.iotworkshop.com/iotbridge/firmwares/4GLTE/4G_V1.575_7ed2afca1cf4919f40346f3f23403594.bin
GOTA:5
GOTA:10
GOTA:15
GOTA:20
GOTA:25
GOTA:30
GOTA:35
GOTA:40
GOTA:45
GOTA:50
GOTA:55
GOTA:60
GOTA:65
GOTA:70
GOTA:75
GOTA:80
GOTA:85
GOTA:90
GOTA:95
GOTA:100
+ok

AT+GVER
+ok=4G_V1.575
```

2.5.2.40. AT+GETIP

- Function: Query the IP address of the specified domain name.
- Format:
  - Query Operation

AT+GETIP<CR>
+ok=<"domain_name" ><CR><LF><CR><LF>

- Parameter:
  - "domain_name": The domain name that needs to be queried for the IP address.

2.5.2.41. AT+PING

- Function: Query Whether the Address is Reachable.
- Format:
  - Query Operation:

AT+PING=<IP><CR>
+ok=<value><CR><LF><CR><LF>

- Parameter:
  - iP: IP address or domain name.
  - value: Success or failure
    - success: Success.
    - fail: Failure.

2.5.2.42. AT+GSLQ

- Function: Query GPRS Signal Strength.
- Format:
  - Query Operation:

AT+GSLQ<CR>
+ok=<status,ret><CR><LF><CR><LF>

- Parameter:
  - state: Signal strength description, including:
    - 0: Disconnect.
    - 1: Connect.
  - ret: Signal strength value, the range is 0-31.

2.5.2.43. AT+GSMST

- Function: Query GSM status.
- Format:
  - Query Operation:

AT+GSMST<CR>
+ok=<status,strength><CR><LF><CR><LF>

- Parameter:

- status: Module network status. :
  - disconnect: Not connect GPRS network.
  - connect: Registered to the GPRS network.
  - sIM Not Exist: SIM card does not exist.
- Strength: Signal strength, range from 0-31.

2.5.2.44. AT+ICCID

- Function: Query module ICCID code.
- Format:
  - Query:

AT+ICCID<CR>
+ok=<code><CR><LF><CR><LF>

- Parameter:
  - code: ICCID code, length is 20 bytes.

2.5.2.45. AT+IMEI

- Function: Query module IMEI code.
- Format:
  - Query Operation:

AT+IMEI<CR>
+ok=<code><CR><LF><CR><LF>

- Parameter:
  - code: IME code, length is 15 bytes.

2.5.2.46. AT+IMSI

- Function: Query SIM card's MSI number.
- Format:
  - Query Operation:

AT+IMSI<CR>
+ok=<code><CR><LF><CR><LF>

- Parameter:
  - code: IMSI code, length is 15 bytes.

2.5.2.47. AT+APN

- Function: Set/Query APN information.
- Format:
  - Query Operation:

AT+APN<CR>
+ok=<apn,user,password]><CR><LF><CR><LF>

  - Set Operation:

AT+APN=<apn,user,password><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - apn: apn information, max 27length, SET "NA" to clear setting.
  - user: apn user, max 21 length.
  - password: apn password, max 21 length

```
AT+APN=NA
+ok
```

2.5.2.48. AT+NTIME

- Function: Query NTP real time function.
- Format:
  - Query Operation:

AT+NTIME<CR>

+ok=<second,run_time,time><CR><LF><CR><LF>

- Parameter:
  - second: 0 time zone UTC time stamp, for example: 【1516884584】.
  - run_time: The current running time, in seconds.
  - time: Beijing time, for example:【2018-01-25 20:45:09】.

The NTP real time can only be queried if the IOTBridge function is enabled. If it is off, the module runs the local time. Enable the IOTBridge function for at least some time each day to ensure time synchronization.

2.5.2.49. AT+IOTEN

- Function: Set/Query IOTBridge function.
- Format:
  - Query Operation:

AT+IOTEN<CR>
+ok=<status[,start,end]><CR><LF><CR><LF>

  - Set Operation:

AT+IOTEN=<status[,start,end]><CR>
AT+IOTEN=<active,time><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - status: Enable to disable IOTBridge function.
    - on: Enable, default【on】.
    - off: Disable.
    - active: Temporarily turn on the IOTBridge function and do not save it to Flash.
  - start: Starting time, default 10:00.
  - end: Ending time, default 10:30.
  - time: Enable duration, in minutes.

When the IOTBridge remote configuration function is disabled to save traffic, but sometimes the module parameters need to be configured remotely. The AT command can be sent by SMS to temporarily enable the IOTBridge function so that the parameters can be modified. After the set time, the module automatically closes the connection with the IOTBridge.

2.5.2.50. AT+IOTUID

- Function: Set/query IOTBrdige's UserID
- Format:
  - Query Operation:

AT+IOTUID<CR>
+ok=<userid><CR><LF><CR><LF>

  - Set Operation:

AT+IOTUID=<userid><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - userid: IOTBridge UserID, set to 【NA】 to clear this setting.

2.5.2.51. AT+PID

- Function: Query Module Model for Configuring Tool to Identify Device.
- Format:
  - Query Operation:

AT+PID<CR>
+ok=<id><CR><LF><CR><LF>

- Parameter:
  - id: Product name, default【G10】.

2.5.2.52. AT+PCID

- Function: Set/Query the Module Users' Defined Name for Display in the Configuration Tool.
- Format:
  - Query Operation:

AT+PCID<CR>
+ok=<id><CR><LF><CR><LF>

  - Set Operation:

AT+PCID=<id><CR>
+ok<CR><LF><CR><LF>

- Parameter:
  - id: Products' customer custom name, default【G10】, max to 20 bytes.

2.5.2.53. AT+NDBGL

- Function: Open/close debug information output.
- Format:
  - Query Operation:

AT+ NDBGL<CR>
+ok=<debug_level,uart_num><CR>< LF><CR>< LF>

  - Set Operation:

AT+ NDBGL =<debug_level,uart_num><CR>
+ok<CR>< LF><CR>< LF>

- Parameter:
  - debug_level: Debug information output level.
    - 0: Close debug information output.
    - 1～XX: Outputs the setting value and above debugging information.
  - uart_num: Debug information output serial channel.
    - 1: UART 1
    - 2: UART 2

When the work is abnormal, please open the debug log information and send it to us for checking the phenomenon. HF2411 input AT+NDBGL=1,0 to enable log output, AT+NDBLG=0,0 disable log.

```
nReload pin is High!
Start to run....
_init_itfs is running
sdk version(HSF-V1.51-201601151711-LPB100-128-16B),the app_main start time is Nov 29
2018 14:52:45
reset_reasion:00000004
Eport start...
guart thread start...
HF2411Read_clean::
GUART::send:AT
GUART::readline:
```

2.5.2.54. AT+SCRIPT

- Function: HIS script operation.
- Format:
  - Query Operation:

AT+SCRIPT<CR>
+ok=<content ><CR>< LF><CR>< LF>

  - Set Operation:

AT+SCRIPT=<command><CR>
+ok<CR>< LF><CR>< LF>

- Parameter:
  - content: HIS script content.
  - command
    - del: Delete HIS script
    - file: Update HIS script with UART
    - url: fill with HTTP url, download from HTTP, such as http://192.168.0.105.1/script.his