Elfin-EG4XB

TTL/RS232/RS485/ to 4G&BLE

User Manual

V 1.1

Overview of Characteristic

- **Support Bluetooth configuration parameters and data transparent transmission**
- **Support 4G full Netcom LTE-TDD, LTE-FDD**
- **Support TCP/UDP/MQTT/WebSocket/HTTP and other network communication protocol**
- **Support RS485/RS232/TTL to4G data transmission, serial port rate up to 460800bps**
- **Support up to 3 TCP/UDP connections, each connection supports 1400 bytes of data Cache**
- **Support Hanfeng industrial control cloud IOTBridge, you can remotely manage and configure parameters through the network.**
- **Support SMS AT command configuration function**
- **Support registration package (registration package content, sending mode), heartbeat packet (heartbeat packet content, sending mode, sending interval) function, registration package support ICCID, IMEI, IMSI, software version number, cellular network connection status and other combinations.**
- **Support serial port, network OTA wireless upgrade firmware**
- **Support Modbus TCP to Modbus RTU**
- **Wide power supply 9~36V**
- **Dimensions: 68.5 x 35 x 17.8mm**

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1. PRODUCT OVERVIEW

1.1. General Description

EG41B supports 4G full Netcom LTE-TDD and LTE-FDD,There are multiple sub-models that support 4G bands in different regions and the network supports a maximum downlink rate of 10Mbps and a maximum uplink rate of 5Mbps.

Elfin-EG4XB built-in rich network protocol, integrated RS232/RS485/TTL standard data transmission interface, without any driver, convenient for traditional serial device networking use. It can meet almost all M2M needs, including automobile and personal tracking service, wireless POS machine, intelligent metering, industrial PDA, shared bicycle, shared car and so on M2M applications.

Elfin-EG4XB module is RJ45 interface type serial port server, ultra-small size only: 68.5 x 35 x 17.8mm

1.2. Device Paremeters

Table1. Elfin-EG4XB Technical Specifications

Item	Parameters
System Information	
Processor/Frequency	RISC/160MHz
Operating System	FreeRTOS
4G interface (-CA submodel)	
Using Regions	China, India, Southeast Asia
Support Frequency Band	LTE-FDD：B1/B3/B5/B8 LTE-TDD：B34/B38/B39/B40/B41
Transmit power	LTE-TDD: Class3(23dBm+1/-3dB) LTE-FDD: Class3(23dBm+-2dB
Reception sensitivity	FDD B1: -99dBm (10M) FDD B3: -99dBm (10M) FDD B5: -99dBm (10M) FDD B8: -99dBm (10M) TDD B34: -100dBm (10M) TDD B38: -100dBm (10M) TDD B39: -100dBm (10M) TDD B40: -100dBm (10M) TDD B41: -100dBm (10M)

LTE	non-CA CAT1 supported Max Support 1.4 ~ 20MHz RF broadband LTE-FDD: Max uplink speed 5Mbps, Max downlink speed 10Mbps LTE-TDD: Maximum uplink speed of 4Mbps and maximum downlink speed of 6Mbps
4G interface (-SA submodel)	
Using Regions	Hong Kong, South Korea, Australia, Asia Pacific
Support Frequency Band	LTE-FDD：B1/B3/B5/B7/B8/B28
Transmit power	LTE-FDD: Class 3(Maximum 23dBm±2dB)
Reception sensitivity	LTE-FDD B1: -99dBm(10M) LTE-FDD B3: -99dBm(10M) LTE-FDD B5: -99dBm(10M) LTE-FDD B7: -97.5dBm(10M) LTE-FDD B8: -98dBm(10M) LTE-FDD B28: -98dBm(10M)
LTE	Maximum Support non-CA CAT1 Supports 1.4-20MHz RF bandwidth LTE-FDD: Maximum uplink rate 5Mbps, maximum downlink rate 10Mbps
4G interface (-EA submodel)	
Using Regions	Europe, Middle East, Africa, Thailand
Support Frequency Band	LTE-FDD：B1/B3/B7/B8/B20/B28
Transmit power	LTE-FDD: Class 3(Maximum 23dBm±2dB)
Reception sensitivity	LTE-FDD B1: -99dBm(10M) LTE-FDD B3: -99dBm(10M) LTE-FDD B7: -97.5dBm(10M) LTE-FDD B8: -98dBm(10M) LTE-FDD B20: -98dBm(10M) LTE-FDD B28: -98dBm(10M)
LTE	Maximum Support non-CA CAT1 Supports 1.4-20MHz RF bandwidth LTE-FDD: Maximum uplink rate 5Mbps, maximum downlink rate 10Mbps
BLE parameter	
Standard	BLE 5.0
Frequency	2402GHz-2480GHz
Tx Power	Max 15dBm
Rx Sensitive	-97dBm
Serial Port	
Number of serial ports	1
Interface standards	EG40B:1 RS232 EG41B:1 RS485 EG42B:1 TTL
Data Bits	7,8
Stop Bit	1,2
Check Bit	None, Even, Odd
Baud Rate	TTL: 1200 bps to 460,800 bps

Flow Control	No flow control Half duplex (RS485) asthenic
Software	
Firmware upgrade	Serial port or OTA upgrade
Configuration	Serial AT instruction IOTService Serial port configuration software IOTService Network configuration software Bluetooth Configuration
Basic Parameter	
SIM card interface	Nano SIM (1.8V/3V)
Size	68.5mm x 35mm x 17.8mm
Operating Temp.	-40 ~ 85°C
Storage Temp.	-45 ~ 125°C， 5 ~ 95% RH（无凝水）
Input Voltage	9~36VDC@1A
Average current	~30mA@12V 100mA peak
Peak current	100mA

1.3. 4G Frequency Band Description

Table2. 4G Operating Frequency

3GPP Frequency Band	Send	Receive	Unit
LTE-FDD B1	1920~1980	2110~2170	MHz
LTE-FDD B3	1710~1785	1805~1880	MHz
LTE-FDD B5	824~849	869~894	MHz
LTE-FDD B7	2500-2570	2620-2690	MHz
LTE-FDD B8	880~915	925~960	MHz
LTE-FDD B20	832~ 861.9	791~ 820.9	MHz
LTE-FDD B28	703~ 747.9	758~ 802.9	MHz
LTE-TDD B34	2010~2025	2010~2025	MHz
LTE-TDD B38	2570~2620	2570~2620	MHz
LTE-TDD B39	1880~1920	1880~1920	MHz
LTE-TDD B40	2300~2400	2300~2400	MHz
LTE-TDD B41	2555~2655	2555~2655	MHz

2. HARDWARE INTRODUCTION

Elfin-EG4XB is a cellular network solution with the function of serial device networking. Data transmission through the cellular network makes product integration very easy. This product

2.1. Device appearance diagram

Figure 1. Elfin-EG40B Appearance

Figure 2. Elfin-EG41B Appearance

Figure 3. Elfin-EG42B Appearance

2.2. Elfin-EG4XB Pins Definition

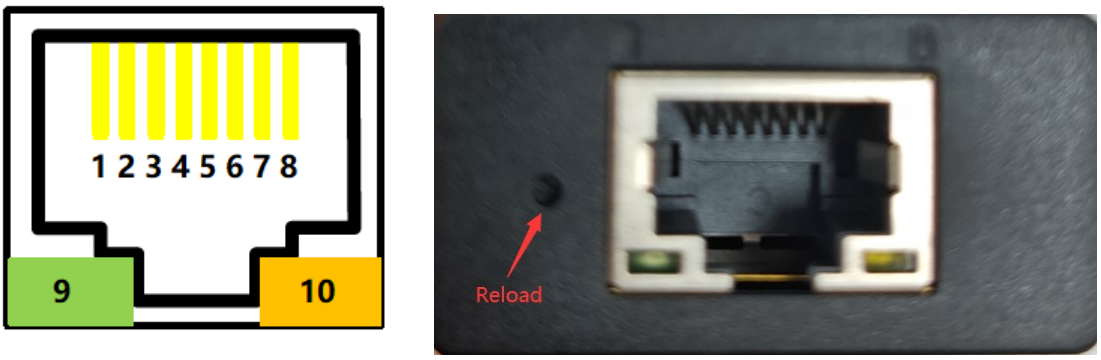

Figure 4. Elfin-EG4XB RJ45 Interface Pin

Table3. Elfin-EG4XB Interface Definition

Pin	Description	Net Name	Signal Type	Comment
1		NC		Reserved
2		NC		Reserved
3		NC		Reserved
4		NC		Reserved
5	Communication serial port	EG40B：RS232_TXD EG41B：RS485_A EG40B：TTL_TX	O	EG40B: RS232 level EG41B: RS485 level A+ phase EG42B: TTL level
6	Communication serial port	EG40B：RS232_RXD EG41B：RS485_B EG40B：TTL_RX	I	EG40B: RS232 level EG41B: RS485 level B- phase EG42B: TTL level
7	Power VCC	VCC	Power	9~36VDC@1A
8	GND	GND	Power	In addition to connecting the negative terminal of the power supply, the GND of RS232 or TTL level also needs to be connected to this pin for normal communication, and RS485 can be connected or not
9	**Green LED** Net Status	Net	O	On: The power supply is normal. Off for 2 seconds and on for 2 seconds: The cellular network is registered and connected properly. Off for 0.1 seconds and on for 0.1 seconds: The cellular network is receiving or sending data
10	**Amber LED** Data Transfer	Active	O	Off: No data is being exchanged Off for 0.3 seconds and on for 0.9 seconds: The serial port outputs data Off for 0.3 seconds and on for 0.3 seconds: The serial port receives data Steady on: sends and receives data in both directions.

<Notes>

I — Input; O — Output; I/O: Digital I/O; Power—Power Supply

2.3. RS232 Interface

Device RS232 does not support hardware flow control. The physical voltage is about ±7V.

2.4. RS485 Interface

RS485 use two wire links, A(DATA+), B(DATA-). Connect A(+) to A(+), B(-) to B(-) for communication. Suggest to connect GND together when interference is very severe.

The RS485 interface support maximum 32 485 device, device. The cable maximum length is 1200 meters. Need to add 120Ohm terminal resistor for over 300 meters.

2.5. TTL Interface

The serial port of this device has no hardware flow control function, and the physical level is ±3.3V TTL

2.6. Mechanical Size

The dimensions of Elfin-EG4XB are defined as following picture (mm):

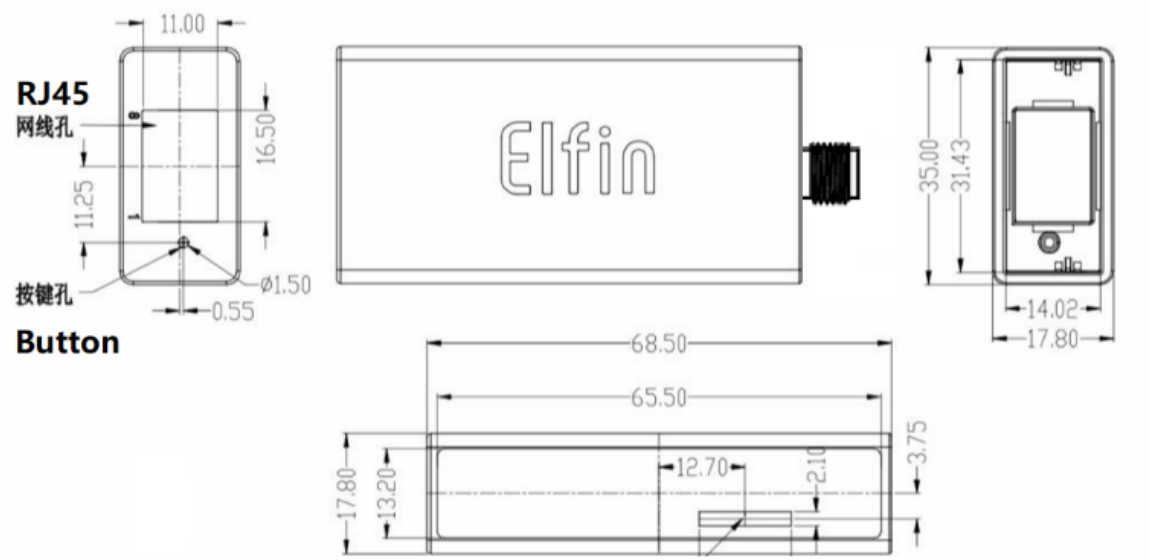

Figure 5. Elfin-EG4XB Mechanical Dimension

2.7. RJ45 4PIN Connector

Figure 6. RJ45 4PIN Connector

Figure 7. EG40B +4PIN Connector

Figure 8. EG41B+4PIN Connector

Figure 9. EG42B+4PIN Connector

2.8. RJ45 Conversion cable

Figure 10. RJ45 Conversion cable

Figure 11. EG40B+RJ45 Conversion cable

Figure 12. EG41B+RJ45 Conversion cable

Figure 13. EG42B+RJ45 Conversion cable

2.9. Homemade cable

Customers can make their own RJ45 conversion cable, add 232 DB9 interface, DC power connector, reset button and so on according to the following sequence.

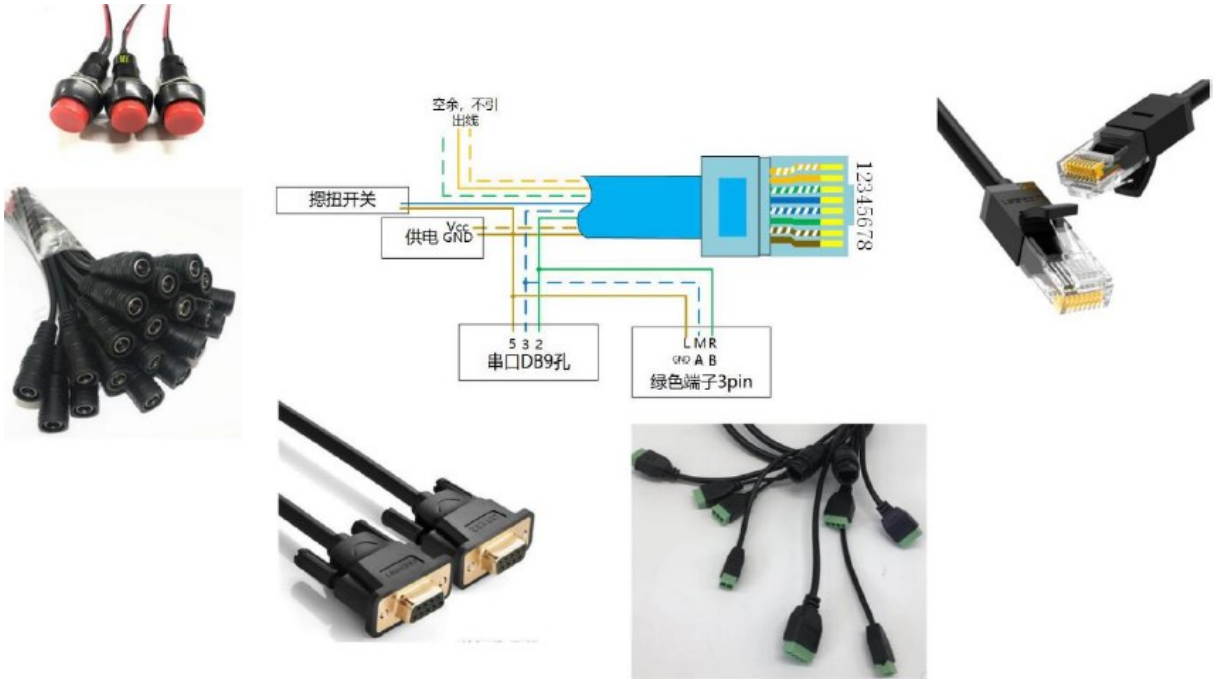

Figure 14. Cable fabrication diagram

2.10. Fixed Bracket

Figure 15. Fixed Bracket

2.11. Rail Bracket

Figure 16. Rail Bracket

2.12. Bracket

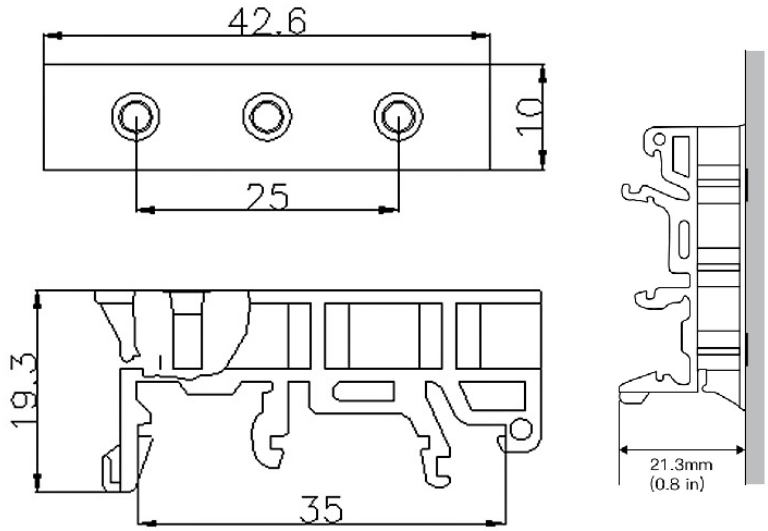

Figure 17. Bracket Size

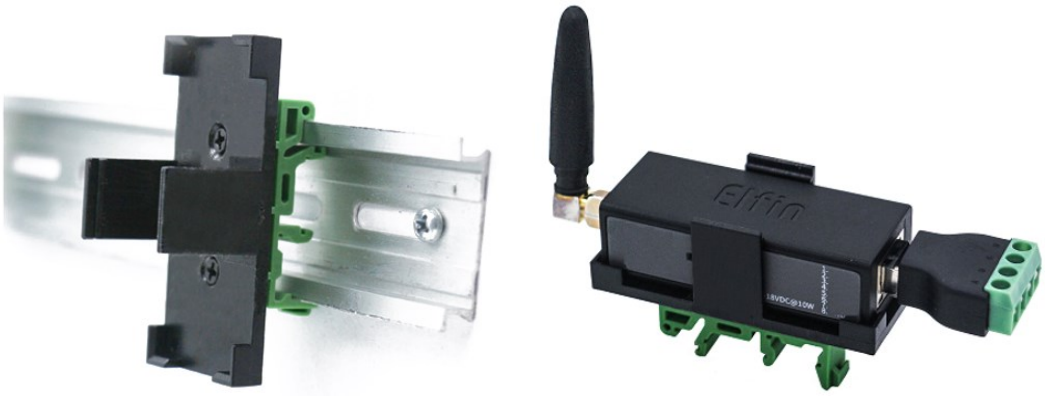

Figure 18. Bracket Install Picture

2.13. Product Installation

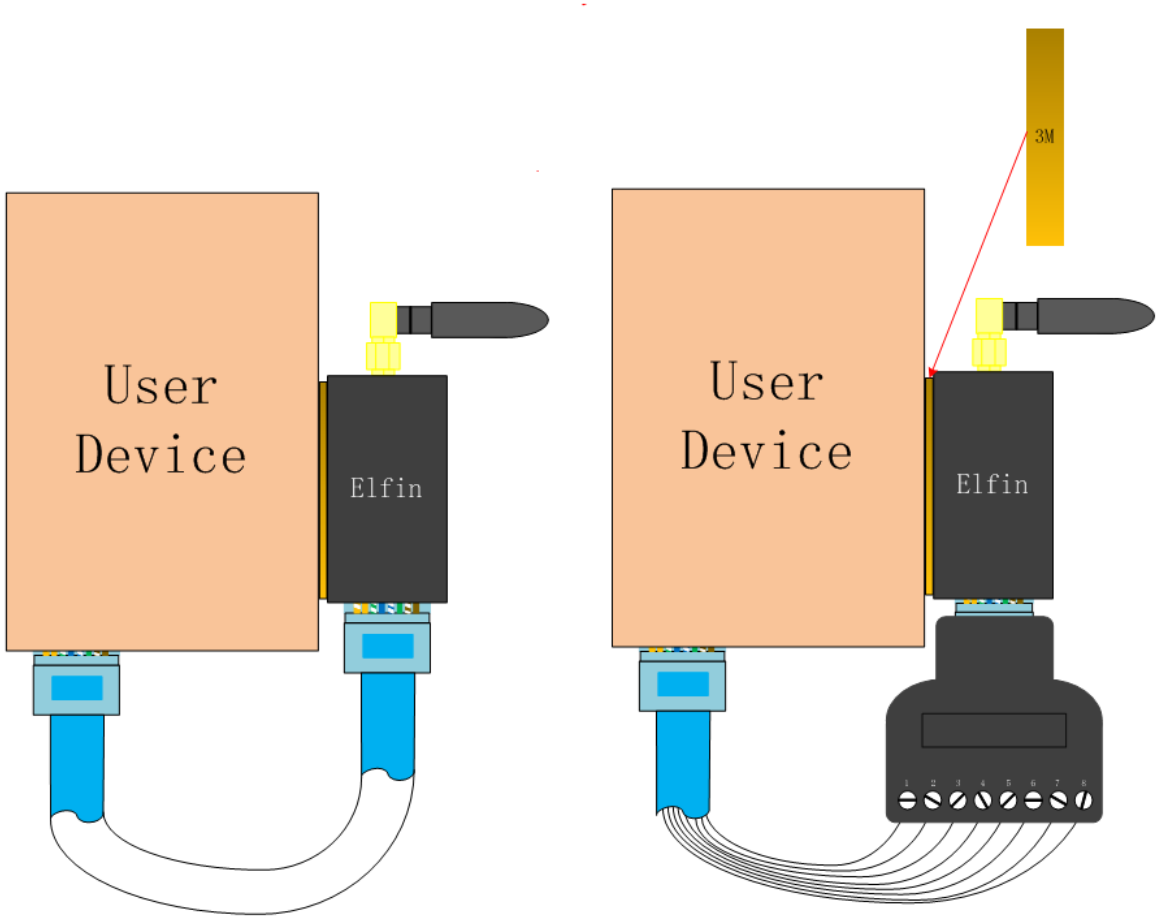

Figure 19. Product Installation

2.14. EVK

EVK indluce one Elfin device, one RJ45 Connector and one screw driver.

Figure 20. EVK Package

2.15. Order Information

EG4XB can be classified into models listed in the following table based on the 4G module model and hardware interface. You can select a submodel based on your own application scenario.

Table4. Product model table

function / model	Use country/region	Hardware parameter			4G frequency band	
		hardware interface	Number of interfaces	Power supply range	LTE-TDD	LTE-FDD
EG40B-CA	China, India, Southeast Asia	RS232	1	9~36V DC	B34/B38/B39/B40/B41	B1/B3/B5/B8
EG40B-SA	Hong Kong, Korea, Australia, Asia Pacific	RS232	1	9~36V DC	—	B1/B3/B5/B7/B8/B28
EG40B-EA	Europe, Middle East, Africa, Thailand	RS232	1	9~36V DC	—	B1/B3/B7/B8/B20/B28
EG41B-CA	China, India, Southeast Asia	RS485	1	9~36V DC	B34/B38/B39/B40/B41	B1/B3/B5/B8
EG41B-SA	Hong Kong, Korea, Australia, Asia Pacific	RS485	1	9~36V DC	—	B1/B3/B5/B7/B8/B28
EG41B-EA	Europe, Middle East, Africa, Thailand	RS485	1	9~36V DC	—	B1/B3/B7/B8/B20/B28
EG42B-CA	China, India, Southeast Asia	TTL	1	9~36V DC	B34/B38/B39/B40/B41	B1/B3/B5/B8
EG42B-SA	Hong Kong, Korea, Australia, Asia Pacific	TTL	1	9~36V DC	—	B1/B3/B5/B7/B8/B28
EG42B-EA	Europe, Middle East, Africa, Thailand	TTL	1	9~36V DC	—	B1/B3/B7/B8/B20/B28

3. BASIC INSTRUCTIONS FOR USE

3.1. Local serial port configuration method

This product uses the AT command to configure parameters, you can connect the 232/485/TTL of the device to the computer with the corresponding USB cable, and then use any serial port class tools, send AT command read and write parameters, the specific AT c ommand refer to "4G_2G_NB DTU product Functions" document, You can also use the serial port tool in our IOTService tool to configure quickly, as shown in the following figure.

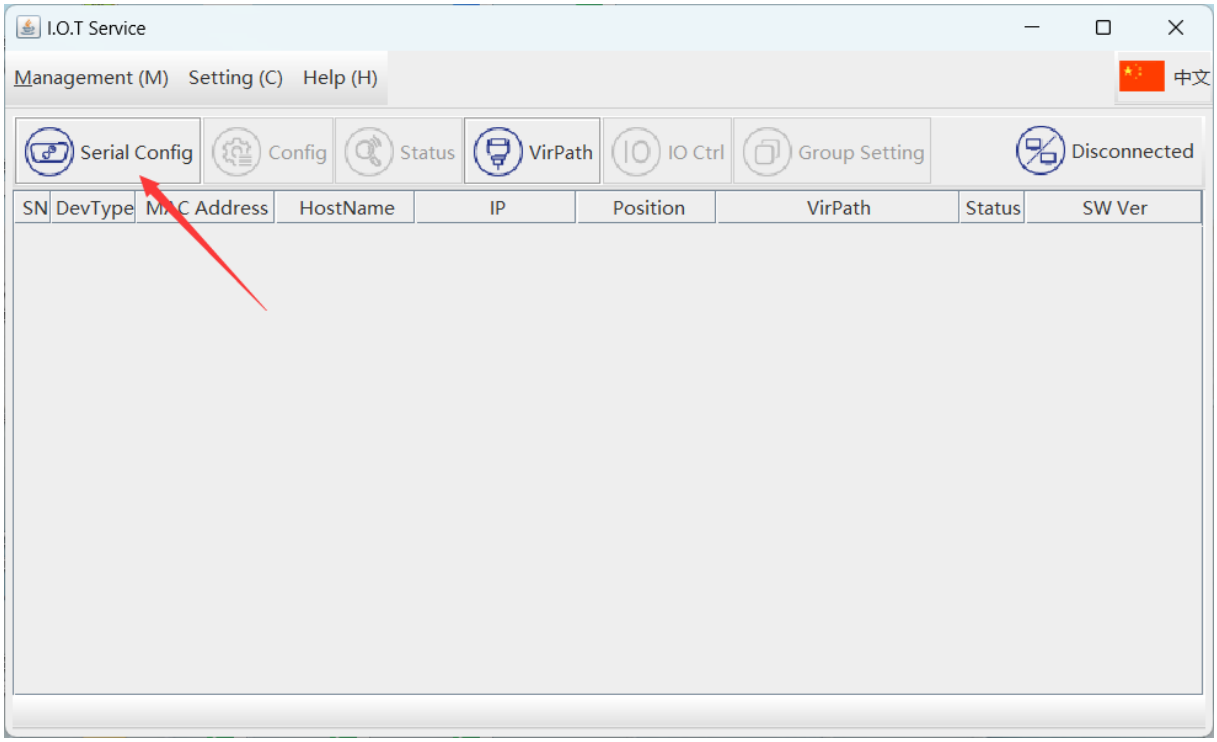

Figure 21. IOT tool configuration diagram 1

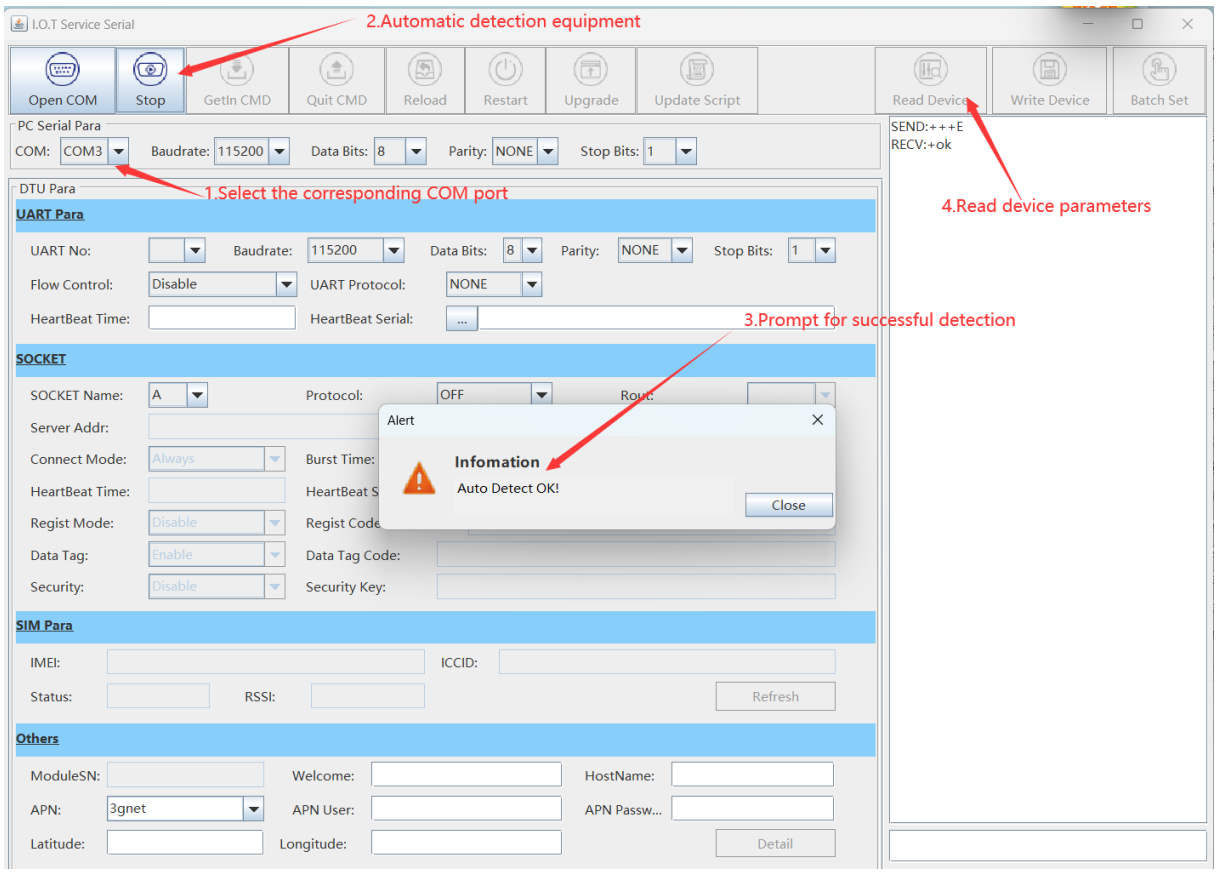

Figure 22. IOT tool configuration Diagram 2

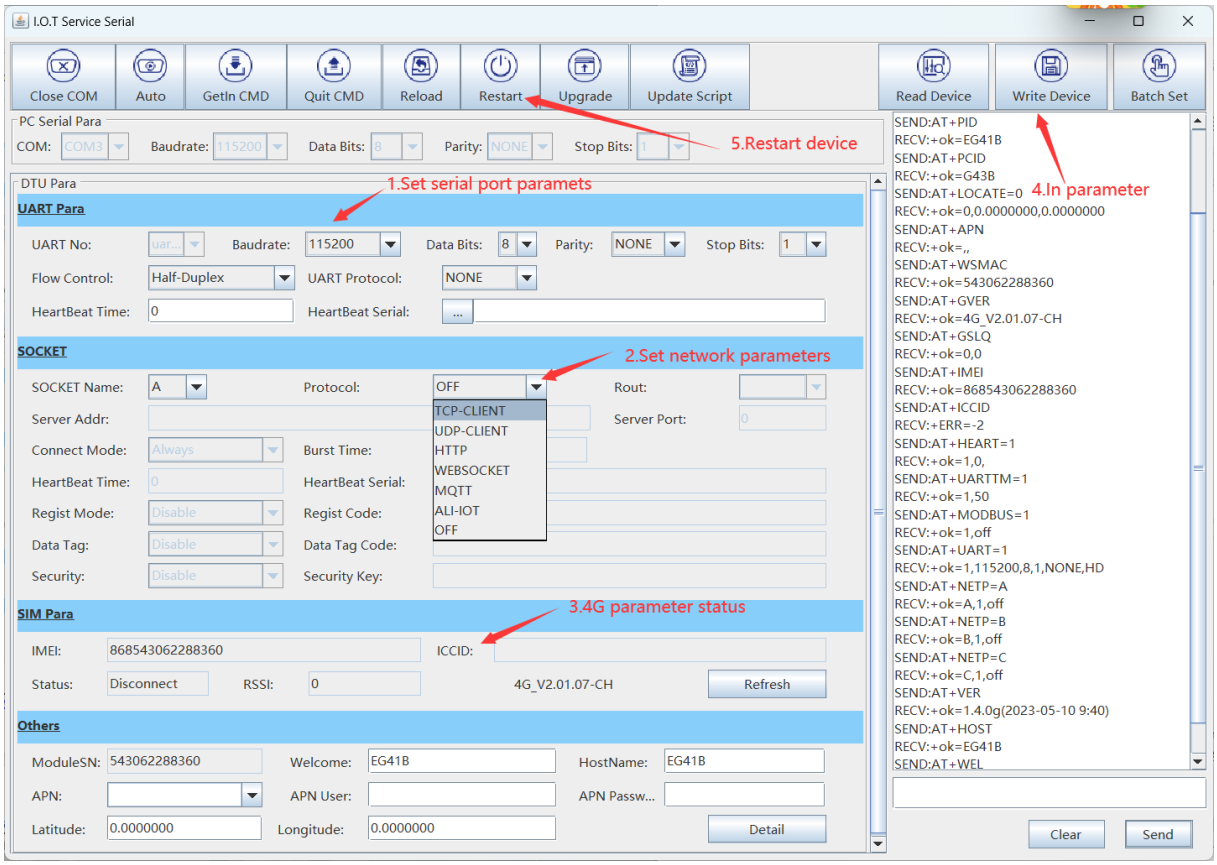

Figure 23. IOT tool configuration Diagram 3

3.2. Network remote configuration mode

We provide a remote management cloud platform. After the device is bound to the cloud platform, the device parameters can be remotely configured through the cloud platform /IOTService tool. The prerequisite is that the device is inserted into the card and connected to the 4G network.

1. Register an account in management cloud platform: I.O.Bridge (hi-flying.com)

2. After logging in to cloud platform, add a Service ID, as shown below:

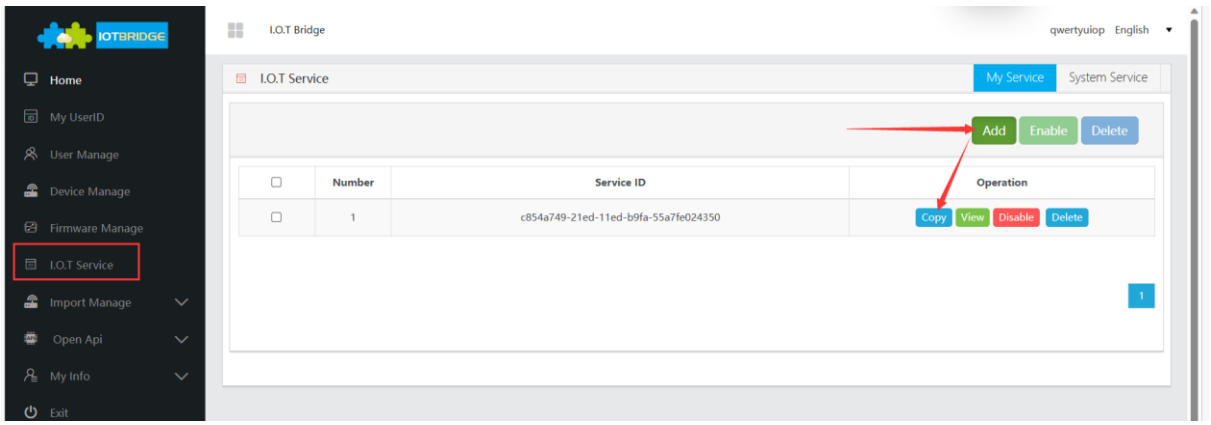

Figure 24. Remote configuration Step 1

3. Copy the Service ID and paste it into the software Settings of the IOTService tool as shown below:

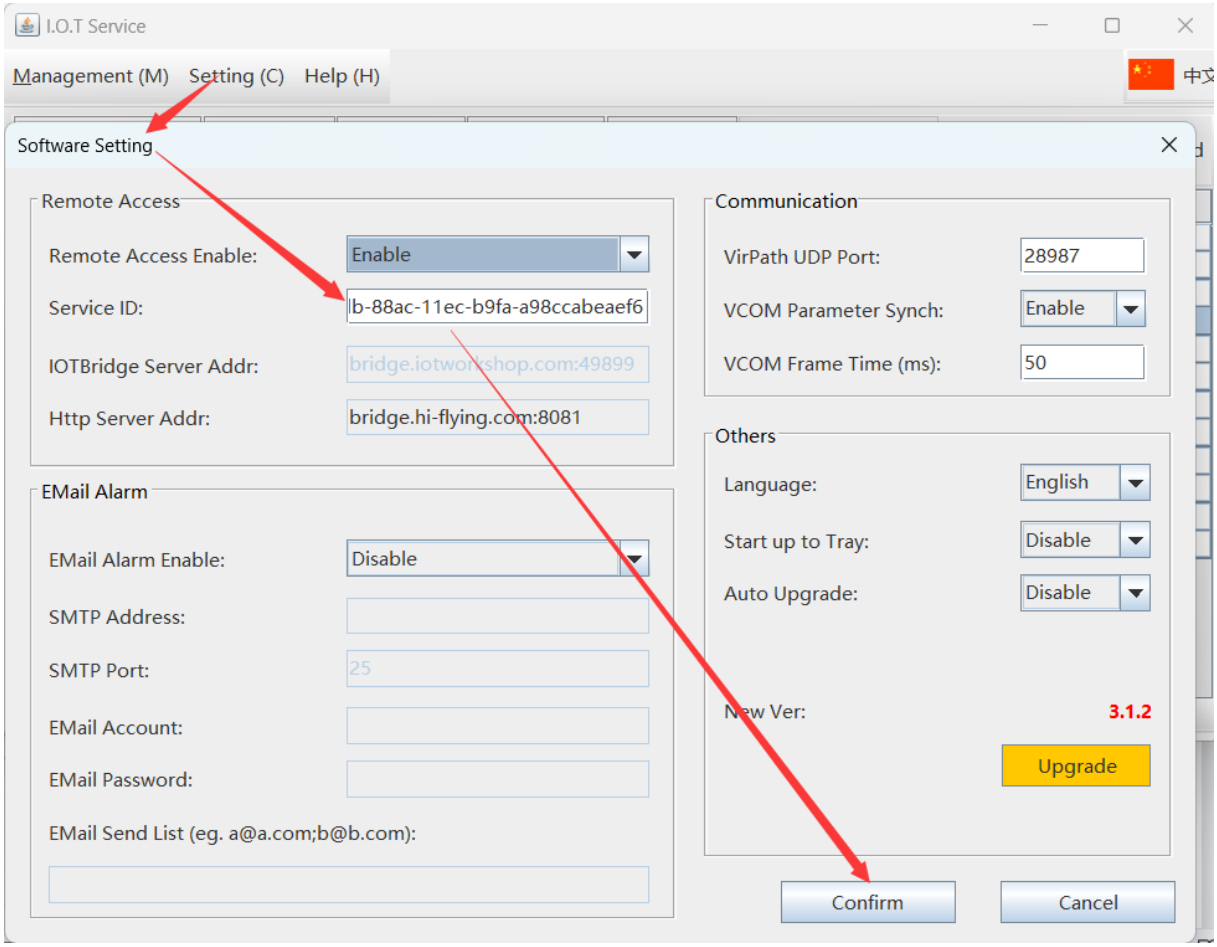

Figure 25. Remote configuration Step 2

4. Add EG4XB's MAC address to the IOT tool (device shell has MAC address attached) as shown below

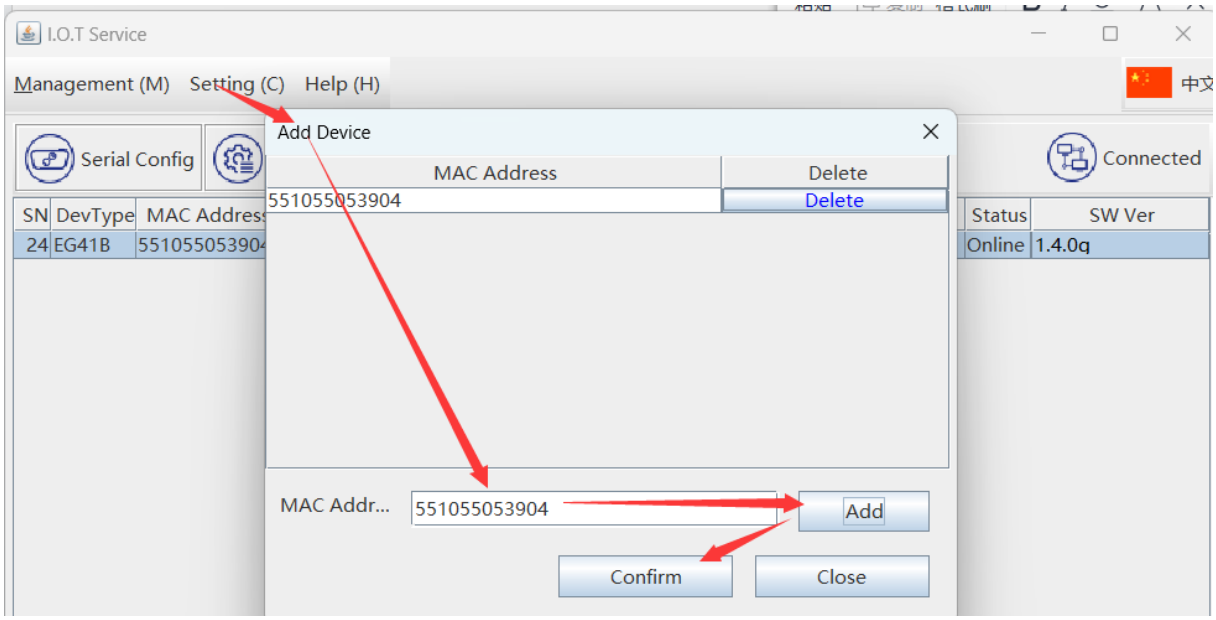

Figure 26. Remote configuration Step 3

5. After the above steps, IOTService tool can search for the device, and then select the device, click device edit, you can configure the device parameters remotely.

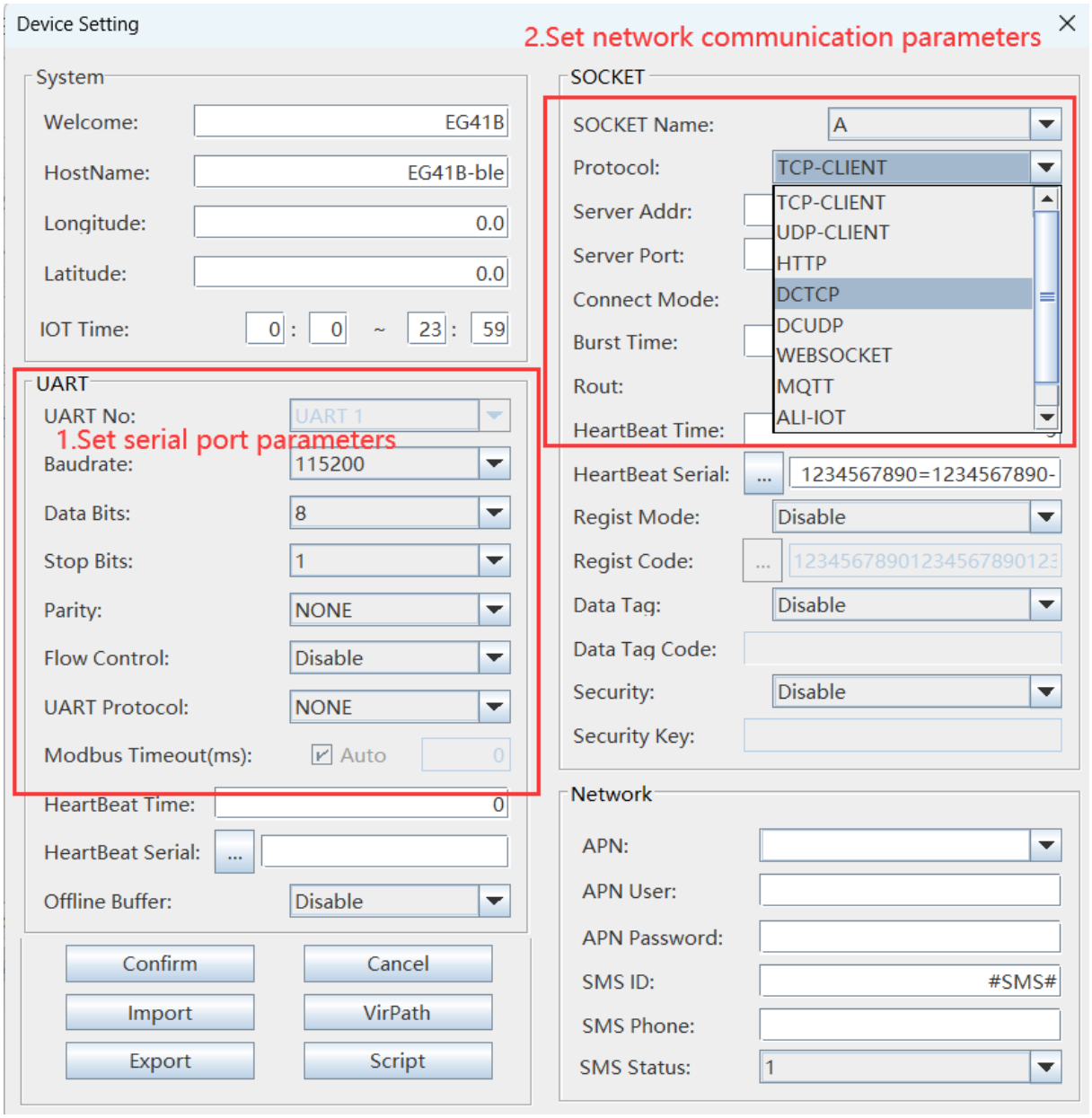

Figure 27. Remote configuration Step 4

3.3. Bluetooth configuration method

The EG41XB supports Bluetooth and can use the mobile phone APP to send AT commands to read and write parameters and transparent data through Bluetooth. The procedure is as follows.

1. Download any Bluetooth debugging software from the App Store

Figure 28. Bluetooth configuration Step 1

2. After logging in, search for Bluetooth, the default Bluetooth name of the device is EG4XB plus the last 4 digits of the device MAC address, as shown below

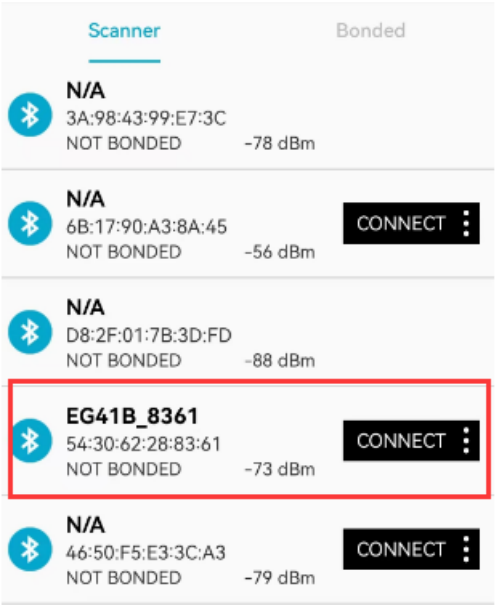

Figure 29. Bluetooth configuration Step 2

3. After the connection, there are a variety of Bluetooth services, corresponding to data transparent transmission and AT command configuration parameters, configure Bluetooth services according to requirements, the function description is as follows:

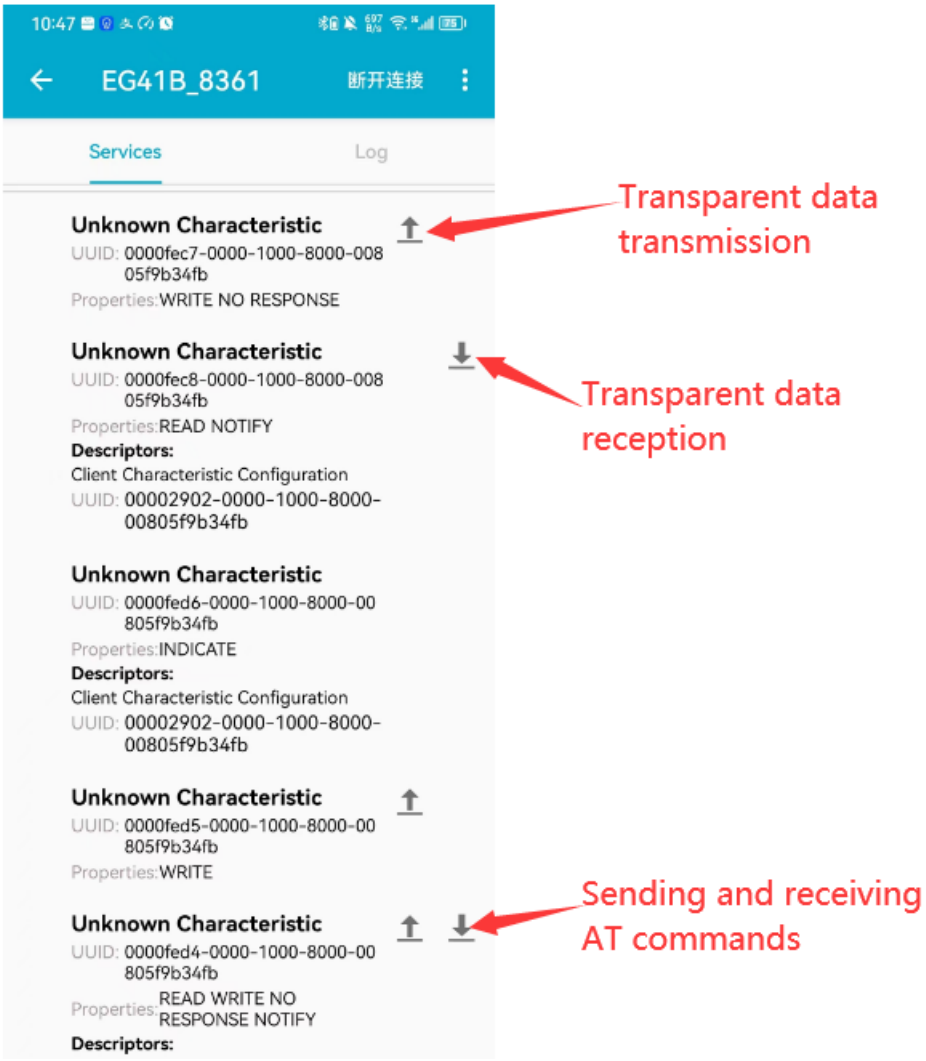

Figure 30. Bluetooth configuration Step 3

4. FUNCTION DESCRIPTION

See the 4G_2G_NB DTU Product Features document for more details on how to use the software functions.

For more details on how to use the software functions, see the 4G_2G_NB Product Operation Guide.

Download:工控产品应用资料 (hi-flying.com)

APPENDIX A: CONTACT INFORMATION

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