EBYTE

Chengdu Ebyte Electronic Technology Co.,Ltd

Wireless Modem

User Manual

Contents

E840-DTU(4G-02E） is developed for serial port devices and network servers to transmit data to each other through a network.It is a LTE-FDD/WCDMA/GSM wireless communication data transmission modem with diversity receiving function, supporting LTE-FDD, DC-HSDPA, HSPA+, HSDPA, HSUPA, WCDMA, EDGE and GPRS network data connections, through simple AT commands Settings, you can easily use this product to achieve two-way data transparent transmission from serial to network.

This manual is a quick introduction to the modem E840-DTU(4G-02E). It is the easiest hardware environment to test the network transmission, that is, to realize data transmitted between the serial device (here, the computer) and the network server.
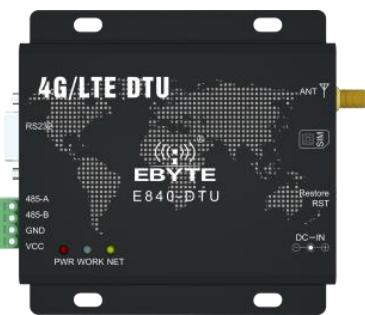
Features

- Meet almost all M2M application demands;

- Data transparent transmission, TCP, UDP network protocol, heartbeat packet, and registration package function available;

- Max serial port baud rate: 230400, two-way serial transmission between device and network server;

- Serial port large cache and the serial port data can be cached locally before the server is established.；

- SMS sending and receiving, SMS remote query/configuration device parameters;

- Multiple Socket links to send and receive at the same time;

- Modbus RTU and Modbus TCP to automatically convert each other;

- The maximum downlink rate is 150Mbps, and the maximum uplink rate is 50Mbps.

- With MQTT protocol, the device can access Alibaba Cloud, oneNET, Baidu cloud, and other IoT platforms;

- Network AT command available, which can be configured remotely through the network.

- E840-DTU has Certificate of conformity No. CQEx20.0576X.

1. Product overview

1.1 Introduction

E840-DTU (4G-02E) is an LTE digital transmission module product launched by E-Tech. The software of this product is fully functional and covers most common application scenarios. Users can implement serial-to-network server through simple setup. Two-way data transparent transmission.

The radio is powered by the DC power supply or RS485 terminal in the power supply section and is powered by a wide voltage of 8.0V to 28.0V. Support mobile, China Unicom, Telecom 4G card, RS485 and RS232 circuits use electrical isolation scheme, with anti-interference ability, can be used in some environments with strong electromagnetic interference, such as some power industry.

1.2 System parameter

Parameter	Value	Description
Characteristic	Frequency	LTE-FDD：B1/B3/B7/B8/B20/B28A WCDMA：B1/B8 GSM：B3/B8
	LTE characteristic	Support max. of 3GPP R8 non-CA Cat 4 FDD and TDD Support 1.4MHz~20MHz , Downstream support： MIMO LTE-FDD: Max downstream rate 150Mbps, Max upstream rate50Mbps
	WCDMA characteristic	WCDMA: Max downstream rate 384Kbps ， Max upstream rate 384Kbps
	GSM characteristic	GPRS: Max downstream rate 107Kbps ， Max upstream rate 85.6Kbps EDGE: Max downstream rate 296Kbps ， Max upstream rate 236.8Kbps
	Network protocol characteristic	TCP/UDP/PPP/FTP/HTTP/NTP/PING/QMI/NITZ/CMUX/HTTPS/SMTP/MMS/FTPS/ SMTPS/SSL/FILE PAP (Password Authentication Protocol) and CHAP (ChallengeHandshake Authentication Protocol)
Hardware Characteristic	Antenna	SMA
	Data interface	RS485 /RS232
	Baud rate	Max 921600bps，default 115200bps
	Transmitting power	Class 4 (33dBm±2dB) for GSM900 Class 1 (30dBm±2dB) for DCS1800 Class E2 (27dBm±3dB) for GSM900 8-PSK Class E2 (26dBm±3dB) for DCS1800 8-PSK Class 3 (24dBm+2/-1dB) for CDMA BC0 Class 3 (24dBm+1/-3dB) for WCDMA bands

		Class 2 (24dBm+1/-3dB) for TD-SCDMA bands Class 3 (23dBm±2dB) for LTE-FDD bands Class 3 (23dBm±2dB) for LTE-TDD bands FDD B1: -101.5dBm (10M)
		FDD B3: -101.5dBm (10M) FDD B7: -99.5dBm (10M) FDD B8: -101dBm (10M) FDD B20: -102.5dBm (10M) FDD B28A: -102dBm (10M) WCDMA B1: -110dBm WCDMA B8: -110.5Bm GSM 3: -109dBm GSM 8: -109dBm
	Consumption （Typical）	11uA @ power off
		1.8mA @LTE sleep (PF=128) 1.5mA @LTE sleep (PF=256)
		20mA @idle
	Bandwidth	1.4/3/5/10/15/20MHz
	Operating temperature	-30℃- +70℃ extending to -40℃~+85℃
	Operating voltage	DC 8 V~2 8 V
	Size	82×84×24mm
	RS485 /RS232	RS485/RS232

1.3 Interface description
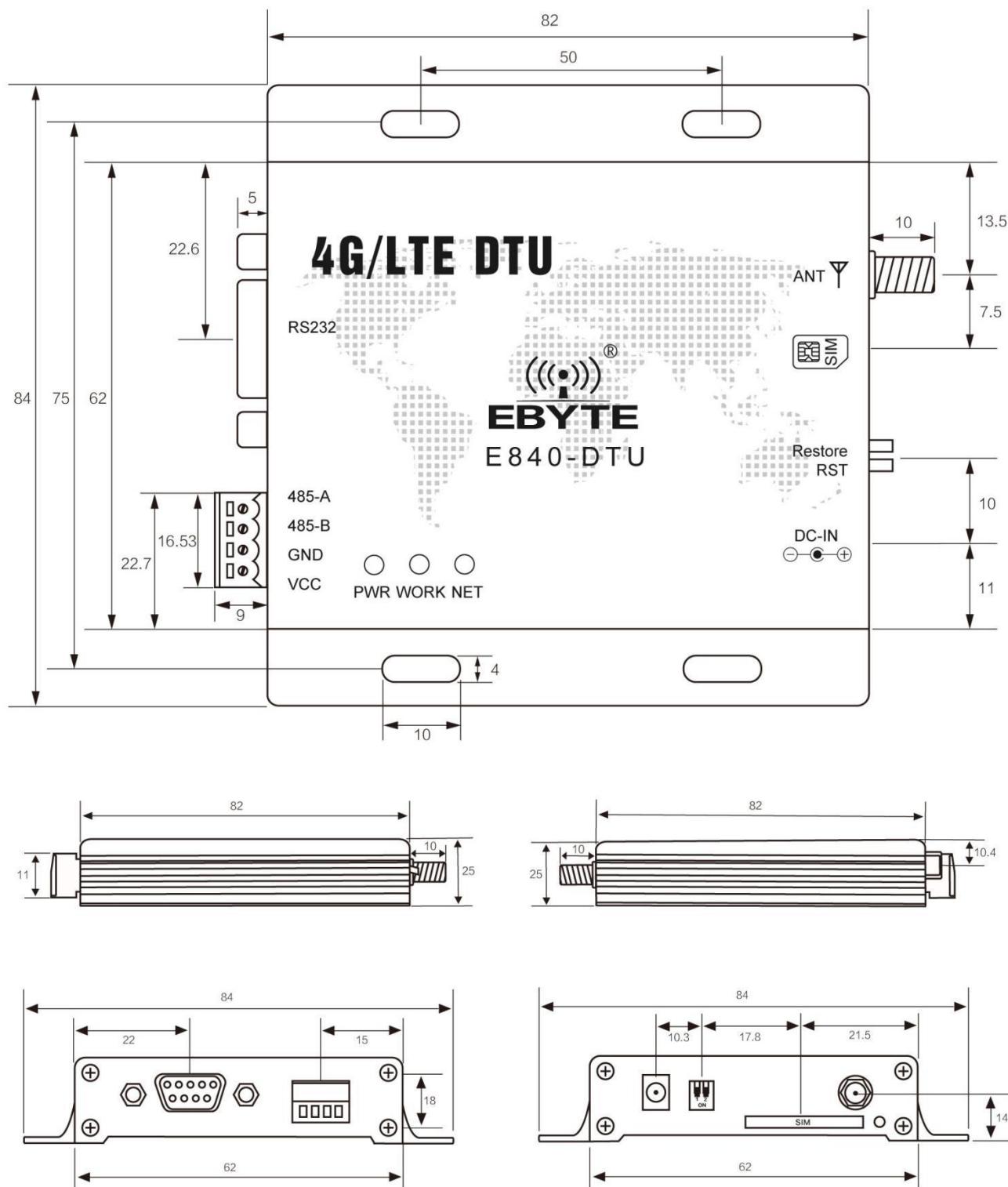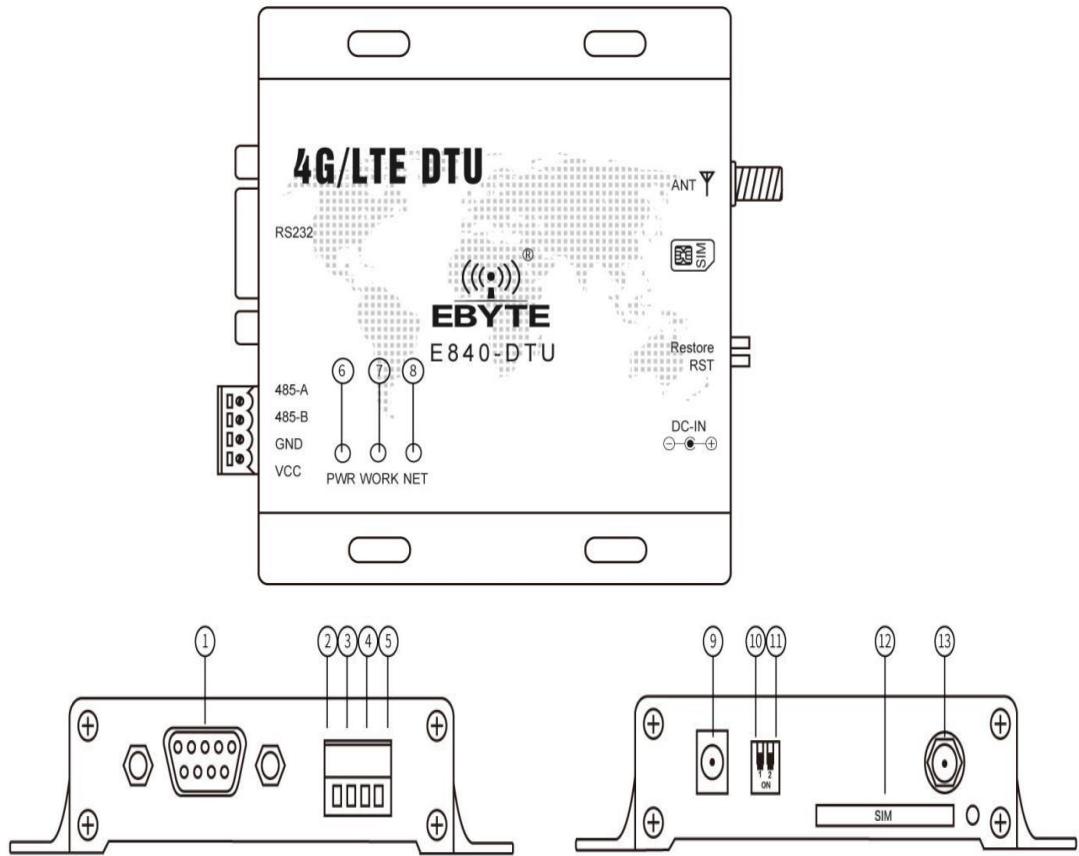
1.4 Pin definition

Pin No.	Name	Description
1	RS232	RS232 interface
2	485_A	To connect the end A of other RS485 device
3	485_B	To connect the end B of other RS485 device
4	GND	Ground
5	VCC	Power supply，8~28V,12V or 24V is recommended
6	PWR	Power indicator
7	WORK	Blue: Receipt transceiver pin, when the network receives data or the serial port receives data (50ms high/10ms low) Green: device status indication pin, Low: The device is powered on to search for a SIM card 1800ms low, 200ms high: The device checks the correct SIM card and is attaching to the network; High: The device is attached to the network successfully;

8	NET	Green: Socket A link connection status indication pin High: Socket A is successfully connected to the network server; Low: Socket A is not successfully connected to the network server; Blue: Socket B link connection status indication pin High: Socket B is successfully connected to the network server; Low: Socket B is not successfully connected to the network server;
9	DC-IN	DC adaptor，8~28V, 12V or 24V is recommended
10	RST	Dip switch（downward，reset）
11	Restore	Dip switch After the radio is powered on normally, the Restore dials from top to bottom, and continues down for 3~10S, then from bottom to top. After the process is completed normally, the radio parameters will be restored to the factory settings and restarted immediately.
12	SIM	SIM card slot
13	ANT	Antenna （SMA-K，50Ω impedance）

2.Quick start

2.1 Hardware

Hardware for test are as follows：

| E840-DTU(4G-02E) | POWER | Antenna | RS232 |
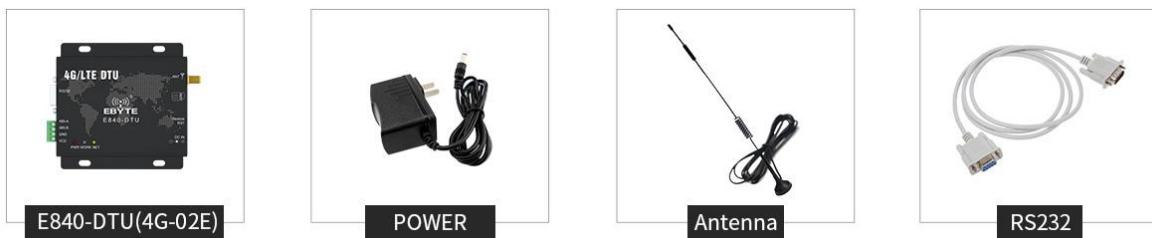
Connect the power supply, antenna, SIM card, serial cable and other hardware before testing.

1. Enter the AT command mode and send +++ in the serial port assistant (except that +++ does not need to tick to send a new line, other AT commands need to check to send a new line to be valid), you must send +++ command 3s Send any other AT command (except for restarting the AT command) to fully enter the AT command mode.

2. After entering the AT command mode, use AT+CPIN to check the SIM card access:

For example: AT+CPIN

+OK=1

Indicates that the SIM card is connected and uses AT+CSQ to view the current signal strength:

For example: AT+CSQ

+OK=26

Indicates that the current signal strength is normal. If the response is 99, the current signal strength is abnormal. Check whether the current antenna is connected or the surrounding base station is abnormal.

3. Access server, AT + SOCK = TCPC, 116.62.42.192, 31687 (parameters are separated by English characters comma, separated by English characters between IP instructions), if it is SOCK1, SOCK2, SOCK3, need to be The front-end plus enable command (see the AT command description section for details).

SOCK settings

For example: AT+SOCK=TCPC, 116.62.42.192, 31687

+OK

SOCK1, SOCK2, SOCK3 settings

For example: AT+SOCK1=0, TCPC, 116.62.42.192, 31687

+OK

Indicates that the setting was successful.

4. Restart (after all AT commands modify parameters, the device will take effect after restarting)

Execution command AT+REBT returns OK and the device restarts immediately. Here IP only shows the demonstration. The actual connection is based on the IP of the server to be connected.
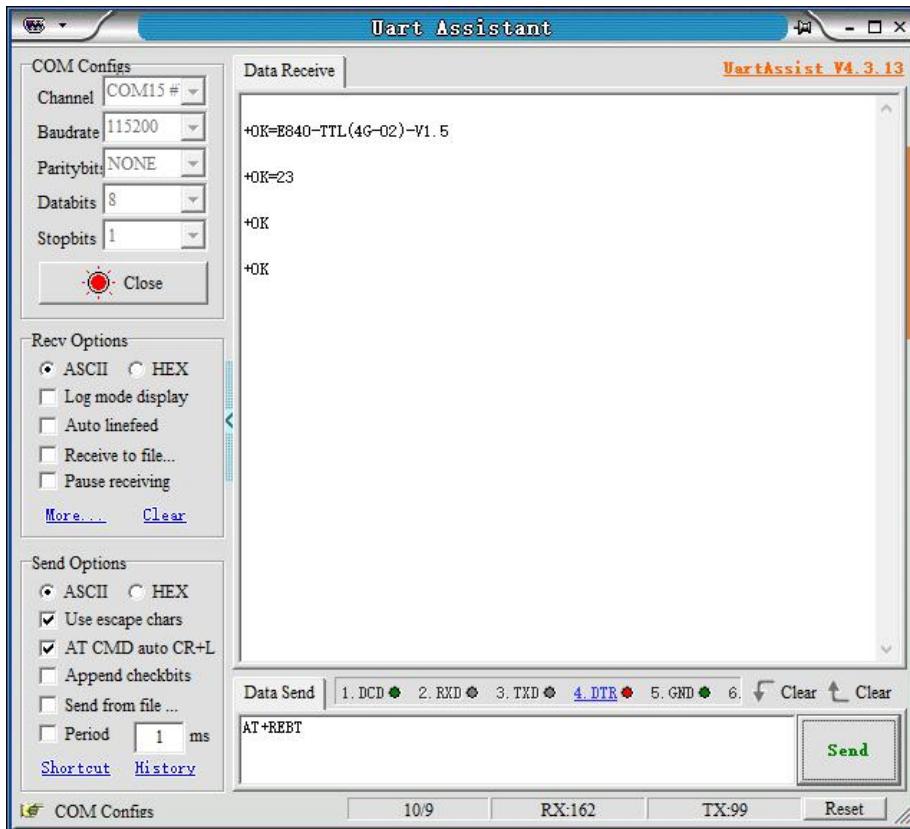
5. After the base station is connected, the NET light is always on to indicate that the server is connected, and transparent transmission is possible at this time.
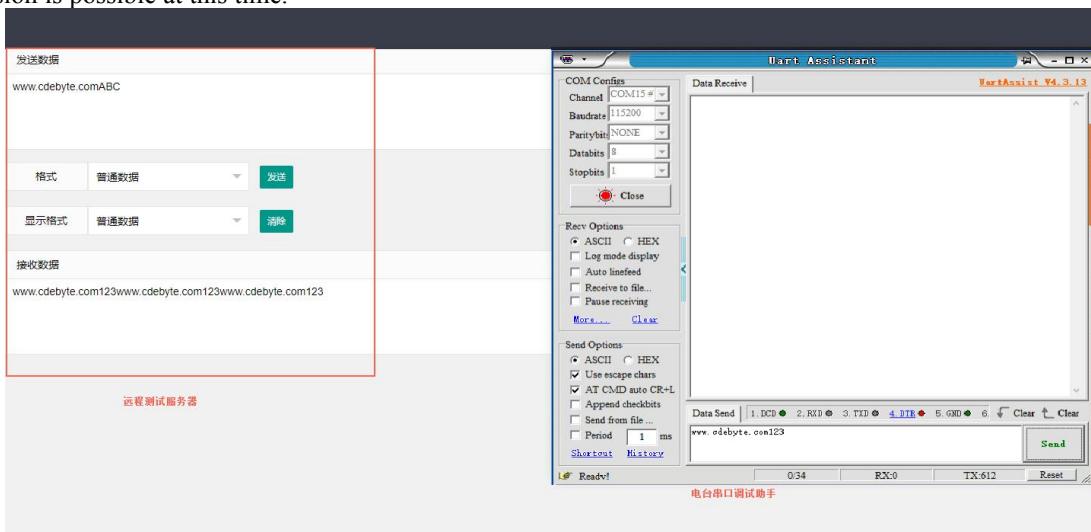
2.2 Data transmission test

● Software tools used for the test are as follows：

Any serial port assistant, XCOM is used in this manual, which can be downloaded from our official website.

2.2.1 Operating mode is as follows：

1、operating mode includes: transparent transmission mode, AT configuration mode

a) Transparent transmission mode: After power-on, the radio works in the transparent transmission mode by default, and automatically starts the network connection. When the connection is established with the server, any data received by the serial port will be transparently transmitted to the server. At the same time, it can also receive data from the server. After receiving the server data, the module will output directly through the serial port. The maximum length of data supported by this module is 1024 bytes. When multiple links are connected to the server at the same time, the data packet will be sent to the four links at the same time. When there are data to be sent from any network link, the radio will transparently output the data.

b) Protocol transmission: This module supports 4-channel Socket connections. For each socket users can configured it as TCP Client or UDP Client. When sending data, users can use protocol transmission or transparent transmission.

Protocol transmission format

Transmit：0x55 0xFE 0xAA ID data

For example：55 FE AA 02 AA BB   //02： SOCK2 link，AA BB：the data that the user actually needs to transmit

Receive：0xAA 0XFE 0x55 ID data length Data

For example： AA FE 55 02 03 11 22 33   //02: SOCK2 link， 03：the valid data length received this time   11 22 33：real data

Demonstration：

Take SOCK2 as an example： ,

Transmit：+++(do not add new line for transmitting)   //enter AT command

Transmit：AT+VER(add new line for transmitting)   //read version info. And enter AT command setting at the same time

+OK=E840-DTU(4G-02E)_V1.0

Transmit：AT+SOCK2=1,TCPC,116.62.42.192,31687   //open SOCK2 and configure the network server parameters that SOCK2 will connect to (the parameter used here is Ebyte test server, not recommended for users)

+OK

Transmit：AT+LINKSTA2   //read if SOCK2 has started connection with server

+OK=Connect

Transmit：AT+POTOCOL=ON   // open protocol transmission mode

+OK

Transmit：AT+POTOCOL   //inquire if protocol transmission is on

+OK=ON

AT+REBT   //restart

+OK

Waiting for the radio to restart, SOCK2 will automatically establish a connection with the server. After the connection is started, data can be transmitted to each other via protocol.
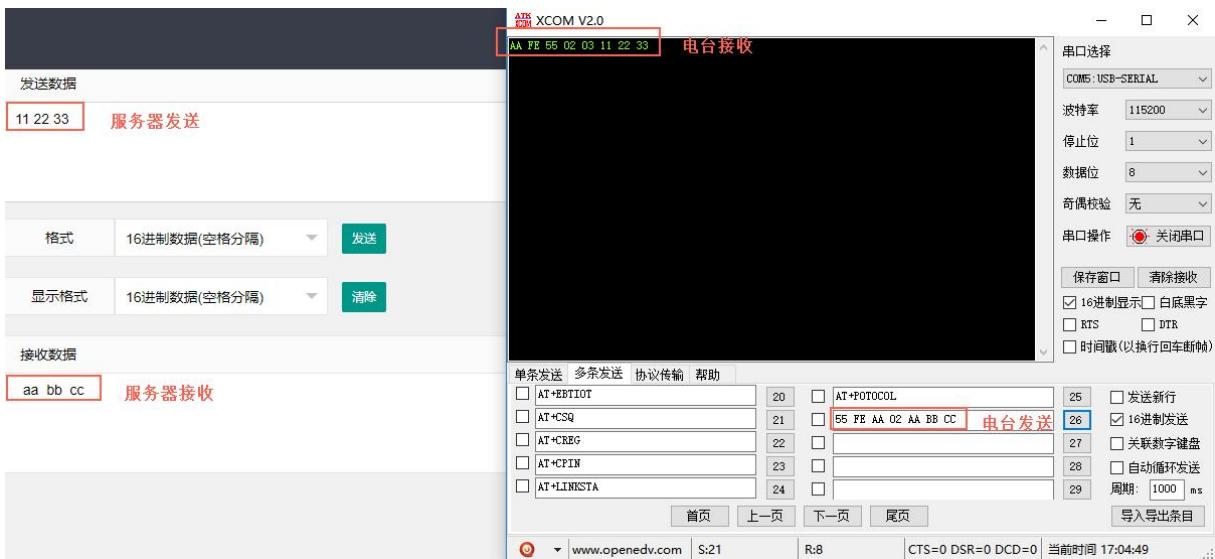
c) AT mode：under this mode all UART data is considered as AT command.

d) Mode switch，In the transparent transmission mode, after the serial port receives the "+++" frame data, the RX pin receives any AT command within 3 seconds, and the mode switches to the AT mode. In AT mode, send AT+EXAT<CR><LF> to switch to transparent transmission mode.
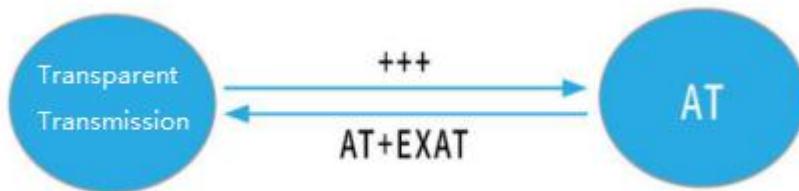
2、Network function

a) Short connection: In TCP Client mode, the short connection function is enabled. If there is no data reception in the serial port or network port within the set time, the network connection will be automatically disconnected. The short connection function is turned off by default. The connection time can be set from 2 to 255 seconds. When set to 0, the short connection function is disabled.

b) Registration package: The registration package is closed by default. The user can configure 4 types of registration packages. You can choose to send the physical address (IMEI code) when connecting, send custom data when connecting, add the physics before the connection and each packet of data. Custom data is added to the address, connection time, and data before each packet. The maximum length of the custom registration packet is 40 bytes (when set to HEX format, the maximum length is 20 bytes).

c) Heartbeat packet: In the idle state of network communication, the heartbeat packet is used for network state maintenance. The heartbeat period can be set from 0 to 65535 seconds, and the maximum length of the heartbeat packet is 40 bytes (when set to HEX format, the maximum length is 20 bytes). Supports two heartbeat types: network heartbeat and serial heartbeat. When the network heartbeat is selected, the communication idle time starts, and the heartbeat data

packet is sent to the server according to the configured heartbeat period. Select the serial port heartbeat, start timing with communication idle, and send heartbeat packets to the serial port according to the configured heartbeat period.

d) Clear the cache: Before the connection to the server is established, the data received by the serial port will be cached. When the connection with the server is established, you can choose whether to clear the cached data. By default, the cache is cleared. The maximum size of each Socket in the local cache is 10 bytes, and each Socket buffer is independent of each other.

3、 High speed mode

The E840-DTU(4G-02E) is designed with a separate high-speed mode. In this mode, both the network and the device can transmit any packet length data, such as file, picture, and video.

Configure/query the high-speed mode state through the AT+HSPEED command. After the high-speed mode is enabled, the device can transmit any packet length data at 230400 serial port baud rate and below.

The E840-TTL-(4G-02E) file transfer process will be demonstrated below:

1). Turn on the device high-speed mode: After the device enters the AT mode, send AT+HSPEED=ON to enable the high-speed mode, configure the connected server address, and restart the device.

2). Ready to transfer the file. The file transferred in this demo is RF_Setting3.49.exe. The file is an executable file. After startup, the following interface is displayed:

3). Open the serial port tool and use the file sending method to open E840_Setting_V2.43.exe. After the device is connected to the network server normally, click "send file" and the sending is completed as shown below. :
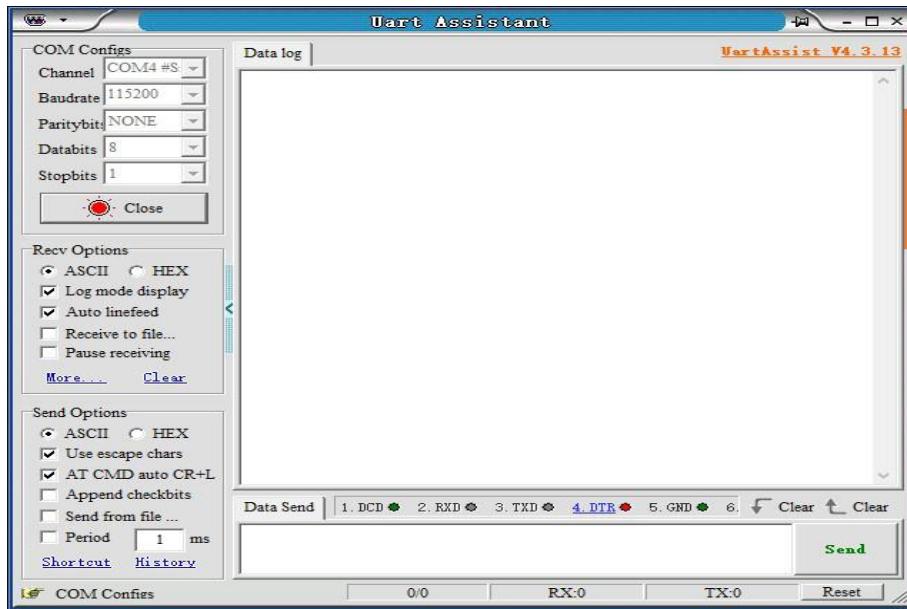
4). The server (the external network mapping used for this demo, the server is the TCP debugging tool), after receiving the data, it is as follows：
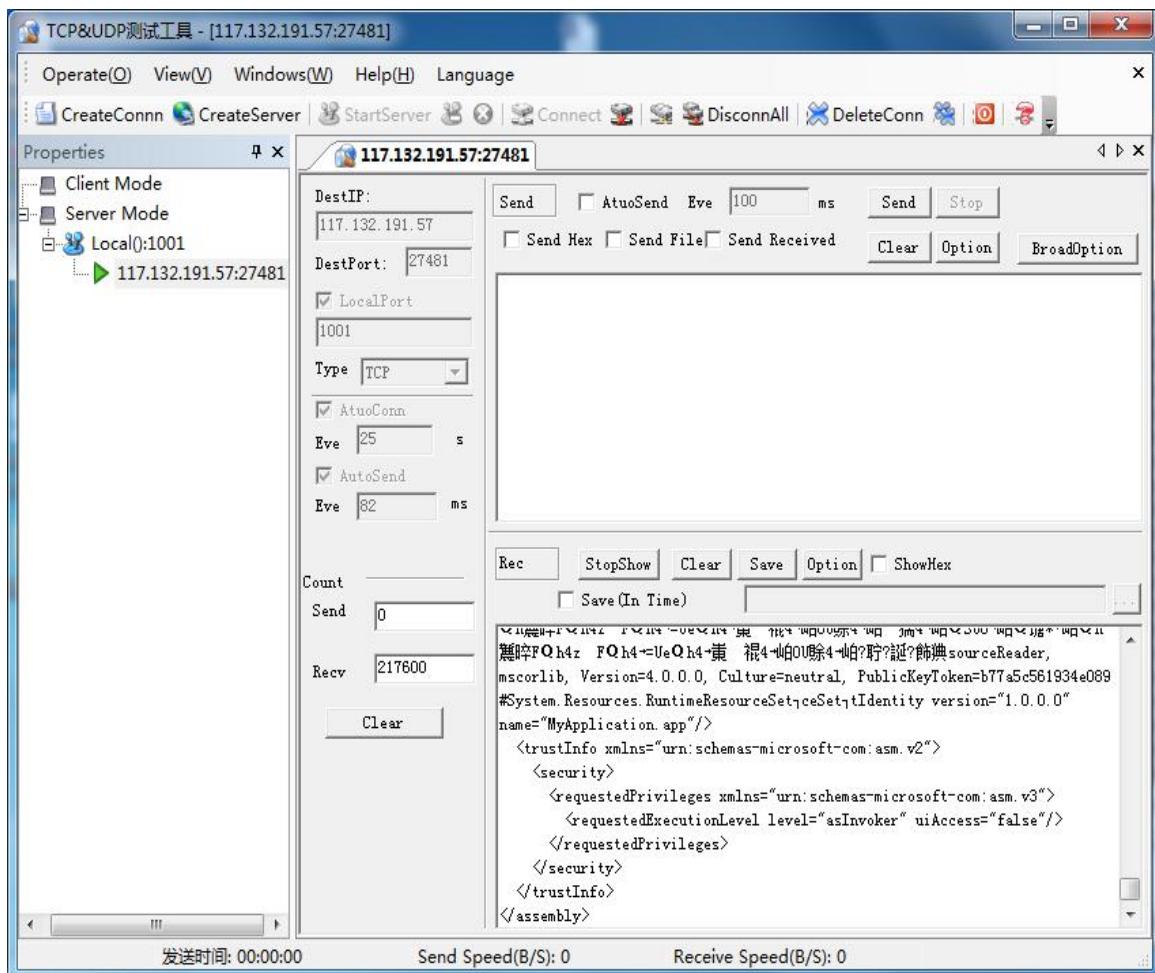
5). Save the data as an .exe trial file type. This time it is named RF.exe, as shown below:：
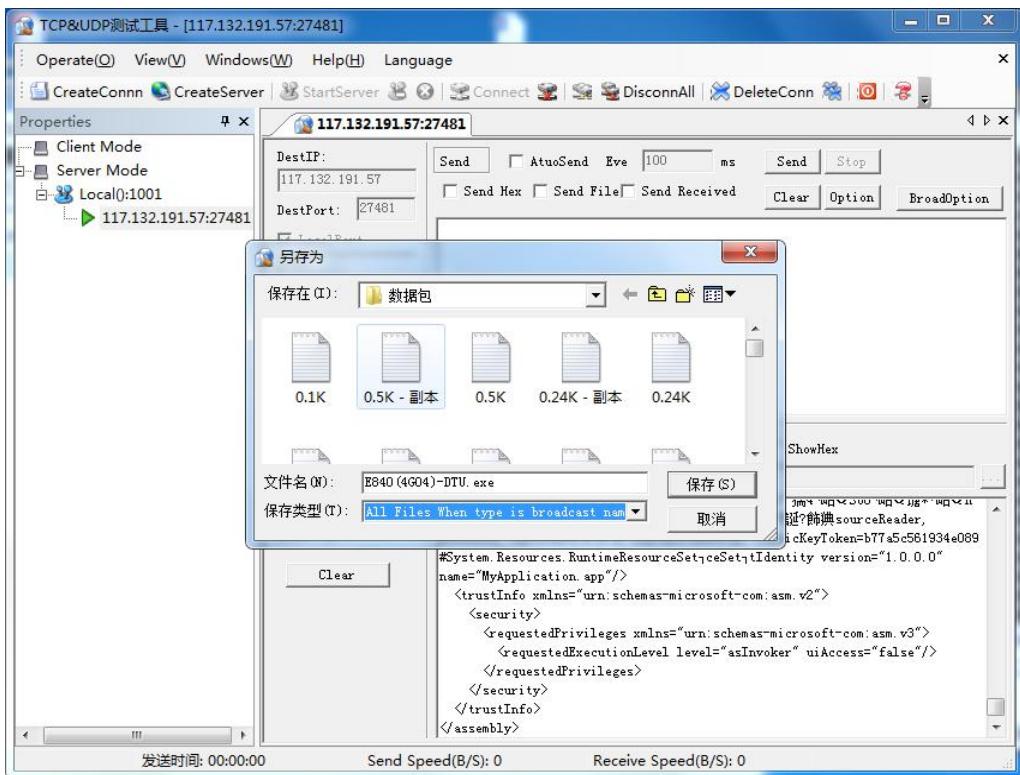
6)Click on the server to run RF.exe to test the file, as shown below：
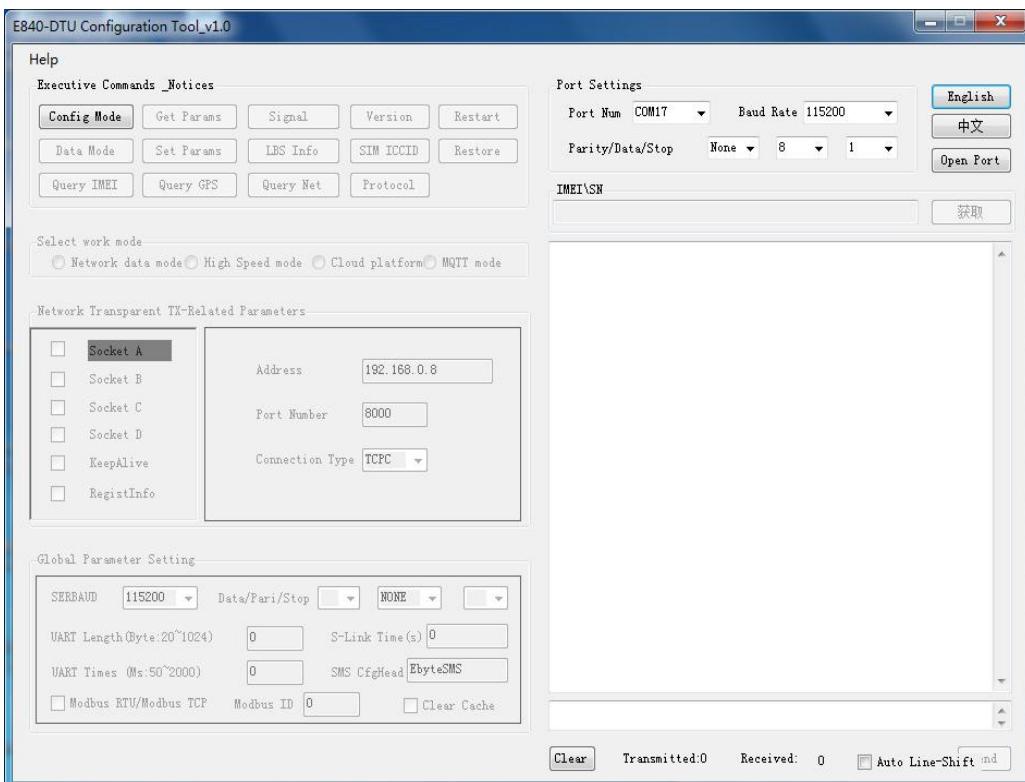
In summary, the E840-DTU(4G-02E) completes the remote transfer of files from the serial port to the network server.

4、SMS function

E840-DTU(4G-02E) can support SMS sending and receiving, SMS remote configuration function (inserted SIM card needs to support SMS service).

a) SMS sending: In AT mode, send AT+SMSSEND=number, data to complete the SMS sending, where number refers to the receiving number, and data refers to the data to be sent.

The demo is shown below:
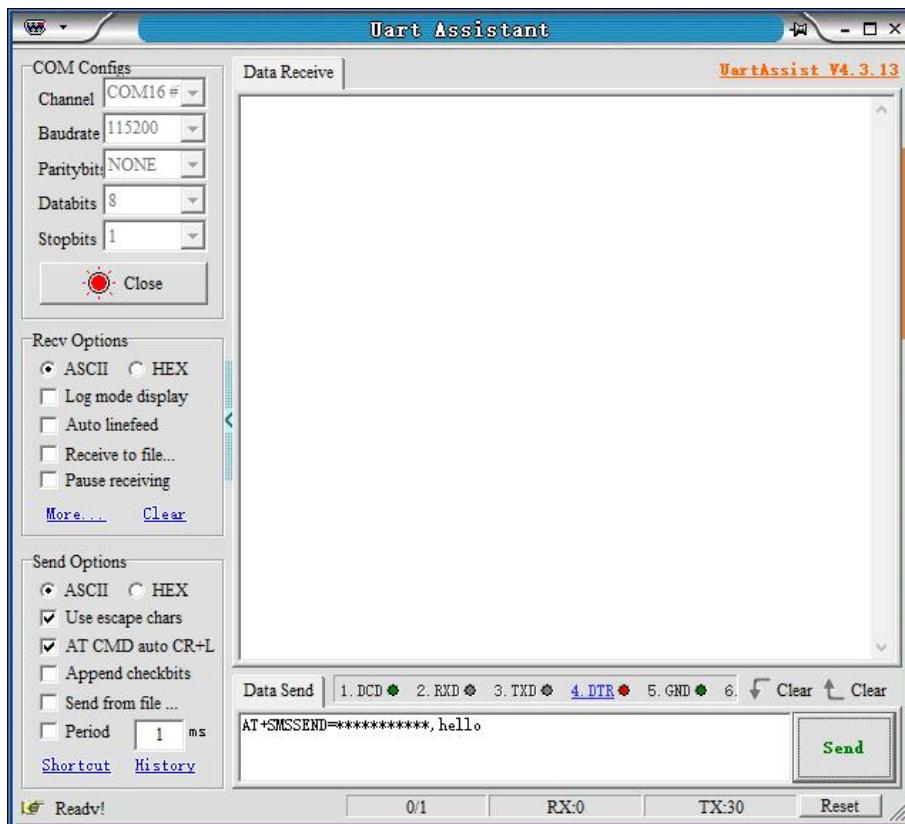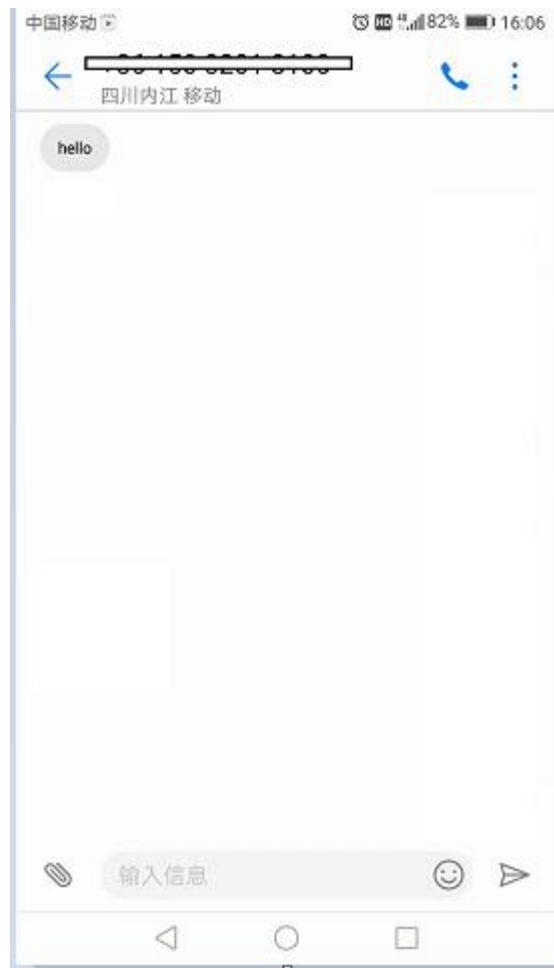
b) SMS receiving: The device can receive remote SMS content in transparent transmission mode. The format is as follows:

+SMS REC: number

Data, where number is the sender's mobile phone number and data is the received short message content;

c) SMS configuration/query: The device can support SMS remote configuration/inquiry parameters in transparent transmission mode. The format of the transmission format command is:

<Head>AT+CMD, where <Head> is the device SMS identifier. The factory default is: EbyteSMS, CMD is the corresponding command. Specifically, you can view the introduction of AT commands.

In this demonstration, remotely use the mobile phone to query the SOCK1 link information of the device:
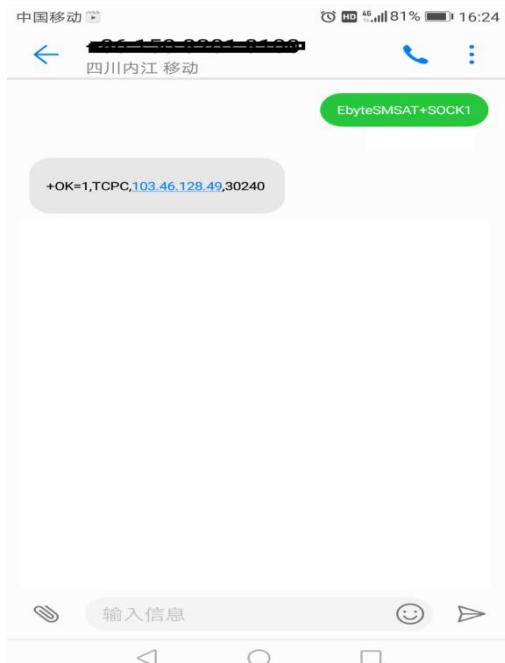
5、Modbus RTU and Modbus TCP are mutually converted;

E840-DTU(4G-02E) supports the mutual conversion between Modbus RTU and ModbusTCP. After the function is enabled, after receiving the data, the device will detect whether the data meets the Modbus RTU or ModbusTCP protocol. If it meets the requirement, the conversion function is enabled. Otherwise, it will output/send original data.

a) For example, the serial port receives the ModbusT RTU write-out command in the following format (hexadecimal):

01 06 00 01 00 01 19 CA (ModbusT RTU), when the conversion function is enabled, the data received by the server is: 00 00 00 00 00 06 01 06 00 01 00 01 (ModbusT TCP)

b) When the data received by the network is: 00 00 00 00 00 06 01 06 00 01 00 01 (ModbusT TCP), the serial port of the device will output the data : 01 06 00 01 00 01 19 CA (ModbusT RTU);

Note: In the Modbus TCP standard protocol, the transaction element identifier needs to be specified. In E840-DTU-(4G-02E), the user can configure the value through AT+MTCPID, and when the value is configured to 0, the receiving end All data conforming to the Modbus TCP protocol will be parsed, otherwise only packets with the same application packet identifier and device configuration identifier will be converted.

6、Base station positioning function;

The E840-DTU(4G-02E) supports the base station positioning function. The user can send the AT+LBS command in the AT mode to read the current LBS information of the device. The device returns the data format as follows:

+OK=LAC,xxxx;CID,xxxx, where LAC is the unique identification number of the global cell, CID is the base station number, (xxxx is the hexadecimal value);

The LAC and CID number can be used to query the current location information of the device. For the query method, refer to the link: http://www.gpsspg.com/bs.htm

7、Serial port packaging function;

The E840-DTU(4G-02E) serial port break time and packing length can be configured. The user can configure the frame break time and the package length through the AT+UARTTS command. Please refers to the AT command for the

specific configuration.

a) Frame break time: When the serial port receives data, it will continuously detect the interval between two bytes. If it is greater than the configuration time (50-2000ms), the device will automatically send the previously received data as a data packet to Network side;

b) Packing length: When the serial port receives data, it will continuously check the length of the currently received data. If the length of the configuration is exceeded (20~1024 bytes), the device will automatically send the previously received data as a data packet to Network side;

8、Enable Ebyte IoT platform function

The AT+EBTIOT command is used to set whether the module enables the transparent transmission function of the EBYTE cloud platform, after it is turned on, the information such as the heartbeat and registration packet configured by the user will be invalid. The user only needs to set the forwarding relationship of the corresponding device to the platform to implement the device. Data is transparent. For details of the related operations, please refer to the "Ebyte Cloud Platform Transparent Transmission Guide".

9、Network AT command

E840-DTU(4G-02E) supports the connection to the network, and the module works in transparent transmission mode, through the connected web page, remote query / configuration parameters,

the command format is:<Head>AT+CMD, where <Head> is the AT identifier of the device network.

The factory default is: EbyteNET, CMD is the corresponding command. Specifically, you can view the introduction of the AT command.

(*Note: For the wrong network AT command, unified reply + ERRER)This demo uses the query baud rate as an example:
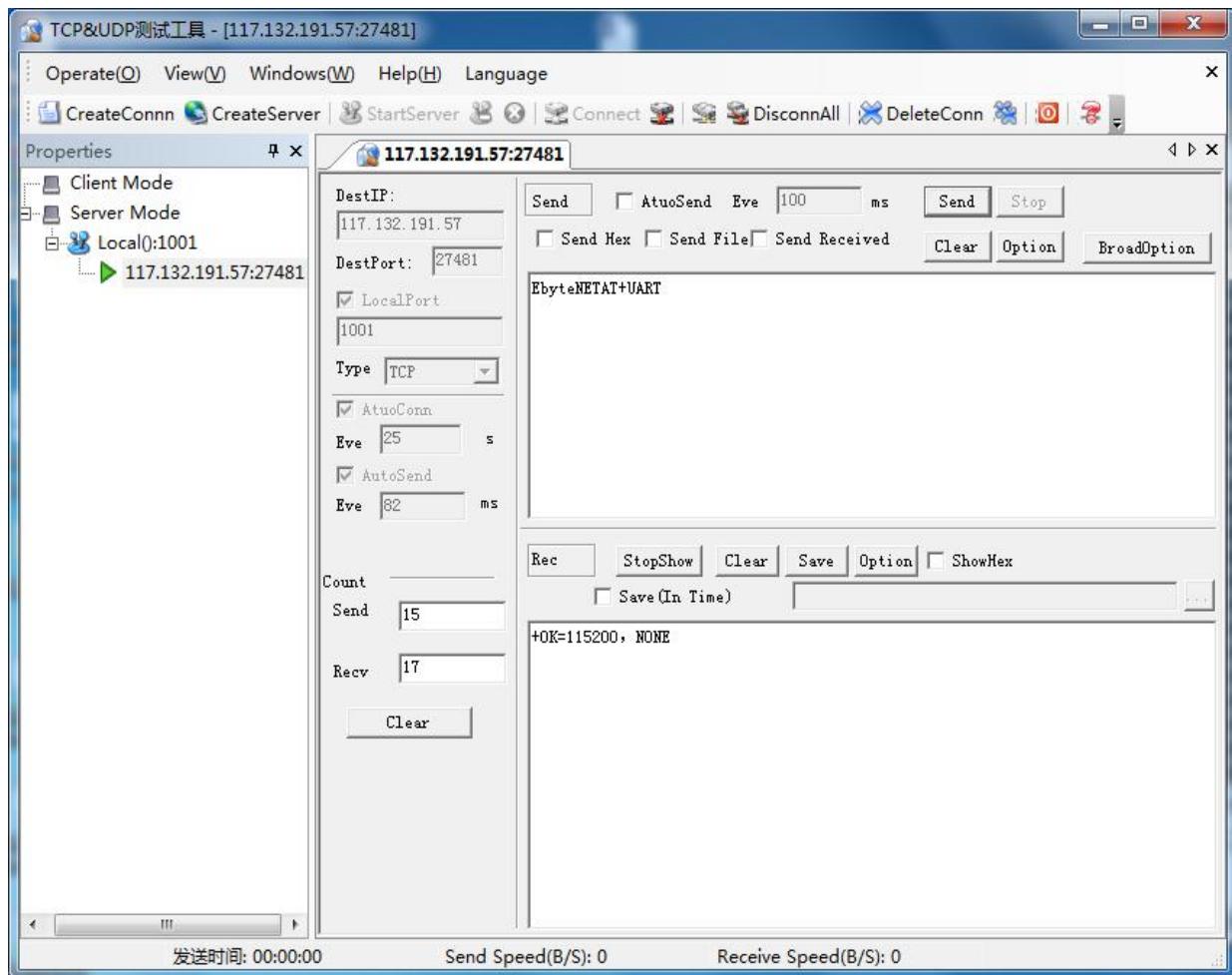
10、MQTT protocol

Support devices to access Alibaba Cloud, oneNET, Baidu Cloud, and all IoT platforms that support the standard MQTT protocol. For detailed access, please refer to the documentation of the access phase platform;

3. AT command

a)   Command format：

<div align="center">AT+<CMD>[op][para1, para2, para3,…]<CR><LF></div>

AT+：command front end

CMD：control command

[op]："=" indicates parameter configuration

　　"NULL"indicates parameters inquire

[para-n]：parameter list

<CR><LF>：CRLF，ASCII 0x0D 0x0A

b)   Command error code：

Error code	Description
-1	Invalid command format
-2	Invalid command
-3	Invalid operator
-4	Invalid parameter
-5	Operation prevented

c)   Commend set:

REBT	restart module
VER	inquire version No.
INFO	inquire device info.
EXAT	exit AT command mode
RESTORE	restore to factory configuration
UART	set/inquire UART parameter
UARTCLR	set/inquire if UART buffer is cleared before module is connected
IMEI	inquire IMEI
LINKSTA	inquire SOCK connection status
LINKSTA1	inquire SOCK1 connection status
LINKSTA2	inquire SOCK2 connection status
LINKSTA3	inquire SOCK3 connection status
SOCK	set/inquire SOCK parameter
SOCK1	set/inquire SOCK1 parameter
SOCK2	set/inquire SOCK2 parameter
SOCK3	set/inquire SOCK3 parameter
REGMOD	set/inquire register packet mode
REGINFO	set/inquire self-defined registration info.（ASCII）
REGINFONEW	set/inquire self-defined registration info (ASCII ,HEX）
HEARTMOD	set/inquire heartbeat packet mode
HEARTINFO	set/inquire self-defined heartbeat packet info.(ASCII）
HEARTINFONEW	set/inquire heartbeat packet info.（ASCII, HEX）
HEARTM	set/inquire heartbeat packet time

SHORTM	set/inquire short connection time
EBTIOT	set/inquire to enable Ebyte IoT Cloud Platform
CREG	Inquire if it is registered to network
CSQ	Inquire signal strength
CPIN	Inquire SIM card status
POTOCOL	set/inquire if protocol transmission mode starts
UARTEX	set/inquire serial port parameter(9600,8，N，1)
ICCID	Inquire SIM card's ICCID
HSPEED	set/inquire if high speed continuous transmission is opened
LBS	set/inquire base station information（base station positioning）
UARTTS	set/inquire serial port packing length and gap
SMSSEND	Send message
SMSINFO	set/inquire message setting identifier
MODBUS	set/inquire ModbusTCP/RTU switch function
MTCPID	set/inquire ModbusTCP event identifier
NETHEAD	set/inquire AT network head
MQTTMODE	set/inquire MQTT mode
MQTT_ADDRESS	set/inquire address and port of IOT
MQTT_CONNECT	set/inquire parameter connected to IOT
MQTT_SUBSCRIBE_TOPIC	set/inquire subscribed topic and level
MQTT_PUBLISH_TOPIC	set/inquire published topic and level
MQTT_ALIAUTH	set/inquire Ali cloud three factor

d) Command Description：

AT+REBT

Function： Restart module

Format： configure

Transmit：AT+REBT<CR>

return：<CR><LF>+OK<CR><LF>

Parameter：None

Description：After the command is executed correctly, the module restarts immediately and enters the transparent transmission mode after restarting.

AT+VER

Function： inquire firmware version

Format： configure

transmit AT+VER<CR><LF>

return <CR><LF>+OK=<ver><CR><LF>

Parameter：ver firmware version

Description：None

AT+INFO

Function： Inquire module type and version info.

Format： configure

transmit AT+INFO<CR><LF>

return <CR><LF>+OK=<mod_name>,<hw_ver>,<sw_ver><CR><LF>

Parameter： mod_name   module name

hw_ver   hardware version

sw_ver   software version

Description：None

AT+EXAT

Function： exit command mode，enter transparent transmission mode

Format： configure

transmit AT+EXAT<CR><LF>
return <CR><LF>+OK<CR><LF>

Parameter：None

Description: After the command is executed correctly, the module is switched from command mode to the transparent transmission mode.

AT+RESTORE

Function： restore factory configuration

Format： configure

transmit AT+RESTORE<CR><LF>
return <CR><LF>+OK<CR><LF>

Parameter：None

Description：None

AT+UART

Function： set/inquire UART parameters

Format： inquire

transmit：AT+UART<CR>

return：<CR><LF>+OK=<baudrate>,< parity ><CR><LF>

configure

transmit：AT+UART=<baudrate>,< parity ><CR><LF>

return：<CR><LF>+OK<CR><LF>

Parameter： baudrate   baud rate 1200~921600bps，self-defined
        Parity   Parity   NON E None
                            EVEN
                                ODD

description：none

AT+UARTCLR

Function： Set/inquire whether to clear the serial port cache before connecting the module.

Format： Inquire

transmit：AT+ UARTCLR <CR>

return：<CR><LF>+OK=< sta ><CR><LF>

configure

transmit：AT+ UARTCLR =< sta ><CR>

return：<CR><LF>+OK<CR><LF>

Parameter： sta status
        ON   Clear the serial port cache before connecting.
        OFF Do not clear the serial port cache before connecting.

AT+IMEI

Function： inquire the IMEI of module

Format： inquire

transmit：AT+IMEI<CR>

return：<CR><LF>+OK=<imei><CR><LF>

parameter： imei   IMEI of module

AT+LINKSTA

Function： inquire whether TCP connection is established

Format： inquire

     transmit：AT+LINKSTA<CR>

     return：<CR><LF>+OK=<sta><CR><LF>

Parameter：   Sta   whether establish TCP connection，Connect(TCP connection)/ Disconnect(TCP cut off)

AT+LINKSTA1

Function： inquire TCP whether TCP connection is established

Format： inquire

     transmit：AT+LINKSTA1<CR>

     return：<CR><LF>+OK=<sta><CR><LF>

Parameter：   Sta   whether establish TCP connection，Connect(TCP connection)/ Disconnect(TCP cut off)

AT+LINKSTA2

Function： inquire whether TCP connection is established

Format： inquire

     transmit：AT+LINKSTA2<CR>

     return：<CR><LF>+OK=<sta><CR><LF>

Parameter：   Sta   whether establish TCP connection，Connect(TCP connection)/ Disconnect(TCP cut off)

AT+LINKSTA3

Function： inquire whether TCP connection is established

Format： inquire

     transmit：AT+LINKSTA3<CR>

     return：<CR><LF>+OK=<sta><CR><LF>

Parameter：   Sta   whether establish TCP connection，Connect(TCP connection)/ Disconnect(TCP cut off)

AT+SOCK

Function：   Set/query the network protocol parameter format.

Format：   inquire

     transmit：AT+SOCK<CR>

     return：<CR><LF>+OK=<protocol>,<ip>,< port ><CR><LF>

configure

     transmit：AT+SOCK=<protocol>,<ip>,< port ><CR>

     return：<CR><LF>+OK<CR><LF>

Parameter：   protocol   protocol type，TCPC / UDPC

     TCPC   corresponding TCP client
     UDPC   corresponding UDP client

Ip   The IP address or domain name of the target server when the module is set to "CLIENT"

Port   The port number of the server, in decimal, less than 65535.

AT+SOCK1

Function：   Set/query the network protocol parameter format.

Format：   inquire

     transmit：AT+SOCK1<CR>

     return：<CR><LF>+OK=<EN>,<protocol>,<ip>,< port ><CR><LF>

configure

     transmit：AT+SOCK1=<EN>,<protocol>,<ip>,< port ><CR>

     return：<CR><LF>+OK<CR><LF>

Parameter：   EN enable 0：turn off SOCK1

1：turn on SOCK1

protocol type， TCPC / UDPC

TCPC   corresponding TCP client

UDPC   corresponding UDP client

Ip   The IP address or domain name of the target server when the module is set to "CLIENT"

Port   The port number of the server, in decimal, less than 65535.

AT+SOCK2

Function： Set/query the network protocol parameter format.

Format： inquire

transmit：AT+SOCK2<CR>

return：<CR><LF>+OK=<EN>,<protocol>,<ip>,< port ><CR><LF>

configure

transmi：AT+SOCK2=<EN>,<protocol>,<ip>,< port ><CR>

return：<CR><LF>+OK<CR><LF>

Parameter： EN enable 0：turn off SOCK2

1：turn on SOCK2

protocol type， TCPC / UDPC

TCPC   corresponding TCP client

UDPC   corresponding UDP client

Ip   The IP address or domain name of the target server when the module is set to "CLIENT"

Port   The port number of the server, in decimal, less than 65535.

AT+SOCK3

Function： Set/query the network protocol parameter format.

Format： inquire

transmit：AT+SOCK3<CR>

return：<CR><LF>+OK=<EN>,<protocol>,<ip>,< port ><CR><LF>

configure

transmit：AT+SOCK3=<EN>,<protocol>,<ip>,< port ><CR>

return：<CR><LF>+OK<CR><LF>

Parameter： EN enable 0：turn off SOCK3

1：turn on SOCK3

protocol type， TCPC / UDPC

TCPC   corresponding TCP client

UDPC   corresponding UDP client

Ip   The IP address or domain name of the target server when the module is set to "CLIENT"

Port   The port number of the server, in decimal, less than 65535.

AT+REGMOD

Function： Set the query registration package mechanism.

Format： inquire

transmit：AT+REGMOD<CR>

return：<CR><LF>+OK=<status><CR><LF>

configure

transmit：AT+REGMOD =<status><CR>

return：<CR><LF>+OK<CR><LF>

Parameter：statusregistration package mechanism.

EMBMAC   adds MAC/IMEI as registration packet data before each packet sent to the server.

EMBCSTM   adds custom registration package data before each packet is sent to the server.

OLMAC   sends a MAC/IMEI registration packet only when it is first linked to the server.

OLCSTM   sends a user-defined registration package only the first time it is linked to the server.

OFF   Disables the registration of the packet mechanism.

AT+REGINFO

Function   Set the contents of the query custom registration package

Format: Query

transmit：AT+ REGINFO <CR>

return：<CR><LF>+OK=<data><CR><LF>

configure

transmit：AT+ REGINFO =<data><CR>

return：<CR><LF>+OK<CR><LF>

Parameter：data ASCII in 40 bytes

AT+REGINFONEW

Function：   set inquire self-defined registration package content

Format：   inquire

transmit：AT+ REGINFONEW<CR>

return：<CR><LF>+OK=<type>,<data><CR><LF>

configure

transmit：AT+ REGINFONEW =<type>,<data><CR>

return：<CR><LF>+OK<CR><LF>

Parameter：type

0 Registration package type is HEX

1 Registration package type is ASCII code

data

ASCII code within 40 bytes, when the registration packet type is HEX, the content must be in the legal HEX format and the length must be an even number.

AT+HEARTMOD

Function：   set/inquire heartbeat mode

Format：   inquire

transmit：AT+ HEARTMOD<CR>

return：<CR><LF>+OK=<mode><CR><LF>

configure

transmit：AT+ HEARTMOD=<mode><CR>

return：<CR><LF>+OK<CR><LF>

parameter：mode

NET Network heartbeat package

UART UART heartbeat package

AT+HEARTINFO

Function：   Set/inquire heartbeat package data

Format：   inquire

transmit：AT+ HEARTINFO<CR>

return：<CR><LF>+OK=<data><CR><LF>

configure

transmit：AT+ HEARTINFO=<data><CR>

return：<CR><LF>+OK<CR><LF>

Parameters: ASCII heartbeat packet data within 40 bytes of data.

AT+HEARTINFONEW

Function：   configure/inquire heartbeat packet data

Format：   inquire

transmit：AT+ HEARTINFONEW<CR>

return：<CR><LF>+OK=<type>,<data><CR><LF>

configure

transmit：AT+ HEARTINFO=<type>,<data><CR>

return：<CR><LF>+OK<CR><LF>

parameter：type

0 Heartbeat package type is HEX

1 Heartbeat type is ASCII code

data

ASCII code within 40 bytes, when the heartbeat packet type is HEX, the content must be a legal HEX format and the length must be an even number.

AT+HEARTM

Function：   configure/inquire heartbeat package time

Format：   inquire

transmit：AT+ HEARTM <CR>

return：<CR><LF>+OK=<time><CR><LF>

configure

transmit：AT+ HEARTM =<time><CR>

return：<CR><LF>+OK<CR><LF>

Parameters: time heartbeat time, 0 off, range 1 to 65535 seconds.

AT+SHORTM

Function：   set/inquire short connection time

Format：   inquire

transmit：AT+ SHORTM<CR>

return：<CR><LF>+OK=<time><CR><LF>

configure

transmit：AT+ SHORTM=<time><CR>

return：<CR><LF>+OK<CR><LF>

parameter：time short connection time，0 off，from 2-255 second

AT+EBTIOT

Function：   set /inquire EBYTE IoT Cloud platform

Format：   inquire

transmit：AT+EBTIOT <CR>

return：<CR><LF>+OK=<ctrl><CR><LF>

configure

transmit：AT+EBTIOT =<ctrl><CR>

return：<CR><LF>+OK<CR><LF>

parameter：   ctrl   EBYTE IoT function switch，0 off/1 on

Note: After the IoT cloud function is enabled, the module is automatically connected to the Yiyi special IoT platform, ignoring the sock configuration, registration package, and heartbeat package function.**AT+CSQ**

Function：   inquire signal strength

Format：   configure

transmit AT+CSQ<CR><LF>

return <CR><LF>+OK=<csq><CR><LF>

parameter：   csq   signal strength

description：none

AT+CREG

Function：   inquire whether it is registered with the carrier.

Format：   configure

transmit AT+CREG<CR><LF>
return <CR><LF>+OK=<creg><CR><LF>

Parameter： creg

1   Register to the network
0   not registered to the network1

Description： None

AT+CPIN

Function： inquire SIM card status

Format： configure

transmit AT+CPIN<CR><LF>
return <CR><LF>+OK=<cpin><CR><LF>

Parameter： cpin

1   Able to detect SIM card
0   unable to detect SIM card

Description： None

AT+ POTOCOL

Function： Set/inquire Whether to enable protocol transmission (valid under 4G multi socket)

Format： inquire

transmit：AT+ POTOCOL <CR>

return：<CR><LF>+OK=<sta><CR><LF>

configure

transmit：AT+ POTOCOL =<data><CR>

return：<CR><LF>+OK<CR><LF>

Parameters: data status
ON   Turns on the transmission of the EBYTE protocol
OFF   Turns off the he transmission of the EBYTE protocol

AT+ UARTEX（extending command）

function： Set/inquire serial port parameter（AT+UART is for configuring baud rate and parity only）

format： inquire

transmit：AT+ UARTEX <CR>

return：<CR><LF>+OK=<sta><CR><LF>

configure

transmit：AT+ UARTEX =<baud>,<data bit>,< parity>,<stop><CR>

return：<CR><LF>+OK<CR><LF>

parameter： baud: UART baud can be configured as levels below：

9600,
19200,
38400,
57600,
115200,
230400,
460800,
921600,

data bit：UART data bit

8，length is 8 bits

7，length is 7 bits

Parity：UART parity

N，None
O，Odd
E，Even

stop：UART stop bit

1，1 bit

2，2 bits

AT+ ICCID

Function：inquire SIM card ID

Format：　　　inquire

　　　　　transmit：AT+ **ICCID** <CR>

　　　　　return：<CR><LF>+OK=<number><CR><LF>

Parameter：　　number：

　　The present ICCID of SIM card

AT+ LBS

Function：inquire the service info. based on location

Format：　　　inquire

　　　　　transmit：AT+ **LBS** <CR>

　　　　　return：<CR><LF>+OK=LAC:<lac>,CID:<cid><CR><LF>

Parameter：　　lac：

　　　base station location code for present device

　　cid:

　　　　　Base station id

AT+ HSPEED

Function：　　configure/inquire if high speed mode is enabled

Format：　　　configure

　　　　　transmit：AT+ HSPEED=<state> <CR>

　　　　　return：<CR><LF>+OK<CR><LF>

　　　Inquire

　　　　　transmit：AT+ HSPEED <CR>

　　　　　return：<CR><LF>+OK=<state> <CR><LF>

Parameter：　state

　　ON　high speed enabled

　　OFF　high speed disabled

AT+ UARTTS

Function：　　configure/inquire serial port packaging and break frame mechanism

Format：　　　configure

　　　　　transmit：AT+ UARTTS =<time>,<length> <CR>

　　　　　return：<CR><LF>+OK<CR><LF>

　　　inquire

　　　　　transmit：AT+ UARTTS <CR>

　　　　　return：<CR><LF>+OK=<time>,<length> <CR>

Parameter：

　　time

　　Serial port break frame packaging time：（50~2000）ms

　　Length

　　　Serial port packaging length：（20~1024）bytes

AT+ SMSSEND

Function：　　transmit SMS command

Format：　　　transmit

　　　　　transmit：AT+ SMSSEND =<number>,<info> <CR>

return：<CR><LF>+OK<CR><LF>

Parameter：

    Number :receiver's phone number

    info: transmitted content（English or number）

AT+ SMSINFO

Function：   configure/inquire SMS configuration identifier ID

Format：   transmit

    transmit：AT+ SMSINFO =<Info> <CR>

    return：<CR><LF>+OK<CR><LF>

    Inquire

    transmit：AT+ SMSINFO <CR>

    return：<CR><LF>+OK=<info> <CR>

Parameter：

Info :remote SMS configuration identifier ID

AT+MODBUS

Function：   configure/ inquire if Modbus RTU/TCP switch function is enabled

Format：   configure

    transmit：AT+ **MODBUS** =<state> <CR>

    return：<CR><LF>+OK<CR><LF>

    inquire

    transmit：AT+ **MODBUS** <CR>

    return：<CR><LF>+OK=<state> <CR><LF>

Parameter： state

    ON   Modbus RTU/TCP switch is on

    OFF Modbus RTU/TCP switch is off

AT+MTCPID

Function：   configure/ inquire Modbus RTU/TCP event identifier

Format：   configure

    transmit：AT+ MTCPID =<id> <CR>

    return：<CR><LF>+OK<CR><LF>

    inquire

    transmit：AT+ MTCPID <CR>

    return：<CR><LF>+OK=<id> <CR><LF>

Parameter： id （0~65535 ）2 bytes

    Remark：when ID is 0，any modbusTCP received will switch to corresponding RTU protocol，otherwise, only when id is matched can it switch

AT+NETHEAD

Function: Set / query network AT command header

Format: Configuration

    Send: AT+ NETHEAD =<value> <CR>

    Returns: <CR><LF>+OK<CR><LF>

  Inquire

    Send: AT+ NETHEAD <CR>

    Returns: <CR><LF>+OK=<value><CR><LF>

Parameters: value, set / query network AT command header

Remarks: The network AT identifier can be up to 19 characters long.

AT+MQTTMODE

Function: Set / query MQTT mode

　　Format: Configuration

Send: AT+ MQTTMODE =<mode> <CR>

Returns: <CR><LF>+OK<CR><LF>

　　　　Inquire

Send: AT+ NETHEAD <CR>

Returns: <CR><LF>+OK=<value><CR><LF>

Parameters: mode, MQTT mode

　　Remarks: The value of mode is as follows:

0, MQTT mode is off;

1, Alibaba Cloud platform;

2, oneNET platform;

3, Baidu cloud platform, and other IoT platforms supporting the standard MQTT protocol;

AT+MQTT_ADDRESS

Function: set / query MQTT platform address, port

　　Format: Configuration

Send: AT+ MQTT_ADDRESS =<addr><port> <CR>

Returns: <CR><LF>+OK<CR><LF>

　　Inquire

Send: AT+ MQTT_ADDRESS<CR>

Returns: <CR><LF>+OK=<addr><port><CR><LF>

Parameters: addr platform address

Port platform port

AT+MQTT_CONNECT

Function: Set/query the necessary parameters for accessing the MQTT platform. You do not need to complete this configuration when using Alibaba Cloud, but you need

Use AT+ MQTT_ALIAUTH to complete the configuration of the three elements

　　Format: Configuration

Send: AT+ MQTT_CONNECT =<value0><value1><value2> <CR>

Returns: <CR><LF>+OK<CR><LF>

　　　　Inquire

Send: AT+ MQTT_CONNECT<CR>

Returns: <CR><LF>+OK=<value0><value1><value2><CR><LF>

Parameter: <value0> When the MQTT mode is set to 2, access to oneNET, value0 is the device ID; when the MQTT mode is set to 3,

That is, access Baidu cloud or other platforms that support the standard MQTT protocol, value0 is the device name.

<value1> When the MQTT mode is set to 2, that is, access to oneNET, value1 is the product ID; when the MQTT mode is set to 3,

That is to access Baidu cloud or other platforms that support the standard MQTT protocol, value1 is the username

<value2> When the MQTT mode is set to 2, access to oneNET, value2 is authentication information; when the MQTT mode is set to 3,

That is to access Baidu cloud or other platforms that support the standard MQTT protocol, value2 is the password.

AT+MQTT_SUBSCRIBE_TOPIC

Function: set / query MQTT platform address, port

　　Format: Configuration

Send: AT+ MQTT_SUBSCRIBE_TOPIC =<topicName><qos> <CR>

Returns: <CR><LF>+OK<CR><LF>

　　　　Inquire

Send: AT+ MQTT_SUBSCRIBE_TOPIC<CR>

Returns: <CR><LF>+OK=<topicName><qos><CR><LF>

Parameters: the subject name of the topicName subscription

The level of the message read by qos, the value of qos can be taken, 0, 1, 2

AT+MQTT_PUBLISH_TOPIC

Function: set / query MQTT platform address, port

　　Format: Configuration

Send: AT+ MQTT_PUBLISH_TOPIC =<topicName><qos> <CR>

Returns: <CR><LF>+OK<CR><LF>

　　　　Inquire

Send: AT+ MQTT_PUBLISH_TOPIC<CR>

Returns: <CR><LF>+OK=<topicName><qos><CR><LF>

Parameters: the subject name of the message published by topicName

The level of the message read by qos, the value of qos can only take 0

AT+MQTT_ALIAUTH

Function: Set/query the three elements of Alibaba Cloud platform. When MQTT mode is set to 1, it needs to be configured when accessing Alibaba Cloud.

　　Format: Configuration

Send: AT+ MQTT_ALIAUTH =<value0><value1><value2> <CR>

Returns: <CR><LF>+OK<CR><LF>

　　　　Inquire

Send: AT+ MQTT_ALIAUTH<CR>

Returns: <CR><LF>+OK=<value0><value1><value2><CR><LF>

Parameters: <value0> product key

<value1>device name

<value2> device key

4 .Notes

- The first Socket of this module will always be opened. After the initialization is successful, it will automatically establish a connection with the configured network server.

- After the module is powered on, it cannot be initialized successfully. That is, the State indicator has no indication for more than 30 seconds. In this case, check whether the module is installed properly, whether the SIM card is properly inserted, and whether the SIM has failed.

- Short connection function can be used to reduce the connection pressure of multiple devices to the server. When the short connection function is enabled (AT+SHORTM>2), the module will actively disconnect the connection when the network or serial port has no data for more than the short connection setting period. After the disconnection, the network cannot send data and the local serial port sends. For valid data, the module will immediately establish a connection with the server. If the local clear cache function is turned off, the packet will be cached (maximum 10K bytes). After the connection is successful, the data will be sent to the server. The local cache function is cleared and the packet will be discarded.

- The heartbeat function is used to maintain the connection after the module and the server are successfully connected. In the network, if the client and the network server successfully establish a connection and there is no data transmission for a long time, the Socket link may appear "dead", that is, the chain. The road exists but cannot send and receive data. Therefore, in actual use, it is recommended to enable the heartbeat packet function to ensure the reliability of the network link.

- In actual use, it is normal for the data delay of the two communications to be different.

- After the protocol is closed, the maximum single packet length supported by a single link is 10K bytes. A local serial port or a network sending a packet exceeding this length may cause packet abnormality. The distribution protocol is enabled. Each Socket is enabled. The link single packet can support up to 1024 bytes (user-configured serial port packing length).

- In the high-speed serial transmission mode, the EMBMAC and EMBCSTM registration package functions cannot be enabled, and in the high-speed mode, the short message transmission and reception function is not supported. Only the first Socket effective link is valid, and the protocol distribution data is not supported.

- After the EBYTE cloud transparent transmission function is enabled, the high-speed mode is invalid.

- When the device serial port outputs the words "pdp error, device will be reset!", it indicates that the PDP context is disabled by the network. The SIM card may be loose or the current network channel is occupied abnormally.

- The SMS function needs to insert the SIM card to support the SMS service. The IoT card cannot send and receive SMS messages. When the device sends a text message, the device responds with OK only to indicate that the module has sent the SMS, which does not mean that the device has received the SMS.

- After modifying the serial port break time, the AT command must be configured according to the frame break time. For example, after setting the parameter to 2000ms, you need to configure the device parameters after power-on. You need to send '+++'. , Send a valid AT command within the period of more than 2000ms and less than 3000ms to enter the AT mode normally

5. Important Statement

- All rights to interpret and modify this manual belong to Ebyte.
- This manual will be updated based on the upgrade of firmware and hardware, please refer to the latest version.
- Please refer to our website for new product information.

6. Reversion History

Version	Edit date	Description	Issued by
1.0	2019/04/12	Initial version	--
1.1	2019/8/8	Format modification	Lyl
1.2	2020/05/22	Content added	du

7. About Us

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