

F2X46-D IP Modem User Manual	Document Version	Confidential
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	Product Name: F2X46-D	Total: 31

## F2X46-D IP Modem User Manual

The user manual is suitable for the following model:

Model	Product Type
F2446-D	WCDMA IP MODEM
F2646-D	EVDO IP MODEM
F2746-D	TDD-LTE IP MODEM
F2846-D	FDD-LTE IP MODEM
F2A46-D	LTE IP Modem

Note: "-D" means use in power industry



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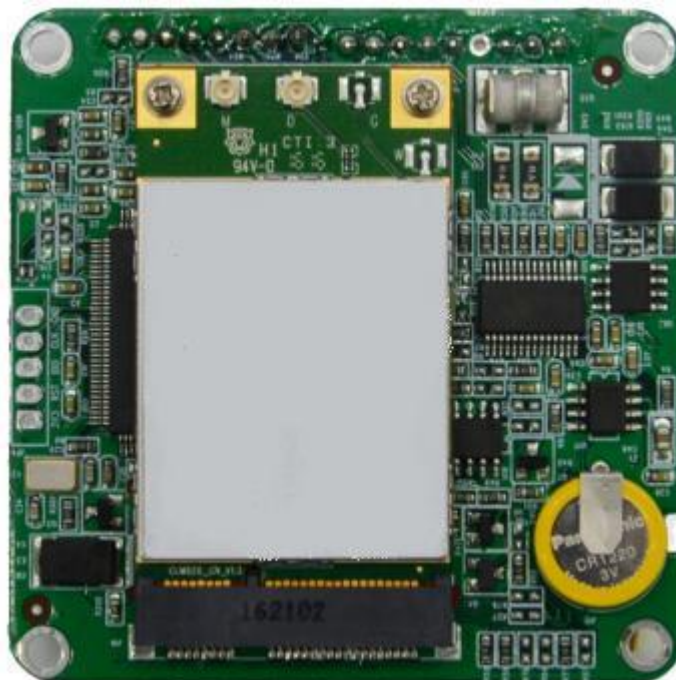
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## Product appearance



TOP



BOTTOM

Note: Different types of accessories and interfaces may be different, please refer to the actual product.

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# Chapter1 Introduction of Product

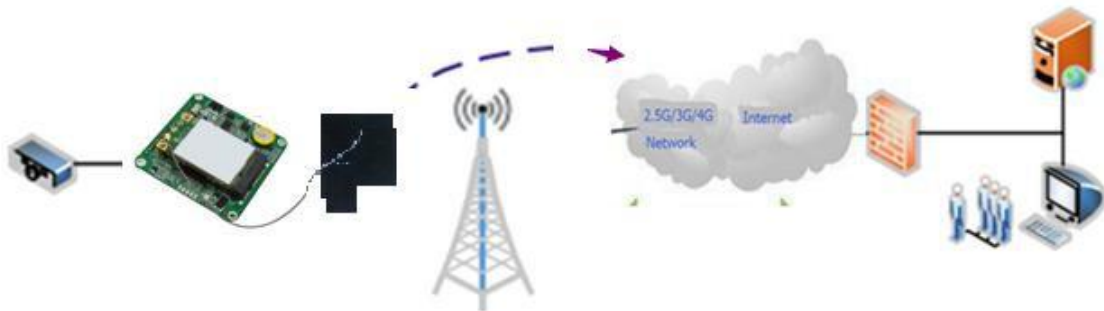
## 1.1 General

F2X46-D IP Modem is a kind of cellular terminal device that provides data transfer function by WCDMA/EVDO/TDD-LTE/FDD-LTE network.

It adopts high-powered industrial 32 bits CPU and embedded real time operating system, it is dual serial port design, supports RS232 or RS485 port (Optional) that can conveniently and transparently connect one device to a cellular network, allowing you to connect to your existing serial devices with only basic configuration. It also has low power consumption states.

It has been widely used on M2M fields, such as intelligent substation, intelligent distribution network, smart electricity meters, intelligent interactive terminal, intelligent scheduling, intelligent home appliances, intelligent electricity building, power grids for smart cities, intelligent power generation system, smart grids (Such as new energy storage systems)and so on.

### Application system topology



## 1.2 Features

### Design for Industrial Application

- ◆ High-powered industrial cellular module
- ◆ High-powered industrial 32 bits CPU
- ◆ Low power consumption design, to reduce the power dissipation in the most way
- ◆ Embedded Real Time Clock(RTC)
- ◆ Power range: (DC 5~36V)
- ◆ Operating temperature: -40~75℃

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### **Stability and Reliability**

- ◆ Support hardware and software WDT
- ◆ Support auto recovery mechanism, including online detect, auto redial when offline to make it always online
- ◆ RS232/RS485 ports:15KV ESD protection and surge protection
- ◆ SIM/UIM port: 15KV ESD protection
- ◆ Power port: reverse-voltage and overvoltage protection
- ◆ Few connectors, with good seismic performance

### **Standard and Convenience**

- ◆ Support standard RS232/RS485 ports (Optional) that can connect to serial devices directly
- ◆ Support intellectual mode, enter into communication state automatically when power is on
- ◆ Provide powerful central management software to facilitate the management of equipment (optional)
- ◆ Support a variety of working modes which make it easy and flexible to use
- ◆ Convenient configuration and maintenance interface
- ◆ Support serial update, remote maintenance, can export the serial log
- ◆ Easy installation, fast fixing, conveniently and quickly

### **High-performance**

- ◆ Support TCP server and support 4 TCP client connection (optional)
- ◆ Support protocol conversion between ModBus and RTU/TCP (optional)
- ◆ Support dual data center backup transmission and multiple data center synchronous transmission (5 data centers)
- ◆ Support multi data centers and it can support 1-5 data centers at the same time
- ◆ Support protocol conversion between 101 and 104 (optional)
- ◆ Support standard TCP/UDP protocol, support data transfer transparently
- ◆ Support login security authentication
- ◆ Multiple indicator lights that can indicate a variety of system states
- ◆ Support read device status in real-time by serial ports, such as IMEI, SIM card status, IP address, signal value and so on
- ◆ Support dual SIM cards



## 1.3 Product Specification

### Wireless parameters

Item	Content
<b>F2446-D WCDMA IP MODEM</b>	
Standard and Band	UMTS/WCDMA/HSDPA/ HSUPA/HSPA+ 850/1900/2100MHz 850/900/1900/2100MHz (Optional) GSM850/900/1800/1900MHz GPRS/EDGE CLASS 12
Bandwidth	HSUPA:5.76Mbps(Upload speed ) HSDPA:7.2Mbps(Download speed ) UMTS: 384Kbps(Download speed / Upload speed) HSPA+:21Mbps ( Download speed ) 5.76Mbps( Upload speed )
TX power	<24dBm
RX sensitivity	<-109dBm
<b>F2646-D EVDO IP MODEM</b>	
Standard and Band	CDMA2000 1X EVDO Rev A 800MHz 800/1900MHz (Optional), 450MHz IS-95 A/B and CDMA2000 1xRTT wireless network
Bandwidth	Download speed 3.1Mbps, Upload speed 1.8Mbps, EVDO Rev. B (Optional):Download speed 14.7Mbps, Upload speed 5.4Mbps
TX power	<23dBm
RX sensitivity	<-104dBm
<b>F2746-D TDD-LTE IP MODEM</b>	
Standard and Band	TDD-LTE 2600/1900/2300MHz ( Band 38/39/40 ) 800/1400/1800MHz ( Band 27/61/62 ) (Optional) TD-SCDMA 2010/1900MHz ( A/F Band : 34/39 ) GSM/GPRS/EDGE 900/1800/1900MHz
Bandwidth	TDD-LTE(Download speed 61Mbps, Upload speed 18Mbps) TD-SCDMA :2.2Mbps(Upload speed)/2.8Mbps(Download speed)
TX power	<23dBm
RX sensitivity	<-97dBm
<b>F2846-D FDD-LTE IP MODEM</b>	
Standard and Band	FDD-LTE 2600/2100/1800/900/800MHz ( Band1/3/7/8/20 ) 700/850/1700/1900/2100MHz (Band 2/4/5/13/17/25) (Optional) DC-HSPA+/HSPA+/HSDPA/HSUPA/WCDMA/UMTS 2100/1900/900/850/800MHz(Band 1/2/5/6/8 ) EDGE/GPRS/GSM 850/900/1800/1900MHz

Bandwidth	FDD-LTE(Download speed 100Mbps, Upload speed 50Mbps) HSUPA:5.76Mbps(Upload speed)/ HSDPA:7.2Mbps(Download speed) UMTS:384Kbps (Download speed/Upload speed) HSPA+: 42Mbps Download speed) 5.76Mbps(Upload speed)
TX power	<23dBm
RX sensitivity	<-93.3dBm
<b>F2A46-D LTE IP MODEM</b>	
Standard and Band	TDD-LTE、FDD-LTE、EVDO、WCDMA、TD-SCDMA、 CDMA1X、GPRS/EDGE
Bandwidth	FDD-LTE(Download speed 100Mbps, Upload speed 50Mbps) TDD-LTE(Download speed 61Mbps, Upload speed 18Mbps) CDMA2000 1X EVDO Rev A (Download speed 3.1Mbps, Upload speed 1.8Mbps) WCDMA(Download speed 42Mbps, Upload speed 5.76Mbps) TD-SCDMA(Download speed 4.2Mbps, Upload speed 2.2Mbps)
TX power	<23dBm
RX sensitivity	<-93.3dBm

#### Interface type

Item	Content
SDI	Num.of ports: 2 Port 1: RS232 Port 2: RS232 (Standard) / RS485 (Optional) Serial port type : 5 pin 2.54mm pitch ; Single row of female header +3 pin 2.54mm pitch; Single row of female header Stop bits: 1、2 Parity: none, even, odd, Baud rate: 300~115200bps
Antenna	IPEX connector, 50 ohm
SIM/UIM	2 pcs of standard clamshell socket interface, support 1.8V/3V SIM/UIM card, 15KV ESD protection
Indicator	Power、SIM card、Operation、network state

#### Power supply

Item	Content
Standard power	DC 12V/0.5A
Power range	DC 5~36V

#### Consumption

Item	Content	
Communication	120mA@12VDC	255mA@5VDC
Standby	41 mA@12VDC	85 mA@5VDC
Sleeping mode	3mA@12VDC	6mA@5VDC

**Physical Characteristics**

Item	Content
Installation	Embedded
Dimension	65x65x18.6mm
weight	About 40g

**Other parameters**

Item	Content
Working temperature	-40~+75°C (-40~+167°F)
Storage temperature	-40~+85°C (-40~+185°F)
relative humidity	95% (( unfreezing)

# Chapter 2 Installation

## 2.1 General

F2X46-D must be installed correctly to make it work properly. Normally, the installation of the equipment must be conducted under the guidance of qualified engineers approved by the company.

➤ *Warning:*

*Forbid to install the IP MODEM when powered!*

## 2.2 Encasement List

For transport safely, proper packaging IP MODEM is usually required. Please take good care of the packing materials when you unpack, so that they can be used for future transportation.

**IP MODEM include below components:**

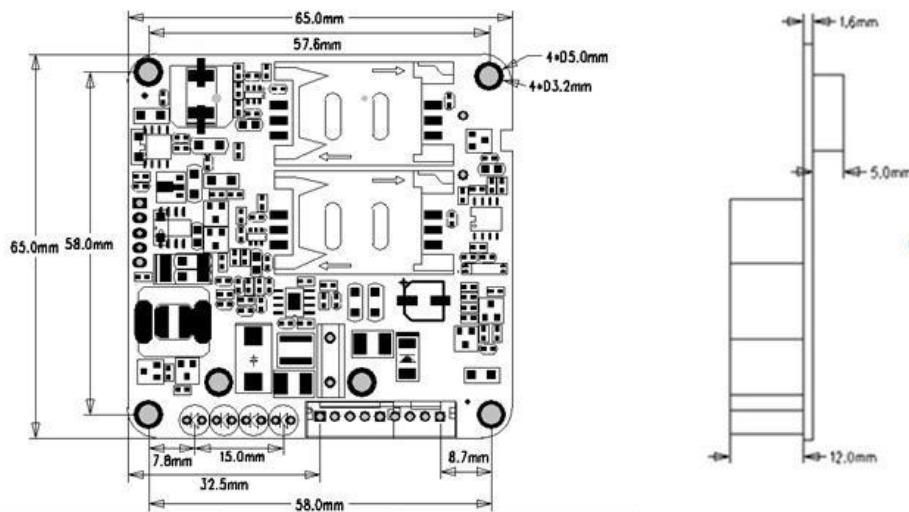
- ✧ IP MODEM host : 1 pcs(According to customer's order)
- ✧ User manual:1 pcs
- ✧ PCB antenna:1 pcs
- ✧ 11CM connection line, one end is connected to DB9M, and one end is 2.54mm pitch, 5PIN , with public row seat: 1 pcs (Standard)

Note:The antenna may have been assembled to the host during packaging, please check it !

## 2.3 Installation and Cable Connection

IP MODEM mainboard has 4 mounting holes with the diameter of 3.2mm, which are easy to fix to the user's equipment

Product size (Unit: mm)



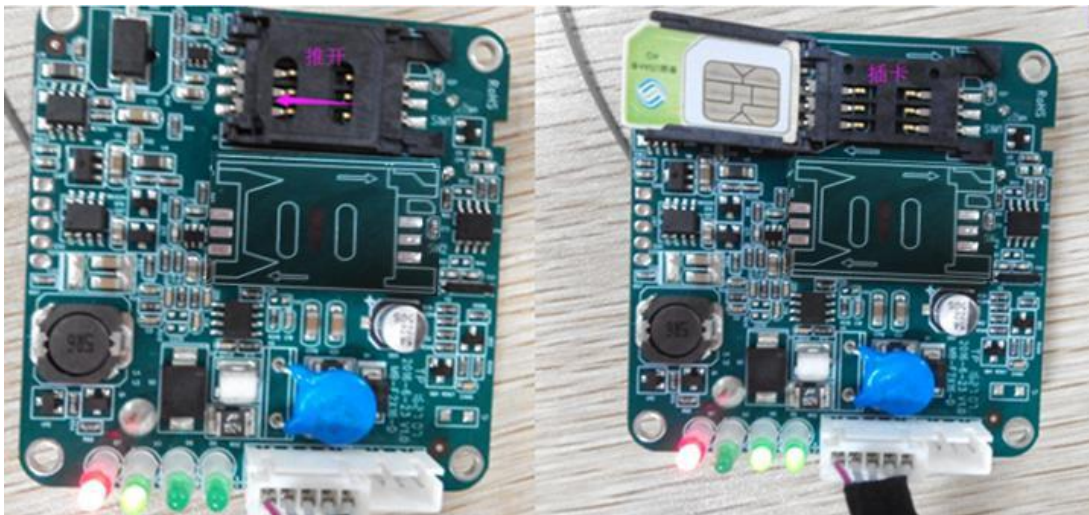
(Note: The components and their position on the PCB board will change slightly with the version upgrade, please refer to the actual product.)

**Antenna and SIM card installation:**

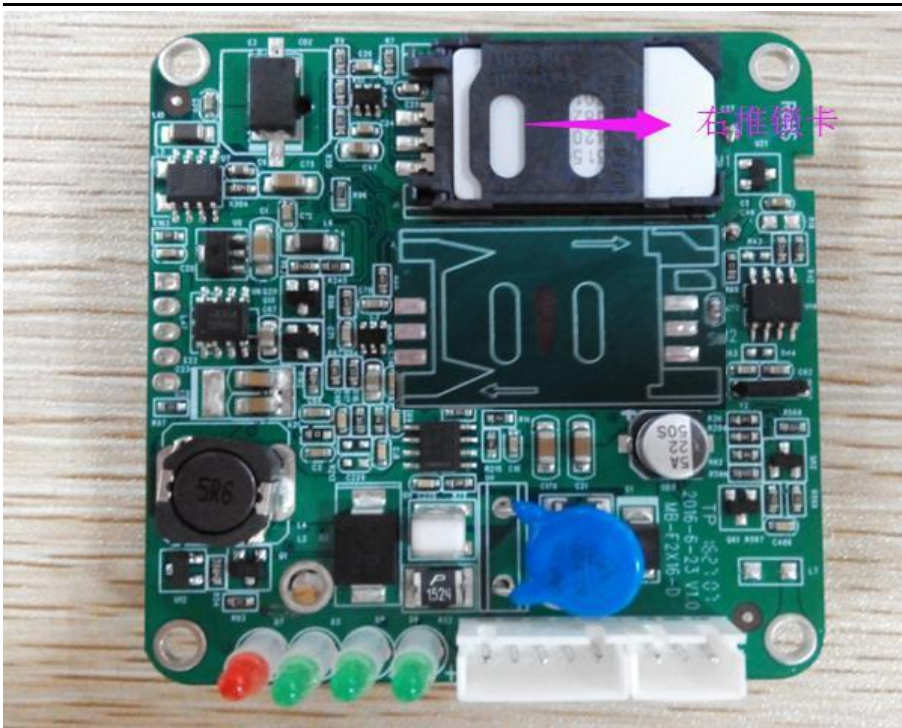
IP MODEM antenna interface is for IPEX connector. Buckle the IPEX male head of the antenna to the antenna interface of IP MODEM, and make sure that the connection is good, so as not to affect the signal quality.



When the SIM card is installed or removed, follow the icon on the device that indicate the direction of installation, make sure the SIM card's metal interface is facing down so that it is in full contact with the socket and be fastened.







Communication cable (Optional):



Definition of 2.54mm interval, 5 pin, single row of female Header+3 pin single row of female Header :

PIN	Definition	Description
1	V-	Power negative, the pin closest to the indicator
2	V+	Power positive
3	TXD	RS232 sending end of F2X16-D
6	GND	For signal
5	RXD	RS232 receiving end of F2X16-D
6	RXD2	Extended serial port 2 of F2X16-D for receiving //RS485_A
7	TXD2	Extended serial port 2 of F2X16-D for sending //RS485_B
8	GND	For signal

## 2.4 Power introduction

IP MODEM usually apply to complex external environments. In order to adapt to the complex application environment and improve the stability of the system, IP MODEM adopts advanced power technology. It can use DC 5-36V to power IP MODEM directly. When users use external power, must ensure power stability. (Ripple is less than 300mV, and make sure instantaneous voltage does not exceed 36V), and ensure that the power supply is greater than 8W.

(12VDC/0.5A power supply is recommended.)

## 2.5 Indicator

IP MODEM provides four indicators, definition as below: Power,Module, SIM, Operation status



States of indicators is as follows:

Through display of indicator light , the user can see the system and connection status

No.	Power	Module	SIM	Status	Definition
	Power	Network	SIM Card	Operation	
1	ON	X	Flash alternately		Module is on and at AT mode
2	ON	X	OFF	Flash slowly	Initialize the module by AT command
3	ON	Flash quickly	OFF	Flash slowly	Dialing
4	ON	X	Flash slowly	OFF	Waiting for activation (short connection mode)
5	ON	X	Flash alternately		System dialing is successful, the module is in data mode but the centers are not connected
6	ON	X	Flash in the same time		APP is normal

Note:

- 1."ON" means LED always bright, hold for at least 3 seconds ;
- 2."OFF" means LED always off, hold for at least 3 seconds ;
- 3."Flash slowly" means flash frequency is about 1 /S.

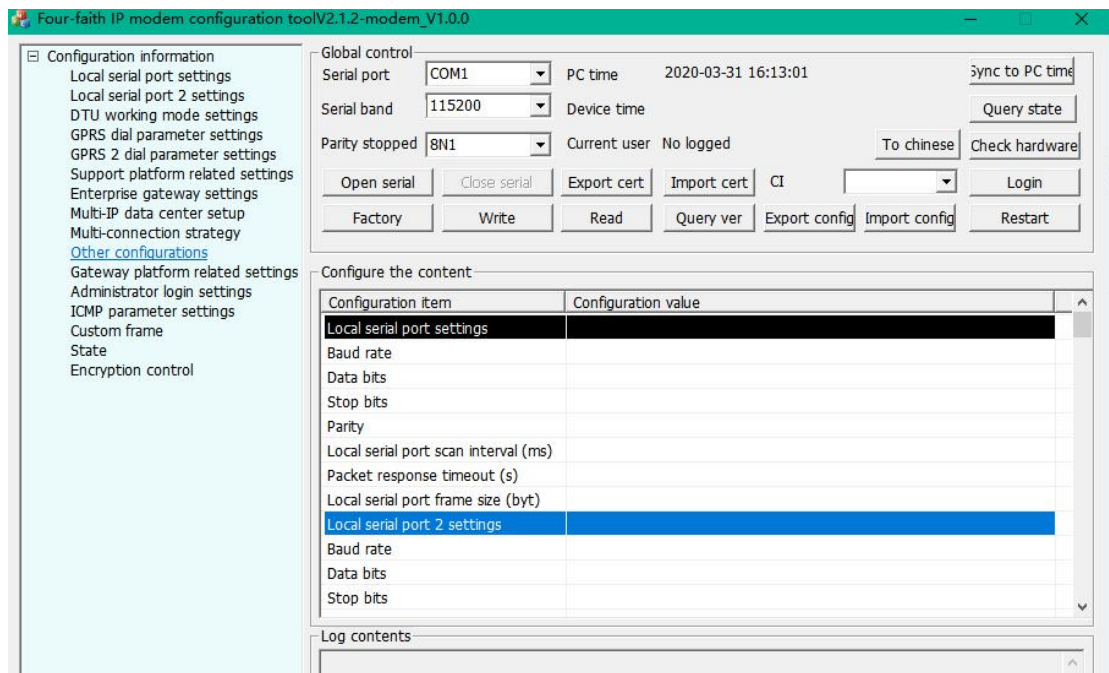


# Chapter 3 Configuration

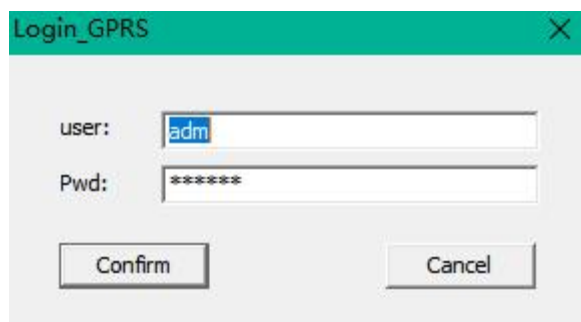
## 3.1 Interface specification

Open configuration tool -"F2x14d\_Soft15031718.exe" , use RS232 serial port line connect F2X46-D to computer, power on, after chosing right serial configuration parameters, the serial port can be used for system parameter configuration (Note: The configuration page can be entered with baudrates of 115200 and 8N1 in the first 3 seconds after booting)

Open configuration tool -"F2x14d\_Soft15031718.exe" , showing as below:

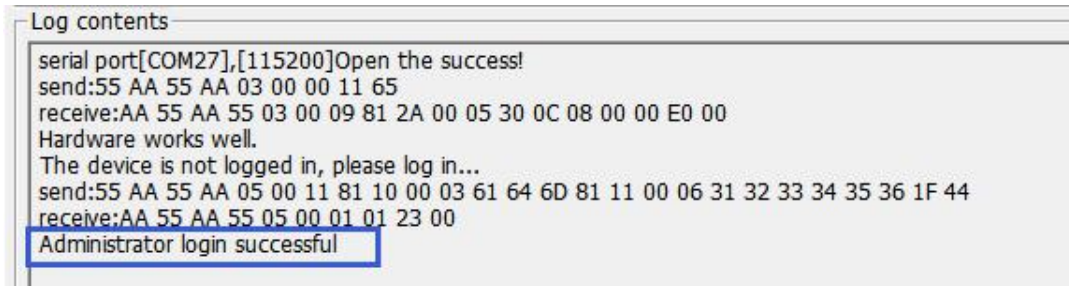


Open the configuration tool, after chosing right serial port parameter, checking the hardware first, if hardware is normal, click the login dialog box, input user name and password, showing as below:



After this step, click"Confirm", upon successful login, the user will have the appropriate level

of permissions, system parameters can be set within this permission, showing as below:



If you do not log in at the beginning, you can click “Cancel”, and then you can click the login button to log in at any time. After logging in, the original login button becomes log out, and users can also click log out to cancel their login.

(Note: The initial administrator user name is adm , and password is 123456, the initial normal user username is guest and the password is 123456. User names and passwords are case sensitive.)

The interface is described as follows:

1、 Parameters such as serial port, baud rate and parity bit can be selected in the "overall control" option of the interface. The configuration software has the function of automatically identifying the available serial ports of the current PC, these serial ports are listed in the “select serial port “ (Please be patient when you click this item because it is slow to automatically identify the currently available serial port), please select the serial port that was connected to F2X46-D, and chose right parameter which be used. Check the "auto" option, configuration software can automatically detect the parameters that match the communication.

2、 After chosing right serial port, click “Download configuration”、 “Read configuration” to write/read confuguration infomation. Moreover, click “Export configuartion file” can export configuration information from the configurator to a text file for saving, click“Import configuration file” can import the saved configuration information file into the configuration program.

3、 The information window at the bottom of the interface displays the operation performed and whether the operation was successful.

4、 “Sync to PC time” can set the device's system time to the PC's current time, after this step, the configuration software will automatically set the current PC time to the device, the “overall control” bar also displays the time of the current device, and it automatically reads the device time once a minute.

5. “Query version” can query the device version. The system version will display in the status bar above the configuration software if it query successfully.

6. Click the tree menu on the left of the screen, the information window in the middle of the interface will display the configuration information under the tree menu, especially click the level 1 tree menu. All the configuration information is displayed in the information window, where you can view all the configuration information through the drop-down scroll bar.

## 3.2 Configuration options

The configuration content of each configuration is described below

### 3.2.1 “Local serial port Settings”

Serial port baud rate: 1200、2400、4800、9600、14400、19200、38400、57600、115200(bps) (Option) ; **115200 (Default)**

Serial port data bits: 8

Serial port stop bits: 1 、 1.5 、 2 (Option)

Serial port parity bits: None/odd/Even

Local serial port scan interval (100 ms):10 (Default)

Packet response timeout (seconds): 5 (Default)

Local serial port frame size (bytes): 1024 (Default),set optionally, Range: ( 10~1024 )

### 3.2.2 “Local serial port 2 Settings”

Serial port baud rate: 1200、2400、4800、9600、14400、19200、38400、57600、115200(bps) ; **9600(Default)**

Serial port data bits: 8

Serial port stop bits: 1 、 1.5 、 2 (Option)

Serial port parity bits: None/odd/Even

Local serial port scan interval (100 ms):10 (Default)

Packet response timeout (seconds): 5 (Default)

Local serial port frame size (bytes): 1024 (Default) ; set optionally; Range: (10~1024)

**Note: 1、 Local serial port is usually used for configuration. Local serial port 2 is used to transfer data and support configuration function.**

**2、 For data ports, changes can be made through the software version.**

### 3.2.3 “DTU Working mode Setting”

**Whether to connect the support platform:** Yes or No (If chose “No”, the item "Support platform related Settings" is invalid, do not need to set it. In general, choose "No", to use the WMMP protocol, you need to choose "Yes").

**Connection mode:** Long connection or short connection (In the “long connection” mode, real-time online, reconnection automatically if it break up; only in the "short connection" mode, there are phone activation, local data activation, timing activation).

**Phone Activation:** Open or close the phone activation ( In general, select "Open") ,in short connection mode, activate the network if any calls come in.

**SMS activation:** Open or close SMS activation, in short connection mode, if a DM or WMMP message is received, the network will be activated

**Local data activation:** Open or close local data activation.(In general, select "Open"),in short connection mode, if the local serial port has data, the network will be activated.

**Timing activation interval (minutes):** According to this time, the timer starts when entering the sleep mode, and when the time is up, the network will be reconnected to realize the timing activation function. Range : 0 ~ 1440.

**Timing offline interval (minutes):** According to this time ,the network will be unblocked and restarted,value is 0 means the time is infinite .(Generally fill in 0, range: 0~60).

**Whether the data flow and business flow are separated:** Yes.

Note: In the state of short connection, open at least one activation mode.

### 3.2.4 “GPRS dial parameter setting”

**GPRS/CDMA dial number:** A dialing number for accessing a mobile network

**Access point name (APN) :** This is required when accessing a mobile network

**GPRS/CDMA dial user name:** A user name is required when dialing into a mobile network.

**GPRS/CDMA dial password:** A password is required for dial-up access to a mobile network

**PPP heartbeat interval (Seconds):** Time interval of heartbeat pack in PPP layer, input range: 0~9999

**Redial interval (seconds):** The interval between redialing after PPP disconnection, input range: 0~3600

**Maximum number of redial:** Restart the system after several consecutive dialing failures, input range: 0~10

Please refer to local rule of GPRS/CDMA network dial parameters

### 3.2.5 “Support platform related Settings”

This bar option is only valid if "Whether connect to support platform or not" in "DTU

working mode Settings" is set to "yes"

**Support platform equipment number:** Device number identification required in the WMMP protocol;

**Support platform gateway:** Need to fill in the IP address and port number of the WMMP center;

**Support platform connection mode:** Only support UDP;

**Support platform heartbeat interval (seconds):** Heartbeat interval associated with the WMMP protocol only, range: 4~3600

**SMS center number:** SMS center number which is needed, in Xiamen is 8613800592500

**SMS alarm number (SMS data number):** SMS registration, binding, alarm number that WMMP protocol requires.

### 3.2.6 “Enterprise gateway related Settings”

**DTU device number:** The user set it to identify DTU

**Enterprise Gateway:** Need to fill in IP address ,port number and domain name of center(if IP and domain name are filled in at the same time, IP shall prevail)

**Enterprise gateway connection mode:** TCP、UDP、DCTCP、DCUDP (Option)

**Maximum number of retransmission allowed for transmission failure:** 0 (TCP protocol retransmission utomatically) .

**Enterprise gateway heartbeat interval (minutes):** Time interval of heartbeat pack, range: 1~60

DNS IP1: 0.0.0.0 or fill in private domain name resolution server address

DNS IP2: 0.0.0.0

### 3.2.7 “Multi IP data center”

When chose multi centers mode, fill in the IP address, port number and connection mode of extension 1 enterprise gateway ~ extension 4 enterprise gateway, leave blank for single center mode.

Note: In the case of multi-center setting, please fill in the IP and port of each center correctly. In the case of non-multi-center setting, please set all non-center IP and port to zero.

### 3.2.8 “Multi connection strategy”

**Minimum reconnection interval (seconds):** The minimum interval in TCP between failed connections and reconnections.

**Maximum reconnection interval (seconds):** The maximum interval in TCP between failed

connections and reconnections.

Polling mode (Y/N) : In multicenter mode, select multicenter connections for polling or concurrent mode, input “Y”or”y” indicate using polling mode, all other inputs indicate using concurrent mode.

TCP serve port/UDP source port: Listen on the port when it as TCP Server (Fill in 0 indicate close TCP Server function).

For the polling mode, datas will be sent in sequence according to the number of configuration centers. Once the data is sent successfully, it is no longer sent to the next center.

For concurrent mode, datas will be sent to all the centers according to the number of configuration centers.

### 3.2.9 “Other configuration”

Maximum number of login: Default 10.

Remote telnet or not: Default NO.

Debug mode or not: Yes or No (Chose “Yes”, you can see the run logs through the serial port tool), This parameter takes effect immediately upon completion of configuration.

### 3.2.10 “ Related settings of network management platform”

Serial No.:A king of number that the gateway platform can identify the device, 15-bit string( Factory defined, can not be modified)。

Working mode: Only SMS mode, SMS plus IP mode or disabled.

List of trust Numbers: Only receive user SMS of trust list, if the list is empty, SMS from any user can be accepted.

Device number: Device identification of gateway platform(Factory defined, can not be modified).

Gateway platform address: IP address and port number of gateway platform.

Gateway platform heartbeat interval (seconds): Heartbeat interval of gateway platform, range: 30~600。

### 3.2.11 “Administrator login Settings”

Administrator login account: Administrator Name Settings for administrator.

Administrator login password: Administrator password Settings.

Ordinary user login account: Name Settings for ordinary users.

Ordinary user login password: Password Settings for ordinary users.

### 3.2.12 “ICMP parameter setting”

ICMP detection of the host: Check whether the PPP connection is normal or not, fill in

the IP address.

ICMP maximum number of lost packets: Redialing if no network packets were received after sending ICMP several times.

Network spare interval (seconds): Send the ICMP probe package after that time no network packets have been received. Input range: 30~3600.

### **3.2.13 “User-defined UDP frame format”**

UDP frame type: ASCII type or HEX type, ASCII type use ASCII character , HEX type use HEX character.

UDP login frame: For the enterprise gateway connection mode is pure UDP.

UDP login response frame: For the enterprise gateway connection mode is pure UDP.

UDP heartbeat frame: For the enterprise gateway connection mode is pure UDP.

UDP heartbeat response frame: For the enterprise gateway connection mode is pure UDP.

UDP drop out frame: For the enterprise gateway connection mode is pure UDP.

UDP drop out and response frame: For the enterprise gateway connection mode is pure UDP.

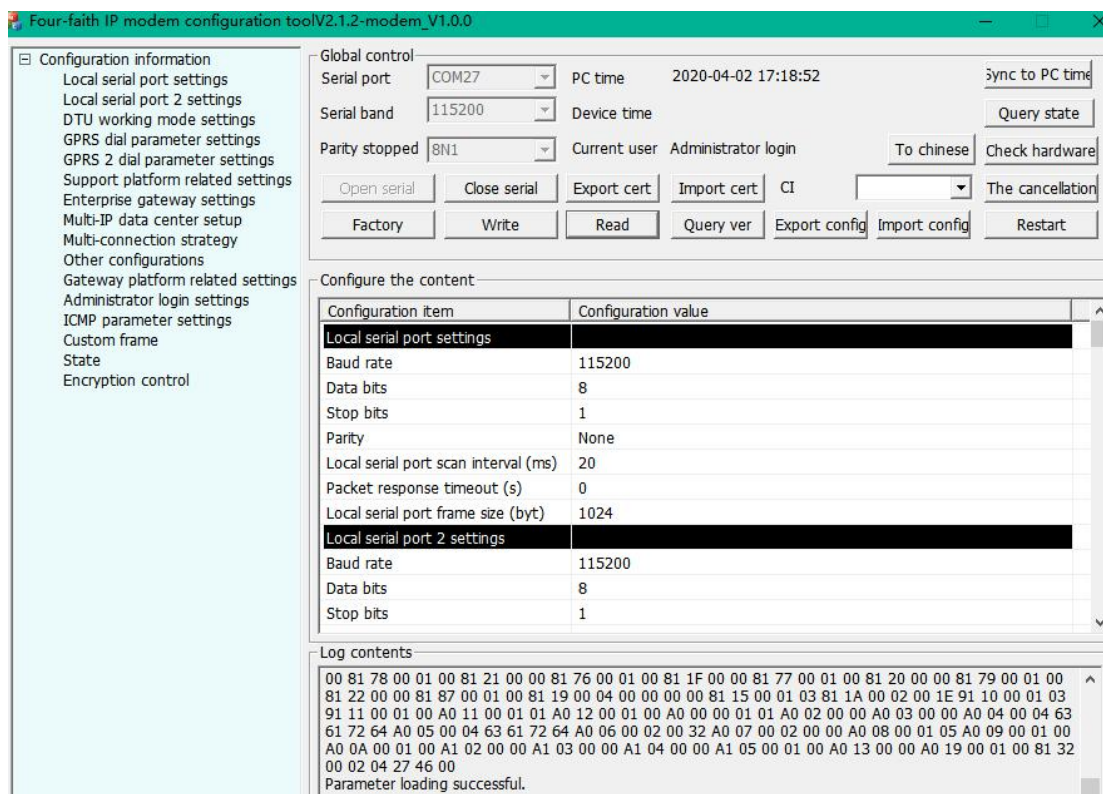
Note: This configuration is only valid if the enterprise gateway connection is pure UDP, the login frame and the login response frame must be configured at the same time, as well as other frames.

The purpose is to enable the enterprise gateway to know about the state of the bottom device in real time.



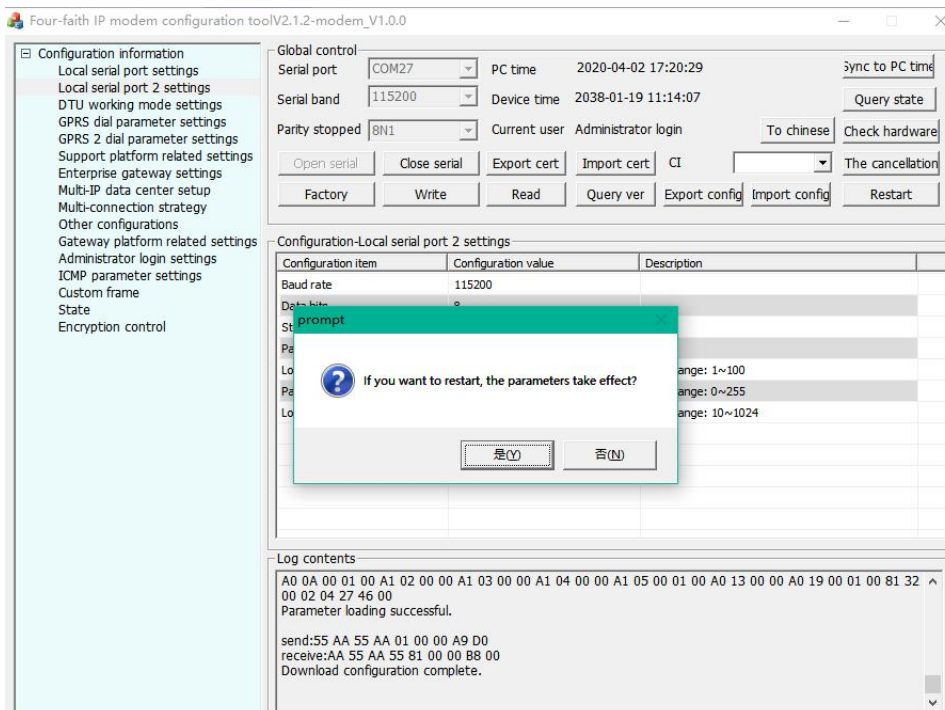
### 3.3 Read/Write configuration

Click "Read" when the power-on hardware detection is normal and you log in as the administrator, the configuration parameters in the device can be read to the configuration software interface display, at this point, you can view the parameter configuration of the item. If read successfully, "Parameter loading successfully " will be displayed in the log contents information bar, showing as below:



Similarly, the download configuration also needs hardware detection is normal and log in as an administrator, after the user has set the parameters, click "Download configuration", if this step is successful, "Download configuration successfully " will be displayed in the log contents information bar, a prompt dialog box will pop up at the same time, asks if you need to restart for the parameter to take effect immediately or for the next restart to take effect, showing as below:





### 3.4 Modification configuration

When you need to modify the configuration, you can read the original configuration, modify the corresponding configuration parameters and then write configuration to modify the required parameters. Or you can export and save the configuration information on the first write to the configuration. When you need to modify the configuration, enter the save file, then modify the corresponding configuration parameters, and then write the configuration. There is a default configuration when ex-factory, users only need to read the configuration, modify the corresponding parameters, and then write the configuration.

## Chapter 4 Use Description

### The prerequisites for the system to work:

- 1、 Normal power supply.
- 2、 Insert a valid SIM card, support data service.
- 3、 GPRS signal is required.
- 4、 Correct parameter configuration of the system, such as the IP address and port number of the data center to be accessed by the system, working mode, etc.

Operating principle: Dialing GPRS after power on, after dialing the IP successfully ,register and connect with the data center(The data center is that the "IP address" and "port number" of the enterprise gateway configured for the system), after successful registration, the data transmission between the bottom device and the data center can be realized.

Function: As a communication bridge between the bottom equipment and the data center(Such as RTU、 PLC etc.), the data sent by the bottom device to the serial port is encapsulated into network packets and sent to the data center and he data from the data center can also be sent to the bottom device through the serial port.

### 4.1 Working mode description

#### 4.1.1 DC mode

When chose DC mode as system work mode, must operate private center software that use DC protocol. Run the software, listen for a service port, after the system on power , it will eventually be able to achieve data communication between the system and the central port.

#### 4.1.2 Transparent transimission mode

Transparent transimission mode, can work at UDP or TCP way,duplex transmission, without any serial data processing,but registration package and heartbeat package can be user-defined.

### 4.2 Connection mode description

#### 4.2.1 Long connection mode

Set the relevant parameter as:

Whether to connect the support platform: NO

Connection mode: Long

Phone Activation: Open or Close

Local data activation: Open or Close

Timing activation interval(Minutes): 0

Timing off-line interval(Minutes): 0

In this connection mode, online in real time, if the line is disconnected, it will dial again automatically. After receiving serial port data, forward to the center. If no serial port data needs to be transmitted, heartbeat packets will be sent to the center on a regular basis according to the set parameters to keep this link unblocked in real time.

### 4.2.2 Short connection mode

**Set the relevant parameter as:**

Whether to connect the support platform: NO

Connection mode: Short

Phone activation: Open or Close

SMS activation: Open or Close

Local data activation: Open or Close

Timing activation interval(Minutes):0-1440 (Chose 0 indicate activate immediately, means do not enter sleep mode)

Timing off-line interval(Minutes): 1~60

Note: In this connection mode, at least one of the three activation modes must be on.

In this connection mode, users can control when to connect and when to disconnect. For example, set "Timing off-line interval=55"、"Timing activate interval=600"、"Phone activation=open"、"Local data activation=close", after networking, it will automatically log off and enter the waiting activation state after 5 minutes without data transmission in the serial port, in this state, you can use calling to make it works, or it will connect to network automatically after waiting 600 minutes. Therefore, users can call the network works at any time as needed, or activate networking regularly, or set to when the bottom device has data(Any data) to send, it will send data to the serial port to activate network transmission. But note that, it takes some time to connect to the center after the activation packet is sent(Within 20 seconds), the serial port cache size is 4K, if the data during this period is less than 4K, the data will be sent after connecting to the center, data exceeding 4K will be discarded.

## 4.3 Check system and connection status

Users can see the current working status of the system through the system indicator light, there are definitions that indicator lights of the system when the system is running, showing as below:

## Sheet 1: status light description

No.	Power	Module	SIM	Status	Definition
	Power	Network	SIM Card	Operation	
1	ON	X	Flash alternately		Module is on and at AT state
2	ON	X	OFF	Flash slowly	Initialize the module by AT command
3	ON	Flash quickly	OFF	Flash slowly	Dialing
4	ON	X	Flash slowly	OFF	Waiting for activation (short connection mode)
5	ON	X	Flash alternately		System dialing is successful, the module is in data mode but the centers are not connected
6	ON	X	Flash in the same time		APP is normal, MP is normal, WMMP is normal

## Note:

- 1."ON" means LED always bright, hold for at least 3 seconds ;
- 2."OFF" means LED always off, hold for at least 3 seconds ;
- 3."Flash slowly" means flash frequency is about 1 /S.

If the center doesn't open, it defaults to be normal state.

## 4.4 Remote upgrade

If you need to upgrade the program remotely, please contact us to get the version number of the upgraded software and the address of the server where the upgraded software is located.

Command: RMTUPGRADE=aa,b,cc,ip,port,ver

Function: upgrade.

Parameter meaning: aa: The properties of the upgrade. The first function “a” is the function to be extended, default 0. And when the second “a” is “0”, it represents an application upgrade, when it is “1”, represents an upgrade of the BOOT program.

b: Upgrade mode. 0 is TCP connection, 1 is UDPconnection.

cc: Number of window. Value: 1-16。The larger the value, the faster the upgrade, so TCP is recommended to be 16, UDP is recommended to be 4 (The UDP mechanism causes the larger the value, the slower it is)。

ip: The IP address of the software which is to be upgraded

port: The server port number of the software which is to be upgraded

ver: Software version that needs to be upgraded

For example:

<123456; RMTUPGRADE=00,0,16,120.42.46.98,9991, F2X64-STANDARD-V1-0-1>

Command: STPUPGRADE

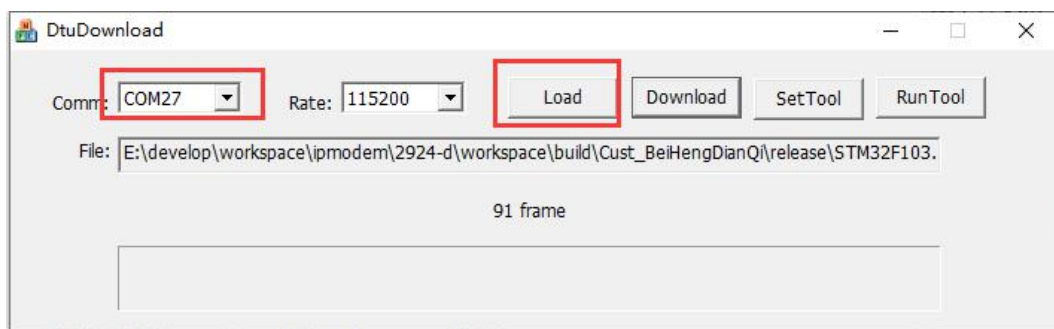
Function: Cancel this uograde

Parameter: None.

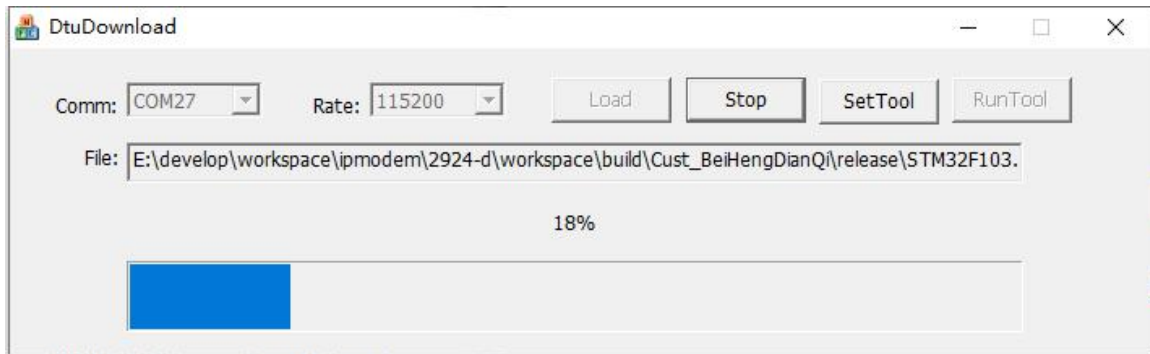
For example: <123456;STPUPGRADE>

## 4.5 Local serial upgrade

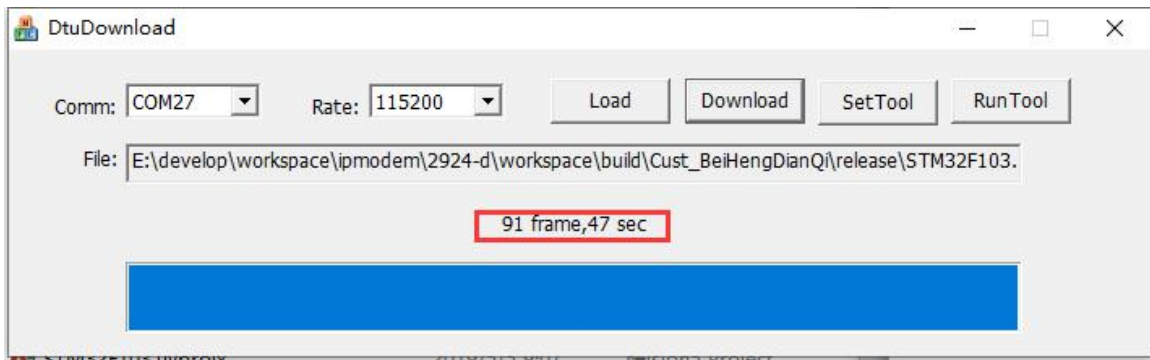
1、Open “DTUDowanLoad.exe” ( multiplex download tool) what our company provide. Chose upgrade program file, use RS232 serial port line to connect F2X16-D to PC. Do not power F2X46-D, showing as below:



2、Power F2X46-D now, it will start upgrading, showing as below:



3、When the upgrade is complete, the red box showing as below will be displayed in the interface:



4、Close download tool, restart the device.

## Chapter 5 Test

In this section, we will introduce how to test., check whether the device can work or not. We suggest that for first-time users, test the device before using it. There are three conditions before your test:

- 1、 A computer with Internet access, run the test software-"F2X14D\_DC.exe" on this computer, in order to listen for a certain TCP/UDP port for communication.
- 2、 Use RS232 serial port line to connect the device to the computer.
- 3、 A SIM card that has already open data service.

### 5.1 DC Test

#### 5.1.1 DCUDP mode

Open "F2X14D\_DC.exe", showing as below:



Working mode must be configured to DCUDP. Connect terminal device's port (Such as PLC, we use a computer simulate it here. ) to F2X46-D's port, after it, power up them all.

- 1、 Click "UDP" to enter DCUDP mode:



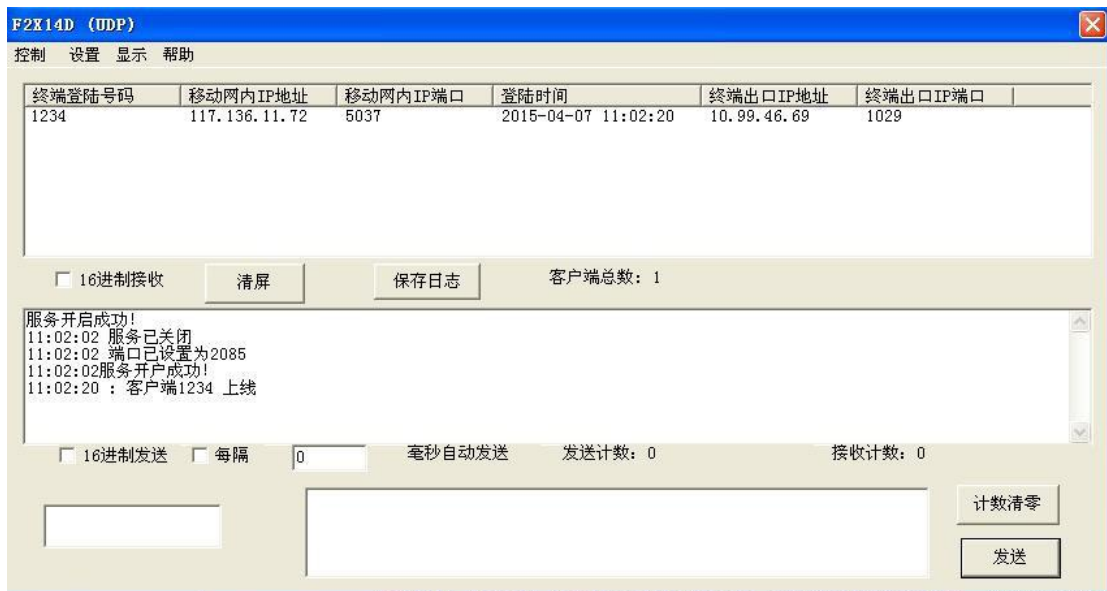
- 2、 The default listener port is 1203. You can modify it by the menu"Setting"->"Setting

port”, fill in the port number that you need. Click”OK”, showing as below:



At this moment, it has already open listen service, if you want to close it , click “Control”->“Close service” button to stop listening on the port. If you want to open it again, click “Control”->“Start service” button to start listening on the port.

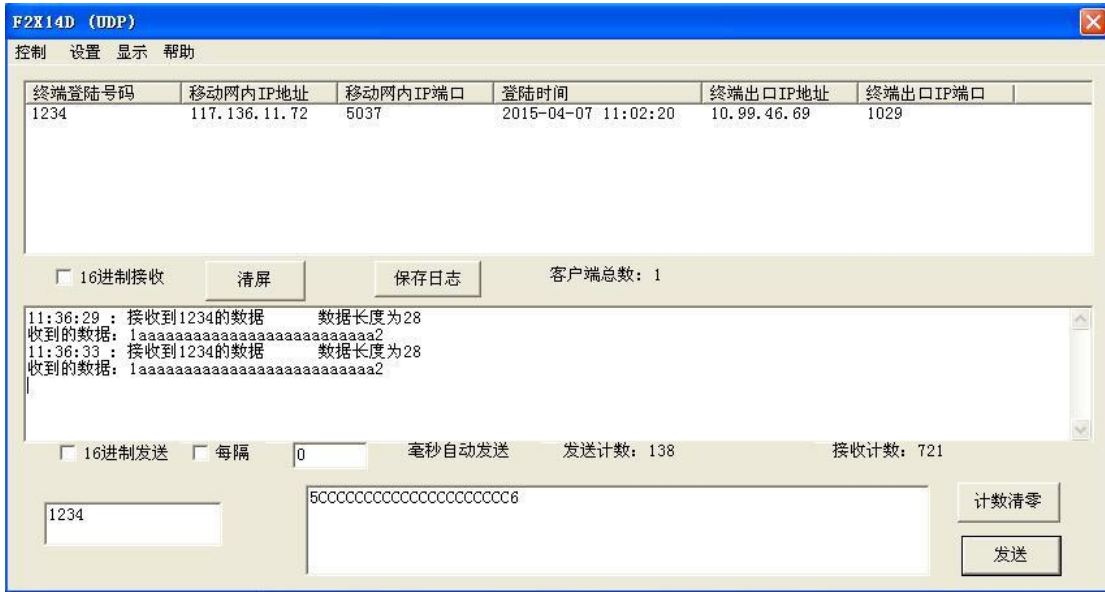
3、 When the device connect to data center successfully, local device number, login time, corresponding IP information will list in the window, showing as below:



4、 You can test communication with data center now. Data that data center received will show up in information window. Data that data center send will received by the other side device. We use a computer to connect serial port to simulate it here(You can use super terminal or other terminal software, we use a serial tool here.)



Input data in serial port tool, these data will send to data center. Showing as below:

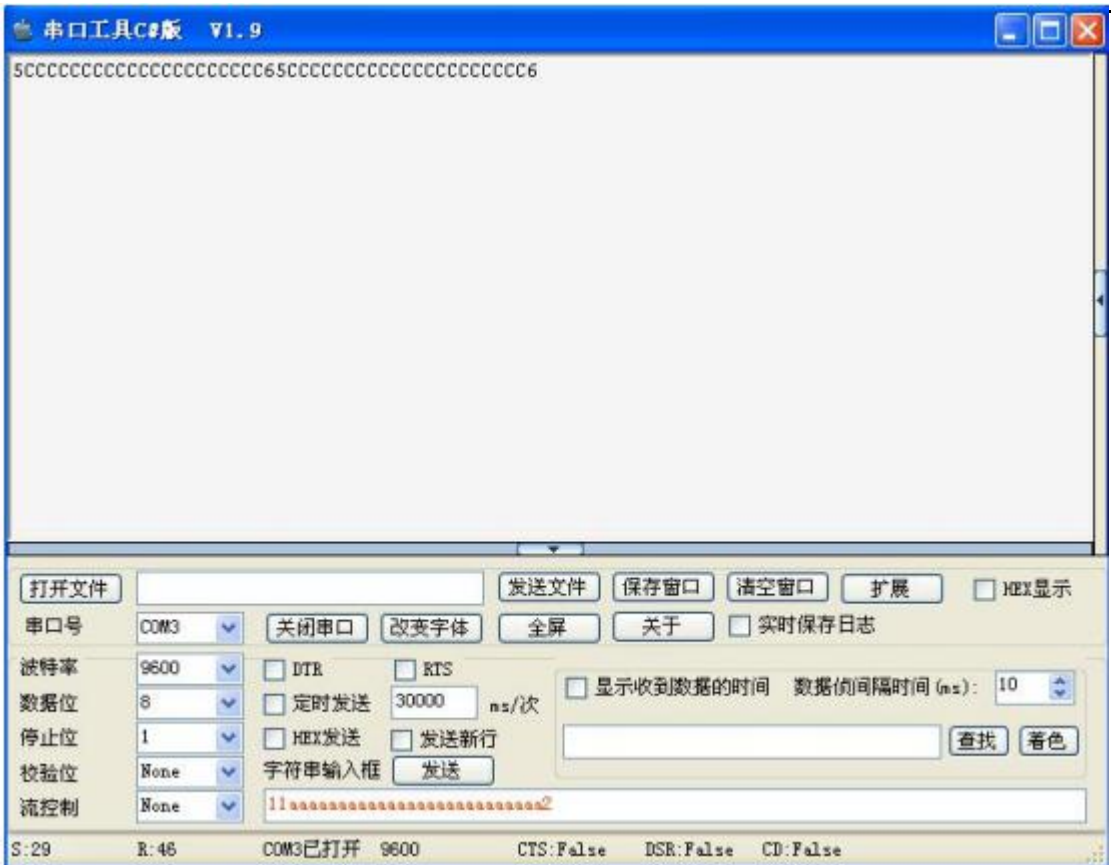


Data can be sent to the specified port through the center software:

Select the device number you want to send from the list, local device number will be displayed in the corresponding window at the bottom, and input data in the bottom of the right window, click “Send” button, data will be send out by software, showing as below:



Data sent by the center to the corresponding device will display in serial port tool, showing as below:



### 5.1.2 DCTCP mode test

Open test tool -“F2X14D\_DC.exe”, click “TCP” to enter TCP mode:



“F2X14D\_DC.exe” will work on TCP mode, at this moment, you can start test if you config the device to DCTCO mode. Test steps is similar to UDP mode.

## Appendix 1 FAQ

Question 1: The power light doesn't work

Solution: Please check whether power supply is normal or not, the polarity is correct or not.

Question 2: Can't set F2X46-D

Solution: Please check serial port cable, and check whether the serial port of PC is normal or not, the selected port of the software is correct or not.

Question 3: After F2X46-D power on, it can't connect to the remote server

Solution:

- (1) Check parameter of F2X46-D is right or not;
- (2) Check SIM card is inserted correctly or not, make sure the SIM card is not stopped (Can be tested by dialing the card number);
- (3) If the remote data server is within the LAN, check that firewall port mapping Settings are correct or not;

Question 4: Unable to transmit data to field control equipment when connect to server data manager

Solution:

- (1) Please check that the cable is connected correctly, TXD、RXD、GND are right or not. If use RS-232 to communicate, whether use three wire communication mode.
- (2) Check communication parameters are right or not, such as baudrate, parity etc.

Question 5: Can't upgrade by serial port

Solution: Please check serial port cable, and check serial port of PC is normal or not, the selected port of the software is correct or not.