

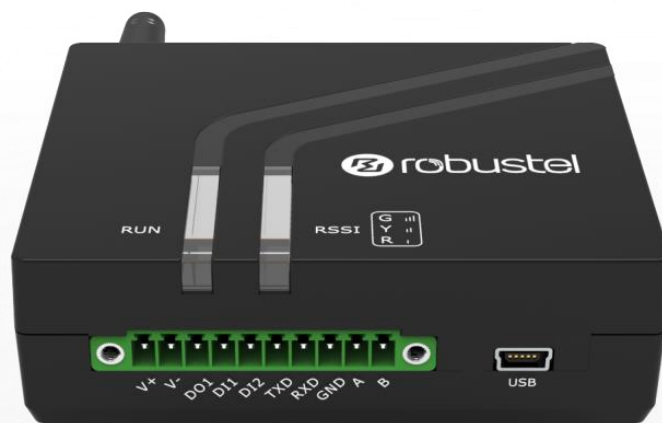


User Guide

M1200

Smart Industrial IoT Gateway

2 SIM + 2 DI + 1 DO + 1 RS-232 + 1 RS-485 + 1 Mini USB



robustOS

Guangzhou Robustel Technologies Co., Ltd.



www.robustel.com

About This Document

This document provides hardware and software information of the Robustel M1200, including introduction, installation, configuration and operation.

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Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the gateway is used in a normal manner with a well-constructed network, the gateway should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Robustel accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the gateway, or for failure of the gateway to transmit or receive such data.

Safety Precautions

General

- The gateway generates radio frequency (RF) power. When using the gateway, care must be taken on safety issues related to RF interference as well as regulations of RF equipment.
- Do not use your gateway in aircraft, hospitals, petrol stations or in places where using cellular products is prohibited.
- Be sure that the gateway will not be interfering with nearby equipment. For example: pacemakers or medical equipment. The antenna of the gateway should be away from computers, office equipment, home appliance, etc.
- An external antenna must be connected to the gateway for proper operation. Only uses approved antenna with the gateway. Please contact authorized distributor on finding an approved antenna.
- Always keep the antenna with minimum safety distance of 20 cm or more from human body. Do not put the antenna inside metallic box, containers, etc.
- RF exposure statements
 1. For mobile devices without co-location (the transmitting antenna is installed or located more than 20cm away from the body of user and nearby person)
- FCC RF Radiation Exposure Statement
 1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
 2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and human body.

Note: Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open. Gateway may be used at this time.

Using the gateway in Vehicle

- Check for any regulation or law authorizing the use of cellular devices in vehicle in your country before installing the gateway.
- The driver or operator of any vehicle should not operate the gateway while driving.
- Install the gateway by qualified personnel. Consult your vehicle distributor for any possible interference of electronic parts by the gateway.
- The gateway should be connected to the vehicle's supply system by using a fuse-protected terminal in the vehicle's fuse box.
- Be careful when the gateway is powered by the vehicle's main battery. The battery may be drained after extended period.

Protecting Your Gateway

To ensure error-free usage, please install and operate your gateway with care. Do remember the following:

- Do not expose the gateway to extreme conditions such as high humidity / rain, high temperature, direct sunlight, caustic / harsh chemicals, dust, or water.
- Do not try to disassemble or modify the gateway. There is no user serviceable part inside and the warranty would be void.
- Do not drop, hit or shake the gateway. Do not use the gateway under extreme vibrating conditions.
- Do not pull the antenna or power supply cable. Attach/detach by holding the connector.
- Connect the gateway only according to the instruction manual. Failure to do it will void the warranty.
- In case of problem, please contact authorized distributor.

Regulatory and Type Approval Information

Table 1: Directives



2013/56/EU	Directive 2013/56/EU of the European Parliament and of the Council of 10 February 2013 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)	
2012/19/EU	Directive 2012/19/EU the European Parliament and of the Council of 24 July 2012 on waste electrical and electronic equipment (WEEE)	

Table 2: Standards of the Ministry of Information Industry of the People’s Republic of China


SJ/T 11363-2006	“Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products” (2006-06).	
SJ/T 11364-2006	<p>“Marking for Control of Pollution Caused by Electronic Information Products” (2006-06).</p> <p>According to the “Chinese Administration on the Control of Pollution caused by Electronic Information Products” (ACPEIP) the EPUP, i.e., Environmental Protection Use Period, of this product is 20 years as per the symbol shown here, unless otherwise marked. The EPUP is valid only as long as the product is operated within the operating limits described in the Hardware Interface Description.</p> <p>Please see Table 3 for an overview of toxic or hazardous substances or elements that might be contained in product parts in concentrations above the limits defined by SJ/T 11363-2006.</p>	

Table 3: Toxic or Hazardous Substances or Elements with Defined Concentration Limits

Name of the Part	Hazardous Substances					
	(Pb)	(Hg)	(Cd)	(Cr (VI))	(PBB)	(PBDE)
Metal parts	o	o	o	o	o	o
Circuit modules	x	o	o	o	o	o
Cables and cable assemblies	o	o	o	o	o	o
Plastic and polymeric parts	o	o	o	o	o	o

o:
Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

x:
Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part *might exceed* the limit requirement in SJ/T11363-2006.

Document History

Updates between document versions are cumulative. Therefore, the latest document version contains all updates made to previous versions.

Date	Firmware Version	Document Version	Change Description
12 Mar., 2018	1.0.0	v.1.0.0	Initial release
4 Apr., 2018	1.0.0	v.1.0.1	Updated product name
9 Apr., 2018	1.0.0	v.1.0.2	Updated EMI information

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Chapter 1 Product Overview

1.1 Key Features

The Robustel Smart Industrial IoT Gateway M1200 is a compact cellular gateway based on GSM/GPRS/EDGE/UMTS/WCDMA/HSDPA/HSUPA/HSPA+/FDD LTE/TDD LTE networks. This dual-SIM gateway enables remote data transmission of local serial ports and I/O, and supports such interfaces as RS-232, RS-485 and mini-USB. M1200 provides users with stable network connectivity and data transmission. It is available to meet industrial application demands for its standards-compliant industrial designs. As a universal gateway, it can be applied in many scenarios such as Energy, Transportation and Agriculture, etc.

- Auto GSM/GPRS/EDGE/UMTS/WCDMA/HSDPA/HSUPA/HSPA+/FDD LTE/TDD LTE connections (No AT command required)
- Supporting two dial-up policies, Always Online and Connect on Demand
- Dual-SIM backup (push-push or MFF type optional)
- Supporting SMS Direct mode which can transparently convert serial data to SMS or vice versa
- Transparent TCP and UDP protocol connections
- ICMP, DDNS, SNTP and Telnet
- Modbus RTU to TCP
- Auto rebooting via SMS and Timer
- Configuration and firmware upgrading via USB and RobustLink
- Sending SMS if DI is triggered (optional)
- Robust industrial design (9 to 36V DC, -40 to +75 °C extended operating temperature, desktop or wall mounting or DIN rail mounting)

1.2 Package Contents

Before installing your M1200, verify the kit contents as following.

Note: The following pictures are for illustration purposes only, not based on their actual sizes.

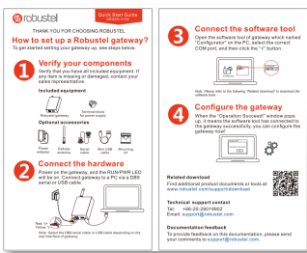
- 1 x Robustel Smart Industrial IoT Gateway M1200



- 1 x 10-pin 3.5 mm RP female terminal block with lock for DI/DO connections



- 1 x *Quick Start Guide* with download link of other documents or tools



Note: If any of the above items is missing or damaged, please contact your Robustel sales representative.

Optional Accessories (sold separately)

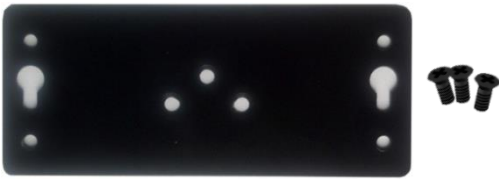
- 3G/4G SMA cellular antenna (stubby/magnet optional)

Stubby antenna 1

Stubby antenna 2



- Wall mounting kit



- 35 mm DIN rail mounting kit



- Mini USB converter



- AC/DC power adapter (12V DC, 1.5 A; EU/US/UK/AU plug optional)



1.3 Specifications

Cellular Interface

- Number of antennas: 1
- Connector: SMA, female
- SIM slot: 2 (3.0 V & 1.8 V)
- Standards: GSM/GPRS/EDGE/UMTS/WCDMA/HSDPA/HSUPA/HSPA+/FDD LTE/TDD LTE
 - GSM: max DL/UL = 9.6/2.7 Kbps
 - GPRS: max DL/UL = 86 Kbps
 - EDGE: max DL/UL = 236.8 Kbps
 - UMTS: max DL/UL = 384/128 Kbps
 - WCDMA: max DL/UL = 2.8 Mbps/384 Kbps
 - HSDPA: max DL/UL = 14.4 Mbps/384 Kbps

- HSPA+: max DL/UL = 21/5.76 Mbps, fallback to 2G
- FDD LTE: max DL/UL = 100/50 Mbps, fallback to 2G/3G
- TDD LTE: max DL/UL = 100/50 Mbps, fallback to 2G/3G

Serial Interface

- Number of ports: 1 x RS-232 + 1 x RS-485
- Connector: 10-pin 3.5 mm RP female socket with lock
- Baud rate: 300 bps to 115200 bps
- RS-232: TxD, RxD, GND
- RS-485: A (Data+), B (Data-)

Digital Input / Digital Output

- Number of ports: 2 x DI (wet contact) + 1 x DO (wet contact)
- Connector: 10-pin 3.5 mm RP female socket with lock
- ESD withstand level: contact: ± 6 K, air: ± 8 K
- Absolute maximum VDC: “V+” +5V DC (DI), 30V DC (DO)

USB Port

- Number of ports: 1 x Mini USB for configuration and power supply
- Connector: Mini Female
- Speed: 2.0 high speed up to 480 Mbit/s

Others

- LED indicators: 1 x RUN + 1 x RSSI (red/green bi-color light)
- Built-in: RTC, Watchdog, Timer

Software (Basic features of RobustOS)

- Network protocols: PPP, TCP, UDP, ICMP, HTTP, HTTPS, DNS, NTP, SMTP, Telnet, SSH2, DDNS, etc.
- Management: Web, CLI, SMS
- Serial port: Transparent, TCP Client/Server, UDP, Modbus RTU Gateway

App Center (Available Apps for RobustOS)

- Apps*: Language, RobustLink

*Request on demand. For more Apps please visit www.robustel.com.

Power Supply and Consumption

- Connector: 10-pin 3.5 mm RP female socket with lock
- Input voltage: 9 to 36V DC
- Power consumption: Idle: 50 to 70 mA@12 V
Data link: 300 mA (peak) @12 V

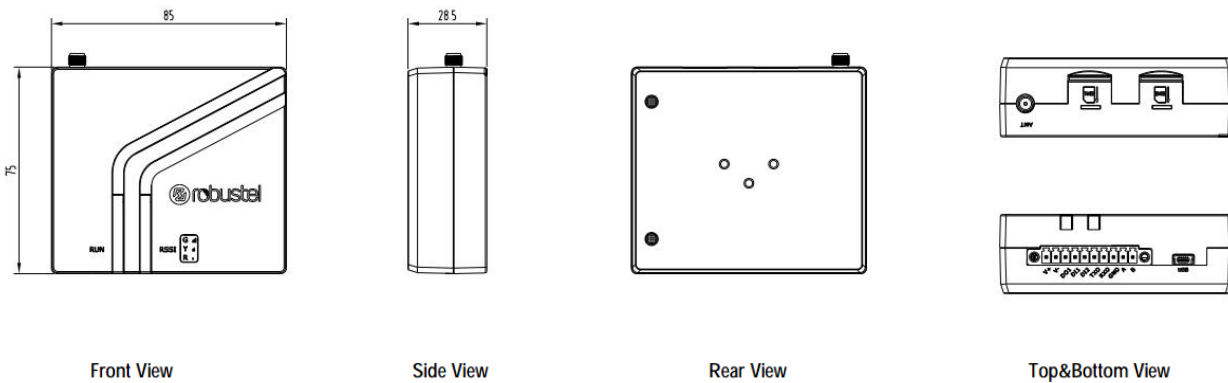
Physical Characteristics

- Ingress protection: IP30
- Housing & Weight: Plastic, 106 g
- Dimensions: 85 x 75 x 28.5 mm
- Installations: Desktop, wall mounting and 35 mm DIN rail mounting

EMC

- EMI: EN 55032: 2015 (CE) Class B
EN 55032: 2015 (RE) Class B
- EMS: IEC 61000-4-2 2009 (ESD) Contact Level 3; Air Level 3
IEC 61000-4-4 2012 (EFT) Level 2
IEC 61000-4-5 2014 (Surge) Level 2

1.4 Dimensions



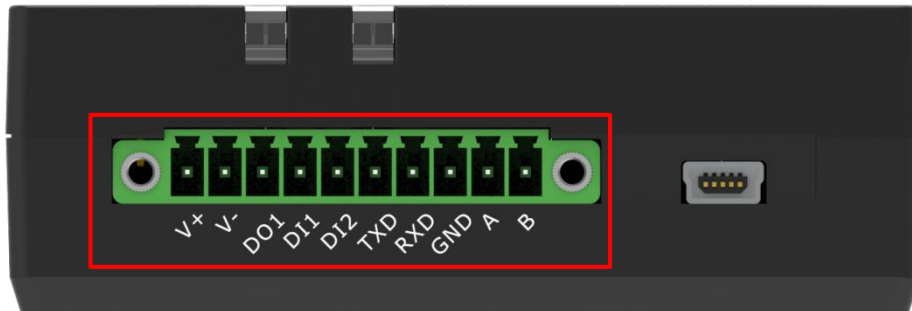
1.5 Ordering Information

Model	M1200-3P	M1200-4L
Antenna Number	1	1
Air Interface	GSM/GPRS/EDGE/UMTS/WCDMA/HSDPA/HSUPA/HSPA+	GSM/GPRS/EDGE/UMTS/WCDMA/HSDPA/HSUPA/HSPA+/FDD LTE/TDD LTE
Frequency Bands	--	FDD LTE: B1/B2/B3/B4/B5/B7/B8/B13/B20/B28 TDD LTE: B38/B40/B41 3GPP E-UTRA Release 11
4G*		
3G	B1/B2/B5/B8/B19	B1/B2/B5/B8
2G	850/900/1800/1900 MHz	850/900/1800/1900 MHz
Operating Environment	-40 to +75 °C 0 to 95% RH	-40 to +75 °C 0 to 95% RH

*For more information about frequency bands in different countries, please contact your Robustel sales representative.

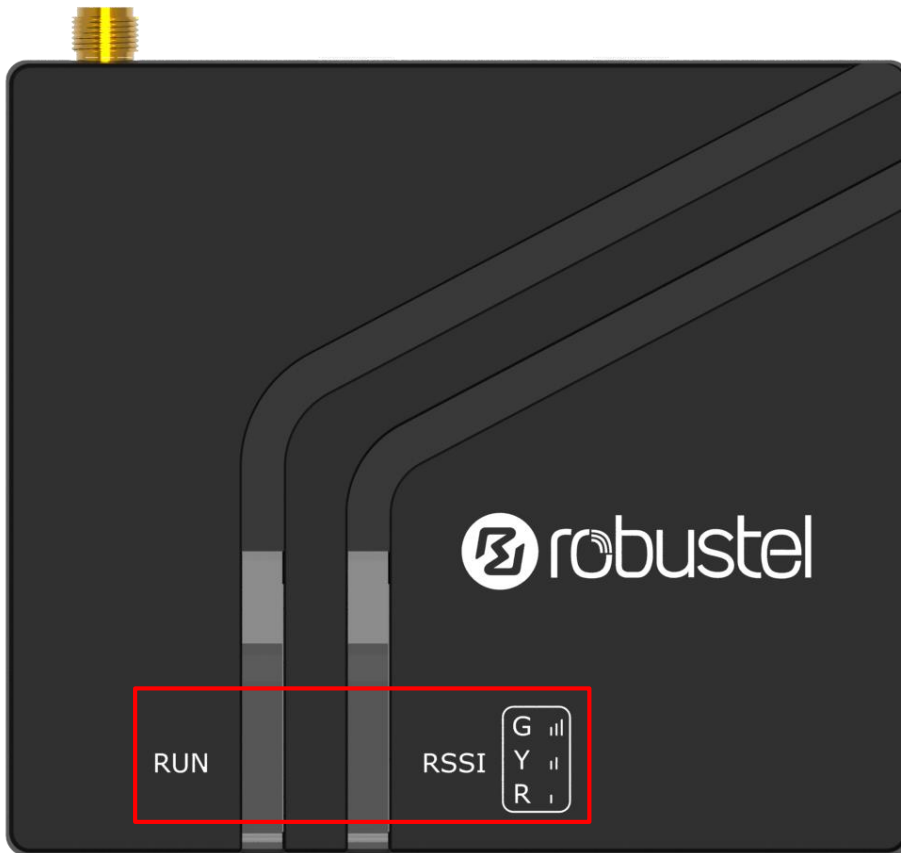
Chapter 2 Hardware Installation

2.1 PIN Assignment



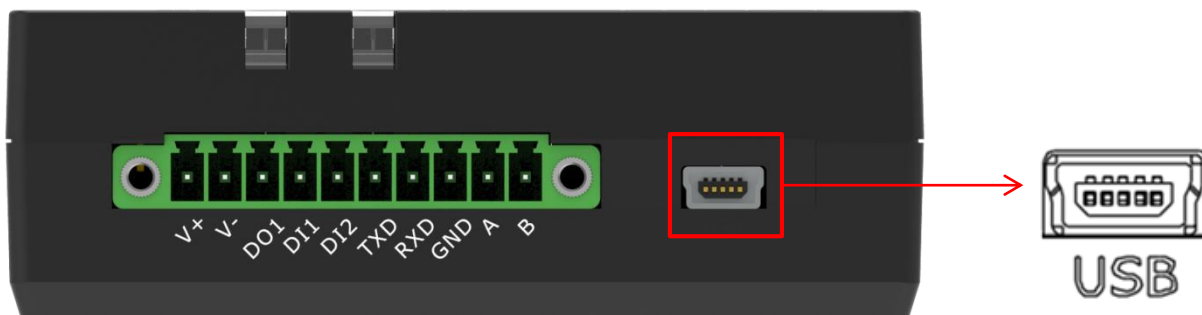
PIN	Power	Function	RS-232	RS-485	Direction
1	V+	--	--	--	M1200 ← Device
2	V-	--	--	--	M1200 ← Device
3	--	DO1	--	--	M1200 → Device
4	--	DI1	--	--	M1200 ← Device
5	--	DI2	--	--	M1200 ← Device
6	--	--	TXD	--	M1200 ← Device
7	--	--	RXD	--	M1200 → Device
8	--	--	GND	--	M1200 ↔ Device
9	--	--	--	Data+(A)	M1200 ↔ Device
10	--	--	--	Data- (B)	M1200 ↔ Device

2.2 LED Indicators



Name	Color	Status	Description
RUN	Yellow	On, solid	Power on
	Yellow	Fast blinking (2Hz)	System initializing
	Yellow	On, blinking (1Hz)	Initialization completed, device operating normally
	Green	On, blinking	Device operating normally, GPRS connected
	Red	Fast blinking	Device in abnormal state
RSSI	None	Off	CSQ value 0 or 99, not registered on the network
	Red	On, solid	CSQ 1-10, poor signal
	Yellow	On, solid	CSQ 11-20, normal signal
	Green	On, solid	CSQ 21-31, good signal

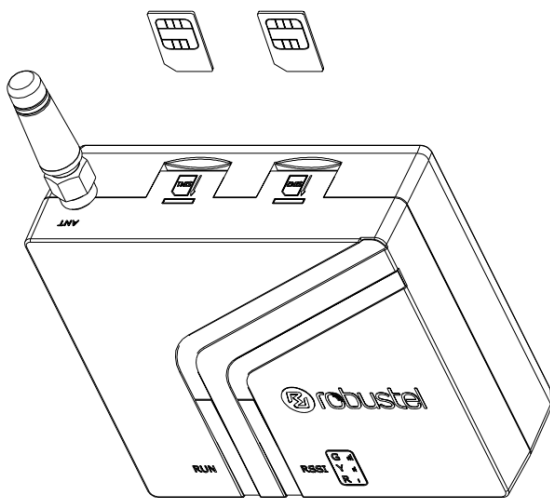
2.3 USB interface



Function	Operation
Data communication	Use a USB cable to connect the gateway's mini USB interface to an external communication device.
Power supply	Use a USB cable to connect the gateway's mini USB interface to external power supply.

Note: In general, a notebook computer USB 2.0 interface output current and output voltage are only 0.5 A and 5 V, so when using the USB interface for configuration, you should use power supply input interface for power supply; and when using the USB interface for configuration and power supply, the output current of USB interface should be at least 1 A, output voltage at least 5 V.

2.4 Insert or Remove SIM Card



Please confirm before inserting the SIM card. When the SIM card is turned on and the device is configured without the correct PIN, the SIM card is unavailable.

- **Insert SIM card**

1. Make sure gateway is powered off.
2. To insert SIM card, press the card with finger until you hear a click

- **Remove SIM card**

1. Make sure gateway is powered off.
2. To remove SIM card, press the card with finger until it pops out and then take out the card.

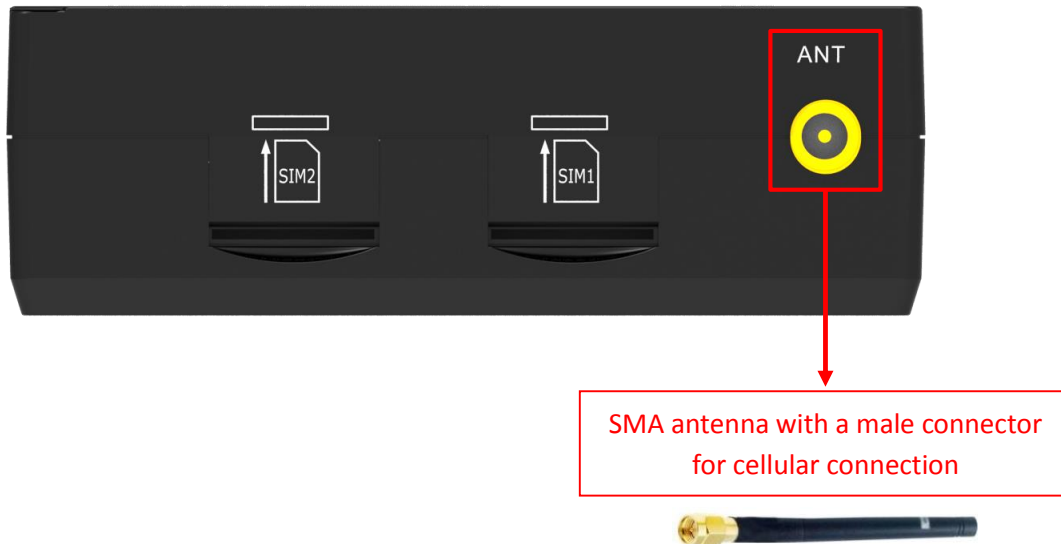
Note:

1. Recommended torque for inserting is 0.5 N.m, and the maximum allowed is 0.7 N.m.
2. Use the specific card when the device is working in extreme temperature (temperature exceeding 40 °C), because the regular card for long-time working in harsh environment will be disconnected frequently.
3. Do not touch the metal of the card surface in case information in the card will lose or be destroyed.
4. Do not bend or scratch the card.
5. Keep the card away from electricity and magnetism.
6. Make sure gateway is powered off before inserting or removing the card.

2.5 Attach External Antenna (SMA Type)

Attach an external SMA antenna to the gateway's antenna connector and twist tightly. Make sure the antenna is within the correct frequency range provided by the ISP and with 50 Ohm impedance.

Note: Recommended torque for tightening is 0.35 N.m.

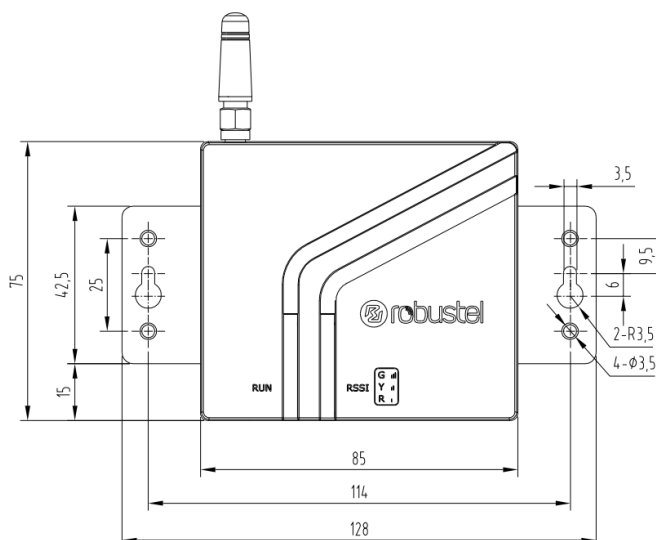


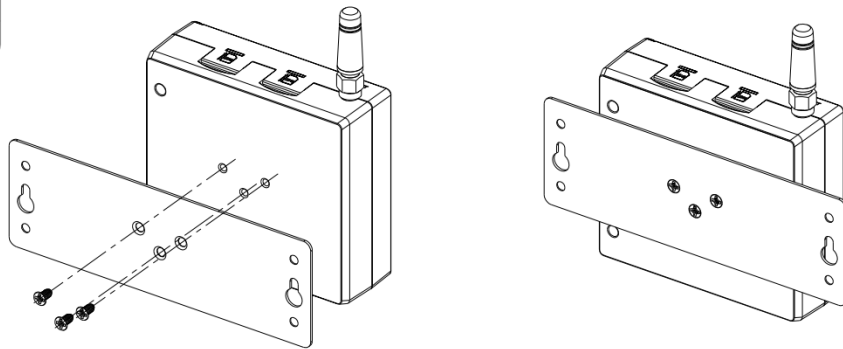
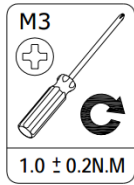
2.6 Mount the Gateway

The gateway can be placed on a desktop or mounted to a wall or a 35 mm DIN rail.

Two methods for mounting the gateway

- Wall mounting (measured in mm)

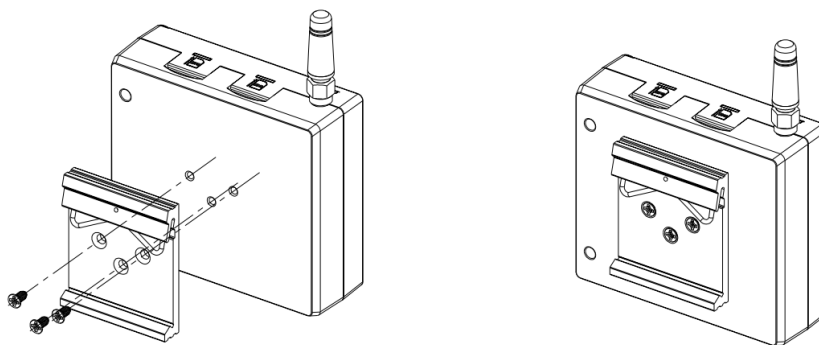
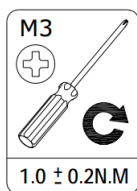
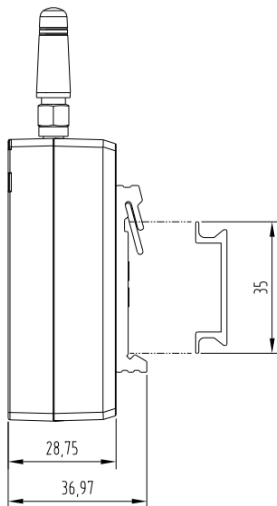




Use 3 pcs of ST2.9*6 flat head self-tapping Phillips screws to fix the wall mounting kit to the gateway, and then use 2 pcs of M3 drywall screws to mount the gateway associated with the wall mounting kit on the wall.

Note: Recommended torque for mounting is 1.0 N.m, and the maximum allowed is 1.2 N.m.

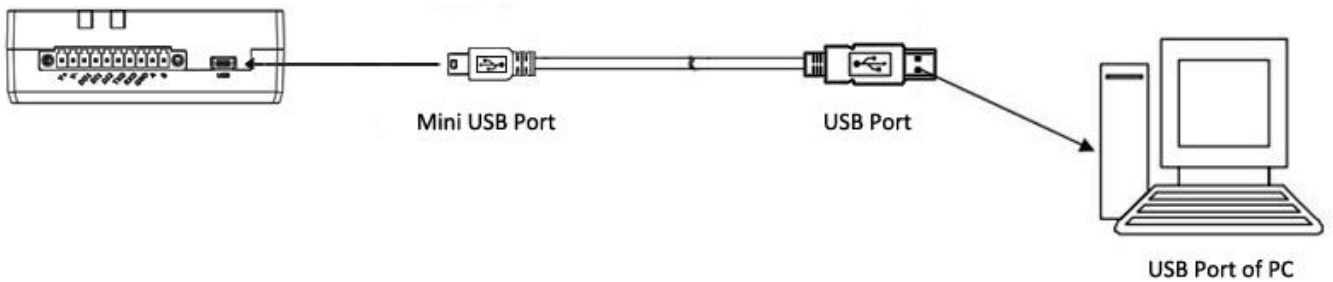
- DIN rail mounting (measured in mm)



Use 3 pcs of ST3*8 flat head self-tapping Phillips screws to fix the DIN rail to the gateway, and then hang the DIN rail on the mounting bracket. It is necessary to choose a standard bracket.

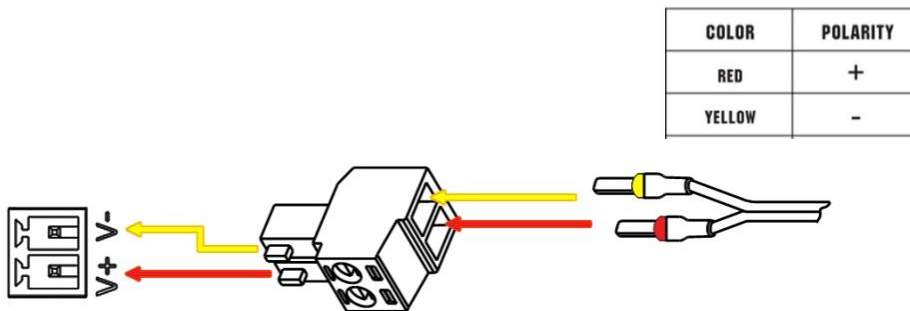
Note: Recommended torque for mounting is 1.0 N.m, and the maximum allowed is 1.2 N.m.

2.7 Connect the Gateway to a Computer



Connect a USB cable to the gateway's mini USB interface to an external controller or computer's USB port

2.8 Power Supply



M1200 supports reverse polarity protection, but always refers to the figure above to connect the power adapter correctly. There are two cables associated with the power adapter. Following to the color of the head, connect the cable marked red to the positive pole through a terminal block, and connect the yellow one to the negative in the same way.

Note: The range of power voltage is 9 to 36V DC.

Chapter 3 Initial Configuration

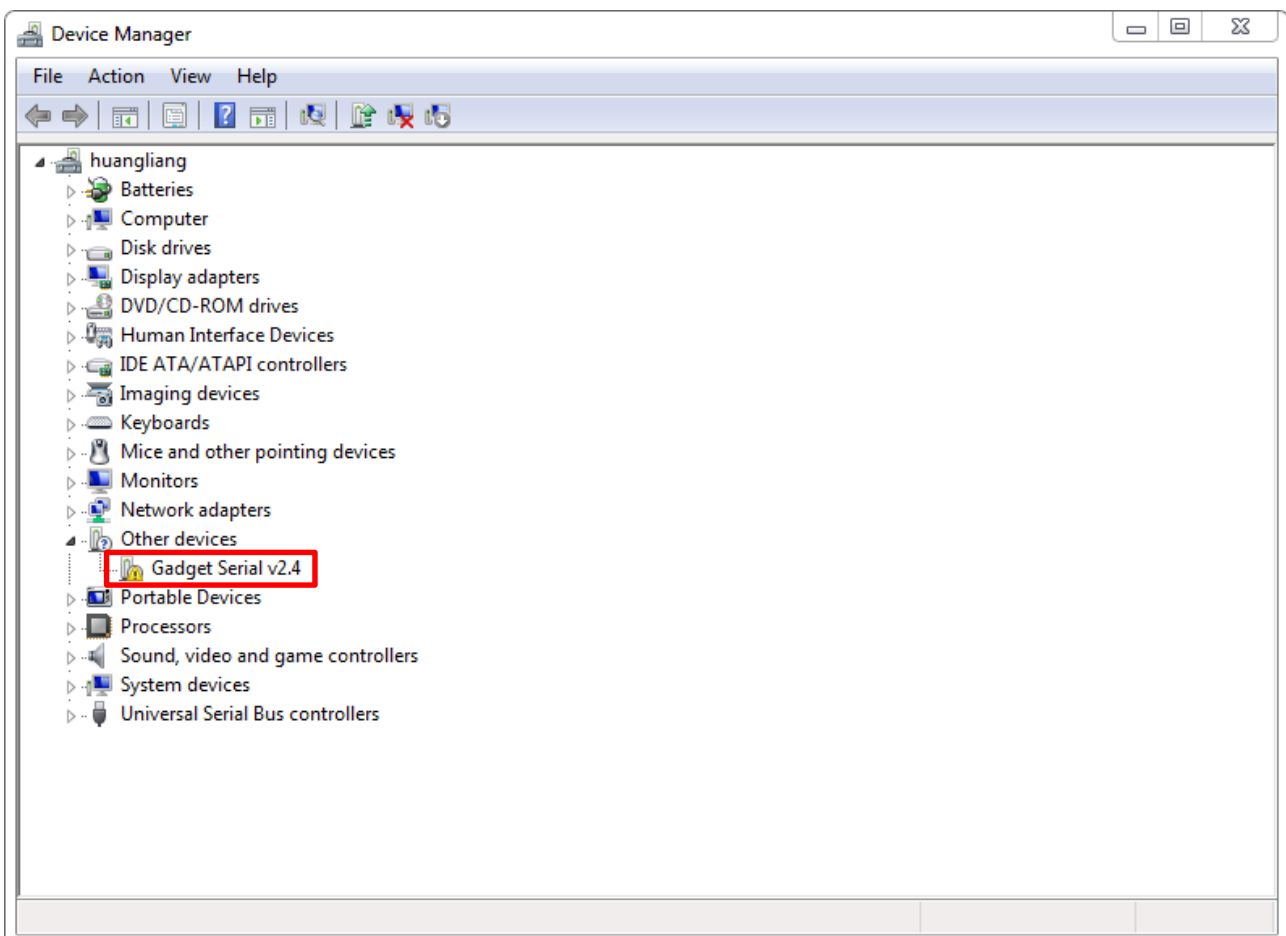
The gateway supports webpage configuration. The supported browsers are IE8.0 or above, Google, Firefox, etc. The supported operating systems are Windows XP, Windows 7 and Windows 10. For M1200, the method of connecting to the gateway is to use a PC to make a PPP dial-up connection to the device so that users can configure it on the web page through the mini USB port.

3.1 Configure the PC

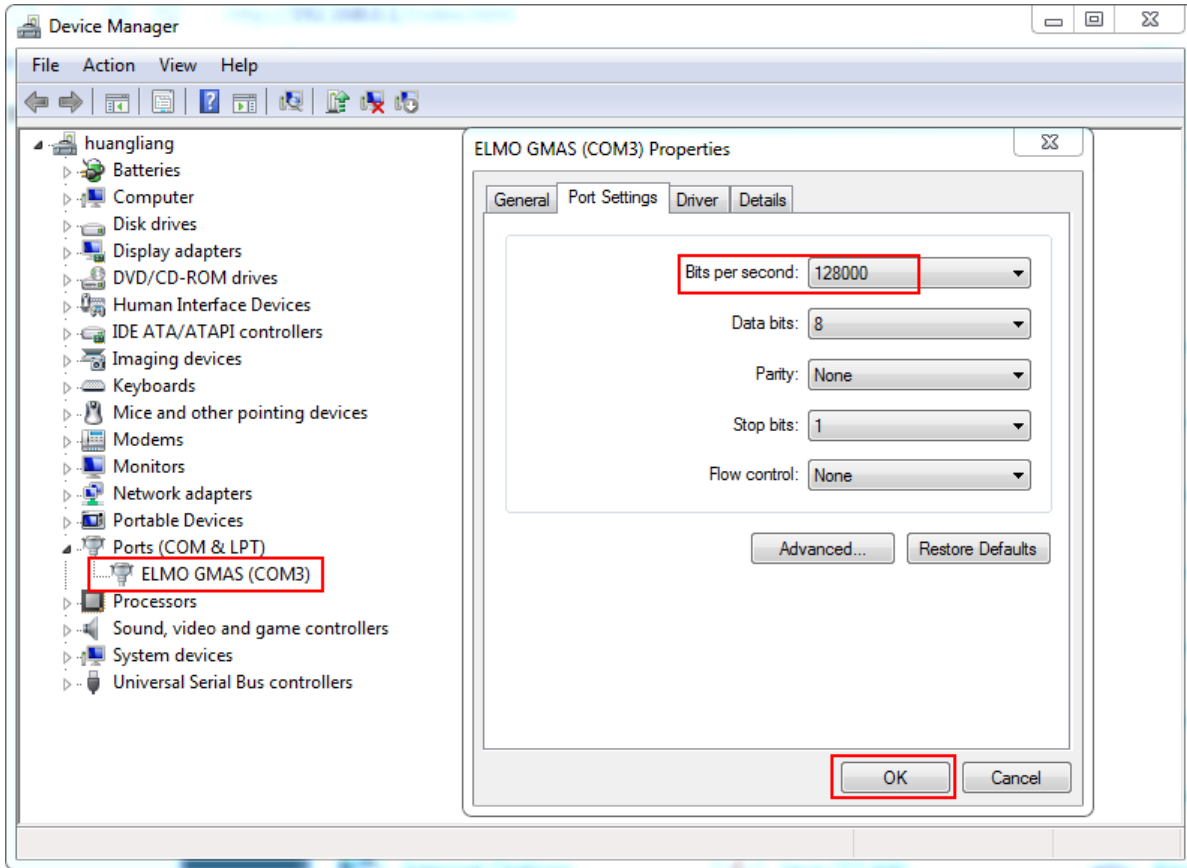
Establishing a PPP Server on the device side to monitor dialing request from the serial port, then use the serial port to establish a PPP connection with PC to establish IP channel. On the PC side, configure the following for different operating systems:

Here take **Windows 7** as example, and the configuration for windows system is similar.

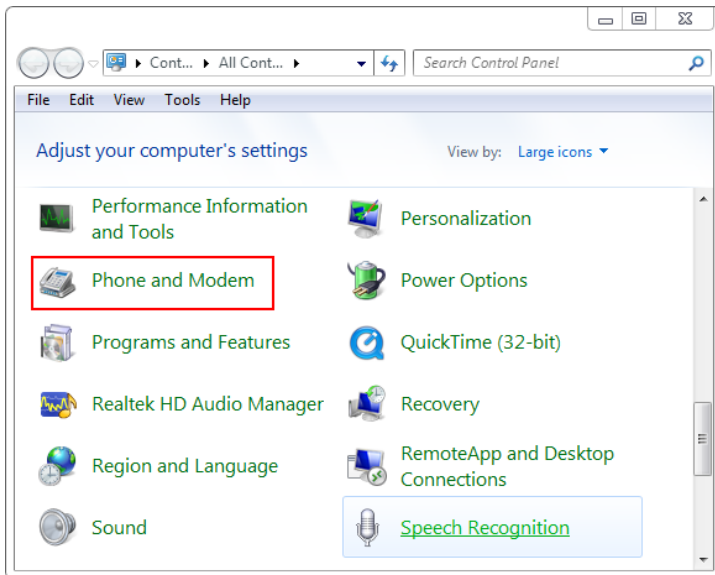
1. After the device is powered on, the PC detects the new serial port and tries to install the driver. If the PC can not automatically install the driver, as shown in the figure below, you need to manually add the driver; please follow the readme operation tips under m1200_ppp_configure\usb_driver in the attachment. Please download from the official website or consult technical support for the corresponding attachments.

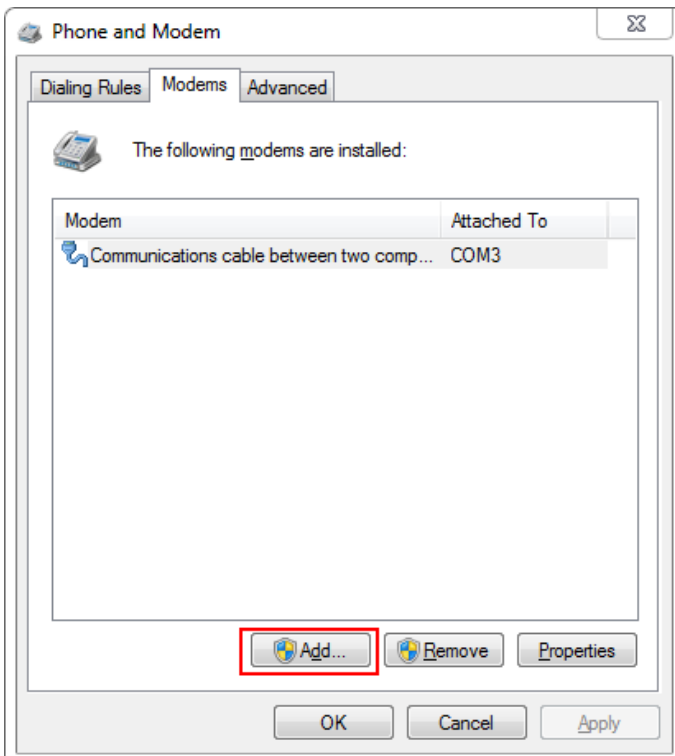
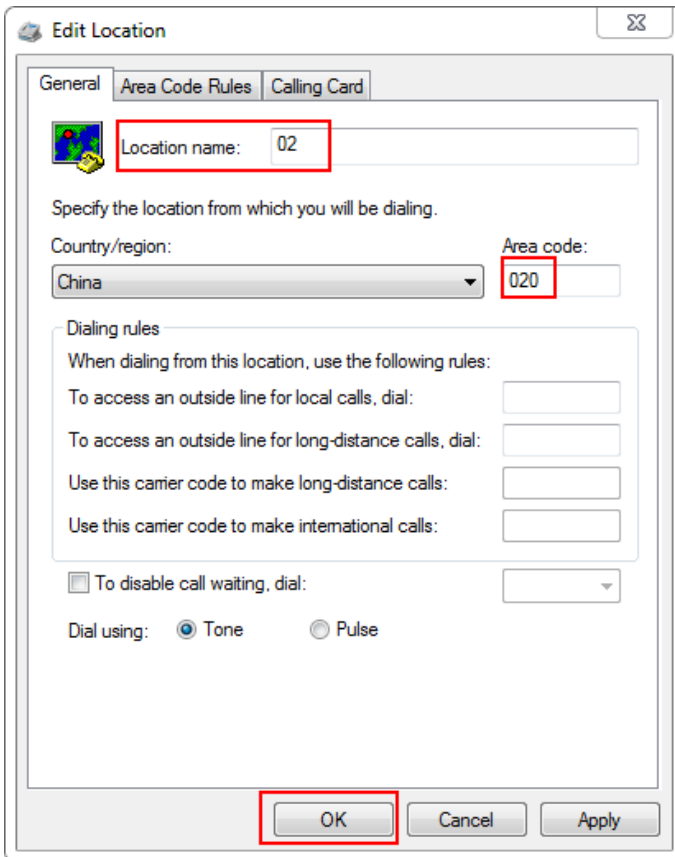


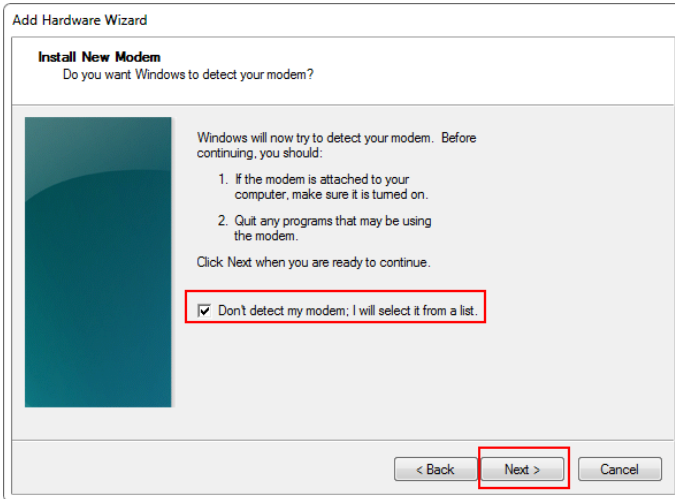
2. After the device USB is connected to the computer, check the identified serial port, right-click the Properties, and set the serial port rate.



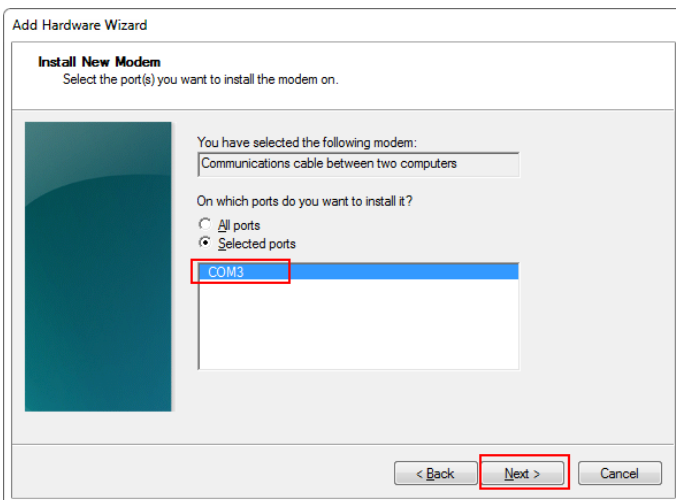
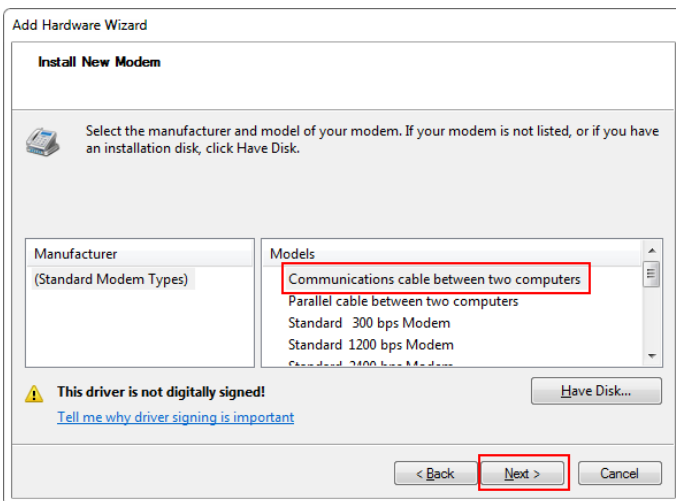
3. In the Control Panel, select Phone and Modem, add a modem.

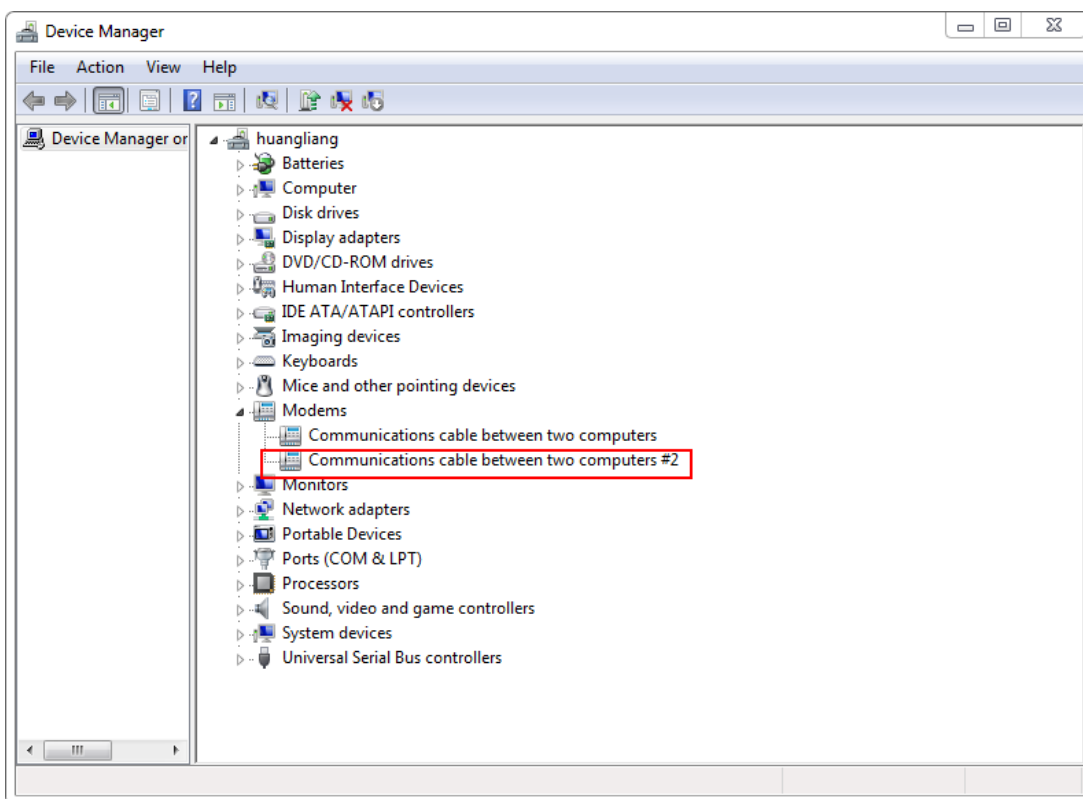
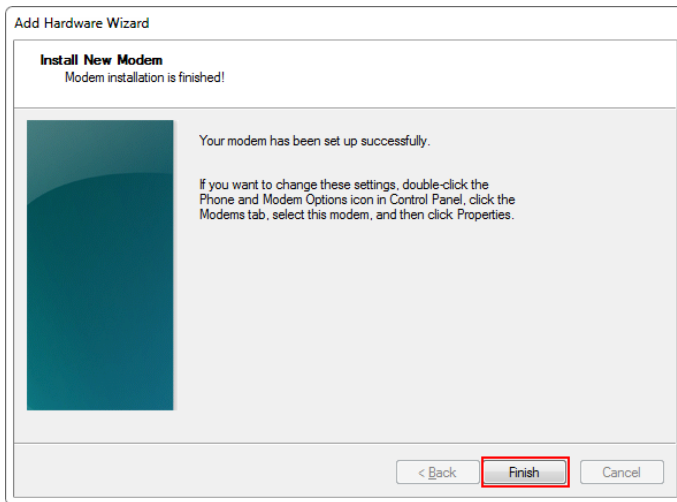




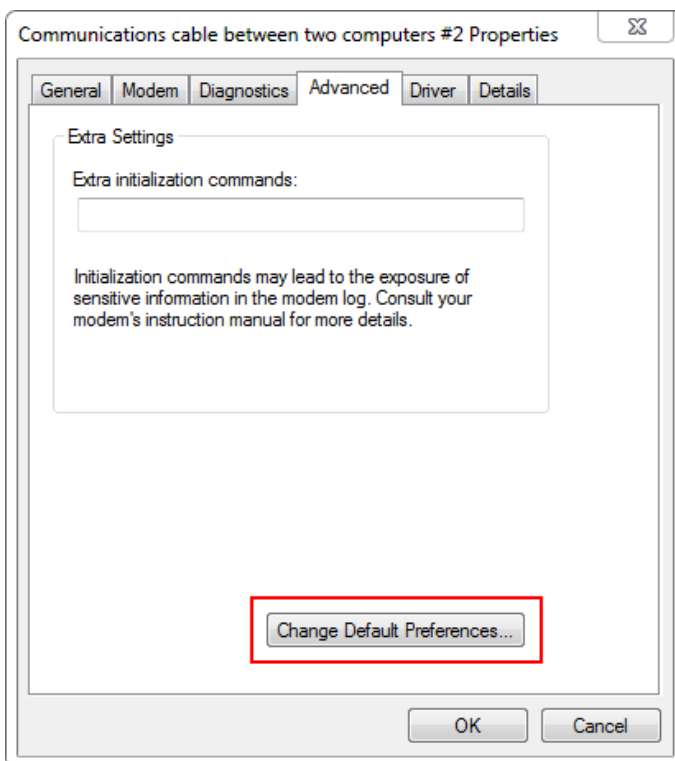
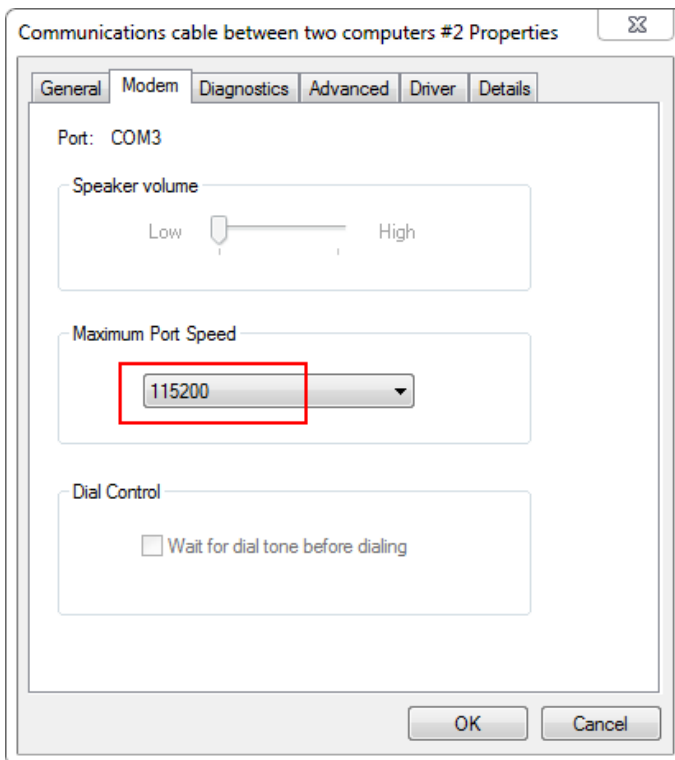


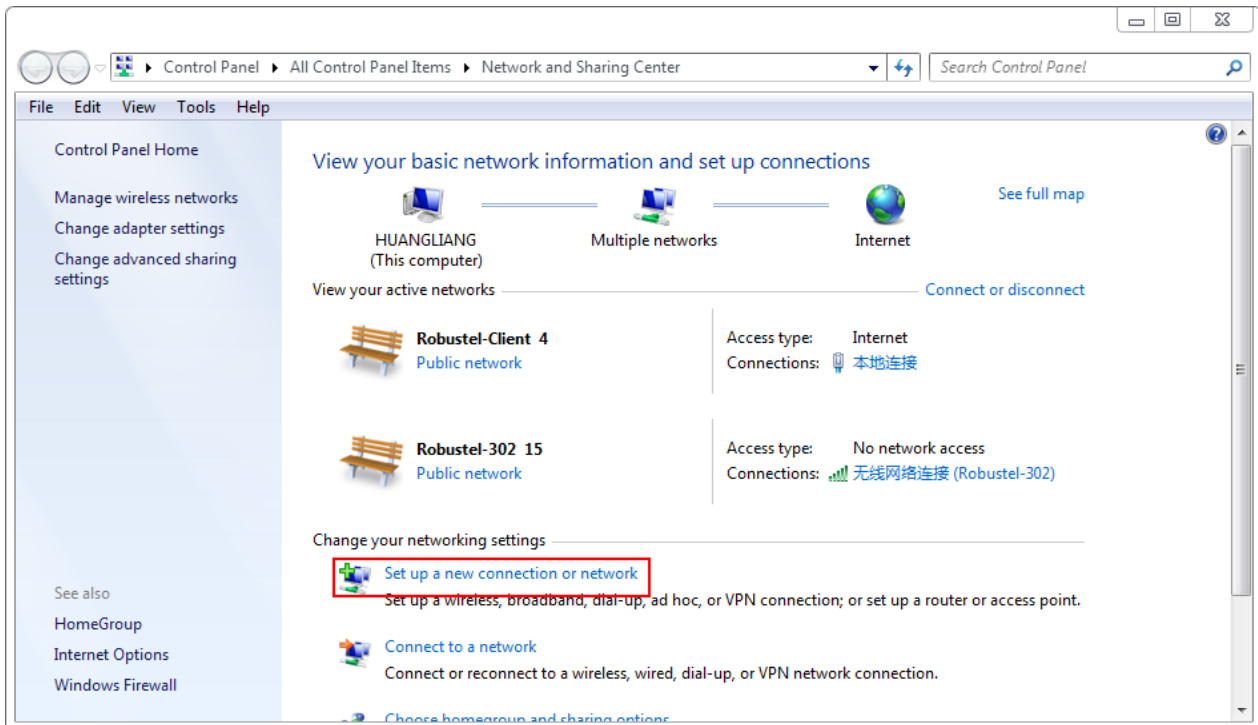
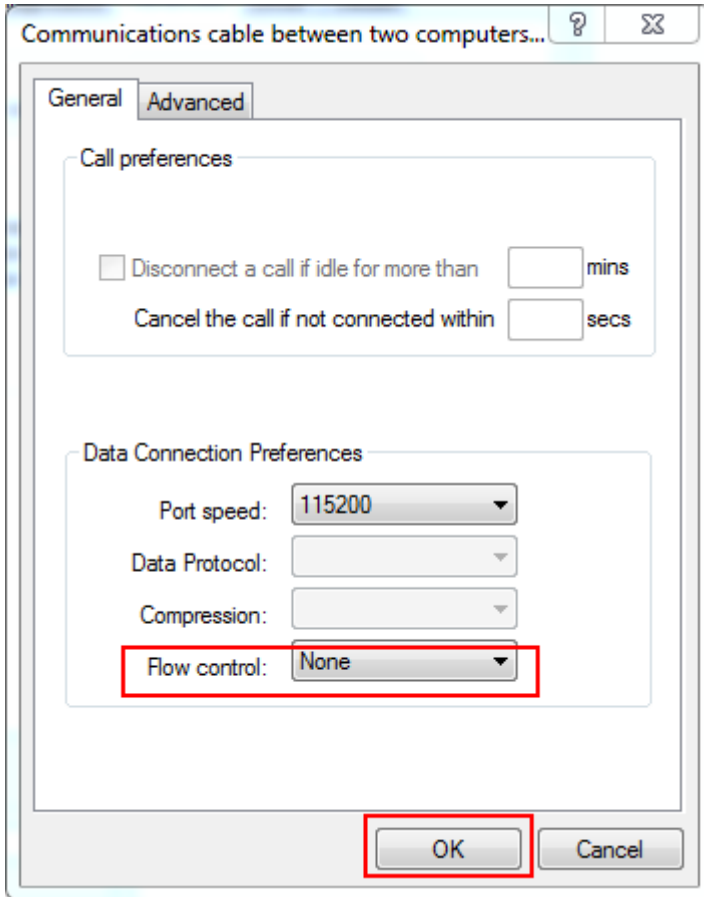
When the standard modem type list as shown below does not appear, you need to manually add the driver; please follow the readme operation tips under m1200_ppp_configure\usb_driver in the attachment. Please download from the official website or consult technical support for the corresponding attachments.

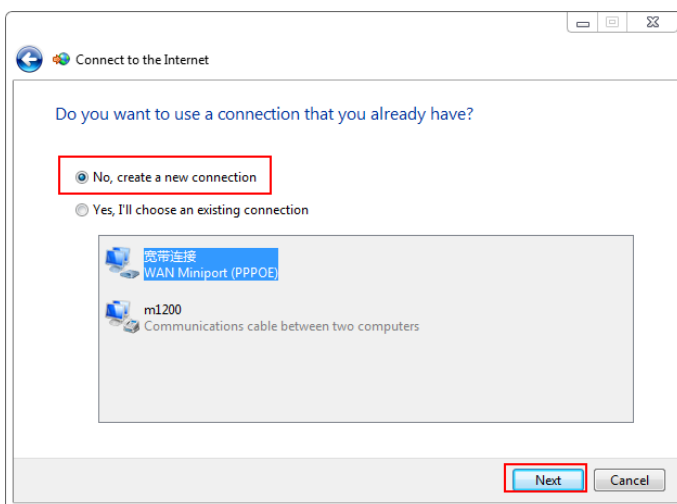
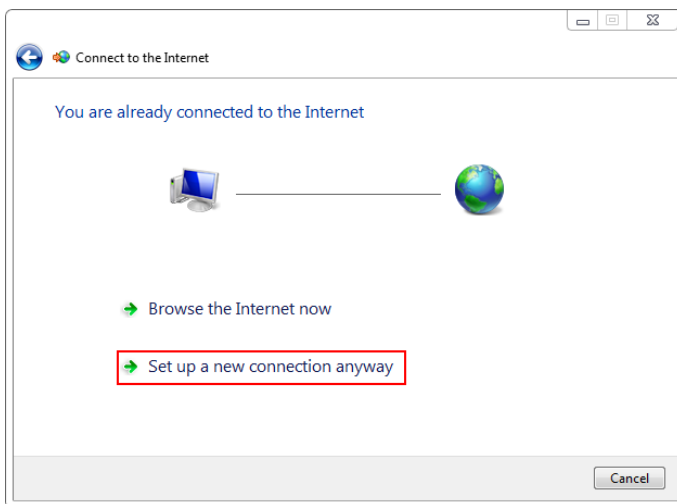
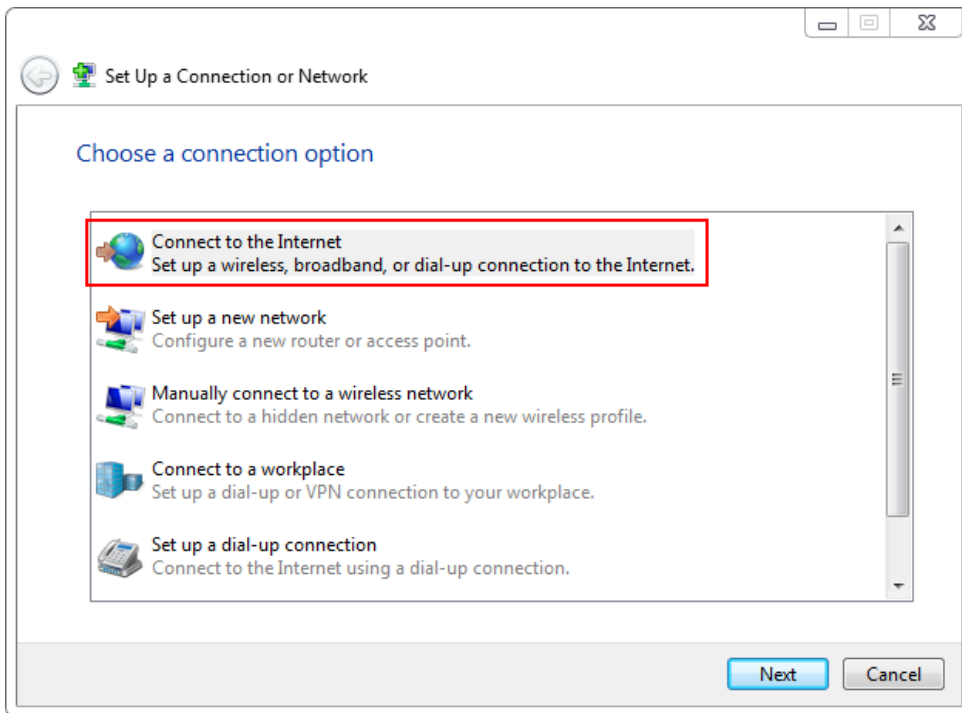


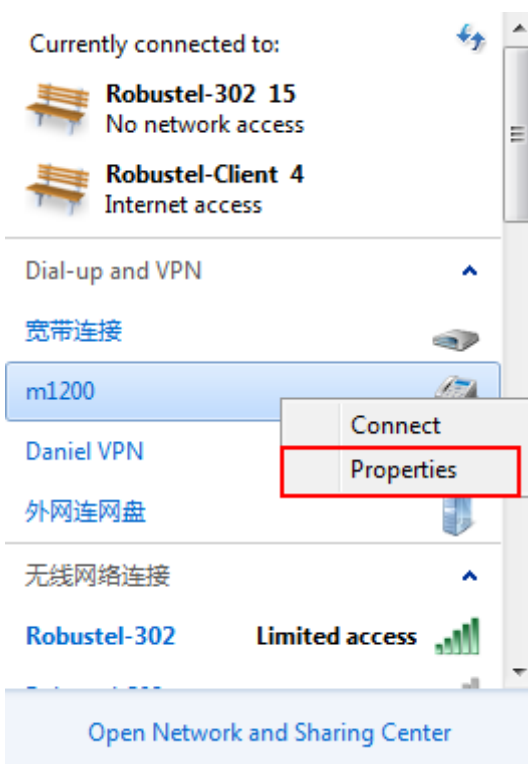
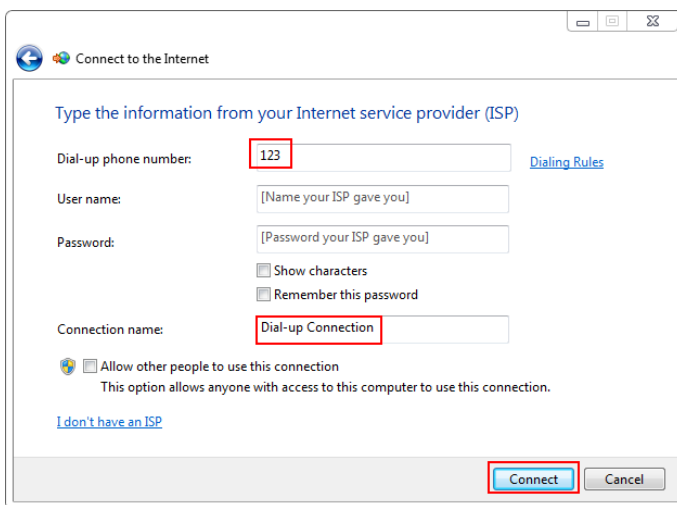
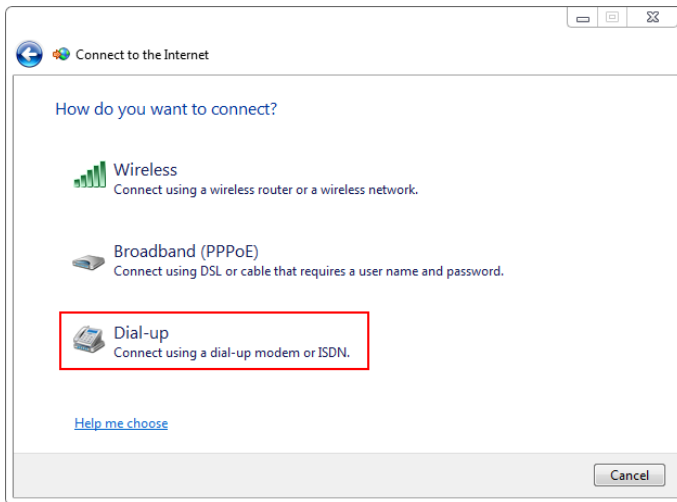


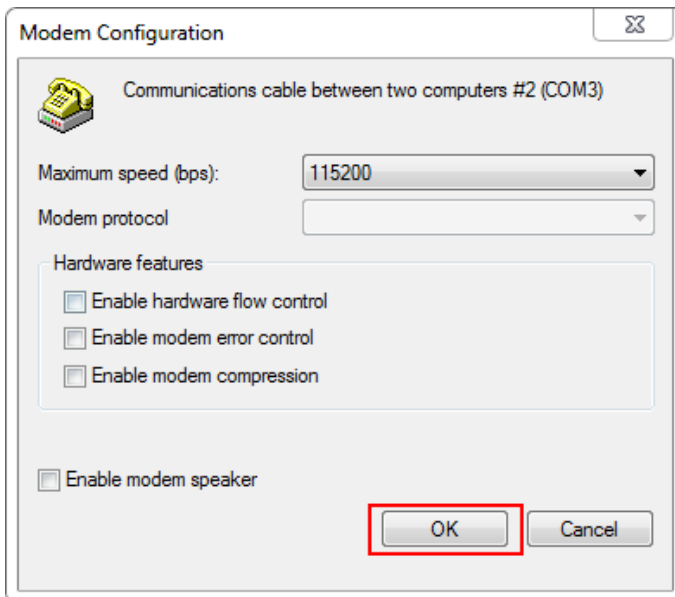
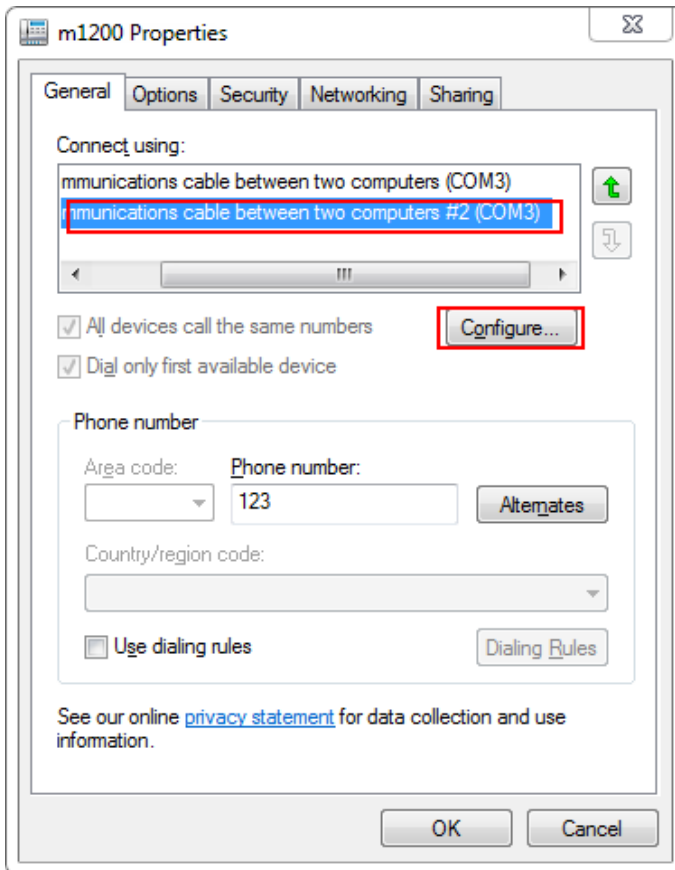
Right-click the Properties to configure it.

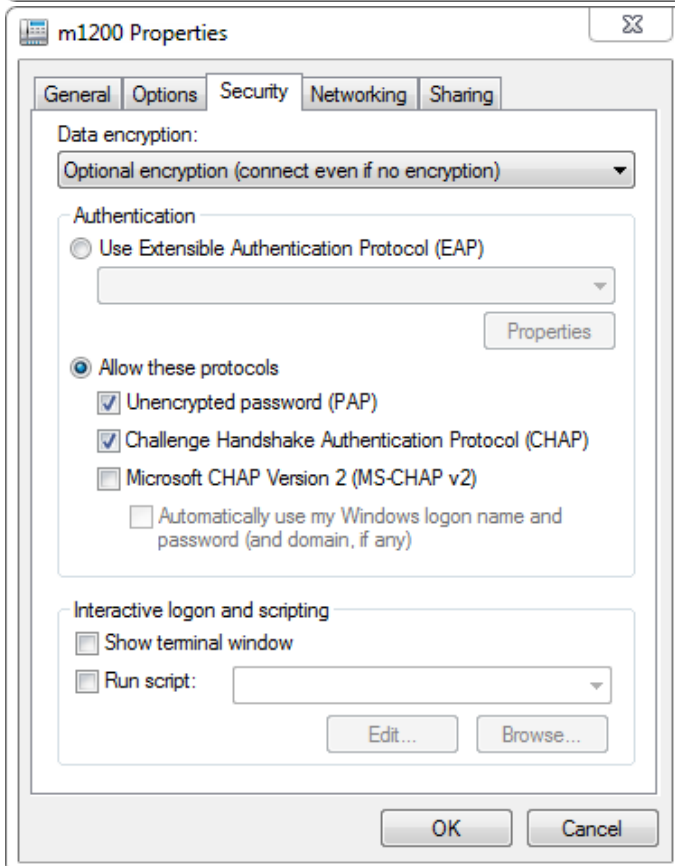
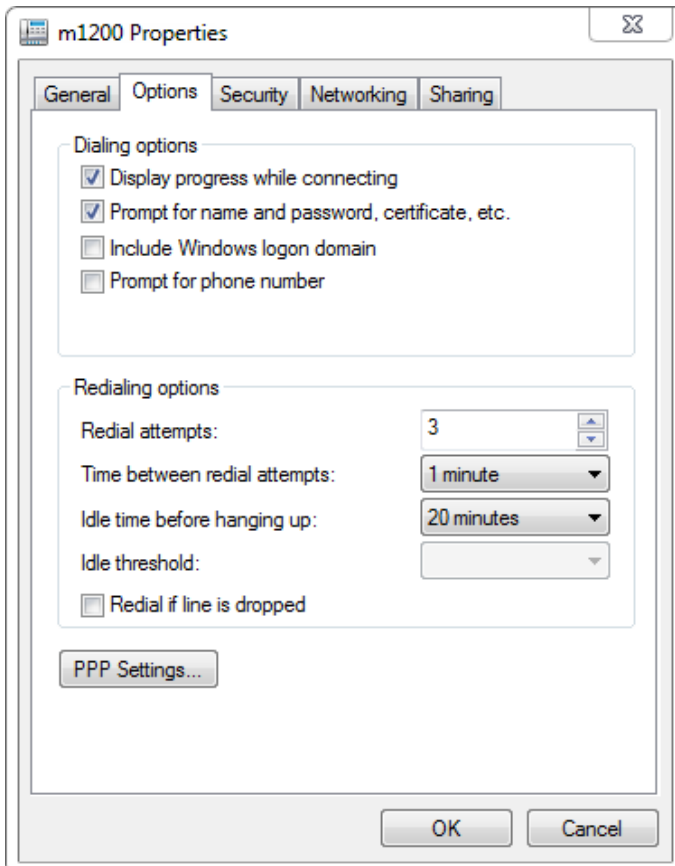


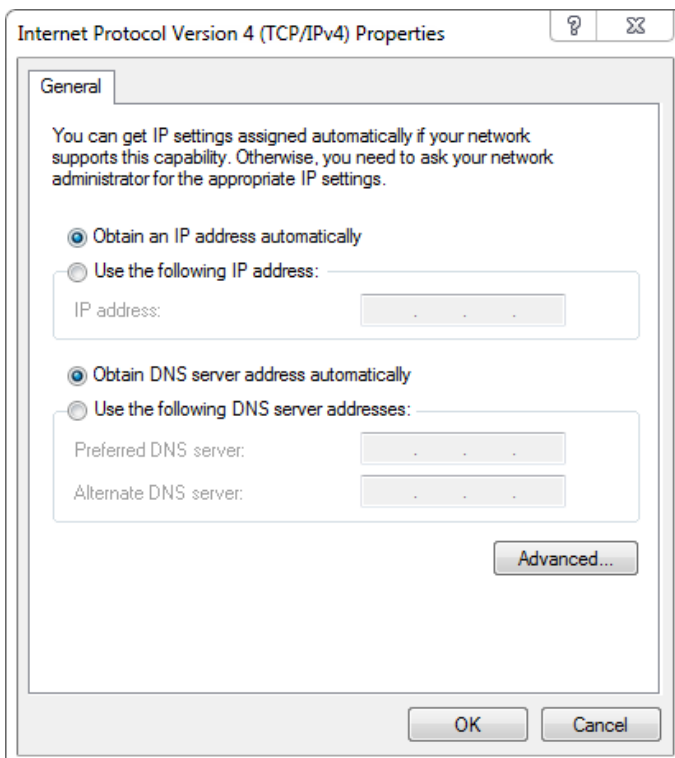
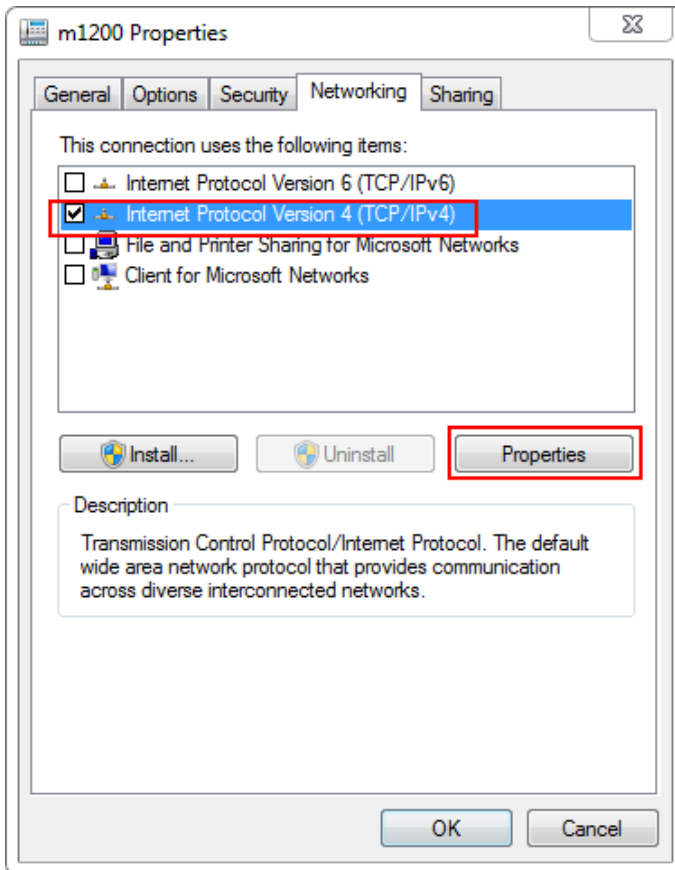


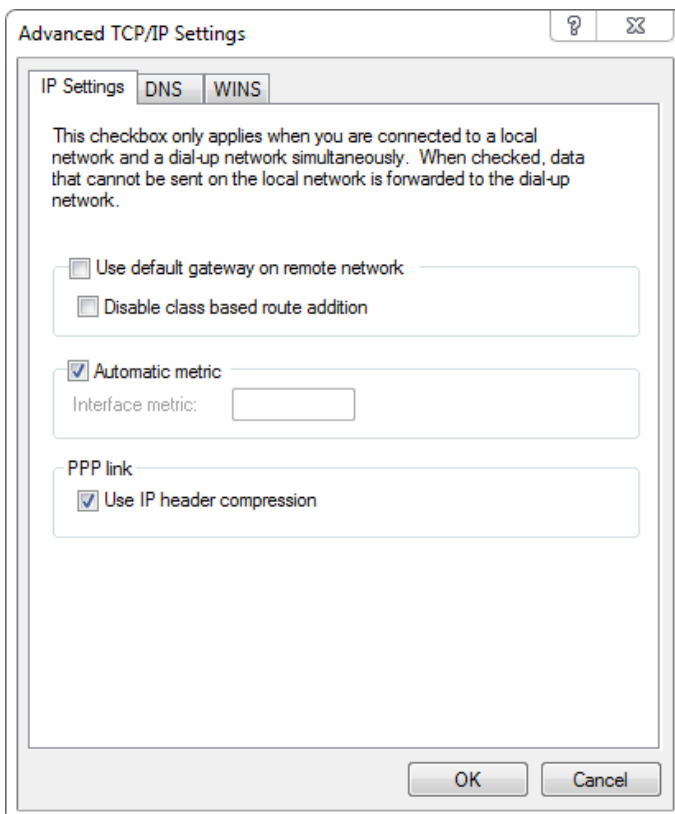
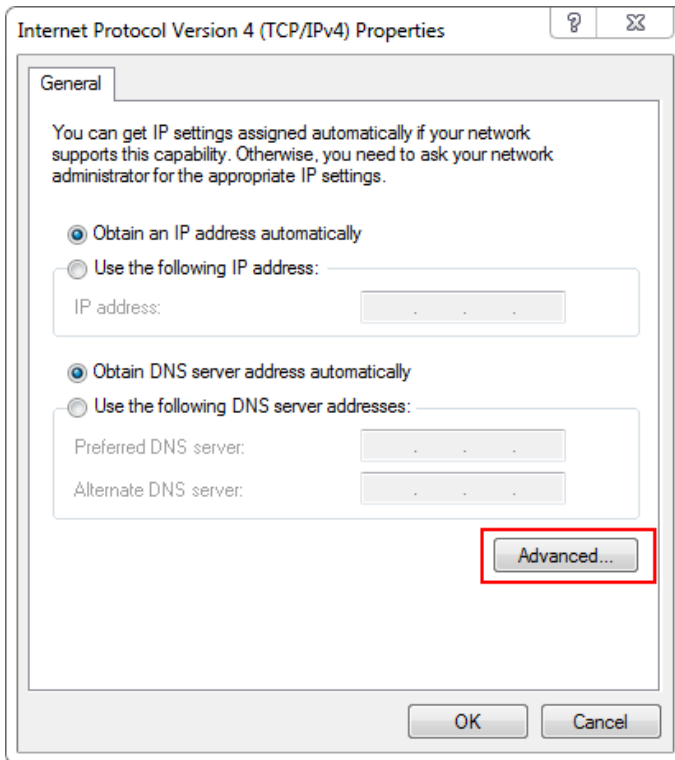














3. Click Connect to establish a connection with the device.
4. After dialing successfully, open it on the browser: 192.168.0.1.

3.2 Factory Default Settings

Before configuring your gateway, you need to know the following default settings.

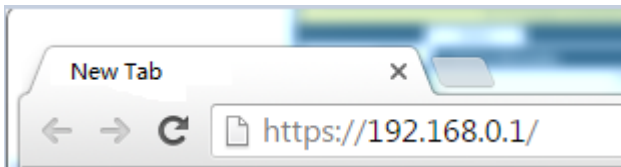
Item	Description
Username	admin
Password	admin

3.3 Log in the Gateway

To log in to the management page and view the configuration status of your gateway, please follow the steps below.

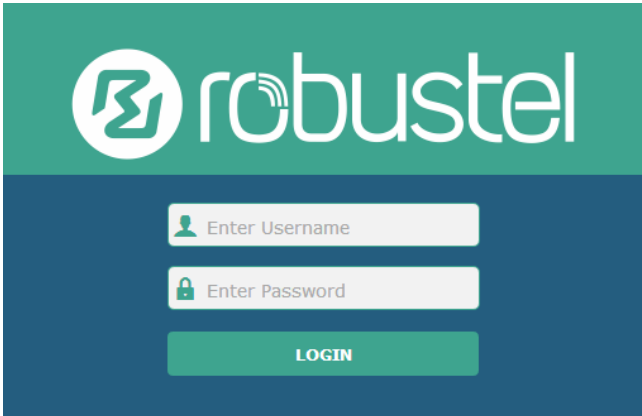
1. On your PC, open a web browser such as Internet Explorer, Google and Firebox, etc.
2. From your web browser, type the IP address of the gateway into the address bar and press enter. The default IP address of the gateway is 192.168.0.1, though the actual address may vary.

Note: If a SIM card with a public IP address is inserted in the gateway, enter this corresponding public IP address in the browser's address bar to access the gateway wirelessly.



- In the login page, enter the username and password, choose language and then click **LOGIN**. The default username and password are “admin”.

Note: If enter the wrong username or password over six times, the login web will be locked for 5 minutes.

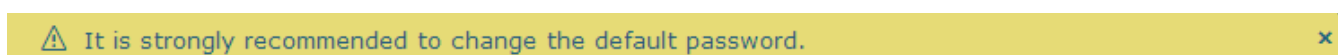


3.4 Control Panel

After logging in, the home page of the M1200’s web interface is displayed, for example.



Using the original password to log in the gateway, the page will pop up the following tab



It is strongly recommended for security purposes that you change the default username and/or password. To change your username and/or password, see **3.25 System > User Management**.

Control Panel		
Item	Description	Button
Save & Apply	Click to save the current configuration into gateway's flash and apply the modification on every configuration page, to make the modification taking effect.	Save & Apply
Reboot	Click to restart the gateway.	Reboot
Logout	Click to log the current user out safely.	Logout
Submit	Click to save the modification on current configuration page.	Submit
Cancel	Click to cancel the modification on current configuration page.	Cancel

Note: The steps of how to modify configuration are as bellow:

1. Modify in one page;
2. Click **Submit** under this page;
3. Modify in another page;
4. Click **Submit** under this page;
5. Complete all modification;
6. Click **Save & Apply**.

3.5 Status

This page allows you to view the System Information, Internet Status and LAN Status of your gateway.

System Information

^ System Information	
Device Model	m1200
System Uptime	0 days, 00:32:01
System Time	Tue Feb 27 10:21:44 2018 (NTP not updated)
RAM Usage	28M Free/64M Total
Firmware Version	1.0.0_0205beta (Rev 74)
Hardware Version	1.0
Kernel Version	3.10.106
Serial Number	

System Information	
Item	Description
Device Model	Show the model name of your device.
System Uptime	Show the current amount of time the gateway has been connected.
System Time	Show the current system time.
RAM Usage	Show the free memory and the total memory.
Firmware Version	Show the firmware version running on the gateway.
Hardware Version	Show the current hardware version.
Kernel Version	Show the current kernel version.
Serial Number	Show the serial number of your device.

Internet Status

^ Internet Status	
Active Link	WWAN1
Uptime	0 days, 01:12:38
IP Address	10.230.111.211/255.255.255.255
Gateway	10.64.64.64
DNS	120.80.80.80 221.5.88.88

Internet Status	
Item	Description
Active Link	Show the current active link.
Uptime	Show the current amount of time the link has been connected.
IP Address	Show the IP address of current link.
Gateway	Show the gateway address of the current link.
DNS	Show the current primary DNS server and secondary server.

3.6 Interface > Link Manager

This section allows you to setup the link connection.

Link Manager
Status

^ General Settings

Primary Link

WWAN1

v
?

Backup Link

WWAN2

v

Backup Mode

Cold Backup

v
?

Revert Interval

0

?

Emergency Reboot

ON

OFF



?

General Settings @ Link Manager		
Item	Description	Default
Primary Link	Select from "WWAN1" or "WWAN2". <ul style="list-style-type: none"> WWAN1: Select to make SIM1 as the primary wireless link WWAN2: Select to make SIM2 as the primary wireless link 	WWAN1
Backup Link	Select from "WWAN1", "WWAN2", or "None". <ul style="list-style-type: none"> WWAN1: Select to make SIM1 as backup wireless link WWAN2: Select to make SIM2 as backup wireless link None: Do not select any backup link 	WWAN2
Backup Mode	Can only select from "Cold Backup". <ul style="list-style-type: none"> Cold Backup: The inactive link is offline on standby 	Cold Backup
Revert Interval	Specify the number of minutes that elapses before the primary link is checked if a backup link is being used in cold backup mode. 0 means disable checking.	0
Emergency Reboot	Click the toggle button to enable/disable this option. Enable to reboot the whole system if no links available.	OFF

Note: Click  for help.

Link Settings allows you to configure the parameters of link connection, including WWAN1/WWAN2, WAN and WLAN. It is recommended to enable Ping detection to keep the gateway always online. The Ping detection increases the reliability and also costs the data traffic.

^ Link Settings

Index	Type	Description	Connection Type	
1	WWAN1		DHCP	
2	WWAN2		DHCP	

Click on the right-most of WWAN1/WWAN2 to enter the configuration window.

WWAN1/WWAN2

^ Link Settings			
Index	Type	Description	Connection Type
1	WWAN1		DHCP
2	WWAN2		DHCP

The window is displayed as below when enabling the “Automatic APN Selection” option.

^ WWAN Settings

Automatic APN Selection ON OFF

Dialup Number

Authentication Type

Switch SIM By Data Allowance ON OFF ?

Data Allowance ?

Billing Day ?

The window is displayed as below when disabling the “Automatic APN Selection” option.

^ WWAN Settings

Automatic APN Selection ON OFF

APN

Username

Password

Dialup Number

Authentication Type

Switch SIM By Data Allowance ON OFF ?

Data Allowance ?

Billing Day ?

^ Ping Detection Settings
?

Enable ON OFF

Primary Server

Secondary Server

Interval ?

Retry Interval ?

Timeout ?

Max Ping Tries ?

^ Advanced Settings

NAT Enable ON OFF

Upload Bandwidth ?

Download Bandwidth

Overridden Primary DNS

Overridden Secondary DNS

Debug Enable ON OFF

Verbose Debug Enable ON OFF

Link Settings (WWAN)		
Item	Description	Default
General Settings		
Index	Indicate the ordinal of the list.	--
Type	Show the type of the link.	WWAN1
Description	Enter a description for this link.	Null
WWAN Settings		
Automatic APN Selection	Click the toggle button to enable/disable the “Automatic APN Selection” option. After enabling, the device will recognize the access point name automatically. Alternatively, you can disable this option and manually add the access point name.	ON
APN	Enter the Access Point Name for cellular dial-up connection, provided by local ISP.	internet
Username	Enter the username for cellular dial-up connection, provided by local ISP.	Null
Password	Enter the password for cellular dial-up connection, provided by local ISP.	Null
Dialup Number	Enter the dialup number for cellular dial-up connection, provided by local ISP.	*99***1#
Authentication Type	Select from “Auto”, “PAP” or “CHAP” as the local ISP required.	Auto
Switch SIM By Data Allowance	Click the toggle button to enable/disable this option. After enabling, it will switch to another SIM when the data limit reached. Note: Only used for dual-SIM backup.	OFF

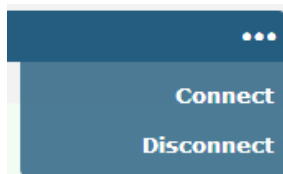
Link Settings (WWAN)		
Item	Description	Default
Data Allowance	Set the monthly data traffic limitation. The system will record the data traffic statistics when data traffic limitation (MiB) is specified. The traffic record will be displayed in Interface > Link Manager > Status > WWAN Data Usage Statistics . 0 means disable data traffic record.	0
Billing Day	Specify the monthly billing day. The data traffic statistics will be recalculated from that day.	1
Ping Detection Settings		
Enable	Click the toggle button to enable/disable the ping detection mechanism, a keepalive policy of the gateway.	ON
Primary Server	Gateway will ping this primary address/domain name to check that if the current connectivity is active.	8.8.8.8
Secondary Server	Gateway will ping this secondary address/domain name to check that if the current connectivity is active.	114.114.114.114
Interval	Set the ping interval.	300
Retry Interval	Set the ping retry interval. When ping failed, the gateway will ping again every retry interval.	5
Timeout	Set the ping timeout.	3
Max Ping Tries	Set the max ping tries. Switch to another link or take emergency action if the max continuous ping tries reached.	3
Advanced Settings		
Overridden Primary DNS	Override primary DNS will override the automatically obtained DNS.	Null
Overridden Secondary DNS	Override secondary DNS will override the automatically obtained DNS.	Null
Debug Enable	Click the toggle button to enable/disable this option. Enable for debugging information output.	ON
Verbose Debug Enable	Click the toggle button to enable/disable this option. Enable for verbose debugging information output.	OFF

Status

This page allows you to view the status of link connection and clear the monthly data usage statistics.

^ Link Status ...				
Index	Link	Status	Uptime	IP Address
1	WWAN1	Connected	0 days, 01:23:30	10.230.111.211/255.255.255.255
2	WWAN2	Disconnected		

Click the right-most button ... to select the connection status of the current link.



Click the row of the link, and it will show the details information of the current link connection under the row.

^ Link Status ...				
Index	Link	Status	Uptime	IP Address
1	WWAN1	Connected	0 days, 01:23:30	10.230.111.211/255.255.255.255
Index 1 Link WWAN1 Status Connected Interface wwan Uptime 0 days, 01:23:30 IP Address 10.230.111.211/255.255.255.255 Gateway 10.64.64.64 DNS 120.80.80.80 221.5.88.88 RX Packets 39 TX Packets 41 RX Bytes 2121 TX Bytes 2181				
2	WWAN2	Disconnected		

^ WWAN Data Usage Statistics	
WWAN1 Monthly Stats	Clear
WWAN2 Monthly Stats	Clear

Click the Clear button to clear SIM1 or SIM2 monthly data traffic usage statistics. Data statistics will be displayed only if enable the Data Allowance function in **Interface > Link Manager > Link Settings > WWAN Settings > Data Allowance**.

3.7 Interface > Cellular

This section allows you to set the related parameters of Cellular. M1200 has two SIM card slots, but do not support two SIM cards online simultaneously due to its single-module design. If insert single SIM card at the first time, SIM1 slot and SIM2 slots are available.

Index	SIM Card	Phone Number	Network Type	Band Select Type	
1	SIM1		Auto	All	
2	SIM2		Auto	All	

Click of SIM 1 to edit the parameters.

Cellular

^ General Settings

Index

SIM Card

Phone Number

PIN Code ?

Extra AT Cmd ?

Telnet Port ?

The window is displayed as below when choosing "Auto" as the network type.

^ Cellular Network Settings

Network Type ?

Band Select Type ?

^ Advanced Settings

Debug Enable ON OFF

Verbose Debug Enable ON OFF

The window is displayed as below when choosing "Specify" as the band select type.

^ Cellular Network Settings

Network Type ?

Band Select Type ?

^ Band Settings

GSM 850	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
GSM 900	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
GSM 1800	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
GSM 1900	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
WCDMA 800	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
WCDMA 850	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
WCDMA 900	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
WCDMA 1900	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
WCDMA 2100	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF

^ Advanced Settings

Debug Enable	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
Verbose Debug Enable	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF

Cellular		
Item	Description	Default
General Settings		
Index	Indicate the ordinal of the list.	--
SIM Card	Show the currently editing SIM card.	SIM1
Phone Number	Enter the phone number of the SIM card.	Null
PIN Code	Enter a 4-8 characters PIN code used for unlocking the SIM.	Null
Extra AT Cmd	Enter the AT commands used for cellular initialization.	Null
Telnet Port	Specify the Port listening of telnet service, used for AT over Telnet.	0
Cellular Network Settings		
Network Type	Select from "Auto", "2G Only", "2G First", "3G Only", "3G First". <ul style="list-style-type: none"> Auto: Connect to the best signal network automatically 2G Only: Only the 2G network is connected 2G First: Connect to the 2G Network preferentially 3G Only: Only the 3G network is connected 3G First: Connect to the 3G Network preferentially 	Auto
Band Select Type	Select from "All" or "Specify". You may choose certain bands if choosing "Specify".	All
Advanced Settings		
Debug Enable	Click the toggle button to enable/disable this option. Enable for debugging information output.	ON
Verbose Debug Enable	Click the toggle button to enable/disable this option. Enable for verbose debugging information output.	OFF

This section allows you to view the status of the cellular connection.

Cellular	Status	AT Debug		
^ Status				
Index	Modem Status	Modem Model	IMSI	Registration
1	Ready	UC20	460015896619780	Registered to home network

Click the row of status, the details status information will be displayed under the row.

^ Status				
Index	Modem Status	Modem Model	IMSI	Registration
1	Ready	UC20	460015896619780	Registered to home net...
<p>Index 1</p> <p>Modem Status Ready</p> <p>Modem Model UC20</p> <p>Current SIM SIM1</p> <p>Phone Number</p> <p>IMSI 460015896619780</p> <p>Registration Registered to home network</p> <p>Network Provider CHN-UNICOM</p> <p>Network Type WCDMA</p> <p>Signal Strength 19 (-75dBm)</p> <p>Bit Error Rate 99</p> <p>PLMN ID 46001</p> <p>Local Area Code A507</p> <p>Cell ID 1476286</p> <p>IMEI 867060030689273</p> <p>Firmware Version UC20GQBR03A14E1G</p>				

Status	
Item	Description
Index	Indicate the ordinal of the list.
Modem Status	Show the status of the radio module.
Modem Model	Show the model of the radio module.
Current SIM	Show the SIM card that your gateway is using.
Phone Number	Show the phone number of the current SIM. Note: This option will be displayed if enter manually in Cellular > Advanced Cellular Settings > SIM1/SIM2 > General Settings > Phone Number.
IMSI	Show the IMSI number of the current SIM.
Registration	Show the current network status.
Network Provider	Show the name of Network Provider.
Network Type	Show the current network service type, e.g. WCDMA.

Status	
Item	Description
Signal Strength	Show the signal strength detected by the mobile.
Bit Error Rate	Show the current bit error rate.
PLMN ID	Show the current PLMN ID.
Local Area Code	Show the current local area code used for identifying different area.
Cell ID	Show the current cell ID used for locating the gateway.
IMEI	Show the IMEI (International Mobile Equipment Identity) number of the radio module.
Firmware Version	Show the current firmware version of the radio module.

This page allows you to check the AT Debug.

Cellular
Status
AT Debug

^ AT Debug

Command

Result

AT Debug		
Item	Description	Default
Command	Enter the AT command that you want to send to cellular module in this text box.	Null
Result	Show the AT command responded by cellular module in this text box.	Null
<input style="background-color: #2e7d32; color: white; padding: 2px 10px; border: none;" type="button" value="Send"/>	Click the button to send AT command.	--

3.8 Interface > DIDO

This section allows you to set the DI and DO parameters. Digital Input and Digital Output are the specific interfaces for M1200. The DI interface can be used for triggering alarm, while the DO can be used for controlling the slave device so as to realize real-time monitoring.

DI

DI	DO	Status		
^ DI Settings				
Index	Enable	Mode	Inversion	
1	false	ON-OFF	false	
2	false	ON-OFF	false	

Click the right-most button of index 1 as below. The default mode is “ON-OFF”.

DI

^ General Settings

Index:

Enable: ON OFF

Mode: v

Inversion: ON OFF

Alarm On Content:

Alarm Off Content:

The window is displayed as below when choosing “Counter” as the mode.

^ General Settings

Index:

Enable: ON OFF

Mode: v

Inversion: ON OFF

Threshold Value:

Alarm On Content:

Alarm Off Content:

General Settings @ DI		
Item	Description	Default
Index	Indicate the ordinal of the list.	--
Enable	Click the toggle button to enable/disable this DI.	OFF
Mode	Select from “ON-OFF” or “Counter”.	ON-OFF

General Settings @ DI		
Item	Description	Default
	<ul style="list-style-type: none"> ON-OFF: DI interface support ON and OFF mode (high or low level electrical) trigger DI alarm. The mode default to ON, and OFF mode is available only when enabling the inversion feature ON—Under this mode, DI alarm status will be triggered to ON when DI interface open from GND or input a high level electrical (logic 1), on the contrary DI alarm status will be trigged to OFF when DI interface connect to GND or input a low level electrical (logic 0) OFF—Under this mode, DI alarm status will be triggered to ON when DI interface connect to GND or input a low level electrical (logic 0), on the contrary DI alarm status will be trigged to OFF when DI interface open from GND or input a high level electrical (logic 1) Counter: Event counter mode 	
Inversion	Click the toggle button to enable/disable this option. Enable to set DI mode as OFF mode.	OFF
Threshold Value	Set the threshold vale. It will trigger alarm when event counter reaches this figure. After triggering alarm, DI will keep counting but not trigger alarm again. Enter 0 to 65535 digits. (0=will not trigger alarm) Note: This option is only available when DI under the “Counter” mode.	Null
Alarm on Content	When alarm is on, show its content	Alarm On
Alarm off Content	When alarm is off, show its content.	Alarm Off

Note: It defaults as high alarm, while turns to low alarm after enabling the “Inversion” button.

DO

DI	DO	Status			
^ DO Settings					
Index	Enable	Alarm On Action	Alarm Off Action	Initial State	Alarm Source
1	false	High	Low	Last	DI1 Alarm

Click to enter the DO configuration window.

DO

^ General Settings

Index:

Enable:

Alarm On Action:

Alarm Off Action:

Initial State:

Delay:

Hold Time:

Alarm Source:

The window is displayed as below when choosing “Pulse” as the alarm on action.

DO

^ **General Settings**

Index

Enable ON OFF

Alarm On Action v

Alarm Off Action v

Initial State v

Delay ?

Hold Time ?

Low-level Width ?

High-level Width ?

Alarm Source v

The window is displayed as below when choosing “Pulse” as the alarm off action.

^ **General Settings**

Index

Enable ON OFF

Alarm On Action v

Alarm Off Action v

Initial State v

Delay ?

Hold Time ?

Low-level Width ?

High-level Width ?

Alarm Source v

General Settings @ DO		
Item	Description	Default
Index	Indicate the ordinal of the list.	--
Enable	Click the toggle button to enable/disable this DO.	OFF
Alarm On Action	Digital Output initiates when there is an alarm. Selected from “High”, “Low” or “Pulse”. <ul style="list-style-type: none"> High: a high electrical level output Low: a low electrical level output Pulse: Generates a square wave as specified in the pulse mode parameters when triggered 	High

General Settings @ DO		
Item	Description	Default
Alarm Off Action	Digital Output initiates when alarm removed. Selected from “High”, “Low” or “Pulse”. <ul style="list-style-type: none"> High: a high electrical level output Low: a low electrical level output Pulse: Generates a square wave as specified in the pulse mode parameters when triggered 	Low
Initial State	Specify the Digital Output status when powered on. Selected from “Last”, “High” or “Low”. <ul style="list-style-type: none"> Last: DO’s status will consist with the status of last power off High: DO interface is in high electrical level Low: DO interface is in low electrical level 	Low
Delay	Set the delay time for DO alarm start-up. The first pulse will be generated after a “Delay”. Enter from 0 to 30000ms. (0=generate pulse without delay)	0
Hold Time	Set the hold time of DO status (Alarm On Action/Alarm Off Action). When the action time reach this specified time, DO will stop the action. Enter from 0 to 255 seconds. (0=keep on until the next action)	0
Low-level Width	Set the low-level width. It is available when enabling Pulse as “Alarm On Action/Alarm Off Action”. In Pulse Output mode, the selected digital output channel will generate a square wave as specified in the pulse mode parameters. The low level widths are specified here. Enter from 1 to 300000 ms.	10
High-level Width	Set the high-level width. It is available when enabling Pulse as “Alarm On Action/Alarm Off Action”. In Pulse Output mode, the selected digital output channel will generate a square wave as specified in the pulse mode parameters. The high level widths are specified here. Enter from 1 to 300000 ms.	10
Alarm Source	Digital Output initiates according to different alarm source. Selected from “DI1 Alarm”, “DI2 Alarm”. DI1/DI2 Alarm: Digital Output triggers the related action when there is alarm from Digital Input.	DI1 Alarm

Status

This window allows you to view the status of DO and DI interfaces. It also can clear the counter alarm of DI in here. Click **Clear** button to clear DI1 or DI2 monthly usage statistics info for counter alarm.

DI	DO	Status	
^ DI Status			
Index	Level	Status	Count
1	High	Alarm off	
2	High	Alarm off	
^ Action Of Clear			
		Counter Alarm Of DI 1	Clear
		Counter Alarm Of DI 2	Clear
^ DO Status			
Index	Level	Low-level Width	High-level Width
1	Low		

Click one row to view.

^ DI Status			
Index	Level	Status	Count
1	High	Alarm off	
Index 1 Level High Status Alarm off Count			
2	High	Alarm off	

3.9 Interface > Serial Port

This section allows you to set the serial port parameters. M1200 supports one RS-232s and one RS-485. Serial port provides a way to transfer serial data to IP data, or vice versa, and transmit these data via wired or wireless network to achieve data transparent transmission.

Serial Port	Status			
^ Serial Port Settings				
Index	Port	Enable	Baud Rate	Application Mode
1	COM1	false	115200	Transparent
2	COM2	false	115200	Transparent

Click the edit button of COM1.

Serial Port

Serial Port Application Settings

Index	<input type="text" value="1"/>
Port	<input type="text" value="COM1"/>
Enable	<input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF
Baud Rate	<input type="text" value="115200"/>
Data Bits	<input type="text" value="8"/>
Stop Bits	<input type="text" value="1"/>
Parity	<input type="text" value="None"/>
Flow Control	<input type="text" value="None"/>

Data Packing

Packing Timeout	<input type="text" value="50"/>	<input style="font-size: 1em; border: none; padding: 0 5px;" type="button" value="?"/>
Packing Length	<input type="text" value="1200"/>	

Server Setting

Application Mode	<input type="text" value="Transparent"/>
Protocol	<input type="text" value="TCP Client"/>
Server Address	<input type="text"/>
Server Port	<input type="text"/>

- The window is displayed as below when choosing “Transparent” as the application mode and “TCP Client” as the protocol.

Server Setting

Application Mode	<input type="text" value="Transparent"/>
Protocol	<input type="text" value="TCP Client"/>
Server Address	<input type="text"/>
Server Port	<input type="text"/>

The window is displayed as below when choosing “Transparent” as the application mode and “TCP Server” as the protocol.

Server Setting

Application Mode	<input type="text" value="Transparent"/>
Protocol	<input type="text" value="TCP Server"/>
Local IP	<input type="text"/>
Local Port	<input type="text"/>

The window is displayed as below when choosing “Transparent” as the application mode and “UDP” as the protocol.

^ Server Setting

Application Mode	Transparent	v
Protocol	UDP	v
Local IP	<input type="text"/>	
Local Port	<input type="text"/>	
Server Address	<input type="text"/>	
Server Port	<input type="text"/>	

- The window is displayed as below when choosing “Modbus RTU Gateway” as the application mode and “TCP Client” as the protocol.

^ Server Setting

Application Mode	Modbus RTU Gatewa	v
Protocol	TCP Client	v
Server Address	<input type="text"/>	
Server Port	<input type="text"/>	

The window is displayed as below when choosing “Modbus RTU Gateway” as the application mode and “TCP Server” as the protocol.

^ Server Setting

Application Mode	Modbus RTU Gatewa	v
Protocol	TCP Server	v
Local IP	<input type="text"/>	
Local Port	<input type="text"/>	

The window is displayed as below when choosing “Modbus RTU Gateway” as the application mode and “UDP” as the protocol.

^ Server Setting

Application Mode	Modbus RTU Gatewa	v
Protocol	UDP	v
Local IP	<input type="text"/>	
Local Port	<input type="text"/>	
Server Address	<input type="text"/>	
Server Port	<input type="text"/>	

- The window is displayed as below when choosing “Modbus ASCII Gateway” as the application mode and “TCP Client” as the protocol.

^ Server Setting

Application Mode

Protocol

Server Address

Server Port

The window is displayed as below when choosing “Modbus ASCII Gateway” as the application mode and “TCP Server” as the protocol.

^ Server Setting

Application Mode

Protocol

Local IP

Local Port

The window is displayed as below when choosing “Modbus ASCII Gateway” as the application mode and “UDP” as the protocol.

^ Server Setting

Application Mode

Protocol

Local IP

Local Port

Server Address

Server Port

Serial Port		
Item	Description	Default
Serial Port Application Settings		
Index	Indicate the ordinal of the list.	--
Port	Show the current serial’s name, read only.	--
Enable	Click the toggle button to enable/disable this serial port. When the status is OFF, the serial port is not available.	OFF
Baud Rate	Select from “300”, “600”, “1200”, “2400”, “4800”, “9600”, “19200”, “38400”, “57600”, “115200” or “230400”.	115200
Data Bits	Select from “7” or “8”.	8
Stop Bits	Select from “1” or “2”.	1
Parity	Select from “None”, “Odd” or “Even”.	None
Data Packing		
Packing Timeout	Set the packing timeout. The serial port will queue the data in the buffer and send the data to the Cellular WAN/Ethernet WAN	50

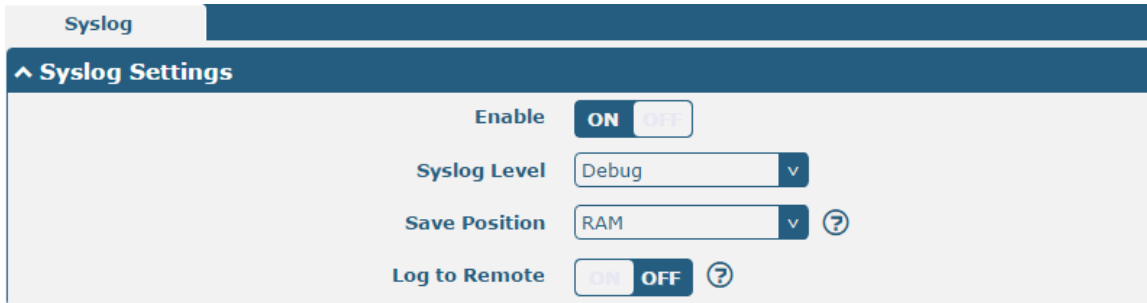
Serial Port		
Item	Description	Default
	when it reaches the Interval Timeout in the field. Note: Data will also be sent as specified by the packet length even when data is not reaching the interval timeout in the field.	
Packing Length	Set the packet length. The Packet length setting refers to the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. When a packet length between 1 and 3000 bytes is specified, data in the buffer will be sent as soon it reaches the specified length.	1200
Server Setting		
Application Mode	Select from “Transparent”, “Modbus RTU Gateway” or “Modbus ASCII Gateway”. <ul style="list-style-type: none"> Transparent: gateway will transmit the serial data transparently Modbus RTU Gateway: gateway will translate the Modbus RTU data to Modbus TCP data and sent out, and vice versa Modbus ASCII Gateway: gateway will translate the Modbus ASCII data to Modbus TCP data and sent out, and vice versa 	Transparent
Protocol	Select from “TCP Client”, “TCP Server” or “UDP”. <ul style="list-style-type: none"> TCP Client: Gateway works as TCP client, initiate TCP connection to TCP server. Server address supports both IP and domain name TCP Server: Gateway works as TCP server, listening for connection request from TCP client UDP: Gateway works as UDP client 	TCP Client
Server Address	Enter the address of server which will receive the data sent from gateway’s serial port. IP address or domain name will be available.	Null
Server Port	Enter the specified port of server which is used for receiving the serial data.	Null
Local IP	Enter the IP of TCP or UDP.	Null
Local Port	Enter the port of TCP or UDP.	Null

Click the “Status” column to view the current serial port type.

Serial Port	Status			
^ Serial Port Status				
Index	Type	TX	RX	Connection Status
1	RS232	0B	0B	
2	RS485	0B	0B	

3.10 Services > Syslog

This section allows you to set the syslog parameters. The system log of the gateway can be saved in the local, also supports to be sent to remote log server and specified application debugging. By default, the “Log to Remote” option is disabled.



The window is displayed as below when enabling the “Log to Remote” option.



Syslog Settings		
Item	Description	Default
Enable	Click the toggle button to enable/disable the Syslog settings option.	OFF
Syslog Level	Select from “Debug”, “Info”, “Notice”, “Warning” or “Error”, which from low to high. Note: The lower level will output more syslog in details.	Debug
Save Position	Select the save position from “RAM”, “NVM” or “Console”. Choose “RAM”. The data will be cleared after reboot. Note: It's not recommended that you save syslog to NVM for a long time.	RAM
Log to Remote	Click the toggle button to enable/disable this option. Enable to allow gateway sending syslog to the remote syslog server. You need to enter the IP and Port of the syslog server.	OFF
Remote IP Address	Enter the IP address of syslog server when enabling the “Log to Remote” option.	Null
Remote Port	Enter the port of syslog server when enabling the “Log to Remote” option.	514

3.11 Services > Event

This section allows you to set the event parameters. Event feature provides an ability to send alerts by SMS or Email when certain system events occur.

The screenshot shows the 'Event' configuration interface with the 'Notification' tab selected. Under 'General Settings', there is a 'Signal Quality Threshold' input field containing the value '0' and a help icon.

General Settings @ Event		
Item	Description	Default
Signal Quality Threshold	Set the threshold for signal quality. Gateway will generate a log event when the actual threshold is less than the specified threshold. 0 means disable this option.	0

The screenshot shows the 'Event Notification Group Settings' page. It has a header with tabs for 'Event', 'Notification', and 'Query'. Below the header, there are tabs for 'Index', 'Description', 'Send SMS', 'Send Email', and 'Save to NVM', followed by a plus sign button.

Click **+** button to add an Event parameters.

The screenshot shows the 'Event Selection' page. It lists various system events with toggle switches, all currently set to 'OFF':

- System Startup
- System Reboot
- System Time Update
- Configuration Change
- Cellular Network Type Change
- Cellular Data Stats Clear
- Cellular Data Traffic Overflow
- Poor Signal Quality
- Link Switching
- WWAN Up
- WWAN Down
- DDNS Update Success

DDNS Update Fail OFF

Received SMS OFF

SMS Command Execute OFF

DI 1 ON OFF

DI 1 OFF OFF

DI 1 Counter Overflow OFF

DI 2 ON OFF

DI 2 OFF OFF

DI 2 Counter Overflow OFF

General Settings @ Notification		
Item	Description	Default
Index	Indicate the ordinal of the list.	--
Description	Enter a description for this group.	Null
Sent SMS	Click the toggle button to enable/disable this option. When enabled, the gateway will send notification to the specified phone numbers via SMS if event occurs. Set the related phone number in "3.14 Services > Email", and use ';' to separate each number.	OFF
Phone Number	Enter the phone numbers used for receiving event notification. Use a semicolon (;) to separate each number.	Null
Send Email	Click the toggle button to enable/disable this option. When enabled, the gateway will send notification to the specified email box via Email if event occurs. Set the related email address in "3.14 Services > Email".	OFF
Email Address	Enter the email addresses used for receiving event notification. Use a space to separate each address.	Null
Save to NVM	Click the toggle button to enable/disable this option. Enable to save event to nonvolatile memory.	OFF

In the following window you can query various types of events record. Click **Refresh** to query filtered events while click **Clear** to clear the event records in the window.

Event
Notification
Query

^ Event Details

Save Position

Filtering

```
Mar 14 09:36:31, system startup
Mar 14 09:37:48, switch link, from WWAN1 to WWAN2
Mar 14 09:39:13, switch link, from WWAN2 to WWAN1
```

Clear Refresh

Event Details		
Item	Description	Default
Save Position	Select the events' save position from "RAM" or "NVM". <ul style="list-style-type: none"> RAM: Random-access memory NVM: Non-Volatile Memory 	RAM
Filtering	Enter the filtering message based on the keywords set by users. Click the "Refresh" button, the filtered event will be displayed in the follow box. Use "&" to separate more than one filter message, such as message1&message2.	Null

3.12 Services > NTP

This section allows you to set the related NTP (Network Time Protocol) parameters, including Time zone, NTP Client and NTP Server.

NTP

Status

^ Timezone Settings

Time Zone

Expert Setting

^ NTP Client Settings

Enable ON OFF

Primary NTP Server

Secondary NTP Server

NTP Update Interval

^ NTP Server Settings

Enable ON OFF

NTP		
Item	Description	Default
Timezone Settings		
Time Zone	Click the drop down list to select the time zone you are in.	UTC +08:00
Expert Setting	Specify the time zone with Daylight Saving Time in TZ environment variable format. The Time Zone option will be ignored in this case.	Null
NTP Client Settings		
Enable	Click the toggle button to enable/disable this option. Enable to synchronize time with the NTP server.	ON
Primary NTP Server	Enter primary NTP Server's IP address or domain name.	pool.ntp.org
Secondary NTP Server	Enter secondary NTP Server's IP address or domain name.	Null
NTP Update interval	Enter the interval (minutes) synchronizing the NTP client time with the NTP server's. Minutes wait for next update, and 0 means update only once.	0

NTP Server Settings		
Enable	Click the toggle button to enable/disable the NTP server option.	OFF

This window allows you to view the current time of gateway and also synchronize the gateway time. Click **Sync** button to synchronize the gateway time with the PC's.

NTP

Status

^ Time

System Time 2017-01-01 01:11:41

PC Time 2018-01-24 15:31:15 Sync

Last Update Time Not Updated

3.13 Services > SMS

This section allows you to set SMS parameters. Gateway supports SMS management, and user can control and configure their gateways by sending SMS.

SMS

SMS Testing

^ SMS Management Settings

Enable ON OFF

Authentication Type Password v ?

Phone Number ?

SMS Management Settings		
Item	Description	Default
Enable	Click the toggle button to enable/disable the SMS Management option. Note: If this option is disabled, the SMS configuration is invalid.	ON
Authentication Type	Select Authentication Type from "Password", "Phonenum" or "Both". <ul style="list-style-type: none"> Password: Use the same username and password as WEB manager for authentication. For example, the format of the SMS should be "username: password; cmd1; cmd2; ..." Note: Set the WEB manager password in System > User Management section. Phonenum: Use the Phone number for authentication, and user should set the Phone Number that is allowed for SMS management. The format of the SMS should be "cmd1; cmd2; ..." Both: Use both the "Password" and "Phonenum" for authentication. User should set the Phone Number that is allowed for SMS management. The format of the SMS should be "username: password; cmd1; cmd2; ..." 	Password
Phone Number	Set the phone number used for SMS management, and use ';' to separate each number. Note: It can be null when choose "Password" as the authentication type.	Null

User can test the current SMS service whether it is available in this section.

SMS
SMS Testing

^ SMS Testing

Phone Number

Message

Result

SMS Testing		
Item	Description	Default
Phone Number	Enter the specified phone number which can receive the SMS from gateway.	Null
Message	Enter the message that gateway will send it to the specified phone number.	Null
Result	The result of the SMS test will be displayed in the result box.	Null
<input style="background-color: #004a7c; color: white; padding: 2px 5px;" type="button" value="Send"/>	Click the button to send the test message.	--

3.14 Services > Email

Email function supports to send the event notifications to the specified recipient by ways of email.

Email

^ Email Settings

Enable ON OFF

Enable TLS/SSL ON OFF ?

Outgoing Server

Server Port

Username

Password

From

Subject

Email Settings		
Item	Description	Default
Enable	Click the toggle button to enable/disable the Email option.	OFF

Email Settings		
Item	Description	Default
Enable TLS/SSL	Click the toggle button to enable/disable the TLS/SSL option.	OFF
Outgoing server	Enter the SMTP server IP Address or domain name.	Null
Server port	Enter the SMTP server port.	25
Username	Enter the username which has been registered from SMTP server.	Null
Password	Enter the password of the username above.	Null
From	Enter the source address of the email.	Null
Subject	Enter the subject of this email.	Null

3.15 Services > WakeUp

Gateway supports a variety of wake-up dialing policies, including regular wake-up, interval wake-up, serial data wake-up, and SMS wake-up. Here, users can set different wake-up policies.

WakeUp

^ WakeUp Settings

Enable ON OFF

^ Timing

Index	Enable	Timing	
			+

^ Periodical

Enable ON OFF

Interval ?

^ Serial Data

Enable ON OFF

^ SMS

Enable ON OFF

Enable SMS Reply ON OFF

Phonenum ?

Password

Click on the right side + of the Timing to add a wake-up time point. Up to 3 can be added.

WakeUp

^ General Settings

Index

Enable ON OFF

Timing ?

WakeUp		
Item	Description	Default
WakeUp		
Enable	Click the toggle button to enable/disable this option. When it is set to ON, the current link is disconnected, while set to OFF, the device restarts GPRS dial-up.	OFF
Timing General Settings		
Index	Display number.	--
Enable	Click the toggle button to enable/disable this option. When it is set to ON, the gateway make GPRS dial-up on the set timing.	OFF
Timing	Every day at the timing (HH:MM) the gateway makes GPRS dial-up.	Null
Periodical		
Periodical WakeUp	Click the toggle button to enable/disable this option. When it is set to ON, the gateway will periodically make GPRS dial-up.	OFF
Interval	Set the interval time for Periodical WakeUp, ranging 3-720 min.。	5
Serial Data		
Serial Data WakeUp	Click the toggle button to enable/disable this option. When it is set to ON, while sending data to the serial port, the gateway make GPRS dial-up.	OFF
SMS		
SMS WakeUp	Click the toggle button to enable/disable this option. When it is set to ON, while gateway receives SMS from the set phone number, the gateway make GPRS dial-up.	OFF
Enable SMS Reply	Click the toggle button to enable/disable this option. When it is set to ON, while the gateway makes GPRS dial-up via SMS WakeUp, it will send a reply message to the WakeUp phone number.	OFF
Phonenum	The phone number which is allowed to wake up the gateway, separated each number by a ';' character.	Null
Password	The phone number needs to send the password to the gateway. If the sent content and the set password do not match, the GPRS dial-up cannot be performed.	Null

3.16 Services > DDNS

This section allows you to set the DDNS parameters. The Dynamic DNS function allows you to alias a dynamic IP address to a static domain name, allows you whose ISP does not assign them a static IP address to use a domain name. This is especially useful for hosting servers via your connection, so that anyone wishing to connect to you may use your domain name, rather than having to use your dynamic IP address, which changes from time to time. This dynamic IP address is the WWAN IP address of the gateway, which is assigned to you by your ISP. The service provider defaults to “DynDNS”, as shown below.

The screenshot shows the 'DDNS Settings' window. At the top, there are two tabs: 'DDNS' and 'Status'. Below the tabs, there is a section titled 'DDNS Settings'. It contains an 'Enable' toggle switch set to 'OFF'. Below that is a 'Service Provider' dropdown menu with 'DynDNS' selected. Underneath are four input fields: 'Hostname', 'Username', and 'Password', all of which are currently empty.

When “Custom” service provider chosen, the window is displayed as below.

The screenshot shows the 'DDNS Settings' window with 'Custom' selected in the 'Service Provider' dropdown menu. Below the dropdown is a 'URL' input field, which is currently empty. The 'Enable' toggle switch remains 'OFF'.

DDNS Settings		
Item	Description	Default
Enable	Click the toggle button to enable/disable the DDNS option.	OFF
Service Provider	Select the DDNS service from “DynDNS”, “NO-IP”, “3322” or “Custom”. Note: the DDNS service only can be used after registered by Corresponding service provider.	DynDNS
Hostname	Enter the hostname provided by the DDNS server.	Null
Username	Enter the username provided by the DDNS server.	Null
Password	Enter the password provided by the DDNS server.	Null
URL	Enter the URL customized by user.	Null

Click “Status” bar to view the status of the DDNS.

The screenshot shows the 'DDNS Status' window. At the top, there are two tabs: 'DDNS' and 'Status'. Below the tabs, there is a section titled 'DDNS Status'. It displays the current 'Status' as 'Disabled'. Below that, there is a label for 'Last Update Time', which is currently blank.

DDNS Status	
Item	Description
Status	Display the current status of the DDNS.
Last Update Time	Display the date and time for the DDNS was last updated successfully.

3.17 Services > SSH

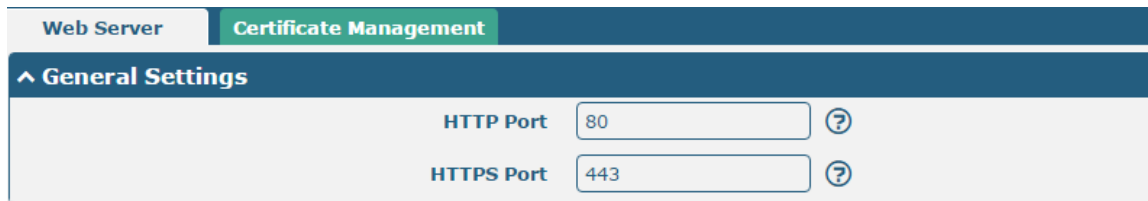
Gateway supports SSH password access and secret-key access.

SSH Settings		
Item	Description	Default
Enable	Click the toggle button to enable/disable this option. When enabled, you can access the gateway via SSH.	ON
Port	Set the port of the SSH access.	22
Disable Password Logins	Click the toggle button to enable/disable this option. When enabled, you cannot use username and password to access the gateway via SSH. In this case, only the key can be used for login.	OFF

Import Authorized Keys	
Item	Description
Authorized Keys	Click on “Choose File” to locate an authorized key from your computer, and then click “Import” to import this key into your gateway. Note: This option is valid when enabling the password logins option.

3.18 Services > Web Server

This section allows you to modify the parameters of Web Server.



The screenshot shows the 'Certificate Management' tab under 'Web Server'. Under the 'General Settings' section, there are two input fields: 'HTTP Port' with the value '80' and 'HTTPS Port' with the value '443'. Each field has a help icon (question mark) to its right.

General Settings @ Web Server		
Item	Description	Default
HTTP Port	Enter the HTTP port number you want to change in gateway's Web Server. On a Web server, port 80 is the port that the server "listens to" or expects to receive from a Web client. If you configure the gateway with other HTTP Port number except 80, only adding that port number then you can login gateway's Web Server.	80
HTTPS Port	Enter the HTTPS port number you want to change in gateway's Web Server. On a Web server, port 443 is the port that the server "listens to" or expects to receive from a Web client. If you configure the gateway with other HTTPS Port number except 443, only adding that port number then you can login gateway's Web Server. Note: HTTPS is more secure than HTTP. In many cases, clients may be exchanging confidential information with a server, which needs to be secured in order to prevent unauthorized access. For this reason, HTTP was developed by Netscape corporation to allow authorization and secured transactions.	443

This section allows you to import the certificate file into the gateway.



The screenshot shows the 'Import Certificate' section under 'Certificate Management'. The 'Import Type' dropdown menu is set to 'CA'. Below it, the 'HTTPS Certificate' section contains a 'Choose File' button, the text 'No file chosen', and an 'Import' button.

Import Certificate		
Item	Description	Default
Import Type	Select from "CA" and "Private Key". <ul style="list-style-type: none"> CA: a digital certificate issued by CA center Private Key: a private key file 	CA
HTTPS Certificate	Click on "Choose File" to locate the certificate file from your computer, and then click "Import" to import this file into your gateway.	--

3.19 Services > Advanced

This section allows you to set the reboot.

System
Reboot

^ Periodic Reboot Settings

Periodic Reboot ?

Daily Reboot Time ?

Periodic Reboot Settings		
Item	Description	Default
Periodic Reboot	Set the reboot period of the gateway by every X hours. 0 means disable.	0
Daily Reboot Time	Set the daily reboot time of the gateway. You should follow the format as HH:MM, in 24h time frame. Leave it empty means disable.	Null

3.20 System > Debug

This section allows you to check and download the syslog details.

Syslog

^ Syslog Details

Log Level v

Filtering ?

```
[2089]: AT+CGREG? Jan 1 00:02:23 router user.debug modemd[2089]: +CGREG: 2,3 Jan 1 00:02:23 router user.debug modemd[2089]: OK Jan 1 00:02:23 router authpriv.info web_server: pam_unix(login:session): session opened for user admin by (uid=0) Jan 1 00:02:23 router authpriv.info web_server: pam_unix(login:session): session closed for user admin Jan 1 00:02:26 router user.debug modemd[2089]: AT+CGREG? Jan 1 00:02:26 router user.debug modemd[2089]: +CGREG: 2,3 Jan 1 00:02:26 router user.debug modemd[2089]: OK Jan 1 00:02:26 router user.debug link_manager[2051]: rcv action disconnected from modemd Jan 1 00:02:26 router user.debug link_manager[2051]: target link WWAN1, state Disconnected Jan 1 00:02:26 router user.notice link_manager[2051]: WWAN1 disconnected Jan 1 00:02:26 router user.info link_manager[2051]: there is no need to switch link (WWAN1:10 - WWAN2:20) Jan 1 00:02:26 router user.notice link_manager[2051]: WWAN1 try reconnect firstly, wait 600 seconds Jan 1 00:02:36 router authpriv.info web_server: pam_unix(login:session): session opened for user admin by (uid=0) Jan 1 00:02:36 router authpriv.info web_server: pam_unix(login:session): session closed for user admin Jan 1 00:02:43 router authpriv.info web_server: pam_unix(login:session): session opened for user admin by (uid=0) Jan 1 00:02:43 router authpriv.info web_server: pam_unix(login:session): session closed for user admin
```

v

^ Syslog Files

Index	File Name	File Size	Modification Time
1	messages	26328	Wed Oct 11 16:56:29 2017

^ System Diagnostic Data

System Diagnostic Data

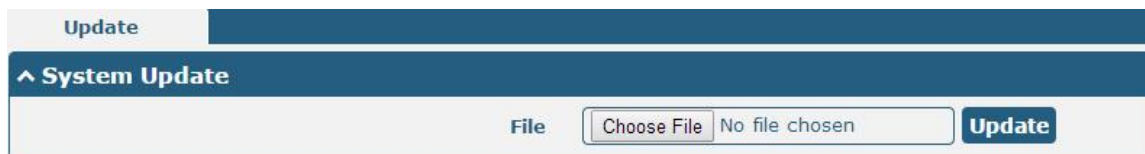
System Diagnostic Data

Syslog		
Item	Description	Default
Syslog Details		
Log Level	Select from “Debug”, “Info”, “Notice”, “Warn”, “Error” which from low to high. The lower level will output more syslog in detail.	Debug
Filtering	Enter the filtering message based on the keywords. Use “&” to separate more than one filter message, such as “keyword1&keyword2”.	Null
Refresh	Select from “Manual Refresh”, “5 Seconds”, “10 Seconds”, “20 Seconds” or “30 Seconds”. You can select these intervals to refresh the log information displayed in the follow box. If selecting “manual refresh”, you should click the refresh button to refresh the syslog.	Manual Refresh
Clear	Click the button to clear the syslog.	--
Refresh	Click the button to refresh the syslog.	--
Syslog Files		
Syslog Files List	It can show at most 5 syslog files in the list, the files’ name range from message0 to message 4. And the newest syslog file will be placed on the top of the list.	--
System Diagnosing Data		
Generate	Click to generate the syslog diagnosing file.	--
Download	Click to download system diagnosing file.	--

3.21 System > Update

This section allows you to upgrade the firmware of your gateway. Click **System > Update > System Update**, and click on “Choose File” to locate the firmware file to be used for the upgrade. Once the latest firmware has been chosen, click “Update” to start the upgrade process. The upgrade process may take several minutes. Do not turn off your gateway during the firmware upgrade process.

Note: To access the latest firmware file, please contact your technical support engineer.



3.22 System > App Center

This section allows you to add some required or customized applications to the gateway. Import and install your applications to the App Center, and reboot the device according to the system prompts. Each installed application will be displayed under the “Services” menu.

Note: After importing the applications to the gateway, the page display may have a slight delay due to the browser cache. It is recommended that you clear the browser cache first and log in the gateway again.

App Center

For more information about App, please refer to <http://www.robustel.com/products/app-center/>.

^ **App Install**

File

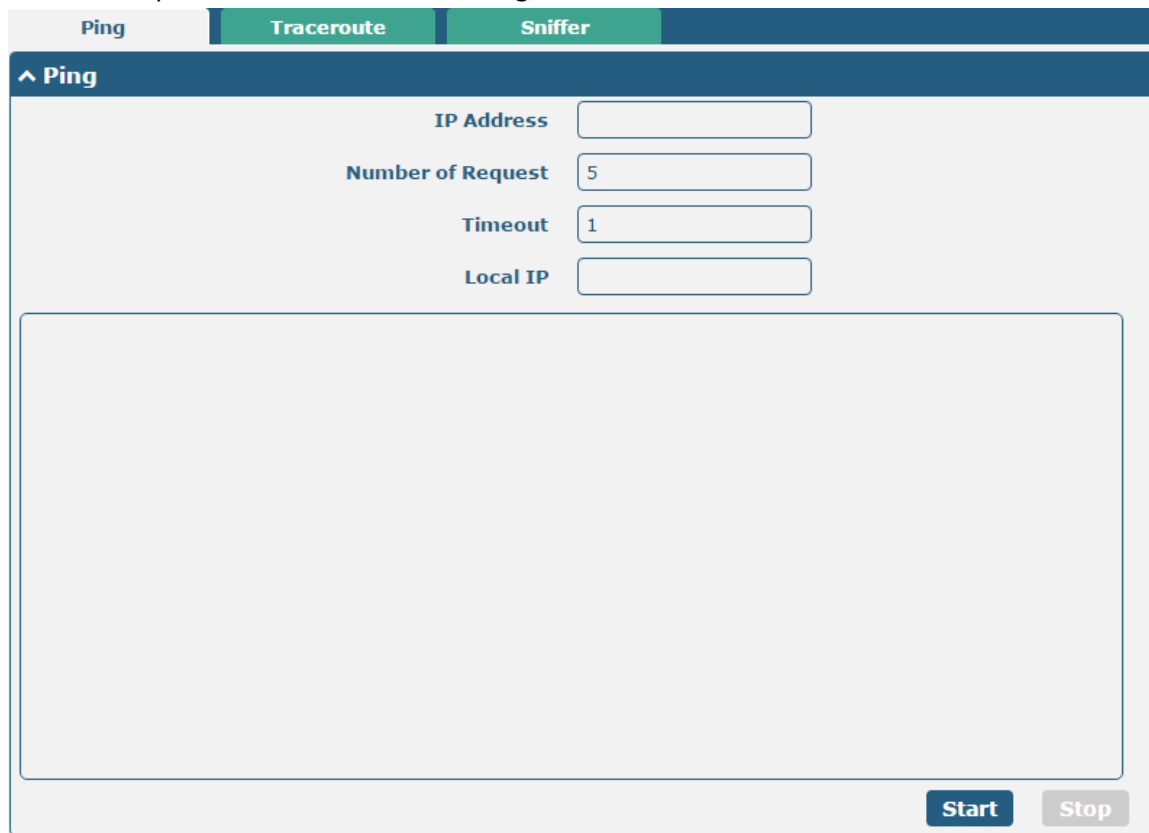
^ **Installed Apps**



Index	Name	Version	Status	Description
1	language_chinese	3.0.0	Stopped	Chinese language X

App Center		
Item	Description	Default
App Install		
File	Click on “Choose File” to locate the App file from your computer, and then click <input type="button" value="Install"/> to import this file into your gateway. Note: File format should be <i>xxx.rpk</i> , e.g. <i>M1200-robustlink-1.0.0.rpk</i> .	--
Installed Apps		
Index	Indicate the ordinal of the list.	--
Name	Show the name of the App.	Null
Version	Show the version of the App.	Null
Status	Show the status of the App.	Null
Description	Show the description for this App.	Null

3.23 System > Tools

This section provides users three tools: Ping, Traceroute and Sniffer.



Ping		
Item	Description	Default
IP address	Enter the ping's destination IP address or destination domain.	Null
Number of Requests	Specify the number of ping requests.	5
Timeout	Specify the timeout of ping requests.	1
Local IP	Specify the local IP from cellular WAN, Ethernet WAN or Ethernet LAN. Null stands for selecting local IP address from these three automatically.	Null
	Click this button to start ping request, and the log will be displayed in the follow box.	Null
	Click this button to stop ping request.	--

Ping | Traceroute | Sniffer

^ Traceroute

Trace Address
 Trace Hops
 Trace Timeout

Start Stop

Traceroute		
Item	Description	Default
Trace Address	Enter the trace’s destination IP address or destination domain.	Null
Trace Hops	Specify the max trace hops. gateway will stop tracing if the trace hops has met max value no matter the destination has been reached or not.	30
Trace Timeout	Specify the timeout of Traceroute request.	1
Start	Click this button to start Traceroute request, and the log will be displayed in the follow box.	--
Stop	Click this button to stop Traceroute request.	--

Ping | Traceroute | Sniffer

^ Sniffer

Interface v
 Host
 Packets Request
 Protocol v
 Status

Start Stop

^ Capture Files

Index	File Name	File Size	Modification Time
1	17-01-01_00-05-01.cap	24	Sun Jan 1 00:05:01 2017

Sniffer		
Item	Description	Default
Interface	Select the interface according to the "Ethernet" configuration and select from "All", "PPP1", "WWAN" and "IO".	All
Host	Filter the packet that contain the specify IP address.	Null
Packets Request	Set the packet number that the gateway can sniffer at a time.	1000
Protocol	Select from "All", "IP", "TCP", "UDP" and "ARP".	All
Status	Show the current status of sniffer.	Null
	Click this button to start the sniffer.	--
	Click this button to stop the sniffer. Once you click this button, a new log file will be displayed in the following List.	--
Capture Files	Every times of sniffer log will be saved automatically as a new file. You can find the file from this Sniffer Traffic Data List and click to download the log, click to delete the log file. It can cache a maximum of 5 files.	Null

3.24 System > Profile

This section allows you to import or export the configuration file, and restore the gateway to factory default setting.

Profile

Rollback

Import Configuration File

Reset Other Settings to Default OFF

Ignore Invalid Settings OFF

XML Configuration File

Export Configuration File

Ignore Disabled Features OFF

Add Detailed Information OFF

Encrypt Secret Data OFF

XML Configuration File

XML Configuration File

Default Configuration

Save Running Configuration as Default

Restore to Default Configuration

Profile		
Item	Description	Default
Import Configuration File		
Reset Other Settings to Default	Click the toggle button as "ON" to return other parameters to default settings.	OFF

Ignore Invalid Settings	Click the toggle button as “OFF” to ignore invalid settings.	OFF
XML Configuration File	Click on Choose File to locate the XML configuration file from your computer, and then click Import to import this file into your gateway.	--
Export Configuration File		
Ignore Disabled Features	Click the toggle button as “OFF” to ignore the disabled features.	OFF
Add Detailed Information	Click the toggle button as “On” to add detailed information.	OFF
Encrypt Secret Data	Click the toggle button as “ON” to encrypt the secret data.	OFF
XML Configuration File	Click Generate button to generate the XML configuration file, and click Export to export the XML configuration file.	--
Default Configuration		
Save Running Configuration as Default	Click this button to save the current running parameters as default configuration.	--
Restore to Default Configuration	Click this button to restore the factory defaults.	--

Profile

Rollback

^ Configuration Rollback

Save as a Rollbackable Archive
Save
?

^ Configuration Archive Files

Index	File Name	File Size	Modification Time	
1	config1.tgz	3274	Sun Jan 1 00:00:03 2017	↺
2	config2.tgz	3274	Mon Jan 22 00:00:00 2018	↺
3	config3.tgz	3274	Sun Jan 21 00:00:00 2018	↺
4	config4.tgz	3274	Sat Jan 20 00:00:00 2018	↺

Rollback		
Item	Description	Default
Configuration Rollback		
Save as a Rollbackable Archive	Create a save point manually. Additionally, the system will create a save point every day automatically if configuration changes.	--
Configuration Archive Files		
Configuration Archive Files	View the related information about configuration archive files, including name, size and modification time.	--

3.25 System > User Management

This section allows you to change your username and password, and create or manage user accounts. One gateway has only one super user who has the highest authority to modify, add and manage other common users.

Note: Your new password must be more than 5 character and less than 32 characters and may contain numbers, upper and lowercase letters, and standard symbols.

Super User
Common User

^ Super User Settings

New Username

?

Old Password

?

New Password

?

Confirm Password

Super User Settings		
Item	Description	Default
New Username	Enter a new username you want to create; valid characters are a-z, A-Z, 0-9, @, ., -, #, \$, and *. If you do not want to modify the username, leave it blank.	Null
Old Password	Enter the old password of your gateway. The default is "admin".	Null
New Password	Enter a new password you want to create; valid characters are a-z, A-Z, 0-9, @, ., -, #, \$, and *.	Null
Confirm Password	Enter the new password again to confirm.	Null

Super User
Common User

^ Common User Settings

Index	Role	Username
+		

Click button to add a new common user. The maximum rule count is 5.

Common User

^ Common Users Settings

Index

Role

v

Username

?

Password

?

Common User Settings		
Item	Description	Default
Index	Indicate the ordinal of the list.	--
Role	Select from "Visitor" and "Editor". <ul style="list-style-type: none"> Visitor: Users only can view the configuration of gateway under this level Editor: Users can view and set the configuration of gateway under this level 	Visitor

Username	Set the Username; valid characters are a-z, A-Z, 0-9, @, ., -, #, \$, and *.	Null
Password	Set the password which at least contains 5 characters; valid characters are a-z, A-Z, 0-9, @, ., -, #, \$, and *.	Null

Glossary

Abbr.	Description
AC	Alternating Current
APN	Access Point Name
ASCII	American Standard Code for Information Interchange
CE	Conformité Européene (European Conformity)
CHAP	Challenge Handshake Authentication Protocol
CLI	Command Line Interface for batch scripting
CSD	Circuit Switched Data
CTS	Clear to Send
dB	Decibel
dBi	Decibel Relative to an Isotropic radiator
DC	Direct Current
DCD	Data Carrier Detect
DCE	Data Communication Equipment (typically modems)
DCS 1800	Digital Cellular System, also referred to as PCN
DI	Digital Input
DO	Digital Output
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-frequency
DTR	Data Terminal Ready
EDGE	Enhanced Data rates for Global Evolution of GSM and IS-136
EMC	Electromagnetic Compatibility
EMI	Electro-Magnetic Interference
ESD	Electrostatic Discharges
ETSI	European Telecommunications Standards Institute
EVDO	Evolution-Data Optimized
FDD LTE	Frequency Division Duplexing Long Term Evolution
GND	Ground
GPRS	General Packet Radio Service
GRE	generic route encapsulation
GSM	Global System for Mobile Communications
HSPA	High Speed Packet Access
ID	identification data
IMEI	International Mobile Equipment Identity
IP	Internet Protocol
IPsec	Internet Protocol Security
kbps	kbits per second

Abbr.	Description
L2TP	Layer 2 Tunneling Protocol
LAN	local area network
LED	Light Emitting Diode
LoRa	Long Range
LoRaWAN	LoRa Wide Area Network
LPWAN	Low Power Wide Area Network
M2M	Machine to Machine
MAX	Maximum
Min	Minimum
MO	Mobile Originated
MS	Mobile Station
MT	Mobile Terminated
OpenVPN	Open Virtual Private Network
PAP	Password Authentication Protocol
PC	Personal Computer
PCN	Personal Communications Network, also referred to as DCS 1800
PCS	Personal Communication System, also referred to as GSM 1900
PDU	Protocol Data Unit
PIN	Personal Identity Number
PLCs	Program Logic Control System
PPP	Point-to-point Protocol
PPTP	Point to Point Tunneling Protocol
PSU	Power Supply Unit
PUK	Personal Unblocking Key
R&TTE	Radio and Telecommunication Terminal Equipment
RF	Radio Frequency
RTC	Real Time Clock
RTS	Request to Send
RTU	Remote Terminal Unit
Rx	Receive Direction
SDK	Software Development Kit
SIM	subscriber identification module
SMA antenna	Stubby antenna or Magnet antenna
SMS	Short Message Service
SNMP	Simple Network Management Protocol
TCP/IP	Transmission Control Protocol / Internet Protocol
TE	Terminal Equipment, also referred to as DTE
Tx	Transmit Direction
UART	Universal Asynchronous Receiver-transmitter
UMTS	Universal Mobile Telecommunications System
USB	Universal Serial Bus
USSD	Unstructured Supplementary Service Data

Abbr.	Description
VDC	Volts Direct current
VLAN	Virtual Local Area Network
VPN	Virtual Private Network
VSWR	Voltage Stationary Wave Ratio
WAN	Wide Area Network

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