Industrial 4G module

I-8213W-4G Series

User Manual

Version 1.3 AUG 2023

Service and usage information for

I-8213W-4GE/I-8213W-4GC

Warranty

All products manufactured by ICP DAS are under warranty regarding defective materials for a period of one year, beginning from the date of delivery to the original purchaser.

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Email: service@icpdas.com

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1. Introduction

The I-8213W-4G series are industrial grade 4G LTE modules with GPS. While I-8213W-4GE supports FDD LTE B1/B3/B5/B7/B8/B20 bands, I-8213W-4GC supports FDD LTE B1/B3/B8 and TDD LTE B38/B39/B40/B41 bands.

For WCDMA, the I-8213W-4G supports 850/900/2100 MHz as well as GSM 850 MHz, EGSM 900 MHz, DCS 1800 MHz, PCS 1900 MHz, and these modules can be used to collect remote data over a convenient 2G/3G/4G network, including a variety of traffic meters, or for timely remote control.

These modules also have built-in TCP/IP stacks that can be used to connect to the Internet or send and receive SMS messages with simple control commands.

With the features of I-8213W-4G, the systems can be SMS, GPRS and 4G connection applications with our PAC series like WinPAC-8000, LinPAC-8000 or XP-8000.

2. Hardware Specifications

2.1. Specifications

Models	I-8213W-4GE	I-8213W-4GC
4G System		
Frequency Band(FDD)	B1/B3/B5/B7/B8/B20	B1/B3/B8
Frequency Band(TDD)		B38/B39/B40/B41
3G System		
Frequency Band(WCDMA)	850/900/2100 MHz	900/2100 MHz
Frequency Band(TDSCDMA)		1900/2100 MHz
GSM/GPRS System		
Frequency Band	850/900/1800/1900 MHz	900/1800MHz
GPRS connectivity	GPRS class 33; GPRS station class B	GPRS class 12; GPRS station class B
DATA	**GPRS (Kbps):** max. 107 (DL) / 85.6 (UL) **WCDMA (Kbps):** max. 384 (DL) / 384 (UL) **DC-HSPA (Mbps):** max. 42 (DL) / 5.76 (UL) **LTE-FDD (Mbps):** max. 150 (DL) / 50 (UL) **LTE-TDD (Mbps):** max. 130 (DL) / 50 (UL)	**GPRS (Kbps) :** max. 107 (DL) / 85.6 (UL) **DC-HSPA+ (Mbps):** max. 42 (DL) / 5.76 (UL) **TD-SCDMA(Mbps):** max. 4.2 (DL) / 2.2 (UL) **CDMA2000 EVDO(Mbps):** max. 3.1 (DL) / 1.8 (UL) **LTE-FDD (Mbps):** max. 150 (DL) / 50 (UL) **LTE-TDD (Mbps):** max. 130 (DL) / 30 (UL)
Coding Schemes	CS 1, CS 2, CS 3, CS 4	
SMS		
SMS	MT, MO, CB, Text and PDU mode	
Comm. Interface		
USB	USB 2.0 (high speed)	
GPS Interface		

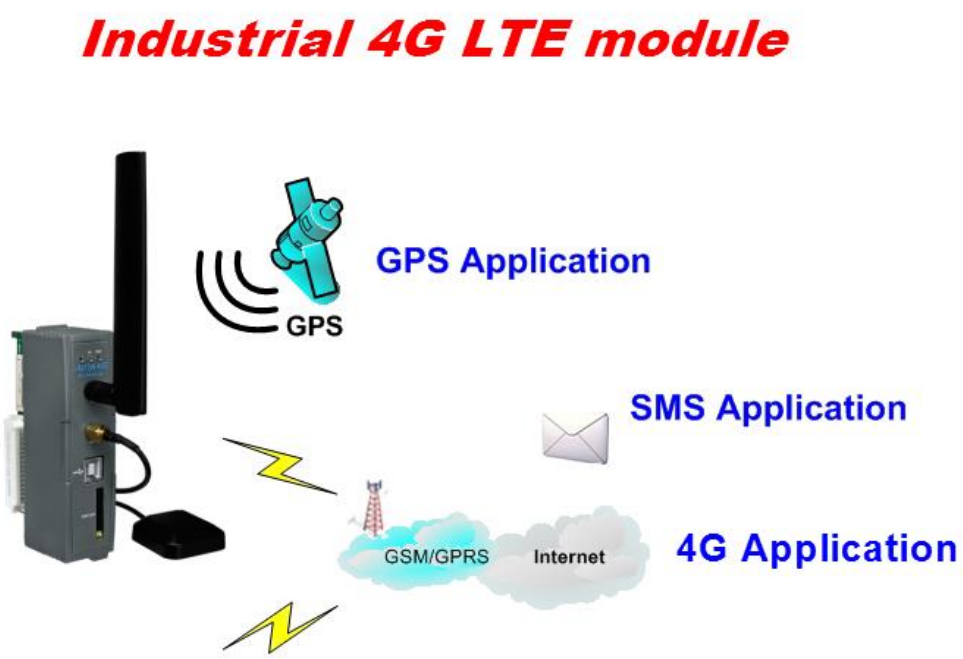
Support Channels	32
Protocol Support	NMEA 0183
LED Indicators	
Power	Red color
GPRS	Yellow color
Power	
Frame Ground Protection	ESD, Surge, EFT, Hi-Pot
Power Consumption	Idle: 0.15 A @ 5 VDC; Data Link: 0.2 ~ 1.62 A (peak) @ 5 VDC
Mechanical	
Casing	Plastic
Dimensions (W x L x H)	30mm x 85mm x 114mm
Environment	
Operating Temperature	-25°C ~ +75 °C
Storage Temperature	-30°C ~ +80 °C
Humidity	5~95% RH, non-condensing

2.2. I-8213W-4G Features

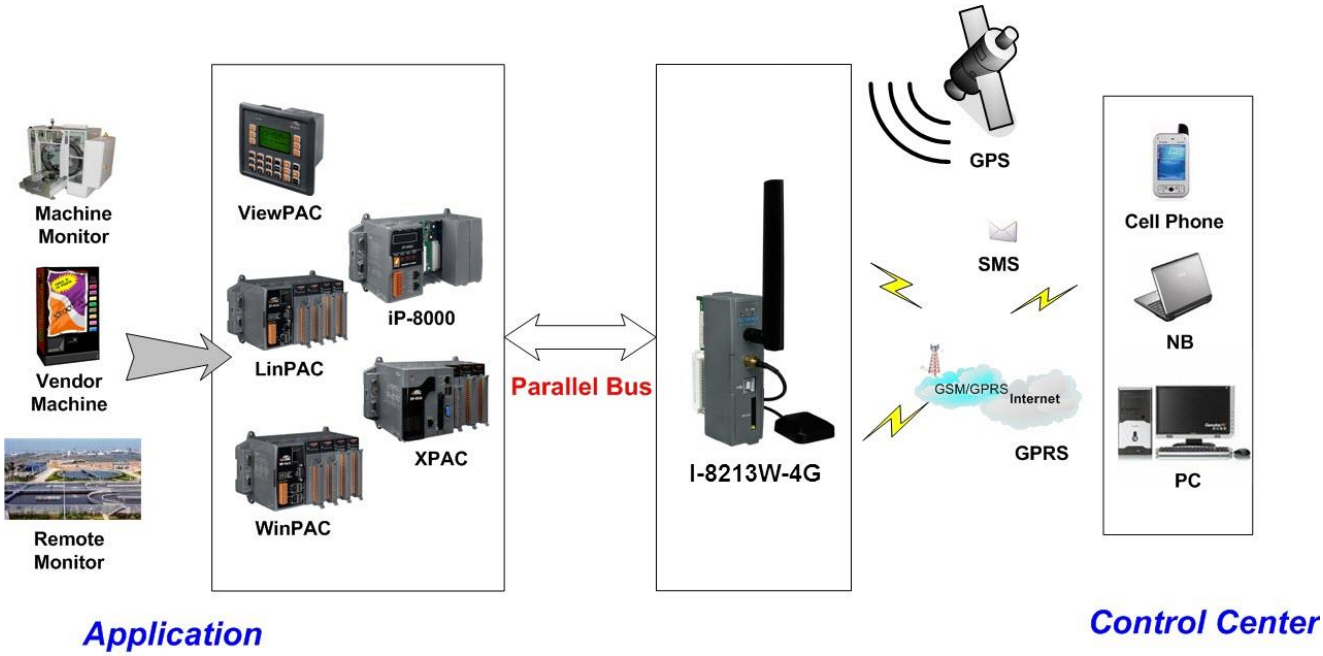
- The I-8213W-4GE supports FDD LTE B1/B3/B5/B7/B8/B20 bands while the I-8213W-4GC supports FDD LTE B1/B3/B8 and TDD LTE B38/B39/B40/B41 bands. 850/900/2100 MHz is supported by the WCDMA and 850 MHz is supported by GSM, EGSM 900 MHz, DCS 1800 MHz, PCS 1900 MHz. WCDMA supports 850/900/2100 MHz and GSM 850 MHz, EGSM 900 MHz, DCS 1800 MHz, PCS 1900 MHz.
- Designed for FDD LTE, WCDMA, GPRS and SMS Applications
- Supports TCP Server, TCP Client, UDP Client Connection stack from 4G, 3G or GPRS
- Supports Standard AT Commands
- Supports 32-channels GPS and NMEA v0183 v3.01
- Supports XP-8000, WinPAC-8000, LinPAC-8000, ViewPAC

3. Application architecture

Application 1

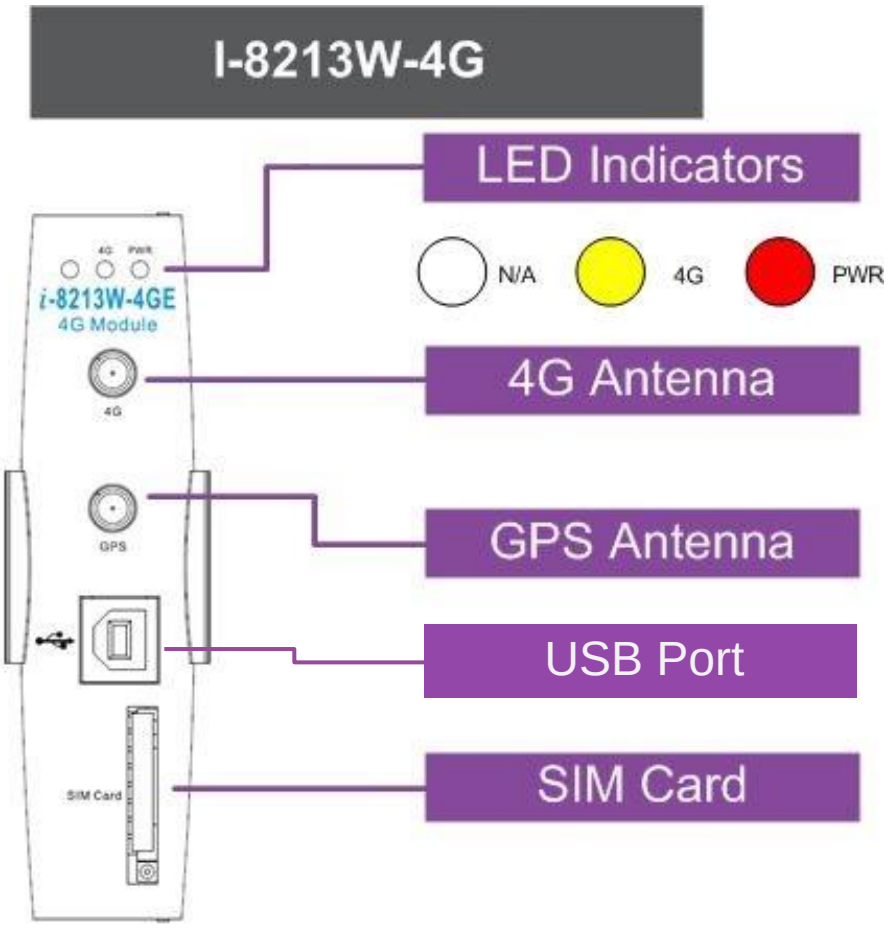


Application 2

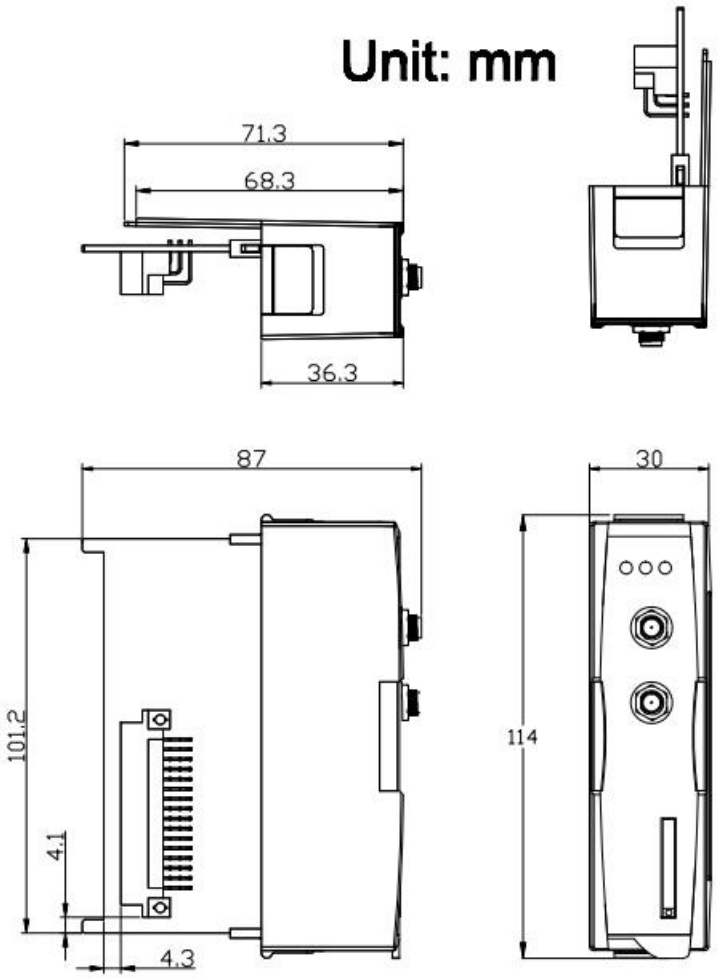


4. Hardware Appearance

- Pin Assignments



4.1. Hardware Dimensions



4.2. LED indicators

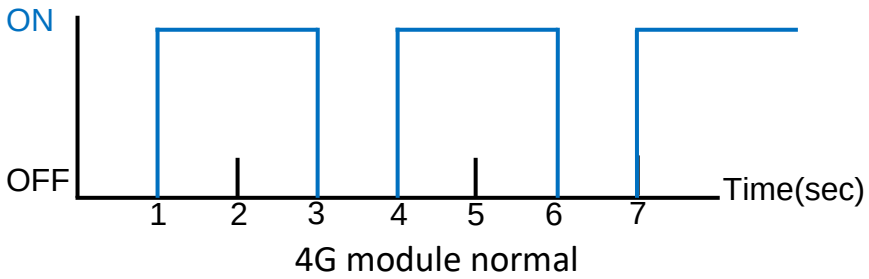
There are two LED indicators to help users to judge the various conditions of I-8213W-4G. The description is as follows：

A. PWR(Red)：The PWR LED can indicate the status of Power module.

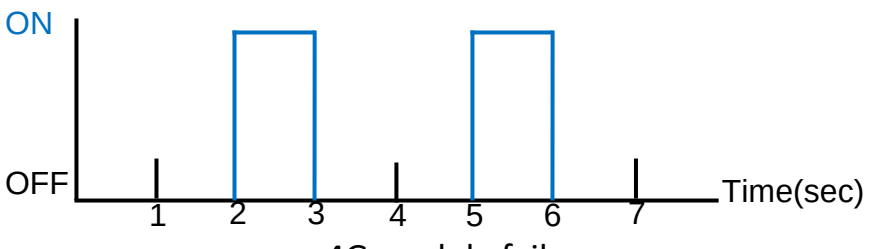
Power normal	Power fail
Always ON	**Always OFF**

B. 4G (Yellow)：The modem LED can indicate the status of GSM module.

4G module normal	4G module fail	Data transmission
ON 2 sec and OFF 1 sec	**OFF or ON 1 sec and OFF 2 sec**	**Blinking per 0.2 sec**



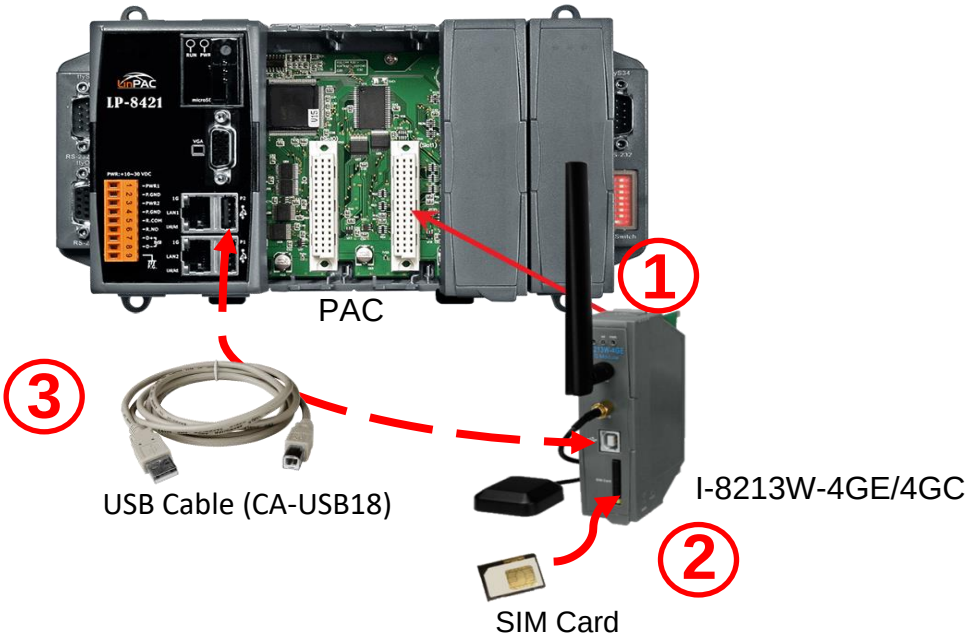
4G module normal



4G module fail

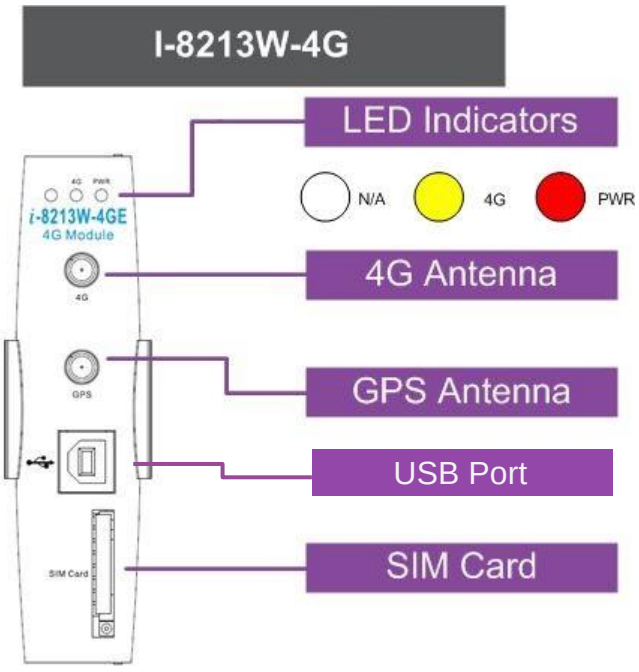
4.3. Hardware Installation

- I-8213W-4G Installation



1. Install the I-8213W-4G on the host computer.
2. Insert SIM card
3. Connect USB

- Antenna Installation

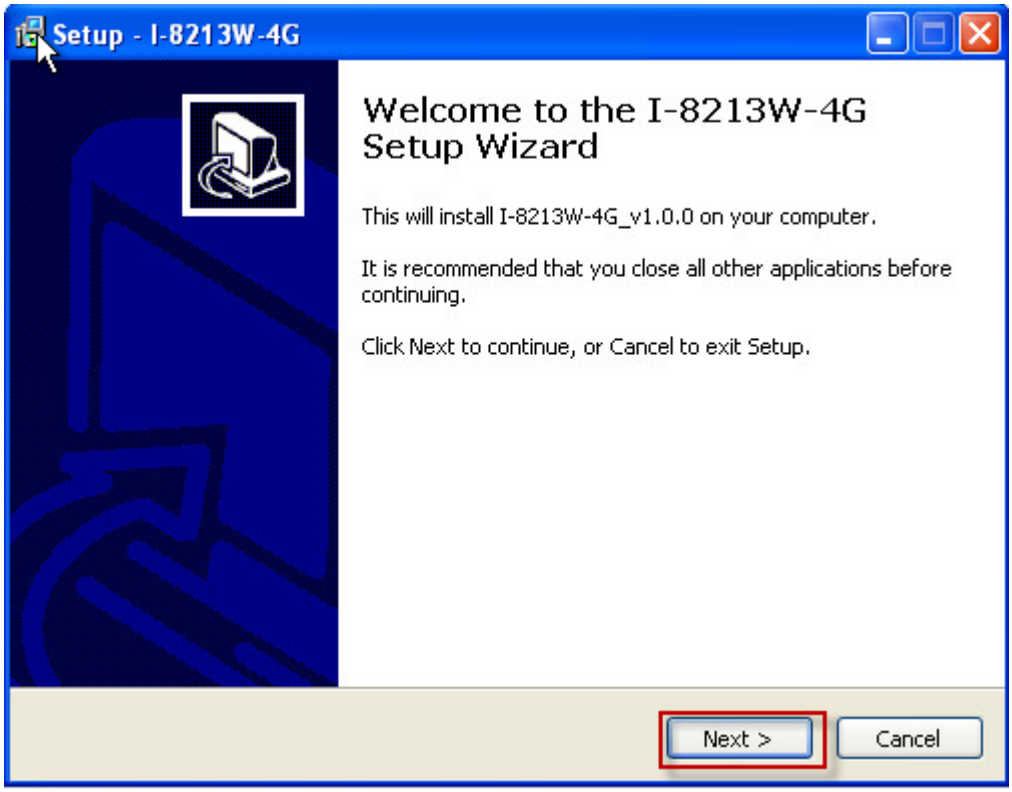


5. USB Driver Installation

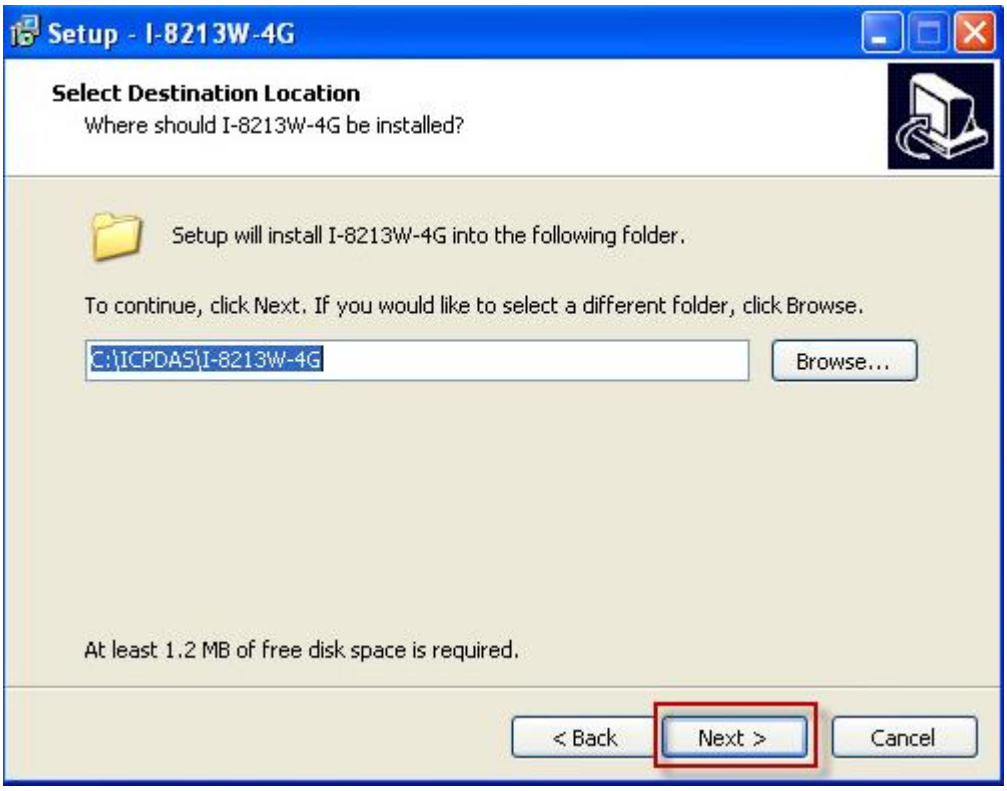
5.1. Example: XP-8000 (Microsoft Windows OS)

Step 1：Double Click “I-8213W-4G USB driver V1.00.exe” to install the driver.

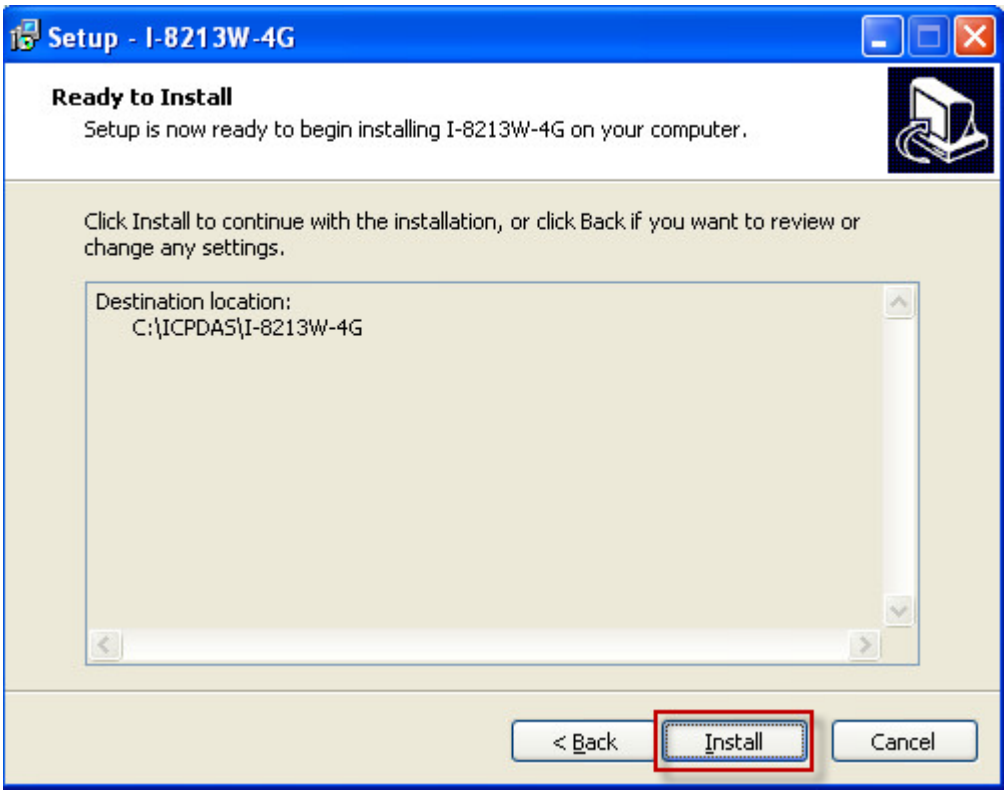
Step 2：Click “Next”.



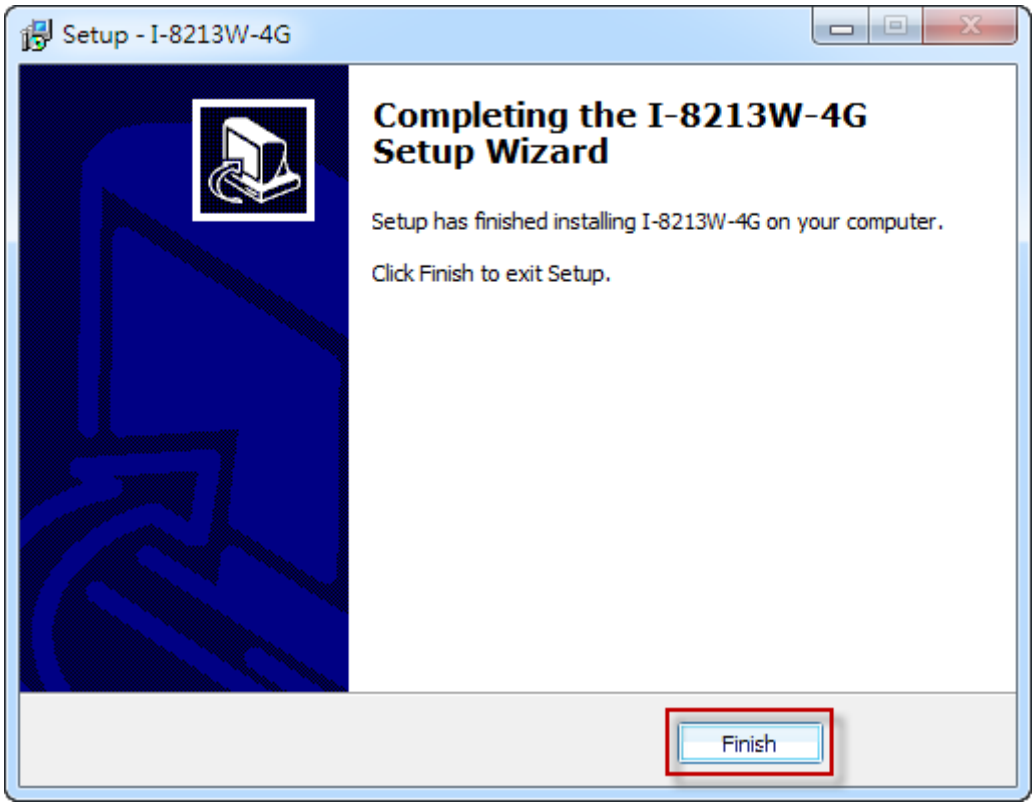
Step 3：Click “Next”



Step 4：Select “Install”

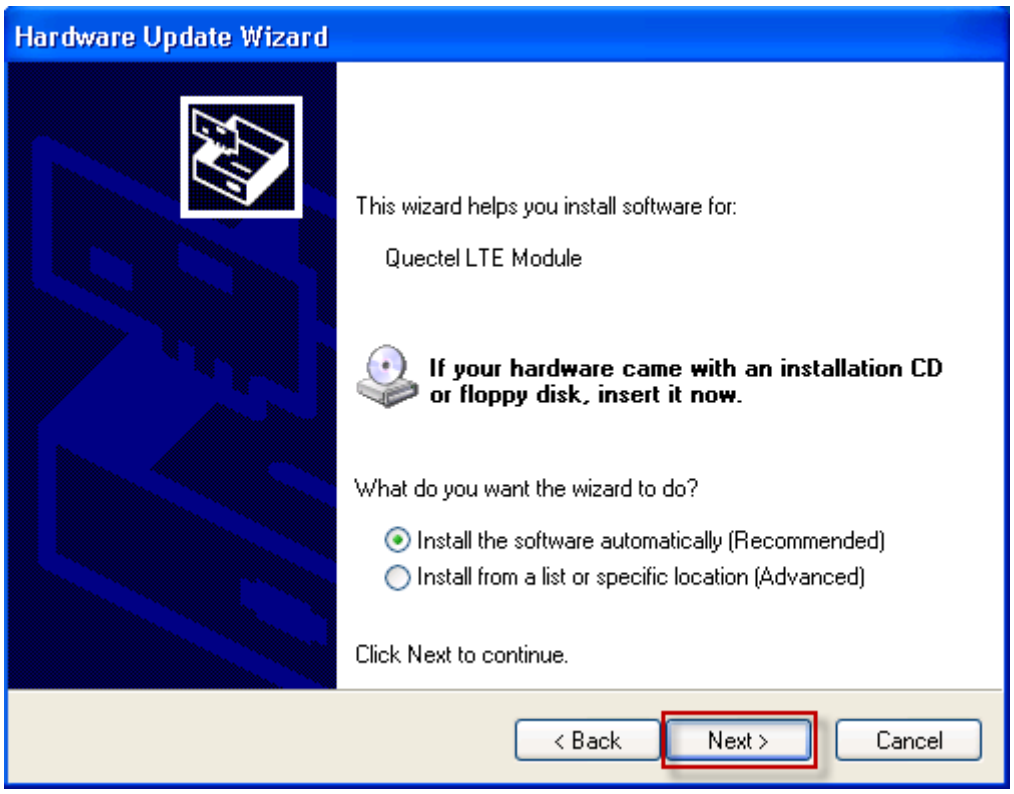


Step 5：Click “Finish”



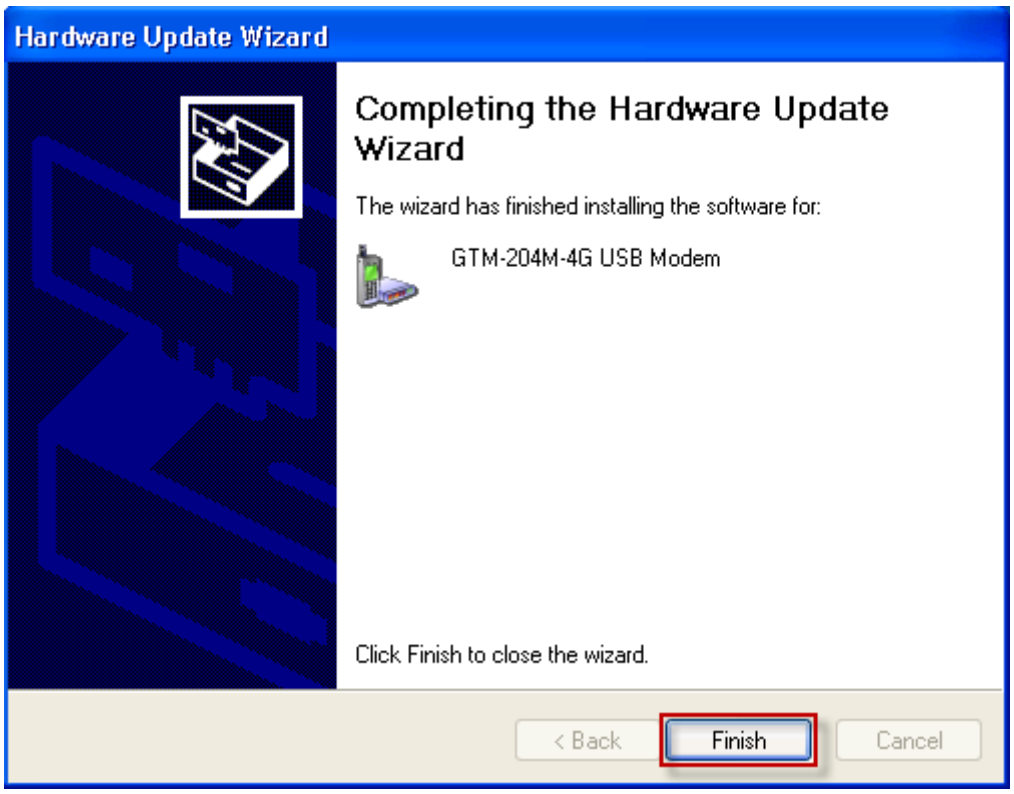
Step 6：Connect the USB of I-8213W-4G with the PC

Step 7：The “Found New Hardware Wizard” window for “Quectel LTE Module” will pop-out. Please click “Next”.

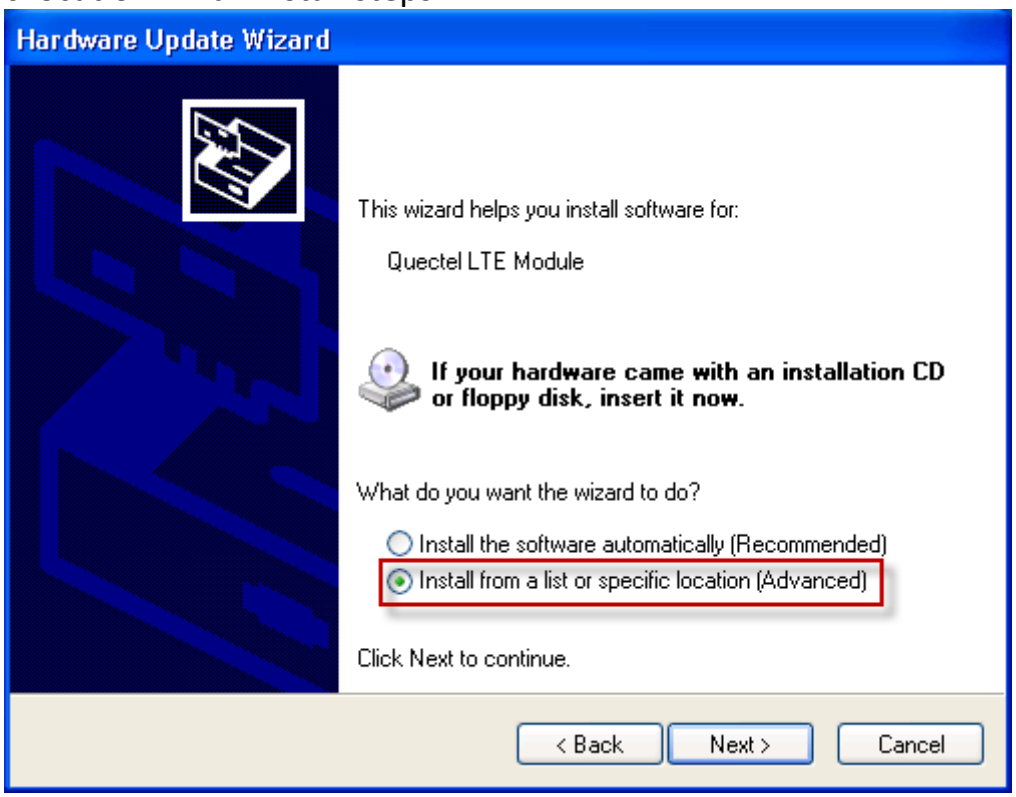


Step 7-1：Click “Continue Anyway”.

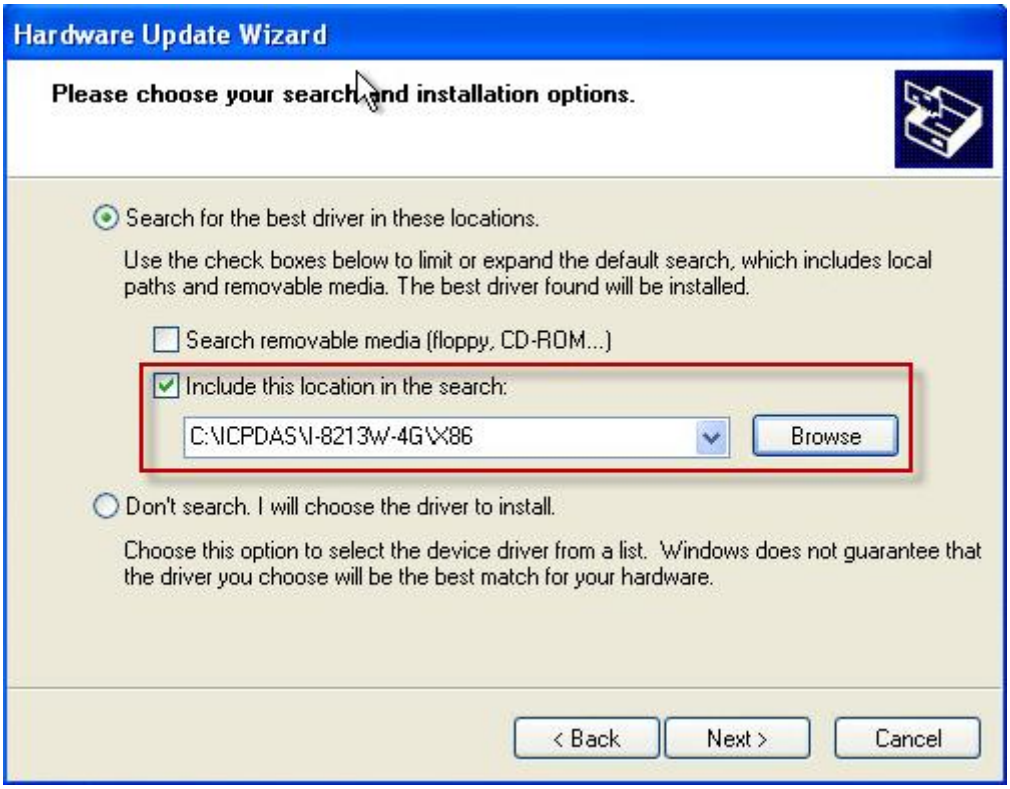
Step 7-2：Click “Finish” if you got a success message.



Step 7-3：Click “Back” if you got a fail message, and then choose “Install from a list or specific location” in all install steps.



Step 7-4：Click “Browse” to choose your installing folder, and Click “Next”.



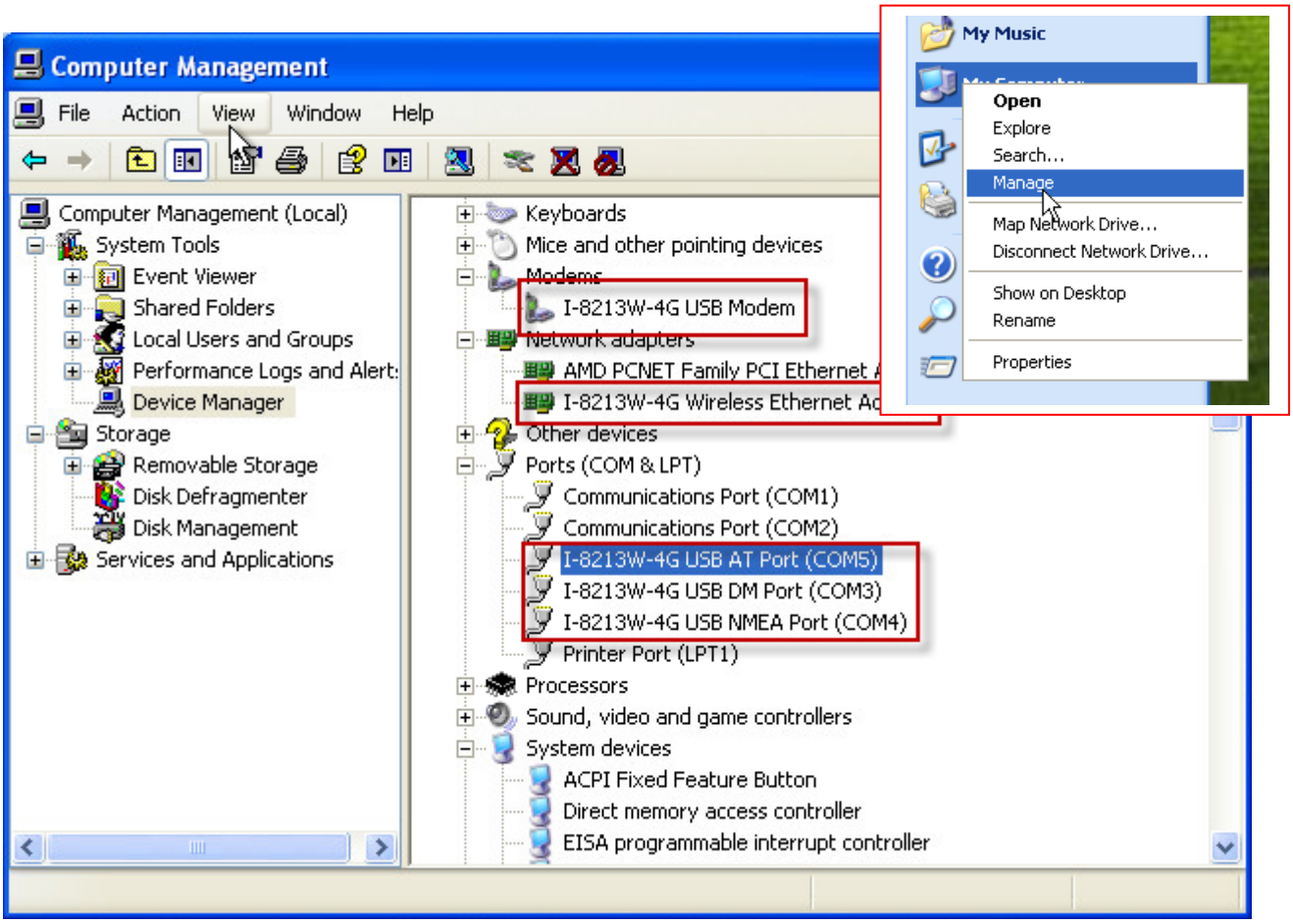
Step 8：The “Hardware Installation” window for “I-8213W-4G Wireless Ethernet Adapter” will pop-out. Please click “Continue Anyway”.

Step 9：The “Hardware Installation” window for “I-8213W-4G USB AT Port” will pop-out. Please click “Continue Anyway”.

Step 10：The “Hardware Installation” window for “I-8213W-4G USB NMEA Port” will pop-out. Please click “Continue Anyway”.

Step 11：The “Hardware Installation” window for “I-8213W-4G USB DM Port” will pop-out. Please click “Continue Anyway”.

Step 12：Finish the all install steps. Please open “Device manager”, and you will found new 8 items in your computer.



5.2. Example: LinPAC (Linux OS)

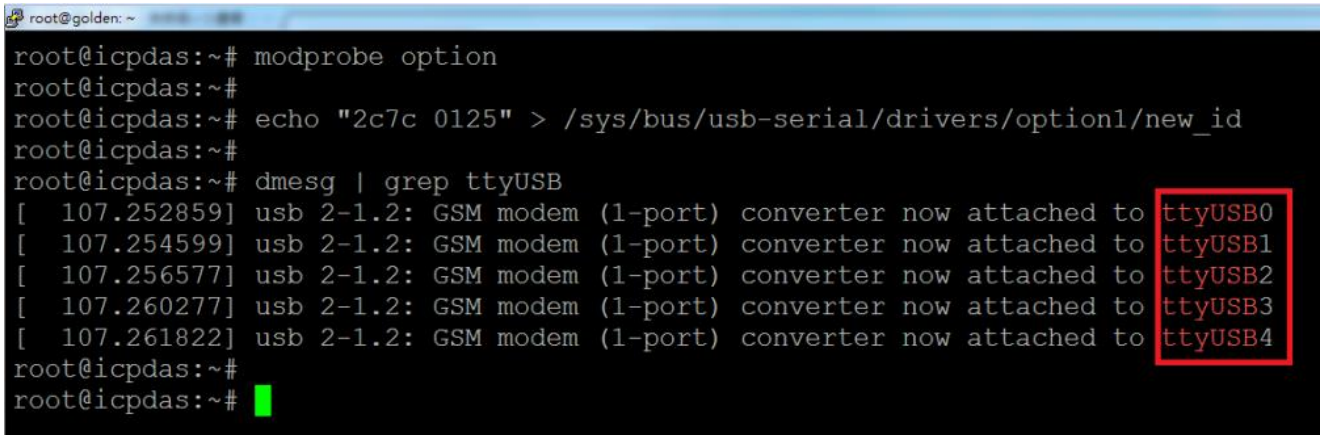
- **i-8213W-4G Driver Installing**

Linux can install the driver module “option” for I-8213W-4G.Please refer to the following Linux command steps.

Step 1：Enter the ”modprobe option” command

Step 2：And ”echo “2c7c 0125” > /sys/bus/usb-serial/drivers/option1/new_id”

Step 3：After the installation is complete, ttyUSBn will be displayed.



Please refer to below the interface information of i-8213W-4G:

Port Name	Interface Function
ttyUSB1	GPS/GNSS interface
ttyUSB2	AT Command interface
ttyUSB3	2G/3G/4G system interface

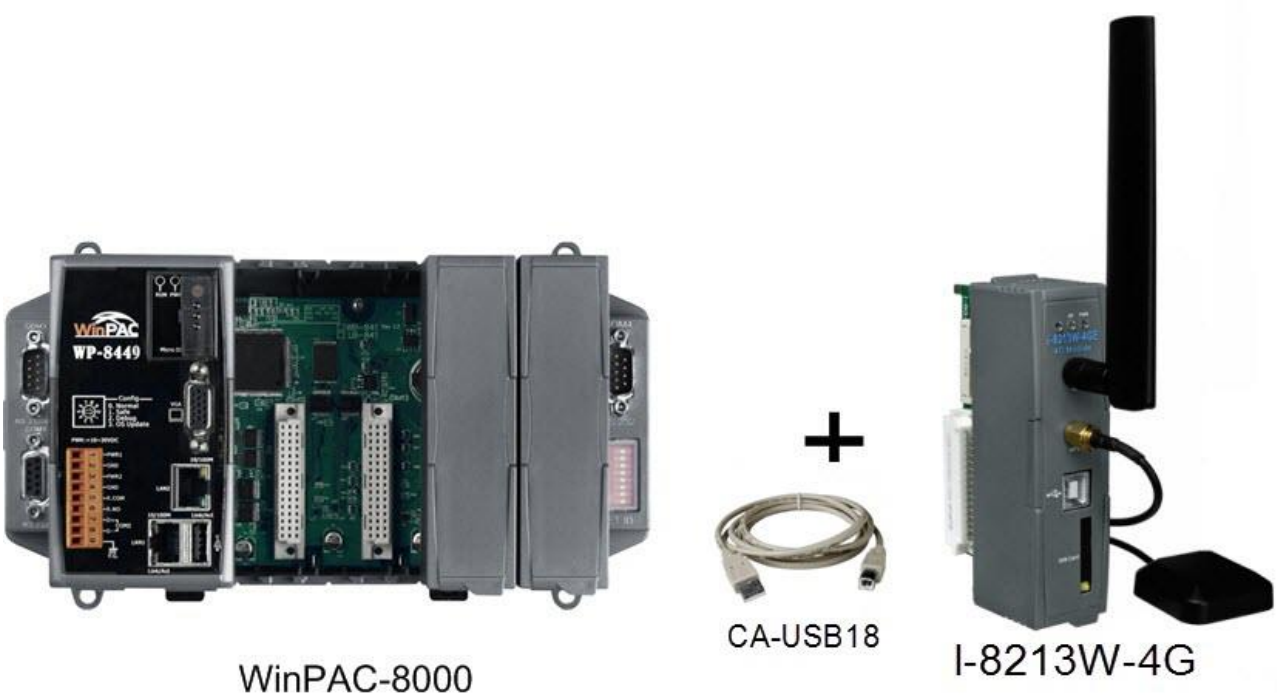
- **i-8213W-4G Driver Uninstalling**

Step 1：If you need to uninstall it, enter the command "modprobe -r option"

6. GPRS connection

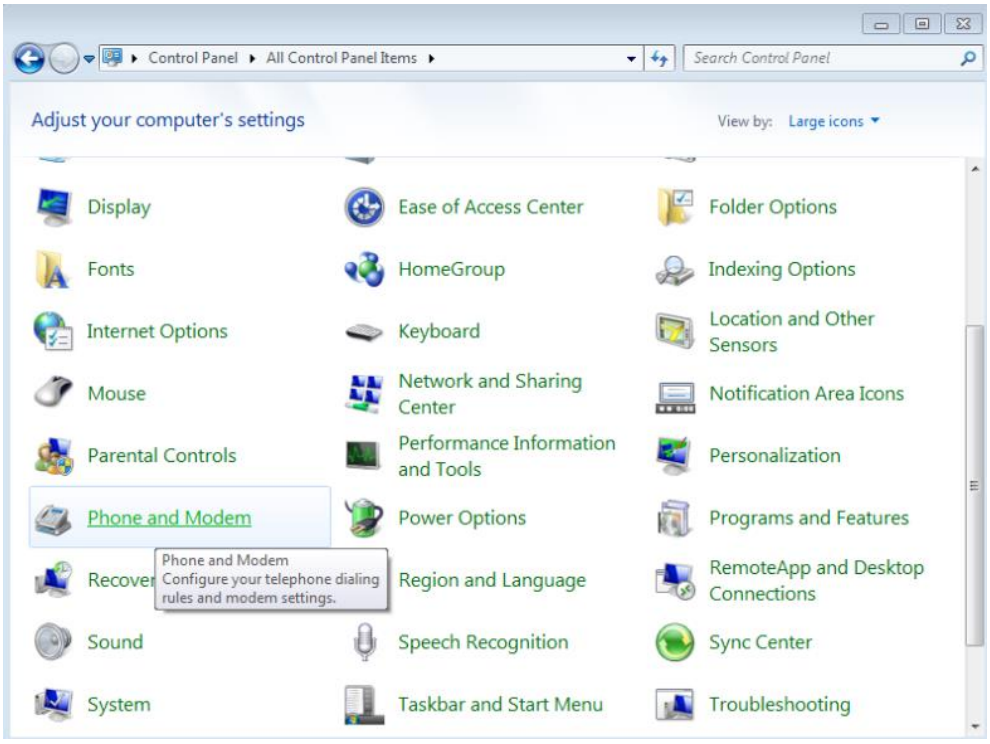
6.1. Example: XP-8000 (Windows Embedded Standard 2009)

- Hardware requirement
  1) I-8213W-4G
  2) CA-USB18 USB CABLE
  2) XP-8000

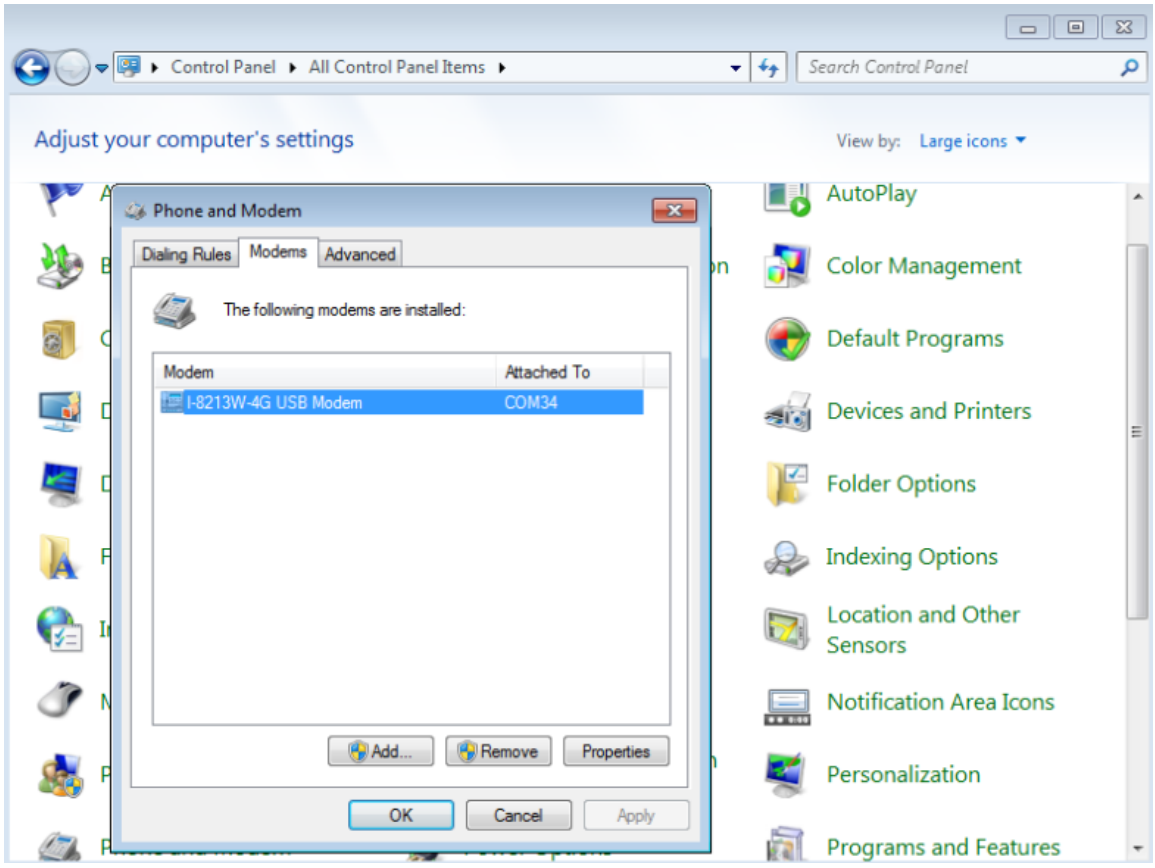


➢ Create a new modem connection

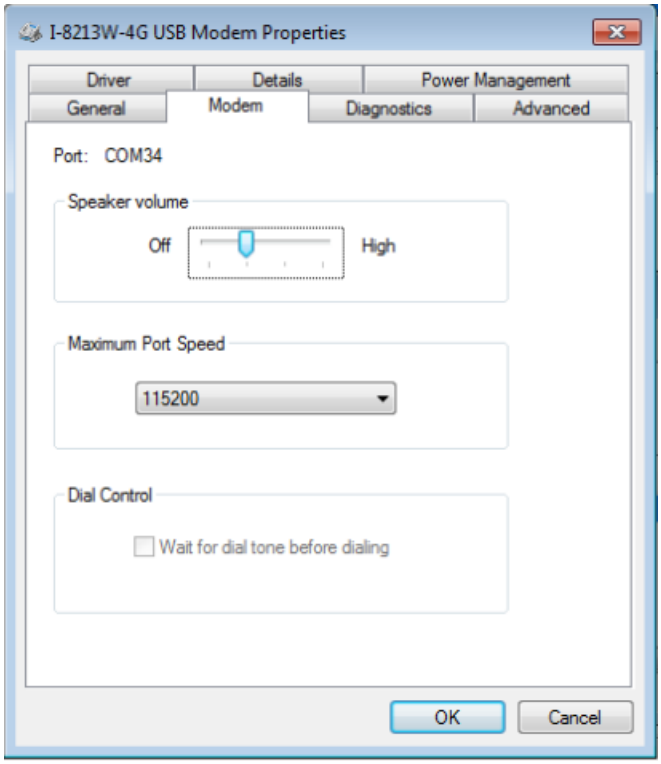
Step1. Control Panel → Double-click “Phone and Modem”



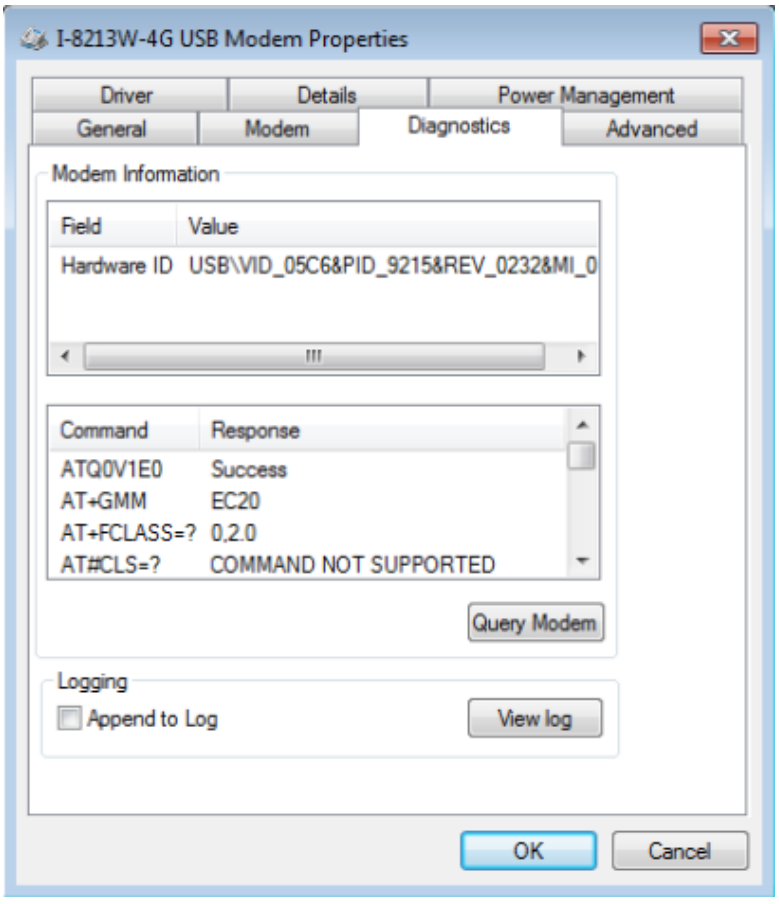
Step2. View "Modems" Options → Tap "Properties" on "I-8213W-4G USB Modem".



Step3. Check that the Maximum Port Speed in the Modem tab is 115200, if not, set it to 115200.



Step4. Click “Query Modem” on the “Diagnostics” page, wait a few seconds to check if the value is read, if not, make sure the USB driver is correct first.



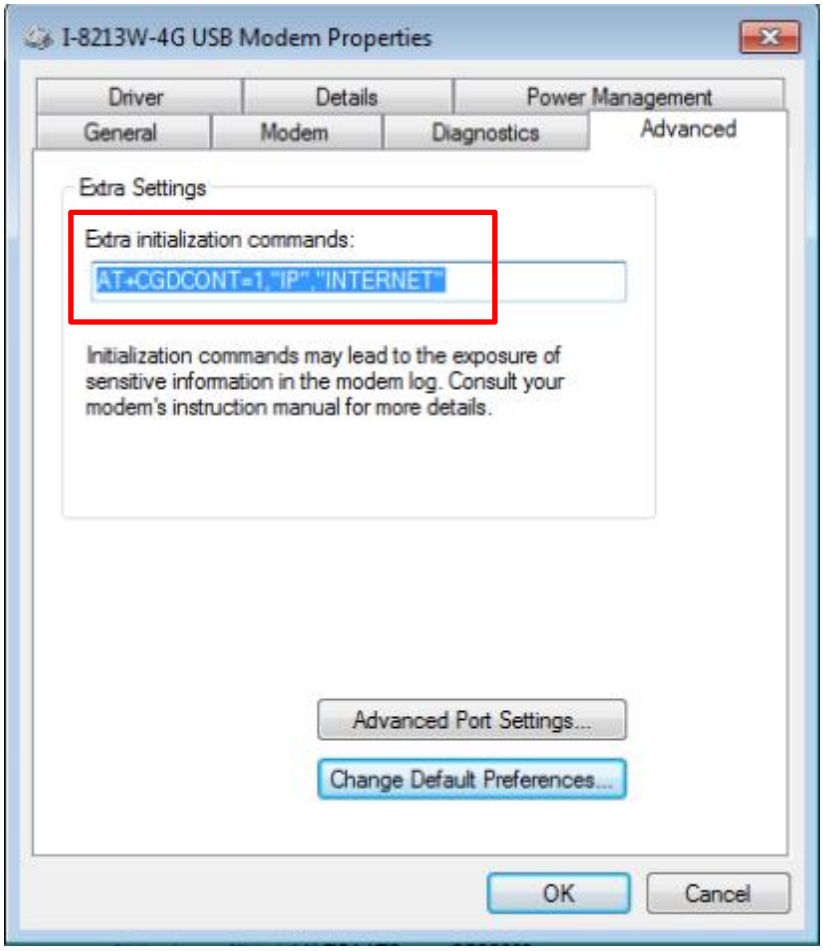
Step5. In the "Advanced" tab, enter additional dialing commands as shown below:

Note: The APN for GPRS is provided by your local carrier.

Example:

In Taiwan, enter: AT+CGDCONT=1, "IP", "INTERNET".

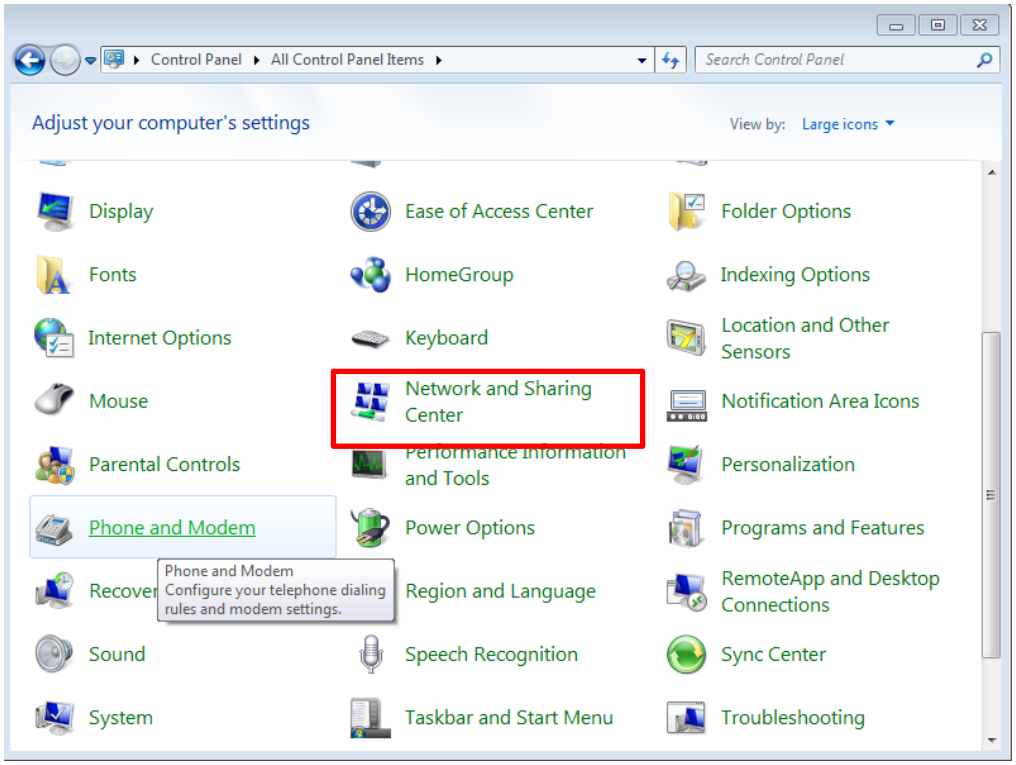
In Mainland China: AT+CGDCONT=1, "IP", "CMNET".



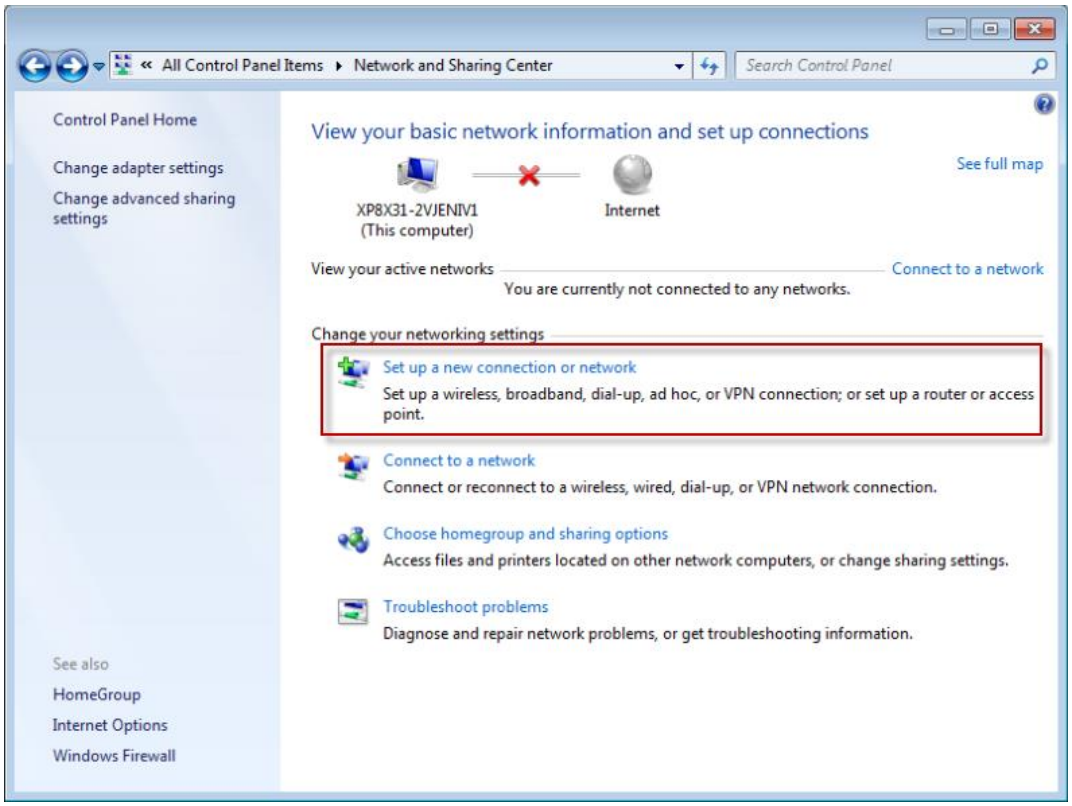
Step6. Click "OK

➢ Create a new dial-up and networking connection

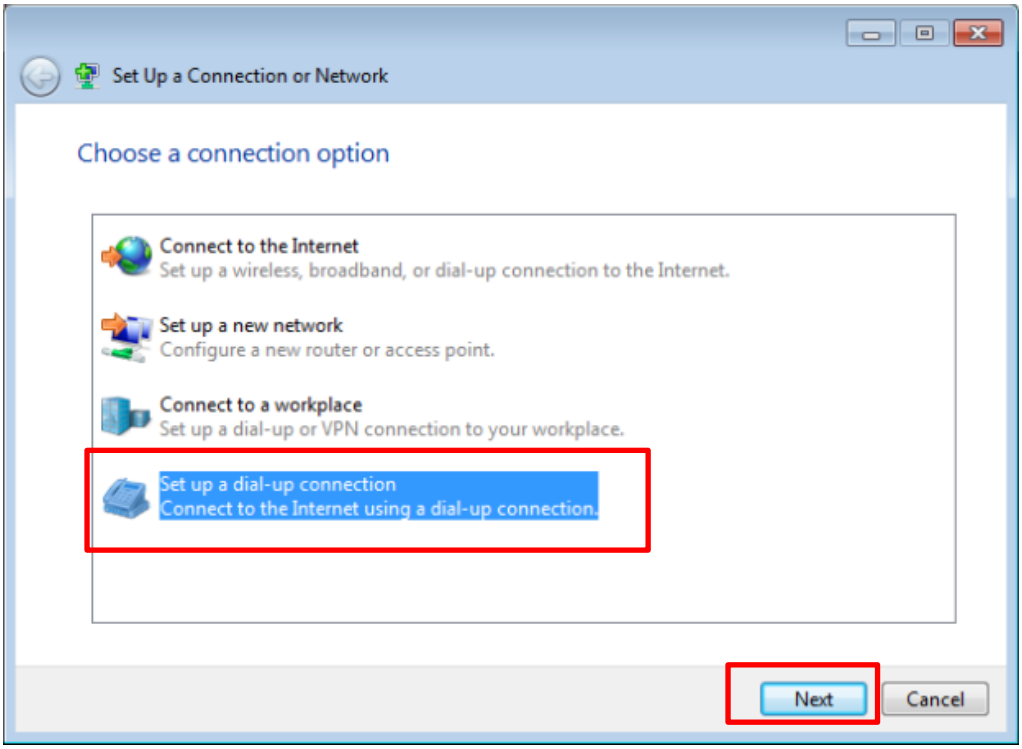
Step1. Control Panel →Click “Network and Sharing Center”



Step2. Click “Set up a new connection or network”

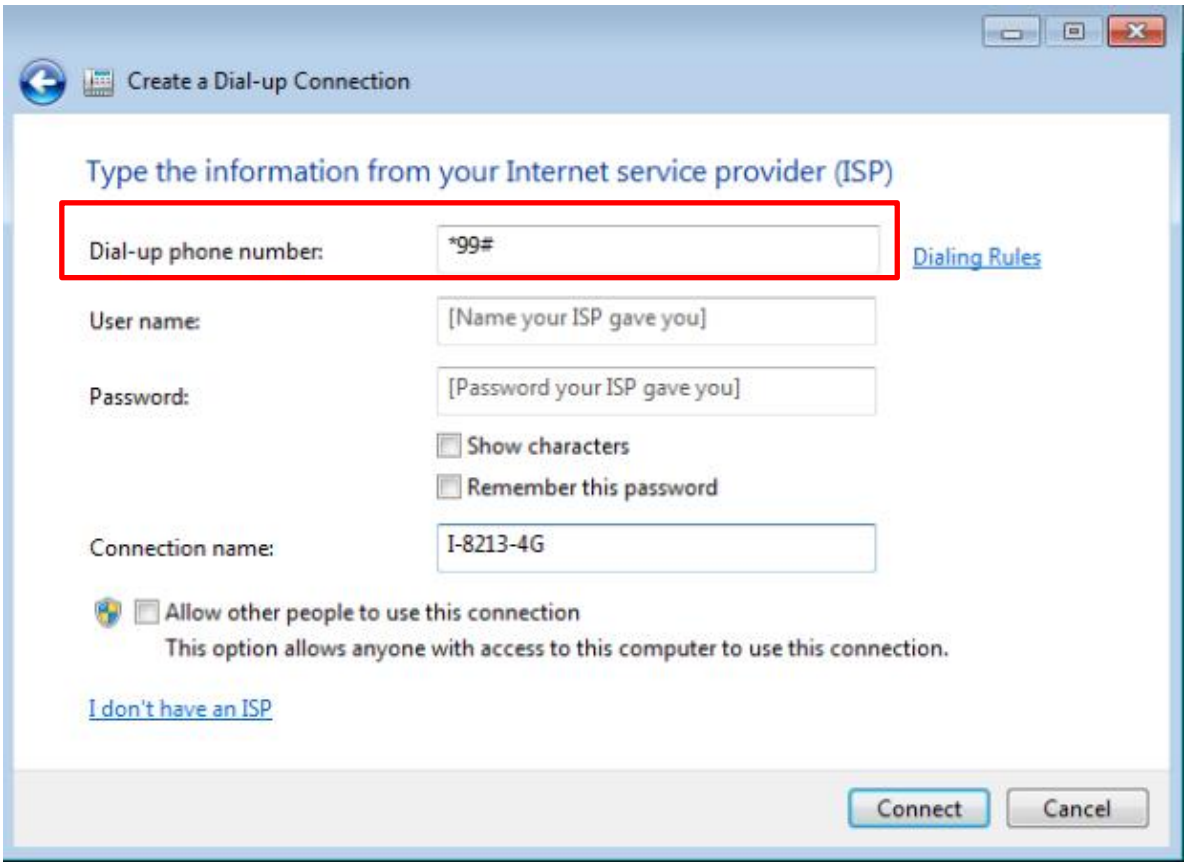


Step3. Select “Set up a dial-up connection” → Click “Next”

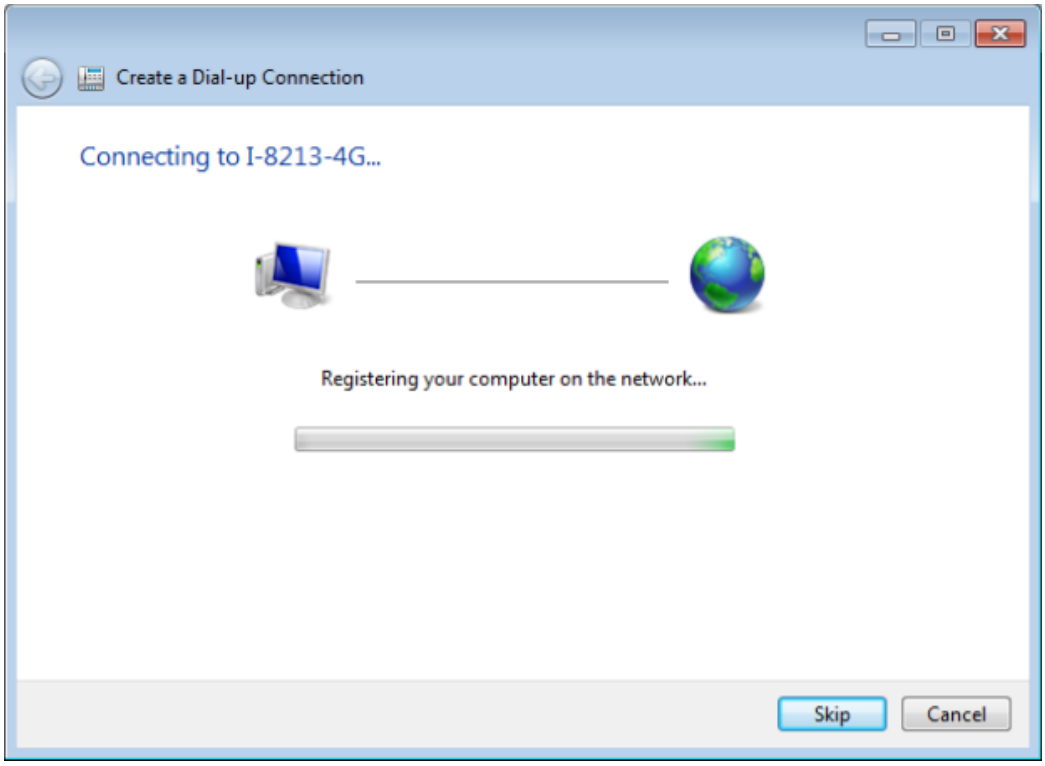


Step4. Fill in the phone number in the "Dial Phone Number" field → Press "Next" to go to the next step.

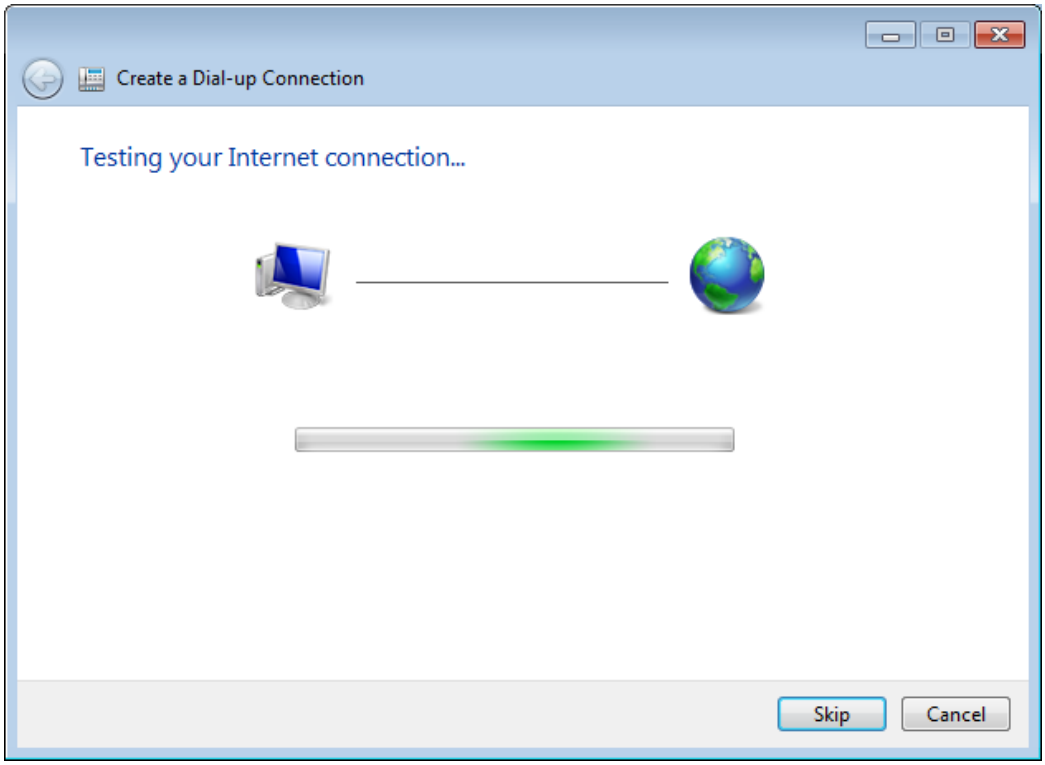
Note: The phone number is provided by your local telecom provider, e.g. *99# in Taiwan.



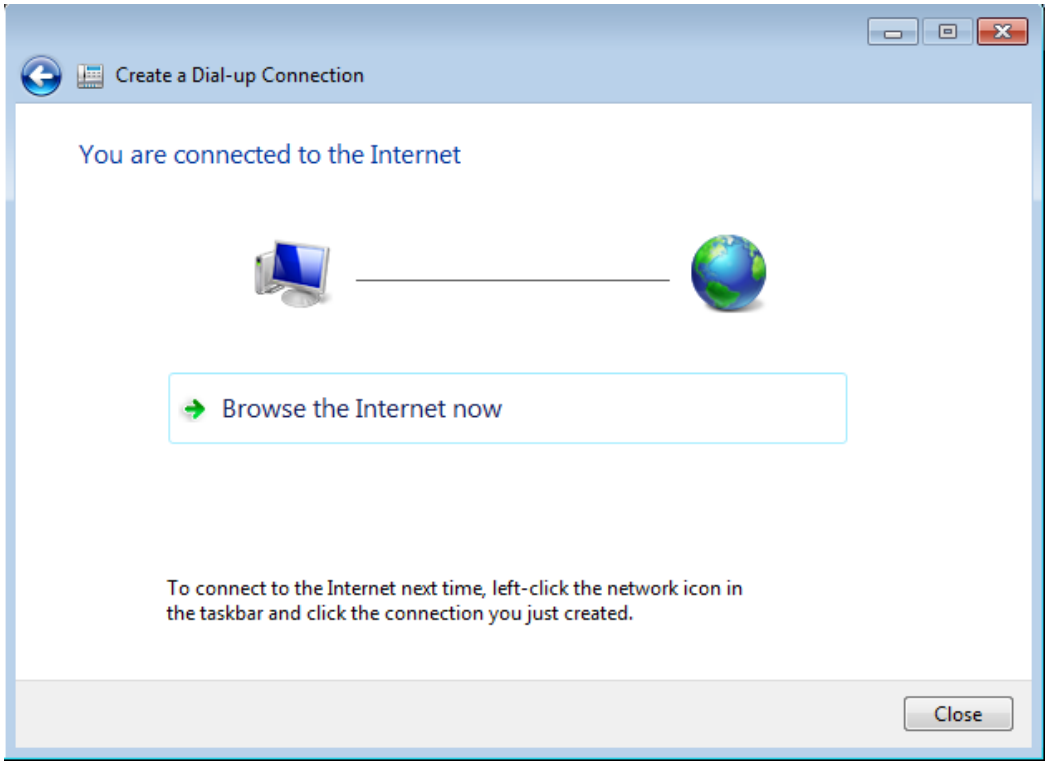
Step5. Connecting, please wait



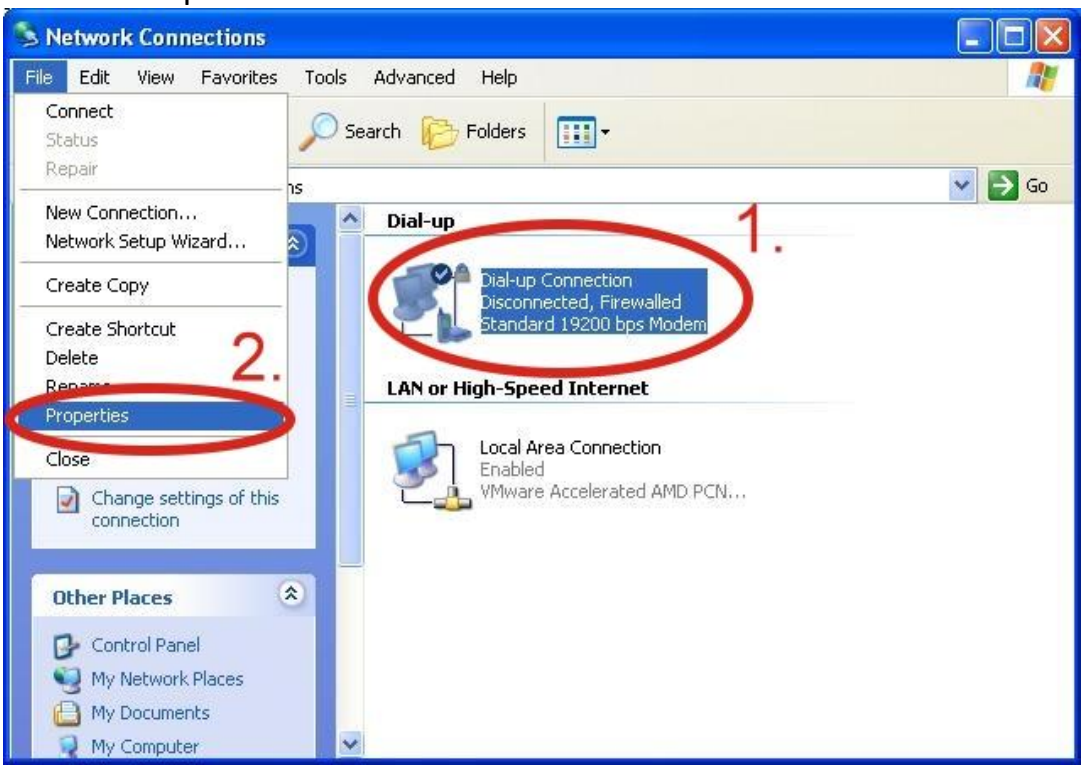
Step6. Connecting to the network will test the connection status first.



Step7. Confirm network connection.

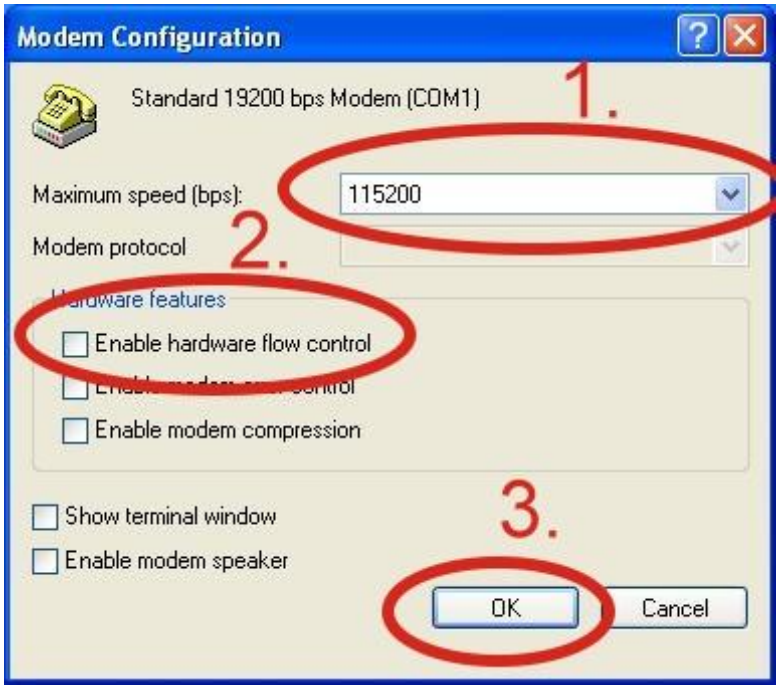


Step9. Control Panel → Network Connections → Click “Your GPRS’s name” → File → Properties



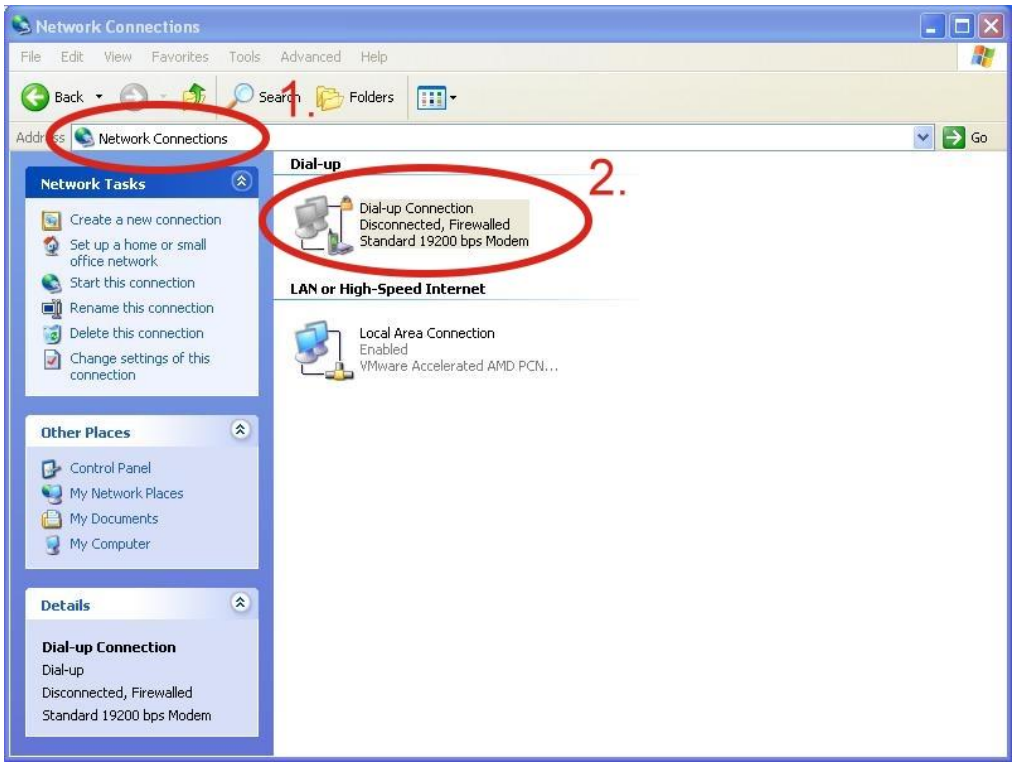
Step10. General → Select ”Standard 19200 bps Modem” → Click “Configure”

Step11. Maximum speed(bps) → Select ”115200” → do not select “Enable hardware flow control “ → Click “OK”



Step12. Click “OK”

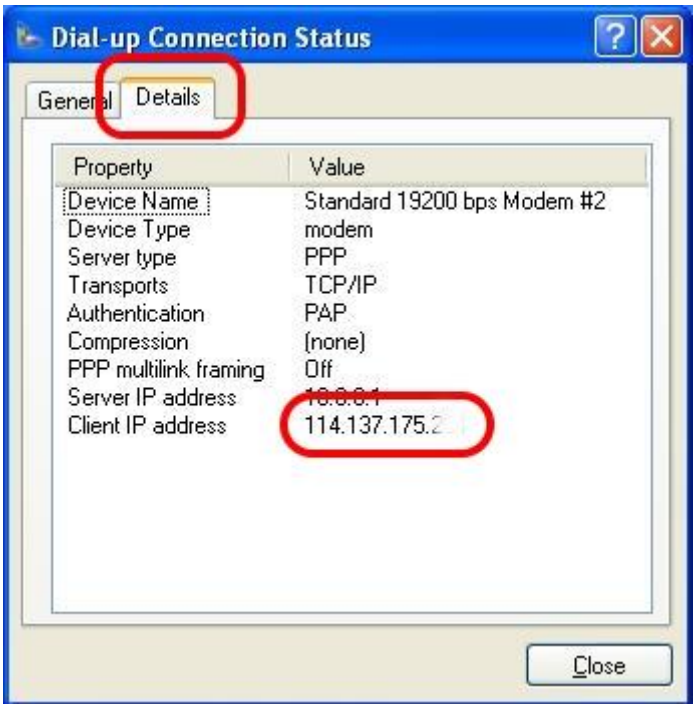
Step13. Control Panel → Network Connections → Double-Click “Your GPRS’s name”



Step14. Click “Dial”

Step15. If you connect to internet successfully, your toolbar have new logo

Step16. You can Double-Click the new logo → Click “Details” → Get your IP address



6.2. Example: LinPAC (Linux OS)

User can use the Linux command “wvdial” to connect the network via i-8213W-4G’s port “ttyUSB3”.

Step 1： Enter the command "cat /etc/wvdial.conf" to modify the ISR's wvdial.conf file, set the ISP's network configuration and save it, refer to the following example

Step 2：Enter the command "wvdial &" to enable 2G/3G/4G.

Step 3： After checking the IP address provided by the network provider, see if the "ppp0" network interface is active.

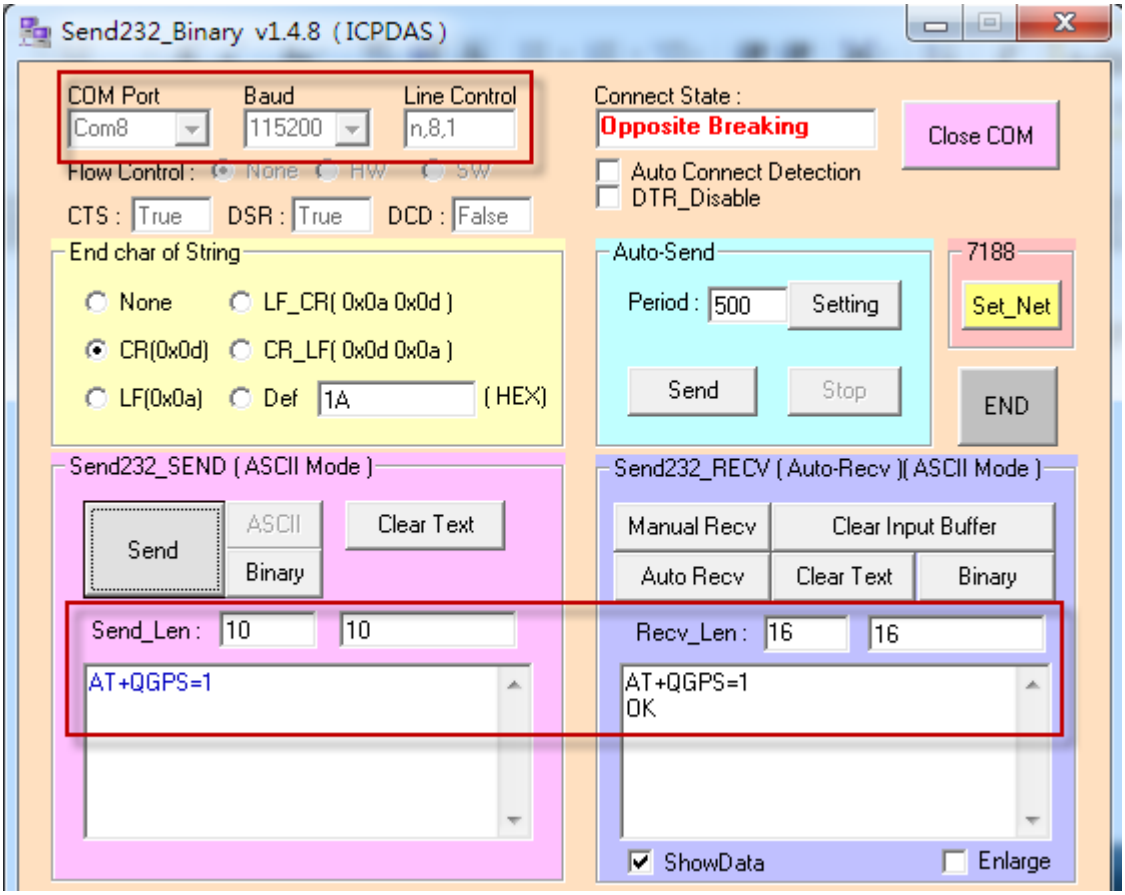
7. Quick test GPS

7.1. Example: XP-8000 (Windows Embedded Standard 2009)

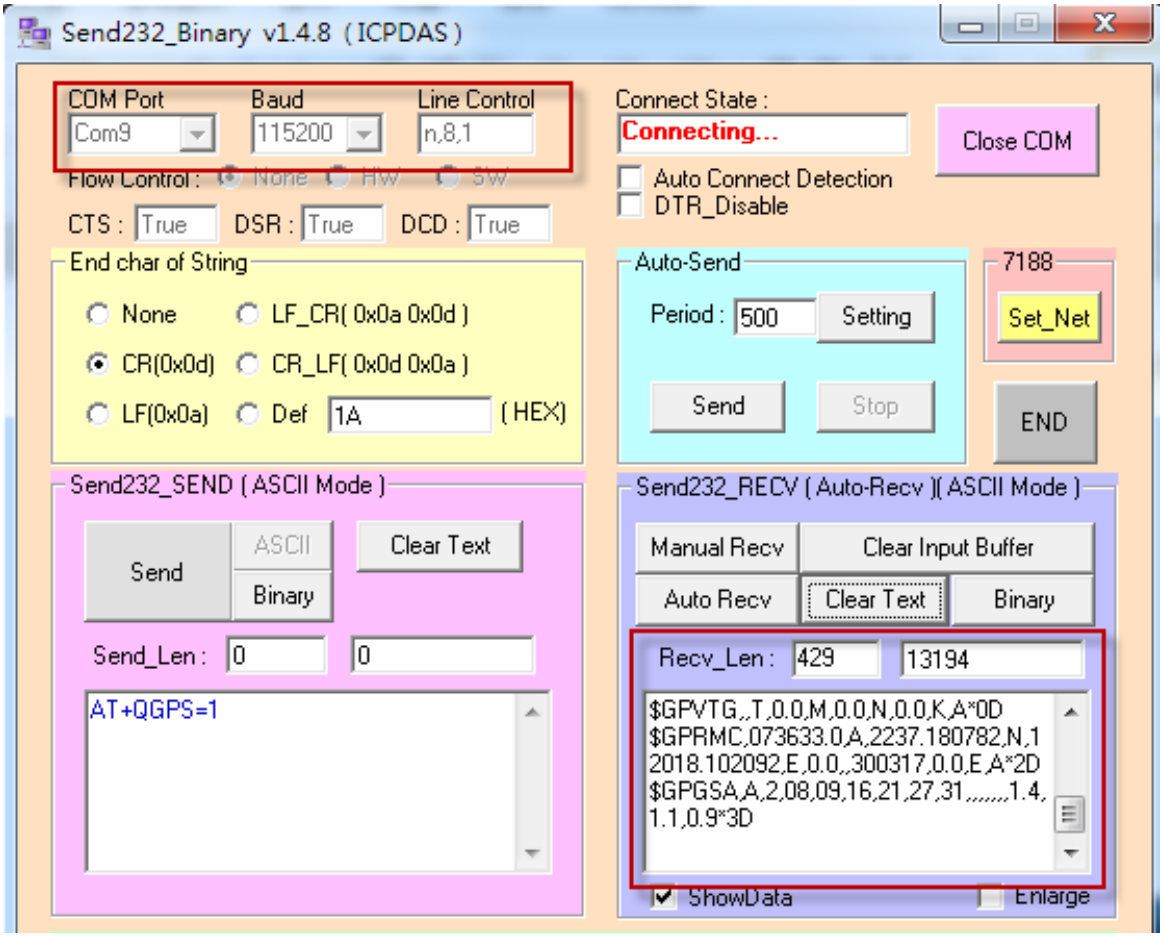
Step 1：To ICPDAS website download **XP-8000_Tool**
https://www.icpdas.com/en/download/show.php?num=2382&model=I-8213W-4GE
Step 2：Copy the tested software (Send232.exe) to your XP-8000 from the CD
Path: CD:\ gprs_gsm_modem\I-8213W-4G\Software\XP-8000\GPSTest

Step 3：Execute the tested software and select your AT port number of your XP-8000.

Step 4：Type the command: **AT+QGPS=1**



Step 5：Re-open the port (NMEA port) number, then you will get GPS data.



7.2. Example: LinPAC (Linux OS)

To read GPS NMEA data from the i-8213W-4G interface "/dev/ttyUSB1", follow the steps below:

Step 1：Enter the command " echo -e "AT+QGPS=1 \r\n" > /dev/ttyUSB2 > /dev/ttyUSB2 "

Step 2：Input the command "cat /dev/ttyUSB1", the result is as follows, GPS information will be output continuously.

```
root@icpdas:~# echo -e "AT+QGPS=1 \r\n" > /dev/ttyUSB2
root@icpdas:~#
root@icpdas:~# cat /dev/ttyUSB1
$GPVTG,,T,,M,,N,,K,N*2C


$GPGSA,A,1,,,,,,,,,,,,,,*1E


$GPGGA,,,,,,0,,,,,,,,*66


$GPRMC,,V,,,,,,,,,,N*53


$GPVTG,,T,,M,,N,,K,N*2C
```

Revised Note

Version	Editor	Date	Description
1.0	Eddie	2017-03-30	Release
1.1	Eddie	2017-09-05	Update Hardware Specifications
1.2	Eddie	2018-04-19	Update Dial-up Connection
1.3	Patty	2023-08-09	Add LinPAC Example