M300 Series Industrial Modem

User Manual

Content

Chapter1

1 Prologue

This document is just suit for the following mode type; it helps you quickly to used M300 Modem function and resolves some common questions.

Type	Marks
M300e	EDGE Modem
M300ev	EVDO Modem
M300d	HSDPA Modem
M300u	HSUPA Modem

1.1 Version

Version No.	Date	Description
1.00	2008-07-07	
1.01	2008-07-14	Add FAQ
1.02	2008-8-19	Add ZTE S/W operation

1.2 Referenced Documents

EL-M300 Series Modem Datasheet.pdf

1.3 Notice

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Chapter2

2 Introduction

2.1 Brief

With the development of wireless communication technologies, wireless products are being adopted in numerous industrial and civilian fields. E-Lins Technology Co., Limited is a leader of wireless communication equipment manufacturer releases the Wireless Modems, which support various frequency bands of EDGE/EVDO/HSDPA, and provide industrial terminal solutions for 2.75G/3G communication.

M300 series wireless modem adopts industrial level modules, specially designed for the complicated industrial environment which compatible with EMC, and will be your best choose of wireless communication.

2.2 Features

- Remote Data Monitor and Control
- Water, gas and oil flow metering
- AMR (automatic meter reading)
- Power station monitoring and control
- Remote POS (point of sale) terminals
- Traffic signals monitor and control
- Fleet management
- Power distribution network supervision
- Central heating system supervision
- Weather station data transmission
- Hydrologic data acquisition
- Vending machine
- Traffic info guidance
- Parking meter and Taxi Monitor
- Telecom equipment supervision (Mobile base station, microwave or optical relay station)

2.3 Benefits and Features

- Industrial design with intelligent software capabilities, making it a reliable cellular solution for data collection and transmission
- Plug-and-play design with easy-to-use software interface for easy integration
- Easily manage and control distributed remote devices over the air
- Built-in Watch Dog
- Real-time Clock (RTC)
- Remote Data Monitor and Control
- Reliable GSM/GPRS/CDMA/EVDO network connectivity, providing fast and cost-effective long-range wireless communication
- Always-On-Line
- Easy-to-use
- Industrial design with surge protection
- Local and remote configuration over the air , No need to build expensive fixed line network, saving cost substantially

2.4 Specification

M300e Radio Frequency
GSM Phase2/2+
GSM (EGSM) 900MHzDCS (GSM) 1800MHz or GSM850/900/1800/1900Mhz
Output power: 2W (GSM900MHz Class 4)   1W (DCS1800MHz Class 1)
M300ev Radio Frequency
TIA/EIA-95B, CDMA2000 1X
Band class 0: 800MHz
Band class 1: (USPCS 1900MHz)
450Mhz is optional
M300d/M300u Radio Frequency
WCDMA/UMTS HSDPA Band: 2100Mhz or 2100/1900/850Mhz tri-band
Support E-GPRS Class 10, GPRS class12
EDGE Quad-Band GSM
850/900/1800/1900 MHz
Output power:
Class 4 (2 W) for EGSM850
Class 4 (2 W) for EGSM900
Class 1 (1 W) for GSM1800
Class 1 (1 W) for GSM1900

Data transfer

SMS:

      Point-to-point MO and MT

      SMS cell broadcast

      Text and PDU mode

CSD up to 14.4 kbps, USSD, Non transparent mode, V.110

Fax: Group 3, Class 1, 2

Audio: Half Rate (HR) Full Rate (FR)   Enhanced Full Rate (EFR)

Interface

Plug in power supply

Mini-SIM card reader

Standard RS-232/485/TTL

Standard serial Port (DB-9)

SIM interface: 3V And1.8V

Shell:

   Steel shell: good electromagnetic shield and, heat radiate performance

Environment

Ambient temperature: –20 centigrade degrees ~ +60 centigrade degrees

Storage temperature: -50 centigrade degrees ~85 centigrade degrees

Humidity: ≤90%

Electromagnetic Compatible

Electrostatic Discharge (ESD):   3 class

Radiated, radio-frequency, electromagnetic field immunity test: 3 class

For details, please refer to the related Datasheet.

2.5 Application

- Remote Data Monitor and Control
- Water, gas and oil flow metering
- AMR (automatic meter reading)
- Power station monitoring and control
- Remote POS (point of sale) terminals
- Traffic signals monitor and control
- Fleet management
- Power distribution network supervision
- Central heating system supervision
- Weather station data transmission
- Hydrologic data acquisition

- Vending machine
- Traffic info guidance
- Parking meter
- Telecom equipment supervision (Mobile base station, microwave or optical relay station)
- Oil field data acquisition
- Warehouse supervision

Chapter3

3 Getting Started

3.1 Connect to product

1. Please connect antenna and cable with our products, make sure the following
   The port is COM1 or COM2.
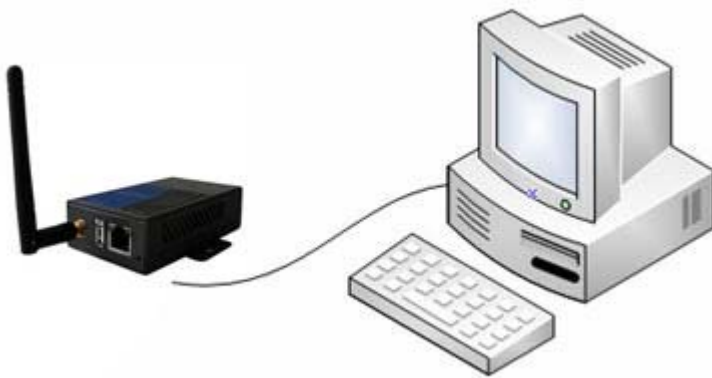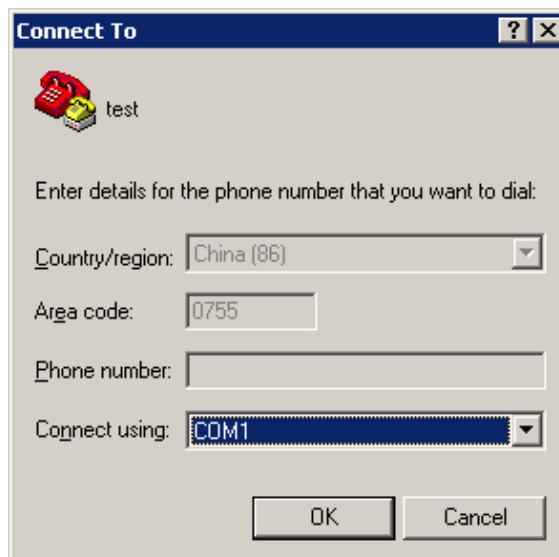

3.5 Insert SIM Card

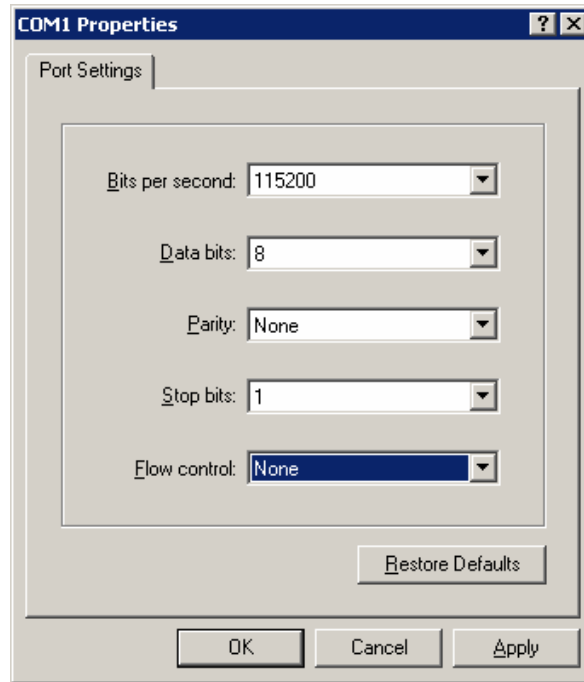2. Open the SIM Card Slot and insert into SIM card,

3.6 Note: Hyper Terminal

3. Open the HyperTerminal and input ***(any) as follows

4. Choose a right port


5. The right configuration as following

（图 3-3）

6. When your start-up Hyper Terminal, it is not connected really, you can see the red mark of follow picture without any number .And then, first Disconnect existing connection, second ,Click the red arrowhead
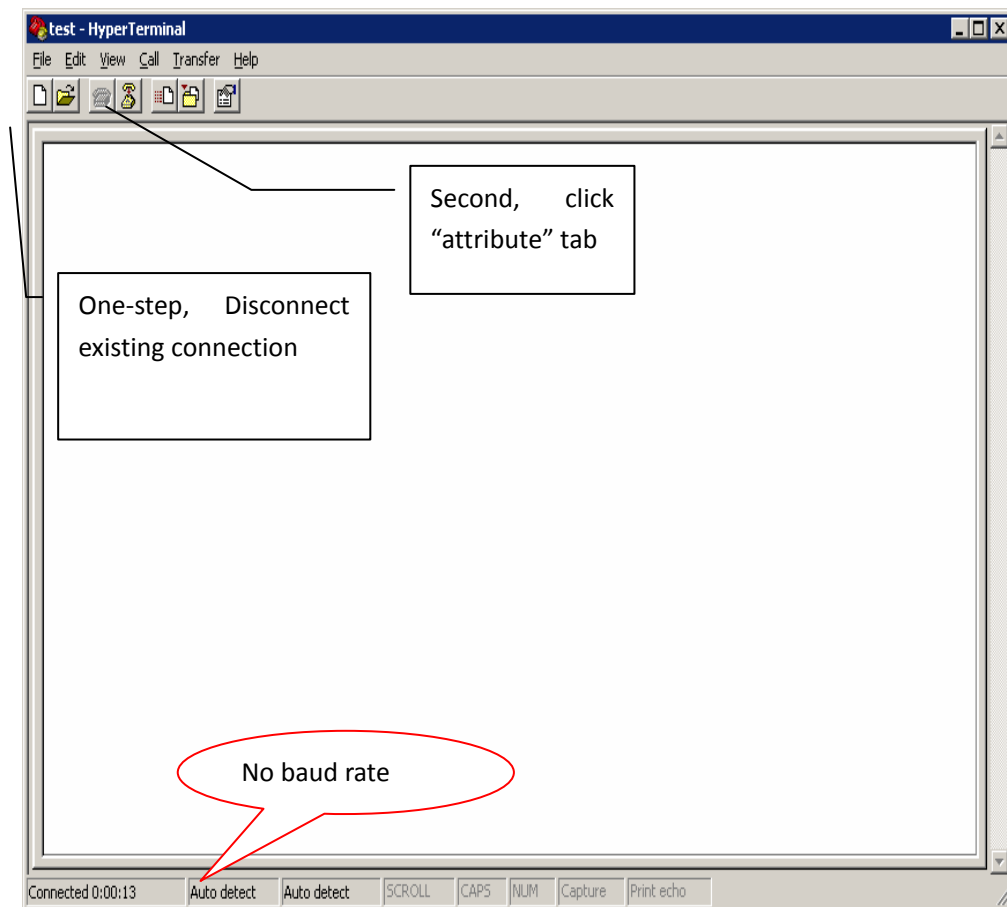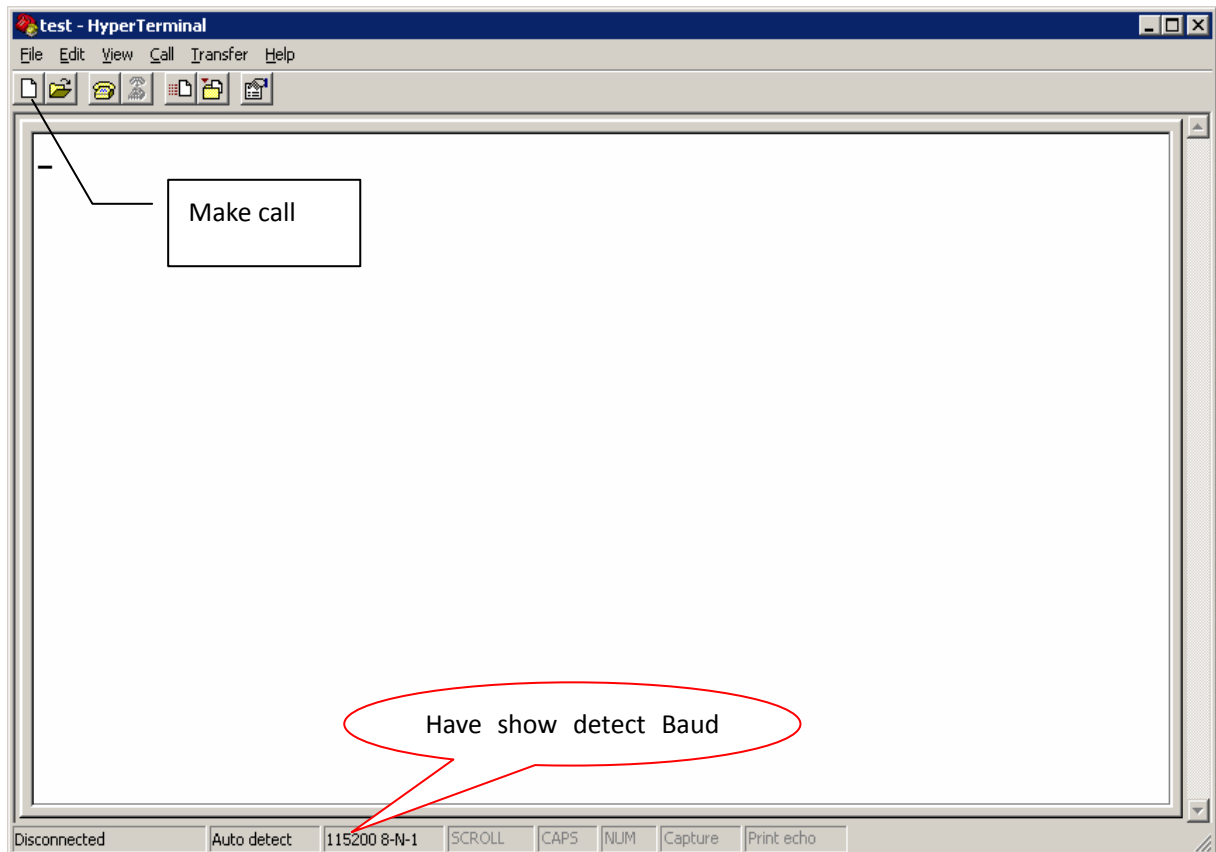

7. Click the "configure", and double confirm your modified configuration
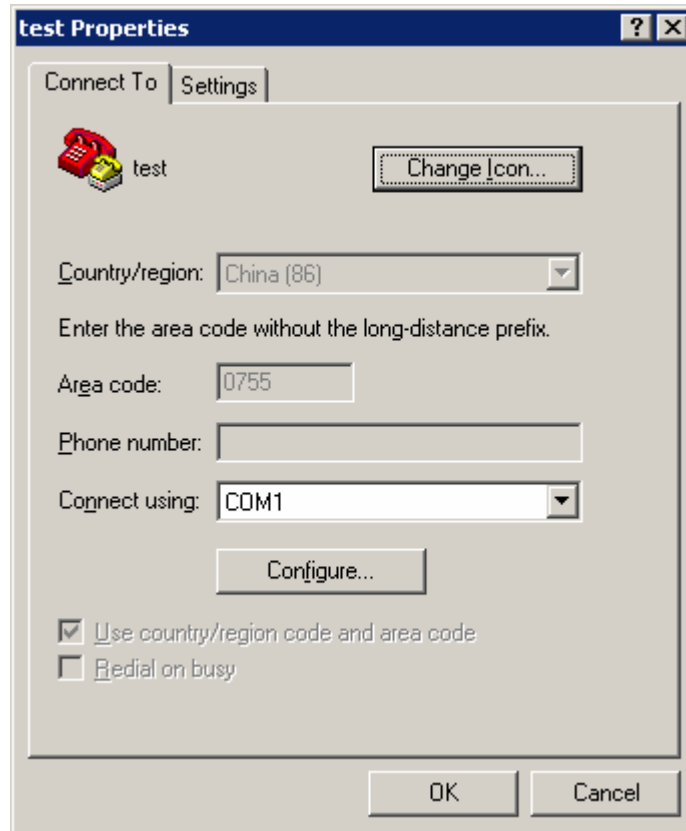
8. Double confirm your modified configuration and click "OK"
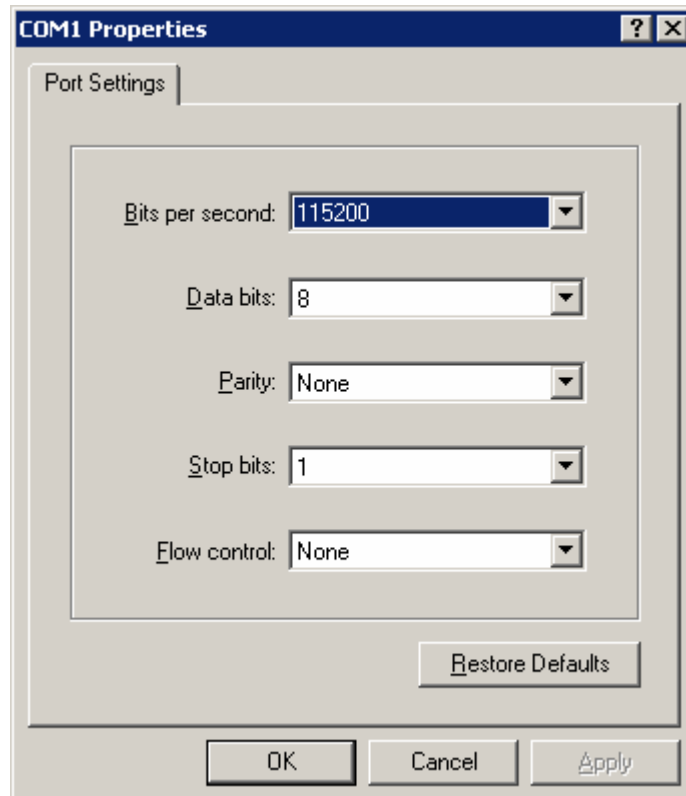
9. Then you can see it appeared baud rate on white label, then click the black label   to make call

```
test - HyperTerminal
File  Edit  View  Call  Transfer  Help
```

Make call

Have show detect Baud

```
Disconnected        Auto detect   115200 8-N-1   SCROLL   CAPS   NUM   Capture   Print echo
```

10. provide power supply with our products, you configured the Hyper Terminal successfully

3.7 Test command

Test AT command

AT<CF>   //Test "at"command

I/OK   //Response ok parameter if successfully connected, you can make sure the module have no malfunction

AT+CSQ<CF>   // to check the Signal quality

+CSQ: **, ##   // ** Should be the number between 10 and 31, the signal quality becomes better as the number grows.   ## should be is 99, Or you should checking the equipment of antenna or SIM card.

 If you succeed in testing command, at now, you can begin to use Modem

Chapter4

4 Configure directory

4.1 About SMS

How to used SMS:
Please follow the SMS User Manual

4.2 About CSD

4.2.1 Introduce CSD

CSD (Circuit Switched Data) is 9.6kbps speed circuit Switched Data from GSM network,
GSM+2 operations could attainability 14.4kb/s speed. and encrypts the data at the same time, so the GSM system has the encryption function. It can connect with the line Modem,

4.2.2 Getting started

- Connect two modems with each two computers" cable and open up Hyper Terminal
- Setting Modems baud rate 9600bps
- Register the CSD function. if you used this function, the SIM card have Register CSD. Dredge CSD Function usually have two number. one is "pn" for voice message .and other is" un" for date message

4.2.3 Mutuality command

4.2.3.1 Generally command

```
ATD136******          //make call
ATA                   //answer a call
+++                   //Switch from date mode or PPP online mode to command mode
ATO                   //Switch from command mode to data mode or PPP online mode
ATH                   //Disconnect existing Connection
```

4.2.3.2 Set the auto answer in ringing

ATS0=n   //Set number of ring before automatically answering the call
AT+IPR=n   //Setting Baud Rate of Module (default is auto-acclimatize)

Note: n=0/300/600/1200/2400/4800/9600/14400/28800/38400/57600/115200 (in M12S211, this parameter default is 0; in M12H111, this parameter default is 115200)

4.2.4 Test

Initialization commands"
AT&F0   // renew default parameter
AT+IPR=9600   // setting fixed baud rate
AT&W   // save parameter

Initialization command of Callee
ATS0=1

Initialization command of caller
ATD[dn]   //note: not ending as" ; "is data call, end as";" is voice call   make call [dn]is data
                        number.
        Callee answer command
ATA   // answer call

Communicate account command
+++   // abort communicate, return command mode
ATO   // Switch from command mode to data mode or PPP online mode

Disconnect existing Connection
ATH   // Disconnect existing Connection，in command mode

When Callee receives a ring, it answers automatically. Both them will show connect 9600and enter data state .then you can used CSD.

There is a simple test course; it is suitable for modem products, and fit for the wireless modem connect with line modem.

The Connecting mode of the CSD is same with line modem, even replace, but it is expensive, and not always online, only point to point, can not be one point to many points (center need to use modem, if come true point to point)

4.3 Dial-up

Dial-up to connect network in windows XP operation System

4.3.1 Setup Modem

Please connect Modem with your computer Rs232 interface cable .then Start from "Control Panel", click "Phone and Modem Options", and select "Modem":
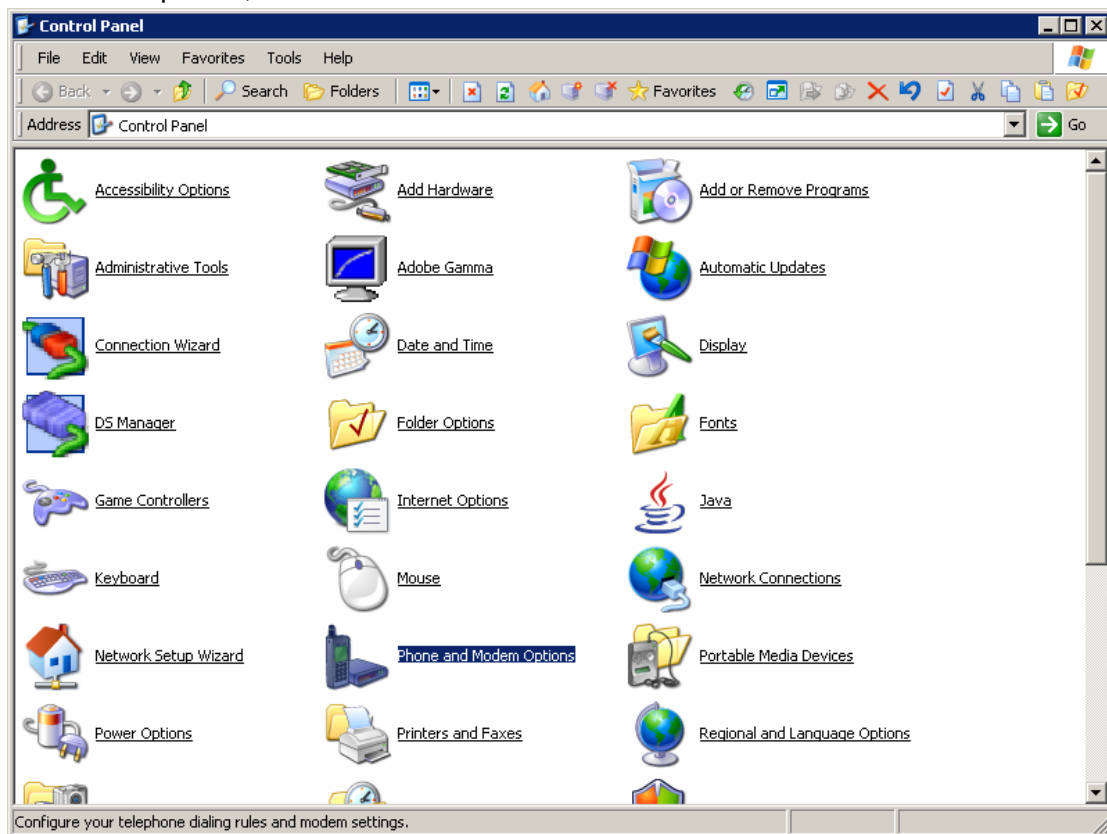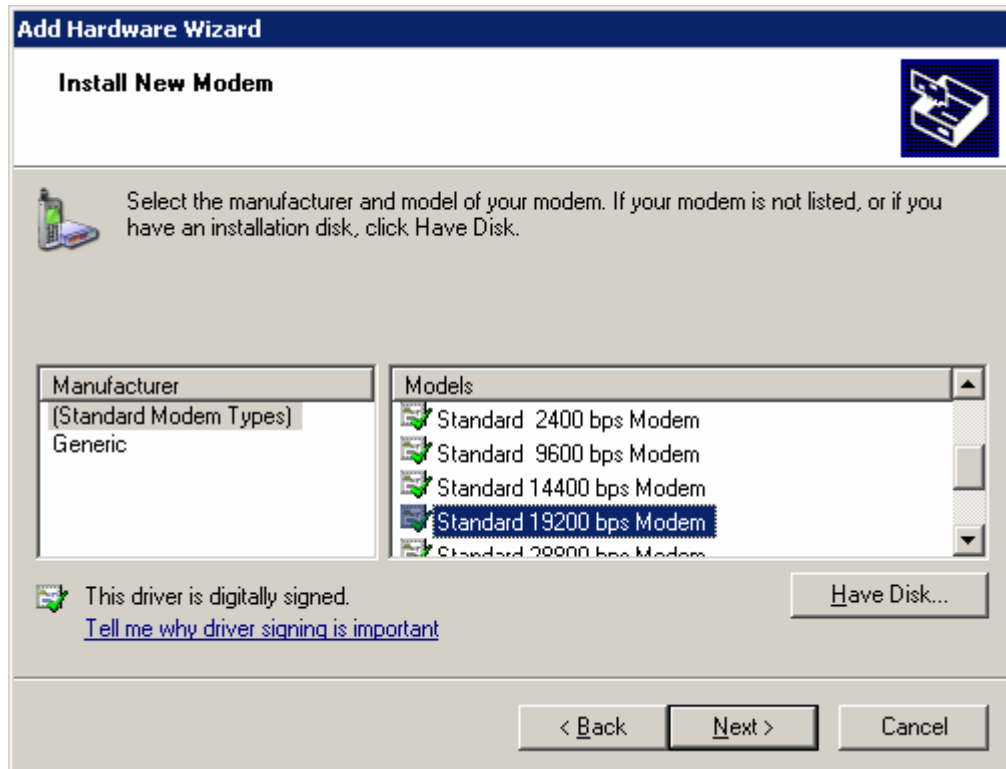

click "New location" to add a new modem:
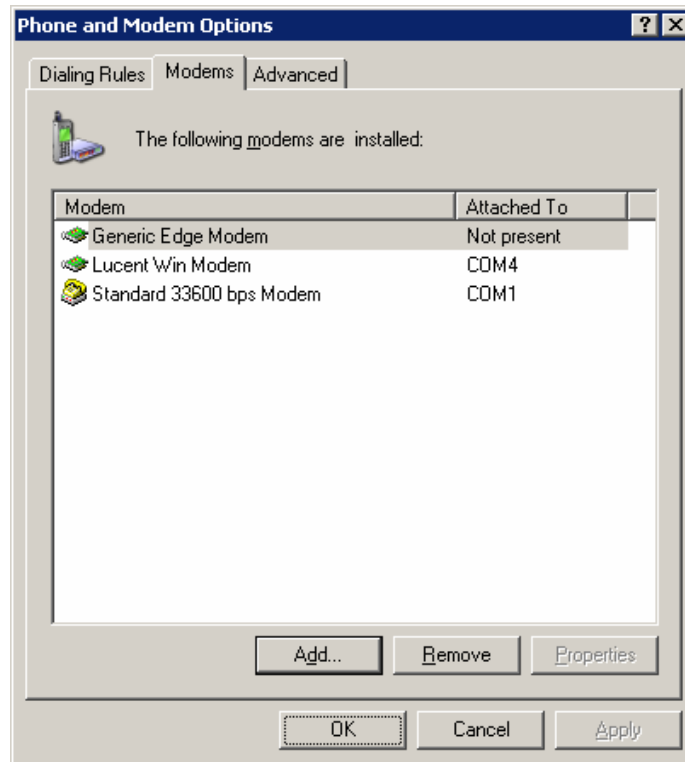
Tap "Don't detect my modem; I will select it from a list ", and then click" Next" to continue
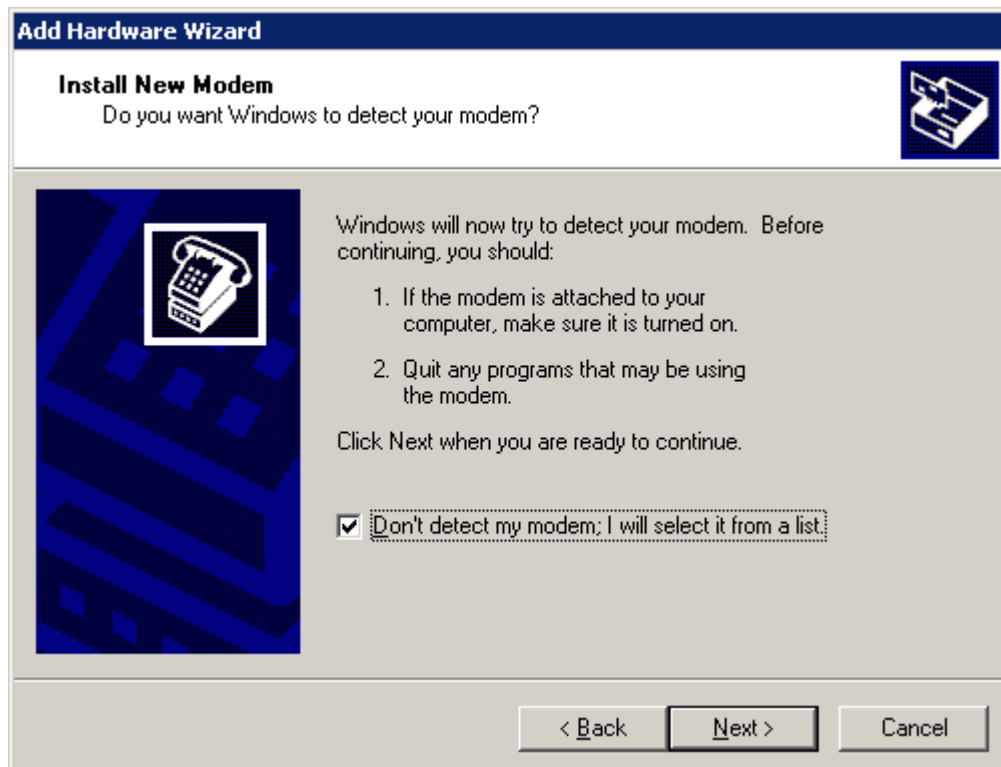
When appear "install new modem" dialog box, choose "standard Modem Types" in the left manufacturer, and choose "Standard 19200 bps Modem" in the right Models

Select COM port: Choose the right port (it depends your computer, may be not "COM1".), and click "next" then you will finish installation.
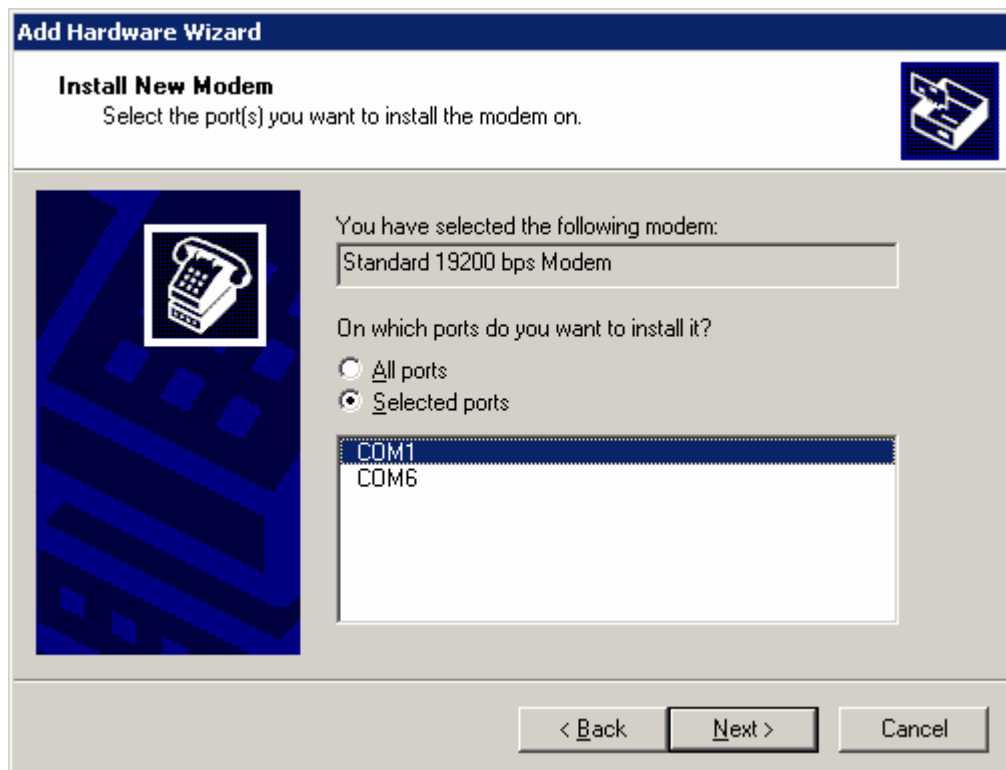
When appear Following Frame, Click "Finish" to succeed your modem installation.
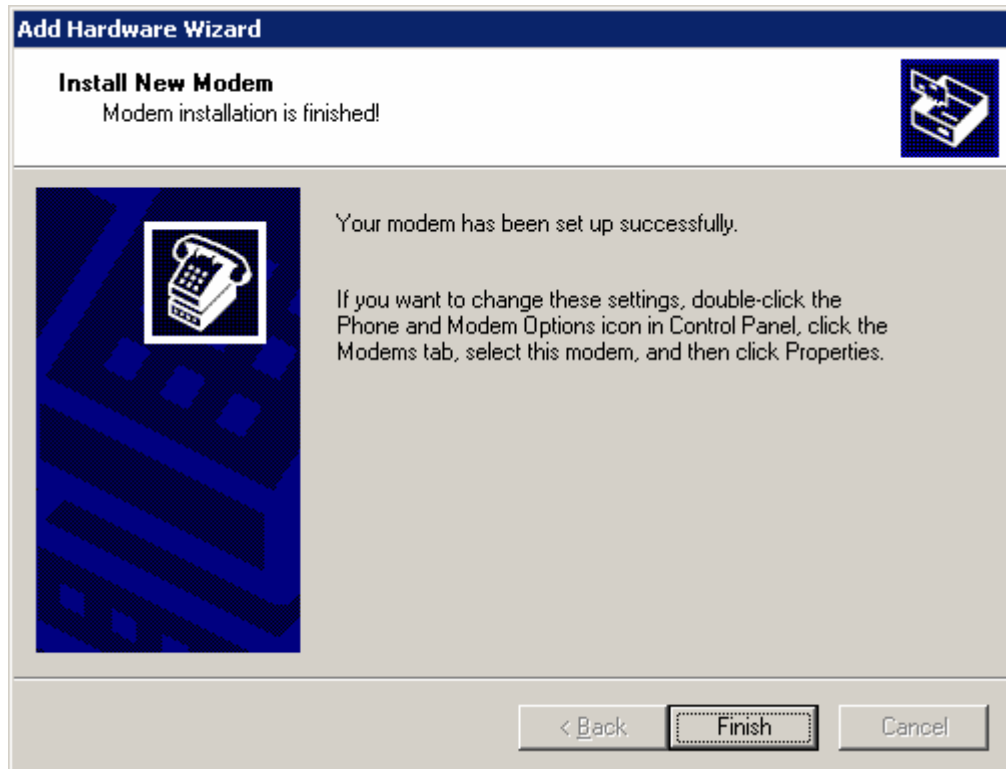
4.3.2 Setup 19200 Modem

Click "Phone and Modem Options" from "Control Panel", Click "Modems" tab; select the modem that choose the" Standard 19200 bps modem", and then click "Properties" button.
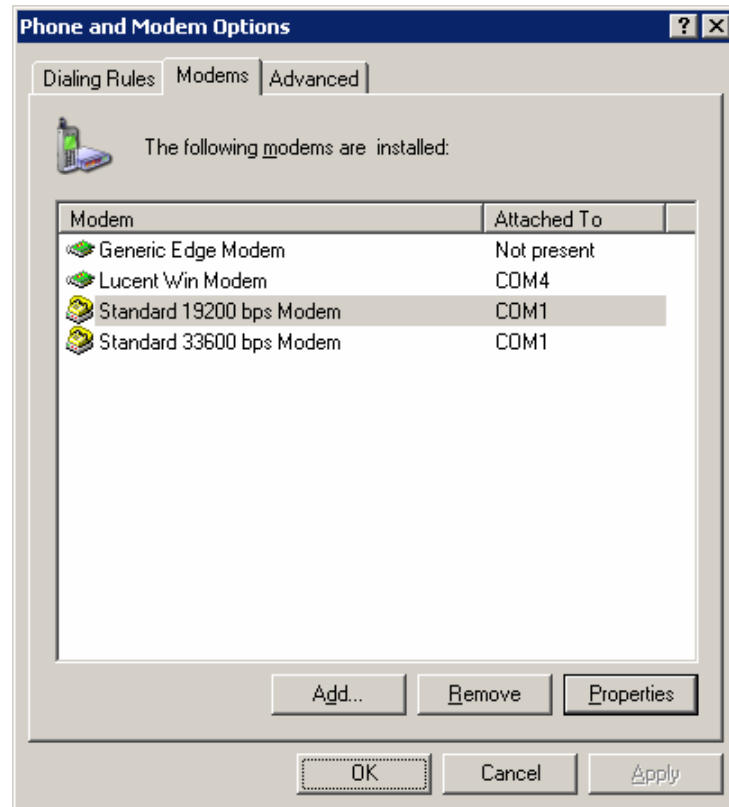
At "Modem" tab, set the "Maximum Port Speed" to "115200".
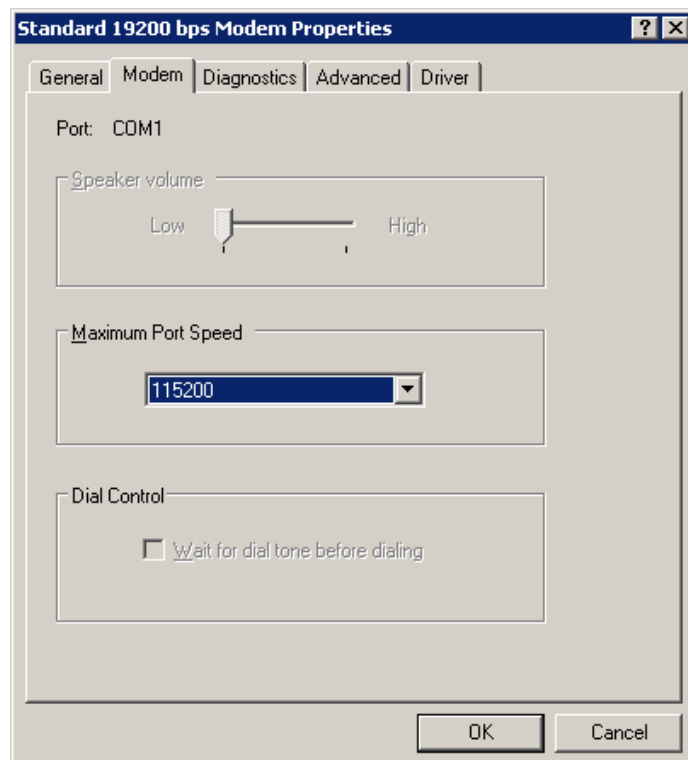
Choose "Diagnostics" tab, click the "Query Modem, if Baud rate setting and so on is right, there are automatic indication that it is have pass
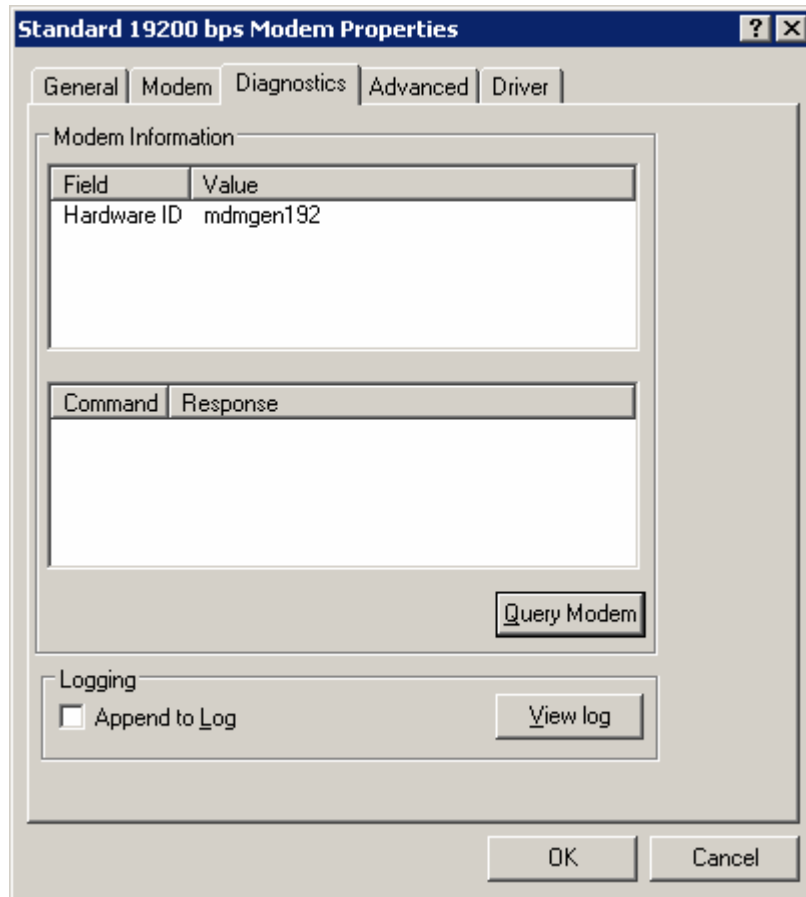
Next, click "Advanced" tab, Here, you can add or change settings by filling in Extra initialization commands at "Advanced" tab

M300d   Extra initialization commands: AT+CGDCONET=1, IP, CMNET
EL-M300d2   Extra initialization commands: AT+CGDCONET=1, \"IP\", \"CMNET\"
EL-M300ev   Extra initialization commands: AT&D2

Notes: CMNET is the APN from the network. Different network provider has different APN. Please confirm before setting.
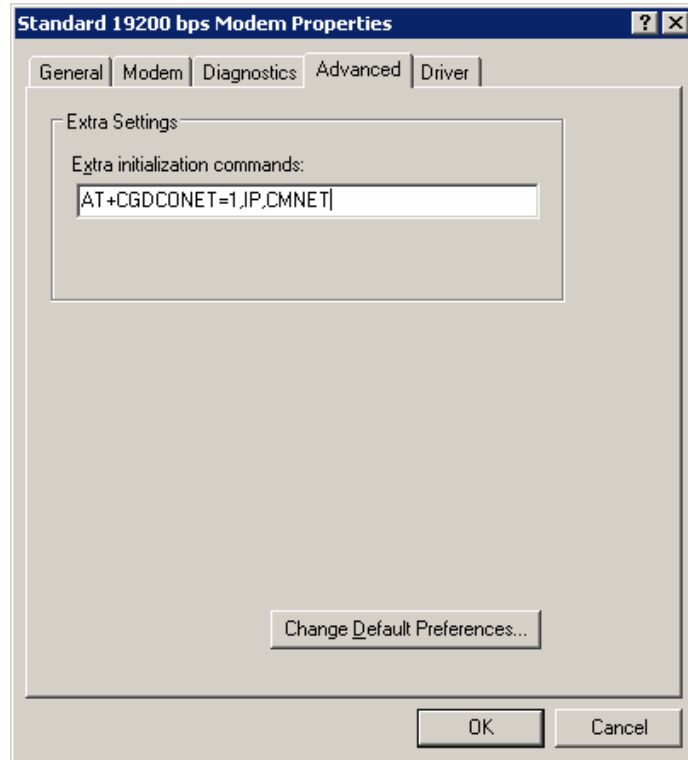
（this picture is the example to the modem for reference）
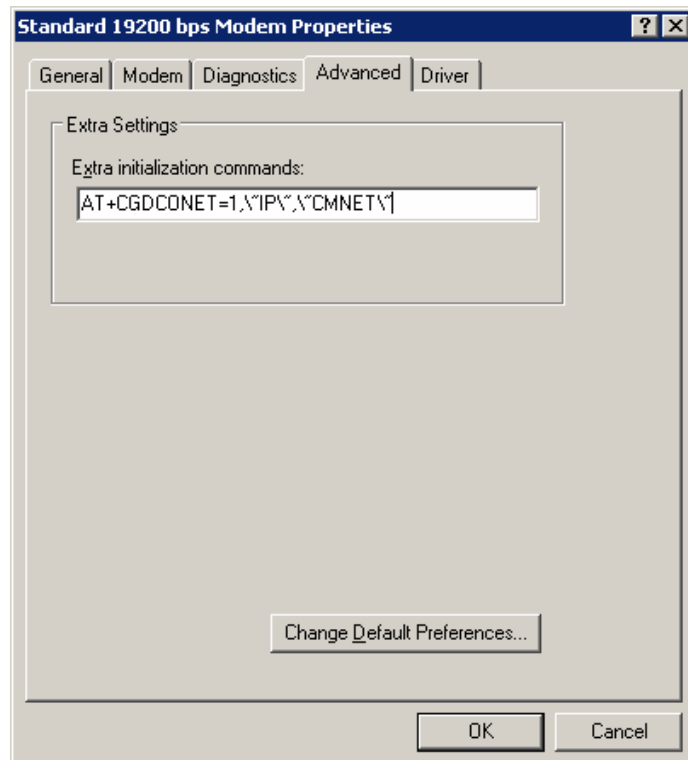
（this picture is the example to the modem for reference）
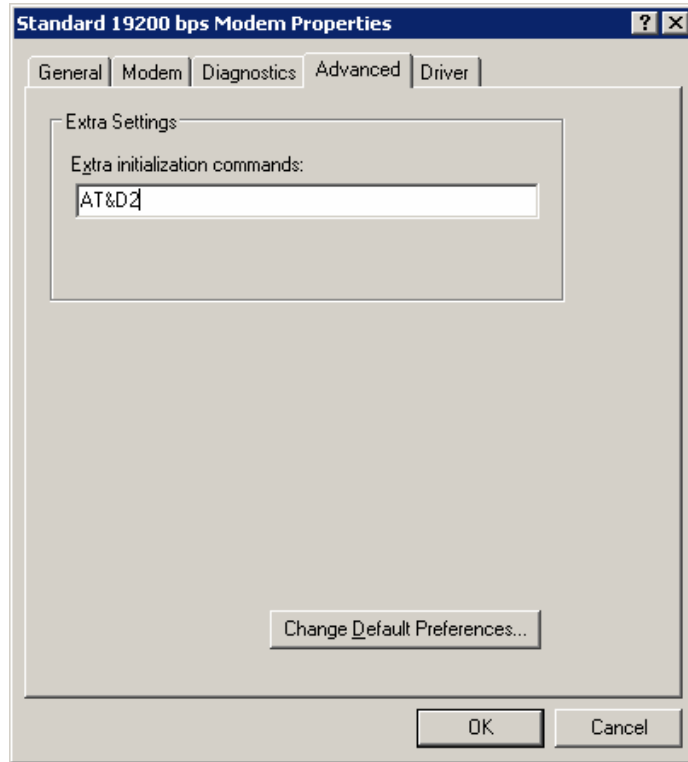
（this picture is the example to the modem for reference）

NOTICE: "CMNET" is China Mobile APN setting; you should change it in accordance with the information provided by your local service provider.

4.3.3 Create Dial-up network

The Modem have been right setting as following picture, next ,To setup your GPRS/CDMA/EDGE/EVDO/HSDPA Dial-up network, Open "Network Connections".
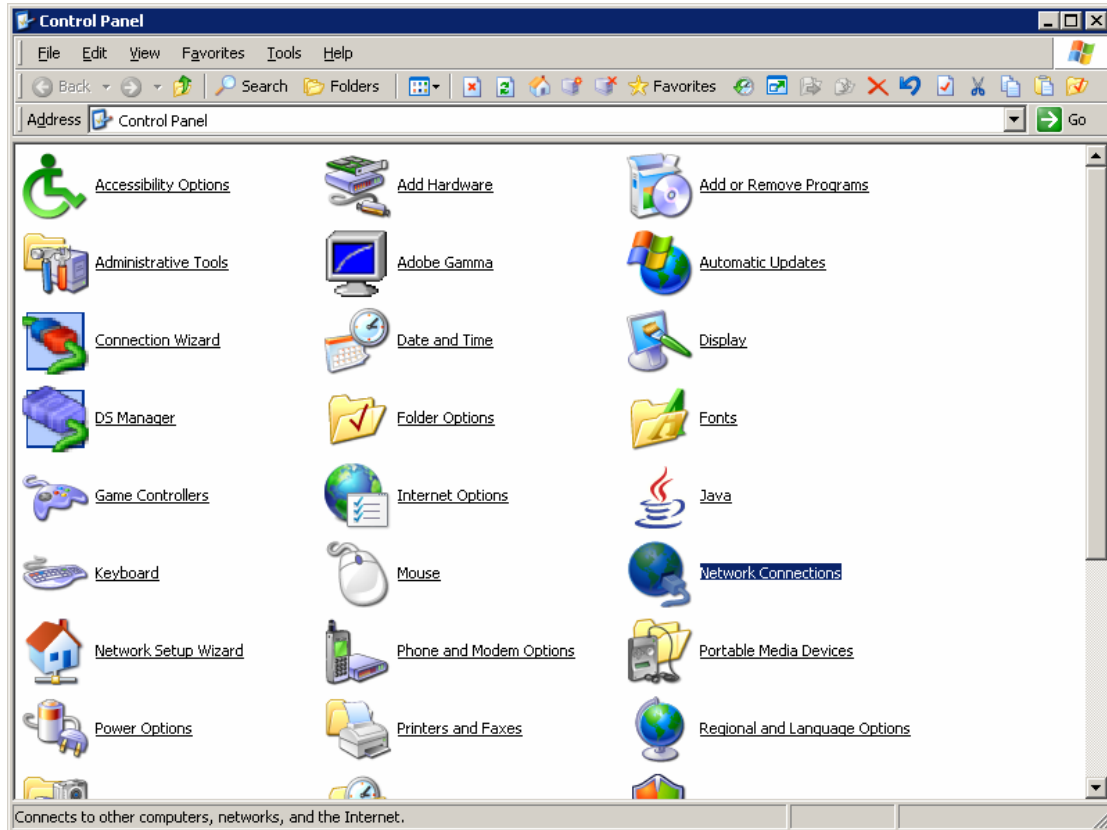
Double click "network Connection", click "Next" to continue
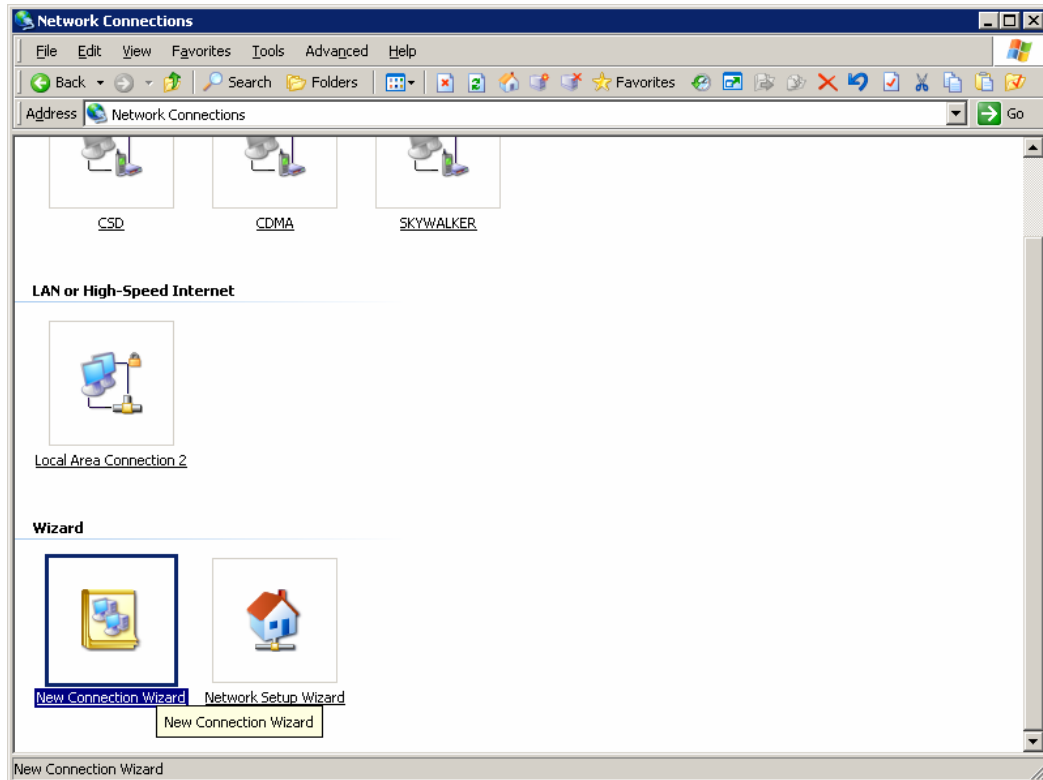
The Network Connection Wizard opens. Click "Next" to continue. Put a check mark on
Connect to the Internet and click next.
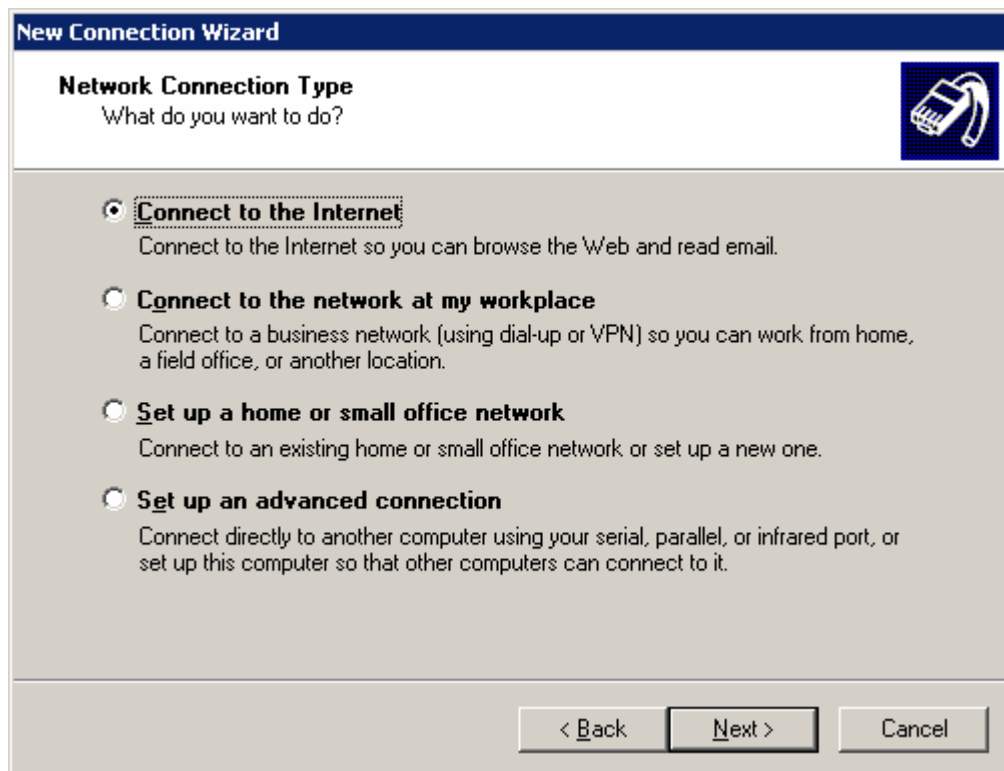
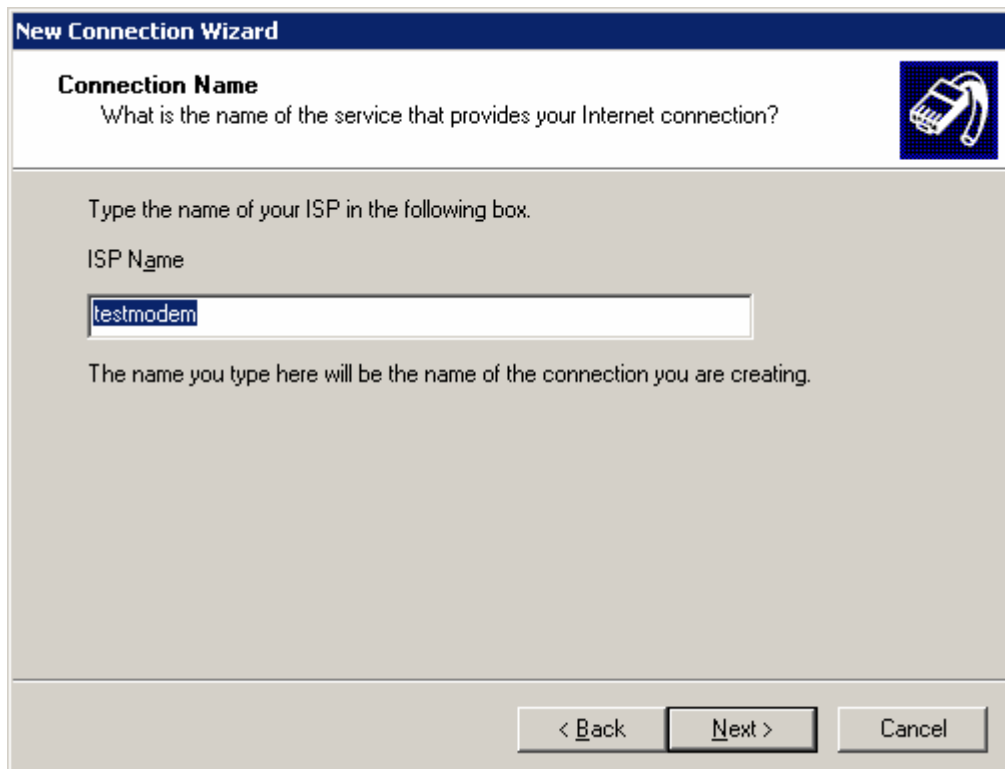Select the options Set up my connection manually and click next.
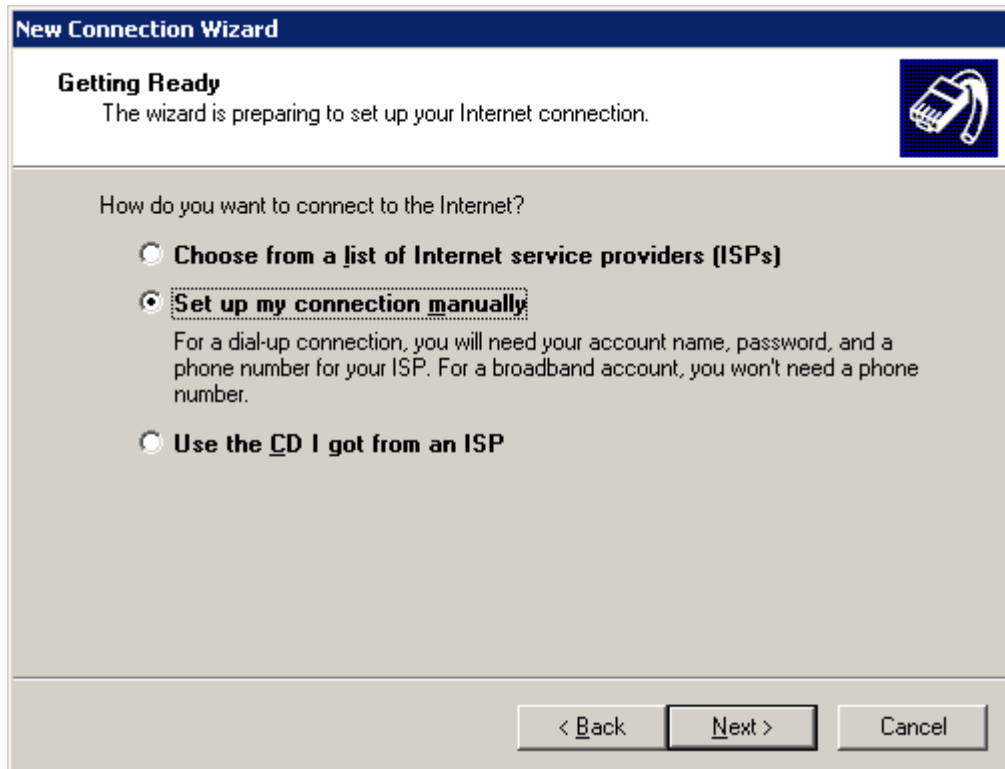
Select Connect using a dial-up modem and click "next" button to continue.
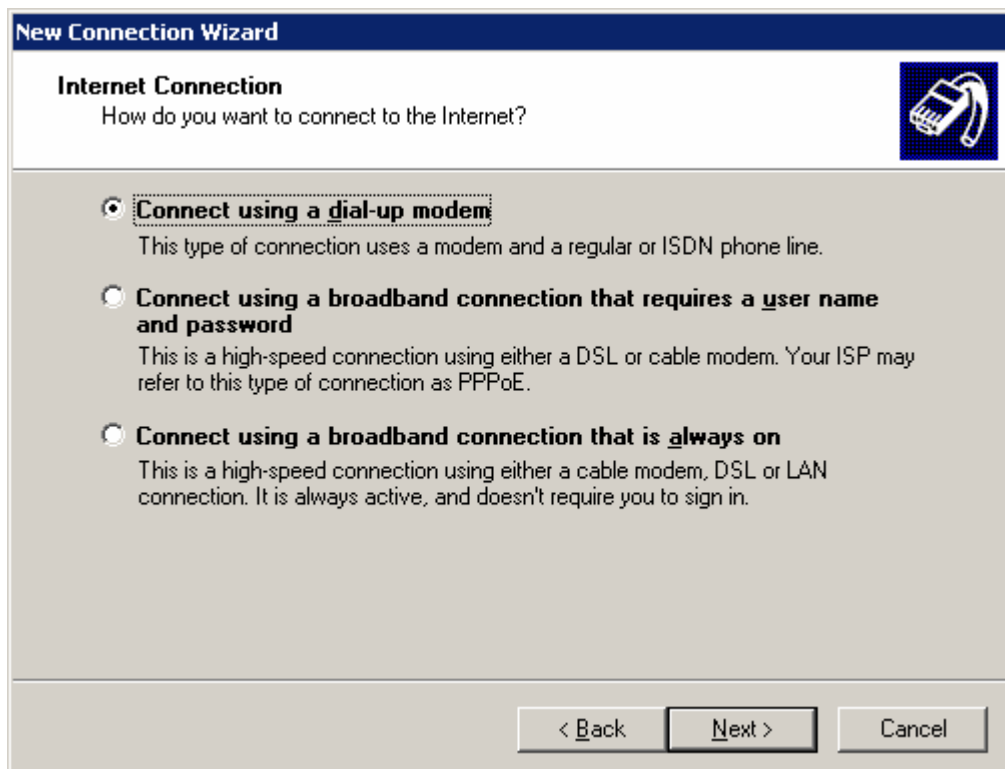
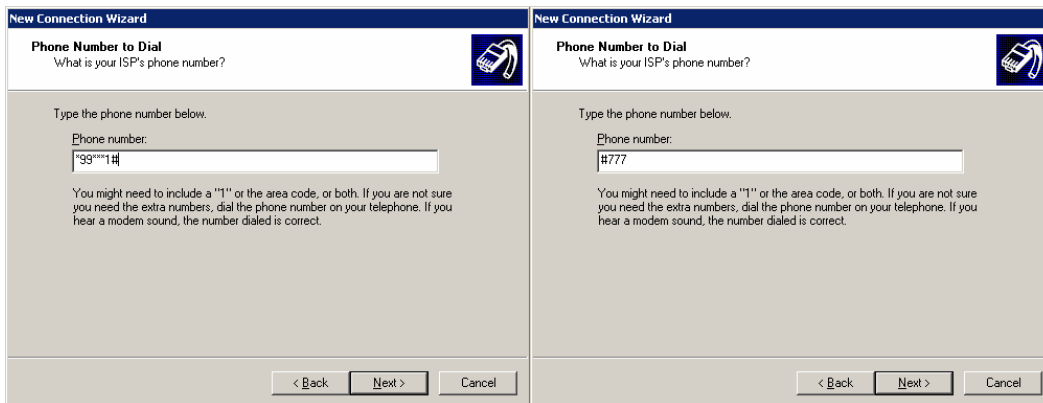Select the modem driver that you want to use for the dial-up connection. Click Next to Continue.

New Connection Wizard

Select a Device
This is the device that will be used to make the connection.

You have more than one dial-up device on your computer.

Select the devices to use in this connection:

- ☐ Modem - Lucent Win Modem (COM4)
- ☑ Modem - Standard 19200 bps Modem (COM1)
- ☐ Modem - Standard 33600 bps Modem (COM1)

[< Back] [Next >] [Cancel]
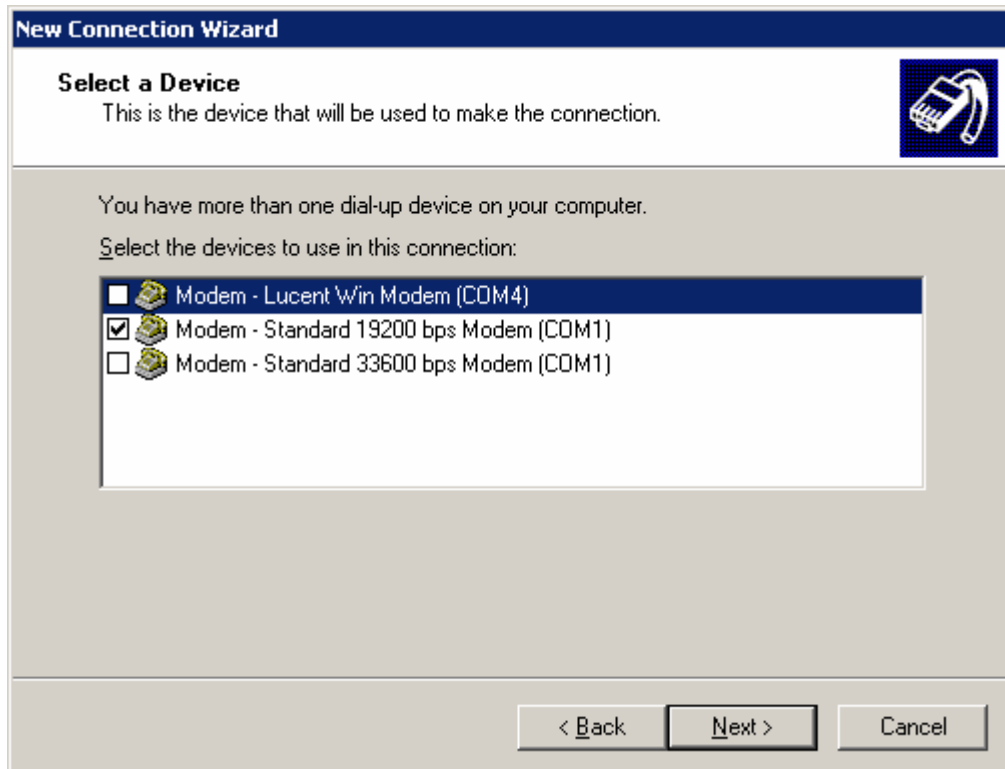
Type an appropriate Connection name and click next.

New Connection Wizard

Connection Name
What is the name of the service that provides your Internet connection?

Type the name of your ISP in the following box.

ISP Name

testmodem

The name you type here will be the name of the connection you are creating.

[< Back] [Next >] [Cancel]

AS showing below picture, Depending on the network, input ISP phone number in "phone number" box,

if modem type is GSM that standard phone number is"*99***1#",

If modem type is CDMA that standard phone number is"#777"
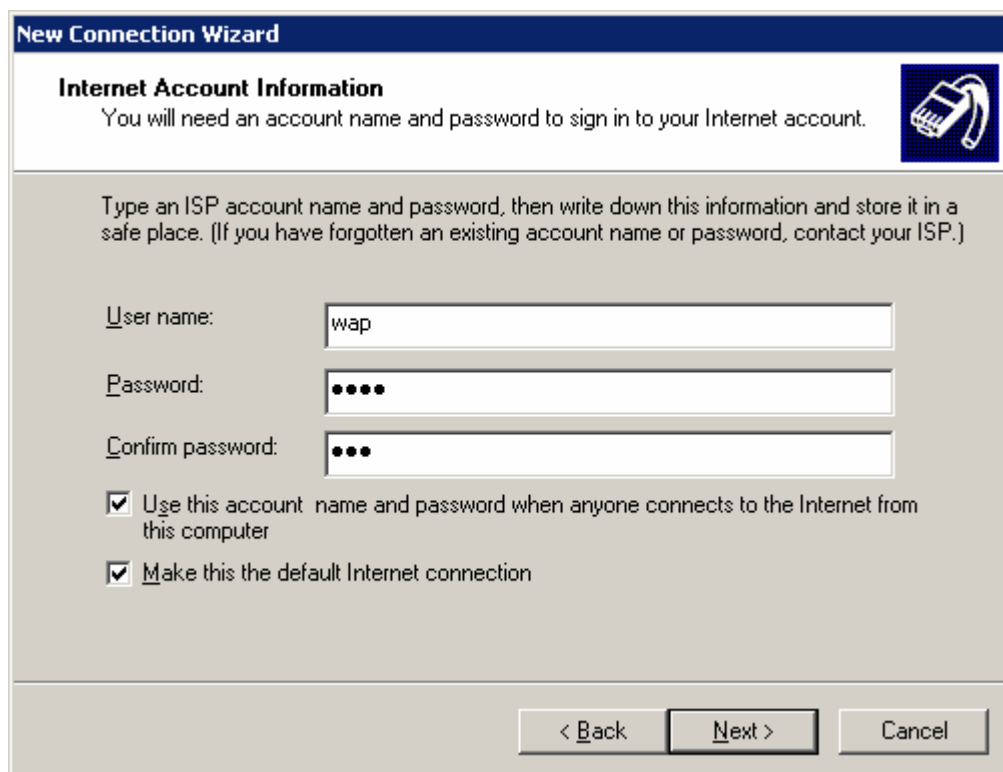
(Modem phone number)
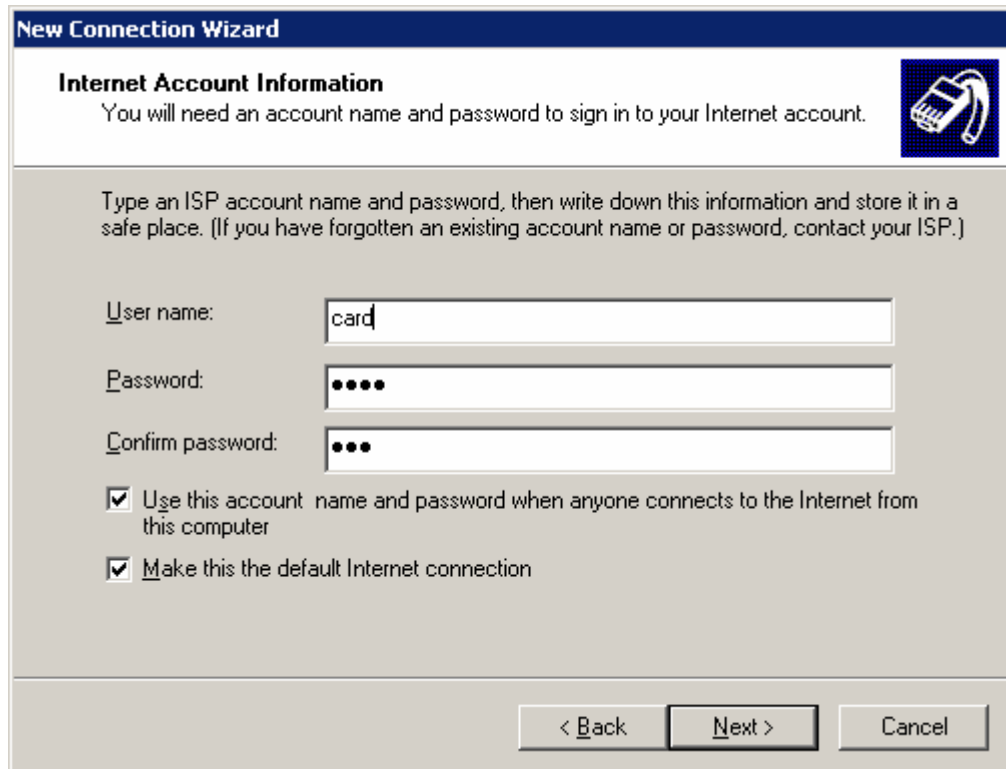
It will display the following "Internet Account Information" Frame. You may be required to put a User name and a Password for the dial-up connection

If modem type is GSM that user name and password both are "wap",

If modem type is CDMA that user name and password both is "Card".

(example to gsm modem)

(example to cdma modem)

Click "next" button, as showing below picture, Click "Finish" to succeed your new Connection installation


Notice: The modem may be initialized for Chinese market options. If it is, it should be changed with your local operator initializations.

Every newly created dial-up connection should be configured before using it to establish a PPP connection.
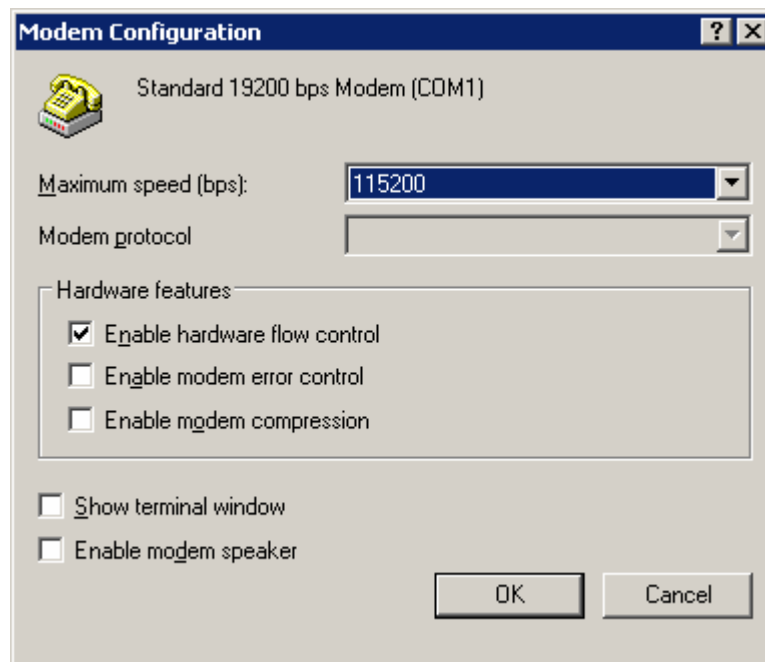
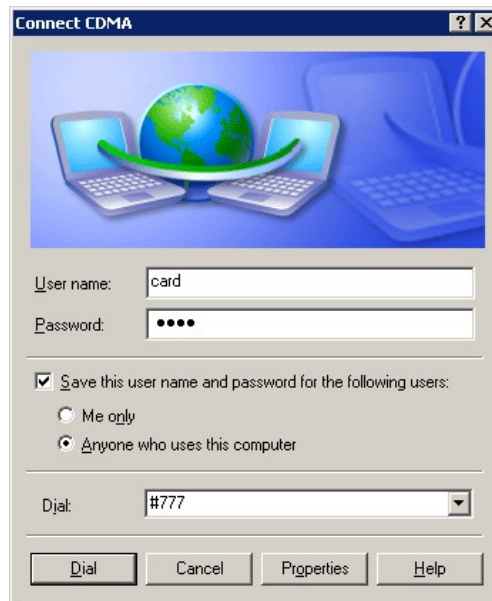Select the dial-up connection you want to configure. And click the "Properties,
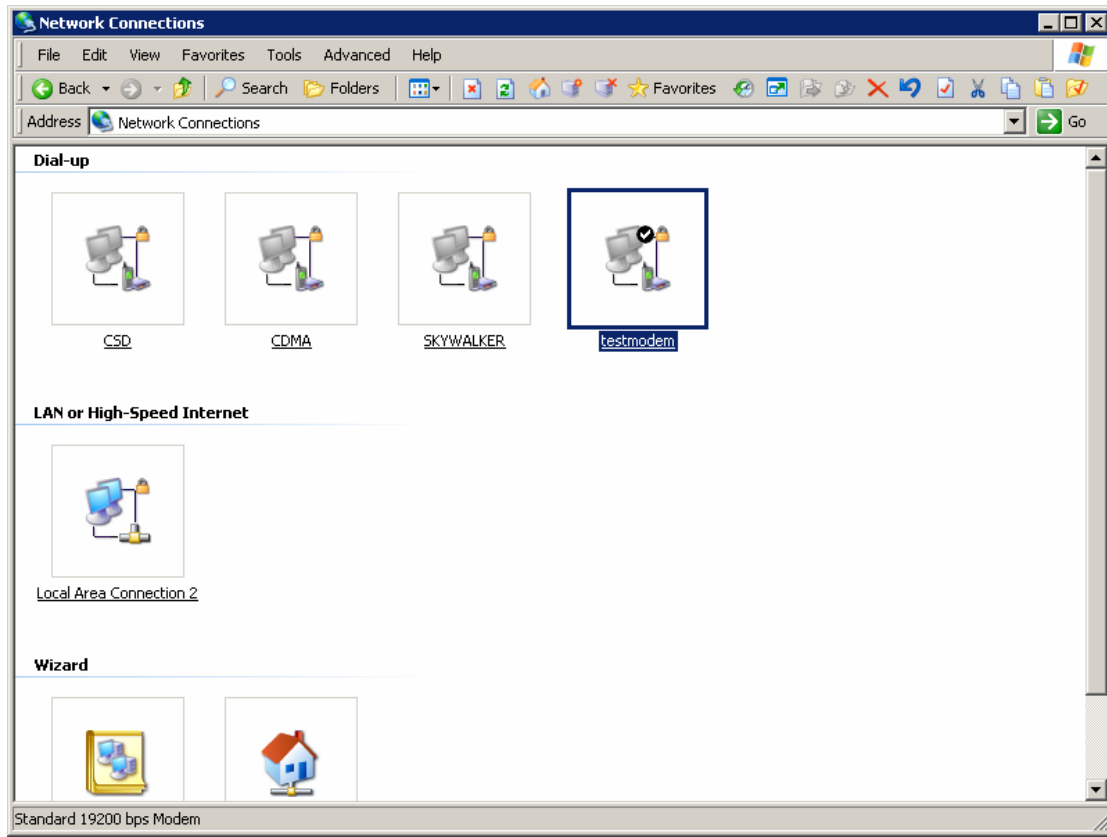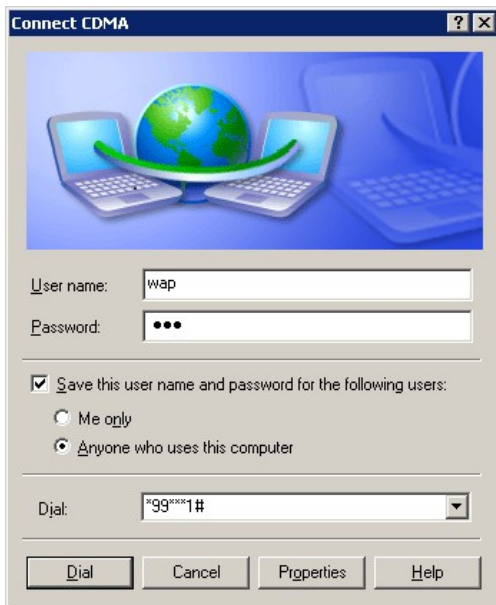

Select a right device as you're just having setup modem. Make an example to "modem standard 19200bps modem (com 1). Then Click "configure" button to continue.
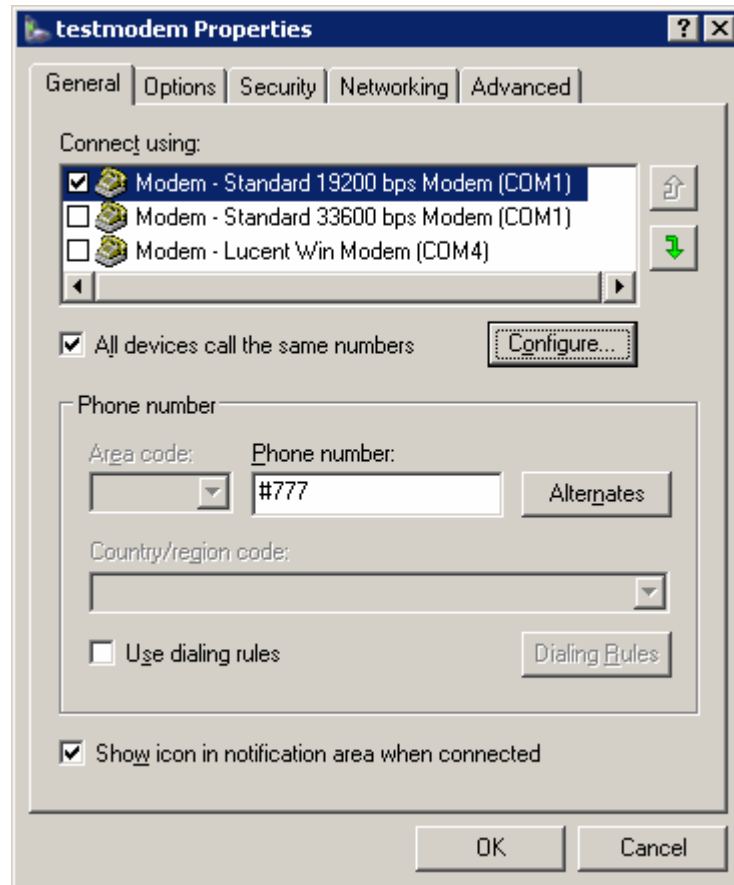
Setting Maximum speed (Bps) is 115200 and click "ok" to finish modem configuration.

4.3.4 Login on network

Double click new network connection, dial up directly, depends on the network, input user name and password both,

If modem type is gsm that user name and password both are "wap",

If modem type is cdma that user name and password both is "Card".

After detecting user name and password, login on network. The symbol of dial-up network will appear at the right corner, open IE and then you can browse web. If in connect network have any problem. Please sure

A. Your SIM block GPRS is CMNET server, but CNWAP server

B. For else Internet Explorer of network set is right

C. It's without any modem is running in the currently computer

4.4 Setting APN or VPDN

When you dial-up network, you need to set up APN or VPDN configuration after you created a19200 modem. You need to input extra initialization command in different network

Click "Advanced" tab, Here, you can add or change settings by filling in Extra initialization commands at "Advanced" tab.
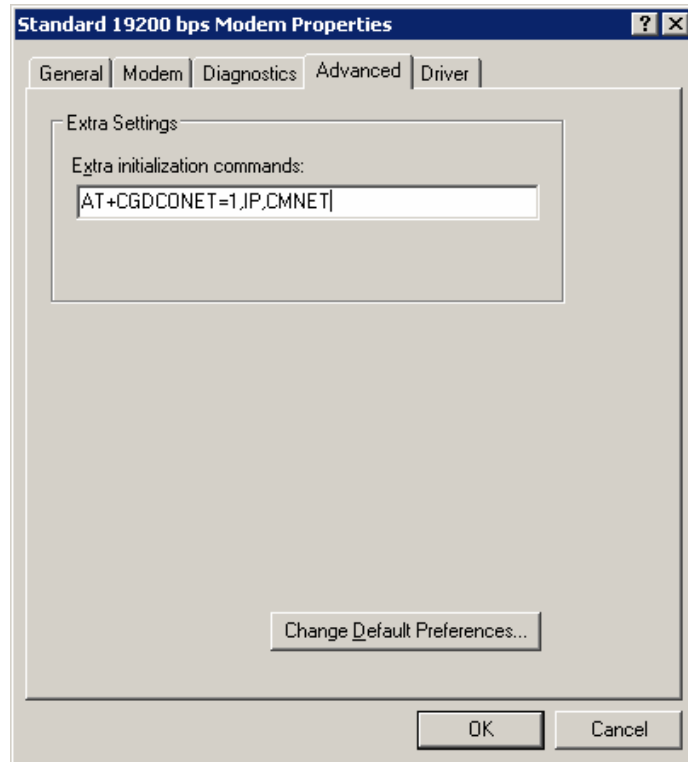
Notice: the Dial-up function is not only supported by the GSM Modem, but also for other modems

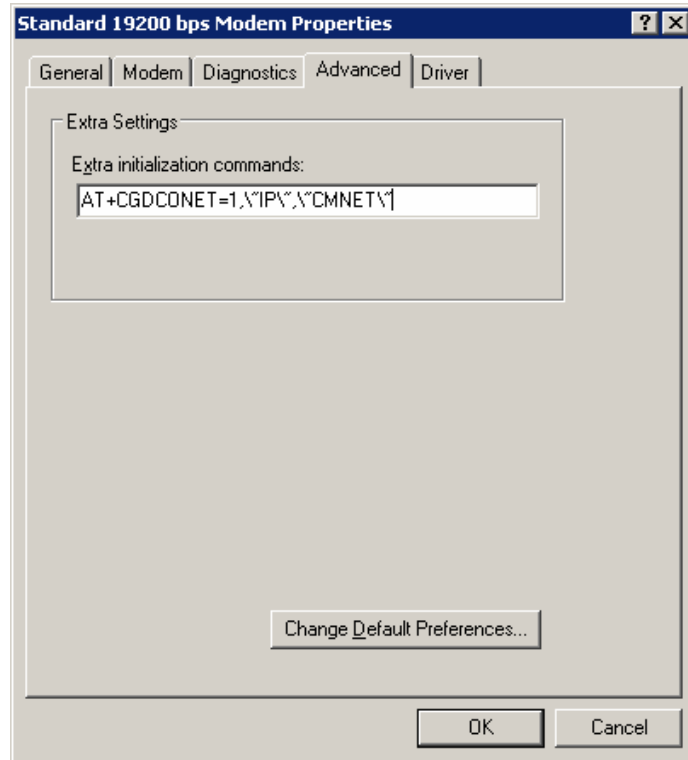# 4.4.1 Setting APN

Extra initialization commands:

GSM: AT+CGDCONET=1, IP, CMNET

GSM: AT+CGDCONET=1, \"IP\", \"CMNET\"
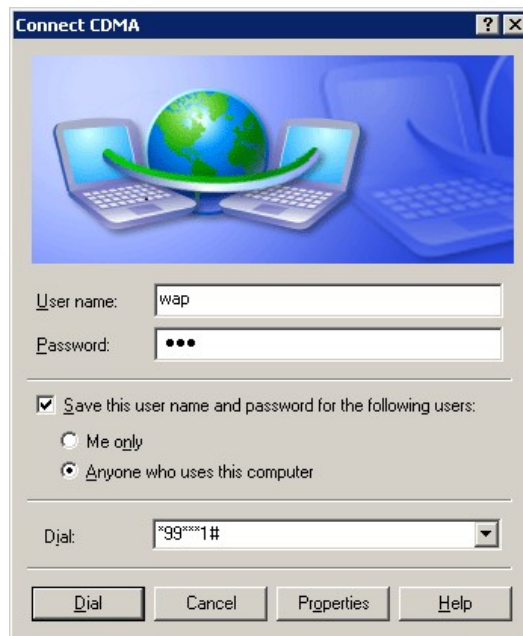
(this picture is the example for GSM modem)
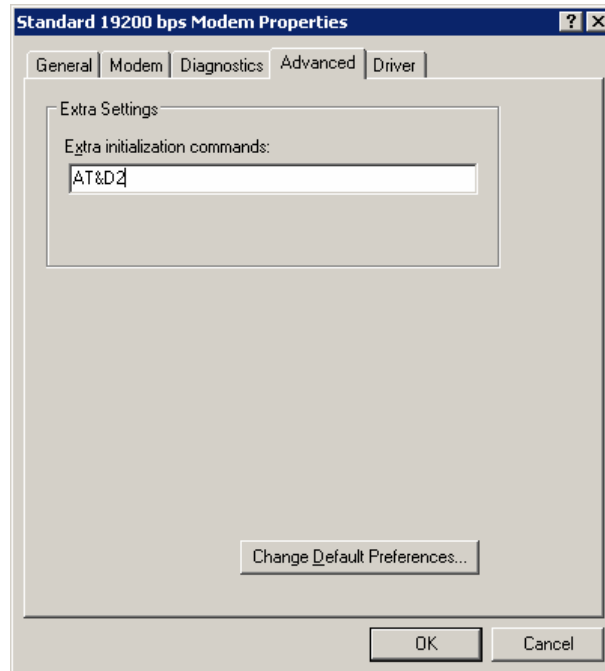
(example to GSM modem)

It showing below picture, You may be required to put a User name and a Password for the dial-up connection; setting the APN user name and password both are "wap" and save it

4.4.2 Setting VPDN

VPDN Extra initialization commands:

AT&D2   // suitable for CDMA/EVDO Modem

(example to GSM modem)

Double click new network connection, dial up directly, depend on the network, input VPDN user name and password both are "card".

Chapter 5

5 Production list

name	unit	number	description	Sketch-map
Host	Entries	1	Standard supply	
Power Supply	Entries	1	Supply 9V	
Antenna	Entries	1	Standard supply	
Production-CD	piece	1	Standard supply	

Chapter 6

6 Terminology

Internet   A network of computer networks which operates world-wide using a common set of communications protocols.

GPRS   Short for General Packet Radio Service, a standard for Cellular communications which runs at speeds up to 115 kilobits per

SIM   Subscriber Identity Module – a small rectangular piece of plastic with a layer of copper. Provided as a part of mobile telephone service.

ISP   Internet Service Provider

DDNS   Dynamic Domain Name Server