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Quectel Cellular Engine

GPRS Startup
User Guide

GPRS_Startup_UGD_V1.01
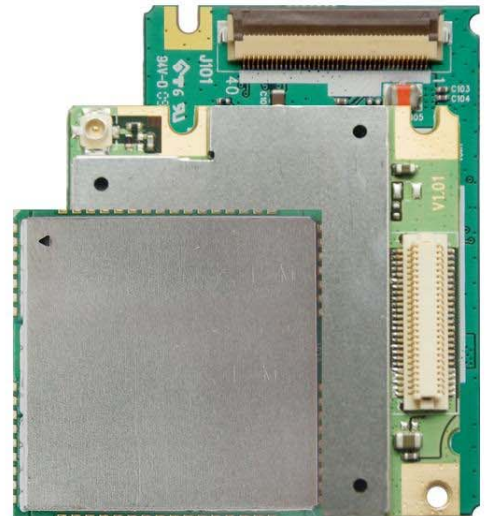
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Contents

Table index

0. Revision history

Revision	Date	Author	Description of change
1.00	2009-06-27	Jean HU	Initial
1.01	2009-11-16	Ella HUANG	Add Chapter 6 GPRS AT Commands

1. Introduction

This document describes how to establish a PPP connection with Microsoft Windows 2000 using the prototype of GSM/GPRS. Configurations and settings for other Windows operating systems may be slightly differ, but the general process is similar.

The figures presented in this guide show the settings required for the network provider China-Mobile. Users of other networks must adapt their settings accordingly.

1.1. Reference

Table 1: Reference

SN	Document name	Remark
[1]	M10_ATC	
[2]	RFC 1661 – The Point-to-Point Protocol (PPP)	
[3]	RFC 1334 –PPP Authentication Protocols(PAP)	
[4]	RFC 1994 –PPP Challenge Handshake Authentication Protocol (CHAP)	

1.2. Terms and abbreviations

Table 2: Terms and abbreviations

Abbreviation	Description
APN	Access Point Name
CHAP	Challenge Handshake Authentication Protocol
CID	Context Identity
DNS	Domain Name Server
GPRS	General Packet Radio Service
GSM	Global System of Mobile Communication
IP	Internet Protocol
OS	Operating System
PDP	Packet Data Protocol
PPP	Point to Point Protocol
SIM	Subscriber Identity Module
TCP	Traffic Control Protocol

2. What you need

2.1. GPRS setting from network provider

Before setting up your device to access the GPRS network, contact your network provider to obtain the GPRS settings.

2.2. Modem installation and configuration

You need to set the modem configuration. Follow the steps in Chapter 3.

Note:
Administrator right for the operating system may be needed in order to set the modem configuration. Connect your local system administrator for advice.

### 2.3. Dial-up network installation and configuration

You need to set up the dial-up network. Follow the steps in chapter 4.

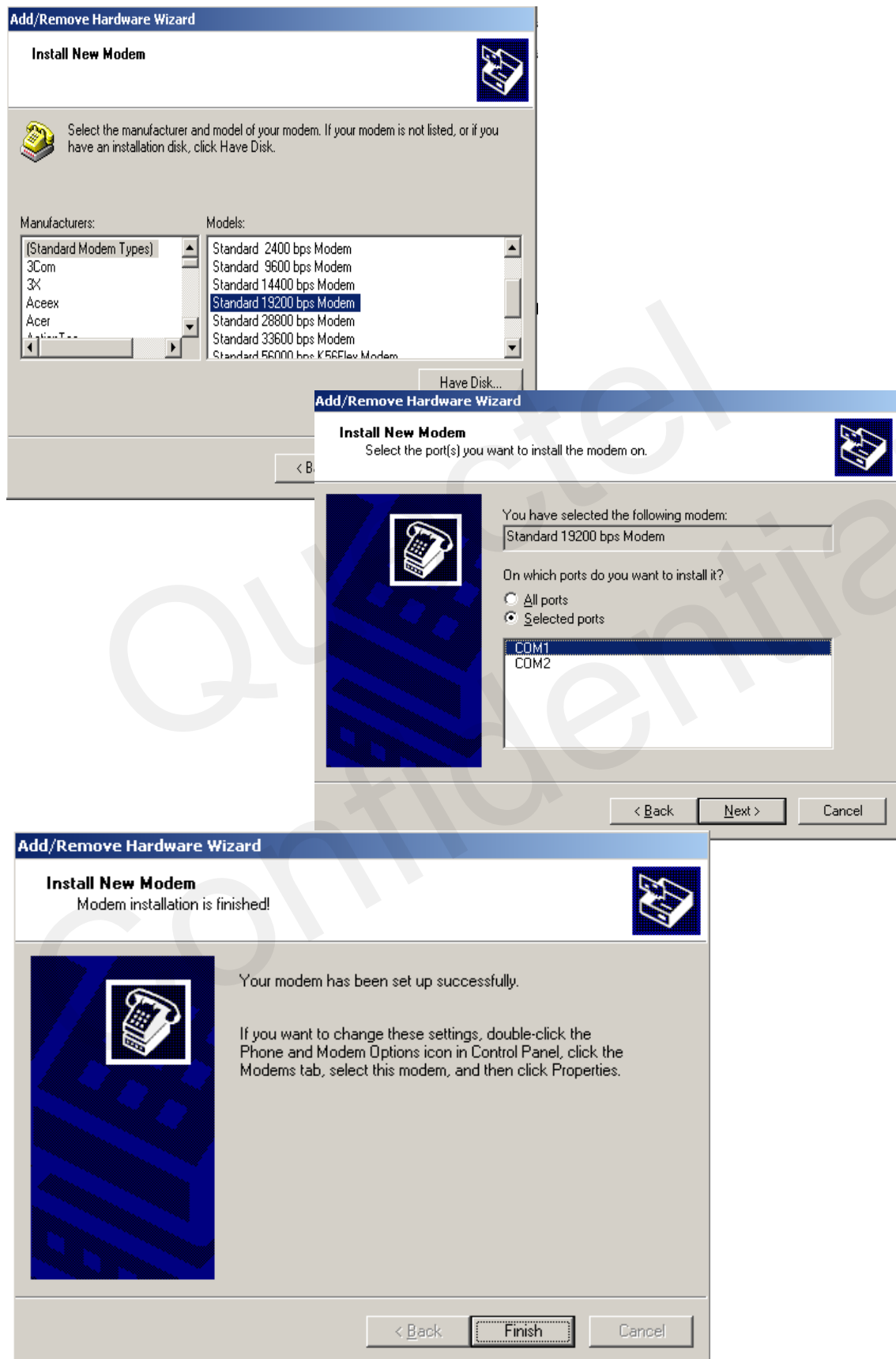## 3. Set up a Windows modem driver

3.1. Add a new modem

If there is no standard 19200bps modem has been installed, you can add a new standard modem to the modem section of the control panel.

Click **Start** -> **Settings** -> **Control Panel** -> **Phone and Modem options** -> **Modem** -> **Add**.
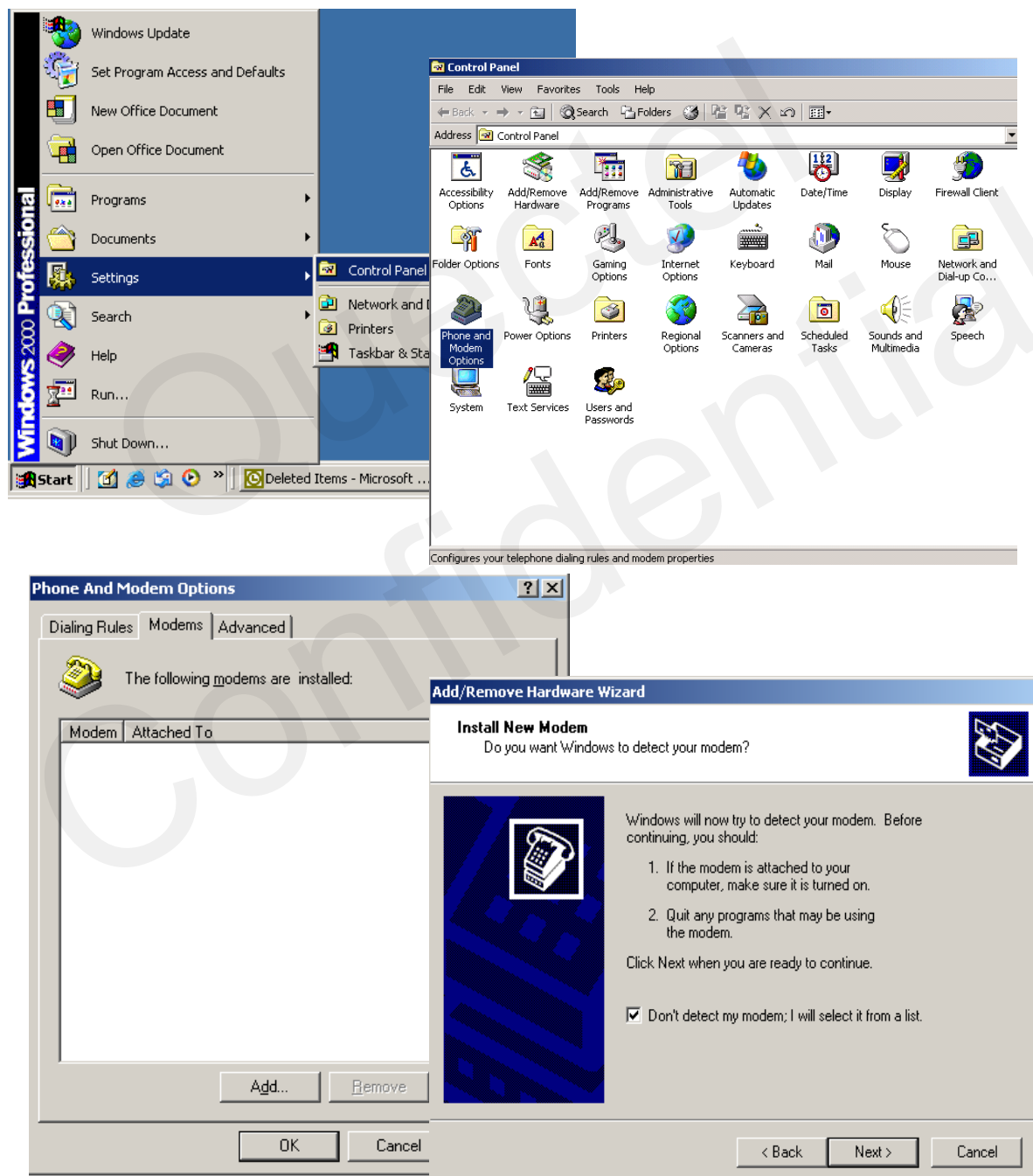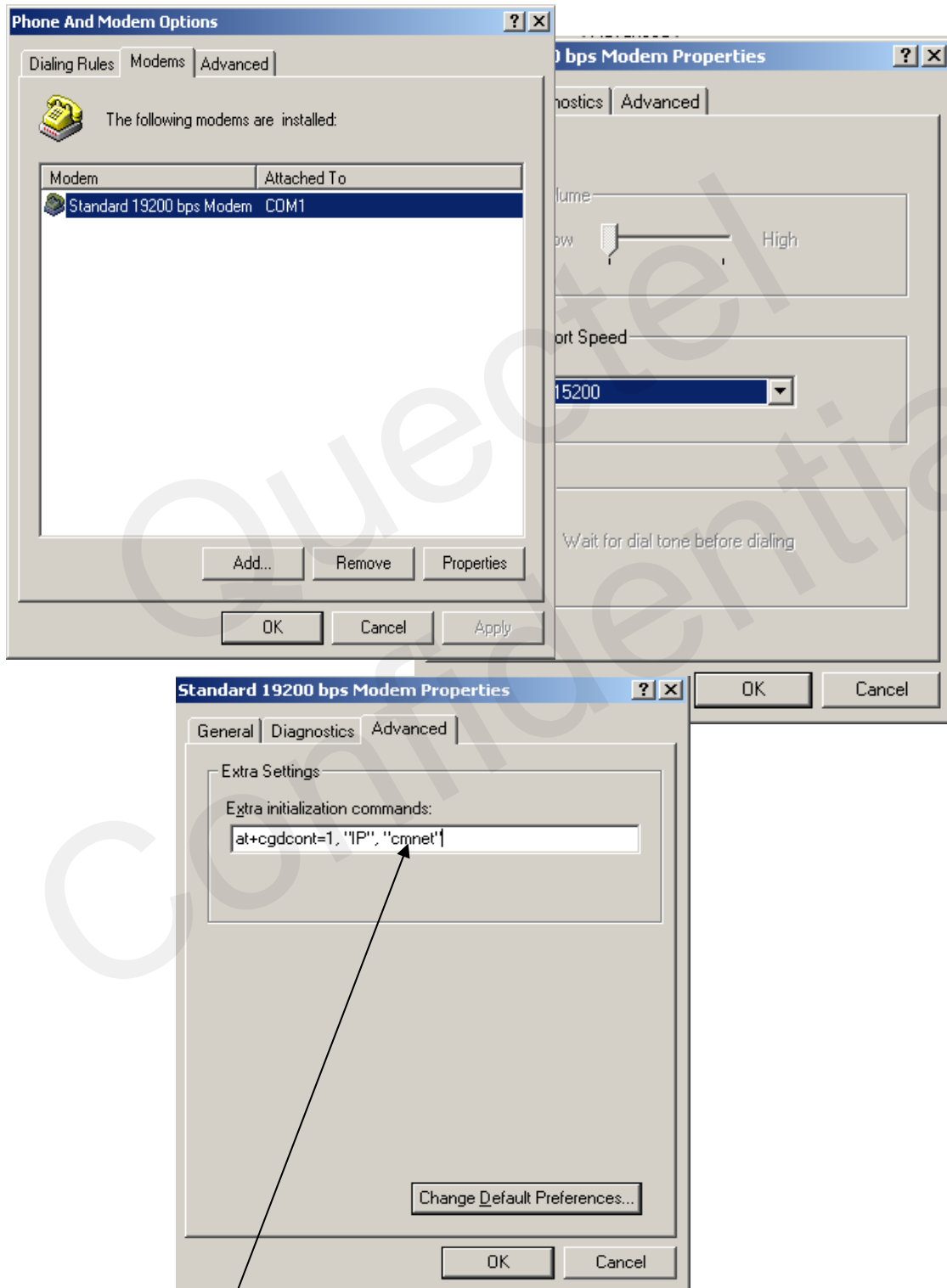

Follow the instructions on the screen, choose "**19200 bps modem**" and "**COM1**", click "**NEXT**",

till to finish the configuration.

3.2. Configure the modem driver

Choose the installed standard 19200bps modem, click "**Properties**", choose the max port speed (default value: 115200), and click "**Advanced**" to configure "**Extra settings**" as illustrated in the figures below.

In the example above, the settings predefine a PDP context where CID =1, PDP type = *IP* and

APN = *cmnet*. *cmnet* is the APN for the network provider China-Mobile and it should be replaced with the APN by your network provider.

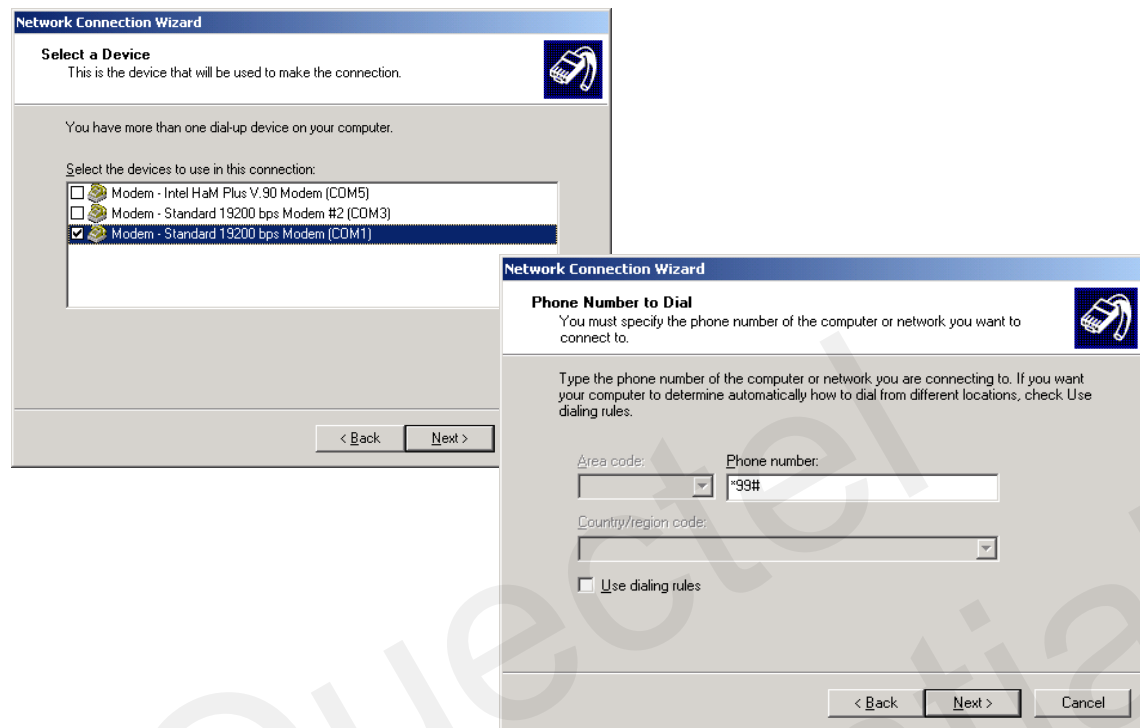# 4. Set up the dial-up network

4.1. Set up a new connection

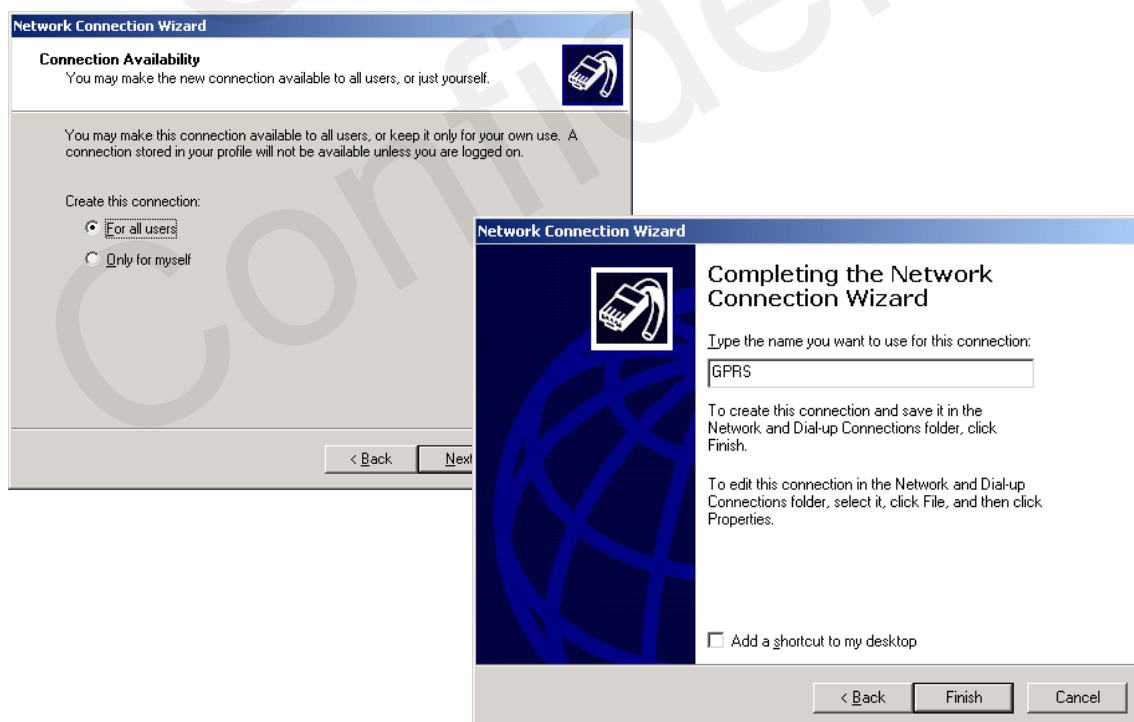Select "**Network and Dial-up Connections**" and then "**Make new connection**" in control panel.

Select "**Dial-up to private network**" -> click "**Next**"

4.2. Configure the setting

Select "**Modem – Standard 19200bps modem (COM1)**", and then click "**Next**".
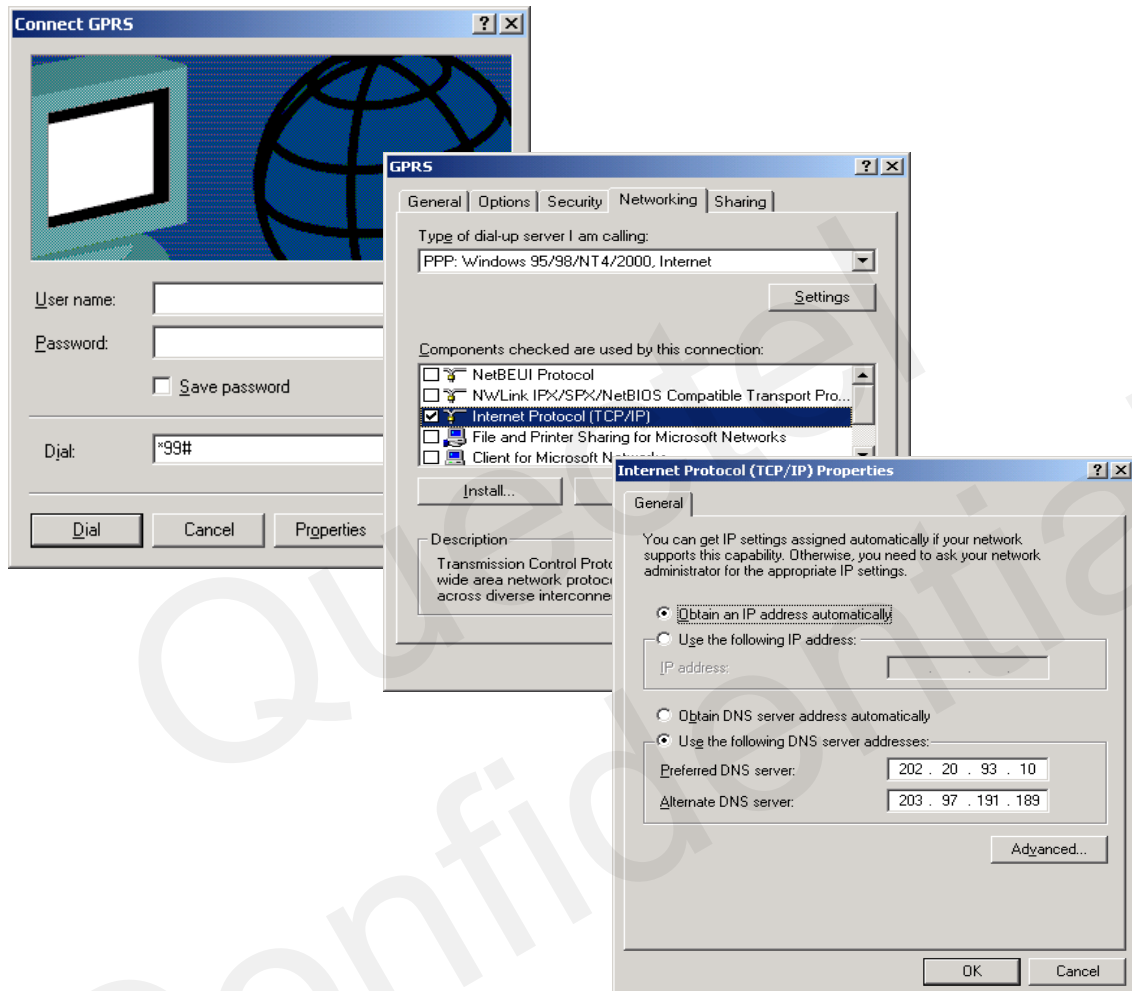
Enter the number for GPRS connection (do not select "**Use dialling rules**"), then click "**Next**".

Enter the name for this connection (for example, "GPRS"), then click "**Finish**".

5. Configure the dial-up tool

Ensure "**User name**" and "**Password**" are both blank.

Click "**Properties**", then select "**Networking**" tab. Select "**Internet protocol (TCP/IP)**" and click "**Properties**", then set DNS and click "**OK**" to finish the configuration. Besides, it is supported to select the option "**Obtain DNS server address automatically**".

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Select "**General**" tab, then click "**Configure**". Set the maximum speed to "**115200**". Click "**OK**" to finish the configuration.
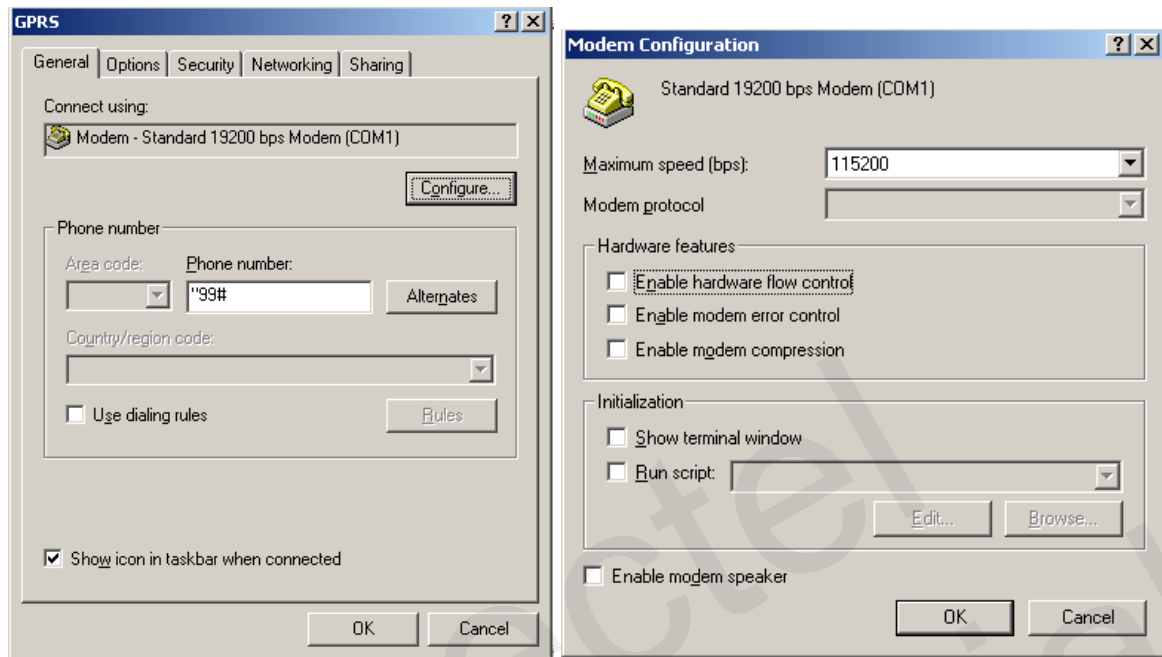
Now click "**Dial**".
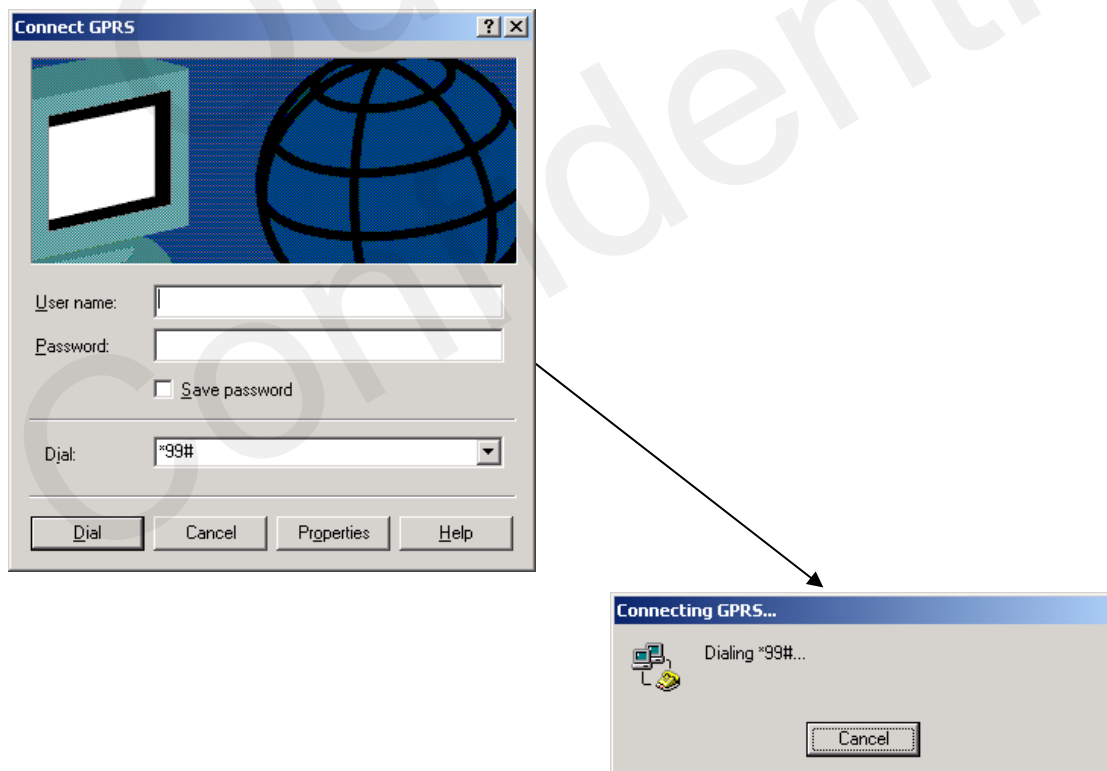
6. GPRS AT commands

6.1. General

To transmit data via GPRS, the application software MUST include a PPP stack. Most standard operating systems (e.g. Windows, Unix/Linux) take it as a part of standard modem driver. In the operating systems based on Windows, the application "Dial-up network" encapsulates a PPP stack.

For other operating system which does not include an application like "Dial-up network", an application software should be developed to activate a PDP context with a series of AT commands and then finish PPP negotiation Of course, you can also manually finish the work on any terminal program.

Refer to the following chapters for instruction.

6.2. Modem compatible PDP context activation

● **GPRS attach: AT+CGATT**
In order to use the GPRS service, the module must be GPRS attached. GPRS attaches automatically after module starts up. You can query the state of GPRS attachment with +CGATT.
> **Example:** AT+CGATT?
> +CGATT: 1
>
> OK

Please make sure GPRS function is supported by the SIM card. GPRS attachment means the module can initiate a GPRS data call and Mobility Management routines apply.

● **Defining a PDP context: AT+CGDCONT**
For the detailed parameters description of AT+CGDCONT, please refer to *M10_ATC* document.
> **Example:** AT+CGDCONT=1,"IP","cmnet"

Note: In the example above, the settings predefine a PDP context where CID =1, PDP type = *IP* and APN = *cmnet. cmnet* is the APN for the network provider China-Mobile and it should be replaced with the APN by your network provider.

● **GPRS dial up with defined PDP context parameters**
> **Example:** ATD*99***1#
> CONNECT
> ~ }#?}!}!} }2}"}&} }*} } }#}$?}'}"}(}"U僧~ }

After the module answered with CONNECT, it is in PPP data mode and no further AT command can be sent to the module until the PPP connection was terminated or exit data mode. The cryptic letter combination displayed after the CONNECT is the terminal interpretation of the PPP traffic. For more details about the PPP protocol, please refer to [2] and [3] and [4].

Note: The activation of the drivers necessary to make a TCP/IP connection has to be initiated by the OS. It is the user's responsibility to adapt the software accordingly and provide the appropriate drivers.

6.3. Data mode and command mode

There are two modes for UART which we called data mode and command mode separately. There are various methods to switch between data mode and command mode.

6.3.1. Switch from data mode to command mode

● **Use DTR level switch**
  DTR changes from ON to OFF, and reaction depends on presetting AT&D1.

● **Use sequence +++ to switch from data mode to command mode**
  To prevent the +++ escape sequence from UART being misinterpreted as data, it should be preceded and followed by a pause of at least 500 ms. The interval time between each "+" must be less than 1000ms.

Note: Please make sure above operation operated after completion of PPP negotiation. If not, above operation will hang up the PPP negotiation and quit data mode.

6.3.2. Switch from command mode to data mode

● **Use ATO to switch from command mode to data mode.**
      Example: ATO
              CONNECT
  "CONNECT" indicate that TA has been in data mode.

6.4. Shutting down the connection

● **It is recommended to shut down the connection with LCP Terminate-Request message in PPP protocol. This method must be operated in data mode.**

● **ATH is the method of shutting down connection with AT command, which closes a data connection, deactivates the PDP context. And it is only supported in command mode.**

      Example: ATH
              OK

Note: ATH closes all ongoing voice and data connections.

- **Shut down the connection with switching of the DTR level. At first, open DTR function with AT&D2. This method can be operated in both data mode and command mode.**

    Example: AT&D2

    　　　　OK

    And then set the disconnection delay time with ATS10.

    Example: ATS10=5

    　　　　OK

    Switch the DTR level from Low to High, and keep High level for five seconds which is set by ATS10 as the example above, the data connection will shut down automatically. TA enter command mode after shutting down completely.

- **Another method is using AT command CGACT. It is only supported in command mode.**

    Example: AT+CGACT=0, <cid>

    　　　　OK