

Quectel Cellular Engine

GPRS Startup User Guide

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0. Revision history

Revision Date Author		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
СНАР	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
ТСР	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.

Add/Remove Hardware Wizard			
Install New Modem			
Select the manufacturer and mo have an installation disk, click H	del of your modem. If your modem is not listed, o ave Disk.	r if you	
Manufacturers: Mod (Standard Modem Types) 3Com 3X Accex Accer 4tim T	els: ndard 2400 bps Modem ndard 9600 bps Modem ndard 19200 bps Modem ndard 28800 bps Modem ndard 36600 bps Modem ndard 56000 bps K56Elev Modem Have Add/Remove Hardwarv	► Pisk e Wizard	
	Install New Modem Select the port(s)	you want to install the modem on.	
G		You have selected the following m Standard 19200 bps Modem On which ports do you want to inst O All ports Selected ports COM1 COM2	odem: all it?
Add /Remove Hardware Wi	zard	< <u>B</u> ack	Next > Cancel
Install New Modem Modem installation is fir	ished!		
	Your modern has been set up succ	cessfully.	
	If you want to change these setting Phone and Modem Options icon in Modems tab, select this modem, a	gs, double-click the i Control Panel, click the nd then click Properties.	
	< <u>B</u> ack	Finish Cancel	

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.

Phone And Modem Options		
Dialing Rules Modems Advanced) bps Modem Properties	
The following modems are installed:	nostics Advanced	
Modem Attached To		
Add Remove Properties	Wait for dial tone before dialing	
Standard 19200 bps Modem Properties General Diagnostics Advanced Extra Settings Extra initialization commands: at+cgdcont=1, "IP", "cmnet" Change Default Plant OK	Perferences	
	Cancel	

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.

Network Connection Wizard	
	Welcome to the Network Connection Wizard Using this wizard you can create a connection to other computers and networks, enabling applications such as e-mail, Web browsing, file sharing, and printing. To continue, click Next.
	< Back Next> Cancel
	Network Connection Type You can choose the type of network connection you want to create, based on your network configuration and your networking needs. • Dial-up to private network Connect using my phone line (modem or ISDN). • Dial-up to the Internet Connect to the Internet using my phone line (modem or ISDN). • Connect to a private network through the Internet Create a Virtual Private Network (VPN) connection or 'tunnel' through the Internet. • Cancet directly to another computer Connect directly to another computer Connect using my serial, parallel, or infrared port.

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

4.2. Configure the setting

Select "Modem – Standard 19200bps modem (COM1)", and then click "Next".

ork Connection Wizard	
select a Device This is the device that will be used to make the connection.	Ś
You have more than one dial-up device on your computer.	
Select the devices to use in this connection:	
Modem - Intel HaM Plus V.90 Modem (COM5) Modem - Standard 19200 bps Modem #2 (COM3) Modem - Standard 19200 bps Modem (COM1)	
	Network Connection Wizard
	Phone Number to Dial You must specify the phone number of the computer or network you want to connect to.
	Type the phone number of the computer or network you are connecting to. If you want your computer to determine automatically how to dial from different locations, check Use dialing rules.
<u> </u>	Area code: Phone number:
	Countru/region code:
	☐ Use dialing rules
	<u> < B</u> ack <u>N</u> ext > Cancel

Enter the number for GPRS connection (do not select "Use dialling rules"), then click "Next".

Network Connection Wizard	
Connection Availability You may make the new connection available to all users, or just yourself.	H.
You may make this connection available to all users, or keep it only for yo connection stored in your profile will not be available unless you are logge	your own use. A ged on.
Create this connection:	
Eor all users	Network Connection Wizard
C Only for myself	Image: Completing the Network connection wizard Image: Second text of the second text of tex of text of text of tex of text of text of tex of text of text of
	< <u>B</u> ack Finish Cancel

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



5. Configure the dial-up tool

Connect GPRS	? ×	
70	2	
	GPR5	<u>? ×</u>
	General Options Security	Networking Sharing
	Type of dial-up server I am ca	illing:
	PPP: Windows 95/98/NT4/2	2000, Internet
User name:	-	Settings
Password:	Components checked are use	ed by this connection:
Save password	NetBEUI Protocol	etBIDS Compatible Transport Pro
	Internet Protocol (TCF	2/IP)
Dial: ×99#	 Eile and Printer Sharin Eilent for Microsoft National State 	ng for Microsoft Networks
. ,		Internet Protocol (TCP/IP) Properties
		General
Dial Cancel Properties	Description Transmission Control Prote wide area network protoci	You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
	across diverse interconne	Obtain an IP address automatically
		C Use the following IP address:
		[P address:
		Obtain DNS server address automatically
		Use the following DNS server addresses:
		Preferred DNS server: 202 . 20 . 93 . 10
		Alternate DNS server: 203 . 97 . 191 . 189
		Advanced

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**".

Select "General" tab, then click "Configure". Set the maximum speed to "115200". Click "OK" to finish the configuration.

Image: Security Networking Sharing Image: Security Networking Sharing Image: Modem - Standard 19200 bps Modem (COM1) Image: Configure Phone number Image: Phone number: Image: I	Standard 19200 bps Modem (COM1) Maximum speed (bps): 115200 Modem grotocol Hardware features Enable hardware flow control Enable modem error control Enable modem compression Initialization Show terminal window
Show icon in taskbar when connected OK Cancel	Enable modern speaker OK Cancel

Now click "Dial".

Connect GPR5	<u>?</u> ×	
	1 APO	
<u>U</u> ser name:		
Password:		
	Save password	`
Djal:	×99#	
<u>D</u> ial	Cancel Properties <u>H</u> elp	
		Connecting GPRS
		jendang *99# L⊗

Cancel

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儈~ } 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





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