



Confidential

iTegno 3800 GPRS Modem

Hardware User Guide

(For firmware version AB_02_00_30N_DEF003)

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1 INTRODUCTION

Riding on General Packet Radio Service (GPRS) technology, iTegno 3800 GPRS modem offers reliable data connectivity. This USB modem is extended to corporate users who require SMS for simple messaging and mobile office communication. It is a cost effective solution to send multi-party SMS from laptop. It can be used for a wide range of SMS applications including SMS messaging and alerts for call centre and customer services support, SMS alert for remote machine monitoring, and SMS notification for sales representatives and field technicians.

The iTegno 3800 can also be integrated with the SMS server for SMS applications like CRM and even e-commerce and transaction-based applications.

This manual provides an overview of the operation of iTegno 3800. It includes technical information on configuring the modem using a Windows-based PC via the PC's USB port.



1.1 Abbreviations

The following abbreviations are used in this document:

DC – Direct Current

V – Voltage

LED – Light Emitting Diode

DTE – Data Terminal Equipment (Refers to the host terminal/application in control)

DCE – Data Communication Equipment (Refers to the device controlled by the host)

1.2 References

S/N	Document	Our Reference	File
1	iTegno 38XX AT Commands Guide	02000C13	iTegno 38XX ATC Guide_v1.0
2	iTegno Mobile Office Suite User Guide (in Installation CD)	N/A	N/A

2 PACKAGING

2.1 Standard Package

The standard package consists of:

- iTegno 3800 GPRS Modem
- USB Cable
- Installation CD



3 HARDWARE INTERFACE

3.1 Overview

The general interfaces are shown in the figure below:



Modem Interface Overview

3.2 Status Indicator

The status indicator indicates the operational status of the modem. The table below describes the modem's operational status in various LED light status:

LED Light Status	Modem Status
LED ON permanently	Modem is switched on but is not registered on the network.
LED ON and flashing slowly	Modem is switched on and registered to network. However, there is no active communication in progress.
LED ON and flashing quickly	Modem is switched on and registered to network with an active communication in progress.
LED OFF	Modem is switched off.

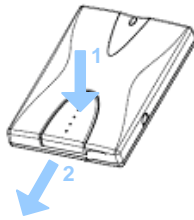
3.3 USB Communications and Power Supply

The connector type used in the modem is a USB Receptacle mini-B. External power supply is not required for the modem as the modem is powered via the USB connection.

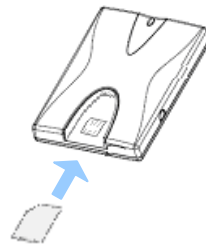
3.4 SIM Cover and SIM Tray

The following steps describe the insertion of SIM Card to the Modem.

Step 1. Gently press down and slide out the SIM cover as shown.

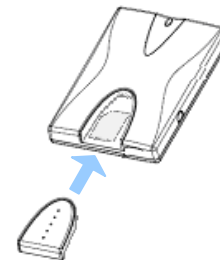


Step 2. Insert SIM Card with the metallic part facing down and the clipped corner in the left.



Inserting the SIM Card

Step 3. Insert SIM Cover back accordingly.



3.5 Internal GSM Antenna

The iTegno 3800 uses an embedded quad band antenna.

4 GETTING STARTED

4.1 Setting up the modem

Step 1: Prepare the SIM Card

Before using the modem, you must contact a network operator to get a personal SIM card. If you need to use GPRS service, do acquire the GPRS APN, User-ID and Password from your network operator.

Step 2: Insert SIM card into the modem

Please refer to Chapter 3.4 “SIM Cover and SIM Tray” for more information.

Step 3: Connect the modem to the computer

Connect the modem to the computer using the USB cable provided.

Step 4: Install the modem driver

Insert the installation CD into the CD drive. iTegno installation wizard will be executed. Follow the instructions given and select the option “**CD-ROM**”. Select “**Continue Anyway**” when prompted to confirm the driver installation. Once the driver has been successfully installed, proceed to the next step.

Step 5: Install iTegno Mobile Office Suite (iMOS)

Explore the CD-ROM and run **Mobile Office Setup.exe** to install the iTegno Mobile Office Suite (iMOS). Follow the instructions given and complete the installation.

Step 6: Communicate with the modem

The status indicator LED will indicate the modem status. Please refer to Chapter 3.2 “Status Indicator” for the modem’s operating status. The modem is now ready for use.

You may choose to operate the modem with iTegno Mobile Office Suite (iMOS) or other communication software such as HyperTerminal.

Communicating with iMOS

Please refer to the iMOS User Guide on how to communicate with the iTegno 3800 modem using iTegno Mobile Office Suite (iMOS).

Communicating with HyperTerminal

Please refer to Chapter 4.2 “Interfacing Modem with HyperTerminal Software” for communicating with the iTegno 3800 modem using HyperTerminal.

Type **AT<Enter>** in the HyperTerminal. An **OK** response indicates that the communication is successfully established.

The following are some other AT command examples that you can use:

AT+CPIN?	To check whether SIM Lock is enabled.
AT+CPIN=xxxx	To enter a PIN code if SIM lock is enabled.
AT+CSQ	To query and verify the current received signal strength.
AT+CREG?	To check on modem registration to the network.
AT+CGMR	To query for modem firmware version number.

Please refer to the iTegno 38XX AT Commands Guide for communicating with the modem using AT Commands.

4.2 Interfacing Modem with HyperTerminal Software

This section suggests examples for some basic functions using HyperTerminal:

1. Sending Short Messages (SMS)
2. Reading Short Messages (SMS)

4.2.1 Configuring HyperTerminal for Modem

Step 1

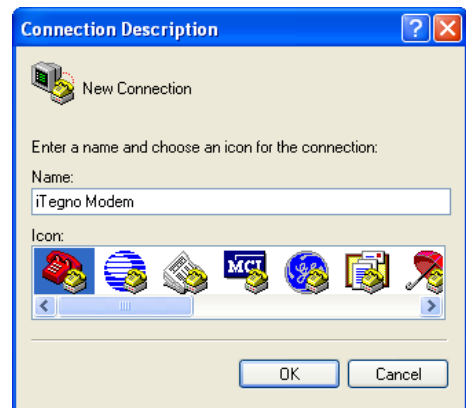
Connect the iTegno 3800 modem to the PC and run HyperTerminal software.

From the Taskbar, click [Start], followed by “All Programs” → Accessories → Communications → HyperTerminal”.



Step 2

You will be prompted to enter a description for the new connection. Enter a name for the connection (e.g. "iTegno Modem") and click [OK] to continue.



Step 3

In the "Connect to" dialog box, select the PC COM port number, which is connected to the modem, and click [OK] to continue.

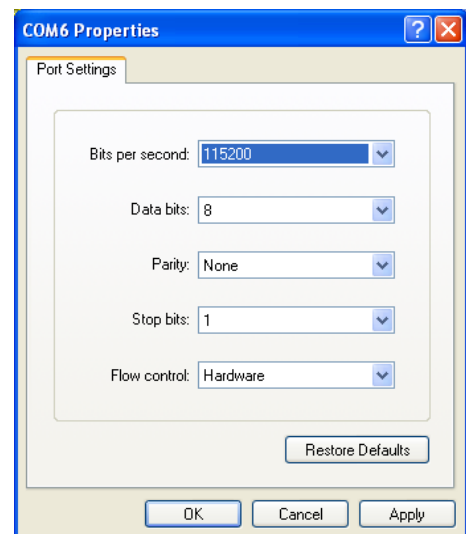


Step 4

In the next prompted dialog box, enter the COM port settings which is configured in the modem and click [OK] to continue.

Note: Default settings for the modem are:

Item	Settings
Baud Rate:	115200 bps
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	Hardware

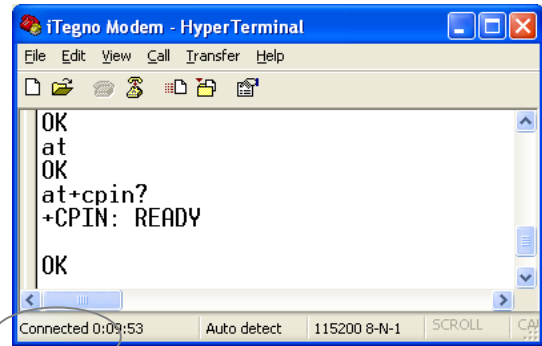


Step 5

The “Connected” text in HyperTerminal status bar indicates that the PC is ready to communicate with the modem.

Perform a simple check on the connection between HyperTerminal and the modem:

- Enter **AT<Enter>** command.
- An **OK** response indicates that the connection is successfully established.



4.2.2 Sending Short Messages (SMS)

Step 1

Set short message format as Text mode.

AT+CMGF=1<Enter>

Step 2

Check whether SMS center (SMSC) number is set to SIM card.

AT+CSCA?<Enter>

Step 3

Send a message to a phone number.

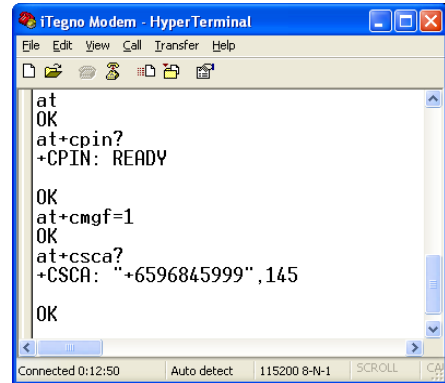
AT+CMGS= "Phone number"<Enter>

>Goodday from iTegno<Ctrl-Z>

Step 4

Wait for **+CMGS** for the result of sending SMS.

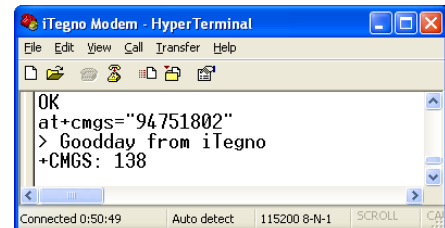
+CMGS: <mr> indicates that the SMS has been sent successfully.



```
iTegno Modem - HyperTerminal
File Edit View Call Transfer Help
at
OK
at+cpin?
+CPIN: READY

OK
at+cmgf=1
OK
at+cscA?
+CSCA: "+6596845999",145

OK
Connected 0:12:50 Auto detect 115200 8-N-1 SCROLL CA
```



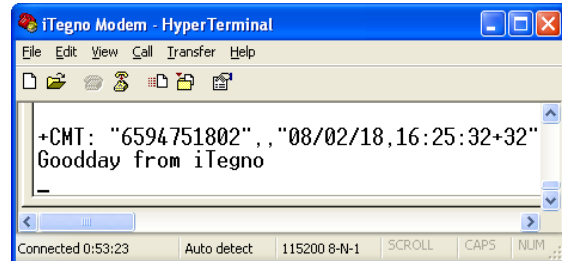
```
iTegno Modem - HyperTerminal
File Edit View Call Transfer Help
OK
at+cmgs="94751802"
> Goodday from iTegno
+CMGS: 138
Connected 0:50:49 Auto detect 115200 8-N-1 SCROLL CA
```

4.2.3 Receiving Short Messages (SMS)

Step 1

Set short message format as Text mode.

AT+CMGF=1<Enter>



Step 2

Set modem to forward received SMS to HyperTerminal directly.

AT+CNMI=2,2,0,0,0<Enter>

Step 3

Save the current settings.

AT&W<Enter>

New incoming SMS will be displayed on the HyperTerminal.

5 TECHNICAL SPECIFICATIONS

5.1 General Features

Feature	Specification
Standard	<ul style="list-style-type: none"> • Quad-band: GSM 850/ EGSM900/ DCS1800/ PCS1900 • Compliant to ETSI GSM Phase 2+
Data	<ul style="list-style-type: none"> • Asynchronous, transparent and non-transparent • Maximum speed: up to 14.4kbps • Point-to-point (MO/MT) • Text /PDU • Cell Broadcast
GPRS	<ul style="list-style-type: none"> • Terminal Class B • Multislot Class 10 • Data rates: Downlink – up to 85.6 kbps Uplink – up to 42.8 kbps
Fax	<ul style="list-style-type: none"> • Group 3 • Fax 2.0 • Max speed (kbps): up to 9.6kbps
Host Protocol	<ul style="list-style-type: none"> • AT Commands compliant to GSM 07.07, 07.05 • iWOW Proprietary AT Commands
Firmware Stack	<ul style="list-style-type: none"> • TCP/IP and UDP/IP • MMS

5.2 Mechanical Characteristics

Feature	Specification
Dimension (mm)	94.2 x 66.0 x 14.5
Weight (g)	58
Lead-free	Yes
Cooling Mechanism	Internal Dual Flow Air Convection
Power Supply Interface	PC Powered via USB host (No external power supply)
Communication Port	USB Receptacle mini-B USB 1.1 VBUS, D+, D-, GND Baud rates from 110 to 115200 bps

5.3 Electrical Characteristics

Current Consumption				
Operating Mode	Conditions	I _{nom}	I _{max}	Units
Modem OFF/Backup		50	100	uA
Modem IDLE	DRX=6 (Ave) with SLEEP mode enabled	3	-	mA
GPRS DATA (3Rx/2Tx)	EGSM – PCL 5 (Ave)	420	460	mA
	DCS/PCS – PCL 0 (Ave)	380	420	mA

Above values taken at 25°C

Power Supply	
Operating Voltage	5V

SIM Interface	
SIM Card Support	1.8V, 3V

5.4 RF Performance

Feature	Specifications
Frequency band	<ul style="list-style-type: none"> • GSM 850/ EGSM900/ DCS1800/ PCS1900
Sensitivity	<ul style="list-style-type: none"> • GSM 850: -102dBm • EGSM 900: -102dBm • DCS 1800: -100dBm • PCS 1900: -100dBm
Output power	<ul style="list-style-type: none"> • GSM 850: Class 4, 2W (33dBm) • EGSM 900: Class 4, 2W (33dBm) • DCS 1800: Class 1, 1W (30dBm) • PCS 1900: Class 1, 1W (30dBm)

5.5 Environmental Characteristics

Feature	Specifications
Operating temperature range	-20 °C to + 55 °C
Storage temperature range	-40 °C to +85 °C

6 TROUBLESHOOTING

This section suggests the possible solutions for common problems encountered when using the iTegno 3800 GPRS modem.

6.1 Is my modem powered up?

- Check whether the LED on the modem is lighted up. If it is not lighted up, check whether the modem is properly connected to the PC via the USB cable.

6.2 Is my SIM Lock enabled?

- Use **AT+CPIN?** to request for PIN Status, or
- **AT+CLCK="SC",0,"password"** to disable SIM LOCK.

6.3 What is my SIM card PIN code?

If you have forgotten or lost your PIN code, or, you have not received such a code, please contact your network service provider for assistance.

6.4 Unable to register to the network

- Check the modem Status Indicator LED. The LED should be blinking if the modem is registered to the network.
- Use **AT+CREG?** to request for registration status.
- Check the signal strength of the network using **AT+CSQ** command. You should receive a +CSQ response (+CSQ: <rsssi>, <ber>). If the rssi value is 99, it means the network is unknown or undetectable. The ideal rssi value should be 8 to 31. An rssi value less than 8 has weaker signal strength.

6.5 Cannot enter AT Commands or no communication between device and modem

- Check whether the modem is powered up.
- Check whether the SIM Lock is turned on.
- Ensure that the USB cable is connected properly to the PC.
- Make sure that the COM port settings are correct. Do ensure that both modem and your device are communicating with the same settings (such as baud rate, data bits, stop bits and parity). The modem default port settings are:

Item	Settings
Baud Rate:	115200 bps
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	Hardware

- Try isolating your device by connecting the modem to a Windows-based PC with HyperTerminal and test the communication between the modem and PC. Please refer to Chapter 4.2 “Interfacing Modem with HyperTerminal Software” for the setup instructions.

6.6 Cannot send SMS using AT+CMGS command

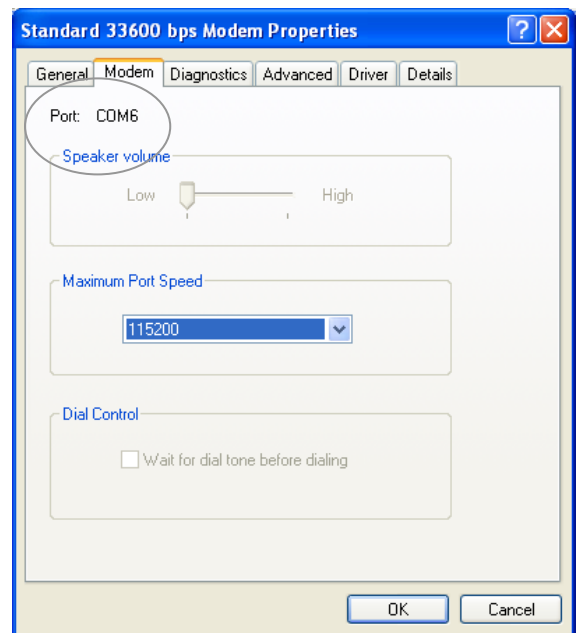
- Check whether the modem is powered up.
- Check whether the SIM Lock is turned on.
- Check whether the modem is registered to the network.
- Try inserting the SIM card into a mobile phone and/or another modem to send an SMS. If the SMS cannot be sent, please check with your network service provider on the status of the SIM card.
- Verify that the SMS Service Centre Number is correct using **AT+CSCA?** command.
- Ensure that the modem is set to text message mode. You may do so by using **AT+CMGF=1** command. Please refer to Chapter 4.2.2 “Sending Short Messages (SMS)” for more details.

6.7 Cannot connect to GPRS

- Check whether the modem is powered up.
- Check whether the SIM Lock is turned on.
- Check whether the modem is registered to the network.
- Check whether the SIM card supports GPRS Service. You can verify it with the network service provider. If SIM card supports GPRS service, check whether APN settings are correct. Use the **AT+CGDCONT?** command to query or assign the APN settings. Ensure that it is correct by confirming the APN with your network service provider.

6.8 Which COM Port is my modem connected to?

- From the MS Windows taskbar, click [Start] and select Control Panel → System → Hardware → Device Manager → Modem.
- Double-click on the installed modem name (Note: this modem name is specified in your last modem setup).
- On the Modem properties dialog box, select “Modem” tab and the COM port is displayed as shown in the diagram.



7 SAFETY RECOMMENDATIONS

7.1 General Safety

It is very important to follow any regulations regarding the use of radio equipment especially due to the possibility of Radio Frequency (RF) interference.

Please follow the safety advice given below carefully:

- Switch off your GPRS Modem when in an aircraft. The use of cellular telephones in an aircraft may endanger the operation of the aircraft, disrupt the cellular network and is illegal. Failure to observe this instruction may lead to suspension or denial of cellular telephone services to the offender, legal action or both.
- Switch off your GPRS Modem when at a refuelling point.
- Switch off your GPRS Modem in hospitals and at any other place where medical equipment may be in use.
- Respect restrictions on the use of radio equipment in fuel depots, chemical plants or where blasting operations are in progress.
- There may be hazards associated with the operation of your GPRS Modem close to inadequately protected personal medical devices such as hearing aids and pacemakers. Consult the manufacturers of the medical device to determine if it is adequately protected.
- Operation of your GPRS Modem close to other electronic equipment may also cause interference if the equipment is inadequately protected. Observe any warning signs and manufacturers recommendations.

7.2 Vehicle Safety

If incorrectly installed in a vehicle, the operation of the GPRS Modem could interfere with the proper functioning of vehicle electronics. Ensure that only qualified personnel perform the installation to avoid such problems. Verification of the protection of vehicle electronics should form part of the installation.

7.3 Care and Maintenance

Your GPRS Modem is the product of advanced engineering, design and craftsmanship and should be treated with care. The suggestions below will help you to enjoy this product for many years.

- Do not expose the GPRS Modem to any extreme environment where the temperature or humidity is high.
- Do not attempt to disassemble the GPRS Modem. There are no user serviceable parts inside.
- Do not expose the GPRS Modem to water, rain or split beverages. It is not waterproof.
- Do not abuse your GPRS Modem by dropping, knocking, or violent shaking. Rough handling can damage it.
- Do not place the GPRS Modem alongside computer discs, credit or travel cards or other magnetic media. The information contained on discs or cards may be affected by the frequency emitted by the modem.
- The use of third party equipment and/or accessories, not made or authorised by iWOW Connections Pte Ltd may invalidate the warranty of iTegno 3800 GPRS Modem.

Do contact us in the unlikely event of a fault.

8 Contact Us / Support

For online support (FAQs and drivers download), please visit www.iTegno.com.

For technical support, please contact our distributors/resellers or email us at developers@iTegno.com.

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