WAVENET
TECHNOLOGY

Dualwave-I
Wireless Modem

User Manual

Revision 3.2
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Contents

Introduction

The Wavenet Dualwave-I modem is a high performance wireless modem developed for the Compaq iPAQ Pocket PC, H3800 and H3900 series devices. It enables access to worldwide DataTAC wireless networks to send and receive email, job dispatch, stock market trading, Internet browsing, etc. All of which can be done while in transit.

Front and Rear views of the Dualwave-I Modem

This manual provides details on how to set up, charge and use the modem. There is a troubleshooting section to the rear of the manual and a section on care and maintenance. Specifications are provided on the last page.

Modem Features

The Dualwave-I modem has the following features:

- Automatic power on/off when the iPAQ Pocket PC is inserted and removed, respectively – no manual on/off switch

- Always on-line using the Private DataTAC network with automatic network roaming

- High sensitivity reception

- Auto wake-up of Compaq iPAQ Pocket PC on incoming messages with silent "Vibration Alert" option

- Status indicators for visual feedback:

    o "Power/On-Line" showing modem and network status

    o "Battery Low" warning

    o "Battery Charging" status (on the rear face of the battery)

- Externally replaceable rechargeable Li-Ion polymer battery which can be conveniently swapped as required. A 920 mAh capacity is fitted as standard, sufficient for a full business day of activity

- Use the modem battery to trickle charge the iPAQ battery during modem use or as an exclusive extended battery to increase iPAQ operating time

- Modem battery is recharged simultaneously with the iPAQ Pocket PC when both units are inserted into the iPAQ Desktop Cradle or when directly connected to the mains adaptor via the iPAQ serial port (depending on iPAQ model – refer to the iPAQ user manual)

- Supports Private DataTAC RD-LAP and Native Command Language (NCL) Protocols

- Easy to attach and remove with plug and play capability (using supplied drivers)

- Form hugging stylish design with compact ¼-wave helical coil antenna

Compliance Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instructions, may cause interference harmful to radio communications.

There is no guarantee however, that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by comparing the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your supplier or an experienced radio/TV technician for assistance.

Warning: *Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.*

Information for Your Safety

Please read these safety instructions and the operation instructions provided in this manual before operating the modem or the battery charger.

SAR (RF Absorption Levels into body)

Your modem contains a low power transmitter and receiver. When it is switched on, it receives and sends out radio frequency (RF) signals. In August 1996, the Federal Communications Commission (FCC) adopted RF exposure (SAR) guidelines with safety levels for handheld wireless devices. These guidelines are consistent with safety standards previously set by both USA and International Standards: ANSI C95.1 (1992), NCRP Report 89 (1986), ICNIP (1996).

The modem is designed for handheld operation and has been certified to comply with the aforementioned FCC guidelines and standards under worst case conditions (zero separation distance). To maintain the optimum operational characteristics, no part of the human body should be in contact with the antenna during use.

Safe Use

Switch the modem off in areas where radio devices are forbidden, or when it may cause interference or danger. For example, fuel depots (fuel storage and distribution areas), chemical plants, locations in which hazardous or combustible gases may be present and where blasting operations are in progress.

Do not use the modem in an aircraft. Such use may affect aircraft instrumentation, communication and performance and may be illegal.

Be aware that the modem may interfere with the functionality of inadequately protected medical devices, including pacemakers. Additionally, the effect of the radio signals from the modem on other electronic systems, including those in your car (such as electronic fuel-injection systems, electronic anti-skid braking systems, and electronic cruise-control systems) is unknown and malfunction of these systems may result.

Do not place the modem on an unstable surface. It may fall, causing injury and damage the equipment.

Discard the modem properly; the unit uses a lithium-ion battery. The lithium-ion battery should not be disposed of in a fire. Dispose of the lithium-ion battery in accordance with the laws and regulations in your area governing disposal of such cell types. Contact your supplier if you have any questions concerning disposal of the modem or battery.

Never push objects of any kind into the modem through any openings as they may short out parts that could result in a fire or electrical shock. Never spill liquid of any kind on the modem. Do not use the modem near water (for example near a bathtub or sink, in a wet basement, near a swimming pool etc.). The modem should be situated away from heat sources.

Unplug the modem from the battery charger and remove the battery before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth to clean the unit.

Disconnect the battery charger, remove the battery and contact your supplier if:

- Rain or other liquids have been spilled on and damaged the modem.

- The modem has been dropped or damaged in any way.

- The modem does not operate normally by following the instructions contained in this manual.

Failure to observe any or all of these instructions will void the warranty.

System Requirements

To install the modem device driver and Modem Info user interface software onto your iPAQ, your computer system must meet the following minimum requirements:

- Intel compatible 486 computer or higher
- Windows 98, or Windows NT 4.0, or later.
- Microsoft ActiveSync v3.5 or later
- 8MB RAM (memory) minimum, 16 MB recommended
- 1MB available hard disk space
- CD-ROM drive
- One available USB/com port (used for the ActiveSync process)

In addition, your iPAQ must have:

- The iPAQ desktop software already installed
- 500kB of available memory
- Microsoft Pocket PC v3.0 or later

Checking the Package Contents

The following items should be included in the box.

Dualwave-I
Modem

Slim
920mAh
Battery

You should also have the CD-ROM, which includes the Modem Info software and this User Manual.

Exploring Your Dualwave-I Modem

A picture of the Dualwave-I modem is shown below.
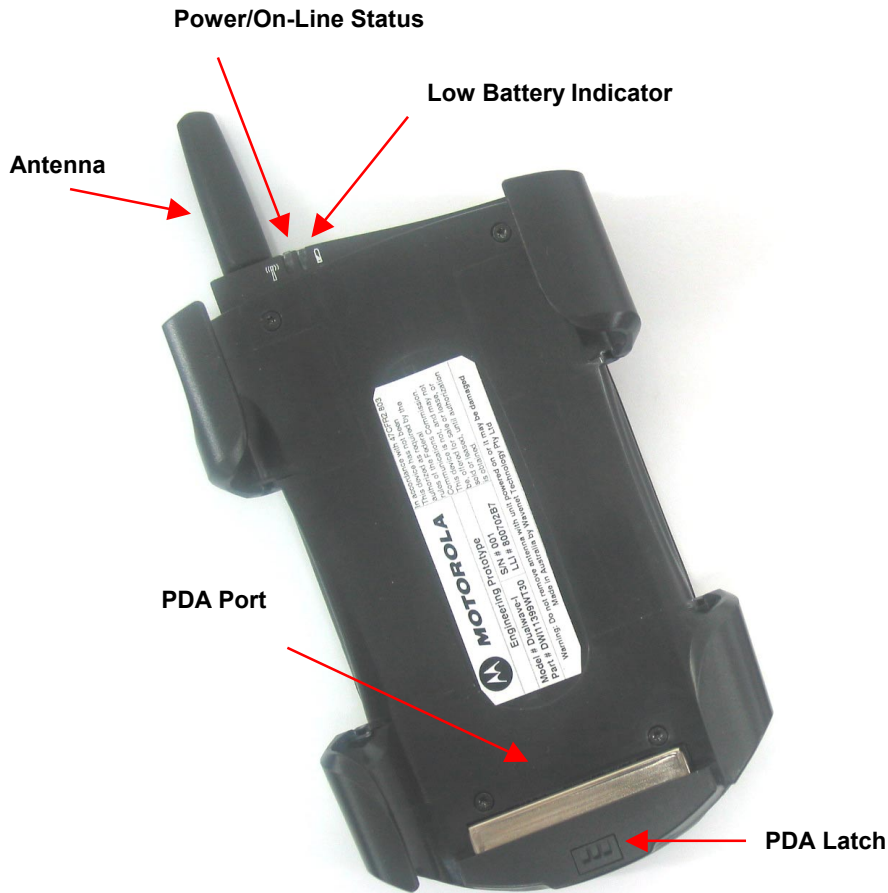
The modem is comprised of the following components:

PDA Port	Provides a connection between the iPAQ and the modem.
Latches	Connects and releases the iPAQ from the modem.
Antenna	Compact ¼ wave helical coil type
Status Indicators	Provides visual feedback regarding network connectivity (On-Line) and Battery Capacity

Note there is no manual on/off power switch. The modem is automatically powered on/off when the iPAQ Pocket PC is inserted and removed respectively.

Power/On-Line Indicator

On-Line Indicator
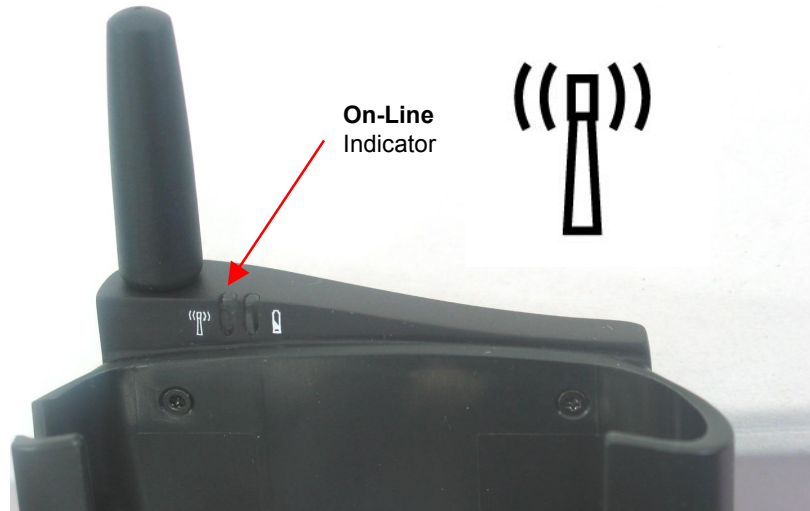
Off	○	The modem is off.
Slow flashing green (once per 12 seconds)	-○-	The modem is off but the battery is being used to supplement the iPAQ.
Slow flashing green (once per second)	-○-	The modem is on and scanning for a network connection.
On	●	The modem is on and registered to a network.

Low Battery Indicator

Low Battery Indicator
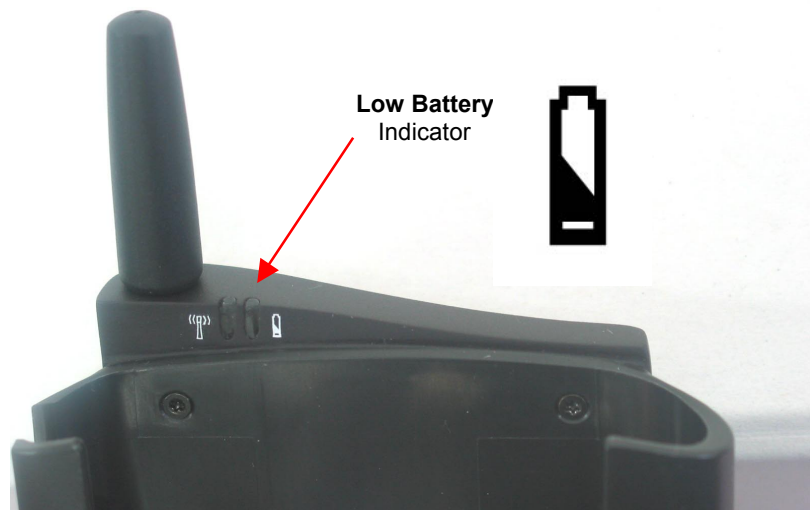
Off	○	Battery is ok
Rapid flashing red (five times per second)	-●-	The battery is too low for normal operation. Re-charge the battery immediately.

Battery Charging Indicator

Battery Charging
Indicator

Off	○	Battery is ok
Slow flashing orange (two times per sec)	☼	The battery being re-charged.
On	●	The battery is fully re-charged.

Getting Started

Setting up the Modem and iPAQ

Before using your Dualwave-I modem, you must:

- ❑ Install the modem software onto your iPAQ Pocket PC
- ❑ Fit the external battery to the modem
- ❑ Engage the iPAQ Pocket PC onto the modem
- ❑ Fully charge the modem and iPAQ batteries

Dualwave-I Modem Software Overview

Included on the CD-ROM are the modem device drivers and Modem Info user application software. These are contained within three CAB files, which need to be installed on iPAQ Pocket PC, namely:

- ❑ DWiUART.ppc30_arm.CAB
- ❑ DWiVDD.ppc30_arm.CAB
- ❑ MSMQ.ppc30_arm.CAB

DWiUART.ppc30_arm.CAB

This CAB file contains the low level drivers that instantly create a serial communications port to the Dualwave-I modem upon every iPAQ insertion into the modem sleeve. These drivers must be installed to enable access to the Dualwave-I modem for any application software. This CAB file also contains a basic programmers interface for third party application developers who should refer to document "DWI Modem Device Driver" (DWI10006WTxx) for further information.

DWiVDD.ppc30_arm.CAB

This CAB file contains the Dualwave-I Virtual Device Driver, Port Server and Modem Info application.

Modem Info is a graphical user interface modem diagnostic and information tool to enable you to:

- ❑ Check the network connection status and modem parameters
- ❑ Check the modem hardware and battery status
- ❑ Set the various operating modes of the modem
- ❑ Register third party applications for invocation on specific modem events

Modem Info is supplied in both executable and source code form as an example for iPAQ application developers to communicate with the Dualwave-I modem.

The Virtual Device Driver (VDD) and Port Server are essentially "middleware" software which provides a layer of abstraction to application developers so that communications with the modem can be significantly simplified. They remove the requirement to fully understand the Native Communication Language (NCL) syntax to communicate with the modem.

In addition, the VDD and Port Server allows multiple applications (or "sessions") on the iPAQ Pocket PC to simultaneously interface with different network host servers, such as an email client, web browser, dispatch application or Modem Info itself. Messages are routed to the appropriate application via the Microsoft Message Queue facility. Third party application developers should refer to document "DWI Modem Virtual Device Driver and Application Interface" (DWI10010WTxx) for further information.

If multi-session capability is not required, the VDD and Port Server CAB file does not need to be installed, however, Modem Info requires this middleware software in order to operate.

MSMQ.ppc30_arm.CAB

The Microsoft Message Queue (MSMQ) allows multiple applications (or sessions) to simultaneously utilise the single Dualwave-I modem in which an iPAQ is inserted. It is the mechanism by which information is routed between the appropriate application on the iPAQ Pocket PC and the network host server.

Installing the Modem Software

To install the CAB files onto your iPAQ, ensure that the iPAQ desktop software has been installed on your computer first and then use the following procedure.

Note: *Do NOT connect the modem to your iPAQ whilst installing the CAB files*.

1. Connect the auto-sync cable (supplied with your iPAQ), between the iPAQ and the corresponding port on your PC or use the iPAQ cradle.

2. Switch the PC on and insert the CD-ROM, which was supplied with your modem, into your CD-ROM drive.

3. Locate the three CAB files on the CDROM using Microsoft Explorer.

4. From your PC, copy and paste the three CAB files into the Mobile Device/My Pocket PC/Temp folder as shown in the following diagram:

Copy and paste all the CAB files into this folder.
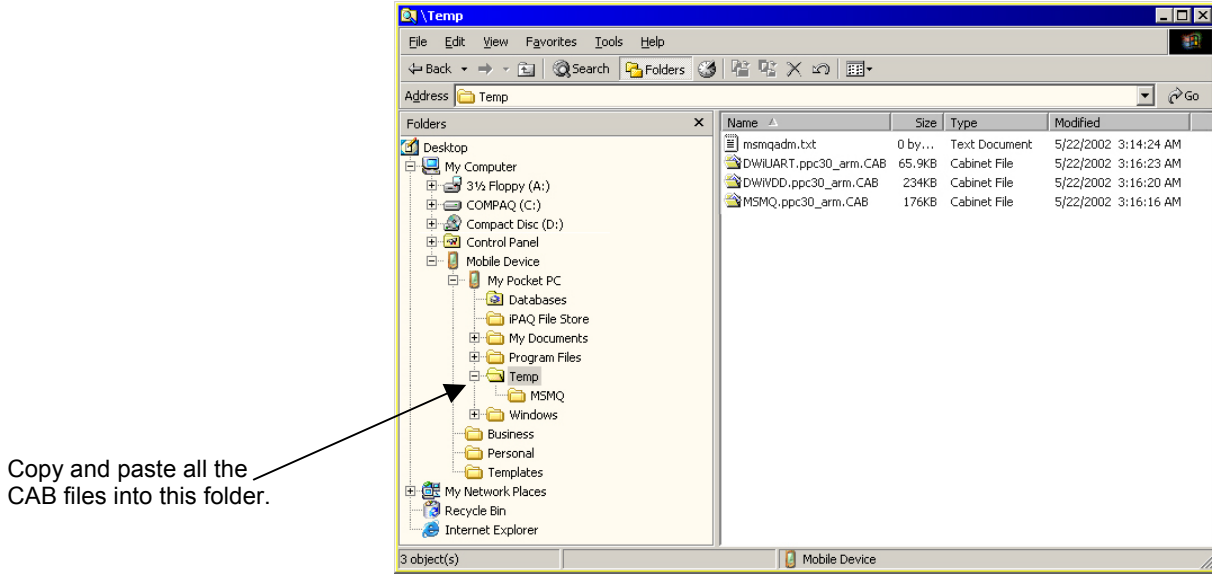
5. From your iPAQ, select **Start** to display the Start menu.

6. Select **Programs > File Explorer**.

7. Navigate to the Temp folder.

Temp folder
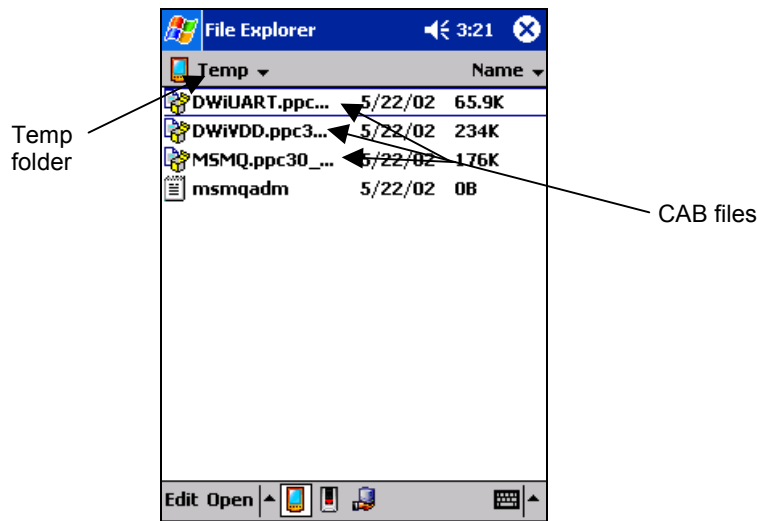
CAB files

8. Tap the DWiVDD.ppc30_arm.CAB file to install the Dualwave-I Virtual Device Driver and Modem Info application

A progress bar is displayed during the installation.

Progress bar
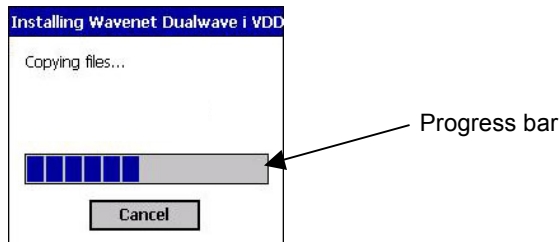
After the installation the CAB file is automatically deleted from the Temp folder.

9. Install the DWiUART.ppc30_arm.CAB file using the same procedure for installing the ModemInfo CAB file described above.

10. Check to see if MSMQ (Microsoft Message Queue) application has already been installed on your iPAQ.

   a. Tap **Start** and select **Settings**.

   b. Select the **System tab** and tap the **Remove Programs** icon.

   c. If the MSMQ application has already been installed, you should see a reference to it in the **Programs in Storage Memory** list.

   d. If there is a reference to MSMQ, there is no need to install the CAB file. Proceed to step 14.

   e. If there is no reference to MSMQ, you must install the CAB file.

11. To install the MSMQ CAB file, follow the same procedure for installing the ModemInfo CAB file.

12. After installing the MSMQ CAB file, the following screen is displayed.
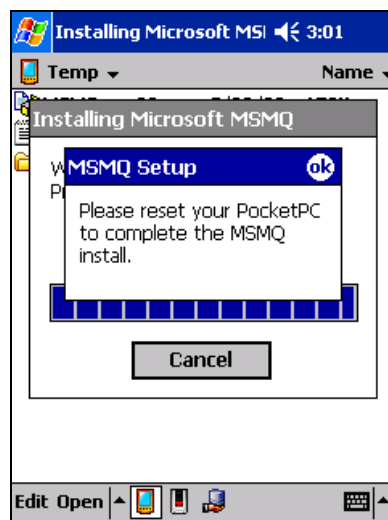
13. Reset the iPAQ by pressing the iPAQ reset button located on the bottom of the iPAQ. The iPAQ reset button is recessed, simply insert a thin blunt pointed object (e.g. your iPAQ stylus), into the recession and press.

14. Connect your iPAQ to the modem.

15. To confirm the successful installation, tap **Start** to display the Start menu. The ModemInfo application is now visible.

ModemInfo
application
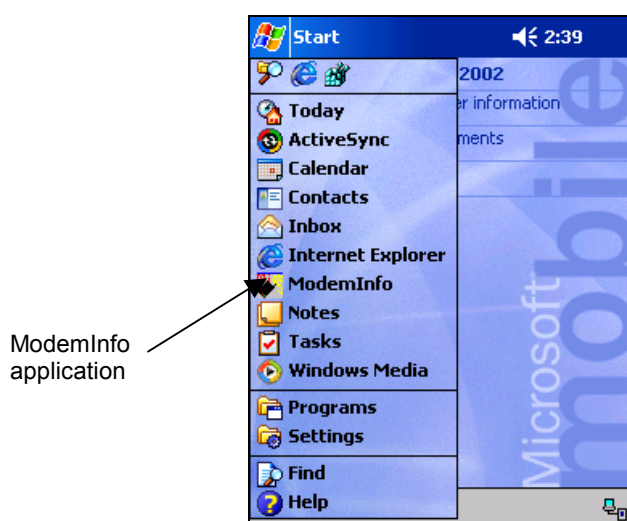
Removing Software From Your iPAQ

To remove the software from your iPAQ, refer to the instructions in your iPAQ User manual. The typical procedure is shown below.

1. Close all applications.

2. Remove the iPAQ from the modem.

3. Tap **Start** to display the Start menu.

4. Tap **Settings**.

5. Select the **System tab**.

   The following screen is displayed:

6. Tap **Remove Programs**.
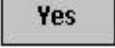
7. Select the appropriate application.

8. Tap [Remove].
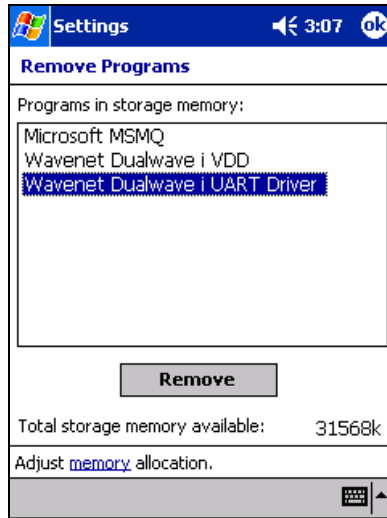
A confirmation message is displayed.

9. Tap [Yes] to uninstall the application from your iPAQ.

Note: *It is NOT recommended to uninstall the MSMQ application.*

Fitting the external battery to the modem

To fit the external battery to the modem, follow the steps below:

1. Slide the top two pins of the battery into the corresponding holes on the rear of the modem

2. Press the lower battery latch into the modem until you hear a click.

Engaging the iPAQ with the modem

To connect the modem to your iPAQ, follow the steps below:

3. Slide the iPAQ into the modem so that the PDA ports are aligned.

4. Push the modem until you hear a click. The iPAQ engages onto a latch that secures the iPAQ to the modem.

Removing the Dualwave-I Modem

To remove the modem from your iPAQ, use your thumb to push the iPAQ forward from the base of the modem to disengage the latch and then slide the iPAQ away from the modem.

Charging the Modem Battery

Your modem's lithium-ion battery is supplied discharged. For optimum performance, you should charge it fully before use. If during use, the Low battery indicator starts flashing red, the battery needs immediate recharging or it should be swapped with a re-charged unit.

The modem battery is automatically recharged simultaneously with the iPAQ when both units are inserted into the iPAQ Desktop Cradle (as supplied with the iPAQ) or when directly connected to the mains adaptor via the iPAQ serial port (depending on iPAQ model – refer to your iPAQ user manual)

Follow the steps below to charge the iPAQ and modem's battery:

1. Connect your iPAQ to the modem.

   Slide the iPAQ into the desktop cradle.

2. Plug the iPAQ battery charger into a power source and the iPAQ cradle. The iPAQ battery charging indicator on the iPAQ front panel will flash when the iPAQ is charging and the battery charging indicator on the rear face of the modem battery will also flash when it is charging.

   Note: *Perform an overnight charge when charging the modem's battery for the first time.*

3. When the iPAQ and battery charging indicators fully illuminate both batteries are fully charged. If only one indicator fully illuminates, only that corresponding battery is fully charged.

4. Remove the iPAQ and modem from the cradle when fully charged.

When the modem battery is fully charged, the internal charger stops charging until the battery capacity falls below a certain value. The battery charger will then automatically start recharging the batteries again.

Using Your Dualwave-I Modem

Switching the Modem On/Off

The Dualwave-I modem does not contain a manual on/off power switch. The modem is automatically powered on/off when the iPAQ Pocket PC is inserted and removed respectively.

Before operating your Dualwave-I modem ensure the battery is fully charged, Modem Info software has been installed on the iPAQ and the iPAQ is inserted into the modem, as described earlier.

Upon first iPAQ insertion the modem Power/On-Line indicator should display slow flashing green (once per second) as the modem searches for a network connection. As soon as the modem is registered the Power/On-Line indicator will fully illuminate. If network access is denied or no network can be found the Power/On-Line indication will continue to search to flash until it can register somewhere. On subsequent insertions the Power/On-Line indicator will reflect the power mode state set in the Modem Info application (refer to page).

If the Low Battery display starts flashing red, the battery needs charging. See the previous section, Charging the Modem Battery on page 21, for further information.

The iPAQ and Dualwave-I modem is now ready for use.

Note: *The network profile is set by default for the modem to be used in U.S.A. To use the modem in Canada or other countries, this setting must be changed. See page 26 for information on changing the network profile.*

Using the Modem Info Application

Modem Info is a graphical user interface modem diagnostic and information tool to enable you to:

❑ Check the network connection status and modem parameters

❑ Check the modem hardware and battery status

❑ Set the various operating modes of the modem

❑ Send and Receive short text messages

❑ Register third party applications for invocation on specific modem events

Modem Info consisting of a single screen with six tabs. These tabs are described in the following sub-sections.

To access ModemInfo, select the ModemInfo application from the main screen. By default the Settings tab is displayed.

RF (Network Status) Tab

This tab displays the following information:

RF Protocol	The network radio protocol
Channel	Radio channel currently being used by the modem. This is displayed as a hexadecimal number.
Frequency	The frequency measured in MHz.
Signal (RSSI)	The Received Signal Strength Indicator (RSSI) measured in dBm.
Radio Carrier	Indicates whether the modem is in or out of radio range.
Base Station ID	The identity of the Base Station.

Modem (Status) Tab
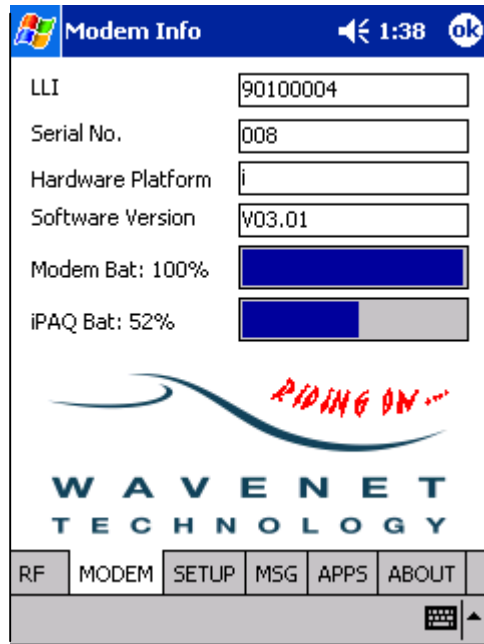
This tab contains the version information on the modem, including the LLIs and serial numbers. The following information is displayed:

LLI	Logical Link Identifier. This is the unique identity of the modem.
Serial No.	Serial number of the modem.
Hardware Platform	The hardware platform of the modem.
Software Version	Shows the version number of the firmware in the modem.
Modem Battery	A visible indicator that shows the status of the modem battery. Low battery levels can affect the wireless connection robustness.
IPAQ Battery	A visible indicator that shows the status of the iPAQ battery.

Settings Tab
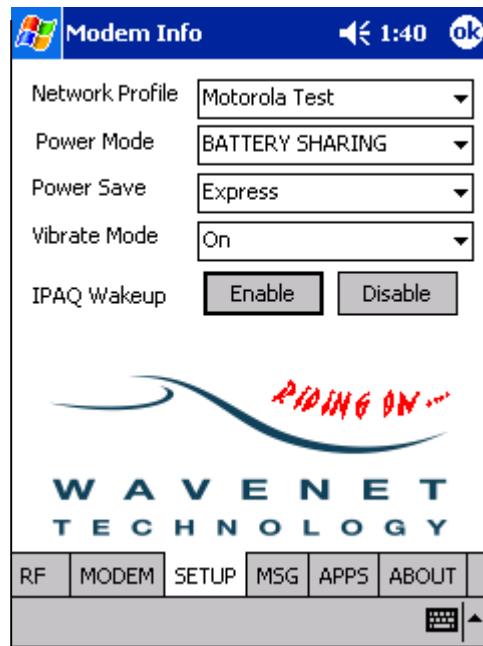
This tab displays the following information about the modem attached to the iPAQ:

Network Profile You may select a network profile from those stored in the modem. Change the setting by tapping ▼ and select from the drop-down list.

Power Mode There are four power modes available;

ON (modem only) – The modem is on and the battery is exclusively used by the modem

Battery Sharing – The modem is on but the modem battery is "shared" with the iPAQ to extend the iPAQ operating time. In order to share this capacity the modem periodically trickle charges the iPAQ when the voltage is lower than the modem battery by a certain threshold. Trickle charging is inhibited when the modem battery voltage falls below 3.7V.

Battery Extended – The modem is off (actually in a very low power mode) and the modem battery is exclusively used by the iPAQ through the trickle charge mechanism described previously.

OFF (No battery sharing) – The modem is off (actually in a very low power mode) and access to the modem battery is disabled.

Power Save	The Power Save option can greatly reduce the power consumption of your modem but it requires the network operator to support these options.
	The modem is designed to stay on so that it can notify you when it receives incoming messages and so you can quickly access your e-mail messages and information from the web.
	To conserve power, the modem can be set to one of several modes which have different power usage and latency options.
	By default, the Power Save option is set to Maximum.
	Tap ▼ and select one of the following options from the drop down list.

Express	The power save option is disabled, shortest battery life. The modem receiver is continuously powered.
Min	Minimum power save. The modem wakes up to receive messages every 32 seconds.
Average	Average power save. The modem wakes up to receive messages every 64 seconds.
Max	Maximum power save, longest battery life. The modem wakes up to receive messages every 128 seconds.

Vibrate Mode	Tap to switch the vibrator on, off or Test. If the vibrate mode is set to on, the modem vibrator will be triggered when a packet is received while the iPAQ is off. Select test to test the vibrator.
IPAQ Wakeup	This is a master Wakeup enable feature for the iPAQ to be woken up by the modem on an incoming message.

Messages Tab

This tab allows you to send simple text messages to and from the iPAQ:

Protocol	You may select different message transport protocols. The correct type for the connected network must be used to successfully send and receive messages. Change the setting by tapping ▼ and select from the following drop-down list.
	USER Defined
	Host Messaging
	MG (Australia)
	MG (USA)
	For example, to send a message between two Dualwave-I devices, select the MG protocol for the country you are in, uncheck MDC and type the device LLI in the "Msg To" field
MDC	Selecting this button will put the message in MDC compatibility format. This is only required for private networks.
Send	Selecting this button will transmit the text in the message box to the addressed host or device.
Msg To	This field is used to specify the destination host or device address. In the case of User Defined you must provide the full message header

	format, for Host Messaging you must provide the host address and in the case of MG messaging you must provide the device LLI address.
Msg From	The field opposite provides information on the received message source address and the field below displays the received message text
Clear	This button is used to clear the received message text box

Applications Tab

This tab displays a list of Registered Applications on your iPAQ that are registered for wakeup

If desired, register those applications that need to be invoked when the modem receives an incoming message and/or when the iPAQ is inserted into the Dualwave-I modem. Up to eight applications can be registered for wakeup. To register an application, tab onto a blank edit box, fill in the full path of an application and check one or both of the associated check boxes. To deregister simply ensure both check boxes are unchecked and/or delete the contents of the associated edit box.

In the example shown, the Modem Info application will be automatically invoked the next time the iPAQ is inserted into the modem.

The Registered Server edit box lists the full path of the server application. This application is invoked when the iPAQ is inserted into the modem. It runs in the background, allowing multiple client applications (like Modem Info) concurrent use of the Dualwave-I modem. If you want to run an application that requires exclusive use of the modem, deregister the server application by deleting the contents of the edit box and re-attach the modem.

About Tab

The Modem Info version number is displayed.

Tap the OK icon to return to the Main screen.

Synchronising Data Between Your iPAQ and Computer

To synchronise data between the iPAQ and your computer, refer to the instructions in your iPAQ User Manual.

Updating Firmware on Your Dualwave-I Modem

Firmware is the resident software installed on your modem.

For optimum performance ensure that you are using the latest firmware version.

Follow the procedure below to check the version number of the firmware currently loaded on your modem.

1. Connect your iPAQ to the modem as described previously.

2. Switch your iPAQ on.

3. Select the Modem Info application from the main screen.
   By default the Info tab is displayed.

4. Select the Modem Versions tab.

5. From the Modem Versions tab, check the version number of the firmware.

Using your web browser on your PC, navigate to the download site and check for the latest version of the modem firmware.

If the version on the web is later than the firmware version on your modem, download the self-extracting file and follow the online instructions.

Installing New Software on Your iPAQ

Refer to the installation instructions that came with your software. There may be a Read Me file.

Typically, to install new software on your iPAQ from your PC, follow the same steps as installing the ModemInfo Software on page 21.

Troubleshooting

If you encounter a problem with your modem or battery charger, review the following list of frequently asked questions.

I'm getting no response from the modem.

Make sure that the iPAQ is fully inserted into the modem, the Modem Info application has power setting is on and the modem is fully charged. The Power/On-Line indicator should be illuminated and Low-Battery indicator off.

Select the Modem Info application from your iPAQ's main screen to display the Modem Info screen. Check the battery indicator is showing adequate battery charge status.

Battery Charge Capacity is shown here
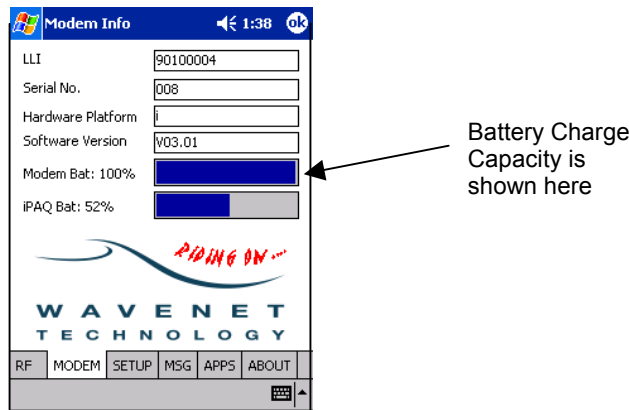
Refer to page 21 for information on charging your modem.

The Power/On-Line Indicator is continually flashing green.

Check your network profile setting by selecting the Modem Info application from your iPAQ's main screen to display the Modem Info screen. Select the Settings tab to display the screen below:

Default profile is shown
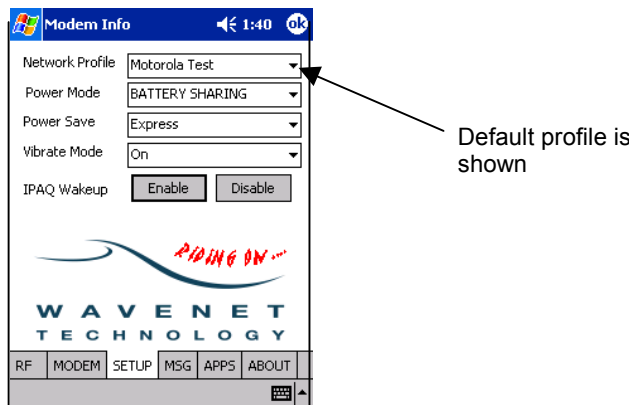
Select the operator profile you have subscribed to eg Motient if you are using your modem in U.S.A. or Bell Mobility if you are in Canada.

Check the Power/On-Line indicator. It should fully illuminate when connected with the network. Also check the RSSI signal level in the ModemInfo application. It should be greater than –110dBm.

I'm having difficulty sending and receiving messages. The Online indicator fluctuates between on and flashing.

Fluctuation in signal strength can happen in fringe areas on densely populated areas with tall building. When operating in an area of low signal strength, the modem may go on and off line as the signal fluctuates above and below the minimum user level.

Check that you are in an area that provides coverage. Your network provider should have the details.

The modem may also temporarily go off line and back on as it roams from one frequency to another in order to obtain improved coverage per normal network operation.

What can I do to get back in range?

The wireless signal needs a clear path; avoid congested or metal buildings or tunnels. Tree leaves and windows may also affect the signal strength, as can environmental conditions, for example heavy rain. Try moving away from buildings and hold the device away from your body.

The status shows that I'm in range, but I'm still having difficulty sending and receiving messages.

Check the battery level as low battery levels can affect the connection. Select the Modem Info application from your iPAQ's main screen to display the Modem Info screen. Check the battery indicator and compare it with the examples below.
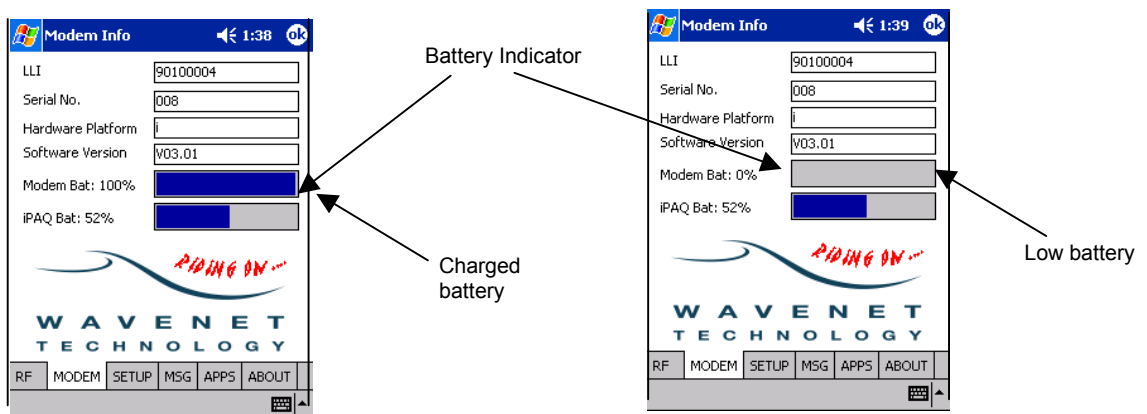
If the battery indicator shows that the battery capacity is low, charge the battery as described on page 21.

How do I locate the LLI and serial numbers assigned to my modem?

The LLI and serial numbers are located in three places:

- ❑ On the package
- ❑ On the label on the back of the modem
- ❑ From the Modem Versions tab in the Modem Info application.

How do I check the modem settings?

The Modem Info application provides information about your modem and the active settings. Select the Setup tab from Modem Info.

I can't get the modem to charge.

Confirm that iPAQ is fully inserted into the modem, the pair are fully inserted into the iPAQ cradle and the battery charger power cable is properly connected to the cradle.

Confirm that your battery charger is plugged into an AC outlet and that the AC outlet has power.

How can I extend battery life?

You can extend battery life by:

- ❑ Turning off the modem when you are not using it.
- ❑ Selecting the Maximum Power Save option from the Modem Info Setup tab if your network operator supports this feature.

Does a weak RF signal affect battery life?

The battery usage estimates assume that the modem is switched on between eight to ten hours a day and you are located in a good RF area. The life of the battery charge may be considerably less if you are operating your modem in a weak RF area.

Can I still receive messages when the iPAQ and modem is charging?

Yes, messages can be sent and received when the iPAQ and modem batteries are charging.

What happens if I don't disconnect the battery charger after the battery is fully charged?

When the batteries are fully charged, the battery charger stops charging until the batteries' capacity falls below a certain value. The battery charger will then automatically start recharging the batteries again.

Technical Support

If after reviewing all the sources listed you cannot solve your problem, please contact your supplier.

Care & Maintenance

Your modem does not require regular maintenance. However, periodically clean off the dirt and dust that may adhere to the exterior casing. Use the following procedure:

1. Disconnect the battery charger and cables from the modem.

2. Dampen a clean, soft cloth with water and wring the cloth well.

3. Use the well wrung cloth to gently remove dirt and dust.

Do not dampen the connectors or ports. Immediately remove any moisture that contacts these components by wiping them with a dry cloth.

Optionally clean the iPAQ connector by using a pencil eraser.

Do not use a sodden cloth or apply a liquid to any portion of the modem or battery charger.

Never use substances containing alcohol, thinners or benzene on the equipment. Use of these substances may deform, discolour or dissolve the casing.

The modem's lithium-ion battery life will be shortened if used in extreme temperatures.

Do not use the modem outside its extreme temperature limits

Do not leave the modem switched on in direct sunlight inside automobiles as the case temperature can easily exceed specification limits.

Specifications

Physical Properties	
Weight	Approximately 150g
Size (L x W x H)	136mm x 82mm x 18mm (excluding antenna)

LED Indicators		
Power/On-Line indicator (Green)	Off -	Power off
	Slow flashing -	Scanning
	On -	Registered
Low Battery Indicator (Red)	Rapid flashing -	Re-charge battery

Communication Protocols	
Modem to radio network protocol	RD-LAP 19.2 kbps RD-LAP 9.6 kbps
Modem to terminal (e.g. handheld) protocol	NCL 1.2
PDA Port	Compaq iPAQ 100 pin Expansion Pack Serial communications interface

Transmitter	
Frequency range	806 – 825MHz
Channel spacing	25 kHz for RD-LAP 19.2 kbps 12.5 kHz for RD-LAP 9.6 kbps
Data rate	RDLAP 9.6kbps, 19.2kbps MDC 4.8kbps
RF output power	1.8W nominal (into 50Ω load)

Receiver	
Frequency range	851 – 870MHz
Channel spacing	25 kHz for RD-LAP 19.2 kbps 12.5 kHz for RD-LAP 9.6 kbps
Sensitivity (*)	< -113dB (5% PER conducted, 19.2kbps)
RSSI	-120dBm ~ -45dBm

Modem Battery	
Battery	Externally replaceable Li-Ion type 3.6V nominal, 920mA/hour
Protection circuit	Prevents overcharge and deep discharge
Note - Extreme temperature operation will degrade battery life.	

Environmental Conditions	
Operating temperature	0°C to 45°C
Storage temperature	-20°C to 60°C
Relative humidity	5-95% Non condensing

(*) Receiver sensitivity excludes influence of the iPAQ Pocket PC RFI emissions. Over-the-air performance varies with iPAQ model and antenna used.