MultiModem® rCell
Intelligent Wireless Router

Quick Start Guide

MultiTech Systems
Quick Start Guide
MultiModem® rCell
MTCBA-Xx-EN2
82100400L, Revision A

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Record of Revisions

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<tr>
<th>Revision</th>
<th>Date</th>
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<tr>
<td>A</td>
<td>05/12/09</td>
<td>Initial release.</td>
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Introduction
The purpose of this guide is to cover safety concepts, the basic connections, and general setup of the MultiModem rCell Intelligent Wireless Router. For detailed information refer to the User Guide which is available on your MultiModem CD accompanying your router product and on the Multi-Tech Web site.

Check Multi-Tech’s Web site for current versions of our product documentation.

Safety

Ethernet Ports Caution
The Ethernet ports are not designed to be connected to a Public Telecommunication Network or used outside the building.

Handling Precautions
All devices must be handled with certain precautions to avoid damage due to the accumulation of static charge. Although input protection circuitry has been incorporated into the devices to minimize the effect of this static build up, proper precautions should be taken to avoid exposure to electrostatic discharge during handling and mounting.

Caution: Maintain a separation distance of at least 20 cm (8 inches) between the transmitter’s antenna and the body of the user or nearby persons. The modem is not designed for, nor intended to be, used in applications within 20 cm (8 inches) of the body of the user.

Vehicle Safety
- Do not use your Wireless MultiModem while driving, unless equipped with a correctly installed vehicle kit allowing ‘Hands-Free’ Operation.
- Respect national regulations on the use of cellular telephones in vehicles. Road safety always comes first.
- If incorrectly installed in a vehicle, the operation of Wireless MultiModem telephone could interfere with the correct
functioning of vehicle electronics. To avoid such problems, be sure that qualified personnel have performed the installation. Verification of the protection of vehicle electronics should be part of the installation.

- The use of an alert device to operate a vehicle’s lights or horn on public roads is not permitted.

**Internal Lithium Battery**

- A lithium battery located within product provides backup power for the timekeeping capability. The battery has an estimated life expectancy of ten years.
- When the battery starts to weaken, the date and time may be incorrect. If the battery fails, the board must be sent back to Multi-Tech Systems for battery replacement.
- Lithium cells and batteries are subject to the Provisions for International Transportation. Multi-tech Systems Inc. confirms that the Lithium batteries used in the Multi-Tech product(s) referenced in this manual comply with Special Provision 188 of the UN Model Regulations, Special Provision A45 of the ICAO-TI/IATA-DGR (Air), Special Provision 310 of the IMDG Code, and Special Provision 188 of the ADR and RID (Road and Rail Europe).

**Warning!** There is danger of explosion if the battery is incorrectly replaced!

**Ship Kit Contents**

<table>
<thead>
<tr>
<th>Unbundled Package with no Accessories</th>
<th>Bundled Package with Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 router</td>
<td>1 router</td>
</tr>
<tr>
<td>1 Quick Start Guide</td>
<td>1 antenna</td>
</tr>
<tr>
<td>1 MultiModem CD</td>
<td>1 Ethernet cable</td>
</tr>
<tr>
<td><strong>Note:</strong> You must supply mounting screws, AC or DC power supply, and an antenna.</td>
<td>1 power supply</td>
</tr>
<tr>
<td></td>
<td>1 Quick Start Guide</td>
</tr>
<tr>
<td></td>
<td>1 MultiModem CD</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> You must supply mounting screws</td>
</tr>
</tbody>
</table>

**Note:** Refer to the User Guide for antenna specifications.
Activate your Wireless Account

Please refer to the wireless account Activation Notice located with your product and on the MultiModem CD. Choose the one for your wireless network provider and follow the directions to activate your account.

Phone Numbers for the Wireless Modem

Every wireless modem will have its own unique phone number. The phone number may simply be given to you by your wireless service provider or it may be on the SIM card or both. Wireless provider implementations may vary.

Note: If you need remote access to your MultiModem over the internet for remote configuration, you need to ensure that your wireless network provider has provisioned mobile terminated data and fixed or dynamic public IP address in which they can configure the network to redirect any incoming connection to that predefined IP.

Insert the SIM Card into Holder, If required

The MultiModem requires the power supply connection to begin operation. It also requires a SIM card (Subscriber Identity Module) to operate on a GSM network. To install the SIM, do the following:

1. Using a small Phillips screwdriver, remove the two SIM door screws and remove the SIM door.

Note: When changing a SIM, ensure that power is removed from the unit.
2. Insert the SIM card into the card holder. The above graphic illustrates the correct SIM card orientation.
3. Verify that the SIM card fits into the holder properly and then replace the cover.

Connect the Antenna and Power

1. Connect a suitable antenna to the SMA connector (see antenna specifications in Chapter 1).
2. Using an Ethernet cable, connect one end of the cable to the ETHERNET connector on the back of the router and the other end to your pc either directly or via a switch or hub.
3. The Serial RS-232 connector is provided for future use.
4. Depending on the power source, connect either the power supply module with the appropriate blade or the optional DC power cable. If you are using the power supply module, remove the protective shipping cover. Attach the appropriate interchangeable blade piece to the power supply module.
Screw-on the power lead from the power supply module into the power connection on the router. Now, plug the power supply into your power source.

**For Optional Direct DC Power**

- Screw-on the DC power cable into the power connector on the router.
- Then attach the two wires at the other end of the DC power cable to a DC fuse/terminal block on a vehicle in which you are mounting the MultiRouter.
- Connect red wire to the "+" (positive) terminal and black wire to the "−" (negative) terminal. Be sure the GND connection is correct.

**Warning:** Over-voltage protection is provided on the device. To ensure complete protection, you may want to add additional filtering to the DC input.

**Note:** For automotive application: according to the type of application, you can use permanent “+” or key-switched “+” source. Connect the power supply to its source (for example, in a mobile situation, to the vehicle’s DC fuse/terminal block).

**Notes**

- The **POWER LED**. The **POWER LED** lights after power-up.
- The **Reset Button**. Pressing and holding the **Reset** button for 5 seconds will restore all factory default settings. It also will set the username and password back to admin and admin as well as setting the IP address to the default of 192.168.2.1.

**Set Your PC’s TCP/IP Address for Ethernet Functionality**

The following directions establish a TCP/IP connection at the pc so the PC can communicate with the router. The following directions were written using a Windows XP/2003+ operating system.
1. Click **Start | Settings | Control Panel**. Double-click the **Network Connections** icon.

2. The **Network Connections** screen displays. Right-click the **Local Area Connection** icon and choose **Properties** from the drop down list.
3. The **Local Area Connection Properties** dialog box displays.
   - Select **Internet Protocol [TCP/IP]**.
   - Click the **Properties** button. The **Internet Protocol (TCP/IP) Properties** screen displays.

4. The **Internet Protocol (TCP/IP) Properties** screen.

   ![Internet Protocol (TCP/IP) Properties](image)

**Important Note:**
If this screen opens and displays your current IP configuration, we suggest you record this information for future reference (i.e., after the router is configured, you may wish to return this PC to its original settings).

- To set a Fixed IP Address for the PC, select **Use the following IP address**.
  - Enter the **IP Address**. Example: 192.168.2.x.
  - **Note**: The x in the address stands for numbers 101 and up.
  - Enter the **Subnet Mask**. Example: 255.255.255.0
  - Enter the **Default Gateway**. Example: 192.168.2.2
**Note:** The pc settings must be in the same subnet range as the router.

The factory default settings for the router are:

- **IP Address:** 192.168.2.1
- **Subnet Mask:** 255.255.255.0
- **Default Gateway:** 192.168.2.2

- Select **Use the following DNS server addresses.**
  - Enter the IP Address for the **Preferred DNS Server.**
    - Example: 205.171.3.65
  - Click **OK.**
- Close the **Local Area Properties** screen by clicking **OK.**
- Close the **Control Panel.**
- Repeat these steps for each PC on your network.

### AT Command for Verifying Signal Strength

To communicate directly with the cellular modem to verify signal strength, network registration, and roaming status, telnet to the modem.

1. To Telnet to the modem. You can access the modem thru the Run icon or from the Command Prompt:
   - Click **Start I Run** icon. In the Open window, enter `cmd` and then press **ENTER.**
   - or
   - Click **Start I All Programs I Accessories I Command Prompt**
     - In the command window, type `telnet 192.168.2.1 5000`
     - At the Login prompt, type the default user name: `admin` (all lower-case). Press **ENTER**
     - At the Password prompt, type the default pass word: `admin` (all lower-case). Press **ENTER**

2. In the command window, type `AT+CSQ`

3. The router responds with the received signal strength (rssi) and the channel bit error rate (ber).
RSSI ranges from 0 to 31. BER ranges from 0 to 7 (7 is the highest error rate).

<table>
<thead>
<tr>
<th>Signal Strength – RSSI</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 31</td>
<td>Sufficient</td>
</tr>
<tr>
<td>0 – 9</td>
<td>Weak or Insufficient</td>
</tr>
<tr>
<td>99</td>
<td>Insufficient</td>
</tr>
</tbody>
</table>

**AT Command for Checking Network Registration and Roaming Status**

Use this command to verify that the wireless Router has been registered on a wireless network.

1. In the command window, type **AT+CREG?**
2. The router will respond in one of the following ways:

<table>
<thead>
<tr>
<th>Network Registration Verification</th>
<th>Value</th>
<th>Network Registration Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+CREG: 0,0</td>
<td>The router is not registered on any network</td>
</tr>
<tr>
<td></td>
<td>+CREG: 0,1</td>
<td>The router is registered on the home network</td>
</tr>
<tr>
<td></td>
<td>+CREG: 0,5</td>
<td>The router is registered on a network and it is roaming</td>
</tr>
</tbody>
</table>

**Note:** If the router indicates that it is not registered, verify the signal strength to determine if the problem is the strength of the received signal.

**Exiting Modem Mode**

1. After the last AT Command is entered, press: **CTRL + ]** (the right bracket).
2. The following prompt displays: **telnet>**
   - Type **quit** and press **Enter**.
3. Then the following prompt displays: **c:>**
   - Type **exit** and press **Enter**.
Configure the Ethernet Interface
Using the Web Management Software

You are now ready to configure the Ethernet interface. This is accomplished by using the router's factory-installed Web Management software. The software is accessed through a Web Browser.

1. From the pc, open a Web Browser.
   Type the default Gateway Address: http://192.168.2.1

2. Login
   After entering the Address, the Login screen displays.
   ● Type the default User name: admin (all lower-case).
   ● Type the default password: admin (all lower-case).

User Name and Password Note: The User name and Password are case-sensitive (both must be typed in lower-case). A password can be up to 60 characters. If Windows displays the AutoComplete screen, you may want to click No to tell the Windows OS not to remember the password; this helps maintain PC security.

Password Caution: It is recommended that you change the default password to better protect the security of your router. Use a safe password! Your first name spelled backwards is not a sufficiently safe password; a password such as xfT35$4 is better.
   ● Click the Login button. The Web Management Home screen displays.

4. Use the Setup Wizard for Quick Configuration
   A quick way to configure the modem is to use the Wizard Setup in the Web Management software.
   ● To begin configuration, click the Wizard Setup button located under the menu bar.
   ● After clicking the Wizard Setup button, the Wizard Setup screen displays.

The Setup Wizard Screen
The following is a screen shot of the Setup Wizard. Using this screen saves you time so that you are not entering the same
information several screens; the data entered here defaults to the other screens.

**IP Configuration**

**IP Address** – The default is 192.168.2.1. To change it, simply enter your own IP address.

**Mask** – The default is 255.255.255.0

**DNS** – Enter the primary DNS IP address for the system. The default is 0.0.0.0

**PPP Configuration**

**PPP** – The default is *Disable*. To connect to the internet, you have to enable PPP. To issue commands to the modem, PPP must be disabled and telnet port 5000 used.

**Dial-on-Demand** – The default is *Disabled*.

**Idle Time Out** – Sets the amount of time the PPP link stays active before disconnecting. Setting the value to zero causes the link to stay active continuously.

**Dial Number** – Enter the dial number. The number is *99***1#.

**APN** – Enter the APN (Access Point Name). The APN is assigned by your wireless service provider.

**Init String** – 4 modem initialization strings are allowed.
**PPP Authentication**

**Authentication Type** – Click the button corresponding to the authentication protocol you want to use to negotiate with the remote peer. PAP, CHAP, or PAP-CHAP. Default = PAP-CHAP

**User Name** – Enter the PPP User Name (it authenticates the remote peer).

**Password** – Enter the PPP Password (it authenticates the remote peer).

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**Important Note About Submit and Save & Restart**

Click the **Submit** button located at the bottom of most screens to save any changes you make. Then you must click the **Save & Restart** button in order for your settings to take effect. **Save & Restart** does not have to be executed after each screen; you can change and Submit several screens, and then click **Save & Restart**. The **Save & Restart** button is located on the Menu bar.

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**Setting Time and Date**

The date and time must be set using the Web Management software. The time and date set in *IP Setup* will not be correct unless the SNTP client is enabled and you have a live Internet connection. See *SNTP Client* in User Guide for more details.

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**Shutdown Caution**

Never unplug the power until after you have performed the **Save & Restart** process when changing settings. If setup changes are not properly saved before unplugging the power, data could be lost.