BlueGate 2100

Administrator's Guide

July 26, 2001

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Confidential and Proprietary Information

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FCC STATEMENT

WIDCOMM, Inc., 9645 Scranton Road, Suite 205, San Diego, CA 92121, 858-453-8400. BlueGate, PKLWBG-2100.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and, (2) This device must accept any interference received including interference that may cause undesired operation.

Per CFR 47, PART 15, Paragraph 15.21: User changes or modifications not expressly approved by the party responsible for compliance could void the users authority to operate the equipment.

Application PKLWBG-2100

Additional Information for the FCC approval of Widcomm Inc.'s BlueGate 2100

RF Exposure Statement

IMPORTANT NOTE: To meet FCC RF exposure compliance requirements the following antenna installation and device operating configurations must be satisfied:

BlueGate 2100 must be wall or ceiling mounted or placed on a surface such that a minimum normal operating distance of 20 centimeters is maintained from the human body at all times.

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1 Introduction

BlueGate™ 2100 provides access to a local area network (LAN) using wireless technology. It is Bluetooth Specification 1.1 compliant.

Devices that can access the network through BlueGate 2100 are Personal Digital Assistants (PDAs), computers, or other Bluetooth-enabled devices that support the industry standard LAN Access using PPP Profile (LAP) portion of Bluetooth Specification Version 1.1.

Configuration information is saved in internal Non-Volatile Random Access Memory (NVRAM) and preserved even when power is lost.

An on-board, internal Web server is accessed to set up, diagnose, and configure BlueGate 2100.

A browser[1] is used to access the internal Web server from a computer on the same network subnet.

From the browser, access the internal Web server to:

- Configure BlueGate 2100 for proper network operation.
- Change the user-friendly device name of BlueGate 2100.
- Access network diagnostic tools.
- View BlueGate 2100 network statistics.
- Upgrade BlueGate 2100 software.

[1] Browsers compatible with BlueGate 2100 are Microsoft® Internet Explorer, version 5.0 or later, and Netscape™ Navigator™, version 4.7 or later. However, the Java applet described in Appendix C will not work with Netscape Navigator.

2 Kit Contents

The BlueGate 2100 kit includes:

- A BlueGate 2100 network access point:
  - Dimensions (HxDxW): 160x60x160 mm (6.3x2.4x6.3 in.).
  - Weight: 350 g (12.3 oz) excluding power supply.
- An external power adapter; cord length is 6 ft.
- A standard Ethernet cable with an RJ-45 connector on each end; cable length is 7 ft. (2 m).
- Hardware installation components:
  - Four (4) mounting screws, Rounded Head Philips, #8, 1 ½ in.
  - Four (4) self-drilling wall anchors, #8, 1 ¼ in.
  - Wall/Ceiling mounting template.
- A compact disc that contains the BlueGate 2100 documentation and support software.
- A *Start Here* quick-start guide.
- Mounting instructions and template.

3 Installation

Before installing BlueGate 2100, you should be familiar with basic local area network (LAN) and Bluetooth concepts.

For a non-technical overview of key Bluetooth concepts refer to *Appendix A—An Introduction To Bluetooth.*

3.1 Power Cord and Ethernet Cable Installation

1. Mount BlueGate 2100 on the wall or ceiling or place it on a flat surface away from heat, moisture, open flames, microwave devices, and 2.4 GHz telecommunication devices (for example, 802.11b LAN adapters). See also the RF Exposure Statement on page i.

NOTE: See Section 3.2 for additional information on mounting BlueGate 2100 on the wall or ceiling.

2. Use the Ethernet cable provided in the kit to connect BlueGate 2100 to the local area network. See Figure 1 for the location of BlueGate 2100's Ethernet jack.

   The Ethernet cable can be plugged into a network switch or network hub, or into a hardwired wall jack that connects to the network. Consult your network administrator if you are unsure of where or how to establish a physical connection to the network.

   Place the other end of the Ethernet cable securely into the Ethernet jack (RJ-45 connector) on BlueGate 2100. The Ethernet LED blinks off and on depending on Ethernet activity.

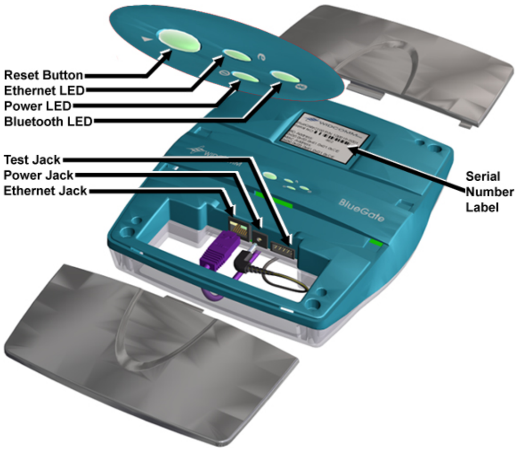
   Route the network cable away from other cables that may cause electrical interference. Avoid routing the cable through areas where it will be stepped on, tripped over, or damaged in any way.

NOTE: Telephone cables often use the same type of connector as network cables; some wall plates, especially in office environments, have both telephone and network jacks in the same wall plate. When connecting through a wall plate of this type verify the physical connection between the jack and the network.

3. Insert the small circular power plug into the power jack on the back of BlueGate 2100 and then plug the power supply into a wall outlet (120-220VAC, 60-50 Hz). When power is applied the bottom light emitting diode (LED) will blink for 6 seconds and then stay on continuously.

If the LAN is 10Base-T or 100Base-T and a Dynamic Host Configuration Protocol (DHCP) server is available, BlueGate 2100 is ready to use.

Figure 1: BlueGate 2100 connector and LED locations.



3.2 WALL OR CEILING INSTALLATION

Required materials and tools:

- Adhesive tape.
- #2 Philips head screwdriver or drill/driver with Philips bit.

Install template and drywall anchors:

> ***NOTE:*** ***The self-drilling anchors are for drywall installation only. The anchors are not recommended for use in acoustical ceiling tiles or other types of wall / ceiling materials.***

1. Decide where BlueGate 2100 will be mounted keeping in mind:
   - The lengths of the Ethernet cable and power cord.
   - The location of the Bluetooth-enabled devices that will use BlueGate 2100's service. Typically devices must be within 30 meters of BlueGate 2100; walls and other obstructions may shorten this distance.
2. Tape the mounting template to the installation location and use a nail or other small pointed object to mark the locations of the screw anchors.
3. Remove the template.
4. Using a screwdriver or drill/driver, install the self-drilling drywall anchors:
   a) Place the screwdriver or driver/drill into recess of anchor.
   b) Press the anchor into the drywall while turning the anchor clockwise until it is seated flush with the wall.

Mount BlueGate 2100:

1. Slide the covers outward from the center of BlueGate 2100 to remove them.

> ***NOTE:*** ***Do not lift or pry the covers.***

2. Complete the power cord and Ethernet cable installation described in Section 3.1 (also described in the *Start Here* booklet).
3. Hold the base of BlueGate 2100 firmly against the wall or ceiling aligning the device's screw holes over the wall anchors.
4. Using the four (4) included Philips head screws, secure BlueGate 2100 to the wall anchors.
5. Replace the covers.

4 Reset BlueGate 2100

BlueGate 2100 can be reset to the factory-default reset parameters shown in Table 1 in several ways:

1. From within BlueGate 2100's internal Web server, click **System > Reset to Factory Defaults > Reset BlueGate to Factory Defaults Now.**

OR

2. Press the hardware reset button (see Figure 1):
   a) **ALL CRITICAL PARAMETERS**—hold the hardware reset button down for more than five seconds to reset all critical Non-Volatile Random Access Memory (NVRAM) parameters to their factory default settings (see Table 1). BlueGate 2100 will reboot three seconds after the button is released.
   b) **ADMINISTRATOR'S USER NAME AND PASSWORD ONLY**—press the hardware reset button briefly (less than five seconds) to reset ONLY the administrator's user name and password to the factory default settings. BlueGate 2100 does NOT reboot.

Table 1: BlueGate 2100's factory-default critical NVRAM settings.

BlueGate 2100 Factory-Default Reset Parameters	
Parameter	**Default Setting**
Administrator's user name	widcomm (case sensitive)
Administrator's password	admin (case sensitive)
Device name	BGNNNNNN (NNNNNN = serial number)
LAN Access Profile (LAP) Service name	LAN Access
Antenna	Internal
Authentication	Off / Disabled
Encryption	Off / Disabled
Authorization	Off / Disabled
Point-to-Multipoint	Disabled
DHCP	Enabled
NAT	Enabled
Default IP address	192.168.0.1
Fixed IP address	Cleared
Gateway	Cleared
Subnet Mask	Cleared
DNS Server	Cleared
Secondary DNS Server	Cleared

NOTE: When BlueGate 2100 is reset in a DHCP environment it is possible for the server to assign a different IP address to it. See Section 5.1 for information on how to obtain the new IP address.

5 Find BlueGate 2100's IP address

BlueGate 2100 is set up and configured through an internal Web server.

To access BlueGate 2100's internal Web server you must know the IP address assigned to BlueGate 2100.

In a Dynamic Host Configuration Protocol (DHCP) environment, BlueGate 2100's IP address is dynamically assigned by the DHCP server.

The *FindIP* application that discovers BlueGate 2100's dynamically assigned IP address is included on the BlueGate 2100 compact disc (see Section 5.1).

In a non-DHCP environment BlueGate 2100 defaults to a static IP address that can be used to access the internal Web server (see Section 5.2).

A Java™ applet[2] is included on the compact disc for environments not operating under Windows®. For more information on the Java applet, see *Appendix C—Find IP address in a Non-Windows Environment*.

5.1 IP ADDRESS IN A DHCP ENVIRONMENT

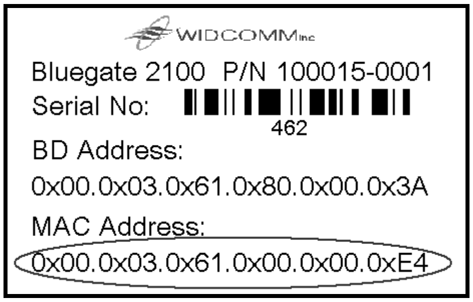
To discover the dynamically assigned IP address:

1. Insert the BlueGate 2100 compact disc into your CD-ROM drive and wait a few seconds for the *FindIP.exe* application to auto-start. If the application does not auto-start, from the Windows taskbar click **Start** > **Run >** *Drive Designation Letter (for example D:\)* > **FindIP.exe**.
2. On the *Welcome to Widcomm's BlueGate Wizard* screen, click **Next**.
3. When prompted, enter the Media Access Control (MAC) Address from the serial number label on BlueGate 2100 (Figure 2) located beneath the covers (Figure 1) and click **Next**.
4. *FindIP* returns the IP address. Select the check box to automatically open the internal Web server home page and click **Finish**.

NOTE: The FindIP application uses a UDP broadcast packet to interrogate BlueGate 2100 for its assigned IP address. UDP packets are not routed; be sure that a router is not between BlueGate 2100 and the computer running FindIP.

Section 6 describes how to complete the logon process.

Figure 2: BlueGate 2100's serial number label.



WIDCOMM Inc

Bluegate 2100 P/N 100015-0001

Serial No: 462

BD Address:

0x00.0x03.0x61.0x80.0x00.0x3A

MAC Address:

0x00.0x03.0x61.0x00.0x00.0xE4

[2] An applet is a Java-based program that is downloaded by a browser. See also *Appendix C—Find IP address in a Non-Windows Environment.*

5.2 IP ADDRESS IN A NON-DHCP ENVIRONMENT

BlueGate 2100's internal Web server can also be accessed using a static IP address.

When DHCP is enabled (factory default), the DHCP attempt must first timeout before attempting to access BlueGate 2100's internal Web server using the static IP address.

After the DHCP timeout (120 seconds), BlueGate 2100 uses the static IP address.

NOTE: The factory-default static IP address is: 192.168.0.1.

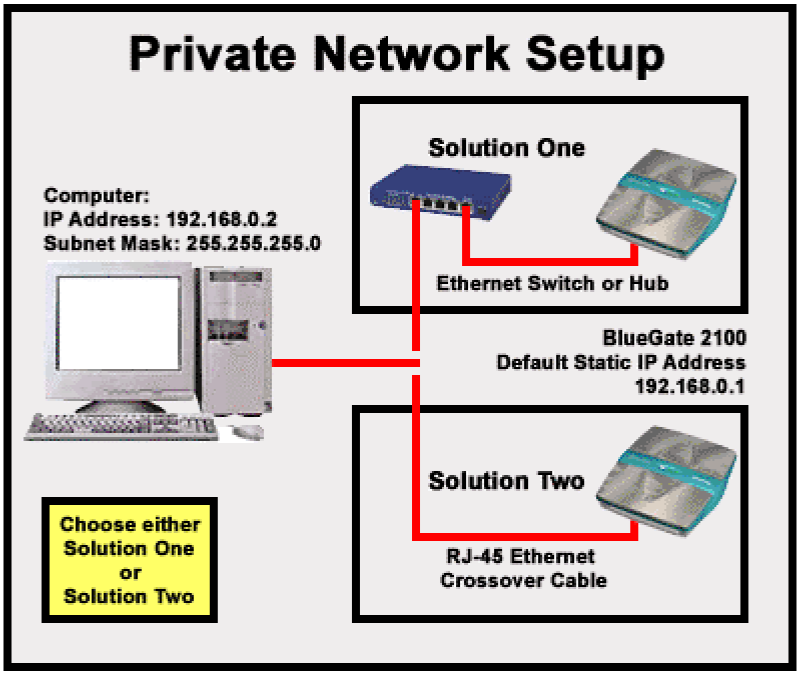
To access BlueGate 2100's internal Web server using the static IP address, create a two-node private network between a single computer and BlueGate 2100:

1. Connect BlueGate 2100 and the computer (see Figure 3):
   - **Solution One:** use standard Ethernet cables to establish a connection through a switch or hub.
   - **Solution Two:** use a crossover cable to create a direct connection. Figure 14 on page B-1 shows the connections for a crossover cable.
2. Configure the computer:
   - Static IP address of 192.168.0.2.
   - Subnet mask of 255.255.255.0.
3. Start the browser and enter http://192.168.0.1 in the address field.
4. Click **Go** or press the **Enter** key.

Section 6 describes how to complete the logon process.

NOTE: The default static IP address for BlueGate 2100 can be changed through the Configuration > Network Settings option. If BlueGate 2100's static IP address has been reconfigured, enter the current address.

Figure 3: Two-node private network options.



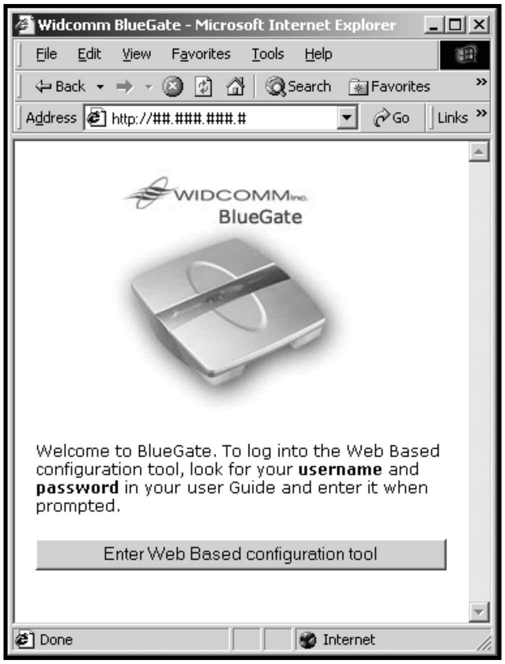
6 Access the Internal Web Server

The following sections describe how to access BlueGate 2100's internal Web server.

6.1 In a DHCP environment

1. Start a supported browser.
2. Enter BlueGate 2100's IP address (see Section 5.1) in the address area and click **Go** or press the **Enter** key. The welcome page shown in Figure 4 opens in the browser.

Figure 4: BlueGate 2100's internal Web server > Welcome page.

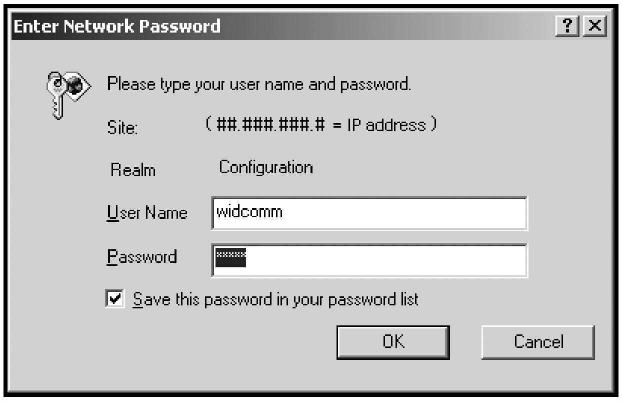


Welcome to BlueGate. To log into the Web Based configuration tool, look for your **username** and **password** in your user Guide and enter it when prompted.

Enter Web Based configuration tool

3. When the **Enter Web Based configuration tool** button is clicked, a logon screen (Figure 5) appears.
4. Enter the user name *widcomm*.
5. Enter the password *admin* and click **OK**. The home page (Figure 6, page 10) is displayed.

Figure 5: Enter Network Password dialog box.



Please type your user name and password.

Site: (##.###.###.# = IP address)

Realm Configuration

User Name widcomm

Password

☑ Save this password in your password list

6.2 IN A NON-DHCP (PRIVATE NETWORK) ENVIRONMENT

See Section 5.2 for details about setting up a private network:

1. Start a supported browser.
2. Enter *http://192.168.0.1* in the address area and click **Go** or press the **Enter** key. The welcome page shown in Figure 4 opens in the browser.
3. When the **Enter Web Based configuration tool** button is clicked, a logon screen (Figure 5) appears.
4. Enter the user name *widcomm*.
5. Enter the password *admin* and click **OK**. The internal home page (Figure 6, page10) is displayed.

Refer to Section 7 for specific configuration options and information on how to use them.

7 User Interface

7.1 Home Page

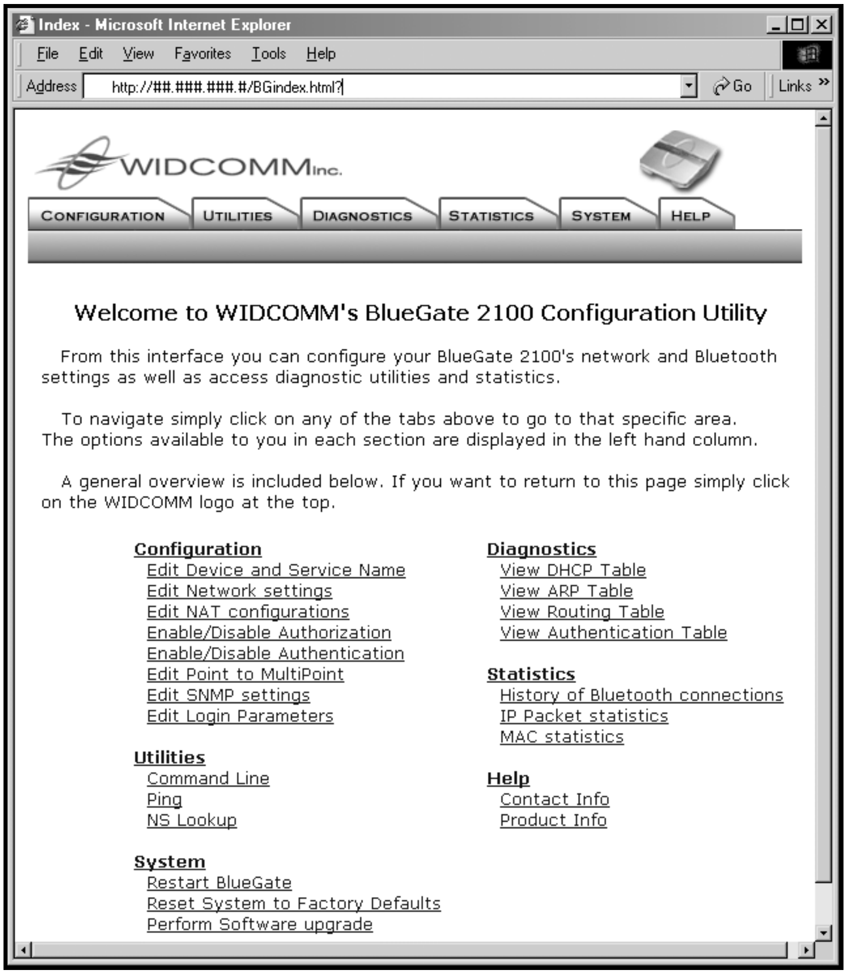
The BlueGate 2100 internal Web server's user interface is tab-based. The page associated with each tab has an Options panel that provides access to sub-topics.
There are six tabs:

- Configuration.
- Utilities.
- Diagnostics.
- Statistics.
- System.
- Help.

Click the WIDCOMM logo at the top of any tab to return to the home page shown in Figure 6.

The home page also contains hyperlinks to each of the sub-topics accessed through the tabs.

Figure 6: BlueGate 2100's internal Web server > Home page.


Index - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://##.###.###.#/BGindex.html?
Go
Links »
WIDCOMM Inc.
CONFIGURATION
UTILITIES
DIAGNOSTICS
STATISTICS
SYSTEM
HELP

Welcome to WIDCOMM's BlueGate 2100 Configuration Utility

From this interface you can configure your BlueGate 2100's network and Bluetooth settings as well as access diagnostic utilities and statistics.

To navigate simply click on any of the tabs above to go to that specific area. The options available to you in each section are displayed in the left hand column.

A general overview is included below. If you want to return to this page simply click on the WIDCOMM logo at the top.

Configuration
Edit Device and Service Name
Edit Network settings
Edit NAT configurations
Enable/Disable Authorization
Enable/Disable Authentication
Edit Point to MultiPoint
Edit SNMP settings
Edit Login Parameters

Utilities
Command Line
Ping
NS Lookup

System
Restart BlueGate
Reset System to Factory Defaults
Perform Software upgrade

Diagnostics
View DHCP Table
View ARP Table
View Routing Table
View Authentication Table

Statistics
History of Bluetooth connections
IP Packet statistics
MAC statistics

Help
Contact Info
Product Info

7.2 CONFIGURATION

The Configuration tab provides a means to setup and/or change basic network and Bluetooth security settings that control:

- The identification information that is displayed to other Bluetooth devices.
- The way BlueGate 2100 communicates with the LAN.

Settings can also be modified one at a time with command line parameters. See Sections 7.3 and 8 for more information.

The available options are:

- Identity:
  - Device Name.
  - Service Name.
- Network Settings:
  - Dynamic Host Configuration Protocol (DHCP).
  - IP (Internet Protocol) address.
  - Gateway.
  - Subnet Mask.
  - Primary DNS (Domain Name System) Server.
  - Secondary DNS Server.
- Network Address Translation (NAT).
- Point-to-Multipoint.
- Authorization:
  - Define up to seven authorized users (user names and passwords).
- Authentication (Bluetooth security):
  - Enable encryption.
  - Configure fixed or individual PIN codes.
- Simple Network Management Protocol (SNMP) settings:
  - MIB-II Community.
  - BlueGate MIB Community.
  - Authentication Failure Trap.
  - SNMP Manager IP address.
- Login:
  - Change the administrator’s user name and password.

To modify an option:

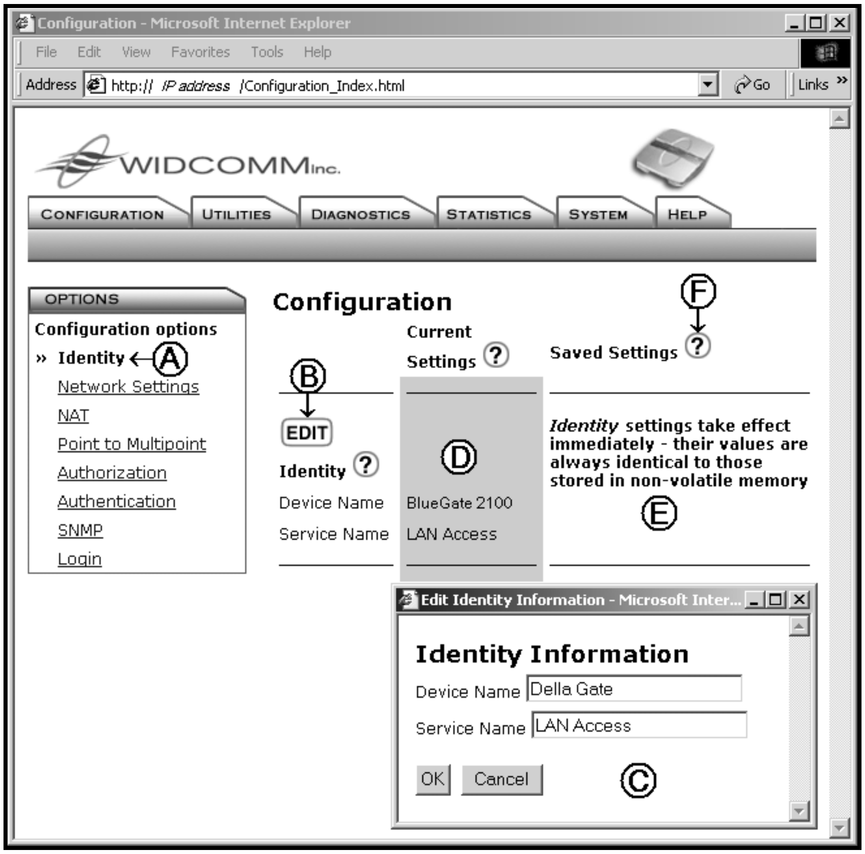
1. In the *Options* panel, click the option to be modified (Figure 7-A).
2. Click the **EDIT** button (Figure 7-B).
3. In the browser window that appears, fill in or modify the fields and click **OK** (Figure 7-C).

The Current Settings column (Figure 7-D) displays the settings that are in use. Unless the Current Settings column indicates that settings take effect immediately, BlueGate 2100 must be restarted to implement the changes (see Section 7.6.1).

The Saved Settings column (Figure 7-E) displays the settings that are stored in NVRAM and is the data that BlueGate 2100 will use the next time it is started, regardless of what appears in the Current Settings column.

The question marks (Figure 7-F), when clicked, provide help and/or additional information about specific items.

Figure 7: Configuration tab > Identity option (inset).



Configuration

	Current Settings	Saved Settings
Identity		*Identity* settings take effect immediately - their values are always identical to those stored in non-volatile memory
Device Name	BlueGate 2100	
Service Name	LAN Access	

Identity Information

Device Name: Della Gate

Service Name: LAN Access

7.2.1 Identity

Configures the identification information that is displayed to other Bluetooth devices.

- **Device Name:** helps identify BlueGate 2100 to other Bluetooth devices.
  - Device Name is limited in length to 100 alphanumeric characters.
  - To change the Device Name, click the **EDIT** button, highlight the existing text, and type the new name.
  - Example: “My BlueGate 2100 Network Access Point.”
  - Default Value: “BGNNNNNN” (the letters “BG” followed by the unit’s serial number), for example “BG9123.”
- **Service Name:** the service name that BlueGate 2100 displays to other Bluetooth devices.
  - Service Name is limited in length to 100 alphanumeric characters.
  - To change the Service Name, click the **EDIT** button, highlight the existing text, and type the new name.
  - Example: “ABC123 Co. Network Access.”
  - Default value: “LAN Access.”

Click **OK** to store the changes in NVRAM and update BlueGate 2100’s current settings. Changes to the Identity settings *take effect immediately* after OK is clicked.

Click **Cancel** to abort the changes and return to the previous screen.

7.2.2 Network Settings

Configures how and where BlueGate 2100 gets the required Internet Protocol (IP) addresses it needs to function properly.

The default is Dynamic Host Control Protocol (DHCP) enabled.

DHCP Enabled:

When DHCP is enabled:

- BlueGate 2100 is assigned an IP address by the DHCP-enabled LAN server.
- The LAN server handles gateway, subnet, and DNS addressing.
- All of the fields in the *Network Settings Information* configuration window appear dimmed and are unavailable.

To enable DHCP select the **Enable** option and click **OK**. BlueGate 2100 must be restarted for the change to take effect. Restart is explained in Section 7.6.1, page 24.

DHCP Disabled:

To disable DHCP select the **Disable** option, enter the addresses in dotted decimal notation (000.000.000.000), and click **OK**.

BlueGate 2100 must be restarted for the change(s) to take effect. Restart is explained in Section 7.6.1, page 24.

- **IP address:** the IP address of BlueGate 2100.
  - Example: `10.140.102.8`
  - Default value: “” (blank field, no entry)
- **Gateway:** the IP address of the LAN gateway to which BlueGate 2100 will route packets destined for outside networks.
  - Example: `10.140.0.1`
  - Default value: “” (blank field, no entry)
- **Subnet:** identifies the subnet to which an IP address belongs.
  - Example: `255.255.255.0`
  - Default value: “” (blank field, no entry)
- **Primary DNS** (Domain Name System): the IP address of the primary DNS server. When a DNS server is provided with a *hostname*, it returns the host’s IP address:
  - Example: `10.140.10.1`
  - Default value: “” (blank field, no entry)
- **Secondary DNS:** the IP address of the secondary DNS server—used if the primary DNS server is unavailable or unable to translate a submitted hostname to an IP address.
  - Example: `10.140.10.2`
  - Default value: “” (blank field, no entry)

Click **OK** to store the changes in Saved Settings. BlueGate 2100 must be restarted for the change to take effect. Restart is explained in Section 7.6.1, page 24.

Click **Cancel** to abort the changes and return to the previous screen.

7.2.3 Network Address Translation (NAT)

NAT is an Internet standard that allows a network to use one set of IP addresses for internal traffic and a different set of addresses for external traffic.

BlueGate 2100 handles address translations between the Local Area Network (external) and the Bluetooth devices (internal) connected to BlueGate 2100.

The default is NAT enabled.

- When NAT is enabled *and*:
  - DHCP is enabled, BlueGate 2100 receives its IP address from the DHCP server, but internally assigns IP addresses to the devices in its private subnet (the Bluetooth devices connected to it).
  - DHCP is disabled, BlueGate 2100 uses a fixed IP address (**Configuration > Network Settings > Edit > IP Address**) on the external network but assigns IP addresses to the devices in its private subnet (the Bluetooth devices connected to it).
- When NAT is disabled *and*:
  - DHCP is enabled, Bluetooth devices get their IP address from the DHCP server.
  - DHCP is disabled, the IP address for each Bluetooth device must be configured in BlueGate 2100's NVRAM.

If both NAT and DHCP are disabled, a range of usable IP addresses must be configured manually. If either NAT or DHCP is disabled and then the other is also disabled, a window opens with fields to configure a range of usable IP addresses.

- In the *Range Starting From* field enter the starting IP address.
- In the *No. of IP Addresses in this range* field enter the number (< 255) of addresses to assign and click the **Update** button.

7.2.4 Point-to-Multipoint

Point-to-Multipoint refers to BlueGate 2100's ability to service more than one client at the same time.

BlueGate 2100's Point-to-Multipoint ability, when enabled, is limited to seven devices.

To enable/disable Point-to-Multipoint click **EDIT**, select the appropriate radio button, and click **OK**.

The default is Point-to-Multipoint disabled.

NOTE: When Point-to-Multipoint is enabled, Bluetooth devices that only support Point-to-Point will not be able to connect to BlueGate 2100.

7.2.5 Authorization

BlueGate 2100 authorization is the process of granting or denying access to a resource. A user name and password are required.

The default Authorization setting is disabled.

NOTE: BlueGate 2100 authorization is not the same as the Bluetooth authorization described in Appendix A.

If Authorization is disabled (*No*), all users are allowed to connect to BlueGate 2100.

If Authorization is enabled (*Yes*), only specific users can connect to BlueGate 2100.

NOTE: Do not enable Authorization if the connecting device does not support security.

To enable/disable Authorization (Figure 8):

1. Click **EDIT**, select the appropriate radio button (**Yes** or **No**), and click **OK**.
2. Set up authorized users and passwords:
   a) Select a user number from the drop-down list.
   b) Enter a user name; 1 to 16 alphanumeric characters (case sensitive).
   c) Enter a password; 1 to 16 alphanumeric characters (case sensitive).

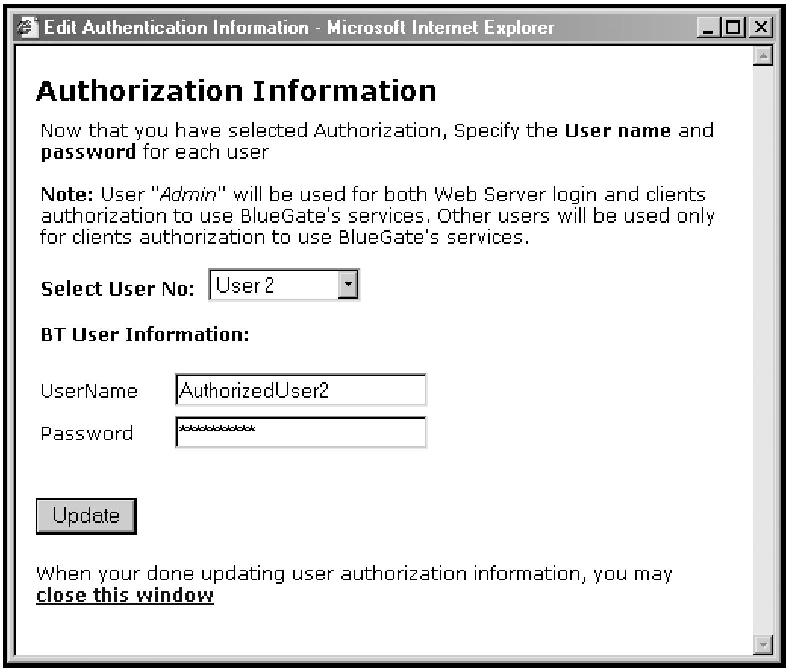
NOTE: User names and passwords are case sensitive.

3. Repeat steps 2a through 2c for each user (up to seven) to be authorized and then click the **Update** button.

BlueGate 2100 can store up to seven authorized user names (including the administrator) and their associated passwords.

The administrator is the first name in the list (User zero); the default setting is user name = *widcomm* and password = *admin*. The remaining user names/password entries are numbered User one through User six. The authorized user name and password information also can be re-configured through the command line entry feature (see Sections 8.16 and 8.25).

Figure 8: Configuration tab > Authorization option.



Edit Authentication Information - Microsoft Internet Explorer

Authorization Information

Now that you have selected Authorization, Specify the **User name** and **password** for each user

Note: User "*Admin*" will be used for both Web Server login and clients authorization to use BlueGate's services. Other users will be used only for clients authorization to use BlueGate's services.

Select User No: User 2

BT User Information:

UserName AuthorizedUser2

Password **********

When your done updating user authorization information, you may **close this window**

7.2.6 Authentication

Bluetooth Authentication requires a Personal Identification Number (PIN) code before allowing a client to establish a connection.

There are two types of PIN code:

- Fixed—the same PIN code is used for all devices attempting to connect.
- Individual—each device attempting to connect has its own code.

BlueGate 2100's *Authentication* options are:

- Disable.
- Enable using fixed PIN code.
- Enable using individual PIN codes for each connecting device.

The default is disabled.

Selecting either Enable option brings up a window where PIN(s) can be configured and encryption can be turned on or off.

When enabled, encryption applies only to data transferred between Bluetooth devices—data transferred via the network is not encrypted.

Encryption is accomplished using the *Authentication* PIN code as the *key*; if *Authentication* is not enabled, the PIN is not used and encryption is not possible.

Notes: Encryption cannot be used unless Authentication is enabled.

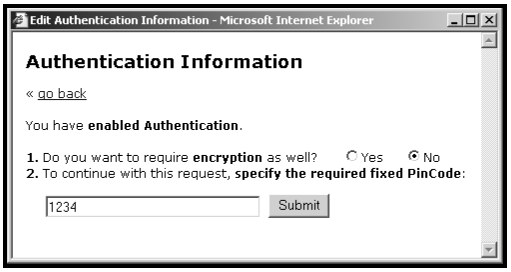
Do not enable Authentication if the connecting device does not support security.

Enable using a Fixed PIN code (Figure 9):

1. Select **Yes** or **No** to enable/disable encryption.
2. Enter the fixed PIN code to be used by all connecting devices (1 to 16 alphanumeric characters). For example, *9999ABCD* is a valid PIN code.
3. Click **Submit**.

BlueGate 2100 must be restarted for the change(s) to take effect. Restart is explained in Section 7.6.1, page 24.

Figure 9: Configuration tab > Authentication option > fixed PIN code.



Edit Authentication Information - Microsoft Internet Explorer

Authentication Information

« go back

You have **enabled Authentication**.

1. Do you want to require **encryption** as well? ○ Yes ● No

2. To continue with this request, **specify the required fixed PinCode**:

1234

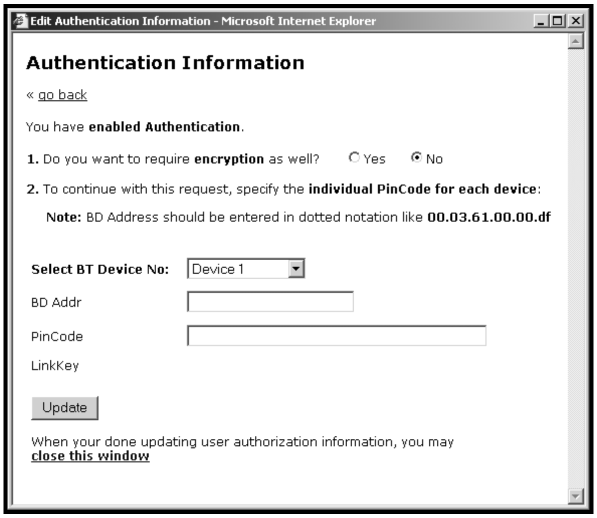
Enable using Individual PIN codes (Figure 10):

1. Select **Yes** or **No** to enable/disable encryption.
2. Set up individual PIN codes:
   a) Select a device from the drop-down list.
   b) Enter the Bluetooth Device Address ("BD Addr") associated with that device in dotted notation.
   c) Enter the individual PIN code to be used by the selected device (1 to 16 alphanumeric characters). For example, *9999ABCD* is a valid PIN code.
3. Repeat steps 2a through 2c for each device (up to seven) to be authenticated and then click the **Update** button.

4. Click the **close this window** hyperlink to close the *Edit Authentication Information* window.

BlueGate 2100 must be restarted for the change(s) to take effect. Restart is explained in Section 7.6.1, page 24.

Figure 10: Configuration tab > Authentication option > individual PIN codes.


Edit Authentication Information - Microsoft Internet Explorer

Authentication Information

« go back

You have **enabled Authentication**.

1. Do you want to require **encryption** as well? ○ Yes ● No

2. To continue with this request, specify the **individual PinCode for each device**:

Note: BD Address should be entered in dotted notation like **00.03.61.00.00.df**

Select BT Device No: Device 1

BD Addr

PinCode

LinkKey

Update

When your done updating user authorization information, you may **close this window**

7.2.7 Simple Network Management Protocol (SNMP)

SNMP is implemented in BlueGate 2100 to configure and manage multiple BlueGate 2100 devices from a central location. BlueGate 2100 supports both SNMP Version 1 and Version 2 requests.

NOTE: HP® OpenView®[3] must be installed in order to implement SNMP settings.

SNMP-compliant devices, called agents, store data about themselves in Management Information Bases (MIBs) and return this data to the SNMP requesters. BlueGate 2100 supports two MIBs:

- MIB II—standard MIB for Network Management of TCP/IP-based Internets.
- BlueGate Private MIB—to manage all configuration and statistics related to BlueGate 2100.

Read and write access to each of these MIBs is controlled through the use of Community Names.

- MIB-II Community Names:
  - Read—has read access to MIB-II data.
  - Read-Write—has read and write access to MIB-II data.
- BlueGate MIB Community Names:
  - Read—has read access to BlueGate MIB data.
  - Read-Write—has read and write access to BlueGate MIB data.

NOTE: All community names must be unique. The read community for the BlueGate MIB has read access to the MIB-II MIB. The read-write community for the BlueGate MIB has read-write access to the MIB-II MIB.

[3] The HP OpenView software suite is an Internet and e-services management solution developed by the Hewlett-Packard Company. For additional information about this software suite go to www.openview.hp.com/.

The *Authentication Failure Trap* setting enables/disables SNMP traps upon authentication failure of an SNMP message from an SNMP manager.

The default is disabled.

Click **OK** to store the changes in NVRAM and update BlueGate 2100's current settings.

Click **Cancel** to abort the changes and return to the previous screen.

7.2.8 Login

Edit the login parameters for the administrators (*User zero*). Change user name and password. The administrator's login, the first user name and password pair in the Bluetooth Authorization list, is the Web interface login.

These may also be changed through command line entry. See Section 8 for additional information.

7.3 UTILITIES

The Utilities tab provides a means to:

- Command Line—directly issue commands to the BlueGate 2100 software engine.
- Ping—send network packets to a designated network device.
- NS Lookup—a list of recently accessed IP addresses and the host names associated with them.

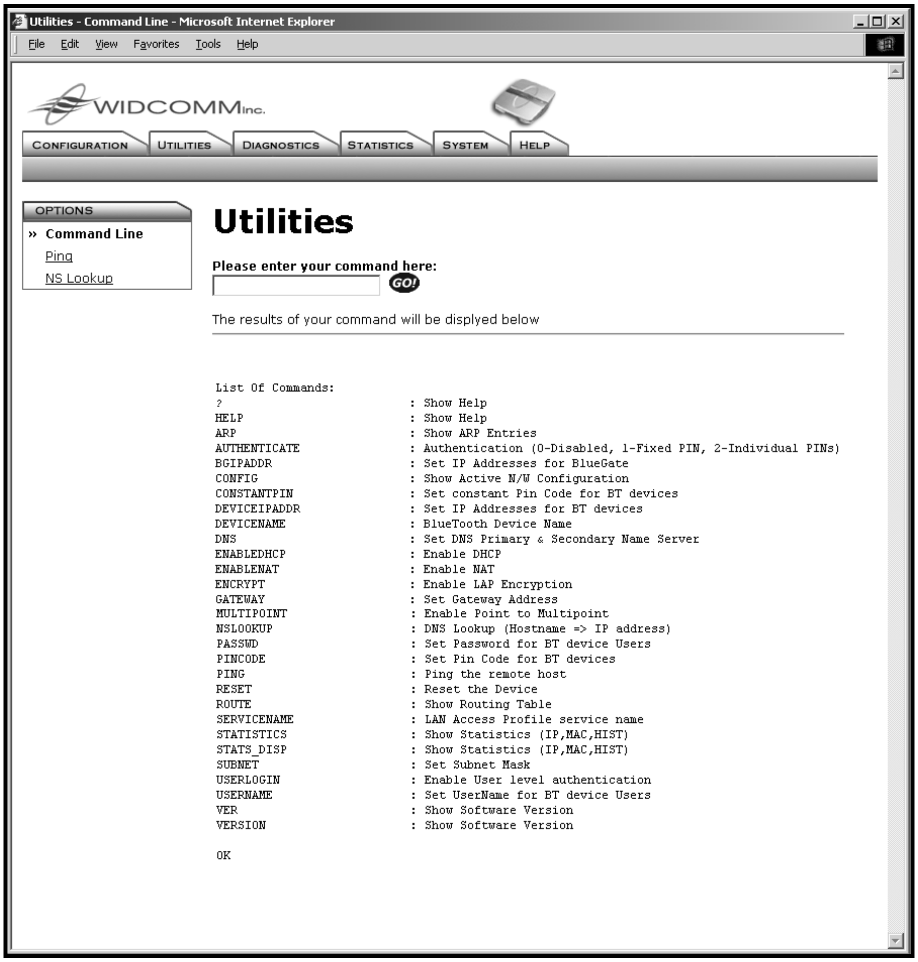
7.3.1 Command Line

The **Utilities > Command Line** tab allows you to enter commands directly to the BlueGate 2100 software engine to perform specific tasks or change settings.

Enter **?** or **Help** in the command line field and click **Go!** or press the **Enter** key to display a list of the available commands (Figure 11) that can be entered directly into the *Please enter your command here* field.

For information about these commands and how to use them, see Section 8.

Figure 11: Utilities tab > Command Line option > List of commands.



Utilities

Please enter your command here:

The results of your command will be displyed below

```
List Of Commands:
?                          : Show Help
HELP                       : Show Help
ARP                        : Show ARP Entries
AUTHENTICATE               : Authentication (0-Disabled, 1-Fixed PIN, 2-Individual PINs)
BGIPADDR                   : Set IP Addresses for BlueGate
CONFIG                     : Show Active N/W Configuration
CONSTANTPIN                : Set constant Pin Code for BT devices
DEVICEIPADDR               : Set IP Addresses for BT devices
DEVICENAME                 : BlueTooth Device Name
DNS                        : Set DNS Primary & Secondary Name Server
ENABLEDHCP                 : Enable DHCP
ENABLENAT                  : Enable NAT
ENCRYPT                    : Enable LAP Encryption
GATEWAY                    : Set Gateway Address
MULTIPOINT                 : Enable Point to Multipoint
NSLOOKUP                   : DNS Lookup (Hostname => IP address)
PASSWD                     : Set Password for BT device Users
PINCODE                    : Set Pin Code for BT devices
PING                       : Ping the remote host
RESET                      : Reset the Device
ROUTE                      : Show Routing Table
SERVICENAME                : LAN Access Profile service name
STATISTICS                 : Show Statistics (IP,MAC,HIST)
STATS_DISP                 : Show Statistics (IP,MAC,HIST)
SUBNET                     : Set Subnet Mask
USERLOGIN                  : Enable User level authentication
USERNAME                   : Set UserName for BT device Users
VER                        : Show Software Version
VERSION                    : Show Software Version

OK
```

7.3.2 Ping

The **Utilities > Ping** tab (Figure 12) provides a way to send network packets to a designated network device. The remote device echoes the packets, in the process providing information about the performance of the network connection.

Select the appropriate radio button and fill in the field:

- **Host Name**—the user-friendly name of the remote device, for example, *www.widcomm.com*.
- **IP address**—the IP address of the remote device, for example, *64.124.55.234*.

The remaining parameters are:

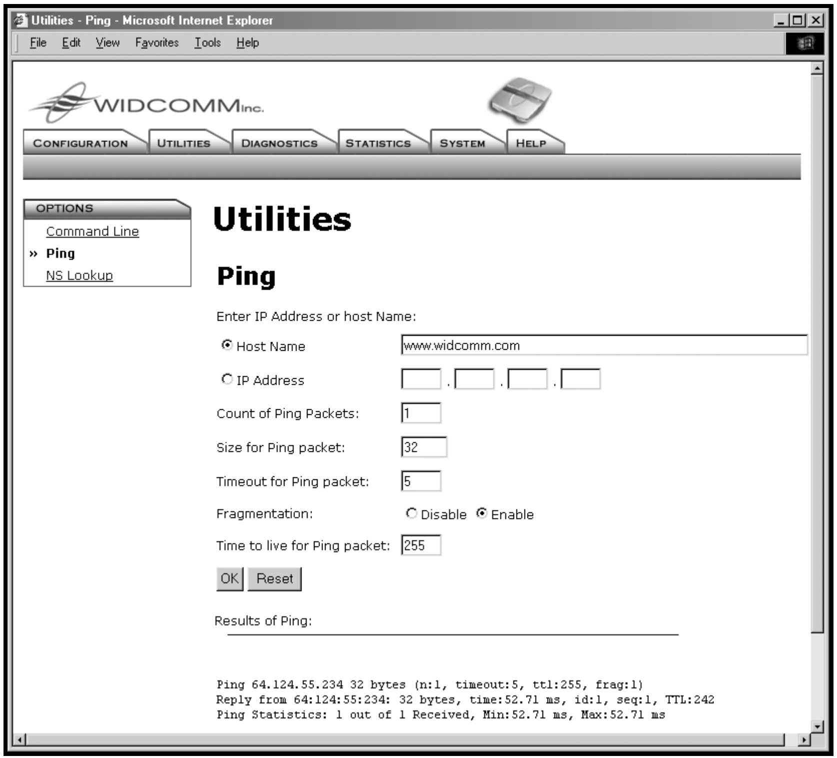
- **Count of ping packets**—the number of ping packets to be sent; the default is 1 packet.
- **Size for ping packets**—the default is 32 bytes.
- **Timeout for ping packet**—the length of time in seconds to wait for a response from the remote machine; the default is 5 seconds.
- **Fragmentation**—enables/disables packet fragmentation if the packet size is greater than the maximum size allowed on the network. The default value is enabled.
- **Time to live for ping packet**—the lifetime in seconds of the ping packet; this value is contained in the IP packet. After the specified number of seconds, the packet is removed from the network. The default is 255 seconds.

The only required parameter is either the IP address or the host name; all other parameters are optional.

The **OK** button executes the ping operation. The results of the ping are displayed.

The **Reset** button resets all fields to the previous ping setting but only when Reset is selected before OK is clicked.

Figure 12: Utilities tab > Ping option.



Utilities

Ping

Enter IP Address or host Name:

● Host Name www.widcomm.com

○ IP Address . . .

Count of Ping Packets: 1

Size for Ping packet: 32

Timeout for Ping packet: 5

Fragmentation: ○ Disable ● Enable

Time to live for Ping packet: 255

OK Reset

Results of Ping:

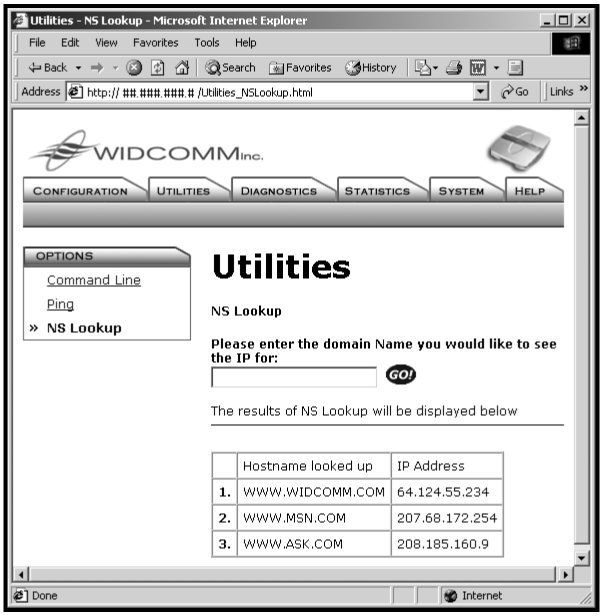
```
Ping 64.124.55.234 32 bytes (n:1, timeout:5, ttl:255, frag:1)
Reply from 64:124:55:234: 32 bytes, time:52.71 ms, id:1, seq:1, TTL:242
Ping Statistics: 1 out of 1 Received, Min:52.71 ms, Max:52.71 ms
```

7.3.3 NS Lookup

The **Utilities** > **NS Lookup** tab provides a way to look up an IP address:

Enter the domain name, for example, WWW.WIDCOMM.COM, in the field and click **Go!** or press the **Enter** key. NS Lookup displays the IP address and associated host name in a table (Figure 13).

Figure 13: Utilities tab > NS Lookup option.



Address http:// ##.###.###.# /Utilities_NSLookup.html

Utilities

NS Lookup

Please enter the domain Name you would like to see the IP for:

The results of NS Lookup will be displayed below

	Hostname looked up	IP Address
1.	WWW.WIDCOMM.COM	64.124.55.234
2.	WWW.MSN.COM	207.68.172.254
3.	WWW.ASK.COM	208.185.160.9

7.4 DIAGNOSTICS

The Diagnostics tab provides access to additional pages that contain information related to the network and Bluetooth settings of BlueGate 2100. The diagnostic tables include:

- DHCP—IP addresses assigned by the DHCP.
- ARP—the active Address Resolution Protocol (ARP) entries.
- Routing—the active routing entries.
- Authentication—the Bluetooth authentication-level security table.

7.4.1 DHCP

The **Diagnostics > DCHP** tab displays the IP addresses assigned by the DHCP server for use by BlueGate 2100 and its clients.

If Network Address Translation (NAT) is enabled this page displays a single entry that corresponds to IP address of BlueGate 2100.

If NAT is disabled this page displays multiple entries that correspond to BlueGate 2100 and the Bluetooth devices connected to it.

If DHCP is disabled no DHCP entries will exist, regardless of the NAT setting.

7.4.2 ARP

The **Diagnostics** > **ARP** tab displays the active Address Resolution Protocol (ARP) entries in BlueGate 2100, including:

- Entries for Ethernet devices communicating with BlueGate 2100.
- Proxy entries for Bluetooth devices.

The ARP table lists the MAC Address and IP address for each entry.

7.4.3 Routing

The **Diagnostics** > **Routing** tab displays a table of routing entries for gateway and other network node entities.

7.4.4 Authentication

The **Diagnostics** > **Authentication** tab displays the contents of the table used for Bluetooth security.

This table contains the mapping between the Bluetooth device addresses (BD Addresses) and Bluetooth device attributes. Depending on how authentication is configured the table will show:

- PIN Code and Link Key if authentication is enabled separately for each device.
- The fixed PIN Code enabled for all devices.

7.5 STATISTICS

The Statistics tab provides access to additional pages that contain read only information related to the network and the Bluetooth settings of BlueGate 2100.

These functions display a snapshot of network statistics.

- History—shows Bluetooth connection statistics.
- IP Packet Statistics—displays network packet counts.
- MAC Statistics—displays framing and error information related to the MAC layer.

Link Controller statistics may also be displayed, but these are only available through the command line entry option.

7.5.1 History

The **Statistics** > **History** tab displays the number of times a connection was successful with a particular Bluetooth device address (BD Addr).

The list displays only the eight most recently connected Bluetooth devices.

7.5.2 IP Packet Statistics

The **Statistics** > **IP Packet Statistics** tab displays the number of IP packets transmitted and received by BlueGate 2100 on the Ethernet and Bluetooth connections.

The **CLEAR IP** button resets the counters to zero.

7.5.3 Media Access Control (MAC) Statistics

The **Statistics** > **MAC Statistics** tab displays statistics related to the MAC (Media Access Control) layer.

The **CLEAR MAC** button resets the counters to zero.

7.6 SYSTEM

The System tab provides access to options for:

- Restarting BlueGate 2100.
- Resetting BlueGate 2100 to the factory defaults.
- Upgrading BlueGate 2100's software.

7.6.1 Restart BlueGate 2100

Restarting BlueGate 2100 puts the settings currently saved in NVRAM into effect. The restart typically takes fifteen seconds. However, if DHCP is enabled the restart period will be affected by the time the network DHCP server takes to respond.

To restart BlueGate 2100:

1. Click **System > Restart BlueGate 2100 Now** button.

OR

2. Physically remove power from BlueGate 2100:
   a) Unplug the power to the unit.
   b) Plug the power back in. BlueGate 2100 will reboot in approximately 30 seconds.

OR

3. From within BlueGate 2100's internal Web server, click **Utilities > Command Line,** enter **Reset** in the command line field, and click **Go!** or press the **Enter** key.

7.6.2 Reset BlueGate 2100 to Factory Defaults

Resetting BlueGate 2100 to the factory defaults replaces current connectivity values with those shown in Table 1, page 5.

If using DHCP, run the FindIP application from the BlueGate 2100 compact disc to re-discover the IP address that the DHCP server has assigned to BlueGate 2100.

If using a fixed IP address, make note of it before resetting to factory defaults.

A confirmation page is displayed when the reset is complete. Click the *configuration page* hyperlink to view the new settings. BlueGate 2100 must also be restarted for the new settings to take effect (see Section 7.6.1, page 24).

NOTE: See Section 4 for additional information about resetting BlueGate 2100.

7.6.3 Perform Software Upgrade

This tab is reserved for use by WIDCOMM support personnel.

NOTE: Do not attempt software upgrades unless instructed to do so by WIDCOMM support personnel. Unauthorized upgrades may have unexpected results.

7.7 HELP

The Help tab displays:

- Contact Info—a link to on-line resources at WIDCOMM's Technical Support Website.
- Product Info:
  - BlueGate device name.
  - MAC Address.
  - Bluetooth Device (BD) Address.
  - BlueGate software version information.

There are no settings or options to configure on the Help tab.

8 Command Line Entry

On the **Utilities > Command Line** tab, commands may be entered directly to the BlueGate 2100 software engine to perform specific tasks or change settings.

Enter the command and its associated parameters in the command line field and click **GO!** or press the **ENTER** key.

Many of the available commands accept parameters. When a command is entered without parameters, the current setting(s) for that command are displayed; exceptions to this general rule are noted on a command-by-command basis in the remainder of this section.

For a list of available commands type "help" or "?" in the command line field and click **GO!** or press the **ENTER** key (also see Section 7.3.1).

NOTE: BlueGate 2100 must be reset for most configuration changes to take effect.

8.1 ? OR HELP

Displays a list of the available commands and provides a brief description of each.

There are no parameters associated with this command.

8.2 ARP

Displays the active Address Resolution Protocol (ARP) table entries for BlueGate 2100.

There are no parameters associated with this command.

8.3 AUTHENTICATE

Sets the authentication level.

Default value: "0" (authentication disabled).

Format: `AUTHENTICATE = n`

- `n` is 0, 1 or 2:
  - 0 disables authentication.
  - 1 enables the use of a fixed PIN Code for all connecting devices.
  - 2 enables the use of an individual PIN Code for each connecting device.

Example: `AUTHENTICATE = 0`

8.4 BGIPADDR

Sets the IP address of BlueGate 2100. It is only used when DHCP is disabled.

Default values:

- n: "0"
- IP address: "192.168.0.1"

Format: `BGIPADDR = n,aa.bb.cc.dd`

- `n` must be 0.
- `aa.bb.cc.dd` is the dotted decimal notated IP address of BlueGate 2100.

Example: `BGIPADDR = 0,192.168.0.50`

8.5 CONFIG

Displays the active configuration of BlueGate 2100.

There are no parameters associated with this command.

8.6 CONSTANTPIN

Sets the fixed PIN Code to be used by all Bluetooth devices attempting to access BlueGate 2100. The PIN Code can be up to 16 alphanumeric characters long.

Default value: “” (blank field, not defined).

Format: `CONSTANTPIN = ASCII string`

- `ASCII string` is the actual PIN Code.

Example: `CONSTANTPIN = 2A33`

NOTE: Do not use *CONSTANTPIN* if the connecting device does not support security.

8.7 DEVICEIPADDR

Sets the IP address range for Bluetooth Devices if DHCP is disabled.

Default values:

- Range number: “” (blank field, no entry).
- Number of IP addresses: “” (blank field, no entry).
- IP address: “0.0.0.0” (blank field, not defined).

Format: `DEVICEIPADDR = n,cnt,aa.bb.cc.dd`

- `n` is the range number: range1, range 2, or range 3.
- `cnt` is the number of IP addresses.
- `aa.bb.cc.dd` is the starting IP address in dotted decimal notation.

Example: `DEVICEIPADDR = 1,3,192.168.0.1` generates a pool of three IP addresses (192.168.0.1, 192.168.0.2, and 192.168.0.3) in range one on BlueGate 2100.

8.8 DEVICENAME

Sets the user-friendly device name of BlueGate 2100. The device name helps identify BlueGate 2100 to other devices; the name can be up to 100 alphanumeric characters in length.

Default value: the letters “BG” plus the unit’s serial number (NNNNNN), for example, “BG9123.”

Format: `DEVICENAME = ASCII string`

- `ASCII string` is the actual user-friendly name of the device.

Example: `DEVICENAME = My BlueGate Network Access Point`

8.9 DNS

Sets the Domain Name System (DNS) Primary and Secondary Server IP addresses.

Default values:

- Primary: “1” and “0.0.0.0” (blank field, no entry)
- Secondary: “2” and “0.0.0.0” (blank field, no entry).

Format: `DNS = n,aa.bb.cc.dd`

- `n` is 0 or 1
  - 0 sets the primary DNS server IP address.
  - 1 sets the secondary DNS server IP address.
- `aa.bb.cc.dd` is the IP address, in dotted decimal notation.

Examples: `DNS = 0,100.140.10.1` sets the Primary DNS server IP address to 100.140.10.1.

`DNS = 1,100.140.10.2` sets the Secondary DNS server IP address to 100.140.10.2.

8.10 ENABLEDHCP

Enables/disables Dynamic Host Configuration Protocol (DHCP).

Default value: “1” (DCHP enabled).

Format: `ENABLEDHCP = n`

- `n` is 0 or 1:
  - 1 enables DHCP.
  - 0 disables DHCP.

Example: `ENABLEDHCP = 1`

8.11 ENABLENAT

Enables/disables Network Address Translation (NAT).

Default value: “1” (NAT enabled).

Format: `ENABLENAT = n`

- `n` is 0 or 1:
  - 1 enables NAT.
  - 0 disables NAT.

Example: `ENABLENAT = 1`

8.12 ENCRYPT

Enables/disables encryption. Authentication must be enabled before enabling encryption.

Default value: “0” (encryption disabled).

Format: `ENCRYPT = n`

- `n` is 0 or 1:
  - 1 enables Encryption.
  - 0 disables Encryption.

Example: `ENCRYPT = 1`

8.13 GATEWAY

Displays the IP address of the LAN gateway to which BlueGate 2100 is connected.

Default value: "" (blank field, not defined).

Format: `GATEWAY = aa.bb.cc.dd`

- `aa.bb.cc.dd` is the dotted decimal notated IP address of the LAN gateway.

Example: `GATEWAY = 192.168.1.1`

8.14 MULTIPOINT

Enables/disables Point-to-Multipoint.

Default value: "0" (Point-to-Multipoint disabled).

Format: `Multipoint = n`

- `n` is 0 or 1:
  - 1 enables Point-to-Multipoint.
  - 0 disables Point-to-Multipoint (device configured to be Point-to-Point).

Example: `Multipoint = 1`

8.15 NSLOOKUP

Displays the DNS lookup table, i.e. mapping of HostName to IP addresses.

Default value: "" (blank field, no entry).

Format: `NSLOOKUP = valid hostname`

Example: `NSLOOKUP = www.widcomm.com`

8.16 PASSWD

Sets the authorization password for the administrator and individual remote users. Password length is limited to 16 alphanumeric characters. BlueGate 2100 can store up to seven user names and their associated passwords. The first password in the list (User zero) is *Admin*. The remaining password entries are numbered User one through User six.

Default values for User zero:

- user number: "0".
- password: "admin" (case sensitive).

Default values for User one through six:

- user number: "" (blank field, no entry).
- password: "" (blank field, empty string).

Format: `PASSWD = n,ASCII string`

- `n` is a number zero to six.
- `ASCII string` is the actual password.

Example: `PASSWD = 1,2smith`

NOTE: When passwords are added or changed through command line entry the resulting password defaults to uppercase. For example, type *2smith* in command line, the result will be *2SMITH*. To preserve case of the text, make changes through Configuration > Authorization.

8.17 PINCODE

Sets the Individual PIN Code used to authenticate connecting Bluetooth devices. The individual PIN Code is limited in length to a maximum of 16 alphanumeric characters.

Default values:

- device number: “”(blank field, no entry).
- PIN code: “” (blank field, not defined).

Format: `PINCODE = n,ASCII`

- `n` is device number, from one to seven.
- `ASCII string` is the actual PIN Code.

Example: `PINCODE = 1,1AB3`

8.18 PING

Pings the remote host. This command can be used to determine if a remote machine is “up.”

“Ping” displays an error message if either the host name or IP address is not entered as a parameter.

Format: `PING hostname[or IPAddr] -nCOUNT -lSIZE -wTIMEOUT -f –iTTL.`

- `Hostname:` the user-friendly name of the remote device.
- `IP Addr`: the IP address of remote device, entered in dotted decimal notation.
- `-nCOUNT`: the number of ping packets to be sent (default = 1).
- `-lSIZE`: the size of each ping packet (default = 32 bytes).
- `-wTIMEOUT`: the length of time to wait for a response from the remote machine (default = 5 seconds).
- `-iTTL`: the lifetime, in seconds, of the ping packet. This value is contained in the IP Packet. After `TTL` seconds the packet is removed from the network (default = 255 seconds).
- `-f:` enables packet fragmentation if the packet size is greater than the maximum size allowed on the network.

The only required parameter in the PING command is either the IP address or the host name; all other parameters are optional.

Example: `PING 192.168.1.34 –n2` or `www.widcomm.com -n2` sends two ping packets to the remote device that has IP address 192.168.1.34. The omitted parameters assume their default values.

8.19 RESET

Restarts BlueGate 2100 and puts the settings currently saved in NVRAM into effect. This is the same as removing and restoring power to the device or **System > Restart BlueGate 2100 Now**.

The restart typically takes fifteen seconds. However, if DHCP is enabled the restart period will be affected by the time the network DHCP server takes to respond.

There are no parameters associated with this command.

8.20 ROUTE

Displays the static and dynamic route table entries for BlueGate 2100.

There are no parameters associated with this command.

8.21 SERVICENAME

Sets the LAN Access Profile (LAP) service name for BlueGate 2100.

The service name is limited in length to a maximum of alphanumeric 100 characters.

Default value: “LAN Access.”

Format: `SERVICENAME = ASCII string`

- `ASCII string` is the actual service name.

Example: `SERVICENAME = LOCAL LAN.`

8.22 STATISTICS OR STATS_DISP

Displays various statistics for BlueGate 2100.

Format: `Statistics=InterfaceName`

`InterfaceName` can be one of:

- `LC`: Link Controller statistics; lowest level of the Bluetooth software.
- `IP`: packet statistics for IP layer.
- `MAC`: statistics for Ethernet (MAC) layer.
- `HIST`: a history of active Bluetooth connections.

Examples: `STATISTICS=IP` or `STATS_DISP=IP`.

8.23 SUBNET

Sets the subnet mask of the LAN gateway to which BlueGate 2100 is connected.

Default value: “” (blank field, no entry).

Format: `SUBNET=aa.bb.cc.dd`

- `aa.bb.cc.dd` is the decimal notated IP address of the subnet mask of the LAN gateway.

Example: `SUBNET=255.255.0.0`

8.24 USERLOGIN

Format: `USERLOGIN = n`

Default value: “0” (authorization disabled)

- `n` is 0 or 1:
  - 1 enables authorization.
  - 0 disables authorization.

Example: `USERLOGIN = 1`

8.25 USERNAME

Sets the authorization user name for the administrator and individual remote users of BlueGate 2100. The user name is limited in length to 16 characters. BlueGate 2100 can store up to seven user names and their associated passwords. The first name in the list (User zero) is *widcomm*. The remaining user names entries are numbered User one through User six.

Default values for User zero:

- user number: "0"
- user name: "widcomm" (case sensitive)

Default values for User one through six:

- user number: "" (blank field, no entry)
- user name: "" (blank field, empty string).

Format: `USERNAME = n,ASCII string`

- `n` is a number between zero and six.
- `ASCII string` is the actual user name.

Example: `USERNAME = 1,falcon`

NOTE: When user names are added or changed through command line entry the resulting user name defaults to uppercase. For example, type *newuser* in command line, the result will be *NEWUSER*. To preserve case, make changes through Configuration > Authorization.

8.26 VERSION OR VER

Displays the version number of the software.

There are no parameters associated with either of these commands.

9 Troubleshooting

9.1 General

BlueGate 2100 is factory configured to be ready to use out of the box.

The general steps for achieving LAN access via BlueGate 2100 are:

1. Verify that the client supports the *LAN Access Profile* (LAP); consult the user's manual for the client Bluetooth device.
2. Configure the client to use the *LAN Access Profile*; consult the user's manual for the client Bluetooth device.
3. Ensure that the Bluetooth security settings on the client are compatible with those that are configured on BlueGate 2100. In the case of the client, these may be device-wide settings (for example, a fixed PIN code for all connections), or may be configurable on a service-by-service or profile-by-profile basis.
4. Perform a device inquiry from the client. Verify that BlueGate 2100 shows up.

   Some client devices may display:

   - Only the Bluetooth Device Addresses (BD Addr) of other units.
   - Only the user-friendly name (device name) of these devices.
   - Some may display both.
5. Select BlueGate 2100 and perform a service discovery on it.
6. Select the "LAN Access", "Network Access", or similarly named service associated with the Bluetooth *LAN Access Profile*.
7. Initiate a connection to the selected service.
8. Test the connection using ping, FTP, or an Internet browser.

The remainder of this section deals with specific problems.

9.2 BlueGate 2100 Fails During Power Up

BlueGate 2100 cycles through a Power On Self Test (POST) prior to booting.
The power LED indicates the state BlueGate 2100:

- Blinking rapidly: POST in progress.
- Blinking slowly: Boot in progress.
- On steady: the BlueGate software is up-and-running and the unit is ready to use.

If an error occurs during the POST, the power LED blinks a specific number of times to indicate the type of failure. Blink codes are displayed in the format BLINK, BLINK…, PAUSE, REPEAT. For example, if a *flash fault* is detected the power LED flashes three times, pauses, and then flashes three times….

The blink counts and their meanings are listed in Table 2.

Table 2: Fatal POST Blink Codes.

Fatal POST Blink Codes	
Blink Count	**Meaning**
2	RAM fault detected.
3	Flash fault detected.
4	Image checksum error (FPGA or main image).
5	NVRAM error.
6	MAC address error.
7	No FPGA image available in flash.
8	No BlueGate image available in flash.

If a POST failure occurs, physically remove power from BlueGate 2100 for five seconds, then restart the unit. If the error persists, contact WIDCOMM technical support (www.widcomm.com/support).

9.3 ETHERNET LIGHT IS OFF OR DOES NOT BLINK

BlueGate 2100's power LED is ON, but the Ethernet LED is OFF.

- Check the plugs on either end of the Ethernet cable to ensure that these are properly seated in the jack on BlueGate 2100 and the hub or wall jack.
- Make sure the Ethernet cable is plugged into the proper jack; telephone systems sometimes use the same type of jack.
- Verify that the Ethernet cable is good; replace it if necessary.
- Verify that the network is "up."

9.4 BLUETOOTH LIGHT DOES NOT BLINK

The Bluetooth activity light only flashes when a Bluetooth connection is active.

9.5 ADMINISTRATIVE USERNAME AND/OR PASSWORD FORGOTTEN

See Section 4 for information about how to restore the administrator's user name and password to the factory-default settings.

9.6 RETURN BLUEGATE 2100 TO THE FACTORY-DEFAULT SETTINGS

Press the hardware reset button (Figure 1, page 3) for more than five seconds to reset BlueGate 2100 to its factory-default condition. The factory default settings are shown in Table 1 on page 5.

9.7 BLUETOOTH DEVICE ADDRESS IS MISSING

BlueGate 2100's Bluetooth Device Address (BD Addr) is on the serial number tag of the unit (Figure 2, page 6).

The BD Addr is also available via BlueGate 2100's internal Web server on the **Diagnostics > DCHP Table** tabe in the *BD Address* column.

9.8 MEDIA ACCESS CONTROL (MAC) ADDRESS IS MISSING

BlueGate 2100's Media Access Control (MAC) address can be used to access the internal web server. The MAC address is on the serial number tag of BlueGate 2100.

The MAC address is also available via BlueGate 2100's internal web server on the **Help > Product Info** tab.

If the serial number tag is missing or unreadable the internal Web server can be accessed via a private network. See Section 5.2 of this manual for more information.

9.9 CANNOT FIND BLUEGATE 2100’S IP ADDRESS WITH FINDIP

Does a dialog box appear to indicate that the IP Address could not be found?

- YES Go to Section 9.9.1.
- NO Go to Section 9.9.2.

9.9.1 The Dialog Box Appears

If the dialog box appears there is a high likelihood that the FindIP application is operating properly but could not locate BlueGate 2100’s IP address.

- Verify that:
  - BlueGate 2100 and the computer running FindIP are on the same subnet. FindIP uses a UDP broadcast packet to query BlueGate 2100; broadcast packets are not routed. If there is a router between the computer and BlueGate 2100, the IP address will not be found.
  - The Media Access Control address has been properly entered in FindIP.
  - The local DHCP server is on-line and accessible.
- There are two addresses on BlueGate 2100’s serial number tag:
  - The Bluetooth Device Address (BD Addr)
  - The Media Access Control address (MAC).

  Be sure the correct address (the MAC address) is entered in FindIP.

9.9.2 The Dialog Box Does NOT Appear

If the dialog box does NOT appear there is a high likelihood that the problem is related to the FindIP application.

- The browser must be Internet Explorer 5.0 or higher or Netscape Navigator 4.7 or higher.

Contact WIDCOMM support personnel for assistance.

9.10 CANNOT FIND BLUEGATE 2100’S IP ADDRESS WITH THE JAVA APPLET IN UNIX ENVIRONMENT

Does a dialog box appear to indicate that the IP Address could not be found?

- YES Go to Section 9.10.1.
- NO Go to Section 9.10.2.

9.10.1 The Dialog Box Appears

If the dialog box appears there is a high likelihood that the Java applet is operating properly but could not locate BlueGate 2100’s IP address.

- Verify that:
  - BlueGate 2100 and the computer running the Java applet are on the same subnet. The Java applet uses a UDP broadcast packet to query BlueGate 2100; broadcast packets are not routed. If there is a router between the computer and BlueGate 2100, the IP address will not be found.
  - The Media Access Control address has been properly entered in the Java applet.
  - The local DHCP server is on-line and accessible.

- There are two addresses on BlueGate 2100's serial number tag:
  - The Bluetooth Device Address (BD Addr)
  - The Media Access Control address (MAC).

  Be sure the correct address (the MAC address) is entered in FindIP.

9.10.2 The Dialog Box Does NOT Appear

If the dialog box does NOT appear there is a high likelihood that the problem is related to the Java applet. For more information about the following suggestions refer to *Appendix C—Find IP address in a Non-Windows Environment* in this manual.

- The browser must be Internet Explorer 5.0 or higher.
- The browser must be restarted after downloading the Java Run-time environment (JRE).
- The Java applet support files must be copied to the correct directory.
- The security file must be properly modified.

9.11 BLUEGATE 2100 DOES NOT SHOW UP WHEN A DEVICE INQUIRY IS MADE

- Verify the security settings of BlueGate 2100 and the client device. The authentication, authorization, and encryption settings of BlueGate 2100 and the client must be the same; if BlueGate 2100 has one or more of these options turned ON and the client has the same setting(s) turned OFF the connection will fail.
- The fixed PIN code of BlueGate 2100 and the client must be the same; if the PIN codes do not match the connection will fail. Since fixed PIN codes are configured on both sides, there may never be a dialog box displayed to inform you that an authentication was performed.
- Verify that the client is not configured to screen out the "LAN Access" class of Bluetooth devices.
- Verify that the Bluetooth client device is Bluetooth Specification 1.1 compliant. Bluetooth client devices that are not 1.1 compliant may not work with BlueGate 2100, which *is* Bluetooth Specification 1.1 compliant.
- Change the distance between BlueGate 2100 and the other Bluetooth device. If they are close together move them further apart—if they are far apart move them closer together.
- If there are numerous Bluetooth devices in the area move to an area with fewer devices.

9.12 DIFFERENTIATING BETWEEN MULTIPLE BLUEGATE 2100 DEVICES

To differentiate between multiple BlueGate 2100 units installed in the same Bluetooth Neighborhood:

- Check the serial number tags on the BlueGate 2100 devices. Match the Bluetooth Device addresses of the units to the addresses displayed by the client when an inquiry is made.
- If the client software displays only the user-friendly name of the units:
  The default user-friendly name of each BlueGate 2100 is the letters "BG" followed by the unit's serial number; a unit with the serial number of 9123 has a default user name of ***BG9123***.

9.13 Cannot Discover Services

Verify that the client device supports the LAN Access Profile (LAP).

Verify that the client is not configured to screen out the "LAN Access" class of Bluetooth devices.

9.14 Cannot Connect to the LAN Access Profile Service

Device Inquiry and Service Discovery succeed but the connection fails.

- Verify the security settings of BlueGate 2100 and the client device. The authentication, authorization, and encryption settings of BlueGate 2100 and the client must be the same; if BlueGate 2100 has one of more of these options turned ON and the client has the same setting(s) turned OFF the connection will fail.
- The fixed PIN code of BlueGate 2100 and the client must be the same; if the PIN codes do not match the connection will fail. Since fixed PIN codes are configured on both sides, there may never be a dialog box displayed to inform you that an authentication was performed.
- Verify that the client is not configured to screen out the "LAN Access" class of Bluetooth devices.
- Verify that the Bluetooth client device is Bluetooth Specification 1.1 compliant. Bluetooth client devices that are not 1.1 compliant may not work with BlueGate 2100, which *is* Bluetooth Specification 1.1 compliant.

9.15 Can't Establish more than one LAP connection

- Verify that the Point-to-Multipoint option is enabled for BlueGate 2100.
- Verify that the client device supports Master/Slave switching. If it doesn't, BlueGate 2100 will not be able to make additional connections.

Appendix A—An Introduction To Bluetooth

This is a brief non-technical overview of Bluetooth.

For information on a specific topic click the appropriate link below.

To return to this list of topics, click the <back> link found at the end of each topic:

1. Overview
2. Device Identity
3. Security Introduction
    a) Authorization
    b) Authentication
    c) Encryption
    d) Service Level
    e) Link Keys
4. Bluetooth Services
5. Device Inquiry and Service Discovery
    a) Device Inquiry
    b) Service Discovery
    c) Security
6. A typical connection scenario.

OVERVIEW

The term “Bluetooth” refers to a worldwide standard for the wireless exchange of data between two devices.

In order to exchange data, two Bluetooth devices must establish a connection.

Before a connection is established, one device must request a connection with another. The second device accepts (or rejects) the connection.

The originator of the request is known as the *client*.

The device that accepts (or rejects) the request is known as the *server*.

Bluetooth devices can act as both client and server.

A client Bluetooth device runs a software program that requests a connection to another device as part of its normal operation. For example, the program may request a connection to a remote computer, a printer, or a modem.

Becoming a Bluetooth client normally requires an action by the device operator, such as an attempt to browse a remote computer, print a file or dial out on a modem.

Every Bluetooth device that provides a service must be prepared to respond to a connection request. Bluetooth software is always running in the background on the server, ready to respond to connection requests. <back>

DEVICE IDENTITY

Each Bluetooth device has a unique forty-eight-bit binary Bluetooth Device (BD Addr) burned into its Read Only Memory during the manufacturing process. This address cannot be changed by the end-user.

A devices' BD Addr is usually displayed in hexadecimal format, for example, 00:D0:B7:03:2E:9F is a valid BDA.

Each Bluetooth device also has an operator-configurable user-friendly device name to help distinguish it from other Bluetooth devices in the vicinity. Valid user-friendly names include:

- Bob's PC.
- Randy's Laptop.
- John Q. Public's PDA.

User-friendly names make it easier to recognize the devices in the Bluetooth Neighborhood. However, because the name is easily changed, it is not reliable for security purposes. <back>

SECURITY

Bluetooth offers five types, or levels, of security:

- None—all Bluetooth devices are allowed to connect.
- Authorization—the local device operator must authorize a remote device connection, usually by physically clicking an on-screen button.
- Authentication—remote devices must provide a password that matches that of the local device.
- Encryption—connections with remote devices can be encrypted for additional security.
- Service Level—individual local services may be disabled. Disabled services are not available to any remote device. Service Level security is only available on some types of devices. <back>

Authorization

Authorization provides name-level and device-level security.

An audible and/or visual warning notifies the local operator that a remote device is attempting to access the system.

The local operator can open a dialog box that provides:

- Name-level security information—the user-friendly name of the device attempting access.
- Device-level security information—the Bluetooth Device Address (BD Addr) of the device attempting access.
- The type of access the requesting device is trying to achieve.

Based on the information provided in the dialog box, the operator may authorize or deny access by physically clicking an on-screen button.

If the initial notification is ignored access is denied after a preset timeout.

Authorization does not provide foolproof security since Bluetooth device names are re-configurable by the end-user.

Advantages of authorization: Ease of use—requires a simple **YES**-or-**NO** response.

Disadvantages of authorization: Weak security. <back>

AUTHENTICATION

Authentication requires a passkey from the remote device attempting to access the local device.

An audible and/or visual warning notifies the local operator that a remote device is attempting to access the system.

The local operator can open a dialog box that provides:

- Name-level security information—the user-friendly name of the device attempting access.
- Device-level security information—the Bluetooth Device Address (BD Addr) of the device attempting access.
- The type of access the requesting device is trying to achieve.
- A place for the local operator to enter a passkey.

The operator of the remote system must enter the identical passkey or access is denied.

If the initial notification is ignored access is denied after a preset timeout.

There is no limit to the number passkeys that may be assigned. Individual remote devices may be assigned different passkeys for each service provided by the local computer.

For example, John's PC, BDA 00:00:D0:11:22:33, may be assigned a passkey of "2468" and granted access to all services on the local computer, or John's PC can be assigned a different passkey for each service.

Advantages of authentication: Stronger security.

Disadvantages of authentication: Passkeys must be protected. <back>

ENCRYPTION

The Bluetooth specification allows for encrypted transactions using a key size of up to 128 bits.

Some Bluetooth devices do not support encryption. If a device or service is configured to use encryption and attempts a connection with a device that does not support encryption the connection may fail unexpectedly.

Encryption is available when authentication is required.

Advantages of encryption: Protects against radio frequency snooping.

Disadvantages of encryption: The receiving unit must also support encryption. <back>

SERVICE LEVEL

Each Bluetooth service can be selectively disabled. If all Bluetooth services are disabled the local computer is unable to accept connections from a remote computer.

The local machine can still initiate outgoing connections to other Bluetooth units, but incoming connections will not be allowed.

Advantages of service level security: Strong security.

Disadvantages of service level security: It is non-selective; it shuts out all incoming Bluetooth connections for a particular service. <back>

Link Keys

To avoid entering a passkey over-and-over for a known and trusted remote device, a link key can be created.

A link key is a number created from:

- The passkey.
- The Bluetooth device address of the remote device.
- An internally random-generated number.

There is no limit to the number of link keys that may be created.

Devices that share a link key are "bonded." Bonded devices are authenticated automatically, without operator intervention. <back>

SERVICES

The software that allows a Bluetooth device to act as a server is known as a *service*. Enabled services are started automatically when the computer boots. The services then run as background tasks.

Typical Bluetooth services include:

- Local Area Network access.
- Dial-up networking.
- File transfer between computers.
- Object exchange between computers.
- Serial port emulation.
- FAX device support.
- File system synchronization. <back>

NOTE: BlueGate only supports one service—Local Area Network access using PPP (LAP).

DEVICE INQUIRY AND SERVICE DISCOVERY

To connect to a remote Bluetooth device, the remote device must:

- Be within radio range.
- Provide a Bluetooth service.
- Be accessible, from a security standpoint, by the local device. <back>

Device Inquiry

A Bluetooth device must be within radio range of a second Bluetooth device to establish a connection.

Every Bluetooth device keeps a list that contains the user-friendly name and device address of each remote device that is within its radio range.

As Bluetooth devices wander in and out of the Bluetooth Neighborhood the list must be updated. This is accomplished in two ways:

- The list is updated automatically when the local device periodically queries all other Bluetooth devices within range.
- The list can also be updated as necessary by selecting an on-screen option. <back>

Service Discovery

Even though a device is within radio range the local device will not be able connect to it if the remote device does not provide the requested service.

Service Discovery is the process of determining which Bluetooth services are available on the devices within radio range.

Connection requests are made for a specific service. If the desired service is the File Transfer Protocol (FTP) and the remote device does not offer that service, the connection will not be allowed. <back>

Security

The security parameters of the remote device must be set to allow the local device to establish a connection.

Even though there is a remote device in the Bluetooth Neighborhood that provides the desired service, the remote device security parameters may be set to allow only specific devices to connect. If the requesting device is not on that list, it will not be allowed to connect. <back>

A Typical Connection Scenario

In this simplified scenario Joe's PC is a Bluetooth-aware computer that needs access to the network:

1. Joe's PC performs a search of the Bluetooth Neighborhood (a Device Inquiry) and determines that there are four Bluetooth devices in the vicinity.
2. Joe's PC queries each of the four nearby devices to determine which services they provide (a Service Discovery). Ann's Computer offers the network access service.
3. Joe's PC sends a network connection request to Ann's Computer.
4. Ann's Computer evaluates the request and determines that Joe's PC is permitted to use the network connection service, PROVIDED THE CORRECT PASSWORD IS SUBMITTED.
5. Ann's Computer queries Joe's PC for the password (Authentication).
6. Joe's PC returns the correct password and the network connection is established.
7. Joe's PC uses the network access connection on Ann's Computer as if Joe's PC was connected directly to the network.

When Joe's PC no longer needs the network access service the connection between it and Ann's Computer is disconnected by the operator.

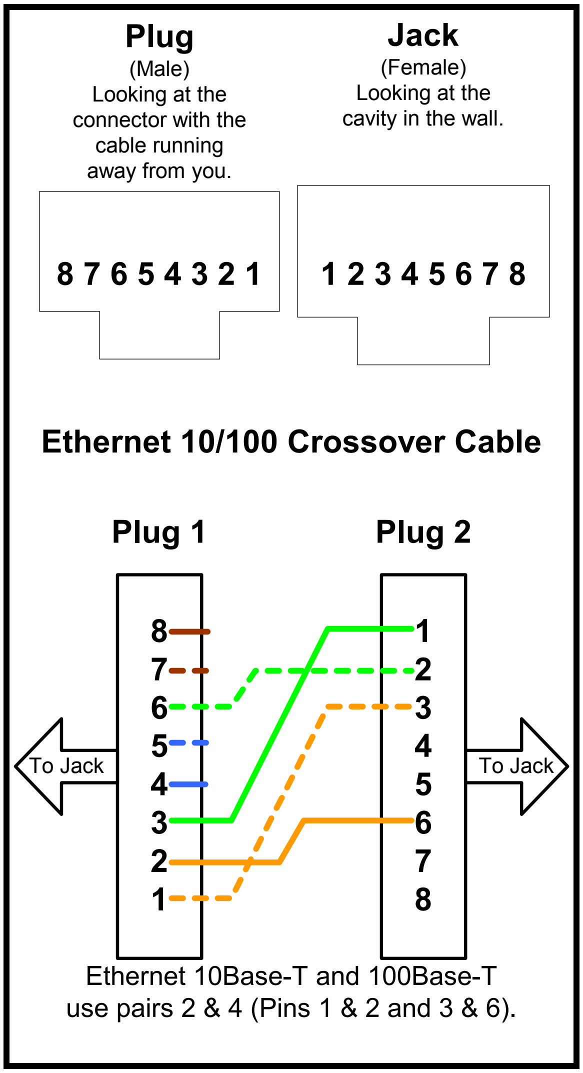
Some Bluetooth services disconnect automatically; others must be closed manually. <back>

Appendix B—Crossover Cable Connections Diagram

This appendix contains additional information regarding the use of BlueGate 2100 in a non-DHCP environment.

Figure 14 shows the connections for a crossover cable. This is one of the two solutions that can be used to access BlueGate 2100's internal Web server in a non-DHCP environment. Refer to Section 5.2 for more information.

Figure 14: Crossover cable connections.


Plug
(Male)
Looking at the connector with the cable running away from you.
8 7 6 5 4 3 2 1
Jack
(Female)
Looking at the cavity in the wall.
1 2 3 4 5 6 7 8
Ethernet 10/100 Crossover Cable
Plug 1
Plug 2
8
7
6
5
4
3
2
1
1
2
3
4
5
6
7
8
To Jack
To Jack
Ethernet 10Base-T and 100Base-T use pairs 2 & 4 (Pins 1 & 2 and 3 & 6).

Appendix C—Find IP address in a Non-Windows Environment

JAVA APPLET

The BlueGate 2100 compact disc contains a Java applet that may be used instead of the FindIP application to find BlueGate 2100's IP address. The Java applet was written for a Windows environment but can be translated by the user to work in a non-Windows environment.

NOTE: The Java applet only works with Microsoft Internet Explorer, version 5.0 or higher.

To determine BlueGate 2100's IP address:

1. Create a directory named *C:\BGPolicy* on the system hard drive.
2. Copy *BGIPLookup.html, BGIPLookup.class, BGPolicy*, and *widcomm.jpg* from the root directory of the BlueGate 2100 compact disc to the new *C:\BGPolicy* directory.
3. Run Internet Explorer and open *BGIPLookup.html* from the *C:\BGPolicy* directory. If version 1.3 of the Java Run-time Environment (JRE) is not installed on your computer, *BGIPLookup.html* will prompted you to download and install JRE from the Sun^{SM} Microsystems' Web site (see below for Java Run-time Environment download and installation). After completing the Java Run-Time Environment installation, return to this step to complete the process of getting an IP address.
4. Enter the Media Access Control (MAC) address of BlueGate 2100 from the serial number label (see Figure 1 and Figure 2) and click the "*Click here to Find IP Addr of BG WebServer*" button (DO NOT press enter).

The IP address of BlueGate 2100 is displayed in an Internet Explorer dialog box, (Figure 15, inset).

Click the **OK** button to close the dialog box and automatically open BlueGate 2100's internal Web server in Internet Explorer.

NOTE: The Java applet uses a UDP broadcast packet to interrogate BlueGate 2100 for its assigned IP address. UDP packets are not routed; be sure that a router is not between BlueGate 2100 and the computer running the Java applet.

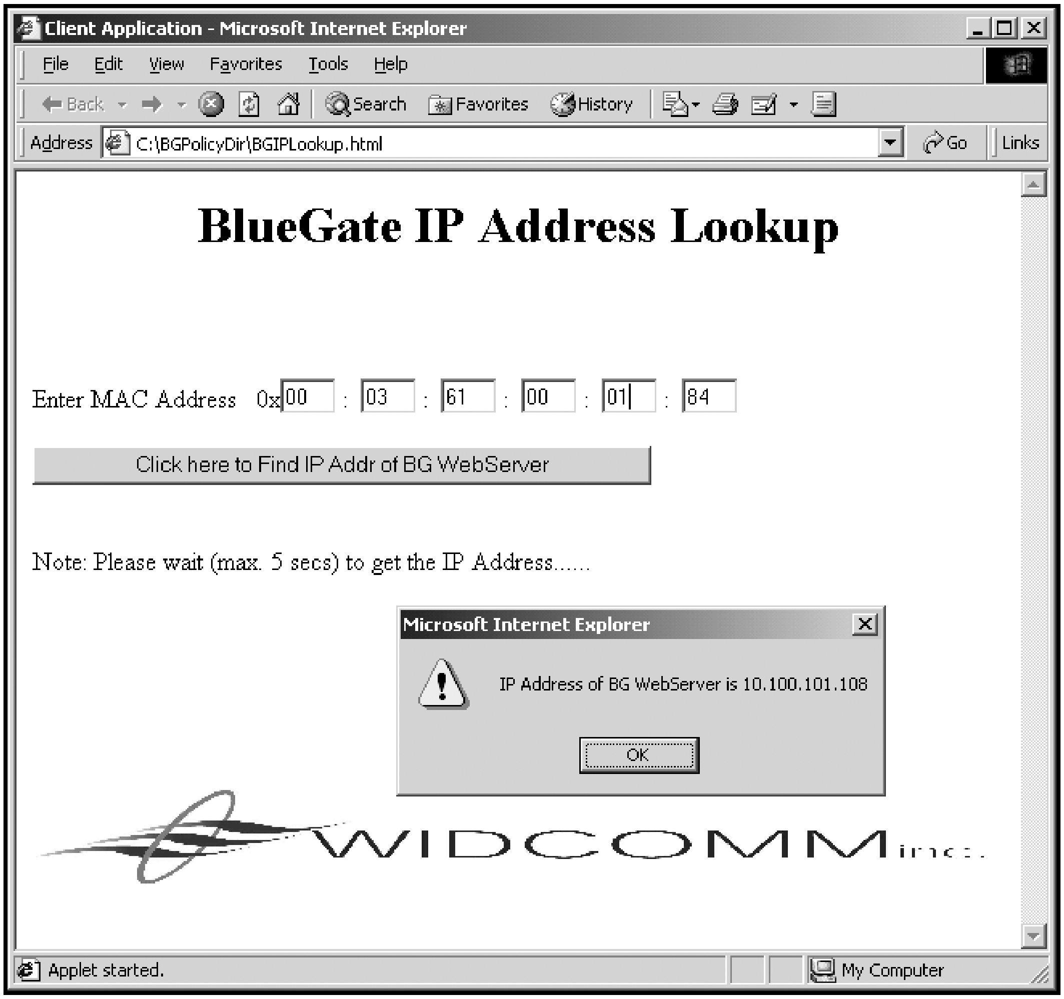
JAVA RUN-TIME ENVIRONMENT

To download, install, and configure Java Run-time Environment (JRE):

1. Select **Yes** when prompted to download JRE and then follow the on-screen instructions.
2. Close Internet Explorer.
3. Open `C:\ProgramFiles\JavaSoft\JRE\1.3\lib\security\java.security` in a text editor.
4. Insert a blank line after the line:
   `policy.url.2=file:${user.home}/.java.policy`
5. On the blank line enter:
   `policy.url.3=file:/C:/BGPolicy/BGPolicy`
   This line points to the *BGPolicy* file in the `C:\BGPolicy directory`.
6. Save the file.

The JRE installation is complete. Return to Step 3 above and complete the determination of BlueGate 2100's IP address.

Figure 15: Java applet and the IE dialog box (inset) that displays the IP address.



Client Application - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address C:\BGPolicyDir\BGIPLookup.html
Go Links

BlueGate IP Address Lookup

Enter MAC Address 0x 00 : 03 : 61 : 00 : 01 : 84

Click here to Find IP Addr of BG WebServer

Note: Please wait (max. 5 secs) to get the IP Address......

Microsoft Internet Explorer

IP Address of BG WebServer is 10.100.101.108

OK
WIDCOMM inc.
Applet started.
My Computer