CyberData Corporation

PoE VoIP Paging Gateway Operations Guide

SIP Compliant 010846

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Revision History

Revision	Date Released	Description of Changes
B	3/01/2007	Updates Figure 2-7 through Figure 2-13.
C	4/12/2007	Changes the Authenticate ID and password character limit from 30 to 25 in Table 2-4.

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1 Product overview

The VoIP Paging Gateway enables access to existing paging speakers through a VoIP phone system. This interface uses a standard paging amplifier, and supports paging to multiple zones from a VoIP phone.

Product features

- SIP compliancy
- Dual speeds of 10Mbps and 100 Mbps
- Multi-zone paging for up to 99 Zones
- Web-based firmware upgrades
- PoE enabled
- Connector for optional external power supply

Supported

- Asterisk™ SIP server

  Offers Open Source benefits with the rich and flexible feature set of a large, proprietary PBX system.
- HTTP Web-based configuration

  Provides an intuitive GUI for easy system configuration and verification of gateways operations.
- DHCP Client

  Dynamically assigns IP addresses in addition to the option to use static addressing.
- TFTP Client

  Facilitates Web-based firmware upgrades of the latest speaker capabilities.
- RTP Version 2 Multicast and Unicast
- Audio Codec
  - G.711 U-law
  - Packet size: 20 ms
  - DTMF detection/generation
  - Echo cancellation

Product specifications

VoIP Paging Gateway Specifications

Power Requirement	PoE or 48V DC
Baud Rate	10/100 Mbps
Protocol	SiP compliant
Part Number	010844
Dimensions	6.11”L x 4.05”W x 1.15” H
Weight	1.2 pounds

2 Implementing the VoIP Paging Gateway

The topics in this chapter provide information on setting up, configuring, and using the VoIP Paging Gateway.

2.1 Parts list

The packaging for the VoIP Paging Gateway includes the parts in this illustration.

Table 2-1. Parts List

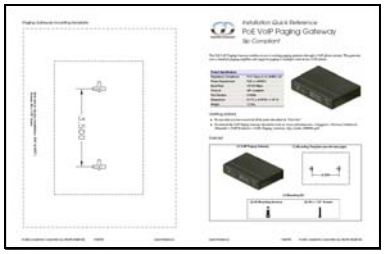
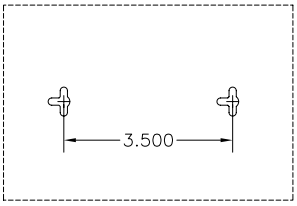
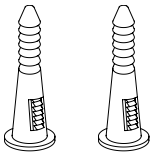
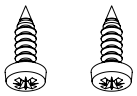
Quantity	Part Name	Illustration
1	VoIP Paging Gateway	
1	Installation Quick Reference Guide	
1	Mounting Template (located on the last page of the *Installation Quick Reference*)	
1	Mounting Kit (part #070057A) which includes: (2) #4-6 x 7/8" Mounting Anchors (2) #4 x 1-1/4" Round Phillips Wood Screws	
2	#4-6 x 7/8" Mounting Anchors	

Table 2-1. Parts List (continued)

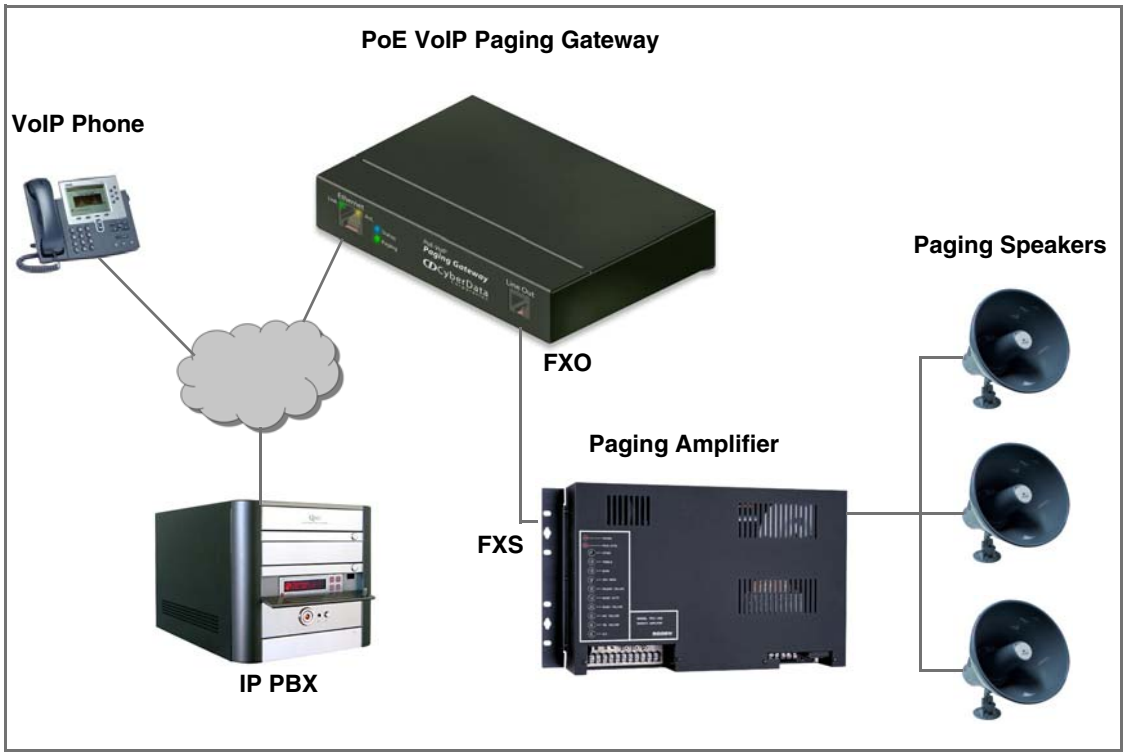
Quantity	Part Name	Illustration
2	#4 x 1-1/4" Round Phillips Wood Screws	

2.2 Typical Installation

Figure 2-1 illustrates how the VoIP Paging Gateway is normally installed as part of a paging system:

- When you call to make a page, the VoIP Paging Gateway generates a tone over the phone.
- When you hear this tone, enter the two-digit code for the zone that you want to page.
- The VoIP Paging Gateway sends the code to the paging amplifier.
- When the paging amp acknowleges the code, the VoIP Paging Gateway generates another tone to the phone.
- When you hear this tone, you can begin paging.

Figure 2-1. Typical Installation



2.3 Setting up the VoIP Paging Gateway

Before you set up the VoIP Paging Gateway, be sure that you have received all the parts described in Section 2.1, "Parts list".

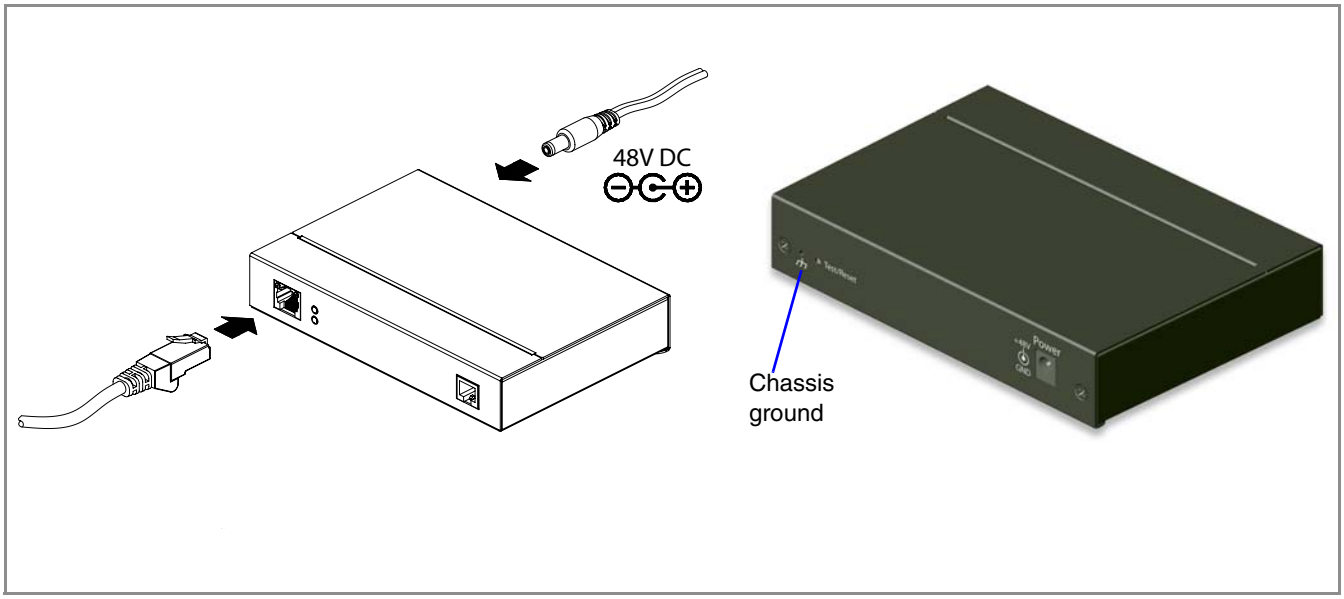
To set up the VoIP Paging Gateway:

- Connect to the Power Source
- Connect to the Network
- Confirm that the VoIP Paging Gateway is up and running
  - Confirm Power on, Network Connectivity, and Baud Rate
  - Verify Network Activity
- Connect to a Paging Device
  - Connect the VoIP Paging Gateway to a Paging Amplifier
  - Connect the VoIP Paging Gateway to a Telephone
- Broadcast a test message to all paging zones
- Restore the Factory Default Settings as Required

2.3.1 Connect to the Power Source

To use PoE, plug a Cat 5 Ethernet cable from the VoIP Paging Gateway **Ethernet** port to your network. As an alternative to PoE, you can plug one end of a +48V DC power supply into the Paging Gateway, and plug the other end into a receptacle. Connect the earth grounding wire to the chassis ground on the back of the unit.

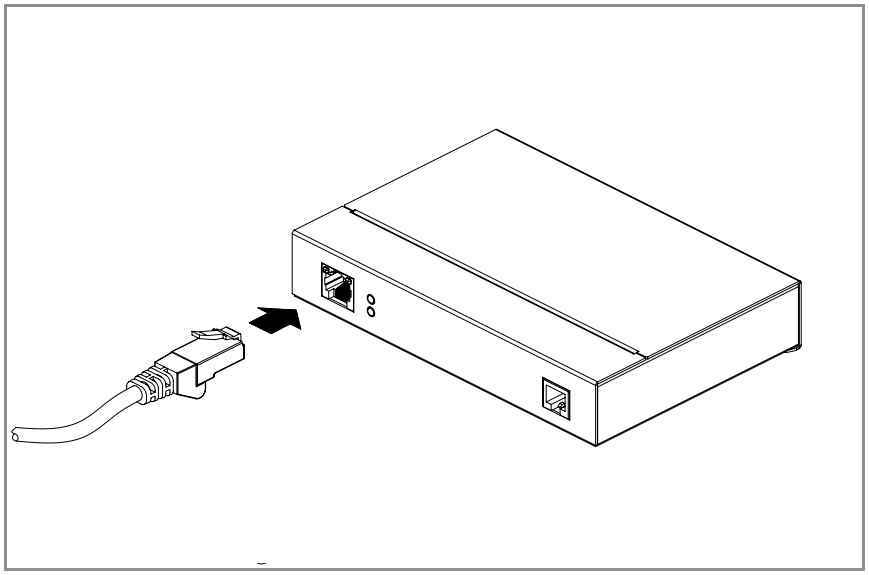
Figure 2-2. Connecting to the Power Source



2.3.2 Connect to the Network

Plug one end of a standard Ethernet cable into the Paging Gateway **Ethernet** port. Plug the other end into your network.

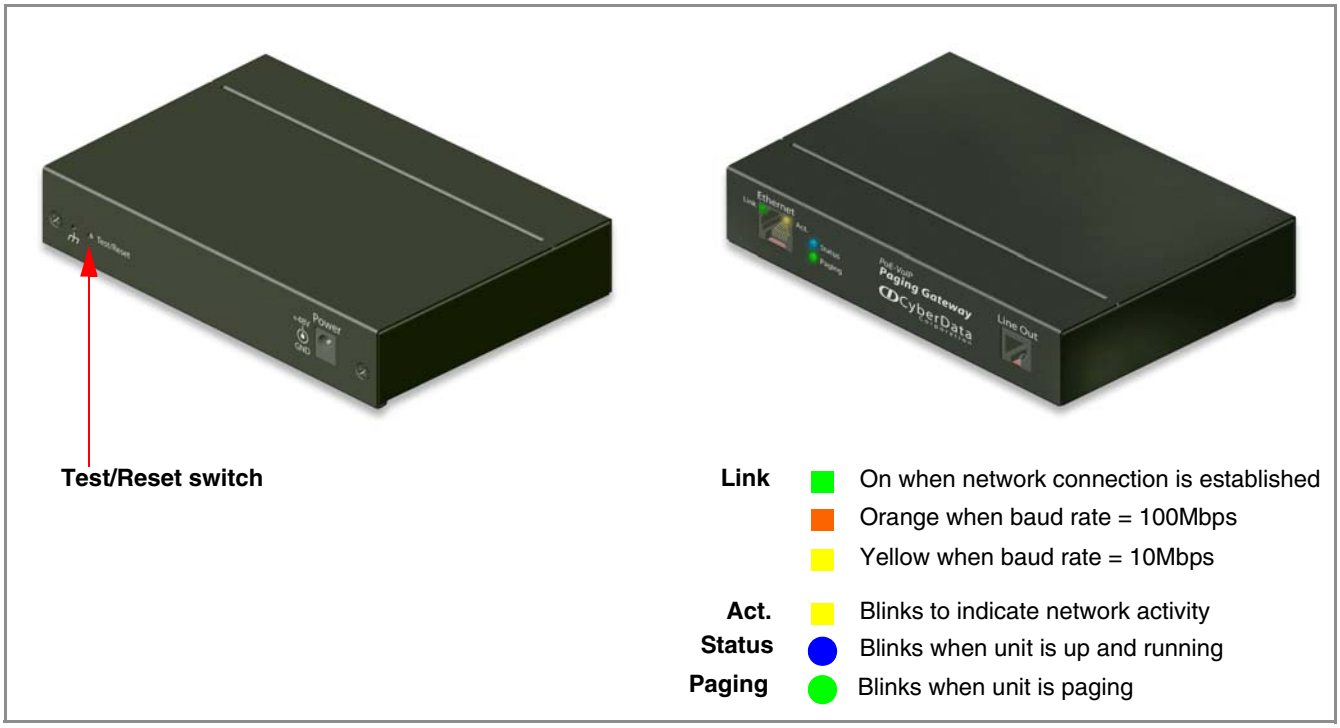
Figure 2-3. Connecting to the Network



2.3.3 Confirm that the VoIP Paging Gateway is up and running

The indicator lights on the front of the VoIP Paging Gateway verify the unit's operations.

Figure 2-4. Paging Gateway Indicator Lights



2.3.3.1 Confirm Power on, Network Connectivity, and Baud Rate

When you plug in the Ethernet cable or power supply:

- The round, blue **Status** light on the front of the VoIP Paging Gateway comes on indicating that the power is on. Once the device has been initialized, this light blinks at one second intervals.
- The square, green **Link** light above the Ethernet port indicates that the network connection has been established. The Link light changes color to confirm the auto-negotiated baud rate:
  - This light is yellow at 10 Mbps.
  - It is orange at 100 Mbps.
- The green **Paging** light comes on after the device is booted and initialized. This light blinks when a page is in progress.

2.3.3.2 Verify Network Activity

The square, yellow **Act** light blinks when there is network activity.

2.3.4 Connect to a Paging Device

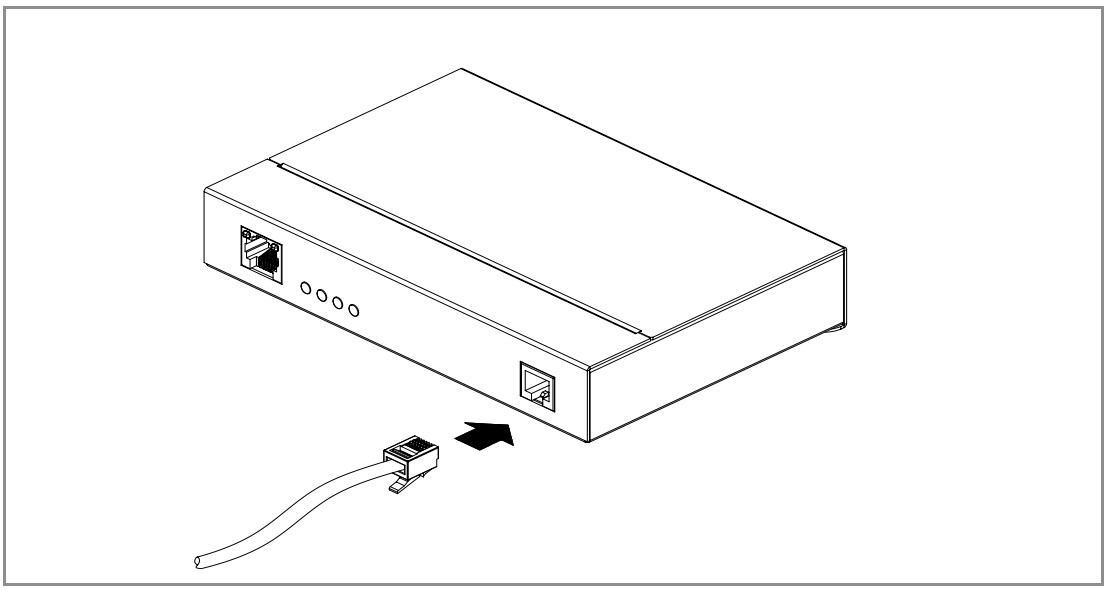
You can broadcast test messages via two different paging devices:

- A paging amplifier, which you use for normal paging operations, broadcasts the test message to the speakers in a specified paging zone. To do so, you need to first Connect the VoIP Paging Gateway to a Paging Amplifier.
- Via a Plain Old Telephone (POT), which broadcasts the test message to you over the phone. First, Connect the VoIP Paging Gateway to a Telephone.

2.3.4.1 Connect the VoIP Paging Gateway to a Paging Amplifier

Plug one end of a modular telephone cord into the Paging Gateway **Line Out** port. Plug the other end into your paging amplifier.

Figure 2-5. Connecting to a Paging Amplifier



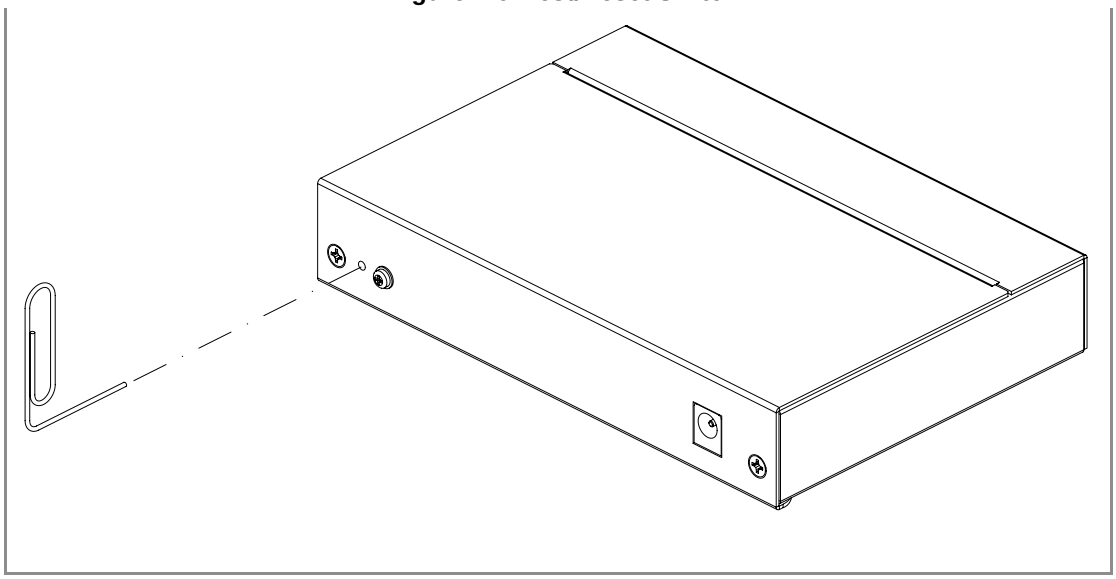
2.3.4.2 Connect the VoIP Paging Gateway to a Telephone

Plug one end of a modular telephone cord into the Paging Gateway **Line Out** port. Plug the other end into a touch tone telephone.

2.3.5 Broadcast a test message to all paging zones

The **Test/Reset** switch is located on the back of the VoIP Paging Gateway. It enables testing to all paging zones, and lets you restore the VoIP Paging Gateway to its factory default settings.

Figure 2-6. Test/Reset Switch



Once the VoIP Paging Gateway is running and connected to a paging device, use the **Test/Reset** switch to broadcast a test message to all zones in the paging system.

Note When the VoIP Paging Gateway has been configured and connected to a paging device, you can also broadcast a test message to a paging zone that you specify. Refer to Section 2.4.5, "Broadcast a Test Message to a Specific Paging Zone"

To use the Test/Reset switch to broadcast a test message to *all* zones:

1. Press the end of a paper clip into the switch only until it beeps after one second.
2. *Immediately* release the switch. The VoIP Paging Gateway sends the audio message, via the paging amplifier, to zone 00, which is the code for all zones, and the test message is broadcast to all enabled paging zones. The round, green **Paging** light below the Status light blinks when the page is in progress.

CAUTION Pressing the Test/Reset switch for longer than one second might restore the VoIP Paging Gateway settings to the factory defaults.

2.3.6 Restore the Factory Default Settings as Required

The VoIP Paging Gateway is delivered with factory set default values for the following parameters. Use the **Test/Reset** switch on the back of the unit to restore these parameters to the factory default settings. See Figure 2.3.5 for an illustration.

Note When you perform this procedure, the factory default settings are restored for *all* the following parameters.

Parameter	Factory Default Setting
IP Addressing	static
IP Address	192.168.3.10
Username	admin

Parameter	Factory Default Setting
Password	admin
Subnet Mask	255.255.255.0
Default Gateway	192.168.3.1

To restore these parameters to the factory default settings:

1. Press and hold the **Test/Reset** switch while the unit beeps after one second and all indicator lights on the front of the unit come on.
2. Continue to press the switch until after the indicator lights go off, and then release it.

- The VoIP Paging Gateway settings are restored to the factory defaults.
- The unit announces the restored default IP address:

  `192.168.3.10`

- Then, a voice message announces that the unit is rebooting.

2.4 Configuring the VoIP Paging Gateway

Perform the following steps to configure the VoIP Paging Gateway online:

- Gather the Required Configuration Information
- Log in to the Configuration GUI
- Configure the Network Parameters
- Change the Default Username and Password
- Configure the SiP Parameters

2.4.1 Gather the Required Configuration Information

Have the following information available before you configure the VoIP Paging Gateway.

2.4.1.1 Static or DHCP Addressing?

Know whether your system uses static or dynamic (DHCP) IP addressing. If it uses static addressing, you also need to know the values to assign to the following VoIP Paging Gateway parameters:

- IP Address
- Subnet Mask
- Default Gateway

2.4.1.2 Username and Password for Configuration GUI

Determine the Username and Password that will replace the defaults after you initially log in to the configuration GUI.

- The Username is case-sensitive, and must be from four to 25 alphanumeric characters long
- The Password is case-sensitive, and must be from four to 20 alphanumeric characters long

2.4.1.3 Zone Numbers for Testing Purposes

To audio test the VoIP Paging Gateway you need to enter the zone number you are testing. Be sure to have this information on hand so that you can audio test the gateway with each paging zone.

2.4.1.4 SIP Settings

To configure the SIP parameters, determine whether you want to register the server. If you do, determine the number of minutes the registration lease remains valid, and whether you want to automatically unregister when you reboot. To configure the SIP parameters, you also need to determine the values for these parameters:

- SIP Server IP Address
- Remote and Local SIP Port Numbers
- SIP User ID, and Authenticate ID and Password for this User ID

2.4.2 Log in to the Configuration GUI

To log in:

1. For the initial configuration of the VoIP Paging Gateway, open your browser and enter the following address:

   `http://192.168.3.10`

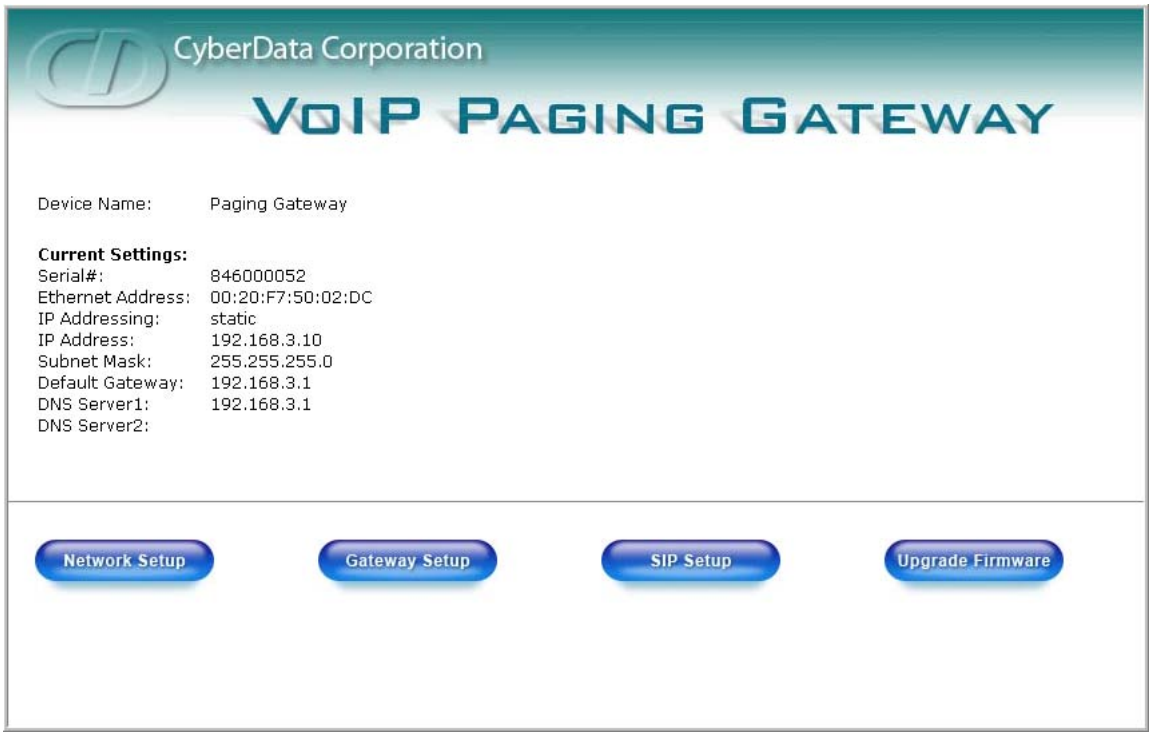
Note To work with the VoIP Paging Gateway configuration *after* the initial configuration, log in using the IP address you assign to the device. Section 2.4.3, "Configure the Network Parameters" provides instructions for entering the IP address.

2. When prompted, use the following default **Username** and **Password** to open the configuration Home page:

   Username: **admin**

   Password: **admin**

Figure 2-7. Home Page

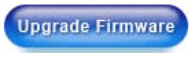


3. On the **Home Page**, review the setup details and navigation buttons described in Table 2-1.

Table 2-1. Home Page Overview

Web Page Item	Description
Device Name	Shows the device name.
Serial #	Device serial number.
Ethernet Address	Device ethernet address.

Table 2-1. Home Page Overview

Web Page Item	Description
IP Addressing	Shows the current IP addressing setting (**DHCP** or **static**).
IP Address	Shows the current IP address.
Subnet Mask	Shows the current subnet mask address.
Default Gateway	Shows the current default gateway address.
	Link to the **Network Setup** web page.
	Link to the **Gateway Setup** web page.
	Link to the **SIP Setup** web page.
	Link to the **Upgrade Firmware** web page.

At this point you can:

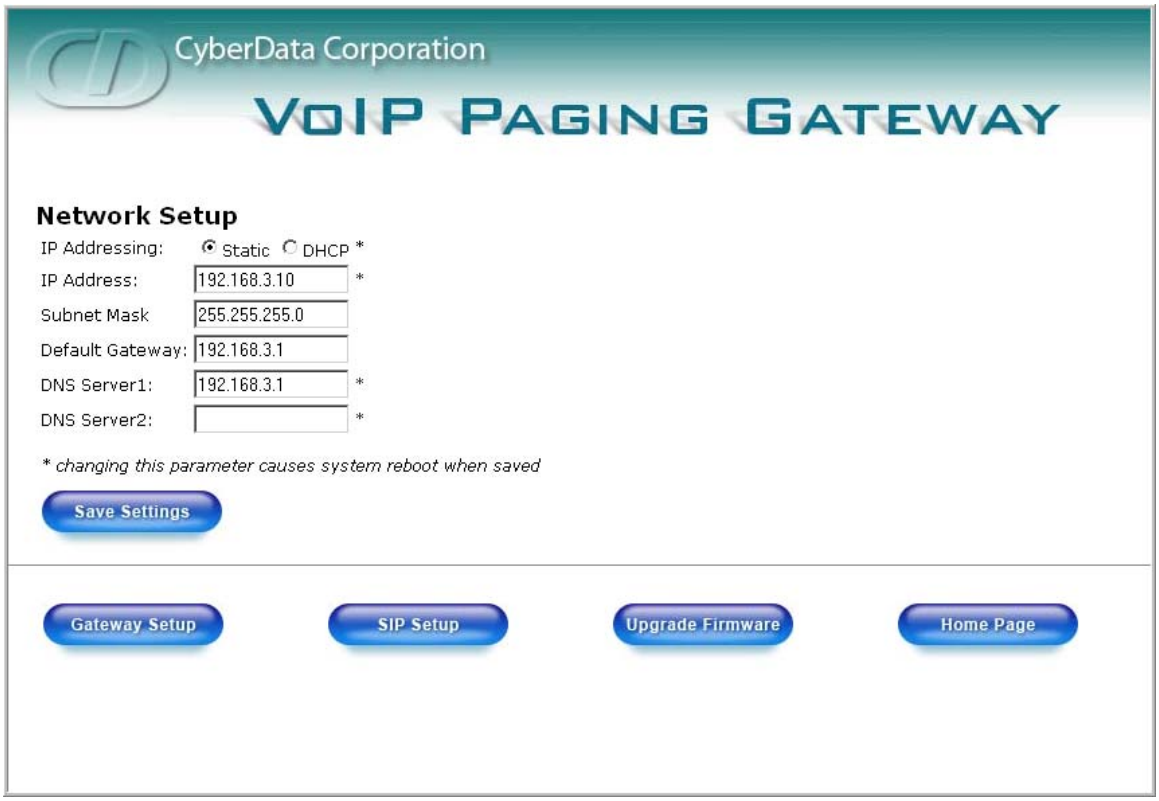
- Review the VoIP Paging Gateway's **Current Settings**. Use the Test/Reset switch toRestore the Factory Default Settings as Required. Refer to page 10.
- Configure the network parameters. Click **Network Setup** and refer to Section 2.4.3, "Configure the Network Parameters" for instructions.
- Configure the VoIP Paging Gateway parameters. Click **Gateway Setup** and refer to Section 2.4.4, "Change the Default Username and Password" for instructions.
- Configure the SIP parameters. Click **SIP Setup** and see Section 2.4.6, "Configure the SiP Parameters".

Note Click the **Upgrade Firmware** button any time you need to upload new versions of the firmware or **Reboot** the VoIP Paging Gateway. Refer to Section 2.5, "Upgrading the Firmware" and Section 2.6, "Rebooting the VoIP Paging Gateway" for instructions.

2.4.3 Configure the Network Parameters

Configuring the network parameters enables your network to recognize the VoIP Paging Gateway and communicate with it. Click **Network Setup** on the Home page to open the **Network Configuration** page.

Figure 2-8. Network Setup Page



4. On the **Network Setup** page, enter values for the parameters indicated in Table 2-2.

Table 2-2. Network Setup Parameters

Web Page Item	Description
IP Addressing*	Select either **DHCP IP Addressing** or **Static IP Addressing** by marking the appropriate radio button. If you select **Static**, configure the remaining parameters indicated in Table 2-2. If you select **DHCP**, go to Step 3.
IP Address*	Enter the Static IP address.
Subnet Mask	Enter the Subnet Mask address.
Default Gateway	Enter the Default Gateway address.
DNS Server 1*	Enter the DNS Server 1 address.
DNS Server 2*	Enter the DNS Server 2 address.
Save Settings	Click on this button to save your configuration settings. Changing a parameter that has an asterisk next to it will cause a system reboot when saved.
Gateway Setup	Link to the **Gateway Setup** web page.
SIP Setup	Link to the **SIP Setup** web page.

Table 2-2. Network Setup Parameters (continued)

Web Page Item	Description
	Link to the **Upgrade Firmware** web page.
	Link to the **Home** page.

On this page:

1. Specify whether you use **Static** or **DHCP IP Addressing** by marking the appropriate radio button. Then, if you select Static, go to Step 2.

Note Changing the **IP Addressing** selection causes the system to reboot when click Save Settings.

2. For Static IP Addressing, also enter values for the following parameters:
   a. The VoIP Paging Gateway's **IP Address**: The VoIP Paging Gateway is delivered with a factory default IP address. Change the default address to the correct IP address for your system.

Note Changing the VoIP Paging Gateway's **IP Address** causes the system to reboot when you click Save Settings.

   b. The **Subnet Mask.**
   c. The **Default Gateway.**

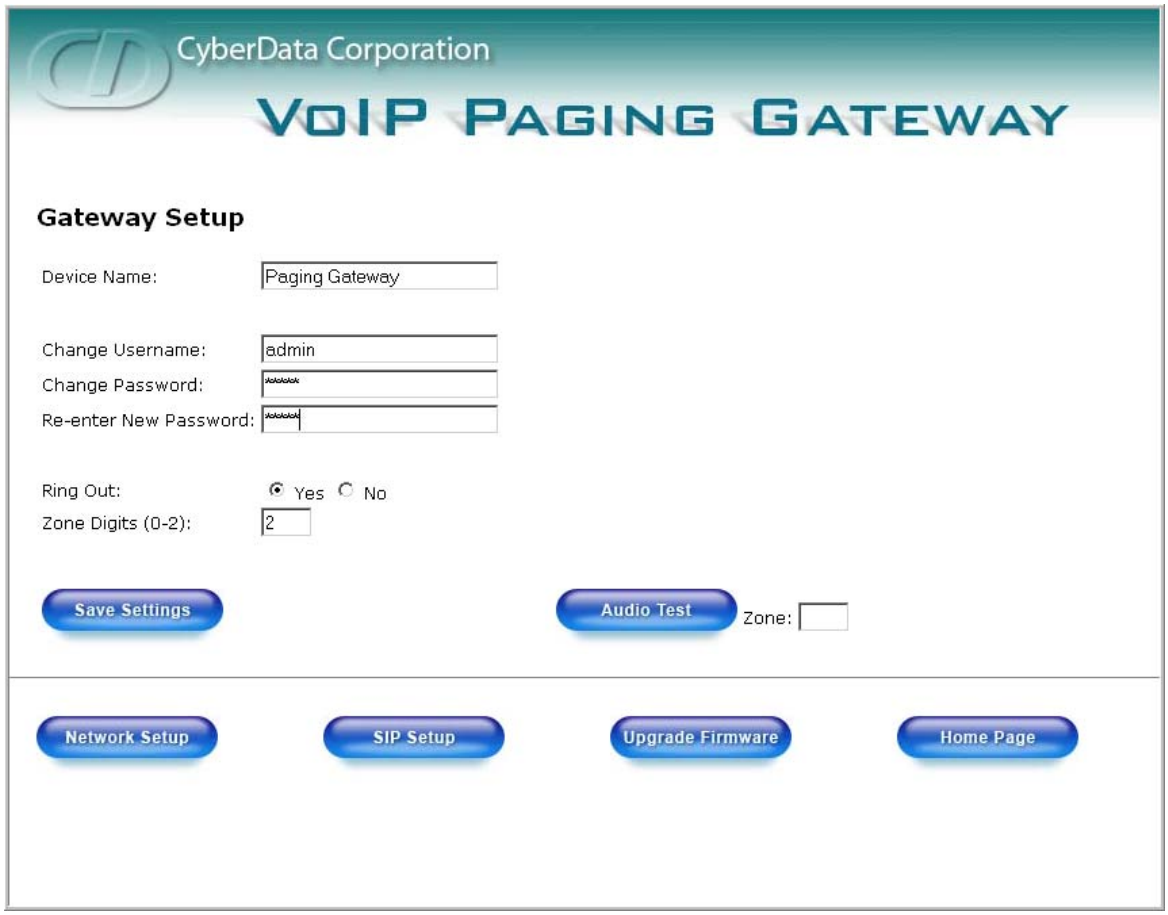
3. Click **Save Settings** when you finish.

2.4.4 Change the Default Username and Password

On the Home page, click **Gateway Setup** to open the **Gateway Configuration** page. After changing the Username and Password on this page, new browser requests require you to log in using these new parameters.

Note You can also run an audio test from this page, as described in Section 2.4.5, "Broadcast a Test Message to a Specific Paging Zone".

Figure 2-9. Gateway Configuration Page



4. On the **Gateway Setup** page, enter values for the parameters indicated in Table 2-3.

Table 2-3. Gateway Setup Parameters

Web Page Item	Description
Device Name	Enter the name of the device.
Change Web Access Username	Use this field to change the Web Access Username
Change Web Access Password	Use this field to change the Web Access Password
Re-enter New Password	Use this field to re-enter a new password
Ring Out	This selects the option for the gateway to either provide a ring to the attached device or to connect without ringing. Select Yes or No whether you want to enable the Ring.
Zone Digits (0-2)	Selecting **0** Zone digits enables the caller to connect directly to the attached device without having to enter in a DTMF tone. Selecting either **1** or **2** digits forces the entry of the DTMF tones.
Zone	Enter the Zone number to be tested.
Save Settings	Click on this button to save your configuration settings. Changing a parameter that has an asterisk next to it will cause a system reboot when saved.

Table 2-3. Gateway Setup Parameters (continued)

Web Page Item	Description
	Click on this button to do an audio test. Generates a voice message for testing the speaker audio quality and volume.
	Link to the **Network Setup** web page.
	Link to the **SIP Setup** web page.
	Link to the **Upgrade Firmware** web page.
	Link to the **Home** page.

To change the default Web access Username and Password:

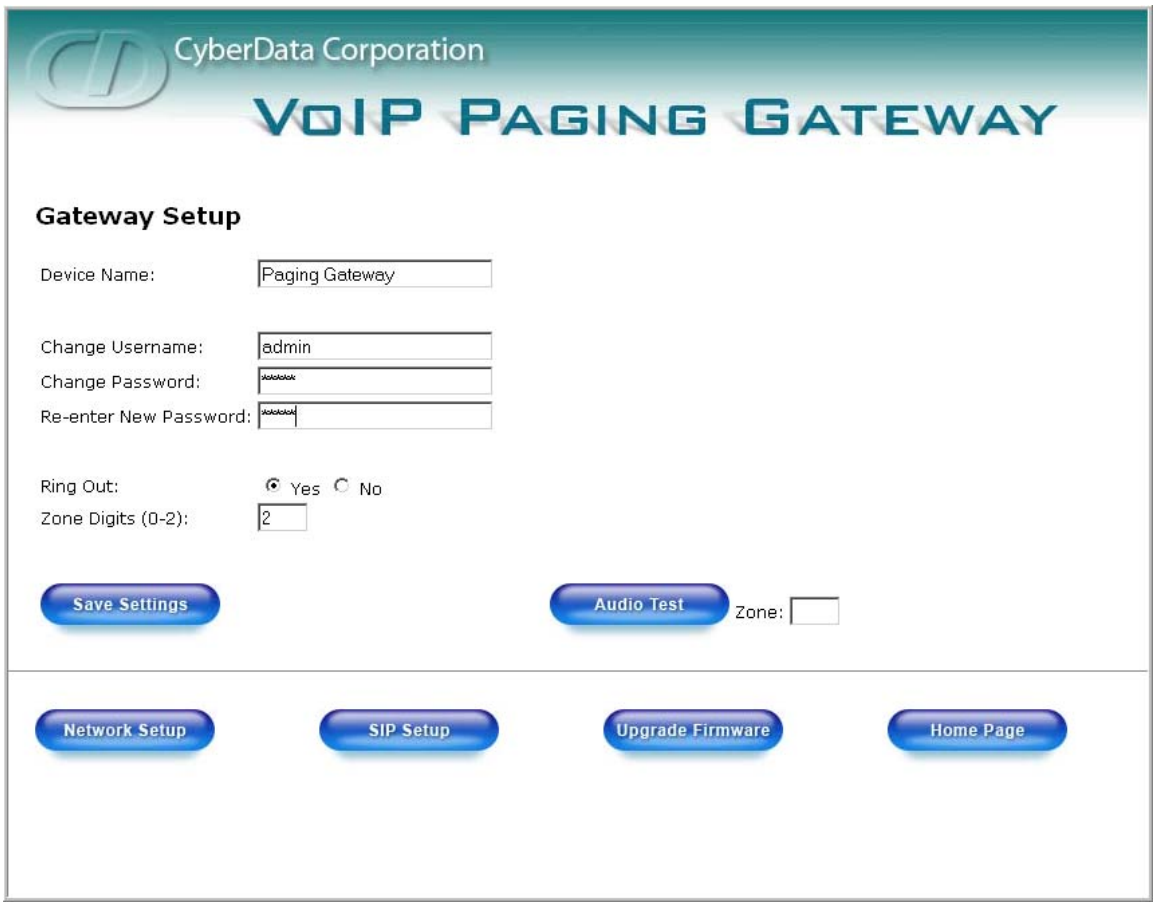
1. Enter the new Username from four to 25 alphanumeric characters in the **Change Username** field. The Username is case-sensitive.
2. Enter the new Password from four to 20 alphanumeric characters in the **Change Password** field. The Password is case-sensitive.
3. Enter the new password again in the **Re-enter New Password** field.
4. Click **Save Settings**.

2.4.5 Broadcast a Test Message to a Specific Paging Zone

Once the VoIP Paging Gateway is set up and configured, you can broadcast test messages to different paging zones that you specify. On the Home page, click **Gateway Setup** to open the **Gateway Configuration** page.

Note You can broadcast a test message to *all* paging zones using the **Test/Reset** switch on the back of the VoIP Paging Gateway.Refer to Section 2.3.5, "Broadcast a test message to all paging zones" for instructions.

Figure 2-10. Gateway Configuration Page



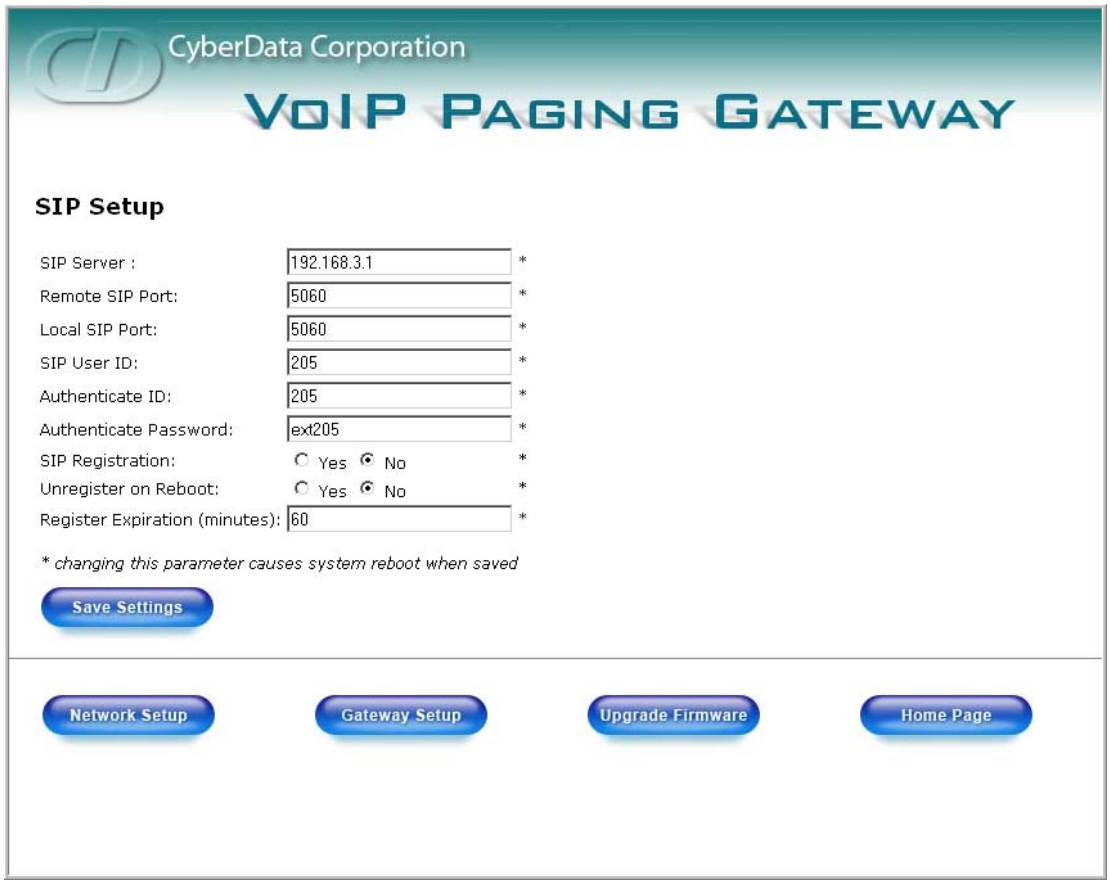
To broadcast a test message to a specific paging zone.

1. Enter the paging **Zone** you want to test.
2. Click **Audio Test**. The VoIP Paging Gateway sends a brief audio message to that zone. Notice that the round, green **Paging** light below the Status light blinks when a page is in progress

2.4.6 Configure the SiP Parameters

The SIP parameters enable the VoIP Paging Gateway to contact and register with the SIP server. On the Home page, click **SIP Setup** to open the **SIP Configuration** page.

Figure 2-11. SIP Configuration Page

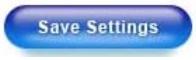


3. On the **SIP Setup** page, enter values for the parameters indicated in Table 2-4.

Table 2-4. SIP Setup Parameters

Web Page Item	Description
SIP Server*	Enter the SIP server represented as either a numeric IP address in dotted decimal notation or the fully qualified host name (FQHN) up to 64 characters.
Remote SIP Port*	Enter the **Remote SIP Port** number (default is 5060).
Local SIP Port*	Enter the **Local SIP Port** number (default is 5060).
SIP User ID*	Enter the **SIP User ID** (up to 25 alphanumeric characters).
Authenticate ID*	Enter the **Authenticate ID** (up to 25 alphanumeric characters).
Authenticate Password*	Enter the **Authenticate Password** (up to 25 alphanumeric characters).
SIP Registration*	Enable/Disable SIP Registration.
Unregister on Reboot*	• Select **Yes** to automatically unregister the speaker when it is rebooted. • Select **No** to keep the speaker registered when it is rebooted.
Register Expiration*	Enter the SIP Registration lease time in minutes (default is 60 minutes).

Table 2-4. SIP Setup Parameters (continued)

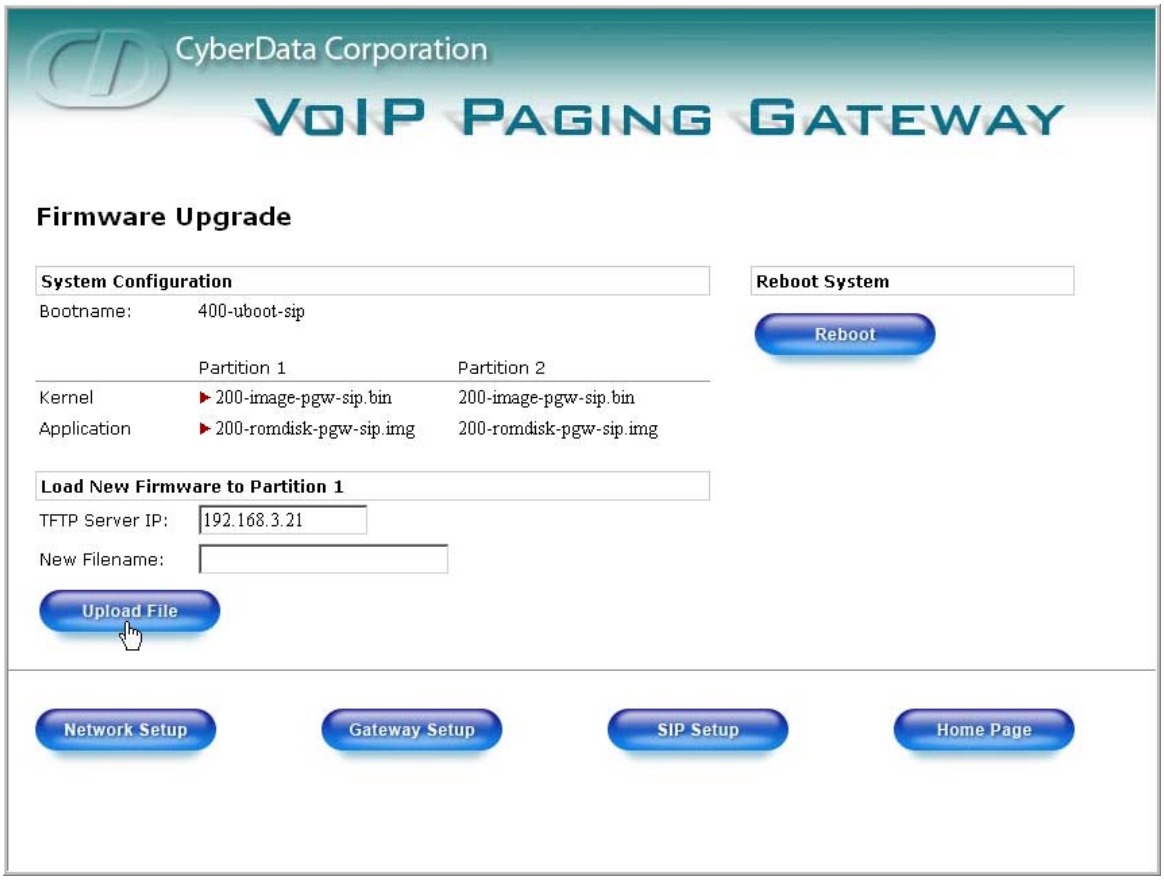
Web Page Item	Description
	Click on this button to save your configuration settings. Changing a parameter that has an asterisk next to it will cause a system reboot when saved.
	Link to the **Network Setup** web page.
	Link to the **Gateway Setup** web page.
	Link to the **Upgrade Firmware** web page.
	Link to the **Home** page.

1. Enter the IP address of the **SIP Server**.
2. Enter the port numbers used for SIP signaling:
   a. **Remote SIP Port**
   b. **Local SIP Port**
3. Enter the SIP registration parameters:
   a. **SIP User ID**
   b. **Authenticate ID**
   c. **Authenticate Password**
4. For **SIP Registration**, designate whether you want the IP Gateway to register with your SIP server.
5. At **Unregister on Reboot**:
   a. Select **Yes** to automatically unregister the VoIP Paging Gateway when you reboot it. Section 2.6, "Rebooting the VoIP Paging Gateway" provides instructions on that process.
   b. Select **No** to keep the VoIP Paging Gateway registered when you reboot it.
6. In the **Register Expiration** field, enter the number of minutes the VoIP Paging Gateway registration lease remains valid with the SIP Server. The VoIP Paging Gateway automatically re-registers with the SIP server before the lease expiration timeout.

2.5 Upgrading the Firmware

The firmware on the board consists of two files: a Kernel and an Application, that can be loaded separately. Uploading the firmware files requires a host machine running a TFTP server. If you need to set up this server, Appendix A, "Setting up a TFTP server" provides instructions.

Figure 2-12. Firmware Upgrade Page



To upload a firmware file, log in as instructed in Section 2.4.2, "Log in to the Configuration GUI". Table 2-5 shows the web page items on the **Firmware Upgrade** page.

Table 2-5. Firmware Upgrade Parameters

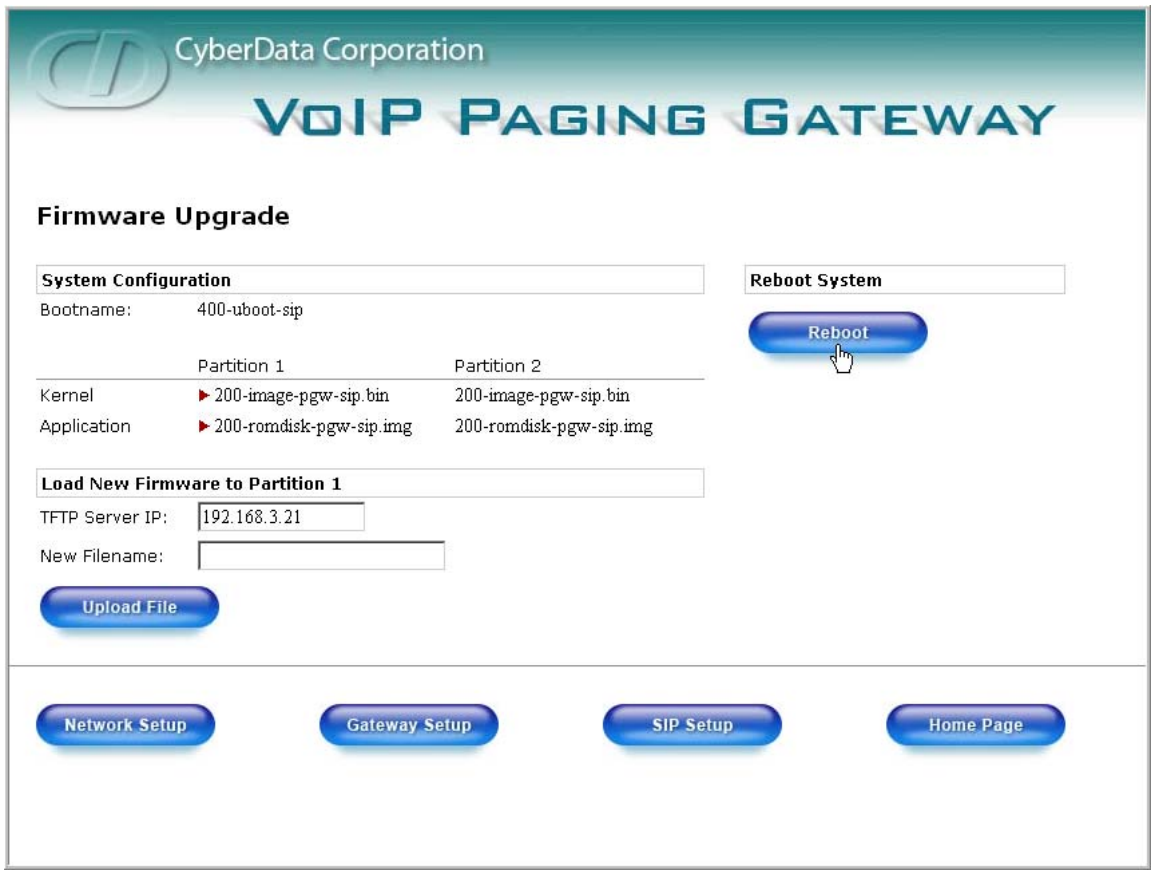
Web Page Item	Description
System Configuration	Shows the current configuration.
Bootname	Shows the current boot loader filename.
Kernel	Shows the current kernel filename for partition 1 and 2.
Application	Shows the current application filename for partition 1 and 2.
TFTP Server IP address	Enter the TFTP Server IP address.
New Filename	Use this field to enter the new file name for the kernel or application firmware file that you are uploading.
	Click on this button to automatically upload the selected firmware and reboot the system.
	Link to the **Network Setup** web page.
	Link to the **Gateway Setup** web page.
	Link to the **SIP Setup** web page.
	Link to the **Home** page.
	Click on this button to reboot the system.

1. On the Home page, click **Upgrade Firmware** to open the **Firmware Upgrade** page.
2. Enter the **TFTP Server IP** address.
3. Enter the Kernel or Application **New Filename** for the firmware file you are uploading.
4. Select the **Partition** to which the firmware is uploaded.
5. Click **Upload File** to automatically upload the selected firmware, and reboot your system.

2.6 Rebooting the VoIP Paging Gateway

To reboot the system, log in as instructed in Section 2.4.2, "Log in to the Configuration GUI".

Figure 2-13. .Firmware Upgrade Page



1. On the Home page, click **Upgrade Firmware** to open the **Firmware Upgrade** page. Go to the **Reboot** section on the right side of the page.
2. Select **Partition 1** or **Partition 2** for the **Kernel** *and* the **Application**.
3. Click **Reboot**.

Appendix A: Setting Up a TFTP Server

Upgrading the firmware requires a TFTP server on which you access the Web interface where you upload the firmware files.

A.1 Set up a TFTP Server

Upgrading the VoIP Paging Server firmware requires a TFTP server on which you access the Web interface where you can upload the firmware files.

A.1.1 In a LINUX Environment

To set up a TFTP server on LINUX:

1. Create a directory dedicated to the TFTP server, and move the files to be uploaded to that directory.
2. Run the following command where `/tftpboot/` is the path to the directory you created in Step 1: the directory that contains the files to be uploaded. For example:

   `in.tftpd -l -s /tftpboot/your_directory_name`

A.1.2 In a Windows Environment

You can find several options online for setting up a Windows TFTP server. This example explains how to use the Solarwinds freeware TFTP server, which you can download at:

`http://www.CyberData.net/support/voip`

To set up a TFTP server on Windows:

1. Install and start the software.
2. Select **File/Configure/Security** tab/**Transmit Only**.
3. Make a note of the default directory name, and then move the firmware files to be uploaded to that directory.
4. You can find several options online for setting up a Solarwinds server. This example explains how to use the Solarwinds freeware TFTP server, which you can download at:

   `http://www.CyberData.net/support/voip`

Appendix B: Troubleshooting/Technical Support

B.1 Frequently Asked Questions (FAQ)

Go to the following URL to see CyberData's list of frequently asked questions:

http://www.cyberdata.net/support/voip/paginggateway.html

B.1.1 Documentation

The documentation for this product is released in an English language version only. You can download PDF copies of CyberData product documentation at:

www.CyberData.net—>Support—>Drivers, Utilities & Manuals—>Product Drivers & Documentation—>VoIP Paging Gateway

B.2 Contact Information

Contact	CyberData Corporation 2555 Garden Road Monterey, CA 93940 USA www.CyberData.net Phone: 800-CYBERDATA (800-292-3732) Fax: 831-373-4193
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Technical Support	Phone: 831-373-2601 Extension 333 Email: support@CyberData.net
Returned Materials Authorization	To return the product, contact the CyberData Returned Materials Authorization (RMA) department at: Phone: 831-373-2601, Extension 136 Email: RMA@CyberData.net When returning a product to CyberData, an approved CyberData RMA number must be printed on the outside of the original shipping package. No product will be accepted for return without an approved RMA number. Send the product, in its original package, to the following address: CyberData Corporation 2555 Garden Road Monterey, CA 93940 Attention: RMA "your RMA number"

B.3 Warranty

CyberData warrants its product against defects in material or workmanship for a period of two years from the date of purchase. Should the product fail within the warranty period, CyberData will repair or replace the product free of charge. This warranty includes all parts and labor.

If the product is out-of-warranty and fails, a flat rate repair charge of one half the product purchase price will be assessed. Repair costs for products that are in warranty, but damaged by improper modifications or abuse, will be charged at the out-of-warranty rate. Products returned to CyberData, both in and out-of-warranty, are shipped to CyberData at the expense of the customer. Charges for shipping repaired products back to the customer will be paid by CyberData.

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