Initial Setup Guide

BSGX4e
Business Gateway

NN47928-311
Software Release 2.1.1

BSGX4e 1.2
Business Services Gateway

Document Status: **Standard**

Document Version: **01.01**

Document Number: **NN47928-311**

Date: **July 2008**

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1 INTRODUCTION AND PREPARATION

Hardware notice

WARNING: Before working on this equipment, be aware of good safety practices and the hazards involved with electrical circuits.

WARNING: To reduce risk of injury, fire hazard, and electric shock, do not install the unit near a damp location.

CAUTION: Do not connect the PHONE port to the central office line.

CAUTION: To reduce the risk of fire, use only number 26 AWG or larger UL Listed or CSA Certified telecommunication line cord for all network and telecommunication connections.

Introduction

This Initial Setup Guide provides explanations and instruction details for using the Initial Setup Wizard in the BSGX4e. The Initial Setup Wizard guides you through a series of steps that configure the basic functions of the BSGX4e so that it is ready for operation.

The comprehensive configuration tool for the BSGX4e is the Web User Interface (Web UI). To access the Initial Setup Wizard you logon to the Web UI. The Web UI is highly detailed and is designed for technicians and engineers. The Initial Setup Wizard performs a simplified configuration process using the most common configuration parameters.

This document applies to the BSGX4e model in a home or small office environment and assumes you are connecting primarily SIP phones (for VoIP service) and PCs to your BSGX4e.

The BSGX4e has an Ethernet interface for connecting to the Internet. This interface is suitable for connecting to Digital Subscriber Line (DSL) and Cable modems.

The BSGX4e is a stand-alone box designed to sit on a desktop.

The following BSGX4e models are also available.

- The 210 model has an Asymmetric Digital Subscriber Line (ADSL) interface for connecting to the Digital Subscriber Line Access Multiplexer (DSLAM) of a service provider, which is a central office switch for DSL service. This model has a DSL modem built in to the WAN connector.
- The BSGX4e has a T1/E1 interface for connecting to a T1/E1 link of a service provider.

Who should use the Initial Setup Wizard?

The BSGX4e is typically installed by professional technicians in a corporate setting using the Web UI or the command line utility. However, the Initial Setup Wizard is designed to allow a less-technical user to perform a self-installation in a small office or home setting.

You are expected to have computer experience such as installing programs and connecting hardware devices.

Technicians: If you use this wizard, be aware that it sets many parameter defaults in the background. You must use the Web UI to change their values as needed.

What is the BSGX4e?

BSGX4e is a powerful device that delivers Unified Communications to your office.

- What is a gateway device?

  In general, a gateway is an Internet device that connects one network to another. In this case, it is connecting your office to the Internet, or perhaps to another office.

  Connecting two networks involves several different functions. BSGX4e handles them all in one device rather than having several different boxes with each handling one function.
- What is unified communications?

  Unified communications is a popular term to describe the convergence of various communications technologies in one device. As applied to BSGX4e, this refers to voice, video, and data communications.

What does the Initial Setup Wizard do?

You can use the Initial Setup Wizard to:

- Change the administrator password from the factory default password.
- Assign a name to the unit and select the country of operation.
- Set the date and time for the system clock.
- Configure the Internet interface in accordance with the specifications of your service provider's network.
- Configure the local network interface. The phones, computers, and fax machines that you connect to the BSGX4e constitute your local network.
- Configure the Quality of Service (QoS) feature. QoS guarantees bandwidth for critical functions when your Internet connection is at full capacity. With QoS you can use Voice over Internet Protocol (VOIP) telephones without the call being disrupted.
- Configure the VoIP feature in accordance with the specifications of your VoIP service provider.

Getting started

At this point, you are ready to make the initial cabling connections and then begin the configuration process. The Quick Start Guide and the Installation Guide contain a lot of technical information, but they are intended primarily for technicians.

This document provides summarized installation information specifically for a home or small office, self-install user. Use the Quick Start Guide and Installation Guide as references while reading this document.

Cables

You must supply the network cables needed for the BSGX4e installation. The BSGX4e uses commonly available cables that you can find at most consumer electronic stores.

Look at the connection diagrams in Figure 1 and Figure 2 that apply to your model of the BSGX4e. Decide on where to place the BSGX4e box and determine the length of cables needed to your Internet connection, and to any devices that you connect to the BSGX4e. After determining these lengths, you must acquire the cables listed in the following table.

Table 1 BSGX4e Cables

BSGX4e connector	Cable Type/ connector Type	Notes
WAN	Ethernet / RJ-45 plug Both ends	Use CAT-5E or better cables. The cables can be straight-thru or cross-over.
1 2 3 4	Ethernet / RJ-45 plug Both ends	Use CAT-5E or better cables. The cables can be straight-thru or cross-over.
LINE	Telephone / RJ-11 plug Both ends	Standard 2-wire telephone cable.

Nortel recommends that you connect the cable from the LINE port to the phone wall jack, although this is optional. You connect the cable from the LINE port to the phone wall jack to provide backup phone service through the traditional telephone line when your Internet connections goes down, or when the VoIP servers are not available. The LINE port is also used for all 911 calls.

Figure 1 BSGX4e internet-side connection diagram

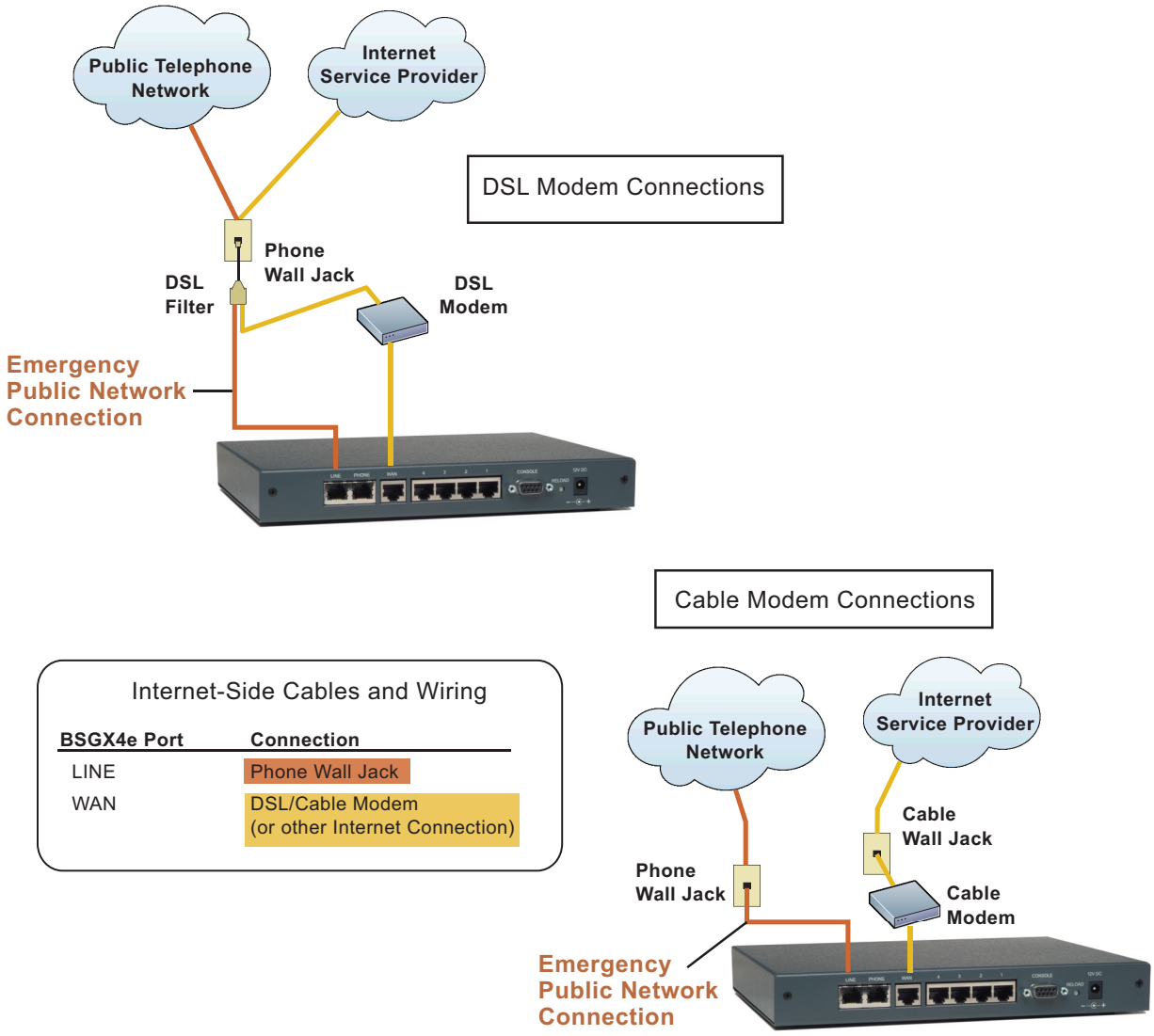
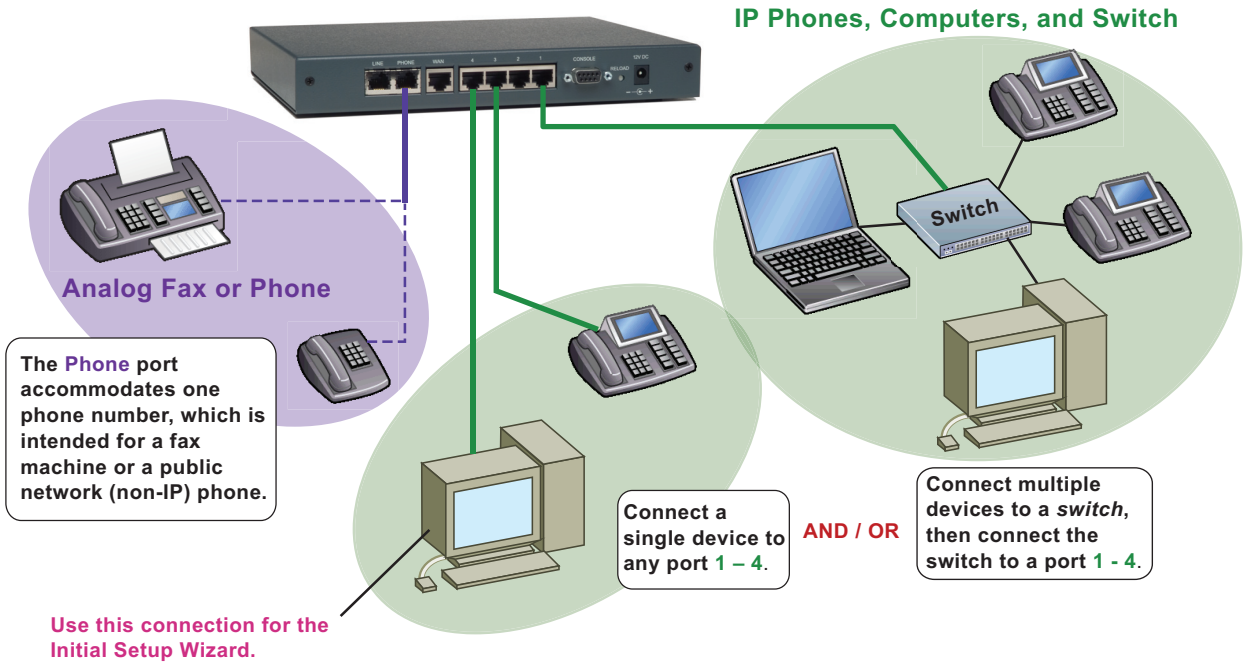


Figure 2 BSGX4e Local Network Connection Diagram



Local Network Cables and Wiring

BSGX4e Port	Connection
PHONE	Analog Fax or Phone
1 – 4	IP Phones, Computers and other Intenet Devices
CONSOLE	Command Line Terminal (used by technicians)

Preliminary Information

When you enter data into the Initial Setup Wizard, you are asked for various Internet addresses and other technical data for your service account. Table 2 shows the information you need. Gather this information before proceeding with the configuration process. Most of this information is available from your service provider and probably was received with your account information.

For frequently used acronyms and terms, see Terminology on page 12 .

Table 2 Preliminary Configuration Data

Wizard Page	Page Field	Description
Time and Date	SNTP IP/FQDN	Simple Network Time Protocol is a server on the Internet that provides a time signal to your BSGX4e. Does your service provider offer an SNTP service? If not, you can set the time manually.
Time and Date	GMT Offset	If you use an SNTP server, you must tell it how many hours you are away from Greenwich Mean Time. In the U.S., the East Coast is –5 (minus 5) hours from GMT and the West Coast is –8 hours.
WAN Interface Setup	PPP Variation include: • PPPoE • PPPoHDLC • PPPoATM	PPP is one type of protocol used for transporting data packets over the Internet. Most DSL connections use PPP, and it is also common with a T1 interface. If your account uses PPP, your service provider will supply a user name and password. A PPP account may also require a Self IP address, which is like the static IP address described in the following row.
LAN Interface Setup	IP Address Subnet Mask	By default, the BSGX4e automatically supplies this address and mask. This works for most situations so no further information is needed. If you are connecting a device to the BSGX4e that requires this address or mask be changed, seek professional advice. See more discussion on the LAN Interface Setup Page on page 24.
Quality of Service Setup	Upstream QoS Max Bandwidth Downstream QoS Line Rate	Your service provider states the bandwidth rate for the service account you have purchased. Ideally, they state an upstream and downstream rate separately. Having both of these rates helps QoS work more efficiently.
Voice over IP Setup	SIP Session Controller SIP Server	Your VoIP service provider will supply the needed addresses and logon information with your account.

Terminology

This section provides definitions for technical terms used in this guide.

Standard Internet Connection Parameters

When configuring the BSGX4e to connect to the Internet, or to connect to any devices you connect to ports 1–4, you are asked for the following common network parameters. Since these terms appear frequently in the Initial Setup Wizard, they are defined here for your information.

IP Address (self IP)	The network (IP) address of any device connected to a local network or the Internet. The format is `148.174.89.25`. Each of the four numbers in the address has a range of 0-255. See the IP listing in Acronyms and Abbreviations.
Subnet Mask (mask or netmask)	This mask helps Internet traffic route through networks and subnetworks, and defines the range of addresses that can be used when creating a subnetwork. The format is the same as an IP address, but typically ends with 0: `148.174.0.0`.
Gateway	A device that connects one network to another. This typically involves converting raw data into an IP protocol, or converting one protocol to another protocol.
DNS Server	A system for converting domain names into IP addresses. For example, `www.webpage.com` is translated to `142.178.15.12`.

Acronyms and Abbreviations

ADSL – Asymmetric Digital Subscriber Line is an Internet technology that uses the telephone line to transmit Internet data at broadband speeds. “Asymmetric” means the download speed is faster than the upload speed.

DHCP – Dynamic Host Configuration Protocol is a service that automatically assigns temporary IP addresses to network equipment.

DNS – Domain Name System is a service that converts host names and domain names into IP addresses. For example, a Web URL of `www.someplace.com` is translated to an IP address such as 140.178.12.56 on the Internet.

FQDN – A Fully Qualified Domain Name is similar to the common Web URL we all use for surfing the Web. Its format typically looks like `some.domain.com` or just `domain.com`.

IP (address) – Internet Protocol is commonly used in this document to indicate an address on the Internet. It consists of four numbers separated by periods. For example, 140.178.12.56. Each of these four number must be 0 through 255. Every device on the Internet (including the BSGX4e, computers, and IP phones) has an IP address.

A dynamic address is temporary and is assigned by a DHCP server.

A static address is permanent and is manually set in the device.

LAN – A Local Area Network is a technical term for a collection of PCs, IP phones, and other devices that you connect to BSGX4e’s 1–4 ports.

PPP – Point-to-Point Protocol is a popular network protocol for establishing a direct connection between your computer and your service provider. If PPP includes encapsulation schemes, the designation is, for example PPPoE or PPPoHDLC.

PVC – A Permanent Virtual Circuit establishes a permanent, long-term connection directly between your BSGX4e and another network device, such as a switch or server. A PVC has to be ordered from your service provider.

SIP – Session Initiation Protocol is the most popular protocol used with VoIP. The phones you use with the BSGX4e are likely marked as “SIP phones.”

VoIP – Voice over Internet Protocol is a digital telephone service that uses the public Internet instead of the traditional analog telephone network.

WAN – A Wide Area Network is a technical term for the network of servers and other devices on the Internet with which you will connect.

How to get help

This section explains how to get help for Nortel products and services.

Getting help from the Nortel Web site

The best way to get technical support for Nortel products is from the Nortel Technical Support Web site:

www.nortel.com/support

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. More specifically, the site enables you to:

- download software, documentation, and product bulletins
- search the Technical Support Web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

Getting help over the phone from a Nortel Solutions Center

If you do not find the information you require on the Nortel Technical Support Web site, and have a Nortel support contract, you also get help over the phone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following web site to obtain the phone number for your region:

www.nortel.com/callus

Getting help from a specialist by using an Express Routing Code

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

www.nortel.com/erc

Getting help through a Nortel distributor or reseller

If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

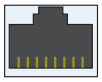
2 CONNECTING TO BSGX4E

This section explains how to connect your PC to the BSGX4e, log in, and start the Initial Setup Wizard. This section also describes the navigation features of the wizard and an overview of the configuration process.

At this point you have:

- acquired all the cables you need, as shown in Table 1 on page 9
- gathered the configuration data cited in Table 2 on page 12.

Note: The next procedure includes connecting your PC to the BSGX4e. Your PC must be equipped with a Network Interface Card (NIC), which provides the RJ-45 connector needed for this connection. A NIC is built in to virtually all laptop PCs, and is standard equipment on most desktop PCs. Look for an RJ-45 connector on the back panel of your PC. The RJ-45 has eight connector pins in it.



RJ-45

Browser requirements

The BSGX4e has been tested with Microsoft® Internet Explorer® and Mozilla® FireFox® browsers.

Internet Explorer must have the Adobe® Shockwave® Flash Object add-on. Firefox must have the Adobe Flash Player plug-in. Use the Manage Add-ons (Explorer) or the Add-ons (Firefox) command in your browser to obtain the plug-in.

Initial connections

Perform the following steps to connect the BSGX4e to the Internet, connect your PC to the BSGX4e, and open the Initial Setup Wizard. Network cables are described in Table 1 on page 9.

For connection diagrams, see Figure 1 and Figure 2 beginning on page 10.

CAUTION: Your PC must be configured to accept addresses from DHCP rather than having a static address, otherwise Step 3 fails. DHCP is the default in PCs. But if your PC has been previously configured for a particular network (for example, a home network), it may have a static address. Consult the user guide of your PC, or professional assistance, to change the address configuration.

Step 1 Connect the power source.

Connect the power supply to **12V DC** connector on the back panel of the BSGX4e.

The **STATUS** LED on the front panel is off and then red during the start-up process. When the LED is steady green, the unit is ready for operation.

Step 2 Connect the Internet cable.

The Internet cable for the BSGX4e is an Ethernet cable from your DSL or cable modem. Connection to other Internet outlets is possible, but these modems are the most common source.

Connect the Ethernet cable to the BSGX4e **WAN** port on the back panel. See the connection diagram in Figure 1 on page 10 for reference.

After connecting the cable, the **WAN** LED on the front panel is steady green indicating the link is active. The LED flickers when data is being passed. The LED blinks slow when no signal is detected.

Step 3 Connect your PC to the BSGX4e.

Connect an Ethernet cable from your PC to any of the LAN ports labeled **1–4** on the back panel. See the connection diagram in Figure 2 on page 11 for reference.

The front panel contains green LEDs labeled **Ethernet 10/100** and **1–4** that correspond to the back panel ports.

The LED corresponding to the port where you connected the PC cable is steady green when the link is active. The LED flickers when data is being passed.

These lighting patterns apply to all equipment that you connect to the LAN ports. You are instructed to connect your equipment to the LAN ports after the configuration process.

Step 4 Open a Web browser (Internet Explorer or Firefox) on your computer.

In the address bar of your browser, enter:

192.168.1.1

The login page opens.

Step 5 On the login page:

a. Enter the default login names:

   User name: `admin`

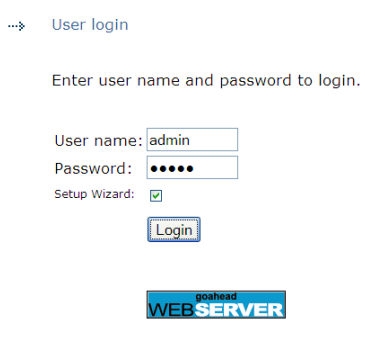
   Password: `PlsChgMe!`

b. Select the **Setup Wizard** check box.

c. Click **Login**.

   The Welcome page of the wizard appears.

   After reading the Welcome page, click **Next** to begin the configuration process.



Wizard navigation and features

The various configuration pages of the wizard contain the following features to help you fill in the data fields on each page. See Figure 3.

- Navigation

  All configuration pages in the wizard are listed in the left panel of each page. The current page is highlighted. Completed pages are bold. Remaining pages are dim.

  Each page has **Previous**, **Skip**, and **Next** buttons.

  Next accepts your data entries and moves to the next page.

  Skip moves you to the next page without having entered any data.

  Previous moves you backward through the pages. This does not undo any configuration entries that you have already made.

- Help

  Most fields on each page have “mouse-over” help. Hover the mouse pointer over the field label and a pop-up help window opens with a brief description of the item.

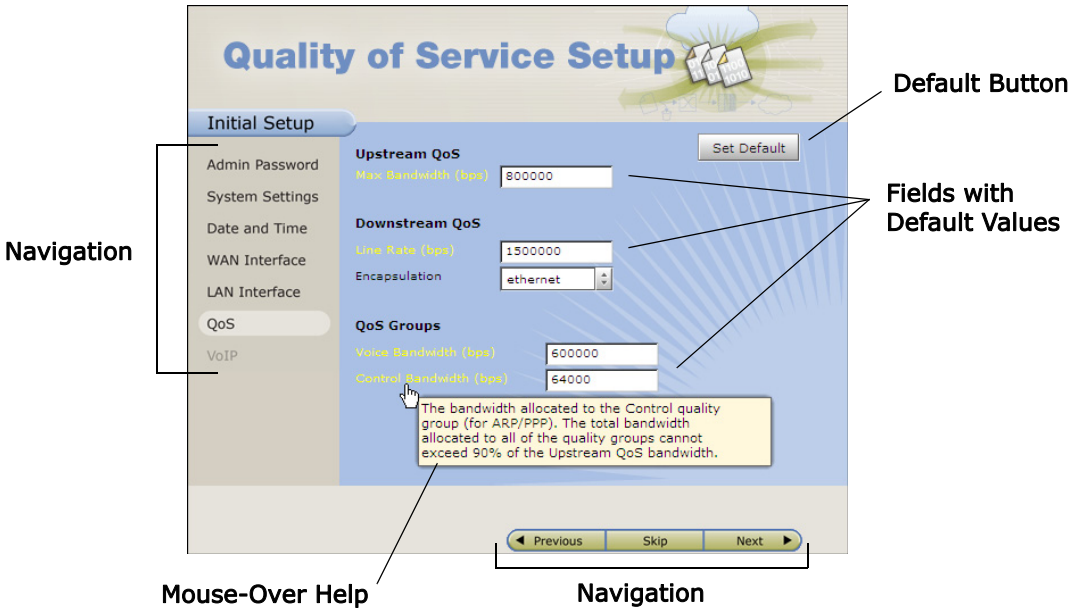
- Default values

  A few of the pages contain a **Set Default** button. Also, notice that on these pages some of the field labels are yellow. When you click the default button, the fields with the yellow labels are populated with default values that are calculated from other data on the page, or are common defaults that work in most situations.

- Error protection

  The logic built into the wizard pages displays an error message if you leave blank a field that is required, or if you have entered data outside the allowable limits.

Figure 3 Configuration Page Features



Configuration overview

Before you begin the actual configuration of the BSGX4e, you may find an overview of the process beneficial.

After the Welcome page, the Initial Setup Wizard consists of the following pages:

1. Administrator Password page (page 21)

   Change main password used to log on to the Web User Interface and the Initial Setup Wizard.

2. System Information Setup page (page 22)

   Create a display name for your system and select the country of operation.

3. Date and Time Setup page (page 22)

   Set the date and time for the system clock.

4. WAN Interface Setup page (page 23)

   Configure the Internet interface in accordance with the technical requirements of the network of your service provider.

5. LAN Interface Setup page (page 24)

   Configure the local network. The telephones, computers, and fax machines you connect to the BSGX4e constitute your local network.

6. Quality of Service Setup page (page 25)

   Configure the *Quality of Service* (QoS) feature. QoS guarantees bandwidth for critical functions during times when your Internet connection is at full capacity. This allows you to use VoIP (voice over internet protocol) telephones without the call being disrupted.

7. Voice over IP Setup page (page 28)

   Configure the VoIP feature in accordance with the technical requirements of your VoIP service provider.

8. Finishing up page (page 28)

   Completion message and reminder to save the configuration created by the wizard.

3 WIZARD PAGES

This section provides an overview of the configuration process, then walks you through the process of filling in the fields on each page of the wizard. We conclude with a short process on how to save a configuration file.

The wizard pages contain fields into which you enter data. But, much of that data is technical in nature and the purpose of this section is to explain those technical details.

Configuration process

Perform the following steps to configure the BSGX4e.

Note: Remember: Use the **Skip** button to move to the next page without changing any data on the current page. Use the **Next** button to save data changes on the current page and move to the next page.

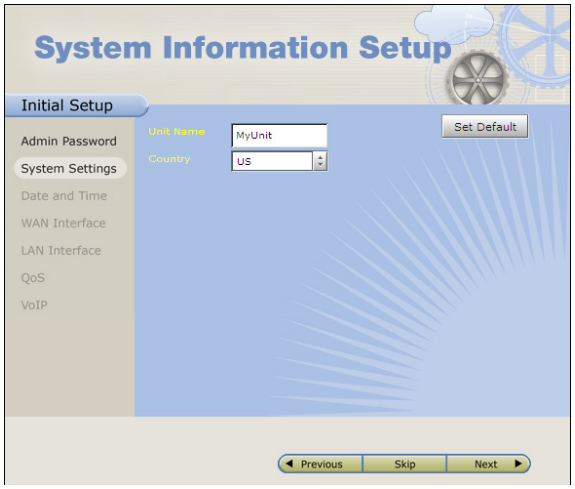
Step 1 Administrator Password page

For security reasons, create a new password.

After doing so, your login user name is still **admin**, but the password is what you have set here.

CAUTION: Be sure to record your new password and store it in a secure location.

Step 2 System Information Setup page



- The **Unit Name** appears on the button bar of the Web UI, near the corporate logo on the top-left.

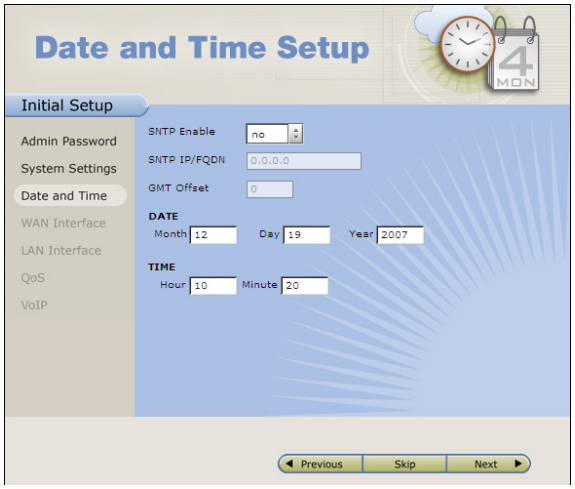
  Change the default name as desired.

- United States (**US**) and Canada (**CA**) are the two choices for the **Country** field in the current models.

  The country selection defines some of the telephone standards that the BSGX4e uses.

Step 3 Date and Time Setup page

Most network equipment use a date and time signal in their internal processing, logging, and messaging functions. Your choices are:



- **SNTP Enable**

  Simple Network Time Protocol refers to a network server that sends a date and time signal to the BSGX4e.

  Choose **yes** if your service provider offers an SNTP server.

  Choose **no** to set date and time manually.

- **SNTP IP/FQDN**

  If using an SNTP server, enter the IP address (ex. **`123.156.7.89`**) or the FQDN (ex. **`some.domain.com`**).

- **GMT Offset**

  If using an SNTP server, enter the difference (offset) in hours from your location to Greenwich Mean Time (SNTP servers use GMT). For example, the East Coast of the U.S. is –5 (minus) hours and the West Coast is –8 hours.

- **Date** and **Time**

  If using manual settings, enter the current date and time here. All fields are numeric. The **Hour** field accepts **`1–24`**.

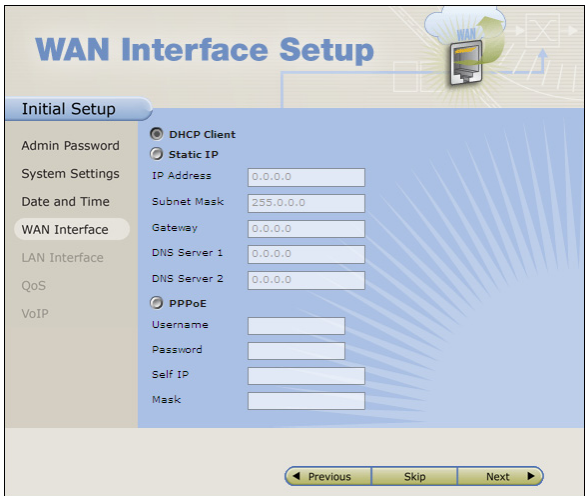
Step 4 WAN Interface Setup page

WAN (Wide Area Network) is your Internet connection. Your choices to define this connection are:

DHCP Client – Your service provider assigns a dynamic (temporary) IP address. This is the most common interface type.

Static IP – You have purchased a static (permanent) IP address.

PPPoE – This is a protocol that establishes a direct connection to your service provider (rather than routing an IP address). This is common with DSL.



Note: Make note of the connection type you select here because you use it again in Step 6.

Click the radio button that corresponds to your service account's interface type:

- **DHCP Client**

  No configuration is required.

- **Static IP**

  If you purchased a static IP address, you received from your service provider the standard Internet connection data (see page 12) for the fields under this heading.

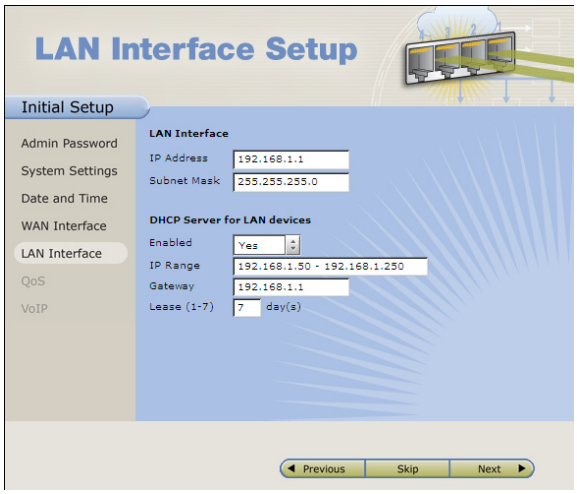
- **PPPoE**

  If your service provider uses PPPoE, you received from your service provider your account login information, which you enter here.

  If the PPP account includes a static IP address, enter it into the **Self IP** field, and enter the subnet mask into the **Mask** field.

Step 5 LAN Interface Setup page

LAN (Local Area Network) is the collection of phones, PCs, and other equipment that you connect to the BSGX4e ports 1–4. These are referred to as "LAN devices."



- **LAN Interface**

  This is the address of the switch that drives ports 1–4. When a LAN device sends data to the BSGX4e, it is sending to this address.

  The default IP address and mask are automatically filled in. Unless you have professional advice to the contrary, use the default settings.

CAUTION: If you change the IP address, the connection with your PC ceases. You must repeat Step 4 on page 17 and enter the new address into the browser, and you may need to re-configure the DHCP server and change the address in your PC. Seek professional advice for this procedure.

- **DHCP Server for LAN devices**

  The BSGX4e has a DHCP server that provides IP addresses to the LAN devices. Each device receives a unique address. When the BSGX4e sends data to a LAN device, it is sending to this address.

  The DHCP server is enabled and configured by default.

  Unless you have professional advice to the contrary, use the default settings.

Step 6 Quality of Service Setup page

Background

QoS is a system that reserves some amount of bandwidth for critical functions at times when your Internet connection is at maximum capacity.

Placing a function under QoS management means it has protected and uninterrupted service. Functions not under QoS management may experience delays and interruptions during times of data traffic congestion.

Critical functions are assigned to "QoS Groups," which then get priority over unprotected traffic that the BSGX4e is transmitting out its WAN port.

The upstream bandwidth reserved for the QoS groups is relative to the total amount of bandwidth available on your upstream Internet connection (**Max Bandwidth** field). The total bandwidth allocated to all groups combined cannot be more than 90 percent of **Max Bandwidth**.

The wizard configures the two most critical QoS groups for you:

- The Voice group is for VoIP phone functions.
- The Control group is for network functions that are critical to the BSGX4e's operation. PPP and ARP are two such functions that get placed into this group.

QoS can protect traffic in both the upstream and downstream directions. Downstream QoS works differently from the upstream. When downsteam QoS is enabled in one or more QoS groups, the BSGX4e limits incoming traffic that is not destined for a function protected by one of those QoS groups. This creates sufficient incoming bandwidth for the protected traffic.

Configuration

Click the **Set Default** button to get started. This loads the following values into the page.

Table 3 Default Values

Variable	Value
Upstream QoS	800000
Downstream QoS	1500000
Voice Group	500000
Control Group	64000

NOTE: The numbers in the previous table are *bps* (bits per second). You may have seen large numbers abbreviated as Kbps (1,000 bps) or Mbps (1,000,000 bps).

The BSGX4e likely requires a change of values, given that this model is commonly used with DSL and cable modems. Bandwidth for DSL and cable can vary widely with various location and network factors. And, service providers may offer different bandwidth rates for different prices.

Compare the upstream and downstream default rates on this page to the bandwidth rates your service provider quoted to you. If there are significant differences, use the quoted rates. If you use the quoted rates, you may want to calculate a new value in the QoS Groups section, as explained below.

Fill in the page fields as follows.

- **Upstream QoS**

  Compare the Upstream QoS default value on the page to the upstream rate your service provider quoted to you. If there is a significant differences, enter the quoted rate in the **Max Bandwidth** field.

  QoS performs best with the most accurate upstream link rate value, so you may want to run bandwidth speed tests to determine your actual rate. For the best results, perform the test several times over different days and average the results. You can use the following popular test sites.

  - `www.speedtest.net`
  - `myspeed.visualware.com`
  - `www.dslreports.com/speedtest`
  - `www.pcpitstop.com/internet/bw.asp`

- **Downstream QoS**

  Link Rate – As with the upstream rate, compare the default value on the page to the downstream rate quoted by your service provider. If there are significant differences, use the quoted rates. The accuracy of the downstream link rate is not as critical as for the upstream rate.

  Encapsulation – Encapsulation is the network process of adding header information to data packets for transporting and routing across the Internet. Encapsulation makes the packets larger thereby consuming more bandwidth. The BSGX4e needs to know the encapsulation type for its internal calculations involving bandwidth.

  The encapsulation field does not have a default value. You must select the value that matches the WAN selection from Step 4:

1. If you chose **PPPoE** in Step 4, select **`PPPoE`** from the drop-down list here.
2. If you chose **DHCP Client** or **Static IP** in Step 4, select **`ethernet`** here.

- **QoS Groups**

  The Voice QoS group protects the data packets traveling to and from your VoIP phones. The Control QoS group protects PPP and ARP signals that are needed to maintain an Internet connection.

  The default value for the Control group is 64,000 bps. Do not change this value.

  The default value for the Voice group is 500 000 bps, which protects between (approximately) 4 and 13 simultaneous calls, based on each VoIP call requiring between approximately 39 000 bps to 133 000 bps of bandwidth.

  The variation in the size of calls is due to different encapsulation types, and because VoIP phones negotiate which *codec* to use. A codec is a program that determines the level of compression of the VoIP traffic stream. VoIP phones decide which codec to use with each call, and different codecs have different compression rates.

  You may want to recalculate the Voice group if your quoted or actual upstream bandwidth is much different than the default 800,000 bps.

  - If the upstream rate is actually lower than the default value, you probably do not have to change the Voice group bandwidth. Its 500,000 value works unless your upstream actual rate drops below 626,000. It is not common to have your bandwidth drop that low.
  - If the upstream rate is actually higher than the default value and you want to protect more simultaneous calls, you can perform a simple calculation to determine the maximum value you can enter into the Voice Bandwidth field:

    — Calculate 90 percent of the upstream QoS bandwidth.

    — Subtract 64 000 (for the Control group).

    The result is the maximum value for the Voice Bandwidth field.

    Here is an example calculation:

    Your service provider informs you that your upstream rate is about 1 Mbps (1,000,000 bps).

    a. 1,000,000 × 0.9 = 900,000

    b. 1,080,000 – 64,000 = 836,000

    The maximum value you can enter into the Voice bandwidth field is **836000**. At this bandwidth:

    The highest compression codec sustains [836,000 ÷ 39,200] 21 calls.

    The lowest compression codec sustains [836,000 ÷ 132,800] 6 calls.

  Typical VoIP traffic is a combination of calls using different compression rates, although the high-compression codecs are more common. You need to consider the number of simultaneous calls you want to support compared to your available bandwidth, and enter an appropriate value up to the maximum that you just calculated.

  Entering the maximum value into the **Voice Bandwidth** field might not restrict bandwidth for other functions. QoS actually reserves only the bandwidth needed for the current number of calls and allows the remaining bandwidth to be available for other, non-protected functions such as email and Web browsing. So you can be generous in reserving bandwidth without

preventing access by non-protected functions. Only when your Internet WAN link is at maximum capacity, and you have many simultaneous calls in progress are your non-protected functions interrupted.

The drawback to using the maximum value for **Voice Bandwidth** is if you want to add another QoS group in the future to protect other traffic. You would have to lower the Voice group bandwidth to accommodate the new group.

Notes on video

The BSGX4e is capable of protecting a video IP stream under QoS. However, due to the unique technical aspects of IP video, professional assistance would be needed to set this up. The BSGX4e does process all types of video streams, but configuring the BSGX4e to guarantee uninterrupted service with QoS is what requires the professional assistance.

Video also requires large amounts of bandwidth. The typical Internet connection in a home or small office may not have enough bandwidth to ensure uninterrupted video transmission.

Step 7 Voice over IP Setup page

VoIP phones must connect to your VoIP service provider's SIP server. The User Agent can also connect to the server. (The User Agent allows you to connect a standard, analog phone to the BSGX4e.)

- **SIP Session Controller**

  Enter the **Domain** name (some.domain.com) or network address (123.456.7.89) of the server of your service provider.

  Your service provider may also have a **Proxy** server (which improves the reliability of your Internet connection). If so, enter its domain name or network address.

  Use the **Set Default** button to populate the **Port, Heartbeat, and Frequency** fields unless you have professional advice to use different settings.

  Set the **Maxcalls** field to what your license agreement states. This is 10 or 30 calls.

- **SIP User Agent**

  If your service provider supports a User Agent (sometimes called a "SIP gateway"), they supply the account login data needed for these fields.

Step 8 Finishing up page

After completing the last configuration page you are taken to the finishing page where you can go back through the pages to check any previous settings, or finish by saving the configuration into the BSGX4e's memory.

Note: You have now completed the configuration process. However, before you disconnect the PC you used for this task, read Backup configuration file (page 29).

Configuration is complete

Now that you have completed the basic configuration process you can proceed to connecting your LAN devices to the BSGX4e LAN ports. See Figure 2 (page 11) and Table 1 (page 9) for reference.

Note: Most network equipment is “plug-n-play” in that they perform a self-configuration when you connect them to the BSGX4e. However, some devices may require manual configuration. Check the literature that accompanies the devices.

You are now ready to use your network equipment with the BSGX4e.

Modifying the configuration

If you need to modify a configuration parameter after you have used the Initial Setup Wizard, you can go back into the wizard and **Skip** to the page that contains the parameter. After changing the parameter value, click **Next** to implement the change. Then **Skip** to the last page and **Save** the changes.

- If you have logged out of the Web UI, log back in as described beginning at Step 4 on page 17.
- If you have closed the wizard but are still logged in to the Web UI:

  Click **Wizards** on the button bar.

  Click **Initial Setup** on the side menu. The Initial Setup Wizard opens.

Backup configuration file

The configuration process you just completed with the Initial Setup Wizard stores the configuration parameters in the BSGX4e’s memory. As with any computer device, there is some possibility of memory corruption. To avoid having to repeat the configuration process if this occurs, you can export a configuration file to your PC. Then, if the BSGX4e loses its configuration, you can import the configuration file for complete recovery. Follow the steps below to perform this task.

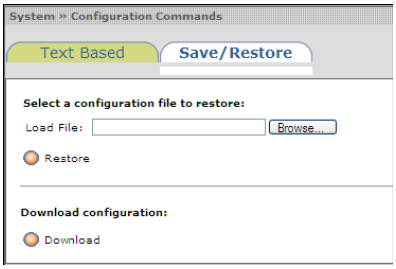
Creating a configuration file requires you to go into the Web UI (User Interface), which is that Web page you see behind the Initial Setup Wizard pages.

Saving a backup configuration file

Step 1 Access the Web UI.

If you closed the Initial Setup Wizard but did not log out of the Web UI, you see the home page.If you did log out of the Web UI, repeat the login instructions on page 17.

Step 2 On the menu in the left pane of the window, click **Configuration**. In the display in the right pane, click the **Save/Restore** tab.



Step 3 Under the **Download configuration** heading, click **Download**.

Click **Save** in the window that opens. This opens the standard **Save As** dialog box where you choose a storage location on your PC.

Restoring a backup configuration file

Step 1 Log in to the Web UI and navigate to the System > Configuration page, as described above for saving the configuration file.

Step 2 Under the **Select a configuration file to restore** heading, click the **Browse** button. (See the graphic in the preceding section.)

This opens the standard **Choose File** dialog box where you navigate to the location on your PC where you stored the configuration file.

Step 3 Select the configuration file and click **Open** in the dialog box. The path to the file now shows in the **Load File** field of the Web UI.

Step 4 Click **Restore** and the configuration file is read into memory. This process may take a few minutes.

Step 5 After uploading the file, you are prompted to click the **Reboot System** button in the lower left pane of the window.

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