

Verizon Wireless

Network Extender for Business

User Manual

Please read this manual before operating your device, and keep it for future reference.



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Section 1: Getting Started

Introduction

The Network Extender for Business enhances the in-building Verizon Wireless Network experience.

This User Guide introduces the Verizon Wireless Network Extender for Business device.

The following sections are included in this guide:

- Getting Started
- Using Your Device
- External GPS Antenna
- Troubleshooting
- Important Safety Information
- Manufacturer's Warranty

Important! Before installing the Network Extender for Business, it is essential to read the entire manual to ensure proper operation of the system.

Features

The following list highlights some of the Network Extender for Business's features:

- The Network Extender for Business is a Plug & Play device that can be installed to automatically provide enhanced in-building wireless service in an enterprise or small office without having to change your existing mobile phone.
- The Network Extender for Business enables users to easily install and configure the system by connecting to an existing broadband network.
- The Network Extender for Business supports a clustering feature which enables seamless mobility between units within a coverage area. For more details, see *"Clustering Guidelines"* on page 6.
- The Network Extender for Business supports an embedded web server which enables customization of IP settings. For more information see *"Web Server and IP Configuration"* on page 7.

Note: For a description of acronyms, see *"Network Extender for Business Acronym Table"* on page 24.

What's In the Box?

- Network Extender for Business
- Ethernet Cable
- Power Supply and Power Cord
- 21' GPS extension cable
- Quick Start Guide
- Product Safety and Warranty

Optional Accessories

- An Auxiliary Hanging Bracket is available to allow for the unit to be conveniently mounted on the wall or ceiling
- A 60' optional GPS extension cable

System Requirements

- An always-on broadband Internet connection with a recommended bandwidth of 3.5 Mbps per unit is required to support optimal data connection.

Note: Wireless connections are not supported.

- An available Ethernet (LAN) port on either your broadband modem or a router connected to the modem.

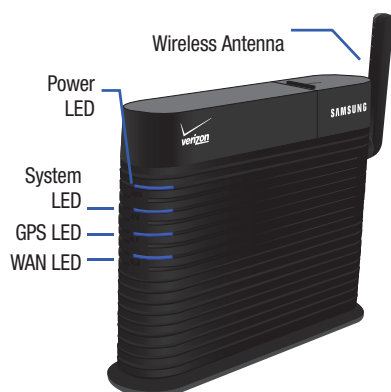
Components - Front View

In addition to a wireless antenna, the Network Extender for Business has four LED lights that are used to indicate the device connectivity status.

- **Wireless Antenna** provides omnidirectional transmission and reception of signals between the Network Extender for Business and communicating Verizon Wireless mobile phones. The wireless antenna rotates 360 degrees.
- **Power LED (PWR)** indicates the power status.
- **System LED (SYS)** indicates the status of Network Extender for Business connectivity to the Verizon Wireless network.
- **GPS LED** indicates the GPS connection status.

Note: GPS antenna receives signals from Global Positioning System satellites and uses them to obtain time and location information.

- **WAN LED** indicates the status of the Ethernet connection and traffic activity on the Network Extender for Business.



Components - Rear View

The rear of the Network Extender for Business provides access to the WAN port, power port, and external GPS antenna.

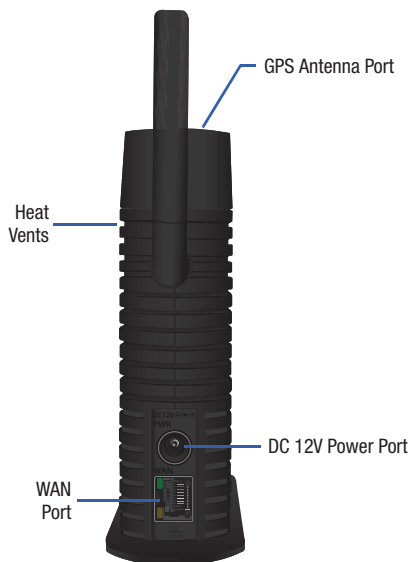
1. **GPS Antenna Port** slides to provide access to the external GPS antenna for removal and relocation.

2. **Heat Vents** provide passive ventilation for the Network Extender for Business and allow for dissipation of internally generated heat.

Note: The Network Extender for Business needs to remain vertical and in a well-ventilated location. The vertical position allows proper air flow to the internal components.

3. **DC 12V Power Port** provides power to the Network Extender for Business when connected to the AC power supply and cord (included).

Warning: Only use the provided power cord and supply. Using any other power source may damage the Network Extender for Business.



4. **WAN Port** allows you to connect the Ethernet cable provided to establish secure communication with the Verizon Wireless network.

- The WAN port provides Ethernet connectivity at 10/100 Mbps.

Network Extender for Business Setup

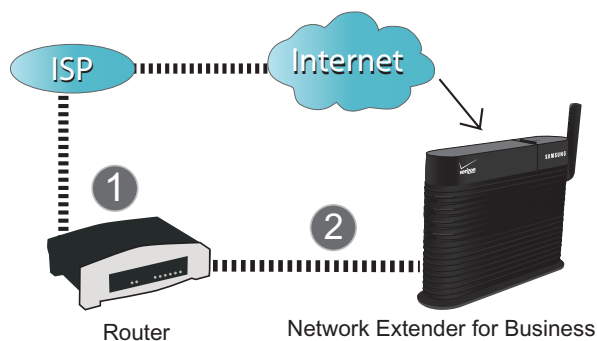
This section outlines the procedures needed to set up the Network Extender for Business.

Note: You may also visit www.verizonwireless.com/b2c/store/accessory?action=gotoSetup to view the online setup and usage tutorial. Follow the on screen prompts.

- Confirm your package contains all components.
- Review the "Important Safety Information" on page 25 before installing the Network Extender for Business.
- Place the unit near a window to acquire a GPS signal. If this is not convenient, See "External GPS Antenna" on page 18.
 - A GPS signal is required to maintain continuous timing for proper operation and E911 service.

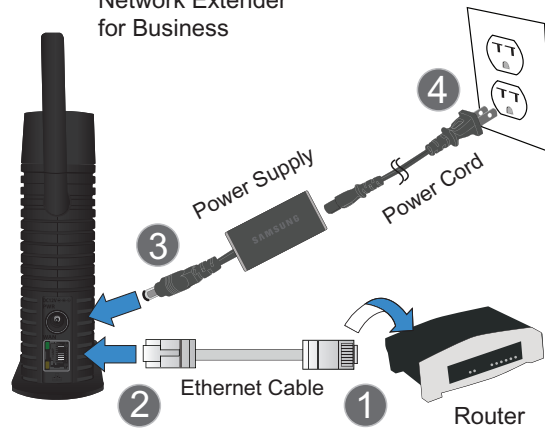
Note: For a single Network Extender for Business deployment refer to the following Stand Alone Setup diagram. If you are planning on deploying more than one Network Extender for Business at your site, please see "Clustering Guidelines" on page 6.

Stand Alone Setup



1. Connect one end of the included Ethernet cable to an open LAN port on the Router (1) and connect the other end to the WAN port located at the rear of the Network Extender for Business. (2)

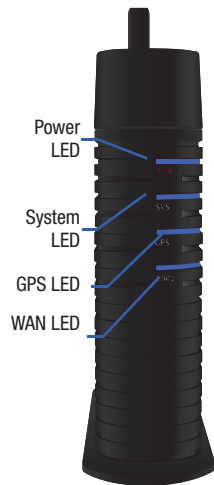
Network Extender for Business



2. Plug the power supply connector into the DC 12V power port located at the rear of the Network Extender for Business (3).
3. Insert one end of the power cord into the power supply and then plug the other end into an available power outlet (4).
4. Confirm that the front LEDs are illuminated as indicated below:

Note: Allow 3 - 5 minutes for the Network Extender for Business to complete the startup sequence and detect both its connections and available communications. The Network Extender for Business may take as long as one hour for the initial GPS acquisition. If the GPS LED is still red after one hour, relocate the GPS antenna to receive a stronger signal. See "Antenna Installation" on page 18.

- **Power LED:** should be a continuous blue light, indicating that the Network Extender for Business is receiving power. No illumination or magenta color indicates there is an issue with the power supply or power connector.
- **WAN LED:** should be a steady blue light, indicating that the Network Extender for Business has detected a valid Ethernet connection. A blinking blue LED indicates data communication.
- **GPS LED:** should be a continuous blue light, indicating that the Network Extender for Business has locked onto a valid GPS signal. If the GPS LED is solid red, the internal antenna may not be able to detect a GPS signal and installation of the external GPS antenna might be necessary. If the GPS LED is persistent magenta while the System LED is slow-blinking red, this indicates a failure condition.
- **System LED:** should be a continuous blue light, indicating that the Network Extender for Business is properly communicating with the Verizon Wireless network. Blinks red while establishing an initial network connection. Persistent solid magenta indicates a failure condition. Persistent solid red or slow-or fast-blinking red indicates an abnormal condition.



5. To confirm the setup was successful, verify all the LEDs are blue.

Note: For more details, see "Clustering Guidelines" on page 6.

Section 2: Using Your Device

Additional Setup Information

This section provides an overview of the product, activation, and how to contact Verizon Wireless for assistance with service and the Network Extender for Business.

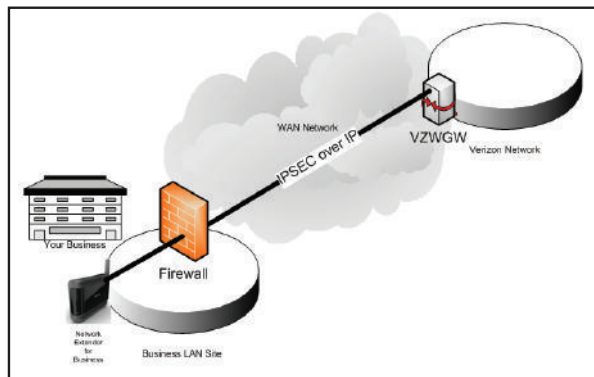


Figure 1 : Network with NAT/PAT

The Network Extender for Business facilitates the delivery of secure cellular traffic through the Internet to the Verizon Wireless network, which then routes the signal to the desired party.

- **Number of Users:** A maximum of six (6) voice calls, or eight (8) data sessions (EV-DO), or a combination of seven (7) voice calls and data sessions are supported simultaneously.
 - An additional channel, open to all callers, is always reserved for emergency (E911) calls.
 - Additional non-E911 users who attempt to make or receive a call/session while all channels are in use may be redirected to the nearest compatible cell tower (if available).
- **Verify service on Network Extender for Business:** Users can verify that they are on the Verizon Wireless Network Extender for Business by dialing **#48** (and receiving an audio announcement). You will also hear a short double tone on your wireless phone when making or receiving a call while on the Network Extender for Business. The tone is played at the beginning of the call.
- **Connect to the Network Extender for Business:** In order to establish an initial connection to the Network Extender for Business network, your Verizon Wireless mobile phone needs to move within approximately 45 feet of the Network Extender for Business unit.
- **Calling on Network Extender for Business:** After registering on the Network Extender for Business, the user can move within a broader perimeter while remaining under coverage.
- **Ranges Will Vary:** Both the coverage area required to register and use the Network Extender for Business cannot be guaranteed and may vary due to environmental factors, such as physical structures.

Warning: You may not be able to make 911 calls in the event of an electrical power outage, broadband connection failure, or other service disruption outside of the Verizon Wireless network coverage area. 911 services may be limited in areas outside of the Verizon Wireless network coverage area. Not all public safety answering points have location-based E911 technology. Always be prepared to report your location to the 911 operator when placing an emergency call. Mobile phones operate using radio signals which cannot guarantee connection in all conditions.

Firewall Rules for the Network Extender for Business

Business networks protect their data and clients using a firewall. Depending on the firewall configuration, certain ports may need to be opened on the firewall to allow the Network Extender for Business to come into service. The Network Extender for Business communicates to the Verizon Wireless Gateway over an IPSEC (Internet Protocol Security Protocol) encrypted tunnel. The use of NAT (Network Address Translation)/PAT (Port Address Translation) within the network will determine which firewall rules need to be opened.

The Network Extender for Business will also access a DNS Server to obtain the IP Address of Verizon's Security Gateways and may access a DHCP Server for its IP Addresses. Since this communication is generally done within the same subnet/network, these settings are not included in the firewall table below. If they are required for some reason, they use the standard DNS and DHCP ports, DNS-UDP 53/ DHCP-BOOTP 67.

The table below shows the protocols/ports that may be required to be opened on a firewall.

Source	Destination	Protocol	DST Port	Inbound (I) Outbound (O)	Description
Protocols/Ports below are required for all instances.					
Network Extender for Business	GPS Assistance Server	UDP	52428	0	Network Extender for Business' GPS assistance data requests to the GPS assistance server. This server is located on the Internet.
Network Extender for Business	Verizon Wireless Gateway	UDP	500, 4500	0	IKE and IPsec over UDP(IKE) from the Network Extender for Business to the Verizon Wireless Gateway
Protocols below are only required when NAT/PAT not present					
Network Extender for Business	Verizon Wireless Gateway	NA	ESP/50	0	Native on IP Encapsulating Security Payload (Contact Verizon Customer Support for Verizon Wireless Gateway IP addresses)
Verizon Wireless Gateway		N/A	ESP/50	I	Native on IP Encapsulating Security Payload (Contact Verizon Customer Support for SGW IP addresses)

In addition to the ports specified above, the table below details the FQDNs (Fully Qualified Domain Names) and the associated IP Address of the Domain Name. The Network Extender for Business solution requires access to each of the items listed below in order to deliver service.

IP Address	FQDN
209.210.15.73	GPS Server (gps.vzwfemto.com)
69.78.95.193 66.174.71.40	Security Gateway (sg.vzwfemto.com)

Figure 2 below shows an example of a network that performs NAT/PAT on traffic leaving the LAN. When the encrypted IPSec packets go through a NAT/PAT, the Network Extender for Business will encapsulate the packets in a UDP packet.

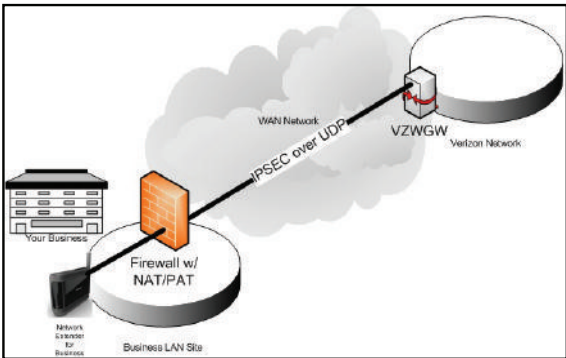


Figure 2: Network with NAT/PAT

Figure 3 below shows a Network Extender for Business behind a firewall without NAT/PAT. In this architecture, the Network Extender for Business is protected by a firewall that is blocking many inbound ports. Port 50 to support ESP via TCP must be opened bidirectionally.

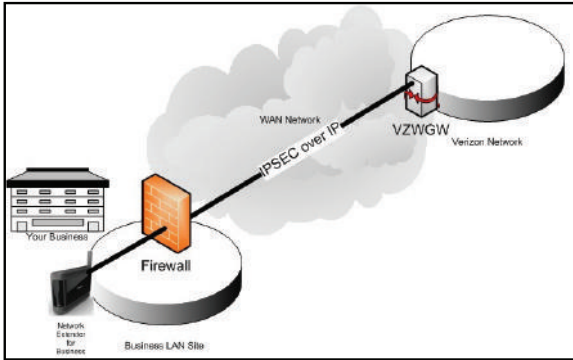


Figure 3: Network without NAT/PAT

Figure 4, the Network Extender for Business is outside the firewall and on the DMZ. Some protection might be in place and the rules stated above must be followed. For the most reliable and secure performance, it is recommended that the Network Extender for Business be placed behind a firewall.

The Network Extender for Business enables the IT administrator to deploy the solution in almost any scenario. The embedded web server allows for flexible configurations. Sections below detail the configuration options that are supported.

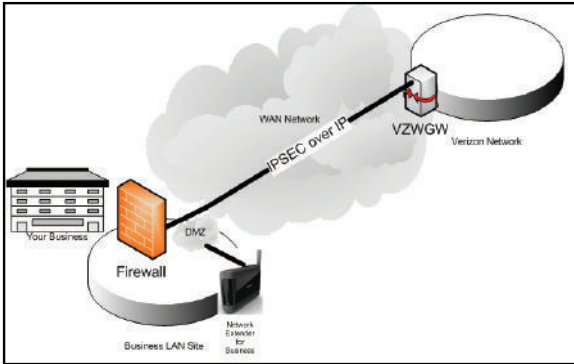
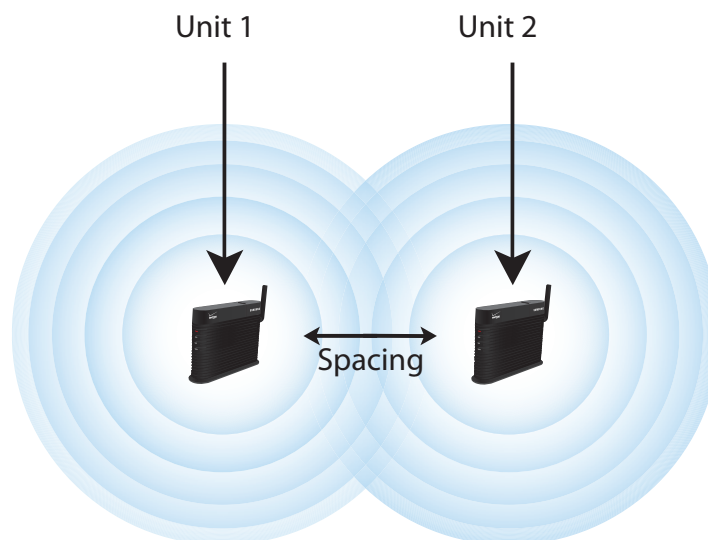


Figure 4: Network with DMZ

Clustering Guidelines

The Network Extender for Business provides CDMA2000 1x and EVDO service to handsets and other user devices throughout a target coverage of 7500 square feet. When the desired coverage area exceeds that, an additional unit can be added as follows:

- In a typical cubicle office environment, the units need to be placed 85 feet apart.
- In a typical open warehouse, the units need to be placed 120 feet apart.
- In a heavily obstructed environment, the units need to be placed 60 feet apart.



Note: The first unit powered up needs to be placed at the entrance of the building.

Clustering Setup

To set up clustering, the following steps must be taken.

Note: Follow the power-up guidelines as previously noted.

1. Determine the locations for the Network Extender for Business units to be deployed. Look for locations that are within range of a window, have an ethernet jack and a power outlet. Follow power-up guidelines as noted above.
2. Install the first unit close to the main entry way of the site. The first unit is also known as the “ingress” unit. All other units are known as “non-ingress”.
3. Once the first unit is operational, install the next unit, within the range as previously noted.

Once all units are operational, the embedded web server can be used to validate that the units are operating as a system. Follow the guidelines below to validate the cluster deployment using the web server. If the cluster is not operating as expected, where either the web server is not displaying the members correctly or calls are being dropped when users are moving within the desired coverage area, check the following:

1. When units were purchased, they must be assigned to the same account.
2. Redeploy the units closer to each other. If they are not spaced correctly, active voice and data handoff may not operate correctly.

Note: When installing the Network Extender for Business in locations where a power outlet is not conveniently located Power Over Ethernet products are available. CDW is a distributor who has Network Extender for Business compatible PoE products. All purchases, returns, and exchanges of PoE products must be handled directly with CDW. Call CDW at 888-653-2394 between 7:00AM and 7:30PM CST.

Web Server and IP Configuration

Introduction

The Network Extender for Business is designed to be plug-and-play on most networks. Should you have the need to configure specific settings for your network, the web interface allows for custom functionality:

- By default the device is set up to use DHCP (Dynamic Host Configuration Protocol) to assign its IP (Internet Protocol) address and obtain DNS (Domain Name Service) information. If DHCP is turned off you can assign static IP addressing information including: IP address, sub net mask, default gateway and DNS server.
- Mark all packets at the IP layer using a configurable DSCP marking value to allow for QoS treatment on your IP network
- User name and Password for controlled access to the web server configuration interface
- Rate limit (throttle) the data usage of foreign users on your network when the device is in managed mode.
- Assign a particular device in a cluster to be the ingress unit beacon for a cluster of Network Extenders for Business.

In addition, the web interface allows you to:

- Display the configured information
- Display the DHCP lease expiry timer when DHCP is enabled
- Reboot the device to make your changes go into effect

It may be helpful to plan for and track configuration information in a deployment of Network Extender for Business.

Accessing the Web Server with the well known IP Address

In the event that the unit is placed in a network without DHCP, DHCP fails or the device is not configured correctly, the Network Extender for Business defaults to a well known IP address of 192.168.1.10.

Browser Support

The Network Extender for Business has been tested for compatibility with the following browsers.

Note: Internet Explorer 6, 7, 8, 9, FireFox and Mosaic (Internet Explorer 6 TLS 1.0 support must be enabled).

Accessing the Web Server Interface with the Default IP Address

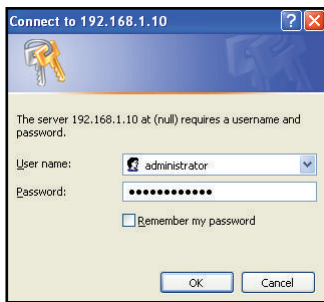
In the event that DHCP is not enabled, the following IP address is assigned to the Network Extender for Business.

[192.168.1.10](#)

Each Network Extender for Business is configured at the factory with the same user name and password, which are case sensitive:

User Name: administrator

Password: enterpriseFemt0 (zero at end)



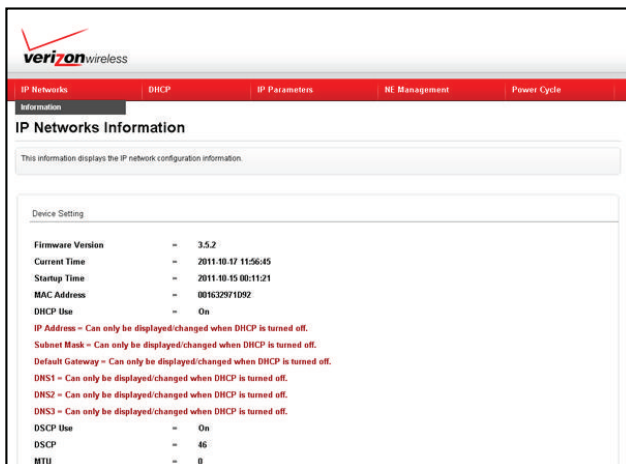
Web Server Configuration Guide

IP Networks Configuration

This screen shows the current IP configuration of the device. If DHCP is enabled, the IP information is not shown.

The screen shows the following attributes:

1. Firmware Version: The version of the software loaded onto the Network Extender for Business
2. Current time: The system GMT time.
3. Starting Time: The last time the system was started
4. MAC Address: The MAC ID of the unit - also found on the bottom of the Network Extender for Business
5. DHCP Use: Indicates if DHCP is on or off
6. IP Address: The IP Address of the unit, when assigned a static IP. When assigned a DHCP address, an address won't be displayed.
7. Subnet Mask: The Subnet Mask of the unit, when assigned a Subnet Mask. When assigned a DHCP address, a Subnet Mask won't be displayed.
8. Default Gateway: The Default Gateway of the unit, when assigned a Default Gateway. When assigned a DHCP address, a Default Gateway won't be displayed.
9. DNS1/DNS2/DNS3: This option displays the DNS server address settings. The entry must contain an IPv4 address. DNS1 is required when not operating in DHCP mode.
10. DSCP Use: This attribute displays the DSCP bit setting. When set to yes, the DSCP might have been customized. When set to No, the DSCP bits are assigned the default value of 46.
11. DSCP: This attribute displays the DSCP bit setting, when using the customer DSCP option (when DSCP Use is set to yes as noted above).



Changing the User Name and Password

Click on the user name/password option of “NE Management” tab to change the user name and password for access to the web server.

The screenshot shows the Verizon Wireless NE Management web interface. The top navigation bar includes tabs for IP Networks, DHCP, IP Parameters, NE Management, and Power Cycle. The NE Management tab is selected, and a sub-menu on the right shows 'Username / Password' as the active option. The main content area is titled 'Username / Password' and contains instructions: '(Username) Use 6 to 32 characters and start with a letter. You may use letters, numbers, underscores, and one dot (.). (Password) Use 6 to 32 characters and start with a letter. You may use letters, numbers, and punctuation.' Below the instructions are input fields for 'Old Password', 'Username', 'Password', and 'Re-type Password'. At the bottom are 'Submit' and 'Cancel' buttons. A copyright notice '© 2011 Verizon. All rights reserved.' is at the very bottom.

This default user name and password can easily be determined by anyone who can access the Internet and look at this manual. In order to prevent disruption of service you should assign a different user name and password for the devices you plan to deploy at your business site.

Note: Usage of a strong password is recommended.

DHCP Configuration

To use static IP addressing DHCP must be turned off. The DHCP menu allows the ability to turn DHCP on or off. When DHCP is turned off, the following IP Parameters **MUST** be configured.

- IP Address
- Netmask
- Default Gateway
- DNS1

If they are not, the Network Extender for Business will not come into service and revert to its well known default IP Address, 192.168.1.10.

The screenshot shows the Verizon Wireless DHCP Use configuration page. The top navigation bar is the same as the previous screenshot. The DHCP tab is selected, and a sub-menu on the right shows 'DHCP Use' as the active option. The main content area is titled 'DHCP Use' and contains the instruction: 'This setting turns the use of DHCP on or off. A power cycle must be done for the change to take effect.' Below this is a 'Change DHCP Use:' section with a dropdown menu currently set to 'On'. At the bottom are 'Submit' and 'Cancel' buttons. A copyright notice '© 2011 Verizon. All rights reserved.' is at the very bottom.

DHCP Lease Display

The DHCP Lease submenu is accessible from the DHCP Menu and displays the DHCP lease period.

The screenshot shows the Verizon Wireless DHCP Lease configuration page. The top navigation bar is the same as the previous screenshots. The DHCP tab is selected, and a sub-menu on the right shows 'DHCP Lease' as the active option. The main content area is titled 'DHCP Lease' and contains the instruction: 'This information displays the DHCP Lease information. It is only relevant if DHCP is turned on.' Below this is a 'Device Setting' section with two rows of information: 'Obtain Date' with a value of 'GMT TIME 2011-10-15 08:03:14' and 'Expire Date' with a value of 'GMT TIME 2011-10-22 08:03:14'. A copyright notice '© 2011 Verizon. All rights reserved.' is at the very bottom.

IP Parameters

The IP Parameters drop-down menu allows you to configure the static IP configuration as well as DSCP tagging.

Note: Before configuring your IP Parameters, you must disable DHCP.

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IP Networks DHCP IP Parameters NE Management Power Cycle

IP Networks Information

This information displays the IP Networks configuration information.

Device Setting

Firmware Version	=	3.5.2
Current Time	=	2011-10-17 11:56:05
Startup Time	=	2011-10-15 08:15:21
MAC Address	=	88E329F10337
DHCP Use	=	On
IP Address	=	Can only be displayed/changed when DHCP is turned off.
Subnet Mask	=	Can only be displayed/changed when DHCP is turned off.
Default Gateway	=	Can only be displayed/changed when DHCP is turned off.
DNS1	=	Can only be displayed/changed when DHCP is turned off.
DNS2	=	Can only be displayed/changed when DHCP is turned off.
DNS3	=	Can only be displayed/changed when DHCP is turned off.
DSCP Use	=	On
DSCP	=	46
RTT	=	0

IP Address

The IP address menu allows configuration of the IPv4 address.

Note: This parameter is **REQUIRED** for static IP Address assignment.

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IP Networks DHCP IP Address NE Management Power Cycle

IP Address

This setting configures the IP address. It can only be changed when Address, Subnet Mask, Default Gateway, and DNS1 must be manually configured. When DHCP is turned off, IP Address must be manually configured. When DHCP is turned off, IP Address must be manually configured. When DHCP is turned off, IP Address must be manually configured.

IP Address - Can only be displayed/changed when DHCP is turned off.

Change IP Address:

Submit Cancel

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Subnet Mask

The Subnet Mask Menu allows configuration of the sub net mask.

Note: This parameter is **REQUIRED** for static IP Address assignment.

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IP Networks DHCP IP Parameters NE Management Power Cycle

Subnet Mask

This setting configures the IP Subnet Mask address. It can only be changed when IP Address, Subnet Mask, Default Gateway, and DNS1 must be manually configured. When DHCP is turned off, Subnet Mask must be manually configured. When DHCP is turned off, Subnet Mask must be manually configured. When DHCP is turned off, Subnet Mask must be manually configured.

Subnet Mask - Can only be displayed/changed when DHCP is turned off.

Change Subnet Mask:

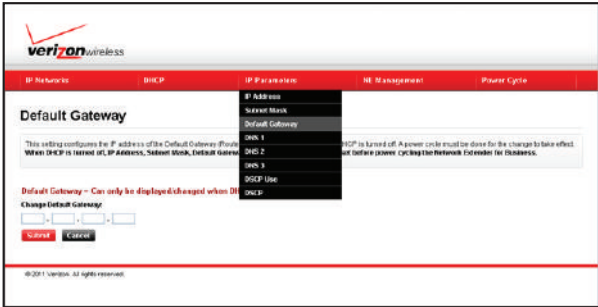
Submit Cancel

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Default Gateway

The Default Gateway allows configuration of the Default Gateway (router).

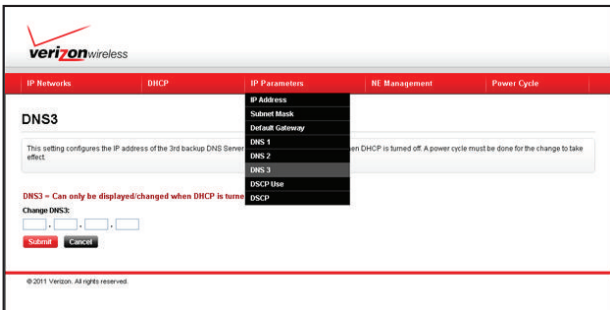
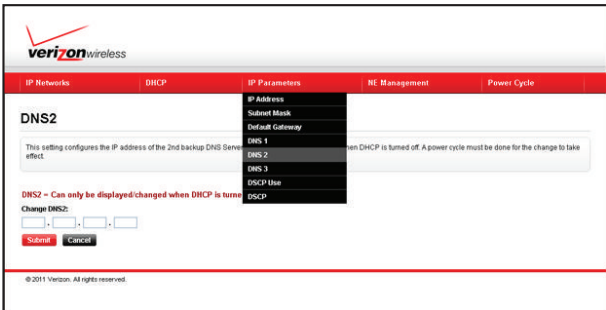
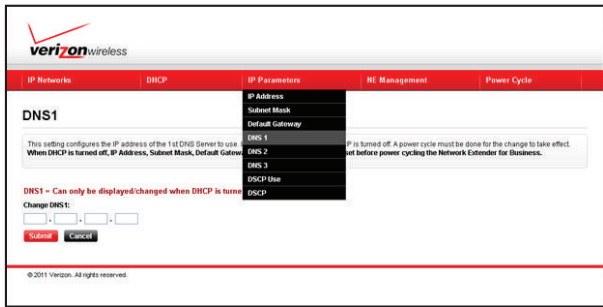
Note: This parameter is **REQUIRED** for static IP Address assignment.



DNS 1, DNS 2, DNS3

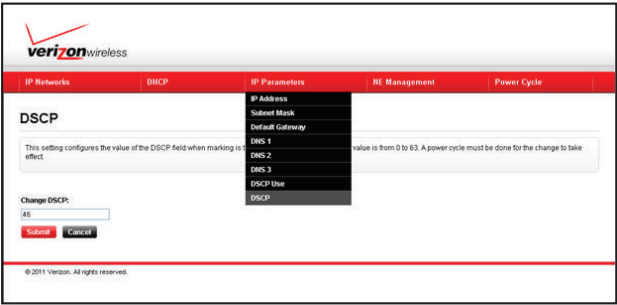
The DNS 1-3 interfaces allow the ability to statically configure up to 3 DNS servers.

Note: DNS1 is **REQUIRED** for static IP Address assignment.



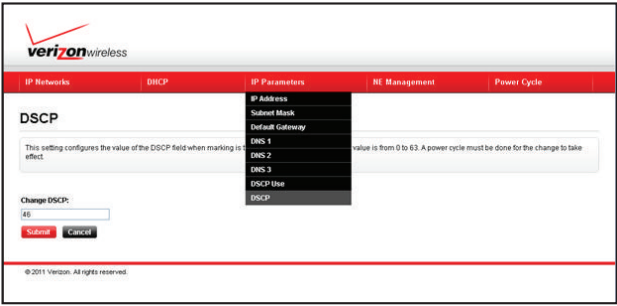
DSCP Use

The DSCP Use Interface allows configuration if DSCP tagging should be enabled or not. DSCP allows the IT Administrator to set the outbound packets from the Network Extender for Business with a particular diffserv setting. Once set, LAN infrastructure downstream can react appropriately. Note that all voice and data traffic is tagged with the same setting.



DSCP

The DSCP page allows configuration of the DSCP value to tag outbound packets that are sent from the Network Extender for Business. When the DSCP Flag is turned off, the Network Extender for Business will send a default value of 46 for the DSCP value.



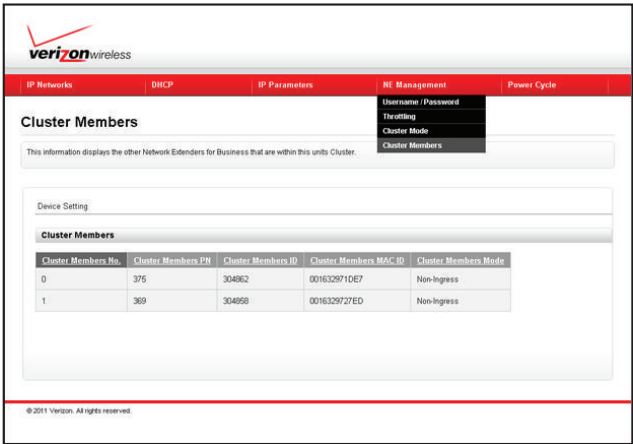
Throttling Page

The Throttling Page allows throttling on or off for foreign users (people not in your access control list). Your device must be configured in Managed Access Mode for this feature to have effect. For more information, see *“For customer with Employee Liable accounts, to manage enabling Managed Access to my Network Extender for Business”* on page 19. When throttling is “On”, foreign users will be restricted to 150 kbps DL and 50 kbps UL.



Accessing Cluster Configuration Pages

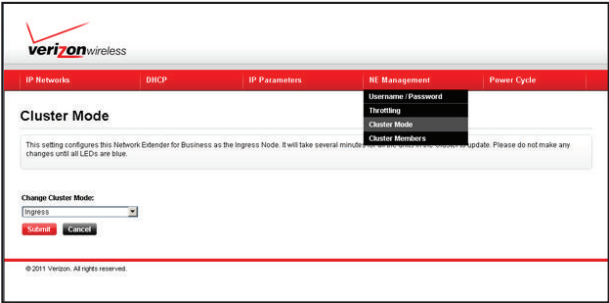
The cluster configuration pages can be accessed via the “NE Management” Submenu.



Cluster Mode Page

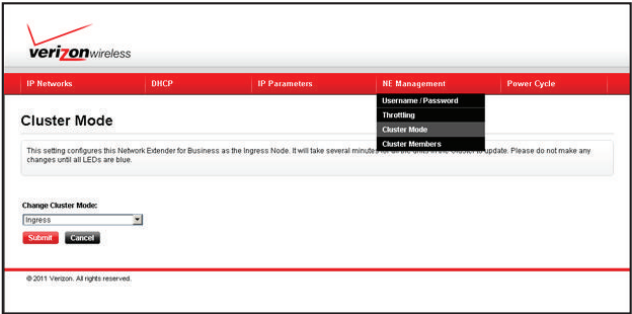
The Network Extender for Business solution is a self install and self configuring system. However, there might be a situation in which the configuration should be modified. The Cluster Mode Page allows you to configure the cluster configuration. There are three choices (Standalone, Ingress and Non-Ingress). Standalone is used for a single unit at a physical site. The Cluster Mode Page allows you to configure the cluster configuration by selecting the Ingress Unit. In general configure the unit as Ingress when the unit is providing coverage for the entrance of a site (e.g. a lobby). Non-Ingress is used for the remaining units in the cluster. There are three modes.

Note: Use caution when modifying the Cluster Mode parameter. When changing the mode from Ingress to Non-Ingress impacts all units in the cluster.

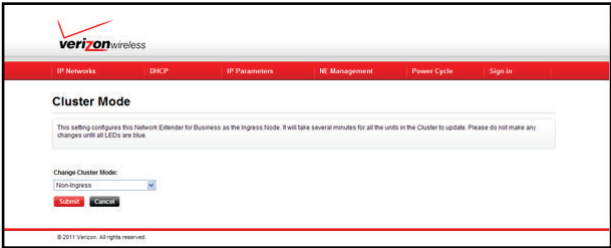


If a single unit is deployed at a site, the system will automatically select Standalone mode.

Note: Standalone units cannot have their modes modified.



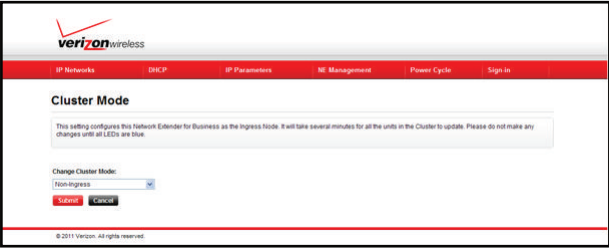
If there is more than one unit at the site then the system will automatically assign the first unit that comes in service to be the Ingress cluster member as shown above.



The other units of the cluster will be automatically assigned to be Non-Ingress members of the cluster.

Changing the Ingress Member of the Cluster

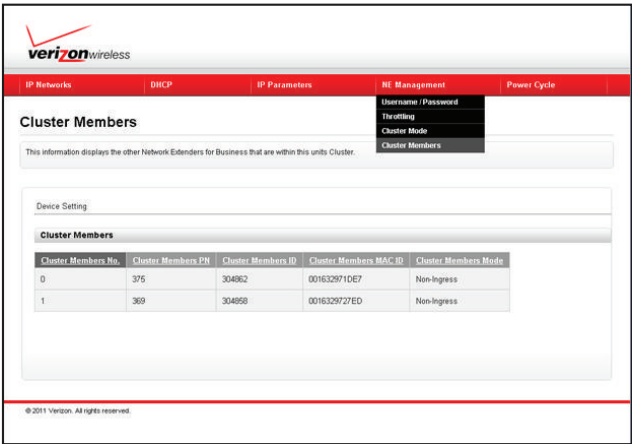
To choose another member of the cluster to take on the Ingress role, log into the selected member's web server and simply change from Non-Ingress to Ingress. The Verizon Network will automatically update the original Ingress member to Non-Ingress.



Cluster Members Page

The Cluster Members Page displays the roles of the other units of the Cluster.

Note: For more information regarding clustering, see "Clustering Guidelines" on page 6.



The example above was taken from a Ingress member of the cluster. The display is showing the other Non-Ingress members of the cluster.

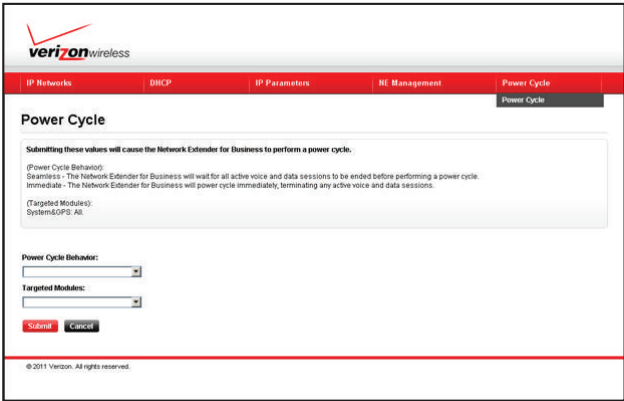
Power Cycle

The power cycle submenu, allows the Network Extender for Business to be power cycled. A power cycle causes services interruption. To reduce impact to subscribers, there are two power cycle options available:

- **Seamless:** The Network Extender for Business will wait for all active voice and data sessions to terminate before rebooting
- **Immediate:** The Network Extender for Business immediately reboots forcefully terminating all voice and data sessions

Once a Power Cycle Behavior is chosen, select the "System & GPS" as the targeted module. Click on submit to begin the power cycle process.

Note: Clicking on Submit causes the unit to immediately react to the chosen power cycle behavior.





[IP Networks](#)
[DHCP](#)
[IP Parameters](#)
[NE Management](#)
[Power Cycle](#)

Power Cycle

Submitting these values will cause the Network Extender for Business to perform a power cycle.

(Power Cycle Behavior):
 Seamless - The Network Extender for Business will wait for all active voice and data sessions to be ended before performing a power cycle.
 Immediate - The Network Extender for Business will power cycle immediately, terminating any active voice and data sessions.

(Targeted Modules):
 System&GPS: All

Power Cycle Behavior:

Seamless
 Immediate

Submit Cancel

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[IP Networks](#)
[DHCP](#)
[IP Parameters](#)
[NE Management](#)
[Power Cycle](#)

Power Cycle

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 Immediate - The Network Extender for Business will power cycle immediately, terminating any active voice and data sessions.

(Targeted Modules):
 System&GPS: All

Power Cycle Behavior:

Targeted Modules:

System&GPS
 System&GPS

Submit Cancel

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If the Network Extender for Business has been configured for a static IP Address, a check will be performed prior to rebooting the device to verify all the required IP Parameters have been provided. If any are missing, an error message will be displayed and the reboot aborted. The following IP Parameters are required for static IP assignment:

- IP Address
- Sub net Mask
- Default Gateway
- DNS 1



[IP Networks](#)
[DHCP](#)
[IP Parameters](#)
[NE Management](#)
[Power Cycle](#)

Power Cycle

Submitting these values will cause the Network Extender for Business to perform a power cycle.

(Power Cycle Behavior):
 Seamless - The Network Extender for Business will wait for all active voice and data sessions to be ended before performing a power cycle.
 Immediate - The Network Extender for Business will power cycle immediately, terminating any active voice and data sessions.

(Targeted Modules):
 System&GPS: All

Power Cycle Behavior:

Targeted Modules:

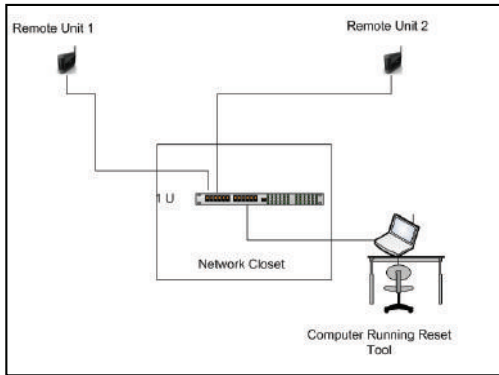
Submit Cancel

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Reset Tool

A Java-based reset tool is available to reset the device to factory settings. The reset tool might be needed in the event that the customized username and/or password is misplaced or forgotten. The reset tool acts as a 'reset button', but can be used remotely without handling the unit.

Reset Tool Network Configuration



The tool must be run from a host (PC, workstation, laptop) with an IP address is contained within the same subnet range as configured in the Network Extender for Business.

Downloading and Launching the Tool

Since the tool is a Java Application the latest version of Java must be installed on your PC. Download and install the latest Java version from the following web URL:

<http://java.com/>

The reset tool Java application is available for download from the following web URL:

<http://www.vzam.net/networkextenderforbusiness/resettool-1.3b1.jar>

Download the file from the previous link and save it locally. Double click on the icon to launch the tool.

This will bring up an application similar to what is described below.



The MSN, MAC-ID and SKU can all be obtained from the label on the bottom of the Network Extender for Business. To obtain the IP address of the Network Extender for Business, contact your IT Administrator.

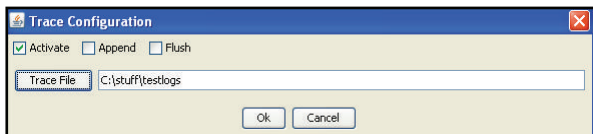
Resetting a Network Extender for Business

After you fill in each of the fields for the Network Extender for Business hit the  start button to reset the device. The tool works by sending a reset packet to the Network Extender for Business every 10 seconds until a reset acknowledgement is received. To stop the reset packets from being sent click the  button.

The tool also comes with a Trace Facility that can be used to capture the reset packets and the response from the Network Extender for Business to help with customer support. This trace tool can be accessed by selecting the trace submenu from the drop down menu shown below.

Selecting the submenu brings up another screen which details the name and directory of the trace file and command actions: Activate, Append and Flush

- Selecting the Activate Check box will activate message trace logging to the file specified.
- Selecting the Append Option will set the tool to append the existing trace log file with additional messages received or sent. (Note the trace still has to be activated via the activated check box)
- Selecting the Flush Option and hitting OK will erase the existing log file. If Activate is also selected the file will be populated with new reset messages.



Factory Default Values

The following table shows what the Network Extender has configured for configuration settings from the Factory. The reset tool will reset these values accordingly.

- DHCP_FLAG=ON,
- STATIC_IP=NULL
- STATIC_MASK= NULL
- STATIC_GW= NULL
- STATIC_DNS1= NULL

- STATIC_DNS2= NULL
- STATIC_DNS= NULL
- STATIC_WINS= NULL
- DSCP_USE=ON
- DSCP_VALUE= 46
- FOREIGN_USER_THROTTLING=OFF
- Web Access Admin=administrator
- Web Access Passwd=enterpriseFemto

Maintenance Notes

These notes should be carefully reviewed before using the Network Extender for Business:

- See “General Precautions” on page 25.
- Only connect the Network Extender for Business’s power plug to a 110–125 VAC outlet.

Note: The use of a surge protector is recommended.

- When cleaning the Network Extender for Business, first unplug the connector from the power outlet. Do not clean the Network Extender for Business using chemical solvents or detergents, but with an anti-static cleaning pad.
- If the Verizon Wireless Network Extender for Business is connected to a Wi-Fi router, ensure that the unit is placed at least 2 feet away from the router (to avoid interference).
- Do not obstruct the heat vents by blocking the openings or covering the Network Extender for Business.
- Remove the Network Extender for Business’s power connector from the power outlet if the device will not be used for an extended period of time.

Section 3: External GPS Antenna

If the Verizon Wireless Network Extender for Business cannot receive a Global Positioning System (GPS) signal, it may be necessary to improve the reception by installing and then positioning the external GPS antenna. This section outlines the installation and relocation of this GPS antenna.

Antenna Installation

In some cases, because of its current location, the Network Extender for Business's GPS antenna may not receive an active GPS signal. If a stable GPS signal is not detected, as indicated by the red GPS LED, install the GPS antenna cable as explained in this section.

Important: Without a valid GPS signal, the Network Extender for Business cannot function properly.

When positioning the GPS antenna, ensure that it is:

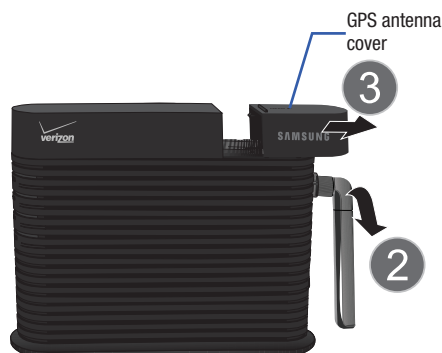
- Installed in a horizontal position.
 - Adjacent to a window and in an open area. This ensures clear reception of the GPS signal.
-

Note: GPS signal strength is greatly reduced when passing through walls or other hard surfaces.

To connect the GPS antenna to the Network Extender for Business, follow these steps:

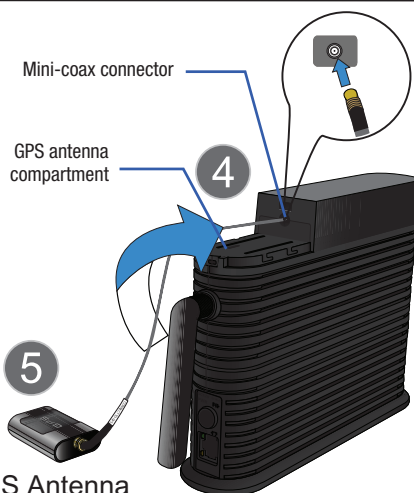
1. Turn off the Network Extender for Business.
 2. Rotate the wireless antenna down to provide access to the GPS antenna's protective cover.
-

Note: The GPS antenna receives signals from Global Positioning System to support 911 location.



3. Slide the protective cover back to expose the rectangular GPS antenna.
 4. Slide out the GPS antenna away from the Network Extender for Business.
 5. Remove the GPS antenna from its compartment.
 6. Connect and secure the GPS antenna to the end of the provided GPS cable labeled "Connect to GPS Antenna."
 7. Connect and secure the terminal end of the same mini-coax cable to the port on the Network Extender for Business (within the GPS antenna compartment).
-

Note: For Wall and Ceiling Mount Installation, refer to the Installation Guide for the Wall and Ceiling Mount Bracket.



GPS Antenna

Warning: Do not force the connector into the GPS antenna port as this can damage the connector.

8. Replace the cover on the station. Verify the cable is threaded through the opening on the cover.
 9. Rotate the wireless antenna back up to its original position.
-

Tip: Use double-sided tape to secure the bottom of the GPS antenna to its new location.

10. Power on the Network Extender for Business.
-

Note: If necessary please contact Verizon Wireless to obtain a longer GPS cable.

Section 4: Troubleshooting

This section provides troubleshooting tips and techniques.

For more information, please visit us online at www.verizonwireless.com/support.

- **Power LED is not Illuminating**

- Ensure that one end of the power cord is securely connected to an active outlet and that the other end is properly connected to the power supply.
- Ensure the power connector is securely inserted into the rear DC 12V port on the back of the Network Extender for Business.

- **Power LED is magenta**

- Power cycle (disconnect and re-connect the power cord) the Network Extender for Business and wait for 10 seconds. If the Power LED is still magenta, call the toll free number (800) 922-0204 and visit the support pages at www.verizonwireless.com/networkextenderforbusiness.

- **GPS LED is magenta**

- Power cycle (disconnect and re-connect the power cord) the Network Extender for Business and wait for 5 minutes. If the GPS LED is still magenta, call the toll free number (800) 922-0204 and visit the support pages at www.verizonwireless.com/networkextenderforbusiness.

- **GPS LED is not illuminating blue even after a few minutes**

Note: The first time the Network Extender for Business is used after installation or after relocation, it can take up to one hour to acquire a GPS connection.

- The GPS antenna cannot obtain a signal.
- If possible, move the Network Extender for Business to a location with fewer surrounding obstructions. The new location should be in an open area and closer to a window, if possible.

- **WAN LED is red**

- A local IP address cannot be obtained. Investigate your DHCP Server, a function usually provided by your router.

- **WAN LED is not illuminating**

- The Ethernet cable connection has not been detected. Verify your connection.

- **System LED is magenta**

- Power cycle (disconnect and re-connect the power cord) the Network Extender for Business and wait for 3 minutes. If the System LED is still magenta, call the toll free number (800) 922-0204 and visit the support pages at www.verizonwireless.com/networkextenderforbusiness.

- **System LED is solid red or blinking red for more than a minute**

- A red System LED indicates a system error was detected and is symptomatic of a communication problem with the Verizon Wireless network. Call Verizon Wireless Customer Service at (800) 922-0204 or *611 from your Verizon Wireless mobile phone and select the option for technical support.
- Before contacting the Verizon Wireless Customer Service Center, confirm the following:
 - Is the WAN LED illuminating blue?
 - If it is not, then there may be a communication problem between your Network Extender for Business and the router.
 - If the WAN LED is illuminating blue, then check that the router is communicating properly with your ISP. The Internet activity LED on the router should be blinking. For further router troubleshooting tips, please review either the router manufacturer's printed or online documentation.
 - Is the GPS LED illuminating blue? If it is not, the Network Extender for Business might not be receiving a GPS signal. Inability to receive a GPS signal can result in the Network Extender for Business failing to validate your account information and network timing, which then prevents usage and reroutes you back to the nearest compatible cell tower. If this is the problem, install the external GPS antenna. See "External GPS Antenna" on page 18.

Note: For further information regarding LED behavior see "LED Guide" on page 21.

- You can reach Verizon Wireless Customer Service in a number of ways:

- Call us toll free at (800) 922-0204 or *611 from your Verizon Wireless mobile phone.
- Visit the support pages at www.verizonwireless.com/networkextender/business.

- **The Network Extender for Business seems to be getting too hot**

- Ensure there is nothing blocking either side of the heat vents located along the side of the Network Extender for Business.
- It is recommended that the Network Extender for Business be located in a well-ventilated open area at least 12 inches from any surrounding surfaces; the ambient temperature should not be above 104 F. It is not recommended that the Network Extender for Business be installed in a cabinet or other enclosed locations.

- **For customer with Employee Liable accounts, to manage enabling Managed Access to my Network Extender for Business**

- For customer with corporate liable accounts, please call into Care to help manage access for the solution.
- To manage priority access settings of the Network Extender for Business for specific numbers log into My Verizon at www.verizonwireless.com. A maximum of 50 authorized Verizon Wireless callers can be registered.
- When the Network Extender for Business is set to open access, the first six callers detected within the device's area are given access to place or receive calls through the Network Extender for Business. The Verizon Wireless Network Extender for Business is set to open access by default.
- Anyone else who then initiates a call while all Network Extender for Business channels are occupied is redirected to the nearest compatible cell tower when available.
- When unauthorized callers (callers not on the managed access list) within range of the Network Extender for Business attempt to place a call, they are automatically redirected to the nearest compatible cell tower.
- If a handoff to the nearest compatible cell tower is not possible and all channels are not in use, one channel may be available for an unauthorized user to access. Callers on the managed access list are always given priority access to the Network Extender for Business.

Note: Both authorized and unauthorized callers may see more service bars on their Verizon Wireless handset due to their proximity to the Verizon Wireless Network Extender for Business.

Note: A seventh channel is always reserved for emergency (E911) calls to any user within range of the Network Extender for Business.

- **Home Phone Connect and Network Extender for Business**

- The "Verizon Wireless Home Phone Connect" product can be used in conjunction with your Network Extender for Business. In order to achieve the maximum benefit, the Home Phone Connect product needs to be placed within 15-feet to 46 feet of the Network Extender for Business.
- Verify that the Home Phone Connect is registered on the Network Extender for Business by dialing #48 from a landline phone connected to the Home Phone Connect. An audio announcement will be played indicating you are registered on the Network Extender for Business. A short double tone is heard when making or receiving calls.
- While using the Network Extender for Business in Managed Access (Prioritized) Mode you will need to add the phone number assigned to the Home Phone Connect product to the access list.

- **Automatic Reboots of the Network Extender for Business**

If there is no response from the DHCP service the device will reboot every 10 minutes until it receives a response.

The Network Extender for Business will assign itself the default IP address of 192.168.1.10 under any one of the following conditions:

- DHCP Timeout
- Static IP invalid or Null
- Subnet Mask invalid or Null
- IP Default Gateway Address invalid or Null (e.g. not part of the subnet)
- DNS1, DNS2, DNS3 invalid or Null

If the Network Extender for Business is configured to use DHCP and does not receive a response from the DHCP server after several retries, the device will assign itself the default IP address and then try to auto-reboot every 10 minutes. This 10 minute period allows a network administrator time to configure the device.

If the Network Extender for Business is configured to use static addressing (DHCP off) but some of the IP Address configuration is missing, the Network Extender for Business will assign itself the default IP address and it will reboot every 10 minutes. This allows the network administrator to resolve the configuration issue via the web server or reset the device.

- **Issues with the IP Configuration**

- **What is the default IP address?**

- The default IP address is 192.168.1.10

- **What if the reset tool doesn't work?**

- Check all the fields on the label of the NE. Also make sure you know the IP address.

- **What is the default user name and password?**

- User Name: administrator
Password: enterpriseFemto (zero on end)

- **How come I can't see the Network Extender for Business address showing up in the arp output on my computer that is directly attached to the Network Extender for Business?**

- The device is likely configured to use DHCP or has an invalid static addressing configuration. In these cases the device will resort to its default IP address 192.168.1.10. When the Network Extender for Business goes into this mode of operation it stops sending out packets to the router/switch and your PC as it has no usable IP address to populate the ARP table with. You should be able to access the web server using <https://192.168.1.10> for reconfiguration.

- **What happens if my Internet Connection goes down?**

- A properly configured unit will continue to try to contact the Verizon Wireless Network until the network issue is resolved. If your DHCP server goes down or is not available and the Network Extender for Business is configured to use DHCP it will try every 10 minutes.

Purpose of Each LED

The Network Extender for Business has 4 LEDs which are distinctly visible and labeled. The LED color could be either red or blue. Solid color indicates a permanent state and blinking LED indicates a transient state unless there is a failure. A solid red LED usually indicates some issue while solid blue LED indicates normal operation.

The figure below shows the location of all the four LEDs.



LED	Purpose
Power	To indicate if the power cable is plugged into the Network Extender for Business.
System	To indicate the overall readiness of the Network Extender for Business to provide service.
GPS	To indicate the status of the GPS function of Network Extender for Business.
WAN	To indicate if the Network Extender for Business has proper Internet connection. It also indicates call activity.

LED Status Indicators

LED State	Power	System	GPS	WAN
Solid RED	NA	Waiting for DNS query for Security Gateway access to be resolved. (During system initialization)	Position fix not yet attained and no satellites have been acquired. (During system initialization)	Ethernet cable plugged-in properly But Local IP address not yet obtained.
Solid BLUE	Power supply to the Network Extender for Business is proper.	Successfully registered with the core network and RF is enabled.	Position fix attained and GPS function providing accurate timing.	Local IP address obtained
Fast Blinking RED	NA	Security Gateway contacted, VPN setup in progress.	Network Extender for Business has acquired at least one satellite and trying to acquire at least 4 to attain position fix.	NA
Slow Blinking RED	NA	VPN tunnel successfully established and configuration in progress. OR Configuration update in progress	Holdover Time Exceeded**.In the process of trying to re-acquire at least one satellite to resume GPS timing.	NA
Slow Blinking BLUE	NA	Software download in progress. LED stays the same until the Network Extender for Business ready for a restart.***	Holdover*.In the process of trying to re-acquire at least one satellite to resume GPS timing.	NA

Fast Blinking BLUE	NA	NA	NA	Indicates traffic activity (voice or data) on the NE.
Solid Magenta	Internal power failure	NE is in POST progress	GPSR Communication failure alarm issued	NA
Solid Green	NA	1x is In-service but DO is in error	NA	NA
Slow Blinking Green	NA	Software download in progress. LED stays the same until the Network Extender for Business ready for a restart.***	NA	NA
Solid Yellow	NA	DO is In-service but 1x is in error	NA	NA
Slow Blinking Yellow	NA	Software download in progress. LED stays the same until the Network Extender for Business ready for a restart.***	NA	NA

The table below shows what each LED represents. Each LED status is unrelated to the other LEDs. For LED combinations please see “LED Combinations - Possible Failure Reason - Recommended Action” on page 22.

Legend:

NA	Not applicable
*	GPS Position/time fix attained but now no usable GPS signals
**	Holdover time has exceeded 1 minute.
***	To alert the user that the Network Extender for Business is about to temporarily go out of service. A call in progress is allowed to complete before it goes out of service.

LED Combinations - Possible Failure Reason - Recommended Action

Power LED	System LED	GPS LED	WAN LED	STATUS	Possible FAILURE REASONS	RECOMMENDED ACTION *If the listed actions don't work, escalate the issue to next level of support.
OFF	X	X	X	Power issue.	- Power failure. - Improper power Connection.	- Check the power cable connection. - Check if socket has power.
Solid Magenta	X	X	X	Power issue.	Power failure of power supply.	Check the power cable connection.
Solid BLUE	X	X	X	Ethernet issue.	- Improper internet connection. - Internet Outage.	Check the ethernet cable connections and the internet.
Solid BLUE	Solid RED	X	Solid BLUE	System issue.	- Reasons: - Internet failure. - DNS failure. - Causes: - Internet outage. - DNS server issue. - Incorrect SG domain name. <u>Symptom</u>: Network Extender for Business restarts every 3 minutes.	Check the Internet connection and if the home router is supported.
Power LED	System LED	GPS LED	WAN LED	STATUS	Possible FAILURE REASONS	RECOMMENDED ACTION *If the listed actions don't work, escalate the issue to next level of support.

Solid BLUE	Fast blinking RED	X	Solid BLUE	System Failure.	- Reason: Failure to setup VPN. - Cause: AAA provisioning, SG or DNS issue. - Symptom: Network Extender for Business restarts every 5 minutes.	- Check AAA provisioning. - Check SG health. - Check DNS.
Solid BLUE	Slow blinking RED	Solid BLUE	Solid BLUE	System Failure.	- Reason: Configuration file download failure. - Cause: Slow internet connection. - Symptom: Network Extender for Business restarts every 5 minutes. - Reason: RF related issue. - Cause: Check Network Extender for Business failure list. - Symptom: Network Extender for Business stays in slow blinking blue. - Reason: JMS/SMS provisioning issue. - Cause: JMS/SMS provisioning error. - Symptom: Network Extender for Business restarts every 6 minutes	Escalate the issue to next level of support.
Power LED	System LED	GPS LED	WAN LED	STATUS	Possible FAILURE REASONS	RECOMMENDED ACTION *If the listed actions don't work, escalate the issue to next level of support.
Solid BLUE	Slow blinking RED	Solid RED	Solid BLUE	GPS issue.	- Reason: - GPS Failure. - Causes: - No satellites acquired.	- Ask the customer to connect GPS antenna extension cable. - Check the GPS server provisioning for this Network Extender for Business. - Check if the Network Extender for Business was initially provisioned with proper zip code.
Solid BLUE	Slow blinking RED	Solid Magenta	X	GPS issue.	- Reason: - GPSR H/W Failure. - Causes: - GPSR H/W Failure.	No Action.
Solid BLUE	Slow blinking RED	Fast blinking RED	Solid BLUE	GPS issue.	- Reason: - GPS Failure. - Causes: - Not enough satellites acquired	- Ask the customer to connect GPS antenna extension cable. - Check the GPS server provisioning for this Network Extender for Business. - Check if the Network Extender for Business was initially provisioned with proper zip code.
Solid BLUE	Slow blinking RED	Fast blinking RED	Solid BLUE	GPS issue.	Reason: - GPS Failure. Causes: - Not enough satellites acquired.	No Action
Solid BLUE	Solid BLUE	Slow blinking RED	Solid BLUE	GPS Condition- Holdover Exceeded	- Causes: - Holdover time exceeded 1 minute. - GPS server provisioning issue.	- Ask the customer to connect GPS antenna extension cable. - Check the GPS server provisioning for this Network Extender for Business.

Section 6: Network Extender for Business Acronym Table

Acronym Table for Verizon Wireless Network Extender for Business

Acronym	Term
1x	CDMA-2000
AGPS	Advanced GPS
A-GPS	Assisted GPS
ANSI	American National Standards Institute
CDMA	Code Division Multiple Access
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
DSCP	Differentiated Services Code Point
ESP	Enhanced Security Payload Protocol
EVDO	Evolution Data Optimized
FA	Frequency Allocation
GPS	Global Positioning System
HTTP	HyperText Transport Protocol
HTTPS	HTTP Secure (HTTP protected by SSL/TLS)
ID	Identifier
IKE	Internet Key Exchange Protocol
Ingress	Entering/Entrance
IP	Internet Protocol
IPSEC	Internet Protocol Security - System of Protocols
IS	Interim Standard
LAN	Local Area Network
MAC	Medium Access Control
MAC-ID	MAC Identifier
MEID	Mobile Equipment Identifier
MSN	Mobile Serial Number
NAT	Network Address Translator
NE	Network Extender for Business
PCS	Personal Communications System
POE	Power Over Ethernet
SKU	Stock Keeping Unit
SSL	Secure Sockets Layer
TCP	Transmission Control Protocol
TLS	Transport Layer Security - System of Protocols
UDP	User Datagram Protocol
VLAN	Virtual Local Area Network
VZWGW	Verizon Wireless Gateway

Section 7: Important Safety Information

This user guide contains important operational and safety information that will help you safely use your Network Extender for Business.

General Precautions

There are several simple guidelines to operating your Network Extender for Business properly and maintaining safe, satisfactory service.

- Avoid exposing your Network Extender for Business to rain or liquid spills. If your device does get wet, immediately turn the power off and remove the power connector.
- Do not operate the Network Extender for Business in an extremely dusty or humid environment.
- Avoid placing the Network Extender for Business near radiators or other heating sources.
- Do not obstruct the heat vents by blocking the openings or covering the Network Extender for Business, and do not operate it in a confined space.
- Avoid locating the Network Extender for Business where it could be exposed to direct sunlight for prolonged periods.
- Do not connect the Network Extender for Business to a power strip containing an excessive number of other devices. Refer to the documentation that came with your power strip for capacity information.
- Do not disassemble the wireless antenna.
- Do not attempt to open the Network Extender for Business or power supply, or disassemble either component, or remove the wireless antenna. You run the risk of electrical shock and/or burn and voiding the limited warranty. No user-serviceable parts are located within the Network Extender for Business enclosure.
- If the Network Extender for Business will not be used for a prolonged period, remove the power cord from the AC outlet.
- Although your Network Extender for Business is quite sturdy, it is a complex piece of equipment and can be broken. Avoid dropping, hitting, bending, or sitting on it.
- Any changes or modifications to your Network Extender for Business not expressly approved in this document could void your warranty for this equipment and void your authority to operate this equipment.

Warning: You may not be able to make 911 calls in the event of an electrical power outage, broadband connection failure, or other service disruption. 911 services may be limited in areas outside of the Verizon Wireless network. Not all public safety answering points have location-based E911 technology. Always be prepared to report your location to the 911 operator when placing an emergency call. Mobile phones operate using radio signals which cannot guarantee connection in all conditions.

Using Your Network Extender for Business Near Other Electronic Devices

Most modern electronic equipment is shielded from radio frequency (RF) signals. However, RF signals from your Network Extender for Business may affect inadequately shielded electronic equipment.

Conversely, ensure the unit is placed at least 2 feet away from products which generate electromagnetic radiation, such as a computer monitor or microwave oven.

Note: For the best care of your Network Extender for Business, ensure that only authorized personnel service your device. Failure to do so may be dangerous and void your warranty. Consult the manufacturer of any personal medical devices, such as pacemakers and hearing aids, to determine if they are adequately shielded from external RF signals.

Radio Frequency (RF) Energy

Understanding How Your Network Extender for Business Operates

Your Network Extender for Business functions as a radio transmitter and receiver. When it is turned on, it receives and transmits radio frequency (RF) signals. When you use your Network Extender for Business, the system handling your call controls the power level.

This power can range from 10 microwatt to 30 milliwatts.

Knowing Radio Frequency Safety

The design of your Network Extender for Business complies with updated NCRP standards described below:

In 1991–92, the Institute of Electrical and Electronics Engineers (IEEE) and the American National Standards Institute (ANSI) joined in updating ANSI's 1982 standard for safety levels with respect to human exposure to RF signals. More than 120 scientists, engineers and physicians from universities, government health agencies and industries developed this updated standard after reviewing the available body of research.

In 1993, the Federal Communications Commission (FCC) adopted this updated standard in a regulation. In August 1996, the FCC adopted a hybrid standard consisting of the existing ANSI/IEEE standard and the guidelines published by the National Council of Radiation Protection and Measurements (NCRP).

For more information about RF exposure, visit the FCC Web site at www.fcc.gov.

FCC Radio Frequency Emission

This device meets the FCC Radio Frequency Emission Guidelines. FCC ID number: A3LSCS-2U01.

FCC Statement

This product has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Important Note.

FCC Radiation Exposure Statement

To ensure the safety of users, the FCC has established criteria for the amount of radio frequency energy various products may produce depending on their intended usage. This product has been tested and found to comply with the FCC's exposure criteria.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The installation of the base unit should allow at least 20 centimeters between the base and persons to be in compliance with FCC RF exposure guidelines.

Please read the following important safety notices and instructions before installing or using the product.

- A DANGER warning refers to situations that could cause bodily injury.
 - A CAUTION warning refers to situations that could result in equipment malfunction or damage.
1. Follow all warnings and instructions marked on the product.
 2. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use an anti-static cleaning pad for cleaning.
 3. Do not use this product near water.
 4. Do not place this product on an unstable cart, stand or table. If the product falls, it could be seriously damaged.

5. This product should be operated using the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
6. Do not allow anything to rest on the power cord. Do not locate this product where people will walk on the cord.
7. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock.
8. Never spill liquid of any kind into or onto the product.
9. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks.
10. Refer all questions regarding servicing of this product to qualified service personnel.

Danger—Electric Shock and Fire

Electric current from power, telephone, and communication cables is hazardous, and could result in electric shock and/or fire.

To avoid electric shock, use caution when connecting cables. For example, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors.

To avoid electric shock, do not operate the product or connect or disconnect cables during electrical storms. To avoid electric shock, do not use this product in or near water.

To reduce the risk of fire or overheating, keep this product in well ventilated areas, away from radiators or other heat sources. Do not block cooling vents.

The plug-socket combination must be accessible at all times because it serves as the main power-disconnecting device.

Use only the manufacturer-provided AC adaptor approved for use with this product. Use of another AC adaptor may cause a fire or explosion.

This product relies on short-circuit (over current) protection installed in your home or office. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. is used on the phase conductors (all current carrying conductors).

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a. When the power cord or plug is damaged or frayed.
- b. If liquid has been spilled into the product.
- c. If the product has been exposed to rain or water.
- d. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions, since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal condition.

Caution—Electromagnetic Interference

This product generates, uses, and can radiate radio frequency energy and, if not installed or used in accordance with the manufacturer's instruction manual, may cause interference with radio and television reception. This product has been tested and found to comply with the limits set forth in Part 15 of the Federal Communications Commission Rules.

Owner's Record

The model name, model number, regulatory number, and FCC ID are located on a label affixed to the bottom of the unit. The MSN and MAC ID are on a sticker affixed on the side of the unit. Record the MSN and the MAC ID in the space provided below. This will be helpful if you need to contact us about your Network Extender for Business in the future.

Model: Verizon Wireless Network Extender for Business

MSN:

MAC ID:

Section 8: Warranty Information

Your Verizon Wireless Network Extender for Business has been designed to provide reliable, worry-free service. If for any reason you have a problem with your equipment, please refer to the manufacturer's warranty in this section. For information regarding the terms and conditions of service for your Network Extender for Business, please visit www.verizonwireless.com or call Verizon Wireless Customer Service at (800) 922-0204 or *611 from your Verizon Wireless mobile phone.

Standard Limited Warranty

What is Covered and For How Long?

SAMSUNG TELECOMMUNICATIONS AMERICA, LLC ("SAMSUNG") warrants to the original purchaser ("Purchaser") that SAMSUNG's Network Extender for Business and accessories ("Products") included in this package are free from defects in material and workmanship under normal use and service for the period commencing upon the date of purchase and continuing for the following specified period of time after that date:

All components carry a one-year warranty.

What is Not Covered? This Limited Warranty is conditioned upon proper use of Product by Purchaser. This Limited Warranty does not cover: (a) defects or damage resulting from accident, misuse, abuse, neglect, unusual physical, electrical or electromechanical stress, or modification of any part of Product, including antenna, or cosmetic damage; (b) equipment that has the serial number removed or made illegible; (c) any plastic surfaces or other externally exposed parts that are scratched or damaged due to normal use; (d) malfunctions resulting from the use of Product in conjunction with accessories, products, or ancillary/peripheral equipment not furnished or approved by SAMSUNG; (e) defects or damage from improper testing, operation, maintenance, installation, or adjustment; (f) installation, maintenance, and service of Product, or (g) Product used or purchased outside the United States or Canada.

What are SAMSUNG's Obligations? During the applicable warranty period, SAMSUNG will repair or replace, at SAMSUNG's sole option, without charge to Purchaser, any defective component part of Product. To obtain service under this Limited Warranty, Purchaser must return Product to an authorized service facility in an adequate container for shipping, accompanied by Purchaser's sales receipt or comparable substitute proof of sale showing the date of purchase, the serial number of Product and the sellers' name and address. To obtain assistance on where to deliver the Product, call Samsung Customer Care at 1-888-987-4357. Upon receipt, SAMSUNG will promptly repair or replace the defective Product.

SAMSUNG may, at SAMSUNG's sole option, use rebuilt, reconditioned, or new parts or components when repairing any Product or replace Product with a rebuilt, reconditioned or new Product. All other repaired/replaced Product will be warranted for a period equal to the remainder of the original Limited Warranty on the original Product or for 90 days, whichever is longer. All replaced parts, components, boards and equipment shall become the property of SAMSUNG. If SAMSUNG determines that any Product is not covered by this Limited Warranty, Purchaser must pay all parts, shipping, and labor charges for the repair or return of such Product.

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"DESIGN, CONDITION, QUALITY, OR PERFORMANCE OF THE PRODUCT;

"THE WORKMANSHIP OF THE PRODUCT OR THE COMPONENTS CONTAINED THEREIN; OR

"COMPLIANCE OF THE PRODUCT WITH THE REQUIREMENTS OF ANY LAW, RULE, SPECIFICATION OR CONTRACT PERTAINING THERETO.

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This offer is valid to anyone in receipt of this information, subject to compliance with the terms of the Applicable License).

Below is the list of the UbiCell Open Source components covered under the Applicable Licenses.

Component	License	Component	Applicable License
Pauls PPP Package	BSD License	md5	MD5 license [Note: Not Attached]
axhttpd	BSD License	SNMP++	SNMP++ License
Das U-Boot	GPL 2.0	NcFTP Client	The Clarified Artistic License
Linux Kernel 2.6.18	GPL 2.0	libdes	Eric Young Implementation License
libtftp	LGPL 2.1		

Below is the list of MontaVista Linux Packages that compose Root File System ("MontVista Root Files").

Component	License	Component	Applicable License
apache	Apache	udev	GPL
mdnsresponder	Apple Public Source License	uuid-dev	GPL
finger	BSD	uuid-libs	GPL
ipsec-tools	BSD	watchdog	GPL
mailx	BSD	wget	GPL
netkit-ftp	BSD	which	GPL
netkit-inetd	BSD	xkbd	GPL
netkit-rsh-server	BSD	bsdutils	GPL/BSD
netkit-telnet-client	BSD	mount	GPL/BSD
netkit-telnet-server	BSD	util-linux	GPL/BSD
nvi	BSD	binutils	GPL/LGPL
traceroute	BSD	binutils-dev	GPL/LGPL
pam	BSD/GPL	libgcc1	GPL/LGPL
pam-cracklib	BSD/GPL	libstdc4.2.0	GPL/LGPL
pam-dev	BSD/GPL	libstdcdev	GPL/LGPL
pam-libs	BSD/GPL	procps	GPL/LGPL
pam-modules	BSD/GPL	procps-libs	GPL/LGPL
adduser	GPL	mvutils	GPL/Other
anacron	GPL	postfix	IBM Public License
at	GPL	glibc	LGPL
atm-tools	GPL	glibc-dev	LGPL
aumix	GPL	glibc-locales	LGPL
autofs	GPL	glibc-nscd	LGPL
base-passwd	GPL	glibc-tzdata	LGPL
bash	GPL	prelink	LGPL
bridge-utils	GPL	tslib	LGPL
comerr-dev	GPL	expat-dev	MIT/X Consortium [Note: X Consortium License Not Attached]
comerr-libs	GPL	expat-libs	MIT/X Consortium
console-tools	GPL	pcmcia-cs	MPL/GPL
console-tools-libs	GPL	elfutils-libelf-dev	OSL
dhcpcd	GPL	elfutils-libelf-libs	OSL
dnrd	GPL	bind	Other
e2fsprogs	GPL	bind-lwresd	Other
e2fsprogs-dev	GPL	cracklib-libs	Other
e2fsprogs-libs	GPL	cron	Other
fileutils	GPL	dhcp	Other
findutils	GPL	dhcp-relay	Other
gawk	GPL	file-dev	Other
grep	GPL	file-libs	Other
gzip	GPL	iputils-ping	Other
hostapd	GPL	iputils-tracepath	Other
hostap-utils	GPL	libcap-libs	Other
hostname	GPL	libncurses	Other
hotplug	GPL	libpcap-dev	Other
ifupdown	GPL	libpcap-libs	Other
info	GPL	libpcre-dev	Other
initscripts	GPL	libpcre-libs	Other
iptables	GPL	libwrap-libs	Other
iptables-libs	GPL	login	Other
klogd	GPL	makedev	Other
ksymoos	GPL	ncurses-base	Other

Component	License	Component	Applicable License
logrotate	GPL	ncurses-bin	Other
ltrace	GPL	net-snmp	Other

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Version 2, June 1991

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