# ESTeem

## Wireless Modems

# ESTeem MODEL 195Eg
# USER'S MANUAL

*Manual Revision 1.0*
**June 2004**

**Electronic Systems Technology, Inc.**

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# USER'S MANUAL

*Manual Revision 1.0*

**Firmware Version 3.3.0 and above**

**June 2004**

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Electronic Systems Technology
415 North Quay Street
Kennewick, Washington USA 99336

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## MODEL 195Eg OVERVIEW

The ESTeem Model 195Eg is a IEEE 802.11g and IEEE 802.11b protocol compatible wireless LAN transceiver that can used to build a Wireless Local Area Network (WLAN) for line-of-sight distances to 7 miles for fixed base and mobile applications. The IEEE 802.11 WLAN was designed to look and feel like any IEEE 802 wired LAN. The Model 195Eg can be configured for multiple modes of operation depending upon the needs of the wireless and wired LAN system.

## MODEL 195Eg CONFIGURATION MODES

The Model 195Eg can be configured for multiple modes of operation without any changes to the hardware:



**Figure 1: Access Point Bridge Mode Diagram**

1.  **Access Point Bridge Mode**. When the Model 195Eg is configured as an Access Point it will provide a wireless bridge from a hardwired Local Area Network (LAN) to laptops, office computers, Personal Digital Assistants (PDA's), video cameras, PLC's, etc. that have integral or external 802.11g or 802.11b wireless devices. All Access Points can be physically connected to the same network (LAN) or through a radio link but using the Access Point Repeater mode to provide seamless Ethernet communication for mobile devices. The ESTeem Model 195Eg in Access Point Bridge mode will pass all network traffic between connected devices including global network broadcasts.

2.  **Access Point Router Mode**. In this mode the ESTeem Model 195Eg will function the same as the Access Point Bridge Mode described above with the following exception, the Access Point Router mode will pass network traffic for connected devices but will not pass global network broadcasts. This mode of operation should be used instead of the Access Point Bridge mode when connecting the ESTeem to larger LAN Networks.

3.  **Access Point Masquerade Mode**. The Access Point Masquerade mode is a special use of the Access Point mode where the Model 195Eg will connect 802.11g or 802.11b wireless devices as clients into a single static IP address on a network. The 195Eg will hide all the IP addresses connected on the wireless link. You should use this mode of operation if Model 195Eg is connected directly to the Internet with a static IP address (DSL, T1, etc.) and you want the wireless clients to access the information through the Model 195Eg (Figure 2). This mode should also be
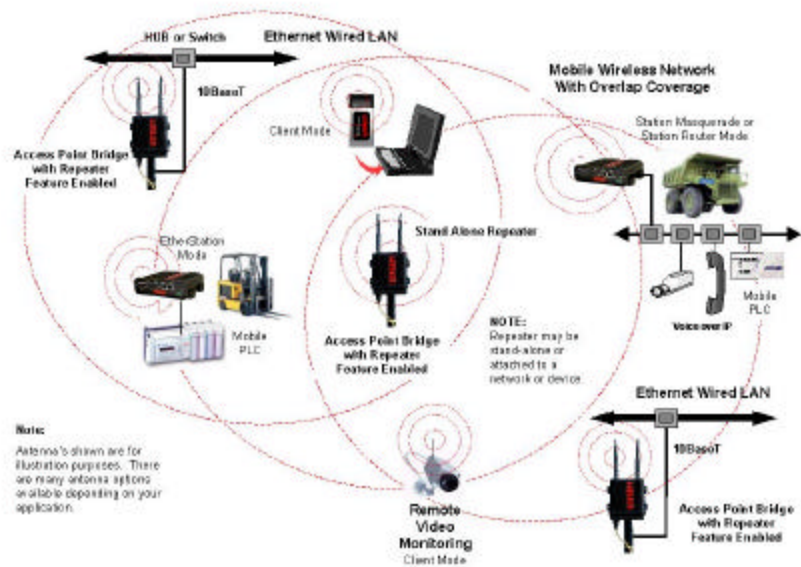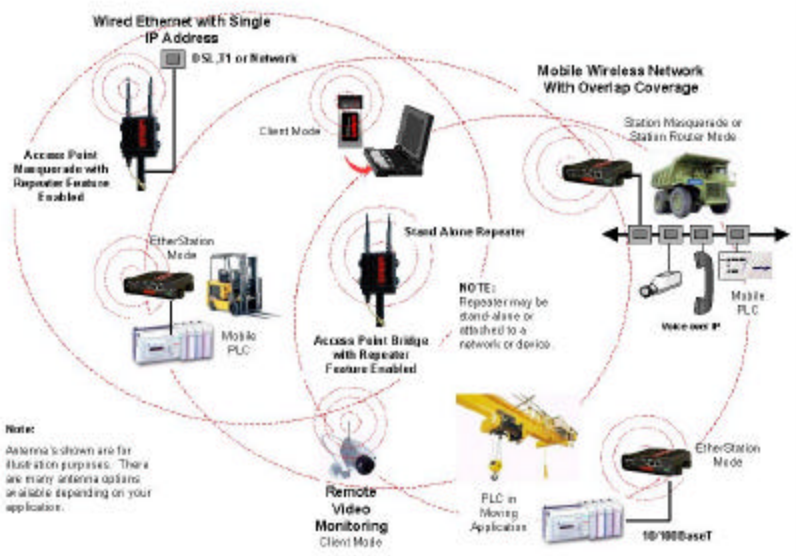


**Figure 2: Access Point Masquerade Mode Diagram**

used for attaching the Model 195Eg to a network where few IP addresses are available or a separate, inaccessible subnet for the wireless clients is required.



**Figure 3: Access Point Repeater Mode Diagram**

4. **Access Point Repeater Modes**. The Access Point Repeater is a unique enhancement of the 802.11g Access Point mode. This feature is available only in the ESTeem Model 195Eg. With this repeater feature enabled, the Model 195Eg Access Points do not have to be hardwired together on the same physical LAN to provide seamless Ethernet communication for roaming 802.11b/g Clients. On power up the Model 195Eg will automatically associate with other Model 195Egs programmed with the same configuration (i.e. SSID, Frequency, Security, etc.) for routing message traffic over the wireless Ethernet network. If there are multiple routes to a destination, this feature will create a "self-healing" network by automatically re-routing data through an alternate path to reach its destination if the primary path is inoperable. When programmed in any of the Access Point modes, the Model 195Eg will also bridge any Ethernet network or Ethernet device connected to the unit over this same wireless Ethernet network. This mode gives the user the features of a point to multi-point bridge network but also allows 802.11b/g Client devices or the Model 195Eg in the Client mode to roam under the network. See Figure 3.
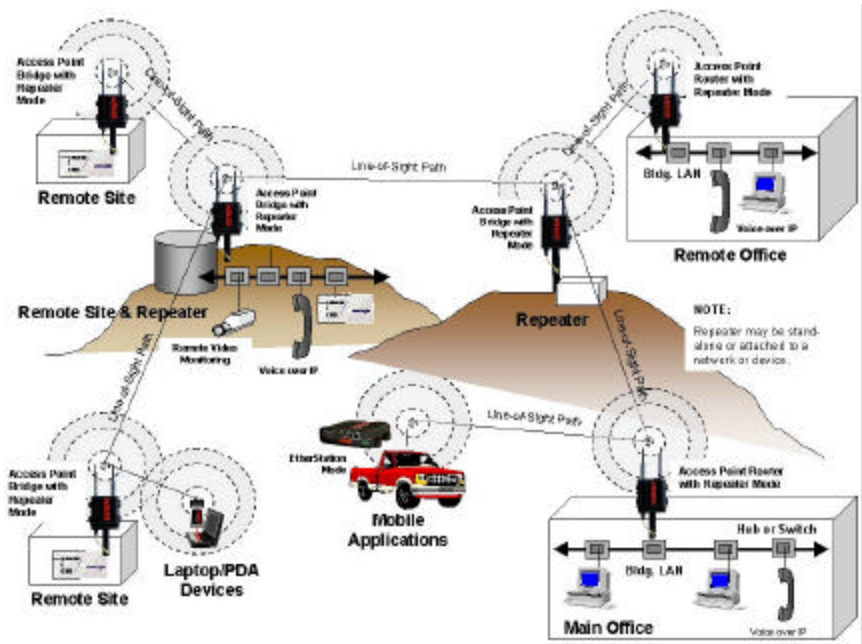
5. **EtherStation Mode**. This is a special feature of the Model 195Eg when used in an Access Point application. When the 195Eg is configured in the EtherStation Mode and attached to a single Ethernet Device, the Model 195Eg will emulate an 802.11g PCMCIA wireless card in functionality for communication to an 802.11g Access Point. This mode can provide greatly increased range over a Wireless LAN Card for mobile Ethernet devices such as vehicles, forklifts, cranes, etc. See Figures 1 - 3.

6. **Station Router Mode**. This is a special feature of the Model 195Eg when used in an Access Point application where multiple devices will be connected to a single ESTeem in a mobile or Client application. When the 195Eg is configured in the Station Router Mode and attached to multiple Ethernet devices, the Model 195Eg will emulate an 802.11g client in functionality for communication to an 802.11g Access Point. This mode would be used where multiple Ethernet devices will be connected to a single Model 195Eg in a mobile application and the *IP addresses for each device will be visible on the LAN* connected to the Access Point. See Figure 2.

7. **Station (Router) Masquerade Mode**. This is a special feature of the Model 195Eg when used in an Access Point application where multiple devices will be connected to a single ESTeem in a mobile or Client application. When the 195Eg is configured in the Station Router Mode and attached to multiple Ethernet devices, the Model 195Eg will emulate an 802.11g client in functionality for communication to an 802.11g Access Point. This mode would be used where multiple Ethernet devices will be connected to a single Model 195Eg in a mobile application and the *IP addresses for each device will be hidden on the LAN* connected to the Access Point. See Figure 2.

To begin setup of your wireless Ethernet network you must first configure the Model 195Eg for the mode desired. Chapter 2 will show you how to begin programming the Model 195Eg.

Chapter 2 of the User's Manual will show basic configuration of the system using the RS-232 port to allow further programming using the ESTeem Web Page shown in Chapter 3.

*When powering up the ESTeem for the first time you must use the ESTeem RS-232C Configuration Menu to setup the basic operating parameters such as assigning the ESTeem an IP Address, IP Net Mask, Gateway IP Address, Domain Name, and DNS IP Address. Once the IP address is configured you can communicate to the ESTeem through your web browser.*

Any terminal emulation program can be used for this configuration of the ESTeem. Most Windows users will probably use Hyper Terminal. Configure your RS-232C port for a Baud Rate to 38,400, Data Bits to 8, Parity to None, Stop Bits to 1 and Handshaking to None. Once your ESTeem has an IP address, you can attach the ESTeem to your network and use the Web Server for further programming.

## MODEL 195Eg HARDWARE LAYOUT

Locate the items contained in Figure 1 for initial configuration of the ESTeem Model 195Eg. Take a few minutes to inventory your equipment before you proceed. Report any missing or damaged items to Customer Support (509-735-9092) as soon as possible.



**Figure 1: Model 195Eg Hardware Layout Diagram**

*Notes:*
- *There is no Power On/Off switch on the Model 195Eg.*
- *Attach the programming Cable to the RS-232 Programming Port and the Patch Cable between the Power Supply and Ethernet port.*
- *One word of caution please attached an antenna to the Model 195Eg before power up.*

## MODEL 195Eg CONFIGURATION

The following steps should be completed before any modifications are made to the network operating parameters for the ESTeem Model 195Eg.

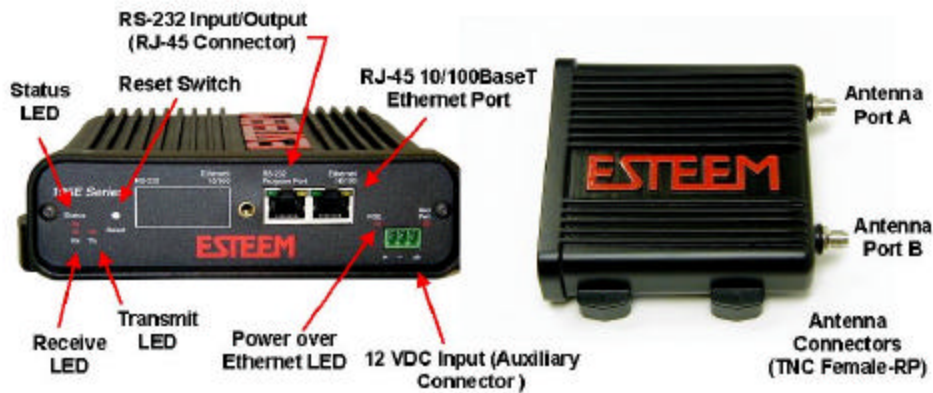1.  Connect the antenna to the antenna connector on the ESTeem Model 195Eg (Figure 2).



**Figure 2: Model 195Eg Front Panel Description**

*Notes:*
*   *Configure the Model 195Eg prior to mounting.*
*   *Some of the following steps, such as connecting the serial cable, are easier to perform if the ESTeem is accessible.*

*   *Please attach an antenna to the Model 195Eg before power up.*

*   *There is no Power On/Off switch on the Model 195Eg.*

2.  When powering up the Model 195Eg for the first time you must use the ESTeem RS-232C Configuration Menu to setup the basic operating parameters such as assigning the IP Address, IP Net Mask, Gateway IP Address, Domain Name, and DNS IP Address.

3.  Connect the serial cable (EST P/N: AA0621) between the RS-232 connector on the Model 195Eg to the serial port on the computer.

4.  Any terminal emulation program can be used for the configuration of the Model 195Eg. Most Windows users use Hyper Terminal. Configure your RS-232C port for a Baud Rate to 38,400, Data Bits to 8, Parity to None, Stop Bits to 1 and Handshaking to None and Terminal to VT100 emulation.

5.  Plug the Model AA175 power supply into a wall socket and connect the Ethernet patch cable to the Model 195Eg Ethernet port. The Power over Ethernet (POE) LED on the front of the ESTeem should be illuminated.

6.  If your computer is configured properly, you will see the ESTeem Model 195Eg booting sequence on your Terminal Emulation program.

    Once the ESTeem boot sequence is complete (approximately 1 minute) you will receive this message:

    *"Please press Enter to active this console."*

    If you don't see this message press the Reset button on the front panel of the Model 195Eg and/or check the programming of your RS-232 port.

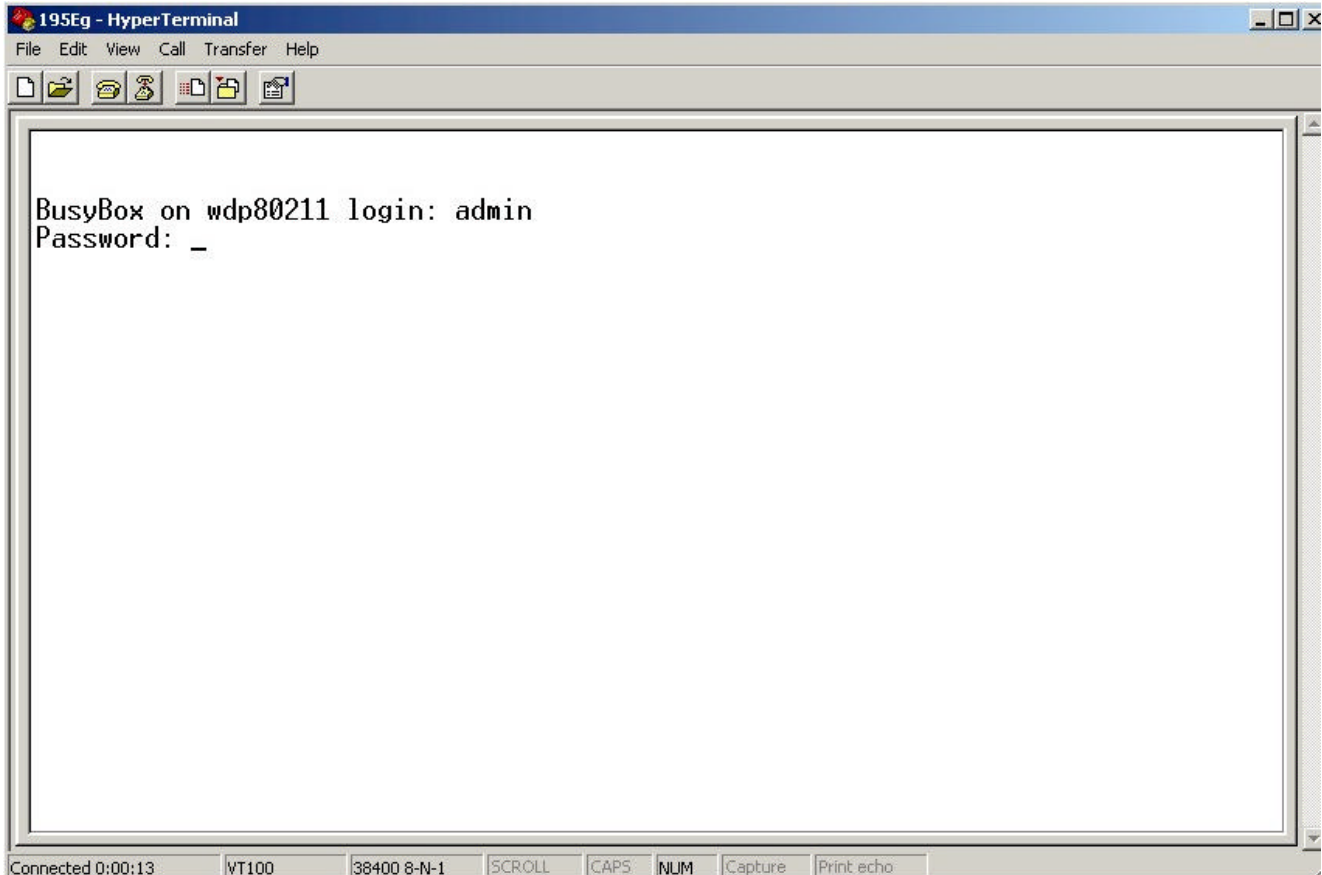7. Press the Enter key and you will be at the Configuration Menu login prompt 195Eg login.  See Figure 3.



**Figure 3: RS-232 Port Log-in Screen**

8. To enter the Model 195Eg Main Menu you will need to log into the system with a login name and password.

9. If this is not the first time configuration of the Model 195Eg, see your network systems administrator for the password.

10. At the 195Eg login prompt type *admin* for the login name and press the *Enter key* (<Enter>).  *The login name is defined at the factory and is not changeable by the user.  Note that all characters are lower case.*

11. If this is the first time the Model 195Eg has been programmed or the Password was not changed from the factory default values, the factory default password is also *admin*.  Enter *admin* for the password and press the Enter key (<Enter>).

   *Note:  All characters are lower case.*

12. The ESTeem Configuration Welcome Screen (Figure 4) will now be displayed.

*Note:* *The configuration menu will function the same as the Web Configuration Manager, but requires moving the arrows to change fields*
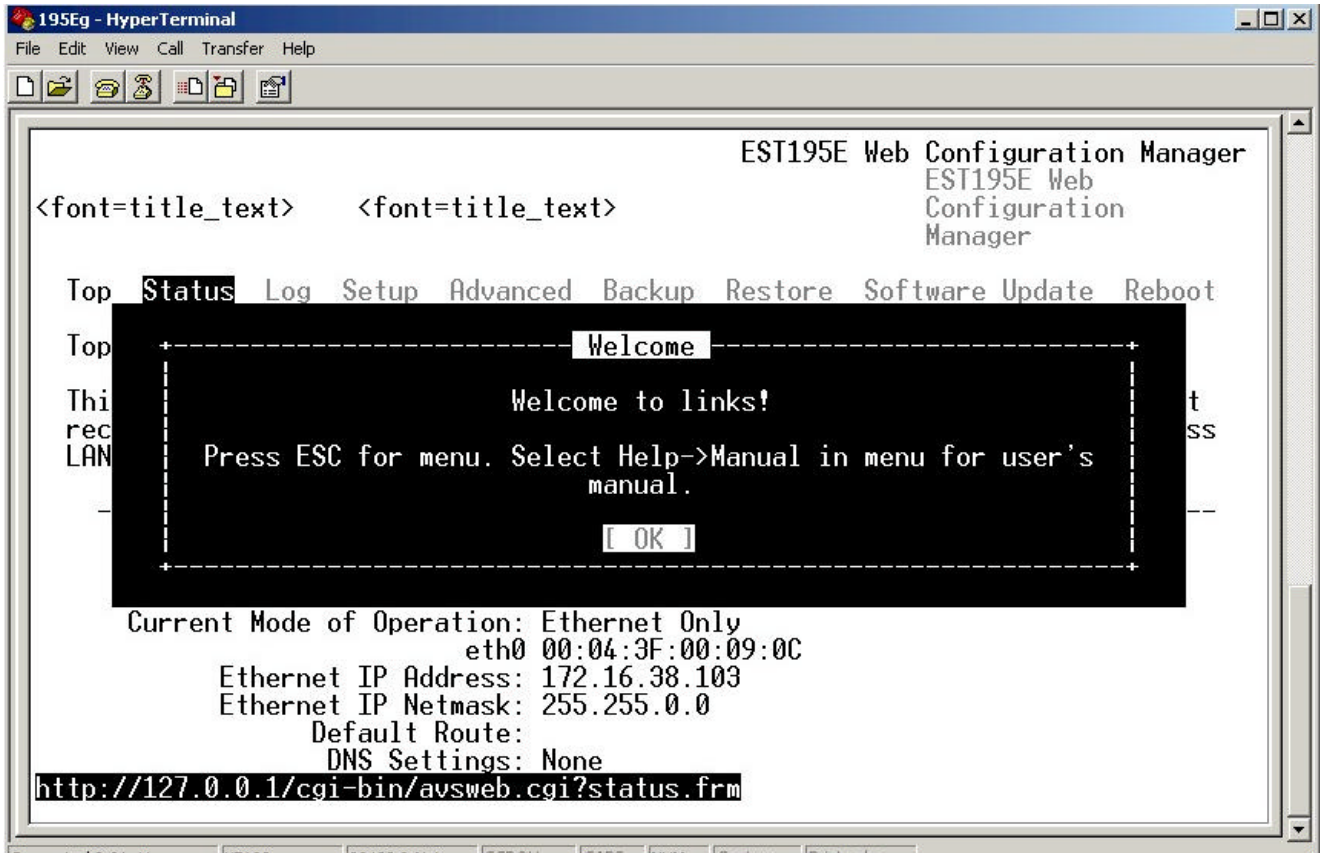


**Figure 4: RS-232 Welcome Screen**

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13. Select SETUP and ETHERNET ONLY.  You will see the screen in Figure 5.  Program the basic operating parameters such as assigning the Model 195Eg an IP Address, IP Net Mask, Gateway IP Address, Domain Name, or DNS IP Address.  When you have completed entering the basic operating parameters as required for your application, answer Yes, to save your changes to flash memory.
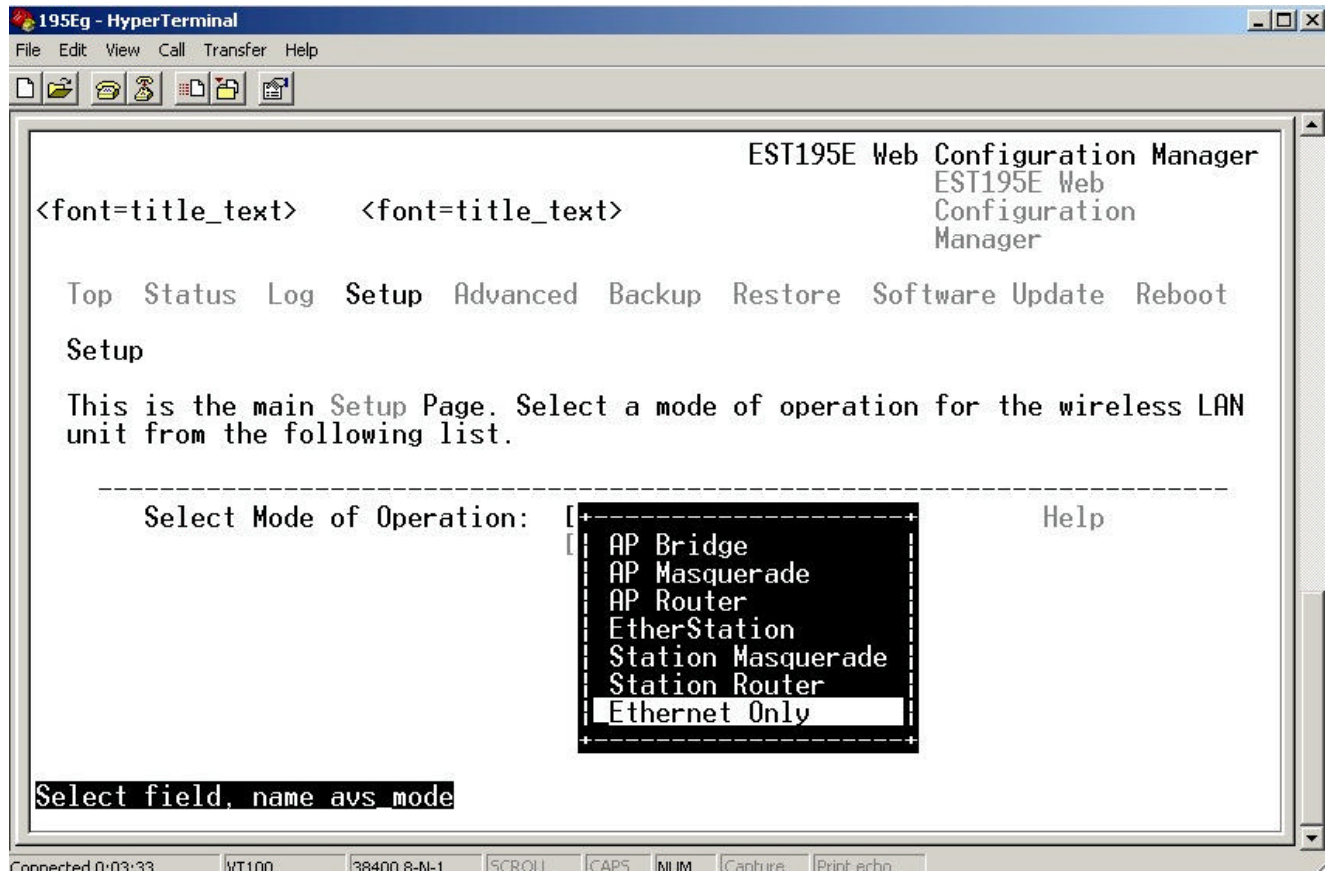


**Figure 5: Setup Ethernet Only Screen**

14. After the basic parameters have been entered into the Model 195Eg you will need to commit the commands to the Model 195Eg (Figure 6). The changes will be saved to flash memory. You can use the higher level programming features in the ESTeem Web Configuration Manager to configure the unit for your application. Proceed to Chapter 3.
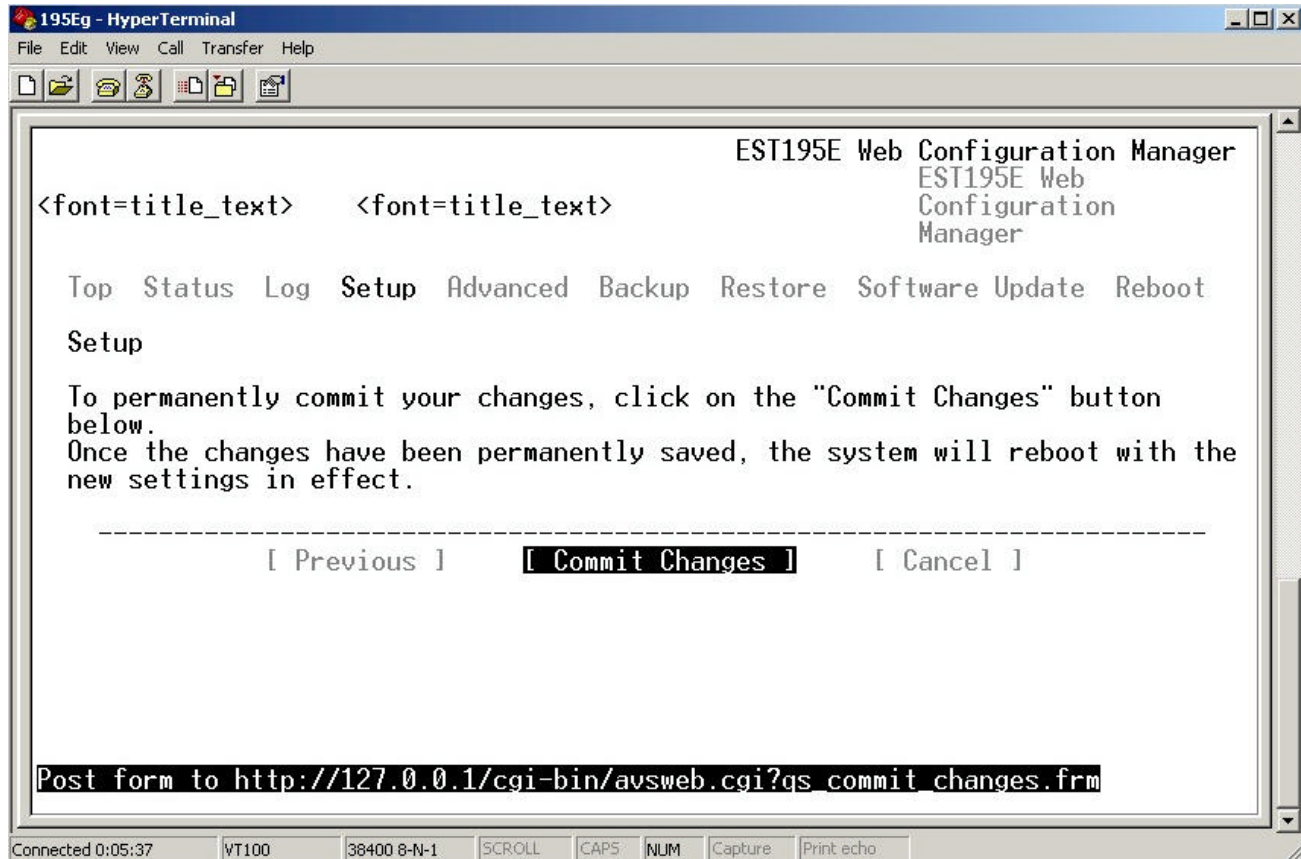
**Figure 6: Commit Changes Screen**

When powering up the Model 195Eg for the first time you must use the ESTeem RS-232C Configuration Menu to setup the basic operating parameters such as assigning the Model 195Eg an IP Address, IP Net Mask, Gateway IP Address, Domain Name, and DNS IP Address. This is necessary to communicate with the Model 195Eg using your web browser. Chapter 2, Starting Out will provide detailed information on how this is done.

## HARDWARE SETUP

Figure 1 shows a typical hardware configuration if you are accessing the ESTeem Web page from a computer over a hardwired LAN. The Model 195Eg is interfaced to the LAN from a Hub or Switch. Figure 2 shows a typical hardware configuration if you are accessing the ESTeem Web page from a computer interfaced directly to the Model 195Eg Ethernet port.
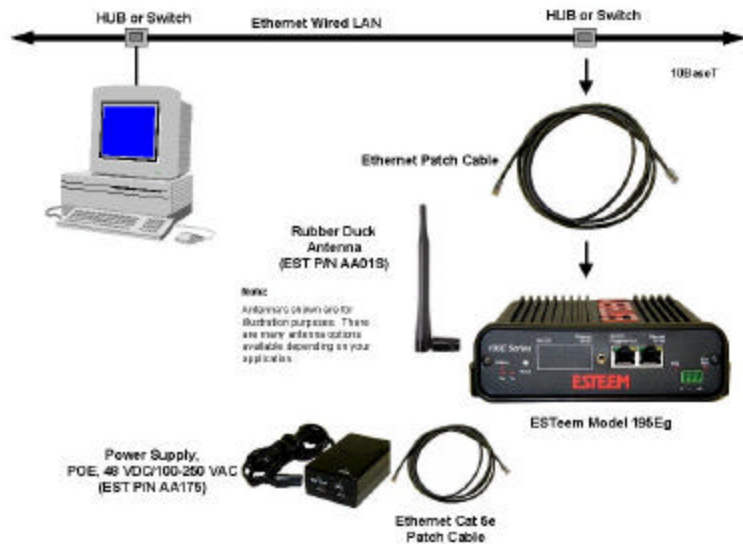


**Figure 1: Hardware Setup Using LAN Ethernet Connection**

1.  Connect the antenna/s to the antenna connector on the Model 195Eg.

2.  Plug the Model AA175 power supply into a wall socket and connect the Ethernet patch cable to the Ethernet port on the Model 195Eg. The Power over Ethernet (POE) LED on the front of the Model 195Eg should be illuminated.

3.  Connect the Ethernet cable to the LAN or computer.

    *Notes:*
    - *There is no Power On/Off switch on the Model 195Eg.*
    - *Please attach an antenna to the Model 195Eg before power up.*
    - *When powering up the Model 195Eg for the first time you must use the ESTeem RS-232C Configuration Menu described in Section 2 to setup the basic operating parameters such as assigning the IP Address, IP Net Mask, Gateway IP Address, Domain Name, and DNS IP Address.*



**Figure 2: Hardware Setup Direct to Computer**

## LOGGING ON TO THE ESTeem WEB PAGE

1. Using your Web Browser connect to the Model 195Eg Web Page with the IP Address that you have assigned it in Chapter 2.

2. You will now see the Log-on Menu on Figure 3. To enter the Model 195Eg Status Menu you will need to log into the system with a User Name and Password.

3. For the User Name enter **admin** and press the Enter key (<Enter>). The User Name is defined at the factory and is not changeable.

4. Enter your Password and press the Enter key (<Enter>).

   *If this is the first time the Model 195Eg has been programmed and Password was not changed from the factory default values, proceed with the steps below to access the Configuration Menu.*

- *The factory default Password is also admin. Enter admin for the Password and press the Enter key (<Enter>).*
- *Note: All characters are lower case.*

5. After Log-in the next screen displayed will be the Model 195Eg Top Menu page (Figure 4). This example screen shows the Top Menu screen.



**Figure 3: ESTeem Web Page Log-on Screen**



**Figure 4: Top Menu Screen**

*Note: Throughout the Configuration Manager are Help Screens that can accessed for further information on each item.*

## STATUS MENU SCREENS

The ESTeem Web Page Status Menu displays the current mode of operation and status of the communication links to other wireless devices. The Status Menu lists connected wireless devices (either other Model 195Egs or 802.11g clients), their signal strength, data rate and background noise.  An example is shown below in Figure 5:



**Figure 5: Status Screen**

## SYSTEM LOG SCREEN

The Log Screen is a trouble-shooting tool that shows the current log of Model 195Eg system messages.  See Figure 6.
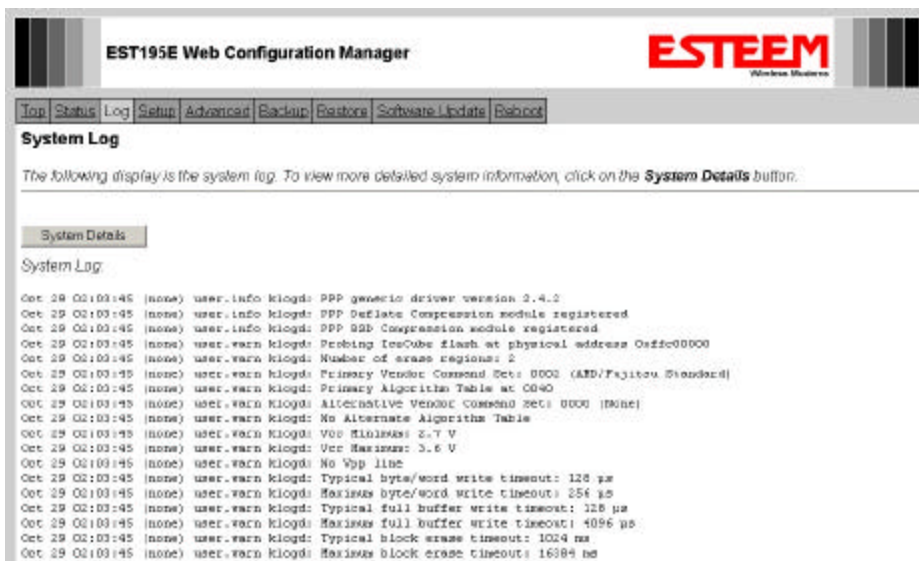


**Figure 6: System Log Screen**

## SETUP SCREEN

The Setup screen allows the step-by-step configuration of the Model 195Eg.  Please see Chapter 4 for complete description on System Configuration.  See Figure 7.



**Figure 7: Setup Screen**

## ADVANCED CONFIGURATION SCREEN

The Advanced screen allows the user to access all configuration parameters.  The parameters are grouped based upon their variable.  See Figure 8.
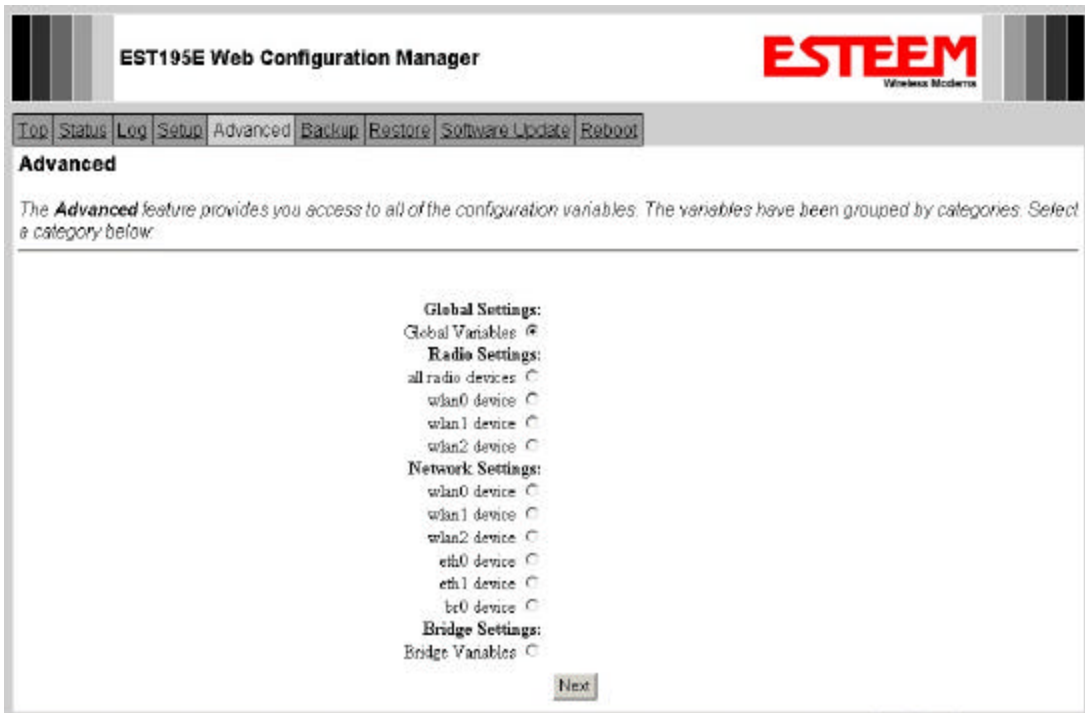


**Figure 8: Advanced Features Screen**

## BACKUP SCREEN

The Backup Screen saves the current configuration in the Model 195Eg to a file on the computer.  See Figure 9.

## RESTORE SCREEN

The Restore screen is used to access the configuration files that were backed up to the computer.  See Figure 10.



**Figure 10: Restore Setting Screen**

## SOFTWARE UPDATE SCREEN

The Software Update feature allows the user to update the latest Model 195Eg operating system software from the factory via the Ethernet port to the Model 195Eg's flash memory. See Figure 11.
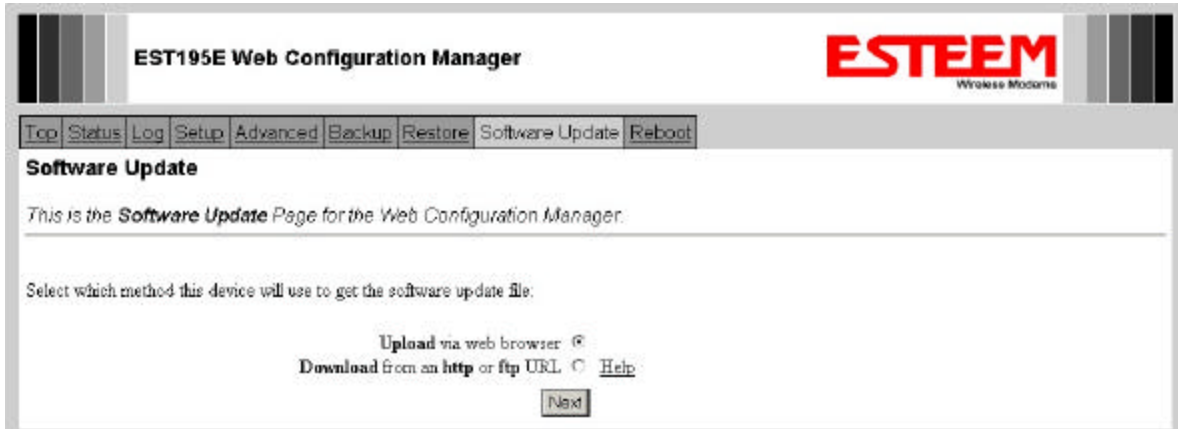


**Figure 11: Software Update Screen**

## SYSTEM REBOOT SCREEN

The Reboot Password screen allows the user to reset the Model 195Eg. See Figure 12.



**Figure 12: System Reboot Screen**