



Before You Begin

- The ESTEem Model 195Es wireless Ethernet radio modem is compatible with many different applications. The most common application is to bridge two or more Ethernet devices. This guide will demonstrate the basic configuration and testing of a pair of 195Es's. For more detailed information, please see the ESTEem Model 195Es User's Manual.
- This guide assumes you have a working knowledge of Ethernet networking, TCP/IP protocol and how to identify and set the TCP/IP address on your computer.
- The 195Es can be configured using any current web browser software such as Internet Explorer, Netscape or Mozilla.
- The following procedure will provide an initial communication link between two or more Model 195's for testing purposes. All the example commands listed in this guide can be adjusted to fit your communication network. Please consult the ESTEem Model 195Es User's Manual for more details.

Unpack Contents

Each node in your ESTEem Model 195Es's network may have different hardware components based upon the final installation location (i.e Outdoor, Indoor, Point-to-point or Muti-Point). Antenna types, cable lengths, power supplies may be different, but the following items will be required for basic setup:

Model 195Es



AA109 Resource Disk



Antenna
(AA20DMEs
Displayed)



(2) Ethernet Cables



Power Supply
(AA175 Displayed)

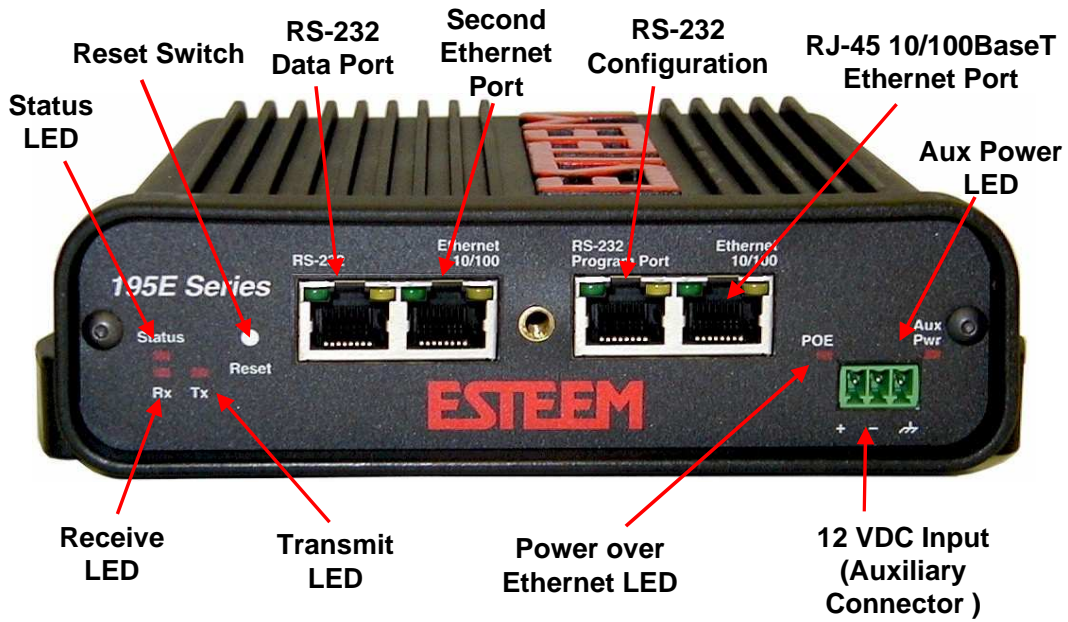


Serial Interface Cable
(AA6021.1)



Note: Your accessory model numbers may vary from the above, but you will need to locate each of above items to continue configuration.

Front Panel Overview



Antenna Overview



Antenna Port A
(Single Antenna Port)

Weatherproof Cap

Antenna Connector
(TNC Female-RP)

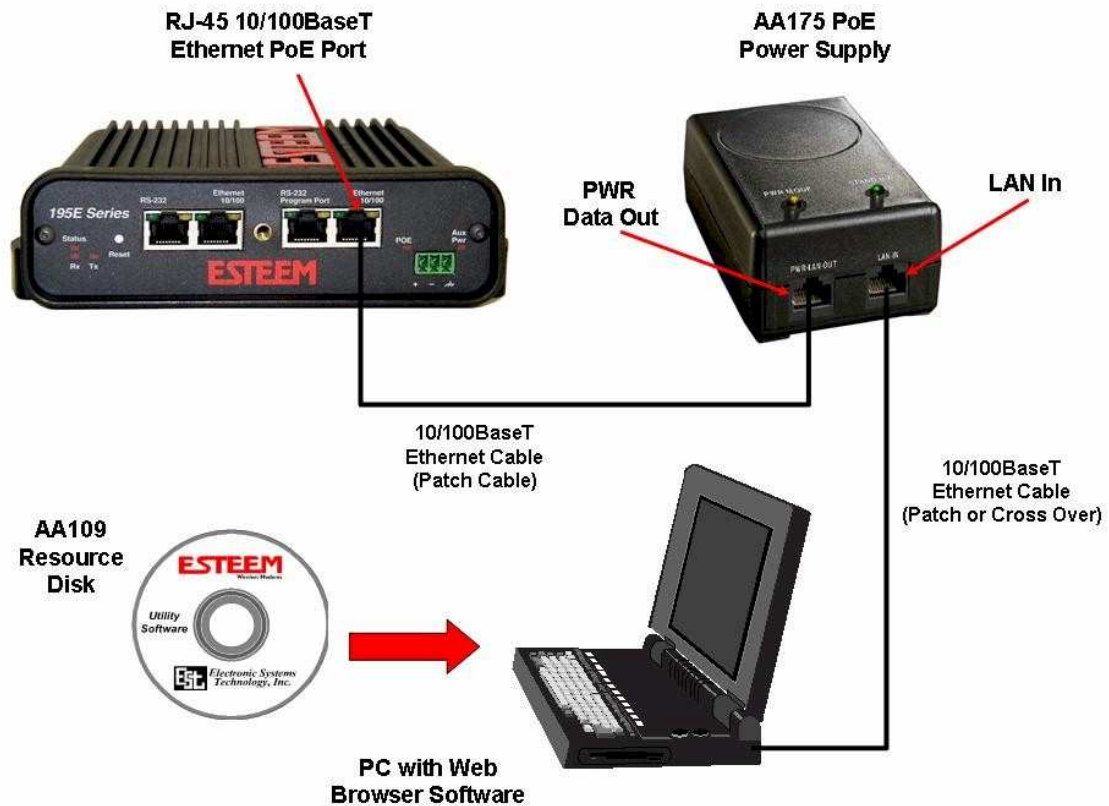
Begin Programming

1. Assemble the ESTEEM Model 195Es using the following:

Antenna Connections



Power and Data Connection



- The Model 195Es will link to other Model 195Es's on the network via the WLAN Media Access Control (MAC) address found on the bottom of the case. This MAC address is six hexadecimal digits separated by colons and is configured at the factory. Every MAC address in the world is unique and can not be changed. Complete the following chart to aid in your configuration:

Name	Serial Number	IP Address	Ethernet MAC	WLAN MAC
Example Modem 1	E-14001	172.16.8.101	00:04:3f:00:01:01	00:04:3f:00:01:02

- Configuration of the Model 195Es is completed through the product's internal web server. To access this configuration page, you will need to enter the 195Es's IP address in your web browser. The IP address set at the factory is Class B (i.e. 172.16.x.x) address and is printed on the Quality Assurance sheet sent with each 195Es. If the factory default address matches your network configuration, please proceed to **Using Setup**, otherwise continue to step 4.
- Install the ESTeem Discovery Utility.** The ESTeem Discovery Utility will allow you to configure the IP address on the Model 195Es to match your network. Install the Discovery Utility on your computer by inserting the Resource Disk in your CD drive.

Note: The ESTeem Resource Disk is stand-alone copy of the ESTeem Web site (Figure 1). Navigation of the Resource Disk is as simple as using your web browser. All technical documentation, User's Manuals and the ESTeem Utility Program is available on the disk.

Place the ESTeem Utility CD in your CD-ROM drive. The CD will auto load the ESTeem main page

Note: If the page does not auto load, open your web browser and set your address line to D:\index.html (Where D: is the drive letter for your CD-ROM drive).

From the Main Page select [Support](#) > [ESTeem Utilities](#) and click on [ESTeem Discovery Utility](#).



Figure 1 –ESTeem Resource Disk Main Page

Note: This program is saved in a compressed file format. Microsoft Windows XP® will open the file directly, but other operating systems will require a common compression program such as WinZip available for download at <http://www.winzip.com>

Double click on the 195EdiscoverySetup.exe file listed in the window to install the program.

5. **Set IP Address on the 195Es.** Connect the Model 195Es to your computer either direct to the Ethernet card or through a HUB/Switch using a CAT-5e Ethernet cable. The Ethernet port on the 195Es supports Auto-Negotiation so either a patch cable or crossover cable will work. Open the ESTeem Discovery Program and press the Discover Modems button. The Model 195Es will be displayed in the program by the Ethernet MAC address and Current IP Address (Figure 3). **Note: The SSID and Mode of Operation will be adjusted later in the configuration.**



Figure 2- ESTeem Utility Download

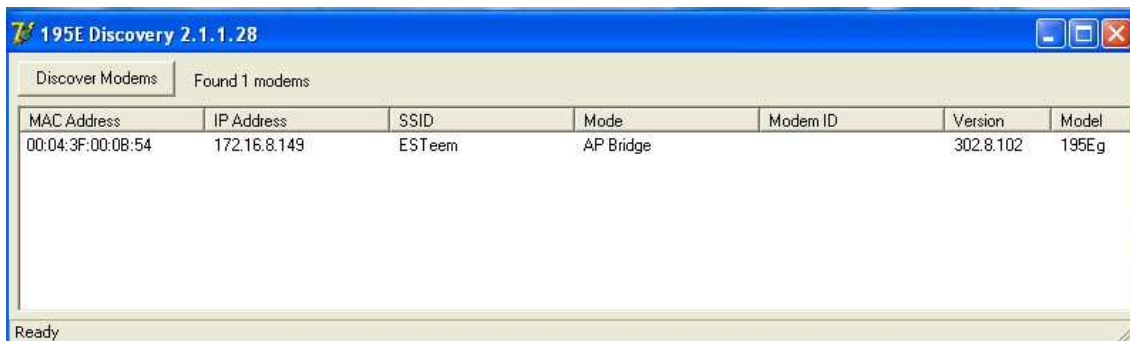


Figure 3 – Discovery Program Main Page

Double-click on the 195Es you wish to program and the *Configure IP Address* window will be displayed (Figure 4). Enter an IP address and Subnet Mask for the 195Es that matches your network subnet and press the OK button to save this to the ESTeem. You will receive notification that the Configuration was Successful and the 195Es will reboot. Proceed to ESTeem Setup to continue configuration.

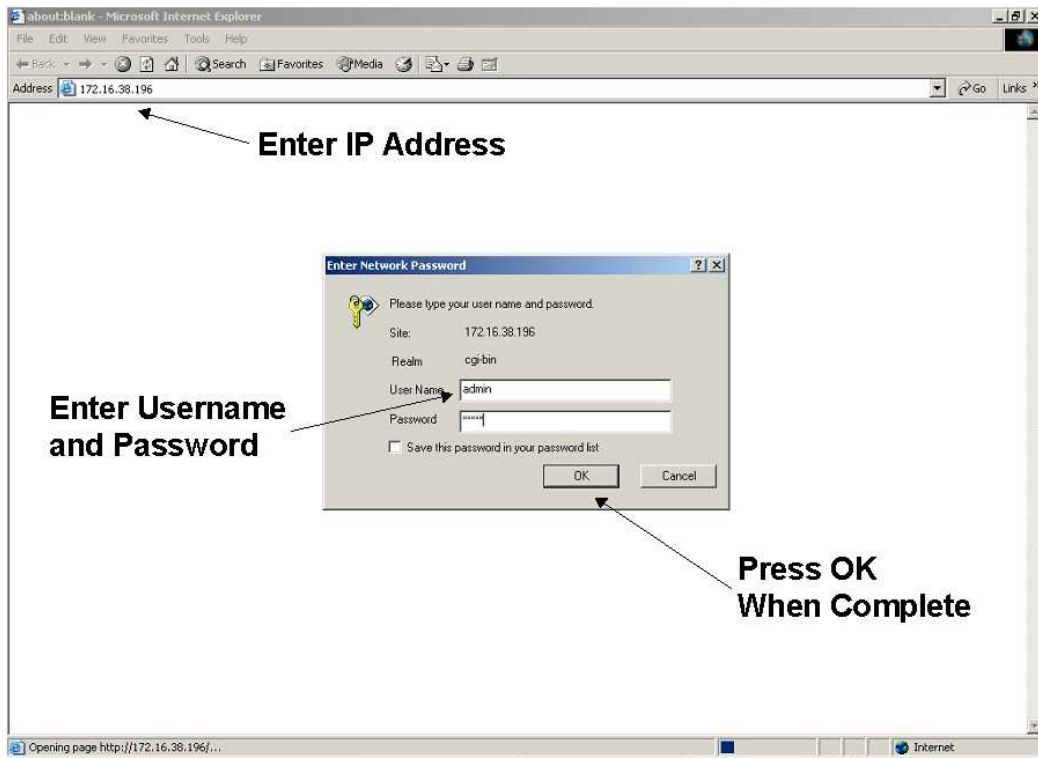


Figure 4 – Change IP Address Window

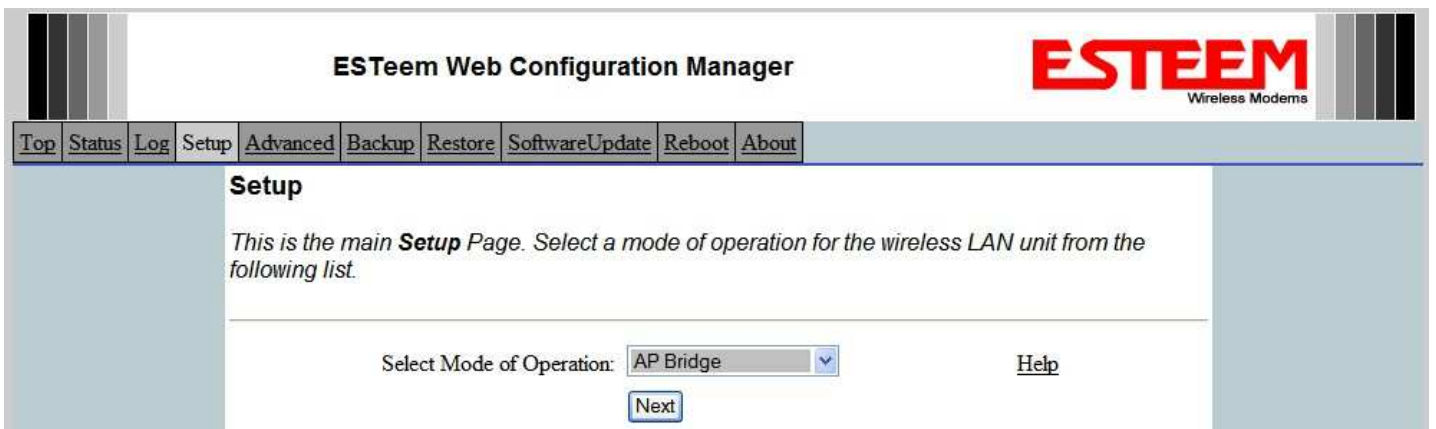
Setup Programming

You should now be ready to configure the Model 195Es through your web browser. Open the web browser program and enter the IP address of the ESTeem in the address line and press enter.

1. When prompted, enter **admin** for both the username and password and press the OK button.
2. Select Setup on the top menu.
3. Press the drop-down menu and select AP Bridge and press the *Next* button.



Step 1 – Sign-In Screen



Step 3 – Select AP Bridge

4. Set the DHCP services to OFF and press the *Next* button.

ESTeem Web Configuration Manager **ESTEEM** Wireless Modems

Top Status Log Setup **Advanced** Backup Restore SoftwareUpdate Reboot About

Setup

Select whether you wish to use DHCP client services or whether you wish configure a DHCP server. Selecting "None" will take you through a manual setup of IP addresses as opposed to using DHCP services.

Selected mode of operation: AP Bridge

DHCP services on the bridge interface: None [Help](#)
 Client
 Server

Step 4 – Turn DHCP Off

5. Verify the IP address and netmask for the 195Es (listed as **bridge** device) are correct press the *Next* button.

ESTeem Web Configuration Manager **ESTEEM** Wireless Modems

Top Status Log Setup **Advanced** Backup Restore SoftwareUpdate Reboot About

Setup

Enter values for the following fields for manual IP setup of the **bridging** device.

Mode of operation: AP Bridge

DHCP Services: Off

Enter IP address for bridge device: [Help](#)

Enter netmask for bridge device: [Help](#)

Step 5 – Verify IP Address

6. Enter in the Gateway address in the default route IP address block and any DNS information for the server. If this is not known or on a network without a Gateway, leave these items at factory default.

The screenshot shows the 'Setup' page of the ESTEEM Web Configuration Manager. The page title is 'ESTEEM Web Configuration Manager' and the logo 'ESTEEM Wireless Modems' is in the top right. A navigation bar at the top contains links: Top, Status, Log, Setup, Advanced, Backup, Restore, SoftwareUpdate, Reboot, and About. The main content area is titled 'Setup' and contains the instruction: 'Enter values for the following fields to set up the default route and DNS settings'. Below this, the 'Mode of operation' is set to 'AP Bridge'. The 'Enter default route IP address' field contains '172.16.1.6'. The 'Use DNS client services?' section has 'No' selected. The 'Enter DNS domain', 'Enter primary DNS server IP address', and 'Enter secondary DNS server IP address' fields are empty. 'Previous' and 'Next' buttons are at the bottom.

Step 6 – Enter Gateway Address

7. All 195Es modems in the network must have the exact same Service Set Identification (SSID). The default SSID is **ESTEEM** and we will use this for demonstration. Enter the SSID as listed above and turn off the wireless security features by selecting the NO radial. Press the *Next* button to continue.

The screenshot shows the 'Setup' page of the ESTEEM Web Configuration Manager. The page title is 'ESTEEM Web Configuration Manager' and the logo 'ESTEEM Wireless Modems' is in the top right. A navigation bar at the top contains links: Top, Status, Log, Setup, Advanced, Backup, Restore, SoftwareUpdate, Reboot, and About. The main content area is titled 'Setup' and contains the instruction: 'In the following fields, select whether you want wireless security features turned on and enter the service set identifier (SSID) that will be common to all wireless LAN devices.' Below this, the 'Selected mode of operation' is 'AP Bridge'. The 'Turn on wireless security features?' section has 'No' selected. The 'Enter the SSID' field contains 'ESTEEM'. 'Previous' and 'Next' buttons are at the bottom.

Step 7 – Enter SSID

Note: It is recommended that security be used in all wireless applications. This procedure will forgo the security configuration for brevity. Please see the example applications and the security appendix for further information.

8. The next step is the configuration of the Frequency Hopping Timing Master. In the first modem, set Network Timing Master to **Yes** and leave the “Upstream Timing Master” at 00:00:00:00:00:00. In the second modem, set the Network Timing Master to **No** and set the “Upstream Timing Master” to the WLANC MAC address of the Timing Master (00:04:3f:00:01:02 in the following example).

Example Addresses				
Name	Serial Number	IP Address	Ethernet MAC	WLAN MAC
Timing Master	E-14096	172.16.48.189	00:04:3f:00:01:01	00:04:3f:00:01:02
Opposite 195Es We Will Create Wireless Link	E-14034	172.16.38.114	00:04:3F:00:0B:00	00:04:3F:00:11:02

Example E-14096 Configuration

ESTEEM Web Configuration Manager

Top Status Log Setup **Advanced** Backup Restore SoftwareUpdate Reboot About

Setup

Select whether this unit will be the overall Network Master. (Network Master **must** only be selected for one unit in the network) If this unit is not the Network Master enter the WLAN MAC address of the unit that will be this unit's upstream Timing Master.

Network Timing Master: Yes [Help](#)
 No

Repeater 1: Enter the WLAN MAC Address of the Network Master
 Repeater 2: Enter the WLAN MAC address of Repeater 1
 Repeater 3: Enter the WLAN MAC address of Repeater 2

Upstream Timing Master: [Help](#)

Example E-14034 Configuration

ESTEEM Web Configuration Manager

Top Status Log Setup **Advanced** Backup Restore SoftwareUpdate Reboot About

Setup

Select whether this unit will be the overall Network Master. (Network Master **must** only be selected for one unit in the network) If this unit is not the Network Master enter the WLAN MAC address of the unit that will be this unit's upstream Timing Master.

Network Timing Master: Yes [Help](#)
 No

Repeater 1: Enter the WLAN MAC Address of the Network Master
 Repeater 2: Enter the WLAN MAC address of Repeater 1
 Repeater 3: Enter the WLAN MAC address of Repeater 2

Upstream Timing Master: [Help](#)

- Configure the repeater peer list by selecting Enable the repeater capability radial to YES. Press the *Add* button to the right of the repeater peer table and, using the chart created in the **Begin Programming** section of this guide, enter the Wireless MAC (WLAN MAC) address of the opposite 195Es (the 195Es this unit you are programming will communicate with) in the Peer 1 – MAC Addr field (right). Leave the Path Cost settings at the default value, select None for encryption and change the Enable Link radial to Enable and press the *Create Repeater Peer* button. Press the *Next* button.

Example Addresses				
Name	Serial Number	IP Address	Ethernet MAC	WLAN MAC
195Es We Are Programming	E-14096	172.16.48.189	00:04:3f:00:01:01	00:04:3f:00:01:02
Opposite 195Es We Will Create Wireless Link	E-14034	172.16.38.114	00:04:3F:00:0B:00	00:04:3F:00:11:02

Top Status Log Setup **Advanced** Backup Restore SoftwareUpdate Reboot About

Setup - Add a Repeater Peer

To add a new repeater peer for the first wireless LAN interface, enter the MAC address, the port priority, the port cost, the key type and key, and click the "Create Repeater Peer" button.

Enter the WLAN MAC address:

Enter a 48-bit MAC address containing 6 colon separated hex bytes

Enter the port path cost (1-65535):

Select the encryption type: None
 WEP 64-bit
 WEP 128-bit
 TKIP

Select the repeater link encryption method. Note: the encryption method and key setting *must* be the same on *both* repeater peers.

Enter the encryption key:

Enter the encryption key as a sequence of hexadecimal bytes (e.g. 0a:0b:1c:2d:3e). Key length: None=0 bytes, WEP64=5 bytes, WEP128=13bytes, TKIP=32 bytes.

Enable/disable link: Enable
 Disable

Enable/disable the repeater peer link. Enable must be selected for the repeaters to communicate.

Step 9 – Configure Peer Table

- Press the *Commit Changes* button and the modem will save all the changes made and reboot. The reboot time is approximately 1 minute to be ready for operation.
- Complete all steps in this **Setup Programming** section for the other Model 195Es's you will be testing before moving on the Testing Communication section.

Testing Communication Link

After you have configured at least two of the Model 195Es wireless Ethernet modems for operation, you can verify communication with each the following steps:

Status Light – The quickest source of link status is to view the Status Light on the face of the 195Es. If the Status light is solid on the remote 195Es, the Model 195Es has a connection to the Timing Master Model 195Es listed in the Peer Table. The Timing Master will have the status light illuminated at all times.

Status Screen/Peer Table – To view further information on the status of the communication link (signal strength and last update time) you can open the Status Screen from the Web Interface. After press the Status tab at the top of the screen the Status: Summary will be displayed showing the status of all ports and memory in the 195Es. Under the Wireless Status heading click on the View Peer Table (Figure 5). The Peer Table will list all 195Es in client mode connected to this modem and how it is classified.

Find the opposite 195Es in the Repeater Peers list and information such as signal strength (in dBm) and time/speed of last data packet will be displayed.



EST195E Web Configuration Manager

ESTEEM
Wireless Modems

[Top](#)
[Status](#)
[Log](#)
[Setup](#)
[Advanced](#)
[Backup](#)
[Restore](#)
[SoftwareUpdate](#)
[Reboot](#)
[About](#)

Status: Peer Table

This page is a summary view of the peer table for WLAN device wlan0. Click on a given MAC address for more details about that peer.

[Return to Status Summary Page](#) **Opposite Modem's Wireless MAC**

Associated Stations

None	Receive Signal Strength (dBm)	Last Packet Received
None		

Repeater Peers

MAC Addr	Signal	LastRx (sec@kbps)	Modem ID
00:04:3f:00:09:66	-36	0@11000	Remote ← Peer Modem ID

Access Points

MAC Addr	Signal	LastRx (sec@kbps)	Enc	SSID
00:02:2d:03:2a:78	-70	0@2000	y	← Other Access Points
00:02:2d:3f:7d:d3	-89	8@2000	y	
00:04:3f:00:09:66	-36	0@11000	y	

Figure 5 – Repeater Peer Table

