LANTRONIX®

WiBox

WiBox™ User Guide

6/15/2006

Part Number 900-351
Revision F ??? 2006

Copyright and Trademark

WiBox, with its patent-pending technology, is a trademark of Lantronix.

Ethernet is a trademark of XEROX Corporation. UNIX is a registered trademark of The Open Group. Windows 95, Windows 98, Windows 2000, Windows NT, and Windows XP are trademarks of Microsoft Corp. Netscape is a trademark of Netscape Communications Corporation.

Contacts

Lantronix Corporate Headquarters
15353 Barranca Parkway
Irvine, CA 92618, USA
Phone: 949-453-3990
Fax: 949-453-3995

Technical Support
Phone: 800-422-7044 or 949-453-7198
Fax: 949-450-7226
Online: www.lantronix.com/support
Email support@lantronix.com

Sales Offices
For a current list of our domestic and international sales offices, go to the Lantronix web site at www.lantronix.com/about/contact

Contents

List of Tables

List of Figures

1: Using This Guide

Purpose and Audience

This guide provides the information needed to configure, use, and update the WiBox. It is for network administrators, system integrators, and those responsible for installing and maintaining the WiBox.

Chapter Summary

The remaining chapters in this guide include:

2: Introduction	Describes the main features of the WiBox and the protocols it supports.
3: Quick Start	Describes the steps to the physical installation and initial configuration of the WiBox.
4: Web-Manager	Details using the Web-Manager to set parameters such as port and server properties.
5: Telnet or Serial Port (Setup Mode) Configuration	Provides instructions for accessing Setup Mode (command line interface) using a Telnet connection through the network or a terminal or terminal emulation program through the serial port.
6: Setup Mode: Server Configuration	Details the network (server) settings
7: Setup Mode: Channel Configuration	Details the serial port settings.
8:Setup Mode: Advanced Settings	Detailsxpert, and security settings and explains how to reset the unit to default values.
9: Wireless Bridging	Provides information on the WiPort wireless bridging feature.
10:Monitor Mode	Provides instructions for accessing and using the command line interface for monitoring the network and diagnosing problems.
11: Updating Firmware	Provides instructions for obtaining the latest firmware and updating the WiBox.
12: Troubleshooting	Describes common problems and error messages and how to contact Lantronix Technical Support.
A: Binary to Hexadecimal Conversions	Provides instructions for converting binary numbers to hexadecimals.
Compliance	
Warranty	

Additional Documentation

The following guides are available on the product CD and the Lantronix web site (www.lantronix.com)

Com Port Redirector Online Help	Provides information on using the Windows-based utility to create a virtual com port.
Secure Com Port Redirector User Guide	Provides information on using the Windows-based utility to create a virtual com port in a secure environment.
WiBox Quick Start	Provides instructions for getting your WiBox up and running.
DeviceInstaller Online Help	Provides information on using DeviceInstaller to assign an IP address and view current configuration settings.

2: Introduction

The WiBox™ family of wireless device servers provides serial-to-wireless network connectivity. They enable virtually any serial device or equipment to be remotely accessed, controlled, monitored, or shared on an 802.11b/G/G wireless network.

The WiBox provides a fully integrated solution that combines an operating system, embedded Web server, full TCP/IP protocol stack with an 802.11b/G transceiver supporting WEP and WPA security, and two high-speed serial ports into a small compact package. For additional security, the WiBox offers secure data communications using Rijndael Advanced Encryption Standards (AES).

This device server allows serial devices to connect and communicate over 802.11b/G wireless networks using IP protocol (TCP for connection-oriented stream applications and UDP for datagram applications). The WiBox also supports 4-wire RS-422/485 and 2-wire RS-485 protocols for multipoint connections. The WiBox with Ethernet model provides an Ethernet connection as well.

The WiBox2100 is configurable for wireless bridging (see *9:Wireless Bridging*). This allows a host connected to the WiBox over a wired Ethernet interface to be accessible over a wireless network.

Name	Model	Part Numbers
WiBox with Ethernet	WBX2100E	WB21000EG1-01 (115 VAC, 50/60 Hz adapter) WB21000EG2-01 (100-240 VAC, 50/60 Hz Intl. adapter) WB2100EGB-01 (WiBox board only) WB2100EG0-01 (No power supply)

Note: *In this User Guide, unless information refers to a specific model, we use the general term WiBox.*

Applications

The WiBox device server connects serial devices such as those listed below to wireless and Ethernet networks using the IP protocol family.

- Security alarms
- Access control devices
- Fire control panels
- Time/attendance clocks and terminals
- ATM machines
- Data collection devices
- RFID readers
- Universal Power Supply (UPS) Management units

- Telecommunications equipment
- Data display devices
- Virtually any RS-232, RS-422 or RS-485 asynchronous serial device

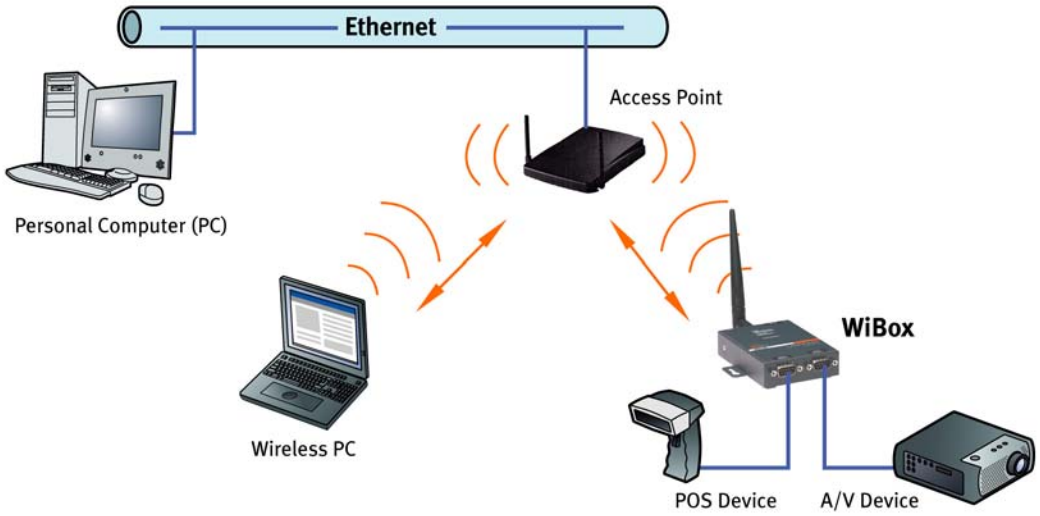
Application Examples

The WiBox has two serial ports and an 802.11b/G transceiver. Each serial port is connected to the serial communication port of a device. The wireless transceiver connects to another wireless device or to an Access Point (AP). The WBX2100E also provides an Ethernet connection.

This section includes typical scenarios for using the WiBox.

Serial Tunneling – Network

Figure 2-1. Serial Tunneling Infrastructure Network Example



A PC connected to an AP via an Ethernet connection and a PC with a wireless connection to the AP LAN access the WiBox as though they are directly connected to it. The combination of the WiBox, a PC, and Lantronix's Redirector software allows the PC to communicate directly to the WiBox's serial devices, providing wireless serial tunneling.

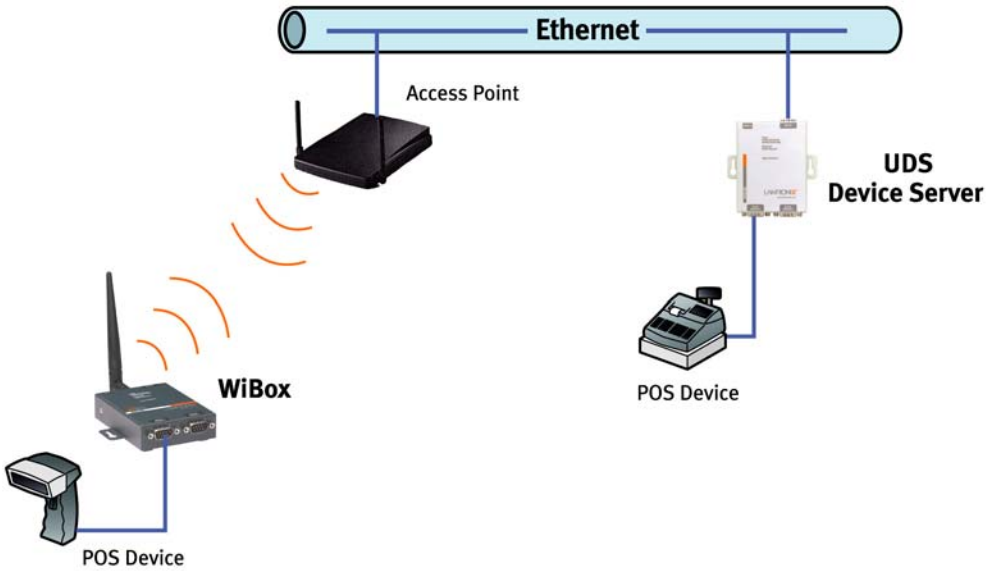
Ad Hoc Network

Figure 2-2. Ad Hoc Network Example

In the example above, the AP is not present. The PC makes a direct wireless connection with the WiBox to manage serial devices. Without an AP, it is a peer-to-peer relationship.

Serial Tunneling – Infrastructure

Figure 2-3. Serial Tunneling Infrastructure Example



In the example above, the WiBox communicates with another device server via the AP. The UDS device server, in this example, is connected via an Ethernet connection to the AP. In this way, the WiBox and the device server communicate directly and can transfer information between their serial devices.

Ad Hoc WiBox Connection

Figure 2-4. Direct WiBox to WiBox Connection

In the example above, two WiBoxes have established an Ad Hoc peer-to-peer relationship. They communicate directly to each other's serial devices without a PC or an AP.

WiBox with Ethernet

With this model, you can select either a wireless or an Ethernet connection.

APPLICATION EXAMPLE?

Protocol Support

The WiBox device server uses the TCP/IP protocol stack for network communications. Other supported protocols include:

- ARP, UDP, TCP, ICMP, Telnet, TFTP, AutoIP, DHCP, HTTP, and SNMP for network communications and management.
- TCP, UDP, and Telnet for connections to the serial port.
- TFTP for firmware and web page updates.
- IP for addressing, routing, and data block handling over the network.
- User Datagram Protocol (UDP) for typical datagram applications in which devices interact with other devices without maintaining a point-to-point connection.

Configuration Methods

After the physical installation of the WiBox, configuration is required. For the unit to operate correctly on a network, it must have:

- A unique IP address
- Appropriate settings for network communications

Methods for logging into the device server and assigning IP addresses (as well as setting other configurable parameters) include:

Web-Manager: Through a web interface, configure the WiBox and its settings using the WiBox's Web-Manager. (See *4: Web-Manager*.)

Serial & Telnet Ports: There are two approaches to accessing Serial Mode. Make a Telnet connection to the network port (9999) or connect a terminal (or a PC running a terminal emulation program) to the unit's serial port. (See *5: Telnet or Serial Port (Setup Mode) Configuration.)*

DeviceInstaller: This utility provides a GUI interface for assigning the IP address, viewing the current configuration, and updating firmware. To use DeviceInstaller for communication to a WiBox over a wireless network, the WLAN network settings must be configured first. No such configuration is required for using DeviceInstaller over an Ethernet network.

Addresses and Port Numbers

Hardware Address

The hardware address is also referred to as the Ethernet address or the MAC address. The first three bytes of the Ethernet address are fixed and read 00-20-4A, identifying the unit as a Lantronix product. The fourth, fifth, and sixth bytes are unique numbers assigned to each unit.

Example: 00-20-4A-14-01-18

IP Address

Every device connected to an IP network must have a unique IP address. This address references the specific unit. DHCP is enabled by default, and the WiBox automatically accepts an IP address once the wireless settings are configured for the wireless network.

WLAN Settings

Before the WiBox can communicate on an 802.11b/G wireless network, the WLAN settings must match the wireless network. By default, the WiBox is set to Ad Hoc network mode and its wireless network name (SSID) is **LTRX_IBSS**.

Port Numbers

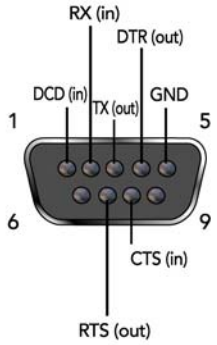
Every TCP connection and every UDP datagram is defined by a destination IP address and a port number. For example, a Telnet application commonly uses port number 23. A port number is similar to an extension on a phone system.

The unit's serial channel (port) can be associated with a specific TCP/UDP port number. Port number 9999 is reserved for access to the unit's Setup (configuration) Mode window. Ports 0-1024 are reserved as well. For more information on reserved port numbers, refer to *Port Number* on page 52.

Serial Connector Pinouts

The two DB9M DTE serial ports provide default settings for RS-232C communications of 9600 baud, 8 bits, no parity, and 1 stop bit (9600, 8, N, 1).

Figure 2-5. DB9M DTE Serial Connector



Alternatively, you can configure the WiBox for RS-422/485 4-wire communications (Figure 2-6) or for RS-485 2-wire communications (*Figure 2-7*).

Figure 2-6. RS-422/485 4-Wire Pinouts

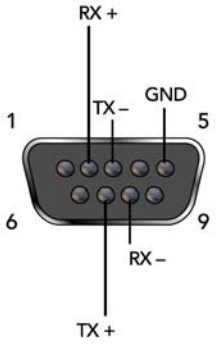
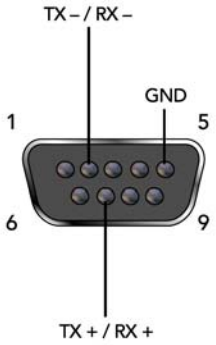


Figure 2-7. RS-485 2-Wire Pinouts



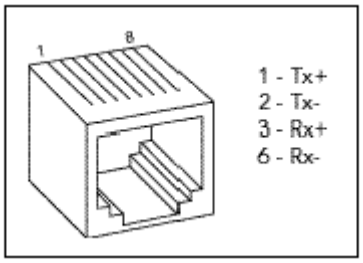
WBX2100E Network Interface

The back panel of the WBX2100E contains a 9-30VDC power plug and an RJ45 (10/100) Ethernet port.

Figure 2-8. Network Interface

Ethernet Connector Pinouts

Figure 2-9. RJ45 Ethernet Connector



LEDs

Table 2-1. WiBox LEDs

LEDs	Meaning
Power LED: Green, steady on	Power is on.
Wireless Link LED: Yellow, blinking	Active wireless connection. Transmitting/receiving.
Wireless Link LED: Yellow, off Port 1 LED flashes (pauses and repeats) 4 times	No active connection, searching for network connection.
Ethernet Link LED: Green, steady on	Active network connection.
Port 1 LED: Green, steady on	Idle.
Port 1 LED: Green, blinking	Active TCP connection.
Port 2 LED: Yellow, steady on	Idle.
Port 2 LED: Yellow, blinking	Active TCP connection.

Technical Specifications

Table 2-2. WiBox Technical Specifications

CPU, Memory	Lantronix DSTni-EX 186 CPU 256 KB zero wait state SRAM 2048 KB Flash
Serial Interface	Rate is software selectable (300 bps to 921600 bps)
Network Interface	Wireless 802.11b/G 10/100 RJ45 Ethernet (WBX2100E only)
Power Supply	External adapter included 120 VAC (1-01 models) USA 100 – 240 VAC (2-01 models) Universal with regional connectors
Power Input	9 – 30 VDC (2.5 W maximum) DC input
Dimensions	Height: 2.3 cm (0.9 in) Width: 7.3 cm (2.87 in) Depth: 9.5 cm (3.74 in)
Weight	0.28 kg (0.62 lbs)
Temperature	Operating temperature range: -30°C to 70°C. Storage temperature range: -40°C to 85°C VERIFYING WITH DARYL/VAN
Relative Humidity	Operating: 10% to 90% non-condensing, 40% to 60% recommended Storage: 10% to 90% non-condensing

3: Quick Start

This chapter describes installation procedures for the WiBox units.

Required Information

Hardware Address

Take note of the unit's hardware address (also known as MAC address). It is on the product label, in the format: 00-20-4a-XX-XX-XX, where the XXs are unique numbers assigned to the product.

Hardware Address: **00-20-4a-_____-_____-_____**

IP Address

The WiBox must have a unique IP address on the network. The systems administrator generally provides the IP address, subnet mask, and gateway.

IP Address: _____ _____ _____ _____

Subnet Mask: _____ _____ _____ _____

Gateway: _____ _____ _____ _____

WLAN Settings

Before the WiBox can communicate on an 802.11b/G wireless network, the WLAN settings must match the wireless network. By default, the WiBox is set to Ad Hoc network mode, and its wireless Network Name (SSID) is **LTRX_IBSS**.

You can configure either WEP or WPA settings:

Note: *WPA Security is only available in infrastructure mode.*

WLAN SSID: _____ (case-sensitive)

WEP Enabled Y/N? _____

WEP Key 64 bit or 128 bit? _____

WEP Key: _____
(Entered in HEX format (0-9 A-F) xx-xx-xx-xx-xx-xx-xx-xx-xx-xx-xx-xx-xx)

or

WPA Enabled Y/N: _____

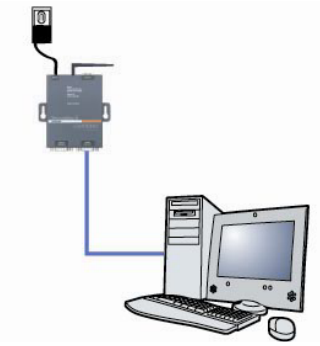
WPA Key Type hex or passphrase? _____

WPA Key: _____

Installing and Configuring the WiBox

Complete the following steps to connect and initially configure the WiBox. Initial configuration is done using the Serial Mode's Change Setup menu.

Figure 3-1. WiBox Connected for Configuration



1. Connect one end of the supplied DB9F – DB9F null modem serial cable to the WiBox's serial port 1.
2. Connect the other end of the DB9 serial cable to a terminal or a PC's serial COM port.
3. On the PC, open a terminal emulation application (e.g. HyperTerminal). The default serial settings are 9600 baud, 8 bits, not parity, 1 stop bit, and no flow control (9600, 8, N, 1).
4. Enter Setup Mode by simultaneously connecting the power supply and holding down the x key. Upon connection , the following information displays:

```
*** Lantronix WiBox Device Server ***
MAC address 00204A8178A4
Software version 05.6b3 (040519)
Press Enter for Setup Mode
```

5. Press **Enter** within 5 seconds to display the **Change Setup** menu.

Two settings are required for the WiBox to communicate on a wireless network:

- The Server (0) settings
- The WLAN (4) settings

Current settings display in parentheses.

Note: *Due to regulations, the country-specific setting has been removed from the setup menu and Web-Manager. We provide a separate utility for changing the* ***Country/Zone*** *setting. The utility is called SetZone and is included in the WiBox package. It is also available for download from the Lantronix web site.*

The syntax is ***`SetZone <IP address> [<zone abbreviation>]`***

Leaving the zone blank causes the utility to report the current setting only. Following are valid zone abbreviations. These settings are consistent with IEEE802.11b/G zones:

US=United States and Canada	**JP=Japan**
FR=France	**OT=Others, such as Europe (excluding France), Asia, Africa, and Australia**

6. To configure the Server settings, select **0** from the **Change Setup** menu and edit the following fields:

   a) **IP Address:** The IP address must be set to a unique value in the network. Enter each octet and press **Enter** between each section inputted.

```
IP Address: IP Address : ( 0) ( 0) ( 0) ( 0) _
```

   b) **Set Gateway IP Address:** The gateway address should be the IP address of the router connected to the same LAN segment as the WiBox unit.

```
Set Gateway IP Address (N) ? Y
Gateway IP addr ( 0) ( 0) ( 0) ( 0)_
```

   c) **Netmask:** A netmask defines the number of bits taken from the IP address that are assigned for the host part.

```
Netmask: Number of Bits for Host Part (0=default)(0)_
```

   d) **Change Telnet Configuration Password:** Change the Telnet configuration password to prevent unauthorized access to the Change Setup menu and Web-Manager.

```
Change telnet config password (N) ? _
```

   e) **Change DHCP Device Name:** Change the DHCP name if the network is DHCP-enabled.

```
Change DHCP device name (not set) ? (N) N
Enter new DHCP device name :
```

7. To modify WLAN settings, select **4 WLAN** from the Change Setup menu and edit the following fields:

   a) **Enable WLAN:** Enable the Ethernet or the Wireless interface. When enabling WLAN, the Ethernet interface is disabled.

```
Enable WLAN (Y) ? _
```

   b) **Topology:** Select Infrastructure (ESS) mode or Adhoc (IBSS) mode. Infrastructure mode communicates with Access Points. Adhoc mode communicates only with other clients.

```
Topology 0=Infrastructure, 1=Adhoc (0) ?
```

c) **Network Name (SSID):** Enter the name of the network to which the WiBox will connect.

```
Network name (LTRX_IBSS) ? _
```

d) **Ad Hoc Network Creation Channel:** When Adhoc mode is selected, and the WiBox cannot find the specified network, it creates one with that name by transmitting a beacon on the selected channel.

```
Channel (11) ?
```

Only channels allowed in the country for which the WiBox is designated can be selected. The country is shown in the settings overview.

e) **Security:** The WiBox features WEP and WPA to secure all wireless communication. If Adhoc is selected as topology, only WEP is available

```
Security 0=none, 1=WEP, 2=WPA (0) ? _
```

f) **WEP:**

```
Authentication 0=open/none, 1=shared (0)
? _
Encryption 0=WEP64, 1=WPE128 (0) ?
Display current key (N) ?
Change key (N) ?
Key type 0=hex, 1=passphrase (0) ?
Enter key:
```

Authentication selects whether the encryption keys are matched (**1** = shared) with those of the communication partner before passing through messages or not (**2** = open/none).

The **Encryption** prompt requests the length of the encryption key and the security strength. WEP64 is 5 bytes or 40 bits (option **0**). WEP128 is 13 bytes or 104 bits (option **1**).

Select (**Y**) Yes at the **Display current key** prompt to show the currently configured key/passphrase

Change key permits modifying the currently configured key by selecting (**Y**) Yes.

The **Key type** specifies whether the new key is in hexadecimal or passphrase format.

Enter key prompts for the new encryption key. The passphrase input is not the same as ASCII input (as used on other products). ASCII is translated directly into hexadecimal bytes according to the ASCII table. The WiBox passphrase is hashed using the Neesus Datacom algorithm (for WEP64) or MD5 (for WEP128).

The passphrase input is safer because it is up to 63 chars long. ASCII input is a maximum of 5 (WEP64) or 13 (WEP128) characters long and limits the number of key combinations.

Please refer to the other equipment's manual to determine the passphrase input style recommended.

Note: *Lantronix recommends using a passphrase of 20 characters or more for maximum security.*

g) **WPA:** This firmware version allows only Pre-Shared Keys (PSK) for authentication and encryption.

```
Allow WEP group keys (N) ?
Display current key (N) ?
Change key (N) ?
Key type 0=hex, 1=passphrase (1) ?
Enter key: () ?
```

Selecting (**Y**) Yes at the **Allow WEP group keys** prompt enables the reception of broadcast messages if older WEP equipment shares the same Access Point.

Select (**Y**) Yes at the **Display current key** prompt to show the currently configured key/passphrase

Change key permits modifying the currently configured key by selecting (**Y**) Yes.

The **Key type** requests whether the new key is in hexadecimal or passphrase format.

Enter key prompts for the new encryption key. The passphrase input is not the same as ASCII input (as used on other products). ASCII is translated directly into hexadecimal bytes according to the ASCII table. The WiBox passphrase is hashed using the Neesus Datacom algorithm (for WEP64) or MD5 (for WEP128).

The passphrase input is safer because it is up to 63 chars long. ASCII input is a maximum of 5 (WEP64) or 13 (WEP128) characters long and limits the number of key combinations.

Please refer to the other equipment's manual to determine the passphrase input style recommended.

Note: *Lantronix recommends using a passphrase of 20 characters or more for maximum security.*

h) **Data Rate:** WiBox permits the control of the transmission rate. Lower data rates allow for larger distances. It may also be needed to communicate with older devices. Select **0** - **3** to set a fixed data rate or select **4** - **6** to set a maximum data rate. This setting allows the radio to lower the data rate in case of bad link quality.

```
Data rate, Only : 0=1, 1=2, 2=5.5, 3=11 Mbps or
Up to: 4=2, 5=5.5, 6=11 Mbps  (6) ?
```

i) **Enable Power Management:** This allows the software to turn off the radio when expecting not to receive or transmit soon. This feature reduces the power consumption by up to 170 mA. Enabling power management increases the response time, because the radio needs to start up again. The radio regularly starts to synchronize and check for incoming messages.

```
Enable power management (N) ? _
```

8. Upon completing the IP and WLAN settings, select menu option **9** to save and exit the WiBox Serial Mode.
9. To further configure the WiBox, continue to *4: Web-Manager* or *5:Telnet or Serial Port (Setup Mode) Configuration.*

Using Device Installer

You can use DeviceInstaller, a utility on the product CD, to manually assign the IP address to the WiBox, view its current configuration settings, and upgrade its firmware. DeviceInstaller only works with a wired Ethernet connection or if the wireless settings are already set.

To install the DeviceInstaller:

1. Insert the product CD into your CD-ROM drive.

   If the CD does **not** launch automatically:

   a) Click the **Start** button on the Task Bar and select **Run**.

   b) Enter your CD drive letter, colon, backslash, **deviceinstaller.exe** (e.g., **E:\deviceinstaller.exe**).

2. Click the **DeviceInstaller** button. The installation wizard window displays.
3. Respond to the installation wizard prompts. (When prompted to select an installation type, select **Typical**.)
4. Once DeviceInstaller has been installed, follow the instructions in DeviceInstaller's online Help to assign the IP address and view the current configuration.
5. To further configure the WiBox, continue onto *4: Web-Manager* or or *5:Telnet or Serial Port (Setup Mode) Configuration.*

Viewing the Current Configuration

ARE THESE STILL THE SAME?

After locating the WiBox as described in DeviceInstaller Help, you can view its current configuration.

To view the WiBox's configuration settings:

1. In the right window, click the **Device Details** tab. The current WiBox configuration displays:

Name	A name to identify the WiBox. Double-click the field, type the value, and press **Enter** to complete. This name is not visible on other PCs or laptops using DeviceInstaller.
Group	A group to categorize the WiBox. Double-click the field, type the value, and press **Enter** to complete. This group name is not visible on other PCs or laptops using DeviceInstaller.
Comments	Comments about the WiBox. Double-click the field, type the value, and press **Enter** to complete. This description or comment is not visible on other PCs or laptops using DeviceInstaller.
Device Family	Displays the WiBox's device family type as **Wireless**.
Type	Displays the device type as **WiBox**.
ID	Displays the WiBox's ID embedded within the box.
Hardware Address	Displays the WiBox's hardware (or MAC) address.
Firmware Version	Displays the firmware currently installed on the WiBox.

Extended Firmware Version	Displays the firmware currently installed on the WiBox.
Online Status	Displays the WiBox's status as online, offline, unreachable (the WiBox is on a different subnet), or busy (the WiBox is currently performing a task).
Telnet Enabled	Displays **True** if the unit can be accessed using Telnet.
Telnet Port	Displays the unit's port for Telnet sessions.
Web Enabled	Displays **True** if the unit can be accessed using Web-Manager.
WebPort	Displays the WiBox's port for Web-Manager configuration.
Maximum Baud Rate Supported	Displays the WiBox's maximum baud rate. ***Note:*** *The WiBox may not currently be running at this rate.*
Firmware Upgradeable	Displays **True**, indicating the WiBox's firmware is upgradeable as newer version become available.
IP Address	Displays the WiBox's current IP address. To change the IP address, click the **Assign IP Address** button.
Number of COB partitions supported	Displays the number of COB partitions supported (between 19 and 59).
DynamicIP	Indicates whether the current IP address was set using static or DHCP.
Subnet Mask	Displays the WiBox's current subnet mask. To change the subnet mask, click the **Assign IP Address** button.
Gateway	Displays the WiBox's current gateway. To change the gateway, click the **Assign IP Address** button.
Number of Ports	Displays the number of ports on the WiBox.
TCP Keepalive valid range	Displays **45**, the WiBox's TCP keepalive range.
Supports Configurable Pins	False
Supports Email Triggers	False
Supports AES Data Stream	WiBox unit supports AES encryption.
Supports 485	WiBox supports the RS-485 protocol.
Supports 920K Baudrate	WiBox supports baud rates up to 920K.
Supports Wired Ethernet	WBX2100E supports wired Ethernet.

Supports HTTP Setup	WiBox supports HTTP setup.
Supports 230K Baudrate	WiBox supports a baud rate of 230K.
Supports GPIO Communication	False

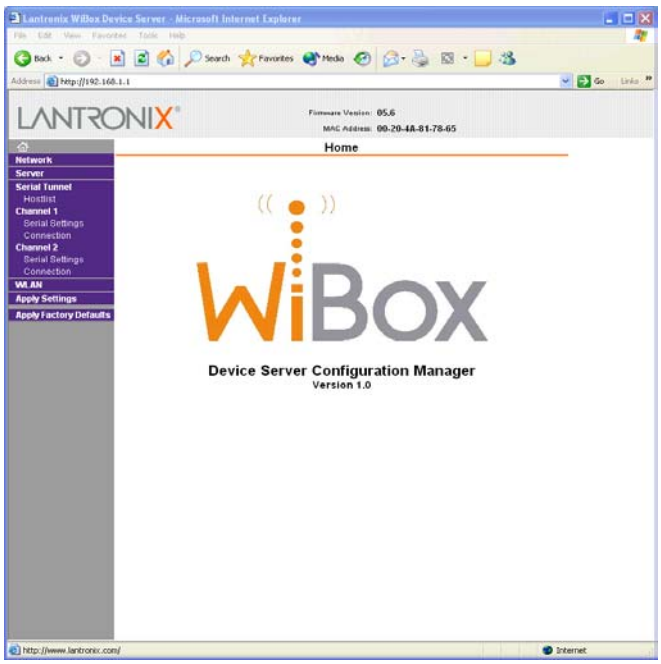
4: Web-Manager Configuration

This chapter describes how to configure the WiBox using Web-Manager, Lantronix's browser-based configuration tool. The unit's configuration is stored in nonvolatile memory and is retained without power. The unit performs a reset after the configuration is changed and stored.

Accessing Web-Manager through a Web Browser

1. Open a standard web browser (Netscape Navigator 6.x and above, or Internet Explorer 5.5. and later).
2. In the address bar, enter the WiBox IP address or host DHCP name as listed below:
   a) http://xxx.xxx.xxx.xxx (where xxx.xxx.xxx.xxx is the IP address assigned to the WiBox unit).
   b) http://my_WiBox (where "my_WiBox" is the name assigned to the WiBox unit if DHCP is enabled).
   c) Cxxxxxx (where xxxxxxx is the last 6 digits of the unit's MAC address on DHCP-enabled networks).
3. Press **Enter**. The Web-Manager for WiBox opens in a browser window.

Figure 4-1. Web-Manager



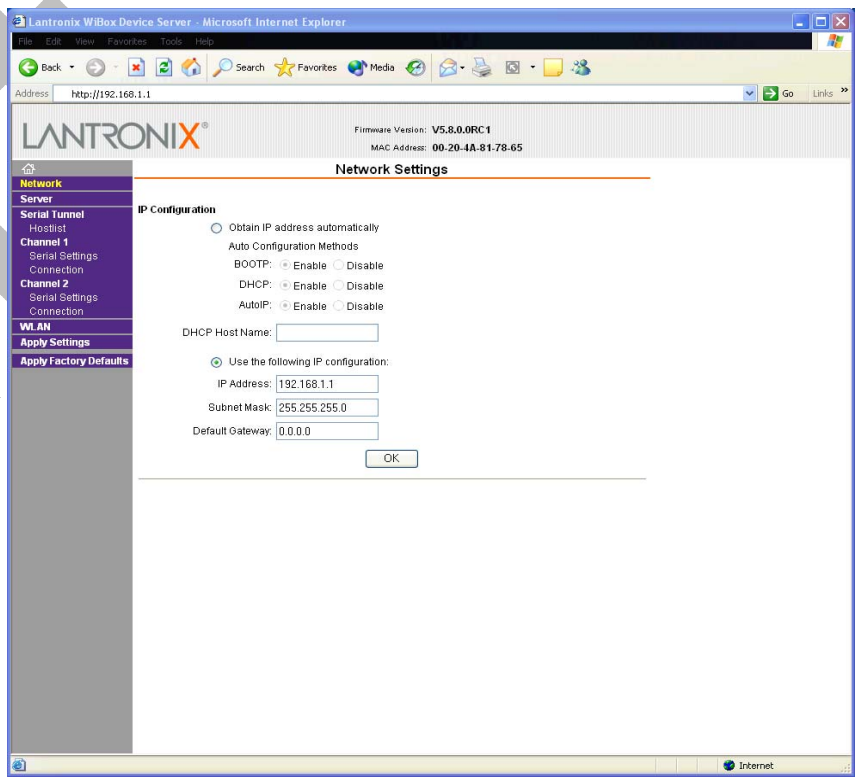
The main menu is on the left panel of the Web-Manager window.

Network Configuration

The unit's network values display upon selecting **Network** from the main menu. The following sections describe the configurable parameters within the Network configuration menu.

Note: *If the IP address is assigned via DHCP, its DHCP settings are not displayed.*

Figure 4-2. Network Settings NEED NEW SCREEN SHOT



Automatic IP Address Configuration

To automatically assign an IP address and its network configuration:

1. Click **Network** from the main menu.
2. Select **Obtain IP address automatically**.
3. Enter the following (as necessary):

BOOTP	Select **Enable** to permit the Bootstrap Protocol (BOOTP). The BOOTP server automatically assigns the IP address from a pool of addresses.
DHCP	Select **Enable** to permit Dynamic Host Configuration Protocol (DHCP). DHCP automatically assigns a leased IP address to the WiBox unit.
Auto-IP	The WiBox generates an IP in the 169.254.x.x address range with a Class B subnet. Select the **Disable** checkbox to disable

	this feature.
DHCP Host Name	Enter the name of the host on the network providing the IP address.

Note: *Consult the System or Network Administrator before adjusting these settings. Disabling all three methods is not advised as the only available IP assignment method will then be ARP or serial port.*

4. Click the **OK** button when finished.
5. On the main menu, click **Apply Settings**.

Static IP Address Configuration

To manually assign an IP address and its network configuration:

1. Click **Network** from the main menu.
2. Select **Use the following IP configuration**.
3. Enter the following (as necessary):

IP Address	If DHCP is not used to assign IP addresses, enter it manually. The IP address must be set to a unique value in the network.
Subnet Mask	A subnet mask defines the number of bits taken from the IP address that are assigned for the host part.
Default Gateway	The gateway address, or router, allows communication to other LAN segments. The gateway address should be the IP address of the router connected to the same LAN segment as the WiBox. The gateway address must be within the local network.

4. Click the **OK** button when finished.
5. On the main menu, click **Apply Settings**.

Ethernet Configuration

TOOK FROM COBOS MASTER. DOES THIS BELONG HERE?

You must specify the speed and direction of data transmission.

To specify how data will be transmitted:

1. On the main menu, click **Network**.
2. Enter the following (as necessary):

Auto Negotiate	With this option, the Ehernet port auto-negotiates the speed and duplex with the hardware endpoint to which it is connected. This is the default setting. If this option is not selected, complete the fields that become available: **Speed:** The speed of data transmission. The default setting is **100 Mbps**. **Duplex:** The direction of data transmission. The default setting is **Full**.

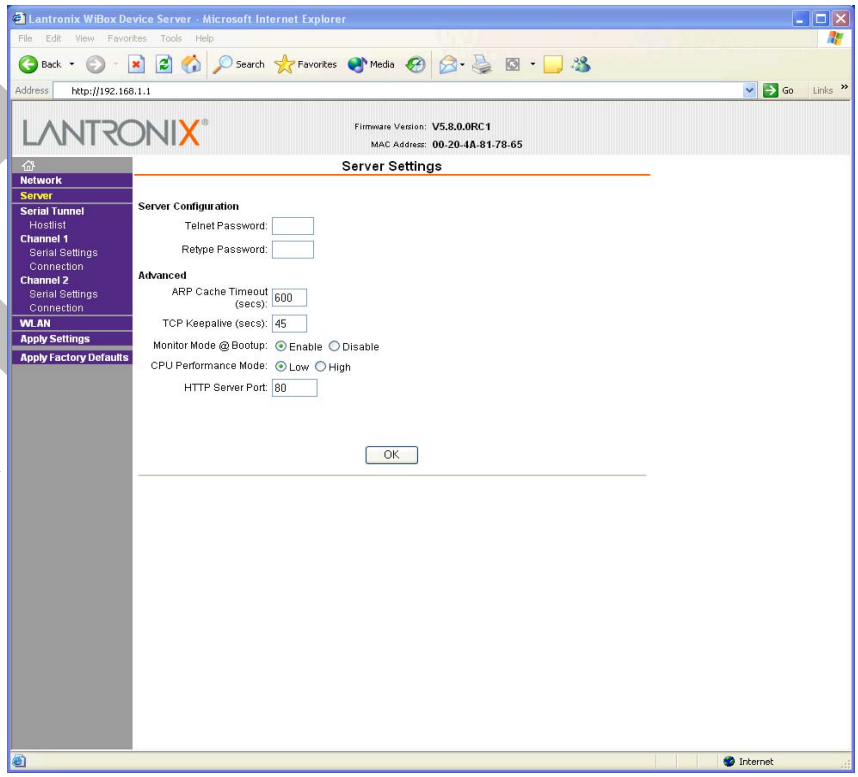
3. When you are finished, click the **OK** button.

4. On the main menu, click **Apply Settings**.

Server Configuration

The unit's server values display upon selecting **Server** from the main menu. The following sections describe the configurable parameters within the Server configuration menu.

Figure 4-3. Server Settings



To configure the WiBox's device server settings:

1. Click **Server** from the main menu.
2. Configure or modify the following fields:

Server Configuration

Telnet Password	Enter the password required for Telnet access.
Retype Password	Re-enter the password required for Telnet access.

Advanced

ARP Cache Timeout	When the unit communicates with another device on the network, it adds an entry into its ARP table. ARP Cache timeout defines the number of seconds (1-600) before it refreshes this table.
TCP Keepalive	TCP Keepalive time defines how many seconds the unit waits during an inactive connection before checking its status. If the

	unit does not receive a response, it drops that connection. Enter a value between **1** and **65** seconds. **0** disables keepalive. The default setting is **45**.
Monitor Mode @ Bootup	Select **Disable** to disable the entry into the monitor mode via the **yyy** or **xx1** key sequence at startup. This command prevents the unit from entering monitor mode by interpreting the stream of characters that are received during the device server's initialization at startup.
CPU Performance Mode	The WiBox provides a high-performance mode that supports the baud rates 460 Kbps and 921 Kbps. When running the serial port at 460 Kbps or 921Kbps, the CPU must be placed in the high performance mode to keep the serial port within this baud rate specification. The maximum serial speed when not in high performance mode is 230 Kbps. The default is **Low**. FROM COBOS MASTER Select the WiBox's performance mode. Higher performance settings require more energy. **Regular** is 48 Mhz; **High** is 88 Mhz. The default setting is **Regular**.
HTTP Server Port	This option allows the configuration of the web server port number. The valid range is 1-65535. The default HTTP server port number is **80**.
MTU Size? DOES WIBOX HAVE THIS?	

3. When you are finished, click the OK button.
4. On the main menu, click Apply Settings.

Hostlist Configuration

The hostlist operates in a sequential order when attempting to connect to the first available host. The WiBox scrolls through the hostlist until it connects to a device listed in the hostlist table. After a successful connection, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until the next successful connection.

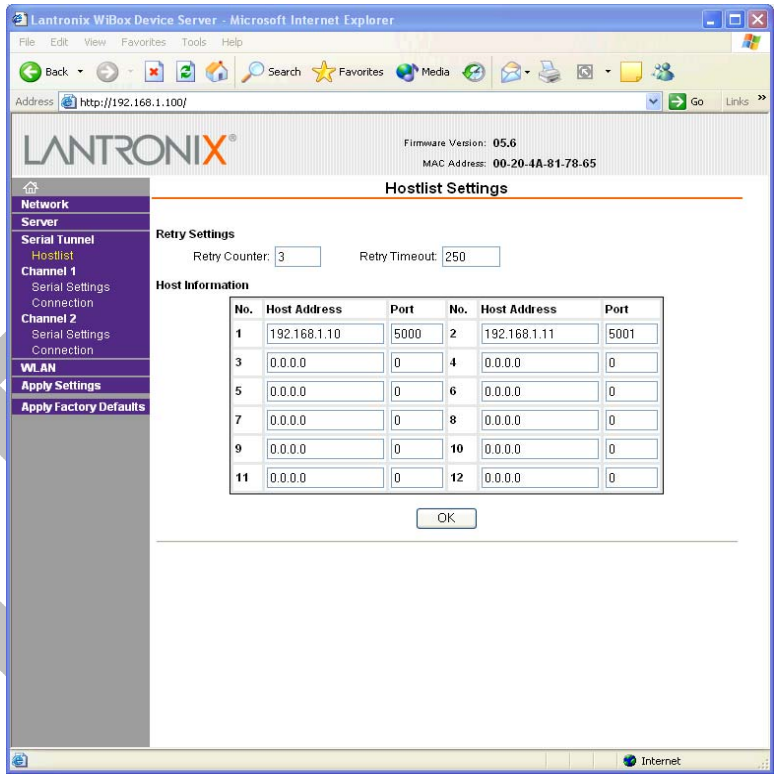
The hostlist supports a minimum of 1 and a maximum of 12 entries. Each entry contains an IP address and a port number.

Note: *The hostlist is disabled for Manual and Modem Mode. The unit will not accept a data connection from a remote device when the hostlist option is enabled.*

To configure the WiBox's hostlist:

1. From the main menu, click the **Hostlist** tab.

Figure 4-4. Hostlist Settings NEED NEW SCREEN SHOT



2. Enter or modify the following fields from the Hostlist Settings window:

Retry Settings

Retry Counter	Enter the value for the number of times the WiBox should attempt to retry connecting to the hostlist. The default setting is **3**.
Retry Timeout	Enter the duration (in seconds) the WiBox should abandon attempting a connection to the hostlist. The default setting is **250**.

Host Information

Host Address	Enter or modify the host's IP address.
Port	Enter the target port number.

3. When you are finished, click the **OK** button.
4. On the main menu, click **Apply Settings**.

Channel 1 and Channel 2 Configuration

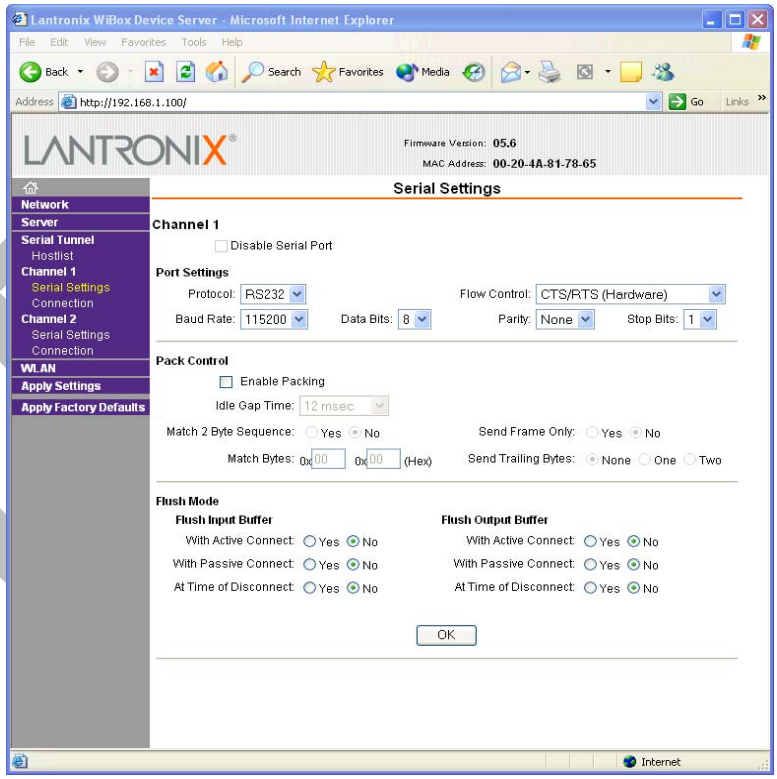
Channel 1 and Channel 2 configurations define how the serial ports respond to network and serial communication.

Serial Settings

To configure a channel's serial settings:

1. From the main menu, click **Serial Settings** for either Channel 1 or Channel 2 to display the Serial Settings page for the selected channel.

Figure 4-5. Channel Serial Settings



2. In the available fields, enter the following information:

Channel

Disable Serial Port	Available on Channel 2 settings only. When selected, disables communication through the serial port.

Port Settings

Protocol	Select the protocol type from the pull-down menu for the selected channel. Available options are RS232, RS422/485 (for 4-wire mode), and RS485 (for 2-wire mode). Applies to Channel 2 only.
Flow Control	Flow control manages data flow between devices in a network to ensure it is processed efficiently. Too much data arriving before a device is prepared to manage it causes lost or retransmitted data. The default is **None**.
Baud Rate	The unit and attached serial device, such as a modem, must agree on a speed or baud rate to use for the serial connection. Valid baud rates are 300, 600, 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200, 230400, 460800, or 921600. For baud rates 460 and 921 Kbps, the CPU Performance Mode must be set to **High**. NOT IN COBOS MASTER.
Data Bits	Indicates the number of character bits. The default setting is **8**.

Parity	Checks for the parity bit. The default setting is **None**.
Stop Bits	The stop bit follows the data and parity bits in serial communication. It indicates the end of transmission. The default setting is **1**.

Pack Control

Enable Packing	Select the checkbox to enable packing on the WiBox. Two firmware-selectable packing algorithms define how and when packets are sent to the network. The standard algorithm is optimized for applications in which the unit is used in a local environment, allowing for very small delays for single characters, while keeping the packet count low. The alternate packing algorithm minimizes the packet count on the network and is especially useful in applications in a routed Wide Area Network (WAN). Adjusting parameters in this mode can economize the network data stream. Disabled by default.
Idle Gap Time	Select the maximum time for inactivity. The default time is **12** milliseconds.
Match 2 Byte Sequence	Use to indicate the end of a series of data to be sent as one group. The sequence must occur sequentially to indicate to the WiBox end of the data collection. The default is **No**.
Match Bytes	Use to indicate the end of a series of data to be sent as one group. Set this value to **00** if specific functions are not needed.
Send Frame Only	After the detection of the byte sequence, indicates whether to send the data frame or the entire buffer. Select **Yes** to send only the data frame. The default is **No**.
Send Trailing Bytes	Select the number of bytes to send after the end-of-sequence characters. The default **None**.

Flush Input Buffer (Serial to Network)

With Active Connect	Select **Yes** to clear the input buffer with a connection that is initiated from the device to the network. The default is **No**.
With Passive Connect	Select **Yes** to clear the input buffer with a connection initiated from the network to the device. The default is **No**.
At Time of Disconnect	Select **Yes** to clear the input buffer when the network connection to or from the device is disconnected. The default is **No**.

Flush Output Buffer (Network to Serial)

With Active Connect	Select **Yes** to clear the output buffer with a connection that is initiated from the device to the network. The default is **No**.

With Passive Connect	Select **Yes** to clear the output buffer with a connection initiated from the network to the device. The default is **No**.
At Time of Disconnect	Select **Yes** to clear the output buffer when the network connection to or from the device is disconnected. The default is **No**.

3. When you are finished, click the **OK** button.
4. On the main menu, click **Apply Settings**.

Connection Settings - TCP

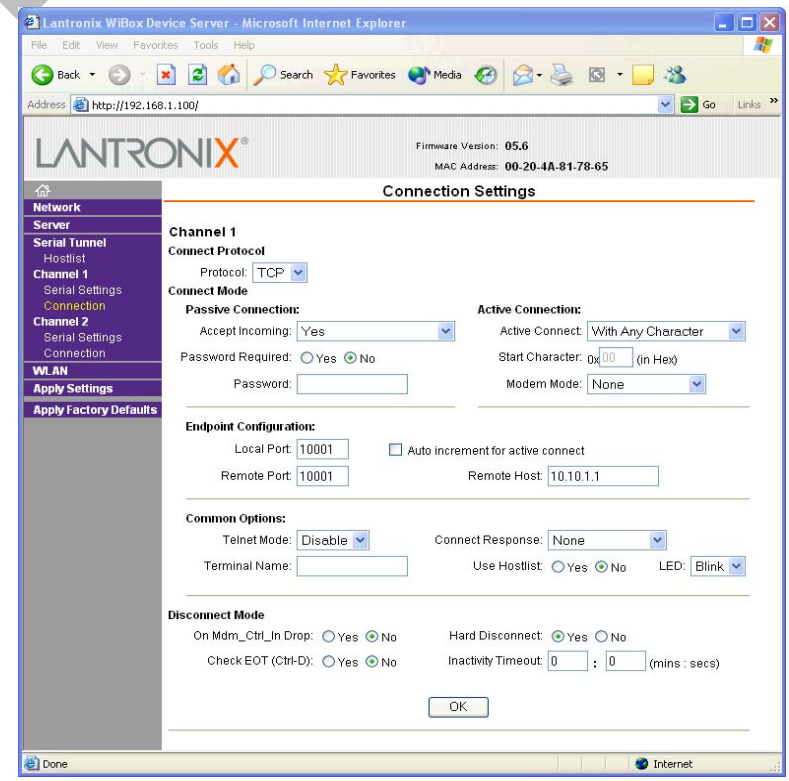
To configure a channel's TCP settings:

1. From the main menu, click **Connection** for either Channel 1 or Channel 2 to display the Connection Settings page for the selected channel.
2. In the available fields, enter the following information:

Connect Protocol

Protocol	Select **TCP** from the pull-down menu.

Figure 4-6. TCP Connection Settings



Connect Mode: Passive Connection

Accept Incoming	Select **Yes** to accept incoming connections.
Password Required	Determines whether a password is required for an incoming passive connection. This field is not available when a password is set for Telnet mode. The default setting is **No**.

Password	If **Password Required** was set to **Yes**, enter the password for passive connections.

Connect Mode: Active Connection

Active Connect	Select **None** (default) to disable **Active Connect**. Otherwise, indicate the connection type from the drop-down list: **With Any Character:** Attempts to connect when any character is received from the serial port. **With Active Mdm Ctrl In:** Accepts external connection requests only when the **modem_control_in** input is asserted. **With Start Character:** Attempts to connect when it receives a specific start character from the serial port. The default start character is carriage return. **Manual Connection:** Attempts to connect when directed by a command string received from the serial port. **Auto Start:** Automatically connects to the remote IP address and port after booting up.
Start Character	If **Active Connect** is set to **With Start Character**, enter the start character in this field. The default setting is **0D**.
Modem Mode	Indicates the on-screen response type when in Modem Mode (if **Modem Mode** is enabled). The default setting is **None**.

Endpoint Configuration

Local Port	Enter the local port number.
Auto increment local port number	Select to auto-increment the local port number for new outgoing connections. The range of auto-incremented port numbers is 50,000 to 59,999 and loops back to the beginning when the maximum range is reached. Disabled by default.
Remote Port	Enter the remote port number.
Remote Host	Enter the IP address of the remote device.

Common Options

Telnet Mode	This field is available for configuration only when **Active Connection** is not set to **None**. Select **Enable** to permit Telnet communication to the WiBox unit.
Terminal Name	This field is available for configuration only when Telnet Mode is **Enable**. Use the terminal name for the Telnet terminal type. Enter only one name. When this option is enabled, the unit also reacts to the EOR (End Of Record) and binary options, which can be used for applications such as terminal emulation to IBM hosts.
Connect Response	A single character is transmitted to the serial port when there

	is a change in connection state. The default setting is **None**.
Use Hostlist	The hostlist operates in a sequential order when attempting to connect to the first available host. If this option is set to **True**, the device server scrolls through the hostlist until it connects to a device listed in the hostlist table. Once it connects, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until it is able to connect to another IP in the hostlist. The hostlist is disabled for Manual Mode and for Modem Mode. The unit will not accept a data connection from a remote device when the hostlist option is enabled..
LED	Select **Blink** for the status LEDs to blink upon connection or **None** for no LED output. The default setting is **Blink**.

Disconnect Mode

On Mdm_Ctrl_In Drop	Set to **Yes** for the network connection to or from the serial port to drop when **modem_control_in** transitions from a high state to a low state. The default setting is **No**.
Hard Disconnect	When set to **Yes**, the TCP connection closes even if the remote site does not acknowledge the disconnect request.
With EOT	Select **Yes** to drop the connection when **Ctrl+D** or Hex 04 is detected. Both **Telnet mode** and **Disconnect with EOT** must be enabled for **Disconnect with EOT** to function properly. **Ctrl+D** is only detected going from the serial port to the network. The default setting is **No**.
Inactivity Timeout	Use this parameter to set an inactivity timeout. The unit drops the connection if there is no activity on the serial line before the set time expires. Enter time in the format mm:ss, where m is the number of minutes and s is the number of seconds. To disable the inactivity timeout, enter **00:00**.

3. When you are finished, click the **OK** button.
4. On the main menu, click **Apply Settings**.

Connection Settings - UDP

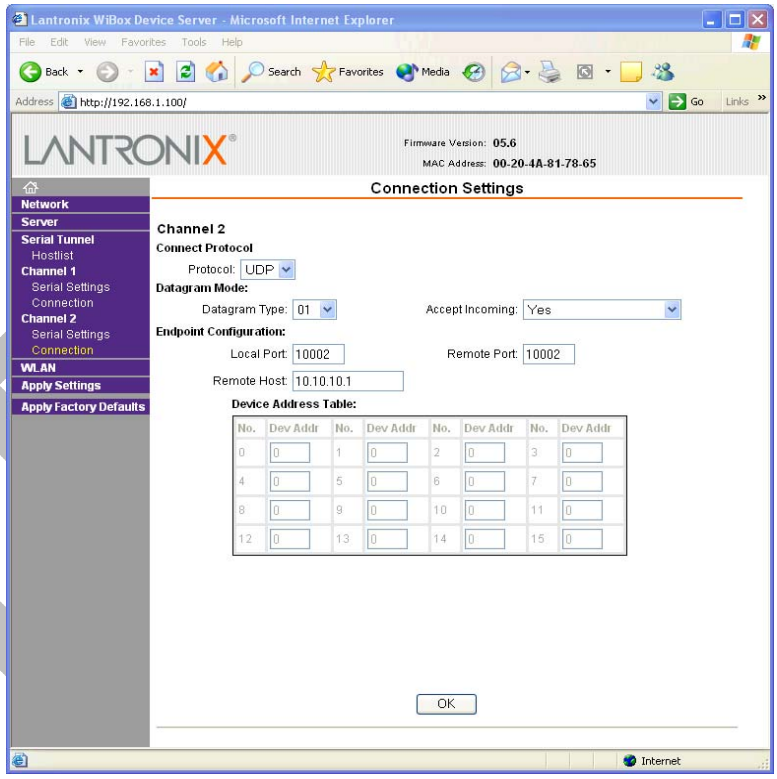
To configure a channel's UDP settings:

1. From the main menu, click **Connection** for either Channel 1 or Channel 2 to display the Connection Settings page for the selected channel.

Connect Protocol

Protocol	Select **UDP** from the pull-down menu.

Figure 4-7. UDP Connection Settings



2. In the available fields, enter the following information:

Datagram Mode

Datagram Type	Configures remote IP or network broadcast address and the remote port. Enter **01** for directed or broadcast UDP. The default setting is **00**.
Accept Incoming	Select **Yes** to accept incoming UDP datagrams.

Endpoint Configuration

Local Port	Enter the local port number.
Remote Port	Enter the port number of the remote device.
Remote Host	Enter the IP address of the remote device.
Device Address Table	This table is enabled when **Datagram Type** is set to **FD**. Enter values between 1-255 to identify units on the local network of device servers.

3. When you are finished, click the **OK** button.
4. On the main menu, click **Apply Settings**.

WLAN Configuration

Without adequate protection, a wireless LAN is susceptible to access by unauthorized users.

The WiBox WLAN Settings menu permits the following actions:

- Configuration of the wireless network profile available for activation.
- Configuration of the wireless network security settings.
- Configuration of advanced settings such as radio power management.

Note: *Due to regulations, the country-specific setting has been removed from the setup menu and Web-Manager. We do, however, provide a separate utility for changing the* ***Country/Zone*** *setting. The utility is called SetZone and is included in the WiBox package. It is also available for download from the Lantronix web site.*

The syntax is ***`SetZone <IP address> [<zone abbreviation>]`***

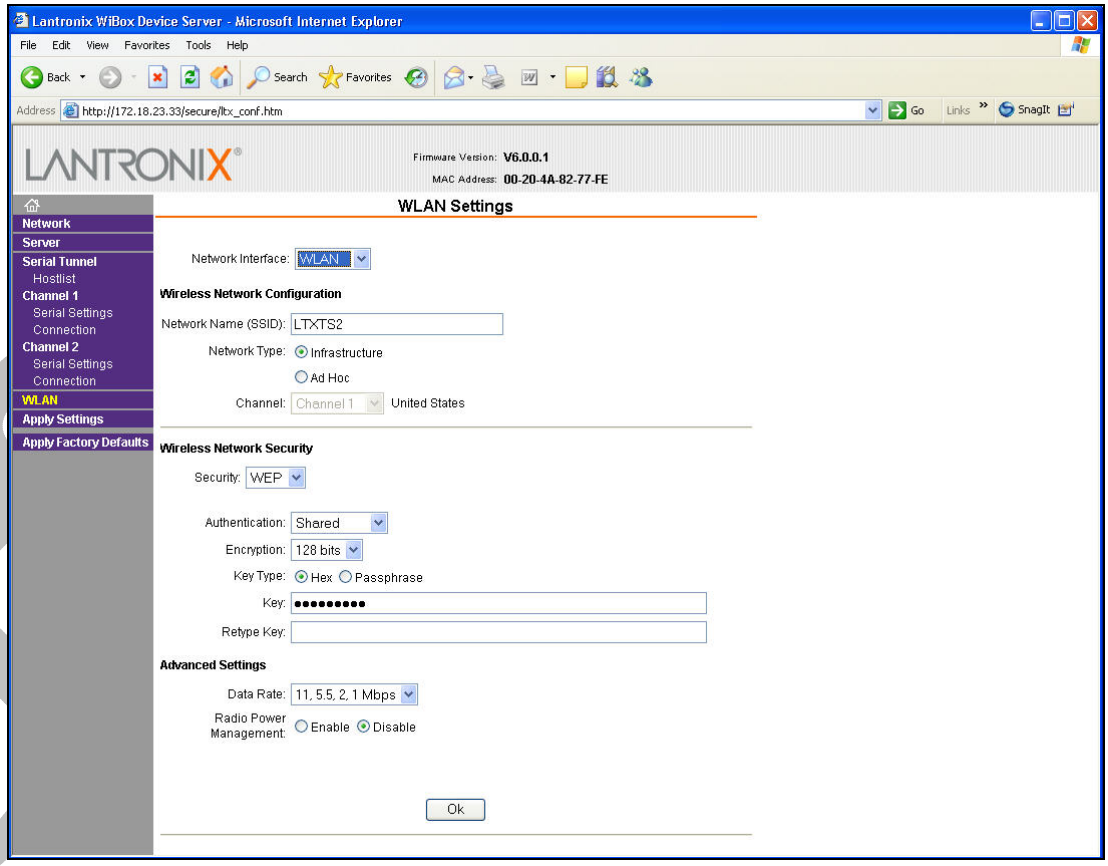
Leaving the zone blank causes the utility to report the current setting only. Following are valid zone abbreviations. These settings are consistent with IEEE802.11b/G zones:

US=United States and Canada	**JP=Japan**
FR=France	**OT=Others, such as Europe (excluding France), Asia, Africa, and Australia**

To configure the WiBox's WLAN settings:

1. Select **WLAN** from the main menu to open the WLAN Settings window.

Figure 4-8. WLAN Settings



2. Enter or modify the following fields:

Network Interface	Use the pull-down menu to select a **WLAN** interface or an **Ethernet** interface.

Wireless Network Configuration

Network Name	Enter the name of the wireless network (SSID). The WiBox connects to this wireless network.
Network Type	Select **Infrastructure** or **Ad Hoc**.
Channel	Configurable only when **Network Type** is **Ad Hoc**. Select from the pull-down menu the radio channel for the Ad Hoc network. The default value is **11**.

Wireless Network Security

Security	As a security measure, enable **WEP** or **WPA** on the WiBox. By default, wireless security is disabled on the WiBox.

WEP Options

Authentication	Select an authentication scheme (**Open/None** or **Shared**) from the drop down menu.
Encryption	Select the encryption type (**64 bits** or **128 bits** for WEP) from the pull-down menu. **64 bits** is the default encryption for WEP.

Key Type	Select the key type (**Hex** or **Passphrase**).
Key	Enter the **Encryption Key** in hexadecimal value if **Hex** is selected as the key type. Enter the key as a string if **Passphrase** is selected as the key type. Passphrase input is not the same as ASCII input . A passphrase of more than 20 characters is recommended. Spaces and punctuation characters are permitted.

WPA Options

Authentication	Select **Pre-Shared Keys** from the drop down menu.
Encryption	Select the encryption type from the pull-down menu. **TKIP** is the default encryption for WPA.
Key Type	Select the key type (**Hex** or **Passphrase**).
Key	Enter the **Encryption Key** in hexadecimal value if **Hex** is selected as the key type. Enter the key as a string if **Passphrase** is selected as the key type. Passphrase input is not the same as ASCII input. A passphrase of more than 20 characters is recommended. Spaces and punctuation characters are permitted.

Advanced Settings

Data Rate	WiBox permits the control of the transmission data rate. Click the **Auto** check box to allow the WiBox to automatically set the data rate (or leave unchecked to manually set the transmission rate). The default rate is **11 Mbps**. If the **Auto** check box is selected, choose the maximum data rate from the drop down menu. If the **Auto** check box is not selected, select the fixed data rate (in Mbps) from the drop down menu. ***IS THE FOLLOWING TRUE FOR WIBOX?*** ***Note:*** *For WiPort version WP2001000G-02 (WiPort-G), the maximum data rate cannot be selected when the WiPort automatically sets the data rate. WiPort-G supports the following additional rates: 18 Mbps, 24 Mbps, 36 Mbps, and 54 Mbps.*
Radio Power Management	Power management reduces the overall power consumption of the WiBox unit. Selecting **Enable** increases the response time.

3. When you are finished, click the **OK** button.
4. On the main menu, click **Apply Settings**.

Updating Settings

1. If you have not already done so, click the **Apply Settings** button from the main menu to save and apply the configuration changes.

Apply Defaults

Click the **Apply Defaults** button to reset the unit's Channel 1 configuration, Channel 2 configuration, Security, and Expert settings to the factory default settings. The server configuration settings for IP address, gateway IP address, netmask, and WLAN remain unchanged. The specific settings that this option changes are listed below:

CHECK THESE

Channel 1 Configuration

Baudrate	9600
I/F Mode	4C (1 stop bit, no parity, 8 bit, RS-232C)
Port No	10001
Connect Mode	C0 (always accept incoming connection; no active connection startup)
Hostlist Retry Counter	3
Hostlist Retry Timeout	250 (msec)
Send Character	0x0D (CR)
All other parameters	0

Channel 2 Configuration

Baudrate	9600
I/F Mode	4C (1 stop bit, no parity, 8 bit, RS-232C)
Port No	10002
Connect Mode	C0 (always accept incoming connection; no active connection startup)
Hostlist Retry Counter	3
Hostlist Retry Timeout	250 (msec)
Send Character	0x0D (CR)
All other parameters	0

WLAN Settings

Enable WLAN	(Y) Yes
Topology	Infrastructure
Network Name	LTRX_IBSS
Channel	11
Security	0 (none)

TX Data Rate	0 (fixed)
TX Data Rate	11 Mbps
Enable Power Management	N (No)

Expert Settings

TCP keepalive	45 (seconds)
ARP cache timeout	600 (seconds)
CPU performance	Disabled
Disable Monitor Mode	(N) No
HTTP port number	0 (resulting in an operational value of 80)

WHAT ABOUT:

MTU Size	1400
Enable Alternate MAC	N (No) (for OEM use only)
Ethernet Connection Type	0 (auto negotiate)

Security Settings

Disable SNMP	(N) No
SNMP Community Name	Public
Disable Telnet Setup	(N) No
Disable TFTP Firmware Update	(N) No
Disable Port 77FEh	(N) No
Disable Web Server	(N) No
Disable Web Setup	(N) No
Disable ECHO ports	(N) No
Enable Encryption	(N) No
Enable Enhanced password	(N) No

5: Telnet or Serial Port (Setup Mode) Configuration

You must configure the unit so that it can communicate on a network with your serial device. As an alternative to using a web browser, as described in the previous chapter, you can use the following procedures remotely or locally:

- Use a Telnet connection to configure the unit over the network.
- Use a terminal or terminal emulation program to access the serial port locally.

The series of prompts at which you enter configuration settings is called **Setup Mode**.

Note: *Detailed information about other setup methods is available from your Lantronix Sales Associate.*

The unit's configuration is stored in nonvolatile memory and is retained without power. You can change the configuration at any time. The unit performs a reset after the configuration has been changed and stored.

This chapter tells you how to access Setup Mode and the general procedure for using it. To complete the configuration, continue with *6:Setup Mode: Server Configuration*, *7:Setup Mode: Channel Configuration*, and *8:Setup Mode: Advanced Settings*.

Note: *The menus in the configuration chapters show a typical device. Your device may have different configuration options.*

Accessing Setup Mode

Telnet Connection

To configure the unit over the network, establish a Telnet connection to port **9999**.

Note: *You can also use DeviceInstaller to access Telnet. Select the device from the main window list, and click the **Telnet Configuration** tab. Skip steps 1 and 2.*

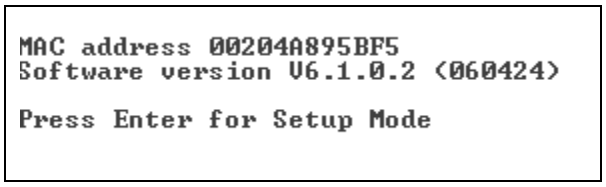
To establish a Telnet connection:

1. From the Windows **Start** menu, click **Run** and type the following command, where x.x.x.x is the IP address, and 9999 is the unit's fixed network configuration port number:

   Windows: `telnet x.x.x.x 9999`
   UNIX: `telnet x.x.x.x:9999`

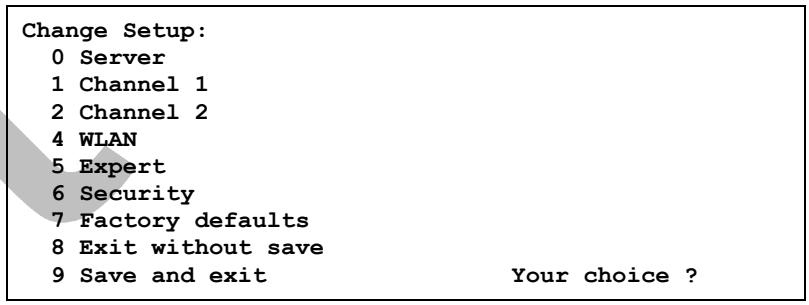
2. Click **OK**. The following information displays.

Figure 5-1. MAC Address



3. To enter Setup Mode, **press Enter within 5 seconds**. The current configuration settings display, followed by the Change Setup menu.

Figure 5-2. Setup Menu Options***



4. Select an option on the menu by entering the number of the option in the **Your choice** ? field and pressing **Enter**.
5. To enter a value for a parameter, type the value and press **Enter**, or to confirm a current value, just press **Enter**.
6. When you are finished, save the new configuration (option 9). The unit reboots.

Serial Port Connection

To configure the unit through a serial connection:

1. Connect a console terminal or PC running a terminal emulation program to your unit's serial port. The default serial port settings are **9600 baud, 8 bits, no parity, 1-stop bit, no-flow control**.
2. Reset the WiBox unit by cycling the unit's power (turning the power off and back on). Immediately upon resetting the device, enter three lowercase **x** characters (**xxx**).

   Note: *The easiest way to enter Setup Mode is to hold down the **x** key at the terminal (or emulation) while resetting the unit. **You must do this within three seconds of resetting the*** WiBox.

At this point, the screen display is the same as when you use a Telnet connection. To continue, go to step 3 in *Telnet Connection, above.*

Exiting Setup Mode

To exit setup mode:

You have two options:

- To save all changes and reboot the device, select option **9 Save and exit** from the Change Setup menu. All values are stored in nonvolatile memory.
- To exit the configuration mode without saving any changes or rebooting. select option **8 Exit without save** from the Change Setup menu.

6: Setup Mode: Server Configuration

This chapter explains how to configure the network settings.

Note: *Current values display in parentheses.*

Server Configuration (Option 0)

The unit's basic network parameters display when you select **Server configuration** (option **0**). The **IP Address**, **Set Gateway IP Address**, and **Netmask** fields display the current values.

```
IP Address : (000) .(000) .(000) .(000)
Set Gateway IP Address (N)
Netmask: Number of Bits for Host Part (0=default)  (0)
Change telnet config password (N)
```

Network Mode

Select the network mode for the WiBox. Options available are **Wired Only**, **Wireless Only**, and **Bridging**. For more information on bridging, see *9:Wireless Bridging*.

```
Network Mode <0=Wired Only 1=Wireless Only
2=Bridging<One Host> >:
```

IP Address

If DHCP is not used to assign IP addresses, enter the IP address manually. The IP address must be set to a unique value in the network. Enter each octet and press **Enter** between each section. The current value displays in parentheses.

```
IP Address : (000) (000) (000) (000) _
```

If DHCP is used, the third octet of the IP address sets the BootP/DHCP/AutoIP options. The following table shows the bits you can manually configure to force the Product Name to disable AutoIP, DHCP, or BootP. To disable an option, set the appropriate bit.

Table 6-1. BootP/DHCP/AutoIP options

Options	Bit
AutoIP	0
DHCP	1
BootP	2

For example, if the third octet is 0.0.5.0, the AutoIP and BootP options are disabled; only DHCP is enabled. (The value 5 results from adding the binary equivalents of 0 and 2.) This is the most common setting when using DHCP.

Set Gateway IP Address

The gateway address, or router, allows communication to other LAN segments. The gateway address should be the IP address of the router connected to the same LAN segment as the unit. The gateway address must be within the local network. The default setting is **N** (No), meaning the gateway address has not been set. To set the gateway address, type **Y** and enter the address.

```
Set Gateway IP Address (N) ? Y
Gateway IP addr (000) (000) (000) (000)_
```

Netmask: Number of Bits for Host Part

A netmask defines the number of bits taken from the IP address that are assigned for the host part.

```
Netmask: Number of Bits for Host Part (0=default) (0) _
```

Note: *Class A: 24 bits; Class B: 16 bits; Class C: 8 bits*

The unit prompts for the number of host bits to be entered, then calculates the netmask, which appears in standard decimal-dot notation (for example, 255.255.255.0) when the saved parameters display. The default setting is **0**.

Table 6-2. Standard IP Network Netmasks

Network Class	Host Bits	Netmask
A	24	255.0.0.0
B	16	255.255.0.0
C	8	255.255.255.0

Change Telnet Configuration Password

Setting the Telnet configuration password prevents unauthorized access to the setup menu through a Telnet connection to port 9999 or through web pages. The password must have 4 characters. The default setting is **N** (No).

```
Change telnet config password (N) ? _
```

An enhanced password setting (for Telnet access only) of 16 characters is available under *Security Settings* on page 69.

Note: *You do not need a password to access the Setup Mode window by a serial connection.*

DHCP Name

If a DHCP server has automatically assigned the IP address and network settings, you can discover the unit by using the DeviceInstaller network search feature or Monitor Mode (see *10: Monitor Mode*).

*Note: When you enter Monitor Mode from the serial port with network connection enabled and issue the **NC** (Network Communication) command, you see the unit's IP configuration.*

There are three methods for assigning DHCP names to the unit.

- **Default DHCP Name**: If you do not change the DHCP name, and you are using an IP of 0.0.0.0, then the DHCP name defaults to CXXXXXX (XXXXXX is the last 6 digits of the MAC (hardware) address shown on the label on the bottom/side of the unit). For example, if the MAC address is 00-20-4A-12-34-56, then the default DHCP name is C123456.
- **Custom DHCP Name**: You can create your own DHCP name. If you are using an IP address of 0.0.0.0, then the last option in Server configuration is **Change DHCP device name**. This option allows you to change the DHCP name to an alphanumeric name (LTX in our example).

```
Change DHCP device name (not set) ? (N) Y
Enter new DHCP device name : LTX
```

- **Numeric DHCP Name:** You can change the DHCP name by specifying the last octet of the IP address. When you use this method, the DHCP name is LTXYY where YY is what you chose for the last octet of the IP address. If the IP address you specify is 0.0.0.12, then the DHCP name is LTX12. This method only works with 2 digit numbers (01-99).

7: Setup Mode: Channel Configuration

This chapter explains how to configure the serial port.

Notes:

- *Current values display in parenthesis.*
- *You must enter some values in hexadecimal notation. (See **Error! Reference source not found.Error! Reference source not found.**.)*

Channel 1 (Option 1)

Select **Channel 1** (option **1)** from the Change Setup menu to define how the serial port responds to network and serial communications. The following sections describe the configurable parameters within the **Channel** configuration menu.

Figure 7-1. Serial Port Parameters

```
Baudrate (9600) ?
I/F Mode (4C) ?
Flow (00) ?
Port No (10001) ?
ConnectMode (C0) ?
Send '+++' in Modem Mode  (Y) ?
Auto increment source port  (N) ?
Remote IP Address : (000) .(000) .(000) .(000)
Remote Port  (0) ?
DisConnMode (00) ?
FlushMode   (00) ?
DisConnTime (00:00) ?:
SendChar 1  (00) ?
SendChar 2  (00) ?
```

Baudrate

The unit and attached serial device, such as a modem, must agree on a speed or baud rate to use for the serial connection. Valid baud rates are 300, 600, 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200, 230400, 460800, or 921600. The current value is displayed in parentheses.

```
Baudrate (9600) ? _
```

I/F (Interface) Mode

The Interface (I/F) Mode is a bit-coded byte entered in hexadecimal notation. The default setting is **4C**.

Note: *RS-422 amd RS-485 are available on Channel 2 only.*

```
I/F Mode (4C) ? _
```

The following table displays available I/F Mode options:

Note: *All bit positions in the table that are blank represent "don't care" bits for that particular option, which can be set to either a 0 or 1 value.*

Table 7-1. Interface Mode Options

I/F Mode Option	7	6	5	4	3	2	1	0
RS-232C (1)							0	0
RS-422/485 4-wire							0	1
RS-485 2-wire							1	1
7 Bit					1	0		
8 Bit					1	1		
No Parity			0	0				
Even Parity			1	1				
Odd Parity			0	1				
1 stop bit	0	1						
2 stop bits(1)	1	1						

(1) 2 stop bits are implemented by the software. This might influence performance.

The following table demonstrates some common I/F Mode settings:

Table 7-2. Common Interface Mode Settings

Common I/F Mode Setting	Binary	Hex
RS-232C, 8-bit, No Parity, 1 stop bit	0100 1100	4C
RS-232C, 7-bit, Even Parity, 1 stop bit	0111 1000	78
RS-485 2-wire, 8-bit, No Parity, 1 stop bit	0100 1111	4F
RS-422, 8-bit, Odd Parity, 1 stop bit	0101 1101	5D

Flow

Flow control sets the local handshaking method for stopping serial input/output. The default setting is **00**.

```
Flow (00) ? _
```

Use the following table to select flow control options:

Table 7-3. Flow Control Options

Flow Control Option	Hex
No flow control	00
XON/XOFF flow control	01
Hardware handshake with RTS/CTS lines	02
XON/XOFF pass characters to host	05

Port Number

The setting represents the source port number in TCP connections. It is the number that identifies the channel for remote initiating connections.

```
Port No (10001) ? _
```

The default setting for Port 1 is **10001**. The range is 1-65535, except for the following reserved port numbers:

Table 7-4. Reserved Port Numbers

Port Numbers	Reserved for
1 – 1024	Reserved (well known ports)
9999	Telnet setup
14000-14009	Reserved for Redirector
30704	Reserved (77F0h)
30718	Reserved (77FEh)

***Warning:* We recommend that you not use the reserved port numbers for this setting as incorrect operation may result.**

Use Port **0** for the outgoing local port to change with each connection. The port range is 50,000 to 59,999. Each subsequent connection increments the number by 1 (it wraps back around to 50,000).

Only use this automatic port increment feature to initiate a connection using TCP. Set the port to a non-zero value when the unit is in a passive mode or when using UDP instead of TCP.

Connect Mode

Connect Mode defines how the unit makes a connection, and how it reacts to incoming connections over the network. The default setting is **C0**.

```
ConnectMode (C0) ? _
```

Enter Connect Mode options in hexadecimal notation.

Note: *All bit positions in the table that are blank represent "don't care" bits for that particular option, which can be set to either a 0 or 1 value.*

Table 7-5. Connect Mode Options

Connect Mode Option	7	6	5	4	3	2	1	0
a) Incoming Connection								
Never accept incoming	0	0	0					
Accept with DTR Active	0	1	0					
Always Accept	1	1	0					
b) Response								
Nothing (quiet)				0				
Character response (C=connect, D=disconnect, N=unreachable)				1				
c) Active Startup								
No active startup					0	0	0	0
With any character					0	0	0	1
With DTR Active					0	0	1	0
With a specific start character					0	0	1	1
Manual connection					0	1	0	0
Autostart					0	1	0	1
Hostlist	0	0	1	0				
d) Datagram Type								
Directed UDP					1	1	0	0
e) Modem Mode								
No Echo			0	0		1	1	
Data Echo & Modem Response (Numeric)			0	1		1	1	1
Data Echo & Modem Response (Verbose)			0	1		1	1	0
Modem Response Only (Numeric)			0	0	1	1	1	1
Modem Response Only (Verbose)			0	0	1	1	1	0

a) Incoming Connection

Never Accept Incoming	Rejects all external connection attempts.

Accept with DTR Active	Accepts external connection requests only when the DTR input is asserted. Cannot be used with Modem Mode.
Always Accept	Accepts any incoming connection when a connection is not already established. Default setting.

b) Response

Character Response	A single character is transmitted to the serial port when there is a change in connection state: **C** = connected, **D** = disconnected, **N** = host unreachable. Single character mode specifies the character response. The IP address of the host connecting to the unit displays when the unit is in verbose mode. This option is overridden when the **Active Start Modem Mode** or **Active Start Host List** is in effect. Default setting is **Nothing (quiet)**.

c) Active Startup

No Active Startup	Does *not* attempt to initiate a connection under any circumstance. Default setting.
With Any Character	Attempts to connect when any character is received from the serial port.
With DTR Active	Attempts to connect when the DTR input changes from not asserted to asserted.
With a Specific Start Character	Attempts to connect when it receives a specific start character from the serial port. The default start character is carriage return.

Manual Connection	Attempts to connect when directed by a command string received from the serial port. The first character of the command string must be a **C** (ASCII 0x43), and the last character must be either a carriage return (ASCII 0x0D) or a line feed (0x0A). No blanks or space characters may be in the command string. Between the first and last command string characters must be a full or partial destination IP address and may be a destination port number. The IP address must be in standard decimal-dot notation and may be a partial address, representing the least significant 1, 2, or 3 bytes of the remote IP address. The period is required between each pair of IP address numbers. If present, the port number must follow the IP address, must be presented as a decimal number in the range 1-65535, and must be preceded by a forward slash (ASCII 0x2F). The slash separates the IP address and the port number. If you omit the port number from a command string, the internally stored remote port number starts a connection. If a partial IP address is presented in a command string, it is interpreted to be the least significant bytes of the IP address and uses the internally stored remote IP address to provide the most significant bytes of the IP address. If the IP address entered is 0.0.0.0/0, the device server enters Monitor Mode. For example, if the remote IP address already configured in the unit is 129.1.2.3, then an example command string would be C3/7. (This would connect to 129.1.2.3 and port 7.) You may also use a different ending for the connection string. For example, C50.1/23 would connect you to 129.1.50.1 and port 23.

Figure 7-2. Manual Connection Address Example

Command String	Result if remote IP is 129.1.2.3 and remote port is 1234
C121.2.4.5/1	Complete override; connection is started with host 121.2.4.5, port 1.
C5	Connects to 129.1.2.5, port 1234.
C28.10/12	Connects to 129.1.28.10, port 12.
C0.0.0.0/0	Enters Monitor Mode.

Autostart (Automatic Connection)	If you enable **Autostart**, the unit automatically connects to the remote IP address and remote port specified when the firmware starts.
Hostlist	If you enable this option, the device server scrolls through the hostlist until it connects to a device listed in the hostlist table. Once it connects, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until it is able to connect to another IP in the hostlist. Hostlist supports a minimum of 1 and a maximum of 12 entries

	Each entry contains the IP address and the port number. The hostlist is disabled for Manual and Modem Modes. The unit does not accept a data connection from a remote device when the hostlist option is enabled.

Figure 4-7. Hostlist Option

```
Baudrate (9600) ?
I/F Mode (4C) ?
Flow (00) ?
Port No (10001) ?
ConnectMode (25) ?
Send '+++' in Modem Mode  (Y) ?
Auto increment source port  (N) ?

Hostlist :
01. IP : 172.019.000.001  Port : 00023
02. IP : 172.019.000.002  Port : 03001
03. IP : 172.019.000.003  Port : 10001

Change Hostlist ? (N) ? Y
01. IP address : (172) .(019) .(000) .(001)      Port :  (23) ?
02. IP address : (172) .(019) .(000) .(002)      Port :  (3001) ?
03. IP address : (172) .(019) .(000) .(003)      Port :  (10001) ?
04. IP address : (000) .(000) .(000) .(000)
Hostlist :
01. IP : 172.019.000.001  Port : 00023
02. IP : 172.019.000.002  Port : 03001
03. IP : 172.019.000.003  Port : 10001

Change Hostlist ? (N) ? N
Hostlist Retrycounter  (3) ?
Hostlist Retrytimeout  (250) ?
DisConnMode (00) ?
FlushMode   (00) ?
DisConnTime (00:00) ?:
SendChar 1  (00) ?
SendChar 2  (00) ?
```

To enable the hostlist:

1. Enter a **Connect Mode** of 0x20 (**2**X), where X is any digit. The menu shows you a list of current entries already defined in the product.
2. To delete, modify, or add an entry, select **Yes**. If you enter an IP address of **0.0.0.0**, that entry and all others after it are deleted.
3. After completing the hostlist, repeat the previous step if necessary to edit the hostlist again.
4. For **Retrycounter**, enter the number of times the Lantronix unit should try to make a good network connection to a hostlist entry that it has successfully ARPed. The range is 1-15, with the default set to **3**.
5. For **Retrytimeout**, enter the number of seconds the unit should wait before failing an attempted connection. The time is stored as units of milliseconds in the range of 1-65535. The default setting is **250**.

d) Datagram Type

Directed UDP	When selecting this option, you are prompted for the Datagram type. Enter **01** for directed or broadcast UDP.

	When the UDP option is in effect, the unit never attempts to initiate a TCP connection because it uses UDP datagrams to send and receive data.

e) Modem Mode

In Modem (Emulation) Mode, the unit presents a modem interface to the attached serial device. It accepts AT-style modem commands and handles the modem signals correctly.

Normally, there is a modem connected to a local PC and a modem connected to a remote machine. A user must dial from the local PC to the remote machine, accumulating phone charges for each connection. Modem Mode allows you to replace modems with the WiBox, and to use an Ethernet connection instead of a phone call. By not having to change communications applications, you avoid potentially expensive phone calls.

To select Modem Mode, set the Connect Mode to **C6** (no echo), **D6** (echo with full verbose), **D7** (echo with numeric response), **CF** (modem responses only, numeric response), or **CE** (modem responses only, full verbose).

Note: *If the unit is in Modem Mode, and the serial port is idle, the unit can still accept network TCP connections to the serial port if Connect Mode is set to* ***C6*** *(no echo),* ***D6*** *(echo with full verbose),* ***D7*** *(echo with numeric response,* ***CF*** *(modem responses only, numeric response), or* ***CE*** *(modem responses only, full verbose).*

Without Echo	In Modem Mode, echo refers to the echo of all of the characters entered in command mode; it does *not* mean to echo data that is transferred. Quiet Mode (without echo) refers to the modem *not* sending an answer to the commands received (or displaying what was typed).
Data Echo & Modem Response	**Full Verbose:** The unit echoes modem commands and responds to a command with a message string shown in the table below. **Numeric Response:** The unit echoes modem commands and responds to a command with a numeric response.
Modem Responses Only	**Full Verbose:** The unit does not echo modem commands and responds to a command with a message string shown in the table below. **Numeric Response:** The unit does not echo modem commands and responds to a command with a numeric response.

Table 4-11. Modem Mode Messages

Message	Meaning
Full Verbose	
OK	Command was executed without error.
CONNECT	A network connection has been established.
NO CARRIER	A network connection has been closed.

Message	Meaning
RING n.n.n.n.	A remote device, having IP address n.n.n.n, is connecting to this device.
Numeric Response	
0	OK
1	Connected
2	Ring
3	No Carrier
4	Error

Received commands must begin with the two-character sequence **AT** and be terminated with a carriage return character.

The unit ignores any character sequence received *not* starting with **AT**, and only recognizes and processes single **AT**-style commands. The unit treats compound **AT** commands as unrecognized commands.

If the **Full Verbose** option is in effect, the unit responds to an unrecognized command string that is otherwise formatted correctly (begins with **AT** and ends with carriage return) with the "OK" message and takes no further action.

If the **Numeric Response** option is in effect, the unit responds to an unrecognized command string that is otherwise formatted correctly with the "OK" message and takes no further action.

When an active connection is in effect, the unit transfers data and does not process commands received from the serial interface.

When a connection is terminated or lost, the unit reverts to command mode.

When an active connection is in effect, the unit terminates the connection if it receives the following sequence from the attached serial device:

- No serial data is received for one second.
- The character sequence +++ is received, with no more than one second between each two characters.
- No serial data is received for one second after the last + character. At this time, the unit responds affirmatively per the selected echo/response mode.
- The character string **ATH** is received, terminated with a carriage return. The unit responds affirmatively according to the selected echo/response mode and drops the network connection. The serial interface reverts to accepting command strings.

If this sequence is not followed, the unit remains in data transfer mode.

7-6. Modem Mode Commands

Modem Mode Command	Function
ATDTx.x.x.x,pppp or ATDTx.x.x.x/pppp	Makes a connection to an IP address (x.x.x.x) and a remote port number (pppp).

Modem Mode Command	Function
ATDTx.x.x.x	Makes a connection to an IP address (x.x.x.x) and the remote port number defined within the unit.
ATD0.0.0.0	Forces the unit into Monitor Mode if a remote IP address and port number are defined within the unit.
ATD	Forces the unit into Monitor Mode if a remote IP address and port number are not defined within the unit.
ATDx.x.x.x	Makes a connection to an IP address (x.x.x.x) and the remote port number defined within the unit.
ATH	Hangs up the connection (Entered as +++ATH).
ATS0=n	Enables or disables connections from the network going to the serial port. n=0 disables the ability to make a connection from the network to the serial port. n=1-9 enables the ability to make a connection from the network to the serial port. n>1-9 is invalid.
ATEn	Enables or disables character echo and responses. n=0 disables character echo and responses. n=1 enables character echo and responses.
ATVn	Enables numeric response or full verbose. n=0 enables numeric response. n=1 enables full verbose.

Note: *The unit recognizes these AT commands as single commands such as ATE0 or ATV1; it does not recognize compound commands such as ATE0V.*

Send the Escape Sequence (+++) in Modem Mode

```
Send '+++' in Modem Mode (Y) ? _
```

Disable or enable the WiBox's ability to send the escape sequence. The default setting is **Y** (Yes) (send the escape sequence).

Auto Increment Source Port

```
Auto increment source port (N) ? _
```

Y (Yes) auto increment the source port. The WiBox increments the port number used with each new connection.

Remote IP Address

This is the destination IP address used with an outgoing connection.

```
Remote IP Address : (000) (000) (000) (000)_
```

Note: *This option does not display when Hostlist is enabled from the* ***ConnectMode*** *prompt (see Connect Mode on page 52 for more information).*

Remote Port

You must set the remote TCP port number for the unit to make outgoing connections. This parameter defines the port number on the target host to which a connection is attempted.

```
Remote Port (0) ? _
```

To connect an ASCII terminal to a host using the unit for login purposes, use the remote port number 23 (Internet standard port number for Telnet services).

Note: *This option does not display when Hostlist is enabled from the ConnectMode prompt (see Connect Mode on page 52 for more information).*

DisConnMode

This setting determines the conditions under which the unit will cause a network connection to terminate. The default setting is **00**.

```
DisConnMode (00) ? _
```

Notes:

In DisConnMode (Disconnect Mode), DTR drop either drops the connection or is ignored.

Note: *All bit positions in the table that are blank represent "don't care" bits for that particular option, which can be set to either a 0 or 1 value.*

Table 7-7. Disconnect Mode Options

Disconnect Mode Option	7	6	5	4	3	2	1	0
Disconnect with DTR drop (6)	1							
Ignore DTR	0							
Telnet mode and terminal type setup (1)		1						
Channel (port) password (2)				1				
Hard disconnect (3)					0			
Disable hard disconnect					1			
State LED off with connection (4)								1
Disconnect with EOT (^D) (5)			1					

(1) The WiBox sends the "Terminal Type" upon an outgoing connection.
(2) A password is required for a connection to the serial port from the network.
(3) The TCP connection closes even if the remote site does not acknowledge the disconnection.
(4) When there is a network connection to or from the serial port, the state LED turns off instead of blinking.
(5) When **Ctrl+D** or **Hex 04** is detected, the connection is dropped. Both Telnet Mode and **Disconnect with EOT** must be enabled for **Disconnect with EOT** to function properly. **Ctrl+D** is only detected going from the serial port to the network.
(6) When DTR transitions from a high state to a low state, the network connection to or from the serial port drops.

Flush Mode (Buffer Flushing)

Using this parameter, you can control line handling and network buffers with connection startup and disconnect. The default setting is **00**.

```
FlushMode (00) ? _
```

You can also select between two different packing algorithms.

Note: *All bit positions in the table that are blank represent "don't care" bits for that particular option, which can be set to either a 0 or 1 value.*

Table 7-8. Flush Mode Options

Function	7	6	5	4	3	2	1	0
Input Buffer (Serial to Network)								
Clear with a connection initiated from the device to the network				1				
Clear with a connection initiated from the network to the device			1					
Clear when the network connection to or from the device is disconnected		1						
Output Buffer (Network to Serial)								
Clear with a connection initiated from the device to the network								1
Clear with a connection initiated from the network to the device							1	
Clear when the network connection to or from the device is disconnected						1		
Alternate Packing Algorithm (Pack Control)								
Enable	1							

Pack Control

The packing algorithms define how and when packets are sent to the network. The standard algorithm is optimized for applications in which the unit is used in a local environment, allowing for very small delays for single characters, while keeping the packet count low. The alternate packing algorithm minimizes the packet count on the network and is especially useful in applications in a routed Wide Area Network (WAN). Adjusting parameters in this mode can economize the network data stream.

Pack control settings are enabled in Flush Mode. Set this value to **00** if you do not need specific functions.

Note: *All bit positions in the table that are blank represent "don't care" bits for that particular option, which can be set to either a 0 or 1 value.*

Table 7-9. Pack Control Options

Option	7	6	5	4	3	2	1	0
Packing Interval								
Interval: 12 msec							0	0

Option	7	6	5	4	3	2	1	0
Interval: 52 msec							0	1
Interval: 250 msec							1	0
Interval: 5 sec							1	1
Trailing Characters								
None					0	0		
One					0	1		
Two					1	0		
Send Characters								
2-Byte Send Character Sequence				1				
Send Immediately After Send chars			1					

Packing Interval

Packing Interval defines how long the unit should wait before sending accumulated characters. This wait period is between successive network segments containing data. For alternate packing, the default interval is **12** ms.

Trailing Characters

In some applications, CRC, Checksum, or other trailing characters follow the end-of-sequence character; this option helps to adapt frame transmission to the frame boundary. The default setting is **00** (none).

Send Characters

- If **2-Byte Send Character Sequence** is enabled, the unit interprets the sendchars as a 2-byte sequence; if this option is not enabled, the unit interprets them independently. The default setting is **0** (disabled).
- If **Send Immediately After Characters** is *not* set, any characters already in the serial buffer are included in the transmission after a "transmit" condition is found. If this option is set, the unit sends immediately after recognizing the transmit condition (sendchar or timeout). The default setting is **0**.

  Note: *A transmission might occur if status information needs to be exchanged or an acknowledgment needs to be sent.*

DisConnTime (Inactivity Timeout)

Use this parameter to set an inactivity timeout. The unit drops the connection if there is no activity on the serial line before the set time expires. Enter time in the format mm:ss, where m is the number of minutes and s is the number of seconds.

```
DisConnTime (00:00) ?:
```

To disable the inactivity timeout, enter **00:00**. Range is 0 (disabled) to **5999** seconds (99 minutes, 59 seconds). The default setting is **0**.

Send Characters

Enter up to two characters in hexadecimal representation in sendchar.

```
SendChar 1 (00) ? _
SendChar 2 (00) ? _
```

If the unit receives a character on the serial line that matches one of these characters, it sends the character immediately, along with any awaiting characters, to the TCP connection. This action minimizes the response time for specific protocol characters on the serial line (for example, ETX, EOT). Setting the first sendchar to **00** disables the recognition of the characters. Alternatively, the unit can interpret two characters as a sequence (see *Pack Control* on page 61). The default setting is **00.**

Telnet Terminal Type

This parameter displays only if you enabled the terminal type option in Disconnect Mode. With this option enabled, you can use the terminal name for the Telnet terminal type. Enter only one name.

With terminal type option enabled, the unit also reacts to the EOR (end of record) and binary options, useful for applications like terminal emulation to IBM hosts.

Channel (Port) Password

This parameter displays only if the channel (port) password option is enabled in Disconnect Mode. With this option enabled, you can set a password on the serial port. The default setting is all **0**s.

WLAN Settings

Without adequate protection, a wireless LAN is susceptible to access by unauthorized users. WiBox features the WPA security standard, based on IEEE802.11i and IEEE802.1X. WEP is provided for backwards compatibility and interaction with older devices.

Without adequate protection, a wireless LAN is susceptible to access by unauthorized users.

The WiBox WLAN Settings menu permits the following actions:

- Configuration of the wireless network profile available for activation.
- Configuration of the wireless network security settings.
- Configuration of advanced settings such as radio power management.

NOT IN COBOS MASTER:

Note: *Due to regulations, the country-specific setting has been removed from the setup menu and Web-Manager. We do, however, provide a separate utility for changing the* ***Country/Zone*** *setting. The utility is called SetZone and is included in the package. It is also available for download from the Lantronix web site.*

The syntax is: ***`SetZone <IP address> [<zone abbreviation>]`***

Leaving the zone blank causes the utility to report the current setting only. Following are valid zone abbreviations. These settings are consistent with IEEE802.11b/G zones:

US=United States and Canada	**JP=Japan**
FR=France	**OT=Others, such as Europe (excluding France), Asia, Africa, and Australia**

To modify WLAN settings, select 4 WLAN from the Change Setup menu.

Enable WLAN

Enable the Ethernet or the Wireless interface. When WLAN is enabled, the Ethernet interface is disabled.

```
Enable WLAN (Y) ? _
```

Topology

Select **Infrastructure** or **Adhoc**. Infrastructure (ESS) mode communicates with Access Points. Ad Hoc (IBSS) mode communicates only with other clients.

```
Topology 0=Infrastructure, 1=Adhoc (0) ?
```

Network Name (SSID)

Enter the name of the network to which the WiBox will connect.

```
Network name (LTRX_IBSS) ? _
```

Ad Hoc Network Creation Channel

When **Adhoc** mode is selected and the WiBox cannot find the specified network, it creates one with that name by transmitting a beacon on the selected channel.

```
Channel (11) ?
```

Only channels allowed in the country for which the WiBox is designated can be selected. The country displays in the settings overview.

Security

The WiBox features WEP and WPA to secure all wireless communication. If **Adhoc** is selected as topology, only WEP is available

```
Security 0=none, 1=WEP, 2=WPA (0) ? _
```

WEP

```
Authentication 0=open/none, 1=shared (0) ? _
Encryption 0=WEP64, 1=WPE128 (0) ?
Display current key (N) ?
Change key (N) ?
Key type 0=hex, 1=passphrase (0) ?
Enter key:
```

Authentication selects whether the encryption keys are matched (**1** = shared) with those of the communication partner before passing through messages or not (**2** = open/none).

The **Encryption** prompt requests the length of the encryption key and the security strength. WEP64 is 5 bytes or 40 bits (option **0**). WEP128 is 13 bytes or 104 bits (option **1**).

Select (**Y**) Yes at the **Display current key** prompt to show the currently configured key/passphrase

Change key permits modifying the currently configured key by selecting (**Y**) Yes.

The **Key type** requests whether the new key is in hexadecimal or passphrase format.

Enter key prompts for the new encryption key. The passphrase input is not the same as ASCII input (as used on other products). ASCII is translated directly into hexadecimal bytes according to the ASCII table. The WiBox passphrase is hashed using the Neesus Datacom algorithm (for WEP64) or MD5 (for WEP128).

The passphrase input is safer because it is up to 63 chars long. ASCII input is a maximum of 5 (WEP64) or 13 (WEP128) characters long and limits the number of key combinations.

Please refer to the other equipment's manual to determine the passphrase input style recommended.

Note: *Lantronix recommends using a passphrase of 20 characters or more for maximum security.*

WPA

This firmware version allows only Pre-Shared Keys (PSK) for authentication and encryption.

```
Allow WEP group keys (N) ?
Display current key (N) ?
Change key (N) ?
Key type 0=hex, 1=passphrase (1) ?
Enter key: () ?
```

Selecting (**Y**) Yes at the **Allow WEP group keys** prompt enables the reception of broadcast messages if older WEP equipment shares the same Access Point.

Select (**Y**) Yes at the **Display current key** prompt to show the currently configured key/passphrase

Change key permits modifying the currently configured key by selecting (**Y**) Yes.

The **Key type** requests whether the new key is in hexadecimal or passphrase format.

Enter key prompts for the new encryption key. The passphrase input is not the same as ASCII input (as used on other products). ASCII is translated directly into hexadecimal bytes according to the ASCII table. The WiBox passphrase is hashed using the Neesus Datacom algorithm (for WEP64) or MD5 (for WEP128).

The passphrase input is safer because it is up to 63 chars long. ASCII input is a maximum of 5 (WEP64) or 13 (WEP128) characters long and limits the number of key combinations.

Please refer to the other equipment's manual to determine the passphrase input style recommended.

Note: *Lantronix recommends using a passphrase of 20 characters or more for maximum security.*

Data Rate

WiBox permits the control of the transmission rate. Lower data rates allow for larger distances. It may also be needed to communicate with older devices. Select **0** - **3** to set a fixed data rate or select **4** - **6** to set a maximum data rate. This allows the radio to lower the data rate in case of bad link quality.

```
Data rate, Only : 0=1, 1=2, 2=5.5, 3=11 Mbps or
Up to: 4=2, 5=5.5, 6=11 Mbps  (6) ?
```

Enable Power Management

This allows the software to turn off the radio when expecting not to receive or transmit soon. This feature reduces the power consumption by up to 170 mA. Enabling power management increases the response time, because the radio needs to start up again. The radio regularly starts to synchronize and check for incoming messages.

```
Enable power management (N) ? _
```

8: Setup Mode: Advanced Settings

Expert Settings (Option 5)

Note: *You can change these settings using Telnet or serial connections only, not on the Web-Manager.*

Caution: ***Only an expert should change these parameters. You must definitely know the consequences the changes might have.***

Figure 8-1. Expert Settings NEED NEW

```
Change Setup:
  0 Server
  1 Channel 1
  3 E-mail
  5 Expert
  6 Security
  7 Defaults
  8 Exit without save
  9 Save and exit              Your choice ? 5

ICP Keepalive time in s (1s - 65s; 0s=disable):  (45) ?
ARP Cache timeout in s (1s - 600s) :  (600) ?
Enable High Performance (N) ?
Disable Monitor Mode @ bootup (N) ?
HTTP Port Number :  (80) ?
SMTP Port Number :  (25) ?
MTU Size (512 - 1400):  (1400) ?
Enable alternate MAC (N) ?
Ethernet connection type:  (0) ?
```

The default settings are listed below:

TCP Keepalive time in s (1s – 65s; 0s=disable)	45
ARP Cache timeout in s (1s – 600s)	600
Enable High Performance	Disabled (applies to Product Name-03, Product Name-485, and later units only)
Disable Monitor Mode @ bootup	Enabled
HTTP Port Number (1-65535)	80
SMTP Port Number (1-65535)	25
MTU Size (512 – 1400)	0 (resulting in an operational value of 1400)
Enable alternate MAC	Disabled (OEM use only)
Ethernet connection type	0 (resulting in auto-negotiation)

TCP Keepalive time in seconds

This option allows you to change how many seconds the unit waits during a silent connection before attempting to see if the currently connected network device is still on the network. If the unit gets no response, it drops that connection. The default setting is **45**.

```
TCP Keepalive time in s (1s - 65s; 0s=disable): (45)? _
```

ARP Cache timeout in seconds

Whenever the unit communicates with another device on the network, it adds an entry into its ARP table. The ARP Cache timeout option allows you to define how many seconds (1-600) the unit will wait before timing out this table. The default setting is **600**.

```
ARP Cache timeout in s (1s - 65s; 0s=disable): (600)? _
```

Enable High Performance

This option applies to Product Name-03 and later units only. It allows you to increase the CPU performance required to use the higher baud rates on the serial interface (460 Kbps and 920 Kbps). The standard CPU performance mode supports up to 230400 Kbps.

```
Enable High Performance (N)?
```

Notes:

- *If a baud rate of 460 Kbps or 920 Kbps is set and the high performance mode is disabled, the operation of the serial channel would be out of the specified error tolerance, thereby leading to inconsistent speed settings on the two ends of the serial channel.*
- *Increasing CPU clock speed consumes more power and generates more heat. This reduces the maximum operating temperature specification. See the appropriate product brief for details.*

Disable Monitor Mode at bootup

This option allows you to disable all entries into Monitor Mode during startup, except for the 'xxx' sequence. This prevents entry using **yyy**, **zzz**, **xx1**, and **yy1** key sequences (only during the bootup sequence). The default for Monitor Mode at bootup is **N** (No). (See *10:Monitor Mode*.)

```
Disable Monitor Mode @ bootup (N) ? _
```

HTTP Port Number

This option allows the configuration of the web server port number. The valid range is 1-65535.The default HTTP port number is **80**.

```
HTTP Port Number : (80) ? _
```

SMTP Port Number

This option allows the configuration of the email port number. The valid range is 1-65535. The default SMTP port number is **25**.

```
SMTP Port Number : (25) ? _
```

Note: When configuring the HTTP or SMTP port number, take note of the 'reserved' port numbers on page 52.

MTU Size

The Maximum Transmission Unit (MTU) is the largest physical packet size a network can transmit for TCP and UDP. Enter between **512** and **1400** bytes. The default setting is **1400** bytes.

```
MTU Size: (1400) ? _
```

Ethernet Connection Type

The Product Name allows for the Ethernet speed and duplex to be manually configured. Enter **0** for auto-negotiation (default). To select the speed and duplex, enter one of the following: **2** (10Mbit/half duplex), **3** (10Mbit/full duplex), **4** (100Mbit/half duplex), or **5** (100Mbit/full duplex).

```
Ethernet connection type: (0) ? _
```

Configurable Server Port Number

The host attached to the WiPort may communicate with other CoBos devices on the wireless network using the Lantronix Configuration Access Protocol (LCAP). This service is available on server port number 0x77FE (30718) and is fixed. When the WiPort is in bridging mode, the LCAP port number is modifiable so that the LCAP service is available on the wired interface for WiPort configuration.

For more information on bridging, see *9:Wireless Bridging*.

```
Config Server Port Number: (30718) ? _
```

Security Settings

Security settings can only be changed via the setup menu, through a Telnet or serial connection.

Note: As recommended, set security over the dedicated network or over the serial setup. If the parameters are set over the network (Telnet 9999), someone else could capture these settings.

Caution: Disabling both Telnet Setup and Port 77FE prevents users from accessing the setup menu from the network.

Disable SNMP

For security purposes, disable SNMP (if required) on the WiBox unit. The current setting displays in parentheses.

```
Disable SNMP (N) ? _
```

SNMP Community Name

The SNMP Community Name is a required field for NMS to read or write to a device. Enter a string of 1 to 13 characters.

```
SNMP Community Name (public): _
```

The default entry is **public**. The current value displays in parentheses.

Disable Telnet Setup

Note: *Disabling both Telnet Setup and Port 77FE prevents users from accessing the setup menu from the network.*

This setting defaults to the **N** (No) option. The **Y** (Yes) option disables access to Setup Mode by Telnet (port 9999). It only allows access locally via the web pages and the serial port of the unit.

```
Disable Telnet Setup (N) ? _
```

Disable TFTP Firmware Upgrade

This setting defaults to the **N** (No) option. The **Y** (Yes) option disables TFTP for network firmware upgrades.

```
Disable TFTP Firmware Update (N) : _
```

Disable Port 77FE (Hex)

Note: *Disabling both Telnet Setup and Port 77FE and web setup prevents users from accessing the setup from the network.*

Port 77FE is used by Web-Manager and custom programs to configure the unit remotely. If required, disable this capability for security purposes.

```
Disable Port 77FEh (N) ? _
```

The default setting is the **N** (No) option, which enables remote configuration. As a result, configure the unit by using web pages, Telnet, or serial configuration.

The **Y** (Yes) option disables remote configuration and web sites.

Note: *The **Y** (Yes) option disables many of the GUI tools for configuring the unit, including the embedded Web-Manager tool.*

Disable Web Server

The **Y** (Yes) option disables the web server. This setting defaults to the **N** (No) option. Disabling the web server also disables the web setup.

```
Disable Web Server (N) ? _
```

Disable Web Setup

The **Y** (Yes) option disables configuration via the Web-Manager (but the web server remains active for custom web pages). This setting defaults to the **N** (No) option.

```
Disable Web Setup (N) ? _
```

Disable ECHO Ports

This setting controls whether the serial port echoes characters it receives. The current value displays in parentheses.

```
Disable ECHO ports (Y) ? _
```

Enable Enhanced Password

This setting defaults to the **N** (No) option, which permits a 4-character password protecting Setup Mode by means of Telnet and web pages.

```
Enable Enhanced Password (Y) ? _
```

The **Y** (Yes) option allows an extended security password of 16-characters for protecting Telnet access.

Enable Encryption

Rijndael is the block cipher algorithm chosen by the National Institute of Science and Technology (NIST) as the Advanced Encryption Standard (AES) to be used by the US government. The WiBox supports 128-, 192-, and 256-bit encryption key lengths.

Note: *Configuring encryption should be done through a local connection to the serial port of the WiBox, or via a secured network connection. Initial configuration information including the encryption key is sent in clear text over the network.*

To configure AES encryption on the WiBox:

Figure 8-2. Encryption Keys

```
Enable Encryption (N) Y

Key length in bits (0): 128

Change Keys (N) Y

Enter Keys: **-**-**-**-**-**-**-**-**-**-**-**-**-**-**-**
```

1. When prompted to enable encryption, select **Y**.
2. Enter the encryption key length when prompted. The WiBox supports 128-, 192-, and 256-bit encryption key lengths.
3. When prompted to change keys, select **Y**.
4. At the **Enter Keys** prompt, enter your encryption key. The encryption keys are entered in hexadecimal. The hexadecimal values are echoed as asterisks to prevent onlookers from seeing the key. Hexadecimal values are 0-9 and A-F.
   - For a 128-bit key length, enter 32 hexadecimal characters.
   - For a 192-bit key length, enter 48 hexadecimal characters.
   - For a 256-bit key length, enter 64 hexadecimal characters
5. Continue pressing **Enter** until you return to the Change Setup menu.
6. From the Change Setup menu, select option **9** to save and exit.

Encryption only applies to the port selected for data tunneling (default 10001), regardless of whether you are using TCP or UDP.

Generally, one of three situations applies:

- Encrypted WiBox-to-WiBox communication. Be sure to configure both WiBox devices with the same encryption key.
- Third-party application to WiBox-encrypted communication: WiBox uses standard AES encryption protocols. To communicate successfully, products and applications on the peer side must use the same protocols and the same encryption key as the WiBox.

- Lantronix Secure Com Port Redirector provides an encrypted connection from Windows-based applications to the WiBox. Information about SCPR is at http://www.lantronix.com/device-networking/software-services/scpr.html A 30-day trial version of SCPR is included on the CD.

Default Settings

Select **7 Default Settings** from the Change Setup menu to reset the unit's Channel 1 configuration, Channel 2 configuration, and Expert settings to the factory default settings. The server configuration settings for IP address, gateway IP address, netmask, and WLAN remain unchanged. The specific settings that this option changes are listed below:

Channel 1 Configuration CHECK THESE

Baudrate	9600
I/F Mode	4C (1 stop bit, no parity, 8 bit, RS-232C)
Port No	10001
Connect Mode	C0 (always accept incoming connection; no active connection startup)
Hostlist Retry Counter	3
Hostlist Retry Timeout	250 (msec)
Send Character	0x0D (CR)
All other parameters	0

Channel 2 Configuration

Baudrate	9600
I/F Mode	4C (1 stop bit, no parity, 8 bit, RS-232C)
Port No	10002
Connect Mode	C0 (always accept incoming connection; no active connection startup)
Hostlist Retry Counter	3
Hostlist Retry Timeout	250 (msec)
Send Character	0x0D (CR)
All other parameters	0

Expert Settings

TCP keepalive	45 (seconds)
ARP cache timeout	600 (seconds)
High CPU performance mode	Disabled

Disable Monitor Mode	(N) No
HTTP port number	0 (resulting in an operational value of 80)

Security Settings

Disable SNMP	(N) No
SNMP Community Name	public
Disable Telnet Setup	(N) No
Disable TFTP Firmware Update	(N) No
Disable Port 77FEh	(N) No
Disable Web Server	(N) No
Disable Web Setup	(N) No
Disable ECHO ports	(Y) Yes
Enable Encryption	(N) No
Enable Enhanced password	(N) No

Exit Configuration Mode

To exit setup mode, do one of the following:

- To save all changes and reboot the device, select option **9 Save and exit** from the Change Setup menu.

  or

- To exit the configuration mode without saving any changes or rebooting, select option **8 Exit without save** from the Change Setup menu.

9: Wireless Bridging

The WiBox2100E supports wireless bridging. This allows a host, connected on the WiBox's wired Ethernet interface, to be accessible over the wireless network (via the WiBox).

To initialize the bridging feature:

1. Configure the WiBox's wireless settings. See *WLAN Configuration* on page 40.
2. Enable bridging in Serial Mode. See *Network Mode* on page 47.
3. Set up the wired host connected to the WiBox's Ethernet port.

Configuring the WiBox in Bridging Mode

Once in bridging mode, the services on the WiBox are available only through the wired interface. There are three methods for configuring the WiBox when in bridging mode.

Method 1

This method uses the current Ethernet wired host to configure the WiBox. This requires the modification of the wired host's IP address as well as the following steps:

1. Use a utility to locate the WiBox's MAC address and auto-IP address. This utility must use the Lantronix access protocol to query the WiBox.
2. Assign a static auto-IP address to the wired host within the same subnet as the WiBox.
3. Use the WiBox's Web-Manager or Telnet to port 9999 to configure the WiBox as necessary.
4. Configure the wired host's IP address back to the original IP address configuration.

Method 2

This method requires the current wired host to be disconnected temporarily. Another device physically connects to the WiBox's wired interface for configuration.

1. Disconnect the current wired host from the WiBox and connect the device used for configuring the WiBox.
2. Use a utility to locate the WiBox's MAC address and auto-IP address. This utility must use the Lantronix access protocol to query the WiBox.
3. Assign a static auto-IP address to the wired host within the same subnet as the WiBox.
4. Use the WiBox's Web-Manager or Telnet to port 9999 to configure the WiBox as necessary.
5. Disconnect the wired device and reconnect the original wired host to the WiBox.

Method 3

As an alternative to configuring through the wired interface, connect a device through the WiBox's serial port. For more information on configuration through the serial port, see *5: Telnet or Serial Port (Setup Mode) Configuration*.

.

10: Monitor Mode

Monitor Mode is a command-line interface used for diagnostic purposes. There are two ways to enter Monitor Mode: locally via the serial port or remotely via the network.

Entering Monitor Mode via the Serial Port

To enter Monitor Mode locally:

1. Follow the same steps used for setting the serial configuration parameters (see *5: Telnet or Serial Port (Setup Mode) Configuration*).
2. Instead of typing three **x** keys, however:
   a) Type **zzz** to enter Monitor Mode with network connections.
   b) Type **yyy** to enter Monitor Mode without network connections.

A **0>** prompt indicates that you have successfully entered Monitor Mode.

Entering Monitor Mode via the Network Port

To enter Monitor Mode using a Telnet connection:

1. Establish a Telnet session to the configuration port (9999). The following message displays

```
: MAC address 00204A0113A3
Software version 05.3 (040129) WBX
Press Enter to go into Setup Mode
```

2. Type **M** (upper case).

   A **0>** prompt indicates that you have successfully entered Monitor Mode.

Monitor Mode Commands

The following commands are available in Monitor Mode.

Note: *All commands must be in capital letters.*

Table 10-1. Monitor Mode Commands

Command	Command Name	Function
VS	Version	Queries software header record (16 bytes) of unit.
GC	Get Configuration	Gets configuration of unit as hex records (120 bytes).
SC	Send Configuration	Sets configuration of unit from hex records.

Command	Command Name	Function
PI x.x.x.x	Ping	Pings unit with IP address x.x.x.x to check device status.
AT	ARP Table	Shows the unit's ARP table entries.
TT	TCP Connection Table	Shows all incoming and outgoing TCP connections.
NC	Network Connection	Shows the unit's current IP address.
RS	Reset	Resets the unit.
QU	Quit	Exits diagnostics mode.
G0, G1, ...,Ge, Gf	Get configuration from memory page	Gets a memory page of configuration information from the device.
S0, S1,...,Se, Sf	Set configuration to memory page	Sets a memory page of configuration information on the device.
GM	Get MAC address	Shows the unit's 6-byte MAC.
SS	Set Security record	Sets the Security record without the encryption key and length parameters. The entire record must still be written, but the encryption-specific bytes do not need to be provided (they can be null since they are not overwritten).

Responses to some of the commands are given in Intel Hex format.

Note: *Entering any of the commands listed above generates one of the following command response codes:*

Table 10-2. Command Response Codes

Response	Meaning
0>	OK; no error
1>	No answer from remote device
2>	Cannot reach remote device or no answer
8>	Wrong parameter(s)
9>	Invalid command

11: Updating Firmware

This chapter explains how to obtain and update the unit's firmware.

Reloading Firmware

There are several ways to update the unit's internal operational code (*ROM) via TFTP or via the serial port. You can also update the unit's internal web interface (*COB) via TFTP.

Here are typical names for those files. Check the Lantronix web site for the latest versions and release notes.

Table 11-1. Firmware Files

ROM File	COB
WBXxxx.ROM	WBXvx_x.COB (Web-Manager)_WNxxx.COB (Web-Manager)

Network Upgrade

Use the command: **`tftp –i <ip address> put <wbx rom filename> W5`** or the Device Installer upgrade feature. DI 4.0.0.4 and later support the **W5** destination file.

Serial Upgrade

Use the Advanced Recovery feature of DeviceInstaller 4.0.0.4 and later as instructed in the *DeviceInstaller Online Help*.

Web Pages

Due to the extra space taken by the firmware, the number of web pages has been reduced from 28 to 19.

Also, the start of the web pages has been moved in FLASH, requiring a reload of any loaded web pages after the firmware upgrade. Follow regular TFTP or DeviceInstaller procedures.

WLAN Country Setting

Due to regulations, the country-specific setting has been removed from the setup menu and Web-Manager. We do, however, provide a separate utility for changing the **Country/Zone** setting. The utility is called SetZone and is included in the package. It is also available for download from the Lantronix web site.

The syntax is: **`SetZone <IP address> [<zone abbreviation>]`**

Leaving the zone blank causes the utility to report the current setting only. Following are valid zone abbreviations. These settings are consistent with IEEE802.11b/G zones:

US=United States and Canada	***JP=Japan***
FR=France	***OT=Others, such as Europe (excluding France), Asia, Africa, and Australia***

THE FOLLOWING IS WHAT WE HAVE IN THE COBOS MASTER:

Obtaining Firmware

You can obtain the most up-to-date firmware and release notes for the unit from the Lantronix web site (www.lantronix.com) or by using anonymous FTP (ftp.lantronix.com).

Reloading Firmware

Note: For details on upgrading to version 6.1.0.0 from pre-6.1.0.0, see the Product Name Upgrade Notice on the Lantronix ftp site (ftp.lantronix.com).

There are several ways to update the unit's internal operational code (*.ROM): using DeviceInstaller (the preferred way), using TFTP, or using the serial port. You can also update the unit's internal Web interface (*.COB) using TFTP or DeviceInstaller.

Here are *typical* names for those files. Check the Lantronix web site for the latest versions and release notes.

Table 11-2. Firmware Files

ROM File	COB
XPT_6100.rom	XPT_webm_1300.cob

Please refer to the DeviceInstaller online Help for information about reloading firmware using DeviceInstaller. The other methods are discussed below.

Using TFTP: Graphical User Interface

To download new firmware from a computer:

1. Use a TFTP client to send a binary file to the unit (*.ROM to upgrade the unit's internal operational code and *.COB to upgrade its internal Web interface).

   Note: TFTP requires the .ROM (binary) version of the unit's internal operational code.

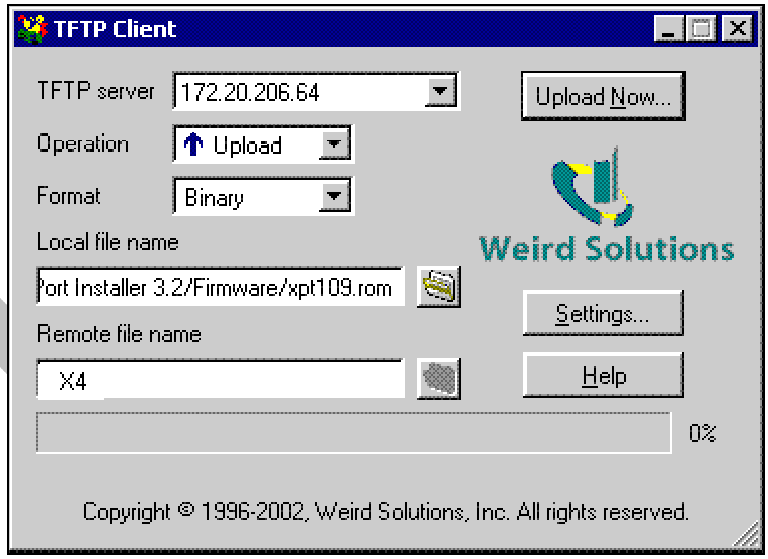
2. In the **TFTP server** field, enter the IP address of the unit being upgraded.
3. Select **Upload** operation and **Binary** format.
4. Enter the full path of the firmware file in the **Local file name** field.
5. In the **Remote file name** field, enter the current internal operational code or **WEB1** to **WEB6** for the internal Web interface.

   For firmware releases 6.1 and later, the TFTP destination files for Product Name-01, Product Name-03, and Product Name 485 are **X4**, **X5**, and **X6**, respectively.

For firmware 1.8 and earlier, the TFTP destination files for Product Name-01, Product Name-03, and Product Name 485 are **X1**, **X2**, and **X3**, respectively.

6. Click the **Upload Now** button to transfer the file to the unit.

Figure 11-1. TFTP Window



After the firmware has been loaded and stored, which takes approximately 8 seconds, the unit performs a power reset. Using TFTP: Command Line Interface

To download new firmware from a computer:

1. Enter the following from a TFTP command line interface:

```
tftp –i <ip address> put <local filename> <destination file name>
```

The following examples demonstrate the TFTP command sequence to download the .rom file and the .cob file:

```
tftp –i 192.168.1.111 put XPT_6100.rom X4
tftp –i 192.168.1.111 put XPT_webm_1300.cob  WEB4
```

2. In the **Remote file name** field, enter the current internal operational code or **WEB1** to **WEB6** for the internal Web interface.

   For firmware releases 6.1 and later, the TFTP destination files for Product Name-01, Product Name-03, and Product Name 485 are **X4**, **X5**, and **X6**, respectively. For firmware 1.8 and earlier, the TFTP destination files for Product Name-01, Product Name-03, and Product Name 485 are **X1**, **X2**, and **X3**, respectively.

Recovering the Firmware Using the Serial Port and DeviceInstaller

If for some reason the firmware is damaged, you can recover the firmware file by using DeviceInstaller to download the *.ROM file over the serial port.

To recover firmware:

1. Start DeviceInstaller. If your PC has more than one network adapter, a message displays. Select an adapter and click **OK**.
2. From the **Tools** menu, select **Advanced/Recover Firmware**. The Serial Port Firmware Upgrade window displays.
3. For **Port on PC**, enter the COM port on the PC that is connected to the serial port of the Lantronix unit.
4. For **Device Model**, be sure the appropriate Product Name device is shown (Product Name-01, Product Name-03, or XP485).
5. For **Firmware File**, click the **Browse** button and go to the location where the firmware file resides.

Note: *Make sure the* Product Name *on which you are recovering firmware is connected to this selected port on your PC.*

6. Click **OK** to download the file.
7. When prompted, reset the device. Status messages and a progress bar at the bottom of the screen show the progress of the file transfer. When the file transfer completes, the message "**Successful, Click OK to Close**" appears.
8. Click the **OK** button to complete this procedure.

Note *For more information, see Recovering Firmware in the DeviceInstaller online Help.*

12: Troubleshooting

This chapter discusses how you can diagnose and fix errors quickly without having to contact a dealer or Lantronix. It helps to connect a terminal to the serial port while diagnosing an error to view summary messages that may be displayed. When troubleshooting, always ensure that the physical connections (power cable, network cable, and serial cable) are secure.

Note: Some unexplained errors might be caused by duplicate IP addresses on the network. Make sure that your unit's IP address is unique.

Diagnostic LED States

Condition	Channel 1 Status LED
Network controller error	Blink 3x/4 seconds
Serial number storage checksum error	Blink 4x/4 seconds
Duplicate IP address present	Blink 5x/4 seconds
No DHCP response	Blink 5x/4 seconds
Setup menu active	Blink 2x/second for 2 seconds, off for 2 seconds

Problems and Error Messages

Problem/Message	Reason	Solution
Cannot establish an Infrastructure network connection to the WiBox.	Network Name (SSID) in the WiBox is not set or does not match the Access Point (AP).	Verify Network Name (SSID) for the WiBox and AP are exactly the same. These are case-sensitive.
	The AP has WEP encryption enabled and the WiBox does not or WEP authentication type does not match the AP.	Enable WEP encryption in WiBox. Set encryption key and authentication type to match the AP. Ensure the key is entered in HEX notation in both the AP and the WiBox.

Problem/Message	Reason	Solution
Cannot establish an Ad Hoc network connection to the WiBox. ***Note:*** *With 6.x.x.x firmware and later, there is only one setting for Network Name; it is the same for both Infra*structure and Ad Hoc modes.	Ad Hoc network is not enabled in the WiBox.	Enable Ad Hoc network. Set Ad Hoc Network Name (IBSS) to match. These are case-sensitive.
	Infrastructure Network Name (SSID) is set blank or different than the Ad Hoc name and the WiBox is associated to Infrastructure Network	Set the Infrastructure Network Name (SSID) to the same name as the Ad Hoc name.
	The IP address is not set or not in same subnet as other Ad Hoc PCs or the WiBox.	Verify the IP address is set and in the same subnet for each Ad Hoc device.
Cannot ping or connect to the WiBox DHCP name.	The DHCP server is not automatically setting the DHCP name in DNS on the network.	Contact the Network Administrator to add the WiBox to DNS manually.
When you issue the **ARP –S** command in Windows, *The ARP entry addition failed: 5* message displays.	Your user login does not have the right to use this command on this PC.	Have your IT department log you in with sufficient rights.
When you attempt to assign an IP address to the unit by the ARP method and Telnet to the device server through port 1, the connection fails.	The ARP method only creates a temporary password. When you Telnet to port 1, the connection should fail. When you Telnet into port 9999 and do not press **Enter** quickly, the device server reboots, causing it to lose the IP address.	Telnet back to Port 1. Wait for it to fail, then Telnet to port 9999 again. Make sure you press **Enter** within 5 seconds.
When you Telnet to port 9999, the *Press Enter to go into Setup Mode* message displays. However, nothing happens when you press **Enter**, or your connection is closed.	To enter Setup Mode via Telnet, the **Enter** key must be pressed within 5 seconds.	Telnet to port 9999 again and press **Enter** as soon as you see the *Press Enter to go into Setup Mode* message.
When you Telnet to port 1 to assign an IP address to the device server, the Telnet window does not respond for a long time.	You may have entered the Ethernet address incorrectly with the ARP command.	Confirm that the Ethernet address that you entered with the ARP command is correct. The Ethernet address must only include numbers 0-9 and letters A-F. In Windows and usually in Unix, the segments of the Ethernet address are separated by dashes. In some forms of Unix, the Ethernet address is segmented with colons.

Problem/Message	Reason	Solution
	The IP address you are trying to assign is not on your logical subnet.	Confirm that your PC has an IP address and that it is in the same logical subnet that you are trying to assign to the device server.
	The device server may not have a network connection. ***Note:*** *Applies to WBX2100E only.*	Make sure that the Link LED is lit. If the Link LED is not lit, then the device server does not have a network connection.
The device server is not communicating with the serial device it is attached to.	The most likely reason is the wrong serial settings were chosen.	The serial settings for the serial device and the device server must match. The default serial settings for the device server are RS-232, 9600 baud, 8 character bits, no parity, 1 stop bit, no flow control.
When you try to enter the setup mode on the device server via the serial port, you get no response.	The issue is most likely something covered in the previous problem, or possibly, you have **Caps Lock** on.	Double-check everything in the problem above. Confirm that **Caps Lock** is not on.
You can ping the device server, but not Telnet to the device server on port 9999.	There may be an IP address conflict on your network The Telnet configuration port (9999) is disabled within the device server security settings.	Turn the device server off and then issue the following commands at the DOS prompt of your computer: ARP -D X.X.X.X (X.X.X.X is the IP of the device server). PING X.X.X.X (X.X.X.X is the IP of the device server). If you get a response, then there is a duplicate IP address on the network. If you do not get a response, use the serial port to verify that Telnet is not disabled.
WiBox2100E only: You are using the correct serial cable, and the WiBox should be set up correctly, but you are not communicating with your device attached to the WiBox across the network.	If you are sure that the serial cable is correct, then you may not be connecting to the correct socket of the WiBox. Another possibility is that the WiBox is not set up correctly to make a good socket connection to the network.	You can check to see whether there is a socket connection to or from the WiBox by looking at the Status LED. If the Status LED is blinking consistently, or is completely off, then there is a good socket connection. If the Status LED is solid green, then the socket connection does not exist. Use the Connect Mode option **C0** for making a connection to the

Problem/Message	Reason	Solution
		WiBox from the network. Use Connect Mode option **C1** or **C5** for a connection to the network from the WiBox

Technical Support

If you are experiencing an error that is not described in this chapter, or if you are unable to fix the error, you may:

- To check our online knowledge base or send a question to Technical Support, go to http://www.lantronix.com/support.
- Email us at support@lantronix.com.
- Call us at:

  (800) 422-7044 Domestic
  (949) 453-7198 International
  (949) 450-7226 Fax

Our phone lines are open from 6:00AM - 5:00 PM Pacific Time Monday through Friday excluding holidays.

Technical Support Europe, Middle East, and Africa
Phone: +49 (0) 89 31787 817
Email: eu_techsupp@lantronix.com or eu_support@lantronix.com

Firmware downloads, FAQs, and the most up-to-date documentation are available at: www.lantronix.com/support

When you report a problem, please provide the following information:

- Your name, and your company name, address, and phone number
- Lantronix model number
- Lantronix MAC number
- Software version (on the first screen shown when you Telnet to port 9999)
- Description of the problem
- Status of the unit when the problem occurred (please try to include information on user and network activity at the time of the problem).

A: Binary to Hexadecimal Conversions

Many of the unit's configuration procedures require assembling a series of options (represented as bits) into a complete command (represented as a byte). Convert the resulting binary value to a hexadecimal representation.

Converting Binary to Hexadecimal

Following are two simple ways to convert binary numbers to hexadecimals.

Conversion Table

Hexadecimal digits have values ranging from 0 to F, which are represented as 0-9, A (for 10), B (for 11), etc. To convert a binary value (for example, 0100 1100) to a hexadecimal representation, the upper and lower four bits are treated separately, resulting in a two-digit hexadecimal number (in this case, 4C). Use the following table to convert values from binary to hexadecimal.

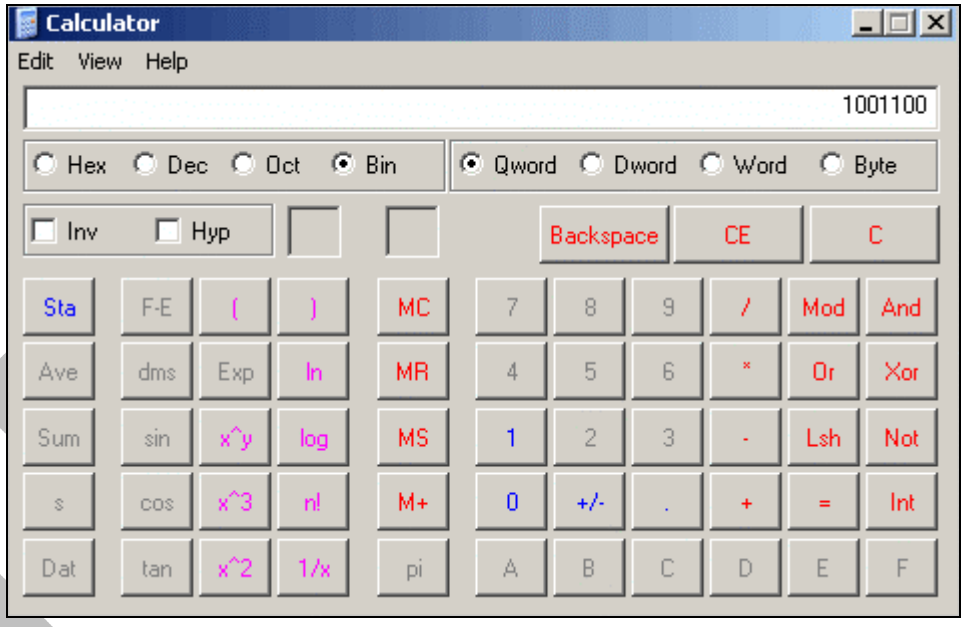
Decimal	Binary	Hex
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

Scientific Calculator

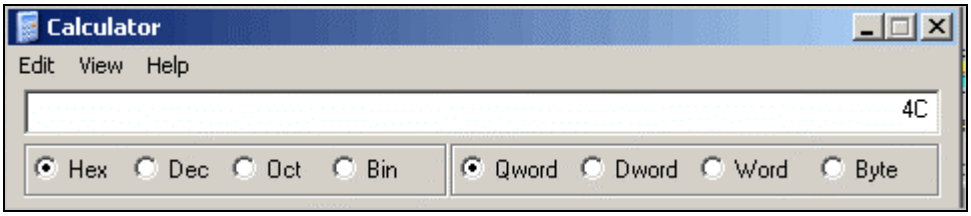
Another simple way to convert binary to hexadecimals is to use a scientific calculator, such as the one available on Windows' operating systems. For example:

1. On the Windows' Start menu, click **Programs→Accessories→Calculator**.
2. On the **View** menu, select **Scientific**. The scientific calculator displays.

3. Click **Bin** (Binary), and type the number to convert.



4. Click **Hex**. The hexadecimal value displays.



Compliance

Compliance Information

Manufacturer's Name & Address:

Lantronix 15353 Barranca Parkway, Irvine, CA 92618 USA

Declares that the following product:

Product Name Model: WiBoxE Device Server

Conforms to the following standards or other normative documents:

Safety:

UL 60950:2003

CAN/CSA-C22.2 No. 60950:2003

EN 60950:2003 +A1-A4, A11 , Low Voltage Directive (73/23/EEC)

EMC & Radio:

CFR Title 47 FCC Part 15, Subpart B and C, Class B

Industry Canada ICES-003 Issue 4 (2004), Class B

Industry Canada RSS-Gen Issue 1 (2005)

Industry Canada RSS-210 Issue 6 (2005)

EN 301 489-1 v1.4.1 (2002-08), EMC Directive (1999/5/EC)

EN 301 489-17 v.1.2.1 (2002-08), EMC Directive (1999/5/EC)

EN 300 328 v1.4.1 (2003-04), R&TTE Directive (1999/5/EC)

Australia / New Zealand AS/NZS CISPR 22 (2006), Class B

AS/NZS 4771 (2000 + A1:2003) (radio)

Japan VCCI (EMC emissions) V-3/2006-04

EN55022: 1998 + A1: 2000 + A2: 2003
EN55024: 1998 + A1: 2001 + A2: 2003
EN61000-3-2: 2000 + A2: 2005
EN61000-3-3: 1995 + A1: 2001

Manufacturer's Contact:

Director of Quality Assurance, Lantronix
15353 Barranca Parkway, Irvine, CA 92618 USA
Tel: 949-453-3990
Fax: 949-453-3995

Regulatory Information

USA Federal Communications Commission (FCC) Notice

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference, and

This device must accept any interference received, including interference that may cause undesired operation.

Caution: *Changes or modifications to this product not expressly approved by Lantronix could void the user's authority to operate this equipment.*

Note: *This equipment has been tested and found to comply with the limits 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 in accordance with 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 can be determined 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.

Caution: *Exposure to Radio Frequency Radiation*

The equipment contains transmitter with FCC ID: ***R69WIPORTG (IC: 3867A-WIPORTG)***.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Installers and end-users must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Canada – Industry Canada Notice

This device complies with Industry Canada RSS-210 regulations. Operation is subject to the following two conditions:

- This device may not cause interference, and
- This device must accept any interference, including interference that may cause undesired operation of the device.

To prevent radio interference to the licensed service, this device must be operated indoors only and should be kept away from windows to provide maximum shielding.

This Class B digital apparatus complies with Canadian ICES-003." Cet appareil numérique de la classe B est conforme à la norme NMB- 003 du Canada.

Antenna Notice:

This device has been designed to operate with an antenna having a maximum gain of 3 dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

Exposure of Humans to RF Fields

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website: www.hc-sc.gc.ca/rpb

Europe – R&TTE Directive 99/5/EC, Wireless Notice

This product is designated as a Class 2 type radio device which utilizes non-harmonized frequencies and power levels for Europe. It is marked with the following warning symbol to bring to your attention to the fact it might not be legal to use this product in every country. In most cases this product has already been granted permission for use from individual countries in Europe. If you are unsure, please contact the communications authority for the country to be operated in.

In addition to this notice, the following countries in Europe have certain restrictions on the operation of 2.4 GHz WLAN type devices:

Country	Restriction
France	Outdoor use is limited to 10mW E.I.R.P within the frequency band 2454-2483.5 MHz
Italy	If used outside of own premises, general authorization is required
Luxembourg	General authorization required for public service
Romania	Individual license is required.

Australia & New Zealand – Wireless Notice

This product has been found to be compliant with the wireless regulatory requirements for Australia and New Zealand and is designated to have met Compliance Level 2.

The compliance mark is designated with the circle and check mark inside is called the “C-Tick” mark. This C-Tick mark label is located underneath this product and signifies its compliance, as shown below:

ACN 095 223 484

The number “ ACN 095 223 484 “ stands for Australian Company Number and the 9 digit number designates the local representative in Australia who can take inquiries regarding this product’s compliance status. The following contact address is found below:

Lantronix Australia Pty. Ltd.

c/o LLK Chartered Accountants

Suite 2, Level 7

122 Walker Street

North Sydney, NSW 2060

Australia

Warranty

Lantronix warrants each Lantronix product to be free from defects in material and workmanship for a period of TWO YEARS. During this period, if a customer is unable to resolve a product problem with Lantronix Technical Support, a Return Material Authorization (RMA) will be issued. Following receipt of a RMA number, the customer shall return the product to Lantronix, freight prepaid. Upon verification of warranty, Lantronix will -- at its option -- repair or replace the product and return it to the customer freight prepaid. If the product is not under warranty, the customer may have Lantronix repair the unit on a fee basis or return it. No services are handled at the customer's site under this warranty. This warranty is voided if the customer uses the product in an unauthorized or improper way, or in an environment for which it was not designed.

Lantronix warrants the media containing its software product to be free from defects and warrants that the software will operate substantially according to Lantronix specifications for a period of 60 DAYS after the date of shipment. The customer will ship defective media to Lantronix. Lantronix will ship the replacement media to the customer.

In no event will Lantronix be responsible to the user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss of equipment, plant or power system, cost of capital, loss of profits or revenues, cost of replacement power, additional expenses in the use of existing software, hardware, equipment or facilities, or claims against the user by its employees or customers resulting from the use of the information, recommendations, descriptions and safety notations supplied by Lantronix. Lantronix liability is limited (at its election) to:

- Refund of buyer's purchase price for such affected products (without interest).
- Repair or replacement of such products, provided that the buyer follows the above procedures.

There are no understandings, agreements, representations or warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose, other than those specifically set out above or by any existing contract between the parties. Any such contract states the entire obligation of Lantronix. The contents of this document shall not become part of or modify any prior or existing agreement, commitment or relationship.

For details on the Lantronix warranty replacement policy, go to our web site at www.lantronix.com/support/warranty