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WiBox™ User Guide

Part Number 900-351
Revision A June 2004

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Disclaimer and Revisions

Note: *This product has been designed to comply with the limits for a Class B digital device pursuant to Part 15 of 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 this guide, may cause harmful interference to radio communications.*

Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

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1: Using This Guide

Purpose and Audience

This guide provides the information needed to configure, use and update the WiBox and is intended for network administrators, system integrators, and those responsible for installation 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 of the WiBox.
4:Configuration via Serial Mode or Telnet Port	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. Details the parameters that you must configure.
5:Configuration using Web-Manager	Details configuration using the Web-Manager to set parameters such as port and server properties.
6:Configuration using DeviceInstaller	Provides information for configuring the WiBox using DeviceInstaller.
Error! Reference source not found.Error! Reference source not found.	Illustrates various common configurations and applications for the WiBox.
7:Monitoring the Network	Provides instructions for accessing and using the command line interface for monitoring the network and diagnosing problems.
8:Updating Firmware	Provides instructions for obtaining the latest firmware and updating the WiBox.
9:Troubleshooting	Describes common problems and error messages and how to contact Lantronix Technical Support.

Additional Documentation

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

<i>DeviceInstaller User Guide</i>	Provides instructions for using the Windows-based utility to configure the WiBox and other Lantronix device servers.
<i>Com Port Redirector User Guide</i>	Provides information on using the Windows-based utility to create a virtual com port.
<i>Creating Custom Web Pages</i>	Explains the detailed requirements for adding web services to the WiBox and to other Lantronix device servers.

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 wireless network.

The WiBox provides a fully integrated solution that combines an operating system, embedded Web server, and full TCP/IP protocol stack with an 802.11b transceiver supporting WEP security and two high-speed serial ports into a small compact package.

The WiBox allows serial devices to connect and communicate over 802.11b wireless networks using IP protocol (TCP for connection-oriented stream applications and UDP for datagram applications).

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 RS232, RS422 or RS485 asynchronous serial device

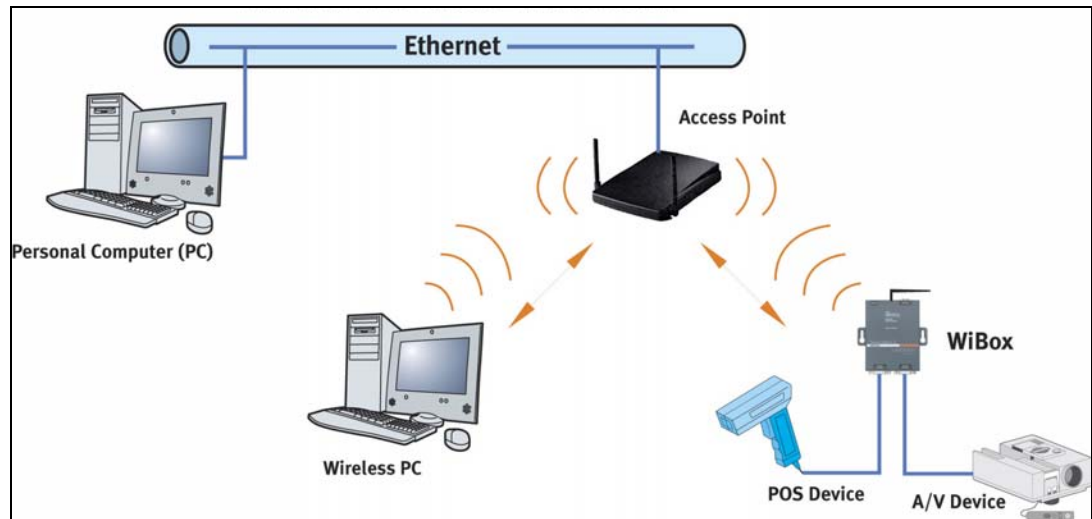
Application Examples

The WiBox has two serial ports and an 802.11b transceiver. Each serial port can be connected to the console port of an IT device. The wireless transceiver can connect to another wireless device or to an Access Point (AP) connecting to a network through an Ethernet connection.

This chapter includes four typical scenarios for using the WiBox. The scenarios assume that the WiBox is configured and has an IP address assigned.

Serial Tunneling – Network

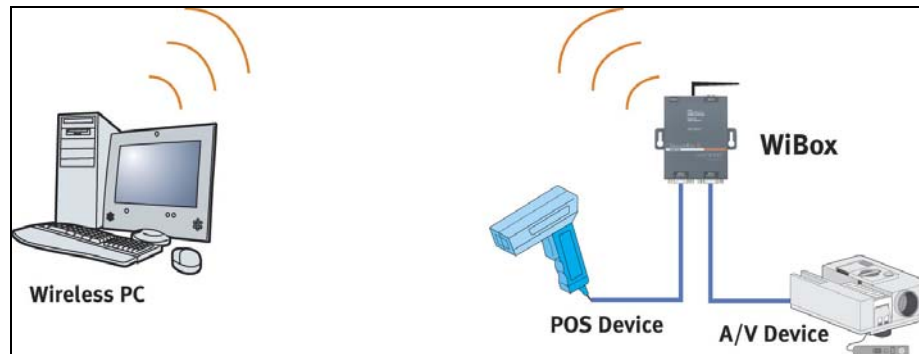
Figure 2-1. Serial Tunneling Network Example



In **Error! Reference source not found.**, a PC connected to an AP via an Ethernet connection and a PC with a wireless connection to the AP access the WiBox as though they are directly connected to it. The combination of the WiBox, a PC, and Lantronix's Redirector behave such that it seems the PC is directly communicating to the WiBox's serial devices without the use of the AP. However, communication is preserved through the AP.

Ad-Hoc Network

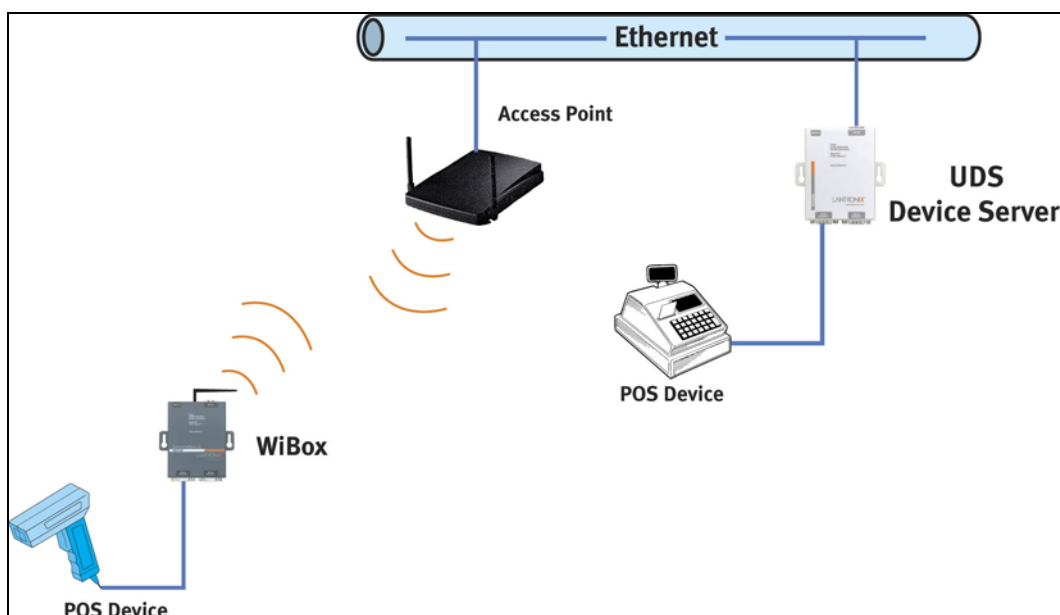
Figure 2-2. Ad-Hoc Network Example



In the above example, 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 point-to-point relationship.

Serial Tunneling – Infrastructure

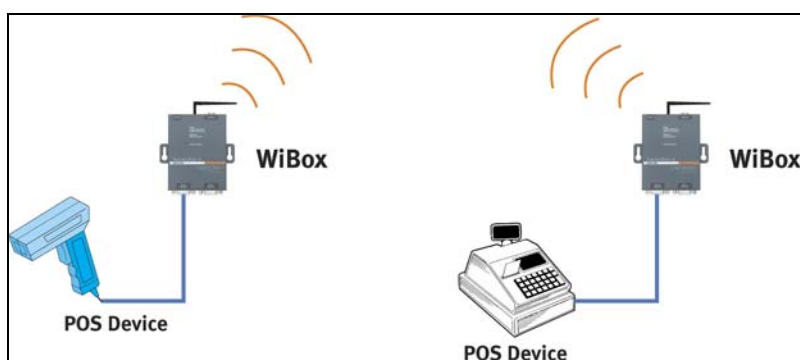
Figure 2-3. Serial Tunneling Infrastructure Example



In **Error! Reference source not found.**, the WiBox communicates with another device server via the AP. The device server (in this example, the UDS) is connected via an Ethernet connection to the AP. As such, 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 above example, two WiBoxes have established an Ad-Hoc point-to-point relationship. They communicate directly to each other's serial devices without a PC or an AP.

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, it requires configuration. For the unit to operate correctly on a network, it must have a unique IP address and appropriate wireless settings for network communications. There are three basic methods for logging into the device server and assigning IP addresses (as well as setting other configurable parameters):

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 [4: Configuration via Serial Mode or Telnet Port](#).)

Web-Manager: Through a web interface, configure the WiBox and its settings using the WiBox's Web-Manager. (See [5: Configuration using Web-Manager](#).)

DeviceInstaller: Configure the ports and other features on the WiBox using a Graphical User Interface (GUI) on a PC attached to a network. (See [6: Configuration using DeviceInstaller](#).)

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

Note: Make note of the MAC address. It is needed to locate the WiBox using DeviceInstaller.

IP Address

Every device connected to an IP network must have a unique IP address. This address is used to reference 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 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.

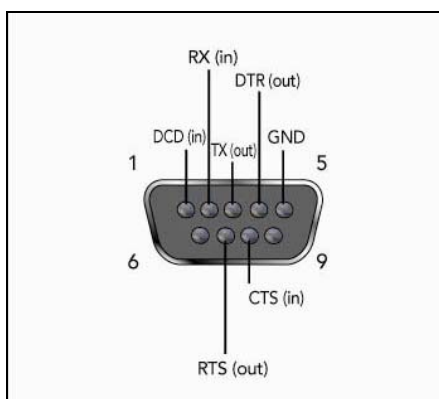
The unit's serial channel (port) can be associated with a specific TCP/UDP port number. Port number 9999 is reserved for access to the unit's Setup (configuration)

Mode window. Ports 0-1024 are reserved as well. For more information on reserved port numbers, refer to [Table 4-5. Reserved Port Numbers](#).

Serial Connector Pinouts

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

Figure 2-5. DB9M DTE Serial Connector



LEDs

Table 2-1. WiBox LEDs

LEDs	Meaning
Power LED: Green, steady on	Power is on
Wireless Link LED: Yellow, blinking	Transmitting/receiving (activity)
Wireless Link LED: Yellow, off	Not in wireless mode
Port 1 LED: Green, steady on	Active
Port 1 LED: Green, blinking	Incoming TCP connection
Port 2 LED: Yellow, steady on	Active
Port 2 LED: Yellow, blinking	Incoming 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

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: 0-60C. Storage temperature range: -40C to 85C
Relative Humidity	Operating: 10% to 90% non-condensing, 40% to 60% recommended Storage: 10% to 90% non-condensing

3: Quick Start

This chapter describes the installation procedure for the WiBox.

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 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".

Installing the WiBox

Complete the following steps to connect and initially configure the WiBox. Initial configuration is done using Serial Mode.

INSERT Wibox diagram Figure x.x

1. Connect one end of the supplied DB9F – DB9M 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.

5. Upon connection , the following information displays:

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

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) and the WLAN (4) settings. Current settings are displayed in parentheses.

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 Setup Menu.

```
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) Y
Enter new DHCP device name : LTX
```

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

- a) Find Network Name: enter the network name (SSID). The default is displayed in parentheses.

```
Find network name (LTRX_IBSS) ?
```

- b) Enable Ad Hoc Network Creation: Ad Hoc network creation is enabled by default. Select **Y** to modify Ad Hoc parameters or select **N** for infrastructure network creation.

```
Enable Ad Hoc network creation (Y) ?
Name (LTRX_IBSS) ?
Country 0=US, 1=FR, 2=JP, 3=Other (0) ?
Channel (11) ?
```

- c) Security: as an additional security measure, enable WEP on the WiBox.

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

- d) Authentication: when WEP is set to enabled, select an authentication scheme.

Authentication 0=open/none, 1=shared (0) ?_

- e) Encryption: when WEP is set to enabled, select the encryption type from the menu.

Encryption 0=WEP64, 1=WEP128 (0) ?_

- f) Change Key: displays when WEP is enabled. Select Y to change the encryption key. Enter the key at the prompt.

Change Key (N) ? _

- g) Data Rate: the data rate is the WiBox's bandwidth.

**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) ?**

- h) Power Management: enter Y to reduce the WiBox's overall power consumption (this increases the unit's response time).

Enable power management (N) ? _

8. Upon completing the IP and WLAN settings configuration, select menu option **9** to save and exit the Wibox Serial Mode setup.
9. The WiBox is ready for wireless connection. Disconnect the serial cable from the PC or to the WiBox.

4: Configuration via Serial Mode or Telnet Port

As an alternative to DeviceInstaller and Web-Manager, the WiBox unit is configurable using a terminal program to access the serial port locally. Configure the WiBox so that it can communicate on a network with serial devices. Using this terminal program to respond to prompts is referred to as the **Setup Mode**.

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

***Note:** The menus in this section show a typical device. Not all devices display information in the same manner.*

Accessing Setup Mode

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. This must be done within three seconds of resetting the WiBox.*

3. Upon connection, the following information displays:

Figure 4-1. MAC Address

```
MAC address 00204AFFFF30
Software version 05.3 (040129) WBX

Press Enter to go into Setup Mode
```

4. To enter the Setup Mode, press **Enter** within 5 seconds.

***Note:** Connection fails if **Enter** is not pressed within 5 seconds.*

The configuration settings display, followed by the setup menu options:

Figure 4-2. Setup Menu Options

```
Change Setup:
0 Server
1 Channel 1
2 Channel 2
4 WLAN
5 Expert
6 Security
7 Factory defaults
8 Exit without save
9 Save and exit
Your choice ?
```

5. Select an option on the menu by entering the number of the option in the **Your choice ?** field and pressing **Enter**.

View the current configuration by pressing **Enter** from the Change Setup menu.

To enter a value for a parameter, type the value and press **Enter**. To confirm a current value, press **Enter** (without inputted parameters).

6. When finished, save the new configurations (**9 Save and exit**). The unit reboots.

Server Configuration

The unit's basic server (i.e. network) values display upon selecting **Server** (option 0 from the Change Setup menu). The following sections describe the configurable parameters within the Server configuration menu.

Set the 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. Enter each octet and press Enter between each section inputted. The current value is displayed in parentheses.

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

Set the 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 is **N** (No), indicating the gateway address has not been set. To set the gateway address, type **Y**. At the prompt, enter the gateway address.

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

Set the 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) _
```

The unit prompts for the number of host bits to be entered, then calculates the netmask, which displays in standard decimal-dot notation when the saved parameters are displayed (for example, 255.255.255.0).

Table 4-1. Standard IP Network Netmasks Representing Host Bits

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 via a Telnet connection to port 9999 or via web pages. The password must have 4 characters.

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

An enhanced password setting (for Telnet access only) of 16 characters is available under option **6 Security** from the Change Setup menu.

Note: A password is not required to access the Setup Mode window via a serial connection.

DHCP Name

If a DHCP server has automatically assigned the IP address and network settings, discover the unit by using the DeviceInstaller network search feature.

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

- ◆ **Default DHCP Name:** If the DHCP name is not changed and the IP is 0.0.0.0, then the DHCP name defaults to CXXXXXX (XXXXXX is the last 6 digits of the MAC 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:** Create your own DHCP name. If 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 the example).

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

- ◆ **Numeric DHCP Name:** Change the DHCP name by specifying the last octet of the IP address. When using this method, the DHCP name is LTXYY where YY is the last octet of the IP address. If the IP address specified is 0.0.0.12, then the DHCP name is LTX12. This method only works with 2 digit numbers (0-99).

Channel 1 and Channel 2 Configuration

Select option **1 Channel 1** or **2 Channel 2** 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 4-3. Serial and Telnet Port Parameters

```
Baudrate <115200> ?
I/F Mode <4C> ?
Flow <00> ?
Port No <14009> ?
ConnectMode <C0> ?
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 current value is displayed in parentheses.

I/F Mode (4C) ? _

The following table displays available I/F Mode options:

Table 4-2. Interface Mode Options

I/F Mode Option	7	6	5	4	3	2	1	0
RS-232C ⁽¹⁾							0	0
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.

Note: If attempting to select an I/F Mode bit pertaining to RS-422/485, a “WARNING: RS-422/485 I/F Modes not supported” message displays.

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

Table 4-3. 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

Flow

Flow control sets the local handshaking method for stopping serial input/output. The current value is displayed in parentheses.

Flow (0) ? _

Use the following table to select flow control options:

Table 4-4. 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 **Port No** setting represents the source port number in TCP connections. It is the number that identifies the channel for remote initiating connections. The port number functions as the TCP/UDP source port number for outgoing packets. Packets sent to the unit with this port number are received to this channel. The port number selected is the Incoming TCP/UDP port and Outgoing TCP/UDP source port.

Port No (10001) ? _

The current value is displayed in parentheses. The default setting for Port 1 is 10001. The range is 1-65535, except for the following reserved port numbers:

Table 4-5. Reserved Port Numbers

Port Numbers	Reserved for
1 – 1024	Reserved
9999	Telnet setup
14000-14009	Reserved for Redirector
30718	Reserved (77FEh)

Note: It is recommended to **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 the unit's connection method and its reaction to incoming connections over the network. The current value is displayed in parentheses.

ConnectMode (C0) ? _

Enter Connect Mode options in hexadecimal notation:

Table 4-6. 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 modem-control_in 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 modem_control_in 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								
Full Verbose				1	0	1	1	0
Without Echo				0	0	1	1	0
Numeric modem result codes				1	0	1	1	1

a) Incoming Connection

Never Accept Incoming	Rejects all external connection attempts.
Accept with modem_control_in Active	Accepts external connection requests only when the modem_control_in 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. This option is overridden when the Active Start Modem Mode or Active Start Host List is in effect. Default setting is Nothing (quiet).
No Active Startup	Does <i>not</i> attempt to initiate a connection. Default setting.
With Any Character	Attempts to connect when any character is received from the serial port.
Accept with modem_control_in Active	Attempts to connect when the modem_control_in 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 can include a destination port number. The IP address must be in standard dot-decimal 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.
--------------------------	--

Table 4-7. 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	Connects to 129.1.28.10, port 12; enters Monitor Mode

Autostart (Automatic Connection)	The unit automatically attempts a connection to the remote IP address and port after booting up.
Hostlist	The host list 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 host list until it connects to the first available device listed in the host list table. Once it connects, the unit stops further attempts. If this connection fails, the unit continues to scroll through the table until it is able to connect to the next available IP address in the host list. 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 Mode and for Modem Mode. The unit will not accept a data connection from a remote device when the hostlist option is enabled.

Figure 4-4. Hostlist Example

```

Baudrate (9600) ?
I/F Mode (4C) ?
Flow (00) ?
Port No (10001) ?
ConnectMode (C0) ?25

Hostlist :

No Entry !

Change Hostlist ? (N) Y
01. IP address : (000) 172.(000) 19.(000) 0.(000) 1      Port :
(0) ?23
02. IP address : (000) 172.(000) 19.(000) 0.(000) 2      Port :
(0) ?3001
03. IP address : (000) 172.(000) 19.(000) 0.(000) 3      Port :
(0) ?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. The menu shows a list of current entries already defined in the product.
2. To delete, modify, or add an entry, select **Yes**. If entering 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 host list 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 is 250.

c) Datagram Type

Directed UDP	When selecting this option, the prompt requests the Datagram type. Enter 01 for directed or broadcast UDP. When the UDP option is in effect, the unit uses UDP datagrams to send and receive data.
---------------------	--

d) 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 WiBoxes, 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), or **D7** (echo with 1-character response).

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), or D7 (echo with 1-character response).

Without Echo	In Modem Mode, echo refers to the echo of all of the characters entered in command mode; it does <i>not</i> mean to echo data that is transferred. Quiet Mode (without echo) refers to the modem <i>not</i> sending an answer to the commands received (or displaying what was typed).
Full Verbose	The unit echoes modem commands and responds to a command with a message string shown in the table below.
1-Character Response	The unit echoes modem commands and responds to a command with a single character response.

Table 4-8. 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.
RING n.n.n.n.	A remote device, having IP address n.n.n.n, is connecting to this device.
1-Character 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 1-Character Response option is in effect, the unit responds to an unrecognized command string that is otherwise formatted correctly with **OK** 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.

Table 4-9. 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).
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. Uses remote IP address and port settings to initiate a connection.
ATD or ATDT	Forces the unit into Monitor Mode. Uses remote IP address and port settings to initiate a connection.
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>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 1-character response or full verbose. n=0 enables 1-character 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.

Auto Increment Source Port

Enter Y (Yes) 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.

Auto increment source port (N)? _

Remote IP Address

This is the destination IP address used with an outgoing connection. The current value is displayed in parentheses.

Remote IP Address : (0) (0) (0) (0) _

Note: This option is not displayed when Hostlist is enabled from the ConnectMode prompt (see [Connect Mode](#) on page 26 for more information).

Remote Port

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.

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).

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

Note: This option is not displayed when Hostlist is enabled from the ConnectMode prompt (see [Connect Mode](#) on page 26 for more information).

DisConnMode

Disconnect Mode (DisConnMode) determines the conditions under which the unit will cause a network connection to terminate. The current value is displayed in parentheses.

```
DisConnMode ( 0 ) ? _
```

In DisConnMode, modem_control_in either drops the connection or is ignored. The following table displays the available input options:

Table 4-10. Disconnect Mode Options

Disconnect Mode Option	7	6	5	4	3	2	1	0
Disconnect with modem_control_in drop ⁽⁶⁾	1							
Ignore modem_control_in	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 modem_control_in transitions from a high state to a low state, the network connection to or from the serial port drops.

Flush Mode

The FlushMode (buffer flushing) parameter controls line handling and network buffers with connection startup and disconnect.

```
FlushMode ( 0 ) ? _
```

Select between two different packing algorithms (the current configuration is displayed within the parentheses). Available Flush Mode options are:

Table 4-11. Flush Mode Options

Function	7	6	5	4	3	2	1	0
Input Buffer (Serial to Network)								
Clear with a connection that is 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 that is 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 algorithm defines 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. 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 specific functions are not needed.

Table 4-12. Pack Control Options

Option	7	6	5	4	3	2	1	0
Packing Interval								
Interval: 12ms							0	0
Interval: 52ms							0	1
Interval: 250ms							1	0
Interval: 5sec							1	1
Trailing Characters								
None					0	0		
One					0	1		

Option	7	6	5	4	3	2	1	0
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.

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.
- ◆ 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).

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 (0: 0) ?:

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

SendChar 1 and SendChar2

Enter up to two characters in hexadecimal representation.

SendChar 1 (0) ? _
SendChar 2 (0) ? _

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 34).

Telnet Terminal Type

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

If the terminal type 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 UNIX hosts.

Channel (Port) Password

This parameter appears only if the channel (port) password option is enabled in Disconnect Mode. If the option is enabled, set a password on the serial port.

WLAN Settings

Without adequate protection, a wireless LAN is susceptible to access by unauthorized users. As such, WiBox includes the Wired Equivalent Privacy (WEP) encryption standard as an additional means of security.

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

Find Network Name

Enter the name of the network in which the WiBox unit resides. The current value is displayed in parentheses.

```
Find network name (LTRX_IBSS) ? _
```

Enable Ad Hoc Network Creation

The current value is displayed in parentheses. By default, Ad Hoc network creation is enabled on WiBox.

```
Enable Ad Hoc network creation (Y) ?  
Name (LTRX_IBSS) ?  
Country 0=US, 1=FR, 2=JP, 3=Other (0) ?  
Channel (11) ?
```

Enter Y to enable Ad Hoc network creation and display configurable parameters:

1. At the **Name** prompt, enter the network name as text and hit **Enter**. The default name displays in parentheses.
2. Select a **Country** by entering 0, 1, or 3. By default, 0 (United States) is selected. Press **Enter**.
3. At the **Channel** prompt, enter the WiBox's channel setting.

Security

As an additional security measure, enable WEP on the WiBox. The current value is displayed in parentheses. By default, WEP is disabled on WiBox.

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

Authentication

Displays when **Security** is set to **1 (WEP)**. Select an authentication scheme from the available menu options: **None** (Open) or **Shared**. Selecting **Shared** requires manually entering the authentication key.

Authentication 0=open/none, 1=shared (0) ? _

Encryption

Displays when **Security** is set to **1 (WEP)**. Select the encryption type from the menu. WEP provides a level of security by encrypting data so that it is protected as it is transmitted from one end point to another. **128 bits** is the default encryption.

Encryption 0=WEP64, 1=WEP128 (0) ? _

Change Key

Displays when **Security** is set to **1 (WEP)**. Select **Y** to change the encryption key used for WEP. The default is **N**, which keeps the current encryption key.

Change Key (N) ? _

Enter Key

Displays when **Change Key** is set to **Y**. Enter the encryption key in hexadecimal values (characters do not display to the screen). For 64 bit encryption, enter 10 characters. For 128 bit encryption, enter 26 characters.

Enter Key: ** _ ** _ ** _ *

Data Rate

WiBox permits the control of the transmission rate. The data rate is the WiBox's bandwidth. If multiple products are used, it may be required to lower the bandwidth to ensure one product is not using all the available bandwidth. The current value is displayed in parentheses.

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) ?

Power Management

Power management reduces the overall power consumption of the WiBox unit. Enabling power management increases the unit's response time. The current value is displayed in parentheses.

Enable power management (N) ? _

Expert Settings

Note: Change these settings via Telnet or serial connections only.

Caution: Only an expert should change these parameters. These changes hold serious consequences.

TCP Keepalive Time

TCP Keepalive time defines how many seconds the unit waits during a silent connection before checking whether the currently connected network device is still on the network. If the unit does not receive a response, it drops that connection.

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

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) the unit waits before timing out this table.

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

Security Settings

Change security settings via Telnet or serial connections only, not on the Web-Manager.

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 prevent 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 is displayed 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 is displayed in parentheses.

Disable Telnet Setup

Note: If this option is disabled, note that 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) : _

With this option, download firmware upgrades over the serial port using DeviceInstaller's Recover Firmware procedure (see [Recovering the Firmware Using the Serial Port](#) on page 12).

Disable Port 77FE (Hex)

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

Port 77FE is used by DeviceInstaller, 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 DeviceInstaller, 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 (option).

Disable Web Server (N) ? _

Disable Web Setup

The Y (Yes) option disables configuration via the Web-Manager. This setting defaults to the N (option).

Disable Web Setup (N) ? _

Disable ECHO Ports

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

Disable ECHO ports (Y) ? _

Enable Enhanced Password

This setting defaults to the N (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.

Factory Defaults

Select **7 Factory Defaults** from the Change Setup menu to reset the unit's Channel 1 configuration, Channel 2 configuration, E-mail settings, and Expert settings to the factory default settings. The server configuration settings for IP address, gateway IP

address, and netmask remain unchanged. The specific settings that this option changes are listed below:

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
Find Network Name	LTRX_IBSS
Enable Ad Hoc Network Creation	(Y) Yes
Name	LTRX_IBSS
Country	(0) United States
Channel	11
Security	(0) None
Data Rate	11Mbps

Expert Settings

TCP keepalive	45 (seconds)
ARP cache timeout	600 (seconds)

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 ECHO ports	(Y) Yes
Enable Enhanced password	(N) No

Exit Configuration Mode

To exit setup mode:

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

5: Configuration using Web-Manager

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.

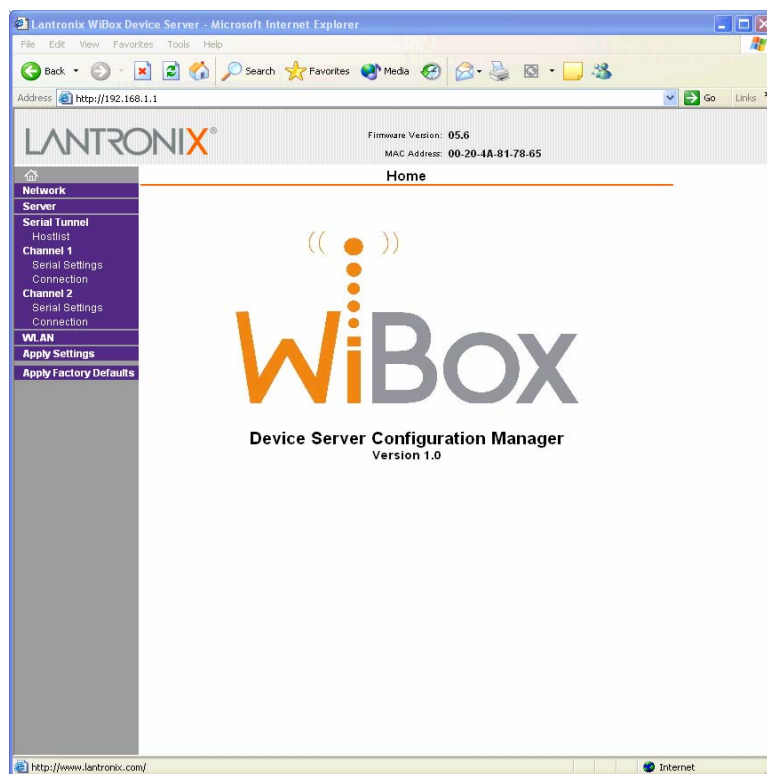
Accessing WiBox using Web-Manager

Note: Make note of the MAC address. It is needed to locate the WiBox using DeviceInstaller. For more information on the hardware address, see [Hardware Address](#) on page 14.

Follow the instructions on the product CD to install and run DeviceInstaller.

1. Click **Start→Programs → Lantronix→DeviceInstaller→DeviceInstaller**. If the PC has more than one network adapter, a message displays requesting the selection of a network adapter. Select an adapter and click **OK**.
2. Click the **Search** icon and select the WiBox unit from the list of Lantronix device servers on the local network.
3. Highlight the WiBox device in the list and click **Web**. Web-Manager for WiBox opens in a new browser window.

Figure 5-1. Web-Manager



The main menu is displayed in the left side of the Web-Manager window.

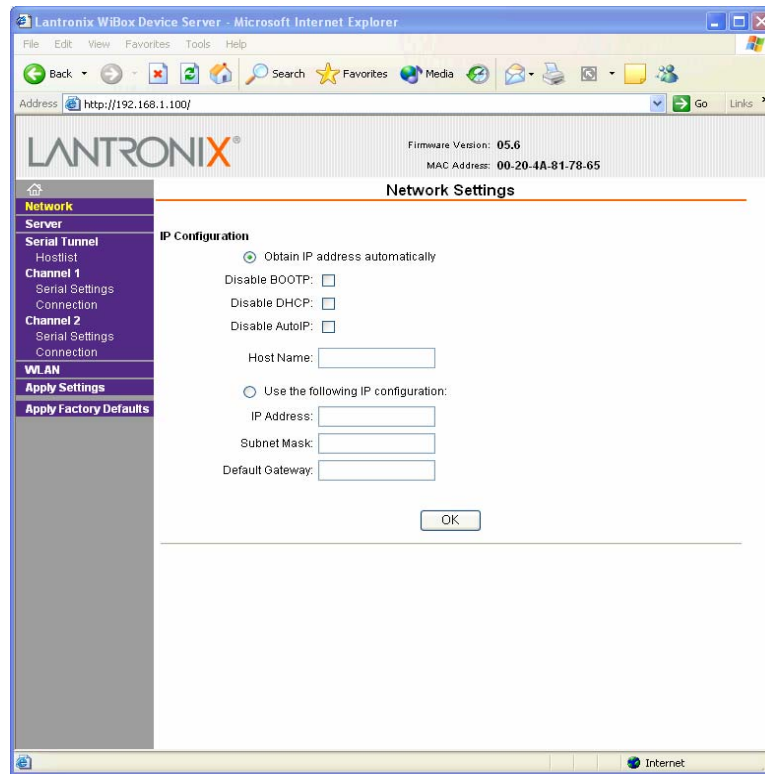
Note: Alternatively, access the WiBox's Web-Manager if it is connected to the network by entering its IP address in a web browser.

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: The IP address is assigned via DHCP (on DHCP-enabled networks). Assign a static IP address only if necessary.

Figure 5-2. Network Settings



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):

Disable BOOTP	Leave the checkbox empty to enable Bootstrap Protocol (BOOTP). The BOOTP server automatically assigns the IP address from a pool of addresses.
Disable DHCP	Leave the checkbox empty to enable Dynamic Host Configuration Protocol (DHCP). DHCP automatically assigns a leased IP address to the WiBox unit.
Disable Auto-IP	The WiBox generates an IP in the 169.254.x.x address range with a Class B subnet. Select the checkbox to disable this feature.
Host Name	Enter the name of the host on the network.

Note: Consult the System or Network Administrator before adjusting these settings.

4. Click the **OK** button when finished.

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):

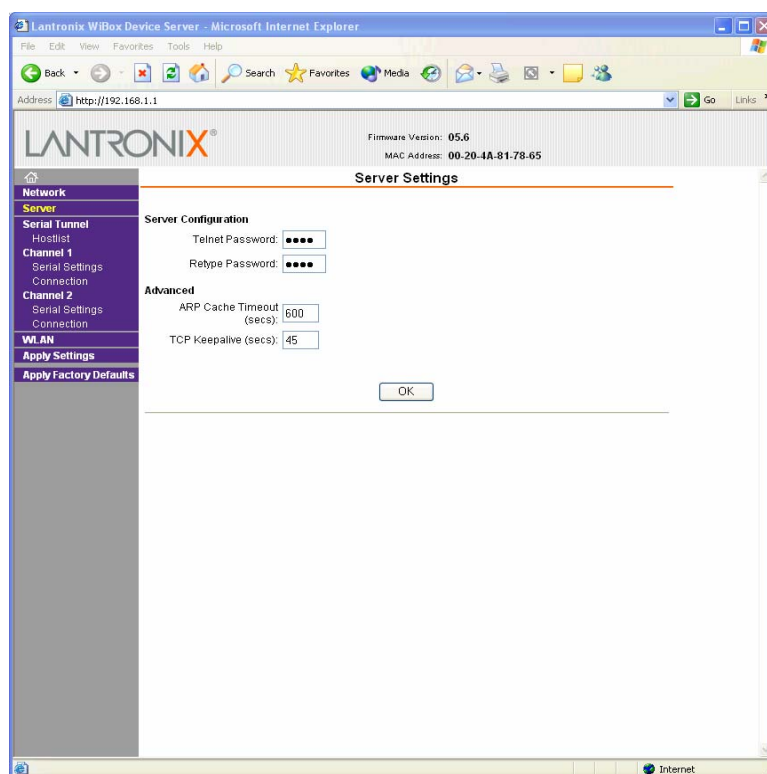
IP Address	If DHCP is not used to assign IP addresses, enter it manually. The IP address must be set to a unique value in the network.
Subnet Mask	A subnet mask defines the number of bits taken from the IP address that are assigned for the host part.
Default Gateway	The gateway address, or router, allows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

4. Click the **OK** button when finished.

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 5-3. 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 0 and 60 seconds. 0 disables keepalive.

Host List Configuration

The host list operates in a sequential order when attempting to connect to the first available host. The WiBox scrolls through the host list until it connects to a device listed in the host list 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 host list supports a minimum of 1 and a maximum of 12 entries. Each entry contains an IP address and a port number.

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

To configure the WiBox's host list:

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

Figure 5-4. Hostlist Settings

The screenshot shows the Lantronix WiBox Device Server web interface in Microsoft Internet Explorer. The address bar shows <http://192.168.1.100/>. The page title is "LANTRONIX®" with "Firmware Version: 05.6" and "MAC Address: 00-20-4A-81-78-65". The "Hostlist Settings" page is displayed, featuring a sidebar menu and a main content area. The sidebar menu includes "Network", "Server", "Serial Tunnel", "Hostlist", "Channel 1", "Channel 2", "WLAN", "Apply Settings", and "Apply Factory Defaults". The main content area shows "Hostlist Settings" with "Retry Settings" (Retry Counter: 3, Retry Timeout: 250) and a table for "Host Information" with 12 rows for host addresses and ports.

No.	Host Address	Port	No.	Host Address	Port
1	192.168.1.10	5000	2	192.168.1.11	5001
3	0.0.0.0	0	4	0.0.0.0	0
5	0.0.0.0	0	6	0.0.0.0	0
7	0.0.0.0	0	8	0.0.0.0	0
9	0.0.0.0	0	10	0.0.0.0	0
11	0.0.0.0	0	12	0.0.0.0	0

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 host list.
Retry Timeout	Enter the duration (in seconds) the WiBox should abandon attempting a connection to the host list.

Host Information

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

Channel 1 and Channel 2 Configuration

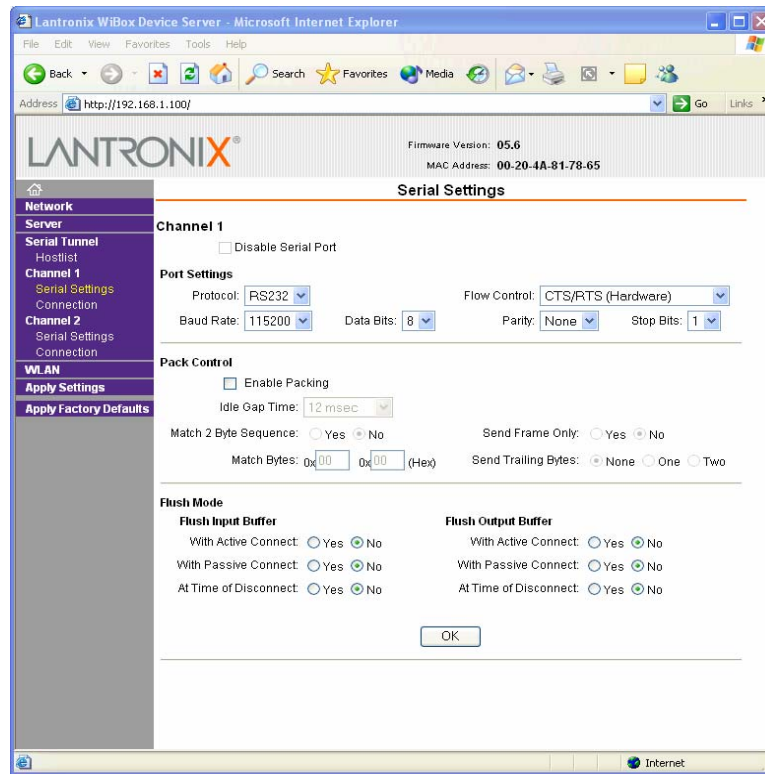
Channel 1 and Channel 2 configurations define how the serial ports respond to network and serial communication.

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 5-5. Channel Serial Settings



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

Channel 1

Disable Serial Port	Available on Channel 1 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.
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.
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.
Data Bits	Indicates the number of bits in a transmitted data package.
Parity	Checks for the parity bit. The default is None .
Stop Bits	The stop bit follows the data and parity bits in serial communication. It indicates the end of transmission.

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.
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.
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 True to send only the data frame.
Send Trailing Bytes	Select the number of bytes to send after the end-of-sequence characters.

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.
With Passive Connect	Select Yes to clear the input buffer with a connection initiated from the network to the device.
At Time of Disconnect	Select Yes to clear the input buffer when the network connection to or from the device is disconnected.

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.
With Passive Connect	Select Yes to clear the output buffer with a connection initiated from the network to the device.
At Time of Disconnect	Select Yes to clear the output buffer when the network connection to or from the device is disconnected.

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 5-6. 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. Field is not available when a password is set for Telnet mode.
Password	If Password Required was set to Yes , enter the password for passive connections.

Connect Mode: Active Connection

Active Connect	Select None to disable Active Connect. Otherwise, indicate the connection type from the available list. Never Accept Incoming rejects all external connection attempts. Accept with modem_control_in Active accepts external connection requests only when the modem_control_in input is asserted. Cannot be used with Modem Mode. Always Accept accepts any incoming connection when a connection is not already established.
Start Character	If Active Connect is set to With Start Character , enter the start character in this field.
Modem Mode	Indicates the on-screen response type when in Modem Mode (if enabled).

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.
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 set to 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. Default setting is None .
Use Hostlist	The host list 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 host list until it connects to a device listed in the host list 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 host list. The host list is disabled for Manual Mode and for Modem Mode. The unit will not accept a data connection from a remote device when the host list option is enabled. For information on configuring the host list, see Host List Configuration on page 47.
LED	Select Blink for the status LEDs to blink upon connection or None for no LED output.

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.
Hard Disconnect	When set to Yes , the TCP connection closes even if the remote site does not acknowledge the disconnect request.
With EOT	Choose 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.

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.

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

Connect Protocol

Protocol

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

Figure 5-7. UDP Connection Settings

The screenshot shows the Lantronix WiBox Device Server web interface in Microsoft Internet Explorer. The address bar shows http://192.168.1.100/. The page title is "LANTRONIX®" and the firmware version is 05.6. The MAC address is 00-20-4A-81-78-65. The main content area is titled "Connection Settings" and shows settings for "Channel 2". The "Connect Protocol" is set to "UDP". The "Datagram Mode" is set to "01". The "Accept Incoming" checkbox is checked. The "Endpoint Configuration" section shows "Local Port" as 10002, "Remote Port" as 10002, and "Remote Host" as 10.10.10.1. Below this is a "Device Address Table" with 16 columns, each containing a "No." and a "Dev Addr" field. The "OK" button is at the bottom right.

Datagram Mode

Datagram Type

Configures remote IP or network broadcast address and the remote port. Enter 01 for directed or broadcast UDP.

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.
Change Address Table	Field enabled when Datagram Type is set to FD . Enter values between 1-255 to identify units on the local network of device servers.

WLAN Configuration

Without adequate protection, a wireless LAN is susceptible to access by unauthorized users. As such, WiBox includes the Wired Equivalent Privacy (WEP) encryption standard as an additional means of security.

To configure the WiBox's WLAN settings:

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

Figure 5-8. WLAN Settings

The screenshot shows the 'LANTRONIX' web interface for a 'WiBox Device Server'. The browser address bar shows 'http://192.168.1.100/'. The left sidebar has a menu with 'WLAN' selected. The main content area is titled 'WLAN Settings'. It contains several sections: 'Network Interface' (set to WLAN), 'Network Name' (ACME_IBSS), 'Ad Hoc Mode Settings' (with a checked 'Ad Hoc Network Creation' box, Network Name: ACME_ADH, Country: United States, and Network Channel: Channel 11), 'Wireless Network Security' (Security: WEP, Authentication: Shared, Encryption: 128 bits, and an Encryption Key of 4e5db6ac29 in hex), and 'Advanced Settings' (Data Rate: 11, 5.5, 2, 1 Mbps and Radio Power Management: Enable/Disable). An 'Ok' button is at the bottom.

2. Enter or modify the following fields:

Network Interface	Field is set to WLAN.
Network Name	Enter the name of the network where the WiBox is located.

Ad Hoc Settings

Ad Hoc Network Creation	Select the checkbox when using a client (such as a wireless card) to communicate with the WiBox instead of an Access Point.
--------------------------------	---

Ad Hoc Network Name	Enter the network name for the Ad Hoc network.
Ad Hoc Network Channel	Select from the pull down menu the radio channel for the Ad Hoc network. The default value is 11 .
Ad Hoc Country	From the pull down menu, select a country for the Ad Hoc network. The default is United States .

Wireless Network Security

Security	As an additional security measure, enable WEP on the WiBox. By default, WEP is disabled on WiBox.
Authentication	Select an authentication scheme from the pull down menu: None (Open) or Shared . Selecting Shared requires manually entering the authentication key.
Encryption	Select the encryption type from the pull down menu. 128 bits is the default encryption.
Encryption Key	Field is enabled when WEP is selected as the Security type. Enter the Encryption Key in hexadecimal value

Advanced Settings

Data Rate	WiBox permits the control of the transmission rate. The data rate is the WiBox's bandwidth. If multiple products are used, it may be required to lower the bandwidth to ensure one product is not using all the available bandwidth. Select the data rate (in Mbps) from the pull down menu.
Radio Power Management	Power management reduces the overall power consumption of the WiBox unit. Selecting Enable increases the response time.

Updating Settings

Click the **Apply Settings** button from the main menu to save and apply the configuration changes.

6: Configuration using DeviceInstaller

This chapter covers the steps for getting the WiBox device server online and working.

Accessing WiBox using DeviceInstaller

Note: Make note of the MAC address. It is needed to locate the WiBox using DeviceInstaller. For more information on the hardware address, see [Hardware Address](#) on page 14.

Follow the instructions on the product CD to install and run DeviceInstaller.

1. Click **Start→Programs → Lantronix→DeviceInstaller→DeviceInstaller**. If the PC has more than one network adapter, a message displays requesting the selection of a network adapter. Select an adapter and click **OK**.
2. Click the **Search** icon and select the WiBox unit from the list of Lantronix device servers on the local network.
3. Highlight the WiBox device in the list and click **Settings**. The Configure Device window for the WiBox unit displays.
4. To store configuration changes, click **OK**. To store and apply modifications, click **Apply**.

Server Configuration

To manually assign an IP Address:

1. Click the **Assign IP** icon .
2. If prompted, enter the hardware address (on the product label) and click **Next**.
3. Select **Assign a specific IP address** and click **Next**.
4. Enter the **IP address**. The **Subnet mask** displays automatically based on the IP address; if desired, change it. On a local network, you can leave the **Default gateway** blank (all zeros). Click **Next**.
5. Click the **Assign** pushbutton and wait several seconds until a confirmation message displays. Click **Finish**.
6. Select the device from the main window list and select **Ping** from the **Tools** menu. The Ping Device dialog box shows the IP address of the selected unit.
7. Click the **Ping** button. The results display in the Status window. Click the **Clear Status** button to clear the window so you can ping the device again.

Note: If you do not receive “Reply” messages, make sure the unit is properly attached to the network and that the IP address assigned is valid for the particular network segment you are working with. If you are not sure, check with your systems administrator.

8. Click the **Close** button to close the dialog box and return to the main window.

WLAN Configuration

Without adequate protection, a wireless LAN is susceptible to access by unauthorized users. As such, WiBox includes the Wired Equivalent Privacy (WEP) encryption standard as an additional means of security.

To configure the WiBox's WLAN settings:

Note: These settings are dependent on a given network's individual settings.

1. From the Configure Device window for the WiBox unit, click the **Advanced** tab.
2. In the WLAN Configurable Items section, enter the following fields:

Current Network Interface	Use the pull down menu to select a WLAN interface or an Ethernet interface.
Network Name to Search	Enter the name of the network in which the WiBox unit resides.
Ad Hoc Network Creation	Select Enable when using a client (such as a wireless card) to associate to a network.
Ad Hoc Network Name	Enter the network name for the Ad Hoc network.
Ad Hoc Country	From the pull down menu, select a country for the Ad Hoc network. The default is United States .
Ad Hoc Network Channel	Select the radio channel from the pull down menu for the Ad Hoc network. The default value is 11 .
Security	As an additional security measure, enable WEP on the WiBox. By default, WEP is disabled.
Authentication	Select an authentication scheme from the pull down menu: None (Open) or Shared . Selecting Shared requires manually entering the authentication key.
Encryption	Select the encryption type from the pull down menu. 128 bits is the default encryption.
Encryption Key	Manually enter the Encryption Key in hexadecimal value. 10 hexadecimal characters are required for 64 bit encryption. 26 hexadecimal characters are required for 128 bit encryption.
Data Rate	WiBox permits the control of the transmission rate (in Mbps). The data rate is the WiBox's bandwidth. If multiple products are used, it may be required to lower the bandwidth to ensure one product is not using all the available bandwidth.

3. Click **Apply** to apply the changes immediately to the WiBox and automatically reboot. Click **OK** to save the changes to apply at the next reboot.

Host List Configuration

The host list 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 host list until it connects to the first available device listed in the host list table. Once it connects, the unit stops further attempts. If this connection fails, the unit continues to scroll through the table until it is able to connect to the next available IP address in the host list.

The host list supports a minimum of 1 and a maximum of 12 entries. Each entry contains an IP address and a port number. This field is available for configuration only when Active Connection is not set to **None**.

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

To configure the WiBox's host list:

1. From the Configure Device window for the WiBox unit, click the **Advanced** tab.
2. In the Host List section, modify the following fields:

Retry Counter	Enter the value for the number of times the WiBox should attempt to retry connecting to the host list.
Retry Timeout	Enter the duration (in seconds) the WiBox should abandon attempting connection to the host list.

3. Click the "..." next to the **Host List** field to open the HostListEntry Collection Editor Window. The list of host list IP addresses display in the Members section.
4. Click on a host list member to highlight it and enter the following information in the Properties section:

Host	Enter or modify the Host's IP address.
Port	Enter the port on which the Host's IP address resides.

5. Click **Apply** to apply the changes immediately to the WiBox and automatically reboot. Click **OK** to save the changes to apply at the next reboot.

Channel 1 and Channel 2 Configuration

Channel 1 and Channel 2 configurations define how the serial port responds to network and serial communications.

To configure the channel configurations:

1. From the Configure Device window for the WiBox unit, click the **Ports** tab. The list of available ports display.
2. Click on a port number and click **Edit Settings**. The Port Properties window opens.
3. Click the **Port Settings** tab. In the available fields, change the following pull down menu options as necessary:

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, and 921600.
Data bits	Indicates the number of bits in a transmitted data package.
Parity	Refers to the checking whether data has been lost or written over when transmitted between computers. The default is None .
Stop bits	The stop bit follows the data and parity bits in serial

	communication. It indicates the end of transmission.
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 following table demonstrates some common Interface Mode (I/F) settings:

Table 6-1. Common Interface Mode Settings

Common I/F Mode Setting
RS-232C, 8-bit, No Parity, 1 stop bit
RS-232C, 7-bit, Even Parity, 1 stop bit

To configure advanced channel configurations:

- From the Configure Device window for the WiBox unit, click the **Ports** tab. The list of available ports display.
- Click on a port number and click **Edit Settings**. The Port Properties window opens.
- Click the **Advanced** tab. In the available fields, change the following pull down menu options as necessary:

Serial Settings

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.
Data bits	Indicates the number of bits in a transmitted data package.
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.
Stop bits	The stop bit follows the data and parity bits in serial communication. It indicates the end of transmission.
Parity	Refers to the checking whether data has been lost or written over when transmitted between computers. The default is None.

UDP Datagram Mode

Datagram Mode	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. Select True to enable Datagram Mode.
Datagram Type	Configurable when Datagram Mode is set to True . Configures remote IP or network broadcast address and the remote port. Enter 01 for directed or broadcast UDP.

Passive Connection

Accept Passive Connection	Select Yes to permit incoming network connection on this port.
Local Port	Port number for an incoming connection. Also used as the source port number.
Password Required	Select True to require a password for incoming connections.
Port Password	This parameter appears only when Password Required is set to True . Enter a password for the selected channel or serial port.

Active Connection

Active Connection	Defines the unit's connection method. The default is None (no Active Connection).
Terminal Type	This field is available for configuration only when Telnet Mode to True. 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 UNIX hosts.
Remote Port	This field is available for configuration only when Active Connection is not set to None. 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. 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).
Use Host List	This field is available for configuration only when Active Connection is not set to None. If this option is set to True, the device server attempts a connection from the host list. This process stops at the first valid connection. The host list is disabled for Manual or Modem Mode. The unit will not accept a data connection from an incoming remote device when the host list option is enabled. For information on configuring the host list, see Host List Configuration on page 3.
Modem Emulation 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 accordingly. For more information on Modem Emulation Mode, see Modem Mode on page 30. Selecting Without Echo tells the modem not send an answer to the commands received (or display typed data). Choose Full Verbose for the unit to echo modem commands and respond to a command with a message string. Character Response tells the WiBox unit to echo modem commands and respond to a command with a single character response.

Telnet Mode	This field is available for configuration only when Active Connection is not set to None . Select True to permit a Telnet connection to the WiBox unit.
Remote Host	This field is available for configuration only when Active Connection is not set to None . Denotes the destination IP address used with an outgoing connection.
Connection Response	A single character is transmitted to the serial port when there is a change in connection state. Default setting is None .

Disconnection

Disable Hard Disconnect	The TCP connection closes even if the remote site does not acknowledge a disconnect request.
Disconnect with modem_control_in	The connection drops when modem_control_in transitions from a high state to a low state.
Disconnect with EOT	The connection is dropped 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.
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 .

Connection

Connection LED	Select Blink for the status LEDs to blink upon connection or None for no LED output.
-----------------------	--

Buffer Flushing

Flush Input Buffer	
At Time of Disconnect	Clear the network buffer when a network connection to or from the serial port drops.
On Active Connection	Clear the network buffer upon initializing a connection.
On Passive Connection	Clear the buffer upon a connection initiated from the network to the serial port.
Flush Output Buffer	
At Time of Disconnect	Clear the buffer when the network connection to or from the device is dropped.
On Active Connection	Clear the buffer with a new connection initiated from the device to the network.
On Passive Connection	Clear the buffer with a connection from the network to the device.

Packing

Enable Packing	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, while keeping the packet count low. The alternate packing algorithm optimizes the packet for 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. Select True to enable packing on the WiBox.
Idle Time	Select the maximum time for inactivity between data bytes on the serial port. The default time is 12 milliseconds.
Match Byte 1	Use to set the termination byte. Set this value to 00 if not used.
Match Byte 2	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.
Match 2 Byte Sequence	Used with Match Byte 1 and Match Byte 2 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 packet.
Send Frame Only	After the detection of the byte sequence, indicates whether to send the data frame or the entire buffer (i.e. include the trailing bytes). Select True to send only the data frame.
Send Trailing Bytes	Select the number of bytes to send after the end-of-sequence characters.

7: Monitoring the Network

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 [Accessing Setup Mode](#) on page 21).
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 appears:

```
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 7-1. 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.

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 7-2. 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

8: Updating Firmware

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

Obtaining Firmware

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/pub/](ftp://ftp.lantronix.com/pub/)).

Reloading Firmware

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

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

Table 8-1. Firmware Files

ROM File	FWX File	COB
WBXxxx.ROM	H2_FW_200.FWX	WBXvx_x.COB (Web-Manager)

Please refer to the DeviceInstaller User Guide for information about reloading firmware using DeviceInstaller. The other methods are discussed below:

Using TFTP: Graphical User Interface (GUI)

To download new firmware from a computer using a TFTP GUI (such as *TFTP Turbo Basic*):

1. Use a TFTP client to put 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 **WEB28** for the internal Web interface with 2MB flash (For WiBox, **W2** = ROM file. **FWX1** = FWX file.)
6. Click the **Upload Now** button to transfer the file to the unit. The unit performs a power reset after the firmware has been loaded and stored.

Using TFTP: Command Line Interface

To download new firmware from a computer, 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, the .fwx file, and the .cob file:

```
tftp -i 192.168.1.111 put wbx540.rom W2  
tftp -i 192.168.1.111 put H2_FW_200.fwx FWX1  
tftp -i 192.168.1.111 put wbx_wm110.cob WEB1
```

Recovering the Firmware Using the Serial Port

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

1. Start DeviceInstaller.
2. From the **Tools** menu, select **Advanced/Recover Firmware**. The Recover Firmware window displays.
3. Enter the com port on your PC and the location of the firmware file. The Device Model should indicate WiBox.
4. Click **OK** to download the file.

Note: See also *Recovering Firmware in the DeviceInstaller User Guide*.

9: 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.

When troubleshooting the following problems, make sure that the WiBox is powered up. Confirm that you are using a good network connection.

Problems and Error Messages

Problem/Message	Reason	Solution
When you issue the ARP -S command in Windows, <i>The ARP entry addition failed: 5</i> message displays.	Your currently logged-in user does not have the right to use this command on this PC.	Have someone from 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.	When you Telnet to port 1 on the device server, you are only assigning a temporary IP address. 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.	You did not press Enter quickly enough. You only have 5 seconds to press Enter before the connection is closed.	Telnet to port 9999 again, but press Enter as soon as you see the <i>Press Enter to go into Setup Mode</i> 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 may 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 be plugged into the network properly.	Make sure that the Link LED is lit. If the Link LED is not lit, then the device server is not properly plugged into the network.
When you try to assign an IP with DeviceInstaller, you get the following message: <i>No response from device! Verify the IP, Hardware Address and Network Class. Please try again.</i>	The cause is most likely one of the following: The Hardware address you specified is incorrect. The IP address you are trying to assign is not a valid IP for your logical subnet. You did not choose the correct subnet mask.	Double-check the parameters that you specified. Note: You cannot assign an IP address to a device server through a router.
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 You are not Telnetting to port 9999. 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.

Problem/Message	Reason	Solution
The device server appears to be set up correctly, but you are not communicating with your device attached to the device server across the network.	If you are sure that the serial port setting is correct, then you may not be connecting to the correct socket of the device server. Another possibility is that the device server 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 device server by checking the state of CP1, if it has been configured for LED1 functionality. If the state of CP1 is blinking consistently, or is completely off, then there is a good socket connection. If the state of CP1 is low, use the Connect Mode option C0 for making a connection to the device server from the network. Use Connect Mode option C1 or C5 for a connection to the network from the device server. See the full list of Connect Mode options in Connect Mode on page 26.
When connecting to the Web-Manager within the device server, the <i>No Connection With The Device Server</i> message displays.	Your computer is not able to connect to port 30718 (77FEh) on the device server.	Make sure that port 30718 (77FEh) is not blocked with any router that you are using on the network. Also, make sure that port 77FEh is not disabled within the Security settings of the device server.

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 - 5:30 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: Compliance and Warranty Information

Compliance Information

Manufacturer's Name & Address:

Lantronix 15353 Barranca Parkway, Irvine, CA 92618 USA

Declares that the following product:

Product Name Model: WiBox Device Server

Conforms to the following standards or other normative documents:

Safety:

UL 60950

CAN/CSA-C22.2 No. 60950

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

EMC Emissions:

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

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

EMC Immunity:

EN 301 489-17 v.1.2.1 (2002-08) , EMC Directive (89/336/EEC)

CISPR 22 (2003)

Australia / New Zealand AS/NZS CISPR 22 (2002), Class B

EN 301 489-17 v.1.2.1 (2002-08) , EMC Directive (89/336/EEC)

CISPR 24 (A2:2002)

Australia / New Zealand AS/NZS CISPR 24 (2002)

Radio:

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

Australia / New Zealand AS/NZS 4771 (2000 + A1:2003)

Manufacturer's Contact:

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

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 <http://www.lantronix.com/support/warranty/index.html>