



XPort[®] Direct+

Embedded Serial-to-Ethernet Device Server User Guide

Intellectual Property

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Revision History

Date	Rev.	Comments
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September 2013	B	Updated to firmware release 6.9.0.3.
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Table of Contents

Intellectual Property _____	2
Contacts _____	2
Disclaimer and Revisions _____	2
Revision History _____	2
List of Figures _____	7
List of Tables _____	7
1: About This Guide _____	8
Purpose and Audience _____	8
Chapter Summary _____	8
Additional Documentation _____	9
2: Introduction _____	10
Capabilities _____	10
Applications _____	10
Protocol Support _____	11
Addresses and Port Numbers _____	11
Hardware Address _____	11
IP Address _____	11
Port Numbers _____	11
Configuration Methods _____	12
3: Using the DeviceInstaller Application _____	13
Installing DeviceInstaller Application _____	13
Assigning an IP Address _____	13
Accessing the XPort Direct+ Serial-to-Ethernet Device Server Using the DeviceInstaller Application _____	14
Viewing the Current Configuration _____	15
4: Configuration Using Web Manager _____	18
Accessing XPort Direct+ Serial-to-Ethernet Device Server Using the DeviceInstaller Application _____	18
Network Configuration _____	20
Network Mode _____	20
Automatic IP Address Configuration _____	20
Static IP Address Configuration _____	21
Ethernet Configuration _____	22
Server Configuration _____	22
Host List Configuration _____	24
Channel 1 Configuration _____	25
Serial Settings _____	25
Connection Settings - TCP _____	27
Connection Settings - UDP _____	30
Email Settings _____	31
Trigger Configuration _____	32
Configurable Pin Settings _____	33
Apply Settings _____	34
Apply Defaults _____	34

5: Configuration via Telnet or Serial Port (Setup Mode)	35
Accessing Setup Mode _____	35
Telnet Connection _____	35
Serial Port Connection _____	36
Exiting Setup Mode _____	37
6: Setup Mode: Server Configuration	38
Server Configuration (Option 0) _____	38
IP Address _____	38
Set Gateway IP Address _____	39
Netmask: Number of Bits for Host Part _____	39
Set DNS Server IP Address _____	39
Change Telnet/Web Manager Password _____	40
DHCP Name _____	40
7: Setup Mode: Channel Configuration	41
Channel 1 (Option 1) _____	41
Baudrate _____	42
I/F (Interface) Mode _____	42
Flow _____	43
Port Number _____	43
Connect Mode _____	44
Send the Escape Sequence (+++) in Modem Mode _____	50
Show IP addr after 'RING' _____	50
Auto Increment Source Port _____	51
Remote IP Address _____	51
Remote Port _____	51
DisConnMode _____	51
Flush Mode (Buffer Flushing) _____	52
Pack Control _____	53
Packing Interval _____	53
Trailing Characters _____	53
Send Characters _____	54
DisConnTime (Inactivity Timeout) _____	54
Send Characters _____	54
Telnet Terminal Type _____	54
Channel (Port) Password _____	55
8: Setup Mode: Advanced Settings	56
Email Settings (Option 3) _____	56
Mail Server _____	57
Unit Name _____	57
Domain Name _____	57
Recipient 1 _____	57
Recipient 2 _____	57
Trigger 1 _____	57
Trigger 2 _____	58
Trigger 3 _____	58
Expert Settings (Option 5) _____	58
TCP Keepalive time in seconds _____	59
ARP Cache timeout in seconds _____	59

CPU Performance _____	59
Disable Monitor Mode at Bootup _____	60
HTTP Port Number _____	60
SMTP Port Number _____	60
MTU Size _____	60
TCP Re-transmission Timeout _____	60
Enable alternate MAC _____	61
Ethernet Connection Type _____	61
Security Settings (Option 6) _____	61
Disable SNMP _____	62
SNMP Community Name _____	62
Disable Telnet Setup _____	62
Disable TFTP Firmware Upgrade _____	62
Disable Port 77FE (Hex) _____	62
77FEh Access Mode _____	63
Disable Web Server _____	63
Disable Web Setup _____	63
Disable ECHO Ports _____	63
Enable Encryption _____	63
Enable Enhanced Password _____	64
Disable Port 77F0 (Hex) _____	64
Default Settings (Option 7) _____	65
Channel 1 Configuration Defaults _____	65
Email Server Defaults _____	65
Trigger (1, 2 or 3) Defaults _____	65
Expert Settings Defaults _____	66
Security Settings Defaults _____	66
9: GPIO Interface _____	67
Configurable Pins _____	67
Features _____	67
Control Protocol _____	68
Guidelines _____	68
Commands _____	68
Examples _____	70
10: Firmware Upgrades _____	72
Obtaining Firmware _____	72
Reloading Firmware _____	72
Using TFTP: Graphical User Interface _____	72
Using TFTP: Command Line Interface _____	73
Recovering the Firmware Using the Serial Port and DeviceInstaller _____	74
11: Monitor Mode _____	75
Entering Monitor Mode Using the Serial Port _____	75
Entering Monitor Mode Using the Network Port _____	75
Monitor Mode Commands _____	75
12: Troubleshooting _____	78
Problems and Error Messages _____	78
A: Lantronix Technical Support _____	81

B: Binary to Hexadecimal Conversions	82
Converting Binary to Hexadecimal	82
Conversion Table	82
Scientific Calculator	82

List of Figures

Figure 4—1. Lantronix Web Manager	19
Figure 4—2. Network Settings	20
Figure 4—3. Server Settings	22
Figure 4—4. Hostlist Settings	24
Figure 4—5. Channel Serial Settings	25
Figure 4—6. TCP Connection Settings	27
Figure 4—7. UDP Connection Settings	30
Figure 4—8. Email Settings	31
Figure 4—9. Email Trigger Settings	32
Figure 4—10. Configurable Pins Settings	33
Figure 5—1. MAC Address	36
Figure 5—2. Setup Menu Options	36
Figure 7—1. Serial Port Parameters	41
Figure 7—2. Hostlist Option	47
Figure 8—1. Email Settings	56
Figure 8—2. Expert Settings	58
Figure 8—3. Security Settings	61
Figure 10—1. TFTP Window	73

List of Tables

Table 6—1. BootP/DHCP/AutoIP options	38
Table 6—2. Standard IP Network Netmasks	39
Table 7—1. Interface Mode Options	42
Table 7—2. Common Interface Mode Settings	42
Table 7—3. Interface Mode Options	43
Table 7—4. Flow Control Options	43
Table 7—5. Reserved Port Numbers	43
Table 7—6. Connect Mode Options	44
Table 7—7 Manual Connection Address Example	46
Table 7—8. Modem Mode Messages	49
Table 7—9. Modem Mode Commands	50
Table 7—10. Disconnect Mode Options	52
Table 7—11. Flush Mode Options	52
Table 7—12. Pack Control Options	53
Table 10—1. Firmware Files	72
Table 11—1. Monitor Mode Commands	76
Table 11—2. Command Response Codes	77

1: About This Guide

Purpose and Audience

This guide covers the Lantronix® XPort® Direct+ embedded serial-to-Ethernet device server. It provides the information needed to configure, use, and update the XPort Direct+ firmware and is for OEMs and system integrators who are embedding the XPort Direct+ serial-to-Ethernet device server in their product designs.

Chapter Summary

The remaining chapters in this guide include:

Chapter	Description
2: Introduction	Describes the main features of the XPort Direct+ serial-to-Ethernet device server and the protocols it supports.
3: Using the DeviceInstaller Application	Provides information for getting your unit up and running, using the DeviceInstaller™ application to assign an IP address.
4: Configuration Using Web Manager	Details using the Web Manager to set parameters such as port and server properties.
5: Configuration via Telnet or Serial Port (Setup Mode)	Provides instructions for accessing Setup Mode (command line interface) using a Telnet connection through the network or a terminal or terminal emulation program through the serial port.
6: Setup Mode: Server Configuration	Details the network (server) settings
7: Setup Mode: Channel Configuration	Details the serial port settings.
8: Setup Mode: Advanced Settings	Details email, expert, and security settings and explains how to reset the unit to factory default values.
9: GPIO Interface	Provides instructions for configuring the three General Purpose I/O pins (CP1-3).
10: Firmware Upgrades	Provides instructions for obtaining the latest firmware and updating the XPort Direct+ serial-to-Ethernet device server.
11: Monitor Mode	Provides instructions for accessing and using the command line interface for monitoring the network and diagnosing problems.
12: Troubleshooting	Describes common problems and error messages and how to contact Lantronix Technical Support.
A: Lantronix Technical Support	Provides information on how to contact Lantronix Technical Support.
B: Binary to Hexadecimal Conversions	Provides instructions for converting binary numbers to hexadecimals.

Additional Documentation

Visit the Lantronix web site at <http://www.lantronix.com/support/documentation.html> for the latest documentation and the following additional documentation:

Document	Description
<i>XPort Direct+ Embedded Serial-to-Ethernet Device Server Quick Start</i>	Provides the steps for getting the XPort Direct+ evaluation board up and running.
<i>XPort Direct+ Embedded Serial-to-Ethernet Device Server Integration Guide</i>	Provides information about the XPort Direct+ hardware, testing the XPort Direct+ serial-to-Ethernet device server using the evaluation board, and integrating the XPort Direct+ serial-to-Ethernet device server into your product.
<i>DeviceInstaller Online Help</i>	Provides information on using the Lantronix® DeviceInstaller™ application to configure IP addresses and locate Lantronix devices on the network.
<i>“Live” Tutorials on the Lantronix Web Site (English)</i>	Explain and demonstrate assigning an IP address to the XPort Direct+ device server and setting it up with the Com Port Redirector. See http://ltxfaq.custhelp.com/app/answers/detail/a_id/1119
<i>Com Port Redirector User Guide</i>	Provides information on using the Lantronix Windows-based utility to create secure virtual com port.

2: Introduction

This chapter summarizes the XPort Direct+ serial-to-Ethernet device server features and the basic information needed to get started.

Capabilities

The XPort Direct+ device server has the following capabilities:

- ◆ Connects devices through a TCP data channel or through a Telnet connection to computers or to another device server. The XPort Direct+ serial-to-Ethernet device server also supports UDP datagrams.
- ◆ Contains a web [HTTP] server allowing presentation of custom content and easy configuration through a browser.
- ◆ Has three programmable I/O pins used to monitor or control attached devices.

Applications

The XPort Direct+ device server connects serial devices such as those listed below to Ethernet networks using the IP protocol family.

- ◆ ATM machines
- ◆ CNC controllers
- ◆ Data collection devices
- ◆ Environmental sensors
- ◆ Universal Power Supply (UPS) management units
- ◆ Telecommunications equipment
- ◆ Data display devices
- ◆ Security alarms and access control devices
- ◆ Handheld instruments
- ◆ Modems
- ◆ Time/attendance clocks and terminals

Protocol Support

The XPort Direct+ device server uses the Internet Protocol (IP) for network communications. It uses the Transmission Control Protocol (TCP) to assure that no data is lost or duplicated, and that everything sent to the connection arrives correctly at the target.

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.
- SMTP for email transmission.

Addresses and Port Numbers

Hardware Address

The hardware address is also referred to as the Ethernet address or the MAC address. It is on the product label in one of the following formats.

Hardware Address : 00 – 80 - A3 - ____ - ____ - ____

Or

Hardware Address : 00 – 20 - 4A - ____ - ____ - ____

Note: Make note of the MAC address. It is needed to locate the XPort Direct+ serial-to-Ethernet device server using Lantronix® DeviceInstaller™ application.

IP Address

Every device connected to an IP network must have a unique IP address. This address is used to reference the specific unit. The XPort Direct+ serial-to-Ethernet device server is automatically assigned an IP address on DHCP-enabled networks, as it is DHCP-enabled by default.

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, see to [Table 7—5. Reserved Port Numbers](#) on page 43.

Configuration Methods

For the unit to operate correctly on a network, it must have a unique IP address on the network. There are three basic methods for logging into the device server to assign an IP address and configure the unit:

DeviceInstaller application: Assign an IP address and view the current XPort Direct+ serial-to-Ethernet device server configuration using a Graphical User Interface (GUI) on a PC attached to a network. (See [3: Using the DeviceInstaller Application](#).)

Web Manager: Through a web interface, configure the XPort Direct+ device server and its settings using the XPort Direct+ Web Manager. (See [4: Configuration Using Web Manager](#).)

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

3: Using the DeviceInstaller Application

This chapter covers the steps for getting the XPort Direct+ serial-to-Ethernet device server online and viewing its current configuration.

Note: *DeviceInstaller* is a free utility program provided by Lantronix that discovers, configures, upgrades, and manages Lantronix Device Servers. It can be downloaded from the Lantronix website at www.lantronix.com/support/downloads.

For instructions on using the *DeviceInstaller* to configure the IP address and related settings or for more advanced features, see the *DeviceInstaller Online Help*.

Installing DeviceInstaller Application

Use *DeviceInstaller* utility to configure the IP address and other network parameters when a connection is established between the XPort Direct+ device server and a laptop or desktop.

Note: You will need a Windows® PC running Lantronix *DeviceInstaller* 4.2 or higher.

1. Download the latest version of *DeviceInstaller* from www.lantronix.com/downloads.
2. Run the executable to start the installation process.
3. Respond to the installation wizard prompts. (If prompted to select an installation type, select Typical.)

Assigning an IP Address

The unit's IP address must be configured before it can work correctly on a network. You have several options for assigning an IP to your unit. We recommend that you manually assign the IP address over the network using the *DeviceInstaller* software, which can be downloaded from www.lantronix.com/downloads.


Note: To use a serial connection instead of an Ethernet connection to configure the device, see [5: Configuration via Telnet or Serial Port \(Setup Mode\)](#) on page 36.

The unit's IP address is normally set to 0.0.0.0 at the factory. The hardware address is on the product label. The unit is DHCP enabled as the default.

To assign an IP address manually:

4. Click **Start→All Programs → Lantronix→DeviceInstaller→DeviceInstaller**. If your PC has more than one network adapter, a message displays. Select an adapter and click **OK**.

Note: If the unit already has an IP address (e.g., DHCP has assigned an IP address), click the **Search** icon and select the unit from the list of Lantronix device servers on the local network.

5. Click the **Assign IP** icon .
 6. If prompted, enter the hardware address (on the product label) and click **Next**.
 7. Select **Assign a specific IP address** and click **Next**.
 8. Enter the **IP address**. The **Subnet mask** displays automatically based on the IP address; if desired, you may change it. On a local network, you can leave the **Default gateway** blank (all zeros). Click **Next**.
 9. Click the **Assign** button and wait several seconds until a confirmation message displays. Click **Finish**.
 10. 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.
 11. From the **Tools** menu, 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.
12. Click the **Close** button to close the dialog box and return to the main window.

Accessing the XPort Direct+ Serial-to-Ethernet Device Server Using the DeviceInstaller Application

1. Click **Start→All Programs →Lantronix→DeviceInstaller→DeviceInstaller**.
2. Click the **XPort** folder. The list of available Lantronix XPort Direct+ devices displays.
3. Expand the list of devices by clicking the **+** symbol next to the XPort Direct+ icon. Select the XPort Direct+ unit by clicking on its IP address to view its configuration.

Viewing the Current Configuration

DeviceInstaller Application provides a view of the unit's configuration.

To view the unit's current settings:

1. Follow the instructions above to locate the XPort Direct+ device server.
2. In the right pane, click the **Device Details** tab. The current XPort Direct+ configuration displays:

Name	Configurable field. A name that identifies the XPort Direct+ serial-to-Ethernet device server. Double-click the field, type in the value, and press Enter to complete. This name is not visible on other PCs or laptops using the DeviceInstaller Application.
DHCP Device Name	Non-configurable field. Displays the name associated with XPort Direct+ device's current IP address, if the IP address was obtained dynamically. To change the DHCP device name, see chapters, 4: Configuration Using Web Manager or 5: Configuration via Telnet or Serial Port (Setup Mode) .
Group	Configurable field. A group name to categorize the XPort Direct+ serial-to-Ethernet device server. Double-click the field, type in the value, and press Enter to complete. This group name is not visible on other PCs or laptops using the DeviceInstaller application.
Comments	Configurable field. Information about the XPort Direct+ serial-to-Ethernet device server. Double-click the field, type in the value, and press Enter to complete. This description or comment is not visible on other PCs or laptops using the DeviceInstaller Application.
Device Family	Non-configurable field. Displays the device family type as XPort .
Type	Non-configurable field. Displays the device type as XPort Direct+ .
ID	Non-configurable field. Displays the ID embedded within the XPort Direct+ box.
Hardware Address	Non-configurable field. Displays the hardware (or MAC) address of the XPort Direct+ serial-to-Ethernet device server.
Firmware Version	Non-configurable field. Displays the firmware currently installed on the XPort Direct+ serial-to-Ethernet device server.
Extended Firmware Version	Non-configurable field. Displays the full version nomenclature of the firmware.
Online Status	Non-configurable field. Displays the status of the XPort Direct+ serial-to-Ethernet device server as online, offline, unreachable (the XPort Direct+ serial-to-Ethernet device server is on a different subnet), or busy (the XPort Direct+ serial-to-Ethernet device server is currently performing a task).
IP Address	Non-configurable field. Displays the current IP address of the XPort Direct+ device. To change the IP address, see 3: Using the DeviceInstaller Application on page 13 to configure the IP address and other network parameters.

IP Address was Obtained	<p>Displays “Dynamically” if the device automatically received an IP address (e.g., from DHCP). Displays “Statically” if the IP address was configured manually. If the IP address was assigned dynamically, the following fields appear:</p> <ul style="list-style-type: none"> ◆ Obtain via DHCP with value of True or False. ◆ Obtain via BOOTP with value of True or False. ◆ Obtain via RARP with value of True or False ◆ Obtain via Auto IP with value of True or False
Subnet Mask	<p>Non-configurable field. Displays the current subnet mask of the XPort Direct+ serial-to-Ethernet device server. To change the subnet mask, see 3: Using the DeviceInstaller Application on page 13 to configure the subnet mask and other network parameters.</p>
Gateway	<p>Non-configurable field. Displays the current gateway of the XPort Direct+ serial-to-Ethernet device server. To change the gateway, see 3: Using the DeviceInstaller Application on page 13 to configure the gateway and other network parameters.</p>
Number of COB partitions supported	<p>Non-configurable field. Displays the number of COB partitions supported.</p>
Number of Serial Ports	<p>Non-configurable field. Displays the number of ports on the XPort Direct+ serial-to-Ethernet device server.</p>
TCP Keepalive	<p>Non-configurable field. Displays 1-65s, the TCP keepalive value of the XPort Direct+ serial-to-Ethernet device server. The default setting is 45.</p>
Telnet Supported	<p>Non-configurable field. Permits Telnet sessions.</p>
Telnet Port	<p>Non-configurable field. Displays the XPort Direct+ port for Telnet sessions.</p>
Web Port	<p>Non-configurable field. Displays the XPort Direct+ port for Web Manager configuration.</p>
Maximum Baud Rate Supported	<p>Non-configurable field. Displays the maximum baud rate of the XPort Direct+ serial-to-Ethernet device server. Note: <i>the XPort Direct+ unit may not currently be running at this rate.</i></p>
Firmware Upgradeable	<p>Non-configurable field. Displays True, indicating the XPort Direct+ firmware is upgradeable as newer versions become available.</p>
Supports Configurable Pins	<p>Non-configurable field. Displays True, indicating configurable pins are available on the XPort Direct+ device server.</p>
Supports Email Triggers	<p>Non-configurable field. Displays True, indicating email triggers are available on the XPort Direct+ device server.</p>
Supports AES Data Stream	<p>Non-configurable field. Displays False.</p>
Supports 485	<p>Non-configurable field. Displays True if the XPort Direct+ serial-to-Ethernet device server supports the RS-485 protocol.</p>
Supports 921K Baud Rate	<p>Non-configurable field. XPort Direct+ serial-to-Ethernet device server supports baud rates up to 920 Kbps.</p>
Supports HTTP Server	<p>Non-configurable field. Displays True.</p>
Supports HTTP Setup	<p>Non-configurable field. Displays True.</p>
Supports 230K Baud Rate	<p>Non-configurable field. Displays True.</p>

Supports GPIO	Non-configurable field. Displays True , indicating the XPort Direct+ serial-to-Ethernet device server supports communication via General Purpose Input Output (GPIO).
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4: Configuration Using Web Manager

You must configure the unit so that it can communicate on a network with your serial device. For example, you must set the way the unit will respond to serial and network traffic, how it will handle serial packets, and when to start or close a connection.




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

In this chapter, we describe how to configure the XPort Direct+ embedded serial-to-Ethernet device server using Web Manager, a Lantronix browser-based configuration tool. (For information on using Setup Mode, our command line configuration interface, see [5: Configuration via Telnet or Serial Port \(Setup Mode\)](#)).

Note: The examples in this section show a typical device. Your device may have different configuration options.

Accessing XPort Direct+ Serial-to-Ethernet Device Server Using the DeviceInstaller Application

Note: Make note of the hardware (MAC) address. You will need it to locate the XPort Direct+ device server using the DeviceInstaller application. For more information on the hardware address, see [Hardware Address](#) on page 11.

1. Click **Start**→**All Programs** → **antronix**→**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 . The list of Lantronix device servers displays in the left pane.
3. Click on the **XPort** folder. A list of available XPort Direct+ units displays.
4. Expand the list of XPort Direct+ units by clicking the **+** symbol next to the **XPort Direct+** icon.
5. Select the XPort Direct+ unit by clicking its hardware address.
6. In the right pane, click the **Web Configuration** tab.
7. To view the XPort Direct+ Web Manager in the current DeviceInstaller window, click the  button in the upper right corner of the DeviceInstaller application.
8. To open the Web Manager in a new web browser, click the  button in the upper right corner of the DeviceInstaller application.

Note: Alternatively, to open Web Manager, open your web browser and enter the IP address of the XPort Direct+ serial-to-Ethernet device server. (With firmware 1.8 or earlier, your browser must be JAVA-enabled to use Web Manager. With firmware 6.1.0.0 and later, your web browser does not need to be JAVA-enabled.)

The XPort Direct+ serial-to-Ethernet device server prompts for a **User name** and **Password**.

9. Perform one of the following:

- ♦ If no Telnet password has been defined, leave both fields blank and click **OK**.
- ♦ If a Telnet password has been defined, leave the username blank, type in the password, and then click **OK**.

Note: We recommend that you always use the enhanced password setting and create a strong 16 character password. See [Security Settings \(Option 6\)](#) on page 61

The Web Manager displays.

Figure 4—1. Lantronix Web Manager

The screenshot shows the Lantronix Web Manager interface. On the left is a vertical navigation menu with a home icon at the top. The menu items are: Network, Server, Serial Tunnel (with sub-items Hostlist and Channel 1), Email (with sub-items Trigger 1, Trigger 2, and Trigger 3), Configurable Pins, Apply Settings, and Apply Defaults. The main content area is titled 'Device Status' and contains a table of configuration parameters:

Product Information	
Firmware Version:	V6.11.0.0
Build Date:	22-May-2015
Network Settings	
MAC Address:	F9-80-97-CC-BB-AA
Network Mode:	Wired
DHCP HostName:	< None >
IP Address:	172.19.203.8
Default Gateway:	0.0.0.0
DNS Server:	0.0.0.0
MTU:	1400
Line settings	
Line 1:	RS232, 9600, 8, None, 1, None.

At the bottom left of the interface, it says 'WebManager Version: 2.0.0.7'.

The main menu is in the left pane of the Web Manager window.

Network Configuration

The unit's network values display when you select **Network** from the main menu. The following sections describe the configurable parameters on the Network Settings page.

Figure 4—2. Network Settings

Network Mode

1. Click **Network** from the main menu.
2. Note the following:

Network Mode	Wired Only is the only choice. It enables the Ethernet network connectivity.
--------------	---

Automatic IP Address Configuration

An IP address can be assigned automatically. You then enter related network settings.

To assign an IP address automatically:

1. On the main menu, click **Network**.
2. Select **Obtain IP address automatically**.

- Enter the following (as necessary):

BOOTP	Select Enable to permit the Bootstrap Protocol (BOOTP) server to assign the IP address from a pool of addresses automatically. Enable is the default.
DHCP	Select Enable to permit the Dynamic Host Configuration Protocol (DHCP) to assign a leased IP address to the XPort Direct+ unit automatically. Enable is the default.
AutoIP	Select Enable to permit the XPort Direct+ serial-to-Ethernet device server to generate an IP in the 169.254.x.x address range with a Class B subnet. Enable is the default.
DHCP Host Name	Enter the name of the host on the network providing the IP address.

Note: Disabling *BOOTP*, *DHCP*, and *AutoIP* (all three checkboxes) is not advised as the only available IP assignment method will then be ARP or serial port.

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

Static IP Address Configuration

You manually assign an IP address to the unit and enter related network settings.

To assign an IP address manually:

- On the main menu, click **Network**.
- Select **Use the following IP configuration**.
- Enter the following (as necessary):

IP Address	If DHCP is not used to assign IP addresses, enter it manually in decimal-dot notation. 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.
DNS Server	The DNS server allows the name of a remote machine to be resolved automatically. Enter the IP address of the DNS server. If the device is DHCP enabled, the DHCP server provides the DNS server IP address, which will override this configured value. Note: This setting is applicable only in Manual Connection mode.

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

Ethernet Configuration

You must specify the speed and direction of data transmission.

To specify how data will be transmitted:

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

Auto Negotiate	<p>With this option selected, the Ethernet port auto-negotiates the speed and duplex with the hardware endpoint to which it is connected. This is the default.</p> <p>If this option is not selected, the complete the fields that become available:</p> <ul style="list-style-type: none"> ♦ Speed: The speed of data transmission. The default is 100 Mbps. ♦ Duplex: The direction of data transmission. The default is Full.
-----------------------	--

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

Server Configuration

The unit's server values display when you select **Server** from the main menu. The following sections describe the configurable parameters on the Server Settings page.

Figure 4—3. Server Settings

Server Settings

Server Configuration

Enhanced Password: Enable Disable

Telnet/Web Manager Password:

Retype Password:

Advanced

ARP Cache Timeout (secs):

TCP Keepalive (secs):

Monitor Mode @ Bootup: Enable Disable

CPU Performance Mode: Low Regular High

HTTP Server Port:

Config Server Port:

MTU Size:

TCP Re-transmission timeout (ms):

To configure the device server settings:

1. On the main menu, click **Server**.
2. Configure or modify the following fields:

Server Configuration

<p>Enhanced Password</p> <p><i>Note: We recommend that you always enable the enhanced password setting, and create a strong 16 character password.</i></p>	<p>Select whether to enable enhanced password:</p> <ul style="list-style-type: none"> ◆ Enable: selecting this option enables advanced password creation, allowing you to create passwords up to 16 bytes in length. ◆ Disable: selecting this option disables advanced password creation, allowing you to create basic passwords up to 4 bytes in length.
<p>Telnet/Web Manager Password</p>	<p>Enter the password required for Telnet configuration and Web Manager access.</p>
<p>Retype Password</p>	<p>Re-enter the password required for Telnet configuration and Web Manager access.</p>

Advanced

<p>ARP Cache Timeout</p>	<p>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.</p>
<p>TCP Keepalive</p>	<p>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. The default setting is 45.</p>
<p>Monitor Mode @ Bootup</p>	<p>Select Disable to disable entry into the monitor mode using the 'yyy' or 'xx1' key sequence at startup. This field prevents the unit from entering monitor mode by interpreting the stream of characters that are received during the device server's initialization at startup.</p>
<p>CPU Performance Mode</p>	<p>Select the performance mode for the XPort Direct+ serial-to-Ethernet device server. Higher performance settings require more energy. Regular is 48 Mhz; High is 88 Mhz. The default is Regular.</p>
<p>HTTP Server Port</p>	<p>This option allows the configuration of the web server port number. The valid range is 1-65535. The default port is 80.</p>
<p>Config Server Port</p>	<p>Not applicable for this product.</p>
<p>MTU Size</p>	<p>The Maximum Transmission Unit (MTU) is the largest physical packet size a network can transmit for TCP and UDP. Enter between 512 and 1400 bytes. The default is 1400 bytes.</p>
<p>TCP Re-transmission timeout (ms)</p>	<p>The desired TCP re-transmission timeout value. If the ACK is not received for a packet sent from the XPort Direct+ device server, then the unit will retransmit the data. The valid range is 500-4000 msec.</p>

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

Host List Configuration

The XPort Direct+ serial-to-Ethernet device server 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 does not accept a data connection from a remote device when the hostlist option is enabled.

To configure the XPort Direct+ host list:

1. On the main menu, click **Hostlist**.

Figure 4—4. Hostlist Settings

Hostlist Settings

Retry Settings

Retry Counter: Retry Timeout:

Host Information

No.	Host Address	Port	No.	Host Address	Port
1	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	2	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
3	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	4	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
5	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	6	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
7	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	8	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
9	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	10	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>
11	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>	12	<input type="text" value="0.0.0.0"/>	<input type="text" value="0"/>

2. Enter or modify the following fields:

Retry Settings

Retry Counter	Enter the value for the number of times the XPort Direct+ serial-to-Ethernet device server should attempt to retry connecting to the host list.
Retry Timeout	Enter the duration (in milliseconds) the XPort Direct+ serial-to-Ethernet device server 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.

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

Channel 1 Configuration

The Channel 1 configuration defines how the serial port responds to network and serial communication.

Serial Settings

To configure the channel's serial settings:

1. On the main menu, click **Serial Settings** (under **Channel 1**) to display the Serial Settings window.

Figure 4—5. Channel Serial Settings

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

Channel 1

Disable Serial Port	<p>When selected, disables communication through the serial port. The serial port is enabled by default. The Disable Serial Port option will always be disabled for Channel 1. This option is available for Channel 2 or higher channel only, if any.</p> <p>Note: Using a telnet session you may enter a baud rate of 00 in channel settings to disable the serial port.</p>
----------------------------	--

Port Settings

Protocol	<p>From the drop-down menu, select the protocol type for the selected channel.</p>
-----------------	--

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. None is the default.
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. When CPU Performance Mode is set to High, only baud rates 460800 and 921600 are available.
Data Bits	Indicates the number of bits in a transmitted data package. The default is 8 .
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. The default is 1 .

Pack Control

Enable Packing	<p>Select to enable packing on the XPort Direct+ serial-to-Ethernet device server.</p> <p>Two firmware-selectable packing algorithms define how and when packets are sent to the network.</p> <p>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.</p> <p>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.</p> <p>Disabled by default.</p>
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 end of the data collection to the XPort Direct+ serial-to-Ethernet device server. The default is No .
Match Bytes	Use to indicate the end of a series of data to be sent as one group. Set this value to 00 if specific functions are not needed.
Send Frame Immediate	After the detection of the byte sequence, indicates whether to send the data frame or the entire buffer. Select Yes to send only the data frame. The default setting is No .
Send Trailing Bytes	Select the number of bytes to send after the end-of-sequence characters. The default is None .

Flush Input Buffer (Serial to Network)

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

At Time of Disconnect	Select Yes to clear the input buffer when the network connection to or from the device is disconnected. The default is No .
------------------------------	---

Flush Output Buffer (Network to Serial)

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

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

Connection Settings - TCP

To configure a channel's TCP settings:

- On the main menu, click **Connection**. The Connection Settings window for the channel displays.

Figure 4—6. TCP Connection Settings

Connection Settings

Channel 1

Connect Protocol
Protocol: TCP

Connect Mode

<p>Passive Connection:</p> <p>Accept Incoming: Yes</p> <p>Password Required: <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>Password: </p> <p>Modem Escape Sequence Pass Through: <input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>Active Connection:</p> <p>Active Connect: None</p> <p>Start Character: 0x0D (in Hex)</p> <p>Modem Mode: None</p> <p>Show IP Address After RING: <input checked="" type="radio"/> Yes <input type="radio"/> No</p>
---	--

Endpoint Configuration:

Local Port: 10001	Remote Port: 0
<input type="checkbox"/> Auto increment Local Port for active connect	Remote Host: 0.0.0.0

Common Options:

Telnet Com Port Cntrl: Disable	Connect Response: None
Terminal Name: 	Use Hostlist: <input type="radio"/> Yes <input checked="" type="radio"/> No
	LED: Blink

Disconnect Mode

On Mdm_Ctrl_In Drop: <input type="radio"/> Yes <input checked="" type="radio"/> No	Hard Disconnect: <input checked="" type="radio"/> Yes <input type="radio"/> No
Check EOT(Ctrl-D): <input type="radio"/> Yes <input checked="" type="radio"/> No	Inactivity Timeout: 0 : 0 (mins : secs)

OK

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

Connect Protocol

Protocol	From the drop-down menu, select TCP .
-----------------	--

Connect Mode: Passive Connection

Accept Incoming	Select Yes to accept incoming connections. The default is Yes .
Password Required	Determines whether a password is required for an incoming passive connection. This field is not available when a password is set for Telnet mode.
Password	If Password Required was set to Yes , enter the password for passive connections.
Modem Escape Sequence Pass Through	Disable or enable the unit's ability to send the escape sequence. The default is Y (Yes) (send the escape sequence).

Connect Mode: Active Connection

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

Endpoint Configuration

Local Port	Enter the local port number.
Auto increment for Local Port for active connect	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 Com Port Cntrl	This field is available for configuration only when Active Connect is set to None . Select Enable to permit Telnet communication to the unit. The Telnet Com Port Cntrl feature is used in conjunction with the Com Port Redirector (CPR) utility. (See the CPR online Help for details.)
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 end of record (EOR) 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	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 connects 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.
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 disconnect (drop) when Modem Control In transitions from an asserted state to not asserted state. The default setting is No .
Hard Disconnect	When set to Yes , the TCP connection closes even if the remote site does not acknowledge the disconnect request.
Check EOT (Ctrl-D)	Select Yes to drop the connection when Ctrl-D or Hex 04 is detected. Both Telnet Com Port Cntrl and Check EOT (Ctrl+ D) must be enabled for Disconnect with EOT to function properly. Ctrl+D is only detected going from the serial port to the network. The default setting is No .
Inactivity Timeout	Use this parameter to set an inactivity timeout. The unit drops the TCP connection to port 10001/10002 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. Note: The default port number for Port 1 is 10001 and 10002 for Port 2. However, port numbers may be set to a different value.

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

Connection Settings - UDP

To configure a channel's UDP settings:

1. On the main menu, click **Connection**. The Connection Settings window for the selected channel displays.
2. In the available fields, enter or modify the following information:

Figure 4—7. UDP Connection Settings

Connection Settings

Channel 1

Connect Protocol
Protocol: UDP

Datagram Mode:
Datagram Type: 00 Accept Incoming: Yes

Endpoint Configuration:
Local Port: 10001 Remote Port: 0
Remote Host: 0.0.0.0 Use Broadcast

Device Address Table:

No.	Dev Addr	No.	Dev Addr	No.	Dev Addr	No.	Dev Addr
0	0	1	0	2	0	3	0
4	0	5	0	6	0	7	0
8	0	9	0	10	0	11	0
12	0	13	0	14	0	15	0

OK

Connect Protocol

Protocol	Select UDP from the drop-down menu.
-----------------	--

Datagram Mode

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

Endpoint Configuration

Local Port	Enter the local port number.
Remote Port	Enter the port number of the remote device.
Remote Host	Enter the IP address of the remote device.
Use Broadcast	Select to broadcast the UDP datagram. The default is not to broadcast. <i>Note: Datagrams are sent as subnet-directed broadcasts.</i>

Device Address Table	<p>The table is enabled when Datagram Type is set to FD. Enter values between 1 and 255 to identify units on the local network of device servers.</p> <p><i>Note: Lantronix Tech Support supports Datagram type 01. Datagram Type FD is for OEM use.</i></p>
-----------------------------	--

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

Email Settings

The unit sends an email to multiple recipients when a specific trigger event occurs. There are three separate triggers, based on any combination of the configurable pins selected as user I/O functions. Optionally, use a two-byte serial string to initiate a trigger. Each trigger is independent of the others. Each condition within an individual trigger must be met before the unit will send the email.

To configure the email settings of the XPort Direct+ device server:

- On the main menu, select **Email**. The Email Settings window opens.

Figure 4—8. Email Settings

The screenshot shows a web-based configuration window titled "Email Settings". At the top, there are four input fields: "Server IP Address" with the value "0.0.0.0", "Server Port" with the value "25", "Domain Name", and "Unit Name". Below these fields is a section titled "Recipients" which contains two entries, "Recipient 1" and "Recipient 2", each with an "Email Address" input field. At the bottom center of the window is an "OK" button.

- Configure the following fields:

Server IP Address	Enter the IP address of the mail server.
Server Port	Enter the port number on the email server.
Domain Name	Enter the email server's domain name.
Unit Name	Enter the user name used by the XPort Direct+ serial-to-Ethernet device server to send email messages.

Recipients

Recipient 1: Email Address	Enter the email address designated to receive email notifications.
-----------------------------------	--

Recipient 2: Email Address	Enter an additional email address designated to receive email notifications.
-----------------------------------	--

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

Trigger Configuration

A trigger event occurs when the unit receives the specified trigger input resulting from a specified combination of conditions on the configurable pins.

Set the configurable pins to **Active**, **Inactive**, or **None**. The configurable pins are disabled if they are all set to **None**. If both the serial sequence and the configurable pins are disabled, the trigger is disabled.

To configure the email trigger settings of the XPort Direct+ serial-to-Ethernet device server:

- On the main menu, click **Trigger 1**, **Trigger 2**, or **Trigger 3** to configure the desired trigger settings. The **Email Trigger Settings** page opens.

Figure 4—9. Email Trigger Settings

- Configure or modify the following fields:

Conditions

Configurable Pins	Select the condition from the drop-down menu for the configurable pins. Repeat for each Trigger Input field.
Enable Serial Trigger Input	Enabling this option causes specified serial communications to count as a trigger input.
Channel	Select the channel prompting the trigger. For the XPort Direct+ serial-to-Ethernet device server, there is only one channel.
Data Size	Select the data size prompting the trigger.

Match Data	Enter the data, which, when it appears in the communication stream, prompts a trigger.
-------------------	--

Note: All of the conditions must match for the XPort Direct+ serial-to-Ethernet device server to send an email notification.

Message Properties

Message	The subject line of the trigger event email to the specified recipient(s).
Priority	The priority level for the email.
Min. Notification Interval	The minimum time allowed between individual triggers. If a trigger event occurs within the minimum interval since the last trigger, it is ignored.
Re-notification Interval	Indicates the time interval in which a new email message is sent to the recipient(s) when a single trigger event remains active.

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

Configurable Pin Settings

There are three configurable hardware pins on the XPort Direct+ unit. For each pin, configure the pin function, communication direction, and activity level. For more information, see [9: GPIO Interface](#).

To configure the XPort Direct+ Configurable Pins:

- On the main menu, click **Configurable Pins**. The Configurable Pins page opens.

Figure 4—10. Configurable Pins Settings

Configurable Pin Settings				
CP	Function	Direction	Trigger Input	Active Level
0	General Purpose I/O	<input checked="" type="radio"/> Input <input type="radio"/> Output	<input type="checkbox"/>	<input checked="" type="radio"/> Low <input type="radio"/> High
1	General Purpose I/O	<input checked="" type="radio"/> Input <input type="radio"/> Output	<input type="checkbox"/>	<input checked="" type="radio"/> Low <input type="radio"/> High
2	General Purpose I/O	<input checked="" type="radio"/> Input <input type="radio"/> Output	<input type="checkbox"/>	<input checked="" type="radio"/> Low <input type="radio"/> High

- Configure or modify the following fields for each pin:

Function	From the drop-down menu, select the purpose of the specified pin. See Configurable Pin Functions (below) for a description of each available function.
Direction	Select whether the pin inputs or outputs.
Trigger Input	Select whether to turn on the trigger input.

	<ul style="list-style-type: none"> ◆ Check the checkbox to turn on the trigger input for the specific configurable pin. ◆ Uncheck the checkbox to turn off the trigger input for the specific configurable pin.
Active Level	Select the signal active level (Low or High).

Configurable Pin Functions

General Purpose I/O	Monitors input using the 77F0 port or controls output by the 77F0 port.
Modem Ctrl Channel 1 In	Allows for control of the connection (and disconnection) of channel 1.

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

Apply Settings

1. To save and apply the configuration changes to the device server, click the **Apply Settings** button.

Note: Clicking **OK** on each page does not change the configuration on the device. **OK** tells the XPort Direct+ serial-to-Ethernet device server what changes to use; **Apply Settings** makes the changes permanent and reboots the XPort Direct+ serial-to-Ethernet device server.

2. Click **Yes** to set factory settings or click **No** to cancel.

Apply Defaults

Click the **Apply Defaults** button to set the device server back to the default settings. For details see [Default Settings](#) on page 65.

5: Configuration via Telnet or Serial Port (Setup Mode)

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

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

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

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

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

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

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

Accessing Setup Mode

Telnet Connection

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

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

To establish a Telnet connection:

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

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

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

Figure 5—1. MAC Address

```
MAC address F98097CCBBAA
Software version V6.11.0.0 (150522)
AES library version 1.8.2.1

Press Enter for Setup Mode
```

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

Figure 5—2. Setup Menu Options

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

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

Serial Port Connection

To configure the unit through a serial connection:

1. Connect a console terminal or PC running a terminal emulation program to your unit's serial port. Set the terminal emulator to **9600 baud, 8 bits, no parity, 1-stop bit, no-flow control**.

Note: The XPort Direct+ serial-to-Ethernet device server always uses the serial settings above at boot time.

2. 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**.
3. Reset the XPort Direct+ unit by cycling the unit's power (turning the power off and back on). Immediately upon resetting the device, enter three lowercase **x** characters (**xxx**).

Note: *The easiest way to enter Setup Mode is to hold down the **x** key at the terminal (or emulation) while resetting the unit. **You must do this within three seconds of resetting the XPort Direct+ serial-to-Ethernet device server.***

At this point, the screen display is the same as when you use a Telnet connection. To continue, go to step 4 in [Telnet Connection](#), above.

Exiting Setup Mode

To exit setup mode:

You have two options:

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

6: Setup Mode: Server Configuration

This chapter explains how to configure the network settings.

Note: Current values display in parentheses.

Server Configuration (Option 0)

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

```
IP Address : (172) . (019) . (203) . (008)
Set Gateway IP Address (N) ?
Netmask: Number of Bits for Host Part (0=default) (0)
Set DNS Server IP addr (N) ?
Change Telnet/Web Manager password (N) ?
```

IP Address

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

```
IP Address : (172) . (019) . (203) . (008)
```

If DHCP is used, the third octet of the IP address sets the BootP/DHCP/AutoIP options. The following table shows the bits you can manually configure to force the XPort Direct+ serial-to-Ethernet device server to disable AutoIP, DHCP, or BootP. To disable an option, set the appropriate bit.

Table 6—1. BootP/DHCP/AutoIP options

Options	Bit
AutoIP	0
DHCP	1
BootP	2

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

Set Gateway IP Address

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

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

Netmask: Number of Bits for Host Part

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

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

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

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

Table 6—2. Standard IP Network Netmasks

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

Set DNS Server IP Address

The DNS server allows the name of a remote machine to be resolved automatically. The default is **N** (No), indicating the DNS server address has not been set. To set the DNS server address, type **Y**. At the prompt, enter the DNS server address. If the device is DHCP enabled, the DHCP server provides the DNS server IP address, which will override this configured value.

Note: This setting is applicable only in Manual Connection mode.

```
Set DNS Server IP addr (N) ?
```

Change Telnet/Web Manager Password

Setting the Telnet/Web Manager password prevents unauthorized access to the setup menu through a Telnet connection to port 9999 or through web pages.

- Always select Y to enable Telnet/Web Manager password
- Enable the enhanced password setting and create a strong 16-character password. For details, see [Security Settings \(Option 6\)](#) on page 61.

Note: We do not recommend that you only use the 4-character basic password as it does not offer sufficient security. Using no password is very dangerous.

```
Change Telnet/Web Manager password (N) ?
```

DHCP Name

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

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

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

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

- **Numeric DHCP Name:** You can change the DHCP name by specifying the last octet of the IP address. When you use this method, the DHCP name is LTXYY where YY is what you chose for the last octet of the IP address. If the IP address you specify is 0.0.0.12, then the DHCP name is LTX12. This method only works with 2 digit numbers (01-99).
- **Fully Qualified Domain Name (FQDN):** A fully qualified domain name (FQDN) is the complete domain name for your device in network. The FQDN consists of two parts, the hostname and the domain name. For example, an FQDN for your device might be myxport.lantronix.com. The hostname is myxport, and the host is located within the domain lantronix.com. The option to enable DHCP FQDN becomes available if DHCP is enabled.

7: Setup Mode: Channel Configuration

This chapter explains how to configure the serial port.

Notes:

- Current values display in parenthesis.
- You must enter some values in hexadecimal notation. (See [B: Binary to Hexadecimal Conversions.](#))

Channel 1 (Option 1)

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

Figure 7—1. Serial Port Parameters

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

Baudrate

The unit and attached serial device, such as a modem, must agree on a speed or baud rate to use for the serial connection. Valid baud rates are 300, 600, 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200, and 230400 bits per second. XPort Direct+ serial-to-Ethernet device server supports high-performance baud rates of 460800 and 921600 bits per second (see [ARP Cache timeout in s \(0s - 600s\)](#) : (600) ?

CPU Performance on page 59).

Baudrate (9600) ? _

I/F (Interface) Mode

The Interface (I/F) Mode is a bit-coded byte entered in hexadecimal notation.

I/F Mode (4C) ? _

The following table displays available I/F Mode options:

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

Table 7—1. Interface Mode Options

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

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

The following table demonstrates how to build some common Interface Mode settings:

Table 7—2. Common Interface Mode Settings

Common I/F Mode Setting	Binary	Hex
RS-232C, 8-bit, No Parity, 1 stop bit	0100 1100	4C
RS-232C, 7-bit, Even Parity, 1 stop bit	0111 1000	78

Additional settings for RS-422 4-wire and RS-485 2-wire are available.

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

Table 7—3. Interface Mode Options

I/F Mode Option	7	6	5	4	3	2	1	0
RS-422 4-wire							0	1
RS-485 2-wire							1	1

Flow

Flow control sets the local handshaking method for stopping serial input/output.

Flow (00) ? _

Use the following table to select flow control options:

Table 7—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 setting represents the source port number in TCP connections. It is the number that identifies the channel for remote initiating connections.

Port No (10001) ? _

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

Table 7—5. Reserved Port Numbers

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

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

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

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

Connect Mode

Connect Mode defines how the unit makes a connection, and how it reacts to incoming connections over the network.

ConnectMode (C0) ? _

Enter Connect Mode options in hexadecimal notation.

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

Table 7—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 active Modem Control In	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 active Modem Control In					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

Connect Mode Option	7	6	5	4	3	2	1	0
e) Modem Mode								
No Echo			0	0		1	1	
Data Echo & Modem Response (Numeric)			0	1		1	1	1
Data Echo & Modem Response (Verbose)			0	1		1	1	0
Modem Response Only (Numeric)			0	0	1	1	1	1
Modem Response Only (Verbose)			0	0	1	1	1	0

a) Incoming Connection

Never Accept Incoming	Rejects all external connection attempts.
Accept with active Modem Control In	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	<p>A single character is transmitted to the serial port when there is a change in connection state: C = connected, D = disconnected, N = host unreachable. The IP address of the host connecting to the CoBos device will be provided when you use verbose mode.</p> <p>This option is overridden when the Active Start Modem Mode or Active Start Host List is in effect. Default setting is Nothing (quiet).</p>
---------------------------	---

c) Active Startup

No Active Startup	Does <i>not</i> attempt to initiate a connection under any circumstance. Default setting.
With Any Character	Attempts to connect when any character is received from the serial port.
With active Modem Control In	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	<p>Attempts to connect when directed by a command string received from the serial port. The first character of the command string must be a C (ASCII 0x43), and the last character must be either a carriage return (ASCII 0x0D) or a line feed (0x0A). No blanks or space characters may be in the command string. Between the first and last command string characters must be a full or partial destination IP address and may be a destination port number.</p> <p>The IP address must be in standard decimal-dot notation and may be a partial address, representing the least significant 1, 2, or 3 bytes of the remote IP address. The period is required between each pair of IP address numbers.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>If an IP address does not follow the first command string character (which is "C"), the subsequent character string is interpreted as the host name and domain to be used in DNS lookup. This character string can include a destination port number as well. The port number can be preceded by either a forward slash (/) or a colon (:).</p>
--------------------------	---

Table 7—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	Enters Monitor Mode
Cwww.lantronix.com/80	Tries to connect to the Lantronix web server if the <hostname:domain> (www.lantronix.com) is configured in the DNS server database.
Autostart (Automatic Connection)	If you enable Autostart , the unit automatically connects to the remote IP address and remote port specified when the firmware starts.
Hostlist	If you enable this option, the device server scrolls through the hostlist until it connects to a device listed in the hostlist table. Once it connects, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until it is

Command String	Result if remote IP is 129.1.2.3 and remote port is 1234
	<p>able to connect to another IP in the hostlist.</p> <p>Hostlist supports a minimum of 1 and a maximum of 12 entries. Each entry contains the IP address and the port number.</p> <p>The hostlist is disabled for Manual and Modem Modes. The unit does not accept a data connection from a remote device when the hostlist option is enabled.</p>

Figure 7—2. Hostlist Option

```

Baudrate (9600) ?
I/F Mode (4C) ?
Flow (00) ?
Port No (1000) ?
ConnectMode (25) ?
Send `+++` in Modem Mode (Y)
Auto increment source port (N) ?

Hostlist:
IP : 172.019.000.001 Port : 00023
IP : 172.019.000.002 Port : 00001
IP : 172.019.000.003 Port : 10001

Change Hostlist ? (N) ? Y
IP address : (172) .(019) .(000) .(001) Port : (23)
IP address : (172) .(019) .(000) .(002) Port : (3001)
IP address : (172) .(019) .(000) .(003) Port : (10001)
IP address : (000) .(000) .(000) .(000)

Hostlist:
IP : 172.019.000.001 Port : 00023
IP : 172.019.000.002 Port : 00001
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 (2X), where X is any digit. The menu shows you a list of current entries already defined in the product.
2. To delete, modify, or add an entry, select **Yes**. If you enter an IP address of **0.0.0.0**, that entry and all others after it are deleted.
3. After completing the hostlist, repeat the previous step if necessary to edit the hostlist again.
4. For **Retrycounter**, enter the number of times the Lantronix unit should try to make a good network connection to a hostlist entry that it has successfully ARPed. The range is **1-15**, with the default set to **3**.

5. For **Retrytimeout**, enter the number of milliseconds 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**.

d) Datagram Type

Directed UDP	<p>When selecting this option, you are prompted for the Datagram type. Enter 01 for directed or broadcast UDP. Datagrams of type 01 can be sent as a broadcast by enabling the Send as Broadcast option. The default is not to broadcast.</p> <p>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.</p>
---------------------	---

e) Modem Mode

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

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

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

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

Without Echo	In Modem Mode, echo refers to the echo of all of the characters entered in command mode; it does <i>not mean</i> 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).
Data Echo & Modem Response	<ul style="list-style-type: none"> ◆ Full Verbose: The unit echoes modem commands and responds to a command with a message string shown in the table below. ◆ Numeric Response: The unit echoes modem commands and responds to a command with a numeric response.
Modem Responses Only	<ul style="list-style-type: none"> ◆ Full Verbose: The unit does not echo modem commands and responds to a command with a message string shown in the table below. ◆ Numeric Response: The unit does not echo modem commands and responds to a command with a numeric response.

Table 7—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.
Numeric Response	
0	OK
1	Connected
2	Ring
3	No Carrier
4	Error

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

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

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

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

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

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

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

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

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

Table 7—9. Modem Mode Commands

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

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

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

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

Disable or enable the XPort Direct+ serial-to-Ethernet device server's ability to send the escape sequence. The default is **Y** (Yes) (send the escape sequence).

Show IP addr after 'RING'

```
Show IP addr after `RING` (Y) ? _
```

Disable or enable the XPort Direct+ serial-to-Ethernet device server's ability to show the IP address after RING in Modem Mode. The default is **Y** (Yes), to show the IP address.

Auto Increment Source Port

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

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

Remote IP Address

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

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

Note: This option does not display when Hostlist is enabled from the **ConnectMode** prompt (see [Connect Mode](#) on page 44 for more information).

Remote Port

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

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

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

Note: This option does not display when Hostlist is enabled from the **ConnectMode** prompt (see [Connect Mode](#) on page 44 for more information).

DisConnMode

This setting determines the conditions under which the unit will cause a network connection to terminate.

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

Notes:

- ♦ In DisConnMode (Disconnect Mode), Modem Control In drop either drops the connection or is ignored.
- ♦ All bit positions in the table that are blank represent “don’t care” bits, for that particular option, which can be set to either a 0 or 1 value.

Table 7—10. Disconnect Mode Options

Disconnect Mode Option	7	6	5	4	3	2	1	0
Disconnect when Modem Control In is not asserted ⁽⁶⁾	1							
Ignore Modem Control In	0							
Telnet Com Port Cntrl 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 **Telnet Com Port Control** feature is used in conjunction with Com Port Redirector. The unit 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 Com Port Cntrl** 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 (Buffer Flushing)

Using this parameter, you can control line handling and network buffers with connection startup and disconnect.

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

You can also select between two different packing algorithms.

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

Table 7—11. Flush Mode Options

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

Pack Control

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

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

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

Table 7—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		
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 TCP connection to port 10001/10002* 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.

Note*: The default port number for Port 1 is 10001 and 10002 for Port 2. However, port numbers may be set to a different value.

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

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

Send Characters

Enter up to two characters in hexadecimal representation in sendchar.

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

If the unit receives a character on the serial line that matches one of these characters, it sends the character immediately, along with any awaiting characters, to the TCP connection. This action minimizes the response time for specific protocol characters on the serial line (for example, ETX, EOT). Setting the first sendchar to **00** disables the recognition of the characters. Alternatively, the unit can interpret two characters as a sequence (see [Pack Control](#) on page 53).

Telnet Terminal Type

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

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

Channel (Port) Password

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

8: Setup Mode: Advanced Settings

Email Settings (Option 3)

Note: You can change these settings using Telnet, a serial connection, or Web Manager. To configure email settings using the DeviceInstaller application, see *Email Notification in the DeviceInstaller online Help*.

The unit sends an email to multiple recipients when a specific trigger event occurs. There are three separate triggers, based on any combination of the configurable pins (PIO) when selected as user I/O functions. Optionally, use a two-byte serial string to initiate a trigger.

To configure email configuration settings, select **Email (option 3)** from the Change Setup menu.

Figure 8—1. Email Settings

```
Mail server (0.0.0.0) ? (000) .(000) .(000) .(000)
Unit name () ?
Domain name () ?
Recipient 1 () ?
Recipient 2 () ?

- Trigger 1
Enable serial trigger input (N) ?
Trigger input1 [A/I/X] (X) ?
Trigger input2 [A/I/X] (X) ?
Trigger input3 [A/I/X] (X) ?
Message () ?
Priority (L) ?
Min. notification interval (1 s) ?
Re-notification interval (0 s) ?

- Trigger 2
Enable serial trigger input (N) ?
Trigger input1 [A/I/X] (X) ?
Trigger input2 [A/I/X] (X) ?
Trigger input3 [A/I/X] (X) ?
Message () ?
Priority (L) ?
Min. notification interval (1 s) ?
Re-notification interval (0 s) ?

- Trigger 3
Enable serial trigger input (N) ?
Trigger input1 [A/I/X] (X) ?
Trigger input2 [A/I/X] (X) ?
Trigger input3 [A/I/X] (X) ?
Message () ?
Priority (L) ?
Min. notification interval (1 s) ?
Re-notification interval (0 s) ?
```


Mail Server

Enter the IP address of the mail server. Enter each 3-digit section and press **Enter** between each section inputted. The current value is displayed in parentheses.

```
Mail server (0.0.0.0) ? (000) .(000) .(000) .(000)
```

Unit Name

Enter the username used by the XPort Direct+ serial-to-Ethernet device server to send email messages. The current value is displayed in parentheses.

```
Unit name () ? _
```

Domain Name

Enter the email server's domain name. The current value is displayed in parentheses.

```
Domain name () ? _
```

Recipient 1

Enter the full email address of the trigger email recipient. The current value is displayed in parentheses.

```
Recipient 1 () ? _
```

Recipient 2

Enter the full email address of the trigger email recipient. The current value is displayed in parentheses.

```
Recipient 2 () ? _
```

Trigger 1

A trigger event occurs when the unit receives the specified trigger input because of a specified combination of conditions on the configurable pins.

```
Enable serial trigger input (N) ?
Trigger input1 [A/I/X] (X) ?
Trigger input2 [A/I/X] (X) ?
Trigger input3 [A/I/X] (X) ?
Message () ?
Priority (L) ?
Min. notification interval (1 s) ?
Re-notification interval (0 s)
```

Set the configurable pins to **A** = Active, **I** = Inactive, or **X** = Don't Care. Active can mean active low or active high. If the configurable pins are all set to **X** (Don't Care), then they are disabled. If both the serial sequence and the configurable pins are disabled, the trigger is disabled.

To change the configurable pins' settings, send setup records to Port 77FE.

Message	The subject line of the trigger event email to the specified recipient(s).
Priority	The priority level for the trigger even email. Enter L for normal priority or H for high priority.
Minimum notification interval	The minimum time allowed between individual triggers. If a trigger event occurs within the minimum interval since the last trigger, it is ignored.
Re-notification interval	Indicates the time interval at which a new email message is sent to the recipient(s) when a single trigger event remains active.

Trigger 2

Refer to [Trigger 1](#) for details on completing these fields.

Note: Each trigger is independent of the others. Each condition within an individual trigger must be met before the unit sends the email.

Trigger 3

Refer to [Trigger 1](#) for details on completing these fields.

Note: Each trigger is independent of the others. Each condition within an individual trigger must be met before the unit sends the email.

Expert Settings (Option 5)

Note: You can change the Enable alternate MAC setting using telnet or serial connections only. It is not available through the Web Manager.

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

Figure 8—2. Expert Settings

```
TCP Keepalive time in s (1s - 65s; 0s=disable): (45) ?
ARP Cache timeout in s (0s - 600s) : (600) ?
CPU performance (0=Regular, 1=Low, 2=High): (0) ?
Disable Monitor Mode @ bootup (N) ?
HTTP Port Number : (80) ?
SMTP Port Number : (25) ?
MTU Size (512 - 1400): (1400) ?
TCP Re-transmission Timeout (500 - 4000) (ms): (500) ?
Enable alternate MAC (N) ?
Ethernet connection type: (0) ?
```

The default settings are listed below:

TCP Keepalive time in s (1s – 65s; 0s=disable)	45
ARP Cache timeout in s (1s – 600s)	600
CPU Performance	0 (Regular)
Disable Monitor Mode @ bootup	N (No)
HTTP Port Number (1-65535)	80
SMTP Port Number (1-65535)	25
MTU Size (512 – 1400)	0 (resulting in an operational value of 1400)
TCP Re-transmission Timeout (500 – 4000) (ms): (500) ?	500 (default)
Enable alternate MAC	No (OEM use only)
Ethernet connection type	0 (resulting in auto-negotiation)

TCP Keepalive time in seconds

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

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

ARP Cache timeout in seconds

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

```
ARP Cache timeout in s (0s - 600s) : (600) ?
```

CPU Performance

This option allows you to increase the CPU performance required to use the higher baud rates on the serial interface (460 Kbps and 920 Kbps). The standard CPU performance mode supports up to 230400 Kbps.

```
CPU performance (0=Regular, 1=Low, 2=High): (0) ?
```

Notes:

- If a baud rate of 460 Kbps or 920 Kbps is set and the high performance mode is disabled, the operation of the serial channel would be out of the specified

error tolerance, thereby leading to inconsistent speed settings on the two ends of the serial channel.

- ♦ *Increasing CPU clock speed consumes more power and generates more heat. This reduces the maximum operating temperature specification. See the appropriate product brief for details.*

Disable Monitor Mode at Bootup

This option allows you to disable all entries into Monitor Mode during startup, except for the 'xxx' sequence. This prevents entry using **yyy**, **zzz**, **xx1**, and **yy1** key sequences (only during the bootup sequence). The default for Monitor Mode at bootup is **N** (No). (See [11:Monitor Mode](#).)

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

HTTP Port Number

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

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

SMTP Port Number

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

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

Note: When configuring the HTTP or SMTP port number, take note of the 'reserved' port numbers on page [43](#).

MTU Size

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

```
MTU Size (512 - 1400): (1400) ?
```

TCP Re-transmission Timeout

This feature allows the configuration of the desired TCP re-transmission timeout value. If the ACK is not received for a packet sent from the XPort Direct+ device, then the unit will retransmit the data. The valid range is 500-4000 msec with 500 msec as default.

```
TCP Re-transmission Timeout (500 - 4000) (ms): (500) ?
```

Enable alternate MAC

If necessary, enable the alternate MAC address (if specified in the OEM setup record).

```
Enable alternate MAC (N) ? _
```

Ethernet Connection Type

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

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

Security Settings (Option 6)

You can change security settings by means of Telnet or serial connections only, not on the Web Manager. We recommend that you set security over the dedicated network or over the serial setup to prevent eavesdropping.

Caution: *Disabling both Telnet Setup and Port 77FE will prevent users from accessing the setup menu from the network. Disabling Port 77FE also disables the Web from configuring the device.*

Select **7** to configure security settings.

Figure 8—3. Security Settings

```
Disable SNMP (N) ?
SNMP Community Name (public):
Disable Telnet Setup (N) ?
Disable TFTP Firmware Update (N) ?
Disable Port 77FEh (N) ?
77FEh Access Mode (0=Read & Write, 1=Read Only): (0) ?
Disable Web Server (N) ?
Disable Web Setup (N) ?
Disable ECHO ports (Y) ?
Enable Encryption (N) ?
Enable Enhanced Password (N) ?
Disable Port 77F0h (N) ?
```

Disable SNMP

This setting allows you to disable the SNMP protocol on the unit for security reasons.

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 you choose to disable this option, keep in mind that disabling both Telnet Setup and Port 77FE will prevent 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 using 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 the use of TFTP to perform network firmware upgrades. With this option, you can download firmware upgrades over the serial port using the DeviceInstaller Recover Firmware procedure. (See [10: Firmware Upgrades](#).)

Disable TFTP Firmware Update (N) : _

Disable Port 77FE (Hex)

Note: If you choose to disable this option, keep in mind that disabling both Telnet Setup and Port 77FE will prevent users from accessing the setup menu from the network.

Port 77FE is a setting that allows DeviceInstaller application, Web Manager, and custom programs to configure the unit remotely. You may wish to disable this capability for security purposes.

Disable Port 77FEh (N) ? _

The default setting is the **N** (No) option, which enables remote configuration. You can configure the unit by using the DeviceInstaller application, 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.

77FEh Access Mode

Configuring this setting is available if port 77FE is enabled. This option will not be listed if port 77FE is disabled.

Set 0 for Read & Write mode, and 1 for Read Only mode. Default value of this setting is Read-Write(0).

If access mode is Read-only, then read operation can be done through port 77FE, if Read-Write access is selected, then both read and write of data can be done through port 77FE.

```
77FEh Access Mode (0=Read & Write, 1=Read Only): (0) ? _
```

Disable Web Server

This setting defaults to the **N** (option). The **Y** (Yes) option disables the web server.

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

Disable Web Setup

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

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

Disable ECHO Ports

This setting controls whether port 7 echoes characters it receives.

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

Enable Encryption

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

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

To configure AES encryption on the XPort Direct+ device server:

```
Enable Encryption (Y) ? _
Key length in bits (256): _
Change Key (N) ? _
Enter Key: _
```

Enable Encryption	This option enables AES encryption for tunneling only.
Key length in bits	Valid options are 128, 192 and 256 bits.
Change Key	Select to modify the current AES encryption key. The default is N (No).
Enter Key	If you selected Change Key , enter the key (at the Enter Key prompt) in hexadecimal numbers. Enter 32 characters for 128 bits key length, 48 characters for 192 bits key length, or 64 characters for 256 bits key length.

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

Generally, one of two situations applies:

- ◆ Encrypted XPort Direct+ to XPort Direct+ device communication. Be sure to configure both XPort Direct+ device servers with the same encryption key.
- ◆ Third-party application to XPort Direct+ unit-encrypted communication: XPort Direct+ device uses standard AES encryption protocols. To communicate successfully, products and applications on the peer side must use the same protocols and the same encryption key as the XPort Direct+ serial-to-Ethernet device server.

Lantronix Secure Com Port Redirector provides an encrypted connection from Windows-based applications to the XPort Direct+ device server. Information about SCPR is at <http://www.lantronix.com/device-networking/utilities-tools/scpr.html>.

Enable Enhanced Password

The Enhanced Password setting allows you to set a password of up to 16 characters for protecting Telnet and Web Page access. We recommend that you select the **Y** (Yes) option and enable the enhanced password setting.

Avoid using either the 4 character basic password setting or no password at all as they are not secure options.

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

Disable Port 77F0 (Hex)

Port 77F0 is a setting that allows a custom application to query or set the three XPort Direct+ configurable pins when they are functioning as general purpose I/O (GPIO). You may want to disable this capability for security purposes. The default setting is the **N** (No) option, which enables GPIO control. The **Y** (Yes) option disables the GPIO control interface.

```
Disable Port 77F0h ? _
```


Default Settings (Option 7)

Select **7** to reset the unit's Channel 1 configuration, email settings, and expert settings to the default settings. The server configuration settings for IP address, gateway IP address, and netmask remain unchanged. The configurable pins' settings also remain unchanged. The specific settings that this option changes are listed below:

Channel 1 Configuration Defaults

Baudrate	9600
I/F Mode	4C (1 stop bit, no parity, 8 bit, RS-232C)
Flow	00
Port number	10001
Connect Mode	C0 (always accept incoming connection; no active connection startup)
Send '+++ ' in Modem Mode	Enabled
Show IP addr after 'RING'	Enabled
Auto increment source port	Disable
Remote IP Address	(000) .(000) .(000) .(000)
Remote Port	0
DisConnnMode	00
FlushMode	00
DisConnTime	00:00
SendChar 1	00
SendChar 2	00

Email Server Defaults

Mail server	(000) .(000) .(000) .(000)
Unit name	Unassigned
Domain name	Unassigned
Recipient 1	Unassigned
Recipient 2	Unassigned

Trigger (1, 2 or 3) Defaults

Enable serial trigger input	No
Trigger input 1	X
Trigger input 2	X
Trigger input 3	X
Message	
Priority	Low (L)

Minimum notification interval	1 second (1 s)
Re-notification interval	0 seconds (0 s)

Expert Settings Defaults

TCP Keepalive time in seconds	45
ARP Cache timeout in seconds	600
CPU Performance	0 (Regular)
Disable Monitor Mode @ bootup	No
HTTP Port Number (1-65535)	80
SMTP Port Number (1-65535)	25
MTU Size (512 – 1400)	0 (resulting in an operational value of 1400)
TCP Re-Transmission Timeout	500
Enable Alternate MAC	No (N)
Ethernet Connection Type	0 (auto-negotiate)

Security Settings Defaults

Disable SNMP	No
SNMP Community Name	public
Disable Telnet Setup	No
Disable TFTP Firmware Update	No
Disable Port 77FEh	No
77FEh Access Mode	0 (Read & Write)
Disable Web Server	No
Disable Web Setup	No
Disable ECHO ports	Yes
Enable Encryption	No
Enable Enhanced Password	No
Disable Port 77F0h	No

9: GPIO Interface

Configurable Pins

The XPort Direct+ serial-to-Ethernet device server has three pins (CP0-2) that you can configure for General Purpose I/O (GPIO).

Note: You can also configure any one of the pins for modem control input signal (serial port control line) using the DeviceInstaller application.

You can use these GPIO pins to control devices such as relays, servers, lights, monitor switches, sensors, and even processes such as data transfer.

You can set the functions for the three pins independently and in any combination. The initial directions (input/output) and active levels (active low or high) at boot up can also be configured through 77FE, for example, by using the DeviceInstaller application.

This chapter describes how the directions, active levels, and states can be dynamically controlled and probed through special port 77F0.

The configurable pins default configuration is:

- ♦ Function: General Purpose Input
- ♦ Active Level: Active Low

Features

- ♦ TCP and UDP can be used.
- ♦ Function configuration can be retrieved.
- ♦ Input or output selection can be retrieved and controlled.
- ♦ Active low or high selection can be retrieved and controlled.
- ♦ Active or inactive selection can be retrieved and controlled.
- ♦ 77F0 can be disabled.

Every change of state (active/inactive) requires a command over TCP or UDP, and thus is not very fast. If you use this port for data transfer, the throughput is low, usually up to 1 Kbps.

Control Protocol

The GPIO control protocol is a simple, proprietary protocol.

Guidelines

The GPIO control protocol is described from the PC side.

- ◆ **Send** means from PC to XPort Direct+ serial-to-Ethernet device server.
- ◆ **Response** comes from XPort Direct+ serial-to-Ethernet device server to PC.

The protocol allows for control of up to 32 GPIOs. How many are actually available depends on the product. XPort Direct+ serial-to-Ethernet device server has only three.

The parameters are four bytes long and represent GPIOs 0-31, with GPIO0 in bit 0 of the first byte (Little Endian). Parameter bits for configurable pins not configured as GPIOs are undefined for **Get** commands and ignored on **Set** commands.

Every command consists of nine bytes: one command type of one byte and two parameters of four bytes each.

Command	Parameter 1				Parameter 2			
0	1	2	3	4	5	6	7	8

On some commands, one or all parameters are ignored.

For UDP, command type and parameters need to be in the same datagram.

Responses to valid commands are always five bytes long, consisting of the returned command byte and as parameters in the current or updated values. In case of an invalid command, only one byte with value 0FFh is returned.

Command	Parameter 1			
0	1	2	3	4

When sending a command (TCP and UDP), wait for the response before sending the next command.

Commands

Byte 0 Command Types

10h	Get functions
11h	Get directions (input or output)
12h	Get active levels (high active or low active)
13h	Get current states (active or not active)
19h	Set directions
1Ah	Set active levels
1Bh	Set current states

There is no **Set functions** command. Since the pin's function depends on the hardware in which the *XPort Direct+ serial-to-Ethernet device server* is embedded, that configuration is only allowed using 77FE. Settings changed by any of the **Set** commands are not stored and are lost when the unit is powered down or rebooted.

Command 10h, Get Functions

Send:

No parameters

Response:

1 parameter

Bytes 1-4: Functions

Bit X 1 means general purpose I/O available to the user.

0 means dedicated function (e.g., serial flow control, diagnostics) for configurable pin X.

Command 11h, Get Directions

Send:

No parameters

Response:

1 parameter

Bytes 1-4: Directions

Bit X 1 means GPIO X is an output.

0 means it is an input.

Command 12h, Get Active Levels

Send:

No parameters

Response:

1 parameter

Bytes 1-4: Active levels

Bit X 1 means GPIO X is active low (0V when active, 3.3V when inactive).

0 means it is active high (3.3V when active, 0V when inactive).

Command 13h, Get Current States

Send:

No parameters

Response:

1 parameter

Bytes 1-4: States

Bit X 1 means GPIO X is active

0 means it is inactive.

Command 19h, Set Directions

Send:

2 parameters

Bytes 1-4: Mask

Bit X 1 means the direction for GPIO X will be updated with the value in the second parameter.

0 means the direction for that GPIO will not change.

Bytes 5-8: New Directions

Bit X 1 means GPIO X will become an output.

0 means it will become an input.

Response:

1 parameter
Bytes 1-4: The updated directions

Command 1Ah, Set Active Levels**Send:**

2 parameters
Bytes 1-4: Mask
Bit X 1 means the direction for GPIO X will be updated with the value in the second parameter.
0 means the active type for that GPIO will not change.
Bytes 5-8: New Active Levels
Bit X 1 means GPIO X will become active low.
0 means it will become active high.

Response:

1 parameter
Bytes 1-4: Updated active levels

Command 1Bh, Set States**Send:**

2 parameters
Bytes 1-4: Mask
Bit X 1 means the state for GPIO X will be updated with the value in the second parameter.
0 means the state for that GPIO will not change.
Bytes 5-8: New States
Bit X 1 means GPIO X will become active.
0 means it will become inactive.

Response:

1 parameter
Bytes 1-4: Updated states

Examples

Example 1: PC sends command 10h to find out which configurable pins are available as GPIO.

PC -> XPort Direct+: 10h, 00h, 00h, 00h, 00h, 00h, 00h, 00h
XPort Direct+ -> PC: 10h, 03h, 00h, 00h, 00h

Command details:

10h = command 10h
00h, 00h, 00h, 00h = ignored
00h, 00h, 00h, 00h = ignored

Response details:

10h = response to command 10h
03h, 00h, 00h, 00h =

bits 0 and 1 are 1 → CP1 and CP2 are configured as GPIOs.
The other bits are ignored because there are only two configurable pins on the XPort Direct+.

Example 2: PC sends command 1Bh to change the current states of GPIO 0 and 1.

PC -> XPort Direct+: 1Bh, 01h, 00h, 00h, 00h, 00h, 00h, 00h, 00h
XPort Direct+ -> PC: 1Bh, 05h, 00h, 00h, 00h

Command details:

1Bh = command 1Bh
01h, 00h, 00h, 00h = the mask that determines which GPIOs will be changed.

bit 0 is 1 → GPIO0 will be changed.
bit 1 is 0 → GPIO1 will remain the same.

00h, 00h, 00h, 00h = the new states

bit 0 is 0 → GPIO0 will become 0.
bit 1 is ignored since it is masked out.

Response details:

1Bh = response to command 1Bh
05h, 00h, 00h, 00h =

bit 0 is 1 → GPIO0 = 1
bit 1 is 0 → GPIO1 = 0
bit 2 is 1 → GPIO2 = 1
The other bits are ignored because there are only two configurable pins on the XPort Direct+.

Command details:

1Bh = command 1Bh
01h, 00h, 00h, 00h = the mask that determines which GPIOs will be changed.

bit 0 is 1 → GPIO0 will be changed.
bit 1 is 0 → GPIO1 will remain the same.

00h, 00h, 00h, 00h = the new states

bit 0 is 0 → GPIO0 will become 0.
bit 1 is ignored since it is masked out.

Response details:

1Bh = response to command 1Bh
05h, 00h, 00h, 00h =

bit 0 is 1 → GPIO0 = 1
bit 1 is 0 → GPIO1 = 0
bit 2 is 1 → GPIO2 = 1
The other bits are ignored because there are only three configurable pins on the XPort Direct+.

10: Firmware Upgrades

Obtaining Firmware

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

Reloading Firmware

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

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

Table 10—1. Firmware Files

ROM File	COB
xptdp_61100.rom	gen_xptdp_webm_2007.cob

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

Using TFTP: Graphical User Interface

To download new firmware from a computer:

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

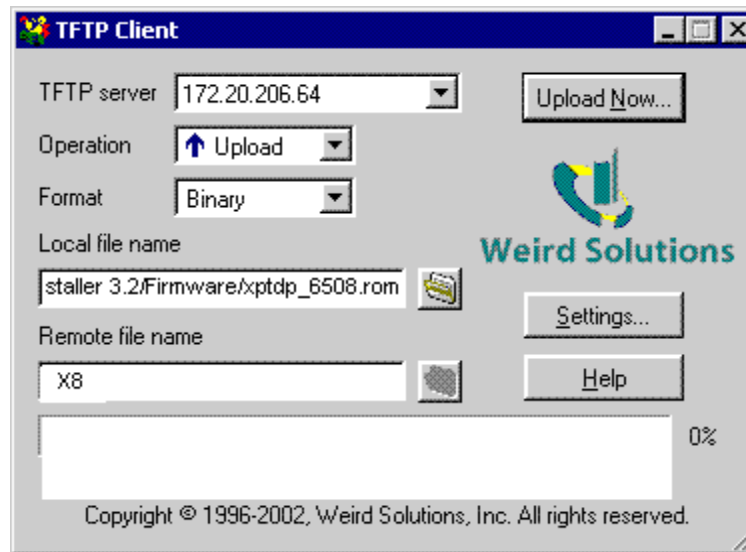
Note: TFTP requires the .ROM (binary) version of the unit's internal operational code.

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

The TFTP destination file for XPort Direct+ serial-to-Ethernet device server is **X8**.

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

Figure 10—1. TFTP Window



After the firmware has been loaded and stored, which takes approximately 8 seconds to complete, the unit performs a power reset.

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 and the .cob file:

```
tftp -i 192.168.1.111 put xptdp_61100.rom X8
tftp -i 192.168.1.111 put gen_xptdp_webm_2007.cob WEB1
```

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

The TFTP destination files for XPort Direct+ serial-to-Ethernet device server is **X8**.

Recovering the Firmware Using the Serial Port and DeviceInstaller

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

To recover firmware:

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

Note: Make sure the XPort Direct+ serial-to-Ethernet device server on which you are recovering firmware is connected to this selected port on your PC.

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

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

11: Monitor Mode

Monitor Mode is a command-line interface used for diagnostic purposes.

There are two ways to enter Monitor Mode: locally using the serial port or remotely using the network.

Entering Monitor Mode Using the Serial Port

To enter Monitor Mode locally:

1. Follow the same steps used for setting the serial configuration parameters (see [Serial Port](#) on page 36).
2. Instead of typing three **x** keys, however:
 - a) Type **zzz** (or **xx1**) to enter Monitor Mode with network connections.
 - b) Type **yyy** (or **yy1**) to enter Monitor Mode without network connections.

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

Entering Monitor Mode Using 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 F98097CCBBAA
Software version V6.11.0.0 (150522)
AES library version 1.8.2.1

Press Enter for 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. Many commands have an IP address as an optional parameter (xxx.xxx.xxx.xxx). If you enter the IP address, the command is applied to another unit with that IP address. If you do not enter the IP address, the command is executed locally.

Note: All commands must be in capital letters.

Table 11—1. Monitor Mode Commands

Command	Command Name	Function
VS x.x.x.x	Version	Queries software header record (16 bytes) of unit with IP address x.x.x.x.
GC x.x.x.x	Get Configuration	Gets configuration of unit with IP address x.x.x.x as hex records (120 bytes).
SC x.x.x.x	Send Configuration	Sets configuration of unit with IP address x.x.x.x from hex records.
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 IP address, gateway, subnet mask, and DNS server.
RS	Reset	Resets the unit's power.
QU	Quit	Exits diagnostics mode.
G0, G1,,Ge, Gf	Get configuration from memory page	Gets a memory page of configuration information from the device.
S0, S1,.....,Se, Sf	Set configuration to memory page	Sets a memory page of configuration information on the device.
GM	Get MAC address	Shows the unit's 6-byte MAC address.
SS	Set Security record	Sets the Security record without the encryption key and length parameters. The entire record must still be written, but the encryption-specific bytes do not need to be provided (they can be null since they are not overwritten).
SA	Scan	Initiates a wireless scan if the wireless interface is enabled. Reports any stations found, including BSSID, SSID, and RSSI. If SA is followed by a string, the string is used to filter SSIDs before reporting. If the BSS does not broadcast its SSID, only the BSSID and RSSI are returned.
NS	Network Status	Reports the network interfaces' statuses. Includes potentially negotiated parameters like speed/duplex for Ethernet or BSSID, encryption, authentication for wireless interfaces.
co	Set IP address, hostbits, gateway , and DNS server IP	<p>Example:</p> <pre>co 192.168.0.10 8 192.168.0.1 10001 192.168.1.10</pre> <p>with</p> <p>192.168.0.10 = IP address of the XPort Direct+ serial-to-Ethernet device server</p> <p>8 = number of hostbits</p> <p>192.168.0.1 = gateway IP address</p> <p>10001 = port number of the XPort Direct+ serial-to-Ethernet device server</p> <p>192.168.1.10 = IP address of the DNS Server</p> <p>The XPort Direct+ serial-to-Ethernet device server</p>

Command	Command Name	Function
		stores the setup and performs a reset. It sends an X before the reset if the command was OK.
VN	Query full firmware version	This command queries and displays full firmware version in readable string format.
WC	Flash write count	This command shows serial flash write counts, valid on serial flash products.

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

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

Table 11—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

12: Troubleshooting

This chapter discusses how you can diagnose and fix errors quickly without having to contact a dealer or Lantronix. It helps to connect a terminal to the serial port while diagnosing an error to view summary messages that may display. 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 XPort Direct+ serial-to-Ethernet device server 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, the "ARP entry addition failed: 5" message displays.	Your currently logged-in user does not have the correct rights 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, the "Press Enter to go into Setup Mode" error (described below) message displays. Now when you Telnet to the device server, 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 quickly.
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 "Press Enter to go into Setup Mode" message.
When you Telnet to port 1 to assign an IP address to the device server, the Telnet window does not respond for a long time.	You may have entered the Ethernet address incorrectly with the ARP command.	Confirm that the Ethernet address that you entered with the ARP command is correct. The Ethernet address 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 application, you get the following : "No response from device! Verify the IP, Hardware Address and Network Class. Please try again."	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: <i>You cannot assign an IP address to a device server through a router.</i>
The device server is not communicating with the serial device to which it is attached.	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 using 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 Telneting 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
<p>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.</p>	<p>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.</p> <p>Another possibility is that the device server is not set up correctly to make a good socket connection to the network.</p>	<p>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.</p> <p>If the state of CP1 is blinking consistently, or is completely off, then there is a good socket connection.</p> <p>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 44.</p>
<p>When connecting to the Web Manager within the device server, the "No Connection With The Device Server" message displays.</p>	<p>Your computer is not able to connect to port 30718 (77FEh) on the device server.</p>	<p>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.</p>

A: Lantronix Technical Support

Lantronix offers many resources to support our customers and products at <http://www.lantronix.com/support>. For instance, ask a question, find firmware downloads, access the FTP site and search through tutorials, FAQs, bulletins, warranty information, extended support services, and product documentation.

To contact technical support or sales, look up your local office at <http://www.lantronix.com/about/contact.html>. When you report a problem, please provide the following information:

- ◆ Your name, company name, address, and phone number
- ◆ Lantronix product and model number
- ◆ Lantronix MAC number or serial number
- ◆ Firmware version and current configuration
- ◆ 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).

B: Binary to Hexadecimal Conversions

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

Converting Binary to Hexadecimal

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

Conversion Table

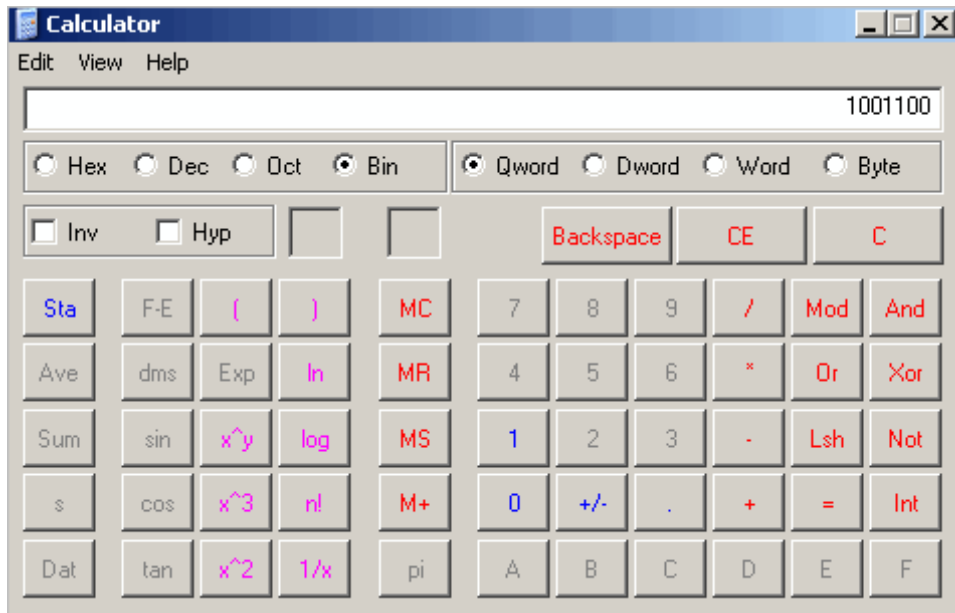
Hexadecimal digits have values ranging from 0 to F, which are represented as 0-9, A (for 10), B (for 11), etc. To convert a binary value (for example, 0100 1100) to a hexadecimal representation, the upper and lower four bits are treated separately, resulting in a two-digit hexadecimal number (in this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

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

Scientific Calculator

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

1. On the Windows Start menu, click **Programs**→**Accessories**→**Calculator**.
2. On the **View** menu, select **Scientific**. The scientific calculator displays.
3. Select **Bin** (Binary), and type the number to convert.



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