



XPort AR User Guide

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Disclaimer & Revisions

Note: *This product has been designed to comply with the limits for a Class B digital device pursuant to Part 15 of FCC and EN55022:1998 Rules when properly enclosed and grounded. These limits are designed to provide reasonable protection against radio interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this guide, may cause interference to radio communications.*

The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this guide.

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1: Using This Guide

Purpose and Audience

This guide provides the information needed to configure, use, and update the XPort AR™. It is intended for software developers and system integrators who are embedding the XPort AR in their designs.

Summary of Chapters

The remaining chapters in this guide include:

Chapter	Description
2: Description and Specifications	Main features of the product and the protocols it supports. Includes technical specifications.
3:Using DeviceInstaller	Instructions for viewing the current configuration using DeviceInstaller.
4:Configuration Using Web Manager	Instructions for accessing Web Manager and using it to configure settings for the XPort AR.
5:Point-to-Point Protocol (PPP)	Overviews PPP on the XPort AR.
6:Tunneling	Information on tunneling features available on the serial lines.
7:SSH and SSL Security	Overview and configuration of SSH and SSL security settings.
8:Using Email	Information on the SMTP server and setting email parameters on the XPort AR.
9:Configuration Pin Manager	Information on the Configuration Pin Manager (CPM) and setting the configurable pins to work with a device.
10:XML	Configuring the XPort AR using XML.
11:Branding the XPort AR	Instructions for customizing the XPort AR.
12:Updating Firmware	Instructions for obtaining the latest firmware and updating the XPort AR.
A: Technical Support	How to contact Lantronix Technical Support.
B: Binary to Hexadecimal	Instructions for converting binary values to hexadecimal and tables listing all configuration options in hexadecimal notation.

Additional Documentation

The following guides are available on the product CD or the Lantronix Web site (www.lantronix.com):

<i>XPort AR Getting Started</i>	Provides the steps for getting the XPort AR evaluation board up and running.
<i>XPort AR Integration Guide</i>	Provides information about the XPort AR hardware, testing the XPort AR using the evaluation board, and integrating the XPort AR into your product.
<i>XPort AR Command Reference</i>	Instructions for accessing Command Mode (the command line interface) using a Telnet connection through the network or through the serial port. Detailed information about the commands.

2: Description and Specifications

This chapter summarizes the XPort AR device server's features and basic information needed before getting started.

Features

The XPort AR is designed with additional features above and beyond the original XPort, including:

- ◆ The Evolution OS operating system
- ◆ Two full serial ports with all hardware handshaking signals or three serial ports without handshaking signals
- ◆ 11 configurable pins
- ◆ Supports fully compliant PoE designs by using PoE compliant magnetics and passing through both the used and unused pairs
- ◆ Increased memory: 4MB Flash and 1.25MB RAM
- ◆ Hardware capability in place to allow future software support for:
 - I2C Bus
 - SPI Bus
 - CAN Bus
 - USB
 - External interrupts, including one non-maskable
 - Timer input

Applications

The XPort AR 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
- ◆ 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 AR device server contains a full-featured TCP/IP stack. Supported protocols include:

- ◆ ARP, IP, UDP, TCP, ICMP, BOOTP, DHCP, Auto IP, Telnet, FTP, TFTP, HTTP, SSH, SSL, SNMP, and SMTP for network communications and management.
- ◆ TCP, UDP, TCP/AES, UDP/AES, Telnet, and SSH for tunneling to the serial port.
- ◆ TFTP, FTP, and HTTP for firmware upgrades and uploading files.

Evolution OS™

XPort AR incorporates Lantronix's Evolution OS™. Key features of the Evolution OS™ include:

- ◆ Built-in Web server for configuration and troubleshooting from Web-based browsers
- ◆ CLI configurability
- ◆ SNMP management
- ◆ XML data transport and configurability
- ◆ Rich Site Summary (RSS) information feeds
- ◆ Enterprise-grade security with SSL and SSH
- ◆ Comprehensive troubleshooting tools

Additional Features

Modem Emulation

In modem emulation mode, the XPort AR can replace dial-up modems. The unit accepts modem AT commands on the serial port, and then establishes a network connection to the end device, leveraging network connections and bandwidth to eliminate dedicated modems and phone lines.

Power over Ethernet (PoE)

The XPort AR supports PoE (also known as the IEEE standard 802.3af). Conventionally, network devices require a connection to the network and a power connection. PoE provides power to network devices over an Ethernet connection if the required hardware is available. The XPort AR passes PoE through the RJ45 to a connector on the bottom. To enable PoE, take the connections and design a PoE circuit and regulator to provide power for the device connected to the XPort AR. The XPort AR passes power not only through unused pairs, but through communications pairs as well.

Web-Based Configuration and Troubleshooting

Built upon popular Internet-based standards, the XPort AR enables users to configure, manage, and troubleshoot efficiently through a simplified browser-based interface that can be accessed anytime from anywhere. All configuration and troubleshooting options are launched from a well-organized, multi-page interface. Users can access all functionality via a Web browser, allowing them flexibility and remote access. As a result, users can enjoy the advantages of decreased downtime (based on the troubleshooting tools) and the ability to implement configuration changes easily (based on the configuration tools).

Command-Line Interface (CLI)

Making the edge-to-enterprise vision a reality, the XPort AR with the Evolution OS™ uses industry-standard tools for configuration, communication, and control. For example, the Evolution OS™ uses a Command Line Interface (CLI) whose syntax is very similar to that used by data center equipment such as routers and hubs.

SNMP Management

The XPort AR supports full SNMP management, making it ideal for applications where device management and monitoring are critical. These features allow networks with SNMP capabilities to correctly diagnose and monitor XPort AR.

XML-Based Architecture and Device Control

XML is a fundamental building block for the future growth of M2M networks. The XPort AR supports XML-based configuration setup records that makes device configuration transparent to users and administrators. The XML is easily editable with a standard text or XML editor.

Rich Site Summary (RSS)

The XPort AR supports Rich Site Summary (RSS), a rapidly emerging technology for streaming and managing on-line content. RSS feeds all the configuration changes that occur on the device. The feed is then read (polled) by an RSS aggregator. More powerful than simple email alerts, RSS uses XML as an underlying Web page transport and adds intelligence to the networked device while not taxing already overloaded email systems.

Enterprise-Grade Security

Without the need to disable any features or functionality, the Evolution OS™ provides the XPort AR the highest level of security possible. This 'data center grade' protection ensures that each device on the M2M network carries the same level of security as traditional IT networking equipment in the corporate data center.

By protecting the privacy of serial data being transmitted across public networks, users can maintain their existing investment in serial technology, while taking advantage of the highest data-protection levels possible.

SSH and SSL can:

- ◆ Verify the data received came from the proper source

- ◆ Validate that the data transferred from the source over the network has not changed when it arrives at its destination (shared secret and hashing)
- ◆ Encrypt data to protect it from prying eyes and nefarious individuals
- ◆ Provide the ability to run popular M2M protocols over a secure SSH connection

In addition to keeping data safe and accessible, the XPort AR has robust defenses to hostile Internet attacks such as denial of service (DoS), which can be used to take down the network. Moreover, the XPort AR can not be used to bring down other devices on the network.

The XPort AR can be used with Lantronix's Secure Com Port Redirector (SCPR) to encrypt COM port-based communications between PCs and virtually any electronic device. SCPR is a Windows application that creates a secure communications path over a network between the computer and serial-based devices that are traditionally controlled via a COM port. With SCPR installed at each computer, computers that were formerly "hard-wired" by serial cabling for security purposes or to accommodate applications that only understood serial data can instead communicate over an Ethernet network or the Internet.

Troubleshooting Capabilities

The XPort AR offers a comprehensive diagnostic toolset that lets you troubleshoot problems quickly and easily. Available from the Web Manager, CLI, and XML interfaces, the diagnostic tools let you:

- ◆ View critical hardware, memory, MIB-II, buffer pool, and IP socket information.
- ◆ Perform ping and traceroute operations.
- ◆ Conduct forward or backup DNS lookup operations.
- ◆ View all processes currently running on the XPort AR, including CPU utilization and total stack space available.

Configuration Methods

After installation, the XPort AR requires configuration. 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 XPort AR and assigning IP addresses and other configurable settings:

DeviceInstaller: Configure the IP address and view network settings on the XPort AR using a Graphical User Interface (GUI) on a PC attached to a network. (See [3:Using DeviceInstaller](#).)

Web Manager: Through a web browser, configure the XPort AR's settings using the Lantronix Web Manager. (See [4:Configuration Using Web Manager](#).)

Command Mode: There are two methods to accessing Command Mode: making a Telnet connection or connecting a terminal (or a PC running a terminal emulation program) to the unit's serial port. (See the [XPort AR Command Reference Guide](#) for Command Mode input and available commands.)

Addresses and Port Numbers

Hardware Address

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

Figure 2-1. Sample Hardware Address

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

IP Address

Every device connected to an IP network must have a unique IP address. This address references the specific unit.

Port Numbers

Every TCP connection and every UDP datagram is defined by a destination and source IP address, and a destination and source port number. For example, a Telnet server commonly uses port number 23.

The following is a list of the default server port numbers running on the XPort AR:

- ◆ TCP Port 22: SSH Server (Command Mode configuration)
- ◆ TCP Port 23: Telnet Server (Command Mode configuration)
- ◆ TCP Port 80: HTTP (Web Manager configuration)
- ◆ TCP Port 443: HTTPS (Web Manager configuration)
- ◆ UDP Port 161: SNMP
- ◆ TCP Port 21: FTP
- ◆ UDP Port 69: TFTP
- ◆ UDP Port 30718: 0x77FE Query port
- ◆ TCP/UDP Port 1001: Tunnel 1
- ◆ TCP/UDP Port 1002: Tunnel 2

Product Information Label

The product information label on the underside of the unit contains the following information about the specific unit:

- ◆ Bar code
- ◆ Serial number
- ◆ Product ID (name)
- ◆ Part number

◆ Hardware address (MAC address)

Figure 2-2. Product Label



3: Using DeviceInstaller

This chapter covers the steps for viewing the XPort AR device server's properties and device details.

Accessing XPort AR using DeviceInstaller

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

- ◆ Follow the instructions on the product CD to install and run DeviceInstaller.
- 1. Click **Start→Programs → Lantronix→DeviceInstaller→DeviceInstaller**.
- 2. Click on the XPort AR folder. The list of Lantronix XPort AR devices available displays.
- 3. Expand the list of XPorts by clicking the **+** symbol next to the XPort AR icon. Select the XPort AR unit by clicking on its IP address to view its configuration.

Viewing the XPort AR's Current Configuration

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

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

Extended Firmware Version	Provides additional information on the firmware version.
Online Status	Non-configurable field. Displays the XPort AR's status as online, offline, unreachable (the XPort AR is on a different subnet), or busy (the XPort AR is currently performing a task).
Telnet Enabled	Displays whether Telnet is enabled on this XPort AR.
Telnet Port	Non-configurable field. Displays the XPort AR's port for telnet sessions.
Web Enabled	Displays whether Web Manager access is enabled on this XPort AR.
WebPort	Non-configurable field. Displays the XPort AR's port for Web Manager configuration.
Maximum Baud Rate Supported	Non-configurable field. Displays the XPort AR's maximum baud rate. <i>Note: the XPort AR may not currently be running at this rate.</i>
Firmware Upgradeable	Non-configurable field. Displays True , indicating the XPort AR's firmware is upgradeable as newer version become available.
IP Address	Displays the XPort AR's current IP address. To change the IP address, click on the Assign IP button on the DeviceInstaller menu bar.
Supports Configurable Pins	Non-configurable field. Displays True , indicating configurable pins are available on the XPort AR.
Supports Email Triggers	Non-configurable field. Displays True , indicating email triggers are available on the XPort AR.

4: Configuration Using Web Manager

This chapter describes how to configure the XPort AR using Web Manager, Lantronix's browser-based configuration tool. The unit's configuration is stored in nonvolatile memory and is retained without power. All changes take effect immediately, unless otherwise noted.

Accessing Web Manager through a Web Browser

Log into the XPort AR using a standard Web browser.

Note: Alternatively, access the Web Manager by selecting the **Web Configuration** tab from DeviceInstaller.

To access Web Manager:

1. Open a standard web browser (such as Netscape Navigator 6.x and above, Internet Explorer 5.5. and above, Mozilla Suite, Mozilla Firefox, or Opera).
2. Enter the IP address of the XPort AR in the address bar. The XPort AR's built-in security requires you to log in with your user name and password.

Note: The factory-default user name is **admin** and the factory-default password is **PASS**.

3. The Web Manager home page displays.

Note: The XPort AR Status page (the home page) displays the common XPort AR configuration and product information.

Figure 4-1. Web Manager Home Page



Network Settings

Click the **Network** link on the left navigation bar to display the Network menu. The sub-menus displayed allow for the configuration of the general network settings, protocol stack, DNS, SNMP, FTP, TFTP, IP address filter, and the query port.

Network Configuration

To configure the network's general configuration:

1. Click **Network** → **Configuration** from the navigation menu. The Network Configuration window displays.

Figure 4-2. Network Configuration

LANTRONIX® XPort AR

Network Configuration

BOOTP Client: ☐ On ☐ Off

DHCP Client: ☐ On ☐ Off

IP Address:

Network Mask:

Gateway:

MAC Address:

Hostname:

Domain:

DHCP Client ID:

Ethernet Link: Speed: ☐ Auto ☐ 10Mbps ☐ 100Mbps
Duplex: ☐ Auto ☐ Half ☐ Full

Current Configuration

	Current	After Reboot
BOOTP Client:	Off	Off
DHCP Client:	On [Renew]	On
IP Address:	172.18.100.10 (DHCP)	<DHCP>
Network Mask:	255.255.0.0 (DHCP)	<DHCP>
Gateway:	172.18.0.11 (DHCP)	<DHCP>
MAC Address:	00:20:48:88:01:26	00:20:48:88:01:26
Hostname:	<None>	<DHCP>
Domain:	support.int.lantronix.com (DHCP) [Delete]	<DHCP>
DHCP Client ID:	<None>	<None>
Ethernet:	Auto 10/100 Mbps Auto Half/Full (100 Mbps Full)	Auto 10/100 Mbps Auto Half/Full

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2. Enter or modify the following fields:

BOOTP Client	Select On or Off. Overrides the configured IP address, network mask, gateway, hostname, and domain. Note: When DHCP is set to On, the system automatically uses DHCP, regardless if BOOTP Client is set to On.
DHCP Client	Select On, Off, or Renew. Overrides the configured IP address, network mask, gateway, hostname, and domain.
IP Address	Enter the XPort AR's static IP address. The static address is used when BOOTP and DHCP are both set to Off.
Network Mask	Enter the XPort AR's network mask.
Gateway	Enter the XPort AR's gateway address.
MAC Address	Enter the XPort AR's new MAC address.
Hostname	Enter the unit's hostname.
Domain	Enter the unit's domain name.

DHCP Client ID	Enter the ID if a DHCP ID is used by the DHCP server. The DHCP server's lease table displays IP addresses and MAC addresses for devices. The lease table displays the Client ID, in hexadecimal notation, instead of the XPort AR's MAC address.
Ethernet	Select the speed for Ethernet transmission.

3. In the **Current Running Configuration** table, delete currently stored fields as necessary.
4. Click **Submit**. Changes are applied immediately to the XPort AR. Changes to the following settings require a reboot for the changes to take effect: DHCP, BOOTP, IP address, network mask, gateway, MAC address, and DHCP client ID.

Note: If DHCP or BOOTP fails, AutoIP intervenes and assigns an address. In this case, the static IP (if configured) is ignored.

Line 1, Line 2, and Line 3 Settings

Select the **Line 1**, **Line 2**, or **Line 3** link on the left menu bar to display the **Line** menu. The sub-menus allow for both general configuration and command mode configuration.

Note: The following section describes the steps to configure Line 1; these steps also apply to Line 2 and Line 3 menu options.

Line 1 Configuration

To configure Line 1:

1. Click **Line 1 → Configuration** from the navigation menu. The Line 1 Configuration window displays.

Figure 4-3. Line 1 Configuration

LANTRONIX® XPort AR

Status Network Line Tunnel CPM DNS PPP SNMP FTP TFTP Syslog HTTP RSS CLI Email SSH SSL XML Filesystem Protocol Stack IP Address Filter Query Port Diagnostics System

Line 1 Line 2 Line 3

Statistics Configuration Command Mode

Line 1- Configuration

	Current Setting	Change Setting To
Name:		<input type="text"/>
Status:	Enabled	Enabled <input type="button" value="v"/>
Protocol:	None	None <input type="button" value="v"/>
Interface:	RS232	RS232 <input type="button" value="v"/>
Baud Rate:	9600	9600 <input type="button" value="v"/> Custom <input type="text"/>
Parity:	None	None <input type="button" value="v"/>
Data Bits:	8	8 <input type="button" value="v"/>
Stop Bits:	1	1 <input type="button" value="v"/>
Flow Control:	None	None <input type="button" value="v"/>
Xon char:	0x11 (\17)	<input type="text"/>
Xoff char:	0x13 (\19)	<input type="text"/>
		<input type="button" value="Submit"/>

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This page displays the current configuration of the Serial Line. Changing any of the fields takes effect immediately.

When specifying a Custom baud rate, select 'Custom' from the drop down list and then enter the desired rate in the text box.

When specifying either Xon char or Xoff char, either prefix decimal with \ or prefix hexadecimal with 0x or provide a single printable character. These are used when Flow Control is set to Software.

2. Enter or modify the following fields:

Name	Enter a name for the Line. The default Name is blank.
Status	Displays the whether the current line is enabled. To change the status, select Enabled or Disabled from the pull-down menu.
Protocol	Select the protocol for the Line from the pull-down menu. The default is None .
Interface	Select the Line's interface from the pull-down menu. The default is RS232 .
Baud Rate	Select the XPort AR's baud rate from the pull-down menu. The default is 9600 .
Parity	Select the XPort AR's parity from the pull-down menu. The default is None .
Data Bits	Select the number of data bits from the pull-down menu. The default is 8 .
Stop Bits	Select the number of stop bits from the pull-down menu. The default is 1 .
Flow Control	Select the XPort AR's flow control from the pull-down menu. The default is None .
Xon Char	Character to use to initiate a flow of data. When Flow Control is set to Software , specify Xon char . Prefix a decimal character with \ or a hexadecimal character with 0x, or provide a single printable character. The default Xon char is 0x11.

Xoff Char	When Flow Control is set to Software , specify Xoff char . Prefix a decimal character with \ or a hexadecimal character with 0x, or provide a single printable character. The default Xoff char is 0x13.
------------------	---

- Click **Submit**. Changes are applied immediately to the XPort AR.

Line 1 Command Mode

Setting Command Mode enables the CLI on the serial line.

To configure Line 1's command mode:

- Click **Line 1 → Command Mode** from the navigation menu. The Line 1 Command Mode window displays.

Figure 4-4. Line 1 Command Mode

The screenshot shows the LANTRONIX XPort AR web manager interface. The left navigation menu includes options like Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The main area is titled 'Line 1 - Command Mode' and contains configuration options for Mode, Wait Time, Serial String, Echo Serial String, CP Group, and Signon Message. The 'Current Configuration' table at the bottom shows the current settings.

Current Configuration	
Mode:	Disabled (Active) [Kill]
Wait Time:	5000milliseconds
Serial String:	<None>
Echo Serial String:	On
CP Group:	<None>
Signon Message:	<None>

- Enter or modify the following fields:

Mode	Select the method of enabling command mode or choose to disable command mode. Always immediately enables command mode for the serial line. Use Serial String enables command mode when the serial string is read on the serial line during boot time. Use CP Group starts command mode based on the value of a CP group. Use both Serial String and CP Group enables command mode when both the serial string is read and the appropriate CP group value is communicated. Disabled turns off command mode.
Wait Time	Enter the wait time for the serial string during boot-up.

Serial String	In the Char field, enter the serial string characters. Select the string type from the pull down menu as Character , Binary , or Decimal notation.
Echo Serial String	Select Yes to enable echoing of the serial string at boot-up.
CP Group	Enter the CP group name and its value.
Signon Message	In the Char field, enter the boot-up signon message. Select the string type from the pull down menu as Character , Binary , or Decimal notation.

3. In the **Current Configuration** table, clear currently stored fields as necessary.
4. Click **Submit**. Changes are applied immediately to the XPort AR.

Tunnel 1 and Tunnel 2 Settings

Select the **Tunnel 1** or **Tunnel 2** link on the left menu bar to display the **Tunnel** menu. The sub-menus allow for the configuration of serial settings, connect mode, accept mode, disconnect mode, packing mode, start and stop characters, and modem emulation.

Note: The following section describes the steps to configure Tunnel 1; these steps also apply to Tunnel 2 menu options.

Figure 4-5. Tunnel 1



Accept Mode

In accept mode, the XPort AR listens (waits) for incoming connections.

To configure the tunnel's accept mode:

1. Click **Tunnel 1 → Accept Mode** from the navigation menu. The Tunnel 1 Accept Mode window displays.

Figure 4-6. Tunnel 1 Accept Mode

LANTRONIX® **XPort AR**

Status **Tunnel 1** Tunnel 2

Statistics Serial Settings Start/Stop Chars
 Accept Mode Connect Mode Disconnect Mode
 Packing Mode Modem Emulation AES Keys

Tunnel 1- Accept Mode

Mode: ☐ Disabled ☐ Enabled
☐ Any Character ☐ Modem Control Asserted
☐ Start Character ☐ Modem Emulation

Local Port:

Protocol: ☐ TCP ☐ SSH ☐ Telnet ☐ TCP/AES

Flush Serial Data: ☐ Enabled ☐ Disabled

Block Serial Data: ☐ On ☐ Off

Block Network Data: ☐ On ☐ Off

TCP Keep Alive: seconds

Email on Connect:

Email on Disconnect:

CP Set Group:

On Connection:

On Disconnection:

Password:

Prompt for Password: ☐ On ☐ Off

Current Configuration

Mode:	Enabled (Waiting) WARNING: Serial protocol not Tunnel
Local Port:	10001
Protocol:	Tcp
Flush Serial Data:	Disabled
Block Serial Data:	Off
Block Network Data:	Off
TCP Keep Alives:	Default 45 seconds
Email on Connect:	<None>
Email on Disconnect:	<None>
CP Set Group:	<None>
On Connection Value:	0 (0x0)
On Disconnection Value:	0 (0x0)
Password:	<Not Configured> Reset
Prompt for Password:	Off

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2. Enter or modify the following fields:

Mode

Select the method used to start a tunnel in Accept mode. Choices are:

Disabled = do not accept an incoming connection.

Enabled = accept an incoming connection. (*default*)

Any Character = start waiting for an incoming connection when any character is read on the serial line.

	<p>Start Character = start waiting for an incoming connection when the start character for the selected tunnel is read on the serial line.</p> <p>Modem Control Asserted = start waiting for an incoming connection as long as the Modem Control pin (DSR) is asserted on the serial line until a connection is made.</p> <p>Modem Emulation = start waiting for an incoming connection when triggered by modem emulation AT commands. Connect mode must also be set to Modem Emulation.</p>
Local Port	Enter the port number for use as the local port. The default is port 10001.
Protocol	Select the protocol type for use with Accept Mode. The default protocol is TCP.
Flush Serial Data	Select Enabled to flush the serial data buffer on a new connection.
Block Serial Data	Select On to block, or not tunnel, serial data transmitted to the XPort AR.
Block Network Data	Select On to block, or not tunnel, network data transmitted to the XPort AR.
TCP Keep Alive	Enter the time, in milliseconds, the unit waits during a silent connection before checking if the currently connected network device is still on the network. If the unit then gets no response after 8 attempts, it drops that connection.
CP Set Group	Identifies a CP or CP Group whose value should change when a connection is established and dropped.
On Connection	Specifies the value to set the CP or CP Group when a connection is established.
On Disconnection	Specifies the value used when the connection is closed.
Password	<p>Enter a password that clients must send to the EDS within 30 seconds from opening a network connection to enable data transmission.</p> <p>The password can have up to 31 characters and must contain only alphanumeric characters and punctuation. When set, the password sent to the XPort AR must be terminated with one of the following: (a) 0x10 (LF), (b) 0x00, (c) 0x13 0x10 (CR LF), or (d) 0x13 0x00.</p>
Prompt for Password	<p>Indicate whether the user should be prompted for the password upon connection.</p> <p>On = prompt for a password upon connection.</p> <p>Off = do not prompt for a password upon connection.</p>

- Click **Submit**. Changes are applied immediately to the XPort AR.

Packing Mode

When in packing mode, data is not transferred one byte at a time. Instead, data is queued and sent in segments.

To configure the tunnel's packing mode:

1. Select **Tunnel 1** → **Packing Mode** from the navigation menu. The Tunnel 1 Packing Mode window displays.

Figure 4-7. Tunnel 1 Packing Mode

Tunnel 1- Packing Mode

Mode: ☐ Disabled ☐ Timeout ☐ Send Character

Timeout: milliseconds

Threshold: bytes

Send Character:

Trailing Character:

Current Configuration

Mode:	Disabled
Timeout:	1000 milliseconds
Threshold:	512 bytes
Send Character:	<None>
Trailing Character:	<None>

When Tunneling, instead of sending data on the network immediately after being read on the Serial Line, the data can be packed (queued) and sent in larger chunks.

A Tunnel can be configured to use Packing Mode in a number of ways:

Disabled: data never packed

Timeout: data sent after timeout occurs

Send Character: data sent when the Send Character is read on the Serial Line

The **Threshold** specifies if the amount of queued data reaches this limit, then send the data on the network immediately.

The **Timeout** specifies how long to wait before sending the queued data on the network.

If used, the **Send Character** is a special character that when read on the Serial Line forces the queued data to be sent out immediately.

The **Trailing Character** is a special character that is injected into the outgoing data stream right after the **Send Character**.

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2. Enter or modify the following fields:

Mode	Select Disabled to disable Packing Mode completely. Select Send Character to send the queued data when the Send Character is received. Select Timeout to send data after the specified time has elapsed.
Timeout	Enter a time, in milliseconds, for the XPort AR to send the queued data.
Threshold	Send the queued data when the number of queued bytes reaches the threshold .
Send Character	Enter the send character . Upon receiving this character, the XPort AR sends out the queued data.
Trailing Character	Enter the trailing character . This character is sent immediately following the send character .

3. Click **Submit**. Changes are applied immediately to the XPort AR.

Serial Settings

To configure serial settings:

1. Click **Tunnel 1** → **Serial Settings** from the navigation menu. The Tunnel 1 Serial Settings window displays.

Figure 4-8. Tunnel 1 Serial Settings

LANTRONIX® **XPort™**
AR

Status **Network** Line Tunnel CPM DNS PPP SNMP FTP TFTP Syslog HTTP RSS CLI Email SSH SSL XML Filesystem Protocol Stack IP Address Filter Query Port Diagnostics System

Tunnel 1 Tunnel 2

Statistics **Serial Settings** Start/Stop Chars
Accept Mode Connect Mode Disconnect Mode
Packing Mode Modem Emulation AES Keys

Tunnel 1- Serial Settings

Buffer Size:

Read Timeout: milliseconds

Wait For Read Timeout: ☐ Enabled ☐ Disabled

Current Configuration

Line Settings:	RS232, 9600, N, 8, 1, None
Protocol:	None WARNING: Not Tunnel
Buffer Size:	2048bytes [Reset]
Read Timeout:	200milliseconds
Wait For Read Timeout:	Disabled

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For Tunneling, the Buffer Size of the buffer used for reading data on the Serial Line can be modified. The valid size range is from 1 to 4096 bytes. Changing this value requires a reboot.
A Read Timeout specifies how long to wait when waiting for incoming data on the Serial Line.
The Wait For Read Timeout boolean specifies to wait the entire Read Timeout when waiting for incoming data on the Serial Line. The waiting occurs even if there is data in the read buffer ready to be processed. Only when the read buffer completely fills up is the Read Timeout ignored.

2. Enter or modify the following fields:

Buffer Size	Enter the buffer size used for the tunneling of data received.
Read Timeout	Enter the time, in milliseconds, for tunneling wait for serial data
Wait for Read Timeout	Select Enabled to cause the tunneling to wait for a read timeout before returning serial data.

3. In the **Current Configuration** table, reset currently stored fields as necessary.
4. Click **Submit**. Changes are applied immediately to the XPort AR.


Connect Mode


Connect mode defines how the unit makes an outgoing connection.

To configure Tunnel 1's connect mode:

1. Select **Tunnel 1** → **Connect Mode** from the navigation menu. The Tunnel 1 Connect Mode window displays.

Figure 4-9. Tunnel 1 Connect Mode





Status
 Network
 Line
 Tunnel
 CPM
 DNS
 PPP
 SNMP
 FTP
 TFTP
 Syslog
 HTTP
 RSS
 CLI
 Email
 SSH
 SSL
 XML
 Filesystem
 Protocol Stack
 IP Address Filter
 Query Port
 Diagnostics
 System

Tunnel 1
Tunnel 2

Statistics
Serial Settings
Start/Stop Chars

Accept Mode
Connect Mode
Disconnect Mode

Packing Mode
Modem Emulation
AES Keys

Tunnel 1- Connect Mode

Mode:
☐ Disabled ☐ Enabled
☐ Any Character ☐ Modem Control Asserted
☐ Start Character ☐ Modem Emulation

Remote Address:

Remote Port:

Local Port:

Protocol:
☐ TCP ☐ UDP ☐ SSH
☐ TCP/AES ☐ UDP/AES

Reconnect Timer: milliseconds

Flush Serial Data:
☐ Enabled ☐ Disabled

SSH Username:

Block Serial Data:
☐ On ☐ Off

Block Network Data:
☐ On ☐ Off

TCP Keep Alive: seconds

Email on Connect:

Email on Disconnect:

CP Set Group:

On Connection:

On Disconnection:

A Tunnel in Connect Mode can be started in a number of ways:
Disabled: never started
Enabled: always started
Any Character: started when any character is read on the Serial Line
Start Character: started when the Start Character is read on the Serial Line
Modem Control Asserted: started when the Modem Control pin is asserted on the Serial Line
Modem Emulation: started when triggered by Modem Emulation

The Remote Address and Remote Port specifies the remote host to connect to. The Local Port is by default random but can be overridden.

The Protocol used on the connection can be one of TCP, UDP, SSH, TCP w/AES, or UDP w/AES. If security is a concern it is highly recommended that SSH be used. The SSH Username specifies the SSH Client User to use for an SSH connection.

The Reconnect Timer specifies how long to wait before trying to reconnect to the remote host after a previous attempt failed or connection was closed.

The Flush Serial Data boolean specifies to flush the Serial Line when a connection is made.

For debugging purposes, the Block Serial Data and Block Network Data booleans can be toggled to discard all incoming data on the respective interface.

The TCP Keep Alive timer specifies how often to probe the remote host in order to keep the TCP connection up during idle transfer periods. Enter 0 to disable.

The CP Set Group identifies a CP or CP Group whose value should change when a connection is established and dropped. On Connection specifies the value to set the CP or CP Group to when a connection is established and On Disconnection specifies the value that should be used when the connection is closed.

Current Configuration

Mode:	Disabled
Remote Address:	<None>
Remote Port:	<None>
Local Port:	Random
Protocol:	Tcp
Reconnect Timer:	15000milliseconds
Flush Serial Data:	Disabled
SSH Username:	<None>
Block Serial Data:	Off
Block Network Data:	Off
TCP Keep Alives:	Default 45 seconds
Email on Connect:	<None>
Email on Disconnect:	<None>
CP Set Group:	<None>
On Connection Value:	0 (0x0)
On Disconnection Value:	0 (0x0)

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2. Enter or modify the following fields:

Mode	Select Disabled to turn off connect mode. Any Character enables connect mode upon receiving a character. Start Character enables connect mode upon receiving the start character. Select Modem CTRL Assert to enable connect mode when the modem control pin (DSR pin) is asserted on the serial line. Select Modem Emulation to use modem emulation on this tunnel.
Remote Address	Enter the remote address to which the XPort AR will connect. Enter an IP address or DNS name.
Remote Port	Enter the remote port number.
Local Port	Enter the port for use as the local port. A random port is selected by default.
Protocol	Select the protocol type for use in command mode. TCP is the default protocol.
Reconnect Timer	Enter the reconnect time in milliseconds. The XPort AR attempts to reconnect this amount of time after failing a connection or exiting an existing connection.
SSH Username	Enter the SSH username. The tunnel uses the SSH keys for the client username.
Block Serial Data	Select On to block (not tunnel) serial data transmitted to the XPort AR.
Block Network Data	Select On to block (not tunnel) network data transmitted to the XPort AR.
TCP Keep Alive	Enter the time, in milliseconds, the unit waits during a silent connection before checking if the currently connected network device is still on the network. If the unit then gets no response after 8 attempts, it drops that connection.
CP Set Group	Identifies a CP or CP Group whose value should change when a connection is established and dropped.
On Connection	Specifies the value to set the CP or CP Group when a connection is established.
On Disconnection	Specifies the value used when the connection is closed.

3. Click **Submit**. Changes are applied immediately to the XPort AR.

Modem Emulation

Configure the modem emulation settings when selecting Modem Emulation as the Tunnel 1 or Tunnel 2 Connect Mode type.

To configure modem emulation:

1. Select **Tunnel 1 → Modem Emulation** from the navigation menu. The Tunnel 1 Modem Emulation window displays.

Figure 4-10. Tunnel 1 Modem Emulation

The screenshot shows the LANTRONIX XPort AR web manager interface. The left sidebar contains a navigation menu with items like Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The top navigation bar has tabs for Tunnel 1 and Tunnel 2. The main content area is titled 'Tunnel 1- Modem Emulation' and includes sections for 'Statistics', 'Serial Settings', 'Start/Stop Chars', 'Accept Mode', 'Connect Mode', 'Disconnect Mode', 'Packing Mode', 'Modem Emulation', and 'AES Keys'. The 'Modem Emulation' section contains settings for Echo Pluses, Echo Commands, Verbose Response Codes, Response Codes, Error Unknown Commands, and a Connect String field with a 'Submit' button. A 'Current Configuration' table is shown below, listing the current values for these settings. On the right, there is a 'Help' section with explanatory text for various features.

Current Configuration	
Echo Pluses:	Off
Echo Commands:	On
Verbose Response Codes:	On
Response Codes:	Text
Error Unknown Commands:	Off
Optional Connect String:	<None>

2. Enter or modify the following fields:

Echo Pluses	Select On to echo “+++” when entering modem command mode
Echo Commands	Select On to echo the modem commands to the console.
Verbose Response Codes	Select On to send modem response codes out on the serial line.
Response Codes	Select the type of response code from either Text or Numeric .
Connect String	Enter the connect string . This modem initialization string prepares the modem for communications. It is a customized string sent with the “CONNECT” modem response code.

3. Click **Submit**. Changes are applied immediately to the XPort AR.

Start and Stop Characters

The XPort AR can be configured to start a tunnel when it receives a specific start character from the serial port. The XPort AR can also be configured to disconnect upon receiving the stop character.

To configure the start and stop characters mode:

1. Select **Tunnel 1** → **Stop/Start Chars** from the navigation menu. The Tunnel 1 Start/Stop Chars window displays.

Figure 4-11. Tunnel 1 Start/Stop Chars

The screenshot shows the LANTRONIX XPort AR web manager interface. The left sidebar contains a navigation menu with options: Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The top navigation bar has tabs for 'Tunnel 1' and 'Tunnel 2'. The main content area is titled 'Tunnel 1- Start/Stop Chars'. It contains the following fields:

- Start Character:
- Stop Character:
- Echo Start Character: ☐ On ☐ Off
- Echo Stop Character: ☐ On ☐ Off
-

Below the form is a 'Current Configuration' table:

Start Character:	<None>
Stop Character:	<None>
Echo Start Character:	Off
Echo Stop Character:	Off

On the right side of the page, there is explanatory text:

The Start Character, when read on the Serial Line, can be used to initiate a new connection for a Tunnel in Connect Mode and enable a Tunnel in Accept Mode to start listening for connections.

The Stop Character, when read on the Serial Line, can be used to disconnect an active Tunnel connection.

Optionally, the Start/Stop Characters can be echoed (sent) or not echoed (not set) on the Tunnel when read on the Serial Line.

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2. Enter or modify the following fields:

Start Character	Enter the start character in either ASCII or hexadecimal notation.
Stop Character	Enter the start character in either ASCII or hexadecimal notation.
Echo Start Character	Select On to forward (tunnel) the start character.
Echo Stop Character	Select On to forward (tunnel) the stop character.

3. Click **Submit**. Changes are applied immediately to the XPort AR.


Disconnect Mode

Disconnect mode is disabled by default. When enabled, disconnect mode runs in the background of an active connection to determine when a disconnection is required.

To configure the tunnel's disconnect mode:

1. Click **Tunnel 1 → Disconnect Mode** from the navigation menu. The Tunnel 1 Disconnect Mode window displays.

Figure 4-12. Tunnel 1 Disconnect Mode



LANTRONIX® **XPort AR**

Status | Network | Line | Tunnel | CPM | DNS | PPP | SNMP | FTP | TFTP | Syslog | HTTP | RSS | CLI | Email | SSH | SSL | XML | Filesystem | Protocol Stack | IP Address Filter | Query Port | Diagnostics | System

Tunnel 1 | Tunnel 2

Statistics | Serial Settings | Start/Stop Chars | Accept Mode | Connect Mode | **Disconnect Mode** | Packing Mode | Modem Emulation | AES Keys

Tunnel 1- Disconnect Mode

Mode: ☐ Disabled ☐ Timeout ☐ Stop Character ☐ Modem Control Not Asserted

Timeout: milliseconds

Flush Serial Data: ☐ Enabled ☐ Disabled

Current Configuration

Mode:	Disabled
Timeout:	60000milliseconds
Flush Serial Data:	Disabled

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- Enter or modify the following fields:

Mode	Select Disabled to disable Disconnect Mode completely. Select Timeout to enable Disconnect Mode upon the timeout. Select Stop Character to enable Disconnect Mode upon receiving the stop character. Select Modem Control Not Asserted to disconnect an active connection when the Modem Control pin (DSR) is de-asserted on the serial line..
Timeout	Enter a time, in milliseconds, for the XPort AR to disconnect on a timeout (if specified as the Mode).
Flush Serial Data	Select Enabled to flush the serial data buffer on a disconnection.

- Click **Submit**. Changes are applied immediately to the XPort AR.

AES Keys – Connect Mode

Advanced Encryption Standard (AES) is an encryption algorithm for securing sensitive information by government agencies.

To configure the AES keys for connect mode:

- Click **Tunnel 1 → AES Keys – Connect** from the navigation menu. The Tunnel 1 AES Keys – Connect window displays.

Figure 4-13. AES Keys – Connect

LANTRONIX® XPort™ AR

There are four separate Advanced Encryption Standard (AES) Encryption Keys used for Tunneling, Connect Mode and Accept Mode contain their own sets of keys. One Key is used for encrypting outgoing data and the other Key is used for decrypting incoming data.

These AES Keys are a fixed 16 bytes in length. Any Keys entered that are less than 16 bytes long are padded with zeroes. Key data can be entered in as Text or Binary form. The Text form is a simple string of ASCII characters. Binary form is a string of characters representing byte values where each Hexadecimal byte value starts with 0x and each Decimal byte value starts with \.

Note that the Keys are shared secret keys so they must be known by both sides of the connection and kept secret.

Note that this device also supports SSH using AES Encryption as an alternative to secure tunneling. It is recommended that SSH be used because it does not require configuring shared secret keys and is a more secure standards based protocol: [SSH](#).

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2. Enter or modify the following fields:

Accept Mode AES Keys

Encrypt Key	Enter the value for each byte. From the pull-down menu, select the format for the byte as either character, hexadecimal, or decimal notation. Note: Any empty trailing bites that are not specified are set to 0.
Decrypt Key	Enter the value for each byte of the decrypt key. From the pull-down menu, select the format for the byte as either character, hexadecimal, or decimal notation. Note: Any empty trailing bites that are not specified are set to 0.

Connect Mode AES Keys

Encrypt Key	Enter the value for each byte. From the pull-down menu, select the format for the byte as either character, hexadecimal, or decimal notation. All trailing bytes not specified are set to 0.
Decrypt Key	Enter the value for each byte of the decrypt key. From the pull-down menu, select the format for the byte as either character, hexadecimal, or decimal notation. All trailing bytes not specified are set to 0.

3. Click **Submit**. Changes are applied immediately to the XPort AR.

Protocol Stack Configuration

To configure the XPort AR's network stack protocols:

1. Click **Network** → **Protocol Stack** from the navigation menu. The Protocol Stack window displays the settings for TCP, ICMP, and ARP.

Figure 4-14. Protocol Stack

The screenshot shows the LANTRONIX XPort AR web manager interface. The left navigation menu is expanded to 'Protocol Stack'. The main content area is divided into three sections: TCP, ICMP, and ARP. Each section has a 'Current State' table and a 'Submit' button. The ARP section also includes an 'ARP Cache' table.

TCP

Send RSTs: ☐ On ☐ Off

Current State

Send RSTs:	On
Total Out RSTs:	2
Total In RSTs:	2

ICMP

Enable: ☐ On ☐ Off

Current State

Enable:

ARP

ARP Timeout: seconds

Current State

ARP Timeout:

ARP Cache

IP Address:

MAC Address:

Current State [Clear]

Address	Age	MAC Address	Type	Interface
172.18.100.37 [Remove]	0.5	00:04:23:10:ab:5e	Dynamic	1

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2. Enter or modify the following fields:

TCP

Send RSTs

TCP contains six control bits, with one or more defined in each packet. RST is one of the control bits. The RST bit is responsible for telling the receiving TCP stack to immediately end a connection. Sending this flag may pose a security risk. Select **Off** to disable the sending of the RST flag.

ICMP

Enable	<i>Internet Control Message Protocol (ICMP) can be used as an error-reporting protocol between two hosts. Commands such as ping use this protocol. Sending and processing ICMP messages may post a security risk.</i>
---------------	---

ARP

ARP Timeout	Enter the time, in milliseconds, for the ARP timeout. This is the duration an address remains in the cache.
--------------------	---

ARP Cache

IP Address	Enter the IP address to add to the ARP table.
MAC Address	Enter the MAC address to add to the ARP table.

Note: Both the IP and MAC addresses are required for the ARP cache.

Current State

Clear	Select Clear to remove all entries in the ARP table.
Remove	Removes a specific entry from the ARP table.

- Click **Submit** after each modified field. Changes are applied immediately to the XPort AR.

Configurable Pin Manager

The XPort AR has 11 Configurable Pins (CPs). CPs can be grouped together using the Configurable Pin Manager (CPM). Each CP is associated to an external hardware pin. CPs can trigger an outside event (such as sending an email message or starting Command Mode).

CPM: Configurable Pins

To configure the XPort AR's CPs:

- Click **CPM** → **CPs** from the navigation menu. The CPM: CPs window displays.

Figure 4-15. CPM: CPs

LANTRONIX®

XPort™
AR CROSSFIRE

Status

Network

Line

Tunnel

CPM

DNS

PPP

SNMP

FTP

TFTP

Syslog

HTTP

RSS

CLI

Email

SSH

SSL

XML

Filesystem

Protocol Stack

IP Address Filter

Query Port

Diagnostics

System

CPs

Groups

CPM: CPs

Current Configuration

CP	Pin #	Configured As	State	Groups	Active In Group
CP1	PIN13	Input	1	1	<available>
CP2	PIN16	Input	1	1	<available>
CP3	PIN17	Input	1	2	<available>
CP4	PIN3	Input	1	1	<available>
CP5	PIN7	Input	1	0	<available>
CP6	PIN2	Peripheral	1	1	Serial 2 TX/RX
CP7	PIN10	Peripheral	1	1	Serial 2 TX/RX
CP8	PIN1	Input	1	1	<available>
CP9	PIN6	Input	1	2	<available>
CP10	PIN20	Input	1	1	<available>
CP11	PIN19	Input	1	1	<available>

CP Status: CP1

Name	CP01																			
Status	Enabled																			
Type	Input																			
Value	1 (ox1)																			
Bit	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1
Level	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2
I/O																				
Logic																				
State	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
CP#																				1
Groups	Serial 1 RTS / CTS																			

This page allows you to manage the Configurable Pins (CP) on the device. CPs can be grouped together and based on their state, can trigger an outside event like sending an Email message or starting the CLI on a Serial Line.

Each CP is associated with an external hardware pin and can be configured in either input or output mode. When a CP is configured as output, it can be toggled by setting the value. Whatever value is given, the first bit is used as the setting. 1 means asserted and 0 means de-asserted. Additionally, the CP logic can be inverted so that assertion is low.

A CP can be a member of multiple groups but can only be a member of one enabled group. Note that a CP can only be modified if all the groups it is a member of are disabled.

The Pin Status chart shows the current status for an individual CP. A CP contains one bit of information and the State shows the current value. The Level row shows the voltage as "+" for high and "-" for low. The I/O row shows input "I", output "O", or not available "x". An "I" in the Logic row means the CP is inverted. Lastly, a listing is shown of all groups the CP is a member of.

Set CP1 ▾ to value Submit

Set CP1 ▾ as Input ▾ ☐ Assert Low Submit

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2. The Current Configuration table displays the current settings for each CP:

Current Configuration

CP	Indicates the Configurable Pin number.
Pin #	Indicates the hardware pin number associated with the CP.
Configured As	Displays the CPs configuration. A CP configured as Input is set to read input. A CP configured as Output drives data out of the XPort AR. Peripheral is a setting assigned by the XPort AR.
Binary	A value of 1 means asserted. 0 means de-asserted. I indicates the CP is inverted.
Groups	Indicates the number of groups in which the CP is a member.
Active In Group	A CP can be a member of several groups. However, it may only be active in one group. This field displays the group in which the CP is active.

- To display the CP status of a specific pin, click the CP number under the Current Configuration table. The CP Status table displays detailed information about the CP.

CP Status

Name	Displays the CP number.
State	Current enable state of the CP. Note: <i>Peripheral pins are locked.</i>
Value	Displays the last bit in the CP's current value.
Bit	Visual display of the 32 bit placeholders for a CP.
I/O	A "+" symbol indicates the CP is asserted (the voltage is high). A "-" indicates the CP voltage is low.
Logic	An "I" indicates the CP is inverted.
Binary	Displays the assertion value of the corresponding bit.
CP#	Displays the CP number.
Groups	Lists the groups in which the CP is a member.

4. To change a CP's value:
 - a) Select the CP from the drop-down list.
 - b) Enter the CP's value.
 - c) Click **Submit**. Changes are applied immediately to the XPort AR.
5. To change a CP's configuration:
 - a) Select the CP from the drop-down list.
 - b) Select the CP's configuration from the drop-down list.
 - c) (If necessary) Select the **Assert Low** checkbox.
 - d) Click **Submit**. Changes are applied immediately to the XPort AR.

Note: *To modify a CP, all groups in which it is a member must be disabled.*

CPM: Groups

The CP Groups page allows for the management of CP groups. Create a CP group and add CPs to it. A group, based on its state, triggers outside events (such as sending email messages). Only an enabled group can be used as a trigger.

To configure the XPort AR's CP groups:

1. Click **CPM** → **Groups** from the navigation menu. The CPM: Groups window displays.

Figure 4-16. CPM: Groups

XPort™
AR®

- Status
- Network**
- Line
- Tunnel
- CPM
- DNS
- PPP
- SNMP
- FTP
- TFTP
- Syslog
- HTTP
- RSS
- CLI
- Email
- SSH
- SSL
- XML
- Filesystem
- Protocol Stack
- IP Address Filter
- Query Port
- Diagnostics
- System

CPs Groups

CPM: Groups

Current Configuration

Group Name	State	CP Info
Serial 1 DTR/DSR	Disabled	2 CPs Assigned
Serial 2 RTS/CTS	Disabled	2 CPs Assigned
Serial 3 TX/RX	Disabled	2 CPs Assigned
Serial 2 TX/RX	Enabled	2 CPs Assigned
Serial 1 RTS/CTS	Disabled	2 CPs Assigned
Serial 2 DTR/DSR	Disabled	2 CPs Assigned

This page allows you to manage the Configurable Pin (CP) Groups on the device. CPs can be grouped together and based on their state, can trigger an outside event like sending an Email message or starting the CLI on a Serial Line. Only a Group that is enabled can be used as a trigger.

Here Groups can be created and deleted, enabled and disabled, CPs added and removed, and the current value of the Group modified.

CPs can be added to a Group at a specific bit position. By default, the Next setting adds CPs to the first available position starting at bit zero.

The current value of the Group can be modified. This value is 32 bits long and is used to modify the specific bits where the CPs currently reside in the Group. For example, using a value of 5 would set the CPs at bits 0 and 2 and clear any other CPs. Using a value of 0 would clear all the CPs in the group. Note that a CP can only be modified if it is configured as output.

Group Status: Serial 1 DTR/DSR

Name:	Serial 1 DTR/DSR
State:	Disabled AND Locked
Value:	Disabled
Bit Level:	3 3 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0
I/O:	I O I O I I
Logic:	x x
State:	x x
CP#	4 2

Create Group:

Delete Group: Serial 1 DTR/DSR

Set Serial 1 DTR/DSR state to Enabled

Set Serial 1 DTR/DSR to value

Add CP1 to Serial 1 DTR/DSR at bit Next

Remove CP1 from Serial 1 DTR/DSR

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2. The Current Configuration table displays the current settings for each CP group:

Current Configuration

Group Name	Displays the CP group's name.
State	Indicates whether the group is enabled or disabled.
CP Info	Provides CP group information.

- To display the status of a specific group, click the CP group name under the Current Configuration table. The Group Status table displays, providing detailed information about the CP group.

Group Status

Name	Displays the CP Group name.
State	Current enable state of the CP group. Note: <i>Peripheral pins are locked.</i>
Value	Displays the CP group's current value.
Bit	Visual display of the 32 bit placeholders for a CP.
I/O	A "+" symbol indicates the CP's bit position is asserted (the voltage is high). A "-" indicates the CP voltage is low.
Logic	An "I" indicates the CP is inverted.
Binary	Displays the assertion value of the corresponding bit.
CP#	Displays the Configurable Pin number and its bit position in the CP group.

2. To create a CP group:
 - a) Enter a group name in the **Create Group** field.
 - b) Click **Submit**. Changes are applied immediately to the XPort AR.
3. To delete a CP group:
 - a) Select the CP group from the **Delete Group** drop-down list.
 - b) Click **Submit**. Changes are applied immediately to the XPort AR.
4. To enable or disable a CP group:
 - a) Select the CP group from the **Set** drop-down list.
 - b) Select the state (**Enabled** or **Disabled**) from the drop-down list.
 - c) Click **Submit**. Changes are applied immediately to the XPort AR.
5. To set a CP group's value:
 - a) Select the CP group from the **Set** drop-down list.
 - b) Enter the CP group's value in the **value** field.
 - c) Click **Submit**. Changes are applied immediately to the XPort AR.
6. To add CP to a CP group:
 - a) Select the CP from the **Add** drop-down list.
 - b) Select the CP group from the drop-down list.
 - c) Select the CP's bit location from the **bit** drop-down menu.
 - d) Click **Submit**. Changes are applied immediately to the XPort AR.
7. To delete a CP from a CP group:
 - a) Select the CP from the **Remove** drop-down list.
 - b) Select the CP group from the drop-down list.
 - c) Click **Submit**. Changes are applied immediately to the XPort AR.

DNS Configuration

To configure the XPort AR's DNS configuration:

1. Click **Network** → **DNS** from the navigation menu. The DNS window displays.

Figure 4-17. DNS Settings

LANTRONIX® **XPort™**
AR

Status Network Line Tunnel CPM DNS PPP SNMP FTP TFTP Syslog HTTP RSS CLI Email SSH SSL XML Filesystem Protocol Stack IP Address Filter Query Port Diagnostics System

DNS

Primary Server:
Secondary Server:

Current Configuration

Primary DNS:	172.18.0.11 (DHCP)
Static config:	<None>
Secondary DNS:	172.16.1.26 (DHCP)
Static config:	<None>

DNS Cache

There are no entries in the cache.

This page displays the current configuration of the DNS subsystem.
You may configure the Primary and Secondary static server addresses. If the current configuration shows an address comes from DHCP or BOOTP, your new static address will override until you reboot the device.
When a DNS name is resolved using a forward lookup, the results are temporarily stored in the DNS cache. This cache is consulted first when performing forward lookups. Each item in the cache will eventually timeout and be removed after a certain period of time or can be deleted manually.

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2. Enter or modify the following fields:

DNS

Primary Server	Enter the DNS primary server address.
Secondary Server	Enter the DNS secondary server address.

Current Configuration

Primary Server	Displays the current Primary Server address. Select Delete to remove this value.
Secondary Server	Displays the current Secondary Server address. Select Delete to remove this value.

3. Click **Submit**. Changes are applied immediately to the XPort AR.

PPP

Point-to-Point Protocol (PPP) establishes a direct connection between two nodes. It defines a method for data link connectivity between devices using physical layers (such as serial lines).

The XPort AR supports two types of PPP authorization: Password Authentication Protocol (PAP) and Challenge Handshake Protocol (CHAP). Both of these authentication methods require the configuration of a username and password. It also supports no authentication scheme when no authentication is required during link negotiation.

Note: The following section describes the steps to configure PPP 1 (PPP on serial line 1); these steps also apply to PPP 2.

To configure the XPort AR's PPP configuration:

1. Click **Network** → **PPP Line 1** from the navigation menu. The PPP – Line 1 window displays.

Figure 4-18. PPP Settings

The screenshot shows the LANTRONIX XPort AR web manager interface. On the left is a navigation menu with options: Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The 'Network' menu is selected, and 'Line 1' is chosen from the sub-menu. The main area is titled 'PPP: Line 1'. It contains configuration fields: Local IP Address, Peer IP Address, Network Mask, Auth Mode (radio buttons for None, PAP, CHAP), Auth Username, and Auth Password. A 'Submit' button is below these fields. Below the configuration fields is a 'Current Configuration' table:

Mode:	Disabled
Local IP Address:	<None>
Peer IP Address:	<None>
Network Mask:	<None>
Auth Mode:	None
Auth Username:	<None>
Auth Password:	<None>

On the right side of the page, there is explanatory text: 'This page is used to configure a network link using PPP over a serial line. In order to enable PPP, no other features can be enabled on the serial line. Tunneling (Connect and Accept modes) and Command Mode must both be turned off before proceeding. It's important to note that this device acts as the server side of the PPP link. This device can force authentication and is able to assign an IP Address to the peer. Once the PPP interface is up, IP packets are routed appropriately to and from the Ethernet and PPP interfaces. The Local IP Address is the IP Address that will be assigned to the PPP interface on the device. The Peer IP Address is the IP Address that will be assigned to the peer if asked during negotiation. There are three different authentication schemes supported by this device. None which means no authentication is necessary during link negotiation, the Password Authentication Protocol (PAP) and Challenge-Handshake Authentication Protocol (CHAP). PAP and CHAP require that a username and password be configured for the PPP interface. The Auth Username and Auth Password are the credentials used by the PAP, CHAP, and MS-CHAP authentication protocols during link negotiation. If authentication is to be used on the PPP interface, the peer must be configured to use this username and password.'

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2. Enter or modify the following fields:

Local IP Address	Enter the IP address assigned to the device's PPP interface.
Peer IP Address	Enter the IP address assigned to the peer (when requested during negotiation).
Network Mask	Enter the network mask.
Auth. Mode	Choose the authentication mode. Select None when no authentication is required. Select PAP for Password Authentication Protocol. Select CHAP for the Challenge Handshake Authentication Protocol.

Auth. Username	Enter the username for use if authentication is used on the PPP interface.
Auth. Password	Enter the password for use if authentication is used on the PPP interface.

- Click **Submit**. Changes are applied immediately to the XPort AR

SNMP Configuration

To configure SNMP:

- Click **Network** → **SNMP** from the navigation menu. The SNMP window opens and displays the current SNMP configuration.

Figure 4-19. SNMP Configuration

LANTRONIX[®] **XPort[™] AR**

Status | Network | Line | Tunnel | CPM | DNS | PPP | **SNMP** | FTP | TFTP | Syslog | HTTP | RSS | CLI | Email | SSH | SSL | XML | Filesystem | Protocol Stack | IP Address Filter | Query Port | Diagnostics | System

SNMP

SNMP Agent: ☐ On ☐ Off

Read Community:

Write Community:

System Contact:

System Name:

System Description:

System Location:

Enable Traps: ☐ On ☐ Off

Primary TrapDest IP:

Secondary TrapDest IP:

Current Configuration

SNMP Agent Status:	Running (On)
Read Community:	<Configured> [Delete]
Write Community:	<Configured> [Delete]
System Contact:	<None>
System Name:	xport [Delete]
System Description:	Lantronix XPort AR [Delete]
System Location:	<None>
Traps Enabled:	On
Primary TrapDest IP:	<None>
Secondary TrapDest IP:	<None>

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- Enter or modify the following fields:

SNMP Agent	Select On to enable SNMP.
Read Community	Enter the SNMP read-only community string.
Write Community	Enter the SNMP read/write community string.
System Contact	Enter the name of the system contact.
System Name	Enter the system name.
System Description	Enter the system description.
System Location	Enter the system location.

Enable Traps	Select On to enable the transmission of the SNMP cold start trap messages. This trap is generated during system boot.
Primary TrapDest IP	Enter the primary SNMP trap host.
Secondary TrapDest IP	Enter the secondary SNMP trap host.

3. In the **Current Configuration** table, delete and clear currently stored fields as necessary.
4. Click **Submit**. Changes are applied immediately to the XPort AR.

FTP Configuration

To configure FTP:

1. Click **Network** → **FTP** from the navigation menu. The FTP window opens to display the current configuration.

Figure 4-20. FTP Configuration

The screenshot displays the LANTRONIX XPort AR web interface. On the left is a vertical navigation menu with items: Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP (highlighted), TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The main content area is titled 'FTP'. It contains the following configuration options:

- FTP Server: ☐ On ☐ Off
- Username:
- Password:
- Submit button

Below the configuration fields is a table titled 'Current FTP Configuration and Statistics':

FTP Status:	On (running)
FTP Username:	admin
FTP Password:	<Configured> [Reset]
Connections Rejected:	0
Connections Accepted:	0
Active Connections:	0
Last Client:	No device has connected

At the bottom of the page, it says: Copyright © Lantronix, Inc. 2006. All rights reserved.

2. Enter or modify the following fields:

FTP

FTP Server	Select On to enable the FTP server.
Username	Enter the username to use when logging in via FTP.
Password	Enter the password to use when logging in via FTP.

3. In the **Current FTP Configuration and Statistics** tables, reset currently stored fields as necessary by clicking the **Reset** link.

- Click **Submit**. Changes are applied immediately to the XPort AR.

TFTP Configuration

To configure TFTP:

- Click **Network** → **TFTP** from the navigation menu. The TFTP window opens to display the current configuration.

Figure 4-21. TFTP Configuration

The screenshot shows the LANTRONIX XPort AR web manager interface. On the left is a navigation menu with items like Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The 'TFTP' item is selected. The main content area is titled 'TFTP' and contains two radio button options: 'TFTP Server:' with 'On' selected and 'Off' unselected, and 'Allow TFTP File Creation:' with 'On' selected and 'Off' unselected. Below these is a 'Submit' button. A section titled 'Current TFTP Configuration and Statistics' contains a table with the following data:

TFTP Status:	On (running)
TFTP File Creation:	Disabled
Files Downloaded:	0
Files Uploaded:	0
File Not Found Errors:	0
File Read Errors:	0
File Write Errors:	0
Unknown Errors:	0
Last Client:	No device has connected

On the right side of the page, there is a warning message: 'This page displays the current status and various statistics for the TFTP Server. The Allow TFTP File Creation boolean specifies whether or not the TFTP Server can create a file if it does not already exist. Be careful when turning this feature on as it opens the device up to possible Denial-of-Service (DoS) attacks against the filesystem.'

At the bottom of the page, it says 'Copyright © Lantronix, Inc. 2006. All rights reserved.'

- Enter or modify the following fields:

TFTP

TFTP Server	Select On to enable the FTP server.
Allow TFTP File Creation	Enable the automatic creation of files stored by the TFTP server.

- In the **Current TFTP Configuration and Statistics** table, reset currently stored fields as necessary by clicking the **Reset** link.
- Click **Submit**. Changes are applied immediately to the XPort AR.

IP Address Filter

The IP address filter specifies the hosts and subnets permitted to communicate with the XPort AR.

Note: If using DHCP/BOOTP, ensure the DHCP/BOOTP server is in this list.

To configure the IP address filter:

1. Click **Network** → **IP Address Filter** from the navigation menu. The IP Address Filter window opens to display the current configuration.

Figure 4-22. IP Address Filter Configuration

The IP Address Filter table contains all the IP Addresses and Subnets that **ARE ALLOWED** to send data to this device. All packets from IP Addresses not in this list are ignored and thrown away.

If the filter list is empty then all IP Address are allowed.

WARNING: If using DHCP/BOOTP, make sure the IP Address of the DHCP/BOOTP server is in the filter list.

Current State

The IP Filter Table is empty so ALL addresses are allowed.

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2. Enter or modify the following fields:

IP Address	Enter the IP address to add to the IP filter table.
Network Mask	Enter the IP address' network mask in dotted notation.

3. In the **Current State** table, click **Remove** to delete fields as necessary.
4. Click **Submit**. Changes are applied immediately to the XPort AR.

Syslog

The Syslog page shows the current configuration, status, and statistics for the syslog. Here you can configure the syslog destination and the severity of the events to log.

1. Click **Syslog** from the navigation menu. The Syslog window opens to display the current configuration.

Figure 4-23. Syslog

The screenshot shows the Lantronix XPort AR web manager interface. On the left is a vertical menu with options: Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog (highlighted), HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The main area is titled 'Syslog' and contains configuration fields: 'Syslog' with radio buttons for 'On' and 'Off', 'Host' with a text input, 'Local Port' with a text input, 'Remote Port' with a text input, and 'Severity To Log' with a dropdown menu set to 'None'. A 'Submit' button is below these fields. To the right of the configuration fields is a text box explaining the 'Severity To Log' field. Below the configuration fields is a section titled 'Current Syslog Configuration and Statistics' containing a table with the following data:

Syslog Status:	Off (not running)
Host:	<None>
Local Port:	514
Remote Port:	514
Severity Level:	<None>
Messages Sent:	0
Messages Failed:	0

At the bottom of the page, it says 'Copyright © Lantronix, Inc., 2006. All rights reserved.'

2. Enter or modify the following fields:

Host	Enter the IP address of the remote server to which system logs are sent for storage.
Local Port	Enter the number of the local port on the EDS to which system logs are sent. The system log is always saved to local storage, but it is not retained through reboots. Saving the system log to a server that supports remote logging services (see RFC 3164) allows the administrator to save the complete system log history. The default is 514.
Remote Port	Enter the number of the port on the remote server that supports logging services. The default is 514.
Severity to Log	From the drop-down box, select the minimum level of system message the EDS should log. This setting applies to all syslog facilities. The drop-down list is in descending order of severity (e.g., Emergency is more severe than Alert.)

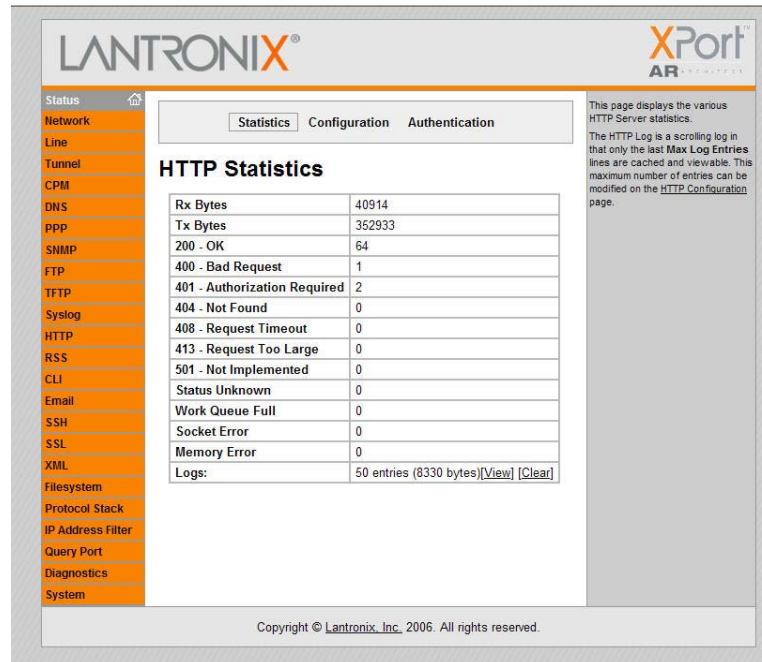
HTTP Settings

Hypertext Transfer Protocol (HTTP) is the transport protocol for communicating hypertext documents on the Internet. HTTP defines how messages are formatted and transmitted. It also defines the actions Web servers and browsers should take in response to different commands.

Select the **HTTP** link on the left menu bar to display the **HTTP** menu. The sub-menus allow for HTTP configuration, HTTP authentication administration, or RSS configuration.

To view HTTP statistics:

1. Click **HTTP → Statistics** from the navigation menu. The HTTP Statistics window displays.

Figure 4-24. HTTP Statistics**HTTP Configuration****To configure HTTP:**

1. Click **HTTP → HTTP Configuration** from the navigation menu. The HTTP Configuration window opens.

Figure 4-25. HTTP Configuration

LANTRONIX® XPort AR

Statistics Configuration Authentication

HTTP Configuration

HTTP Server: ☒ On ☐ Off

HTTP Port:

HTTPS Port:

Max Timeout: seconds

Max Bytes:

Logging: ☐ On ☐ Off

Max Log Entries:

Log Format:

Current Configuration

HTTP Status:	On (running)
HTTP Port:	80
HTTPS Port:	443
Max Timeout:	10seconds
Max Bytes:	40960
Logging:	On
Max Log Entries:	50
Log Format:	%h %t "%r" %s %B "%[Referer]" "%[User-Agent]" [Default]
Logs:	View Clear

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Log Format Directives

- %a remote IP address (could be a proxy)
- %b bytes sent excluding headers
- %B bytes sent excluding headers (0 = '-')
- %h remote host (same as '%a')
- %{h}i header contents from request (h = header string)
- %m request method
- %p ephemeral local port value used for request
- %q query string (prepend with '?' or empty '-')
- %t timestamp HH:MM:SS (same as Apache '%[Time-Scaled-S]' or '%[Time-Scaled-S]')
- %u remote user (could be bogus for 401 status)
- %U URL path info
- %r first line of request (same as '%m %U %q <version>')
- %s return status

The max length for each directive is 64 bytes. The exception is '%r' where each element is limited to 64 bytes (i.e. method, URL path info, and query string).

2. Enter or modify the following fields:

HTTP Server	Select On to enable the HTTP server.
HTTP Port	Enter the port for the HTTP server to use. The default is 80.
HTTPS Port	Enter the port for the HTTPS server to use. The default is 443. The HTTP server only listens on the HTTPS Port when an SSL certificate is configured.
Max Timeout	Enter the maximum time for the HTTP server to wait when receiving a request. This prevents Denial-of-Service (DoS) attacks. The default is 10 seconds.
Max Bytes	Enter the maximum number of bytes the HTTP server accepts when receiving a request. The default is 32 KB (this prevents DoS attacks).
Logging	Select On to enable HTTP server logging.
Max Log Entries	Sets the maximum number of HTTP server log entries. Only the last Max Log Entries are cached and viewable.
Log Format	Set the log format string for the HTTP server. The Log Format directives are as follows: %a - remote IP address (could be a proxy) %b - bytes sent excluding headers %B - bytes sent excluding headers (0 = '-') %h - remote host (same as '%a') %{h}i - header contents from request (h = header string) %m - request method

	<p>%p - ephemeral local port value used for request</p> <p>%q - query string (prepend with '?' or empty '-')</p> <p>%t - timestamp HH:MM:SS (same as Apache '%(%H:%M:%S)t' or '%(%T)t')</p> <p>%u - remote user (could be bogus for 401 status)</p> <p>%U - URL path info</p> <p>%r - first line of request (same as '%m %U%q <version>')</p> <p>%s - return status</p>
--	---

2. Click **Submit**. Changes are applied immediately to the XPort AR.

HTTP Authentication

To configure HTTP authentication settings:

1. Click **HTTP → Authentication** from the navigation menu. The HTTP Authentication window opens.

Figure 4-26. HTTP Authentication

The screenshot shows the LANTRONIX XPort AR web interface. The navigation menu on the left includes Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The main configuration area is titled 'HTTP Authentication' and contains the following fields:

- URI:
- Realm:
- AuthType: ☐ None ☐ Basic ☐ Digest ☐ SSL ☐ SSL/Basic ☐ SSL/Digest
- Username:
- Password:
-

Below these fields is a 'Current Configuration' table:

URI:	/ [Delete]
Realm:	config
AuthType:	Digest
Users:	admin [Delete]

On the right side of the page, there is a detailed explanation of the AuthType values:

The HTTP Server can be configured with many different authentication directives. The authentication is hierarchical in that any URI can be given an authentication directive in order to override a parent URI authentication directive.

The different AuthType values offer various levels of security. From the least to most secure:

- None**: no authentication necessary
- Basic**: encodes passwords using Base64
- Digest**: encodes passwords using MD5
- SSL**: page can only be accessed over SSL (no password)
- SSL/Basic**: page can only be accessed over SSL (encodes passwords using Base64)
- SSL/Digest**: page can only be accessed over SSL (encodes passwords using MD5)

Note that SSL by itself does not require a password but all data transferred to and from the HTTP Server is encrypted.

There is no real reason to create an authentication directive using **None** unless you want to override a parent directive that uses some other AuthType.

Multiple users can be configured within a single authentication directive.

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2. Enter or modify the following fields:

URI	Enter the Uniform Resource Identifier (URI).
Realm	Enter the domain, or realm, used for HTTP. Required with the URI field.
Auth Type	Select the authentication type. None means no authentication is necessary. Basic encodes passwords using Base64. Digest encodes passwords using MD5. SSL means the page can only be accessed over SSL (no password is required). SSL/Basic means the page is accessible only over SSL and encodes passwords using Base64. SSL/Digest means the

	page is accessible only over SSL and encodes passwords using MD5.
Username	Enter the Username used to access the URI .
Password	Enter the Password for the Username .

3. In the **Current Configuration** table, delete and clear currently stored fields as necessary.
4. Click **Submit**. Changes are applied immediately to the XPort AR.

Note: More than one **Username** per **URI** is permitted. Click **Submit** and enter the next **Username** as necessary.

RSS

Rich Site Summary (RSS) is a method of feeding online content to Web users. Instead of actively searching for XPort AR configuration changes, RSS feeds permit viewing only relevant and new information regarding changes made to the XPort AR via an RSS publisher. The RSS feeds are also stored to the filesystem's `cfg_log.txt` file.

To configure RSS settings:

1. Click **RSS** from the navigation menu. The RSS window opens and displays the current RSS configuration.

Figure 4-27. RSS



- Enter or modify the following fields:

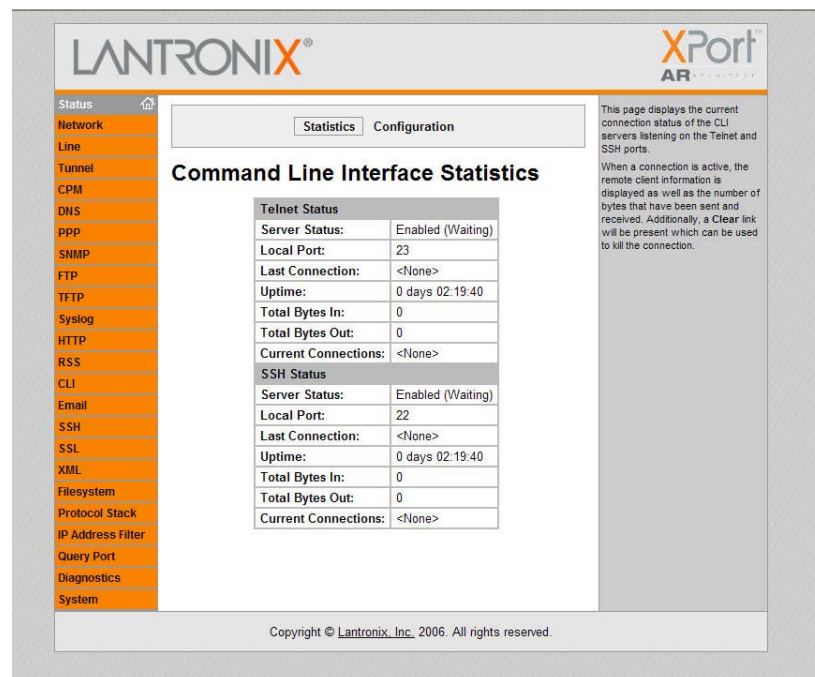
RSS Feed	Select On to enable RSS feeds to an RSS publisher.
Persistent	Select On to enable the RSS feed to be written to a file (cfg_log.txt) and available across reboots.
Max Entries	Sets the maximum number of log entries. Only the last Max Entries are cached and viewable.

- In the **Current Configuration** table, view and clear currently stored fields as necessary.
- Click **Submit**. Changes are applied immediately to the XPort AR.

Command Line Interface Settings

Select the **CLI** link on the left menu bar to display the **Command Line Interface** menu.

Figure 4-28. Command Line Interface Statistics



CLI Configuration

To configure the CLI:

- Click **CLI** → **Configuration** from the navigation menu. The Command Line Interface window displays.

Figure 4-29. Command Line Interface Configuration

LANTRONIX® **XPort™**
AR

Status **Network** Line Tunnel CPM DNS PPP SNMP FTP TFTP Syslog HTTP RSS CLI **Email** SSH SSL XML Filesystem Protocol Stack IP Address Filter Query Port Diagnostics System

Statistics Configuration

Command Line Interface Configuration

Telnet Access: ☐ On ☐ Off
 Telnet Port:
 SSH Access: ☐ On ☐ Off
 SSH Port:
 Password:
 Enable Password:
 Quit connect line:

Current Configuration

Telnet Access:	Enabled
Telnet Port:	23
SSH Access:	Enabled
SSH Port:	22
Password:	<None>
Enable Level Password:	<None>
Quit connect line:	<control>L

Both the Telnet Port and SSH Port used by the CLI servers can be overridden.
 The Password is used for initial Telnet login access.
 For the SSH server, the SSH Server Authorized Users are used for initial login access.
 The Enable Password is used for access to the 'enable' level within the CLI.
 The Quit connect line string is used to terminate a connect line session and resume the CLI. Type <control> before any key to be pressed while holding down the Ctrl key, for example, <control>L.

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2. Enter or modify the following fields:

Telnet Access	Select On to enable Telnet access. Telnet is enabled by default.
Telnet Port	Enter the Telnet port to use for Telnet access. The default is 23.
SSH Access	Select On to enable SSH access. SSH is enabled by default.
SSH Port	Enter the SSH port to use for SSH access. The default is 22.
Password	Enter the password for Telnet access.
Enable Password	Enter the password for access to the Command Mode Enable level. There is no password by default.
Quit connect line	Enter a string to terminate a connect line session and resume the CLI. Type <control> before any key the user must press when holding down the Ctrl key. An example of a such a string is <control>L .

3. Click **Submit**. Changes are applied immediately to the XPort AR.

Email Configuration

The XPort AR allows for the configuration of four email alerts relating to the Configuration Pins (CPs). Select the **Email** link on the left menu bar to display the **Email** menu and statistics.

Note: The following section describes the steps to configure **Email 1**; these steps also apply to **Email 2**, **Email 3**, and **Email 4** menu options.

Figure 4-30. Email Statistics



To configure XPort AR's email settings:

1. Click **Email** → **Configuration** from the navigation menu. The Email Configuration window opens and displays the current Email configuration.

Figure 4-31. Email Configuration

LANTRONIX® **XPort AR**

Status | Network | Line | Tunnel | CPM | DNS | PPP | SNMP | FTP | TFTP | Syslog | HTTP | RSS | CLI | Email | SSH | SSL | XML | Filesystem | Protocol Stack | IP Address Filter | Query Port | Diagnostics | System

Email 1 | Email 2 | Email 3 | Email 4

Statistics | Configuration | Send Email

Email 1- Configuration

To:

Cc:

From:

Reply-To:

Subject:

File:

Overriding Domain:

Server Port:

Local Port: or Random

Priority: ☐ Urgent ☐ High ☐ Normal ☐ Low ☐ VeryLow

CP Send: Group: Value:

Current Configuration

To:	<None>
Cc:	<None>
From:	<None>
Reply-To:	<None>
Subject:	<None>
File:	<None>
Overriding Domain:	<None>
Server Port:	25
Local Port:	Random
Priority:	Normal
CP Send:	Disabled

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When configuring the Email subsystem for delivery of Email notifications, at the very least the To and From fields must be configured.

The File field is used to specify a file on the filesystem that must be sent with all notification Email messages. This file is inserted as the message text, not as an attachment.

The Overriding Domain is used to forge the sender Domain Name in the outgoing Email message. This might be necessary, for example, if this device is located behind a firewall whose IP Address resolves to a different Domain Name than this device. For SPAM protection, many SMTP servers perform reverse lookups on the sender IP Address to ensure the Email message is really from who it says it's from.

An Email can be sent based on a CP Group trigger. When the specified value matches the current value of the group, an Email message is sent.

For testing purposes you can send a Email immediately by pressing the Send Email button.

2. Enter or modify the following fields:

To	Enter the email address to which the email alerts will be sent.
CC	Enter the email address to which the email alerts will be CCed.
From	Enter the email address to list in the From field of the email alert.
Reply-To	Enter the email address to list in the Reply-To field of the email alert.
Subject	Enter the subject for the email alert.
File	Enter the path of the file to send with the email alert. This file displays within the message body of the email.
Overriding Domain	Enter the domain name to override the current domain name in EHLO (Extended Hello).
Server Port	Enter the SMTP server port number. The default is a random port number.
Local Port	Enter the local port to use for email alerts.
Priority	Select the priority level for the email alert.

CP Send	Configure this field to send an email based on a CP Group trigger. An email is sent when the specified Value matches the current Group 's value.
----------------	--

3. In the **Current Configuration** table, delete currently stored fields as necessary.
4. Click **Submit**. Changes are applied immediately to the XPort AR.

SSH Settings

Secure Shell (SSH) is a protocol used to access a remote computer over an encrypted channel. It is a protocol for managing the security of data transmission over the Internet. It provides encryption, authentication, and message integrity services. Select the **SSH** link on the left menu bar to display the **SSH** menu over an encrypted channel. The sub-menus allow for the configuration of the SSH server (when the XPort AR acts as the server) and the SSH client (when the XPort AR acts as the client).

SSH Server's Host Keys

To configure the SSH server's host keys:

1. Click **SSH → Server Host Keys** from the navigation menu. The SSH Server: Host Keys window displays.

Figure 4-32. SSH Server: Host Keys

The screenshot shows the LANTRONIX XPort AR web interface. The left navigation menu is on the left, with 'SSH' selected. The top status bar shows 'SSH Server: Host Keys' and 'SSH Client: Known Hosts'. The main content area is titled 'SSH Server: Host Keys' and contains three sections:

- Upload Keys:** Includes fields for 'Private Key' and 'Public Key', each with a 'Browse...' button. Below these is a 'Key Type' section with radio buttons for 'RSA' and 'DSA', and a 'Submit' button.
- Create New Keys:** Includes a 'Key Type' section with radio buttons for 'RSA' and 'DSA', a 'Bit Size' section with radio buttons for '512', '768', and '1024', and a 'Submit' button.
- Current Configuration:** Includes a table with two rows: 'Public RSA Key' and 'Public DSA Key', both showing 'No RSA Key Configured' and 'No DSA Key Configured'.

On the right side of the main content area, there is a warning message: 'WARNING: When generating new keys, using a large Bit Size will result in a VERY LONG key generation time. Tests on this hardware have shown it can take upwards of: 2 minutes for a 512 bit RSA Key, 5 minutes for a 768 bit RSA Key, 15 minutes for a 1024 bit RSA Key, 30 minutes for a 512 bit DSA Key, 70 minutes for a 1024 bit DSA Key. Note that some SSH Clients require RSA Host Keys to be at least 1024 bits in size.'

2. Enter or modify the following fields:

Host Keys

Private Key	Browse and locate the private key. Required when the Public Key is specified.
Public Key	Browse and locate the public key. Required when the Private Key is specified
Key Type	Select the key type. DSA is more secure than RSA . <i>Note: One set of RSA keys and one set of DSA keys are accepted.</i>

- Click **Submit**. Changes are applied immediately to the XPort AR.
- To create new keys, select the following option buttons:

Create New Keys

Key Type	Select RSA or DSA .
Bit Size	Select the size of the key. Large bit keys require more time to generate. <i>Note: Certain SSH clients require RSA host keys to be at least 1024 bits.</i>

- Click **Submit**. Changes are applied immediately to the XPort AR.

SSH Server's Authorized Users

To configure the SSH server's authorized users:

- Click **SSH → Server Authorized Users** from the navigation menu. The SSH Server: Authorized Users window displays.

Figure 4-33. SSH Server: Authorized Users

The screenshot shows the LANTRONIX XPort AR web interface. The navigation menu on the left includes options like Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The main content area is titled 'SSH Server: Authorized Users' and contains the following fields and buttons:

- SSH Server: Host Keys** and **SSH Client: Known Hosts** tabs.
- SSH Server: Authorized Users** and **SSH Client: Users** sub-tabs.
- Username:**
- Password:**
- Public RSA Key:** **Browse...**
- Public DSA Key:** **Browse...**
- Add/Edit** button
- Current Configuration** section: No Authorized Users are currently configured for the SSH Server.

A sidebar on the right contains the following text:

The SSH Server Authorized Users are used by all applications that play the role of an SSH Server. Specifically the Command Line Interface (CLI) and Tunneling in Accept Mode.

Every user account must have a Password.

The user's Public Keys are optional and only necessary if public key authentication is wanted. Using public key authentication will allow a connection to be made without the password being asked.

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- Enter or modify the following fields:

Authorized Users

Username	Enter the username for an authorized user. Required when the Password is specified.
Password	Enter the password for SSH login to the XPort AR. Required when the Username is specified.
Public RSA Key	Browse and locate the RSA public key for this authorized user. This is used for key authentication. When successful, no password is requested.
Public DSA Key	Browse and locate the DSA public key for this authorized user. This is used for key authentication. When successful, no password is requested.

- Click **Submit**. Changes are applied immediately to the XPort AR.

SSH Client Known Hosts

To configure the SSH client's known hosts:

- Click **SSH → Client Known Hosts** from the navigation menu. The SSH Client: Known Hosts window displays.

Figure 4-34. SSH Client: Known Hosts

The screenshot shows the LANTRONIX XPort AR web interface. On the left is a navigation menu with items like Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The top header features the LANTRONIX logo and the XPort AR logo. The main content area is titled 'SSH Client: Known Hosts' and contains the following elements:

- Navigation tabs: SSH Server: Host Keys, SSH Client: Known Hosts (selected), SSH Server: Authorized Users, and SSH Client: Users.
- Form fields:
 - Server: [text input]
 - Public RSA Key: [text input] with a 'Browse...' button.
 - Public DSA Key: [text input] with a 'Browse...' button.
 - A 'Submit' button.
- Current Configuration section: 'No Known Hosts are currently configured for the SSH Client.'
- Help text on the right: 'The SSH Client Known Hosts are used by all applications that play the role of an SSH Client. Specifically Tunneling in Connect Mode. Configuring these public keys are optional but if they exist another layer of security is offered which helps prevent Man-in-the-Middle (MITM) attacks. Specify either a DNS Hostname or IP Address when adding public host keys for a Server. This Server name should match the name used as the Remote Address in Connect Mode Tunneling.'
- Footer: 'Copyright © Lantronix, Inc. 2006. All rights reserved.'

- Enter or modify the following fields:

Server	Enter the hostname or IP address of the remote server location.
Public RSA Key	Click Browse to locate the public RSA key to use when authenticating the connection to the server.

Public DSA Key

Click **Browse** to locate the public DSA key to use when authenticating the connection to the server.

Note: These fields are not required for communication. They protect against Man-In-The-Middle (MITM) attacks.

3. In the **Current Configuration** table, delete currently stored fields as necessary.
4. Click **Submit**. Changes are applied immediately to the XPort AR.

SSH Client User Configuration

To configure the SSH client's users:

1. Click **SSH → SSH Client Users** from the navigation menu. The SSH Client: Users window displays.

Figure 4-35. SSH Client: Users

The screenshot shows the LANTRONIX XPort AR web manager interface. The left sidebar contains a navigation menu with options like Status, Network, Line, Tunnel, CPM, DNS, PPP, SNMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL, XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The main content area is titled 'SSH Client: Users'. It has tabs for 'SSH Server: Host Keys', 'SSH Client: Known Hosts', 'SSH Server: Authorized Users', and 'SSH Client: Users'. The 'SSH Client: Users' tab is active. Below the tabs, there are input fields for 'Username', 'Password', 'Remote Command', 'Private Key' (with a 'Browse...' button), and 'Public Key' (with a 'Browse...' button). There are radio buttons for 'Key Type' (RSA or DSA) and an 'Add' button. Below this is a 'Create New Keys' section with a note: 'Note: User must first be created using the form above.' It has fields for 'Username', 'Key Type' (RSA or DSA), and 'Bit Size' (512, 768, or 1024), along with a 'Submit' button. At the bottom, there is a 'Current Configuration' section stating 'No Users are currently configured for the SSH Client.' On the right side of the main content area, there is a warning message about SSH Client Known Hosts and a table showing key generation times for different bit sizes and key types.

2. Enter or modify the following fields:

Username	Enter the XPort AR's username for use when connecting to the server.
Password	Enter the password associated with the username.
Remote Command	Enter the remote command to provide to the server. This command triggers the desired or appropriate application to execute. A shell starts by default.
Private Key	Browse and locate the private key to use for authentication with the remote server.

Public Key	Browse and locate the public key to use for authentication with the remote server.
Key Type	Select the key type. DSA is more secure than RSA .

- To create new keys, select the following option buttons:

Create New Keys

Key Type	Select RSA or DSA .
Bit Size	Select the size of the key. Note: Large bit keys require more time to generate.

- Click **Submit**. Changes are applied immediately to the XPort AR.
- In the **Current Configuration** table, delete currently stored fields as necessary.
- Click **Submit**. Changes are applied immediately to the XPort AR.

SSL Settings

Secure Socket Layer (SSL) is a protocol for managing the security of data transmission over the Internet. It provides encryption, authentication, and message integrity services. SSL is widely used for secure communication to a web server.

Select the **SSL** link on the left menu bar to display the **SSL** menu. The Web Manager also permits the creation of self-signed certificates. This type of SSL certificate is a certificate not signed by a valid Certificate Authority (CA).

To configure the XPort AR's SSL settings:

- Click **SSL** from the main menu. The SSL window displays.

Figure 4-36. SSL

The screenshot displays the LANTRONIX XPort AR Web Manager interface for SSL configuration. On the left is a navigation menu with options like Status, Network, Line, Tunnel, CPM, DNS, PPP, SHMP, FTP, TFTP, Syslog, HTTP, RSS, CLI, Email, SSH, SSL (selected), XML, Filesystem, Protocol Stack, IP Address Filter, Query Port, Diagnostics, and System. The main content area is titled 'SSL' and contains three sections: 'Upload Certificate' with fields for 'New Certificate' and 'New Private Key' (each with a 'Browse...' button) and a 'Submit' button; 'Create New Self-Signed Certificate' with fields for 'Country (2 Letter Code)', 'State/Province', 'Locality (City)', 'Organization', 'Organization Unit', 'Common Name', 'Expires' (with a date picker set to 01/01/2010), and 'Bit Size' (radio buttons for 512, 768, and 1024), plus a 'Submit' button; and 'Current SSL Certificate' showing a message: 'No SSL Certificate is currently configured for the device.' On the right side, there is explanatory text about SSL certificates and a warning about generation time for large bit sizes, followed by a table:

2 minutes for a 512 bit RSA Key
4 minutes for a 768 bit RSA Key
15 minutes for a 1024 bit RSA Key

At the bottom, a copyright notice reads: 'Copyright © Lantronix, Inc. 2006. All rights reserved.'

2. Enter or modify the following fields:

Upload Certificate

New Certificate	Browse and locate the digital certificate for use in SSL communications. Required field when configuring the Private Key .
New Private Key	Browse and locate the private key. This private key is a secret and known only to the certificate's owner. Required field when configuring a New Certificate .

3. Click **Submit**. Changes are applied immediately to the XPort AR.
4. To create a new self-signed certificate, enter the following information:

Create New Self-Signed Certificate

Country	Enter the 2-letter country code.
State/Province	Enter the state or province within the country.
Locality	Enter the city within the State/Province .
Organization	The name of the organization owning the certificate.
Organization Unit	The organization's division (unit) using the certificate.
Contact Name	Enter the Contact Name for the certificate.
Expires	Enter, in mm/dd/yyyy format, the certificate's expiry date.
Bit Size	Select the certificate's bit size. Note: Large bit keys require more time to generate.

5. Click **Submit**. Changes are applied immediately to the XPort AR.

XML Configuration

The XPort AR allows for the configuration of units using an XML configuration file. Export a current configuration for use on other XPort ARs or import a saved configuration file. For more information on using XML, see [XML](#) on page 92.

Import System Configuration

To import and apply an XML configuration:

1. Click **XML** → **Import** from the navigation menu. The XML: Import System Configuration window opens.

Figure 4-37. Import System Configuration

LANTRONIX® XPort AR

Export XML Configuration Record Export XML Status Record Import XML Configuration Record

XML: Import System Configuration

Import entire external XCR file:

Import XCR file from the filesystem:
 Filename:
 Groups and Instances to Import:
 Filter:

WHOLE GROUPS TO IMPORT:

<input type="checkbox"/> arp	<input type="checkbox"/> cli
<input type="checkbox"/> command mode passwords	<input type="checkbox"/> cp
<input type="checkbox"/> cp group	<input type="checkbox"/> device
<input type="checkbox"/> email	<input type="checkbox"/> ethernet
<input type="checkbox"/> execute	<input type="checkbox"/> exit cli
<input type="checkbox"/> ftp server	<input type="checkbox"/> http authentication uni
<input type="checkbox"/> http server	<input type="checkbox"/> icmp
<input type="checkbox"/> interface	<input type="checkbox"/> ip filter
<input type="checkbox"/> line	<input type="checkbox"/> ppp
<input type="checkbox"/> query port	<input type="checkbox"/> reboot
<input type="checkbox"/> restore factory configuration	<input type="checkbox"/> rls
<input type="checkbox"/> serial command mode	<input type="checkbox"/> snmp
<input type="checkbox"/> ssh client	<input type="checkbox"/> ssh command mode
<input type="checkbox"/> ssh server	<input type="checkbox"/> ssl
<input type="checkbox"/> syslog	<input type="checkbox"/> tcp
<input type="checkbox"/> telnet command mode	<input type="checkbox"/> test
<input type="checkbox"/> tftp server	<input type="checkbox"/> tunnel accept
<input type="checkbox"/> tunnel aes accept	<input type="checkbox"/> tunnel aes connect
<input type="checkbox"/> tunnel connect	<input type="checkbox"/> tunnel disconnect
<input type="checkbox"/> tunnel modem	<input type="checkbox"/> tunnel packing
<input type="checkbox"/> tunnel serial	<input type="checkbox"/> tunnel start
<input type="checkbox"/> tunnel stop	

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2. Use one of the following methods to import the XCR file:
 - a) To import an external file, select **Import entire external XCR file** and click **Browse**. Locate the file in the Choose File window.
 - b) To import an XCR file from the filesystem, select **Import XCR file from the filesystem** and enter the filename on the XPort AR containing the file to import.
3. (Optional) Enter the filter to apply in the **Filter** field. This selects the groups to import. The format of the input is:

```
<g>:<i>;<g>:<i>; ...
```

Each group name (<g>) is followed by a colon (:) and the instance value (<i>). Each set of these ends with a semi-colon (;). If a group has no instance, specify only the group name (<g>).

4. Select from the list of checkboxes the groups to import. If no groups are selected, all the groups will be imported.
5. Click **Import**. The settings for the groups selected are applied to the XPort AR.

Export System Configuration

To export and store an XPort AR's configuration:

1. Click **XML** → **Export** from the navigation menu. The XML: Export System Configuration window opens.

Figure 4-38. Export System Configuration

LANTRONIX® XPort AR

Status Network Line Tunnel CPM DNS PPP SNMP FTP TFTP Syslog HTTP RSS CLI Email SSH SSL XML Filesystem Protocol Stack IP Address Filter Query Port Diagnostics System

Export XML Configuration Record Export XML Status Record Import XML Configuration Record

XML Configuration Record: Export System Configuration

☐ Export XCR data to browser
☒ Export XCR data to the filesystem:
 Filename:

GROUPS TO EXPORT:

<input type="checkbox"/> arp.eth0	<input type="checkbox"/> cli
<input type="checkbox"/> command mode passwords	<input type="checkbox"/> cp.1
<input type="checkbox"/> cp.10	<input type="checkbox"/> cp.11
<input type="checkbox"/> cp.2	<input type="checkbox"/> cp.3
<input type="checkbox"/> cp.4	<input type="checkbox"/> cp.5
<input type="checkbox"/> cp.6	<input type="checkbox"/> cp.7
<input type="checkbox"/> cp.8	<input type="checkbox"/> cp.9
<input type="checkbox"/> device	<input type="checkbox"/> email.1
<input type="checkbox"/> email.2	<input type="checkbox"/> email.3
<input type="checkbox"/> email.4	<input type="checkbox"/> ethernet.eth0
<input type="checkbox"/> firmware	<input type="checkbox"/> ftp server
<input type="checkbox"/> http authentication/	<input type="checkbox"/> http server
<input type="checkbox"/> icmp	<input type="checkbox"/> interface.eth0
<input type="checkbox"/> ip filter.eth0	<input type="checkbox"/> line.1
<input type="checkbox"/> line.2	<input type="checkbox"/> line.3
<input type="checkbox"/> ppp.1	<input type="checkbox"/> ppp.2
<input type="checkbox"/> query port	<input type="checkbox"/> reboot
<input type="checkbox"/> reload factory defaults	<input type="checkbox"/> rss
<input type="checkbox"/> serial command mode.1	<input type="checkbox"/> serial command mode.2
<input type="checkbox"/> serial command mode.3	<input type="checkbox"/> snmp
<input type="checkbox"/> ssh client	<input type="checkbox"/> ssh command mode
<input type="checkbox"/> ssh server	<input type="checkbox"/> ssl
<input type="checkbox"/> syslog	<input type="checkbox"/> tcp
<input type="checkbox"/> telnet command mode	<input type="checkbox"/> tftp server
<input type="checkbox"/> tunnel accept.1	<input type="checkbox"/> tunnel accept.2
<input type="checkbox"/> tunnel aes accept.1	<input type="checkbox"/> tunnel aes accept.2
<input type="checkbox"/> tunnel aes connect.1	<input type="checkbox"/> tunnel aes connect.2
<input type="checkbox"/> tunnel connect.1	<input type="checkbox"/> tunnel connect.2
<input type="checkbox"/> tunnel disconnect.1	<input type="checkbox"/> tunnel disconnect.2
<input type="checkbox"/> tunnel modem.1	<input type="checkbox"/> tunnel modem.2
<input type="checkbox"/> tunnel packing.1	<input type="checkbox"/> tunnel packing.2
<input type="checkbox"/> tunnel serial.1	<input type="checkbox"/> tunnel serial.2
<input type="checkbox"/> tunnel start.1	<input type="checkbox"/> tunnel start.2
<input type="checkbox"/> tunnel stop.1	<input type="checkbox"/> tunnel stop.2

Export

This page is used for exporting the current system configuration in XML format. The generated XML file can be imported at a later time to restore the configuration. Also, the XML file can be modified and imported to update the configuration on this device or another.

The XML data can be exported to the browser window or to a file on the filesystem. If no configuration groups are specified then all groups will be exported.

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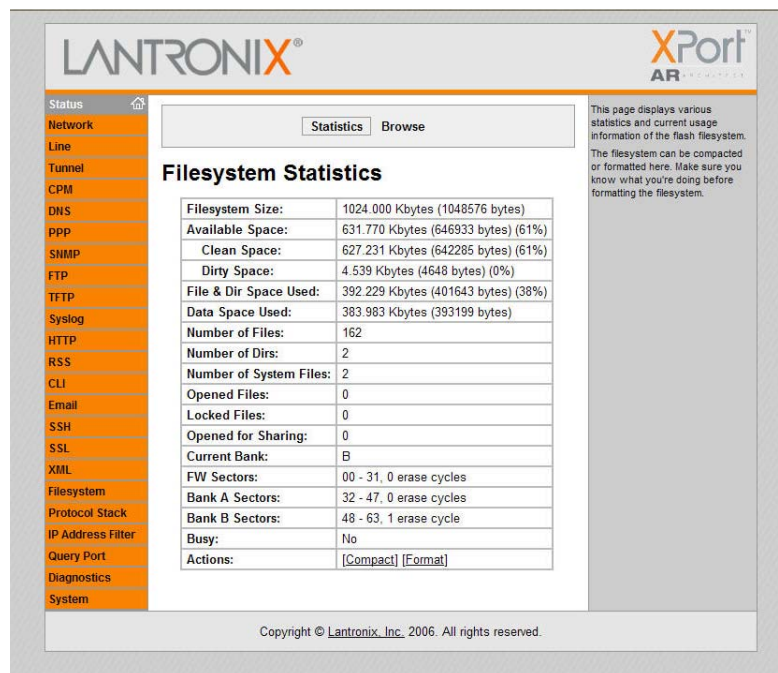
2. Use one of the following methods to export the XCR file:
 - a) To view the XCR data (without storing it), select **Export ECR data to browser**.
 - b) To export to a file on the XPort AR filesystem, select **Export XCR data to the filesystem**. In the text box, enter the name for the file. The system will create the file and store it in the root directory of the XPort AR.

3. Select from the list of checkboxes the groups to export. By default, all groups are selected except those that affect network settings.
4. Click Export. The groups display if exporting the data to the browser. If exporting to the filesystem, the files are stored on the filesystem. (To view these files or store them elsewhere, see [Filesystem Configuration](#) on page 64.)

Filesystem Configuration

The XPort AR uses a flash filesystem to store files. Use the Filesystem option to view current file diagnostics or modify files.

Figure 4-39. Filesystem



To compact or format the XPort AR's filesystem:

1. Click **Filesystem** from the navigation menu. The Filesystem window opens and displays the current filesystem statistics and usage.
2. To compact the files, click **Compact**.

Note: Data can be lost if power is cycled when compacting the filesystem.

3. To reformat the filesystem, click **Format**.

Note: All files and configuration settings on the filesystem are destroyed upon formatting, including Web Manager files. Back up all files as necessary. Upon formatting, the current configuration is lost.

To browse the XPort AR's filesystem:

1. Click **Filesystem** → **Browse** from the navigation menu. The Filesystem Browser window opens and displays the current filesystem configuration.

Figure 4-40. Filesystem Browser

LANTRONIX® **XPort™**
AR

Status **Network** Line Tunnel CPM DNS PPP SNMP FTP TFTP Syslog HTTP RSS CLI Email SSH SSL XML Filesystem Protocol Stack IP Address Filter Query Port Diagnostics System

Statistics Browse

Filesystem Browser

/ http

Create

File: Create

Directory: Create

Upload File

Browse... Upload

Copy File

Source: Destination: Copy

Move

Source: Destination: Move

TFTP

Action: ☐ Get ☐ Put
Mode: ☐ ASCII ☐ Binary
Local File:
Remote File:
Host:
Port:
Transfer

From here you can browse and manipulate the entire filesystem. Directories can be created, deleted, moved, and renamed. A directory must be empty before it can be deleted. Files can be created, deleted, moved, renamed, uploaded via HTTP, and transferred to and from a TFTP server. Newly created files will be empty.

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2. Click on a filename to view the contents.
3. Click the **X** next to a filename to delete the file or directory. A directory can only be deleted if it is empty.
4. Enter or modify the following fields:

Note: Changes apply to the current directory view. To make changes within other folders, click on the folder or directory and then enter the parameters in the fields listed below.

Create

File	Enter a filename and click Create . The XPort AR creates the empty file (0 bytes) and stores it in the current directory.
Directory	Enter a folder name and click Create . The XPort AR creates the folder and stores it in the current directory.

Upload File

Browse	Click Browse and locate the file to upload to the current filesystem directory. Click Upload to complete the process.
---------------	---

Copy File

Source	Enter the filename to copy.
Destination	Enter the folder where the Source file will be copied. Click Copy to complete the process. <i>Note: The Source and Destination filenames can be different.</i>

Move

Source	Enter the filename to move.
Destination	Enter the folder into which the Source file will be moved. Click Move to complete the process. <i>Note: When the Source and Destination filenames are different, the file and folder are renamed.</i>

TFTP

Action	Select Get or Put . Choose Get to receive a file. Choose Put to send a file.
Mode	Select ASCII or Binary .
Local File	Enter the name of the file to send to the remote location (Put) or to store locally (Get).
Remote File	Enter the name of the file on the remote location to store externally (Put) or to store locally (Get).
Host	Enter the IP address or hostname of the remote location.
Port	Enter the port number for TFTP communication. Click Transfer to complete the file transfer. The default is port 69.

Query Port

The query port (0x77FE) is used for the automatic discovery of the device by the DeviceInstaller utility. Only 0x77FE discover messages from DeviceInstaller are supported. For more information on DeviceInstaller, see [Using DeviceInstaller](#) on page 16.

To configure the query port server:

1. Click **Network** → **Query Port** from the navigation menu. The Query Port window opens to display the current configuration.

Figure 4-41. Query Port Configuration

LANTRONIX® **XPort™**
AR

Query Port

Query Port Server: ☒ On ☐ Off

Current Configuration and Statistics

Query Port Status:	On (running)
In Valid Queries:	6
In Unknown Queries:	6
In Erroneous Packets:	0
Out Query Replies:	6
Out Errors:	0
Last Connection:	172.18.13.200:28688

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2. Select **On** to enable the query port server.
3. Click **Submit**. Changes are applied immediately to the XPort AR.

Diagnostics Configuration

The XPort AR has several tools for diagnostics and statistics. Select the **Diagnostics** link on the left menu bar to display the **Diagnostics** menu. The sub-menus allow for the configuration or viewing of MIB2 statistics, IP socket information, ping, traceroute, DNS lookup, memory, buffer pools, processes, and hardware.

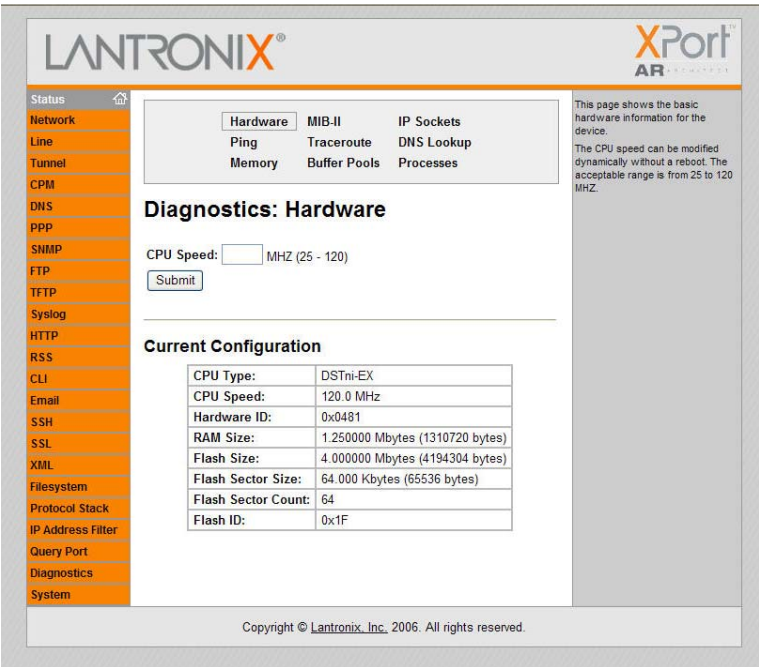
Hardware

The Hardware window displays basic hardware information and allows for the modification of the CPU speed.

To display the XPort AR's hardware diagnostics:

1. Click **Diagnostics** → **Hardware** from the navigation menu. The Diagnostics: Hardware window opens and displays current the current hardware configuration.

Figure 4-42. Diagnostics: Hardware



2. Enter or modify the following field:

CPU Speed	Enter the XPort AR's CPU speed. Accepted values are between 25 and 120 MHz.
-----------	---

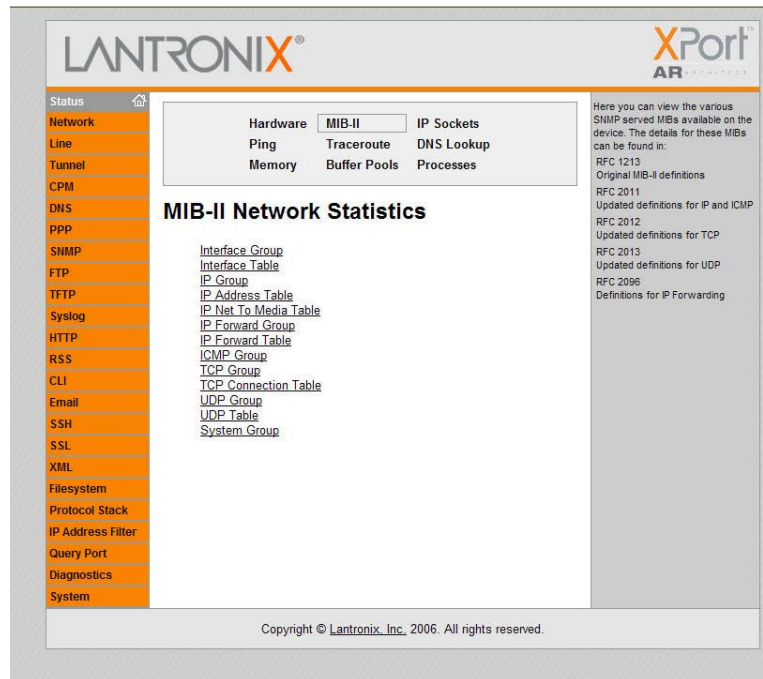
3. Click **Submit**. The CPU speed is updated immediately (no reboot required).

MIB-II Statistics

To view XPort AR's MIB-II statistics:

1. Click **Diagnostics** → **MIB-II Statistics** from the navigation menu. The MIB2 Network Statistics window opens.

Figure 4-43. MIB-II Network Statistics



- Click on any of the available links to open the corresponding table and statistics. For more information, refer to the following Requests for Comments (RFCs):

RFC 1213	Original MIB2 definitions.
RFC 2011	Updated definitions for IP and ICMP.
RFC 2012	Updated definitions for TCP.
RFC 2013	Updated definitions for UDP.
RFC 2096	Definitions for IP forwarding.

IP Sockets

To display open network sockets on the XPort AR:

- Click **Diagnostics** → **IP Sockets** from the navigation menu. The IP Sockets window opens and displays all of the open network sockets on the XPort AR.

Figure 4-44. IP Sockets

This page lists all the currently open network sockets on the device.

Protocol	RxQ	TxQ	LocalAddr:Port	RemoteAddr:Port	State
UDP	0	0	172.18.100.10:161	255.255.255.255:0	
UDP	0	0	172.18.100.10:89	255.255.255.255:0	
TCP	0	0	172.18.100.10:21	255.255.255.255:0	LISTEN
TCP	0	0	172.18.100.10:80	255.255.255.255:0	LISTEN
UDP	0	0	172.18.100.10:30718	172.18.13.200:28688	ESTABLISHED
TCP	0	0	172.18.100.10:22	255.255.255.255:0	LISTEN
TCP	0	0	172.18.100.10:23	255.255.255.255:0	LISTEN
TCP	0	0	172.18.100.10:10002	255.255.255.255:0	LISTEN
TCP	0	4	172.18.100.10:80	172.18.100.37:2253	ESTABLISHED

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Ping

To ping a remote device or computer:

- Click **Diagnostics** → **Ping** from the navigation menu. The Diagnostics: Ping window opens.

Figure 4-45. Diagnostics: Ping

Specify either a DNS Hostname or IP Address when pinging a network host. Additionally, the Count specifies the number of ping packets to send and the Timeout specifies how long to wait for a response for each ping packet sent.

Diagnostics: Ping

Host:

Count:

Timeout: seconds

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3. Enter or modify the following fields:

Host	Enter the IP address for the XPort AR to ping.
Count	Enter the number of ping packets XPort AR should attempt to send to the Host . The default is 3.
Timeout	Enter the time, in seconds, for the XPort AR to wait for a response from the host before timing out. The default is 5 seconds.

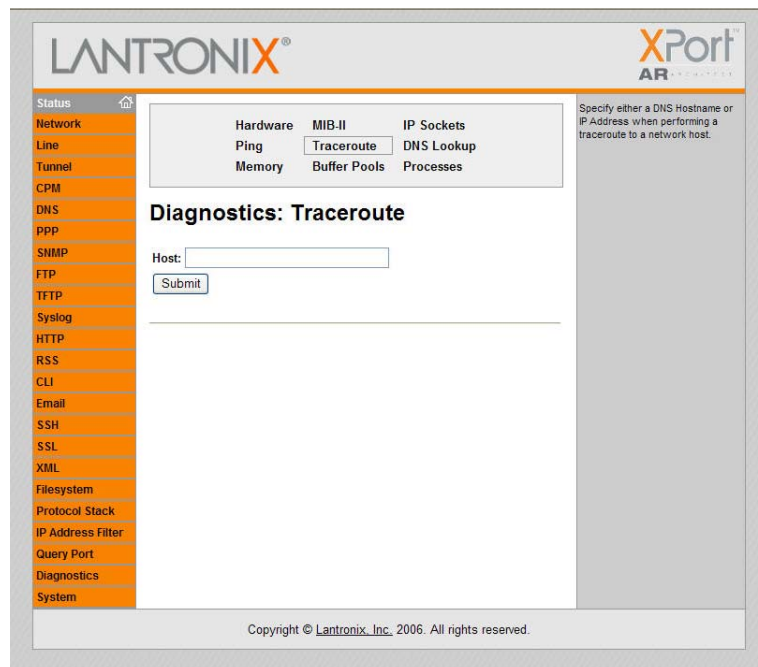
4. Click **Submit**. The results of the ping display in the window.

Traceroute

To use traceroute from the XPort AR:

1. Click **Diagnostics** → **Traceroute** from the navigation menu. The Diagnostics: Traceroute window opens.

Figure 4-46. Diagnostics: Traceroute



2. Enter or modify the following fields:

Traceroute	Enter the IP address or DNS hostname. This address is used to show the path between it and the XPort AR when issuing the traceroute command.
-------------------	--

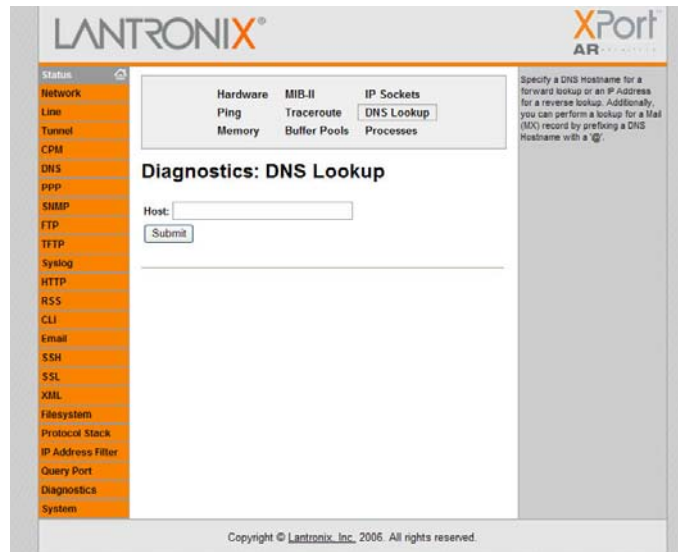
3. Click **Submit**. The results of the traceroute display in the window.

DNS Lookup

To use forward or reverse DNS lookup:

1. Click **Diagnostics** → **DNS Lookup** from the navigation menu. The Diagnostics: DNS Lookup window opens.

Figure 4-47. Diagnostics: DNS Lookup



2. Enter or modify the following field:

Host	
	Enter an IP address for reverse lookup to locate the hostname for that IP address. Enter a hostname for forward lookup to locate the corresponding IP address. Enter a domain name (prefixed with “@”) to look up the Mail Exchange (MX) record IP address.

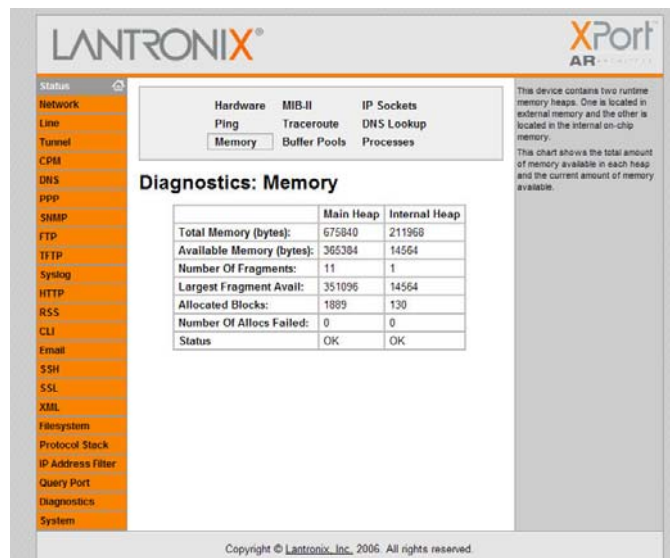
3. Click **Submit**. The results of the lookup display in the window.

Memory

To display memory statistics for the XPort AR:

1. Click **Diagnostics** → **Memory** from the navigation menu. The Diagnostics: Memory window displays.

Figure 4-48. Diagnostics: Memory



	Main Heap	Internal Heap
Total Memory (bytes):	675840	211968
Available Memory (bytes):	365384	14564
Number Of Fragments:	11	1
Largest Fragment Avail:	351096	14564
Allocated Blocks:	1889	130
Number Of Allocs Failed:	0	0
Status	OK	OK

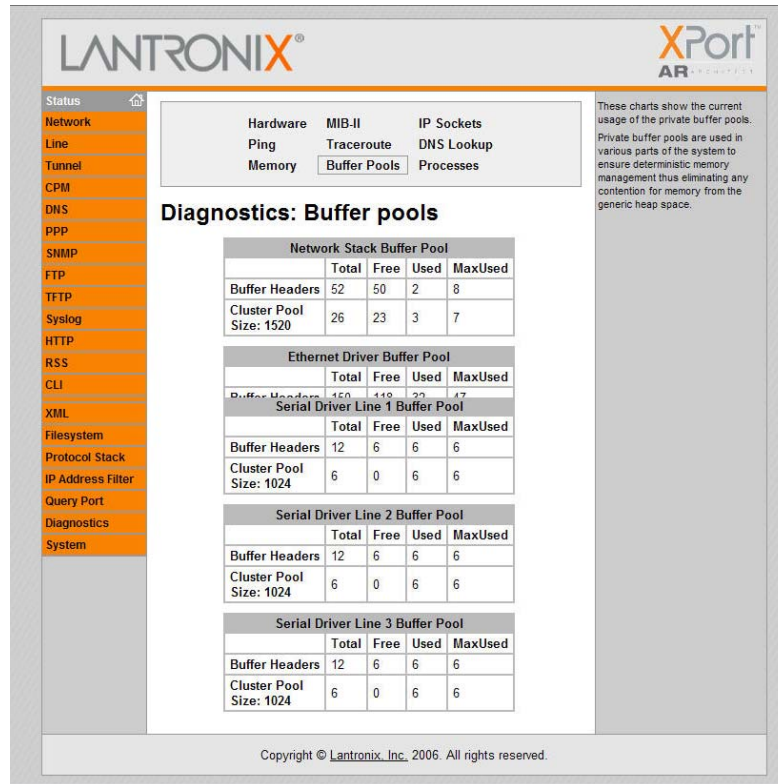
Buffer Pools

Several parts of the XPort AR system use private buffer pools to ensure deterministic memory management.

To display the XPort AR's buffer pools:

1. Click **Diagnostics** → **Buffer Pools** from the navigation menu. The Diagnostics: Buffer Pools window opens.

Figure 4-49. Diagnostics: Buffer Pools



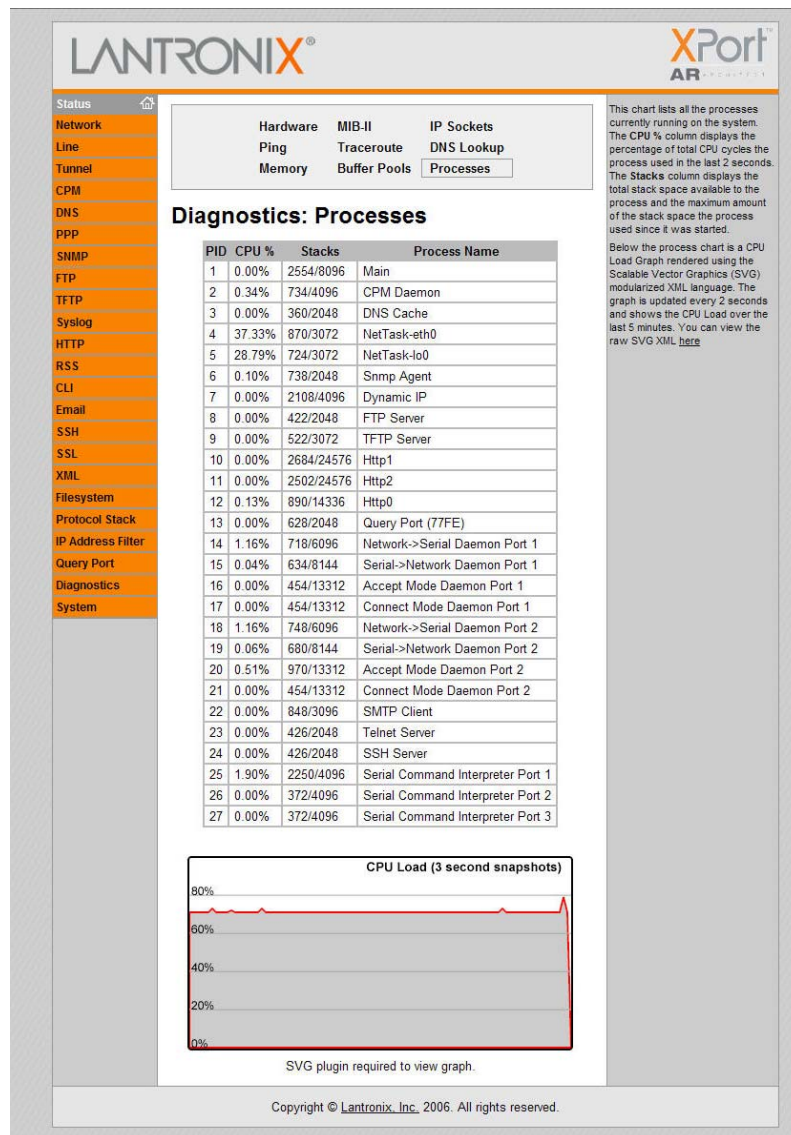
Processes

The XPort AR Processes window displays all the processes currently running on the system. It displays the Process ID (PID), the percentage of total CPU cycles a process used within the last 2 seconds, the total stack space available, the maximum amount of stack space used by the process since it started, and the process name.

To display the processes running on the XPort AR and their associated statistics:

1. Click **Diagnostics** → **Processes** from the navigation menu. The Diagnostics: Processes window opens.

Figure 4-50. Diagnostics: Processes



Note: The Adobe SVG plug-in is required to view the CPU Load Graph.

System Configuration

The XPort AR System window allows for rebooting the device, restoring factory defaults, uploading new firmware, configuring the short and long name, and viewing the current system configuration.

Figure 4-51. System


To configure the XPort AR's system settings:

1. Click **System** from the navigation menu. The System window opens.
2. Configure the XPort AR's system using the following fields:

Reboot Device	Click Reboot to reboot the XPort AR. The system refreshes and redirects the browser to the XPort AR's home page.
Restore Factory Defaults	Click Factory Defaults to restore the XPort AR to the original factory settings. All configurations will be lost. The XPort AR automatically reboots upon setting back to the defaults.
Upload New Firmware	Click Browse to locate the firmware file location. Click Upload to install the firmware on the XPort AR. The device automatically reboots upon the installation of new firmware.
Name	Enter a new Short Name and a Long Name (if necessary). The Short Name is a maximum of 8 characters. Changes take place upon the next reboot.

5: Point-to-Point Protocol (PPP)

Point-to-Point Protocol (PPP) establishes a direct connection between two nodes. It defines a method for data link connectivity between devices using physical layers (such as serial lines). Some of the PPP features include: error detection, compression, and authentication. For each of these capabilities, PPP has a separate protocol.

The XPort AR supports two types of PPP authorization: Password Authentication Protocol (PAP) and Challenge Handshake Protocol (CHAP). Both of these authentication methods require the configuration of a username and password. It also supports no authentication scheme when no authentication is required during link negotiation.

PAP is an authentication protocol in PPP. It offers a straightforward method for the peer to determine its identity. Upon the link establishment, the user ID and password are repeatedly sent to the authenticator until it is acknowledged or the connection is terminated.

Note: *PAP is not a strong authentication process. There is no protection against trial-and-error attacks. As well, the peer is responsible for the frequency of the communication attempts.*

CHAP is a more secure method than PAP. It works by sending a challenge message to the connection requestor. Using a one-way hash function, the requestor responds with its value. If the value matches the server's own calculations, authentication is provided. Otherwise, the connection is terminated.

Note: *RFC1334 defines both CHAP and PAP.*

Use the XPort AR's Web Manager or CLI to configure a network link using PPP over a serial line. Turn off Connect Mode, Accept Mode, and Command mode before enabling PPP.

The XPort AR acts as the server side of the PPP link; it can require authentication and assign an IP address to the peer. Upon PPP configuration, IP packets are routed between Ethernet and PPP interfaces.

6: Tunneling

Serial tunneling allows for devices to communicate over a network, without the realization of other devices connecting between them. Tunneling parameters are configured using the Web Manager's [Tunnel 1 and Tunnel 2 Settings](#) (on page 24) or Command Mode's Tunnel Menu (see the [XPort AR Command Reference](#) for the full list of commands.)

The XPort AR supports 2 tunneling connections simultaneously per serial port. One of these connections is Connect Mode, the other connection is Accept Mode. The connections on one serial port are separate from those on the other serial port.

- ◆ Connect Mode: the XPort AR actively makes a connection. The receiving node on the network must listen for the Connect Mode's connection. Connect Mode is disabled by default.
- ◆ Accept Mode: the XPort AR listens for a connection. A node on the network initiates the connection. Accept Mode is enabled by default.
- ◆ Disconnect Mode: this mode defines how an open connection stops the forwarding of data. The specific parameters to stop the connection are configurable. Once the XPort AR's Disconnect Mode observes the defined event occur, it will disconnect both Accept Mode and Connect Mode connections on that port.

When any character comes in through the serial port, it gets copied to both the Connect Mode connection and the Accept Mode connection (if both are active).

Connect Mode

For Connect Mode to function, it must be enabled, have a remote station (node) configured, and a remote port configured (TCP or UDP). When enabled, Connect Mode is always on.

Enter the remote station as an IP address or DNS name. The XPort AR will not make a connection unless it can resolve the address. For DNS names, after 4 hours of an active connection, the XPort AR will re-evaluate the address. If it is a different address, it will close the connection.

Connect Mode supports the following protocols:

- ◆ TCP
- ◆ AES encryption over UDP
- ◆ AES encryption over TCP
- ◆ SSH (the XPort AR is the SSH client)
- ◆ UDP (available only in Connect Mode since it is a connectionless protocol).

When setting AES encryption, both the encrypt key and the decrypt key must be specified. The encrypt key is used for data sent out. The decrypt key is used for receiving data. Both of the keys may be set to the same value.

For Connect Mode using UDP, if the remote address or port is not configured, then the XPort AR accepts packets from any device on the network. It will send packets to the last device that sent it packets. As a result, it is advised to configure the remote address and port. When the remote port and station are configured, the XPort AR ignores data from other sources.

Note: *The Local Port in Connect Mode is not the same port configured in Accept Mode.*

To ignore data sent to the XPort AR, enable the blocking of serial data or network data (or both).

The TCP keepalive time is the time in which probes are periodically sent to the other end of the connection. This ensures the other side is still connected.

To configure SSH, the SSH client username must be configured. In Connect Mode, the XPort AR is the SSH client. Ensure the XPort AR's SSH client username is configured on the SSH server before using it with the XPort AR.

Connect Mode has five states:

- ◆ Disabled (no connection)
- ◆ Enabled (always makes a connection)
- ◆ Active if it sees any character from the serial port
- ◆ Active if it sees a specific (configurable) character from the serial port
- ◆ Modem emulation

For the “any character” or “specific character” connection states, the XPort AR waits and retries the connection if the connection cannot be made. Once it makes a connection and then disconnects, it will not reconnect until it sees any character or the start character again (depending on the configured setting).

Configure the Modem Control Active setting (for DSR or DTR) to start a Connect Mode connection when the signal is asserted. The XPort AR will indefinitely try to make a connection forever. If the connection closes, it will not make another connection unless the signal is asserted again.

Accept Mode

In Accept Mode, the XPort AR waits for a connection. The configurable local port is the port the remote device connects to for this connection. There is no remote port or address. The default local port is 10001 for serial port 1 and 10002 for serial port 2.

Accept Mode supports the following protocols:

- ◆ SSH (the XPort AR is the server in Accept Mode). When using this protocol, the SSH server host keys and at least one SSH authorized user must be configured.
- ◆ TCP
- ◆ AES encryption over TCP

- ◆ Telnet/IAC mode (The XPort AR currently supports IAC codes. It drops the IAC codes when telnetting and does not forward them to the serial port).

Accept Mode has the following states:

- ◆ Disabled (close the connection)
- ◆ Enabled (always listening for a connection)
- ◆ Active if it receives any character from the serial port
- ◆ Active if it receives a specific (configurable) character from the serial port (same start character as Connect Mode's start character)
- ◆ Modem control signal

Disconnect Mode

Disconnect Mode ends Accept Mode and Connect Mode connections. When disconnecting, the XPort AR shuts down connections gracefully.

The following 3 settings end a connection:

- ◆ The XPort AR receives the stop character.
- ◆ The timeout period has elapsed and no activity is going in or out of the XPort AR. Both Accept Mode and Connect Mode must be idle for the time frame.
- ◆ The XPort AR observes the modem control inactive setting.

To clear data out of the serial buffers upon a disconnect, configure buffer flushing.

Packing Mode

Packing Mode takes data from the serial port, groups it together, and sends it out to nodes on the network. The groupings may be configured by size or by time intervals.

The following settings are configurable for Packing Mode:

- ◆ Disable Packing Mode
- ◆ The Packing Mode timeout. The data is packed for a specified period of time before being sent out.
- ◆ The Packing Mode threshold. When the buffer fills to a specified amount of data (and the timeout has not elapsed), the XPort AR packs the data and sends it out.
- ◆ The send character. Similar to a start or stop character, the XPort AR packs the data until it sees the send character. The XPort AR then sends the packed data and the send character in the packet.
- ◆ A trailing character. If a trailing character is defined, this character is appended to data put on the network immediately following the send character.

Modem Emulation

The XPort AR supports Modem Emulation mode for devices that send out modem signals. There are two different modes supported:

Command Mode: sends back verbal response codes.

Data Mode: information transferred in is also transferred out.

It is possible to change the default on bootup for verbose response codes, echo commands, and quiet mode. The current settings can be overridden, however on bootup it will go back to the programmed settings.

Configure the connect string as necessary. The connect string appends to the communication packet when the modem connects to a remote location. It is possible to append additional text to the connect message.

Command Mode

The Modem Emulation's Command Mode supports the standard AT command set. For a list of available commands from the serial or telnet login, enter **AT?**. Use **ATDT**, **ATD**, and **ATDP** to establish a connection:

+++	Switches to command mode if entered from serial port during connection.
AT?	Help.
ATDT<Address Info>	Establishes the TCP connection to socket (<IP>/<port>).
ATDP<Address Info>	See ATDT.
ATD	Like ATDT. Dials default connect mode remote address and port.
ATD<Address Info>	Sets up a TCP connection. A value of 0 begins a command line interface session.
ATO	Switches to data mode if connection still exists. Vice versa to '+++'.
ATEn	Switches echo in command mode (off - 0, on - 1).
ATH	Disconnects the network session.
ATI	Displays modem information.
ATQn	Quiet mode (0 - enable results code, 1 - disable results code.)
ATVn	Verbose mode (0 - numeric result codes, 1 - text result codes.)
ATXn	Command does nothing and returns OK status.
ATUn	Accept unknown commands. (n value of 0 = off. n value of 1 = on.)

AT&V	Display current and saved settings.
AT&F	Reset settings in NVR to factory defaults.
AT&W	Save active settings to NVR.
ATZ	Restores the current state from the setup settings.
ATS0=n	Accept incoming connection. n value of 0 = disable n value of 1 = connect automatically n value of 2+ = connect with ATA command.
ATA	Answer incoming connection (if ATS0 is 2 or greater).
A/	Repeat last valid command.

All of these commands behave like a modem. For commands that are valid but not applicable to the XPort AR, an “OK” message is sent (but the command is silently ignored).

The XPort AR attempts to make a Command Mode connection as per the IP/DNS/port numbers defined in Connect Mode. It is possible to override the remote address, as well as the remote port number.

Note: Configure either the IP address using the address on its own (<xxx.xxx.xxx.xxx>), or the IP address and port number by entering <xxx.xxx.xxx.xxx>:<port> . The port number cannot be entered on its own.

For ATDT and ATDP commands less than 255 characters, the XPort AR replaces the last segment of the IP address with the configured Connect Mode remote station address. It is possible to also use the last two segments if they’re under 255 characters. For example, if the address is 100.255.15.5, entering “ATDT 16.6” results in 100.255.16.6.

When using ATDT and ATDP, enter 0.0.0.0 to switch to Command Mode. Once Command Mode is exited, the XPort AR reverts back to modem emulation mode.

By default, the +++ characters are not passed through the connection. Turn on this capability using the **modem echo plus** command.

Serial Line Settings

Serial line settings are configurable for both serial line 1 and serial line 2.

Configure the buffer size to change the maximum amount of data the serial port stores. For any active connection, the XPort AR sends the data in the buffer. The read timeout is used for periodically sending data. If the buffer is not full (i.e. reached the buffer size) but the read timeout time has elapsed, the data in the buffer is sent out.

Statistics

The XPort AR logs statistics for tunneling. The **Dropped** statistic displays connections ended by the remote location. The **Disconnected** statistic displays connections ended by the XPort AR.

7: SSH and SSL Security

The XPort AR supports Secure Shell (SSH) and Secure Sockets Layer (SSL). These security protocols are configurable through the Web Manager (see [SSH Settings](#) on page 56 and [SSL Settings](#) on page 60) and Command Mode (see the [XPort AR Command Reference](#) for available SSH and SLL commands).

Note: This chapter overviews security configuration using Web Manager.

Secure Shell: SSH

SSH is a network protocol for securely accessing a remote device. This protocol provides a secure, encrypted communication channel between two hosts over a network.

To configure the SSH settings, there are two instances that require configuration: when the XPort AR is the SSH server and when it is an SSH client. The SSH server is used by the CLI (Command Mode) and for tunneling in Accept Mode. Use the SSH client for tunneling in Connect Mode.

SSH Server Configuration

To configure the XPort AR as an SSH server, there are two requirements:

- ◆ Defined host keys: both private and public keys are required. They keys are used for the Diffie-Hellman key exchange (used for the underlying encryption protocol).
- ◆ Defined users: these users are permitted to connect to the XPort AR's SSH server.

To configure SSH server settings:

1. Click **SSH → Server Host Keys** from the navigation menu. The SSH Server: Host Keys page displays.
2. To configure the host keys:
 - a) If the keys exist, locate the **Private Key** and **Public Key** using the **Browse** button. Select the **Key Type** (RSA is more secure) and click **Submit** to upload the keys.
 - i. SSH keys may be created on another computer and uploaded to the XPort AR. To do so, use the following command using Open SSH to create a 768-bit DSA key pair:

```
ssh-keygen -b 768 -t dsa
```

- b) If the keys do not exist, select the **Key Type** and the key's **Bit Size** from the **Create New Keys** section. Click **Submit** to create new private and public host keys.

Note: Generating new keys with a large bit size results in very long key generation time.

3. Click **SSH → Server Auth Users** from the navigation menu. The SSH Server: Authorized Users page displays.
4. Enter the **Username** and **Password** for authorized users.
5. If available: locate the **Public RSA Key** or the **Public DSA Key** by clicking **Browse**. Configuring a public key results in public key authentication; this bypasses password queries.

Note: When uploading the certificate and the private key, ensure the private key is not compromised in transit.

SSH Client Configuration

To configure the XPort AR as an SSH client, there is one requirement:

- ◆ An SSH client user is configured and exists on the remote SSH server.

To configure SSH client settings:

1. Click **SSH → Client Users** from the navigation menu. The SSH Client: Users page displays.
2. (Required) Enter the **Username** and **Password** to authenticate with the SSH server.
3. (Optional) Complete the SSH client user information as necessary. The **Private Key** and **Public Key** automate the authentication process; when configured and the user public key is known on the remote SSH server, the SSH server does not require a password. (Alternatively, generate new keys using the **Create New Keys** section.). The **Remote Command** is provided to the SSH server. It specifies the application to execute upon connection. The default is a command shell.

Note: Configuring the SSH client's known hosts is optional. It prevents Man-In-The-Middle (MITM) attacks.

Secure Sockets Layer: SSL

SSL uses cryptography to offer authentication and privacy to message transmission over the Internet. Typically, only the server is authenticated. SSL allows the communication of client/server applications without eavesdropping and message tampering. SSL uses the public-and-private key encryption system from RSA, which also includes the use of a digital certificate.

SSL runs on layers between application protocols (HTTP, SMTP, etc.) and the TCP transport protocol. It is most commonly used with HTTP (thus forming HTTPS).

On the XPort AR, configure an SSL certificate for the HTTP server to listen on the HTTPS port. This certificate can be created elsewhere and uploaded to the device.

Alternatively, it can be automatically generated on the device; this certificate type is a self-signed certificate.

Note: *When uploading the certificate and the private key, ensure the private key is not compromised in transit.*

To upload a new certificate, see [Upload Certificate](#) on page 61. To create a new self-signed certificate, see [Create New Self-Signed Certificate](#) on page 61.

8: Using Email

The XPort AR has a Simple Mail Transfer Protocol (SMTP) client. SMTP is a TCP/IP protocol used in sending and receiving email. Its objective is to send email efficiently and reliably.

There are three ways to send an email from the XPort AR:

1. Via the Web Manager (See [Configuration Using Web Manager](#) on page 18).
2. Via Command Mode by using the Send command (See the [XPort AR Command Reference](#) for available email commands under the Chem Menu).
3. By configuring a CP or a CP group (See [Configuration Pin Manager](#) on page 89). When the CP or the CP group changes state to the pre-specified value, an email alert is sent.

SMTP Configuration

This section covers email configuration using Command Mode. (For more information on Command Mode, see the [XPort AR Command Reference](#).)

The minimum requirements for SMTP configuration are:

- ◆ At least one address configured for the “To” field or “Cc” field.
- ◆ The “From” address field configured.

Note: A “Reply-To” field is also available for configuration. This differs from the “From” field in that all replies from the recipient will be sent to this address.

When configuring the “To” and “Cc” fields, separate multiple addresses with a semi-colon (;).

The email queue separates email addresses by domain. One email is sent per domain (not per email address). The XPort AR makes a connection directly to the destination SMTP server instead of a relay server. This prevents the message from not reaching the recipient because of spam filters.

Use the `File` command for the body of the email’s text. The email’s text must be saved in a file; configure the location of this message file. The XPort AR permits entering a filepath even if the file itself is not created yet. If the file does not exist when the email is sent, the body of the email reads “file does not exist”.

Priority Levels

The default priority level for the XPort AR's emails is Normal priority. The XPort AR has 5 configurable priority levels; certain recipient systems have filters based on these priority levels.

Configurable priority levels are:

Priority	XPriority Level
Urgent	1
High	2
Normal (default)	3
Low	4
Very Low	5

Some email programs may translate an Urgent priority to High, and Very Low priority to Low.

The XPort AR makes an SMTP connection to a destination server. By default, it connect to the destination's port 25. Override this port number by using the **Server Port** command.

DNS Records

Domain Name Service (DNS) translates text-based domain names to the numeric IP addresses necessary for locating the domain's server on the Internet. Many DNS servers have multiple records per domain. To resolve these addresses, the XPort AR's DNS server listing looks for MX records first. MX is the Mail Exchange Record; it is an entry in the domain name table identifying the mail server responsible for managing emails for that domain name.

If the MX record is not available, then the DNS server uses the default record. If it cannot find the default record, it will not send the email.

Extended Hello

When the XPort AR makes a connection to the recipient's SMTP server, it send an EHLO message. This message contains the XPort AR's domain.

Use the **Overriding Domain** command to change the domain provided in the EHLO message.

For a more information EHLO, see RFC 2821.

Email Statistics

Use the **show statistics** command to display the XPort AR's email statistics.

Use the `show Log` command to display the email log. When the system sends an email, the following information is logged:

1. Messages the XPort AR sends to the SMTP server.
2. Messages from the SMTP server to the XPort AR.
3. SMTP commands and replies.

Note: *The XPort AR does not log email message contents.*

9: Configuration Pin Manager

There are 11 configurable pins on the XPort AR. All CPs (except for 5) are shared by some other function on the XPort AR. Some of the CPs are assigned to serial port 1 (dtr/dsr for modem control and rts/cts for hardware flow control), others to serial port 2 (dtr/dsr for modem control, rts/cts for hardware flow control, and tx/rx groups as well).

CPs are configurable individually, or may be clustered together and configured as a single group (CP group). This increases flexibility when incorporating the XPort AR into another system.

Each CP group is a 32 bit variable. When a CP is added to a CP group, it is assigned to a bit position within the group. A CP cannot be assigned to a group until it is configured. A CP can be a member of multiple groups, but may only be active in one.

The Configurable Pin Manager (CPM) is available through the Web Manager (see [Configuration Using Web Manager](#) on page 18) or through Command Mode (see the [XPort AR Command Reference](#) for available commands through the CPM Menu).

Configurable Pins

To view a CP's configuration:

1. If using the Web Manager:
 - a) Click **CPM → CPs** from the navigation menu. The CPM: Configurable Pin window displays.
 - b) Click the specific **CP** from the Current Configuration table. The CP's configuration displays in the CP Status table.
2. If using Command Mode (the CLI):
 - a) Enter **Enable → CPM** to access the CPM level menu.
 - b) Type **show cp**.
3. The CP table displays the following:

CP	Indicates the Configurable Pin number.
Pin #	Indicates the hardware pin number associated with the CP.
Configured As	Displays the CPs configuration. A CP configured as Input is set to read input. A CP configured as Output drives data out of the XPort AR. Peripheral is a setting assigned by the XPort AR.

State	A value of 1 means asserted. 0 means de-asserted. I indicates the CP is inverted.
Groups	Indicates the number of groups in which the CP is a member.
Active In Group	A CP can be a member of several groups. However, it may only be active in one group. This field displays the group in which the CP is active.

CP Groups

To view a CP group's configuration:

- If using the Web Manager:
 - Click **CPM → Groups** from the navigation menu. The CPM: Groups window displays.
 - Click the CP groups from the Current Configuration table. The CP's configuration displays in the Group Status table.
- If using Command Mode (the CLI):
 - Enter Enable → CPM to access the CPM level menu.
 - Type **show group <name>**.
- The Group Status table displays the following:

Name	Displays the CP number.
State	Current enable state of the CP. <i>Note: Peripheral pins are locked.</i>
Value	Displays the last bit in the CP's current value.
Bit	Visual display of the 32 bit placeholders for a CP.
I/O	A "+" symbol indicates the CP is asserted (the voltage is high). A "-" indicates the CP voltage is low.
Logic	An "I" indicates the CP is inverted.
Binary	Displays the assertion value of the corresponding bit.
CP#	Displays the CP number.
Groups	Lists the groups in which the CP is a member.

The CP group table displays the CPs assigned to it. It also displays the CP's bit position within the CP group. The wave form shows the actual voltage of inputs and outputs (a value of 1 indicates a high voltage). The state shows the assertion level.

To configure a group's value:

- If using the Web Manager:
 - Click **CPM → Groups** from the navigation menu. The CPM Groups window displays
 - To create a CP group:

- i. Enter a group name in the **Create Group** field.
 - ii. Click **Submit**. Changes are applied immediately to the XPort AR.
- c) To delete a CP group:
 - i. Select the CP group from the **Delete Group** drop-down list.
 - ii. Click **Submit**. Changes are applied immediately to the XPort AR.
- d) To enable or disable a CP group:
 - i. Select the CP group from the **Set** drop-down list.
 - ii. Select the state (**Enabled** or **Disabled**) from the drop-down list.
 - iii. Click **Submit**. Changes are applied immediately to the XPort AR.
- e) To set a CP group's value:
 - i. Select the CP group from the **Set** drop-down list.
 - ii. Enter the CP group's value in the **value** field.
 - iii. Click **Submit**. Changes are applied immediately to the XPort AR.
- f) To add CP to a CP group:
 - i. Select the CP from the **Add** drop-down list.
 - ii. Select the CP group from the drop-down list.
 - iii. Select the CP's bit location from the **bit** drop-down menu.
 - iv. Click **Submit**. Changes are applied immediately to the XPort AR.
- g) To delete a CP from a CP group:
 - i. Select the CP from the **Remove** drop-down list.
 - ii. Select the CP group from the drop-down list.
 - iii. Click **Submit**. Changes are applied immediately to the XPort AR.
- 2. If using Command Mode:
 - a) Type **enable → cpm** to access the CPM level menu.
 - b) Use the add, delete, and set commands to configure values within Command Mode (for more information on these parameters, see the [XPort AR Command Reference](#)).

Note: Each CP with a bit position value of 1 (when the decimal value is converted to binary) has an asserted state.

10: XML

The XPort AR provides an Extensible Markup Language (XML) interface that can be used to configure XPort AR devices. Every configuration setting that can be issued from the XPort AR Web Manager and CLI can also be specified using XML.

The XPort AR can import and export configurations settings as XML document known as an XML configuration record (XCR). An XCR can be imported or exported via the CLI, a Web browser, FTP, the XPort AR's filesystem. An XCR being imported or exported can contain many configuration settings or just a few. For example, it might change all of the configurable parameters for an XPort AR, or it may only change the baud rate for a single serial line. Using XCRs provides a straightforward and flexible way to manage the configuration of multiple XPort AR devices.

For more information on using XML for XPort AR configuration, see the XPort AR Command Reference.

11: Branding the XPort AR

The XPort AR's Web Manager and Command Mode (CLI) are customizable.

Web Manager Customization

Customize the Web Manager's appearance by modifying the following files:

Note: To view these files, open the **http → config** folder using the *Filesystem Browser*. Alternatively, upload and download the files using *FTP/TFTP*. For more on the filesystem, see [Filesystem Configuration](#) on page 64.

Filename	Description
index.css	The Web Manager's style sheet.
footer.html	Formats the web page's footer.
header.html	Formats the web page's header.
ltrx_logo.gif	The Lantronix logo within the header. To replace the logo, ensure the replacement logo's height is 70 pixels.
bg.gif	The background image file. The background is tiled.

Command Mode

Customize the XPort AR's Command Mode by changing its short name and long name. The short name is used for show commands:

```
(enable)# show XPort
```

The long name appears in the Product Type field:

```
(enable)# show XPort
Product Information:
  Product Type: Lantronix XPort AR
```

To change the XPort AR's short and long names:

1. Click **System** from the navigation menu. The System window opens.
1. In the **Short Name** field, enter the new short name for the device, up to 8 characters.
2. In the **Long Name** field, enter the new long name for the device.
3. Click **Submit**.
4. To apply changes, click **Reboot**.

12: Updating Firmware

Obtaining Firmware

Obtain the most up-to-date firmware and release notes for the unit from the Lantronix Web site (<http://www.lantronix.com/>) or by using anonymous FTP (<ftp://ftp.lantronix.com/>).

Loading New Firmware

Reload the firmware using the XPort AR's Web Manager's System window.

To upload new firmware:

1. Click **System** from the navigation menu. The System window opens.
2. Click in the **Upload New Firmware** section, click **Browse**. A pop-up window displays; locate the firmware file.
3. Click **Upload** to install the firmware on the XPort AR. The device automatically reboots upon the installation of new firmware.

A: Technical Support

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

- ◆ Check our online knowledge base at <http://www.lantronix.com/support>.
- ◆ Contact Technical Support in the US:
Phone: 800-422-7044 (US only) or 949-453-7198
Fax: 949-450-7226
Our phone lines are open from 6:00AM - 5:30 PM Pacific Time Monday through Friday, excluding holidays.
- ◆ Contact Technical Support in Europe, Middle East, and Africa:
Phone: +49 (0) 89 31787 817
Email: eu_techsupp@lantronix.com

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

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

- ◆ Your name, and your company name, address, and phone number
- ◆ Lantronix model number
- ◆ Lantronix serial number
- ◆ Software version (on the first screen shown when you Telnet to port 9999)
- ◆ Description of the problem
- ◆ Debug report (stack dump), if applicable
- ◆ 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 you to assemble a series of options (represented as bits) into a complete command (represented as a byte). The resulting binary value must be converted to a hexadecimal representation.

Use this chapter to learn to convert binary values to hexadecimal or to look up hexadecimal values in the tables of configuration options. The tables include:

- ◆ Command Mode (serial string sign-on message)
- ◆ AES Keys

Converting Binary to Hexadecimal

Following are two simple ways to convert binary numbers to hexadecimal notation.

Conversion Table

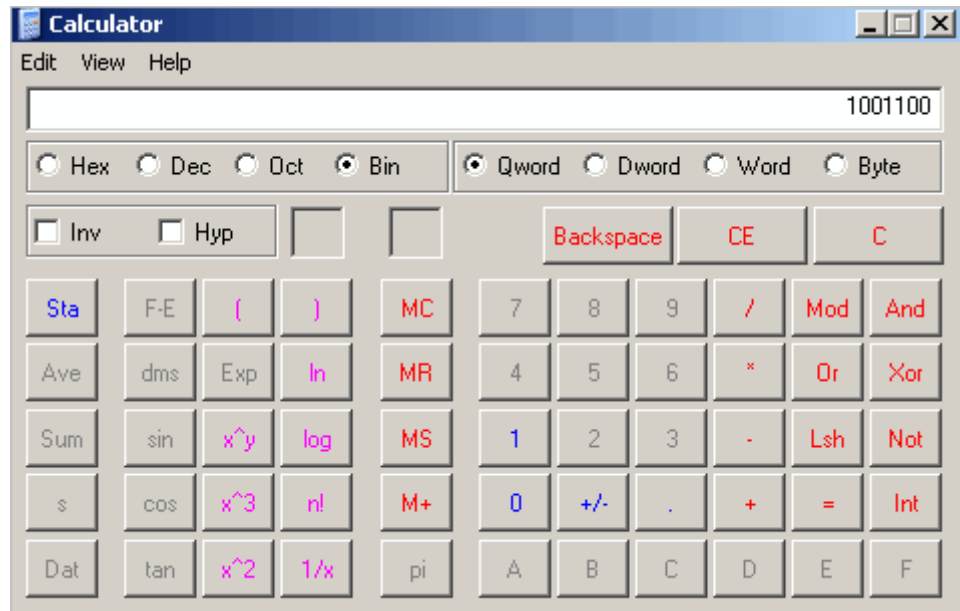
Hexadecimal digits have values ranging from 0 to F, which are represented as 0-9, A (for 10), B (for 11), etc. To convert a binary value (for example, 0100 1100) to a hexadecimal representation, treat the upper and lower four bits separately to produce a two-digit hexadecimal number (in this case, 4C). 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 hexadecimal is to use a scientific calculator, such as the one available on Windows' operating systems. For example:

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



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



Compliance Information

(according to ISO/IEC Guide 22 and EN 45014)

Manufacturer's Name & Address:

Lantronix 15353 Barranca Parkway, Irvine, CA 92618 USA

Declares that the following product:

Product Name Model: Device Server PRODUCT NAME

Conforms to the following standards or other normative documents:

Radiated and conducted emissions

Class B limits of EN 55022:1998

EN55024: 1998 + A1: 2001

Direct & Indirect ESD

EN61000-4-2: 1995

RF Electromagnetic Field Immunity

EN61000-4-3: 1996

Electrical Fast Transient/Burst Immunity

EN61000-4-4: 1995

Surge Immunity

EN61000-4-5: 1995

RF Common Mode Conducted Susceptibility

EN61000-4-6: 1996

Power Frequency Magnetic Field Immunity

EN61000-4-8: 1993

Voltage Dips and Interrupts

EN61000-4-11: 1994

Manufacturer's Contact:

Director of Quality Assurance, Lantronix

15353 Barranca Parkway, Irvine, CA 92618 USA

Tel: 949-453-3990

Fax: 949-453-3995

Warranty

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

* * * *

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refund of buyer's purchase price for such affected products (without interest)

repair or replacement of such products, provided that the buyer follows the above procedures.

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For details on the Lantronix warranty replacement policy, go to our web site at <http://www.lantronix.com/support/warranty/index.html>