

LANTRONIX®

XPort® Pro™



XPort Pro 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.

For the latest revision of this product document, please check our online documentation at www.lantronix.com/support/documentation.html.

Revision History

Date	Rev.	Comments
September 2009	A	Initial Document

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1. Using This Guide

Purpose and Audience

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

Note: This guide occasionally refers to the XPort Pro as just the XPort.

Summary of Chapters

The remaining chapters in this guide include:

Chapter	Description
2: Introduction	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 Pro.
5: Network Settings	Instructions for using the web interface to configure Ethernet settings.
6: Line, Tunnel, Terminal, and Host Settings	Instructions for using the web interface to configure line, tunnel, terminal, and host settings.
7: Configurable Pin Manager	Information about the Configurable Pin Manager (CPM) and how to set the configurable pins to work with a device.
8: Services Settings	Instructions for using the web interface to configure settings for DNS, SNMP, FTP, and other services.
9: Security Settings	Instructions for using the web interface to configure SSH and SSL security settings.
10: VIP Settings	Instructions for configuring a Virtual IP.

Chapter	Description
11: Maintenance and Diagnostics Settings	Instructions for using the web interface to maintain the XPort Pro, view statistics, files, and logs, and diagnose problems.
12: Advanced Settings	Instructions for using the web interface to configure email, CLI, and XML settings.
13: Point to Point Protocol (PPP)	Description of PPP on the XPort Pro.
14: Tunneling	Information about tunneling features available on the serial lines.
15: VIP	Information about Virtual IP (VIP) features available on the XPort Pro.
16: Security in Detail	Description and configuration of SSH and SSL security settings.
17: Branding the XPort Pro	Instructions for customizing the XPort Pro.
18: Updating Firmware	Instructions for obtaining the latest firmware and updating the XPort Pro.
A: Technical Support	Instructions for contacting Lantronix Technical Support.
B: Binary to Hexadecimal Conversions	Instructions for converting binary values to hexadecimals.
C: Compliance	Lantronix compliance information.
D: Warranty	Lantronix warranty statement.

Additional Documentation

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

Document	Description
XPort Pro Integration Guide	Information about the XPort Pro hardware, testing the XPort Pro using the demonstration board, and integrating the XPort Pro into your product.
XPort Pro Command Reference	Instructions for accessing Command Mode (the command line interface) using a Telnet connection or through the serial port. Detailed information about the commands. Also provides details for XML configuration and status.
XPort Universal Demo Board Quick Start	Instructions for getting the XPort Pro demonstration board up and running.
XPort Universal Demo Board User Guide	Provides information needed to use the XPort on the demo board.
DeviceInstaller Online Help	Instructions for using the Lantronix Windows-based utility to locate the XPort Pro and to view its current settings.
Com Port Redirector Quick Start and Online Help	Instructions for using the Lantronix Windows-based utility to create virtual com ports.
Secure Com Port Redirector User Guide	Instructions for using the Lantronix Windows-based utility to create secure virtual com ports.

2. Introduction

The XPort Pro embedded Ethernet Device Server is a complete network-enabling solution in a 13.50 (0.531) X 16.25 (0.640) X 33.90 (1.335) package. This miniature device server empowers original equipment manufacturers (OEMs) to go to market quickly and easily with Ethernet networking and web page serving capabilities built into their products. [DIMS = mm (in.)]

Key Features

- ◆ Power Supply: Regulated 3.3V input required. There is a step-down converter to 1.5 volts for the processor core. All voltages have LC filtering to minimize noises and emissions.
- ◆ Controller: A Lantronix DSTni-FX 32-bit microprocessor, running at 166 MHz internal bus and 83 MHz external bus.
- ◆ Memory: 16 MB Flash and 8 MB SDRAM. Please contact your sales representative if you need larger memory sizes.
- ◆ Ethernet: 10/100 Mbps Ethernet transceiver
- ◆ Serial Ports: One full, RS232-supporting high-speed serial port with all hardware handshaking signals. Baud rate is software selectable (300 bps to 921600 bps).
Note: The standard baud rate of 460800 bps is not supported.
- ◆ Configurable IO Pins (CPs): Up to three pins are configurable as general purpose I/Os if no DTR or DCD is used on serial ports. Not 5V tolerant.
- ◆ Interface Signals: 3.3V-level interface signals.
- ◆ Temperature Range: Operates over an extended temperature range of -40°C to +85°C.

Applications

The XPort Pro 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 unit
- ◆ Telecommunications equipment
- ◆ Data display devices
- ◆ Security alarms and access control devices
- ◆ Handheld instruments
- ◆ Modems
- ◆ Time/attendance clocks and terminals

Protocol Support

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

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

Evolution OS™

XPort Pro incorporates The Lantronix 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
- ◆ Really Simple Syndication (RSS) information feeds
- ◆ Enterprise-grade security with SSL and SSH
- ◆ Comprehensive troubleshooting tools

Additional Features

Modem Emulation

In modem emulation mode, the XPort Pro 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.

Web-Based Configuration and Troubleshooting

Built upon Internet-based standards, the XPort Pro enables you to configure, manage, and troubleshoot through a browser-based interface accessible anytime from anywhere. All configuration and troubleshooting options are launched from a web interface. You can access all functions via a Web browser, for remote access. As a result, you decrease downtime (using the troubleshooting tools) and implement configuration changes (using the configuration tools).

Command-Line Interface (CLI)

Making the edge-to-enterprise vision a reality, the XPort Pro 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.

VIP Access

Virtual IP Access is the Lantronix technology that solves the access-through-firewall problem. With VIP Access, the XPort Pro can act as a ManageLinx DSC and provide direct access to your equipment behind a firewall.

SNMP Management

The XPort Pro 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 Pro.

XML-Based Architecture and Device Control

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

Really Simple Syndication (RSS)

The XPort Pro supports Really Simple Syndication (RSS), a rapidly emerging technology for streaming and managing on-line content. RSS feeds all the configuration changes that occur on the device. An RSS aggregator then reads (polls) the feed. 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

Evolution OS™ provides the XPort Pro the highest level of networking 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 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 or SSL connection

In addition to keeping data safe and accessible, the XPort Pro 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 Pro cannot be used to bring down other devices on the network.

You can use the XPort Pro with the Lantronix 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.

Terminal Server/Device Management

Remote offices can have routers, PBXs, servers and other networking equipment that require remote management from the corporate facility. The XPort Pro easily attaches to the serial ports on a server, Private Branch Exchange (PBX), or other networking equipment to deliver central, remote monitoring and management capability.

Troubleshooting Capabilities

The XPort Pro 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 Pro, including CPU utilization and total stack space available.

Configuration Methods

After installation, the XPort Pro requires configuration. For the unit to operate correctly on a network, it must have a unique IP address on the network. There are four basic methods for logging into the XPort Pro and assigning IP addresses and other configurable settings:

DeviceInstaller: Configure the IP address and related settings and view current settings on the XPort Pro using a Graphical User Interface (GUI) on a PC attached to a network. (See page 19.)

Web Manager: Through a web browser, configure the XPort Pro settings using the Lantronix Web Manager. (See page 22.)

Command Mode: There are two methods for accessing Command Mode (CLI): 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 Pro Command Reference Guide for instructions and available commands.)

XML: The XPort Pro supports XML-based configuration and setup records that make device configuration transparent to users and administrators. XML is easily editable with a standard text or XML editor. (See the XPort Pro Command Reference Guide for instructions and 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 Pro:

- ◆ 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: LDP (Lantronix Discovery Protocol) port
- ◆ TCP/UDP Port 10001: Tunnel 1

Product Information Label

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

- ◆ Bar code
- ◆ Product ID (name)
- ◆ Product Revision
- ◆ Part number
- ◆ Hardware Address (MAC Address)

Figure 2-2. Product Label



3. Using DeviceInstaller

This chapter covers the steps for locating a XPort Pro unit and viewing its properties and device details.

Note: For instructions on using DeviceInstaller to configure the IP address and related settings or for more advanced features, see the Device Installer online Help.

Note: Auto IP generates a random IP address in the range of 169.254.0.1 to 169.254.255.254 if no BOOTP or DHCP server is found.

Accessing XPort Pro using DeviceInstaller

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

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

1. Click **Start→All Programs→Lantronix→DeviceInstaller→DeviceInstaller**.
2. When DeviceInstaller starts, it will perform a network device search. To perform another search, click the “Search” button.
3. Expand the XPort folder by clicking the **+** symbol next to the XPort folder icon. The list of available Lantronix XPort Pro devices appears.
4. Select the XPort Pro unit by expanding its entry and clicking on its hardware (MAC) address to view its configuration.
5. On the right page, click the **Device Details** tab. The current XPort Pro configuration appears. This is only a subset of the full configuration; the full configuration may be accessed via Web Manager, CLI, or XML.

Device Details Summary

Note: The settings are Display Only in this table unless otherwise noted.

Current Settings	Description
Name	Name identifying the XPort Pro.
Group	Configurable field. Enter a group to categorize the XPort Pro. Double-click the field, type in the value, and press Enter to complete. This group name is local to this PC and is not visible on other PCs or laptops using DeviceInstaller.
Comments	Configurable field. Enter comments for the XPort Pro. Double-click the field, type in the value, and press Enter to complete. This description or comment is local to this PC and is not visible on other PCs or laptops using DeviceInstaller.
Device Family	Shows the XPort Pro device family type as "XPort".
Type	Shows the device type as "XPort Pro".
ID	Shows the XPort Pro ID embedded within the unit.
Hardware Address	Shows the XPort Pro hardware (MAC) address.
Firmware Version	Shows the firmware currently installed on the XPort Pro.
Extended Firmware Version	Provides additional information on the firmware version.
Online Status	Shows the XPort Pro status as Online, Offline, Unreachable (the XPort Pro is on a different subnet), or Busy (the XPort Pro is currently performing a task).
IP Address	Shows the XPort Pro current IP address. To change the IP address, click the Assign IP button on the DeviceInstaller menu bar.

Current Settings	Description
IP Address was Obtained	<p>Appears “Dynamically” if the XPort Pro automatically received an IP address (e.g., from DHCP). Appears “Statically” if the IP address was configured manually.</p> <p>If the IP address was assigned dynamically, the following fields appear:</p> <p>Obtain via DHCP with values of True or False. Obtain via BOOTP with values of True or False.</p>
Subnet Mask	Shows the subnet mask specifying the network segment on which the XPort Pro resides.
Gateway	<p>Shows the IP address of the router of this network.</p> <p>There is no default.</p>
Number of Ports	Shows the number of serial ports on this XPort Pro.
Supports Configurable Pins	Shows True, indicating configurable pins are available on the XPort Pro.
Supports Email Triggers	Shows True, indicating email triggers are available on the XPort Pro.
Telnet Enabled	Indicates whether Telnet is enabled on this XPort Pro.
Telnet Port	Shows the XPort Pro port for Telnet sessions.
Web Enabled	Indicates whether Web Manager access is enabled on this XPort Pro.
Web Port	Shows the XPort Pro port for Web Manager configuration.
Firmware Upgradeable	Shows True, indicating the XPort Pro firmware is upgradeable as newer versions become available.

4. Configuration Using Web Manager

This chapter describes how to configure the XPort Pro using Web Manager, the Lantronix 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

Note: You can also access the Web Manager by selecting the Web Configuration tab on the DeviceInstaller window.

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 Pro in the address bar.

Note: The IP address may have been assigned manually using DeviceInstaller or the serial port (see the XPort Pro Quick Start) or automatically by DHCP.

3. Enter your user name and password.

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

The Web Manager home page appears.

Note: The XPort Pro Status page (the home page) shows the overall XPort Pro configuration and product information.

Figure 4-1. Web Manager Home Page

The screenshot displays the XPort Pro Web Manager interface. At the top, the 'XPort Pro' logo is on the left and the 'LANTRONIX EVOLUTION OS' logo is on the right. A vertical navigation menu on the left lists various system functions such as Status, CLI, CPM, Diagnostics, DNS, Email, Filesystem, FTP, Host, HTTP, IP Address Filter, Line, LPD, Network, PPP, Protocol Stack, Query Port, RSS, SNMP, SSH, SSL, Syslog, System, Terminal, TFTP, Tunnel, VIP, and XML. The main content area is titled 'Device Status' and contains two tables: 'Product Information' and 'Network Settings'. Below these, there are sections for 'Line Settings' and 'Tunneling'.

Product Information

Product Type:	Lantronix XPort Pro
Firmware Version:	5.0.0.0R6
Build Date:	Sep 8 2009 (10:52:53)
Serial Number:	11
Uptime:	0 days 00:22:26
Permanent Config:	Saved

Network Settings

Interface:	eth0
Link:	Auto 10/100 Mbps Auto Half/Full (100 Mbps Full)
MAC Address:	00:20:4a:80:8d:6f
Host:	<None>
IP Address:	172.19.212.91 / 255.255.0.0
Default Gateway:	172.19.0.1
Domain:	<None>
Primary DNS:	172.19.1.1
Secondary DNS:	172.19.1.2

Line Settings

Line 1:	RS232, 9600, None, 8, 1, None
---------	-------------------------------

Tunneling

	Connect Mode	Accept Mode
Tunnel 1:	Disabled	Waiting

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Web Manager Page Components

Figure 4-2 shows the areas of a typical Web Manager page.

Figure 4-2. Components of the Web Manager Page

The screenshot shows the XPort Pro Web Manager interface. The header includes the XPort Pro logo and LANTRONIX EVOLUTION OS™. The left side features a menu bar with items like Status, CLI, ICPM, Diagnostics, DNS, Email, Filesystem, FTP, Host, HTTP, IP Address Filter, Line, LPD, Network, PPP, Protocol Stack, Query Port, RSS, SNMP, SSH, SSL, Syslog, System, Terminal, TFTP, Tunnel, VIP, and XML. The main content area is titled 'Line 1 - Command Mode' and includes configuration options for Mode, Wait Time, Serial String, Echo Serial String, CP Group, and Signon Message. A 'Current Configuration' table is also present. The footer contains copyright information: Copyright © Lantronix, Inc. 2007-2009. All rights reserved.

Labels and arrows pointing to components:

- Header**: Points to the XPort Pro logo and LANTRONIX EVOLUTION OS™.
- Items to configure**: Points to the 'Line 1' tab.
- Links to subpages**: Points to the 'Statistics', 'Configuration', and 'Command Mode' tabs.
- Menu Bar**: Points to the left-hand navigation menu.
- Configuration and/or Status Area**: Points to the 'Line' menu item.
- Footer**: Points to the copyright notice at the bottom.
- Information and Help Area**: Points to the right-hand text area containing help information.

The menu bar always appears at the left side of the page, regardless of the page shown. The menu bar lists the names of the pages available in the Web Manager. To bring up a page, click it in the menu bar.

The main area of the page has from one to three sections:

- ◆ At the very top, many pages, such as the one in the example above, enable you to link to sub pages. On some pages, you must also select the item you are configuring, such as a line or a tunnel.
- ◆ In the middle section of many pages, you can select or enter new configuration settings. After you change settings, click **Submit** to apply the change. Some

settings require you to reboot the XPort Pro before the settings take effect. Those settings are identified in the appropriate sections in this chapter.

Note: Some pages show information such as statistics in this area rather than allow you to enter settings.

- ◆ Below the middle section of most pages shows the current configuration. In some cases, you can take an action such as resetting or clearing a configurable.
- ◆ The information or help area shows information or instructions associated with the page.
- ◆ The footer appears at the bottom of the page. It contains copyright information and a link to the Lantronix home page.

Navigating the Web Manager

The Web Manager provides an intuitive point-and-click interface. A menu bar at the left side of each page provides links you can click to navigate from one page to another. Some pages are read-only, while others let you change configuration settings.

Note: There may be times when you must reboot the XPort Pro for the new configuration settings to take effect. The chapters that follow indicate when a change requires a reboot.

Summary of Web Manager Pages

Web Manager Page	Description	See Page
Status	Shows product information and network, line, and tunneling settings.	27
CLI	Shows Command Line Interface (CLI) statistics and lets you change the current CLI configuration settings.	113
CPM	Shows information about the Configurable Pins Manager (CPM) and how to set the configurable pins and pin groups to work with a device.	55
Diagnostics	Lets you perform various diagnostic procedures.	99
DNS	Shows the current configuration of the DNS subsystem and the DNS cache.	61
Email	Shows email statistics and lets you clear the email log, configure email settings, and send an email.	110
Filesystem	Shows file system statistics and lets you browse the file system to view a file, create a file or directory, upload files using HTTP, copy a file, move a file, or perform TFTP actions.	90
FTP	Shows statistics and lets you change the current configuration for the File Transfer Protocol (FTP) server.	65
Host	Lets you view and change settings for a host on the network.	54

Web Manager Page	Description	See Page
HTTP	Shows HyperText Transfer Protocol (HTTP) statistics and lets you change the current configuration and authentication settings.	68
IP Address Filter	Lets you specify all the IP addresses and subnets that are allowed to send data to this device.	97
Line	Shows statistics and lets you change the current configuration and Command mode settings of a serial line.	33
LPD	Shows LPD (Line Printer Daemon) Queue statistics and lets you configure the LPD and print a test page.	74
Network	Shows status and lets you configure the network interface.	28
PPP	Lets you configure a network link using Point-to-Point Protocol (PPP) over a serial line.	61
Protocol Stack	Lets you perform lower level network stack-specific activities.	94
Query Port	Lets you change configuration settings for the query port.	98
RSS	Lets you change current Really Simple Syndication (RSS) settings.	73
SNMP	Lets you change the current Simple Network Management Protocol (SNMP) configuration settings.	63
SSH	Lets you change the configuration settings for SSH server host keys, SSH server authorized users, SSH client known hosts, and SSH client users.	77
SSL	Lets you upload an existing certificate or create a new self-signed certificate.	83
Syslog	Lets you specify the severity of events to log and the server and ports to which the syslog should be sent.	67
System	Lets you reboot the XPort Pro, restore factory defaults, upload new firmware, and change the XPort Pro long and short names.	108
Terminal	Lets you change current settings for a terminal.	51
TFTP	Shows statistics and lets you change the current configuration for the Trivial File Transfer Protocol (TFTP) server.	66
Tunnel	Lets you change the current configuration settings for a tunnel.	37
VIP	Lets you configure Virtual IP addresses to be used in Tunnel Accept Mode and Tunnel Connect Mode.	87
XML	Lets you export XML configuration and status records, and import XML configuration records.	115

Device Status Page

The Device Status page is the first page that appears when you log into the Web Manager. It also appears when you click the Status link in the menu bar. This read-only page shows XPort Pro product information, network settings, line settings, and tunneling settings.

Figure 4-3. Device Status

Device Status		
Product Information		
Product Type:	Lantronix XPort Pro	
Firmware Version:	5.0.0.0R1	
Build Date:	Aug 12 2009 (14:42:14)	
Serial Number:	11	
Uptime:	0 days 15:09:21	
Permanent Config:	Saved	
Network Settings		
Interface:	eth0	
Link:	Auto 10/100 Mbps Auto Half/Full (100 Mbps Full)	
MAC Address:	00:20:4a:80:8d:6f	
Host:	<None>	
IP Address:	172.19.212.91 / 255.255.0.0	
Default Gateway:	172.19.0.1	
Domain:	<None>	
Primary DNS:	172.19.1.1	
Secondary DNS:	172.19.1.2	
Line Settings		
Line 1:	RS232, 921600, None, 8, 1, Hardware	
Tunneling	Connect Mode	Accept Mode
Tunnel 1:	Disabled	Active

5. Network Settings

The Network Settings pages show the status of Ethernet link and let you configure it on the device.

Network Settings

Network 1 (eth0) Interface Status

This page shows the status of the Ethernet network interface.

To view the network interface status:

1. Click **Network** on the menu.
2. Then click **Network 1**, **Interface**, and **Status** at the top of the page. The Network 1 (eth0) Interface Status page appears.

Figure 5-1. Network 1 (eth0) Interface Status

This page is used to view the status of the Network interface on the device.

There are two columns displayed. The first column shows the current operational settings. The second column shows the expected settings after the device is rebooted.

If both BOOTP and DHCP are turned on, DHCP will run, but not BOOTP.

When BOOTP or DHCP fails to discover an IP Address, a new address will automatically be generated using AutoIP. This address will be within the 169.254.x.x space.

	Current	After Reboot
BOOTP Client:	Off	Off
DHCP Client:	Off	Off
IP Address:	172.19.212.91	172.19.212.91
Network Mask:	255.255.0.0	255.255.0.0
Default Gateway:	172.19.0.1	172.19.0.1
Hostname:	<None>	<None>
Domain:	<None>	<None>
DNS Suffix Search List:		<None>
DHCP Client ID:	<None>	<None>

Network 1 (eth0) Interface Configuration

This page shows the configuration settings for the Ethernet connection and lets you change these settings.

To view and configure network interface settings:

1. Click **Network 1, Interface, and Configuration** at the top of the page. The Network 1 (eth0) Interface Configuration page appears.

Figure 5-2. Network 1 (eth0) Interface Configuration

Network 1		<p>This page is used to configure the Network interface on the device. To see the effect of these items after a reboot, view the Status page.</p> <p>The following items require a reboot to take effect:</p> <ul style="list-style-type: none"> BOOTP Client On/Off DHCP Client On/Off IP Address DHCP Client ID <p>If BOOTP or DHCP is turned on, any configured IP Address, Network Mask, Gateway, Hostname, or Domain will be ignored. BOOTP/DHCP will auto-discover and eclipse those configuration items.</p> <p>If both BOOTP and DHCP are turned on, DHCP will run, but not BOOTP.</p> <p>When BOOTP or DHCP fails to discover an IP Address, a new address will automatically be generated using AutoIP. This address will be within the 169.254.x.x space.</p> <p>IP Address may be entered alone, in CIDR form, or with an explicit mask: 192.168.1.1 (default mask) 192.168.1.1/24 (CIDR) 192.168.1.1 255.255.255.0 (explicit mask)</p> <p>Hostname must begin with a letter, continue with letter, number, or hyphen, and must end with a letter or number.</p>
Interface Link		
Status	Configuration	

Network 1 (eth0) Interface Configuration

BOOTP Client:	<input type="radio"/> On <input checked="" type="radio"/> Off
DHCP Client:	<input type="radio"/> On <input checked="" type="radio"/> Off
IP Address:	<input type="text" value="172.19.212.91/16"/>
Default Gateway:	<input type="text" value="172.19.0.1"/>
Hostname:	<input type="text"/>
Domain:	<input type="text"/>
DHCP Client ID:	<input type="text"/> <input checked="" type="radio"/> Text <input type="radio"/> Binary
Primary DNS:	<input type="text" value="172.19.1.1"/>
Secondary DNS:	<input type="text" value="172.19.1.2"/>

2. Enter or modify the following settings:

Network 1 Interface Configuration Page Settings	Description
BOOTP Client	<p>Select On or Off. At boot up the XPort Pro will attempt to obtain an IP address from a BOOTP server.</p> <p>Notes: Overrides the configured IP address, network mask, gateway, hostname, and domain.</p> <p>When DHCP is On, the system automatically uses DHCP, regardless of whether BOOTP Client is On.</p>
DHCP Client	<p>Select On or Off. At boot up the XPort Pro will attempt to lease an IP address from a DHCP server and maintain the lease at regular intervals.</p> <p>Note: Overrides BOOTP, the configured IP address, network mask, gateway, hostname, and domain.</p>
IP Address	<p>Enter the XPort Pro static IP address.</p> <p>You may enter it alone, in CIDR format, or with an explicit mask.</p> <p>The IP address consists of four octets separated by a period and is used if BOOTP and DHCP are both set to Off. Changing this value requires you to reboot the XPort Pro.</p> <p>Note: When DHCP is enabled, the XPort Pro tries to obtain an IP address from DHCP. If it cannot, the XPort Pro uses an Auto IP address in the range of 169.254.xxx.xxx.</p>
Default Gateway	<p>Enter the IP address of the router for this network. Or, clear the field (appears as <None>). This address is only used for static IP address configuration.</p>
Hostname	<p>Enter the XPort Pro hostname. It must begin with a letter, continue with a sequence of letters, numbers, and/or hyphens, and end with a letter or number.</p>
Domain	<p>Enter the XPort Pro's domain name.</p>
DHCP Client ID	<p>Enter the ID if the DHCP server uses a DHCP ID. The DHCP server's lease table shows IP addresses and MAC addresses for devices. The lease table shows the Client ID, in hexadecimal notation, instead of the XPort Pro MAC address.</p>
Primary DNS	<p>IP address of the primary name server. This entry is required if you choose to configure DNS (Domain Name Server) servers.</p>

Network 1 Interface Configuration Page Settings	Description
--	-------------

Secondary DNS	IP address of the secondary name server.
----------------------	--

3. To save changes, click **Submit**. Some Changes to the following settings require a reboot for the changes to take effect:

- DHCP Client On/Off
- BOOTP Client On/Off
- IP address
- Network mask
- 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.

Network 1 Ethernet Link

This page shows the current negotiated Ethernet settings and lets you change the speed and duplex settings.

To view and configure the Ethernet link:

1. Click **Network** on the menu bar. Then click **Network 1** and **Link** at the top of the page. The Network 1 (eth0) Ethernet Link page appears. From another Network page, click **Network 1** and **Link** at the top of the page.

Figure 5-3. Network 1 Ethernet Link

Network 1

Interface
Link

Network 1 (eth0) Ethernet Link

Status

Speed:	100 Mbps
Duplex:	Full

Configuration

Speed:	<input checked="" type="radio"/> Auto <input type="radio"/> 10Mbps <input type="radio"/> 100Mbps
Duplex:	<input checked="" type="radio"/> Auto <input type="radio"/> Half

This page shows status and configuration of an Ethernet Link on the device.

The **Status** table shows the current negotiated settings.

The **Configuration** table shows the current range of allowed settings. After changing a setting, press **Submit** to make the changes on the device.

The **Status** table shows the current negotiated settings. The **Configuration** table shows the current range of allowed settings.

2. Enter or modify the following settings:

Network 1-Ethernet Link Page Settings	Description
Speed	Select the Ethernet link speed. (Default is Auto .)
Duplex	Select the Ethernet link duplex mode. (Default is Auto .)

3. Click **Submit**. The changes take effect immediately.

6. Line, Tunnel, Terminal, and Host Settings

Line Settings

The Line Settings pages display the status and statistics for each of the serial lines (ports). They also let you change the character format and Command Mode settings for the serial lines.

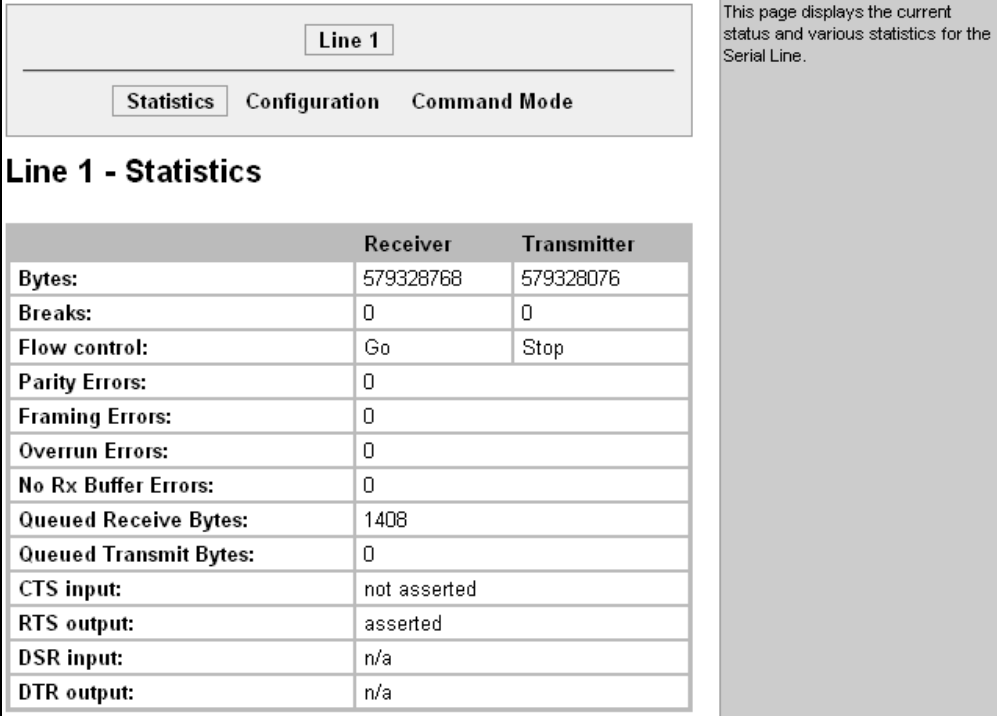
Note: *The following section describes the steps to view and configure Line 1 settings; these steps also apply to Line 2 menu options.*

Line 1 Statistics

This read-only page shows the status and statistics for the serial line selected at the top of this page.

One Step ▶ Select **Line** on the menu bar. The Line 1 Statistics page appears.

Figure 6-1. Line 1 Statistics



The screenshot shows the 'Line 1' statistics page. At the top, there is a 'Line 1' label and three tabs: 'Statistics' (selected), 'Configuration', and 'Command Mode'. Below the tabs is the title 'Line 1 - Statistics' and a table with the following data:

	Receiver	Transmitter
Bytes:	579328768	579328076
Breaks:	0	0
Flow control:	Go	Stop
Parity Errors:	0	
Framing Errors:	0	
Overrun Errors:	0	
No Rx Buffer Errors:	0	
Queued Receive Bytes:	1408	
Queued Transmit Bytes:	0	
CTS input:	not asserted	
RTS output:	asserted	
DSR input:	n/a	
DTR output:	n/a	

To the right of the table, a text box states: 'This page displays the current status and various statistics for the Serial Line.'

Line 1 Configuration

This page shows the configuration settings for the serial line selected at the top of the page and lets you change the settings for that serial line.

To configure Line 1:

1. Click **Line 1** and **Configuration** at the top of the page. The Line 1 Configuration page appears.

Figure 6-2. Line 1 Configuration

Line 1	
Statistics Configuration Command Mode	
Line 1 - Configuration	
Configuration	Status
Name:	
Interface:	RS232
State:	Enabled
Protocol:	Tunnel
Baud Rate:	921600
Parity:	None
Data Bits:	8
Stop Bits:	1
Flow Control:	Hardware
Xon Char:	<control>Q
Xoff Char:	<control>S
Gap Timer:	<None> milliseconds
Threshold:	56 bytes

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

Named lines appear in the [Login Connect Menu](#), if enabled. Set it blank to leave it out of the menu.

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 prefix a single control character with <control>. These are used when **Flow Control** is set to Software.

The driver forwards received serial bytes after the **Gap Timer** delay from the last character received. By default, the delay is four character periods at the current baud rate (minimum 1 ms).

The driver will also forward received characters after **Threshold** bytes have been received.

2. Enter or modify the following settings:

Line - Configuration Page Settings	Description
Name	Enter a name for the line. The default Name is blank.
Interface	Select the interface type from the drop-down menu. The default is RS232.
State	Indicates whether the current line is enabled. To change the status, select Enabled or Disabled from the drop-down menu.

Line - Configuration Page Settings	Description
Protocol	Select the protocol from the drop-down menu. The default is Tunnel.
Baud Rate	Select the baud rate from the drop-down menu. The default is 9600.
Parity	Select the parity from the drop-down menu. The default is None.
Data Bits	Select the number of data bits from the drop-down menu. The default is 8.
Stop Bits	Select the number of stop bits from the drop-down menu. The default is 1.
Flow Control	Select the flow control from the drop-down menu. The default is None.
Xon Char	Specify the character to use to start the flow of data when Flow Control is set to Software. 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	Specify the character to use to stop the flow of data when Flow Control is set to Software. Prefix a decimal character with \ or a hexadecimal character with 0x, or provide a single printable character. The default Xoff char is 0x13.
Gap Timer	The driver forwards received serial bytes after the Gap Timer delay from the last character received. By default, the delay is four character periods at the current baud rate (minimum 1 ms).
Threshold	The driver will also forward received characters after Threshold bytes have been received.

3. Click **Submit**.

Line 1 Command Mode

Setting Command Mode enables the CLI on the serial line.

To configure Line 1 Command Mode:

1. Click **Line 1** and **Command Mode** at the top of the page. The Line 1 Command Mode page appears.

Figure 6-3. Line 1 Command Mode

Line 1

Statistics
Configuration
Command Mode

Line 1 - Command Mode

Mode:

Always
 Use Serial String
 Use CP Group
 Use both Serial String and CP Group
 Disabled

Wait Time: milliseconds

Serial String: Text Binary

Echo Serial String: Yes No

CP Group: Group: Value:

Signon Message: Text Binary

Current Configuration

Mode:	Disabled (Inactive)
Wait Time:	5000 milliseconds
Serial String:	<None>
Echo Serial String:	On
CP Group:	<None>
Signon Message:	<None>

When Command Mode is enabled, the Command Line Interface (CLI) is attached to the Serial Line. Command Mode can be enabled in a number of ways:

The **Always** choice immediately enables Command Mode for the Serial Line.

The **Use Serial String** choice enables Command Mode when the Serial String is read on the Serial Line during boot time.

The **Use CP Group** choice enables Command Mode based on the status of a CP Group. When the value matches the current value of the group, Command Mode is enabled on the Serial Line.

The **Wait Time** specifies the amount of time to wait during boot time for the Serial String. This timer starts right after the Signon Message has been sent on the Serial Line.

The **Serial String** is a string of bytes that must be read on the Serial Line during boot time in order to enable Command Mode. It may contain a **time element** to specify a required delay in milliseconds x, formed as {x}.

The **Signon Message** is a string of bytes that is sent on the Serial Line during boot time.

Binary form is one or more byte values separated by commas. Each byte value may be decimal or Hexadecimal. Start Hexadecimal values with 0x.

2. Enter or modify the following settings:

Line – Command Mode Page Settings	Description
Mode	Select the method of enabling Command Mode or choose to disable Command Mode. <p>Always = immediately enables Command Mode for the serial line.</p> <p>Use Serial String = enables Command Mode when the serial string is read on the serial line during boot time.</p> <p>Use CP Group = enables Command Mode based on the status of a CP Group. When the value matches the current value of the group, Command Mode is enabled on the serial line.</p> <p>Use both Serial String and CP Group = the serial string and</p>

Line – Command Mode Page Settings	Description
	<p>the value of the CP group must be matched to enable Command Mode.</p> <p>Disabled = turns off Command Mode.</p>
Wait Time	Enter the wait time for the serial string during boot-up in milliseconds.
Serial String	<p>Enter the serial string characters. Select a string type.</p> <p>Text = string of bytes that must be read on the Serial Line during boot time to enable Command Mode. It may contain a time element in x milliseconds, in the format {x}, to specify a required delay.</p> <p>Binary = string of characters representing byte values where each hexadecimal byte value starts with \0x and each decimal byte value starts with \.</p>
Echo Serial String	Select Yes to enable echoing of the serial string at boot-up.
CP Group	Enter the name and decimal value of the CP group.
Signon Message	<p>Enter the boot-up signon message. Select a string type.</p> <p>Text = string of bytes sent on the serial line during boot time.</p> <p>Binary = one or more byte values separated by commas. Each byte value may be decimal or hexadecimal. Start hexadecimal values with 0x.</p> <p><i>Note: This string will be output on the serial port at boot, regardless of whether command mode is enabled or not.</i></p>

- In the **Current Configuration** table, clear currently stored settings as necessary.
- Click **Submit**.

Tunnel Settings

The Tunnel pages allow you to view current statistics and configure serial settings, Connect Mode, Accept Mode, Disconnect Mode, Packing Mode, start and stop characters, modem emulation, and AES keys.

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

Tunnel 1 – Statistics

One Step ▶ Click **Tunnel** on the menu bar. The Statistics page for Tunnel 1 appears.

Figure 6-4. Tunnel 1

Tunnel 1

Statistics

Serial Settings

Packing Mode

Accept Mode

Connect Mode

Disconnect Mode

Modem Emulation

Tunnel 1 - Statistics

Aggregate Counters	
Completed Accepts:	1
Completed Connects:	0
Disconnects:	0
Dropped Accepts:	1
Dropped Connects:	0
Octets forwarded from Serial:	579327268
Octets forwarded from Network:	579328768
Accept Connection Time:	0 days 15:10:41
Connect Connection Time:	0 days 00:00:00
Connect DNS Address Changes:	0
Connect DNS Address Invalids:	0
Accept Counters	
There is no active connection.	
Connect Counters	
There is no active connection.	

This page displays all the Tunnel **Statistics** and the current status of both the *Accept Mode* and the *Connect Mode* tunnels.

Serial Settings

This page shows the settings for the tunnel selected at the top of the page and lets you change the settings.

To configure serial settings:

1. Click **Tunnel 1** and **Serial Settings** at the top of the page. The Tunnel 1 Serial Settings page appears.

Figure 6-5. Tunnel 1 Serial Settings

Tunnel 1

Statistics

Serial Settings

Packing Mode

Accept Mode

Connect Mode

Disconnect Mode

Modem Emulation

Tunnel 1 - Serial Settings

Line Settings:	RS232, 9600, None, 8, 1, None
Protocol:	Tunnel
Buffer Size:	<input style="width: 50px;" type="text" value="2048"/> bytes
DTR:	<input type="radio"/> Unasserted <input type="radio"/> TruPort <input checked="" type="radio"/> Asserted while connected <input type="radio"/> Continuously asserted

The **Serial Settings** apply to the Serial Line interface.
See also the [Line](#) page.

- View or modify the following settings:

Tunnel Serial Settings Page Settings	Description
Line Settings (display only)	Current serial settings for the line.
Protocol (display only)	The protocol being used on the line. In this case, Tunnel.
Buffer Size	Enter the buffer size used for the tunneling of serial data received. Requires reboot to take effect.
DTR	Select when to assert DTR.
	<p>TruPort = asserted whenever either a connect or an accept mode tunnel connection is active with the Telnet Protocol RFC2217 saying that the remote DSR is asserted.</p> <p>Asserted while connected = asserted whenever either a connect or an accept mode tunnel connection is active.</p> <p>Continuously asserted = asserted regardless of the status of a tunnel connection.</p>

- Click **Submit**.

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 Packing Mode:

1. Select **Tunnel 1** and **Packing Mode** at the top of the page. The Tunnel 1 Packing Mode page appears. Depending on the **Mode** selection, different configurable parameters are presented to the user. The following figures show the display for each of the three packing modes.

Figure 6-6a. Tunnel 1 Packing Mode (Mode = Disable)

Tunnel 1		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.
Statistics	Serial Settings	
Accept Mode	Connect Mode	Disconnect Mode
Modem Emulation		
Tunnel 1 - Packing Mode		
Mode:	<input checked="" type="radio"/> Disable <input type="radio"/> Timeout <input type="radio"/> Send Character	

Figure 6-7b. Tunnel 1 Packing Mode (Mode = Timeout)

Tunnel 1		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.
Statistics	Serial Settings	
Accept Mode	Connect Mode	Disconnect Mode
Modem Emulation		
Tunnel 1 - Packing Mode		
Mode:	<input type="radio"/> Disable <input checked="" type="radio"/> Timeout <input type="radio"/> Send Character	
Threshold:	<input type="text" value="512"/> bytes	
Timeout:	<input type="text" value="1000"/> milliseconds	
<input type="button" value="Submit"/>		

Figure 6-8c. Tunnel 1 Packing Mode (Mode = Send Character)

Tunnel 1

Statistics
Serial Settings
Packing Mode

Accept Mode
Connect Mode
Disconnect Mode

Modem Emulation

Tunnel 1 - Packing Mode

Mode:	<input type="radio"/> Disable <input type="radio"/> Timeout <input checked="" type="radio"/> Send Character
Threshold:	512 bytes
Send Character:	<control>M
Trailing Character:	<None>

Submit

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.

2. Enter or modify the following settings:

Tunnel - Packing Mode Page Settings	Description
Mode	Select Disable to disable Packing Mode completely. Select Timeout to send data after the specified time has elapsed. Select Send Character to send the queued data when the send character is received.
Threshold (Appears for both Timeout and Send Character Modes)	Send the queued data when the number of queued bytes reaches the threshold.
Timeout (Appears for Timeout Mode)	Enter a time, in milliseconds, for the XPort Pro to send the queued data after the first character was received.
Send Character (Appears for Send Character Mode)	Enter the send character. Upon receiving this character, the XPort Pro sends out the queued data.
Trailing Character (Appears for Send Character Mode)	Enter the trailing character. This character is sent immediately following the send character.

3. Click **Submit**.

Accept Mode

In Accept Mode, the XPort Pro listens (waits) for incoming connections.

To configure the tunnel's Accept Mode:

1. Click **Tunnel 1** and **Accept Mode** at the top of the page. The Tunnel 1 Accept Mode page appears.

Figure 6-9. Tunnel 1 Accept Mode

Tunnel 1

Statistics
Serial Settings
Packing Mode

Accept Mode
Connect Mode
Disconnect Mode

Modem Emulation

Tunnel 1 - Accept Mode

Mode:	<input type="text" value="Always"/> ▼
Local Port:	<input type="text" value="10001"/>
Protocol:	<input type="text" value="TCP"/> ▼
TCP Keep Alive:	<input type="text" value="45000"/> milliseconds
Flush Serial:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Block Serial:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Block Network:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Password:	<input type="text" value="<None>"/>
Email on Connect:	<input type="text" value="<None>"/> ▼
Email on Disconnect:	<input type="text" value="<None>"/> ▼
CP Output:	Group: <input type="text"/>

Tunnel Accept Mode controls how a tunnel behaves when a connection attempt originates from the network.

2. Enter or modify the following settings:

Tunnel - Accept Mode Page Settings	Description
Mode	Select the method used to start a tunnel in Accept mode. Choices are: Disabled = do not accept an incoming connection. Always = accept an incoming connection. (<i>default</i>) Any Character = start waiting for an incoming connection when any character is read on the serial line. Start Character = start waiting for an incoming connection when the start character for the selected tunnel is read on the serial line.

Tunnel - Accept Mode Page Settings	Description
	<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 defaults are port 10001 for Tunnel 1 and port 10002 for Tunnel 2.
Protocol	Select the protocol type for use with Accept Mode. The default protocol is TCP. If you select TCP AES you will need to configure the AES keys.
TCP Keep Alive	Enter the time, in seconds, the XPort Pro 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.
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 Pro.
Block Network Data	Select On to block, or not tunnel, network data transmitted to the XPort Pro.
Password	<p>Enter a password that clients must send to the XPort Pro 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 Pro must be terminated with one of the following: (a) 0x0A (LF), (b) 0x00, (c) 0x0D 0x0A (CR LF), or (d) 0x0D 0x00.</p>
Email on Connect	Select whether the XPort Pro sends an email when a connection is made. Select None if you do not want to send an email. Otherwise, select the Email profile to use for sending.
Email on Disconnect	Select whether the XPort Pro sends an email when a connection is closed. Select None if you do not want to send an email. Otherwise, select the Email profile to use for sending.
CP Output	Identifies a CP or CP Group whose value should change when a connection is established and dropped.

3. Click **Submit**.

Connect Mode

Connect mode defines how the unit makes an outgoing connection.

To configure Tunnel 1 Connect Mode:

1. Select **Tunnel 1** and **Connect Mode** at the top of the page. The Tunnel 1 Connect Mode page appears.

Figure 6-10. Tunnel 1 Connect Mode

Tunnel 1

Statistics
Serial Settings
Packing Mode

Accept Mode
Connect Mode
Disconnect Mode

Modem Emulation

Tunnel 1 - Connect Mode

Mode:	<input type="text" value="Disable"/>
Local Port:	<input type="text" value="<Random>"/>
Host 1:	172.18.0.80:19, TCP, 45000 msec
Host 2:	<None>
Reconnect Timer:	<input type="text" value="15000"/> milliseconds
Flush Serial Data:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Block Serial:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Block Network:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Email on Connect:	<input type="text" value="<None>"/>
Email on Disconnect:	<input type="text" value="<None>"/>
CP Output:	Group: <input type="text"/>

Tunnel Connect Mode controls how a tunnel behaves when a connection attempt originates locally.

2. Enter or modify the following settings:

Tunnel – Connect Mode Page Settings	Description
Mode	<p>Select the method to be used to attempt a connection to a remote host or device. Choices are:</p> <p>Always = a connection is attempted until one is made. If the connection gets disconnected, the XPort Pro retries until it makes a connection. (default)</p> <p>Disable = an outgoing connection is never attempted.</p> <p>Any Character = a connection is attempted when any character is read on the serial line.</p> <p>Start Character = a connection is attempted when the start character for the selected tunnel is read on the serial line.</p> <p>Modem Control Asserted = a connection is attempted as long as the Modem Control pin (DSR) is asserted, until a connection is made.</p> <p>Modem Emulation = a connection is attempted when triggered by modem emulation AT commands.</p>
Local Port	<p>Enter the port for use as the local port. A random port is selected by default. Once you have configured a number, click the Random link in the Current Configuration to switch back to random.</p>
Host	<p>Click <None> in the Host field to configure the Host parameters.</p> <p>VIP = Enabling the VIP directs the tunnel to connect to a remote Lantronix Virtual IP identified by the VIP Name. Default is Disabled.</p> <p>VIP Name = Displays configured VIP name, used only if VIP is enabled.</p> <p>Address = Displays configured IP address or DNS address, used only if VIP is disabled.</p> <p>Port = Displays configured Port.</p> <p>Protocol = Select the protocol type for use with Connect Mode. The default protocol is TCP. If you select TCP AES you will need to configure the AES keys.</p> <p>SSH Username = Displays configured username, used only if SSH protocol is selected.</p> <p>TCP Keep Alive = Default is 45000 milliseconds.</p> <p>AES Encrypt/Decrypt Key = Displays presence of key, used only if protocol with AES is selected.</p>
Reconnect Timer	<p>Enter the reconnect time in milliseconds. The XPort Pro attempts to reconnect after this amount of time after failing a connection or exiting an existing connection.</p>

Tunnel – Connect Mode Page Settings	Description
Flush Serial Data	Select whether to flush the serial line when a connection is made. Choices are: Enabled = flush the serial line when a connection is made. Disabled = do not flush the serial line. (default)
Block Serial Data	Select On to block (not tunnel) serial data transmitted to the XPort Pro.
Block Network Data	Select On to block (not tunnel) network data transmitted to the XPort Pro.
Email on Connect	Select whether the XPort Pro sends an email when a connection is made. Select None if you do not want to send an email. Otherwise, select the Email profile to use.
Email on Disconnect	Select whether the XPort Pro sends an email when a connection is closed. Select None if you do not want to send an email. Otherwise, select the Email profile to use.
CP Output	Identifies a CP or CP Group whose value should change when a connection is established and when it is dropped.

3. Click **Submit**.

Host 1 is configured. A second host appears underneath Host 1 since the XPort Pro supports configuration of up to sixteen hosts.

Connecting Multiple Hosts

If more than one Host is configured, a **Host Mode** option appears. Host Mode controls how multiple hosts will be used in Connect Mode.

The following selections are available:

- ◆ **Sequential** – When it is time for the tunnel to connect it will start with Host 1 and attempt each host in sequence until a connection is accomplished. Default selection.
- ◆ **Simultaneous** – When it is time for the tunnel to connect it will connect to all of the hosts that accept a connection.

Configuring Additional Hosts

The Host fields contain the information necessary to connect to the specified host.

To configure Host 2:

1. Click **<None>** in the Host 2 field. Host 2 expands.

2. Enter IP address in the **Address** field.
3. Click **Submit**.

Note: Repeat these steps to configure any subsequent hosts up to sixteen.

Figure 6-11. Host 2 Expanded

Tunnel 1	
Statistics	Serial Settings
Accept Mode	Connect Mode
	Disconnect Mode
	Modem Emulation
Tunnel 1 - Connect Mode	
Mode:	Always
Local Port:	<Random>
Host 1:	172.19.100.5: <None>, TCP, 45000 msec
Host 2 ↑	VIP: <input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
	Address: 172.19.100.6
	Port: <None>
	Protocol: TCP
	TCP Keep Alive: 45000 milliseconds
Host 3:	<None>
Host Mode:	<input checked="" type="radio"/> Sequential <input type="radio"/> Simultaneous
Reconnect Timer:	15000 milliseconds
Flush Serial Data:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Block Serial:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Block Network:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Email on Connect:	<None>
Email on Disconnect:	<None>
CP Output:	Group:
<input type="button" value="Submit"/>	

Tunnel Connect Mode controls how a tunnel behaves when a connection attempt originates locally.

Host IP Promotion

The XPort Pro allows Host IP promotion of individual hosts in the overall sequence.

To promote a specific Host:


1. Click the arrow icon  in the desired Host field, for example Host 2.
2. The selected Host exchanges its place with the Host above it.

Figure 6-12. Host 1, Host 2 Exchanged

Tunnel 1

Statistics
Serial Settings
Packing Mode

Accept Mode
Connect Mode
Disconnect Mode

Modem Emulation

Tunnel 1 - Connect Mode

Mode:	Always ▼
Local Port:	<Random>
Host 1:	172.19.100.6: <None>, TCP, 45000 msec
Host 2: ↑	172.19.100.5: <None>, TCP, 45000 msec
Host 3:	<None>
Host Mode:	<input checked="" type="radio"/> Sequential <input type="radio"/> Simultaneous
Reconnect Timer:	<input type="text" value="15000"/> milliseconds
Flush Serial Data:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Block Serial:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Block Network:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Email on Connect:	<None> ▼
Email on Disconnect:	<None> ▼
CP Output:	Group: <input style="width: 100%;" type="text"/>

Tunnel Connect Mode controls how a tunnel behaves when a connection attempt originates locally.

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 Disconnect Mode:

1. Click **Tunnel 1** and **Disconnect Mode** at the top of the page. The Tunnel 1 Disconnect Mode page appears.

Figure 6-13. Tunnel 1 Disconnect Mode

Tunnel 1		These settings relate to Disconnecting a Tunnel.
Statistics	Serial Settings	
Accept Mode	Connect Mode	Disconnect Mode
Modem Emulation		
Tunnel 1 - Disconnect Mode		
Stop Character:	<input type="text" value="<None>"/>	
Modem Control:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	
Timeout:	<input type="text" value="0"/> milliseconds	
Flush Serial Data:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	

- Enter or modify the following settings:

Tunnel – Disconnect Mode Page Settings	Description
Stop Character	Enter the stop character in ASCII, hexadecimal, or decimal notation. Select <None> to disable.
Modem Control	Select Enabled to disconnect when the modem control pin is not asserted on the serial line.
Timeout	Enter a time, in milliseconds, for the XPort Pro to disconnect on a timeout. The value 0 (zero) disables the idle timeout.
Flush Serial Data	Select Enabled to flush the serial data buffer on a disconnection.

- Click **Submit**.

Modem Emulation

A tunnel in Connect Mode can be initiated using modem commands incoming from the Serial Line. This page enables you to configure the modem emulation settings when you select Modem Emulation as the Tunnel 1 or Tunnel 2 Connect Mode type.

To configure modem emulation:

- Select **Tunnel 1** and then **Modem Emulation** at the top of the page. The Tunnel 1 Modem Emulation page appears.

Figure 6-14. Tunnel 1 Modem Emulation

Tunnel 1

Statistics

Serial Settings

Packing Mode

Accept Mode

Connect Mode

Disconnect Mode

Modem Emulation

Tunnel 1 - Modem Emulation

Could not find file http/config/tunnel.mtxt

Configuration	Status	
Echo Pluses:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	
Echo Commands:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled	Enabled
Verbose Response:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled	Enabled
Response Type:	<input checked="" type="radio"/> Text <input type="radio"/> Numeric	Text
Error Unknown Commands:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	Disabled
Incoming Connection:	<input checked="" type="radio"/> Disabled <input type="radio"/> Automatic <input type="radio"/> Manual	Disabled
Connect String:	<input style="width: 100%;" type="text"/>	
Display Remote IP:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled	

Tunnel connections can be initiated and accepted using **Modem "AT"** commands incoming from the Serial Line.

2. Enter or modify the following settings:

Tunnel- Modem Emulation Page Settings	Description
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	Select On to send modem response codes out on the serial line.
Response Type	Select the type of response code: Text or Numeric .
Error Unknown Commands	Select whether an ERROR or OK response is sent in reply to unrecognized AT commands. Choices are: Enabled = ERROR is returned for unrecognized AT commands. Disabled = OK is returned for unrecognized AT commands. Default is Disabled .
Incoming Connection	Select whether Incoming Connection requests will be disabled, answered automatically, or answered manually. Default is Disabled .

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.
Display Remote IP	Selects whether the incoming RING sent on the Serial Line is followed by the IP address of the caller. Default is Disabled .

3. Click **Submit**.

Terminal Settings

This page shows configuration settings for attaching a terminal on a serial line or the network and lets you change them as necessary.

Line Terminal Configuration

To configure a line to support an attached terminal:

1. Click **Terminal** on the menu and then select the line that is connected to the terminal you want to configure. The default is **Line 1**. Configuration is automatically selected. The Terminal on Line 1 Configuration page appears.

Figure 6-15. Terminal on Line 1 Configuration

Network Line 1

Configuration

Terminal on Line 1 - Configuration

Terminal Type:	<input type="text" value="UNKNOWN"/>
Login Connect Menu:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Exit Connect Menu:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Send Break:	<input type="text" value="<None>"/>
Break Duration:	<input type="text" value="500"/> milliseconds
Echo:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled

The text in **Terminal Type** will be sent to a host via IAC.

Selecting **Login Connect Menu** will bring the user to a menu rather than to the command line interface (CLI) upon logging in. The menu displays **hosts** and named **lines**.

Selecting **Exit Connect Menu** allows a user to reach the command line interface (CLI) from the Connect Menu.

When the **Send Break** control character is received from the network on its way to a Serial Line, it will not be sent to the Line; instead, the line output will be forced inactive. Example setting: <control>Y
Blank the field to set to <None>.

The **Break Duration** specifies how long the "spacing" condition will be placed on the line when a break is sent.

Echo applies only to Connect Mode Telnet connections, not to Accept Mode. Only disable **Echo** if your terminal echoes, in which case you will see double of each character typed.

2. Enter or modify the following settings:

Terminal on Line Configuration Page Settings	Description
Terminal Type	Enter text to describe the type of terminal. The text will be sent to a host via IAC. Note: IAC means, "interpret as command." It is a way to send commands over the network such as <code>send break</code> or <code>start echoing</code> .
Login Connect Menu	Select the interface to display when the user logs in. Choices are: Enabled = shows the Login Connect Menu. Disabled = shows the CLI
Exit Connect Menu	Select whether to display a choice for the user to exit the Login Connect Menu and reach the CLI. Choices are: Enabled = a choice allows the user to exit to the CLI. Disabled = there is no exit to the CLI.
Send Break	Enter a Send Break control character, e.g., <code><control> Y</code> , or blank to disable. When the Send Break control character is received from the network on its way to the serial line, it is not sent to the line; instead, the line output is forced to be inactive (the break condition).
Break Duration	Enter how long the break should last in milliseconds.
Echo	Applies only to Connect Mode Telnet connections, not to Accept Mode. Only disable Echo if your terminal echoes, in which case you will see double of each character typed.

- To save changes, click **Submit**.

Network Terminal Configuration

To configure menu features applicable to CLI access via the network:

- Click **Terminal** on the menu and then click **Network** at the top of the page. Configuration is automatically selected. The Terminal on Network Configuration page appears.

Figure 6-16. Terminal on Network Configuration

Network Line 1	
Configuration	
<h3>Terminal on Network - Configuration</h3>	
Terminal Type:	UNKNOWN
Login Connect Menu:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Exit Connect Menu:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Echo:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled

The text in **Terminal Type** will be sent to a host via IAC.

Selecting **Login Connect Menu** will bring the user to a menu rather than to the command line interface (CLI) upon logging in. The menu displays *hosts* and named *lines*.

Selecting **Exit Connect Menu** allows a user to reach the command line interface (CLI) from the Connect Menu.

When the **Send Break** control character is received from the network on its way to a Serial Line, it will not be sent to the Line; instead, the line output will be forced inactive. Example setting: `<control>Y`
Blank the field to set to `<None>`.

The **Break Duration** specifies how long the "spacing" condition will be placed on the line when a break is sent.

Echo applies only to Connect Mode Telnet connections, not to Accept Mode. Only disable **Echo** if your terminal echoes, in which case you will see double of each character typed.

- Enter or modify the following settings:

Terminal on Line Configuration Page Settings	Description
Terminal Type	Enter text to describe the type of terminal. The text will be sent to a host via IAC. Note: IAC means, "interpret as command." It is a way to send commands over the network such as <code>send break</code> or <code>start echoing</code> .
Login Connect Menu	Select the interface to display when the user logs in. Choices are: Enabled = shows the Login Connect Menu. Disabled = shows the CLI
Exit Connect Menu	Select whether to display a choice for the user to exit the Login Connect Menu and reach the CLI. Choices are: Enabled = a choice allows the user to exit to the CLI. Disabled = there is no exit to the CLI.
Echo	Applies only to Connect Mode Telnet connections, not to Accept Mode. Only disable Echo if your terminal echoes, in which case you will see double of each character typed.

- To save changes, click **Submit**.

Host Configuration

This page shows current settings for a remote host and lets you change these settings.

1. Click **Host** on the menu and then click the desired host at the top of the page. Configuration is automatically selected. (Host 1 is the default.) Host Configuration page appears.

Figure 6-17. Host Configuration

The text in **Name** will appear in the **Login Connect Menu**, if enabled. Set it blank to leave it out of the menu.

If **Protocol** is SSH, either supply a value in **SSH Username** to select a pre-configured Username / Password / Key (in SSH Client: Users) or leave it blank to be prompted for Username and Password at connect time.

The **Remote Address** and **Remote Port** specify the remote host to connect to.

Host 1 - Configuration	
Name:	<input type="text"/>
Protocol:	<input checked="" type="radio"/> Telnet <input type="radio"/> SSH
Remote Address:	<input type="text"/>
Remote Port:	<input type="text" value="0"/>

2. Enter or modify the following settings:

Host Page

Host Page Settings	Description
Name	Enter a name for the host. This name appears on the Login Connect Menu. To leave a host out of the menu, leave this field blank.
Protocol	Select the protocol to use to connect to the host. Choices are: Telnet SSH <i>Note: SSH keys must be loaded or created on the SSH page for the SSH protocol to work.</i>
SSH Username	Appears if you selected SSH as the protocol. Enter a username to select a pre-configured Username/Password/Key (configured on the SSH: Client Users page), or leave it blank to be prompted for a username and password at connect time.
Remote Address	Enter an IP address for the host to which the XPort will connect.
Remote Port	Enter the port on the host to which the XPort will connect.

3. To save changes, click **Submit**.

7. Configurable Pin Manager

The Configurable Pin Manager is responsible for assignment and control of the configurable pins (CPs) available on the XPort Pro. There are three configurable pins on the XPort Pro.

You can configure the CPs by making them part of a group. A CP Group may consist of one or more CPs. This increases flexibility when incorporating the XPort Pro into another system.

CPM: Configurable Pins

Each CP is associated with an external hardware pin. CPs can trigger an outside event, like sending an email message or starting Command Mode on a serial line.

To configure the XPort Pro CPs:

1. Click **CPM** on the menu bar and then **CPs** at the top of the page. The CPM: CPs page appears.

Figure 7-1. CPM: CPs

CPs Groups

CPM: CPs

Current Configuration

CP	Ref	Configured As	Value	Groups	Active In Group
CP1	Pin 6	Input	0	0	<available>
CP2	Pin 7	Input	1	0	<available>
CP3	Pin 8	Input	0	0	<available>

CP Status

Name	CP1		
State	Enabled		
Type	Input <input type="button" value="v"/>	<input type="checkbox"/> Assert Low	<input type="button" value="Change"/>
Value	0 (0x0)		
Bit	2	1	0
Level			-
I/O			I
Logic			
Binary	x	x	0
CP#			1
Groups			

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 (bit 0) 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 **CP Status** chart shows the current status for an individual CP. A CP contains one bit of information and the **Value** shows the current value. The **Level** row shows the voltage as 'I' for high and '-' for low. The **I/O** row shows input 'I' or output 'O'. 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.

The Current Configuration table shows the current settings for each CP.

Current Configuration

CPM – CPs Page Current Configuration	Description
CP	Indicates the configurable pin number.
Pin #	Indicates the hardware pin number associated with the CP.
Configured As	Shows the CP configuration. A CP configured as Input is set to read input. A CP configured as Output drives data out of the XPort Pro.
Value	Indicates the current status of the CP: 1 = asserted. 0 = de-asserted. Inv = 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 shows the group in which the CP is active.

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

CPM – CPs Page CP Status	Description
Name	Shows the CP number.
State	Shows the current enable state of the CP.
Type	Indicates whether the CP is set for input or output.
Value	Shows the last bit in the CP current value.
Bit	Visual display of the 32 bit placeholders for a CP.
Level	A “+” symbol indicates the CP is asserted (the voltage is high). A “-” indicates the CP voltage is low.
I/O	Indicates the current status of the pin: I = input O = output <blank> = unassigned
Logic	An “I” indicates the CP is inverted.
Binary	Shows the assertion value of the corresponding bit.
CP#	Shows the CP number.
Groups	Lists the groups in which the CP is a member.

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

To change a CP output value:

1. Select the CP from the drop-down list.
2. Enter the CP value.
3. Click **Submit**.

To change a CP configuration:

1. Select the CP from the drop-down list.
2. Select the CP configuration from the drop-down list.
3. (If necessary) Select the **Assert Low** checkbox.
4. Click **Submit**.

Note: *These changes to a CP are not saved in FLASH. Instead, these CP settings are used when the CP is added to a CP Group. When the CP Group is saved, its CP settings are saved with it. Thus, a particular CP may be defined as "Input" in one group but as "Output" in another. Only one group containing any particular CP may be enabled at once.*

CPM: Groups

The CP Groups page allows for the management of CP groups. Groups can be created or deleted. CPs can be added to or removed from groups. A group, based on its state, can trigger outside events (such as sending email messages). Only an enabled group can be a trigger.

To configure the XPort Pro CP groups:

1. Click **CPM** on the menu bar and then **Groups** at the top of the page. The CPM: Groups page appears.

Figure 7-2. CPM: Groups

CPs Groups

CPM: Groups

Current Configuration

Group Name	State	CP Info
Diagnostic_Mode	Disabled	0 CPs Assigned
Line1_Modem_Ctl_In	Disabled	0 CPs Assigned
Line1_Modem_Ctl_Out	Disabled	0 CPs Assigned
Line1_RS485_HDpx	Disabled	0 CPs Assigned
Line1_RS485_Select	Disabled	0 CPs Assigned
Line1_RTS_CTS	Disabled	2 CPs Assigned
Link_Status	Disabled	0 CPs Assigned

Create Group:

Group Status

Click on a Group Name above to view or change.

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.

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 as an **Input** or **Output** and as positive logic or negative (**Assert Low**) logic.

The current **value** of the Group can be modified. This value 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**.

The following groups are built-in. Add the desired CP to the first (bit 0) position and enable to use:

LineX_RTS_CTS is asserted while hardware flow control is set. This group is only enabled automatically by selecting "Hardware" in line flow control.

LineX_RS485_Select is asserted while in any RS485 mode.

LineX_RS485_HDpx is asserted while in half duplex RS485 mode.

LineX_Modem_Ctl_0 is asserted while a tunnel is active.

LineX_Modem_Ctl_In controls Tunnel connections. This group is only enabled automatically by selecting "Modem Control Asserted" in Tunnel Accept or Connect Modes or "Modem Control" in Tunnel Disconnect Mode.

Link_Status is asserted while network Ethernet link is on.

Tunnel_Status is asserted while tunnel is created for the serial port.


Diagnostic_Mode use two CPs to drive LEDs on the test board, it functions as diagnostic indicator.

- The Current Configuration table shows the current settings for each CP group.

Current Configuration

CPM – Groups Page Current Configuration	Description
Group Name	Shows 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 in the Current Configuration table.

Group Status

CPM – Groups Page Group Status	Description
Name	Shows the CP Group name.
State	Current enable state of the CP group.
Value	Shows the CP group's current value.
Bit	Visual display of the 7 bit placeholders for a CP.
Level	A "+" symbol indicates the CP's bit position is asserted (the voltage is high). A "-" indicates the CP voltage is low.
I/O	Indicates the current status of the pin: I = input O = output <blank> = unassigned
Logic	An "I" indicates the CP output is inverted.
Binary	Shows the assertion value of the corresponding bit. X = group is disabled or bit is unassigned in group
CP#	Shows the configurable pin number and its bit position in the CP group.

To create a CP group:

- Enter a group name in the **Create Group** field.
- Click **Submit**.

To delete a CP group:

1. Select the CP group from the **Delete Group** drop-down list.
2. Click **Submit**.

To enable or disable a CP group:

1. Select the CP group from the **Set** drop-down list.
2. Select the state (**Enabled** or **Disabled**) from the drop-down list.
3. Click **Submit**.

To set a CP group's value:

1. Select the CP group from the **Set** drop-down list.
2. Enter the CP group's value in the **value** field.
3. Click **Submit**.

To add a CP to a CP group:

1. Select the CP from the **Add** drop-down list.
2. Select the CP group from the drop-down list.
3. Select the CP bit location from the **bit** drop-down list.
4. Click **Submit**.

To delete a CP from a CP group:

1. Select the CP from the **Remove** drop-down list.
2. Select the CP group from the drop-down list.
3. Click **Submit**.

8. Services Settings

DNS Configuration

This page shows the active run-time settings for the domain name system (DNS) protocol. The primary and secondary DNS addresses come from the active interface. The static addresses from the Network Interface Configuration page may be overridden by DHCP or BOOTP.

The DNS page also shows any contents in the DNS cache. When a DNS name is resolved using a forward lookup, the results are stored in the DNS cache temporarily. The XPort Pro consults this cache when performing forward lookups. Each item in the cache eventually times out and is removed automatically after a certain period, or you can delete it manually.

To view the XPort Pro DNS configuration:


 Click **DNS** on the menu bar. The DNS page appears.

Figure 8-1. DNS Settings

<p>DNS</p> <p>Current Status</p> <table border="1"><tr><td>Primary DNS:</td><td>172.19.1.1</td></tr><tr><td>Secondary DNS:</td><td>172.19.1.2</td></tr></table> <p>DNS Cache</p> <table border="1"><tr><td>There are no entries in the cache.</td></tr></table>	Primary DNS:	172.19.1.1	Secondary DNS:	172.19.1.2	There are no entries in the cache.	<p>This page displays the current status of the DNS subsystem. The primary and secondary DNS addresses come from the active interface. The static addresses from the Network Interface Configuration page may be overridden by DHCP or BOOTP.</p> <p>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.</p>
Primary DNS:	172.19.1.1					
Secondary DNS:	172.19.1.2					
There are no entries in the cache.						

PPP Configuration

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). For more information about PPP, see [13 Point to Point Protocol PPP](#).

The XPort Pro supports two types of PPP authentication: Password Authentication Protocol (PAP) and Challenge Handshake Authentication Protocol (CHAP). Both of these authentication methods require the configuration of a username and password.

The XPort Pro also supports authentication scheme of “None” 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 on other lines.

Note: Since the XPort Pro does not support NAPT (Network Address and Port Translation), static routing table entries must be added to both the serial-side and network-side devices (both of which are external to the XPort Pro).

To configure the XPort Pro PPP configuration:

1. Click **PPP** on the menu bar and **Line1** at the top of the page. The PPP on Line 1 – Configuration page appears.

Figure 8-2. PPP Configuration Settings

Line 1

Configuration

PPP on Line 1 - Configuration

WARNING: Serial protocol is not PPP.

Local IP Address:	<input type="text" value="<None>"/>
Peer IP Address:	<input type="text" value="<None>"/>
Authentication Mode:	<input checked="" type="radio"/> None <input type="radio"/> PAP <input type="radio"/> CHAP <input type="radio"/> MS-CHAP <input type="radio"/> MS-CHAPV2

This page is used to configure a network link using PPP over a serial line. 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 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. It may be entered alone, in CIDR form, or with an explicit mask:
192.168.1.1 (default mask)
192.168.1.1/24 (CIDR)
192.168.1.1 255.255.255.0 (explicit mask)

The **Peer IP Address** is the IP Address that will be assigned to the peer if asked during negotiation.

There are four different authentication schemes supported by this device. **None** (no authentication), the Password Authentication Protocol (**PAP**), the Challenge-Handshake Authentication Protocol (**CHAP**), the Microsoft Challenge-Handshake Authentication Protocol (**MS-CHAP**), and the MS-CHAP Version 2 (**MS-CHAPV2**).

The **Auth Username** and **Auth Password** are the credentials used by the **PAP**, **CHAP**, **MS-CHAP**, and **MS-CHAPV2** 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.

2. Enter or modify the following settings:

PPP Configuration Page Settings	Description
Local IP Address	Enter the IP address assigned to the XPort Pro's PPP interface.

PPP Configuration Page Settings	Description
Peer IP Address	Enter the IP address assigned to the peer (when requested during negotiation).
Authentication Mode	Choose the authentication mode: None = no authentication is required. PAP = Password Authentication Protocol. CHAP = Challenge Handshake Authentication Protocol.

3. Click **Submit**.

SNMP Configuration

This page is used to configure the Simple Network Management Protocol (SNMP) agent. Using this page, you can configure the SNMP service to send a trap when it receives a request for information that contains an incorrect community name and does not match an accepted system name for the service.

To configure SNMP:

1. Click **SNMP** on the menu bar. The SNMP page opens and shows the current SNMP configuration.

Figure 8-3. SNMP Configuration

SNMP

This page displays the current configuration of the SNMP Agent.

SNMP Agent: On Off

Read Community:

Write Community:

System Contact:

System Name:

System Description:

System Location:

Enable Traps: On Off

Primary Trap Dest IP:

Secondary Trap Dest IP:

Current Configuration

SNMP Agent Status:	Running (On)
Read Community:	<Configured> [Delete]
Write Community:	<Configured> [Delete]
System Contact:	<None>
System Name:	xport_pro [Delete]
System Description:	<Default>
System Location:	<None>
Traps Enabled:	On
Primary Trap Dest IP:	<None>
Secondary Trap Dest IP:	<None>

2. Enter or modify the following settings:

SNMP Page Settings	Description
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.

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

- Click **Submit**.
- In the **Current Configuration** table, delete and clear currently stored settings as necessary.

FTP Configuration

This page shows the current File Transfer Protocol (FTP) configuration and connection status and various statistics about the FTP server.

To configure FTP:

- Click **FTP** on the menu bar. The FTP page opens to display the current configuration.

Figure 8-4. FTP Configuration

FTP

Configuration

State:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Admin Username:	<input type="text" value="admin"/>
Admin Password:	<input type="text" value="<None>"/>

Statistics


Status:	Running
Connections Rejected:	0
Connections Accepted:	0
Active Connections:	0
Last Client:	No device has connected

This page displays the configuration and statistics for the FTP Server.

- Enter or modify the following settings:

FTP Page Settings	Description
State	Select Enabled to enable the FTP server.
Admin Username	Enter the username to use when logging in via FTP.
Admin Password	Enter the password to use when logging in via FTP.

- Click **Submit**.

 Click **[Reset]** to reset the adjacent FTP Password.

TFTP Configuration

This page shows the status and various statistics about the Trivial File Transfer Protocol (TFTP) server.

To configure TFTP:

- Click **TFTP** on the menu bar. The TFTP page opens to display the current configuration.

Figure 8-5. TFTP Configuration

TFTP Server	
Configuration	
State:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Allow File Creation:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Allow Firmware Update:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Statistics	
Status:	Running
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

This page displays the current configuration and statistics for the TFTP Server.

- Enter or modify the following settings:

TFTP Page Settings	Description
State	Select Enabled to enable the TFTP server.
Allow TFTP File Creation	Select whether to allow the creation of new files stored on the TFTP server.
Allow Firmware Update	Specifies whether or not the TFTP Server is allowed to accept a firmware update for the device. An attempt to update firmware is recognized based on the name of the file. Note: TFTP has no way to authenticate the client so the device is open to malicious update.

- Click **Submit**.

Syslog Configuration

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

Note: 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 port is 514.

1. Click **Syslog** on the menu bar. The Syslog page opens to display the current configuration.

Figure 8-6. Syslog

Syslog	
Configuration	
State:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Host:	<input type="text"/>
Local Port:	<input type="text" value="514"/>
Remote Port:	<input type="text" value="514"/>
Severity Log Level:	None <input type="button" value="v"/>
Statistics	
Status:	Inactive
Messages Sent:	0
Messages Failed:	0

This page displays the current configuration and statistics for Syslog.

The **Severity Log Level** field is used to specify which level of system message should be logged to the Syslog Host. This setting applies to all syslog facilities. **None** shuts off logging. **Debug** enables all logging. **Emergency** enables only emergency logging. Intermediate levels enable logging for that and all of the more severe levels.

2. Enter or modify the following settings:

Syslog Page Settings	Description
State	Select to enable or disable the syslog.
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 XPort Pro from which system logs are sent.
Remote Port	Enter the number of the port on the remote server that supports logging services. The default is 514 .
Severity Log Level	From the drop-down box, select the minimum level of system message the XPort Pro 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 Configuration

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. This page has three links at the top for viewing statistics and for viewing and changing configuration and authentication settings.

HTTP Statistics

Note: The HTTP log is a scrolling log, with the last **Max Log Entries** cached and viewable. You can change the maximum number of entries that can be viewed on the HTTP Configuration Page.

To view HTTP statistics:

This page shows various statistics about the Hypertext Transfer Protocol (HTTP) server.

One Step Click HTTP on the menu bar and then Statistics at the top of the page. The HTTP Statistics page appears.

Figure 8-7. HTTP Statistics

The screenshot shows the HTTP Statistics page. At the top, there are three tabs: **Statistics** (selected), **Configuration**, and **Authentication**. Below the tabs is the title **HTTP Statistics**. A table displays the following statistics:

Rx Bytes	93152
Tx Bytes	790283
200 - OK	111
400 - Bad Request	0
401 - Authorization Required	24
404 - Not Found	0
408 - Request Timeout	0
413 - Request Too Large	0
501 - Not Implemented	0
Status Unknown	0
Work Queue Full	0
Socket Error	0
Memory Error	0
Logs:	50 entries (7523 bytes) [View] [Clear]

On the right side of the page, there is a sidebar with the following text:

This page displays the various HTTP Server statistics.

The HTTP Log is a scrolling log in that only the last **Max Log Entries** lines are cached and viewable. This maximum number of entries can be modified on the [HTTP Configuration](#) page.

Change HTTP Configuration

On this page you can change HTTP configuration settings.

To configure HTTP:

1. Click **HTTP** on the menu bar and then **Configuration** at the top of the page. The HTTP Configuration page opens.

Figure 8-8. HTTP Configuration

Statistics
Configuration
Authentication

HTTP Configuration

HTTP Server: On Off

HTTP Port:

HTTPS Port:

HTTPS Protocols

SSL3: Enable Disable

TLS1.0: Enable Disable

TLS1.1: Enable Disable

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
HTTPS Protocols:	SSL3, TLS1.0, TLS1.1
Max Timeout:	10 seconds
Max Bytes:	40960
Logging:	On
Max Log Entries:	50
Log Format:	%h %t "%r" %s %B "%{Referer}" "%{User-Agent}"
Logs:	50 entries (7498 bytes) View Clear

Both the **HTTP Port** and **HTTPS Port** (SSL) can be overridden. The HTTP Server will only listen on the **HTTPS Port** when an **SSL Certificate** is configured for the device and at least one SSL protocol version is enabled in **HTTPS Protocols**.

The **Max Timeout** value specifies the maximum amount of time to wait for a request from a client. The **Max Bytes** value specifies the maximum number of bytes allowed in a client request. Both of these value are used to help prevent Denial of Service (DoS) attacks against the HTTP Server.

The HTTP Log is a scrolling log in that only the last **Max Log Entries** lines are cached and viewable.

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 '%{H:%M:%S}t' or '%{T}t')
%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 settings:

HTTP Configuration Page Settings	Description
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.
HTTPS Protocols	<p>Select to enable or disable the following protocols:</p> <p>SSL3 = Secure Sockets Layer version 3</p> <p>TLS1.0 = Transport Layer Security version 1.0. TLS 1.0 is the successor of SSL3 as defined by the IETF.</p> <p>TLS1.1 = Transport Layer Security version 1.1</p> <p>The protocols are enabled by default.</p> <p>A server certificate and associated private key need to be installed in the SSL configuration section to use HTTPS.</p>
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 40 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	<p>Set the log format string for the HTTP server. Follow these Log Format rules:</p> <p>%a - remote IP address (could be a proxy)</p> <p>%b - bytes sent excluding headers</p> <p>%B - bytes sent excluding headers (0 = '-')</p> <p>%h - remote host (same as '%a')</p> <p>%{h}i - header contents from request (h = header string)</p> <p>%m - request method</p> <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>

HTTP Configuration Page Settings	Description
	%s - return status

- Click **Submit**.

HTTP Authentication

HTTP Authentication enables you to require usernames and passwords to access specific web pages or directories on the XPort Pro's built-in web server.

To configure HTTP authentication settings:

- Click **HTTP** on the menu bar and then **Authentication** at the top of the page. The HTTP Authentication page opens.

Figure 8-9. HTTP Authentication

Statistics
Configuration
Authentication

HTTP Authentication

URI:

Realm:

AuthType: None Basic Digest
 SSL SSL/Basic SSL/Digest

Username:

Password:

Current Configuration

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

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 **URI** must begin with / to refer to the filesystem.

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.

- Enter or modify the following settings:

HTTP Authentication Settings	Description
URI	Enter the Uniform Resource Identifier (URI). <i>Note: The URI must begin with '/' to refer to the filesystem.</i>
Realm	Enter the domain, or realm, used for HTTP. Required with the URI field.
Auth Type	Select the authentication type: None = no authentication is necessary. Basic = encodes passwords using Base64. Digest = encodes passwords using MD5. SSL = the page can only be accessed over SSL (no password is required). SSL/Basic = the page is accessible only over SSL and encodes passwords using Base64. SSL/Digest = 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. Click **Submit**.
4. In the Current Configuration table, delete and clear currently stored settings as necessary.

Note:

- ◆ More than one Username per URI is permitted. Click Submit and enter the next Username as necessary.
- ◆ The URI, realm, username, and password are user-specified, free-form fields. The URI must match the directory created on the XPort file system.

RSS Settings

Really Simple Syndication (RSS) (sometimes referred to as Rich Site Summary) is a method of feeding online content to Web users. Instead of actively searching for XPort Pro configuration changes, RSS feeds permit viewing only relevant and new information regarding changes made to the XPort Pro via an RSS publisher. The RSS feeds may also be stored to the file system `cfg_log.txt` file.

To configure RSS settings:

1. Click **RSS** on the menu bar. The RSS page opens and shows the current RSS configuration.

Figure 8-10. RSS

RSS	
RSS Feed:	<input type="radio"/> On <input checked="" type="radio"/> Off
Persistent:	<input type="radio"/> On <input checked="" type="radio"/> Off
Max Entries:	<input type="text" value="100"/>
Current Status	
Data:	0 entries (0 bytes) [View] [Clear]

An RDF Site Summary (RSS) syndication feed is served by the HTTP Server. This feed contains up-to-date information regarding the configuration changes that occur on the device.

Specifying the RSS Feed to be **Persistent** results in the data being stored on the filesystem. The file used is `/cfg_log.txt`. This allows feed data to be available across reboots (or until the factory defaults are set).

Each RSS Feed entry is prefixed with a timestamp as follows: "[BC: HH: MM: SS]". "BC" is the Boot Cycle value. This value is the number of times the device has been rebooted since the factory defaults were last loaded. The resulting "HH: MM: SS" is the time since the device booted up. This somewhat cryptic scheme is used because no Real Time Clock is available.

The RSS Feed is a scrolling feed in that only the last **Max Entries** entries are cached and viewable.

Simply register the RSS Feed within your favorite RSS aggregator and you will automatically be notified of any configuration changes that occur.

2. Enter or modify the following settings:

RSS Page Settings	Description
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 (<code>cfg_log.txt</code>) and to be available across reboots.
Max Entries	Sets the maximum number of log entries. Only the last Max Entries are cached and viewable.

3. Click **Submit**.
4. In the **Current Status** table, view and clear stored settings as necessary.

LPD Settings

In addition to its other functions, the XPort Pro acts as a print server if a printer is connected to one of its serial ports.

Clicking the **LPD** (Line Printer Daemon) link in the menu bar, shows a LPD page. This page has three links at the top for viewing print queue statistics, changing print queue configuration, and printing a test page.

Because the LPD lines operate independently, you can specify different configuration settings for each.

LPD Statistics Page

This read-only page shows various statistics about the LPD server.

To view LPD statistics:


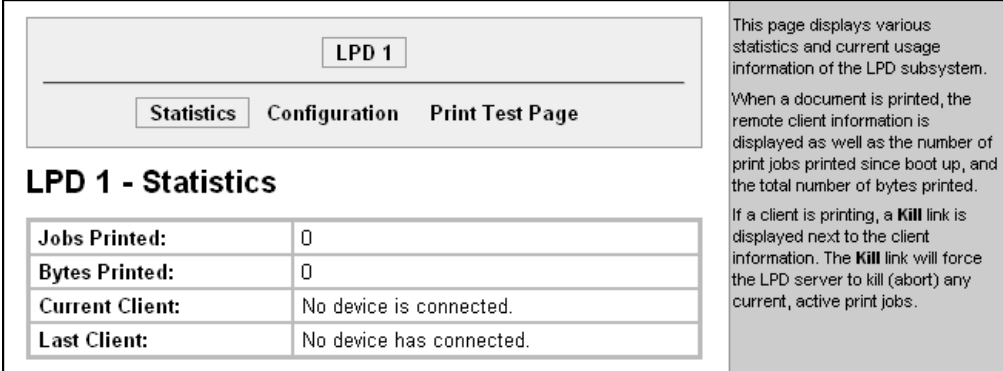
-  Click **LPD** on the menu bar and then select the line and **Statistics** at the top of the page. The LPD page shows LPD statistics.

Figure 8-11. LPD Statistics



LPD 1	
Statistics	Configuration
Print Test Page	

LPD 1 - Statistics

Jobs Printed:	0
Bytes Printed:	0
Current Client:	No device is connected.
Last Client:	No device has connected.

This page displays various statistics and current usage information of the LPD subsystem. When a document is printed, the remote client information is displayed as well as the number of print jobs printed since boot up, and the total number of bytes printed. If a client is printing, a **Kill** link is displayed next to the client information. The **Kill** link will force the LPD server to kill (abort) any current, active print jobs.

LPD Configuration Page

Here you can change LPD configuration settings.

To configure LPD settings:

1. Click **LPD** on the menu bar, select the LPD line and click **Configuration**. The LPD Configuration page appears.

Figure 8-12. LPD Configuration

LPD 1

Statistics
Configuration
Print Test Page

LPD 1 - Configuration

WARNING: Serial protocol is not "LPD".

Banner:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Binary:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Start of Job:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
End of Job:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Formfeed:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
Convert Newlines:	<input type="radio"/> Enabled <input checked="" type="radio"/> Disabled
SOJ String:	<input type="text"/> <input checked="" type="radio"/> Text <input type="radio"/> Binary
EOJ String:	<input type="text"/> <input checked="" type="radio"/> Text <input type="radio"/> Binary
Queue Name:	<input type="text"/>

Enabling **Banner** will force the banner page to be printed even if the incoming print job does not specify to do so.

Enabling **Binary** will pass the entire file to the printer without removing any characters. Disabled, only valid ascii and control characters are passed; all others are stripped. Valid control characters include the tab, linefeed, formfeed, backspace, and newline.

Enabling **Formfeeds** will force a formfeed to be sent to the printer at the end of each print job.

Enabling **Convert Newlines** will convert single newlines and single carriage returns into DOS style carriage return + linefeed line endings; if carriage return and linefeed characters are already in the correct DOS line-ending order, they will remain unchanged.

To send a Start Of Job (**SOJ**) or End Of Job (**EOJ**) string to the printer, enter the appropriate string. The SOJ and EOJ strings are limited to 100 characters each (after possible conversion to binary).

The SOJ and EOF strings can be entered in **Text** or **Binary** form. The Binary form allows square braces [] to enclose one or more character designations separated by commas. Use straight decimal numbers up to 255 or hexadecimal numbers prefixed with 0x up to 0xFF within the square braces. To specify an open brace in binary mode, use two in a row. Example (in Binary mode):
 AB [255 , 0xFF] C [[D] Results in a string containing binary values where the dots appear: AB · C [D]

A **Queue Name** may not contain white space.

2. Enter or modify the following settings:

LPD Configuration Page Settings	Description
Banner	Select Enabled to print the banner even if the print job does not specify to do so. Selected by default.

LPD Configuration Page Settings	Description
Binary	Select Enabled for the XPort Pro to pass the entire file to the printer unchanged. Otherwise, the XPort Pro passes only valid ASCII and valid control characters to the printer. Valid control characters include the tab, linefeed, formfeed, backspace, and newline characters. All others are stripped. Disabled by default.
Start of Job	Select Enabled to print a "start of job" string before sending the print data.
End of Job	Select Enabled to send an "end of job" string.
Formfeed	Select Enabled to force the printer to advance to the next page at the end of each print job.
Convert Newlines	Select Enabled to convert single newlines and carriage returns to DOS-style line endings.
SOJ String	If Start of Job (above) is enabled, enter the string to be sent to the printer at the beginning of a print job. The limit is 100 characters. Indicate whether the string is in text or binary format.
EOJ String	If End of Job (above) is enabled, enter the string to send at the end of a print job. The limit is 100 characters. Indicate whether the string is in text or binary format.
Queue Name	To change the name of the print queue, enter a new name. The name cannot have white space in it and is limited to 31 characters. The default is LPDQueueX (for line number X)

9. Security Settings

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. This page has four links at the top for viewing and changing SSH server host keys, SSH server authorized keys, SSH client known hosts, and SSH client users.

Note: For more information, see [16 Security in Detail](#)

SSH Server Host Keys

To configure the SSH server host keys:

1. Click **SSH** on the menu bar. The SSH Server Host Keys page appears.

Figure 9-1. SSH Server: Host Keys

The SSH Server Host Keys are used by all applications that play the role of an SSH Server. Specifically the Command Line Interface (CLI) and Tunneling in Accept Mode. These keys can be created elsewhere and uploaded to the device or automatically generated on the device.

If uploading existing keys, take care to ensure the Private Key will not be compromised in transit. This implies the data is uploaded over some kind of secure private network.

WARNING: When generating new Keys, using a larger **Bit Size** will result in a longer key generation time. Tests on this hardware have shown it can take upwards of:

- 10 seconds for a 512 bit RSA Key
- 15 seconds for a 768 bit RSA Key
- 1 minute for a 1024 bit RSA key
- 1 minute for a 512 bit DSA Key
- 2 minutes for a 768 bit DSA Key
- 3 minutes for a 1024 bit DSA key

Note that some SSH Clients require RSA Host Keys to be at least 1024 bits in size.

Public RSA Key:	No RSA Key Configured
Public DSA Key:	No DSA Key Configured

2. Enter or modify the following settings:

SSH Server: Host Keys Page Settings	Description
Upload Keys	
Private Key	Enter the path and name of the existing private key you want to upload or use the Browse button to select the key. Be sure the private key will not be compromised in transit. This implies the data is uploaded over some kind of secure private network.
Public Key	Enter the path and name of the existing public key you want to upload or use the Browse button to select the key.
Key Type	Select a key type to use: RSA = use this key with SSH1 and SSH2 protocols. DSA = use this key with the SSH2 protocol.
Create New Keys	
Key Type	Select a key type to use for the new key: RSA = use this key with the SSH1 and SSH2 protocols. DSA = use this key with the SSH2 protocol.
Bit Size	Select a bit length for the new key: 512 768 1024 Using a larger bit size takes more time to generate the key. Approximate times are: 10 seconds for a 512 bit RSA Key 15 seconds for a 768 bit RSA Key 1 minute for a 1024 bit RSA key 30 seconds for a 512 bit DSA key 1 minute for a 768 bit DSA key 2 minutes for a 1024 bit DSA key Some SSH clients require RSA host keys to be at least 1024 bits long.

3. Click **Submit**.

SSH Server Authorized Users

On this page you can change SSH server settings for Authorized Users.

SSH Server Authorized Users are accounts on the XPort that can be used to log into the XPort Pro using SSH. For instance, these accounts can be used to SSH into the CLI or open an SSH connection to a device port. Every account must have a password.

The user's public keys are optional and only necessary if public key authentication is required. Using public key authentication allows a connection to be made without the password being asked.

Under **Current Configuration**, **User** has a **Delete User** link, and **Public RSA Key** and **Public DSA Key** have **View Key** and **Delete Key** links. If you click a **Delete** link, a message asks whether you are sure you want to delete this information. Click **OK** to proceed or **Cancel** to cancel the operation.

To configure the SSH server for authorized users:

1. Click **SSH** on the menu bar and then **Server Authorized Users** at the top of the page. The SSH Server: Authorized Users page appears.

Figure 9-2. SSH Server: Authorized Users

SSH Server: Host Keys SSH Server: Authorized Users	SSH Client: Known Hosts SSH Client: Users	<p>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.</p> <p>Every user account must have a Password.</p> <p>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 at that time.</p>
<h3>SSH Server: Authorized Users</h3> <p>Username: <input type="text"/></p> <p>Password: <input type="password"/></p> <p>Public RSA Key: <input type="text"/> <input type="button" value="Browse..."/></p> <p>Public DSA Key: <input type="text"/> <input type="button" value="Browse..."/></p> <p><input type="button" value="Add/Edit"/></p> <hr/> <p>Current Configuration</p> <p>No Authorized Users are currently configured for the SSH Server.</p>		

- Enter or modify the following settings:

SSH Server: Authorized Users Page Settings	Description
Username	Enter the name of the user authorized to access the SSH server.
Password	Enter the password associated with the username.
Public RSA Key	Enter the path and name of the existing public RSA key you want to use with this user or use the Browse button to select the key. If authentication is successful with the key, no password is required.
Public DSA Key	Enter the path and name of the existing public DSA key you want to use with this user or use the Browse button to select the key. If authentication is successful with the key, no password is required.

- Click **Submit**.

SSH Client Known Hosts

On this page you can change SSH client settings for known hosts.

Note: You do not have to complete the fields on this page for communication to occur. However, completing them adds another layer of security that protects against Man-In-The-Middle (MITM) attacks.

To configure the SSH client for known hosts:

- Click **SSH** on the menu bar and then **Client Known Hosts** at the top of the page. The SSH Client: Known Hosts page appears.

Figure 9-3. SSH Client: Known Hosts


The screenshot shows the 'SSH Client: Known Hosts' configuration page. At the top, there is a navigation menu with 'SSH Client: Known Hosts' selected. Below the menu, the page title 'SSH Client: Known Hosts' is displayed. The main configuration area includes a 'Server' field, a 'Public RSA Key' field with a 'Browse...' button, and a 'Public DSA Key' field with a 'Browse...' button. A 'Submit' button is located at the bottom of the configuration area. Below the configuration area, there is a 'Current Configuration' section that states 'No Known Hosts are currently configured for the SSH Client.' On the right side of the page, there is a sidebar with explanatory text: '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.'

- Enter or modify the following settings:

SSH Client: Known Hosts Page Settings	Description
Server	Enter the name or IP address of a known host. If you enter a server name, the name should match the name of the server used as the Remote Address in Connect mode tunneling.
Public RSA Key	Enter the path and name of the existing public RSA key you want to use with this known host or use the Browse button to select the key.
Public DSA Key	Enter the path and name of the existing public DSA key you want to use with this known host or use the Browse button to select the key.

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

3. Click **Submit**.

 In the **Current Configuration** table, delete currently stored settings as necessary.

SSH Client User Configuration

On this page you can change SSH client settings for users.

SSH client known users are used by all applications that play the role of an SSH client, specifically tunneling in Connect Mode. At the very least, a password or key pair must be configured for a user. The keys for public key authentication can be created elsewhere and uploaded to the device or automatically generated on the device. If uploading existing keys, be sure the private key will not be compromised in transit. This implies the data is uploaded over some kind of secure private network.

Note: If you are providing a key by uploading a file, make sure that the key is not password protected.

To configure the SSH client users:

1. Click **SSH** on the menu bar and then **SSH Client Users** at the top of the page. The SSH Client: Users page appears.

Figure 9-4. SSH Client: Users

SSH Server: Host Keys
SSH Client: Known Hosts

SSH Server: Authorized Users
SSH Client: Users

SSH Client: Users

Username:

Password:

Remote Command:

Private Key:

Public Key:

Key Type: RSA DSA

Create New Keys

Note: User must first be created using the form above.

Username:

Key Type: RSA DSA

Bit Size: 512 768 1024

Current Configuration

No Users are currently configured for the SSH Client.

The SSH Client Users are used by all applications that play the role of an SSH Client. Specifically Tunneling in Connect Mode.

At the very least, a **Password** or **Key Pair** must be configured for a user. The keys for public key authentication can be created elsewhere and uploaded to the device or automatically generated on the device.

If uploading existing Keys, take care to ensure the Private Key will not be compromised in transit. This implies the data is uploaded over some kind of secure private network.

WARNING: When generating new Keys, using a larger **Bit Size** will result in a longer key generation time. Tests on this hardware have shown it can take upwards of:

- 10 seconds for a 512 bit RSA Key
- 15 seconds for a 768 bit RSA Key
- 1 minute for a 1024 bit RSA key
- 1 minute for a 512 bit DSA Key
- 2 minutes for a 768 bit DSA Key
- 3 minutes for a 1024 bit DSA key


The default **Remote Command** is '<Default login shell>' which tells the SSH Server to execute a remote shell upon connection. This can be changed to anything the SSH Server on the remote host can execute.

- Enter or modify the following settings:

SSH Client: Users Page Settings	Description
Username	Enter the name that the XPort Pro uses to connect to a SSH server.
Password	Enter the password associated with the username.
Remote Command	Enter the command that can be executed remotely. Default is shell , which tells the SSH server to execute a remote shell upon connection. This command can be changed to anything the remote host can perform.
Private Key	Enter the name of the existing private key you want to use with this SSH client user. You can either enter the path and name of the key, or use the Browse button to select the key.
Public Key	Enter the path and name of the existing public key you want to use with this SSH client user or use the Browse button to select the key.
Key Type	Select the key type to be used. Choices are: RSA = use this key with the SSH1 and SSH2 protocols. DSA = use this key with the SSH2 protocol.

SSH Client: Users Page Settings	Description
Create New Keys	
Username	Enter the name of the user associated with the new key.
Key Type	Select the key type to be used for the new key. Choices are: RSA = use this key with the SSH1 and SSH2 protocols. DSA = use this key with the SSH2 protocol.
Bit Size	Select the bit length of the new key: 512 768 1024 Using a larger Bit Size takes more time to generate the key. Approximate times are: 10 seconds for a 512 bit RSA Key 15 seconds for a 768 bit RSA Key 1 minute for a 1024 bit RSA key 30 seconds for a 512 bit DSA key 1 minute for a 768 bit DSA key 2 minutes for a 1024 bit DSA key Some SSH clients require RSA host keys to be at least 1024 bits long.

3. Click **Submit**.

 In the **Current Configuration** table, delete currently stored settings as necessary.

SSL Settings

Secure Sockets 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.

Certificate/Private key combinations can be obtained from an external Certificate Authority (CA) and downloaded into the unit. Self-signed certificates with associated private key can be generated by the device server itself.

For more information regarding Certificates and how to obtain them see [Obtaining a Certificate and Private Key](#) on page 138.

To configure the XPort Pro SSL settings:

1. Click **SSL** from the main menu. The SSL page appears.

Figure 9-5. SSL

SSL

Upload Certificate

New Certificate:

New Private Key:

Upload Authority Certificate

Authority:

Create New Self-Signed Certificate

Country (2 Letter Code):

State/Province:

Locality (City):

Organization:

Organization Unit:

Common Name:

Expires: mm/dd/yyyy

Key length: 512 bit 768 bit 1024 bit

Type: RSA DSA

Current SSL Certificates

<None>

Current Certificate Authorities

<None>

An SSL Certificate must be configured in order for the HTTP Server to listen on the HTTPS Port. This certificate can be created elsewhere and uploaded to the device or automatically generated on the device. A certificate generated on the device will be self-signed.

If uploading an existing SSL Certificate, take care to ensure the Private Key will not be compromised in transit. This implies the data is uploaded over some kind of secure private network.

WARNING: When generating a new self-signed SSL Certificate, using a large key size can result in a VERY LONG key generation time. Tests on this hardware have shown it can take upwards of:

- 10 seconds for a 512 bit RSA Key
- 30 seconds for a 768 bit RSA Key
- 1 minute for a 1024 bit RSA Key
- 30 seconds for a 512 bit DSA Key
- 2 minutes for a 768 bit DSA Key
- 6 minutes for a 1024 bit DSA Key

2. Enter or modify the following settings:

SSL Page Settings	Description
Upload Certificate	
New Certificate	<p>This certificate identifies the XPort Pro to peers. It is used for HTTPS and SSL Tunneling.</p> <p>Enter the path and name of the certificate you want to upload, or use the Browse button to select the certificate.</p> <p>RSA or DSA certificates with 512 to 1024 bit public keys are allowed.</p> <p>The format of the file must be PEM. The file must start with "-----BEGIN CERTIFICATE-----" and end with "-----END CERTIFICATE-----". Some Certificate Authorities</p>

SSL Page Settings	Description
	add comments before and/or after these lines. Those need to be deleted before upload.
New Private Key	<p>Enter the path and name of the private key you want to upload, or use the Browse button to select the private key. The key needs to belong to the certificate entered above.</p> <p>The format of the file must be PEM. The file must start with “-----BEGIN RSA PRIVATE KEY-----” and end with “-----END RSA PRIVATE KEY-----”. Read DSA instead of RSA in case of a DSA key. Some Certificate Authorities add comments before and/or after these lines. Those need to be deleted before upload.</p>
Upload Authority Certificate	<p>Authority</p> <p>One or more authority certificates are needed to verify a peer's identity. It is used for SSL Tunneling. These certificates do not require a private key.</p> <p>Enter the path and name of the certificate you want to upload, or use the Browse button to select the certificate.</p> <p>RSA or DSA certificates with 512 to 1024 bit public keys are allowed.</p> <p>The format of the file must be PEM. The file must start with “-----BEGIN CERTIFICATE-----” and end with “-----END CERTIFICATE-----”. Some Certificate Authorities add comments before and/or after these lines. Those need to be deleted before upload.</p>
Create New Self-Signed Certificate	<p>Country (2 Letter Code)</p> <p>Enter the 2-letter country code to be assigned to the new self-signed certificate.</p> <p>Examples: US for United States and CA for Canada</p> <hr/> <p>State/Province</p> <p>Enter the state or province to be assigned to the new self-signed certificate.</p> <hr/> <p>Locality (City)</p> <p>Enter the city or locality to be assigned to the new self-signed certificate.</p> <hr/> <p>Organization</p> <p>Enter the organization to be associated with the new self-signed certificate.</p> <p>Example: If your company is called Widgets, and you are setting up a web server for the Sales department, enter Widgets for the organization.</p>

SSL Page Settings	Description
Organization Unit	<p>Enter the organizational unit to be associated with the new self-signed certificate.</p> <p>Example: If your company is setting up a web server for the Sales department, enter Sales for your organizational unit.</p>
Common Name	<p>Enter the same name that the user will enter when requesting your web site.</p> <p>Example: If a user enters <code>http://www.widgets.abccompany.com</code> to access your web site, the Common Name would be <code>www.widgets.abccompany.com</code>.</p>
Expires	<p>Enter the expiration date, in mm/dd/yyyy format, for the new self-signed certificate.</p> <p>Example: An expiration date of May 9, 2010 is entered as 05/09/2010.</p>
Key length	<p>Select the bit size of the new self-signed certificate. Choices are:</p> <p>512 bits</p> <p>768 bits</p> <p>1024 bits</p> <p>The larger the bit size, the longer it takes to generate the key. Approximate times are:</p> <p>10 seconds for a 512-bit RSA key</p> <p>30 seconds for a 768-bit RSA key</p> <p>1 minute for a 1024-bit RSA key</p> <p>30 seconds for a 512-bit DSA key</p> <p>2 minutes for a 768-bit DSA key</p> <p>6 minute for a 1024-bit DSA key</p>
Type	<p>Select the type of key:</p> <p>RSA = Public-Key Cryptography algorithm based on large prime numbers, invented by Rivest Shamir and Adleman. Used for encryption and signing.</p> <p>DSA = Digital Signature Algorithm also based on large prime numbers, but can only be used for signing. Developed by the US government to avoid the patents on RSA.</p>

10. VIP Settings

The VIP pages allow you to view current VIP statistics and configuration.

Virtual IP (VIP) Statistics

To view the XPort Pro VIP Statistics:

1. Click **VIP** from the main menu. The VIP Statistics page appears.

Figure 10-1. VIP Statistics Page

Virtual IP (VIP) Statistics	
DSM IP Address:	
Local Dna ID:	
Tunnel User:	
Tunnel Port List:	
Current Tunnel Port:	0
Conduit Status:	Down
Conduit Uptime:	0 days 00:00:00
Time of Last Replication:	
Config Name:	
Network Interfaces:	<None>

Virtual IP (VIP) uses a **conduit** to communicate with a Device Services Manager (DSM). The conduit carries multiple simultaneous VIP sessions.

Conduit Status shows when conduit is up. With VIP enabled, the conduit is kept up if possible even if no VIP session is active. If your conduit does not come up, you may need to go to your DSM to create a **bootstrap file**, then import it as XML.

Conduit Uptime shows the elapsed time that the conduit has remained up.

Time of Last Replication is the time as seen on the DSM that VIP configuration data last changed.

Config Name is the name of this device as seen on the DSM.

Network Interfaces is the list of defined VIP names from the DSM. A VIP name may be used under Tunnel Connect Mode for a Host by enabling VIP for that host and providing the VIP name.

2. Enter or modify the following settings:

Line - Configuration Page Settings	Description
DSM IP Address	Address of the Device Services Manager (DSM) from the bootstrap file.
Local DNA ID	Identity of this device from the bootstrap file.
Tunnel User	User name of this device from the bootstrap file.
Tunnel Port List	DSM listening ports from the bootstrap file.
Current Tunnel Port	DSM port currently used by the conduit.
Conduit Status	Indicates the status of the secure communications channel to the ManageLinx DSM.
Conduit Uptime	Amount of time the XPort has had conduit established.
Time of Last Replication	Time and date when configuration information was last received from a ManageLinx DSM.
Config Name	The name used by the ManageLinx DSM to identifies the XPort Pro.
Network Interfaces	VIPs that can be used in Connect Mode VIP tunnels.

Virtual IP (VIP) Configuration

To configure the XPort Pro VIP settings:

1. Click **VIP→Configuration** from the main menu. The VIP Configuration page displays.

Figure 10-2. VIP Configuration Page

The screenshot displays the 'Virtual IP (VIP) Configuration' page. At the top, there are two tabs: 'Statistics' and 'Configuration', with 'Configuration' being the active tab. Below the tabs, the title 'Virtual IP (VIP) Configuration' is centered. Underneath the title, there is a 'State:' label followed by two radio button options: 'Enabled' and 'Disabled'. The 'Disabled' option is selected, indicated by a filled circle. To the right of the configuration area, there is a vertical grey sidebar containing a help text box that reads: 'Enable the VIP State to allow Virtual IP addresses to be used in Tunnel Connect Mode and to accept incoming Virtual IP connection requests to any local listening port.'

2. To allow VIP addresses to be used in Tunnel Accept Mode and Tunnel Connect Mode, click **Enabled**. Default is Disabled.
3. Click **Submit**.

11. Maintenance and Diagnostics Settings

File System Configuration

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

File System Statistics

This page shows various statistics and current usage information of the flash file system.

Figure 11-1. File system Statistics

Statistics Browse

Filesystem Statistics

Filesystem Size:	7.125000 Mbytes (7471104 bytes)
Available Space:	7.122122 Mbytes (7468087 bytes) (99%)
Clean Space:	7.092075 Mbytes (7436580 bytes) (99%)
Dirty Space:	30.768 Kbytes (31507 bytes) (0%)
File & Dir Space Used:	2.946 Kbytes (3017 bytes) (0%)
Data Space Used:	2.138 Kbytes (2190 bytes)
Number of Files:	0
Number of Dirs:	0
Number of System Files:	2
Opened Files:	0
Locked Files:	0
Opened for Sharing:	0
Current Bank:	B
FW Sectors:	02 - 07, 3 erase cycles 08 - 13, 3 erase cycles
Bank A Sectors:	14 - 70, 0 erase cycles
Bank B Sectors:	71 - 127, 2 erase cycles
Busy:	No
Actions:	[Compact] [Format]

This page displays various statistics and current usage information of the flash filesystem.

The filesystem can be compacted or formatted here. Make sure you know what you're doing before formatting the filesystem.

To view file system statistics, compact, or format the XPort Pro file system:

1. Back up all files as necessary.
2. Click **Filesystem** on the menu bar. The File system page opens and shows the current file system statistics and usage.
3. To compact the files, click **Compact**.

CAUTION: *In the next step, all files and configuration settings on the file system are destroyed upon formatting. Back up all files as necessary. Upon formatting, the current configuration is retained.*


4. To reformat the file system, click **Format**.

File System Browser

To browse the XPort Pro file system:

1. Click **Filesystem** on the menu bar and then **Browse** at the top of the page. The File system Browser page opens and shows the current file system configuration.

Figure 11-2. File system Browser

Statistics <input type="button" value="Browse"/>	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.
<h3>Filesystem Browser</h3> <p> /</p>	
Create	
File: <input type="text"/> <input type="button" value="Create"/>	
Directory: <input type="text"/> <input type="button" value="Create"/>	
Upload File	
<input type="text"/> <input type="button" value="Browse..."/> <input type="button" value="Upload"/>	
Copy File	
Source: <input type="text"/>	
Destination: <input type="text"/>	
<input type="button" value="Copy"/>	
Move	
Source: <input type="text"/>	
Destination: <input type="text"/>	
<input type="button" value="Move"/>	
TFTP	
Action: <input type="radio"/> Get <input type="radio"/> Put	
Mode: <input type="radio"/> ASCII <input type="radio"/> Binary	
Local File: <input type="text"/>	
Remote File: <input type="text"/>	
Host: <input type="text"/>	
Port: <input type="text"/>	
<input type="button" value="Transfer"/>	

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

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

File system Browser Page Settings	Description
Create	
File	Enter the name of the file you want to create, and then click Create .
Directory	Enter the name of the directory you want to create, and then click Create .
Upload File	
Enter the path and name of the file you want to upload by means of HTTP(S) or use the Browse button to select the file, and then click Upload .	
Copy File	
Source	Enter the location where the file you want to copy resides.
Destination	Enter the location where you want the file copied. After you specify a source and destination, click Copy to copy the file.
Move	
Source	Enter the location where the file you want to move resides.
Destination	Enter the location where you want the file moved. After you specify a source and destination, click Move to move the file.
TFTP	
Action	Select the action that is to be performed via TFTP: Get = a “get” command will be executed to store a file locally. Put = a “put” command will be executed to send a file to a remote location.
Mode	Select a TFTP mode to use. Choices are: ASCII Binary
Local File	Enter the name of the local file on which the specified “get” or “put” action is to be performed.
Remote File	Enter the name of the file at the remote location that is to be stored locally (“get”) or externally (“put”).
Host	Enter the IP address or name of the host involved in this operation.
Port	Enter the number of the port involved in TFTP operations. Click Transfer to perform the TFTP transfer.

Protocol Stack Configuration

To configure the XPort Pro network stack protocols:

1. Click **Protocol Stack** on the menu bar. The Protocol page appears with links to the TCP, IP, ICMP, and ARP protocols.
2. Click on one of the protocol names to see the details of the settings for that protocol.

TCP Settings

Figure 11-3. TCP Protocol Page

TCP	
Send RSTs:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Ack Limit:	<input type="text" value="3"/> packets
Send Data:	<input checked="" type="radio"/> Standard <input type="radio"/> Expedited
Current Statistics	
Total Out RSTs:	30
Total In RSTs:	2

This page contains lower level TCP Network Stack specific configuration items.

The **Send RSTs** boolean is used to turn on/off sending of TCP RST messages.

The **Ack Limit** specifies how many packets must be received before an ACK is forced. If there is a large amount of data to acknowledge, an ACK will be forced before this.

If the sender TCP implementation waits for an ACK before sending more data even though the window is open, setting **Ack Limit** to "1" packet will improve performance by forcing immediate acknowledgements.

The **Send Data** selection governs when data may be sent into the network. The Standard implementation waits for an ACK before sending a packet less than the maximum length. Select Expedited to send data whenever the window allows it.

On the TCP page, you may modify the following settings:

◆ 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 end a connection immediately.

One Step ▶ Select **Enabled** to enable the sending of the RST flag.

CAUTION: *Setting this flag may pose a security risk.*

One Step ▶ Select **Disabled** to disable the sending of the RST flag.


◆ Ack Limit:

The Ack Limit specifies how many packets must be received before an ACK is forced. If there is a large amount of data to acknowledge, an ACK will be forced before this.

If the sender TCP implementation waits for an ACK before sending more data even though the window is open, setting Ack Limit to "1" packet will improve performance by forcing immediate acknowledgements.

◆ **Send Data:**

The Send Data selection governs when data may be sent into the network. The Standard implementation waits for an ACK before sending a packet less than the maximum length. Select Expedited to send data whenever the window allows it.

 Click **Submit** after changing the desired settings.

IP Settings

Figure 11-4. IP Protocol Page

TCP <input type="checkbox"/> IP <input checked="" type="checkbox"/> ICMP <input type="checkbox"/> ARP <input type="checkbox"/>		This page contains lower level IP Network Stack specific configuration items. The Multicast Time To Live value fills the Time To Live in the IP header. Normally this value will be one so the packet will be blocked at the first router. Set this value to greater than one to intentionally propagate multicast packets to additional routers.
IP		
Multicast Time to Live:	<input type="text" value="1"/> hops	

1. On the IP Protocol page, enter the number of hops a transmitted multicast packet may make before it is terminated, as a Multicast Time to Live limit.
2. Click **Submit** after changing the value.

ICMP Settings

Figure 11-5. ICMP Protocol Page

1. On the ICMP Protocol page, choose Enabled or Disabled.
2. Click **Submit** after changing the selection.

ARP Settings

Figure 11-6. ARP Protocol Page

Address	Age Sec	MAC Address	Type	Interface
172.20.197.102 [Remove]	0.0	00:d0:04:02:c0:00	Dynamic	1

1. On the ARP Protocol page, enter the time, in hours, minutes and seconds, for the ARP timeout. This is the maximum duration an address remains in the cache.
2. Click **Submit** after changing the desired fields.

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

3. Enter the IP address to add to the ARP cache.

4. Enter the MAC address to add to the ARP cache.
5. Click **Add** after supplying both fields.

One Step Under Current State, select Remove All to remove all entries in the ARP cache, or select Remove to remove a specific entry from the ARP cache.

IP Address Filter

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

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

To configure the IP address filter:

1. Click **IP Address Filter** on the menu bar. The IP Address Filter page opens to display the current configuration.

Figure 11-7. IP Address Filter Configuration

IP Address Filter

IP Address:

Network Mask:

Current State

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

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.

2. Enter or modify the following settings:

IP Address Filter Page Settings	Description
IP Address	Enter the IP address to add to the IP filter table.

Network Mask	Enter the IP address' network mask in dotted notation.
---------------------	--

- In the **Current State** table, click **Remove** to delete settings as necessary.
- Click **Submit**.

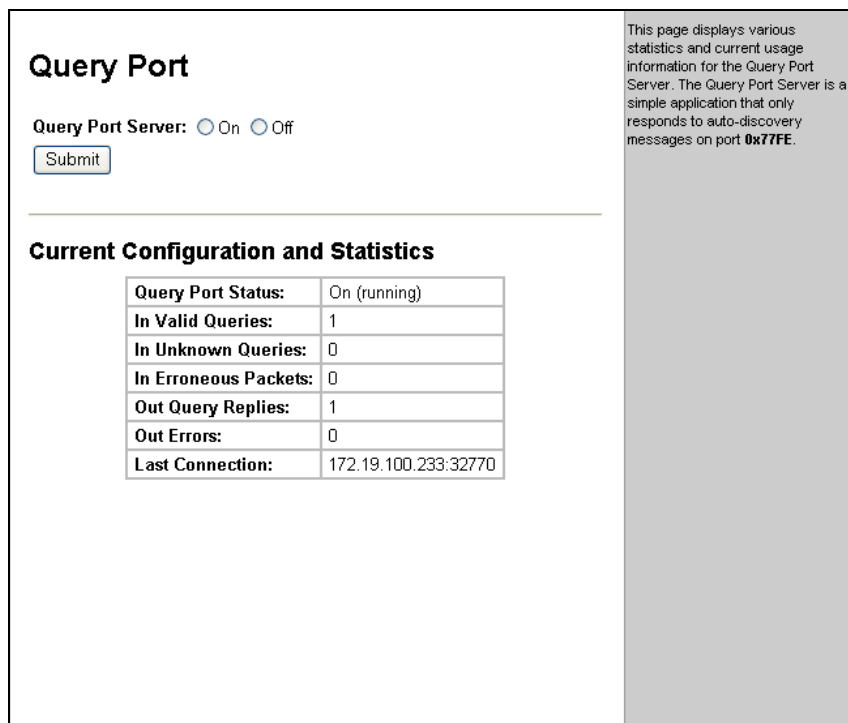
Query Port

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 19

To configure the query port server:

- Click **Query Port** on the menu bar. The Query Port page opens to display the current configuration.

Figure 11-8. Query Port Configuration



Query Port

Query Port Server: On Off

Current Configuration and Statistics

Query Port Status:	On (running)
In Valid Queries:	1
In Unknown Queries:	0
In Erroneous Packets:	0
Out Query Replies:	1
Out Errors:	0
Last Connection:	172.19.100.233:32770

This page displays various statistics and current usage information for the Query Port Server. The Query Port Server is a simple application that only responds to auto-discovery messages on port 0x77FE.

- Select **On** to enable the query port server.
- Click **Submit**.

Diagnostics

The XPort Pro has several tools for diagnostics and statistics. The options at the top of the page allow for the configuration or viewing of MIB2 statistics, IP socket information, ping, traceroute, DNS lookup, memory, buffer pools, processes, and hardware.

Hardware

This read-only page shows the current hardware configuration.

To display the XPort Pro hardware diagnostics:

- One Step** Click **Diagnostics** on the menu bar. The Diagnostics: Hardware page opens and shows the current hardware configuration.

Figure 11-9. Diagnostics: Hardware

This page shows the basic hardware information for the device.

Hardware	MIB-II	IP Sockets
Ping	Traceroute	DNS Lookup
Memory	Buffer Pools	Processes

Diagnostics: Hardware

Current Configuration

CPU Type:	DSTniFX
CPU Speed:	166.666000 MHz
CPU Instruction Cache:	4.000 Kbytes (4096 bytes)
CPU Data Cache:	4.000 Kbytes (4096 bytes)
RAM Size:	8.000000 Mbytes (8388608 bytes)
Flash Size:	8.000000 Mbytes (8388608 bytes)
Flash Sector Size:	64.000 Kbytes (65536 bytes)
Flash Sector Count:	128
Flash ID:	0x1

MIB-II Statistics

The MIB-II Network Statistics page shows the various SNMP-served Management Information Bases (MIBs) available on the XPort Pro.

To view XPort Pro MIB-II statistics:

1. Click **Diagnostics** on the menu bar and then **MIB-II** at the top of the page menu. The MIB-II Network Statistics page opens.

Figure 11-10. MIB-II Network Statistics

2. Click 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 MIB-II 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 Pro:

- Click Diagnostics on the menu bar and then IP Sockets at the top of the page. The IP Sockets page opens and shows all of the open network sockets on the XPort Pro.

Figure 11-11. IP Sockets

Hardware

Ping

Memory

MIB-II

Traceroute

Buffer Pools

IP Sockets

DNS Lookup

Processes

IP Sockets

Protocol	RxQ	TxQ	LocalAddr:Port	RemoteAddr:Port	State
UDP	0	0	172.19.212.91:161	172.19.238.10:38283	ESTABLISHED
TCP	0	0	172.19.212.91:21	255.255.255.255:0	LISTEN
UDP	0	0	172.19.212.91:69	255.255.255.255:0	
TCP	0	0	172.19.212.91:80	255.255.255.255:0	LISTEN
UDP	0	0	172.19.212.91:30718	172.19.212.2:28677	ESTABLISHED
TCP	0	0	172.19.212.91:23	255.255.255.255:0	LISTEN
TCP	0	0	172.19.212.91:22	255.255.255.255:0	LISTEN
TCP	0	0	172.19.212.91:10001	255.255.255.255:0	LISTEN
TCP	0	4	172.19.212.91:80	172.20.197.137:2229	ESTABLISHED

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

Ping

To ping a remote device or computer:

1. Click **Diagnostics** on the menu bar and then **Ping** at the top of the page. The Diagnostics: Ping page opens.

Figure 11-12. Diagnostics: Ping

2. Enter or modify the following settings:

Diagnostics: Ping Page Settings	Description
Host	Enter the IP address or host name for the XPort Pro to ping.
Count	Enter the number of ping packets XPort Pro should attempt to send to the Host . The default is 3 .
Timeout	Enter the time, in seconds, for the XPort Pro to wait for a response from the host before timing out. The default is 5 seconds.

3. Click **Submit**. The results of the ping display in the page.

Traceroute

Here you can trace a packet from the XPort Pro to an Internet host, showing how many hops the packet requires to reach the host and how long each hop takes. If you visit a web site whose pages appear slowly, you can use traceroute to determine where the longest delays are occurring.

To use Traceroute from the XPort Pro:

1. Click **Diagnostics** on the menu bar and then **Traceroute** at the top of the page. The Diagnostics: Traceroute page opens.

Figure 11-13. Diagnostics: Traceroute

Specify either a DNS Hostname or IP Address when performing a traceroute to a network host.

Hardware MIB-II IP Sockets
Ping Traceroute DNS Lookup
Memory Buffer Pools Processes

Diagnostics: Traceroute

Host:

TracerouteResults

1	172.19.0.1	1 ms
2	67.134.254.1	2 ms
3	67.134.135.149	4 ms
4	205.171.13.13	4 ms
5	67.14.12.58	12 ms
6	205.171.214.38	13 ms
7	207.45.213.133	13 ms
8	207.45.213.130	14 ms
9	216.115.106.177	15 ms
10	66.218.82.219	14 ms
11	66.94.234.13	13 ms

2. Enter or modify the following setting:

Diagnostics: Traceroute Page Settings	Description
Host	Enter the IP address or DNS hostname. This address is used to show the path between it and the XPort Pro when issuing the traceroute command.

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

DNS Lookup

Here you can specify a DNS Hostname for a forward lookup or an IP address for a reverse lookup. You can also perform a lookup for a Mail (MX) record by prefixing a DNS Hostname with @.

Note: A DNS server must be configured for DNS Lookup to work.

To use forward or reverse DNS lookup:

1. Click **Diagnostics** on the menu bar and then **DNS Lookup** at the top of the page. The Diagnostics: DNS Lookup page opens.

Figure 11-14. Diagnostics: DNS Lookup

2. Enter or modify the following field:

Diagnostics: DNS Lookup Page Settings	Description
Host	Perform one of the following: For reverse lookup to locate the hostname for that IP address, enter an IP address. For forward lookup to locate the corresponding IP address, enter a hostname. To look up the Mail Exchange (MX) record IP address, enter a domain name prefixed with @.

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

Memory

This read-only page shows the total memory and available memory (in bytes), along with the number of fragments, allocated blocks, and memory status.

To display memory statistics for the XPort Pro:


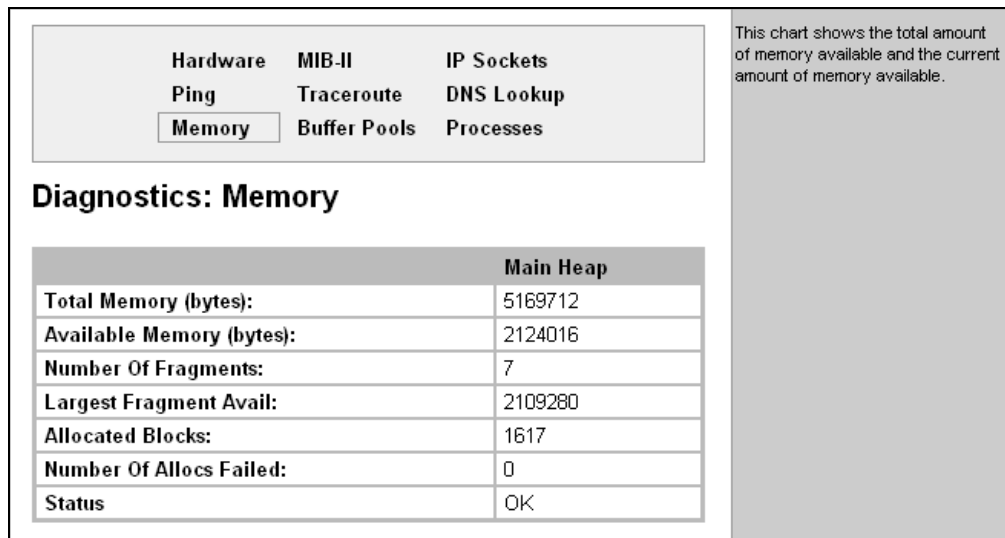
 Click Diagnostics on the menu bar and then Memory at the top of the page. The Diagnostics: Memory page appears.

Figure 11-15. Diagnostics: Memory



Buffer Pools

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

To display the XPort Pro buffer pools:

- One Step** ▶ Click **Diagnostics** on the menu bar and then **Buffer Pools** at the top of the page. The **Diagnostics: Buffer Pools** page opens.

Figure 11-16. Diagnostics: Buffer Pools

Hardware

Ping

Memory

MIB-II

Traceroute

Buffer Pools

IP Sockets

DNS Lookup

Processes

These charts show the current usage of the private buffer pools. Private buffer pools are used in various parts of the system to ensure deterministic memory management thus eliminating any contention for memory from the generic heap space.

Diagnostics: Buffer pools

Network Stack Buffer Pool				
	Total	Free	Used	MaxUsed
Buffer Headers	512	509	3	15
Cluster Pool Size: 2048	256	253	3	14

Ethernet Driver Buffer Pool				
	Total	Free	Used	MaxUsed
Buffer Headers	2048	1984	64	170
Cluster Pool Size: 2048	1024	960	64	170

Serial Driver Line 1 Buffer Pool				
	Total	Free	Used	MaxUsed
Buffer Headers	12	6	6	6
Cluster Pool Size: 1024	6	0	6	6

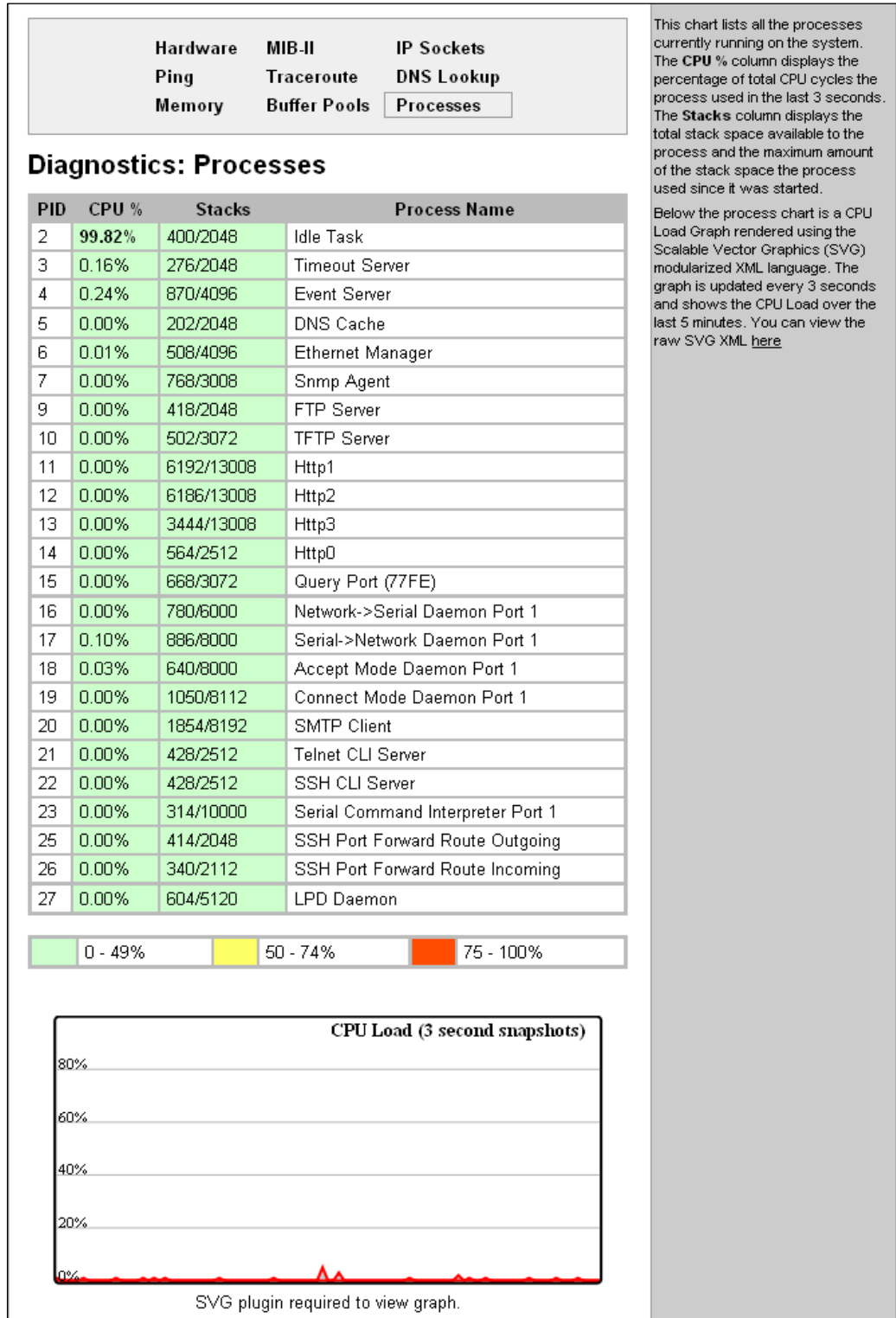
Processes

The XPort Pro Processes page shows all the processes currently running on the system. It shows the Process ID (PID), the percentage of total CPU cycles a process used within the last three 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 Pro and their associated statistics:

- One Step** ▶ Click **Diagnostics** on the menu bar and then **Processes** at the top of the page.

Figure 11-17. Diagnostics: Processes



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

System Configuration

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

Figure 11-18. System

System	
Reboot Device	
<input type="button" value="Reboot"/>	
Restore Factory Defaults	
<input type="button" value="Factory Defaults"/>	
Upload New Firmware	
<input type="text"/>	<input type="button" value="Browse..."/>
<input type="button" value="Upload"/>	
Name	
Short Name:	<input type="text"/>
Long Name:	<input type="text"/>
<input type="button" value="Submit"/>	
Current Configuration	
Firmware Version:	5.0.0.0R1
Short Name:	xport_pro
Long Name:	Lantronix XPort Pro

When the device is rebooted, your browser should be refreshed and redirected to the main status page after 30 seconds. Note that the redirect will not work as expected if the IP Address of the device changes after reboot.

After setting the configuration back to the factory defaults, the device will automatically be rebooted.

Be careful not to power off or reset the device while uploading new firmware. Once the upload has completed and the new firmware has been verified and flashed, the device will automatically be rebooted.

To configure the XPort Pro system settings:

1. Click **System** on the menu bar. The System page opens.
2. Configure the following settings:

System Page Settings	Description
Reboot Device	Click Reboot to reboot the XPort Pro. The system refreshes and redirects the browser to the XPort Pro home page.
Restore Factory Defaults	Click Factory Defaults to restore the XPort Pro to the original factory settings. All configurations will be lost. The XPort Pro 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 Pro. 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 maximum is 32 characters. The Long Name

System Page Settings	Description
	maximum is 64 characters. Changes take place upon the next reboot.

12. Advanced Settings

Email Configuration

The XPort Pro allows you to view and configure email alerts relating to the events occurring within the system.

Note: The following section describes the steps to configure Email 1; these steps also apply to the other Email instances.

Email Statistics

This read-only page shows various statistics and current usage information about the email subsystem.

One Step Click Email 1 and Statistics at the top of the page to view its statistics.

When you transmit an email, the entire conversation with the SMTP server is logged and shown in the bottom portion of the page. To clear the log, click the **Clear** link.

Figure 12-1. Email Statistics

Statistics	Configuration	Send Email
------------	---------------	------------

Email 1- Statistics

Sent successfully (w/retries):	0 / 0
Not sent due to excessive errors:	0
In transmission queue:	0

Log [Clear]
No log data available.

This page displays various statistics and current usage information of the Email subsystem. When transmitting an Email message the entire conversation with the SMTP server is logged and displayed here. This is a scrolling log in that only the last 100 lines are cached and viewable.

Email Configuration

To configure XPort Pro email settings:

1. Click **Email** on the menu bar and then **Email 1** and **Configuration** at the top of the page. The Email 1 - Configuration page opens to display the current Email configuration.

Figure 12-2. Email Configuration

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
Trigger Email Send: CP 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> [Delete]
Priority:	Normal
Trigger Email Send:	Disabled

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.


Trigger Email Send can be used to automatically send an email. When the specified **Value** matches the current value of the [CP 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 settings:

Email – Configuration Page Settings	Description
To	Enter the email address to which the email alerts will be sent. Multiple addresses are separated by semicolon (;).
Cc	Enter the email address to which the email alerts will be copied. Multiple addresses are separated by semicolon (;).
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 appears 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 port 25 .
Local Port	Enter the local port to use for email alerts. The default is a random port number.
Priority	Select the priority level for the email alert.
Trigger Email Send	Configure this field to send an email based on a CP Group trigger. The XPort Pro sends an email when the specified Value matches the current Group 's value.

3. Click **Submit**.
4. In the **Current Configuration** table, delete currently stored settings as necessary.

 To test your configuration, you can send an email immediately by clicking Send Email at the top of the page. Refer back to the Statistics page for a log of the transaction.

Command Line Interface Settings

The Command Line Interface pages enable you to view statistics about the CLI servers listening on the Telnet and SSH ports and to configure CLI settings.

Command Line Interface Statistics

This read-only page shows the current connection status of the CLI servers listening on the Telnet and SSH ports. When a connection is active:

- The remote client information appears.
- The number of bytes that have been sent and received appears.
- A **Kill** link (visible when a connection is active) can be used to terminate the connection.


 Click **CLI** on the menu bar. The Command Line Interface Statistics page appears.

Figure 12-3. Command Line Interface Statistics

Statistics
Configuration

Command Line Interface Statistics

Telnet	
Server Status:	Waiting
Last Connection:	<None>
Uptime:	0 days 17:40:17
Total Bytes In:	0
Total Bytes Out:	0
Current Connections:	<None>
SSH	
Server Status:	Waiting
Last Connection:	local:22 <- 172.19.212.2:3796
Uptime:	0 days 17:40:17
Total Bytes In:	0
Total Bytes Out:	0
Current Connections:	<None>

This page displays the current connection status of the CLI servers listening on the Telnet and SSH ports.

When a connection is active, the remote client information is displayed as well as the number of bytes that have been sent and received. Additionally, a **Kill** link will be present which can be used to terminate the connection.

CLI Configuration

On this page you can change CLI configuration settings.

To configure the CLI:

1. Click **CLI** on the menu and then **Configuration** at the top of the page. The Command Line Interface Configuration page appears.

Figure 12-4. Command Line Interface Configuration

Statistics Configuration	
Command Line Interface Configuration	
Login Password:	<None>
Enable Level Password:	<None>
Quit Connect Line:	<control>L
Inactivity Timeout:	15 minutes
Telnet State:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Telnet Port:	23
Telnet Max Sessions:	3
SSH State:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
SSH Port:	22
SSH Max Sessions:	3

The **Command Line Interface** may be accessed via Telnet, via SSH, or via a serial line.

For the SSH server, the [SSH Server Authorized Users](#) are used for initial login access.

2. Enter or modify the following settings:

Command Line Interface Configuration Settings	Description
Login Password	Enter the password for Telnet access.
Enable Level 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 such a string is <control>L .
Inactivity Timeout	Set an Inactivity Timeout value so the CLI session will disconnect if no data is received after the designated time period. Default is 15 minutes. Enter a value of 0 to disable.

Command Line Interface Configuration Settings	Description
Telnet State	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 .
Telnet Max Sessions	Maximum number of simultaneous Telnet sessions.
SSH State	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 .
SSH Max Sessions	Maximum number of simultaneous SSH sessions.

3. Click **Submit**.

XML Configuration

The XPort Pro allows for the configuration of units using an XML configuration file. Export a current configuration for use on other XPort Pros or import a saved configuration file.

XML: Export Configuration

On this page you can export the current system configuration in XML format. The generated XML file can be imported later to restore a configuration. It can also be modified and imported to update the configuration on this XPort Pro unit or another. The XML data can be exported to the browser window or to a file on the file system.

By default, all groups are selected except those pertaining to the network configuration (Ethernet and WLAN). This is so that if you later import the entire XML configuration, it will not break your network connectivity. You may select or clear the checkbox for any group.

To export a system configuration record:

1. Click **XML** on the menu bar. The **XML: Export Configuration** page appears.

Figure 12-5. XML: Export Configuration

Export Configuration
Export Status
Import Configuration

XML: Export Configuration

Export to browser
 Export to local file

Export secrets (use only with extreme caution)

Lines to Export: [\[Clear All\]](#) [\[Select All\]](#)

1 network

Groups to Export: [\[Clear All\]](#) [\[Select All but Networking\]](#)

<input checked="" type="checkbox"/> arp	<input checked="" type="checkbox"/> cli
<input checked="" type="checkbox"/> cp group	<input checked="" type="checkbox"/> device
<input checked="" type="checkbox"/> email	<input checked="" type="checkbox"/> ethernet: eth0
<input checked="" type="checkbox"/> ftp server	<input checked="" type="checkbox"/> host
<input checked="" type="checkbox"/> http authentication uri	<input checked="" type="checkbox"/> http server
<input checked="" type="checkbox"/> icmp	<input type="checkbox"/> interface: eth0
<input checked="" type="checkbox"/> ip	<input checked="" type="checkbox"/> ip filter
<input checked="" type="checkbox"/> line	<input checked="" type="checkbox"/> lpd
<input checked="" type="checkbox"/> ManageLinx Credentials	<input checked="" type="checkbox"/> ppp
<input checked="" type="checkbox"/> query port	<input checked="" type="checkbox"/> rss
<input checked="" type="checkbox"/> serial command mode	<input checked="" type="checkbox"/> snmp
<input checked="" type="checkbox"/> ssh client	<input checked="" type="checkbox"/> ssh command mode
<input checked="" type="checkbox"/> ssh server	<input checked="" type="checkbox"/> ssl
<input checked="" type="checkbox"/> syslog	<input checked="" type="checkbox"/> tcp
<input checked="" type="checkbox"/> telnet command mode	<input checked="" type="checkbox"/> terminal
<input checked="" type="checkbox"/> tftp server	<input checked="" type="checkbox"/> tunnel accept
<input checked="" type="checkbox"/> tunnel connect	<input checked="" type="checkbox"/> tunnel disconnect
<input checked="" type="checkbox"/> tunnel modem	<input checked="" type="checkbox"/> tunnel packing
<input checked="" type="checkbox"/> tunnel serial	<input checked="" type="checkbox"/> vip
<input checked="" type="checkbox"/> xml import control	

This page is used for exporting the current system configuration in XML format as XCR records. The generated XML file can be imported at a later time to restore the configuration.

Caution: The "http authentication uri" group must be exported with **export secrets** enabled if it is to be used to later restore the configuration.

The exported 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.

Caution: Only **export secrets** over a secure connection and make sure that the data goes only to secure locations.

Notice that by default, all **Groups to Export** are checked except some pertaining to the network configuration; this is so that if you later "paste" the entire XML configuration, it will not break your network connectivity. You may check or uncheck any group to include or omit that group from export.

Selection of **Lines to Export** filters instances to be exported in the line, lpd, ppp, serial, tunnel, and terminal groups.

2. Enter or modify the following settings:

XML Export Configuration Page Settings	Description
Export to browser	Select this option to export the XCR data in the selected fields to a web browser.
Export to local file	Select this option to export the XCR data to a file on the device. If you select this option, enter a file name for the XML configuration record.
Export secrets	Only use this with extreme caution. If selected, secret password and key information will be exported. Use only with a secure link, and save only in secure locations.
Lines to Export	Select the instances you want to export in the line, LPD, PPP, tunnel, and terminal groups.
Groups to Export	Check the configuration groups that are to be exported to the XML configuration record.

3. Click the **Export** button. The groups display if exporting the data to the browser. If exporting to the file system, the file is stored on the file system.

XML: Export Status

On this page you can export the current system status in XML format. The XML data can be exported to the browser page or to a file on the file system.

1. Click **XML** on menu bar and then **Export Status** at the top of the page. The XML Status Record: Export Status page appears.

Figure 12-6. XML Status Record: Export Status

Export Configuration
Export Status
Import Configuration

XML: Export Status

Export to browser
 Export to local file

Lines to Export: [\[Clear All\]](#) [\[Select All\]](#)
 1 network

Groups to Export: [\[Clear All\]](#) [\[Select All\]](#)

<input checked="" type="checkbox"/> arp	<input checked="" type="checkbox"/> buffer pool
<input checked="" type="checkbox"/> cp group	<input checked="" type="checkbox"/> cps
<input checked="" type="checkbox"/> device	<input checked="" type="checkbox"/> email
<input checked="" type="checkbox"/> email log	<input checked="" type="checkbox"/> filesystem
<input checked="" type="checkbox"/> ftp	<input checked="" type="checkbox"/> hardware
<input checked="" type="checkbox"/> http	<input checked="" type="checkbox"/> http log
<input checked="" type="checkbox"/> icmp	<input checked="" type="checkbox"/> interface: eth0
<input checked="" type="checkbox"/> ip	<input checked="" type="checkbox"/> ip sockets
<input checked="" type="checkbox"/> line	<input checked="" type="checkbox"/> lpd
<input checked="" type="checkbox"/> memory	<input checked="" type="checkbox"/> processes
<input checked="" type="checkbox"/> query port	<input checked="" type="checkbox"/> rss
<input checked="" type="checkbox"/> sessions	<input checked="" type="checkbox"/> ssh
<input checked="" type="checkbox"/> syslog	<input checked="" type="checkbox"/> tcp
<input checked="" type="checkbox"/> telnet	<input checked="" type="checkbox"/> tftp
<input checked="" type="checkbox"/> tunnel	<input checked="" type="checkbox"/> udp
<input checked="" type="checkbox"/> vip	<input checked="" type="checkbox"/> xsr

This page is used for exporting the current system status in XML format as XSR records.

The XML data can be exported to the browser window or to a file on the filesystem.

By default, all **Groups to Export** are checked; you may omit groups from export by unchecking them.

Selection of **Lines to Export** filters instances to be exported in the line, lpd, and tunnel groups.

2. Enter or modify the following settings:

XML Status Record: Export System Status Page Settings	Description
Export to browser	Select this option to export the XML status record to a web browser.

XML Status Record: Export System Status Page Settings	Description
Export to local file	Select this option to export the XML status record to a file on the device. If you select this option, enter a file name for the XML status record.
Lines to Export	Select the instances you want to export in the line, LPD, PPP, tunnel, and terminal groups.
Groups to Export	Check the configuration groups that are to be exported into the XML status record.

3. Click the **Export** button. The groups display if exporting the data to the browser. If exporting to the file system, the file is stored on the file system.

XML: Import System Configuration Page

Here you can import a system configuration from an XML file.

The XML data can be imported from a file on the file system or uploaded using HTTP. The groups to import can be specified by toggling the respective group item or entering a filter string. When toggling a group item, all instances of that group will be imported. The filter string can be used to import specific instances of a group. The text format of this string is:

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

Each group name <g> is followed by a colon and the instance value <i>. Each <g>:<i> value is separated with a semicolon. If a group has no instance, specify the group name <g> only.

To import a system configuration:

1. Click **XML** on the menu bar and then **Import Configuration** at the top of the page. The XML: Import Configuration page appears.

Figure 12-7. XML: Import Configuration

Export Configuration Export Status Import Configuration	<p>This page is used for importing system configuration from an XML file.</p> <p>Import Configuration from External file picks up all the settings from the external file. Import Configuration from Filesystem picks up settings from the selected Groups, Lines and Instances. Import Line(s) from single line Settings on the Filesystem copies lines settings from an the input file containing only one Line instance to all of the selected Lines.</p> <p>When selecting a Whole Groups to Import item, all instances of that group will be imported. Notice that by default, all groups are checked except those pertaining to the network configuration; this is so that import will not break your network connectivity. You may check or uncheck any group to include or omit that group from import.</p> <p>Selection of Lines to Import filters instances to be imported in the line, lpd, ppp, serial, tunnel ..., and terminal groups. This affects both Whole Groups to Import and Text List selections.</p> <p>Use the Text List string to import specific instances of a group. The textual format of this string is:</p> <pre><g>: <i>; <g>: <i>; ...</pre> <p>Each group name <g> is followed by a colon and the instance value <i> and each <g>: <i> value is separated by a semi-colon. If a group has no instance then only the group name <g> should be specified.</p>
<h2>XML: Import Configuration</h2> <p>Import:</p> <p> <input type="radio"/> Configuration from External file <input type="radio"/> Configuration from Filesystem <input type="radio"/> Line(s) from single line Settings on the Filesystem </p>	

Import Configuration from External File

This selection shows a field for entering the path and file name of the entire external XCR file you want to import. You can also browse to select the XCR file.

Figure 12-8. XML: Import Configuration from External File

Export Configuration Export Status Import Configuration	<p>This page is used for importing system configuration from an XML file.</p> <p>Import Configuration from External file picks up all the settings from the external file. Import Configuration from Filesystem picks up settings from the selected Groups, Lines and Instances. Import Line(s) from single line Settings on the Filesystem copies lines settings from an the input file containing only one Line instance to all of the selected Lines.</p>
<h2>XML: Import Configuration</h2> <p>Import configuration from (entire) external XCR file:</p> <p> <input type="text"/> <input type="button" value="Browse..."/> </p> <p><input type="button" value="Import"/></p>	

Import Configuration from the Filesystem

This selection shows a page for entering the filesystem and your import requirements – groups, lines, and instances.

Figure 12-9. XML: Import from Filesystem

Export Configuration
Export Status
Import Configuration

XML: Import Configuration

Import configuration from the filesystem:

Filename

Lines to Import: [\[Clear All\]](#) [\[Select All\]](#)

1 network

Whole Groups to Import: [\[Clear All\]](#) [\[Select All but Networking\]](#)

<input checked="" type="checkbox"/> arp	<input checked="" type="checkbox"/> cli
<input checked="" type="checkbox"/> cp group	<input checked="" type="checkbox"/> device
<input checked="" type="checkbox"/> email	<input checked="" type="checkbox"/> ethernet
<input checked="" type="checkbox"/> execute	<input checked="" type="checkbox"/> exit cli
<input checked="" type="checkbox"/> ftp server	<input checked="" type="checkbox"/> host
<input checked="" type="checkbox"/> http authentication uri	<input checked="" type="checkbox"/> http server
<input checked="" type="checkbox"/> icmp	<input type="checkbox"/> interface
<input checked="" type="checkbox"/> ip	<input checked="" type="checkbox"/> ip filter
<input checked="" type="checkbox"/> line	<input checked="" type="checkbox"/> lpd
<input checked="" type="checkbox"/> ppp	<input checked="" type="checkbox"/> query port
<input checked="" type="checkbox"/> rps	<input checked="" type="checkbox"/> serial command mode
<input checked="" type="checkbox"/> snmp	<input checked="" type="checkbox"/> ssh client
<input checked="" type="checkbox"/> ssh command mode	<input checked="" type="checkbox"/> ssh server
<input checked="" type="checkbox"/> ssl	<input checked="" type="checkbox"/> syslog
<input checked="" type="checkbox"/> tcp	<input checked="" type="checkbox"/> telnet command mode
<input checked="" type="checkbox"/> terminal	<input checked="" type="checkbox"/> tftp server
<input checked="" type="checkbox"/> tunnel accept	<input checked="" type="checkbox"/> tunnel connect
<input checked="" type="checkbox"/> tunnel disconnect	<input checked="" type="checkbox"/> tunnel modem
<input checked="" type="checkbox"/> tunnel packing	<input checked="" type="checkbox"/> tunnel serial
<input checked="" type="checkbox"/> vip	<input checked="" type="checkbox"/> xml import control

Text List

This page is used for importing system configuration from an XML file.

Import Configuration from External file picks up all the settings from the external file. **Import Configuration from Filesystem** picks up settings from the selected Groups, Lines and Instances. **Import Line(s) from single line Settings on the Filesystem** copies lines settings from an the input file containing only one Line instance to all of the selected Lines.

When selecting a **Whole Groups to Import** item, all instances of that group will be imported. Notice that by default, all groups are checked except some pertaining to the network configuration; this is so that import will not break your network connectivity. You may check or uncheck any group to include or omit that group from import.

Selection of **Lines to Import** filters instances to be imported in the line, lpd, ppp, serial, tunnel, and terminal groups. This affects both **Whole Groups to Import** and **Text List** selections.

Use the **Text List** string to import specific instances of a group. The textual format of this string is:

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

Each group name <g> is followed by a colon and the instance value <i> and each <g>:<i> value is separated by a semi-colon. If a group has no instance then only the group name <g> should be specified.

2. Enter the filename of the XCR file that has certain groups you want to import.

XML: Import Configuration from Filesystem

Import Configuration from Filesystem Settings	Description
Filename	Enter the name of the file on the XPort Pro (local to its filesystem) that contains XCR data.
Lines to Import	<p>Select the lines whose settings you want to import. Click the Select All link to select all the serial lines and the network lines. Click the Clear All link to clear all of the checkboxes. By default, all line instances are selected.</p> <p>Only the selected line instances will be imported in the line, LPD, PPP, tunnel, and terminal groups.</p>
Whole Groups to Import	<p>Select the configuration groups to import from the XML configuration record. This option imports all instances of each selected group unless it is one of the Lines to Import.</p> <p><i>Note: By default, all groups are checked except those pertaining to the network configuration; this is so that import will not break your network connectivity.</i></p> <p>You may check or uncheck any group to include or omit that group from import. To import all of the groups, click the Select All but Networking link to import all groups. To clear all the checkboxes, click the Clear All link.</p>
Text List	<p>Enter a string to import specific instances of a group. The textual format of this string is:</p> <pre data-bbox="740 1115 1040 1142"><g>:<i>;<g>:<i>;...</pre> <p>Each group name <g> is followed by a colon and the instance value <i> and each <g>:<i> value is separated by a semi-colon. If a group has no instance, then specify the group name <g> only.</p> <p>Use this option for groups other than those affected by Lines to Import.</p>

Import Line(s) from Single Line Settings on the Filesystem

This selection copies line settings from the single line instance in the input file to selected lines. The import file may only contain records from a single line instance; this is done by selecting a single **Line to Export** when exporting the file.

Figure 12-10. XML: Import Line(s) from Single Line Settings on the Filesystem

Export Configuration Export Status Import Configuration

XML: Import Configuration

Import Line(s) from single line settings on the filesystem:

Filename

Lines to Import: [\[Clear All\]](#) [\[Select All\]](#)

1 network

Whole Groups to Import: [\[Clear All\]](#) [\[Select All but Networking\]](#)

<input checked="" type="checkbox"/> arp	<input checked="" type="checkbox"/> cli
<input checked="" type="checkbox"/> cp group	<input checked="" type="checkbox"/> device
<input checked="" type="checkbox"/> email	<input checked="" type="checkbox"/> ethernet
<input checked="" type="checkbox"/> execute	<input checked="" type="checkbox"/> exit cli
<input checked="" type="checkbox"/> ftp server	<input checked="" type="checkbox"/> host
<input checked="" type="checkbox"/> http authentication uri	<input checked="" type="checkbox"/> http server
<input checked="" type="checkbox"/> icmp	<input type="checkbox"/> interface
<input checked="" type="checkbox"/> ip	<input checked="" type="checkbox"/> ip filter
<input checked="" type="checkbox"/> line	<input checked="" type="checkbox"/> lpd
<input checked="" type="checkbox"/> ppp	<input checked="" type="checkbox"/> query port
<input checked="" type="checkbox"/> rss	<input checked="" type="checkbox"/> serial command mode
<input checked="" type="checkbox"/> snmp	<input checked="" type="checkbox"/> ssh client
<input checked="" type="checkbox"/> ssh command mode	<input checked="" type="checkbox"/> ssh server
<input checked="" type="checkbox"/> ssl	<input checked="" type="checkbox"/> syslog
<input checked="" type="checkbox"/> tcp	<input checked="" type="checkbox"/> telnet command mode
<input checked="" type="checkbox"/> terminal	<input checked="" type="checkbox"/> tftp server
<input checked="" type="checkbox"/> tunnel accept	<input checked="" type="checkbox"/> tunnel connect
<input checked="" type="checkbox"/> tunnel disconnect	<input checked="" type="checkbox"/> tunnel modem
<input checked="" type="checkbox"/> tunnel packing	<input checked="" type="checkbox"/> tunnel serial
<input checked="" type="checkbox"/> vip	<input checked="" type="checkbox"/> xml import control

Import

This page is used for importing system configuration from an XML file.

Import Configuration from External file picks up all the settings from the external file. **Import Configuration from Filesystem** picks up settings from the selected Groups, Lines and Instances. **Import Line(s) from single line Settings on the Filesystem** copies lines settings from an the input file containing only one Line instance to all of the selected Lines.

When selecting a **Whole Groups to Import** item, all instances of that group will be imported. Notice that by default, all groups are checked except some pertaining to the network configuration; this is so that import will not break your network connectivity. You may check or uncheck any group to include or omit that group from import.

Selection of **Lines to Import** filters instances to be imported in the line, lpd, ppp, serial, tunnel, and terminal groups. This affects both **Whole Groups to Import** and **Text List** selections.

Use the **Text List** string to import specific instances of a group. The textual format of this string is:

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

Each group name <g> is followed by a colon and the instance value <i> and each <g>: <i> value is separated by a semi-colon. If a group has no instance then only the group name <g> should be specified.

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XML: Import Line(s) from Single Line Settings

Import Line(s) Settings	Description
Filename	Provide the name of the file on the XPort Pro (local to its file system) that contains XCR data.
Lines to Import	Select the line(s) whose settings you want to import. Click the Select All link to select all the serial lines and the network lines. Click the Clear All link clear all of the checkboxes. By default, all serial line instances are selected.
Whole Groups to Import	<p>Select the configuration groups to import from the XML configuration record.</p> <p><i>Note: By default, all groups are checked except those pertaining to the network configuration; this is so that import will not break your network connectivity.</i></p> <p>You may check or uncheck any group to include or omit that group from import. To import all of the groups, click the Select All but Networking link to import all groups. To clear all the checkboxes, click the Clear All link.</p>

13. Point to Point Protocol PPP

Note: For instructions on configuring PPP for the XPort Pro, see [PPP Configuration](#) on page 61.

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 Pro supports two types of PPP authentication: Password Authentication Protocol (PAP) and Challenge Handshake Authentication Protocol (CHAP). Both of these authentication methods require the configuration of a username and password. It also supports authentication scheme “None” 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 Pro 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 Pro 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.

Note: *The XPort Pro does not perform network address translation between the serial-side network interface and the Ethernet/WLAN network interface. Therefore, to*

pass packets through the XPort Pro, a static route must be configured on both the PPP Peer device and the remote device it wishes to communicate with. The static route in the PPP Peer device must use the PPP Local IP Address as its gateway, and the static route in the remote device must use the Ethernet/WLAN IP Address of the XPort Pro as its gateway.

14. Tunneling

Tunneling allows serial devices to communicate over a network, without “being aware” of the devices which establish the network connection between them. Tunneling parameters are configured using the Web Manager (see page 22) or Command Mode Tunnel Menu (see the [XPort Pro Command Reference](#) for the full list of commands.)

The XPort Pro supports two 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 another serial port.

- ◆ Connect Mode: the XPort Pro 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 Pro 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 Pro 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 Pro will not make a connection unless it can resolve the address. For DNS names, after 4 hours of an active connection, the XPort Pro 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 TCP
- ◆ SSH (the XPort Pro is the SSH client)

- ◆ SSL
- ◆ UDP (available only in Connect Mode because it is a connectionless protocol).
- ◆ AES encryption over UDP
- ◆ Telnet

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, the XPort Pro accepts packets from any device on the network. It will send packets to the last device that sent it packets.

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

To ignore data sent to the XPort Pro, 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 Pro is the SSH client. Ensure the XPort Pro SSH client username is configured on the remote SSH server before using it with the XPort Pro.

Connect Mode supports up to sixteen Hosts.

- ◆ At least one Host is required to enable Connect Mode. The Host field contains all the information necessary to connect to that host.

Connect Mode has six 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 control signal
- ◆ Modem emulation

For the “any character” or “specific character” connection states, the XPort Pro 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 Asserted setting (for DSR or DTR) to start a Connect Mode connection when the signal is asserted. The XPort Pro will try to make a connection indefinitely. If the connection closes, it will not make another connection unless the signal is asserted again.

Accept Mode

In Accept Mode, the XPort Pro waits for a connection from the network. 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 Pro 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.
- ◆ SSL
- ◆ TCP
- ◆ AES encryption over TCP
- ◆ Telnet (The XPort Pro 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 (never a 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
- ◆ Modem emulation

Disconnect Mode

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

The following settings end a connection:

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

Note: To clear data out of the serial buffers upon a disconnect, enable "Flush Serial Data".

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:

- Disabled
- Timeout: The data is packed for a specified period before being sent out.
- Send Character: The data is packed until the specified send character is encountered.
- ◆ Timeout: Specifies the time duration in milliseconds; applies only if the Packing Mode is Timeout.
- ◆ Threshold: When the buffer fills to this specified amount of data in bytes (and the timeout has not elapsed), the XPort Pro packs the data and sends it out; applies only if the Packing Mode is not Disabled.
- ◆ The send character: Similar to a start or stop character, the XPort Pro packs the data until it sees the send character. The XPort Pro then sends the packed data and the send character in the packet. Applies only if the Packing Mode is Send Character.
- ◆ 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 Pro 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 settings for verbose response codes, echo commands, and quiet mode, by using Command Mode commands. The current settings can be overridden; however on reboot, 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:

All of these commands behave like a modem.

For commands that are valid but not applicable to the XPort Pro, an "OK" message is sent (but the command is silently ignored).

The XPort Pro 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.

Command	Description
+++	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	Shows 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.

Command	Description
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.

One Step ▶ 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 Pro replaces the last segment of the IP address with the configured Connect Mode remote station address. It is possible to use the last two segments also, if they are 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 the Command Line Interface (CLI). Once the CLI is exited, the XPort Pro reverts to modem emulation mode.

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

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 Pro sends the data in the buffer.

The modem control signal DTR on the Line may be continually asserted or asserted only while either an Accept Mode tunnel or a Connect Mode tunnel is connected.

Statistics

The XPort Pro logs statistics for tunneling. The **Dropped** statistic shows connections ended by the remote location. The **Disconnects** statistic shows connections ended by the XPort Pro.

15. VIP

VIP (Virtual IP) takes advantage of the Lantronix ManageLinx technology that solves the access-through-firewall problem. ManageLinx utilizes existing network infrastructure to create a virtual device network (VDN). The VDN provides direct access to only authorized equipment, behind firewalls, from anywhere via the net.

The VDN technology enables you to create dedicated TCP/IP connections between any two devices, using easily deployed hardware appliances. There is no client software to install. No changes are required to network software or applications at either end of the connection. ManageLinx is a secure and totally transparent remote access solution.

The VDN hardware consists of a publicly accessible Device Services Manager (DSM) and individual Device Services Controller (DSC) appliances in multiple locations. Together, these two components enable you to set up and manage individual Virtual IP (VIP) addresses and routes.

The XPort Pro, with VIP enabled, takes the place of a DSC and provides direct access to your equipment.

Tunneling with VIP Access

The XPort Pro supports both Accept and Connect Mode tunneling through VIPs. Configuring an XPort Pro to use VIP Access involves:

- ◆ Obtaining a ManageLinx XML bootstrap file
- ◆ Importing the ManageLinx XML bootstrap file
- ◆ Enabling VIP access
- ◆ Configuring your tunnels to use the VIPs

Once the XPort Pro is configured and enabled to use VIPs, it will immediately attempt to establish a conduit with the ManageLinx DSM. Once the conduit is up, tunneling via VIP Access is ready to go.

Obtaining a bootstrap file

The ManageLinx XML bootstrap file is an XML file that contains the information required to contact and authenticate to a DSM. This file must be generated and sent to you by the DSM administrator. See the ManageLinx documentation for more details.

Importing the bootstrap file

To configure an XPort Pro to use VIP Access, import the bootstrap file as you would any XML Configuration Record (XCR). For instructions on importing XCRs see chapter 12, [Advanced Settings](#)

Enabling VIP

Once the bootstrap file has been imported, VIP Access can be enabled and a conduit with the DSM will be established. The VIP Statistics shows the current state of the conduit. When configured correctly, a conduit with the DSM will be maintained at all times.

Configuring Tunnels to Use VIP

Configuring Connect Mode tunnels to use VIP is a simple matter of configuring a tunnel as is normally done, but also enabling VIP in the Tunnel Host settings, and using a VIP Name for the address.

VIP Accept Mode tunnels do not require special configuration. If VIP access is enabled (in the VIP configuration page), then VIP Accept Mode requests from a ManageLinux device will be accepted.

16. Security in Detail

The XPort Pro supports Secure Shell (SSH) and Secure Sockets Layer (SSL).

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.

Two instances require configuration: when the XPort Pro 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. The SSH client is for tunneling in Connect Mode.

SSH Server Configuration

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

- ◆ Defined host keys: both private and public keys are required. These 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 Pro SSH server.

To configure SSH server settings:

1. Click **SSH → SSH Server: Host Keys** at the top of the page. The SSH Server: Host Keys page appears.
2. If the keys exist, locate the Private Key and Public Key files using the Browse button. Select the Key Type (RSA is more secure) and click **Submit** to upload the keys.

Note: SSH keys may be created on another computer and uploaded to the XPort Pro. For example, use the following command using Open SSH to create a 1024-bit DSA key pair:

```
ssh-keygen -b 1024 -t dsa
```

SSH Keys from other programs may be converted to the required XPort Pro format. Use Open SSH to perform the conversion.

To convert from RFC-4716 format:

```
ssh-keygen -i
```

For more options, look at the help from Open SSH:

ssh-keygen ?

1. 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 longer key generation times.*

2. Click **SSH → SSH Server: Authorized Users** at the top of the page. The SSH Server: Authorized Users page appears.
3. Enter the **Username** and **Password** for authorized users.
4. If available: locate the **Public RSA Key** or the **Public DSA Key** file by clicking **Browse**. Configuring a public key results in public key authentication; this bypasses password queries.

Note: *When uploading the security keys, ensure the keys are not compromised in transit.*

SSH Client Configuration

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

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

To configure SSH client settings:

1. Click **SSH → SSH Client: Users** at the top of the page. The SSH Client: Users page appears.
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. (Or, generate new keys using the **Create New Keys** section.) The **Remote Command** is provided to the SSH server upon connection. 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 digital certificates for authentication and cryptography against eavesdropping and tampering. Sometimes only the server is authenticated, sometimes both server and client. The XPort Pro can be server and/or client, depending on the application. Public key encryption systems exchange information and keys and set up the encrypted tunnel.

Efficient symmetric encryption methods encrypt the data going through the tunnel after it is established. Hashing provides tamper detection.

Applications that can make use of SSL are Tunneling, Secure Web Server, and WLAN interface.

The XPort Pro supports SSLv3 and its successors, TLS1.0 and TLS1.1.

Note: An incoming SSLv2 connection attempt is answered with an SSLv3 response. If the initiator also supports SSLv3, SSLv3 handles the rest of the connection.

CipherSuites

The SSL standard defines only certain combinations of certificate type, key exchange method, symmetric encryption, and hash method. Such a combination is called a cipher suite.

XPort Pro currently supports the following list of cipher suites:

Certificate	Key exchange	Encryption	Hash
DSA	DHE	3DES	SHA1
RSA	RSA	128 bits AES	SHA1
RSA	RSA	Triple DES	SHA1
RSA	RSA	128 bits RC4	MD5
RSA	RSA	128 bits RC4	SHA1
RSA	1024 bits RSA	56 bits RC4	MD5
RSA	1024 bits RSA	56 bits RC4	SHA1
RSA	1024 bits RSA	40 bits RC4	MD5

Whichever side is acting as server decides which cipher suite to use for a connection. It is usually the strongest common denominator of the cipher suite lists supported by both sides.

Certificates

The goal of a certificate is to authenticate its sender. It is analogous to a paper document that contains personal identification information and is signed by an authority, for example a notary or government agency.

Security Certificate Principles

To sign other certificates, the authority uses a private key. The published authority certificate contains the matching public key that allows another to verify the signature but not recreate it.

The authority's certificate can be signed by itself, resulting in a self-signed or trusted-root certificate, or by another (higher) authority, resulting in an intermediate authority certificate. You can build up a chain of intermediate authority certificates, and the last certification will always be a trusted-root certificate.

An authority that signs other's certificates is also called a Certificate Authority (CA). The last in line is then the root-CA. VeriSign is a famous example of such a root-CA. Its certificate is often built into web browsers to allow verifying the identity of website servers, which need to have certificates signed by VeriSign or another public CA.

Since obtaining a certificate signed by a CA that is managed by another company can be expensive, it is possible to become one's own CA. Tools exist to generate self-signed CA certificates or to sign other certificates.

A certificate before it is signed is known as a certificate request, which only contains the identifying information. Signing it makes it a certificate. One's certificate is also used to sign any message transmitted to the peer to identify the originator and prevent tampering while transported.

In short:

- ◆ When using HTTPS, SSL Tunneling in Accept mode, and/or EAP-TLS, the XPort Pro needs a personal certificate with matching private key to identify itself and sign its messages.
- ◆ When using SSL Tunneling in Connect mode and/or EAP-TLS, EAP-TTLS or PEAP, the XPort Pro needs the authority certificate(s) that can authenticate those it wishes to communicate with.

RSA or DSA

As mentioned above, the certificates contain a public key. Different key exchange methods require different public keys and thus different styles of certificate. The XPort Pro supports key exchange methods that require a RSA-style certificate and key exchange methods that require a DSA-style certificate.

If only one of these certificates is stored in the XPort Pro, only those key exchange methods that can work with that style certificate are enabled. RSA is sufficient in most cases.

Obtaining a Certificate and Private Key

You can obtain a certificate by completing a certificate request and sending it to a certificate authority that will create a certificate/key combo, usually for a fee. Or generate your own. A few utilities exist to generate self-signed certificates or sign certificate requests. The XPort Pro also has the ability to generate its own self-signed certificate/key combo.

You can use XML to export the certificate in PEM format, but you cannot export the key. Hence the internal certificate generator can only be used for certificates that are to identify that particular XPort Pro.

Certificates and private keys can be stored in several file formats. Best known are PKCS12, DER and PEM. Certificate and key can be in the same file or in separate files. The key can be encrypted with a password or not. The XPort Pro currently only accepts separate PEM files. The key needs to be unencrypted.

Utilities

Several utilities exist to convert between the formats.

OpenSSL

OpenSSL is a widely used open source set of SSL related command line utilities. It can act as server or client. It can generate or sign certificate requests. It can convert from and to all kinds of formats.

Executables are available for Linux and Windows.

To generate a self-signed RSA certificate/key combo:

```
openssl req -x509 -nodes -days 365 -newkey rsa:1024 -keyout
mp_key.pem -out mp_cert.pem
```

See www.openssl.org or www.madboa.com/geek/openssl for more information.

Note: Signing other certificate requests is also possible with OpenSSL but is too complicated to explain here.

Steel Belted Radius

Steel Belted Radius is a commercial radius server by Juniper Networks that provides a GUI administration interface. It also provides a certificate request and self-signed certificate generator. The self-signed certificate has extension `.sbrpvk` and is in the PKCS12 format. OpenSSL can convert this into a PEM format certificate and key:

```
openssl pkcs12 -in sbr_certkey.sbrpvk -nodes -out
sbr_certkey.pem
```

The `sbr_certkey.pem` file contains both certificate and key. If loading the SBR certificate into XPort Pro as an authority, you will need to edit it.

1. Open the file in any plain text editor.
2. Delete all info before "----- BEGIN CERTIFICATE-----" and after "----- END CERTIFICATE-----", and then save as `sbr_cert.pem`.

SBR accepts trusted-root certificates in the DER format. Again, OpenSSL can convert any format into DER:

```
openssl x509 -inform pem -in mp_cert.pem -outform der -out
mp_cert.der
```

Note: With SBR, when the identity information includes special characters such as dashes and periods, SBR changes the format it uses to store these strings and

becomes incompatible with the current XPort Pro release. We will add support for this and other formats in future releases.

FreeRadius

Free Radius is a Linux open-source Radius server. It is versatile, but complicated to configure.

17. Branding the XPort Pro

The XPort Pro Web Manager and Command Mode (CLI) are customizable.

Web Manager Customization

Customize the Web Manager's appearance by modifying index.html and style.css. The style (fonts, colors, and spacing) of the Web Manager are controlled with style.css and the text and graphics are controlled with index.html.

The Web Manager files are hidden and are incorporated directly into the firmware image but may be overridden by placing the appropriate file in the appropriate directory on the XPort Pro file system. Web Manager files can be retrieved and overridden with the following procedure:

1. ftp to the XPort Pro
2. mkdir http/config
3. cd http/config
4. get <filename>
5. modify the file to your liking, or create a new one with the same name
6. put <filename>
7. quit

The overriding files will now appear in the file system's http/config directory. Restart any open browser to view the changed effects.

If you wish to go back to the default files in the firmware image, simply delete the overriding files from the file system.

Command Mode

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

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

The long and short names appear in the Product Type field in the following format:

```
Product Type: <long name> (<short name>)
```

For example:

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

To change the XPort Pro short and long names with the web manager:

1. Click System in the menu bar. The System page opens.
2. In the Short Name field, enter the new short name for the device (up to 32 characters).
3. In the Long Name field, enter the new long name for the device (up to 64 characters).
4. Click Submit.
5. To apply changes, click Reboot.

18. 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 Pro Web Manager Filesystem page.

To upload new firmware:

1. Click **System** in the menu bar. The Filesystem page appears.
2. In the **Upload New Firmware** section, click **Browse**. A pop-up page appears. Locate the firmware file.
3. Click **Upload** to install the firmware on the XPort Pro. The device automatically reboots on the installation of new firmware.

Alternatively, firmware may be updated by sending the file to the XPort Pro over a FTP or TFTP connection.

A: Technical Support

If you are unable to resolve an issue using the information in this documentation, please contact Technical Support:

Technical Support US

Check our online knowledge base or send a question to Technical Support at <http://www.lantronix.com/support>.

Technical Support Europe, Middle East, Africa

Phone: [+33 13 930 4172](tel:+33139304172)

Email: eu_techsupp@lantronix.com or eu_support@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
- ◆ Firmware version (on the first screen shown when you Telnet to the device and type **show**)
- ◆ Description of the problem
- ◆ Status of the unit when the problem occurred (please try to include information on user and network activity at the time of the problem)
- ◆ Additionally, it may be useful to export and submit the XML Configuration and XML Status files

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

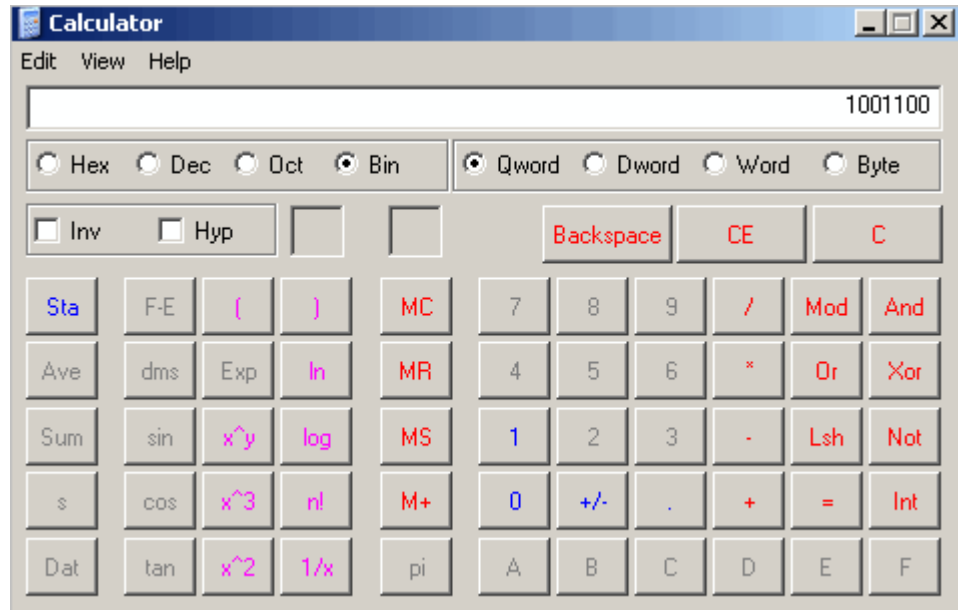
Hexadecimal digits have values ranging from 0 to F, which are represented as 0-9, A (for 10), B (for 11), etc. To convert a binary value (for example, 0100 1100) to a hexadecimal representation, treat the upper and lower four bits separately to produce a two-digit hexadecimal number (in this case, 4C).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

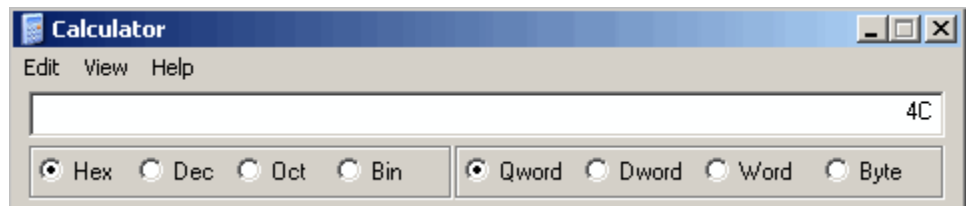
Scientific Calculator

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

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



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



C: Compliance

(According to ISO/IEC Guide 17050-1, 17050-2 and EN 45014)

Manufacturer's Name & Address:

Lantronix 15353 Barranca Parkway, Irvine, CA 92618 USA

Product Name Model: XPort Pro Embedded Device Server

Conforms to the following standards or other normative documents:

Radiated and conducted emissions

CFR Title 47 FCC Part 15, Subpart B and C

Industry Canada ICES-003 Issue 4 2004

VCCI V-3/2007.04

AS/NZS CISPR 22: 2006

EN55022: 1998 + A1: 2000 + A2: 2003

EN61000-3-2: 2000 + A2: 2005

EN61000-3-3: 1995 + A1: 2001 + A2: 2005

Immunity

EN55024: 1998 + A1: 2001 + A2: 2003

Direct & Indirect ESD

EN61000-4-2: 1995

RF Electromagnetic Field Immunity

EN61000-4-3: 2002

Electrical Fast Transient/Burst Immunity

EN61000-4-4: 2004

Surge Immunity

EN61000-4-5: 2006

RF Common Mode Conducted Susceptibility

EN61000-4-6: 1996

Power Frequency Magnetic Field Immunity

EN61000-4-8: 1994

Voltage Dips and Interrupts

EN61000-4-11: 2004

Safety

UL 60950-1

CAN/CSA-C22.2 No. 60950-1-03
EN 60950-1:2001, Low Voltage Directive (73/23/EEC)

Manufacturer's Contact:

Lantronix
15353 Barranca Parkway, Irvine, CA 92618 USA
Tel: 949-453-3990
Fax: 949-450-7249

RoHS Notice:

All Lantronix products in the following families are China RoHS-compliant and free of the following hazardous substances and elements:

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent Chromium (Cr (VI))
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ethers (PBDE)

Product Family Name	Toxic or hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr (VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
UDS1100 and 2100	0	0	0	0	0	0
EDS	0	0	0	0	0	0
MSS100	0	0	0	0	0	0
IntelliBox	0	0	0	0	0	0
XPress DR & XPress-DR+	0	0	0	0	0	0
SecureBox 1101 & 2101	0	0	0	0	0	0
WiBox	0	0	0	0	0	0
UBox	0	0	0	0	0	0
XPort	0	0	0	0	0	0
SLC	0	0	0	0	0	0
XPort	0	0	0	0	0	0
WiPort	0	0	0	0	0	0
SLB	0	0	0	0	0	0
SLP	0	0	0	0	0	0
SCS	0	0	0	0	0	0
SLS	0	0	0	0	0	0
DSC	0	0	0	0	0	0

O: toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

D: Warranty

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

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