

LANTRONIX



EDS1100/2100 Device Server User Guide

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Revision History

Date	Rev.	Comments
September 2009	A	Initial document.
December 2010	B	Updated for firmware version 5.2.0.0R20. Added support for Modbus protocol, configurable MTU, and additional VIP tunnel connect protocols; as well as improvements to SNMP, logging, and SSL.
April 2016	C	Updated for firmware version 5.4.0.0. New features include CLI login string, send break, break duration settings, support for SHA2 SSL certificate, and key size changes in SSL. VIP content and host mode configuration options removed.

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1: About This Guide

This user guide provides the information needed to configure, use, and update the Lantronix® EDS1100/2100 device server. It is intended for software developers and system integrators who are installing the EDS1100/2100 in their designs.

Chapter and Appendix Summaries

A summary of each chapter is provided below.

Chapter	Description
<i>Chapter 2: Introduction</i>	Main features of the product and the protocols it supports. Includes technical specifications.
<i>Chapter 3: Installation of EDS1100</i>	Instructions for installing the EDS1100.
<i>Chapter 4: Installation of EDS2100</i>	Instructions for installing the EDS2100.
<i>Chapter 5: Using DeviceInstaller</i>	Instructions for viewing the current configuration using the Lantronix DeviceInstaller™ application.
<i>Chapter 6: Configuration Using Web Manager</i>	Instructions for accessing Web Manager and using it to configure settings for the device.
<i>Chapter 7: Network Settings</i>	Instructions for using the web interface to configure Ethernet settings.
<i>Chapter 8: Line and Tunnel Settings</i>	Instructions for using the web interface to configure line and tunnel settings.
<i>Chapter 9: Terminal and Host Settings</i>	Instructions for using the web interface to configure terminal and host settings.
<i>Chapter 10: Service Settings</i>	Instructions for using the web interface to configure settings for DNS, SNMP, FTP, and other services.
<i>Chapter 11: Security Settings</i>	Instructions for using the web interface to configure SSH and SSL security settings.
<i>Chapter 12: Modbus</i>	Instructions for using the web interface to configure Modbus.
<i>Chapter 13: Maintenance and Diagnostics Settings</i>	Instructions for using the web interface to maintain the device, view statistics, files, and logs, and to diagnose problems.
<i>Chapter 14: Advanced Settings</i>	Instructions for using the web interface to configure email, CLI, and XML settings.
<i>Chapter 15: Branding the EDS1100/2100 Unit</i>	Instructions for customizing the device.
<i>Chapter 16: Updating Firmware</i>	Instructions for obtaining the latest firmware and updating the device.
<i>A: Technical Support</i>	Instructions for contacting Lantronix Technical Support.
<i>B: Binary to Hexadecimal Conversions</i>	Instructions for converting binary values to hexadecimals.
<i>C: Compliance</i>	Lantronix compliance information.

Additional Documentation

Visit the Lantronix web site at www.lantronix.com/support/documentation for the latest documentation and the following additional documentation.

Document	Description
<i>EDS1100/2100 Device Server Quick Start Guide</i>	Instructions for getting the EDS1100/2100 configured and up and running.
<i>EDS1100/2100 Device Server Command Reference</i>	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.
<i>DeviceInstaller Online Help</i>	Instructions for using the Lantronix Windows® based DeviceInstaller application to locate the device and to view its current settings.
<i>Com Port Redirector Quick Start and Online Help</i>	Instructions for using the Lantronix Windows based utility to create virtual com ports.
<i>Secure Com Port Redirector User Guide</i>	Instructions for using the Lantronix Windows based utility to create secure virtual com ports.

2: Introduction

This chapter introduces the Lantronix EDS1100/2100 device server. It provides an overview of the product, lists the key features, and describes the applications for which they are suited.

The EDS is a unique, hybrid Ethernet terminal and multi-port device server product designed to remotely access and manage virtually all of your IT/networking equipment and servers. It is also designed to provide connectivity for edge devices such as medical equipment, POS/retail terminals, security equipment, and more.

The EDS devices contain all the components necessary to deliver full network connectivity to virtually any kind of serial device. They boast a reliable TCP/IP protocol stack, a variety of remote management capabilities, and an innovative design based on the leading-edge Lantronix Evolution OS® software.

The EDS device server is a complete network-enabling solution. The EDS1100 and EDS2100 provide the same solution and differ only in the number of serial ports. The EDS1100 has one serial port supported via a DB25 connector. The EDS2100 has two serial ports supported via 2 DB9 connectors.

This chapter contains the following sections:

- ◆ [Key Features](#)
- ◆ [Protocol Support](#)
- ◆ [Evolution OS™ Application](#)
- ◆ [Additional Features](#)
- ◆ [Configuration Methods](#)
- ◆ [Addresses and Port Numbers](#)
- ◆ [Product Information Label](#)

Key Features

- ◆ **Power Supply:** Regulated 9 - 30 VDC input required. There is a step-down converter to 1.5V for the processor core. All voltages have LC filtering to minimize noises and emissions.
- ◆ **Controller:** A Lantronix FX 32-bit microprocessor, running at 166 MHz internal bus and 83 MHz external bus.
- ◆ **Memory:** 8 MB flash and 8 MB SDRAM . Please contact your sales representative if you need larger memory sizes.
- ◆ **Temperature Range:** Operates over an extended temperature range of -40°C to +85°C.
- ◆ **Ethernet:** 10/100 megabits per second (Mbps) Ethernet transceiver
- ◆ **Serial Ports:** RS232/422/485 high-speed serial port with all hardware handshaking signals. Baud rate is software selectable (300 bps to 921600 bps).

The EDS1100/2100 device server connects serial devices such as those listed below to Ethernet networks using the IP protocol family.

- ◆ ATM machines
- ◆ Data display devices

- ◆ Security alarms and access control devices
- ◆ Modems
- ◆ Time/attendance clocks and terminals
- ◆ Patient monitoring equipment
- ◆ Medical instrumentation
- ◆ Industrial Manufacturing/Automation systems
- ◆ Building Automation equipment
- ◆ Point of Sale Systems

Protocol Support

The EDS1100/2100 device server contains a full-featured TCP/IP stack. Supported protocols include:

- ◆ ARP, IP, UDP, TCP, ICMP, BOOTP, DHCP, AutoIP, Telnet, DNS, FTP, TFTP, HTTP/HTTPS, 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™ Application

The EDS1100/2100 device server incorporates the Lantronix Evolution operating system (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 EDS1100/2100 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 EDS1100/2100 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 EDS1100/2100 uses industry-standard tools for configuration, communication, and control. For example, the Evolution OS software uses a Command Line Interface (CLI) whose syntax is very similar to that used by data center equipment such as routers and hubs.

SNMP Management

The EDS1100/2100 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 EDS1100/2100 devices.

XML-Based Architecture and Device Control

XML is a fundamental building block for the future growth of M2M networks. The EDS1100/2100 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 EDS1100/2100 supports Really Simple Syndication (RSS) 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 software provides the EDS1100/2100 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.

With built-in SSH and SSL, secure communications can be established between the serial ports and the remote end device or application. 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 are able to do the following:

- ◆ 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 EDS1100/2100 has robust defenses to hostile Internet attacks such as denial of service (DoS), which can be used to take down the network. Moreover, the EDS1100/2100 cannot be used to bring down other devices on the network.

You can use the EDS1100/2100 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 EDS1100/2100 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 EDS1100/2100 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 EDS1100/2100, including CPU utilization and total stack space available.

Configuration Methods

After installation, the EDS1100/2100 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 EDS1100/2100 and assigning IP addresses and other configurable settings:

DeviceInstaller: Configure the IP address and related settings and view current settings on the EDS1100/2100 using a Graphical User Interface (GUI) on a PC attached to a network. See [Chapter 5: Using DeviceInstaller](#).

Web Manager: Through a web browser, configure the EDS1100/2100 settings using the Lantronix Web Manager. See [Chapter 6: Configuration Using Web Manager](#).

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 *EDS1100/2100 Device Server Command Reference* for instructions and available commands. Lantronix documentation is available at www.lantronix.com/support/documentation.)

XML: The EDS1100/2100 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 *EDS1100/2100 Device Server Command Reference* for instructions and available commands. Lantronix documentation is available at www.lantronix.com/support/documentation.)

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 as either 00-20-4A or 08-04-13, 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
08-04-13-14-01-18	or	08:04:13:14:01:18

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 EDS1100/2100.

- ◆ 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
- ◆ TCP/UDP Port 10002: Tunnel 2

Note: Multi-port products include one or more additional supported ports and tunnels with default sequential numbering. For instance: TCP/UDP Port 10002: Tunnel 2, TCP/UDP Port 10003: Tunnel 3, etc.

Product Information Label

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

- ◆ Bar Code
- ◆ Revision
- ◆ Date of Manufacture
- ◆ Country of Manufacture
- ◆ Part Number
- ◆ Hardware Address (MAC address or serial number)

Figure 2-2 Product Label



3: *Installation of EDS1100*

This chapter describes how to install the EDS1100 device server. It contains the following sections:

- ◆ *Package Contents*
- ◆ *User-Supplied Items*
- ◆ *Hardware Components*
- ◆ *Installing the EDS1100*

Package Contents

- ◆ The EDS1100 package includes the following items:
- ◆ One EDS1100 device
- ◆ One DB25M-to-DB9F serial cable
- ◆ Power Cube, 100-240 VAC with international adapters
- ◆ Power cord restraint
- ◆ Printed *Quick Start Guide*

User-Supplied Items

To complete your installation, you need the following items:

- ◆ RS-232/422/485 serial device that requires network connectivity.
- ◆ A serial cable, as in the following list, for your serial device. One end of the cable must have a male DB25 connector for the serial port.
 - A null modem cable to connect the serial port to a DCE device.
 - A straight-through modem cable, such as the one supplied in the package, to connect the serial port to a DTE device.
- ◆ An available connection to your Ethernet network and an Ethernet cable.
- ◆ A working power outlet if the unit will be powered from an AC outlet.

Hardware Components

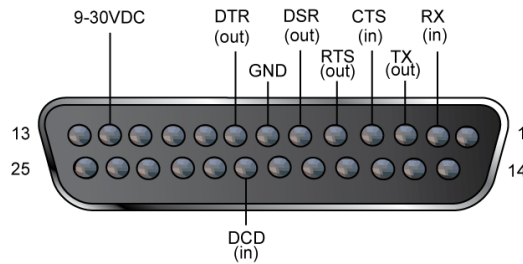
The EDS1100 has a female DB25 serial port that supports RS-232, RS-422, and RS-485 serial devices. The default serial port settings are 9600 baud, 8 bits, no parity, 1 stop bit, no flow control. [Figure 3-1](#) shows the front panel.

Figure 3-1 EDS1100 DB25 (Female) Serial Port



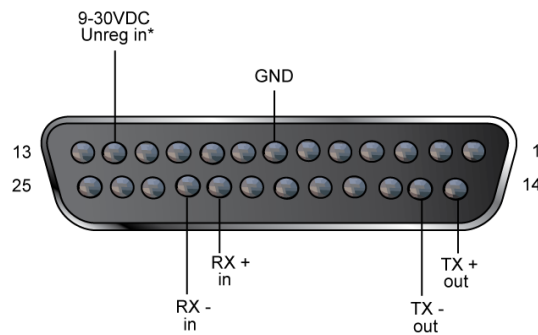
[Figure 3-2](#) shows the RS-232 pinout configuration.

Figure 3-2 EDS1100 RS-232 Pinouts



[Figure 3-3](#) shows the RS-422 (4-wire) pinout configuration.

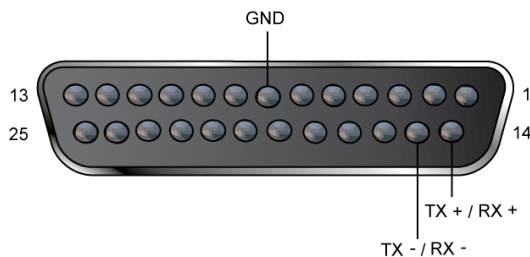
Figure 3-3 EDS1100 RS-422 (4-wire) Pinouts



*Optional Power Connection

[Figure 3-4](#) shows the RS-485 (2-wire) pinout configuration.

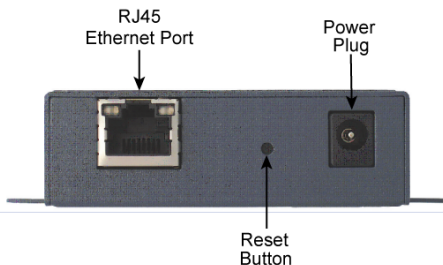
Figure 3-4 EDS1100 RS-485 (2-wire) Pinouts



Back Panel

On the EDS1100 back panel, there is a power plug, reset button, and an RJ45 (10/100) Ethernet port as shown in [Figure 3-5](#).

Figure 3-5 EDS1100 Back Panel



The Ethernet port has two LEDs that indicate the status of the connection.

◆ Left LED

- Green ON 100Mbps Link
- Green Blink 100Mbps Activity
- Orange ON 10Mbps Link
- Orange Blink 10Mbps Activity

◆ Right LED

- Green ON Full Duplex
- OFF Half Duplex

The Ethernet port can connect to an Ethernet (10 Mbps) or Fast Ethernet (100 Mbps) network.

Reset Button

You can reset the EDS1100 to factory defaults, including clearing the network settings. The IP address, gateway, and netmask are set to 00s.

To reset the unit to factory defaults, perform the following steps.

1. Place the end of a paper clip or similar object into the reset opening (back panel) and press for a minimum of 3 seconds.
2. Remove the paper clip to release the button. The firmware restores factory default settings to the configuration and reboots the unit.

Top LEDs

Figure 3-6 shows the top of the EDS1100 and Table 3-7 lists and describes the LEDs that are on the top of the device.

Figure 3-6 EDS1100 Top LEDs

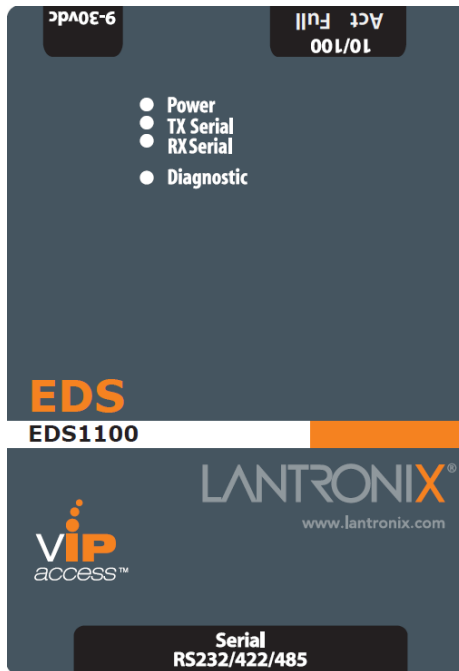


Table 3-7 EDS1100 LEDs and Descriptions

LED	Description
Power (blue)	ON—EDS is receiving power
TX Serial (green)	Blinking—EDS is transmitting data on the serial port
RX Serial (yellow)	Blinking—EDS is receiving data on the serial port
Diagnostic	ON—EDS firmware has completed booting Blinking 1x/sec—EDS firmware is booting Blinking 2x/sec—EDS is writing a file to flash Blinking 4x/sec—EDS is compacting the file system Blinking 5x/sec—EDS is restoring factory defaults

Installing the EDS1100

Be sure to place the device on a flat horizontal or vertical surface. The device comes with mounting brackets for mounting the device vertically, for example on a wall. If using AC power, avoid outlets controlled by a wall switch.

Observe the following guidelines when connecting the serial devices:

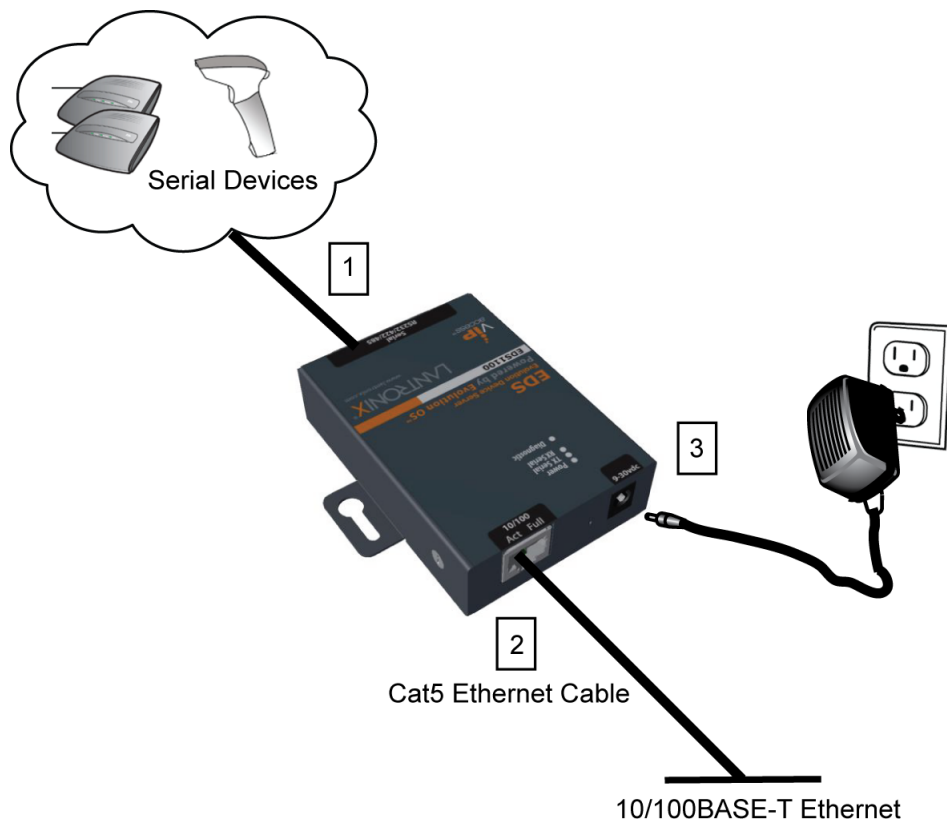
- ◆ The EDS1100 serial ports support RS-232/422/485 devices.
- ◆ The null modem cable is the best cable to connect the serial port to a DCE device. The straight-through (modem) cable is the best cable to connect the serial port to a DTE device.
- ◆ Power-up the device by using the barrel-power connector only. The barrel-power connector supports a power range of 9 to 30 VDC.

Note: As soon as you plug the device into power, the device powers up automatically, the self-test begins, and Evolution OS™ starts.

Perform the following steps to install your device. The steps are shown in [Figure 3-8](#).

1. Connect a serial device to your unit.
2. Connect an Ethernet cable between the EDS1100 RJ45 port and your Ethernet network.
3. Plug the EDS1100 into the power outlet by using the power supply that was included in the packaging. The required input voltage is 9-30 VDC (center +) with 1.5W maximum power required.
4. Power up the serial device.

Figure 3-8 EDS1100 Connections



4: *Installation of EDS2100*

This chapter describes how to install the EDS2100 device server. It contains the following sections:

- ◆ *Package Contents*
- ◆ *User-Supplied Items*
- ◆ *Hardware Components*
- ◆ *Installing the EDS2100*

Package Contents

The EDS2100 package includes the following items:

- ◆ One EDS2100 device
- ◆ One DB9F-to-DB9F serial null modem cable
- ◆ Power Cube, 100-240 VAC with international adapters
- ◆ Power cord restraint
- ◆ Printed *Quick Start Guide*

User-Supplied Items

To complete your installation, you need the following items:

- ◆ RS-232/422/485 serial devices that require network connectivity.
- ◆ A serial cable, as listed below, for each serial device. One end of the cable must have a female DB9 connector for the serial port.
 - A null modem cable, such as the one supplied in your EDS2100 package, to connect the serial port to another DTE device.
 - A straight-through modem cable to connect the serial port to a DCE device.
- ◆ An available connection to your Ethernet network and an Ethernet cable.
- ◆ A working power outlet if the unit will be powered from an AC outlet.

Hardware Components

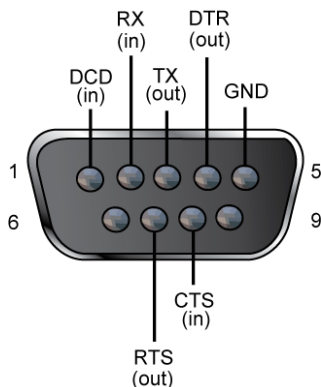
The EDS2100 has two male DB9 serial ports that support RS-232/422/485. [Figure 4-1](#) shows the front of the device. The default serial port settings are 9600 baud, 8 bits, no parity, 1 stop bit, no flow control.

Figure 4-1 EDS2100 Male DB9 DTE Serial Ports



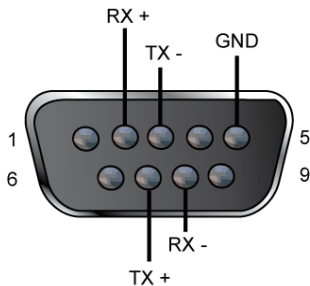
The RS-232 pinout configuration is shown in [Figure 4-2](#).

Figure 4-2 EDS2100 Pinout Configuration for RS-232



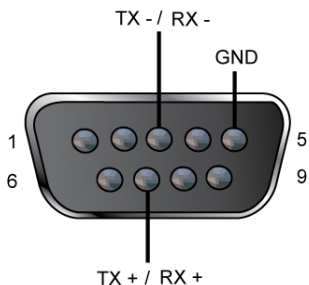
[Figure 4-3](#) shows the pinout configuration for RS-422 (4-wire).

Figure 4-3 EDS2100 Pinout Configuration for RS-422 (4-wire)



[Figure 4-4](#) shows the pinout configuration for RS-485 (2-wire).

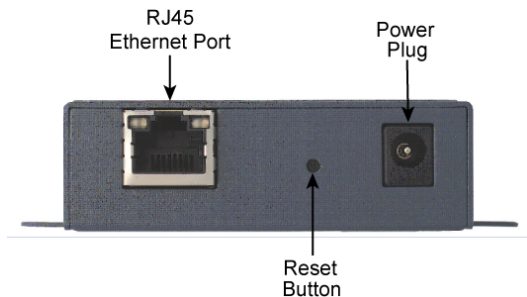
Figure 4-4 EDS2100 Pinout Configuration for RS-485 (2-wire)



Back Panel

On the EDS2100 back panel, there is a power plug, reset button, and an RJ45 (10/100) Ethernet port as shown in [Figure 4-5](#).

Figure 4-5 EDS2100 Ethernet RJ45 Port, Reset Button, and Power Plug



The Ethernet port has two LEDs that indicate the status of the connection as follows:

- ◆ **Left LED**
 - Green ON 100Mbps Link
 - Green Blink 100Mbps Activity
 - Orange ON 10Mbps Link
 - Orange Blink 10Mbps Activity.
- ◆ **Right LED**
 - Green ON Full Duplex.
 - OFF Half Duplex

The Ethernet port can connect to an Ethernet (10 Mbps) or Fast Ethernet (100 Mbps) network.

Reset Button

You can reset the EDS2100 to factory defaults, including clearing the network settings. The IP address, gateway, and netmask are set to 00s. To reset the unit to factory defaults, perform the following steps.

1. Place the end of a paper clip or similar object into the reset opening and press for a minimum of 3 seconds.
2. Remove the paper clip to release the button. The firmware restores factory default settings to the configuration and reboots the unit.

Top LEDs

Figure 4-6 shows the top of the EDS2100. Table 4-7 lists and describes the LEDs.

Figure 4-6 EDS2100 Top LEDs



Table 4-7 EDS2100 LEDs and Descriptions

LED	Description
Power (blue)	ON—EDS is receiving power
TX Serial 1 (green)	Blinking—EDS is transmitting data on serial port 1
RX Serial 1 (yellow)	Blinking—EDS is receiving data on serial port 1
TX Serial 2 (green)	Blinking—EDS is transmitting data on serial port 2
RX Serial 2 (yellow)	Blinking—EDS is receiving data on serial port 2
Diagnostic	ON—EDS firmware has completed booting Blinking 1x/sec—EDS firmware is booting Blinking 2x/sec—EDS is writing a file to flash Blinking 4x/sec—EDS is compacting the file system Blinking 5x/sec—EDS is restoring factory defaults

Installing the EDS2100

Be sure to place the device on a flat horizontal or vertical surface. The device comes with mounting brackets for mounting the device vertically, for example on a wall. If using AC power, avoid outlets controlled by a wall switch.

Observe the following guidelines when connecting the serial devices:

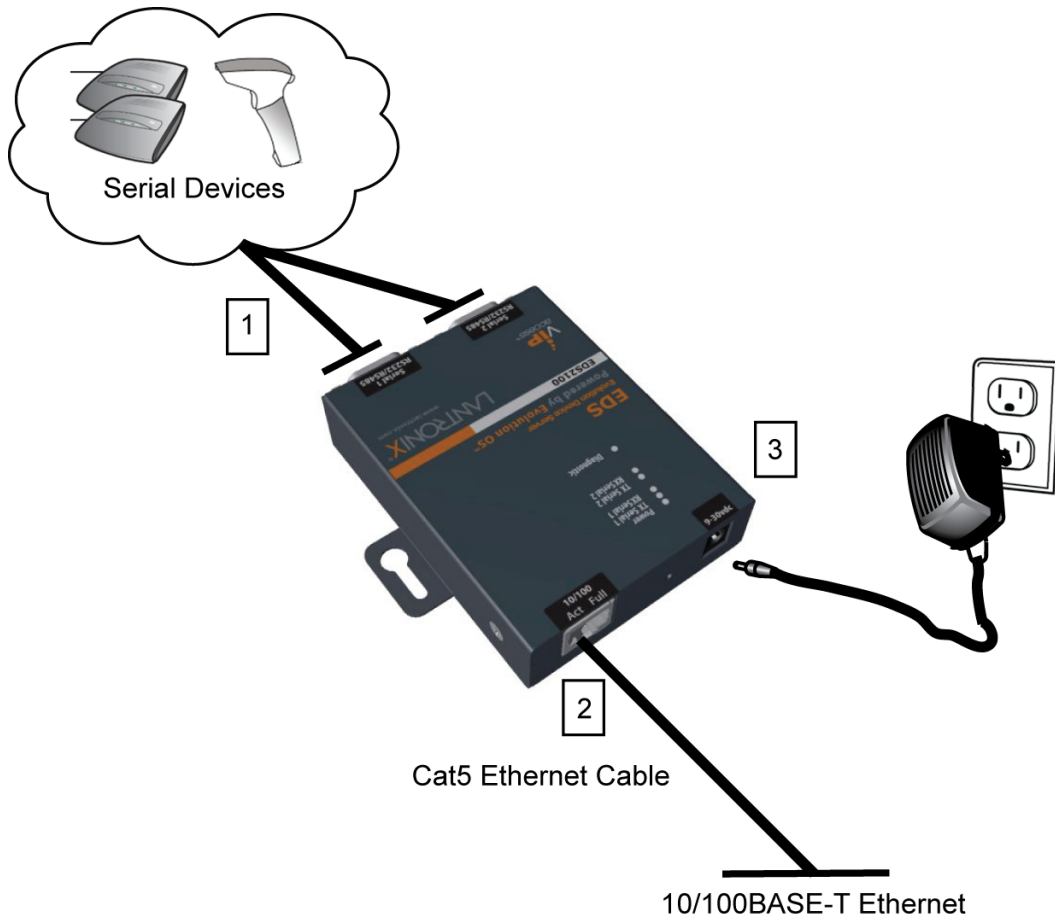
- ◆ The EDS2100 serial ports support RS-232/422/485 devices.
- ◆ The null modem cable is the best cable to connect the serial port to another DTE device. The straight-through (modem) cable is the best cable to connect the serial port to a DCE device.
- ◆ Power-up the device by using the Barrel-power connector only. The barrel-power connector supports a power range of 9 to 30 VDC.

Note: *As soon as you plug the device into power, the device powers up automatically, the self-test begins, and Evolution OS™ starts.*

Perform the following steps to install your device which are numbered in [Figure 4-8](#) also.

1. Connect a serial device to your unit.
2. Connect an Ethernet cable between the EDS2100 RJ45 port and your Ethernet network.
3. Plug the EDS2100 into the power outlet by using the power supply that was included in the packaging. The required input voltage is 9-30 VDC (center +) with 1.5W maximum power required.
4. Power up the serial devices.

Figure 4-8 EDS2100 Connections



5: Using DeviceInstaller

This chapter covers the steps for locating a device and viewing its properties and details. The Lantronix DeviceInstaller application is a free utility program provided by Lantronix that discovers, configures, upgrades, and manages Lantronix device servers. It can be downloaded from the Lantronix website at www.lantronix.com/support/downloads.html. For instructions on using the DeviceInstaller application to configure the IP address, related settings or for more advanced features, see the DeviceInstaller Online Help.

Note: *AutoIP 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.*

Installing DeviceInstaller

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

Accessing the EDS1100/2100 Unit Using DeviceInstaller

Note: *Make note of the MAC address. It may be needed to perform various functions in the DeviceInstaller application.*

1. Click **Start > All Programs > Lantronix > DeviceInstaller 4.4 > DeviceInstaller**.
When DeviceInstaller starts, it will perform a network device search.
2. Click **Search** to perform additional searches, as desired.
3. Expand the **EDS** folder by clicking the **+** symbol next to the **EDS** folder icon. The list of available Lantronix EDS1100/2100 devices appear.
4. Select the EDS1100/2100 unit by expanding its entry and clicking on its hardware (MAC) or IP address to view its configuration.
5. On the right page, click the **Device Details** tab. The current EDS1100/2100 configuration appears. This is only a subset of the full configuration; the complete configuration may be accessed via Web Manager, CLI, or XML.

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

Table 5-1 Device Details Summary

Current Settings	Description
Name	Name identifying the EDS1100/2100 device server.
DHCP Device Name	Shows the name associated with the current IP address, if the IP address was obtained dynamically.

Current Settings (continued)	Description
Group	Configurable field. Enter a group to categorize the EDS1100/2100 device server. 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 the DeviceInstaller application.
Comments	Configurable field. Enter comments for the EDS1100/2100 device server. 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 EDS1100/2100 device family type as "EDS".
Type	Shows the specific device type, such as "EDS1100" or "EDS2100".
ID	Shows the EDS1100/2100 ID embedded within the unit.
Hardware Address	Shows the EDS1100/2100 hardware (MAC) address.
Firmware Version	Shows the firmware currently installed on the EDS1100/2100.
Extended Firmware Version	Provides additional information on the firmware version.
Online Status	Shows the EDS1100/2100 status as Online , Offline , Unreachable (if the EDS1100/2100 is on a different subnet), or Busy (if the EDS1100/2100 is currently performing a task).
IP Address	Shows the EDS1100/2100 device's current IP address. To change the IP address, click the Assign IP button on the DeviceInstaller menu bar.
IP Address was Obtained	Displays Dynamically if the EDS1100/2100 automatically received an IP address (e.g., from DHCP). Displays Statically if the IP address was configured manually. If the IP address was assigned dynamically, the following fields appear: <ul style="list-style-type: none"> ◆ Obtain via DHCP with value of True or False. ◆ Obtain via BOOTP with value of True or False.
Subnet Mask	Shows the subnet mask specifying the network segment on which the EDS1100/2100 resides.
Gateway	Shows the IP address of the router of this network. There is no default.
Number of Serial Ports	Shows the number of serial ports on this EDS1100/2100 unit.
Supports Configurable Pins	Shows False , indicating configurable pins are available on the EDS1100/2100 unit.
Supports Email Triggers	Shows True , indicating email triggers are available on the EDS1100/2100 unit.
Telnet Supported	Indicates whether Telnet is enabled on this EDS1100/2100 unit. Shows True .
Telnet Port	Shows the EDS1100/2100 port for Telnet sessions.
Web Port	Shows the EDS1100/2100 port for Web Manager configuration.
Firmware Upgradable	Shows True , indicating the EDS1100/2100 firmware is upgradable as newer versions become available.

6: Configuration Using Web Manager

This chapter describes how to configure the EDS1100/2100 device server 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. It contains the following sections:

- ◆ [Accessing Web Manager](#)
- ◆ [Web Manager Page Components](#)
- ◆ [Navigating the Web Manager](#)
- ◆ [Summary of Web Manager Pages](#)

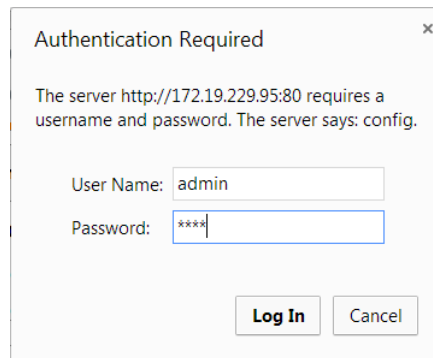
Accessing Web Manager

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

To access Web Manager, perform the following steps:

1. Open a standard web browser. Lantronix supports the latest version of Internet Explorer, Mozilla Suite, Mozilla Firefox, Safari, Chrome or Opera.
2. Enter the IP address of the EDS1100/2100 unit in the address bar. The IP address may have been assigned manually using the DeviceInstaller application (see [Chapter 5: Using DeviceInstaller](#) EDS1100/2100) or automatically by DHCP.

Figure 6-1 Prompt for User Name and Password



Authentication Required

The server http://172.19.229.95:80 requires a username and password. The server says: config.

User Name:

Password:

3. Enter your username and password. The factory-default username is **admin** and the factory-default password is **PASS**. The Device Status web page shown in [Figure 6-2](#) displays configuration, network settings, line settings, tunneling settings, and product information.

Note: The **Logout** button is available on the upper right of any web page. Logging out of the web page would force re-authentication to take place the next time the web page is accessed.

Device Status Page

The Device Status page is the first page that appears after you log into Web Manager. It also appears when you click **Status** in the menu bar (*Figure 6-2*).

Figure 6-2 Web Manager Home Page

EDS2100

Powered by Evolution OS™

LANTRONIX™
EVOLUTION OS™

Status 🏠

CLI

Diagnostics

DNS

Email

Filesystem

FTP

Host

HTTP

IP Address Filter

Line

LPD

Modbus

Network

PPP

Protocol Stack

Query Port

RSS

SNMP

SSH

SSL

Syslog

System

Terminal

TFTP

Tunnel

XML

Device Status

Product Information

Product Type:	Lantronix EDS2100
Firmware Version:	5.4.0.0R7
Build Date:	Mar 18 2016 (14:54:27)
Serial Number:	07102547Y6L05G
Uptime:	7 days 06:16:33
Permanent Config:	Saved

Network Settings

Interface:	eth0
Link:	Auto 10/100 Mbps Auto Half/Full (100 Mbps Full)
MAC Address:	00:20:4a:a8:ba:04
Hostname:	<None>
IP Address:	172.19.100.72/16 (DHCP)
Default Gateway:	172.19.0.1 (DHCP)
Domain:	eng.lantronix.com (DHCP)
Primary DNS:	172.19.1.1 (DHCP)
Secondary DNS:	172.19.1.2 (DHCP)
MTU:	1500

Line Settings

Line 1:	RS232, 921600, None, 8, 1, Hardware
Line 2:	RS232, 921600, None, 8, 1, Hardware

	Connect Mode	Accept Mode
Tunnel 1:	Disabled	Active
Tunnel 2:	Disabled	Waiting

[\[Logout\]](#)

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Web Manager Page Components

The layout of a typical Web Manager page is below.

Figure 6-3 Components of the Web Manager Page

The diagram illustrates the components of the Web Manager page for EDS2100. The page is structured as follows:

- Header:** Displays "EDS2100 Powered by Evolution OS" and the "LANTRONIX EVOLUTION OS" logo.
- Menu Bar:** A vertical sidebar on the left containing navigation links such as Status, CLI, Diagnostics, DNS, Email, Filesystem, FTP, Host, HTTP, IP Address Filter, Line, LPD, Modbus, Network, PPP, Protocol Stack, Query Port, RSS, SNMP, SSH, SSL, Syslog, System, Terminal, TFTP, Tunnel, and XML.
- Main Content Area:**
 - At the top, there are tabs for "Line 1" and "Line 2".
 - Below the tabs are sub-sections: "Statistics", "Configuration", and "Command Mode".
 - The "Line 1 - Command Mode" section includes:
 - Mode:** Radio buttons for "Always", "Use Serial String", and "Disabled".
 - Wait Time:** An input field followed by "milliseconds".
 - Serial String:** An input field with radio buttons for "Text" and "Binary".
 - Echo Serial String:** Radio buttons for "Yes" and "No".
 - Signon Message:** An input field with radio buttons for "Text" and "Binary", and a "Submit" button.
 - Current Configuration:** A table showing the current settings:

Mode:	Disabled (Inactive)
Wait Time:	5000 milliseconds
Serial String:	<None>
Echo Serial String:	On
Signon Message:	<None>
- Information and Help Area:** A text block on the right side providing detailed explanations for the configuration options, such as "When Command Mode is enabled, the Command Line Interface (CLI) is attached to the Serial Line." and "The Wait Time specifies the amount of time to wait during boot time for the Serial String."
- Footer:** Displays the copyright notice: "Copyright © Lantronix, Inc. 2007-2016. All rights reserved."

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 these additional 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 of many pages, you can select or enter new configuration settings. Some pages show status or statistics in this area rather than allow you to enter settings.
- ◆ At the bottom of most pages, the current configuration is displayed. In some cases, you can reset or clear a setting.
- ◆ The information or help area shows information or instructions associated with the page.
- ◆ A **Logout** button is available at the upper right corner of every web page. In Chrome or Safari, it is necessary to close out of the browser to logout. If necessary, reopen the browser to log back in.
- ◆ The footer appears at the very 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 on 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 EDS1100/2100 for the new configuration settings to take effect. The chapters that follow indicate when a change requires a reboot.*

Table 6-4 Summary of Web Manager Pages

Web Manager Page	Description	See Page
Status	Shows product information and network, line, and tunneling settings.	36
CLI	Shows Command Line Interface (CLI) statistics and lets you change the current CLI configuration settings.	127
Diagnostics	Lets you perform various diagnostic procedures.	113
DNS	Shows the current configuration of the DNS subsystem and the DNS cache.	70
Email	Shows email statistics and lets you clear the email log, configure email settings, and send an email.	123
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.	103
FTP	Shows statistics and lets you change the current configuration for the File Transfer Protocol (FTP) server.	74
Host	Lets you view and change settings for a host on the network.	68
HTTP	Shows HyperText Transfer Protocol (HTTP) statistics and lets you change the current configuration and authentication settings.	77
IP Address Filter	Lets you specify all the IP addresses and subnets that are allowed to send data to this device.	111
Line	Shows statistics and lets you change the current configuration and Command mode settings of a serial line.	44

Web Manager Page (continued)	Description	See Page
LPD	Shows LPD (Line Printer Daemon) Queue statistics and lets you configure the LPD and print a test page.	83
Modbus	Shows the current connection status of the Modbus servers listening on the TCP ports and lets you configure the Modbus settings.	100
Network	Shows status and lets you configure the network interface.	40
PPP	Lets you configure a network link using Point-to-Point Protocol (PPP) over a serial line.	71
Protocol Stack	Lets you perform lower level network stack-specific activities.	106
Query Port	Lets you change configuration settings for the query port.	112
RSS	Lets you change current Really Simple Syndication (RSS) settings.	82
SNMP	Lets you change the current Simple Network Management Protocol (SNMP) configuration settings.	73
SSH	Lets you change the configuration settings for SSH server host keys, SSH server authorized users, SSH client known hosts, and SSH client users.	86
SSL	Lets you upload an existing certificate or create a new self-signed certificate.	94
Syslog	Lets you specify the severity of events to log and the server and ports to which the syslog should be sent.	76
System	Lets you reboot device, restore factory defaults, upload new firmware, and change the device long and short names.	121
Terminal	Lets you change current settings for a terminal.	66
TFTP	Shows statistics and lets you change the current configuration for the Trivial File Transfer Protocol (TFTP) server.	75
Tunnel	Lets you change the current configuration settings for a tunnel.	48
XML	Lets you export XML configuration and status records, and import XML configuration records.	129

7: Network Settings

This chapter describes how to access, view, and configure network settings from the Network web page. The **Network** web page contains sub-menus that enable you to view and configure the Ethernet network interface and link.

This chapter contains the following sections:

- ◆ [Network 1 \(eth0\) Interface Status](#)
- ◆ [Network 1 \(eth0\) Interface Configuration](#)
- ◆ [Network 1 Ethernet Link](#)

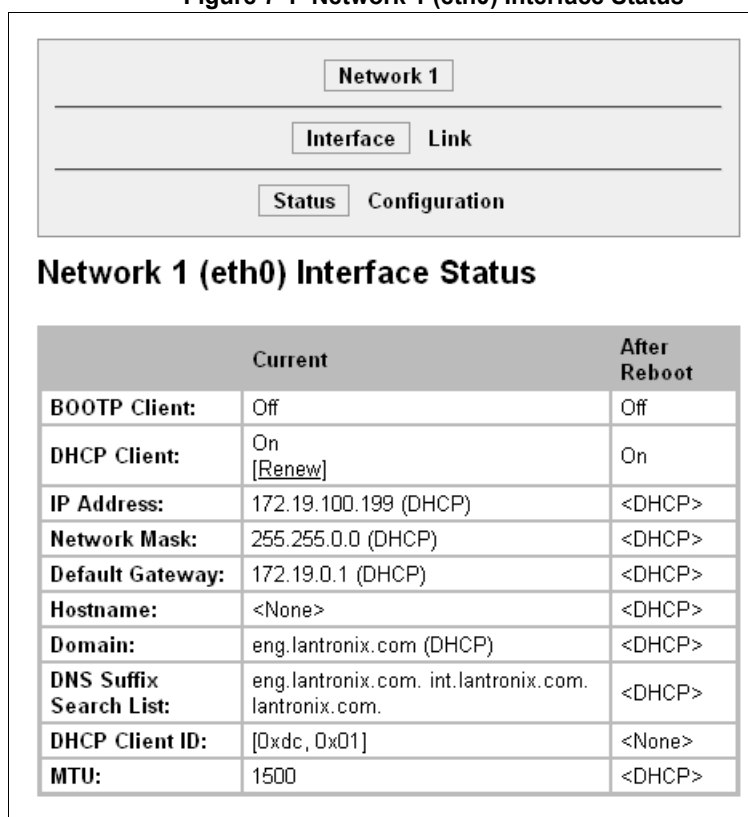
Network 1 (eth0) Interface Status

This page shows the status of the Ethernet network interface.

To view the network interface status:

1. Click **Network** on the menu then click **Network 1 > Interface > Status** at the top of the page. The Network 1 (eth0) Interface Status page appears.

Figure 7-1 Network 1 (eth0) Interface Status



	Current	After Reboot
BOOTP Client:	Off	Off
DHCP Client:	On [Renew]	On
IP Address:	172.19.100.199 (DHCP)	<DHCP>
Network Mask:	255.255.0.0 (DHCP)	<DHCP>
Default Gateway:	172.19.0.1 (DHCP)	<DHCP>
Hostname:	<None>	<DHCP>
Domain:	eng.lantronix.com (DHCP)	<DHCP>
DNS Suffix Search List:	eng.lantronix.com. int.lantronix.com. lantronix.com.	<DHCP>
DHCP Client ID:	[0xdc, 0x01]	<None>
MTU:	1500	<DHCP>

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** on the menu bar and then **Network 1 > Interface > Configuration** at the top of the page. The Network 1 (eth0) Interface Configuration page appears.

Figure 7-2 Network 1 (eth0) Interface Configuration

Network 1 (eth0) Interface Configuration	
BOOTP Client:	<input type="radio"/> On <input checked="" type="radio"/> Off
DHCP Client:	<input checked="" type="radio"/> On <input type="radio"/> Off
IP Address:	<None>
Default Gateway:	<None>
Hostname:	
Domain:	
DHCP Client ID:	<input type="text"/> <input checked="" type="radio"/> Text <input type="radio"/> Binary
Primary DNS:	<None>
Secondary DNS:	<None>
MTU:	1500

2. Enter or modify the following settings:

Table 7-3 Network 1 (eth0) Interface Configuration

Network 1 Interface Configuration Settings	Description
BOOTP Client	<p>Select On or Off. At boot up, the device will attempt to obtain an IP address from a BOOTP server.</p> <p>Notes:</p> <ul style="list-style-type: none"> ◆ Overrides the configured IP address, network mask, gateway, hostname, and domain. ◆ When DHCP is On, the system automatically uses DHCP, regardless of whether BOOTP Client is On.

Network 1 Interface Configuration Settings (continued)	Description
DHCP Client	Select On or Off . At boot up, the device will attempt to lease an IP address from a DHCP server and maintain the lease at regular intervals. <i>Note: Overrides BOOTP, the configured IP address, network mask, gateway, hostname, and domain.</i>
IP Address	Enter the device static IP address. You may enter it alone, in CIDR format, or with an explicit mask. 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 device. <i>Note: When DHCP is enabled, the device tries to obtain an IP address from DHCP. If it cannot, the device uses an AutoIP address in the range of 169.254.xxx.xxx.</i>
Default Gateway	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.
Hostname	Enter the device hostname. It must begin with a letter, continue with a sequence of letters, numbers, and/or hyphens, and end with a letter or number.
Domain	Enter the device domain name.
DHCP Client ID	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 device MAC address. <i>Note: "Binary" entry mode allows a mixed mode of text and special characters in brackets. For example, "abcd<ctrl>A" would be entered "abcd[0x01]".</i>
Primary DNS	IP address of the primary name server. This entry is required if you choose to configure DNS (Domain Name Server) servers.
Secondary DNS	IP address of the secondary name server.
MTU	When DHCP is enabled, the MTU size is (usually) provided with the IP address. When not provided by the DHCP server, or using a static configuration, this value is used. The MTU size can be from 576 to 1500 bytes.

- Click **Submit** to save changes. Some changes to the following settings require a reboot for the changes to take effect:
 - ◆ BOOTP Client
 - ◆ DHCP Client
 - ◆ IP Address
 - ◆ DHCP Client ID

Note: If DHCP or BOOTP fails, AutoIP intervenes and assigns an address. A new DHCP negotiation is attempted every 5 minutes to obtain a new IP address. When the DHCP is enabled, any configured static IP address 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 and then click **Network 1 > Link** at the top of the page. The Network 1 (eth0) Ethernet Link page appears.

Figure 7-4 Network 1 Ethernet Link

The screenshot shows a web interface for configuring Network 1. At the top, there is a breadcrumb trail: "Network 1" > "Interface" > "Link". Below this, the title is "Network 1 (eth0) Ethernet Link". Under the title, there are two sections: "Status" and "Configuration".

The "Status" section contains a table with the following data:

Speed:	100 Mbps
Duplex:	Half

The "Configuration" section contains a table with the following data:

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

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:

Table 7-5 Network 1 Ethernet Link

Network 1-Ethernet Link 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.

Note: The following section describes the steps to view and configure Line 1 settings; these steps apply to other line instances of the device.

8: Line and Tunnel Settings

This chapter describes how to view and configure lines and tunnels. It contains the following sections:

- ◆ [Line Settings](#)
- ◆ [Tunnel Settings](#)

Note: The number of lines and tunnels available for viewing and configuration differ between Lantronix products. For example, the XPort® Pro embedded networking module and the EDS1100 device server support only one line while other device networking products (such as the EDS2100, EDS4100, and MatchPort® b/g Pro embedded device servers, XPort® AR embedded networking module, EDS8/16PS and EDS8/16/32PR) provide additional lines and tunnels.

Line Settings

View statistics and configure serial interfaces by using the Line web page. Serial interfaces are referred to as lines in this user guide, and a different number of lines, from 1 to 32, may be available for selection depending on your product.

The following sub-menus may be used for a selected line number:

- ◆ **Line Statistics**—Displays statistics for the selected line number. For example, the bytes received and transmitted, breaks, flow control, parity errors, etc.
- ◆ **Line Configuration**—Enables the change of the name, interface, protocol, baud rates, and parity, etc.
- ◆ **Line Command Mode**—Enables the types of modes, wait time, serial strings, signon message, etc.

The following sections describe the steps to view and configure specific line number settings. These instructions also apply to additional line instances of the device.

Line Statistics

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

1. Select **Line** on the menu bar. The Line web page appears.
2. Select a line number at the top of the page.
3. Select **Statistics**. The Line Statistics page for the selected line appears.
4. Repeat above steps as desired, according to additional line(s) available on your product.

Figure 8-1 Line 1 Statistics

	Receiver	Transmitter
Bytes:	0	0
Breaks:	0	0
Flow control:	N/A	N/A
Parity Errors:	0	
Framing Errors:	0	
Overrun Errors:	0	
No Rx Buffer Errors:	0	
Queued Receive Bytes:	0	
Queued Transmit Bytes:	0	
CTS input:	asserted	
RTS output:	asserted	
DSR input:	not asserted	
DTR output:	not asserted	

Line 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 a specific line:

1. Select **Line** on the menu bar, if you are not already in the Line web page.
2. Select a line number at the top of the page.
3. Select **Configuration**. The Configuration page for the selected line appears.

Figure 8-2 Line 1 Configuration

The screenshot shows the 'Line 1 - Configuration' page. At the top, there are tabs for 'Line 1' and 'Line 2', and sub-tabs for 'Statistics', 'Configuration', and 'Command Mode'. The 'Configuration' sub-tab is active. Below the title, there is a table with two columns: 'Configuration' and 'Status'. The table contains the following rows:

Configuration		Status
Name:		
Interface:	RS232	
State:	Enabled	Enabled
Protocol:	Tunnel	Tunnel
Baud Rate:	921600	921600
Parity:	None	None
Data Bits:	8	8
Stop Bits:	1	1
Flow Control:	Hardware	Hardware
Xon Char:	<control>Q	<control>Q
Xoff Char:	<control>S	<control>S
Gap Timer:	<None> milliseconds	
Threshold:	56 bytes	
Buffer:	16 Kbytes	

Note: The **Interface** option is only supported in XPort Pro, EDS4100, EDS1100 and EDS2100.

Note: The **Buffer** option is only supported in EDS1100 and EDS2100.

- Enter or modify the following settings:

Table 8-3 Line Configuration

Line - Configuration Settings	Description
Name	If the Terminal Login Menu feature is being used, enter the name for the line. Leaving this field blank will disable this line from appearing in the Terminal Login Menu. The default Name is blank. See Terminal and Host Settings on page 66 for related configuration information.
Interface	Select the interface type from the drop-down menu. The default is RS232. Note: This option is only supported in XPort Pro, EDS4100, EDS1100 and EDS2100 device servers.
State	Indicates whether the current line is enabled. To change the status, select Enabled or Disabled from the drop-down menu.
Protocol	Select the protocol from the drop-down menu. The default is Tunnel. Note: All protocols work in Connect and Accept Mode except the LPD or Tunnel protocol option which is supported only in Accept Mode.
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.
Buffer	Enter the buffer in Kbytes. Specifies the buffer size allocation in RAM that will be used in Tunnel Accept and Tunnel Connect mode connection/session. Buffer range is 16 to 1200 Kbytes.

- Click **Submit**.
- Repeat above steps as desired, according to additional line(s) available on your product.

Line Command Mode

Setting the Command Mode enables the CLI on the serial line.

To configure Command Mode on a specific line:

1. Select **Line** on the menu bar, if you are not already in the Line web page.
2. Select a line number at the top of the page.
3. Select **Command Mode**. The Command Mode page for the selected line appears.

Figure 8-4 Line 1 Command Mode

Select Line: Line 1 ▾

Statistics Configuration **Command Mode**

Line 1 - Command Mode

Mode: Always
 Use Serial String
 Disabled

Wait Time: milliseconds

Serial String: Text Binary

Echo Serial String: Yes No

Signon Message: Text Binary

Current Configuration

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

4. Enter or modify the following settings:

Table 8-5 Line Command Mode

Line – Command Mode Settings	Description
Mode	Select the method of enabling Command Mode or choose to disable Command Mode. <ul style="list-style-type: none"> ◆ Always = immediately enables Command Mode for the serial line. ◆ Use Serial String = enables Command Mode when the serial string is read on the serial line during boot time. ◆ Disabled = turns off Command Mode.
Wait Time	Enter the wait time for the serial string during boot-up in milliseconds.
Serial String	Enter the serial string characters. Select a string type. <ul style="list-style-type: none"> ◆ 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. ◆ Binary = string of characters representing byte values where each hexadecimal byte value starts with 0x and each decimal byte value starts with \.
Echo Serial String	Select Yes to enable echoing of the serial string at boot-up.

Line – Command Mode Settings (continued)	Description
Signon Message	Enter the boot-up signon message. Select a string type. <ul style="list-style-type: none"> ◆ Text = string of bytes sent on the serial line during boot time. ◆ Binary = one or more byte values separated by commas. Each byte value may be decimal or hexadecimal. Start hexadecimal values with 0x. <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>

5. Click **Submit**.
6. Repeat above steps as desired, according to additional line(s) available on your product.

Tunnel Settings

Note: The number of lines and tunnels available for viewing and configuration differ between Lantronix products. For example, XPort Pro and EDS1100 device servers support only one line while other device networking products (such as EDS2100, EDS4100, XPort AR, EDS8/16PS and EDS8/16/32PR devices) provide additional lines and tunnels.

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 or Command Mode Tunnel Menu. See [Configuration Using Web Manager \(on page 35\)](#) or the *Command Reference* for the full list of commands.

The EDS1100/2100 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 EDS1100/2100 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 EDS1100/2100 device 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 EDS1100/2100 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).

View statistics and configure a specific tunnel by using the Tunnel web page. When you select Tunnel from the Main Menu, tunnels available for your product will display. Select a specific tunnel to configure.

The following sub-menus listed may be used to configure a specific tunnel:

- ◆ [Tunnel – Statistics](#)
- ◆ [Tunnel – Serial Settings](#)
- ◆ [Tunnel – Packing Mode](#)
- ◆ [Tunnel – Accept Mode](#)

- ◆ [Tunnel – Connect Mode](#)
- ◆ [Tunnel – Disconnect Mode](#)
- ◆ [Tunnel – Modem Emulation](#)

The following sections describe the steps to view and configure specific tunnel number settings. These instructions also apply to additional tunnel menu options.

Tunnel – Statistics

The EDS1100/2100 logs statistics for tunneling. The **Dropped** statistic shows connections ended by the remote location. The **Disconnects** statistic shows connections ended by the EDS1100/2100 unit.

To display statistics for a specific tunnel:

1. Select **Tunnel** on the menu bar. The Tunnel web page appears.
2. Select a tunnel number at the top of the page.
3. Select **Statistics**. The Tunnel Statistics page for the specific tunnel appears.
If a particular tunnel is connected, the following becomes available:
 - ◆ Identifying information about the tunnel connection (i.e., “Connect 1 Counters”)
 - ◆ Address of connection (i.e., “local:10001 -> 172.22.22.22.10001”)
 - ◆ **Kill Connection(s)** link: Click this link to terminate this active tunnel connection, as desired.
 - ◆ Octets forwarded from Serial
 - ◆ Octets forwarded form Network
 - ◆ Uptime
4. Repeat above steps as desired, according to additional tunnel(s) available on your product.

Figure 8-6 Tunnel 1 Statistics

Tunnel 1
Tunnel 2
Tunnel 3
Tunnel 4

Statistics
Serial Settings
Packing Mode

Accept Mode
Connect Mode
Disconnect Mode

Modem Emulation

Tunnel 1 - Statistics

Aggregate Counters	
Completed Accepts:	0
Completed Connects:	0
Disconnects:	0
Dropped Accepts:	0
Dropped Connects:	0
Octets forwarded from Serial:	0
Octets forwarded from Network:	0
Accept Connection Time:	0 days 00:00:00
Connect 1 Connection Time:	0 days 00:00:00
Connect 2 Connection Time:	0 days 00:00:00
Connect 3 Connection Time:	0 days 00:00:00
Connect 4 Connection Time:	0 days 00:00:00
Connect 5 Connection Time:	0 days 00:00:00
Connect 6 Connection Time:	0 days 00:00:00
Connect 7 Connection Time:	0 days 00:00:00
Connect 8 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 1 Counters	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr style="background-color: #f2f2f2;"> <td colspan="2">Connect 1 Counters [Kill Connection(s)]</td> </tr> <tr> <td colspan="2">local:10001 -> 172.19.213.84:10001</td> </tr> <tr> <td>Octets forwarded from Serial:</td> <td style="text-align: center;">10369</td> </tr> <tr> <td>Octets forwarded from Network:</td> <td style="text-align: center;">31107</td> </tr> <tr> <td>Uptime:</td> <td style="text-align: center;">6 days 00:40:44</td> </tr> </table>	Connect 1 Counters [Kill Connection(s)]		local:10001 -> 172.19.213.84:10001		Octets forwarded from Serial:	10369	Octets forwarded from Network:	31107	Uptime:	6 days 00:40:44
Connect 1 Counters [Kill Connection(s)]											
local:10001 -> 172.19.213.84:10001											
Octets forwarded from Serial:	10369										
Octets forwarded from Network:	31107										
Uptime:	6 days 00:40:44										
There is no active connection.											
Connect 2 Counters											
There is no active connection.											
Connect 3 Counters											
There is no active connection.											
Connect 4 Counters											
There is no active connection.											
Connect 5 Counters											
There is no active connection.											
Connect 6 Counters											
There is no active connection.											
Connect 7 Counters											
There is no active connection.											
Connect 8 Counters											
There is no active connection.											

Additional information appears for each active tunnel connection including a link allowing you to terminate the connection.

Tunnel – Serial Settings

Serial line settings are configurable for the corresponding serial line of the specific tunnel. Configure the buffer size to change the maximum amount of data the serial port stores. For any active connection, the device sends the data in the buffer.

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

To configure serial settings for a specific tunnel:

1. Select **Tunnel** on the menu bar, if you are not already in the Tunnel web page.
2. Select a tunnel number at the top of the page.
3. Select **Serial Settings**. The Serial Settings page for the specific tunnel appears.

Figure 8-7 Tunnel 1 Serial Settings

Tunnel 1	
Statistics	Serial Settings
Accept Mode	Connect Mode
	Modem Emulation
	Packing Mode
	Disconnect Mode
Tunnel 1- Serial Settings	
Line Settings:	RS232, 9600, None, 8, 1, None
Protocol:	Tunnel
DTR:	<input type="radio"/> Unasserted <input type="radio"/> TruPort <input checked="" type="radio"/> Asserted while connected <input type="radio"/> Continuously asserted

4. View or modify the following settings:

Table 8-8 Tunnel - Serial Settings

Tunnel - Serial Settings	Description
Line Settings <i>(display only)</i>	Current serial settings for the line.
Protocol <i>(display only)</i>	The protocol being used on the line. In this case, Tunnel.
DTR	Select when to assert DTR. <ul style="list-style-type: none"> ◆ Unasserted = never asserted ◆ 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. ◆ Asserted while connected = asserted whenever either a connect or an accept mode tunnel connection is active. ◆ Continuously asserted = asserted regardless of the status of a tunnel connection.

5. Click **Submit**.
6. Repeat above steps as desired, according to additional tunnel(s) available on your product.

Tunnel – Packing Mode

Packing Mode takes data from the serial port, packs it together, and sends it over the network. Packing can be configured based on threshold (size in bytes, timeout (milliseconds), or a single character.

Size is set by modifying the threshold field. When the number of bytes reaches the threshold, a packet is sent immediately.

The timeout field is used to force a packet to be sent after a maximum time. The packet is sent even if the threshold value is not reached.

When Send Character is configured, a single printable character or control character read on the Serial Line forces the packet to be sent immediately. There is an optional trailing character parameter which can be specified. It can be a single printable character or a control character.

To configure the Packing Mode for a specific tunnel:

1. Select **Tunnel** on the menu bar, if you are not already in the Tunnel web page.
2. Select a tunnel number at the top of the page.
3. Select **Packing Mode**. The Packing Mode page for the specific tunnel appears.

Figure 8-9 Tunnel 1 Packing Mode (Mode = Disable)

The screenshot displays the configuration interface for Tunnel 1's Packing Mode. At the top, there is a 'Select Tunnel:' dropdown menu currently showing 'Tunnel 1'. Below this is a horizontal menu with several options: 'Statistics', 'Serial Settings', 'Packing Mode' (which is highlighted with a grey background), 'Accept Mode', 'Connect Mode', 'Disconnect Mode', and 'Modem Emulation'. The main section is titled 'Tunnel 1 - Packing Mode'. Underneath this title, there is a 'Mode:' label and three radio button options: 'Disable' (which is selected), 'Timeout', and 'Send Character'.

Depending on the Mode selection, different configurable parameters for the specific tunnel number are presented to the user. The following figures show the display for each of the three packing modes.

Figure 8-10 Tunnel 1 Packing Mode (Mode = Timeout)

Tunnel 1		Tunnel 2	Tunnel 3	Tunnel 4
Statistics	Serial Settings	Packing Mode		
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:	512 bytes
Timeout:	1000 milliseconds
<input type="button" value="Submit"/>	

Figure 8-11 Tunnel 1 Packing Mode (Mode = Send Character)

Tunnel 1		Tunnel 2	Tunnel 3	Tunnel 4
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>
<input type="button" value="Submit"/>	

- Enter or modify the following settings:

Table 8-12 Tunnel Packing Mode

Tunnel - Packing Mode Settings	Description
Mode	<ul style="list-style-type: none"> ◆ 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.

Tunnel - Packing Mode Settings (continued)	Description
Threshold (Appears for both Timeout and Send Character Modes)	Send the queued data when the number of queued bytes reaches the threshold. When the buffer fills to this specified amount of data in bytes (and the timeout has not elapsed), the device packs the data and sends it out; applies only if the Packing Mode is not Disabled.
Timeout (Appears for Timeout Mode)	Enter a time, in milliseconds, for the device to send the queued data after the first character was received. Specifies the time duration in milliseconds; applies only if the Packing Mode is Timeout.
Send Character (Appears for Send Character Mode)	Enter the send character (single printable or control). Upon receiving this character, the device sends out the queued data. The data is packed until the specified send character is encountered. Similar to a start or stop character, the device packs the data until it sees the send character. The device then sends the packed data and the send character in the packet. Applies only if the Packing Mode is Send Character.
Trailing Character (Appears for Send Character Mode)	Enter the trailing character (single printable or control). This character is sent immediately following the send character. This is an optional setting. If a trailing character is defined, this character is appended to data put on the network immediately following the send character.

5. Click **Submit**.
6. Repeat above steps as desired, according to additional tunnel(s) available on your product.

Tunnel – Accept Mode

Controls how a specific tunnel number behaves when a connection attempt originates from the network. In Accept Mode, the EDS1100/2100 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 increases sequentially for each additional serial port, if supported.

Accept Mode supports the following protocols:

- ◆ **SSH**
The EDS1100/2100 device 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 EDS1100/2100 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 accepts 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**
(When the modem control pin is asserted on the serial line corresponding to the tunnel.)
- ◆ **Modem emulation**

To configure the Accept Mode of a specific tunnel:

1. Select **Tunnel** on the menu bar, if you are not already in the Tunnel web page.
2. Select a tunnel number at the top of the page.
3. Select **Accept Mode**. The Accept Mode page for the specific tunnel appears.

Figure 8-13 Tunnel 1 Accept Mode

Tunnel 1	Tunnel 2	Tunnel 3	Tunnel 4
Statistics	Serial Settings	Packing Mode	
Accept Mode	Connect Mode	Disconnect Mode	
Modem Emulation			

Tunnel 1 - Accept Mode

Mode:	Always <input type="button" value="v"/>
Local Port:	<input type="text" value="10001"/>
Protocol:	TCP <input type="button" value="v"/>
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="button" value="v"/> <None>
Email on Disconnect:	<input type="button" value="v"/> <None>
CP Output:	Group: <input type="text"/>

Note: The **CP Output** option is only supported in XPort Pro and XPort AR.

4. Enter or modify the following settings:

Table 8-14 Tunnel Accept Mode

Tunnel - Accept Mode Settings	Description
Mode	Select the method used to start a tunnel in Accept mode. Choices are: <ul style="list-style-type: none"> ◆ Disable = 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 specific tunnel is read on the serial line. ◆ 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. ◆ Modem Emulation = start waiting for an incoming connection when triggered by modem emulation AT commands. Connect mode must also be set to Modem Emulation.
Local Port	Enter the port number for use as the local port. The defaults are port 10001 for Tunnel 1. Additional tunnels, if supported, increase sequentially.
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 device 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 device.
Block Network	Select On to block, or not tunnel, network data transmitted to the device.
Password	Enter a password that clients must send to the device within 30 seconds from opening a network connection to enable data transmission. The password can have up to 31 characters and must contain only alphanumeric characters and punctuation. When set, the password sent to the device must be terminated with one of the following: (a) 0x0A (LF), (b) 0x00, (c) 0x0D 0x0A (CR LF), or (d) 0x0D 0x00.
Email on Connect	Select whether the device 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 device 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.

5. Click **Submit**.
6. Repeat above steps as desired, according to additional tunnel(s) available on your product.

Tunnel – Connect Mode

Connect Mode defines how the device makes an outgoing connection through a specific tunnel. When enabled, Connect Mode is always on and attempting a network connection if the connection mode condition warrants it. For Connect Mode to function, it must:

- ◆ Be enabled
- ◆ Have a remote host configured
- ◆ Have a remote port configured

Enter the remote host address as an IP address or DNS name. The EDS1100/2100 device will make a connection only if it can resolve the address. For DNS names, the EDS1100/2100 will re-evaluate the address after being established for 4 hours. If re-evaluation results in a different address, it will close the connection.

Connect Mode supports the following protocols:

◆ **TCP**

◆ **AES encryption over TCP and UDP**

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.

◆ **SSH**

To configure SSH, the SSH client username must be configured. In Connect Mode, the EDS1100/2100 unit is the SSH client. Ensure the EDS1100/2100 SSH client username is configured on the remote SSH server before using it with the EDS1100/2100.

◆ **SSL**

◆ **UDP**

Is only available in Connect Mode because it is a connectionless protocol. For Connect Mode using UDP, the EDS1100/2100 unit accepts packets from any device on the network. It will send packets to the last device that sent it packets.

◆ **Telnet**

Note: *The Local Port in Connect Mode is independent of the port configured in Accept Mode.*

There are six different connect modes:

◆ **Disable**

No connection is attempted.

◆ **Always**

A connection is always attempted.

◆ **Any Character**

A connection is attempted if it detects any character from the serial port.

◆ **Start Character**

A connection is attempted if it detects a specific and configurable character from the serial port.

◆ **Modem Control Asserted**

A connection is attempted when the modem control pin is asserted in the serial line.

Note: *Configure the Modem Control Asserted setting (for DSR or DTR) to start a Connect Mode connection when the signal is asserted. The unit will try to make a connection indefinitely. If the connection closes, it will not make another connection unless the signal is asserted again.*

◆ **Modem Emulation**

A connection is attempted by an ATD command.

Note: *While in the “Any Character” or “Start Character” connection modes, the EDS1100/2100 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 another character or the start character again (depending on the configured setting).*

To configure Connect Mode for a specific tunnel:

1. Select **Tunnel** on the menu bar, if you are not already in the Tunnel web page.
2. Select a tunnel number at the top of the page.
3. Select **Connect Mode**. The Connect Mode page for the specific tunnel appears.

Figure 8-15 Tunnel 1 - Connect Mode

Note: The **Host Mode** options is supported in all products except the XPort AR.

Note: The **CP Output** option is only supported in MatchPort b/g Pro, XPort Pro and XPort AR device servers.

Tunnel 1		Tunnel 2
Statistics	Serial Settings	Packing Mode
Accept Mode	Connect Mode	Disconnect Mode
	Modem Emulation	

Tunnel 1 - Connect Mode

Mode:	Disable ▾
Local Port:	<Random>
Host 1:	172.19.100.70:10001, TCP, 45000 msec
Host 2: ↑	172.19.50.10:19, TCP, 45000 msec
Host 3: ↑	172.19.213.100:10001, TCP, 45000 msec
Host 4:	<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="text"/>

4. Enter or modify the following settings:

Table 8-16 Tunnel Connect Mode

Tunnel – Connect Mode Settings	Description
Mode	<p>Select the method to be used to attempt a connection to a remote host or device. Choices are:</p> <ul style="list-style-type: none"> ◆ Disable = an outgoing connection is never attempted. ◆ Always = a connection is attempted until one is made. If the connection gets disconnected, the EDS1100/2100 retries until it makes a connection. (default) ◆ Any Character = a connection is attempted when any character is read on the serial line. ◆ Start Character = a connection is attempted when the start character for the specific tunnel is read on the serial line. ◆ Modem Control Asserted = a connection is attempted as long as the Modem Control pin (DSR) is asserted, until a connection is made. ◆ Modem Emulation = a connection is attempted when triggered by modem emulation AT commands.
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> <ul style="list-style-type: none"> ◆ Address = Enter the remote Host Address as an IP address or DNS name. It designates the address of the remote host to connect to. Displays configured IP address or DNS address. ◆ Port = Enter the port for use as the Host Port. It designates the port on the remote host to connect to. Displays configured Port. ◆ Protocol = Select the protocol type for use with Connect Mode. The default protocol is TCP. Additional fields may need to be completed depending on protocol chosen for the host: <ul style="list-style-type: none"> ➢ For SSH, also enter an SSH Username. ➢ For SSL, also select Enabled or Disabled for Validate Certificate. ➢ For SSL, TCP, TCP AES and Telnet, use the TCP Keep Alive field to adjust the value. ➢ For TCP AES, enter the AES Encrypt and AES Decrypt Keys. Both of keys may be set to the same value. ➢ For UDP, there are no additional fields to complete. In this mode, the device accepts packets from any device on the network and sends packets to the last device that sent it packets. ➢ For UDP AES, enter the AES Encrypt and AES Decrypt Keys. ◆ Validate Certificate = select to enable or disable the certificate. Enabling Validate Certificate requires the tunnel to verify the remote SSL server certificate when making a connection. Disabling causes the tunnel to skip verification of the remote SSL server certificate. ◆ SSH Username = Displays configured username, used only if SSH protocol is selected. ◆ TCP Keep Alive = Default is 45000 milliseconds. Enter zero to disable and blank the value to restore the default. ◆ AES Encrypt/Decrypt Key = Displays presence of key, used only if protocol with AES is selected. <p><i>Note: If security is a concern, it is highly recommended that SSH be used. When using SSH, both the SSH Server Host Keys and SSH Server Authorized Users must be configured.</i></p>

Tunnel – Connect Mode Settings (continued)	Description
Reconnect Timer	<p>Enter the reconnect time in milliseconds. The device attempts to reconnect after this amount of time after failing a connection or exiting an existing connection. This behavior depends upon the Disconnect Mode.</p> <p>Note:</p> <ul style="list-style-type: none"> ◆ <i>When you configure Tunnel - Connect Mode, you can specify a number of milliseconds to attempt to reconnect after a dropped connection has occurred. The default is 1500 milliseconds.</i> ◆ <i>The Reconnect Timer only applies if a Disconnect Mode is configured. With a Disconnect Mode set, the device server maintains a connection until the disconnect mode condition is met (at which time the device server closes the connection). If the tunnel is dropped due to conditions beyond the device server, the device server attempts to re-establish a failed connection when the specified reconnect interval reaches its limit.</i> ◆ <i>Any network-side disconnect is considered an error and a reconnect is attempted without regard to the Connect Mode settings. Simultaneous Connect Mode connections require some Disconnect Mode configurations or the connections will never terminate. See To configure Connect Mode for a specific tunnel: on page 58 for more information about the parameters.</i> ◆ <i>If Disconnect Mode is disabled and the network connection is dropped, then the re-establishment of a tunnel connection is governed by the configured Connect Mode settings.</i>
Flush Serial Data	<p>Select whether to flush the serial line when a connection is made. Choices are:</p> <ul style="list-style-type: none"> ◆ Enabled = flush the serial line when a connection is made. ◆ Disabled = do not flush the serial line. (default)
Block Serial	<p>Select Enabled to block (not tunnel) serial data transmitted to the device. This is a debugging tool that causes serial data sent to the device to be ignored.</p>
Block Network	<p>Select Enabled to block (not tunnel) network data transmitted to the device. This is a debugging tool that causes network data sent to the device to be ignored.</p>
Email on Connect	<p>Select whether the device 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.</p>
Email on Disconnect	<p>Select whether the device 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.</p>

5. Click **Submit**. The host is configured. A second host appears underneath the newly configured host.
6. Repeat these steps to configure additional hosts as necessary. EDS1100/2100 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 accessed. For EDS1100/2100, the Connect Mode supports up to sixteen Hosts. Hosts may be accessed sequentially or simultaneously:

- ◆ **Sequential** – Sequential host lists establish a prioritized list of tunnels. The host specified as Host 1 will be attempted first. If that fails, it will proceed to Host 2, 3, etc, in the order they are specified. When a connection drops, the cycle starts again with Host 1 and proceeds in order. Establishing the host order is accomplished with host list promotion (see [Host List Promotion on page 62](#)). Sequential is the default Host Mode.
- ◆ **Simultaneous** – A tunnel will connect to all hosts accepting a connection. Connections occur at the same time to all listed hosts. The device can support a maximum of 64 total aggregate connections.

Figure 8-17 Host 1, Host 2, Host 3 Exchanged

Tunnel 1		Tunnel 2	
Statistics	Serial Settings	Packing Mode	
Accept Mode	Connect Mode	Disconnect Mode	
Modem Emulation			

Tunnel 1 - Connect Mode

Mode:	Disable ▾
Local Port:	<Random>
Host 1:	172.19.100.70:10001, TCP, 45000 msec
Host 2:	↑ 172.19.50.10:19, TCP, 45000 msec
Host 3:	↑ 172.19.213.100:10001, TCP, 45000 msec
Host 4:	<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="text"/>


Note: The **Host Mode** options is supported in all products except the XPort AR.

Note: The **CP Output** option is only supported in MatchPort b/g Pro, XPort Pro and XPort AR device servers.

Host List Promotion

This feature allows Host IP promotion of individual hosts in the overall sequence.

To promote a specific Host:

1. Click the  icon in the desired Host field, for example Host 2 and Host 3.
2. The selected Host(s) exchanges its place with the Host above it.
3. Click **Submit**. The hosts change sequence.

Tunnel – Disconnect Mode

Relates to the disconnection of a specific tunnel. Disconnect Mode ends Accept Mode and Connect Mode connections. When disconnecting, the EDS1100/2100 unit shuts down the specific tunnel connection gracefully.

The following settings end a specific tunnel connection:

- ◆ The EDS1100/2100 receives the stop character.
- ◆ The timeout period has elapsed and no activity is going in or out of the EDS1100/2100 device. Both Accept Mode and Connect Mode must be idle for the time frame.
- ◆ The EDS1100/2100 unit observes the modem control inactive setting.

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

To configure the Disconnect Mode for a specific tunnel:

1. Select **Tunnel** on the menu bar, if you are not already in the Tunnel web page.
2. Select a tunnel number at the top of the page.
3. Select **Disconnect Mode**. The specific tunnel Disconnect Mode page appears.

Figure 8-18 Tunnel 1 Disconnect Mode

Tunnel 1		Tunnel 2	Tunnel 3	Tunnel 4
Statistics	Serial Settings	Packing Mode		
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

4. Enter or modify the following settings:

Table 8-19 Tunnel Disconnect Mode

Tunnel – Disconnect Mode 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 device 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.

5. Click **Submit**.
6. Repeat above steps as desired, according to additional tunnel(s) available on your product.

Tunnel – 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 Connect Mode type. The Modem Emulation 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 EDS1100/2100, an "OK" message is sent (but the command is silently ignored).

The EDS1100/2100 unit 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.

The following table lists and describes the available commands.

Table 8-20 Modem Emulation Commands and Descriptions

Command	Description
+++	Switches to Command Mode if entered from serial port during connection.
AT?	Help.
ATDT<Address Info>	Establishes the TCP connection to socket (<i><ipaddress>:<port></i>).
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 '+++'. 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.)

Table 8-20 Modem Emulation Commands and Descriptions (continued)

Command (continued)	Description
ATXn	Command does nothing and returns OK status.
ATUn	Accept unknown commands. (n value of 0 = off. n value of 1 = on.)
AT&V	Display current and saved settings.
AT&F	Reset settings in NVR to factory defaults.
AT&W	Save active settings to NVR.
ATZ	Restores the current state from the setup settings.
ATS0=n	Accept incoming connection. <ul style="list-style-type: none"> ◆ 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.

For commands that can take address information (ATD, ATDT, ATDP), the destination address can be specified by entering the IP Address, or entering the IP Address and port number. For example, <ipaddress>:<port>. The port number cannot be entered on its own.

For ATDT and ATDP commands less than 255 characters, the EDS1100/2100 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 by using the CLI exit command, the EDS1100/2100 reverts to modem emulation mode. By default, the +++ characters are not passed through the connection. Turn on this capability using the modem echo pluses command.

To configure modem emulation for a specific tunnel:

1. Select **Tunnel** on the menu bar, if you are not already in the Tunnel web page.
2. Select a tunnel number at the top of the page.
3. Select **Modem Emulation**. The Modem Emulation page for the specific tunnel appears.

Figure 8-21 Tunnel 1 Modem Emulation

Tunnel 1 Tunnel 2

Statistics
Serial Settings
Packing Mode

Accept Mode
Connect Mode
Disconnect Mode

Modem Emulation

Tunnel 2 - Modem Emulation

	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	

4. Enter or modify the following settings:

Table 8-22 Tunnel Modem Emulation

Tunnel- Modem Emulation Settings	Description
Echo Pluses	Select Enabled to echo +++ when entering modem Command Mode.
Echo Commands	Select Enabled to echo the modem commands to the console.
Verbose Response	Select Enabled 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: <ul style="list-style-type: none"> ◆ 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 , Automatic (accepted automatically), or Manual (accepted 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 .

5. Click **Submit**.
6. Repeat above steps as desired, according to additional tunnel(s) available on your product.

9: Terminal and Host Settings

This chapter describes how to view and configure the Terminal Login Connect Menu and associated Host configuration. It contains the following sections:

- ◆ [Terminal Settings](#)
- ◆ [Host Configuration](#)

The Terminal Login Connect Menu feature allows the EDS1100/2100 device server to present a menu of predefined connections when the device is accessed via telnet, ssh, or a serial port. From the menu, a user can choose one of the presented options and the device automatically makes the predefined connection.

The Terminal page controls whether a Telnet, SSH, or serial port connection presents the CLI or the Login Connect Menu. By default, the CLI is presented when the device is accessed. When configured to present the Login Connect Menu, the hosts configured via the Hosts page, and named serial lines are presented.

Terminal Settings

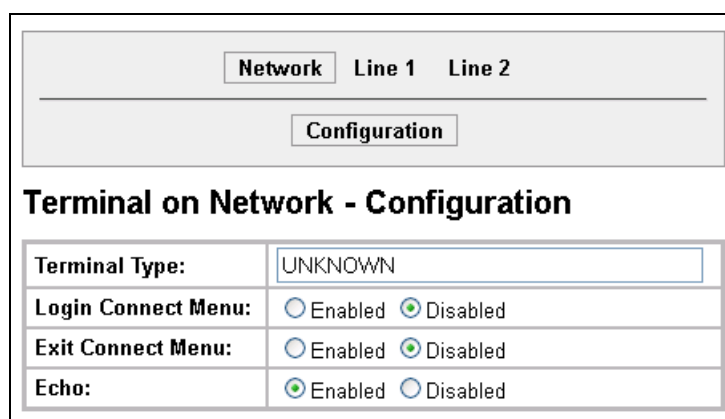
This page shows configuration settings for each terminal connection method. You can configure whether each serial line or the telnet/SSH server presents a CLI or a Login Connect menu when a connection is made.

Terminal Network Configuration

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

1. Select **Terminal** on the menu bar, if you are not already in the Terminal web page.
2. Select **Network** at the top of the page. The Configuration submenu is automatically selected. The Terminal Configuration page appears for the network.

Figure 9-1 Terminal on Network Configuration



Network Line 1 Line 2	
Configuration	
Terminal on Network - Configuration	
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

3. Enter or modify the following settings:

Table 9-2 Terminal on Network Configuration

Terminal on Network Configuration Settings	Description
Terminal Type	Enter text to describe the type of terminal. The text will be sent to a host via IAC. <i>Note: IAC means, "interpret as command." It is a way to send commands over the network such as send break or start echoing.</i>
Login Connect Menu	Select the interface to display when the user logs in. Choices are: <ul style="list-style-type: none"> ◆ 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: <ul style="list-style-type: none"> ◆ 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.

4. Click **Submit** to save changes.

Terminal Line Configuration

To configure a specific line to support an attached terminal:

1. Select Terminal on the menu bar. The Terminal web page appears.
2. Select the line number at the top of the page connected to the terminal you want to configure. The default is Line 1.

Figure 9-3 Terminal on Line Configuration

Select Terminal on: Line 1 ▼

Configuration

Terminal on Line 1 - Configuration

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
Send Break:	<None>
Break Duration:	500 milliseconds
Echo:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled

3. Enter or modify the following settings:

Table 9-4 Terminal on Line 1 Configuration

Terminal on Line Configuration Settings	Description
Terminal Type	Enter text to describe the type of terminal. The text will be sent to a host via IAC. <i>Note:</i> IAC means, "interpret as command." It is a way to send commands over the network such as send break or start echoing .
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 the Send Break control character. If this specified character is received by the serial line, it will not be sent to the line; instead the line output will be forced inactive. Sample setting: <Control>Y. Blank the field to set to <None>.
Break Duration	Enter the time in milliseconds for 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.

4. Click **Submit** to save changes.
5. Repeat above steps as desired, according to the additional line(s) available on your product.

Host Configuration

This Host web page is where you may view and modify current settings for a selected remote host.

To configure a selected remote host:

1. Select **Host** on the menu bar. The Host web page appears.
2. Select a specific host number at the top of the page. The Host Configuration page for the selected host appears.

Note: Number of hosts available differ among Lantronix products. Hosts available for selection may appear listed on the screen (see [Figure 9-5](#)) or within a drop-down menu above the Configuration button.

Figure 9-5 Host Configuration

The screenshot shows a web-based configuration interface for a host. At the top, there is a dropdown menu labeled 'Host 1' and a 'Configuration' button. Below this, the title 'Host 1 - Configuration' is displayed. The configuration is presented in a table-like form with the following fields:

Name:	eds32pr-10001
Protocol:	<input type="radio"/> Telnet <input checked="" type="radio"/> SSH
SSH Username:	patuser
Remote Address:	172.19.213.253
Remote Port:	10001

3. Enter or modify the following settings:

Table 9-6 Host Configuration

Host 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: <ul style="list-style-type: none"> ◆ Telnet ◆ SSH <p>Note: SSH keys must be loaded or created on the SSH page for the SSH protocol to work.</p>
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 device will connect.
Remote Port	Enter the port on the host to which the device will connect.

4. Click **Submit** to save changes.
5. Repeat above steps as desired, according to additional host(s) available on your product.

10: Service Settings

This chapter describes the available services and how to configure each. It contains the following sections:

- ◆ [DNS Settings](#)
- ◆ [Point-to-Point \(PPP\) Settings](#)
- ◆ [SNMP Settings](#)
- ◆ [FTP Settings](#)
- ◆ [TFTP Settings](#)
- ◆ [Syslog Settings](#)
- ◆ [HTTP Settings](#)
- ◆ [RSS Settings](#)
- ◆ [LPD Settings](#)

DNS Settings

The primary and secondary domain name system (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 web page enables you to view the status and cache.

When a DNS name is resolved using a forward lookup, the results are stored in the DNS cache temporarily. The EDS1100/2100 checks 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 DNS status:

1. Select **DNS** on the menu bar. The DNS page appears.

Figure 10-1 DNS Settings

Current Status	
Domain:	
Primary DNS:	<None>
Secondary DNS:	<None>

Cache Entries
There are no entries in the cache.

[\[Remove All\]](#)

To find a DNS Name or IP Address:

1. Enter either a DNS name or an IP address in the field beside the **Lookup** button.
2. Click **Lookup**.
 - ◆ When a DNS name is resolved, the results appear in the DNS cache.
 - ◆ When an IP address is resolved, the results appear in a text below the Lookup field.

To clear cache entries:

1. Click **Remove All** to remove all listed cache entries.
2. Click **Delete** next to a specific cache entry to remove only that one.

Point-to-Point (PPP) Settings

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

The EDS1100/2100 device server 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 EDS1100/2100 device server also supports the authentication scheme of “None” when no authentication is required during link negotiation.

PAP authentication 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. However, PAP is not a strong authentication process. There is no protection against trial-and-error attacks. The peer is responsible for the frequency of the authentication 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.*

The EDS1100/2100 device server also supports authentication scheme of “None” when no authentication is required during link negotiation.

Since the EDS1100/2100 unit does not support Network Address and Port Translation (NAPT), static routing table entries must be added to the serial-side and network-side devices (both of which are external devices).

Use the EDS1100/2100 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 EDS1100/2100 device 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 EDS1100/2100 device server does not perform network address translation (NAT) between the serial-side network interface and the Ethernet/WLAN network interface. Therefore, to pass packets through the EDS1100/2100 unit, 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 network interface IP Address of the EDS1100/2100 device server as its gateway.

The following section describes the steps to configure PPP 1 (PPP on serial line 1); these steps also apply to any line instance of the device. Since the EDS1100/2100 unit 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 EDS1100/2100 device server).

To configure PPP:

1. Select **PPP** on the menu bar. The PPP web page appears.
2. Select a line number at the top of the page. The PPP Configuration page for the selected line number appears.

Figure 10-2 PPP Configuration Settings

The screenshot shows a web interface for configuring PPP on Line 1. At the top, there are tabs for 'Line 1' and 'Line 2', with 'Line 1' selected. Below the tabs is a 'Configuration' button. The main heading is 'PPP on Line 1 - Configuration'. A yellow warning box contains the text 'WARNING: Serial protocol is not PPP.' Below this is a form with the following fields:

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

At the bottom of the form is a 'Submit' button.

3. Enter or modify the following settings:

Table 10-3 PPP Configuration

PPP Configuration Settings	Description
Local IP Address	Enter the IP address assigned to the device's PPP interface.
Peer IP Address	Enter the IP address assigned to the peer (when requested during negotiation).
Authentication Mode	Choose the authentication mode: <ul style="list-style-type: none"> ◆ None = no authentication is required ◆ PAP = Password Authentication Protocol ◆ CHAP = Challenge Handshake Authentication Protocol ◆ MS-CHAP = Microsoft Challenge-Handshake Authentication Protocol ◆ MS-CHAPV2 = Microsoft Challenge-Handshake Authentication Protocol Version 2

PPP Configuration Settings	Description
Username	Enter a username if authentication is to be used on the PPP interface. The peer must be configured to use the same username.
Password	Enter a password if authentication is to be used on the PPP interface. The peer must be configured to use the same password.

4. Click **Submit**.
5. Repeat above steps as desired, according to additional line(s) available on your product.

SNMP Settings

Simple Network Management Protocol (SNMP) is a network management tool that monitors network devices for conditions that need attention. The SNMP service responds to SNMP requests and generates SNMP Traps.

This page is used to configure the SNMP agent.

To configure SNMP:

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

Figure 10-4 SNMP Configuration

SNMP	
State:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Read Community:	<Configured>
Write Community:	<Configured>
System Contact:	
System Name:	<Default> EDS16PR
System Description:	<Default> Lantronix EDS16PR V5.3.0.0R4 (0306346765JJZC)
System Location:	
Traps State:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Traps Primary Destination:	
Traps Secondary Destination:	

Note: The system description string will reflect the specific Lantronix product.

2. Enter or modify the following settings:

Table 10-5 SNMP

SNMP Settings	Description
State	Select Enabled 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 State	Select Enabled to enable the transmission of SNMP Traps. The Cold Start trap is sent on device boot up, and the Linkdown trap is sent when the device is rebooted from software control.
Traps Primary Destination	Enter the primary SNMP trap host.
Traps Secondary Destination	Enter the secondary SNMP trap host.

3. Click **Submit**.

FTP Settings

The FTP web page shows the current File Transfer Protocol (FTP) configuration and various statistics about the FTP server.

To configure FTP:

1. Select **FTP** on the menu bar. The FTP page opens to display the current configuration.

Figure 10-6 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="<Configured>"/>
Statistics	
Status:	Running
Connections Rejected:	0
Connections Accepted:	0
Active Connections:	0
Last Client:	No device has connected

2. Enter or modify the following settings:

Table 10-7 FTP Settings

FTP 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.

3. Click **Submit**.

TFTP Settings

In the TFTP web page, you can configure the server and view the statistics about the Trivial File Transfer Protocol (TFTP) server.

To configure TFTP:

1. Select **TFTP** on the menu bar. The TFTP page opens to display the current configuration.

Figure 10-8 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
Allow XCR Import:	<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

2. Enter or modify the following settings:

Table 10-9 TFTP Server

TFTP Settings	Description
State	Select Enabled to enable the TFTP server.
Allow File Creation	Select whether to allow the creation of new files stored on the TFTP server.

TFTP Settings (continued)	Description
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. <i>Note: TFTP cannot authenticate the client, so the device is open to malicious update.</i>
Allow XCR Import	Specifies whether the TFTP server is allowed to accept an XML configuration file for update. An attempt to import configuration is recognized based on the name of the file. <i>Note: TFTP cannot authenticate the client, so the device is open to malicious update.</i>

3. Click **Submit**.

Syslog Settings

The Syslog web page shows the current configuration and statistics of the system log. Here you may configure the syslog destination and the severity of the events to log.

To configure the Syslog:

Note: The syslog file is always saved to local storage, but it is not retained through reboots. Saving the syslog file to a server that supports remote logging services (see RFC 3164) allows the administrator to save the complete syslog history. The default port is 514.

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

Figure 10-10 Syslog

Syslog	
Configuration	
State:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Host:	<input type="text" value="172.19.39.23"/>
Local Port:	<input type="text" value="514"/>
Remote Port:	<input type="text" value="514"/>
Severity Log Level:	<input type="text" value="Debug"/> ▼
Statistics	
Status:	Running
Messages Sent:	484
Messages Failed:	0

2. Enter or modify the following settings:

Table 10-11 Syslog

Syslog 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 device 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 device 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 .)

3. Click **Submit**.

HTTP Settings

Hypertext Transfer Protocol (HTTP) is the transport protocol for communicating hypertext documents on the Internet. HTTP defines how messages are formatted and transmitted. It also defines the actions web servers and browsers should take in response to different commands. HTTP Authentication enables the requirement of usernames and passwords for access to the EDS1100/2100 device.

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

- ◆ [HTTP Statistics](#)—Viewing statistics such as bytes received and transmitted, bad requests, authorizations required, etc.
- ◆ [HTTP Configuration](#)—Configuring and viewing the current configuration.
- ◆ [HTTP Authentication](#)—Configuring and viewing the authentication.

HTTP Statistics

To view HTTP statistics:

This page shows various statistics about the HTTP server.

1. Select **HTTP** on the menu bar and then **Statistics** at the top of the page. The HTTP Statistics page appears.

Figure 10-12 HTTP Statistics

Statistics Configuration Authentication	
HTTP Statistics	
Rx Bytes	26295
Tx Bytes	198244
200 - OK	15
301 - Moved Permanently	0
400 - Bad Request	0
401 - Authorization Required	13
404 - Not Found	0
408 - Request Timeout	0
413 - Request Too Large	0
500 - Internal Error	0
501 - Not Implemented	0
Status Unknown	0
Work Queue Full	0
Socket Error	0
Memory Error	0
Logs:	42 entries (6291 bytes) View Clear

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.

HTTP Configuration

On this page you may change HTTP configuration settings.

To configure HTTP:

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

Figure 10-13 HTTP Configuration

Statistics Configuration Authentication	
HTTP Configuration	
State:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Port:	<input type="text" value="80"/>
Secure Port:	<input type="text" value="443"/>
Secure Protocols:	<input checked="" type="checkbox"/> SSL3 <input checked="" type="checkbox"/> TLS1.0 <input checked="" type="checkbox"/> TLS1.1
Max Timeout:	<input type="text" value="10"/> seconds
Max Bytes:	<input type="text" value="40960"/>
Logging State:	<input checked="" type="radio"/> Enabled <input type="radio"/> Disabled
Max Log Entries:	<input type="text" value="50"/>
Log Format:	<input %b="" %r\"="" %s="" \"%{referer}i\"="" \"%{user-agent}i\""="" type="text" value="%h %t \"/>
Authentication Timeout:	<input type="text" value="30"/> minutes

2. Enter or modify the following settings:

Table 10-14 HTTP Configuration

HTTP Configuration Settings	Description
State	Select Enabled to enable the HTTP server.
Port	Enter the port for the HTTP server to use. The default is 80 .
Secure 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.

HTTP Configuration Settings (continued)	Description
Secure Protocols	Select to enable or disable the following protocols: <ul style="list-style-type: none"> ◆ SSL3 = Secure Sockets Layer version 3 ◆ TLS1.0 = Transport Layer Security version 1.0. TLS 1.0 is the successor of SSL3 as defined by the IETF. ◆ TLS1.1 = Transport Layer Security version 1.1 The protocols are enabled by default. <p><i>Note: A server certificate and associated private key need to be installed in the SSL configuration section to use HTTPS.</i></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 State	Select Enabled to enable HTTP server logging.
Max Log Entries	Sets the maximum number of HTTP server log entries. Only the last Max Log Entries are cached and viewable.
Log Format	Set the log format string for the HTTP server. Follow these Log Format rules: <ul style="list-style-type: none"> ◆ %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
Authentication Timeout	The timeout period applies if the selected authentication type is either Digest or SSL/Digest . After this period of inactivity, the client must authenticate again.

3. Click **Submit**.

HTTP Authentication

HTTP Authentication enables you to require usernames and passwords to access specific web pages or directories on the EDS1100/2100' built-in web server.

To configure HTTP authentication settings:

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

Figure 10-15 HTTP Authentication

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

2. Enter or modify the following settings:

Table 10-16 HTTP Authentication

Note: To properly view data entries in [RSS Settings](#) in certain web browsers, it may be necessary to first remove authentication from RSS. Enter the following under HTTP Authentication: URI: "/rss", Realm: "rss", and AuthType: "None".

HTTP Authentication Settings	Description
URI	Enter the Uniform Resource Identifier (URI). Note: The URI must begin with '/' to refer to the filesystem.
Realm	Enter the domain, or realm, used for HTTP. Required with the URI field.

HTTP Authentication Settings (continued)	Description
Auth Type	Select the authentication type: <ul style="list-style-type: none"> ◆ 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. <p><i>Note: When changing the parameters of Digest or SSL Digest authentication, it is often best to close and reopen the browser to ensure it does not attempt to use cached authentication information.</i></p>
Username	Enter the Username used to access the URI . More than one Username per URI is permitted. Click Submit and enter the next Username as necessary.
Password	Enter the Password for the Username .

3. Click **Submit**.
4. To delete the URI and users, click **Delete** in the current configuration table.

Note: The URI, realm, username, and password are user-specified, free-form fields. The URI must match the directory created on the EDS1100/2100 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 EDS1100/2100 configuration changes, RSS feeds permit viewing only relevant and new information regarding changes made to the EDS1100/2100 device server via an RSS publisher. The RSS feeds may also be stored to the file system cfg_log.txt file.

To configure RSS settings:

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

Figure 10-17 RSS

RSS

Configuration	
RSS Feed:	<input type="radio"/> On <input checked="" type="radio"/> Off
Persistent:	<input type="radio"/> On <input checked="" type="radio"/> Off
Max Entries:	<input style="width: 50px;" type="text" value="100"/>

Statistics	
Data:	0 entries (0 bytes) View Clear

2. Enter or modify the following settings:

Table 10-18 RSS

RSS 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 (cfg_log.txt) and to be available across reboots.
Max Entries	Sets the maximum number of log entries. Only the last Max Entries are cached and viewable.
View	Click View to view current data entries. <i>Note: It may be necessary to remove authentication from RSS access to view data entries on certain web browsers. Go to HTTP Authentication on page 81 for more information.</i>
Clear	Click Clear to clear data entries.

3. Select **Submit**.
4. In the **Current Status** table, view and clear stored RSS Feed entries, as necessary.

LPD Settings

The EDS1100/2100 device acts as a print server if a printer gets connected to one of its serial ports. Selecting the Line Printer Daemon (LPD) link in the Main Menu displays the LPD web page. The LPD web page has three sub-menus 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

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

To view LPD statistics for a specific LPD line:

1. Select **LPD** on the menu bar. The LPD web page appears.
2. Select an LPD line at the top of the page.
3. Select **Statistics**. The LPD Statistics page for the selected LPD line appears.

Figure 10-19 LPD Statistics

Select LPD Line: LPD 1 ▾	
<input type="button" value="Statistics"/> <input type="button" value="Configuration"/> <input type="button" value="Print Test Page"/>	
LPD 1 - Statistics	
Jobs Printed:	0
Bytes Printed:	0
Current Client:	No device is connected.
Last Client:	No device has connected.

- Repeat above steps as desired, according to additional LPD(s) available on your product.

LPD Configuration

Here you can change LPD configuration settings.

To configure LPD settings for a specific LPD line:

- Select **LPD** on the menu bar, if you are not already at the LPD web page.
- Select a LPD line at the top of the page.
- Select **Configuration**. The LPD Configuration for the selected LPD line appears.

Figure 10-20 LPD Configuration

Select LPD Line: LPD 1 ▾	
<input type="button" value="Statistics"/> <input type="button" value="Configuration"/> <input type="button" value="Print Test Page"/>	
LPD 1 - Configuration	
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"/>

- Enter or modify the following settings:

Table 10-21 LPD Configuration

LPD Configuration Settings	Description
Banner	Select Enabled to print the banner even if the print job does not specify to do so. Selected by default.
Binary	Select Enabled for the device to pass the entire file to the printer unchanged. Otherwise, the device 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)

5. Click **Submit**.
6. Repeat above steps as desired, according to additional LPD lines available on your product.

Print Test Page

This selection can be chosen to print a test page.

To print a test page:

1. Select **LPD** on the menu bar, if you are not already at the LPD web page.
2. Select an LPD line at the top of the page.
3. Select **Print Test Page**. A popup window appears.
4. Enter the numbers to print in the popup window.
5. Click **OK**.

11: Security Settings

The EDS1100/2100 unit supports Secure Shell (SSH) and Secure Sockets Layer (SSL). SSH is a network protocol for securely accessing a remote device. SSH provides a secure, encrypted communication channel between two hosts over a network. It provides authentication and message integrity services.

Secure Sockets Layer (SSL) is a protocol that manages data transmission security over the Internet. It uses digital certificates for authentication and cryptography against eavesdropping and tampering. It provides encryption and message integrity services. SSL is widely used for secure communication to a web server. SSL uses certificates and private keys.

Note: *The EDS1100/2100 device server supports SSLv3 and its successors, TLS1.0 and TLS1.1. An incoming SSLv2 connection attempt is answered with an SSLv3 response. If the initiator also supports SSLv3, SSLv3 handles the rest of the connection.*

This chapter contains the following sections:

- ◆ [SSH Server Host Keys](#)
- ◆ [SSH Server Authorized Users](#)
- ◆ [SSH Client Known Hosts](#)
- ◆ [SSH Client Users](#)
- ◆ [SSL Cipher Suites](#)
- ◆ [SSL Certificates](#)
- ◆ [SSL RSA](#)
- ◆ [SSL Certificates and Private Keys](#)
- ◆ [SSL Utilities](#)
- ◆ [SSL Configuration](#)

SSH Settings

SSH is a network protocol for securely accessing a remote device over an encrypted channel. This protocol manages the security of internet data transmission between two hosts over a network by providing encryption, authentication, and message integrity services.

Two instances require configuration: when the EDS1100/2100 unit 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.

To configure the EDS1100/2100 device server 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 EDS1100/2100 SSH server.

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.

SSH Server Host Keys

SSH Host Keys can be obtained in a few different ways:

- ◆ Uploading keys via PuTTY or other tools which generate RFC4716 format keys.
- ◆ Creating keys through the device.

The steps for creating or uploading keys is described below.

To upload SSH server host keys generated from PuTTY:

1. Create the keys with puttygen.exe. The keys are in PuTTY format.
2. Use puttygen.exe again to convert the private key to Open SSH format as follows:
 - a. Import the private key using "Conversions...Import key."
 - b. Create a new file using "Conversions...Export OpenSSH key."
3. Use ssh-keygen to convert the public key to OpenSSH format.


```
ssh-keygen -i -f putty_file > openssh_file
```
4. Select **SSH** on the menu bar and **SSH Server: Host Keys** at the top of the page. The SSH Server Host Keys page appears.

Figure 11-1 SSH Server: Host Keys (Upload Keys)

SSH Server: Host Keys SSH Client: Known Hosts
SSH Server: Authorized Users SSH Client: Users

SSH Server: Host Keys

Upload Keys

Private Key: No file chosen

Public Key: No file chosen

Key Type: RSA DSA

Create New Keys

Key Type: RSA DSA

Bit Size: 512 768 1024

Current Configuration

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

5. Enter or modify the following settings in the part of the screen related to uploading keys:

Table 11-2 SSH Server Host Keys Settings - Upload Keys Method

SSH Server: Host Keys Settings (continued)	Description
Private Key	Enter the path and name of the existing private key you want to upload or use the Choose File 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 Choose File button to select the key.
Key Type	Select a key type to use for the new key: <ul style="list-style-type: none"> ◆ RSA = use this key with the SSH1 and SSH2 protocols. ◆ DSA = use this key with the SSH2 protocol.

6. Click **Submit**.

To upload SSH server host RFC4716 format keys:

1. Use any program that can produce keys in the RFC4716 format.
2. Use ssh-keygen to convert the format to OpenSSH.

```
ssh-keygen -i -f RFC4716_file > output_file
```

Note: If the keys do not exist, follow directions under [To create new SSH server host keys \(on page 89\)](#).

3. Select SSH on the menu bar and SSH Server: Host Keys at the top of the page. The SSH Server Host Keys page appears.
4. Enter or modify the following settings in the part of the screen related to uploading keys:

Table 11-3 SSH Server Host Keys Settings - Upload Keys Method

SSH Server: Host Keys Settings (continued)	Description
Private Key	Enter the path and name of the existing private key you want to upload or use the Choose File 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 Choose File button to select the key.
Key Type	Select a key type to use for the new key: <ul style="list-style-type: none"> ◆ RSA = use this key with the SSH1 and SSH2 protocols. ◆ DSA = use this key with the SSH2 protocol.

5. Click **Submit**.

Note: SSH keys may be created on another computer and uploaded to the EDS1100/2100 device server. For example, use the following command using Open SSH to create a 1024-bit DSA key pair: `ssh-keygen -b 1024 -t dsa`

To create new SSH server host keys

Note: Generating new keys with large bit size results in longer key generation times.

1. Select **SSH** on the menu bar and **SSH Server: Host Keys** at the top of the page. The SSH Server Host Keys page appears.
2. Enter or modify the following settings in the part of the screen related to creating new keys:

Table 11-4 SSH Server Host Keys Settings - Create New Keys Method

SSH Server: Host Keys Settings	Description
Key Type	Select a key type to use: <ul style="list-style-type: none"> ◆ RSA = use this key with SSH1 and SSH2 protocols. ◆ DSA = use this key with the SSH2 protocol. <p>Note: RSA is more secure.</p>
Bit Size	Select a bit length for the new key: <ul style="list-style-type: none"> ◆ 512 ◆ 768 ◆ 1024 <p>Using a larger bit size takes more time to generate the key. Approximate times are:</p> <ul style="list-style-type: none"> ◆ 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 <p>Note: Some SSH clients require RSA host keys to be at least 1024 bits long. This device generates keys up to 1024 bits long. It can work with larger keys (up to 2048 bit) if they are imported or otherwise created.</p>

3. Click **Submit**.

Note: SSH Keys from other programs may be converted to the required EDS1100/2100 format. Use *Open SSH* to perform the conversion.

SSH Server Authorized Users

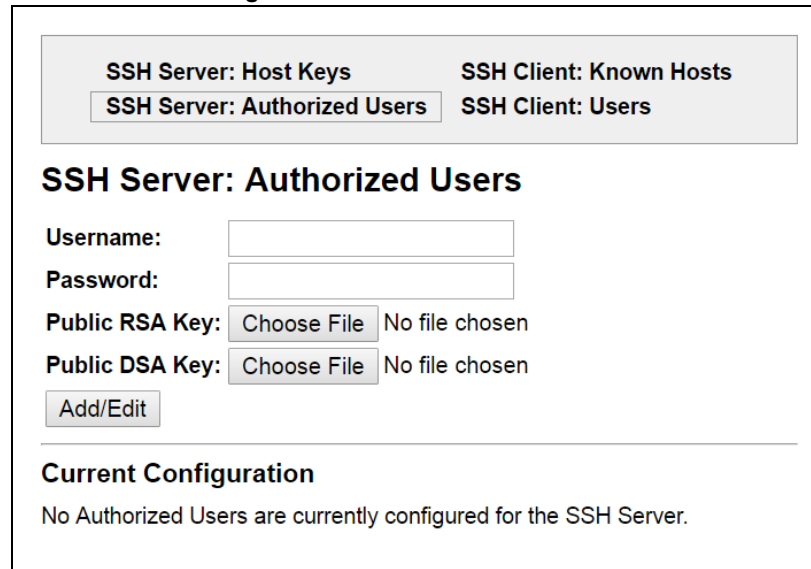
On this page you can change SSH server settings for Authorized Users. SSH Server Authorized Users are accounts on the EDS1100/2100 device server that can be used to log into the EDS1100/2100 using SSH. For instance, these accounts can be used to SSH into the CLI or open an SSH connection to a device 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. Select **SSH** on the menu bar and then **Server Authorized Users** at the top of the page. The SSH Server: Authorized Users page appears.

Figure 11-5 SSH Server: Authorized Users


SSH Server: Host Keys SSH Client: Known Hosts
SSH Server: Authorized Users SSH Client: Users

SSH Server: Authorized Users

Username:

Password:

Public RSA Key: No file chosen

Public DSA Key: No file chosen

Current Configuration

No Authorized Users are currently configured for the SSH Server.

2. Enter or modify the following settings:

Table 11-6 SSH Server Authorized User Settings

SSH Server: Authorized Users 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 Choose File 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 Choose File button to select the key. If authentication is successful with the key, no password is required.

3. Click **Add/Edit**.

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

SSH Client Known Hosts

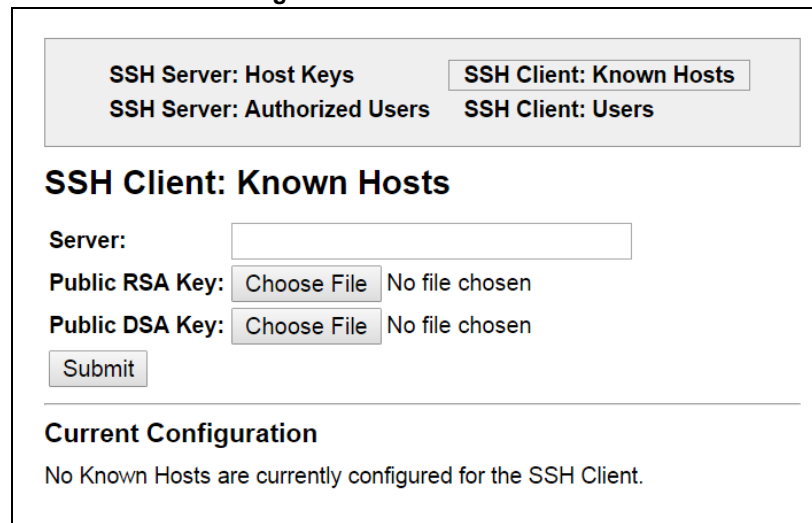
On this page you can change SSH client settings for known hosts.

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:

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

Figure 11-7 SSH Client: Known Hosts



2. Enter or modify the following settings:

Table 11-8 SSH Client Known Hosts

SSH Client: Known Hosts 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 Choose File 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 Choose File 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**.
4. In the **Current Configuration** table, delete currently stored settings as necessary.

SSH Client Users

On this page you can change SSH client settings for users. To configure the EDS1100/2100 device server as an SSH client, an SSH client user must be both configured and also exist on the remote SSH server.

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

Figure 11-9 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: No file chosen

Public Key: No file chosen

Key Type: RSA DSA

Create New Keys

Username:

Key Type: RSA DSA

Bit Size: 512 768 1024

Current Configuration

User:	patuser [Delete User]
Password:	Configured
Remote Command:	<Default login shell>
Public RSA Key:	No RSA Key Configured
Public DSA Key:	No DSA Key Configured

- Enter or modify the following settings:

Table 11-10 SSH Client Users

SSH Client: Users Settings	Description
Username	Enter the name that the device 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 Choose File 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 Choose File button to select the key. <i>Note: If the user public key is known on the remote SSH server, the SSH server does not require a password. 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.</i> <i>Note: Configuring the SSH client's known hosts is optional. It prevents Man-In-The-Middle (MITM) attacks</i>
Key Type	Select the key type to be used. Choices are: <ul style="list-style-type: none"> ◆ RSA = use this key with the SSH1 and SSH2 protocols. ◆ DSA = use this key with the SSH2 protocol.
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: <ul style="list-style-type: none"> ◆ 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: <ul style="list-style-type: none"> ◆ 512 ◆ 768 ◆ 1024 Using a larger Bit Size takes more time to generate the key. Approximate times are: <ul style="list-style-type: none"> ◆ 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 <i>Note: Some SSH clients require RSA host keys to be at least 1024 bits long. This device generates keys up to 1024 bits long. It can work with larger keys (up to 2048 bit) if they are imported or otherwise created.</i>

- Click **Submit**.
- In the **Current Configuration** table, click **Delete User** to delete currently stored user 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 [SSL Certificates and Private Keys \(on page 95\)](#).

SSL uses digital certificates for authentication and cryptography against eavesdropping and tampering. Sometimes only the server is authenticated; sometimes both server and client are authenticated. The EDS1100/2100 device server 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 EDS1100/2100 unit 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.

SSL Cipher Suites

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. Supported cipher suites include the following:

Table 11-11 Supported Cipher Suites

Certificate	Key Exchange	Encryption	Hash
RSA	RSA	128 bits AES	SHA1
RSA	RSA	Triple DES	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.

Note: The SHA2 hash algorithm negotiates with the MD5 or SHA1 ciphers to establish a successful SSL connection.

SSL 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.

The principles of Security Certificate require that in order 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 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 have your own CA. Tools exist to generate self-signed CA certificates or to sign other certificates.

A certificate request is a certificate that has not been signed and only contains the identifying information. Signing it makes it a certificate. A certificate is also used to sign any message transmitted to the peer to identify the originator and prevent tampering while transported.

When using HTTPS, SSL Tunneling in Accept mode, and/or EAP-TLS, the EDS1100/2100 unit needs a personal certificate with a 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 EDS1100/2100 device server needs the authority certificate that can authenticate users with which it wishes to communicate.

SSL RSA

As mentioned above, the certificates contain a public key. Different key exchange methods require different public keys and therefore different certificate styles. The EDS1100/2100 device server supports key exchange methods that require an RSA-style certificate. The RSA key exchange method can work with this style if an RSA certificate is stored in the EDS1100/2100 unit.

The creation of a self-signed SSL certificate supports MD5 hash algorithms with a 1024 bit key length. Uploading an SSL certificate will support MD5, SHA1 and SHA2 families (e.g., SHA256, SHA384, and SHA512 hash algorithms with key lengths of 1024 & 2048 bits).

SSL Certificates and Private Keys

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 you can generate your own. A few utilities exist to generate self-signed certificates or sign certificate requests. The EDS1100/2100 device server 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 EDS1100/2100 unit.

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 EDS1100/2100 device server currently only accepts separate PEM files. The key needs to be unencrypted.

SSL Utilities

Several utilities exist to convert between the formats.

OpenSSL

Open source is a set of SSL related command line utilities. It can act as server or client. It can generate or sign certificate requests. It can convert all kinds of formats. Executables are available for Linux and Windows. To generate a self-signed RSA certificate/key combo use the following commands in the order shown:

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

Note: *Signing other certificate requests is also possible with OpenSSL. See www.openssl.org or www.madboa.com/geek/openssl for more information.*

Steel Belted RADIUS

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 by using the following commands in the order shown:

```
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 EDS1100/2100 unit as an authority, you will need to edit it.

1. Open the file in any plain text editor.
2. Delete all info before the following: “----- BEGIN CERTIFICATE-----“
3. Delete all info after the following: “----- END CERTIFICATE-----“
4. Save as sbr_cert.pem. SBR accepts trusted-root certificates in the DER format.
5. Again, OpenSSL can convert any format into DER by using the following commands in the order shown:

```
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 EDS1100/2100 release. We will add support for this and other formats in future releases. Free RADIUS—Linux open-source RADIUS server. It is versatile, but complicated to configure.*

Free RADIUS

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

SSL Configuration

To configure SSL settings:

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

Figure 11-12 SSL

SSL

Upload Certificate

New Certificate: No file chosen

New Private Key: No file chosen

Upload Authority Certificate

Authority: No file chosen

Create New Self-Signed Certificate

Country (2 Letter Code):

State/Province:

Locality (City):

Organization:

Organization Unit:

Common Name:

Expires: mm/dd/yyyy

Key length: 1024 bit

Type: RSA

Current SSL Certificates

<None>

Current Certificate Authorities

<None>

2. Enter or modify the following settings:

Table 11-13 SSL

SSL Settings	Description
Upload Certificate	
New Certificate	<p>This certificate identifies the device 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 Choose File button to select the certificate.</p> <p>RSA certificates with 1024 or 2048 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> <p>Note: Supported RSA Certificates include MD5, SHA1, SHA256, SHA384, and SHA512.</p>
New Private Key	<p>Enter the path and name of the private key you want to upload, or use the Choose File 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-----”. Some Certificate Authorities add comments before and/or after these lines. Those need to be deleted before upload.</p>
Upload Authority Certificate	
Authority	<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 Choose File button to select the certificate.</p> <p>RSA certificates with 1024 or 2048 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	
Country (2 Letter Code)	<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>
State/Province	Enter the state or province to be assigned to the new self-signed certificate.
Locality (City)	Enter the city or locality to be assigned to the new self-signed certificate.
Organization	<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>
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>

SSL Settings (continued)	Description
Common Name	Enter the same name that the user will enter when requesting your web site. Example: If a user enters http://www.widgets.abccompany.com to access your web site, the Common Name would be www.widgets.abccompany.com .
Expires	Enter the expiration date, in mm/dd/yyyy format, for the new self-signed certificate. Example: An expiration date of May 9, 2020 is entered as 05/09/2020.
Key length	Select the bit size of the new self-signed certificate. ◆ 1024 bits The larger the bit size, the longer it takes to generate the key. Approximate times are: ◆ 1 minute for a 1024-bit RSA key
Type	Select the type of key: ◆ RSA = Public-Key Cryptography algorithm based on large prime numbers, invented by Rivest Shamir and Adleman. Used for encryption and signing.

3. Click **Submit**.

12: Modbus

Modbus ASCII/RTU based serial slave devices can be connected via the Ethernet through an existing Modbus TCP/IP network. Any device having access to a given Modbus implementation will be able to perform full range of operations that the implementation supports. Modbus/TCP uses a reserved TCP port of 502 and includes a single byte function code (1=255) preceded by a 6 byte header:

Table 12-1 6 Byte Header of Modbus Application Protocol

Transaction ID (2 bytes)	Identification of request/response transaction - copied by slave
Protocol ID (2 bytes)	0 - Modbus protocol
Length (2 bytes)	Number of following bytes includes the unit identifier
Address (1 byte)	Identification of remove slave

Note: Reference the *Modbus Protocol User Guide* for additional information. Lantronix documentation is available at www.lantronix.com/support/documentation.)

Serial Transmission Mode

Evolution OS® products can be set up to communicate on standard Modbus networks using either RTU or ASCII. Users select the desired mode and serial port communication parameters (baud rate, parity mode, etc) when in the line configuration options.

Table 12-2 Modbus Transmission Modes

RTU	ASCII
<ul style="list-style-type: none">◆ Address: 8 bits (0 to 247 decimal, 0 is used for broadcast)◆ Function: 8 bits (1 to 255, 0 is not valid)◆ Data: N X 8 bits (N=0 to 252 bytes)◆ CRC Check: 16 bits	<ul style="list-style-type: none">◆ Address: 2 CHARS◆ Function: 2 CHARS◆ Data: N CHARS (N=0 to 252 CHARS)◆ LRC Check: 2 CHARS

The Modbus web pages allow you to check Modbus status and make configuration changes. This chapter contains the following sections:

- ◆ [Modbus Statistics](#)
- ◆ [Modbus Configuration](#)

Modbus Statistics

This read-only web page displays the current connection status of the Modbus servers listening on the TCP ports. When a connection is active, the remote client information is displayed as well as the number of PDUs that have been sent and received. Additionally, a **Kill** link will be present which can be used to kill the connection.

To view modbus statistics:

1. Click **Modbus** on the menu bar and click **Statistics** at the top of the page. The Modbus Statistics page appears.

Figure 12-3 Modbus Statistics

Statistics Configuration	
Modbus Statistics	
TCP Server	
State:	Up
Port:	502
Last Connection:	local:502 <- 172.19.205.10:3903
Uptime:	0 days 02:38:20
Total PDUs In:	0
Total PDUs Out:	0
Total Connections:	1
Current Connections:	local:502 <- 172.19.205.10:3903 [Kill] Uptime: 0 days 02:36:48 PDUs In: 0 PDUs Out: 0
Additional TCP Server	
State:	Up
Port:	505
Last Connection:	<None>
Uptime:	0 days 02:35:53
Total PDUs In:	0
Total PDUs Out:	0
Total Connections:	0
Current Connections:	<None>
Local Slave	
Total PDUs In:	0
Total PDUs Out:	0
Exception Count:	0

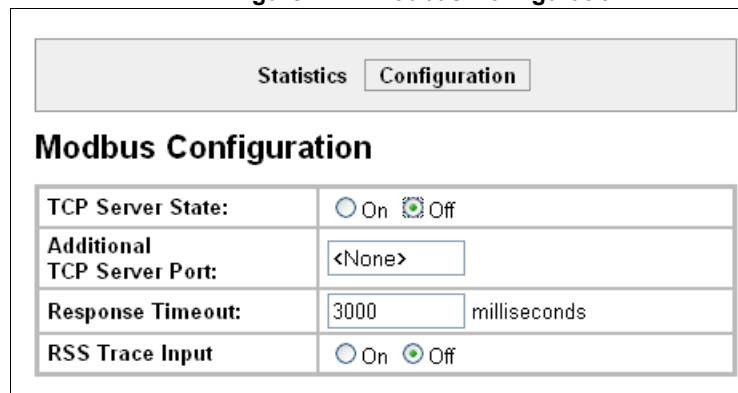
Modbus Configuration

This web page shows the current negotiated Modbus settings and allows configuration changes.

To view and configure the Modbus Server:

1. Click **Modbus** on the menu bar and then click **Configuration** at the top of the page. The Modbus Configuration page appears.

Figure 12-4 Modbus Configuration



Modbus Configuration	
TCP Server State:	<input type="radio"/> On <input checked="" type="radio"/> Off
Additional TCP Server Port:	<input type="text" value="<None>"/>
Response Timeout:	<input type="text" value="3000"/> milliseconds
RSS Trace Input	<input type="radio"/> On <input checked="" type="radio"/> Off

2. Enter or modify the following settings:

Table 12-5 Modbus Configuration

Modbus Configuration Settings	Description
TCP Server State	If On , the Modbus server is active on TCP 502.
Additional TCP Server Port	If present, is used in addition to TCP port 502.
Response Timeout	The number of milliseconds to wait for a response on the serial side. The device returns exception code 11 to the network master controller if the slave serial device fails to reply within this time out.
RSS Trace Input	If On , each PDU received on the Modbus serial line creates a non-persistent descriptive item in the RSS feed.

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

Note: The serial line protocol must also be configured for Modbus, in addition to configuring the Modbus server. See [Chapter 8: Line and Tunnel Settings on page 44](#) for details.

13: Maintenance and Diagnostics Settings

This chapter describes maintenance and diagnostic methods and contains the following sections:

- ◆ [Filesystem Settings](#)
- ◆ [Protocol Stack Settings](#)
- ◆ [IP Address Filter](#)
- ◆ [Query Port](#)
- ◆ [Diagnostics](#)
- ◆ [System Settings](#)

Filesystem Settings

The EDS1100/2100 device server uses a flash filesystem to store files. Use the Filesystem option to view current file statistics or modify files. There are two subsections: Statistics and Browse.

The Statistics section of the Filesystem web page shows current statistics and usage information of the flash filesystem. In the Browse section of the Filesystem web page, you can create files and folders, upload files, copy and move files, and use TFTP.

Filesystem Statistics

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

To view filesystem statistics:

1. Select **Filesystem** on the menu bar. The Filesystem page opens and shows the current filesystem statistics and usage.

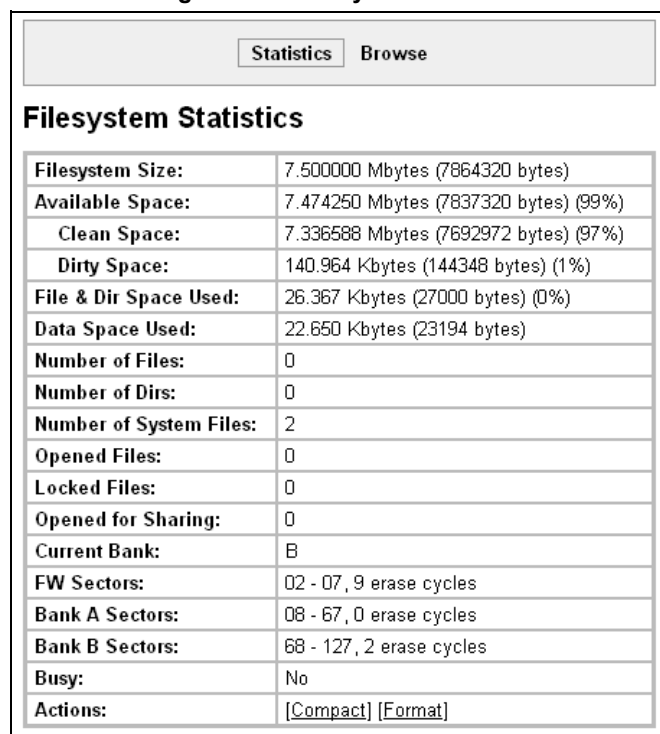
To compact or format the filesystem:

1. Back up all files as necessary.
2. Select **Filesystem** on the menubar, if you are not already in the Filesystem page.
3. Click **Compact** in the Actions row.

Note: *The compact should not be needed under normal circumstances as the system manages this automatically.*

4. Back up all files before you perform the next (Format) step, because all user files get erased in that step.
5. Click **Format** in the Actions row. The configuration is retained and all files on the filesystem will be destroyed.
6. Click **OK** in the warning window which appears.

Figure 13-1 Filesystem Statistics



Filesystem Statistics	
Filesystem Size:	7.500000 Mbytes (7864320 bytes)
Available Space:	7.474250 Mbytes (7837320 bytes) (99%)
Clean Space:	7.336588 Mbytes (7692972 bytes) (97%)
Dirty Space:	140.964 Kbytes (144348 bytes) (1%)
File & Dir Space Used:	26.367 Kbytes (27000 bytes) (0%)
Data Space Used:	22.650 Kbytes (23194 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, 9 erase cycles
Bank A Sectors:	08 - 67, 0 erase cycles
Bank B Sectors:	68 - 127, 2 erase cycles
Busy:	No
Actions:	[Compact] [Format]

Filesystem Browser


To browse the filesystem:





1. Select **Filesystem** on the menu bar and then **Browse** at the top of the page. The Filesystem Browser page opens.

Figure 13-2 Filesystem Browser

Statistics Browse

Filesystem Browser

 /

-  ✗ test_dir
-  ✗ file1.txt 5.000 Kbytes (5120 bytes)
-  ✗ file2.txt 5.000 Kbytes (5120 bytes)
-  ✗ log.txt 34.333 Kbytes (35157 bytes)

Create

File: Create

Directory: Create

Upload File

Choose File No file chosen

Upload

Copy File

Source:

Destination:

Copy

Move

Source:

Destination:

Move

TFTP

Action: Get Put

Mode: ASCII Binary

Local File:

Remote File:

Host:

Port:

Transfer

2. Select 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, select the folder or directory and then enter the parameters in the settings listed below.

Table 13-3 Filesystem Browser

Filesystem Browser 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/HTTPS or use the Choose File 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: <ul style="list-style-type: none"> ◆ 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: <ul style="list-style-type: none"> ◆ 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 on which the specified TFTP get or put command will be performed. Click Transfer to perform the TFTP transfer.

Protocol Stack Settings

In the Protocol Stack web page, you can configure TCP, IP, ICMP, SMTP and ARP.

TCP Settings

To configure the TCP network protocol:

1. Select **Protocol Stack** on the menu bar.
2. Select **TCP**.

Figure 13-4 TCP Protocol

TCP	
<div style="display: flex; justify-content: space-around; border: 1px solid gray; padding: 2px;"> TCP IP ICMP ARP SMTP </div>	
TCP	
Configuration	
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
Max Retrans:	<input type="text" value="12"/>
Max Retrans Syn/Ack:	<input type="text" value="2"/>
Max Timeout:	<input type="text" value="60"/> seconds
Statistics	
Total Out RSTs:	1
Total In RSTs:	5

3. Modify the following settings:

Table 13-5 TCP Protocol Settings

Protocol Stack TCP Settings	Description
Send RSTs	Click Enabled to send RSTs or Disabled to stop sending 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. <i>Note: Setting the RSTs may pose a security risk.</i>
Ack Limit	Enter a number to limit how many packets get received before an ACK gets forced. If there is a large amount of data to acknowledge, an ACK gets forced. If the sender TCP implementation waits for an ACK before sending more data even though the window is open, setting the Ack Limit to 1 packet improves 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.

Protocol Stack TCP Settings	Description
Max Retrans	Enter the maximum number of retransmissions of a packet that will be attempted before failing.
Max Retrans Syn/Ack	Enter the maximum number of retransmissions of a SYN that will be attempted before failing. It is lower than "Max Retrans" to thwart denial-of-service attacks.
Max Timeout	Enter the maximum time between retransmissions.

4. Click **Submit**.

IP Settings

To configure the network protocol settings for IP:

1. Select **Protocol Stack** on the menu bar.
2. Select **IP**.

Figure 13-6 IP Protocol

3. Modify the following settings:

Table 13-7 IP Protocol Settings

Protocol Stack IP Settings	Description
IP Time to Live	This value typically fills the Time To Live in the IP header. SNMP refers to this value as "ipDefaultTTL". Enter the number of hops to be transmitted before the packet is discarded.
Multicast Time to Live	This value fills the Time To Live in any multicast IP header. Normally this value will be one so the packet will be blocked at the first router. It is the number of hops allowed before a Multicast packet is discarded. Enter the value to be greater than one to intentionally propagate multicast packets to additional routers.

4. Click **Submit**.

ICMP Settings

To configure the ICMP network protocol:

1. Select **Protocol Stack** on the menu bar.
2. Select **ICMP**.

Figure 13-8 ICMP Protocol

The screenshot shows a configuration window for the ICMP protocol. At the top, there is a horizontal menu bar with buttons for 'TCP', 'IP', 'ICMP', 'ARP', and 'SMTP'. The 'ICMP' button is highlighted. Below the menu bar, the word 'ICMP' is written in a large, bold font. Underneath that, there is a section titled 'Configuration'. Within this section, there is a label 'State:' followed by two radio buttons: 'Enabled' (which is selected, indicated by a small green dot) and 'Disabled'.

3. Select the appropriate state.

Table 13-9 ICMP Settings

Protocol Stack ICMP Settings	Description
State	The State selection is used to turn on/off processing of ICMP messages. This includes both incoming and outgoing messages. Choose Enabled or Disabled .

4. Click **Submit**.

ARP Settings

To configure the ARP network protocol:

1. Select **Protocol Stack** on the menu bar.
2. Select **ARP**.

Figure 13-10 ARP Protocol Page

TCP
IP
ICMP
ARP
SMTP

ARP

Configuration

ARP Timeout:	0	hours	1	minutes	0	seconds
--------------	---	-------	---	---------	---	---------

ARP Cache

IP Address:

MAC Address:

Address	Age Sec	MAC Address	Type	Interface
172.19.100.3 [Remove]	8.0	00:16:76:b1:e3:50	Dynamic	1
172.19.217.2 [Remove]	43.3	00:25:11:8b:c1:f3	Dynamic	1
172.19.39.20 [Remove]	41.8	00:04:23:0e:19:36	Dynamic	1
172.19.1.1 [Remove]	18.4	00:1b:21:0e:3d:f4	Dynamic	1
172.19.0.1 [Remove]	7.7	00:d0:04:02:c0:00	Dynamic	1
172.19.250.250 [Remove]	0.0	00:25:11:3f:47:4d	Dynamic	1
172.19.100.181 [Remove]	15.7	00:15:17:4a:6d:51	Dynamic	1
172.19.39.23 [Remove]	6.2	00:17:31:47:19:71	Dynamic	1

[\[Remove All\]](#)

3. Modify the following settings:

Table 13-11 ARP Settings

Protocol Stack ARP Settings	Description
ARP Timeout	This is the maximum duration an address remains in the cache. Enter the time, in hours , minutes and seconds .
IP Address	Enter the IP address to add to the ARP cache.

Table 13-11 ARP Settings

Protocol Stack ARP Settings (continued)	Description
MAC Address	Enter the MAC address to add to the ARP cache.

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

4. Click **Submit** for ARP or **Add** after supplying both address fields for ARP cache.
5. Remove entries from the ARP cache, as desired:
 - ◆ Click **Remove All** to remove all entries in the ARP cache.
 - OR
 - ◆ Click **Remove** beside a specific entry to remove it from the ARP cache.

SMTP Settings

SMTP is configuration for a basic SMTP proxy. An SMTP proxy in this sense is a simple forwarding agent.

Note: Lantronix does not support SMTP AUTH or any other authentication or encryption schemes for email. Please see [Email Settings](#) for additional information.

To configure the SMTP network protocol:

1. Select **Protocol Stack** on the menu bar.
2. Select **SMTP**.

Figure 13-12 SMTP

3. Modify the following settings:

Table 13-13 SMTP Settings

Protocol Stack SMTP Settings	Description
Relay Address	Address of all outbound email messages through a mail server. Can contain either a hostname or an IP address.
Remote Port	Port utilized for the delivery of outbound email messages.

4. Click **Submit**.

IP Address Filter

The IP address filter specifies the hosts and subnets permitted to communicate with the EDS1100/2100 device server. When the filter list is empty, then all IP addresses are allowed.

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

To configure the IP address filter:

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

Figure 13-14 IP Address Filter Configuration

IP Address Filter

IP Address:

Network Mask:

Current State

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

Note: If you enter any filter, be careful to make sure that your network IP address is covered. Otherwise you will lose access to the EDS1100/2100 unit. You will have to then access the EDS1100/2100 device server from a different computer to reset the configuration.

2. Enter or modify the following settings:

Table 13-15 IP Address Filter Settings

IP Address Filter 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.

3. Click **Add**.

Note: In the Current State table, click **Remove** to delete any existing settings, as necessary.

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 \(on page 33\)](#).

To configure the query port server:

1. Select **Query Port** on the menu bar. The Query Port page opens to display the current configuration.

Figure 13-16 Query Port Configuration

Query Port

Query Port Server: On Off

Current Configuration and Statistics

Query Port Status:	On (running)
In Valid Queries:	135
In Unknown Queries:	124
In Erroneous Packets:	0
Out Query Replies:	135
Out Errors:	0
Last Connection:	172.19.229.50:28683

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

Diagnostics

The EDS1100/2100 device server has several tools to perform diagnostics and view device statistics. These include information on:

- ◆ [Hardware](#)
- ◆ [MIB-II Statistics](#)
- ◆ [IP Sockets](#)
- ◆ [Ping](#)
- ◆ [Traceroute](#)
- ◆ [Log](#)
- ◆ [Memory](#)
- ◆ [Buffer Pools](#)
- ◆ [Processes](#)

Hardware

This read-only page shows the current device's hardware configuration.

To display hardware diagnostics:

1. Select **Diagnostics** on the menu bar. The Diagnostics: Hardware page opens and shows the current hardware configuration.

Figure 13-17 Diagnostics: Hardware

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

Diagnostics: Hardware

Current Configuration

CPU Type:	DSTniFX
CPU Speed:	166.666666 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:	16.000000 Mbytes (16777216 bytes)
Flash Sector Size:	128.000 Kbytes (131072 bytes)
Flash Sector Count:	128
Flash ID:	0x1

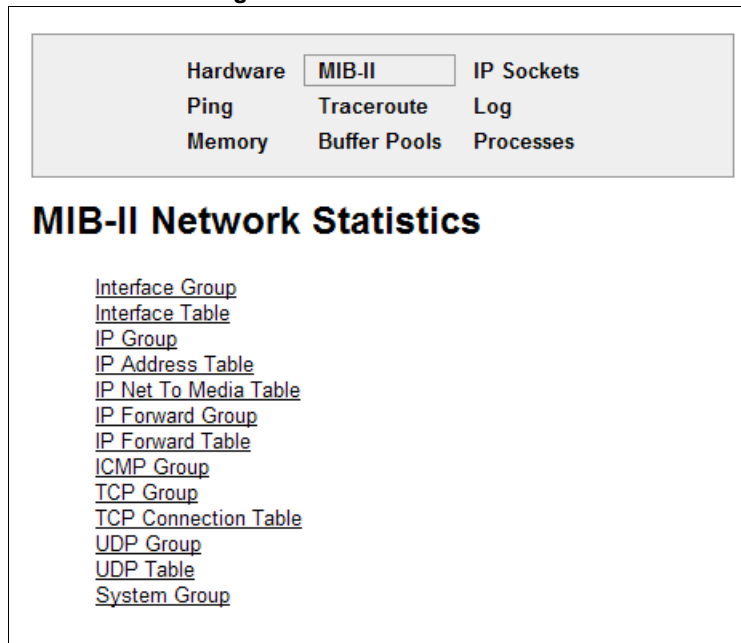
MIB-II Statistics

The MIB-II Network Statistics page shows the various SNMP-served Management Information Bases (MIBs) available on the EDS1100/2100 device server.

To view MIB-II statistics:

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

Figure 13-18 MIB-II Network Statistics



2. Click any of the available links to open the corresponding table and statistics. For more information, refer to the table below:

Table 13-19 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 IP sockets:

1. Select **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 IP sockets on the device.

Figure 13-20 IP Sockets

Protocol	Rx0	Tx0	LocalAddr:Port	RemoteAddr:Port	State
UDP	0	0	172.19.100.199:161	255.255.255.255:0	
TCP	0	0	172.19.100.199:21	255.255.255.255:0	LISTEN
UDP	0	0	172.19.100.199:69	255.255.255.255:0	
UDP	0	0	172.19.100.199:514	172.19.39.23:514	ESTABLISHED
TCP	0	0	172.19.100.199:80	255.255.255.255:0	LISTEN
UDP	0	0	172.19.100.199:30718	172.19.220.50:32770	ESTABLISHED
TCP	0	0	172.19.100.199:23	255.255.255.255:0	LISTEN
TCP	0	0	172.19.100.199:22	255.255.255.255:0	LISTEN
TCP	0	4	172.19.100.199:80	172.19.250.250:1844	ESTABLISHED

Ping

EDS1100/2100 device server uses 56 bytes of data in a ping packet. Ping size is not configurable.

To ping a remote device or computer:

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

Figure 13-21 Diagnostics: Ping

Host:

Count:

Timeout: seconds

2. Enter or modify the following settings:

Table 13-22 Diagnostics: Ping

Diagnostics: Ping Settings	Description
Host	Enter the IP address or host name for the device to ping.
Count	Enter the number of ping packets the device should attempt to send to the Host . The default is 3 .
Timeout	Enter the time, in seconds, for the device 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 EDS1100/2100 unit 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:

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

Figure 13-23 Diagnostics: Traceroute

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

Diagnostics: Traceroute

Host:

Traceroute Results

1	172.19.0.1	2 ms
---	------------	------

2. Enter or modify the following setting:

Table 13-24 Diagnostics: Traceroute

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

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

Log

Here you can enable a diagnostics log of configuration items:

To use diagnostics logging:

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

Figure 13-25 Diagnostics: Log

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

Diagnostics: Log

Configuration	
Output:	Disable ▾

2. Select the **Output** type:

- ◆ Disable (default)
- ◆ Filesystem
- ◆ Line <number>

Figure 13-26 Diagnostics: Log (Filesystem)

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

Diagnostics: Log

Configuration	
Output:	Filesystem ▾
Max Length:	50 Kbytes
Severity Level:	Debug ▾

Figure 13-27 Diagnostics: Log (Line 1)

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

Diagnostics: Log

Configuration	
Output:	Line 1
Severity Level:	Notice

3. Enter the Max Length in kilobytes (if filesystem output type is selected).
4. Select the Severity Level (if a line or filesystem output type is selected):
 - ◆ Debug
 - ◆ Information
 - ◆ Notice
 - ◆ Warning
 - ◆ Error

Memory

This read-only web 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:

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

Figure 13-28 Diagnostics: Memory

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

Diagnostics: Memory

	Main Heap
Total Memory (bytes):	6313920
Available Memory (bytes):	3132304
Number Of Fragments:	9
Largest Fragment Avail:	3123056
Allocated Blocks:	1680
Number Of Allocs Failed:	0
Status	OK

Buffer Pools

Several parts of the EDS1100/2100 system use private buffer pools to ensure deterministic memory management.

To display the buffer pools:

1. Select **Diagnostics** on the menu bar and then **Buffer Pools** at the top of the page. The Diagnostics: Buffer Pools page opens.

Figure 13-29 Diagnostics: Buffer Pools

Network Stack Buffer Pool				
	Total	Free	Used	MaxUsed
Buffer Headers	512	510	2	11
Cluster Pool Size: 2048	256	254	2	9

Ethernet Driver Buffer Pool				
	Total	Free	Used	MaxUsed
Buffer Headers	2048	1984	64	70
Cluster Pool Size: 2048	1024	960	64	69

Processes

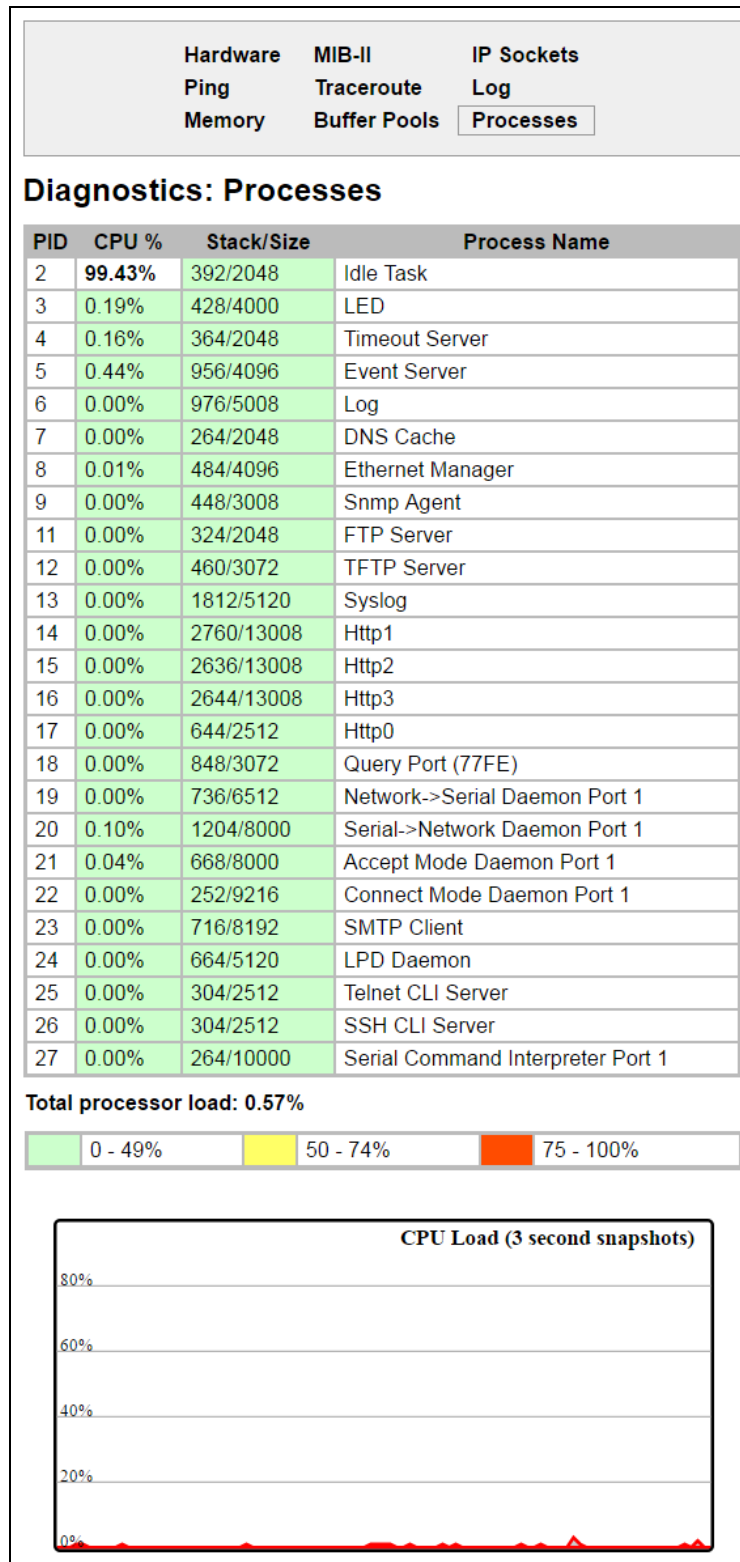
The Processes web page shows all the processes currently running on the system. It shows the Process ID (PID), the percentage of total CPU cycles a process used within the last three seconds, the total stack space available, the maximum amount of stack space used by the process since it started, and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

To display the processes running and their associated statistics:

1. Select **Diagnostics** on the menu bar and then **Processes** at the top of the page.

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

Figure 13-30 Processes



System Settings

The EDS1100/2100 System web page allows for rebooting the device, restoring factory defaults, uploading new firmware, configuring the short and long name, and viewing the current system configuration.

To configure system settings:

1. Select **System** on the menu bar. The System page opens.

Figure 13-31 System

System

Reboot Device

Restore Factory Defaults

Upload New Firmware

No file chosen

Name

Short Name:

Long Name:

Current Configuration

Firmware Version:	5.4.0.0R7
Short Name:	xport_pro
Long Name:	Lantronix XPort Pro

2. Configure the following settings:

Table 13-32 System

System Settings	Description
Reboot Device	Click Reboot to reboot the device. The system refreshes and redirects the browser to the device home page.
Restore Factory Defaults	Click Factory Defaults to restore the device to the original factory settings. All configurations will be lost. The device automatically reboots upon setting back to the defaults.
Upload New Firmware	Click Choose File to locate the firmware file location. Click Upload to install the firmware on the device. The device automatically reboots upon the installation of new firmware. <i>Note:</i> Close and reopen the web manager browser upon a firmware update.

System Settings	Description
Name	<p>Enter a new Short Name and a Long Name (if necessary). The Short Name maximum is 32 characters. The Long Name maximum is 64 characters. Changes take place upon the next reboot.</p> <p>Note: Additional information about long and short name customization is available in Short and Long Name Customization on page 138 of Chapter 15: Branding the EDS1100/2100 Unit.</p>

3. Click **Submit**.

14: Advanced Settings

This chapter describes the configuration of Email, CLI, and XML. It contains the following sections:

- ◆ [Email Settings](#)
- ◆ [Command Line Interface Settings](#)
- ◆ [XML Settings](#)

Email Settings

The EDS1100/2100 allows you to view and configure email alerts relating to the events occurring within the system. Please see [SMTP Settings on page 110](#) for additional information.

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. When you transmit an email, the transmission to the SMTP server gets logged and displayed in the bottom portion of the page.

1. Select **Email** on the menu bar. The Email web page appears.
2. Select an email number at the top of the page.
3. Select **Statistics**. The Email Statistics page for the selected email appears.
4. Repeat above steps as desired, according to additional email(s) available.

Figure 14-1 Email Statistics

Email 1
Email 2
Email 3
Email 4

Statistics
Configuration
Send Email

Email 1 - Statistics

Sent successfully:	1
Retries:	0
Not sent due to excessive errors:	0
In transmission queue:	0

Log [\[Clear\]](#)

```

120:15:49 220 2putt.int.lantronix.com Microsoft ESMTM MAIL
Service, Version: 6.0.3
120:15:49 EHLO eng.lantronix.com
120:15:49 250-2putt.int.lantronix.com Hello [172.19.100.129]
120:15:49 250-TURN
120:15:49 250-SIZE
120:15:49 250-ETRN
120:15:49 250-PIPELINING
120:15:49 250-DSN
120:15:49 250-ENHANCEDSTATUSCODES
120:15:49 250-8bitmime
120:15:49 250-BINARYMIME
120:15:49 250-CHUNKING
120:15:49 250-VRFY
120:15:49 250-X-EXPS GSSAPI NTLM LOGIN
120:15:49 250-X-EXPS=LOGIN
120:15:49 250-AUTH GSSAPI NTLM LOGIN
120:15:49 250-AUTH=LOGIN
120:15:49 250-X-LINK2STATE
120:15:49 250-XEXCH50
120:15:49 250 OK
120:15:49 MAIL FROM: <skuppuswamy@lantronix.com>
120:15:49 250 2.1.0 skuppuswamy@lantronix.com... Sender OK
120:15:49 RCPT TO: <skuppuswamy@lantronix.com>
120:15:49 250 2.1.5 skuppuswamy@lantronix.com
120:15:49 DATA
120:15:49 354 Start mail input; end with <CRLF>.<CRLF>
120:15:49 .
120:15:49 250 2.6.0
<2PUTTmopQeXr0kaR9Gc000002ac@2putt.int.lantronix.com> Queued
m
120:15:49 QUIT

```

Email Configuration

The EDS1100/2100 device server allows you to view and configure email alerts relating to the events occurring within the system.

To configure email settings:

1. Select **Email** on the menu bar, if you are not already at the Email web page.
2. Select an email at the top of the page.
3. Select the **Configuration** submenu. The Email Configuration page opens to display the current email configuration.
4. Enter or modify the following settings:

Note: The **Trigger Email Send** option is only supported in XPort Pro and XPort AR devices.

The screenshot shows the 'Email 1 - Configuration' page. At the top, there are tabs for 'Email 1', 'Email 2', 'Email 3', and 'Email 4'. Below these are buttons for 'Statistics', 'Configuration', and 'Send Email'. The main heading is 'Email 1 - Configuration'. The form contains the following fields:

- To: [Text Input]
- CC: [Text Input]
- From: [Text Input]
- Reply To: [Text Input]
- Subject: [Text Input]
- Message File: [Text Input]
- Overriding Domain: [Text Input]
- Server Port: [Text Input] 25
- Local Port: [Text Input] <Random>
- Priority: [Radio] Urgent [Radio] High [Radio] Normal [Radio] Low [Radio] Very Low
- Trigger Email Send: [Text Input] CP Group: 1 [Text Input] Value: 0

A red circle highlights the 'Trigger Email Send' section. A 'Submit' button is located at the bottom of the form.

Table 14-2 Email Configuration

Email – Configuration Settings	Description
To	Enter the email address to which the email alerts will be sent. Multiple addresses are separated by semicolon (;). Required field if an email is to be sent.
CC	Enter the email address to which the email alerts will be copied. Multiple addresses are separated by semicolon (;).

Email – Configuration Settings (continued)	Description
From	Enter the email address to list in the From field of the email alert. Required field if an email is to be sent.
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.
Message 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.

5. Click **Submit**.

To test your configuration:

- a. Send an email immediately by clicking **Send Email** at the top of the page.
 - b. Refer back to the Statistics page for a log of the transaction.
6. Repeat above steps as desired, according to additional email(s) available.

Command Line Interface Settings

The Command Line Interface (CLI) web page enables you to view statistics about the CLI servers listening on the Telnet and SSH ports and to configure CLI settings.

CLI 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 following display:

- ◆ Remote client information
- ◆ Number of bytes that have been sent and received
- ◆ A **Kill** link to terminate the connection

To view the CLI Statistics:

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

Figure 14-3 CLI Statistics

<input type="button" value="Statistics"/> <input type="button" value="Configuration"/>	
Command Line Interface Statistics	
Telnet	
Server Status:	Waiting
Last Connection:	<None>
Uptime:	0 days 19:20:38
Total Bytes In:	0
Total Bytes Out:	0
Current Connections:	<None>
SSH	
Server Status:	Waiting
Last Connection:	<None>
Uptime:	0 days 19:20:38
Total Bytes In:	0
Total Bytes Out:	0
Current Connections:	<None>

CLI Configuration

On this page you can change CLI settings.

To configure the CLI:

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

Figure 14-4 CLI Configuration

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

2. Enter or modify the following settings:

Table 14-5 CLI Configuration

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.
Login String State	Select to enable or disable. The login string state controls the display of a device-specific string when SSH or Telnet connection is established to the CLI.
Login String	Enabling the login string state allows the display of the Login string. The login string cannot exceed 32 characters. By default Login String will be the device name. <i>Note: This configuration field appears when Login String State is enabled above. This Login String setting only applies to SSH or Telnet connections to the CLI. If the serial line is being used in Command Mode, for CLI access, then refer to the Line Command Mode section for those applicable settings.</i>
Telnet State	Select Disabled to disable 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. The default is 3 and the maximum is 10.
SSH State	Select Disabled to disable 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. The default is 3 and the maximum is 10.

3. Click **Submit**.

XML Settings

An EDS1100/2100 device server allows for the configuration of devices by using XML configuration records (XCRs). You can export an existing configuration for use on other EDS1100/2100 devices or import a saved configuration file.

On the XML: Export Configuration web 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 EDS1100/2100 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. 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.

In the XML: Import System Configuration Page 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>;...
```

For example, if you only wanted to import the line 1 setting from an XCR, use a filter string of line:1.

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.

Note: *The number of lines available for importing and exporting differ between Lantronix products. The screenshots in this chapter represent one line, as available, for example, on an XPort Pro embedded networking module and EDS1100. However, other device networking products (such as EDS2100, EDS4100, XPort AR, MatchPort AR embedded networking modules, EDS8/16PS and EDS8/16/32PR) support additional lines.*

XML: Export Configuration

On this web page you can export the current system configuration in XML format.

To export the system configuration:

1. Select **XML** on the menu bar. The **XML: Export Configuration** page appears.
2. Enter or modify the following settings:

Note: Number of lines and groups available for export configuration vary between Lantronix products.

Figure 14-6 XML: Export Configuration

Table 14-7 XML Export Configuration

XML Export Configuration 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. Check the Comments checkbox to include additional comment information.

XML Export Configuration Settings (continued)	Description
Lines to Export	Select the instances you want to export in the line, LPD, PPP, tunnel, and terminal groups. Click Clear All to clear all Lines to Export checkboxes. Click Select All to select all Lines to Export checkboxes.
Groups to Export	Check the configuration groups that are to be exported to the XML configuration record. Click Clear All to clear all Group checkboxes. Click Select All but Networking to select all the checkboxes available except for the networking-related group checkboxes.

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

Note: Most browsers will interpret and display the XML data without the XML tags. To view the raw XML, choose the view file source feature of your browser.

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.

To export the system status:

1. Select **XML** on menu bar and then **Export Status** at the top of the page. The XML: Export Status page appears.
The number of **Lines to Export** and the specific **Groups to Export** displayed on your screen may vary according to your particular product.
2. Enter or modify the following settings:

Figure 14-8 XML 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"/> modbus local slave	<input checked="" type="checkbox"/> modbus tcp server: additional
<input checked="" type="checkbox"/> modbus tcp server: permanent	<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"/> xsr		

Note: Number of lines and groups available for export vary between Lantronix products.

Table 14-9 XML Export Status

XML: Export System Status Settings	Description
Export to browser	Select this option to export the XML status record to a web browser.
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. Click Clear All to clear all Lines to Export checkboxes. Click Select All to select all the Lines to Export checkboxes.
Groups to Export	Check the configuration groups that are to be exported into the XML status record. Click Clear All to clear all group checkboxes. Click Select All to select all group checkboxes.

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

Note: Most browsers will interpret and display the XML data without the XML tags. To view the raw XML, choose the view file source feature of your browser.

XML: Import Configuration

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

Figure 14-10 XML: Import Configuration

2. Click one of the following radio buttons:
 - ◆ Configuration from External file. [See Import Configuration from External File on page 133.](#)
 - ◆ Configuration from Filesystem. [See Import Configuration from the Filesystem on page 134.](#)
 - ◆ Line(s) from single line Settings on the Filesystem. [See Import Line\(s\) from Single Line Settings on the Filesystem on page 136.](#)

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 14-11 XML: Import Configuration from External File

Import Configuration from the Filesystem

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

Note: Number of lines and groups available for import configuration vary between Lantronix products.

Figure 14-12 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"/> diagnostics	<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"/> modbus	<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"/> smtp	<input checked="" type="checkbox"/> snmp	<input checked="" type="checkbox"/> ssh
<input checked="" type="checkbox"/> ssh client	<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
<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"/> xml import control

Text List

1. Enter or modify the following settings.

Figure 14-13 XML: Import Configuration from Filesystem

Import Configuration from Filesystem Settings	Description
Filename	Enter the name of the file on the device (local to its filesystem) that contains XCR data.
Lines to Import	<p>Select the lines or network 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="630 1035 829 1062"><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>

2. Click **Import**.

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. The number of **Lines to Import** and the specific **Whole Groups to Import** displayed on your screen may vary according to your particular product.

To modify Single Line Settings on the Filesystem:

Figure 14-14 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"/> diagnostics	<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"/> ManageLinux	<input checked="" type="checkbox"/> modbus
<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"/> smtp	<input checked="" type="checkbox"/> snmp
<input checked="" type="checkbox"/> ssh	<input checked="" type="checkbox"/> ssh client	<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	<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	

1. Enter or modify the following settings:

Table 14-15 XML: Import Line(s) from Single Line Settings

Import Line(s) Settings	Description
Filename	Provide the name of the file on the device (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>Note: <i>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>

2. Click **Import**.

15: Branding the EDS1100/2100 Unit

This chapter describes how to brand your EDS1100/2100 device server by using Web Manager and Command Line Interface (CLI). It contains the following sections on customization:

- ◆ [Web Manager Customization](#)
- ◆ [Short and Long Name Customization](#)

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 is 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 EDS1100/2100 device server file system.

Web Manager files can be retrieved and overridden with the following procedure:

1. FTP to the EDS1100/2100 device.
2. Make a directory (**mkdir**) and name it http/config
3. Change to the directory (**cd**) that you created in step 2. (http/config)
4. Get the file by using **get** <filename>
5. Modify the file as required or create a new one with the same name
6. Put the file by using **put** <filename>
7. Type **quit**. The overriding files appear in the file system's http/config directory.
8. Restart any open browser to view the changes.
9. If you wish to go back to the default files in the firmware image, simply delete the overriding files from the file system.

Short and Long Name Customization

Short and long names may be customized in Web Manager according to the directions in [System Settings](#). The names display in the CLI show command and in the System web page in the Current Configuration table. The short name is used for the show command. Both names display in the CLI Product Type field in the following example:

```
(enable)# show
```

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 EDS
Product Information:
Product Type: Lantronix EDS1100/2100 (EDS)
```

16: Updating Firmware

Obtaining Firmware

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

Loading New Firmware

Reload the firmware using the device web manager Filesystem page.

To upload new firmware:

1. Select **System** in the menu bar. The **System** page appears.

Figure 16-1 Update Firmware

The screenshot shows the 'System' page of a device web manager. It contains several sections: 'Reboot Device' with a 'Reboot' button; 'Restore Factory Defaults' with a 'Factory Defaults' button; 'Upload New Firmware' with a 'Choose File' button (showing 'No file chosen') and an 'Upload' button; 'Name' section with 'Short Name' and 'Long Name' input fields and a 'Submit' button; and 'Current Configuration' section with a table showing the current settings.

Current Configuration	
Firmware Version:	5.4.0.0R7
Short Name:	xport_pro
Long Name:	Lantronix XPort Pro

2. Click **Choose File** to browse to the firmware file.
3. Highlight the file and click **Open**.
4. Click **Upload** to install the firmware on the EDS1100/2100 device server. The device automatically reboots on the installation of new firmware.
5. Close and reopen the web manager Internet browser to view the device's updated web pages.

Note: Alternatively, firmware may be updated by sending the file to the EDS1100/2100 device server over a FTP or TFTP connection.

A: Technical Support

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

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

- ◆ Your name, company name, address, and phone number
- ◆ Lantronix product and model number
- ◆ Lantronix MAC address or serial number
- ◆ Firmware version and current configuration
- ◆ Description of the problem
- ◆ Status of the unit when the problem occurred (please try to include information on user and network activity at the time of the problem)

B: Binary to Hexadecimal Conversions

Many of the unit's configuration procedures require 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

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.

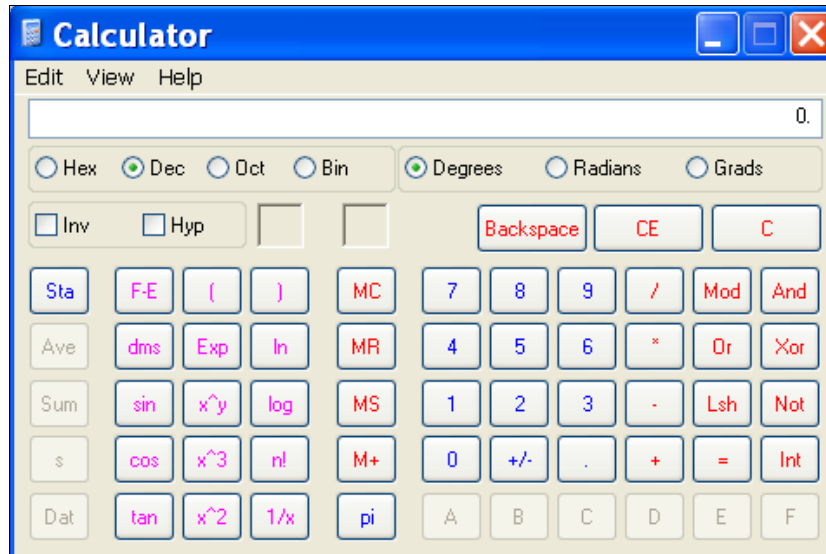
Table B-1 Binary to Hexadecimal Conversion Table

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

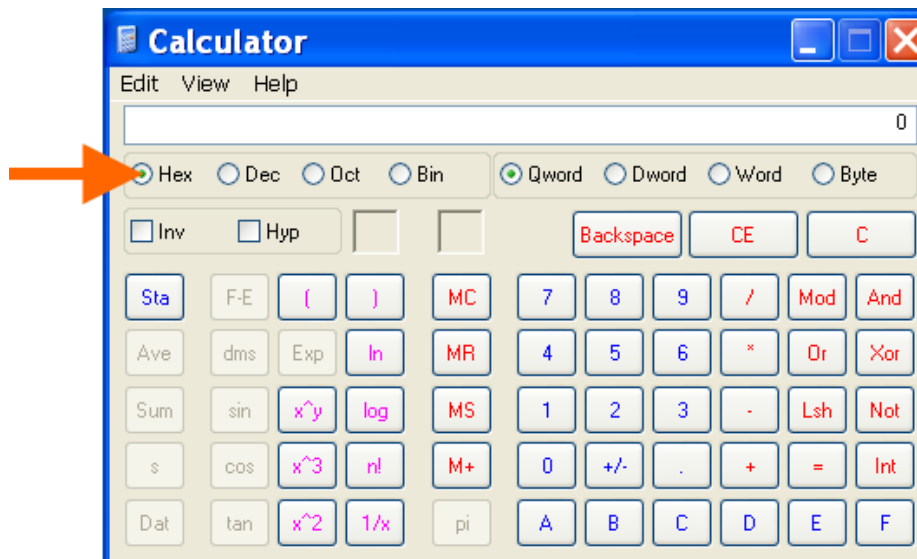
Scientific Calculator

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, Inc. 7535 Irvine Center Drive, Suite 100, Irvine, CA 92618 USA

Product Name Model: EDS1100/2100 Device Server

Conform to the following standards or other normative documents:

Radiated and Conducted Emissions

FCC Part 15 Subpart B

Industry Canada ICES-003 Issue 4 2004

CISPR 22: 2005 Information Technology Equipment

VCCI V-3/2009.04

AS/NZS CISPR 22: 2006

EN55022: 2006

EN61000-3-2: 2006

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

Immunity

EN55024: 1998 + A1: 2001 + A2: 2003

Direct & Indirect ESD

EN61000-4-2: 1995 + A2:2001

RF Electromagnetic Field Immunity

EN61000-4-3: 2006 + A1:2008

Electrical Fast Transient/Burst Immunity

EN61000-4-4: 2004

Surge Immunity

EN61000-4-5: 2006

RF Common Mode Conducted Susceptibility

EN61000-4-6: 2007

Power Frequency Magnetic Field Immunity

EN61000-4-8: 1994 +A1: 2001

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:

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7535 Irvine Center Drive
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Irvine, CA 92618 USA
Tel: 949-453-3990
Fax: 949-453-3995

RoHS, REACH and WEEE Compliance Statement

Please visit <http://www.lantronix.com/legal/rohs/> for Lantronix's statement about RoHS, REACH and WEEE compliance.

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