



XPress™ DR Industrial Device Server User Guide

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Operation of this equipment in a residential area is likely to cause interference in which case the user, at his or her own expense, will be required to take whatever measures may be required to correct the interference.

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

Revision History

Date	Rev.	Comments
February 2016	A	Initial release.
May 2016	B	Included Limited Power Source (LPS) information.
December 2017	C	Updated enhanced password information.

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1: Using this Guide

Purpose and Audience

This user guide describes the family of Lantronix® XPress™ DR device servers, including the XPress DR device server and the XPress DR-IAP device server with support for Industrial Automation Protocols (IAP).

Most of the material in this manual applies to all of the XPress DR products. However, in some cases there will be some features that apply to only one product. In those cases, a note will explain the variation.

Note: In most cases XPress DR refers to both the XPress DR and the XPress DR-IAP industrial device servers.

Chapter Summary

Chapter	Description
2: Introduction	Describes the main features of the XPress DR device server and the protocols supported.
3: Installation of the XPress DR Device Server	Provides information for installing your unit and getting it up and running using DeviceInstaller or a serial port connection.
4: Using DeviceInstaller	Instructions for viewing the current configuration using DeviceInstaller application.
5: Configuration Using Web Manager	Details using the Web-Manager to set parameters such as port and server properties.
6: Configuration via Telnet or Serial Port (Setup Mode)	Provides instructions for accessing Setup Mode (command line interface) using a Telnet connection through the network or a terminal or terminal emulation program through the serial port.
7: Setup Mode: Server Configuration	Details the network (server) settings
8: Channel Mode: Channel Configuration	Details the serial port settings.
9: Setup Mode: Advanced Settings	Details expert and security settings and explains how to reset the unit to factory default values.
10: Firmware Upgrades	Provides instructions for obtaining the latest firmware and updating the XPress DR.
11: Monitor Mode	Provides instructions for accessing and using the command line interface to monitor the network and diagnose problems.
12: Com Port Redirector	Provides an introduction to the Com Port Redirector and where to download the software online.
A: Troubleshooting & Technical Support	Describes common problems and error messages and how to contact Lantronix Technical Support.

<i>B: Network Configuration Using UDP</i>	Describes how to configure and query the device server over the network using UDP datagrams.
<i>C: Connections and Pinouts</i>	Provides descriptions and illustrations of connection hardware.
<i>D: Technical Specifications</i>	Lists technical specifications for the XPress DR.
<i>E: Alternative Ways to Assign an IP Address</i>	Provides detailed information about using DHCP, AutoIP, BOOTP ARP, and Telnet to assign an IP address.
<i>F: Binary to Hex Conversion</i>	Provides instructions for converting binary values to hexadecimal.
<i>G: Compliance</i>	Provides 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>XPress DR Industrial Device Server Quick Start Guide</i>	Provides the steps for getting the XPress DR device server up and running.
<i>DeviceInstaller Online Help</i>	Provides instructions for using the Windows® operating system-based utility to configure the XPress DR and other Lantronix device servers.
<i>“Live” Tutorials on the Lantronix Web Site (English)</i>	Explain and demonstrate assigning an IP address to the XPress DR device server and setting it up with the Com Port Redirector. See http://itxfaq.custhelp.com/app/answers/detail/a_id/1119 .
<i>Com Port Redirector Quick Start Guide</i>	Provides information on using the Windows operating system-based utility to create a virtual com port.

2: Introduction

Applications

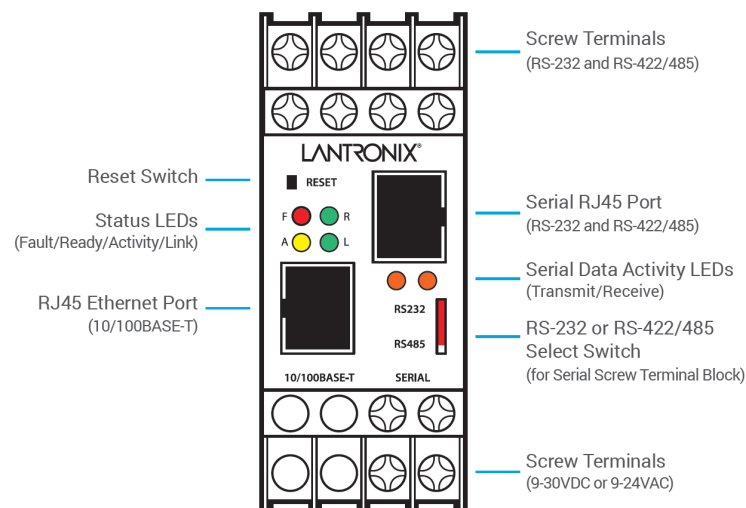
XPress™ DR Industrial Device Server

The XPress DR device server connects serial devices to Ethernet networks using the IP protocol family (TCP for connection-oriented stream applications and UDP for datagram applications). A few of the different types of serial devices supported are listed below:

- ◆ Time/Attendance Clocks and Terminals
- ◆ ATM Machines
- ◆ CNC Controllers
- ◆ Data Collection Devices
- ◆ Universal Power Supply (UPS) Management Units
- ◆ Telecommunications Equipment
- ◆ Data Display Devices
- ◆ Security Alarms and Access Control Devices
- ◆ Handheld Instruments
- ◆ Modems

The XPress DR connects these devices through a TCP data channel or through a Telnet connection to computers or another device server. Datagrams can be sent by UDP.

Figure 2-1 XPress DR



The XPress DR supports RS-232, RS-422/485 via its screw terminals and RJ45 serial port. It supports 10/100 megabytes per second (Mbps) Ethernet through the RJ-45 connector. It can be configured via HTTP, SNMP, DHCP or Telnet. It contains a flash ROM for easy software upgrades.

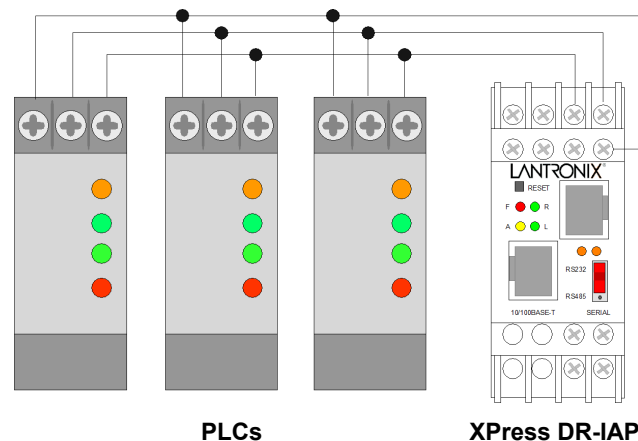
XPress DR-IAP Industrial Device Server

Note: This section is for the XPress DR-IAP only.

The Lantronix Industrial Automation Platform (IAP) family of device servers allows a single network and protocol to connect multiple serial devices from many vendors. IAP provides the automation industry with a network-enabling solution using TCP/IP and standard Ethernet networks that is vendor-independent.

By encapsulating serial data and transporting it over Ethernet, the device server allows virtual serial links to be established over Ethernet and IP (TCP/IP, UDP/IP) networks. As a result, limited distance, point-to-point, direct serial connections can be extended within the plant, throughout the facility, or across the global enterprise. The following picture is one of the device servers in the IAP family.

Figure 2-1 RS-485 Multidrop with XPress DR-IAP



Lantronix provides IAP device servers specifically designed for different industrial environments.

- ◆ XPress DR-IAP, with DIN rail interface for harsh environments or alongside control instruments in electrical panels
- ◆ UDS1100-IAP, a rugged device server for use in applications that require a wide operating temperature range (-40 to 70°C)
- ◆ xDirect-IAP, a compact device server with multiple power options including PoE and wide operating temperature range (-40 to 85°C)

A few examples of attached devices are:

- ◆ PLCs
- ◆ AC/DC drives
- ◆ CNC systems
- ◆ Operator panels and message displays
- ◆ Process Controls
- ◆ Instrumentation
- ◆ Power monitoring equipment
- ◆ Scales and weighing systems
- ◆ Barcode scanners
- ◆ Label printers
- ◆ Most factory floor serial devices

Protocol Support

Industrial Automation Protocols

IAP device servers, adapted to multiple factory environments, can unite any mixture of equipment from industrial automation vendors into a single reliable pipeline. This new and open infrastructure opens the way for data to flow in real time from all your plant devices up to your IT layer.

IAP device servers are delivered with IAP Standard Tunneling protocol and can be loaded with industrial communication protocols. Where the IAP Standard Tunneling protocol is limited to exclusive, standard ASCII device-to-device connections, the industrial protocols offer connections to other devices that require special formatting or features simultaneously.

For information about using any of the industrial communication protocols, see user manuals and protocol firmware files available at www.lantronix.com/downloads.

You can set up the unit using the serial port, or remotely over Ethernet using Telnet or a web browser. The Lantronix® DeviceInstaller™ application, a Windows based configuration software that simplifies the process of installing protocols and configuring them for use with attached devices. The DeviceInstaller application is also available for download at www.lantronix.com/downloads. XPress DR device servers use flash memory for maintenance-free, non-volatile storage which allows for fast system upgrades.

Network Protocols (Standard Tunneling)

The XPress DR uses TCP/IP protocols for network communication. The supported standards are: ARP, UDP, TCP, ICMP, Telnet, TFTP, DHCP, AutoIP, and SNMP. For transparent connections, TCP/IP (binary stream) or Telnet protocols are used. Firmware upgrades can be made with the TFTP protocol.

The IP (Internet Protocol) protocol defines addressing, routing, and data-block handling over the network. The TCP (transmission control protocol) assures that no data is lost or duplicated, and that everything sent into the connection on one side arrives at the target exactly as it was sent.

For typical datagram applications where devices interact with others without maintaining a point-to-point connection, UDP datagram is used.

Additional Features

Packing Algorithm

The two available packet algorithms (which define how and when packets are sent to the network) are software selectable. The standard algorithm is optimized for applications where XPress DR is used in a local environment, allowing for very small delays for single characters while trying to keep the packet count low. The alternate packing algorithm minimizes the packet count on the network and is especially useful for applications in routed Wide Area Networks. Various parameters can be set in this mode to economize the serial data stream.

IP Address

Every active device connected to the TCP/IP network must have a unique IP address. This IP address is used to reference a specific device, for example, to build a connection to XPress DR's serial port. See [E: Alternative Ways to Assign an IP Address](#) for a complete description of IP Addressing.

Port Number

A destination IP address and a port number define every TCP connection and every UDP datagram. A port number is necessary to address an application or a channel on a network host. The port number can be compared to an extension on a PBX system.

A Telnet application (login to a host with an ASCII terminal) is commonly assigned TCP port number 23. More than one Telnet connection can be established to one host using the Telnet port; however, the other peer IP address/port number combinations must be different.

In the XPress DR, a port number can be configured on the channel (port). The XPress DR uses this port number for outgoing messages and incoming connections, or UDP datagrams, which are addressed to its port number. Port 9999 (decimal) is used for remote configuration.

Configuration Methods

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

DeviceInstaller: Configure the IP address and other network settings on the XPress DR using a Graphical User Interface (GUI) on a PC attached to a network. See [4: Using DeviceInstaller](#).

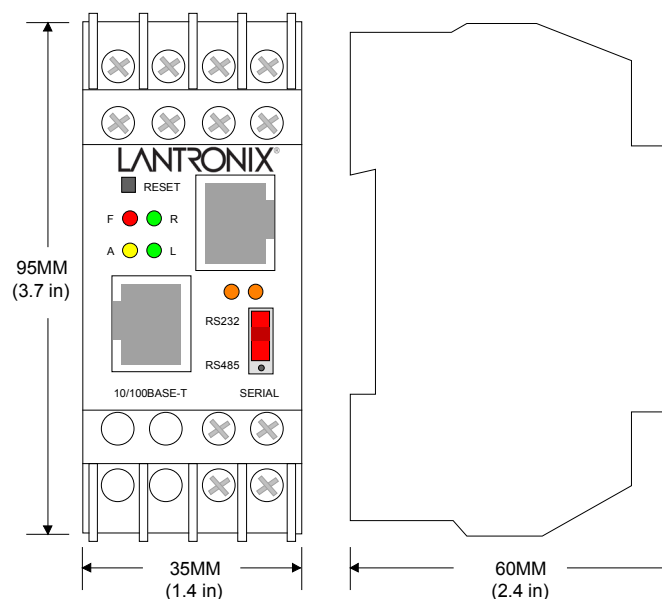
Web-Manager: Through a web browser, configure the XPress DR settings using the Lantronix Web-Manager. See [5: Configuration Using Web Manager](#).

Serial and Telnet Ports: Use Setup Mode, a command line interface. There are two approaches to accessing Setup Mode: making a Telnet connection to the network port (9999) or connecting a terminal (or a PC running a terminal emulation program) to the unit's serial port. See [6: Configuration via Telnet or Serial Port \(Setup Mode\)](#).

Dimensions

The XPress DR dimensions are shown in the following drawing.

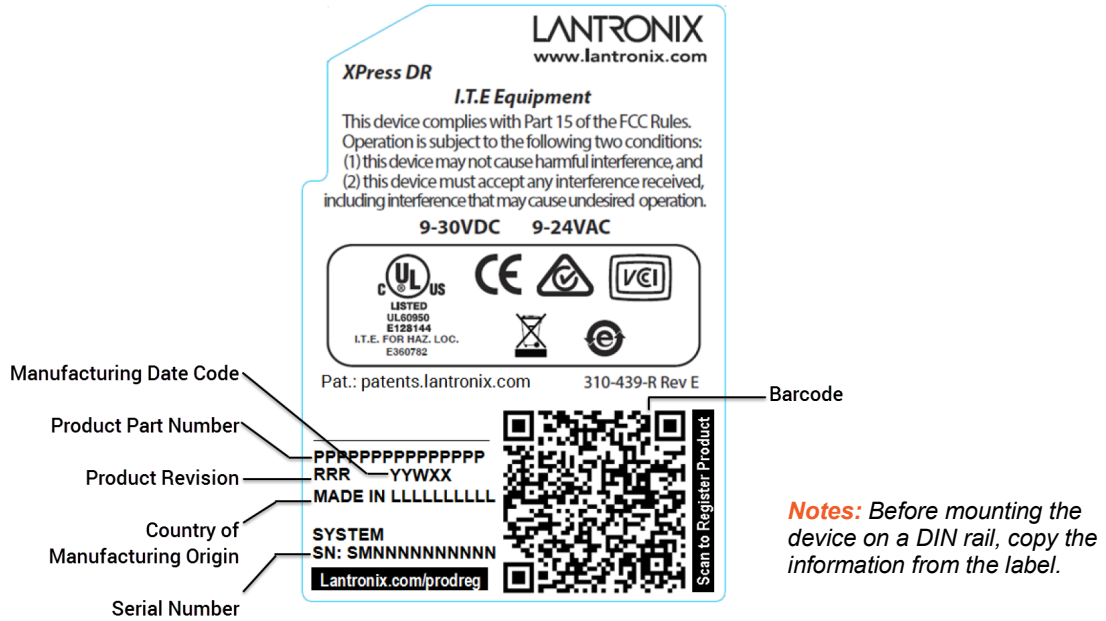
Figure 2-3 Product Dimensions



Product Information Label

The product information label on your XPress DR or XPress DR-IAP industrial device server contains important information about your unit.

Figure 2-4 Product Information Label



3: Installation of the XPress DR Device Server

This section describes how to install your XPress DR device server and get it up and running in the shortest possible time.

XPress DR comes with standard tunnel protocol and the XPress DR-IAP comes with the IAP standard tunnel protocol. Both versions are similar but cannot be interchanged. Standard tunneling is a serial communications protocol used by most Lantronix device servers. It can be configured to Ethernet-enable most serial devices such as barcode scanners, weigh scales, operator panels, data access devices, alpha numeric displays, and thousands of intelligent serial devices. For XPress DR-IAP users, see [Industrial Automation Protocols](#).

Loading industrial protocols to an XPress DR-IAP, such as IAP Modbus Bridge, may remove the web pages and change the configure dialogs. See the user manuals on individual protocols for protocol specific settings and configuration dialogs. Protocol manuals are found at www.lantronix.com/downloads. This section describes the setup and configuration dialogs for the Standard Tunnel Protocol.

Note: The following information is based on the condition that a XPress DR is loaded with Standard Tunnel Protocol. The XPress DR-IAP with IAP Standard Tunnel Protocol has the same options available.

Package Contents

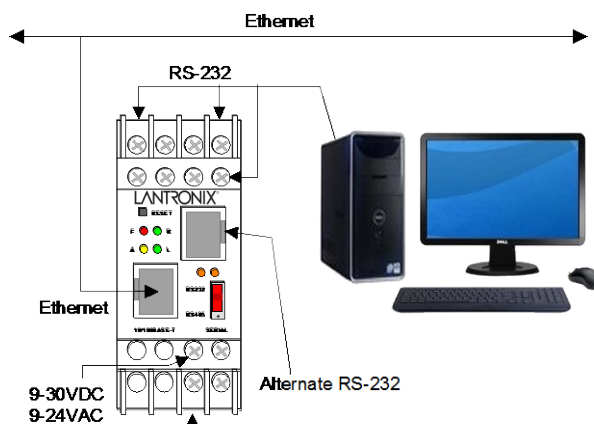
Verify and inspect the contents of your XPress DR device server package using the following list.

- ◆ XPress DR or XPress DR-IAP industrial device server
- ◆ XPress DR Industrial Device Server Quick Start Guide

Installing the XPress DR Unit

The following diagram shows a typical hardware configuration for the XPress DR unit. Use one of the cables described in [Serial Interface Connections](#) to connect a PC COM port to the XPress DR device server.

Figure 3-1 XPress DR Connected to Serial Device and Network



To install the unit

1. Connect a serial device to your XPress DR. See [Serial Interface Connections](#) for more information about cable and connector specifications.
2. Connect an Ethernet cable to the Ethernet port.
3. Supply power to your XPress DR using a 9-30VDC or 9-24VAC source.

Note: The required input voltage is 9-30VDC, 9-24VAC (3 W maximum).

4. Supply power to the serial device.

Note: Connecting a device to an active Ethernet network can disrupt communications on the network. Make sure the device is configured for your application before connecting to an active network.

Required Information

Before configuring the XPress DR device server, have the following information available:

Hardware Address

Take note of the unit's hardware address (also known as the Ethernet or MAC address.) It is on the [Product Information Label](#). The first three bytes of the hardware Address are fixed and read 00-80-A3, identifying the unit as a Lantronix product. The fourth, fifth, and sixth bytes are unique numbers assigned to each unit.

00-80-A3-21-18-17 or 00:80:A3:21:18:17

Internet Protocol (IP) Address

The XPress DR device server must have a unique IP address on your network. This address references the specific unit. By default, the unit is DHCP-enabled and automatically assigned an IP address on DHCP-enabled networks. If you are assigning a static IP address, the systems administrator generally provides the IP address, subnet mask, and gateway.

Note: The factory default IP address is 0.0.0.0 to enable DHCP, BOOTP, and AutoIP. When the units boots, it sends a DHCP broadcast to try and get an IP address. If it receives no reply from a DHCP server, the XPress DR tries BOOTP. If the XPress DR does not receive a response from BOOTP, it reverts to an AutoIP address.

IP Address: _____

Subnet Mask: _____

Gateway: _____

You have several options for assigning an IP address and related network settings to your unit. This chapter provides information about using the DeviceInstaller (graphical user interface) and serial port login (command line interface) methods.

Note: For information about other methods of assigning the IP address, such as DHCP, AutoIP, ARP, and Telnet, see [Alternative Ways to Assign an IP Address](#).

Port Number

Every TCP connection and every UDP datagram is defined by a destination IP address and a port number. For example, a Telnet application commonly uses port number 23. A port number is similar to an extension on a PBX system.

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

Methods for Assigning an IP Address

The unit's IP address must be configured before a network connection is available. You have the following options for assigning an IP to your unit:

Table 3-1 Methods for Assigning IP Addresses

Method	Description
DHCP	A DHCP server automatically assigns the IP address and network settings. See DHCP .
DeviceInstaller (Recommended)	You can manually assign the IP address using a graphical user interface (GUI) on a PC attached to a network.
ARP and Telnet	You manually assign the IP address and other network settings at a command prompt using a UNIX or Windows-based system. Only one person at a time can be logged into the configuration port (port 9999). This eliminates the possibility of several people simultaneously attempting to configure the unit. See ARP and Telnet .
AutoIP	This automatic method is appropriate when you have a small group of hosts rather than a large network. This method allows the hosts to negotiate with each other and assign addresses, in effect creating a small network. See AutoIP .
Serial Port Login	You initially configure the unit through a serial connection. See Assigning the IP Address: Serial Port Login .

These methods are described in the remaining sections of this chapter.

Note: *In most installations, a fixed IP address is desirable. The systems administrator generally provides the IP address.*

Obtain the following information before starting to set up your unit:

IP Address: _____

Subnet Mask: _____

Gateway: _____

4: Using DeviceInstaller

This chapter covers the steps for getting the XPress DR industrial device server online, for viewing its current configuration, and for saving and upgrading device configurations.

Note: *DeviceInstaller is a free utility program provided by Lantronix that discovers, configures, upgrades, and manages Lantronix device servers. It can be downloaded from the Lantronix website at www.lantronix.com/support/downloads. For instructions on using DeviceInstaller to configure the IP address and related settings or for more advanced features, see the DeviceInstaller Online Help.*

Installing DeviceInstaller

1. Download the latest version of DeviceInstaller 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**).

Assigning an IP Address

The unit's IP address must be configured before it can work correctly on a network. The unit's IP address is normally set to 0.0.0.0 at the factory. The hardware address is on the product label. The unit is DHCP enabled as the default.

1. Click **Start -> All Programs -> Lantronix -> DeviceInstaller 4.4 -> DeviceInstaller**. If your PC has more than one network adapter, a message displays. Select an adapter and click **OK**.

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

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

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

Adding the Unit to the Manage List

Now add the unit to the list of similar Lantronix devices on the network so you can manage and configure it. To perform this step, click the **Search** icon.

DeviceInstaller locates the unit and adds it to the list. Now you can manage (configure) the unit so it works with the serial device on the network.

Accessing the XPress DR Device Server Using DeviceInstaller

1. If DeviceInstaller has not already been installed, run the executable to start the installation process and respond to the installation wizard prompts. (If prompted to select an installation type, select **Typical**.)
2. Click **Start -> All Programs -> Lantronix -> DeviceInstaller 4.4 -> DeviceInstaller**.
3. When DeviceInstaller starts, it will perform a network device search. To perform another search, click **Search**.
4. Expand the **xPress** folder by clicking the + symbol next to the folder icon. The list of available Lantronix XPress DR and XPress DR-IAP devices appear.
5. Select the XPress unit by expanding its entry and clicking on its IP address to view its configuration.
6. On the right side of the page, click the **Device Info** tab. The current XPress device configuration appears.

Viewing the Current Configuration

DeviceInstaller provides a view of the unit's configuration.

1. Follow the instructions above to locate the XPress device server.
2. In the right pane, click the **Device Info** tab. The current XPress device server configuration displays.

Table 4-1 XPress DR Configuration in DeviceInstaller

Current Settings	Description
Name	Configurable field. A name that identifies the XPress. The name field is blank by default. Double-click the field, type in the value, and press Enter to complete. This name is not visible on other PCs or laptops using the DeviceInstaller application.
DHCP Device Name	Non-configurable field. Displays the name associated with XPress unit's current IP address, if the IP address was obtained dynamically.
Group	Configurable field. A group name to categorize the XPress device server. Double-click the field, type in the value, and press Enter to complete. This group name is not visible on other PCs or laptops using DeviceInstaller.
Comments	Configurable field. Information about the XPress device server. Double-click the field, type in the value, and press Enter to complete. This description or comment is not visible on other PCs or laptops using DeviceInstaller.
Device Family	Non-configurable field. Displays the XPress device server's device family as "xPress".
Type	Non-configurable field. Displays the device type as "xPress DR" or "xPress DR-IAP".
ID	Non-configurable field. Displays the XPress device server's ID embedded within the unit.

Current Settings	Description
Hardware Address	Non-configurable field. Displays the XPress device server's hardware (or MAC) address.
Firmware Version	Non-configurable field. Displays the firmware currently installed on the XPress device server.
Extended Firmware Version	Non-configurable field. Displays the extended firmware currently installed on the XPress device server.
Online Status	Non-configurable field. Displays the XPress device server's status as online, offline, unreachable (the XPress device server is on a different subnet), or busy (the XPress device server is currently performing a task).
IP Address	Non-configurable field. Displays the XPress device server's current IP address. To change the IP address, see Assigning an IP Address .
IP Address was Obtained	Non-configurable field. Displays "Dynamically" if the XPress device server 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 with DHCP with value of True or False ◆ Obtain with BOOTP with value of True or False ◆ Obtain with RARP with value of True or False ◆ Obtain with Auto IP with value of True or False
Subnet Mask	Non-configurable field. Displays the XPress device server's current subnet mask. To change the subnet mask, see Assigning an IP Address .
Gateway	Non-configurable field. Displays the XPress device server's current gateway. To change the gateway, see Assigning an IP Address .
Number of COB partitions supported	Non-configurable field. Displays the number of COB partitions supported.
Number of Serial Ports	Non-configurable field. Displays the number of serial ports on the XPress unit.
TCP Keepalive	Non-configurable field. Displays the XPress device server's TCP keepalive value. The value is in the range 1-65s , and the default setting is 45 .
Telnet Supported	Non-configurable field. Indicates if Telnet sessions are permitted. Displays True.
Telnet Port	Non-configurable field. Displays the XPress device server's port for telnet sessions.
Web Port	Non-configurable field. Displays the XPress device server's port for Web Manager configuration.
Maximum Baud Rate Supported	Non-configurable field. Displays the XPress unit's maximum baud rate. Note: The XPress device server may not currently be running at this rate.
Firmware Upgradable	Non-configurable field. Displays True , indicating the XPress device server's firmware is upgradable as newer version become available.
Supports Configurable Pins	Non-configurable field. Displays False .
Supports Email Triggers	Non-configurable field. Displays False .
Supports AES Data Stream	Non-configurable field. Displays False .
Supports 485	Non-configurable field. Displays True . The XPress DR supports the RS-485 protocol.
Supports 921K Baud Rate	Non-configurable field. Displays False .
Supports HTTP Server	Non-configurable field. Displays True .
Supports HTTP Setup	Non-configurable field. Displays True .

Current Settings	Description
Supports 230 Baud Rate	Non-configurable field. Displays False .
Supports GPIO	Non-configurable field. Displays False , indicating the The XPress DR does not support General Purpose Input Output (GPIO).

Next Step

You may configure the XPress DR device server now that it has an IP address and other initial settings.

1. Double-click the unit IP address in the list. Details about the unit display under the **Device Info** tab.
2. You have the following options:
 - ◆ To configure the unit using a Web browser, click the Web Configuration tab. The Lantronix Web Manager window displays in your browser. Continue with [Chapter 5: Configuration Using Web Manager](#).

Note: To assign Expert and Security settings, you must use the Setup Mode window in a Telnet session.

 - ◆ To configure the unit using a Telnet session, click the Telnet Configuration tab. The Setup Mode window displays. Continue with [Chapter 6: Configuration via Telnet or Serial Port \(Setup Mode\)](#).

Assigning the IP Address: Serial Port Login

To assign the IP address and other network settings using a serial connection:

1. Connect a console terminal or a PC running a terminal emulation program to the unit's serial port. The default serial port settings are 9600 baud, 8 bits, no parity, 1 stop bit, no flow control.
2. To enter Setup Mode, cycle the unit's power (power off and back on). After power-up, the self-test begins and the red Diagnostic LED starts blinking. You have one second to enter three lowercase x characters.

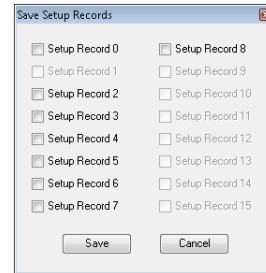
Note: The easiest way to enter Setup Mode is to hold down the **x** key at the terminal (or emulation) while powering up the unit.
3. Select **0** (Server Configuration) and follow the prompts until you get to **IP address**.
4. Enter the new IP address, subnet mask, and gateway (if applicable).
5. Do one of the following:
 - ◆ Continue with [Assigning an IP Address](#).
 - ◆ Select **9** to save and exit Setup Mode. The unit performs a power reset.

Saving Configuration

The device configuration information is stored in flash memory and can be read and saved as a configuration (.cfg) file.

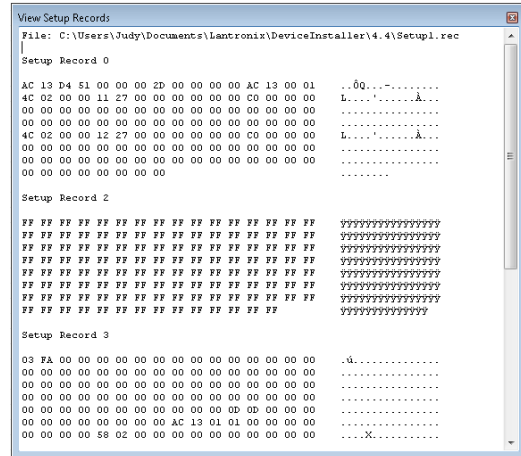
To save configuration information

1. Select your XPress device server through DeviceInstaller (see [Accessing the XPress DR Device Server Using DeviceInstaller](#)).
2. Click **File > Save Setup Records...** in the DeviceInstaller menu bar. A dialog box with setup record choices appears.
3. Check the setup records you wish to save and click **Save**. A browser window appears.
4. Browse to your save location and save your configuration file.



To view saved configuration information

1. Select your XPress device server through DeviceInstaller (see [Accessing the XPress Device Server Using DeviceInstaller](#)).
2. Click **View > Setup Record File** in the DeviceInstaller menu bar.
3. Double-click to select the desired setup record file.
4. A View Setup Records window opens showing contents of the configuration file.

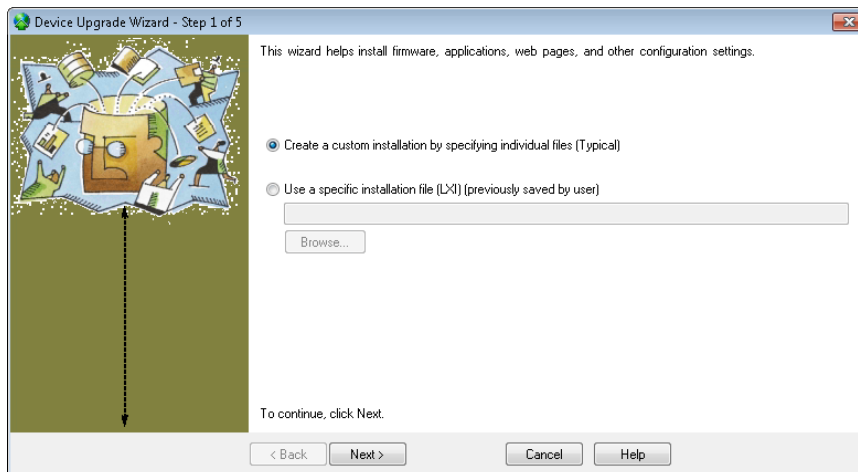


Updating Configuration

Device configuration information can be saved in a file and later used to update the configuration of other devices.

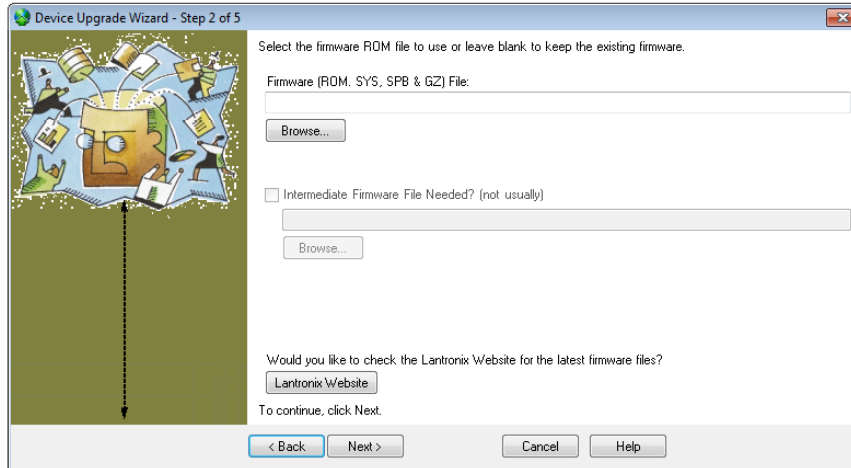
To update the configuration of a device from a saved file

1. Select your XPress device server through DeviceInstaller (see [Accessing the XPress Device Server Using DeviceInstaller](#)).
2. Click **Device > Upgrade** in the DeviceInstaller menu bar. *Step 1 of 5* of the Device Upgrade Wizard appears.

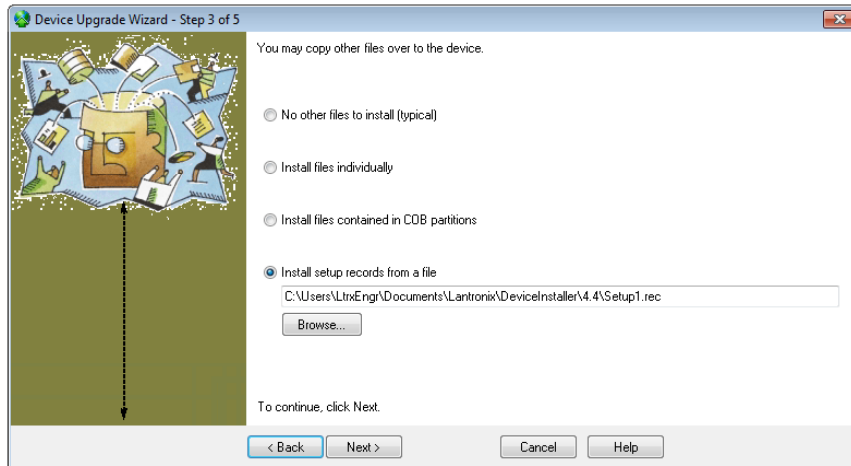


3. Check **Create a custom installation by specifying individual files (Typical)** and click **Next** to advance to *Step 2 of 5*.

4. To continue without installing a new firmware file, just click **Next**. To install new firmware, click **Browse** to browse to the firmware file and click **Next** to advance to *Step 3 of 5*.



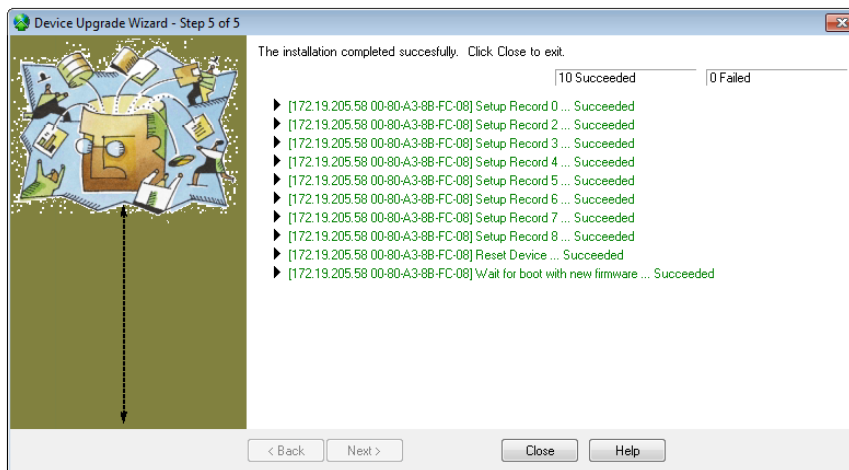
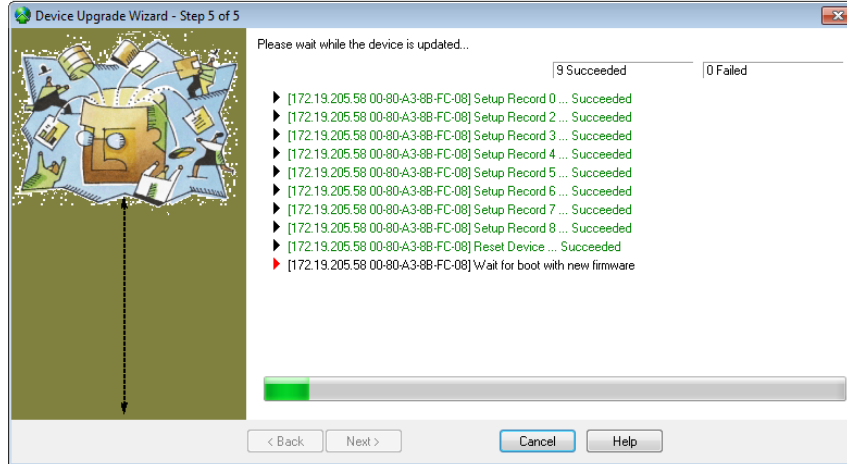
5. Check **Install setup records from a file**, click **Browse** to browse to and select desired setup record file, and click **Next** to advance to *Step 4 of 5*.



6. Click **Save Installation**, browse to and save to a desired save location, and click **Next** to advance to *Step 5 of 5*.



7. Click **Next** to upgrade your device (or **Cancel** to cancel.) Status of your device update will appear in the Device Upgrade Wizard with a confirmation appearing once the unit is updated.



8. Click **Close** to exit the Device Upgrade Wizard.

5: Configuration Using Web Manager

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

The unit's configuration is stored in nonvolatile memory and is retained without power. You can change the configuration any time. The unit resets after configuration is changed and stored.

In this chapter, we describe how to configure the XPress device server using Web Manager, Lantronix's browser-based configuration tool. (For information on using Setup Mode, our command line configuration interface, see [Accessing the Setup Mode Window](#).)

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

Web Manager Page

Note: The XPress DR-IAP may not have a web page or may use a different format web page.

You can start a web browser for configuration by opening your JAVA-enabled web browser and entering the IP address or by clicking the Web Configuration button on the Device Management window. There is initially no Web Manager password for your XPress device server as first received from Lantronix. We recommend that you always use the enhanced password setting and create a strong 16 character password. Using no password is very dangerous. See [Security Settings \(Option 6\)](#) on page 58.

Device Status Home Page


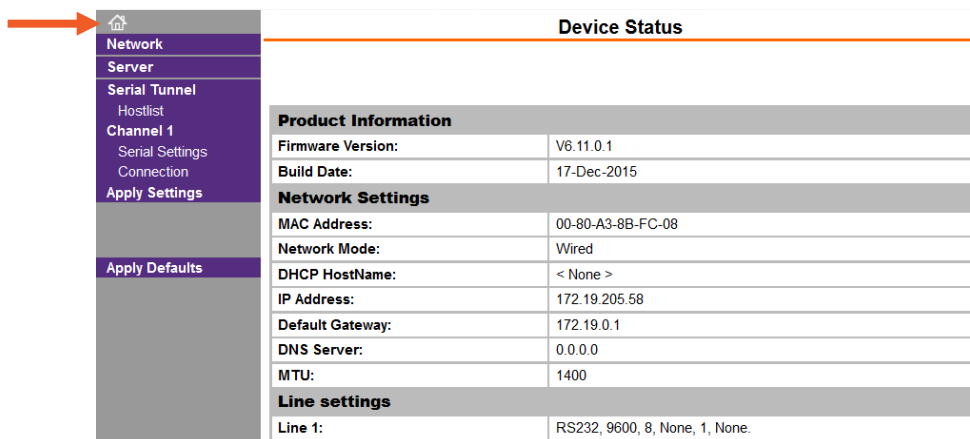

You will reach the Device Status page upon logging into Web Manager. Clicking the Home  icon at the top of the Navigation bar will also bring you to the Device Status page.

Figure 5-1 Device Status Home Page



Product Information	
Firmware Version:	V6.11.0.1
Build Date:	17-Dec-2015
Network Settings	
MAC Address:	00-80-A3-8B-FC-08
Network Mode:	Wired
DHCP HostName:	< None >
IP Address:	172.19.205.58
Default Gateway:	172.19.0.1
DNS Server:	0.0.0.0
MTU:	1400
Line settings	
Line 1:	RS232, 9600, 8, None, 1, None.

Navigate to content organized by links on the Navigation bar to the left:

- ◆  (Device Status Home Page)
- ◆ Network
- ◆ Server
- ◆ Serial Tunnel -- Hostlist
- ◆ Channel 1 -- Serial Settings
- ◆ Channel 1 -- Connection

Apply Settings

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

Note: Clicking **OK** on each page does not change the configuration on the device. Clicking the **OK** button tells the XPress DR device server what changes to use; the **Apply Settings** button makes the changes permanent and reboots the XPress DR unit.

Apply Defaults

1. Click **Apply Defaults** to set the device server back to the default settings.
2. Click **Yes** to set factory settings, or click **No** to cancel.

Figure 5-2 Apply Settings and Apply Defaults

The screenshot shows the 'Device Status' page in the XPress DR web manager. The left sidebar contains a navigation menu with the following items: Network, Server, Serial Tunnel, Hostlist, Channel 1, Serial Settings, Connection, Apply Settings, and Apply Defaults. Two orange arrows point to the 'Apply Settings' and 'Apply Defaults' items. The main content area displays a table of device settings.

Product Information	
Firmware Version:	V6.11.0.1
Build Date:	27-Jan-2016
Network Settings	
MAC Address:	00-80-A3-8B-FC-08
Network Mode:	Wired
DHCP HostName:	< None >
IP Address:	172.19.205.58
Default Gateway:	172.19.0.1
DNS Server:	0.0.0.0
MTU:	1400
Line settings	
Line 1:	RS232, 9600, 8, None, 1, None.

Network Configuration

The unit's network values display when you select **Network** in the Navigation bar. The following sections describe the configurable parameters on the Network Settings page.

Figure 5-3 Network Settings

The screenshot shows the 'Network Settings' page. On the left, a navigation bar has 'Network' highlighted. The main content area is titled 'Network Settings' and includes the following sections:

- Network Mode:** Wired Only (dropdown menu)
- IP Configuration:**
 - Obtain IP address automatically
 - Auto Configuration Methods:**
 - BOOTP: Enable Disable
 - DHCP: Enable Disable
 - AutoIP: Enable Disable
 - DHCP Host Name:
 - Use the following IP configuration:
 - IP Address:
 - Subnet Mask:
 - Default Gateway:
 - DNS Server:
- Ethernet Configuration:**
 - Auto Negotiate
 - Speed: 100 Mbps 10 Mbps
 - Duplex: Full Half

An 'OK' button is located at the bottom right of the form.

Automatic IP Address Configuration

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

To assign an IP address automatically:

1. In the Navigation bar, click **Network**.
2. Select Obtain IP address automatically.
3. Update the following:

Network Mode	For the XPress device server, Wired Only is the only choice. It enables the Ethernet network connectivity.
BOOTP	Select Enable to permit the Bootstrap Protocol (BOOTP) server to assign the IP address from a pool of addresses automatically. Enable is the default.
DHCP	Select Enable to permit the Dynamic Host Configuration Protocol (DHCP) to assign a leased IP address to the XPress unit automatically. Enable is the default.
AutoIP	Select Enable to permit the Automatic Private IP Addressing (AutoIP) to generate an IP in the 169.254.x.x address range for the XPress unit automatically within the a Class B subnet. Enable is the default.
DHCP Host Name	Enter the name of the host on the network providing the IP address.

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

4. When you are finished, click the **OK** button.
5. Click **Apply Settings** in the Navigation bar.

Static IP Address Configuration

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

To assign an IP address manually:

1. In the Navigation bar, click **Network**.
2. Select Use the following IP configuration.
3. Update the following:

IP Address	If DHCP is not used to assign IP addresses, enter it manually in decimal-dot notation. The IP address must be set to a unique value in the network.
Subnet Mask	A subnet mask defines the number of bits taken from the IP address that are assigned for the host part.
Default Gateway	The gateway address, or router, allows communication to other LAN segments. The gateway address should be the IP address of the router connected to the same LAN segment as the unit. The gateway address must be within the local network.
DNS Server	The DNS server allows the name of a remote machine to be resolved automatically. Enter the IP address of the DNS server. If the device is DHCP enabled, the DHCP server provides the DNS server IP address, which will override this configured value. <i>Note: This setting is applicable only in Manual Connection mode.</i>

4. When you are finished, click the **OK** button.
5. Click **Apply Settings** in the Navigation bar.

Ethernet Configuration

You must specify the speed and direction of data transmission.

To specify how data will be transmitted:

1. In the Navigation bar, click **Network**.
2. Update the following:

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

3. When you are finished, click the **OK** button.
4. Click **Apply Settings** in the Navigation bar.

Server Configuration

The unit's server values display when you select **Server** in the Navigation bar. The following sections describe the configurable parameters on the Server Settings page.

Figure 5-4 Server Settings

To configure the XPress device server settings:

1. In the Navigation bar,, click **Server**.
2. Update the following:

Server Configuration

<p>Enhanced Password</p> <p><i>Note: We recommend that you always enable the enhanced password setting, and create a strong 16 character password.</i></p>	<p>Select whether to enable advanced password:</p> <ul style="list-style-type: none"> ♦ Enable: selecting this option enables advanced password creation, allowing you to create passwords up to 16 bytes in length. ♦ Disable: selecting this option disables advanced password creation, allowing you to create basic passwords up to 4 bytes in length.
<p>Telnet/Web Manager Password</p>	<p>Enter the password required for Telnet configuration and Web Manager access. No password or entering a “blank” password entry will disable default password protection.</p>
<p>Retype Password</p>	<p>Re-enter the password required for Telnet configuration and Web Manager access.</p>

Advanced

<p>ARP Cache Timeout (secs)</p>	<p>When the unit communicates with another device on the network, it adds an entry into its ARP table. ARP Cache timeout defines the number of seconds (1-600) before it refreshes this table.</p>
--	--

TCP Keepalive (secs)	TCP Keepalive time defines how many seconds the unit waits during an inactive connection before checking its status. If the unit does not receive a response, it drops that connection. Enter a value between 0 and 60 seconds. 0 disables keepalive. The default setting is 45 .
Monitor Mode @ Bootup	Select Disable to disable entry into the monitor mode using the yyy or xx1 key sequence at startup. This field prevents the unit from entering monitor mode by interpreting the stream of characters that are received during the device server's initialization at startup. The default setting is Enable .
HTTP Server Port	This option allows the configuration of the web server port number. The valid range is 1-65535 . The default setting is 80.
Config Server Port	Not applicable for this product.
MTU Size	The Maximum Transmission Unit (MTU) is the largest physical packet size a network can transmit for TCP and UDP. Enter between 512 and 1400 bytes. The default setting is 1400 bytes.
TCP Re-transmission timeout (ms)	The desired TCP re-transmission timeout value. If the ACK is not received for a packet sent from the XPress device server, then the unit will retransmit the data. The valid range is 500-4000 msec. The default is 500.

3. When you are finished, click the **OK** button.
4. Click **Apply Settings** in the Navigation bar.

Serial Tunnel - Hostlist Configuration

The XPress device server scrolls through the host list until it connects to a device listed in the host list table. After a successful connection, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until the next successful connection.

The host list supports a minimum of 1 and a maximum of 12 entries. Each entry contains an IP address and a port number.

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

To configure the host list:

1. In the Navigation bar, click **Hostlist**.

Figure 5-5 Hostlist Settings

The screenshot shows the 'Hostlist Settings' configuration page. On the left, a navigation menu includes 'Network', 'Server', 'Serial Tunnel', 'Hostlist' (highlighted with an orange arrow), 'Channel 1', 'Serial Settings', 'Connection', 'Apply Settings', and 'Apply Defaults'. The main content area is titled 'Hostlist Settings' and is divided into two sections: 'Retry Settings' and 'Host Information'. Under 'Retry Settings', there are two input fields: 'Retry Counter' with the value '3' and 'Retry Timeout' with the value '250'. The 'Host Information' section contains a table with 12 rows. Each row has three columns: 'No.', 'Host Address', and 'Port'. The 'Host Address' column contains '0.0.0.0' and the 'Port' column contains '0' for all entries. An 'OK' button is located at the bottom center of the form.

2. Update the following:

Retry Settings

Retry Counter	Enter the value for the number of times the XPress device server should attempt to retry connecting to the host list. The default setting is 3 .
Retry Timeout	Enter the duration (in milliseconds) the XPress device server should abandon attempting a connection to the host list. The default setting is 250 .

Host Information

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

3. When you are finished, click the **OK** button.
4. Click **Apply Settings** in the Navigation bar.

Channel 1 - Serial Settings Configuration

The Channel 1 configuration defines how the serial ports respond to network and serial communication.

Serial Settings

To configure the channel's serial settings:

1. In the Navigation bar, click **Serial Settings** (organized under **Channel 1**) to display the Serial Settings window.

Figure 5-6 Channel Serial Settings

5. Update the following:

Channel 1

Disable Serial Port	When selected, disables communication through the serial port. The serial port is enabled by default. <i>Note: This feature is not available on single port device servers, since it can only be applied to channel 1.</i>
----------------------------	---

Port Settings

Protocol	From the drop-down menu, select the protocol type for the selected channel. The default setting is RS232 .
Flow Control	Flow control manages data flow between devices in a network to ensure it is processed efficiently. Too much data arriving before a device is prepared to manage it causes lost or retransmitted data. None is the default.

Baud Rate	The unit and attached serial device, such as a modem, must agree on a speed or baud rate to use for the serial connection. Valid baud rates are 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 baud. The default setting is 9600 .
Data Bits	Indicates the number of bits in a transmitted data package. The default setting is 8 .
Parity	Checks for the parity bit. The default setting is None .
Stop Bits	The stop bit follows the data and parity bits in serial communication. It indicates the end of transmission. The default setting is 1 .

Pack Control

Enable Packing	Select to enable packing on the XPress device server. Two firmware-selectable packing algorithms define how and when packets are sent to the network. The standard algorithm is optimized for applications in which the unit is used in a local environment, allowing for very small delays for single characters, while keeping the packet count low. The alternate packing algorithm minimizes the packet count on the network and is especially useful in applications in a routed Wide Area Network (WAN). Adjusting parameters in this mode can economize the network data stream. Disabled by default.
Idle Gap Time	Select the maximum time for inactivity. The default time is 12 milliseconds.
Match 2 Byte Sequence	Use to indicate the end of a series of data to be sent as one group. The sequence must occur sequentially to indicate end of the data collection to the XPress device server. The default setting is No .
Match Bytes	Use to indicate the end of a series of data to be sent as one group. Set this value to 00 if specific functions are not needed.
Send Frame Immediate	After the detection of the byte sequence, indicates whether to send the data frame or the entire buffer. Select Yes to send only the data frame. The default setting is No .
Send Trailing Bytes	Select the number of bytes to send after the end-of-sequence characters. The default setting is None .

Flush Input Buffer (Serial to Network)

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

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

Flush Output Buffer (Network to Serial)

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

- When you are finished, click the **OK** button.
- Click **Apply Settings** in the Navigation bar.

Channel 1 – Connection Configuration

Connection Settings - TCP

To configure a channel's TCP settings:

- In the Navigation bar, click **Connection** (organized beneath **Channel 1**). The Connection Settings window for the channel displays.

Figure 5-7 TCP Connection Settings

The screenshot shows the 'Connection Settings' window for Channel 1. The left navigation bar includes options like Network, Server, Serial Tunnel, Hostlist, Channel 1, Serial Settings, Connection (highlighted), Apply Settings, and Apply Defaults. The main settings area is divided into several sections:

- Connect Protocol:** Protocol: TCP
- Connect Mode:**
 - Passive Connection:** Accept Incoming: Yes; Password Required: No; Password: ; Modem Escape Sequence Pass Through: Yes
 - Active Connection:** Active Connect: None; Start Character: 0x0D (in Hex); Modem Mode: None; Show IP Address After RING: Yes
- Endpoint Configuration:** Local Port: 10001; Remote Port: 0; Remote Host: 0.0.0.0; Auto increment Local Port for active connect: unchecked
- Common Options:** Telnet Com Port Cntrl: Disable; Connect Response: None; Terminal Name: ; Use Hostlist: No; LED: Blink
- Disconnect Mode:** On Mdm_Ctrl_In Drop: No; Hard Disconnect: Yes; Check EOT(Ctrl-D): No; Inactivity Timeout: 0 : 0 (mins : secs)

An 'OK' button is located at the bottom of the settings area.

2. Update the following:

Connect Protocol

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

Connect Mode: Passive Connection

Accept Incoming	Select Yes to accept incoming connections. The default setting is Yes .
Password Required	Determines whether a password is required for an incoming passive connection. This field is not available when a password is set for Telnet mode. The default setting is No .
Password	If Password Required was set to Yes , enter the password for passive connections.
Modem Escape Sequence Pass Through	Disable or enable the XPress device server's ability to send the escape sequence. The default is Yes (send the escape sequence).

Connect Mode: Active Connection

Active Connect	Select None (default) to disable Active Connect . Otherwise, indicate the connection type from the drop-down list: <ul style="list-style-type: none"> ◆ With Any Character: Attempts to connect when any character is received from the serial port. ◆ With Active Mdm Ctrl In: Accepts external connection requests only when the Modem Control In input is asserted. ◆ With Start Character: Attempts to connect when it receives a specific start character from the serial port. The default start character is carriage return. ◆ Manual Connection: Attempts to connect when directed by a command string received from the serial port. ◆ Auto Start: Automatically connects to the remote IP address and port after booting up.
Start Character	If Active Connect is set to With Start Character , enter the start character in this field. The default setting is 0D .
Modem Mode	Indicates the on-screen response type when in Modem Mode (if Modem Mode is enabled). The default setting is None .
Show IP Address After RING	Indicates whether to display the remote IP address upon connection. The default setting is Yes .

Endpoint Configuration

Local Port	Enter the local port number.
Auto increment for Local Port for active connect	Select to auto-increment the local port number for new outgoing connections. The range of auto-incremented port numbers is 50,000 to 59,999 and loops back to the beginning when the maximum range is reached. Disabled by default.

Remote Port	Enter the remote port number.
Remote Host	Enter the IP address of the remote device.

Common Options

Telnet Com Port Cntrl	This field is available for configuration only when Active Connect is set to None . Select Enable to permit Telnet communication to the XPress unit. The Telnet Com Port Cntrl feature is used in conjunction with the Com Port Redirector (CPR) utility. (See the CPR online Help for details.)
Terminal Name	This field is available for configuration only when Telnet Com Port Cntrl is set to Enable . Use the terminal name for the Telnet terminal type. Enter only one name. When this option is enabled, the unit also reacts to the end of record (EOR) and binary options, which can be used for applications such as terminal emulation to IBM hosts.
Connect Response	A single character is transmitted to the serial port when there is a change in connection state. The default setting is None .
Use Hostlist	If this option is set to Yes , the device server scrolls through the host list until it connects to a device listed in the host list table. Once it connects, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until it connects to another IP in the host list. The host list is disabled for Manual Mode and for Modem Mode. The unit will not accept a data connection from a remote device when the host list option is enabled.
LED	Select Blink for the status LEDs to blink upon connection or None for no LED output. The default setting is Blink.

Disconnect Mode

On Mdm_Ctrl_In Drop	Set to Yes for the network connection to or from the serial port to disconnect (drop) when Modem Control In transitions from an asserted state to not asserted state. The default setting is No .
Hard Disconnect	When set to Yes , the TCP connection closes even if the remote site does not acknowledge the disconnect request.
Check EOT (Ctrl-D)	Select Yes to drop the connection when Ctrl-D or Hex 04 is detected. Both Telnet Com Port Cntrl and Check EOT (Ctrl+ D) must be enabled for Disconnect with EOT to function properly. Ctrl+D is only detected going from the serial port to the network. The default setting is No .
Inactivity Timeout	Use this parameter to set an inactivity timeout. The unit drops the connection if there is no activity on the serial line before the set time expires. Enter time in the format mm:ss, where m is the number of minutes and s is the number of seconds. To disable the inactivity timeout, enter 00:00 .

- When you are finished, click the **OK** button.
- Click **Apply Settings** in the Navigation bar.

Connection Settings - UDP

To configure a channel's UDP settings:

- In the Navigation bar, click **Connection** (organized beneath **Channel 1**). The Connection Settings window for the selected channel displays.
- In the available fields, enter or modify the following information:

Figure 5-8 UDP Connection Settings

The screenshot shows the 'Connection Settings' window for 'Channel 1'. The left navigation bar has 'Connection' highlighted with an orange arrow. The main area contains the following settings:

- Connect Protocol:** Protocol: UDP (dropdown)
- Datagram Mode:** Datagram Type: 00 (dropdown), Accept Incoming: Yes (dropdown)
- Endpoint Configuration:** Local Port: 10001 (text), Remote Port: 0 (text), Remote Host: 0.0.0.0 (text), Use Broadcast:
- Device Address Table:** A table with 16 columns (No., Dev Addr) and 4 rows of data.

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

An 'OK' button is located at the bottom center of the window.

Connect Protocol

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

Datagram Mode

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

Endpoint Configuration

Local Port	Enter the local port number.
Remote Port	Enter the port number of the remote device.
Remote Host	Enter the IP address of the remote device.

Use Broadcast	Select to broadcast the UDP datagram. Datagrams of type 01 can be sent as a broadcast by enabling this option. The default is not to broadcast. <i>Note: Datagrams are sent as subnet-directed broadcasts.</i>
Device Address Table	The table is enabled when Datagram Type is set to FD . Enter Dev Addr values between 1 and 255 to identify units on the local network of device servers. <i>Note: Lantronix Tech Support supports Datagram type 01. Datagram Type FD is for OEM use.</i>

3. When you are finished, click the **OK** button.
4. Click **Apply Settings** in the Navigation bar.

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

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

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

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

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

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

This chapter tells you how to access Setup Mode and the general procedure for using it. To complete the configuration, continue with chapters [7: Setup Mode: Server Configuration](#), [8: Channel Mode: Channel Configuration](#), and [9: Setup Mode: Advanced Settings](#).

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

Accessing the Setup Mode Window

Telnet Connection

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

Note: If you use the **Telnet to Device** icon on the DeviceInstaller Device Management window **OR** a serial port login to establish the connection, skip steps 1 and 2.

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

```
telnet x.x.x.x 9999
```

Note: Be sure to include a space between the IP address and 9999.

2. Click **OK**.
3. The Lantronix Universal Device Server window displays.

```
*** Lantronix XPressDR-IAP Device Server ***
MAC address 0080A38BFC08
Software version V6.11.0.1 (160127)
```

```
Press Enter for Setup Mode
```

4. To enter the Setup Mode, **you must press Enter within 5 seconds**. The configuration settings will appear. See [Figure 6-1 Setup Mode Window](#).

Note: The following line appears only with a Telnet connection.

Model: Device Server Plus+! (Firmware Code:EA)

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

Note: The Firmware Code AQ represents Standard Tunneling firmware.

Figure 6-1 Setup Mode Window (Standard Tunneling)

```

*** basic parameters
Hardware: Ethernet TPI
IP addr 172.19.205.58, gateway 172.19.0.1
DNS Server not set
DHCP FQDN option: Disabled

*** Security
SNMP is                enabled
SNMP Community Name: public
Telnet Setup is        enabled
TFTP Download is        enabled
Port 77FEh is          enabled
77FEh Access Mode is  Read & Write
Web Server is          enabled
Web Setup is           enabled
ECHO is                disabled
Enhanced Password is  disabled

*** Channel 1
Baudrate 9600, I/F Mode 4C, Flow 00
Port 10001
Connect Mode : C0
Send '+++' in Modem Mode enabled
Show IP addr after 'RING' enabled
Auto increment source port disabled
Remote IP Adr: --- none ---, Port 00000
Disconn Mode : 40 (Telnet Com Port Cntrl Enabled)
Flush  Mode : 00
Terminal name:

*** Expert
TCP Keepalive      : 45s
ARP cache timeout: 600s
Monitor Mode @ bootup : enabled
HTTP Port Number  : 80
MTU Size: 1400
TCP Re-transmission timeout: 500 ms
Alternate MAC: disabled
Ethernet connection type: auto-negotiate

Change Setup:
 0 Server
 1 Channel 1
 5 Expert
 6 Security

```

```
7 Defaults
8 Exit without save
9 Save and exit           Your choice ?
```

Serial Port Connection

If you want to initially configure the unit through a serial connection, follow these steps:

1. Connect a console terminal or PC running a terminal emulation program to your unit's serial port. The default serial port settings are 9600 baud, 8 bits, no parity, 1 stop bit, no flow control.
2. To enter Setup Mode, cycle the unit's power (power off and back on). After power-up, the self-test begins and the red Diagnostic LED starts blinking. **You have one second** to enter three lowercase **x** characters (**xxx**).

Note: The easiest way to enter Setup Mode is to hold down the **x** key at the terminal (or emulation) while powering up the unit.

3. At this point, the screen display is the same as when you use a Telnet connection. To continue with a serial port login, go to [Telnet Connection](#).

Exiting Setup Mode

There are two options through which to exit setup mode:

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

7: Setup Mode: Server Configuration

This chapter explains how to configure the server through Setup Mode. All current values are displayed in parenthesis.

Server Configuration (Option 0)

These are the unit's basic network parameters. The following parameters are displayed when you select **Server configuration**.

```
IP Address : (172) .(019) .(205) .(058)
Set Gateway IP Address (Y) ?
Gateway IP addr (172) .(019) .(000) .(001)
Netmask: Number of Bits for Host Part (0=default) (0)
Set DNS Server IP addr (N) ?
Change Telnet/Web Manager password (N) ?
```

IP Address

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

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

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

Table 7-1 BootP/DHCP/AutoIP Options

Options	Bit	Value
AutoIP	0	1
DHCP	1	2
BootP	2	4

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

Set Gateway IP Address

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

```
Set Gateway IP Address (N) ? Y
Gateway IP addr (000) .(000) .(000) .(000) _
```

Netmask: Number of Bits for Host Part

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

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

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

The unit prompts for the number of host bits to be entered, then calculates the netmask, which is displayed in standard decimal-dot notation when the saved parameters are displayed (for example, 255.255.255.0). The default setting is 0.

Table 7-2 Standard IP Network Netmasks

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

Table 7-3 Netmask Examples

Netmask	Host Bits
255.255.255.252	2
255.255.255.248	3
255.255.255.240	4
255.255.255.224	5
255.255.255.192	6
255.255.255.128	7
255.255.255.0	8
255.255.254.0	9
255.255.252.0	10
255.255.248.0	11
...	...
255.128.0.0	23
255.0.0.0	24

Set DNS Server IP Address

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

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

Set DNS Server IP addr (N) ?

Change Telnet/Web Configuration Password

Setting the Telnet configuration password prevents unauthorized access of the setup menu via a Telnet connection to port 9999 or via Web pages.

- ◆ Please protect your device from unauthorized access and follow the instructions below:
- ◆ Always select **Y** to enable Telnet/Web Manager password

Enable the enhanced password setting and create a strong 16-character password. For details, see [Security Settings \(Option 6\)](#) on page 58.

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

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

DHCP Naming

If a DHCP server has automatically assigned the IP address and network settings, you can discover the unit by using the DeviceInstaller network search feature or Monitor Mode (see [11: Monitor Mode](#)).

Note: When you enter Monitor Mode from the serial port with network connection enabled and issue the **NC** (Network Communication) command, you see the unit's IP configuration.

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

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

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

- ◆ **Numeric DHCP Name:** You can change the DHCP name by specifying the last octet of the IP address. When you use this method, the DHCP name is LTXYY where YY is what you chose for the last octet of the IP address. If the IP address you specify is 0.0.0.12, then the DHCP name is LTX12. This method only works with 2 digit numbers (01-99).

8: Channel Mode: Channel Configuration

This chapter explains how to configure the serial port.

Notes:

- ◆ Current values display in parenthesis.
- ◆ You must enter some values in hexadecimal notation. (See 95.)

Channel 1 (Option 1)

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

Figure 8-1. Serial Port Settings

```
Baudrate (9600) ?
I/F Mode (4C) ?
Flow (00) ?
Port No (10001) ?
ConnectMode (C0) ?
Send '+++ ' in Modem Mode (Y) ?
Show IP addr after 'RING' (Y) ?
Auto increment source port (N) ?
Remote IP Address : (000) .(000) .(000) .(000)
Remote Port (0) ?
DisConnMode (40) ? (Telnet Com Port Cntrl Enabled)
FlushMode (00) ?
DisConnTime (00:00) ?:
SendChar 1 (00) ?
SendChar 2 (00) ?
Terminal name () ?
```

Using this option, define how the serial port will respond to network and serial communications.

Baudrate

The unit and attached serial device, such as a modem, must agree on a speed or baud rate to use for the serial connection. Valid baud rates are 300, 600, 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, and 115200 bits per second.

```
Baudrate (9600) ? _
```

I/F (Interface) Mode

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

The following table displays available I/F Mode options:

```
I/F Mode (4C) ? _
```

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

Table 8-1 Interface Mode Options

I/F Mode Option	7	6	5	4	3	2	1	0
RS-232C ⁽¹⁾							0	0
RS-422/485 ⁽¹⁾							0	1
RS-485 2-wire ⁽¹⁾							1	1
7 Bit					1	0		
8 Bit					1	1		
No Parity			0	0				
Even Parity			1	1				
Odd Parity			0	1				
1 Stop bit	0	1						
2 Stop bit	1	1						

(1) The XPress DR requires you to choose the correct setting in the IF mode, and to also set the front-panel switch for selection of RS-232/RS-485.

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

Table 8-2 Common Interface Mode Settings

Common I/F Mode Setting	Binary	Hex
RS-232C, 8-bit, No Parity, 1 stop bit (1)	0100 1100	4C
RS-232C, 7-bit, Even Parity, 1 stop bit (1)	0111 1000	78
RS-485 2-Wire, 8-bit, No Parity, 1 stop bit (1)	0100 1111	4F
RS-422, 8-bit, Odd Parity, 1 stop bit (1)	0101 1101	5D

(1) The XPress DR requires you to choose the correct setting in the IF mode, and to also set the front-panel switch for selection of RS-232/RS-485.

Flow

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

Flow (00) ? _

Table 8-3 Flow Control Options

Flow Control Option	Hex
No flow control	00
XON/XOFF flow control	01
Hardware handshake with RTS/CTS lines	02
XON/XOFF pass characters to host	05

Port Number

The port number functions as the TCP/UDP source port number for outgoing packets. Packets sent to the unit with this port number are received to this channel. The port number selected is the Incoming TCP/UDP port and Outgoing TCP/UDP source port. Port 0 is used when you want the outgoing source port to change with each connection.

Port No (10001) ? _

Default setting for Port 1 is 10001. Range: 0-65535 except for the following reserved port numbers:

Table 8-4 Port Numbers

Port Numbers	Reserved for
1 – 1024	Reserved (well known ports)
9999	Telnet setup
14000-14009	Reserved
30718	Reserved (77FEh)
10000-10999	Recommended ports, should be used for DeviceComm Manager (COM1-COM256) or direct socket connections

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

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

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

Connect Mode

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

ConnectMode (C0) ? _

Enter Connect Mode options in hexadecimal notation. The default setting is **C0**.

Note: See Table 11-1 Binary to Hexadecimal Conversion Table. All bit positions in the table that are blank represent “don’t care” bits for that particular option, which can be set to either a 0 or 1 value.

Table 8-5 Connect Mode Options

Connect Mode Option	7	6	5	4	3	2	1	0
Incoming Connection								
Never accept incoming	0	0	0					
Accept incoming with DTR ⁽¹⁾	0	1	0					
Accept unconditional	1	1	0					
Response								
Nothing (quiet)				0				

Character response (C=conn, D=disconn, N=unreachable)				1				
Startup								
No active startup					0	0	0	0
With any character					0	0	0	1
With active DTR ⁽¹⁾					0	0	1	0
With CR (0x0D) only					0	0	1	1
Manual connection					0	1	0	0
Autostart					0	1	0	1
Datagram Type								
Directed UDP					1	1	0	0
Modem Mode								
Full Verbose				1	0	1	1	0
Without Echo				0	0	1	1	0
1-character Response				1	0	1	1	1

(1) Inactive. DTR is hardwired to +12VDC.

Manual Connection: When you use manual connection, you are not required to enter the entire IP address if the IP is already configured as the remote IP address in the unit. For example, if the remote IP address already configured in the unit is 129.1.2.3, then an example command string would be C3/7. (This would connect to 129.1.2.3 and port 7.) You may also use a different ending for the connection string. For example, C50.1/23 would connect you to 129.1.50.1 and port 23.

Table 8-6 Manual Connection Address Example

Command String	Result if remote IP is 129.1.2.3 and remote port is 1234
C121.2.4.5/1	Complete override; connection is started with host 121.2.4.5, port 1
C5	Connect to 129.1.2.5, port 1234
C28.10/12	Connect to 129.1.28.10, port 12 C0.0.0.0/0 Enters Monitor Mode. Cwww.lantronix.com/80 Tries to connect to the Lantronix web server if the <hostname:domain> (www.lantronix.com) is configured in the DNS server database.

Autostart (Automatic Connection): If you enable **Autostart**, the unit automatically connects to the remote IP address and remote port specified when the firmware starts.

Hostlist: If you enable this option, the device server scrolls through the hostlist until it connects to a device listed in the hostlist table. Once it connects, the unit stops trying to connect to any others. If this connection fails, the unit continues to scroll through the table until it is able to connect to another IP in the hostlist.

Hostlist supports a minimum of 1 and a maximum of 12 entries. Each entry contains the IP address and the port number.

The hostlist is disabled for Manual and Modem Modes. The unit does not accept a data connection from a remote device when the hostlist option is enabled.

Datagram Type: When selecting this option, you will be prompted for the Datagram type. Enter **01** for directed or broadcast UDP.

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

Normally there is a modem connected to a local PC and a modem connected to a remote machine. A user must dial from the local PC to the remote machine, accumulating phone charges for each connection. Modem Mode allows you to replace modems with device servers, and to use an Ethernet connection instead of a phone call, without having to change communications applications and make potentially expensive phone calls.

To select Modem Mode, set the Connect Mode to **C6** (no echo), **D6** (echo with full verbose), or **D7** (echo with 1-character response).

Note: If the unit is in Modem Mode and the serial port is idle, the unit can still accept network TCP connections to the serial port if Connect Mode is set to C6 (no echo), D6 (echo with full verbose), or D7 (echo with 1-character response).

In Modem Mode, echo refers to the echo of all of the characters entered in command mode; it does not mean to echo data that is transferred. Quiet Mode (no echo) refers to the modem not sending an answer to the commands received (or displaying what was typed).

To disconnect a connection using Modem Mode commands:

- ♦ There must be 1-second guardtime (no data traffic) before sending +++.
- ♦ There must not be a break longer than 1 second between +s.
- ♦ There must be another 1-second guardtime after the last + is sent.
- ♦ The unit acknowledges with an **OK** to indicate that it is in command mode.
- ♦ Enter **ATH** and press **Enter**. It is echoed if echo is enabled. ATH is acknowledged by another **OK**.

Table 8-7 Modem Mode Commands

Modem Mode Command	Function
ATDTx.x.x.x,pppp or ATDTx.x.x.x/pppp	Makes a connection to an IP address (x.x.x.x) and a remote port number (pppp).
ATDTx.x.x.x	Makes a connection to an IP address (x.x.x.x) and the remote port number defined within the unit.
ATD0.0.0.0	Forces the unit into monitor mode if a remote IP address and port number are defined within the unit.
ATD	Forces the unit into monitor mode if a remote IP address and port number are not defined within the unit.
ATDx.x.x.x	Makes a connection to an IP address (x.x.x.x) and the remote port number defined within the unit.
ATH	Hangs up the connection (Entered as +++ATH).
ATS0=n	Enables or disables connections from the network going to the serial port. n=0 disables the ability to make a connection from the network to the serial port. n=1-9 enables the ability to make a connection from the network to the serial port. n>1-9 is invalid.
ATEn	Enables or disables character echo and responses. n=0 disables character echo and responses. n=1 enables character echo and responses.

ATVn	Enables 1-character response or full verbose. n=0 enables 1-character response. n=1 enables full verbose.
------	---

Note: These AT commands are only recognized as single commands like ATE0 or ATV1; compound commands such as ATE0V1 are not recognized. All other AT commands with Modem Mode set to full verbose acknowledge with an OK, but no action is taken.

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

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

Disable or enable the XPress DR device server's ability to send the escape sequence. The default setting is **Y** (Yes) (send the escape sequence).

Show IP addr after 'RING'

Show IP addr after 'RING' (Y) ?

Disable or enable the XPress DR unit's ability to show the IP address after RING in Modem Mode. The default is **Y** (Yes), to show the IP address.

Auto Increment Source Port

Auto increment source port (N) ? _

Y (Yes) auto increment the source port. The XPress DR increments the port number used with each new connection.

Remote IP Address

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

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

Remote Port

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

Remote Port (0) ?

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

DisConnMode

DTR is hardwired to +12VDC. The Disconnect with DTR drop option is inactive.

Note: See [Table F-1 Binary to Hexadecimal Conversion Table](#).

DisConnMode (40) ? (Telnet Com Port Cntrl Enabled)

Table 8-8 Disconnect Mode Options

Disconnect Mode Option	7	6	5	4	3	2	1	0
Disconnect with DTR drop ⁽⁶⁾	1							
Ignore DTR	0							
Telnet mode and terminal type setup ⁽¹⁾		1						

Channel (port) password ⁽²⁾				1				
Hard disconnect ⁽³⁾					0			
Disable hard disconnect					1			
State LED off with connection ⁽⁴⁾								1
Disconnect with EOT (^D) ⁽⁵⁾			1					

1. The XPress DR will send the "Terminal Type" upon an outgoing connection.
2. A password is required for a connection to the serial port from the network.
3. The TCP connection will close even if the remote site does not acknowledge the disconnection.
4. When there is a network connection to or from the serial port, the state LED will turn off instead of blink.
5. When Ctrl D or Hex 04 are detected, the connection is dropped. Both Telnet mode and Disconnect with EOT must be enabled for Disconnect with EOT to function properly. Ctrl D will only be detected going from the serial port to the network.
6. DTR hardwired to +12VDC. This option is disabled in the XPress DR.

Flush Mode (Buffer Flushing)

Using this parameter, you can control line handling and network buffers with connection startup and disconnect. You can also select between two different packing algorithms.

FlushMode (00) ?

Note: See [Table F-1 Binary to Hexadecimal Conversion Table](#).

Table 8-9 Flush Mode Options

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

Pack Control

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

Pack control settings are enabled in Flush Mode. Set this value to 00 if specific functions are not needed.

Note: See Table 11-1 Binary to Hexadecimal Conversion Table.

Table 8-10 Pack Control Options

Option	7	6	5	4	3	2	1	0
Idle Time								
Force transmit: 12ms							0	0
Force transmit: 52ms							0	1
Force transmit: 250ms							1	0
Force transmit: 5sec							1	1
Trailing Characters								
None					0	0		
One					0	1		
Two					1	0		
Send Characters								
2-Byte Send Character Sequence				1				
Send Immediately After Send chars			1					

Idle Time: Idle time to "Force transmit" defines how long the unit should wait before sending accumulated characters. This wait period is between characters. If there is an idle period between characters equal to the force transmit set, then the unit will package up the serial data currently in the buffer and send it to the network.

Trailing Characters: In some applications, CRC, Checksum, or other trailing characters follow the end-of-sequence character; this option helps to adapt frame transmission to the frame boundary.

Send Characters: If 2-Byte Send Character Sequence is enabled, the unit interprets the sendchars as a 2-byte sequence; if not set, they are interpreted independently.

If **Send Immediately After Characters** is not set, any characters already in the serial buffer are included in the transmission after a "transmit" condition is found. If set, the unit sends immediately after recognizing the transmit condition (sendchar or timeout).

Note: A transmission might occur if status information needs to be exchanged or an acknowledgment needs to be sent.

DisConnTime (Inactivity Timeout)

Use this parameter to set an inactivity timeout. The connection is dropped if there is no activity on the serial line before the set time expires. Enter time in the following format: **mm:ss**, where **m** is the number of minutes and **s** is the number of seconds. To disable the inactivity timeout, enter **00:00**.

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

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

Send Characters

You can enter up to two characters in hexadecimal representation in the parameters "sendchar." If a character received on the serial line matches one of these characters, it is sent immediately, along with any awaiting characters, to the TCP connection. This minimizes the response time for specific protocol characters on the serial line (for example, ETX, EOT, etc.). Setting the first sendchar to **00** disables the recognition of the characters. Alternatively, the two characters can be interpreted as a sequence.

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

Telnet Terminal Type

This parameter appears only if the terminal type option is enabled in Disconnect Mode (see [DisConnMode](#) above). If this option is enabled, you can use the terminal name for the Telnet terminal type. Enter only one name.

```
Terminal name () ?
```

If the terminal type option is enabled, the unit also reacts to the EOR (end of record) and binary options, which can be used for applications like terminal emulation to IBM hosts.

Channel (Port) Password

This parameter appears only if the channel (port) password option is enabled in Disconnect Mode (see [DisConnMode](#)). If set, you can set a password on the serial port.

9: Setup Mode: Advanced Settings

Expert Settings (Option 5)

These parameters should only be changed if you are an expert and definitely know the consequences the changes might have.

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

TCP Keepalive time in s

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

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

ARP Cache timeout in s

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

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

Disable Monitor Mode at Bootup

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

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

HTTP Port Number

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

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

MTU Size

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

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

TCP Re-Transmission Timeout

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

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

Enable alternate MAC

If necessary, enable the alternate MAC address (if specified in the OEM setup record). The default setting is **N** (No).

Enable alternate MAC (N) ? _

Ethernet Connection Type

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

Ethernet connection type: (0) ? _

Security Settings (Option 6)

Note: You can change these settings via Telnet or serial connections only, not on the Web-Manager. We recommend that you set security over the dedicated network or over the serial setup. If you set parameters over the network (Telnet 9999), someone else could capture these settings.

Disable SNMP (N) ?

SNMP Community Name (public):

Disable Telnet Setup (N) ?

Disable TFTP Firmware Update (N) ?

Disable Port 77FEh (N) ?

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

Disable Web Server (N) ?

Disable Web Setup (N) ?

Disable ECHO ports (Y) ?

Enable Enhanced Password (N) ?

Disable SNMP

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

Disable SNMP (N) ?

SNMP Community Name

This option allows you to change the SNMP Community Name on the unit. This allows for ease of management, and possibly some security. If someone tries to violate security but doesn't know what community to connect to, that person will be unable to get the SNMP community information from the unit. The name is a string of 1 to 13 characters plus a null-terminator (14 bytes total). The default setting is **public**.

```
SNMP Community Name (public):
```

Disable Telnet Setup

This setting defaults to the **N** (No) option. The **Y** (Yes) option disables access to this Configuration Menu by Telnet (port 9999). It only allows access via the Web pages and the serial port of the unit.

```
Disable Telnet Setup (N) ?
```

Disable TFTP Firmware Upgrade

This setting defaults to the **N** (No) option. The **Y** (Yes) option disables the use of TFTP to perform network firmware upgrades. With this option, firmware upgrades can be performed only by using a *.hex file over the serial port of the unit. See [Using the Hyperterminal](#).

```
Disable TFTP Firmware Update (N) ?
```

Disable Port 77FE (Hex)

Port 77FE is a setting that allows DeviceInstaller, Web Pages, and custom programs to configure the unit remotely. You may wish to disable this capability for security purposes. For more information about remote configuration, see the *Lantronix Embedded Integration Kit User Guide* at the Lantronix Web site www.lantronix.com/downloads.

```
Disable Port 77FEh (N) ?
```

The default setting is the **N** (No) option, which enables remote configuration. You can configure the unit by using DeviceInstaller, Web pages, Telnet, or serial configuration. The **Y** (Yes) option disables remote configuration and Web pages.

Note: The Yes option disables many of the GUI tools for configuring the device server, including the embedded Web Page Configuration tool.

77FEh Access Mode

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

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

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

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

Disable Web Server

This setting defaults to the **N** (option). The **Y** (Yes) option disables the use of the Web Page Configuration tool that is built into the unit.

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

Disable Web Setup

The **Y** (Yes) option disables configuration using the Web-Manager. This setting defaults to the **N** (No) option.

Disable Web Setup (N) ? _

Disable ECHO Ports

Controls whether the serial port will echo characters it receives.

Disable ECHO ports (Y) ?

Enable Enhanced Password

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

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

Enable Enhanced Password (N) ?

Default Settings (Option 7)

Select **7** to reset the unit's Channel 1 and Enhanced Security to the factory default settings. The server configurations (IP address information) remain unchanged.

Exit Configuration Mode (Option 8 or Option 9)

Select **8** to exit the configuration mode without saving any changes or rebooting. Select **9** to save all changes and reboot the device. All values are stored in nonvolatile memory.

10: Firmware Upgrades

Obtaining Firmware

The XPress DR-IAP was designed to allow loading of vendor specific protocol firmware. This firmware takes the place of the Standard Tunnel Protocol. Vendor specific protocols and the software tools needed to load them can be found at www.lantronix.com/downloads.

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

Once you load a vendor specific protocol, you must reference the user manual associated with that protocol, since many of the setup and configuration dialogs will be changed. Some features, such as web pages, may not be available with certain vendor protocols.

Note: *If you change the protocol to a vendor specific protocol, you MUST reference the associated protocol manual for setup and configuration information. The menu options shown in this manual are for Standard Tunnel Protocol.*

Reloading Firmware

There are several ways to update the unit's internal operational code (*.rom): via TFTP, via another unit, or via the serial port. You can also update the unit's internal web interface (*.cob) via tftp or deviceinstaller.

The firmware files can be found at www.lantronix.com/downloads and -are installed in the Program Files\DeviceInstaller\Firmware folder. Here is a list of typical names for those files. Check the Lantronix web site for the latest versions and release notes.

Table 10-1 Protocol Firmware

Folder Name	ROM File	COB
DA -XPress\Standard Tunnel	xpressdr_61101.rom	xpressdr_webm_2008.cob
DA -XPress\IAP Tunnel	aqea_61101.rom	xpressdr_IAP_webm_2008.cob
DA -XPress\Modbus IAP	amea_3401.rom	na

Using TFTP Graphical User Interface

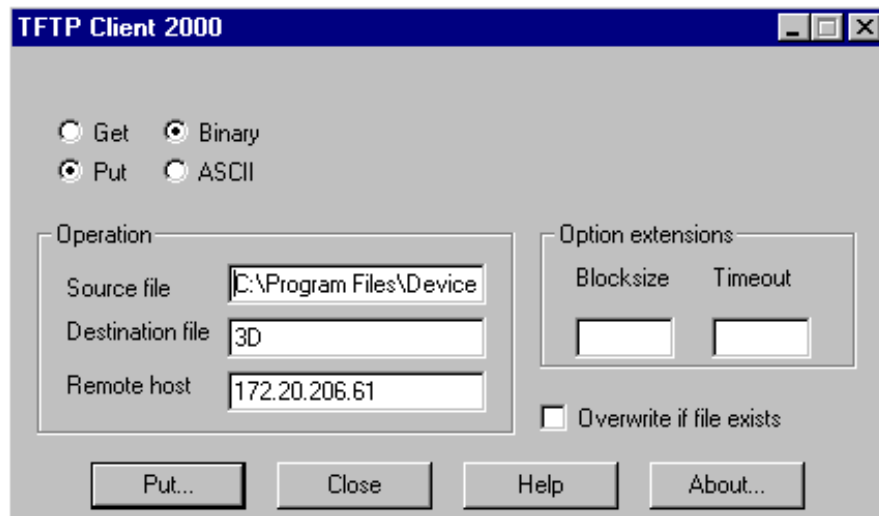
To download new firmware from a computer:

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

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

2. Make sure the Put and Binary options at the top of the window are selected.
3. Enter the full path of the firmware file in the Source File field.
4. In the Destination File field, enter the current internal operational code or WEB5 for the internal Web interface. (DA=XPress Family IAP)
5. In the Remote Host field, enter the IP address of the unit being upgraded.
6. Click the Put button to transfer the file to the unit.

Figure 10-1 TFTP Dialog Box



The unit performs a power reset after the firmware has been loaded and stored.

Distributing Firmware to Another Unit

To distribute firmware to another unit over the network:

1. Enter the host unit's Monitor Mode (see Monitor Mode).
2. Send the firmware to the receiving unit using the SF command, where x.x.x.x is the receiving unit's IP address: SF x.x.x.x

The receiving unit performs a power reset after the firmware has been loaded and stored.

Note: You can only update your unit 's internal Web interface using TFTP or DeviceInstaller.

Using HyperTerminal

The following procedure is for using the HyperTerminal software application. In some cases, the HEX format file is available for download at www.lantronix.com/downloads.

Before you can load firmware through the serial port you need to convert the ROM code to HEX format. There is a DOS application, R2H.EXE that can be used to convert the ROM file to HEX format. The R2H.EXE application is available at ftp://ftp.lantronix.com/pub.

Put R2H.EXE and the *.ROM file into the same directory on a PC then open a DOS Window to that directory and type: C:\ R2H filename

This will create a filename.hex file that you can load via the serial port.

Note: Do not switch off the power supply during the update. A loss of power while reprogramming will result in a corrupt program image and a nonfunctional unit.

To download firmware from a computer via the unit's serial port:

1. Enter Monitor Mode via the serial port. (see Monitor Mode).
2. Download the firmware to the unit using the DL command.
3. Select **Send Text File** and select the *.HEX file to be downloaded. The downloaded file must be the .HEX (ASCII) version.

4. After the final record is received, the unit checks the integrity of the firmware image before programming the new firmware in the flash ROM. The following message displays when the firmware upgrade is complete.

```
*** NodeSet 2.0 ***
```

```
0>DL
```

```
02049 lines loaded.
```

Note: You can only update your unit 's internal Web interface using TFTP or DeviceInstaller.

11: Monitor Mode

Monitor Mode is a command-line interface used for diagnostic purposes (see [Table 11-1- Monitor Mode Commands](#)). There are two ways to enter Monitor Mode: locally via the serial port or remotely via the network.

Entering Monitor Mode Via the Serial Port

To enter Monitor Mode locally:

1. Follow the same principles used in setting the serial configuration parameters. [See Chapter 6: Configuration via Telnet or Serial Port \(Setup Mode\)](#).
2. Enter Monitor Mode in one of two ways:
 - ◆ Type `zzz` (or `xx1`) to enter Monitor Mode with network connections.
 - ◆ Type `yyy` to enter Monitor Mode without network connections.

An `0>` prompt indicates that you have successfully entered Monitor Mode.

Entering Monitor Mode Via the Network Port

To enter Monitor Mode using a Telnet connection:

1. First establish a Telnet session to the configuration port (9999). The following message appears:

```
MAC address 0080A38BFC08
Software version V6.11.0.1 (160127) XPressDR
```

```
Press Enter for Setup Mode
```

An `0>` prompt indicates that you have successfully entered Monitor Mode.

Monitor Mode Commands

The following commands are available in Monitor Mode. Many commands have an IP address as an optional parameter (`xxx.xxx.xxx.xxx`). If the IP address is given, the command is applied to another network device with that IP address. If no IP address is given, the command is executed locally.

Note: All commands must be given in capital letters.

Table 11-1 Monitor Mode Commands

Command	Command Name	Function
VS <code>x.x.x.x</code>	Version	Queries software header record (16 bytes) of unit with IP address <code>x.x.x.x</code> .
GC <code>x.x.x.x</code>	Get Configuration	Gets configuration of unit with IP address <code>x.x.x.x</code> as hex records (120 bytes).
SC <code>x.x.x.x</code>	Send Configuration	Sets configuration of unit with IP address <code>x.x.x.x</code> from hex records.
PI <code>x.x.x.x</code>	Ping	Pings unit with IP address <code>x.x.x.x</code> to check device status.

Command	Command Name	Function
AT	ARP Table	Shows the unit's ARP table entries.
TT	TCP Connection Table	Shows all incoming and outgoing TCP connections.
NC	Network Connection	Shows the unit's current IP address, gateway, subnet mask, and DNS server.
RS	Reset	Resets the unit's power.
QU	Quit	Exits diagnostics mode.
G0, G1,, Ge, Gf	Get configuration from memory page	Gets a memory page of configuration information from the device for setup record 0 to15.
S0, S1,, Se, Sf	Set configuration to memory page	Sets a memory page of configuration information on the device for setup record 0 to15.
R0, R1,, Rb, Rc	Get configuration from memory page	Gets a memory page of configuration information from the device for setup record 16 to28.
W0, W1,, Wb, Wc	Set configuration to memory page	Sets a memory page of configuration information on the device for setup record 16 to 28.
GM	Get MAC address	Shows the unit's 6-byte MAC address.
SS	Set Security record	Sets the Security record without the encryption key and length parameters. The entire record must still be written, but the encryption-specific bytes do not need to be provided (they can be null since they are not overwritten).
SA	Scan	Initiates a wireless scan if the wireless interface is enabled. Reports any stations found, including BSSID, SSID, and RSSI. If SA is followed by a string, the string is used to filter SSIDs before reporting. If the BSS does not broadcast its SSID, only the BSSID and RSSI are returned.
NS	Network Status	Reports the network interfaces' statuses. Includes potentially negotiated parameters like speed/duplex for Ethernet or BSSID, encryption, authentication for wireless interfaces.
co	Set IP address, host bits, gateway, and DNS server IP	Example: co 192.168.0.10 8 192.168.0.1 10001 192.168.1.10 with 192.168.0.10 = IP address of the XPress DR 8 = number of host bits 192.168.0.1 = gateway IP address 10001 = port number of the XPress DR 192.168.1.10 = IP address of the DNS Server The XPress DR stores the setup and performs a reset. It sends an X before the reset if the command was OK.
VN	Query full firmware version	This command queries and displays full firmware version in readable string format.

Responses to some of the commands are given in Intel Hex format (see [The Intel Hex Format](#)).

Note: You may be required to enter QU twice to exit monitor mode.

Entering any of the commands listed above will generate one of the following command response codes:

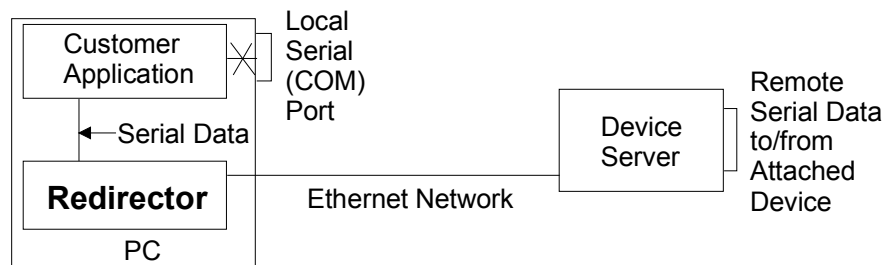
Table 11-2 Command Response Codes

Response	Meaning
0>	OK; no error
1>	No answer from remote device
2>	Cannot reach remote device or no answer
8>	Wrong parameter(s)
9>	Invalid command

12: Com Port Redirector

The Com Port Redirector allows any PC running the Microsoft® Windows® operating system to use ports on a network server as if they were connected directly to the PC. The Redirector creates a virtual COM port within Windows, which for most purposes acts just like the selected serial port on the server. Whenever this virtual port is accessed, the redirector forms a network connection to the server, and routes all data between the physical serial port on the server and the virtual port within Windows. This allows a modem on a server to be shared by many PC users, thus the name of "modem sharing" which is commonly used to describe this.

The Redirector support both IP and IPX. For IP, you must have IP installed and bound to your network card, and a server which supports TCP socket connections to its serial ports. For IPX, you must have IPX/SPX installed and bound to your network card, and the server must support IPX/SPX connections to its serial ports.



The Com Port Redirector software download and the *Com Port Redirector Quick Start Guide* are available at www.lantronix.com/downloads.

Note: *Com Port Redirector* is not suitable for use with Modbus bridge firmware.

A: Troubleshooting & Technical Support

This chapter discusses how you can diagnose and fix errors quickly without having to contact a dealer or Lantronix.

LEDs

The device contains the following LEDs:

- ♦ Two Green (**R** for ready, **L** for link)
- ♦ Three Yellow (**A** for active, serial transmit, and serial receive)
- ♦ One Red (**F** for fault)

Figure A-1 Product Information label

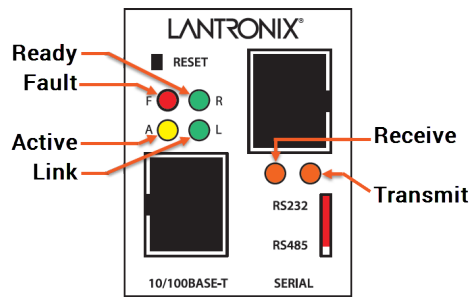


Table A-1 XPress DR LED Functions

LED	Meaning
R (Green)	Ready (Solid=ready, blinking = error message, port busy)
L (Green)	Link (socket connection made) = Solid
A (Yellow)	Activity (network) = Random Flashing
TXD (Yellow)	Transmitting serially = Flashes during transmit
RXD (Yellow)	Receiving serially = Flashes during receive
F (Red)	Fault in XPress DR communication (read error) or XPress DR is in Configuration Mode

Simultaneously lit F (Red) and R (Green) LEDs mean something is wrong. If the F (Red) LED is lit or blinking, count the number of times the R (Green) LED blinks between its pauses. Six possible blink patterns, detailed in the following table, indicate which fault condition exists.

Table A-2 LED Error Indications

LED	Error
Steady F (Red) and Blinking R (Green)	1 blink = EPROM checksum error 2 blinks = RAM error 3 blinks = Token Ring error 4 blinks = EEPROM checksum error
Blinking F (Red) and blinking R (Green)	1 blink = Faulty network connection 2 blinks = No DHCP response 4 blinks = Setup Mode

Problems and Error Messages

It helps to connect a terminal to the serial port while diagnosing an error to view summary messages that may be displayed. When troubleshooting, always ensure that the physical connections (power cable, network cable, and serial cable) are secure.

Note: Some unexplained errors might be caused by duplicate IP addresses on the network. Make sure that your unit's IP address is unique.

Table A-3 Problems and Error Messages

Problem/Message	Reason	Solution
When you issue the ARP -S command in Windows, "The ARP entry addition failed: 5" message displays.	Your currently logged-in user does not have the correct rights to use this command on this PC.	Have someone from your IT department log you in with sufficient rights.
When you attempted to assign an IP address to the device server via the ARP method, "Press Enter to go into Setup Mode" is displayed. Now when you Telnet to the device server, the connection fails.	When you Telnet into port 1 on the device server, you are only assigning a temporary IP address. When you Telnet into port 9999 and do not press Enter quickly, the device server will reboot, causing it to lose the IP address.	Telnet back into Port 1. Wait for it to fail, then Telnet to port 9999 again. Make sure you press Enter quickly.
When you Telnet to port 9999, the message "Press Enter to go into Setup Mode" displays. However, nothing happens when you press Enter, or your connection is closed.	You did not press Enter quickly enough. You only have 5 seconds to press Enter before the connection is closed.	Telnet to port 9999 again, but press Enter as soon as you see the message "Press Enter to go into Setup Mode."
When you Telnet to port 1 to assign an IP address to the device server, the Telnet window does not respond for a long time.	You may have entered the Ethernet address incorrectly with the ARP command.	Confirm that the Ethernet address that you entered with the ARP command is correct. The Ethernet address may only include numbers 0-9 and letters A-F. In Windows and usually in Unix, the segments of the Ethernet address are separated by dashes. In some forms of Unix, the Ethernet address is segmented with colons.
	The IP address you are trying to assign is not on your logical subnet.	Confirm that your PC has an IP address and that it is in the same logical subnet that you are trying to assign to the device server.
	The device server may not be plugged into the network properly.	Make sure that the Link LED is lit. If the Link LED is not lit, then the device server is not properly plugged into the network.

Problem/Message	Reason	Solution
When you try to assign an IP with DeviceInstaller, you get the following message: “No response from device! Verify the IP, Hardware address and Network Class. Please try again.”	The cause is most likely one of the following: The Hardware address you specified is incorrect. The IP address you are trying to assign is not a valid IP for your logical subnet. You did not choose the correct subnet mask.	Double-check the parameters that you specified. Tip: You cannot assign an IP address to a device server through a router.
No LEDs are lit.	The unit or its power supply is damaged.	Change power supplies.
The device server will not power up properly, and the LEDs are flashing.	Various	Consult the LEDs section in the Introduction chapter or the Quick Start for the LED flashing sequence patterns. Call Lantronix Technical Support if the blinking pattern indicates a critical error.
The device server is not communicating with the serial device it is attached to.	The most likely reason is the wrong serial settings were chosen.	The serial settings for the serial device and the device server must match. The default serial settings for the device server are RS232, 9600 Baud, 8 Character Bits, No Parity, 1 Stop Bit, No Flow Control.
When you try to enter the setup mode on the device server via the serial port, you get no response.	The issue will most likely be something covered in the previous problem, or possibly you have Caps Lock on.	Double-check everything in the problem above. Confirm that Caps Lock is not on.
You can ping the device server, but not Telnet to the device server on port 9999.	There may be an IP address conflict on your network You are not Telneting to port 9999. The Telnet configuration port (9999) is disabled within the device server security settings. A network device, such as a router, is blocking port 9999.	Turn the device server off and then issue the following commands at the DOS prompt of your computer: ARP -D X.X.X.X (X.X.X.X is the IP of the device server) PING X.X.X.X (X.X.X.X is the IP of the device server). If you get a response, then there is a duplicate IP address on the network (the LEDs on the device server should flash a sequence that tells you this). If you do not get a response, use the serial port to verify that Telnet is not disabled.
With DeviceInstaller you get the “Wrong Password” error when you try to upgrade the firmware.	You have chosen the incorrect setting for the Existing Firmware field.	Try upgrading the firmware again, but make sure to use the correct setting in the field of Existing Firmware field.

Problem/Message	Reason	Solution
The device server appears to be set up correctly, but you are not communicating with your device attached to the device server across the network.	<p>If you are sure that the serial port setting is correct, then you may not be connecting to the correct socket of the device server.</p> <p>Check the cables and wiring.</p>	<p>You can check to see whether there is a socket connection to or from the device server by looking at the Ready LED.</p> <p>If the Ready LED is blinking consistently then there is a good socket connection.</p> <p>If the Ready LED is solid green, then the socket connection does not exist. Use the Connect Mode option C0 for making a connection to the device server from the network. Use Connect Mode option C1 or C5 for a connection to the network from the device server. See the full list of Connect Mode Options in the Binary to Hexadecimal chapter.</p>
When connecting to the Web-Manager within the device server, the message “No Connection With CoBox” displays.	Your computer is not able to connect to port 30718 (77FEh) on the device server.	Make sure that port 30718 (77FEh) is not blocked with any router that you are using on the network. Also make sure that port 77FEh is not disabled within the Security settings of the device server.

Lantronix Technical Support

Lantronix offers many resources to support our customers and products at 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 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
- ◆ 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).

When troubleshooting the following problems, make sure that the XPress DR is powered up and the Link (L) LED is lit solid green. If the Link LED is not lit, then the physical network connection is bad. Confirm that you are using a good network connection.

B: Network Configuration Using UDP

UDP Datagrams

The device server can also be configured or queried over the network using UDP datagrams. The device server has a UDP listener set for port 30718 (77FE Hex). Responses from the device server are returned to the source port of the UDP packet.

The first three bytes of the UDP data block should be set to zero. The fourth byte selects the function as described in the following table:

Table B-1 UDP Configuration

Byte	Command	Parameters	Notes
03	Node Reset	2 bytes, software type	These 2 bytes are used to prevent accidental reset of the device server. (Value for standard CoBox firmware: 33 51 [Hex], 3Q)
F6	Query for Firmware Version	None	The device server responds with the F7 block below.
F7	Firmware Information	First 16 bytes of the firmware image, and 4 bytes device information and mac address.	The first 16 bytes of the firmware image contain the software type (offset 4,5) and checksum (offset 14,15). The last two bytes of the device information contain the mac address.
F8	Query for Setup Record	None	The device server responds with the F9 block below.
F9	Configuration Readback	120 byte setup record (see Setup Records on page E-7)	n/a
FA	Set Configuration	120 byte setup record (see Setup Records on page E-7)	The IP address (byte 0-3) will not be overridden using FA. See FD for this functionality.
FB	Configuration Change Acknowledge	None	This block is sent back to the host requesting a configuration change (FB). After sending out this block, the device server resets and uses the new configuration sent with the FA command.

Byte	Command	Parameters	Notes
FC	Set IP Address	<p>First 8 bytes must be set to the string IP-SETUP (Hex 49 50 2D 53 45 54 55 50).</p> <p>Next 2 bytes have to be set to 00.</p> <p>Next 2 bytes must contain the mac address.</p> <p>Next 4 bytes have to be the new IP address.</p>	<p>This block can be sent as a broadcast, because the mac address is unique. It provides one method to set the IP address of the device server if is on the local network and the mac address is known. Remember, broadcasts are only 'heard' on the subnet on which they are generated. No reply is sent by the device server, which restarts using the new IP address after the block is received.</p> <p>Example (all in Hex): 49 50 2D 63 45 54 55 50 00 00 2A 12 81 00 01 02 IP address of the node with mac address 42-18 set to 129.0.1.2</p>
FD	Set Configuration and IP Address	Same as FA, but changes IP address as well (bytes 0-3).	n/a

Configuring Multiple Devices

When configuring a number of device servers identically, it is useful to create a template setup record. The setup record can then be sent to the "target" device servers from a "master" device server via "cut and paste" or UDP (see [Network Configuration Using UDP](#)).

Device servers use a 120-byte setup record in Intel Hex format. This format facilitates the transfer of binary data using ASCII characters. See [Setup Records](#) and [The Intel Hex Format](#) for information about setup records and converting them to Intel Hex format.

Figure B-1 Sample Setup Record in Intel Hex Format

```
:20000010AC10C81D0000100000000000AC10010B4C0200001127000000000000C000000011
:200020100000000000000000000000000000000000000000000000000000000000000000B0
:200040104C0200001227000000000000C00000000000000000000000000000000000000049
:1800601000000000000000000000000000000000000000000000000000000078
:00000001FF
```

Acquiring a Valid Setup Record

There are a number of ways to acquire a valid setup record:

- ♦ Copy the setup record of a properly configured device server via Monitor Mode (easiest method).
- ♦ Request the setup record of a properly configured device server via another device server on the network.
- ♦ Build the setup record in software.
- ♦ From a host PC, request the setup record of a properly configured device server via UDP.

To copy the setup record of a properly configured device server:

1. Configure a "master" device server with the desired parameters.
2. Enter Monitor Mode on the master device server (see [11: Monitor Mode](#)).

3. At the prompt, enter GC followed by a carriage return. The device server will respond with its setup record in Intel Hex format.
4. Copy the setup record into a text file and save it for future use.

To request the setup record of a properly configured device server via another device server on the network:

1. Make sure that both units are plugged onto the network properly.
2. Enter Monitor Mode (with network support enabled) on the unit that is not properly configured. (see [11: Monitor Mode](#))
3. Issue the command GC x.x.x.x followed by a carriage return, where x.x.x.x is the IP address of the properly configured device. The properly configured device will respond by sending its setup record to the unit you are currently on. This configuration will be displayed in Intel HEX format.
4. Copy that HEX string, and then issue the command SC. Now paste the copied string.

To build the setup record in software:

1. Create a 120-byte setup record.
2. Convert it to an Intel Hex record (see [The Intel Hex Format](#)).
3. Copy the setup record into a text file and save it for future use.

To request the setup record of a properly configured device server via UDP:

1. Configure a device server with the desired parameters and place it on the network.
2. From a host PC, send the F8 datagram to the device server (see [Network Configuration Using UDP](#)). The device server responds with the F9 datagram, which includes its setup record.
3. Send a previously saved setup record from a host PC via UDP.

Sending a Setup Record

There are also a number of ways to send a setup record to a device server:

- ♦ Send a previously saved setup record via Monitor Mode (easiest method).
- ♦ Send the setup record of a properly configured device server to another device server on the network.
- ♦ Send a previously saved setup record from a host PC via UDP.

To send a setup record via Monitor Mode:

1. Configure a “master” device server with the desired parameters and place it on the network.
2. Place another device server (the “target”) on the network.
3. Enter Monitor Mode (with network support enabled) on the master device server (see [11: Monitor Mode](#).)
4. At the prompt, enter SC, the IP address of the target, and a carriage return.
5. Send the setup record to the target device server.

Note: For example, using HyperTerminal, copy the setup record and select “Paste to Host” to send it to the device server. The device server reboots with the new configuration.

To send a previously saved setup record to a device server via UDP, from a host PC, send the FA (or FD) datagram to the “target” device server (see [Network Configuration Using UDP](#)).

Note: The device server responds with the FB datagram. Refer to the table.

The Intel Hex Format

With this format, 8-bit binary data can be sent and received as ASCII text. The transmission is blocked in records, and every record has its own checksum.

The record begins with a colon (:) and consists of a block length (2-character Hex), a 16-bit address (4-character Hex), and a block type (2-character Hex). It is built by adding all binary 8-bit values and taking the complement, so adding all byte values (including length, address, and type) should yield zero.

Example:

```
00000001FF
```

End record, type 01, length 00, address 00 00, checksum FF.

```
01002000805F
```

Data record consisting of one byte (value 80 Hex) for address 0020 (32 decimal).

For communication with the node, the following block types are defined:

Table B-2 Block Types

Option	Hex
Data block program memory (firmware)	00
End record	01
Data block configuration memory	10

To get and set the node configuration, 120 bytes should be exchanged at once in 32-Byte records. The IP address in the record (bytes 0 to 3) will be ignored (unless the UDP FD command is being used).

Calculating the Checksum

As mentioned in [Table B-2 Block Types](#) above, the last two characters of an Intel Hex setup record represent a checksum of the data in the line. Since the checksum is a two-digit hexadecimal value, it can represent a value from 0 to 255.

The checksum is calculated by summing the value of the data on the line and taking the two's complement of the sum.

Note: Do not include the leading colon or the checksum byte in the sum.

Example:

```
0300300002337A1E
```

Record length: 03 (3 bytes of data)

Address: 0030 (the 3 bytes will be stored at 0030, 0031, and 0032)

Record Type: 00 (normal data)

Data: 02, 33, 7A

Checksum: 1E

$03 + 00 + 30 + 00 + 02 + 33 + 7A = E2$

The two's complement of E2 is 1E. See Calculating the Two's Complement below.

Calculating the Two's Complement

The two's complement of a number is the value that must be added to the number to reach a Hexadecimal value of 100 (256 in decimal). In the example above, E2 + 1E = 100.

You can also calculate the two's complement by subtracting the sum from 100. Using the example above again, 100 - E2 = 1E. It may help to use a scientific calculator.

Setup Records

A setup record consists of 120 bytes. They are transmitted at once from and to the node. Unused bytes should be initialized as 00. [Table B-3 Setup Record Construction](#) defines the structure of a setup record:

Table B-3 Setup Record Construction

Byte(s)	Function
00-03	IP address of the unit (x.x.x.x)
04	Reserved (0)
05	Flag BYTE Bit 7: Reserved (0) Bit 6: Set 1 for AUI, 0 for 10BASE-T (CoBox-Micro only) Bits 5-0: Reserved (0)
06	Number of host bits for subnetting; if 0, matching standard netmask for Class A, B, C is used.
07	Reserved (0)
08-11	Telnet configuration password (0 if not used)
12-15	Gateway IP address (0,0,0,0 if not used)
16-63	48-byte Channel 1 parameters; parameter setup Channel 1 (see Table E-4: Channel Parameters)
64-111	48-byte Channel 2 parameters; parameter setup Channel 2 (see Table E-4: Channel Parameters))
112-119	Reserved (0)

Channel Parameters

Use the following table to select setup record parameters for Channels 1:

Table B-4 Channel Parameters

Byte(s) (Channel 1)	Function
16	Interface Mode (see Table B-5 Interface Mode Options)
17	Line Speed Bits 7-5: Reserved Bits 4-0: Baud Rate (see Table B-7 Baud Rate Settings)
18	Flow Control (see Table B-8 Flow Control Options)
19	Reserved
20-21	Own TCP port low-byte, high-byte (Intel)
22-23	Remote TCP port low byte, high-byte (Intel)
24-27	Remote IP address (low/high low/high)
28	Connect Mode (see Table B-9- Connect Mode Options)
29	Disconnect Mode (see Table B-10 Disconnect Mode Options)
30	Disconnect w/ inactivity time-out, minutes (00 if unused)
31	Disconnect w/ inactivity time-out, seconds (00 if unused)
32-33	Characters to trigger send immediately (sendchar)
34	Flush mode (see Table B-11 Flush Mode Options)
35	Pack Control (see Table B-12 Pack Control Options)
36-47	Reserved (0)
48-63	a) Terminal name for Telnet terminal type option (15 characters max), 0-terminated. If set and Bit 6 in Disconnect Mode is set, Telnet connection will be assumed. b) Password for Passworded Socket Connection (Bit 4 in Disconnect Mode Set).

Interface Mode

The Interface (I/F) Mode is a bit-coded byte entered in hexadecimal notation. Use the following table to select Interface Mode settings:

Table B-5 Interface Mode Options

I/F Mode Option	7	6	5	4	3	2	1	0
RS-232C ⁽¹⁾							0	0
RS-422/485 ⁽¹⁾							0	1
RS-485 2-wire ⁽¹⁾							1	1
7 Bit					1	0		
8 Bit					1	1		
No Parity			0	0				
Even Parity			1	1				
Odd Parity			0	1				
1 Stop bit	0	1						
2 Stop bits	1	1						

(1) The XPress DR requires you to choose the correct setting in the IF mode, and to also set the front-panel switch for selection of RS-232/RS-485.

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

Table B-6 Common Interface Mode Settings

Option	Binary	Hex
RS-232C, 8-bit, No Parity, 1 stop bit ⁽¹⁾	0100 1100	4C
RS-232C, 7-bit, Even Parity, 1 stop bit ⁽¹⁾	0111 1000	78
RS-485 2-Wire, 8-bit, No Parity, 1 stop bit ⁽¹⁾	0100 1111	4F
RS-422, 8-bit, Odd Parity, 2 stop bits ⁽¹⁾	1101 1101	DD

(1) The XPress DR requires you to choose the correct setting in the IF mode, and to also set the front-panel switch for selection of RS-232/RS-485.

Note: See Table 11-1 Binary to Hexadecimal Conversion Table.

Baud Rate

The device server and attached serial device must agree on a speed or baud rate to use for the serial connection. Use the following table to select Baud Rate settings:

Table B-7 Baud Rate Settings

Speed (bps)	Hex
38400	00
19200	01
9600	02
4800	03
2400	04
1200	05
600	06
300	07
115200	08
57600	09

Flow Control

Flow control sets the local handshaking method for stopping serial input/output. Generally, flow control is not required if the connection is used to pass a blocked protocol with block sizes less than 1k (ACK/NAK) and/or speeds of 19200 or less. Use the following table to select Flow Control options:

Table B-8 Flow Control Options

Option	Hex
No flow control	00
XON/XOFF flow control	01
Hardware handshake with RTS/CTS lines	02
XON/XOFF pass characters to host	05

Connect Mode

Connect Mode defines how the device server makes a connection, and how it reacts to incoming connections over the network. Use the following table to select Connect Mode options:

Table B-9 Connect Mode Options

Connect Mode Option	7	6	5	4	3	2	1	0
Incoming Connection								
Never accept incoming	0	0	0					
Accept incoming with DTR ⁽¹⁾	0	1	0					
Accept unconditional	1	1	0					
Response								
Nothing (quiet)				0				
Character response (C=conn, D=disconn, N=unreachable)				1				
Startup								
No active startup					0	0	0	0
With any character					0	0	0	1
With active DTR ⁽¹⁾					0	0	1	0
With CR (0x0D) only					0	0	1	1
Manual connection					0	1	0	0
Autostart					0	1	0	1
Datagram Type								
Directed UDP					1	1	0	0
Modem Mode								
Full Verbose				1	0	1	1	0
Without Echo				0	0	1	1	0
1-character Response				1	0	1	1	1

(1) Inactive. DTR is hardwired to +12VDC.

Note: See Table 11-1 Binary to Hexadecimal Conversion Table.

Disconnect Mode

In Disconnect Mode, DTR drop either drops the connection or is ignored. Use the following table to select Disconnect Mode Options:

Table B-10 Disconnect Mode Options

Disconnect Mode Option	7	6	5	4	3	2	1	0
Disconnect with DTR drop ⁽⁶⁾	1							
Ignore DTR	0							
Telnet mode and terminal type setup ⁽¹⁾		1						
Channel (port) password ⁽²⁾				1				

Disconnect Mode Option	7	6	5	4	3	2	1	0
Hard disconnect ⁽³⁾					0			
Disable hard disconnect					1			
State LED off with connection ⁽⁴⁾								1
Disconnect with EOT (^D) ⁽⁵⁾			1					

1. The XPress DR will send the "Terminal Type" upon an outgoing connection.
2. A password is required for a connection to the serial port from the network.
3. The TCP connection will close even if the remote site does not acknowledge the disconnection.
4. When there is a network connection to or from the serial port, the state LED will turn off instead of blink.
5. When Ctrl D or Hex 04 are detected, the connection is dropped. Both Telnet mode and Disconnect with EOT must be enabled for Disconnect with EOT to function properly. Ctrl D will only be detected going from the serial port to the network.
6. DTR hardwired to +12VDC. This option is disabled in the XPress DR.

Note: See Table 11-1 Binary to Hexadecimal Conversion Table.

Flush Mode (Buffer Flushing)

Using this parameter, you can control line handling and network buffers with connection startup and disconnect. You can also select between two different packing algorithms. Use the following table to select Flush Mode options:

Table B-11 Flush Mode Options

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

Note: See Table 11-1 Binary to Hexadecimal Conversion Table.

Pack Control

Alternate packing algorithm settings are enabled in Flush Mode. Use the following table to select Pack Control options:

Table B-12 Pack Control Options

Option	7	6	5	4	3	2	1	0
Idle Time								
Force transmit: 12ms							0	0
Force transmit: 52ms							0	1
Force transmit: 250ms							1	0
Force transmit: 5sec							1	1
Trailing Characters								
None					0	0		
One					0	1		
Two					1	0		
Send Characters								
Sendchars Define 2-Byte Sequence				1				
Send Immediately After Sendchars			1					

IP Addresses

Each TCP/IP node on a network host has a unique IP address. This address provides the information needed to forward packets on the local network and across multiple networks if necessary.

IP addresses are specified as **x.x.x.x**, where each x is a number from 1 to 254; for example, 192.0.1.99. The device server must be assigned a unique IP address to use TCP/IP network functionality.

IP addresses contain three pieces of information: the network, the subnet, and the host.

Network Portion

The network portion of the IP address is determined by the network type: Class A, B, or C.

Table B-13 Network Portion of IP Address

Network Class	Network Portion of Address
Class A	First byte (2nd, 3rd, and 4th bytes are the host)
Class B	First 2 bytes (3rd and 4th bytes are the host)
Class C	First 3 bytes (4th byte is the host)

In most network examples, the host portion of the address is set to zero.

Table B-14 Available IP Addresses

Class	Reserved	Available
A	0.0.0.0 127.0.0.0	1.0.0.0 to 126.0.0.0
B	128.0.0.0 191.255.0.0	128.1.0.0 to 191.254.0.0
C	192.0.0.0 223.255.255.0	192.0.1.0 to 223.255.254.0
D, E	224.0.0.0 to 255.255.255.254 255.255.255.255	None

Consider the IP address 36.1.3.4. This address is a Class A address; therefore, the network portion of the address is 36.0.0.0 and the host portion is 1.3.4.

Subnet Portion

The subnet portion of the IP address represents which **sub-network** the address is from. Sub-networks are formed when an IP network is broken down into smaller networks using a **subnet mask**.

A router is required between all networks and all sub-networks. Generally, hosts can send packets directly only to hosts on their own sub-network. All packets destined for other subnets are sent to a router on the local network.

Host Portion

The host portion of the IP address is a unique number assigned to identify the host.

Network Address

A host address with all host bits set to 0 addresses the network as a whole (for example, in routing entries).

192.168.0.0

Broadcast Address

A host address with all host bits set to 1 is the broadcast address, meaning for “for every station.”

192.168.0.255

Network and broadcast addresses must not be used as a host address; for example, 192.168.0.0 identifies the entire network, and 192.168.0.255 identifies the broadcast address.

IP Subnet Mask

An IP subnet mask divides IP address differently than the standards defined by the classes A, B, and C. An IP subnet mask defines the number of bits to be taken from the IP address as the network or host sections. The device server prompts for the number of host bits to be entered and then calculates the netmask, which is displayed in standard decimal-dot notation (for example, 255.255.255.0) when saved parameters are displayed.

Table B-15 Standard IP Network Netmasks

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

Table B-16 Netmask Examples

Netmask	Host Bits
255.255.255.252	2
255.255.255.248	3
255.255.255.240	4
255.255.255.224	5
255.255.255.192	6
255.255.255.128	7
255.255.255.0	8
255.255.254.0	9
255.255.252.0	10
255.255.248.0	11
...	...
255.128.0.0	23
255.0.0.0	24

Private IP Networks and the Internet

If your network is not and will not be connected to the Internet, you may use any IP address. If your network is connected or will be connected to the Internet, or if you intend to operate the device server on an intranet, you should use one of the reserved sub-networks. Consult your network administrator with questions about IP address assignment.

Network RFCs

For more information about IP addresses, refer to the following documents, which can be located on the World Wide Web using one of the following directories or indices:

- ♦ RFC 950 Internet Standard Subnetting Procedure
- ♦ RFC 1700 Assigned Numbers
- ♦ RFC 1117 Internet Numbers
- ♦ RFC 1597 Address Allocation for Private Networks.

C: Connections and Pinouts

Serial Interface

XPress DR has a single serial port that can be accessed by an RJ-45 connector or screw block terminals. Both connectors support RS232 and RS485/422. By setting the switch located on the face of the XPress DR, RS232 or RS485/422 can be selected.

Note: XPress DR is a single serial port device, meaning that only the RJ-45 or the screw terminals can be used at a time. In the configuration menu, Channel 1 can refer to either the RJ-45 or the screw terminal currently being used.

RJ-45 Serial Connector

The serial RJ-45 serial connector supports up to 115200 bits per second and has the following signals.

Table C-1 Serial RJ45 Pinouts

Pin	Direction	Name	Function
1	Not Connected		None
2	Hard-wired output	DTR	DTR Data Terminal Ready
3	To XPress DR	RXD or RX-	RS-232 RXD (Received Data) RS-422/485: RX- (Received Data -)
4	From XPress DR	TXD or TX-	RS-232: TXD (Transmit Data) RS-422/485: TX- (Transmit Data -)
5		GND	Ground
6	To XPress DR	CTS or RX+	RS-232: CTS (Clear to Send) RS-422/485: RX+ (Received Data +)
7	From XPress DR	RTS or TX+	RS-232: RTS (Request to Send) RS-422/485: TX+ (Transmit Data +)
8	Not Connected		None

Note: Pin 2 (DTR) is hard wired to an RS232 positive voltage level and cannot be affected by software control.

Note: For RS-485 2-wire functionality, pins 3 & 4 and 6 & 7 must be connected together.

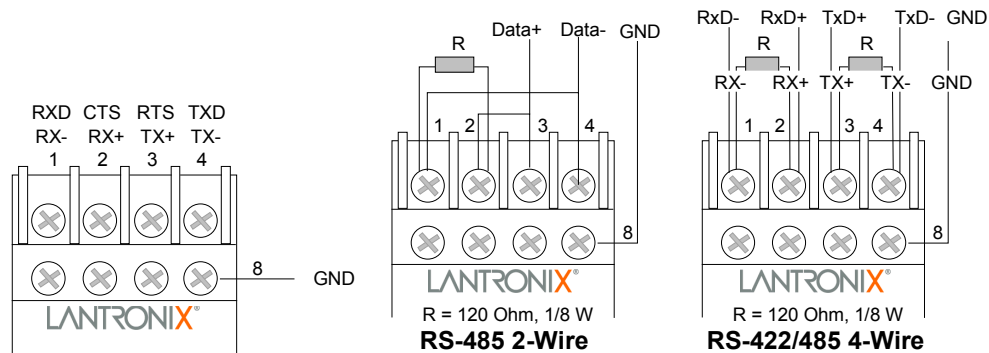
Screw Terminal Serial Connectors

Table C-2 Serial Screw Terminal Pinouts

Pin	Direction	Name	Function
1	To XPress DR	RXD or RX-	RS-232: RXD (Received Data) RS-422/485: RX- (Received Data -)
4	From XPress DR	TXD or TX-	RS-232: TXD (Transmit Data) RS-422/485: TX- (Transmit Data -)
2	To XPress DR	CTS or RX+	RS-232: CTS (Clear to Send) RS-422/485: RX+ (Received Data +)
3	From XPress DR	RTS or TX+	RS-232: RTS (Request to Send) RS-422/485: TX+ (Transmit Data +)
8	Ground	GND	Ground

Note: You can choose pin 5 or pin 8 as a ground (GND) pin.

Figure C-1 Serial Screw Terminal Pinouts



Note: For RS-485 2-wire functionality, pins 1 & 4 and 2 & 3 of the screw terminals must be connected together.

Note: Termination resistors ($R = 120 \text{ Ohm}$) are used to match impedance of a node to the impedance of the transmission (TX) line. Termination resistors should be placed only at the extreme ends of the data line, and no more than two terminations should be placed in any single segment of a RS-485 network. The terminator resistors may not be needed for your application.

RJ-45 Ethernet Interface

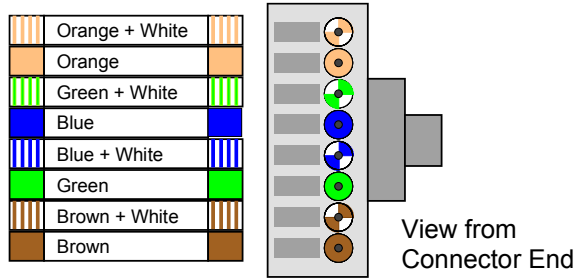
XPress DR supports 10/100Mbit Ethernet through its RJ-45 (10BaseT/100BaseTX) connector.

Table C-3 Ethernet Interface Signals

Signal Name	DIR	PIN	Primary Function
ETX+	Out	1	Ethernet Transmit Data +
ETX-	Out	2	Ethernet Transmit Data -
ERX+	In	3	Ethernet Receive Data +
ERX-	In	6	Ethernet Receive Data -

The next drawing shows a typical RJ-45 connector. The color is not standard but very typical of an Ethernet Patch cable. Pin 1 is located at the top of the connector (Orange + White). The view is from the end of the connector.

Figure C-2 RJ-45 Connector



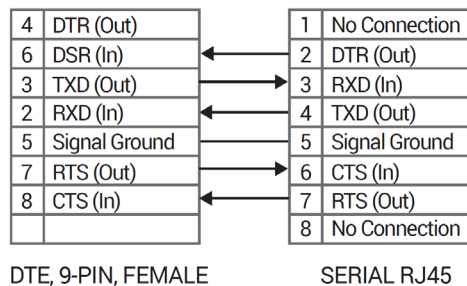
Serial Interface Connections

The serial device can be RS-232 or RS-485/422 and the connections can be screw terminals or RJ-45 connector. This section shows several practical methods for making the hardware connections. The following diagrams show typical interface cables for the RS-232 Serial interface and the Ethernet interface.

9-Pin RS-232 to Serial RJ-45

The cable diagram below is for connecting a PC (com port) to the XPress DR serial RJ45 port. You can use the serial RJ45 port to configure and test port settings prior to connection to your automation device.

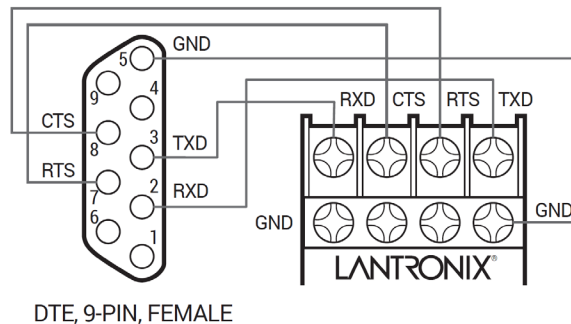
Figure C-3 RS-232 to Serial RJ-45 Connection



9-Pin RS-232 to Serial Screw Terminals

This connection assumes you are connecting a typical PC (COM1) to the XPress DR through the serial screw terminals.

Figure C-4 RS-232 Configuration



Front Panel Description

The following figure illustrates the screw block connector pinouts and other components of the XPress DR. See [Table C-4 Front Panel Components](#) for explanations corresponding to the circled numbers.

Figure C-5 Front Panel Layout

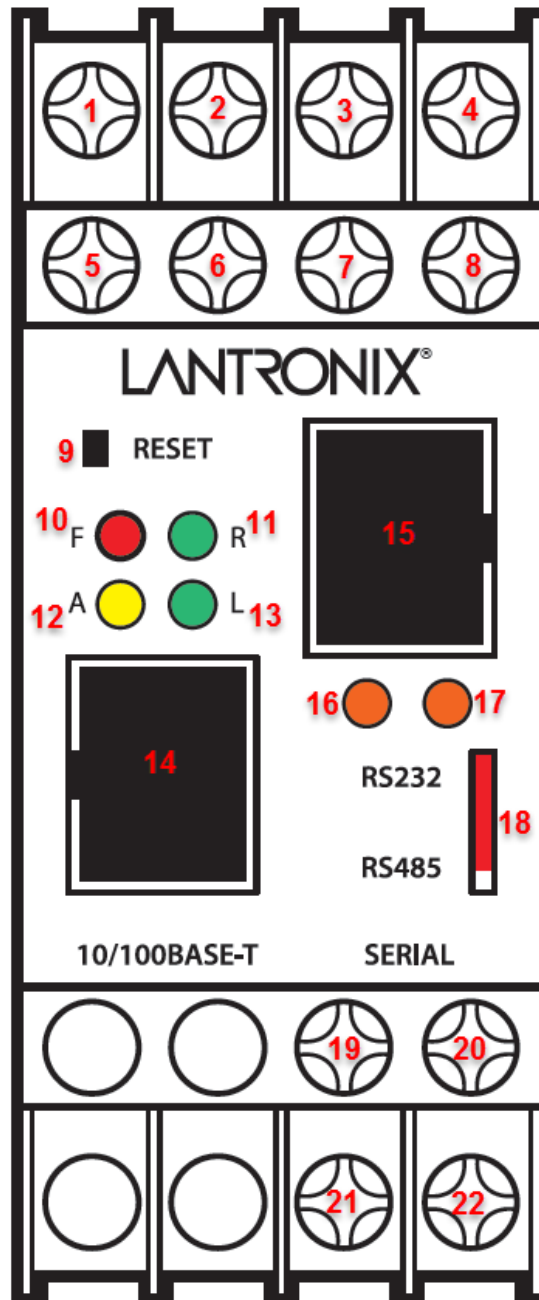


Table C-4 Front Panel Components

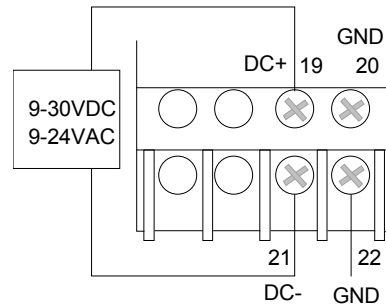
Item	Component	Name	Purpose
1	Screw terminal	RXD or RX-	RS-232: RXD (Received Data) RS-422/485:RX- (Received Data -)
2	Screw terminal	CTS or RX+	RS-232: CTS (Clear to Send) RS-422/485: RX+ (Received Data +)
3	Screw terminal	RTS or TX+	RS-232: RTS (Request to Send) RS-422/485: TX+ (Transmit Data +)
4	Screw terminal	TXD or TX-	RS-232: TXD (Transmit Data) RS-422/485: TX- (Transmit Data -)
6, 7	Screw terminal	NC	No connection
5, 8	Screw terminal	GND	Signal ground
9	Reset switch	RESET	Push to power reset and initialize
10	LED (Red)	Fault or Configuration	SOLID: Fault in XPress DR communication (read error) or XPress DR is in Configuration Mode
11	LED (Green)	Ready	SOLID: Ready, Flashing: Error Message
12	LED (Yellow)	Activity	FLASHING: Network traffic
13	LED (Green)	Link	SOLID: XPress DR has good Ethernet link
14	Connector (RJ45)	Ethernet port	RJ45 connector for Ethernet 10BaseT
15	Connector (RJ45)	Serial port	RJ45 connector for RS-232,RS-422/485
16	LED (Yellow)	Serial TXD	FLASHING: Indicates transmission from the serial port
17	LED (Yellow)	Serial RXD	FLASHING: Indicates reception to the serial port
18	Switch	Switch for screw block	UP: Serial RS-232 DOWN: Serial RS-422/485
19	Screw terminal	DC + (or AC)	Operating power, DC positive or AC
20	Screw terminal	Ground	Earth ground
21	Screw terminal	DC – (or AC)	Operating power, DC negative or AC
22	Screw terminal	Ground	Earth ground

Note: For RS-485 2-wire functionality, pins 1 & 4 and 2 & 3 of the screw terminals must be connected together.

Power Requirements

The XPress DR device server is normally powered by the same 12 VDC or 24 VDC supply that powers other devices in your panel. Many AC-powered industrial controllers also supply 24 VAC for use by field devices. The XPress DR is not shipped with a separate power supply, but any power supply with a Limited Power Source (LPS) between 9-30 VDC or 9-24 VAC can be used. The unit requires a maximum of 3 Watts.

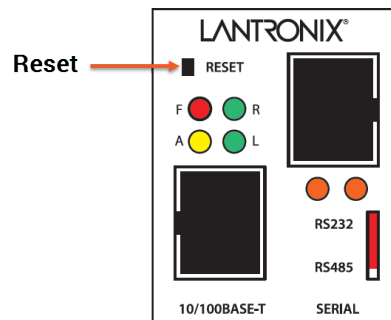
Figure C-6 Power Requirements



Reset Switch

The unit has a reset switch located on the front panel, above the red LED.

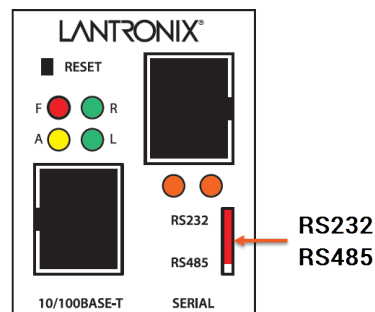
Figure C-7 Reset Switch



RS-232/RS-485 Switch

This switch controls the type of serial interface used by the serial RJ45 connector. Set this switch for RS-232 (Up) or RS-485 (Down).

Figure C-8 RS-232/RS-485 Switch



Note: The serial port RS232/RS485 switch is a hardware function. Do not change the switch while the device is operating.

D: Technical Specifications

Table D-1 Technical Specification

Category	Description
CPU, Memory	DSTni-EX 48MHz clock, 256 KB RAM
Flash, EEPROM	512 KB flash, 1024Byte EEPROM
Serial Interface	RJ45 connector for RS-232 or RS-422/485 interface Screw Terminals for RS-232 or RS-422/485 interface Baud Rate selectable from 300 to 115Kbps Switch selectable RS-232C or RS-422/485 (screw terminals only)
Reset	Front panel recessed push button.
Power Input	9-30 VDC, 9-24 VAC, 3 Watts Max, Screw Terminals Note: The power supply must be a Limited Power Source (LPS).
Dimensions	90 x 60 x 36mm, (3.54 x 2.36 x 1.41 in)
Weight	120g (4.3oz)
Temperature	Operating range: 0° to +60°C (32° to 140°F)
Humidity	20% to 90% RH, non-condensing
Case	High-Impact Plastic case designed for DIN Rail (35mm)
Protocols Supported	ARP, UDP/IP, TCP/IP, Telnet, ICMP, SNMP, DHCP, BOOTP, TFTP, and HTTP
Network Interface	10Base-T/100Base-TX Ethernet, RJ45 connector
Serial Line Formats	Characters: 7 or 8 data bits Stop bits: 1 or 2 Parity: odd, even, none
Modem Control	DTR, DCD, CTS, RTS
Flow Control	CTS/RTS (hardware), XON/XOFF (software) None
Management	Internal web server (Standard Tunneling only) SNMP (read only) Serial login Telnet login
Software Utility	DeviceInstaller, Windows based configuration software
LEDs	Ready, Fault/Configuration, Activity, Link, Serial Transmit, Serial Receive
Compatibility	Ethernet: Version 2.0/IEEE 802.3
Isolation	Ethernet: 1500 Vrms, Serial: 2000 Vrms Galvanic
Agency Approvals	UL and CSA Class I, Division 2 Hazardous Locations, TUV, FCC, CE, RCM, VCCI

E: Alternative Ways to Assign an IP Address

Earlier chapters describe how to assign a static IP address using DeviceInstaller, Web Manager, and Setup Mode (through a Telnet or serial connection). This section covers other methods for assigning an IP address over the network.

DHCP

The unit ships with a default IP address of 0.0.0.0, which automatically enables DHCP.

Provided a DHCP server exists on the network, it will assign the unit an IP address, gateway address, and subnet mask when the unit boots up. The XPress DR has acquired an IP address if the red LED stops flashing and the green Status LED is on continuously. (If no DHCP server exists, the unit responds with a diagnostic error: the red Diagnostic LED blinks continuously, and the green Status LED blinks five times. This blinking only continues for about 15 seconds.)

You can use the Lantronix® DeviceInstaller™ software to search the network for the IP your unit has been assigned by the DHCP server and add it to the managed list. See *Add the Unit to the Manage List* later in this chapter.

Note: This DHCP address will **not** appear in the unit's standard configuration screens. You can determine your unit's DHCP-assigned IP address from the DHCP server, or in Monitor Mode. When you enter Monitor Mode from the serial port with network connection enabled and issue the **NC** (Network Communication) command, you will see the unit's IP configuration.

AutoIP

The unit ships with a default IP address of 0.0.0.0, which automatically enables Auto IP within the unit. AutoIP is an alternative to DHCP that allows hosts to automatically obtain an IP address in smaller networks that may not have a DHCP server. A range of IP addresses (from 169.254.0.1 to 169.254.255.254) has been explicitly reserved for AutoIP-enabled devices. The range of Auto IP addresses is not to be used over the Internet.

If your unit cannot find a DHCP server, and you have not manually assigned an IP address to it, the unit automatically selects an address from the AutoIP reserved range. Then, your unit sends out a (ARP) request to other nodes on the same network to see whether the selected address is being used.

- ♦ If the selected address is not in use, then the unit uses it for local subnet communication.
- ♦ If another device is using the selected IP address, the unit selects another address from the AutoIP range and reboots itself. After reboot, the unit sends out another ARP request to see if the selected address is in use, and so on.

AutoIP is not intended to replace DHCP. The unit will continue to look for a DHCP server on the network. If a DHCP server is found, the unit will switch to the DHCP server-provided address and reboot.

Note: If a DHCP server is found, but it denies the request for an IP address, the unit does not attach to the network, but waits and retries.

AutoIP can be disabled by setting the unit's IP address to 0.0.1.0. This setting enables DHCP but disables AutoIP.

An IP address is a 32-bit value, divided into four octets of eight bits each. The standard representation is four decimal numbers (in the range of 0..255) divided by dots.

192.2.1.123

This is called decimal-dot notation.

The IP address is divided in two parts: network and host. To support different needs, three *network classes* have been defined. Depending on the network class, the last one, two or three bytes define the host, while the remaining part defines the network. In the following explanations, *x* stands for the host part of the IP address:

Class A Network

IP address 1.x.x.x to 127.x.x.x

Only 127 different networks of this class exist. These have a very large number of potential connected devices (up to 16,777,216).

Example: 10.0.0.1, (network 10, host 0.0.1)

Class B Network

IP address 128.0.x.x to 191.255.xxx.xxx

These networks are used for large company networks. Every network can consist of up to 65,534 devices.

Example: 172.1.3.2 (network 172.1, host 3.2)

Class C Network

IP address 192.0.0.xxx to 223.255.255.xxx

These network addresses are most common and are often used in small companies. These networks can consist of a maximum number of 254 hosts.

Example: 192.7.1.9 (network 192.7.1, host 9)

The remaining addresses 224.x.x.x - 239.x.x.x are defined as "class D" and are used as multicast addresses.

The addresses 240.x.x.x - 254.x.x.x are defined as class E and are reserved addresses.

Network Address

The host address with all host bits set to 0 is used to address the network as a whole (in routing entries, for example).

Broadcast Address

The address with the host part bits set to 1 is the broadcast address, meaning for every station.

Network and broadcast addresses must not be used as a host address (for example, 192.168.0.0 identifies the entire network and 192.168.0.255 identifies the broadcast address).

IP Netmask

The netmask is used to divide the IP address differently from the standard defined by classes A, B, C. A netmask defines how many bits from the IP address are to be taken as the network section and how many bits are to be taken as the host section. When the number of host bits is entered, the XPress DR calculates the netmask. The netmask is displayed in standard decimal-dot notation.

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

Netmask	Host bits
255.255.255.252	2
255.255.255.248	3
255.255.255.240	4
255.255.255.224	5
255.255.255.192	6
255.255.255.128	7
255.255.255.0	8
255.255.254.0	9
255.255.252.0	10
255.255.248.0	11
.	.
.	.
255.128.0.0	23
255.0.0.0	24

Private IP Networks and the Internet

If your network is not connected to the Internet, and there are no plans to make such a connection, you may use any IP address you wish.

If your network is not connected to the Internet and you have plans to connect, or you are connected to the Internet and want to operate your XPress DRs on an intranet, use one of the subnetworks below. These network numbers have been reserved for such networks. If you have any questions about IP assignment, consult your Network Administrator.

Class A	10.x.x.x
Class B	172.16.x.x
Class C	192.168.0.x

Network RFCs

For more information regarding IP addressing see the following documents. These can be located on the World Wide Web using one of the directories or indices:

- ◆ RFC 950 Internet Standard Subnetting Procedure
- ◆ RFC 1700 Assigned Numbers
- ◆ RFC 1117 Internet Numbers
- ◆ RFC 1597 Address Allocation for Private Internets

BOOTP

Similar to DHCP, but for smaller networks. Automatically assigns the IP address for a specific duration of time.

ARP and Telnet

If the unit has no IP address, you can use Address Resolution Protocol (ARP) method from UNIX and Windows-based systems to assign a temporary IP address.

To assign a temporary IP address:

1. On a UNIX or Windows-based host, create an entry in the host's ARP table using the intended IP address and the hardware address of the unit (on the product label on the bottom of the unit).

```
arp -s 191.12.3.77 00:20:4a:xx:xx:xx (Unix)
```

```
arp -s 191.12.3.77 00-20-4a-xx-xx-xx (Windows)
```

Note: For the ARP command to work on Windows operating system (OS), the ARP table on the PC must have at least one IP address defined other than its own.

2. 1.1. If you are using Windows OS, type ARP -A at the DOS command prompt to verify that there is at least one entry in the ARP table. If the local machine is the only entry, ping another IP address on your network to build a new entry in the ARP table; the IP address must be a host other than the machine on which you are working. Once there is at least one additional entry in the ARP table, use the following command to ARP an IP address to the unit:

```
arp -s 191.12.3.77 00-20-4a-xx-xx-xx
```

3. Open a Telnet connection to port 1. The connection fails quickly, but the unit temporarily changes its IP address to the one designated in this step.

```
telnet 191.12.3.77 1
```

4. Open a Telnet connection to port 9999, and press **Enter** within **five seconds** to go into Setup Mode. If you wait longer than five seconds, the unit reboots.

```
telnet 191.12.3.77 9999
```

Note: The IP address you just set is temporary and reverts to the default value when the unit's power is reset, unless you configure the unit with a static IP address and store the changes permanently.

F: Binary to Hex Conversion

Many of the device server'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.

Converting Binary to Hexadecimal

The following are two simple ways to convert binary numbers to hexadecimals.

Conversion Table

Hexadecimal digits have values ranging from 0 to F, which are represented as 0-9, A (for 10), B (for 11), etc. To convert a binary value (for example, 0010 0011) to a hexadecimal representation, the upper and lower four bits are treated separately, resulting in a two-digit hexadecimal number (in this case, 4C).

Use the following table to convert values from binary to hexadecimal.

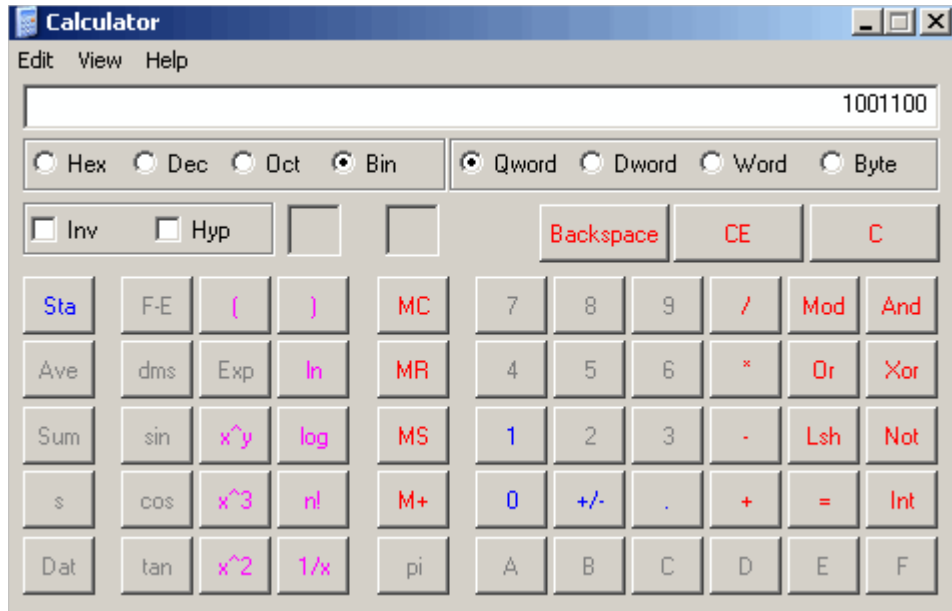
Table F-1 Binary to Hexadecimal Conversion Table

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 hexadecimals is to use a scientific calculator, such as the one available on Windows' operating systems. For example:

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



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

Connect Mode Options

Note: Character response codes are C=connect, D=disconnect, N=unreachable

Table F-2 Connect Mode Options

Accept Incoming Connections	Serial Response Upon Connection	Active Connection Startup	Hostlist	Hex
Never	None (quiet)	No active startup		N/A
Never	None (quiet)	Any character		1
Never	None (quiet)	Active DTR		2
Never	None (quiet)	CR (0x0D)		3
Never	None (quiet)	Manual connection		4
Never	None (quiet)	Autostart		5
Never	None (quiet)	UDP		C
Never	Character	No active startup		10
Never	Character	Any character		11
Never	Character	Active DTR		12
Never	Character	CR (0x0D)		13
Never	Character	Manual connection		14
Never	Character	Autostart		15
Never	Character	UDP		1C
With DTR	None (quiet)	No active startup		40
With DTR	None (quiet)	Any character		41
With DTR	None (quiet)	Active DTR		42
With DTR	None (quiet)	CR (0x0D)		43
With DTR	None (quiet)	Manual connection		44
With DTR	None (quiet)	Autostart		45
With DTR	None (quiet)	UDP		4C
With DTR	Character	No active startup		50

Accept Incoming Connections	Serial Response Upon Connection	Active Connection Startup	Hostlist	Hex
With DTR	Character	Any character		51
With DTR	Character	Active DTR		52
With DTR	Character	CR (0x0D)		53
With DTR	Character	Manual connection		54
With DTR	Character	Autostart		55
With DTR	Character	UDP		N/A
Unconditionally	None (quiet)	No active startup		C0
Unconditionally	None (quiet)	Any character		C1
Unconditionally	None (quiet)	Active DTR		C2
Unconditionally	None (quiet)	CR (0x0D)		C3
Unconditionally	None (quiet)	Manual connection		C4
Unconditionally	None (quiet)	Autostart		C5
Unconditionally	None (quiet)	UDP		CC
Unconditionally	Character	No active startup		D0
Unconditionally	Character	Any character		D1
Unconditionally	Character	Active DTR		D2
Unconditionally	Character	CR (0x0D)		D3
Unconditionally	Character	Manual connection		D4
Unconditionally	Character	Autostart		D5
Unconditionally	Character	UDP		DC
Never	None (quiet)	No active startup	Hostlist	N/A
Never	None (quiet)	Any character	Hostlist	21
Never	None (quiet)	Active DTR	Hostlist	22
Never	None (quiet)	CR (0x0D)	Hostlist	23
Never	None (quiet)	Manual connection	Hostlist	N/A
Never	None (quiet)	Autostart	Hostlist	25
Never	None (quiet)	UDP	Hostlist	
Never	Character	No active startup	Hostlist	N/A
Never	Character	Any character	Hostlist	31
Never	Character	Active DTR	Hostlist	32
Never	Character	CR (0x0D)	Hostlist	33
Never	Character	Manual connection	Hostlist	N/A
Never	Character	Autostart	Hostlist	35
Never	Character	UDP	Hostlist	N/A
With DTR	None (quiet)	No active startup	Hostlist	N/A
With DTR	None (quiet)	Any character	Hostlist	61
With DTR	None (quiet)	Active DTR	Hostlist	62
With DTR	None (quiet)	CR (0x0D)	Hostlist	63
With DTR	None (quiet)	Manual connection	Hostlist	N/A
With DTR	None (quiet)	Autostart	Hostlist	65
With DTR	None (quiet)	UDP	Hostlist	N/A
With DTR	Character	No active startup	Hostlist	N/A
With DTR	Character	Any character	Hostlist	71
With DTR	Character	Active DTR	Hostlist	72
With DTR	Character	CR (0x0D)	Hostlist	73
With DTR	Character	Manual connection	Hostlist	N/A
With DTR	Character	Autostart	Hostlist	75
With DTR	Character	UDP	Hostlist	N/A
Unconditionally	None (quiet)	No active startup	Hostlist	N/A
Unconditionally	None (quiet)	Any character	Hostlist	E1
Unconditionally	None (quiet)	Active DTR	Hostlist	E2
Unconditionally	None (quiet)	CR (0x0D)	Hostlist	E3
Unconditionally	None (quiet)	Manual connection	Hostlist	N/A

Accept Incoming Connections	Serial Response Upon Connection	Active Connection Startup	Hostlist	Hex
Unconditionally	None (quiet)	Autostart	Hostlist	E5
Unconditionally	None (quiet)	UDP	Hostlist	N/A
Unconditionally	Character	No active startup	Hostlist	N/A
Unconditionally	Character	Any character	Hostlist	F1
Unconditionally	Character	Active DTR	Hostlist	F2
Unconditionally	Character	CR (0x0D)	Hostlist	F3
Unconditionally	Character	Manual connection	Hostlist	N/A
Unconditionally	Character	Autostart	Hostlist	F5
Unconditionally	Character	UDP	Hostlist	N/A

Note: The XPress DR DTR signal is hardwired to +12VDC. DTR options are inactive.

The following connect mode options are for when you use modem emulation:

Table F-3 Connect Mode Options for Modem Emulation

Accept Incoming Connections	Response	Hex
Never	Echo	16
Never	Without echo	6
Never	1-character response	7
With DTR	Echo	56
With DTR	Without echo	46
With DTR	1-character response	47
Unconditionally	Echo	D6
Unconditionally	Without echo	C6
Unconditionally	1-character response	C7

Disconnect Mode Options

Table F-4 Disconnect Mode Options

Disconnect with DTR Drop (Note)	Telnet Mode and Terminal Type Setup	Channel (port) Password	Hard Disconnect	State LED Off with Connection	Disconnect with EOT (^D)	Hex
			Enable			0
		Enable	Enable			10
			Enable		Enable	20
		Enable	Enable		Enable	30
	Enable		Enable			40
	Enable	Enable	Enable			50
	Enable		Enable		Enable	60
	Enable	Enable	Enable		Enable	70
Enable			Enable			80
Enable		Enable	Enable			90
Enable			Enable		Enable	A0
Enable		Enable	Enable		Enable	B0
Enable	Enable		Enable			C0
Enable	Enable	Enable	Enable			D0

Disconnect with DTR Drop (Note)	Telnet Mode and Terminal Type Setup	Channel (port) Password	Hard Disconnect	State LED Off with Connection	Disconnect with EOT (^D)	Hex
Enable	Enable		Enable		Enable	E0
Enable	Enable	Enable	Enable		Enable	F0
			Enable	Enable		1
		Enable	Enable	Enable		11
			Enable	Enable	Enable	21
		Enable	Enable	Enable	Enable	31
	Enable		Enable	Enable		41
	Enable	Enable	Enable	Enable		51
	Enable		Enable	Enable	Enable	61
	Enable	Enable	Enable	Enable	Enable	71
Enable			Enable	Enable		81
Enable		Enable	Enable	Enable		91
Enable			Enable	Enable	Enable	A1
Enable		Enable	Enable	Enable	Enable	B1
Enable	Enable		Enable	Enable		C1
Enable	Enable	Enable	Enable	Enable		D1
Enable	Enable		Enable	Enable	Enable	E1
Enable	Enable	Enable	Enable	Enable	Enable	F1
			Disable			8
		Enable	Disable			18
			Disable		Enable	28
		Enable	Disable		Enable	38
	Enable		Disable			48
	Enable	Enable	Disable			58
	Enable		Disable		Enable	68
	Enable	Enable	Disable		Enable	78
Enable			Disable			88
Enable		Enable	Disable			98
Enable			Disable		Enable	A8
Enable		Enable	Disable		Enable	B8
Enable	Enable		Disable			C8
Enable	<i>Enable</i>	Enable	Disable			D8
Enable	Enable		Disable		Enable	E8
Enable	Enable	Enable	Disable		Enable	F8
			Disable	Enable		9
		Enable	Disable	Enable		19
			Disable	Enable	Enable	29
		Enable	Disable	Enable	Enable	39
	Enable		Disable	Enable		49
	Enable	Enable	Disable	Enable		59
	Enable		Disable	Enable	Enable	69
	Enable	Enable	Disable	Enable	Enable	79
Enable			Disable	Enable		89
Enable		Enable	Disable	Enable	Enable	99

Disconnect with DTR Drop (Note)	Telnet Mode and Terminal Type Setup	Channel (port) Password	Hard Disconnect	State LED Off with Connection	Disconnect with EOT (^D)	Hex
Enable			Disable	Enable	Enable	A9
Enable		Enable	Disable	Enable	Enable	B9
Enable	Enable		Disable	Enable		C9
Enable	Enable	Enable	Disable	Enable		D9
Enable	Enable		Disable	Enable	Enable	E9
Enable	Enable	Enable	Disable	Enable	Enable	F9

Note: The XPress DR DTR signal is hardwired to +12VDC. DTR options are inactive.

Flush Mode (Buffer Flushing) Options

Table F-5 Flush Mode Options

SERIAL TO NETWORK Clear input buffer upon:	NETWORK TO SERIAL Clear output buffer upon:	Alternate Packing Algorithm	Hex
None			0
Active connection			10
Passive connection			20
Active connection Passive connection			30
Disconnect			40
Active connection Disconnect			50
Passive connection Disconnect			60
Active connection Passive connection Disconnect			70
		Enable	80
Active connection		Enable	90
Passive connection		Enable	A0
Active connection Passive connection		Enable	B0
Disconnect		Enable	C0
Active connection Disconnect		Enable	D0
Passive connection Disconnect		Enable	E0
Active connection Passive connection Disconnect		Enable	F0
	Active connection		1
Active connection	Active connection		11
Passive connection	Active connection		21
Active connection Passive connection	Active connection		31
Disconnect	Active connection		41
Active connection Disconnect	Active connection		51
Passive connection Disconnect	Active connection		61

SERIAL TO NETWORK Clear input buffer upon:	NETWORK TO SERIAL Clear output buffer upon:	Alternate Packing Algorithm	Hex
Active connection Passive connection Disconnect	Active connection		71
	Active connection	Enable	81
Active connection	Active connection	Enable	91
Passive connection	Active connection	Enable	A1
Active connection Passive connection	Active connection	Enable	B1
Disconnect	Active connection	Enable	C1
Active connection Disconnect	Active connection	Enable	D1
Passive connection Disconnect	Active connection	Enable	E1
Active connection Passive connection Disconnect	Active connection	Enable	F1
	Passive connection		2
Active connection	Passive connection		12
Passive connection	Passive connection		22
Active connection Passive connection	Passive connection		32
Disconnect	Passive connection		42
Active connection Disconnect	Passive connection		52
Passive connection Disconnect	Passive connection		62
Active connection Passive connection Disconnect	Passive connection		72
	Passive connection	Enable	82
Active connection	Passive connection	Enable	92
Passive connection	Passive connection	Enable	A2
Active connection Passive connection	Passive connection	Enable	B2
Disconnect	Passive connection	Enable	C2
Active connection Disconnect	Passive connection	Enable	D2
Passive connection Disconnect	Passive connection	Enable	E2
Active connection Passive connection Disconnect	Passive connection	Enable	F2

SERIAL TO NETWORK Clear input buffer upon:	NETWORK TO SERIAL Clear output buffer upon:	Alternate Packing Algorithm	Hex
	Active connection Passive connection		3
Active connection	Active connection Passive connection		13
Passive connection	Active connection Passive connection		23
Active connection Passive connection	Active connection Passive connection		33
Disconnect	Active connection Passive connection		43
Active connection Disconnect	Active connection Passive connection		53
Passive connection Disconnect	Active connection Passive connection		63
Active connection Passive connection Disconnect	Active connection Passive connection		73
	Active connection Passive connection	Enable	83
Active connection	Active connection Passive connection	Enable	93
Passive connection	Passive connection Active connection	Enable	A3
Active connection Passive connection	Active connection Passive connection	Enable	B3
Disconnect	Active connection Passive connection	Enable	C3
Active connection Disconnect	Active connection Passive connection	Enable	D3
Passive connection Disconnect	Active connection Passive connection	Enable	E3
Active connection Passive connection Disconnect	Active connection Passive connection	Enable	F3
	Disconnect		4
Active connection	Disconnect		14
Passive connection	Disconnect		24
Active connection Passive connection	Disconnect		34
Disconnect	Disconnect		44
Active connection Disconnect	Disconnect		54
Passive connection Disconnect	Disconnect		64
Active connection Passive connection Disconnect	Disconnect		74
	Disconnect	Enable	84
Active connection	Disconnect	Enable	94
Passive connection	Disconnect	Enable	A4
Active connection Passive connection	Disconnect	Enable	B4
Disconnect	Disconnect	Enable	C4
Active connection Disconnect	Disconnect	Enable	D4
Passive connection Disconnect	Disconnect	Enable	E4

SERIAL TO NETWORK Clear input buffer upon:	NETWORK TO SERIAL Clear output buffer upon:	Alternate Packing Algorithm	Hex
Active connection Passive connection Disconnect	Disconnect	Enable	F4
	Active connection Disconnect		5
Active connection	Active connection Disconnect		15
Passive connection	Active connection Disconnect		25
Active connection Passive connection	Active connection Disconnect		35
Disconnect	Active connection Disconnect		45
Active connection Disconnect	Active connection Disconnect		55
Passive connection Disconnect	Active connection Disconnect		65
Active connection Passive connection Disconnect	Active connection Disconnect		75
	Active connection Disconnect	Enable	85
Active connection	Active connection Disconnect	Enable	95
Passive connection	Active connection Disconnect	Enable	A5
Active connection Passive connection	Active connection Disconnect	Enable	B5
Disconnect	Active connection Disconnect	Enable	C5
Active connection Disconnect	Active connection Disconnect	Enable	D5
Passive connection Disconnect	Active connection Disconnect	Enable	E5
Active connection Passive connection Disconnect	Active connection Disconnect	Enable	F5
	Passive connection Disconnect		6
Active connection	Passive connection Disconnect		16
Passive connection	Passive connection Disconnect		26
Active connection Passive connection	Passive connection Disconnect		36
Disconnect	Passive connection Disconnect		46
Active connection Disconnect	Passive connection Disconnect		56
Passive connection Disconnect	Passive connection Disconnect		66
Active connection Passive connection Disconnect	Passive connection Disconnect		76

SERIAL TO NETWORK Clear input buffer upon:	NETWORK TO SERIAL Clear output buffer upon:	Alternate Packing Algorithm	Hex
	Passive connection Disconnect	Enable	86
Active connection	Passive connection Disconnect	Enable	96
Passive connection	Passive connection Disconnect	Enable	A6
Active connection Passive connection	Passive connection Disconnect	Enable	B6
Disconnect	Passive connection Disconnect	Enable	C6
Active connection Disconnect	Passive connection Disconnect	Enable	D6
Passive connection Disconnect	Passive connection Disconnect	Enable	E6
Active connection Passive connection Disconnect	Passive connection Disconnect	Enable	F6
	Active connection Passive connection Disconnect		7
Active connection	Active connection Passive connection Disconnect		17
Passive connection	Active connection Passive connection Disconnect		27
Active connection Passive connection	Active connection Passive connection Disconnect		37
Disconnect	Active connection Passive connection Disconnect		47
Active connection Disconnect	Active connection Passive connection Disconnect		57
Passive connection Disconnect	Active connection Passive connection Disconnect		67
Active connection Passive connection Disconnect	Active connection Passive connection Disconnect		77
	Active connection Passive connection Disconnect	Enable	87
Active connection	Active connection Passive connection Disconnect	Enable	97
Passive connection	Active connection Passive connection Disconnect	Enable	A7
Active connection Passive connection	Active connection Passive connection Disconnect	Enable	B7
Disconnect	Active connection Passive connection Disconnect	Enable	C7
Active connection Disconnect	Active connection Passive connection Disconnect	Enable	D7

SERIAL TO NETWORK Clear input buffer upon:	NETWORK TO SERIAL Clear output buffer upon:	Alternate Packing Algorithm	Hex
Passive connection Disconnect	Active connection Passive connection Disconnect	Enable	E7
Active connection Passive connection Disconnect	Active connection Passive connection Disconnect	Enable	F7

Interface Mode Options

Table F-6 Interface Mode Options

Interface	Bits	Parity	Stop Bits	Hex
RS-232C	7	No	1	48
RS-232C	7	No	2	C8
RS-232C	7	Even	1	78
RS-232C	7	Even	2	F8
RS-232C	7	Odd	1	58
RS-232C	7	Odd	2	D8
RS-232C	8	No	1	4C
RS-232C	8	No	2	CC
RS-232C	8	Even	1	7C
RS-232C	8	Even	2	FC
RS-232C	8	Odd	1	5C
RS-232C	8	Odd	2	DC
RS-422/485	7	No	1	49
RS-422/485	7	No	2	C9
RS-422/485	7	Even	1	79
RS-422/485	7	Even	2	F9
RS-422/485	7	Odd	1	59
RS-422/485	7	Odd	2	D9
RS-422/485	8	No	1	4D
RS-422/485	8	No	2	CD
RS-422/485	8	Even	1	7D
RS-422/485	8	Even	2	FD
RS-422/485	8	Odd	1	5D
RS-422/485	8	Odd	2	DD
RS-422/485 2-Wire	7	No	1	4B
RS-422/485 2-Wire	7	No	2	CB
RS-422/485 2-Wire	7	Even	1	7B
RS-422/485 2-Wire	7	Even	2	FB
RS-422/485 2-Wire	7	Odd	1	5B
RS-422/485 2-Wire	7	Odd	2	DB
RS-422/485 2-Wire	8	No	1	4F

Interface	Bits	Parity	Stop Bits	Hex
RS-422/485 2-Wire	8	No	2	CF
RS-422/485 2-Wire	8	Even	1	7F
RS-422/485 2-Wire	8	Even	2	FF
RS-422/485 2-Wire	8	Odd	1	5F
RS-422/485 2-Wire	8	Odd	2	DF

Pack Control Options

Table F-7 Pack Control Options

Sendcharacter Defined by a:	Trailing Characters	Idle Time Force Transmit:	Send Immediately after Sendcharacter	Hex
1-Byte Sequence	No	12ms		0
1-Byte Sequence	No	52ms		1
1-Byte Sequence	No	250ms		2
1-Byte Sequence	No	5sec		3
1-Byte Sequence	1	12ms		4
1-Byte Sequence	1	52ms		5
1-Byte Sequence	1	250ms		6
1-Byte Sequence	1	5sec		7
1-Byte Sequence	2	12ms		8
1-Byte Sequence	2	52ms		9
1-Byte Sequence	2	250ms		A
1-Byte Sequence	2	5sec		B
2-Byte Sequence	No	12ms		10
2-Byte Sequence	No	52ms		11
2-Byte Sequence	No	250ms		12
2-Byte Sequence	No	5sec		13
2-Byte Sequence	1	12ms		14
2-Byte Sequence	1	52ms		15
2-Byte Sequence	1	250ms		16
2-Byte Sequence	1	5sec		17
2-Byte Sequence	2	12ms		18
2-Byte Sequence	2	52ms		19
2-Byte Sequence	2	250ms		1A
2-Byte Sequence	2	5sec		1B
1-Byte Sequence	No	12ms	Yes	20
1-Byte Sequence	No	52ms	Yes	21
1-Byte Sequence	No	250ms	Yes	22
1-Byte Sequence	No	5sec	Yes	23
1-Byte Sequence	1	12ms	Yes	24
1-Byte Sequence	1	52ms	Yes	25
1-Byte Sequence	1	250ms	Yes	26
1-Byte Sequence	1	5sec	Yes	27
1-Byte Sequence	2	12ms	Yes	28
1-Byte Sequence	2	52ms	Yes	29
1-Byte Sequence	2	250ms	Yes	2A
1-Byte Sequence	2	5sec	Yes	2B

Sendcharacter Defined by a:	Trailing Characters	Idle Time Force Transmit:	Send Immediately after Sendcharacter	Hex
2-Byte Sequence	No	12ms	Yes	30
2-Byte Sequence	No	52ms	Yes	31
2-Byte Sequence	No	250ms	Yes	32
2-Byte Sequence	No	5sec	Yes	33
2-Byte Sequence	1	12ms	Yes	34
2-Byte Sequence	1	52ms	Yes	35
2-Byte Sequence	1	250ms	Yes	36
2-Byte Sequence	1	5sec	Yes	37
2-Byte Sequence	2	12ms	Yes	38
2-Byte Sequence	2	52ms	Yes	39
2-Byte Sequence	2	250ms	Yes	3A
2-Byte Sequence	2	5sec	Yes	3B

G: Compliance

Compliance Information Emission/Susceptibility

(According to ISO/IEC Guide 22 and BS 7514)

Manufacturer's Name & Address

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

Declares that the following product:

Product Name Model: XPress DR, XPress DR-IAP Device Servers

Conforms to the following standards or other normative documents:

Safety

- ◆ IEC 60950-1:2005/A1:2010
- ◆ EN 60950-1:+A11+A1+A12:2011
- ◆ UL 60950-1:2003, First Edition
- ◆ CSA C22.2 No. 60950-1-03 1st Ed. April 1, 2003
- ◆ ISA 12.12.01, Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
- ◆ CSA C22.2 No. 213, Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
- ◆ VCCI 2006/4/3

Electromagnetic Emissions

- ◆ CFR Title 47 FCC Part 15, Subpart B, Class A Emissions
- ◆ EN55022: 2010, Class A Emissions
- ◆ CISPR 22, Class A Emissions: 2009
- ◆ EN61000-6-4: 2007 Emission Standard for Industrial Environment

Electromagnetic Immunity

- ◆ EN55024: 2010 Information Technology Equipment-Immunity Characteristics
- ◆ EN61000-4-2: 2009 Electro-Static Discharge Test
- ◆ EN61000-4-3: 2006 + A1: 2008 + A2: 2010 Radiated Immunity Field Test
- ◆ EN61000-4-4: 2004 Electrical Fast Transient Test
- ◆ EN61000-4-6: 2009 Conducted Immunity Test
- ◆ EN61000-4-8: 2010 Magnetic Field Test
- ◆ EN61000-6-2: 2005 Immunity for Industrial Environment

Supplementary Information

This Class A digital apparatus complies with Canadian ICES-003 (CSA) and has been verified as being compliant within the Class A limits of the FCC Radio Frequency Device Rules (FCC Title 47, Part 15, Subpart B CLASS A), measured to CISPR 22: 1993 limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment. The product complies with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.

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RoHS, REACH and WEEE Compliance Statement

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