

XPort™ Data Sheet

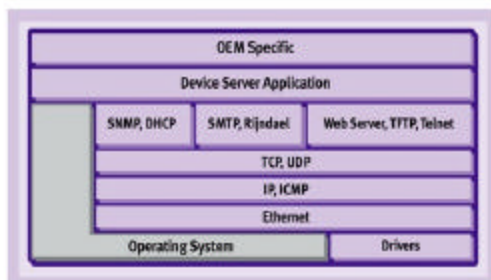
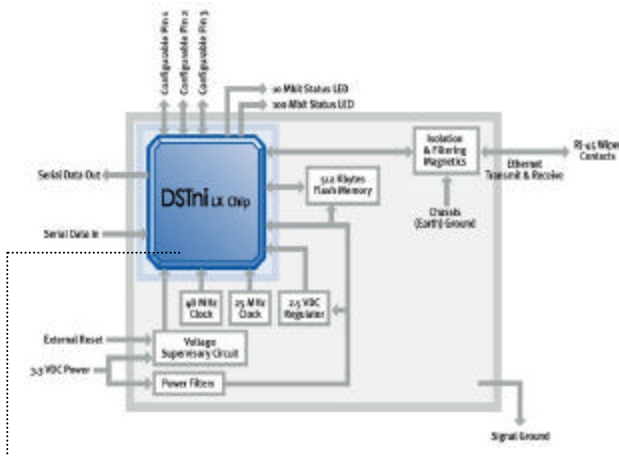
General Description

The XPort™ is the most compact, integrated solution available to web-enable any edge device with a serial interface. By simply adding XPort™ to a product design, device manufacturers can now offer Ethernet connectivity in as little as 60 days.



The XPort offers the highest level of integration available in a device server. Within a compact RJ-45 package is a DSTni-LX 186 controller, memory, 10/100 Ethernet transceiver, high-speed serial port, LED diagnostics, and 3 programmable I/O pins. In the space that is normally consumed by a connector, the XPort provides a complete networking interface.

To enable access to a local network or the Internet, the XPort integrates a fully developed TCP/IP network stack and OS. The XPort also includes an embedded web server that can be used to remotely configure, monitor, or troubleshoot the attached device.



Where there's a need for custom user interfaces and a desire to use common and familiar tools, the XPort can serve Java applets to a web browser. The XPort becomes a conduit between you and your device over the network or Internet.

The Windows™-based configuration software, XPort Installer, simplifies installation and setup. The XPort can also be set up locally through its serial port, or remotely over a network using telnet or a web browser. Flash memory provides for maintenance-free nonvolatile storage of web pages, and allows future system software upgrades.

Using our highly integrated hardware and software platform, you will add profit to your bottom line by significantly reducing product development time, risk, and cost.

Key Features

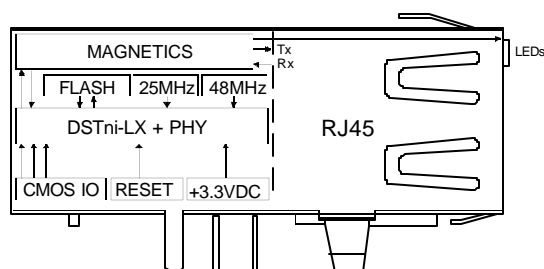
- The only device server in an RJ-45 form factor. Compact package size (industry first)
- Complete integrated solution
- Embedded web server
- 10/100BASE-T Ethernet – Auto-Sensing
- Stable, field proven TCP/IP protocol suite and web-based application framework
- Easy configuration through a web interface
- Easy customization of HTML web pages and configuration screens
- Interactive web pages through the use of Java applets
- E-Mail
- 128-bit AES U.S. Government. approved Rijndael encryption (Optional)
- EMI tested and compliant
- Extended operating temperature -40 to +85° C
- High performance data throughput (12 MIPS at 48 MHz, 10/100M Ethernet)
- Network overhead handled by XPort
- Password protection
- Upgrade XPort's firmware over the network
- 3.3V power requirements
- Serial to Ethernet conversion

Hardware & Software Description

The XPort is a complete solution (hardware and software) for web-enabling your edge devices. Packed into an RJ-45 connector that is smaller than your thumb, this powerful device server comes with a 10BASE-T/100BASE-TX Ethernet connection, a reliable and proven operating system stored in flash memory, an embedded web server, a full TCP/IP protocol stack, and 128-bit standards-based (AES) encryption.

The XPort software runs on a DSTni-LX controller which has 256KB of SRAM, 2KB of boot ROM, and a MAC with integrated 10/100BASE-TX PHY. The XPort communicates to the edge device through a 3.3V serial interface and 3 general purpose programmable IO pins. 512KB of flash memory is included for storing firmware and web pages. The XPort runs on 3.3V, and has a built-in voltage supervisory circuit that will trigger a reset if the supply voltage drops to unreliable levels (3.08V). A built-in 2.5V regulator drives the processing core of the LX controller.

The XPort connects directly to an RJ-45 plug. Ethernet magnetics, status LEDs, and shielding are built in. The XPort was designed to meet class B emissions levels, which makes the electromechanical integration very simple.



Serial Interface

The 8-pin serial interface consists of 3.3V CMOS Data In/Out, 3 Flow Control/Handshake/PIO pins, reset input, +3.3V power, and signal ground.

Table 1 - Serial Interface Signals

| Signal Name | Pin | Function |
|-------------|-----|--|
| GND | 1 | Circuit Ground |
| Vcc | 2 | +3.3V Power In |
| Reset (In) | 3 | External Reset In |
| Data OUT | 4 | Serial Data Out |
| Data IN | 5 | Serial Data In |
| CP1 | 6 | Configurable Pin 1: Flow control – connects to CTS of attached DTE device, Programmable Digital Input or Output, Status LED 1 |
| CP2 | 7 | Configurable Pin 2: Modem control – connects to DCD of attached DTE device, Programmable Digital Input or Output |
| CP3 | 8 | Configurable Pin 3: Flow control – connects to RTS of attached DTE device, Modem control – connects to DTR of attached DTE device, Programmable Digital Input or Output, Status LED 3 |

Ethernet Interface

The 10/100 ethernet magnetics, network status LEDs, and RJ-45 connector are integrated into the XPort.

Table 2 - Ethernet Interface Signals

| Signal Name | DIR | Contact | Primary Function |
|-------------|-----|---------|--------------------------------------|
| TX+ | Out | 1 | Transmit Data + |
| TX- | Out | 2 | Transmit Data – |
| RX+ | In | 3 | Differential Ethernet Receive Data + |
| RX- | In | 6 | Differential Ethernet Receive Data – |
| | | 4 | Terminated |
| | | 5 | Terminated |
| | | 7 | Terminated |
| | | 8 | Terminated |
| SHIELD | | | Chassis Ground |

Protocol Support

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

Other supported protocols are listed below:

- ARP, UDP, TCP, ICMP, Telnet, TFTP, AutoIP, DHCP, HTTP, and SNMP for network communications.
- TCP, UDP, and Telnet for connections to the serial port.
- TFTP for firmware updates.
- IP for addressing, routing, and data block handling over the network.
- User Datagram Protocol (UDP) for typical datagram applications in which devices interact with other devices without maintaining a point-to-point connection.

* For a complete discussion of protocol support, see the XPort user manual.

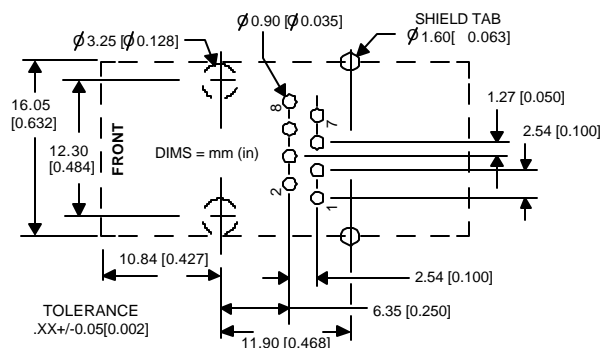
LEDs

The device contains two Bi-color LEDs built into the front of the XPort connector. (See dimension drawing for location.)

| Left LED | Right LED | Meaning |
|----------------|----------------|---------------------------------|
| Off | Off | No Link |
| Off | Solid Amber | 100BASE-T Half Duplex Link |
| Off | Blinking Amber | 100BASE-T Half Duplex; Activity |
| Off | Solid Green | 100BASE-T Full Duplex Link |
| Off | Blinking Green | 100BASE-T Full Duplex; Activity |
| Solid Amber | Off | 10BASE-T Half Duplex Link |
| Blinking Amber | Off | 10BASE-T Half Duplex; Activity |
| Solid Green | Off | 10BASE-T Full Duplex Link |
| Blinking Green | Off | 10BASE-T Full Duplex; Activity |

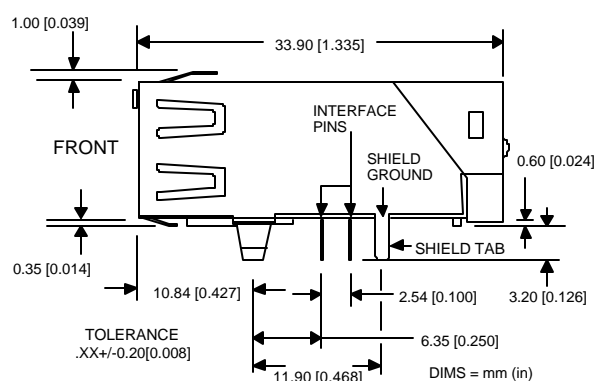
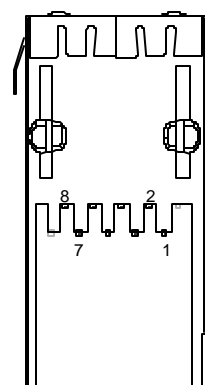
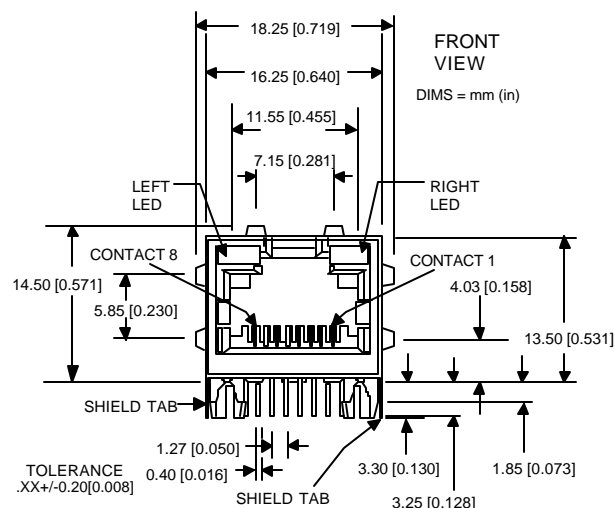
Recommended PC Board Layout

The hole pattern and mounting dimensions for the XPort are shown in the following drawing.



Dimensions

The XPort dimensions are shown in the following drawings.



Note: PADS and PROTEL design files are included with the XPort™ Development Kit.

XPort Technical Data

| Category | Description |
|---------------------|---|
| CPU, Memory | Lantronix DSTni-LX 186 CPU, 256 KB zero wait state SRAM 512KB Flash, 2KB Boot ROM |
| Firmware | Upgradeable via TFTP and serial port |
| Reset Circuit | 200msec power up/down reset pulse. Reset triggered at 3.08V. Manual reset input supplies a 200msec reset. |
| Serial Interface | CMOS (Asynchronous) 3.3V-level signals Speed software selectable (300bps to 230400bps) |
| Serial Line Formats | 7 or 8 data bits, 1-2 Stop bits, Parity: odd, even, none |
| Modem Control | DTR, DCD, CTS, RTS |
| Flow Control | XON/XOFF (software), CTS/RTS (hardware), none |
| Programmable I/O | 3 PIO pins (software selectable) Sink or source 8ma max. |
| Network Interface | RJ45 Ethernet 10BASE-T or 100BASE-TX (auto-sensing) |
| Compatibility | Ethernet: Version 2.0/IEEE 802.3 |
| Protocols Supported | ARP, UDP/IP, TCP/IP, Telnet, ICMP, SNMP, DHCP, BOOTP, TFTP, Auto IP, and HTTP |
| LEDs | 10BASE-T & 100BASE-TX Activity, Full/half duplex. Pins 6 & 8 can also drive external LEDs for XPort™ status & diagnostics. |
| Management | Internal web server, SNMP (read only) Serial login, Telnet login |
| Security | Password protection, locking features, optional Rijndael 128-bit encryption |
| Internal Web Server | Serves web pages and Java applets Storage capacity: 384KB |
| Weight | 9.6 grams (0.34 oz) |
| Material | Metal shell, thermoplastic case |
| Temperature | Operating range: -40°C to +85°C (-40°F to 185°F) Storage range: -40°C to +85°C (-40°F to 185°F) |
| Relative Humidity | Operating: 5% to 95% non-condensing |
| Shock/Vibration | Non-operational shock: 500 g's, Non-operational vibration: 20 g's |
| Warranty | 1-year limited warranty |
| Included Software | Windows™ 98/NT/2000/XP based XPort™ Installer configuration software and Windows™ based Comm Port Redirector |
| EMI Compliance | Radiated & conducted emissions - complies with Class B limits of EN 55022:1998 Direct & Indirect ESD - complies with EN55024:1998 RF Electromagnetic Field Immunity - complies with EN55024:1998 Electrical Fast Transient/Burst Immunity - complies with EN55024:1998 Power Frequency Magnetic Field Immunity - complies with EN55024:1998 RF Common Mode Conducted Susceptibility - complies with EN55024:1998 |

DC Characteristics for Serial and Power Interface

| Symbol | Parameter | Min | Nominal | Max | Units |
|-----------------|---|------|---------|-----------------|-------|
| V _{CC} | Supply voltage (typical 3.3) (+/-5%) | 3.14 | 3.3 | 3.46 | V |
| V _{IL} | Low Level Input Voltage | 0 | | 0.8 | V |
| V _{IH} | High Level Input Voltage | 2.0 | | V _{CC} | V |
| V _{OL} | Low Level Output Voltage | | | 0.4 | V |
| V _{OH} | High Level Output Voltage | 2.4 | | | V |
| I _L | Input or Output Leakage Current | 10 | | 10 | μA |
| I _{CC} | Typical Supply Current (idle) | | 130mA | | |
| I _{CC} | Typical Supply Current (10BASE-T activity) | | 140mA | | |
| I _{CC} | Typical Supply Current (100BASE-T activity) | | 210mA | | |

With the purchase of XPort, the OEM agrees to an OEM firmware license agreement that grants the OEM a non-exclusive, royalty-free firmware license to use and distribute the binary firmware image provided, only to the extent necessary to use the XPort hardware.

Development Kit

Introduction

An XPort development kit is available to provide a simple, quick, and cost effective way to evaluate the XPort. It can also serve as an development kit to allow manufacturers to jumpstart their development work. The XPort development Kit provides a circuit board assembly with the XPort, a power regulator, configuration options, and an RS232 serial interface. A reset circuit with a push button reset, status LEDs, and a timer circuit are also available.

Features of the Development Kit

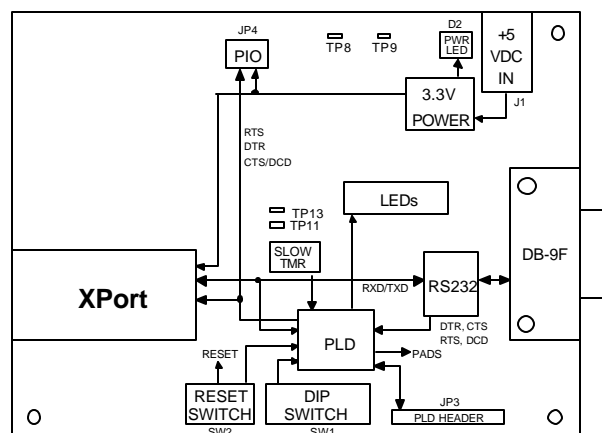
- Complete, ready to use XPort circuit assembly to allow quick assessment and product development
- Universal AC power adapter included
- Network (CAT5) and serial cables included
- Connector adapter included
- Complete User Manual describing XPort installation, configuration, firmware upgrades, product customization, and troubleshooting
- XPort CD containing a configuration utility, Xport Installer, the Comm Port Redirector, sample code, and all the documentation in PDF.



Ordering Information

| | |
|----------------|--|
| XPort-XE | Standard XPort |
| XPort-XE SMPL | Standard XPort Sample Case |
| XPort-SE | Standard XPort with Encryption |
| XPort-XE SMPL | Standard XPort Sample Case with Encryption |
| Xport Dev. Kit | Development Kit with Standard XPort and Encryption |

Block Diagram



Features of the Evaluation Board

The XPort evaluation board includes an XPort integrated with the following features:

- RS232 serial interface
- DIP Switch configuration
- LED Indication for power, RS232 transmit / receive and PIO Status
- Reset circuit with pushbutton reset
- Header connector for the PIO signals CP1, CP2, and CP3
- Test points to monitor the XPort's serial interface signals
- Timer



For details contact your local Lantronix representative or Lantronix directly:

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