XPort™-485 Data Sheet

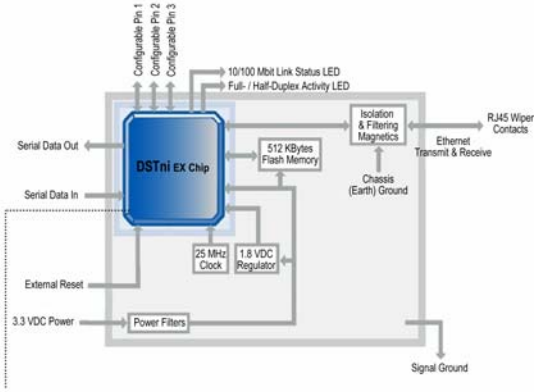
General Description

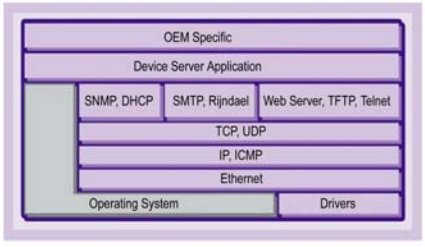
The XPort™-485 is the most compact, integrated solution available to web-enable any device with an RS-422 or RS-485 serial interface. By simply adding XPort-485 to a product design, device manufacturers cut their design cycle by as much as 80% and are able to offer Ethernet connectivity in record time.

The XPort-485 is configurable for either RS-422 4-wire or RS-485 2-wire communication. It supports multi-drop RS-485 networks by providing a logic level serial interface designed to connect directly to an RS-485 transceiver chip. In the RS-485 2- wire mode, one of the PIO pins supplies the necessary transmit enable signal.

The XPort-485 offers the highest level of integration available in a device server. Within a compact RJ45 package is a DSTni-EX 186 controller, memory, 10/100 Ethernet transceiver, high-speed serial port, status/diagnostic LEDs, and 3 programmable I/O pins. In the space that is normally consumed by a connector, the XPort-485 provides a complete networking interface.

To enable access to a local network or the Internet, the XPort-485 integrates a fully developed TCP/IP network stack and OS. The XPort-485 also includes an embedded web server 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-485 can serve web pages to a web browser. The XPort-485 becomes a conduit between you and your device over the network or Internet.

The Windows™-based configuration software, DeviceInstaller, simplifies installation and setup. The XPort-485 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 complete, integrated solution in an RJ45 form factor
- Complete integrated solution
- RS-422/485 support
- Multi-drop RS-485 network support
- Embedded web server
- 10/100Mbit 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 alerts
- 128-, 192-, or 256-bit AES Rijndael encryption (Optional)
- EMI tested and compliant
- Extended operating temperature:
  -40 to +85° C normal mode
  -40 to +75° C high-performance mode
- High-performance processor
  (12 MIPS at 48 MHz, 22 MIPS at 88 MHz)
- Network overhead handled by XPort
- Password protection
- Upgrade XPort's firmware over the network
- 3.3V power
- Serial-to-10/100 Ethernet conversion
- 921,600 baud serial speed

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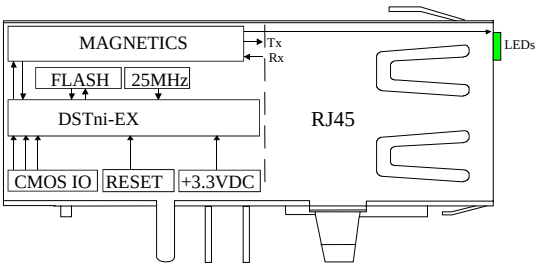
Hardware & Software Description

The XPort-485 is a complete solution (hardware and software) for web-enabling your edge devices. Packed into an RJ45 connector 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 standards-based (AES) encryption.

The XPort-485 software runs on a DSTni-EX controller which has 256 KB of SRAM, 16 KB of boot ROM, and a MAC with integrated 10/100BASE-TX PHY. The XPort-485 communicates to the device through a 3.3V serial interface and three general-purpose programmable I/O pins. 512 KB of flash memory is included for storing firmware and web pages. The XPort-485 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 (2.7V). A built-in 1.8V regulator drives the processing core of the EX controller.

An RJ45 Ethernet cable connects directly into an XPort-485. Ethernet magnetics, status LEDs, and shielding are built in. The XPort-485 was designed to meet class B emissions levels, which makes the electromechanical integration very simple.



PCB Interface

The 8-pin PCB interface consists of 3.3V CMOS Serial In/Out, 3 Flow Control/Handshake/PIO pins, reset input, +3.3V power, and signal ground. All pins are 5V tolerant.

Table 1 - PCB Interface Signals

Signal Name	Pin	Function
GND	1	Circuit Ground
Vcc	2	+3.3V Power In
$\overline{\text{Reset}}$ (In)	3	External Reset In
Data OUT	4	Serial Data Out
Data IN	5	Serial Data In
CP1	6	CP1 can be configured as follows: • **Flow control**: RTS (Request to Send) **output** driven by DSTni's built-in UART for connection to CTS of attached device. • **Programmable input/output**: CP1 can be driven or read through software control, independent of serial port activity.
CP2	7	CP2 can be configured as follows: • **Modem control**: DTR (Data Terminal Ready) **output** driven by DSTni's built-in UART for connection to DCD of attached device. • **Programmable input/output**: CP2 can be driven or read through software control, independent of serial port activity.
CP3	8	CP3 can be configured as follows: • **Flow control**: CTS (Clear to Send) **input** read by DSTni's built-in UART for connection to RTS of attached device. • **Modem control**: DCD (Data Carrier Detect) **input** read by DSTni's built-in UART for connection to DTR of attached device. • **Programmable input/output**: CP3 can be driven or read through software control, independent of serial port activity.

Ethernet Interface

The 10/100 Ethernet magnetics, network status LEDs, and RJ45 connector are integrated into the XPort-485.

Table 2 - Ethernet Interface Signals

Signal Name	DIR	Contact	Primary Function
TX+	Out	1	Transmit Data +
TX-	Out	2	Transmit Data –
RX+	In	3	Receive Data +
RX-	In	6	Receive Data –
Not Used		4	Terminated
Not Used		5	Terminated
Not Used		7	Terminated
Not Used		8	Terminated
SHIELD			Chassis Ground

Protocol Support

The XPort-485 uses Internet Protocol (IP) for network communications and Transmission Control Protocol (TCP) to assure that no data is lost or duplicated, and that everything sent 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 guide.

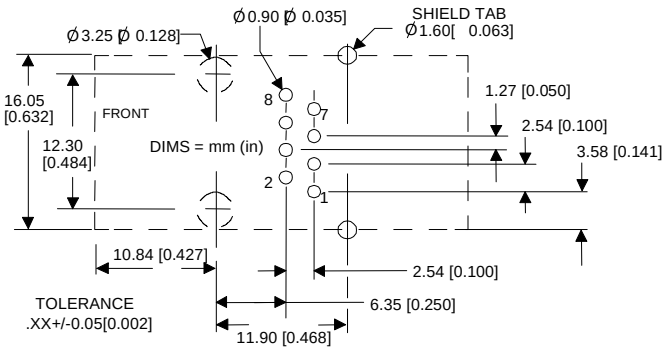
LEDs

The device contains two bi-color LEDs built into the front of the XPort-485 connector. (See dimension drawing for location.)

Link LED (Left Side)		Activity LED (Right Side)	
Color	Meaning	Color	Meaning
Off	No Link	Off	No Activity
Amber	10 Mbps	Amber	Half-Duplex
Green	100 Mbps	Green	Full-Duplex

Recommended PC Board Layout

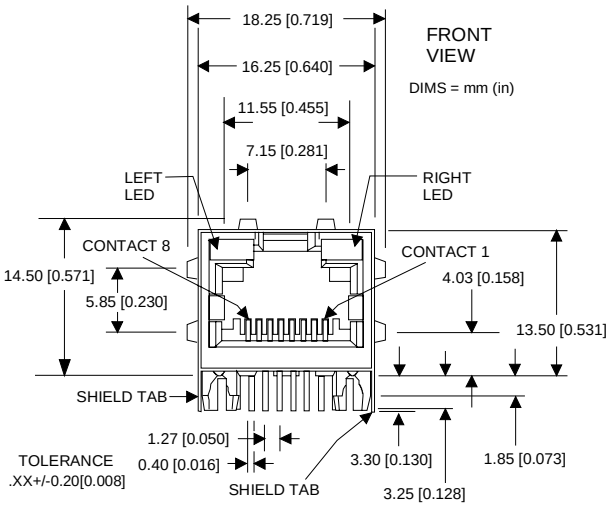
The hole pattern and mounting dimensions for the XPort-485 are shown in the following drawing:

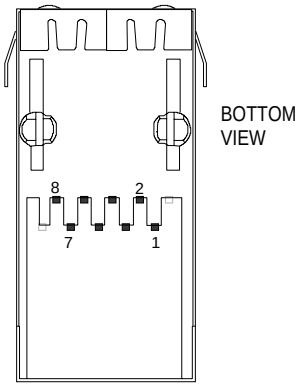


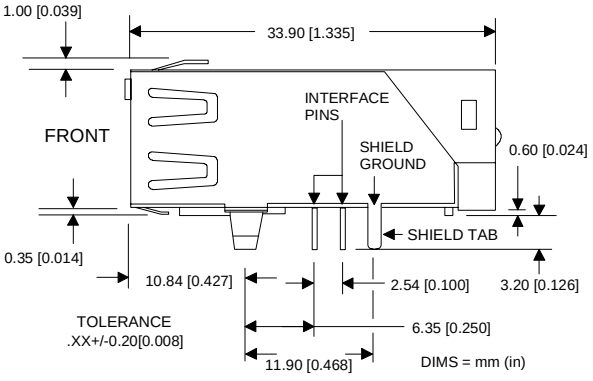
For proper heat dissipation, the PCB should have approximately 1 square inch of copper attached to the shield tabs. The shield tabs are an important source of heat sinking for the device.

Dimensions

The XPort-485 dimensions are shown in the following drawings:







XPort-485 Technical Data

Category	Description
CPU, Memory	Lantronix DSTni-EX 186 CPU, 256 KB zero wait state SRAM 512 KB Flash, 16 KB Boot ROM
Firmware	Upgradeable via TFTP and serial port
Reset Circuit	Internal 200ms power-up reset pulse. Power-drop reset triggered at 2.6V. External reset input causes an internal 200ms reset.
Serial Interface	CMOS (Asynchronous) 3.3V-level signals RS-422 4-wire and RS-485 2-wire support (RS-422/485 transceivers not included) Rate is software selectable (300 bps to 921600 bps)
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 4mA 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 Link Activity, Full/half duplex. Sofware generated status & diagnostic signals can optionally drive external LEDs through CP1 & CP3 (see Int. Guide).
Management	Internal web server, SNMP, Serial login, Telnet login
Security	Password protection, locking features, optional Rijndael 128-, 192-, or 256-bit encryption
Internal Web Server	Serves web pages Storage capacity: 384 KB
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) normal mode -40°C to +75°C (-40°F to 167°F) high-performance mode 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	2-year limited warranty
Included Software	Windows™ 98/NT/2000/XP-based DeviceInstaller 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, PIO, and Power Interface

Symbol	Parameter	Min	Nominal	Max	Units
Vcc	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		5.5	V
V_{OL}	Low Level Output Voltage			0.4	V
V_{OH}	High Level Output Voltage	2.4			V
I_I	Input Leakage Current			1	µA
I_{CC}	Supply Current (idle)@ 48 MHz		119		mA
I_{CC}	Supply Current (10BASE-T activity)@ 48 MHz		224		mA
I_{CC}	Supply Current (10BASE-T activity)@ 88 MHz		267		mA
I_{CC}	Supply Current (100BASE-T activity)@ 48 MHz		190		mA
I_{CC}	Supply Current (100BASE-T activity)@ 88 MHz		233		mA

With the purchase of XPort-485, 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-485 hardware

Ordering Information

Model	Part Number	Description
XPort-485	XP1004000-03	Std. XPort with encryption & RS-485 support Min. order: 50 units
XPort-485 SMPL	XP100400S-03	XPort-485 sample case One XPort-485 enclosed

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