Link

Lava I/O News

LAVA

Lava Ether-Serial Links

Intelligent Remote Serial Ports

What are Ether-Serial Links?

Ether-Serial Links are network devices that install serial ports on Ethernet networks. The serial ports in an Ether-Serial Link send information to an Ethernet, by converting it to an IP-compatible format and sending it out the Ethernet side of the Ether-Serial Link. Data moving the other direction, from the Ethernet side of the Ether-Serial Link to the serial device, undergoes the same process in reverse.

Ether-Serial Links are among the most versatile of network devices. With them, you can access and control serial ports across a network, as simply and easily as if they were right in the box of the PC beside you. You can extend a serial connection to any distance, even across the Internet.

Ether-Serial Links assign IP addresses to their serial ports, making it possible for a single PC to control many serial devices, or for many PCs to access a particular serial device. The ports of a Lava Ether-Serial Link are conventional serial and Ethernet ports.

Extend the reach of serial ports, without a network

An Ether-Serial Link can be connected directly to a PC's network interface card using an Ethernet crossover cable. In this configuration, a one-to-one relationship exists between the Ether-Serial Link and a PC. The serial ports of the PC have the serial ports of the Ether-Serial Link added just as if they were in the PC itself. The 50 foot cable limitation of RS-232 no longer exists!

Access and control a serial device across a network

Here's where things get interesting. An Ether-Serial Link makes it possible to attach a serial device anywhere on a LAN or WAN. Simply attach the serial device you wish to network-enable onto an Ether-Serial Link, and connect the Ether-Serial Link to a network switch or hub. Install the Ether-Serial Link driver on any system that you want to use to access the Ether-Serial Link's ports. This driver installs the Lava Discovery Protocol, which can automatically detect and access Ether-Serial Links on the same network segment. Supply a gateway address, and Ether-Serial Links can be made available to the LAN or WAN as a whole, across switches or routers. Access to the Ether-Serial Link's serial ports can be restricted to specific network users, or open to the network as a whole. Whatever a PC could do through its internal serial ports—controlling factory equipment, operating POS devices, or monitoring a security system, for example—can now be done transparently across a network.

Access and control a serial device across the Internet

The power of the serial networking really shows when it is used to tap the infrastructure of the Internet or a company intranet. In this application, Ether-Serial Links are configured with both IP and gateway addresses, and become available anywhere the Internet reaches. Now that's power!

Ether-Serial Link Marketplaces

- Gaming Systems
- Industrial and Factory Automation
- POS Systems
- Security Systems
- Remote Device Management
- Building Automation
- Residential Automation
- Medical Device Monitoring

Ether-Serial Link Benefits

- Network RS-232 serial devices
- Make devices available to multiple users
- Manage multiple serial devices from a single PC
- Eliminate long dedicated serial runs
- Eliminate costly dedicated terminal servers
- Manage serial devices anywhere
- Eliminate long-distance phone-modem charges

Lava's Ether Link Concept: *The Ethernet Bus*

We at Lava see the Ethernet in the same way we see the PCI bus: not just as a transport medium for data transmission, but as a tool to make hardware easier to install and use. For this reason, Lava Ether-Serial Links handle the Ethernet in much the same way as serial port expansion cards use the Plug and Play capabilities of the PCI bus. (Don't forget: Lava makes a lot of serial PCI products — we know what we're doing.) Ether-Serial Links from Lava have been designed from the ground up to be the most intuitive and easy-to-use products of their type on the market.

This simplicity comes naturally to Lava. We specialize in engineering serial ports for computers, particularly in the Windows Plug and Play and the PCI bus worlds. While many network serial products are rooted in Ethernet, Lava takes a different approach. The serial ports in the Lava Ether-Serial Link family are designed from the outset to be *serial ports*.

The point here is that the serial ports in a Lava Ether-Serial Link are true COM ports. They appear in Windows Device Manager as COM ports, just like the internal COM ports in your PC now. ANY software that needs to communicate with a COM port can communicate with the COM ports of a Lava Ether-Serial Link. This means, for instance, even software running in a DOS window in Windows. Few if any other serial-to-Ethernet devices can make that claim.
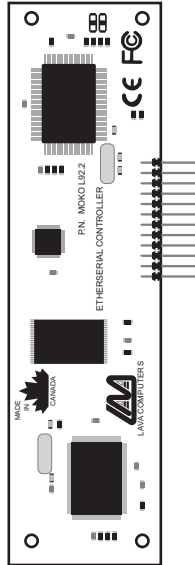
Lava's Ether-Serial Link Family: Modular Design

Lava builds a wide range of Ether-Serial Links. Our modular hardware and software design allows us to create a wide range of standard products. The Ether-Serial Link family has RS-232, RS-422, and RS-485 Ether-Serial Links, in single, two, and four-port versions. Each is ideal for gaming, POS, industrial, security, or general network use. All Ether-Serial Links are "Ethernet Plug and Play" capable, as they use the Lava Discovery Protocol.
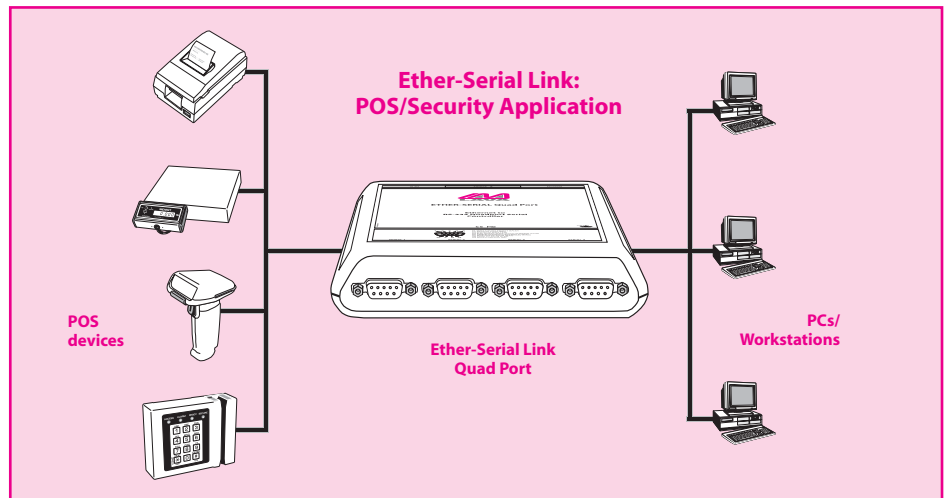
In addition, Lava makes specialized products, such as multi-port and multi-protocol Ether-Serial Links. An example developed for a POS system in major grocery retail chain offers eight RS-232, RS-422, and RS-485 connections in one box.

Lava also makes Ether-Serial Links for the embedded market. One example is an Ether-Serial Link board customized for embedding into a retail store's exit security system.

Embedded Single-Port RS-232 Ether-Serial Link Module for Retail Store Security System

Switchable Eight-port RS-232, RS-422, RS-485 Ether-Serial Link

Ether-Serial Link: POS/Security Application

POS devices

Ether-Serial Link Quad Port

PCs/ Workstations

What Sets the Lava Ether-Serial Link Apart?

Yes, other companies make products that can access a serial port across an Ethernet network. So what makes the Lava Ether-Serial Link better? Simply put, the Lava products are a whole lot smarter. This intelligence provides several key benefits: simpler installation, greater ease of use, flexible configuration, and more reliable connectivity.

Simpler Installation

The software behind the Lava Ether-Serial Link is carefully and innovatively engineered to make installation as effortless as possible. The unique "Lava Discovery Protocol" (LDP), which all Lava Ether-Serial Links recognize and respond to, makes it possible for a station running Lava's device management software to discover, connect to, and configure Lava Ether-Serial Links anywhere on a network segment. Lava makes the Ethernet network act very much like the PCI bus in a computer, and the Lava Ether-Serial Links are effectively Plug and Play devices!

Greater Ease of Use

The Lava Ether-Serial line of remote serial parts are the easiest to use. Lava's driver software completely handles the interface between applications running on your PC and the serial ports on Lava Ether-Serial Links. This makes Lava's Ether-Serial Links easy to use: if your software is looking for a serial port, *nothing* needs to be done to make it work with a Lava Ether-Serial Link. By contrast, the majority of Ethernet-to-serial devices on the market require an additional layer of code be written to make the serial output of an application hand off its data to the Ethernet side of their Ethernet-to-serial device.
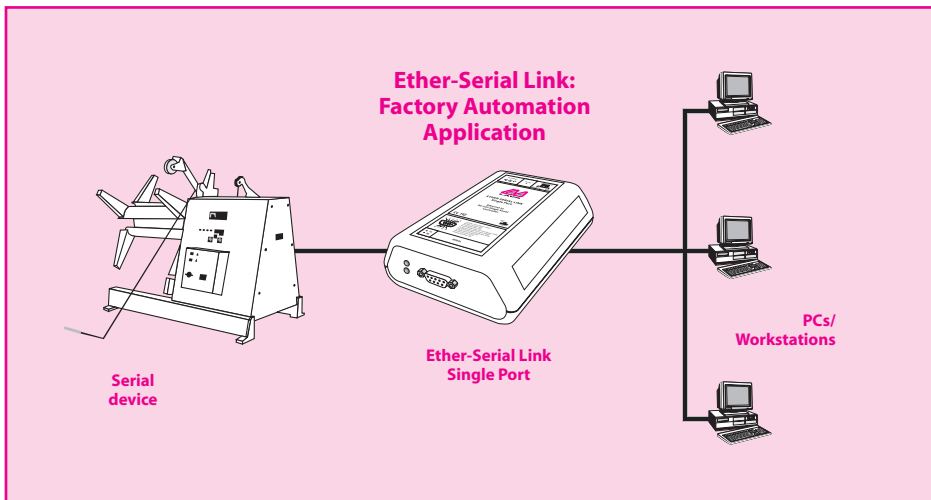
Flexible Configuration

The Ether-Serial Link from Lava can be easily and remotely configured. Whether you need to change serial port settings or upload a new firmware image, the Lava Discovery Protocol's configuration software makes full remote configuration possible thorough a browser-based interface communicating with an embedded web server in the Lava Ether-Serial Link.

More Reliable Connectivity

Lava's remote serial ports have a major advantage when deployed on a network segment that is assigning IP addresses dynamically. When the IP address of an Ether-Serial Link's remote port changes (typically by being reassigned by a DHCP server), the device does not lose connection with client PCs on its network segment. Reliable connections are maintained between those client stations and the Lava Ether-Serial remote ports.

Warranty

The Lava Ether-Serial Links, like all Lava products, are covered by the Lava Lifetime Warranty.

**Ether-Serial Link:
Factory Automation
Application**

**Ether-Serial Link
Single Port**

**Serial
device**

**PCs/
Workstations**

The Rock-Solid Link
Communications Reliability and Security with the Lava Ether-Serial Link

Ether-Serial Links from Lava are highly reliable and secure. In terms of reliability, data exchanges between the PC and the Lava Ether-Serial Link are sent through the network over TCP/IP. The TCP protocol, by design, provides reliability for the data transfer. In addition, Ether-Serial Link data uses a second, Lava-developed, data transport protocol, within the TCP/IP wrapper that adds a second degree of assurance of data integrity. As a second, specialized layer it also adds an informal degree of security, although that is not its purpose. Finally, data integrity is also handled by the nature of serial connection itself, with its attendant error checking, flow control, handshaking, and buffering.

Configuration and control commands are handled by the Lava Discovery Protocol. This protocol has a 24-byte security key that can secure access to Lava Ether-Serial Links, preventing unauthorized access. By design, Lava Discovery Protocol commands expect acknowledgments, guaranteeing their integrity and successful execution, despite the fact that they use UDP — a protocol that does not expect acknowledgments of the successful receipt of data — as their transport protocol.

At the Application Level, any required encryption or special data handling procedures may be easily implemented. In addition, standard Internet-compatible security procedures can be introduced on the network side as required.

Padlock image ©2000 BT Internet.com

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ETHER-SERIAL LINK PRODUCT SUMMARY

	Ports			Connectors			Modes			
Product	1	2	4	DB-9	RJ-45	Powered	RS-232	RS-422	RS-485	TTL
Ether-Serial Link 1-DB9	✔			✔			✔			
Ether-Serial Link 2-DB9		✔		✔			✔			
Ether-Serial Link 4-DB9			✔	✔			✔			
Ether-Serial Link 1-RJ45	✔				✔	✔	✔			
Ether-Serial Link 2-RJ45		✔			✔	✔	✔			
Ether-Serial Link 4-RJ45			✔		✔	✔	✔			
Ether-Serial Link 1-DB9/P	✔			✔		✔	✔			
Ether-Serial Link 2-DB9/P		✔		✔		✔	✔			
Ether-Serial Link 4-DB9/P			✔	✔		✔	✔			
Ether-Serial Link 1-DB9/422	✔			✔				✔		
Ether-Serial Link 2-DB9/422		✔		✔				✔		
Ether-Serial Link 4-DB9/422			✔	✔				✔		
Ether-Serial Link 1-RJ45/422	✔				✔	✔		✔		
Ether-Serial Link 2-RJ45/422		✔			✔	✔		✔		
Ether-Serial Link 4-RJ45/422			✔		✔	✔		✔		
Ether-Serial Link 1-DB9/485	✔			✔					✔	
Ether-Serial Link 2-DB9/485		✔		✔					✔	
Ether-Serial Link 4-DB9/485			✔	✔					✔	
Ether-Serial Link 1-RJ45/485	✔				✔	✔			✔	
Ether-Serial Link 2-RJ45/485		✔			✔	✔			✔	
Ether-Serial Link 4-RJ45/485			✔		✔	✔			✔	
Ether-Serial Link 1-TTL	✔									✔

OTHER LAVA PRODUCTS

Serial Boards
PCI
SSerial-PCI	Single 9-pin serial, 16550 UART
SSerial-PCI/LP	Single 25-pin serial, 16550 UART, low profile
SSerial-PCI 3.3V	Single 9-pin serial, 16550 UART, for 3.3 volt PCI
RS422 SS-PCI	Single 9-pin serial, 16550 UART, RS-422 pinouts
DSerial-PCI	Dual 9-pin serial, 16550 UARTs
DSerial-PCI/LP	Dual 9-pin serial, 16550 UARTs, low profile
DSerial-PCI 3.3V	Dual 9-pin serial, 16550 UARTs, for 3.3 volt PCI
RS422 DS-PCI	Dual 9-pin serial, 16550 UARTs, RS-422 pinouts
Quattro-PCI	Four-port 9-pin serial, 16550 UARTs
Quattro-PCI 3.3V	Four-port 9-pin serial, 16550 UARTs, for 3.3 volt PCI
RS422 Quattro-PCI	Four-port 9-pin serial, 16550 UARTs, RS-422 pinouts
Octopus-550	Eight-port 9-pin serial, 16550 UARTs
LavaPort-650	Single 9-pin serial, 16650 UART
LavaPort-PCI	Dual 9-pin serial, 16650 UARTs
LavaPort-Quad	Four-port 9-pin serial, 16650 UARTs

ISA
SSerial-550	Single 25-pin serial, Com 1-4, 16550 UART, IRQ 3/4/5/7
DSerial-550	Dual 9-pin serial, Com 1-4, 16550 UARTs, IRQ 2/3/4/5/7/10/11/12/15
RS422-550	Dual 9-pin serial, 16550 UARTs, RS-422 pinout
LavaPort-ISA	Single 9-pin serial, Com 1-4, 16650 UART, IRQ 2/3/4/5/10/11/12/15
LavaPort-PnP	Single 9-pin serial, 16650 UART, Plug and Play

Parallel Boards
PCI
Parallel-PCI	Single EPP parallel
Parallel-PCI/LP	Single EPP parallel, low profile
Parallel-PCI 3.3V	Single EPP parallel, for 3.3 volt PCI
Dual Parallel-PCI	Dual EPP parallel

ISA
Parallel Bi-directional	Single bi-directional parallel port, LPT 1/2/3, IRQ 5/7
Parallel-ECP/EPP	Single ECP/EPP parallel, LPT 1-6, IRQ 2/3/4/5/7/10/11/12

Combo Boards
PCI
SP-PCI	Single 9-pin serial, 16550 UART + single bi-directional parallel
2SP-PCI	Dual serial (9 & 25-pin), 16550 UARTs + single EPP parallel
LavaPort-Plus	Dual serial (9 & 25 pin), 16650 UARTs + single EPP parallel

ISA
2SP-550	Dual 9-pin serial, Com 1-4, 16550 UARTs + single bi-dir.parallel, LPT 1-2

USB 2.0 & 1.1 Devices
USB 2.0 Host Adapter	Dual USB 2.0 ports, 480 Mbps, fits in PCI slot
USB 1.1 Host Adapter	Dual USB 1.1 ports, 12 Mbps, fits in PCI slot
SPH-USB 1.1 Hub	Three powered USB 1.1 ports, parallel port, serial port, connects to USB

IEEE 1394 (FireWire®) Devices
IEEE 1394 FireHost	Dual IEEE 1394 ports, 400 Mbps, fits in PCI slot
IEEE 1394/IDE Controller	FireWire®-to-IDE hard drive interface

Specialty Boards
PCI
8255-PIO	8255 PIO interface card

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