

# Product Catalog 2003 - 2004

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# LonWorks® Product Catalog

2003-2004 Edition – Version A

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## Corporate Profile

This catalog presents Echelon's family of products including a complete range of LONWORKS development and network tools and OEM support services.

Echelon is a networking infrastructure company that develops, manufactures, and supports products and services that add intelligence to everyday devices—light switches, washing machines, assembly line robots, thermostats, gas pumps, motion sensors, air conditioners, pumps, and valves—allowing them to communicate with one another locally and across the Internet. Our family of hardware and software products and services are built on open standards and enable devices from different manufacturers, in different industries, to work together. Original equipment manufacturers (OEMs), building owners, facility managers, and system integrators use Echelon products to design, install, and manage device networks of all kinds. Backed by a worldwide support and training organization, Echelon provides development assistance, product design reviews, and a full curriculum of training courses.

At the foundation of Echelon's networking infrastructure is the LONWORKS device networking platform. LONWORKS devices employ distributed peer-to-peer communications, whereby each device in the network can receive, transmit, and process network information independently of other devices. This means that LONWORKS devices can make decisions and process information without the need for a PC, gateway, programmable logic controller (PLC), or some other form of central host processor or controller. This peer-to-peer architecture increases reliability while reducing the total cost of a LONWORKS network.

The protocol, or language, used to communicate among LONWORKS devices is an open standard known as ANSI/EIA/CEA-709.1-B. The same communications protocol has also been incorporated into many other standards including IEEE 1473 (train control), SEMI (semiconductor manufacturing equipment), and IFSF (EU petrol stations). Traditionally, control networks have used closed protocols and systems that locked the customer into a sole supplier for any changes, additions, or spare parts. In the open world of LONWORKS networks, there are multiple sources of products and services, and customers have the freedom to choose from whom they buy.

The LONWORKS platform was designed from the ground up to operate on multiple communications media. Echelon specializes in the supply of twisted pair transceivers (for signaling on copper wires) and power line transceivers (for signaling over the power mains of a building or machine); fiber optic, radio frequency, infrared, and coaxial cable transceivers are available from other suppliers. This flexibility allows LONWORKS networks to be used in a wide variety of industrial, commercial, home, governmental, and institutional applications worldwide. The signaling technology in Echelon's power line and twisted pair transceivers and smart transceivers are accredited as ANSI/EIA 709.3-1999 & 709.2-1999 respectively. Our power line technology is the only one certified to work worldwide—allowing manufacturers to cut costs by using the same power line signaling technology for all markets.

Recognizing that control networks may be located in disparate locations throughout a plant or city, or even in different countries, Echelon designed the LONWORKS platform to support wide-area networking, including dial-in/out modems and IP (Internet Protocol) networking. IP support is an integral component of many Echelon products. Echelon's LNS software—the standard network management platform for LONWORKS networks—permits remote clients to operate over IP networks for remote installation, management, operation,

and maintenance of control networks. The *i*LON Internet Server family provides LONWORKS connectivity, and depending on the model, offers Web Servers (XML/SOAP support), e-mail applications, IP tunneling, and a range of powerful applications. By integrating IP, XML, SOAP, and Web Services into the standard LONWORKS networking architecture, Echelon can provide Internet connectivity to tens of millions of LONWORKS devices in use today.

Echelon recently introduced the Panoramix Enterprise Software Platform to allow businesses with multiple remote sites to supervise those facilities via Web Services based applications. Using the Panoramix platform, companies can gain deeper insights into the operation of their processes and facilities, allowing managers to make better business decisions, provide better and more profitable service, and realize new revenue opportunities.

To make LONWORKS networks as economical as possible, Echelon has worked with semiconductor vendors to create a family of low-cost LONWORKS microprocessors called Neuron® Chips. Embedded by OEMs in their products, Neuron Chips are an economical and simple means of adding LONWORKS control and networking to any product. Programmed with Echelon development tools and integrated with network management software, transceivers, routers, serial adapters, and other Echelon OEM products described in this catalog, Neuron Chips form the basis for complete control devices. With over 30 million Neuron Chips shipped to date, LONWORKS is the leading worldwide control networking platform.

To better serve the users of control networks, Echelon created the LonPoint family of control products. Designed for use both as a stand-alone system or together with LONWORKS products made by other manufacturers, the LonPoint family of products integrates new and legacy analog and digital devices into cost-effective, interoperable control systems. By leveraging the open architecture and distributed intelligence inherent in LONWORKS networks, the LonPoint products lower overall installation and life cycle costs, increase reliability by minimizing single points of failure, and provide the flexibility to adapt to a wide variety of applications.

Echelon's Open Systems Alliance™ program trains and supports OEMs and integrators worldwide on the design, commissioning, and maintenance of open, interoperable LONWORKS network solutions. Drawn from among the best manufacturers and integrators worldwide, Echelon's OSA members are highly trained specialists in the supply of building, home, and industrial automation systems.

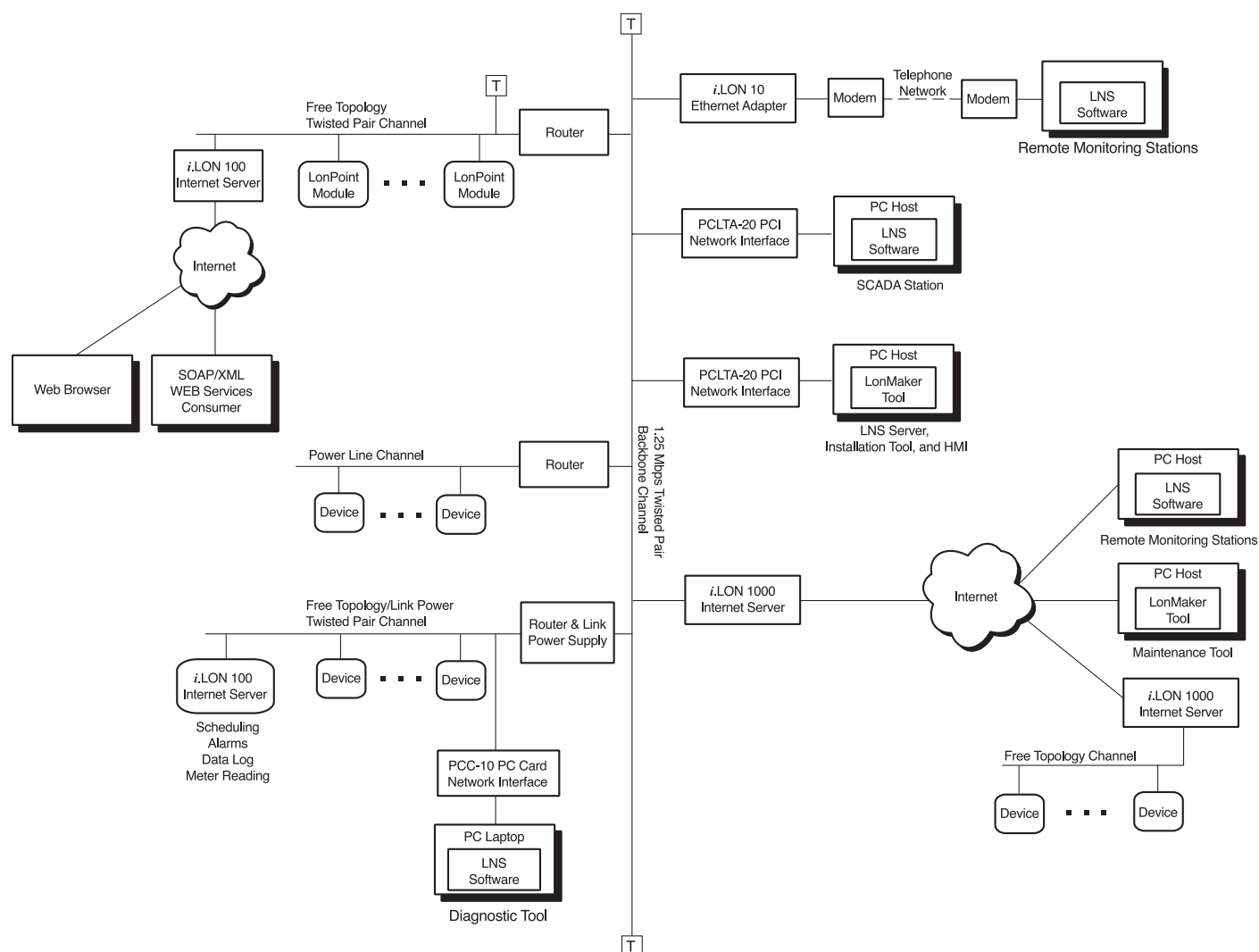
Integrating products from among the thousands of suppliers of LONWORKS products would be a daunting task were it not for the work of the LONMARK Interoperability Association. Formed in May 1994 to enable the easy integration of multi-vendor LONWORKS networks, the Association is funded by a virtual "who's-who" of control manufacturers, end-users, equipment specifiers, and system integrators. The Association provides an open forum for member companies to collaborate on marketing and technical programs to promote open, interoperable control solutions. Products that have been verified to conform to LONMARK interoperability guidelines are eligible to carry the LONMARK logo, which indicates that the product has been designed to interoperate across a LONWORKS network.

## LonWORKS Products Overview

Echelon offers everything you need to develop, manufacture, install, operate, and maintain LONWORKS networks, including:

- Development Tools
- Enterprise Software
- I/O Devices
- Integration Tools
- Internet Connectivity Products
- Network Interfaces
- OEM Components
- Routers

The following figure illustrates how these pieces fit in a LONWORKS network.





## Echelon Software Matrix

Echelon software tools may be used independently or in combination. The following table provides a simple means of determining which tools should be purchased based on the target application.

Echelon Product(s):	Product Type:	License Type:		Purchaser:	Used to Create:
		Click-through	Signed		
LNS Application Developer's Kit for Windows	Application Development Kit	✓		OEM Manufacturer	LNS Applications
LNS Application Developer's Kit for Windows + LNS Redistribution Kit for Windows	Application Development Kit Application	✓	✓	OEM Manufacturer	LNS Applications + LNS Server
LNS Application Developer's Kit for Windows + LNS Redistribution Kit for Windows + Echelon Software License Generator	Application Development Kit Application	✓ ✓	✓	OEM Manufacturer	LNS Applications + LNS Server + LNS Device Credits
LonMaker Integration Tool	Application	✓		OEM Manufacturer Network Integrator End User	LonWORKS Systems + LNS Server
LonMaker Integration Tool + Echelon Software License Generator	Application Application	✓	✓	OEM Manufacturer Network Integrator*	LonWORKS Systems + LNS Server + LonMaker Credits
LonMaker Integration Tool + LNS DDE Server	Application Application	✓ ✓		OEM Manufacturer Network Integrator	LonWORKS Systems + LNS Server + DDE Compatible Application (e.g., HMI)
LonMaker Integration Tool + LNS DDE Server + Echelon Software License Generator	Application Application Application	✓ ✓	✓	OEM Manufacturer Network Integrator	LonWORKS Systems + LNS Server + DDE Compatible Application + LonMaker Credits
LNS Application Developer's Kit for Windows + LonMaker Integration Tool + Echelon Software License Generator	Application Development Kit Application Application	✓ ✓	✓	OEM Manufacturer	LNS Applications (e.g., HMI) + LonWORKS Systems + LNS Server + LonMaker Credits

\*This product requires the purchase of 10,000 LonMaker Credits, and may or may not be suitable for use by a Network Integrator.

## Development Tools

Echelon's development tools provide the foundation for quickly developing intelligent devices and applications.

The **NodeBuilder Development Tool** integrates a complete set of tools for developing LONWORKS devices and systems. These tools include an environment for developing and debugging applications at multiple devices and a network manager to install and configure these devices.

The NodeBuilder tool includes the LONWORKS Wizard, a tool that can save hours to days of programming by generating a software template for an interoperable LONWORKS device with a few clicks of the mouse.

By leveraging the existing 8, 16, or 32-bit micro controller and software inside a device and adding only a tiny amount (less than 4Kbytes) of additional code, Echelon's **ShortStack Micro Server** software enables manufacturers to add substantial new functionality to their products while preserving their past development investment. With ShortStack software, devices can communicate with other smart devices over the Internet and across LONWORKS networks, the world's leading open standard for networking everyday devices.

Echelon offers modules and serial (EIA-232) interfaces for applications in which a host processor other than the Neuron Chip is used as part of a LONWORKS device to provide additional features, functionality, or processing power.

The **Microprocessor Interface Program (MIP)** is firmware that transforms a Neuron Chip into a communications co-processor for an attached host processor. The MIP enables the attached host to implement LONWORKS applications and to communicate with other devices using the EIA-709.1 protocol. Applications on the host can send and receive network variable updates and application messages, as well as poll network variables. The MIP opens the LONWORKS EIA-709.1 protocol to a variety of hosts including PCs, workstations, embedded micro-processors, and micro controllers.

The **LNS Network Operating System** is a powerful, scalable platform for installing, upgrading, and interacting with control networks. The LNS multi-client capability allows multiple users to install devices, diagnose problems, and make repairs simultaneously. LNS maximizes accessibility, because network users and operators can work both locally or remotely. LNS reduces complexity by automating common system tasks and handling directory management and routing of services.

For developers creating OSGi™ enabled service gateways, the **LONWORKS Bundle Deployment Kit** software package may be used for designing, installing, operating, and maintaining multi-vendor, open, interoperable LONWORKS networks. The kit includes ready-to-use LONWORKS support bundles, example device service bundles, utilities, tools, and documentation. The LONWORKS Bundle Deployment Kit provides a complete LONWORKS network service delivery solution for telcos, cable operators, utilities and other service gateway operators.

Product	Model	Description
NodeBuilder Development Tool	10020	LONWORKS device development system.
ShortStack Micro Server	23400	Software that enables existing products to be easily networked.
MIP/P20/P50 and MIP/DPS Developer's Kits	23200 23210	Transforms a Neuron Chip into a communications co-processor for an attached host processor.
Echelon Software License Generator	34311	Software for distributing LNS Device Credits to end-users.
LNS Application Developer's Kit for Windows	34309	Package of tools for developing LNS-based network tools.
LNS Redistribution Kit for Windows	34312	Software for redistributing the LNS Server and Remote Client software.
LONWORKS Bundle Deployment Kit	34611	Software package for designing, installing, operating, and maintaining multi-vendor, open, interoperable LONWORKS networks connected to OSGi enabled service gateways.
LCA Field Compiler API	33300	Software for developing field compilation and debugging tools. Includes functions for compiling, linking, exporting, and debugging Neuron C applications.

## NODEBUILDER DEVELOPMENT TOOL MODEL 10020



### Features

- LTM-10A based platform supports initial application development and testing
- Gizmo 4 I/O Board provides prototype hardware for testing, including a 4x20 character LCD display
- Resource editor displays available functional profiles, network variable types, and configuration property types, and can be used to create new functional profiles and types
- Neuron C Version 2.1 compiler supports many new language features for LONMARK compliant applications
- Code wizard automatically generates Neuron C code to implement a LONMARK standard device interface
- LNS development components support development of LNS device plug-ins

### Description

The NodeBuilder Development Tool is a hardware and software platform that is used to develop applications for Neuron Chips and Echelon Smart Transceivers. The NodeBuilder tool includes a complete suite of device development software for Windows and a hardware platform that can be used for prototyping and testing.

The NodeBuilder tool includes a compiler and debugger for the Neuron C programming language. Neuron C is a high-level programming language based on ANSI C with extensions to simplify network communication, hardware I/O, and event-driven processing.

## SHORTSTACK DEVELOPER'S KIT MODEL 23400



### Features

- Enables existing products to be easily networked without discarding existing application code
- Extends the useful life of product designs by preserving your investment in software code
- Allows devices to be used with new Internet services
- No royalties when used with Echelon's Smart Transceivers, and power line, free topology, link power transceivers

### Description

The ShortStack Micro Server enables any product that contains a microcontroller or microprocessor to quickly and inexpensively become a networked, Internet-accessible device.

By adding the tiny ShortStack API to the device's existing application, adding the appropriate calls to the ShortStack API, and then by adding a ShortStack Micro Server to the device hardware, any smart device can be network-enabled. The result is a communicating device that can communicate with other devices on a LONWORKS network, and can also interface with Internet-based services via LONWORKS Internet servers such as the *i*.LON Internet Servers.

The ShortStack Developer's Kit is available as a free download from [www.echelon.com/shortstack](http://www.echelon.com/shortstack).

## MIP/P20/P50 AND MIP/DPS DEVELOPER'S KITS MODELS 23200 AND 23210

### Features

- Allows any host processor to attach to LONWORKS networks
- Network interfaces based on the MIP can be used with any host application
- High-speed dual-ported RAM interface sends and receives hundreds of packets per second with minimum host overhead (MIP/DPS)
- High-speed parallel interface sends and receives hundreds of packets per second (MIP/P20 and P50)
- Optional up-link interrupt for the MIP/P50 and MIP/DPS reduces latency to incoming network traffic by asynchronously informing the host of the availability of an up-link packet
- Supports host applications with up to 4096 network variables
- Supports the LONWORKS network interface protocol
- ANSI C source code for a network interface library and sample host application included
- ANSI C and PC assembly source code for a sample network driver included

### Description

The Microprocessor Interface Program (MIP) is firmware that transforms a Neuron Chip into a communications co-processor for an attached host processor. The MIP enables the attached host to implement LONWORKS applications and to communicate with other devices using the EIA-709.1 protocol.

Applications on the host can send and receive network variable updates and application messages, as well as poll network variables. The MIP opens the EIA-709.1 protocol to a variety of hosts including PCs, workstations, embedded micro-processors, and microcontrollers. The MIP/P20 is optimized for the Neuron 3120 Chip, providing the lowest-cost network interface, while the MIP/P50 offers higher performance and is intended for use on a Neuron 3150 Chip. The MIP/DPS is the highest performance version and is designed for Neuron 3150 Chip applications using dual-ported RAM.

## LNS APPLICATION DEVELOPER'S KIT FOR WINDOWS / RELEASE 3 MODEL 34309

### Features

- Includes tools for building interoperable LNS applications that can install, maintain, connect, monitor, control, diagnose, and recover LONWORKS networks
- Integrated support for the *i*.LON 10 Ethernet Adapter, *i*.LON 100 Internet Server, and the *i*.LON 1000 Internet Server
- ANSI/EIA 709.1-1999 LonTalk protocol stack executing within LNS provides high performance for monitoring applications
- Distributed, cached monitor sets provide fault-tolerant, instant-on monitoring
- Language-independent dual-interface (COM) component for high programmer productivity and operating performance
- Client/server LNS Network Operating System that runs natively on IP and LONWORKS channels
- Support for multiple Windows operating systems
- Remote data and service access via LONWORKS networks, modem dial-up, or the Internet
- LONMARK Version 3.3 support
- Example Microsoft® Visual C++™, and Microsoft Visual Basic™ application source code

### Description

The LNS Application Developer's Kit for Windows is a software development tool for designing and deploying high-performance, highly scalable LNS network tools for LONWORKS control networks.

The LNS network operating system is the only network operating system that provides essential management, monitoring, and control services for single and multi-channel control networks. Release 3 includes technology for building architecturally-flat LONWORKS networks over an IP infrastructure, and seamlessly integrates with the *i*.LON 10 Ethernet Adapter, the *i*.LON 100 Internet Server, and the *i*.LON 1000 Internet Server. LNS provides these services for any Windows and non-Windows application that interacts with a LONWORKS network, and uses a distributed database technology to ensure that these applications remain synchronized with the network and with each other. This unique capability

allows software components to interoperate, whether those components run on the same computer or on different computers, regardless of whether the computers are located on the Internet or within a LONWORKS network. For example, a network may be installed locally using LNS tools from one vendor and the same network may be operated remotely using LNS operator interface drivers and visualization tools from another vendor.

LNS applications are able to engineer network databases (as typically required in larger systems), with device and router commissioning occurring at a later time when the engineered database is loaded onto an LNS Server. The LNS Server may be detached from the network after the commissioning phase, e.g., the LNS application and LNS Server are running on a notebook computer, and the installer removes the notebook computer from the site after commissioning. This feature is especially desirable for smaller networks where an on-site computer management server is not required. The best remote connectivity option for sites with no IP connection available may be to use an *i*.LON 100 Internet Server with an available internal modem. If a persistent IP connection is available, the *i*.LON 10 Ethernet Adapter, *i*.LON 100 Internet Server, or the *i*.LON 1000 Internet Server may be used.

The LNS Server supports embedded, microcontroller-based, Java™, and Windows-based clients. Embedded, microcontroller-based clients run remotely to the LNS Server via the LONWORKS network, while Java-based clients run remotely to the LNS Server via an IP network. Windows-based clients can run locally to the LNS Server, remotely via the LONWORKS network, remotely via a modem, or remotely via IP. On the Windows platform, the same LNS application can be run in all four of these modes.

Windows-based LNS clients access the services of the LNS network operating system through a dual interface COM component. This COM component provides an easy-to-use, high-performance, programming language-independent interface to the LNS Object Hierarchy managed by the LNS Server. The LNS Object Hierarchy presents the LONWORKS network components such as application devices, network variables, LONMARK objects, configuration

properties, routers and channels as standard Windows objects. Each object has methods that clients can call to invoke operations on the object, properties that clients can get or set to read or modify the configuration of the object, and events to which clients can subscribe in order to stay current with changes to that object. Windows-based LNS client applications can extend the LNS Object Hierarchy by adding user-defined object extensions.

LNS includes comprehensive support for the latest version of the LONMARK Interoperability Guidelines. LNS is able to manage certified and prototype LONMARK devices as well as other LONWORKS devices.

To provide interoperability between LNS applications from different vendors, LNS defines and supports a standard plug-in architecture where an LNS application can invoke the services of any other LNS application on the same computer. A listing of currently available LNS plug-ins is available at [www.echelon.com/plugins](http://www.echelon.com/plugins).

Applications developed with this product require an LNS Server or LNS Remote Client distribution of the LNS network operating system in order to run. The LonMaker Integration Tool, LNS DDE Server, and numerous third-party products include an LNS redistribution and may be used by the LNS application developer to supply the LNS redistribution for the end-user. Additional LNS Device Credits for LNS applications deployed on end-user computers may be ordered by using a software utility included with the LNS Server redistribution package.



## **ECHOLON SOFTWARE LICENSE GENERATOR / RELEASE 3 MODEL 34311**



### **Features**

- Simple wizard interface for processing LNS Device Credit orders from end-users
- Enables LNS application developers to provide a complete, single point of service to LNS application end-users
- Simple wizard interface for requesting new blocks of LNS Device Credits from Echelon
- Distributes LNS Device Credits to any LNS Sever (Release 2 or higher)

### **Description**

The Echelon Software License Generator is an easy-to-use software package that enables an LNS application developer to distribute LNS Device Credits to end-users. Each LNS Device Credit represents a prepaid fee that allows an LNS application to commission or recover a LONWORKS device. The Echelon Software License Generator is available for purchase by companies who have also purchased Model 34312 LNS Redistribution Kit for Windows. A licensee of the Echelon Software License Generator is known as an "LNS Device Credit redistributor."

When the end-user has consumed these LNS Device Credits, they use a software wizard included with the LNS Server to order more LNS Device Credits. The order is transmitted by e-mail, fax or telephone to the LNS Device Credit redistributor. The order is processed with the Echelon Software License Generator software and a software key is delivered back to the end-user by email, fax, or telephone. The key, when installed with the software wizard included with the LNS Server, adds the specified number of LNS Device Credits to the computer.

## **LNS REDISTRIBUTION KIT FOR WINDOWS / RELEASE 3 MODEL 34312**



### **Features**

- Create ready-to-use LNS Server and LNS Remote Client redistribution packages
- Pre-built installation packages make distributing and deploying the LNS network operating system simple and error-free
- LNS Server redistribution supports embedded, microcontroller-based, Java, and Windows-based clients on LONWORKS and IP networks
- LNS Remote Client redistribution supports connection to an LNS Server through LONWORKS and IP networks
- Support for Windows XP, Windows 2000, and Windows 98

### **Description**

The LNS Redistribution Kit for Windows is a software package that generates LNS Server and LNS Remote Client software redistribution packages. LNS application developers can include these packages into their LNS application distributions so that the LNS Server or LNS Remote Client is installed together with their LNS application. In this way, the LNS application does not depend on a prior installation of an LNS Server or LNS Remote Client redistribution in order to function. Once an LNS redistribution package is installed, any application that requires the LNS network operating system will run on that PC.

This product is an optional add-on to Model 34309 LNS Application Developer's Kit for Windows, and is licensed under a signed license agreement.

## LONWORKS BUNDLE DEPLOYMENT KIT / RELEASE 1.0 - MODEL 34611

### Features

- Integrates everyday LONWORKS devices into any service gateway that includes an OSGi Framework
- Support for all types of LONWORKS (ANSI/EIA 709.1) devices on any media including ANSI/EIA 709.2 Power Line Communications and ANSI/EIA 709.3 Free Topology Communications
- Designed to work with any OSGi Framework
- Compatibility tested with these OSGi Frameworks: Sun Microsystems® Java Embedded Server™ (JES™), IBM® System Management Framework™ (SMF), and Gatespace™ Distributed Service Platform
- Browser-based administration of the LONWORKS Bundles using the OSGi Framework's built-in Web server
- Operator-grade solution including LNS based service center software that operates over broadband (cable modem or DSL) or dial-up networks
- Example device access bundle source code for several popular LONWORKS devices

### Description

The LONWORKS Bundle Deployment Kit is a software package for designing, installing, operating, and maintaining multi-vendor, open, interoperable LONWORKS networks connected to Open Services Gateway Initiative (OSGi) enabled service gateways. The kit includes ready-to-use LONWORKS support bundles, example device service bundles, utilities, tools, and documentation.

The LONWORKS Bundle Deployment Kit provides a complete LONWORKS network service delivery solution for telcos, cable operators, utilities and other service gateway operators. Delivery platforms include set top boxes, multimedia gateways, DSL and cable modems, web pads, home appliances, and PCs.

## LCA FIELD COMPILER API MODEL 33300

### Features

- Neuron C Compiler API to create downloadable image files from Neuron C source files
- Neuron C Debugger API provides a high-level interface for debugging Neuron C applications running on field devices
- Online help provides rapid access to detailed function references for all API functions

### Description

The LCA Field Compiler API is a software library for Windows that is used to create graphical tools for writing and debugging LONWORKS applications. The API does not include a user interface; OEM field programming tools provide the user interface. End-users will interact with this OEM tool to program and optionally debug their applications. In turn, the OEM tool produces the required Neuron C code and then calls the Neuron C compiler API to produce the application code. The OEM software then loads the compiled application using either an off-the-shelf or custom-designed LNS network tool.

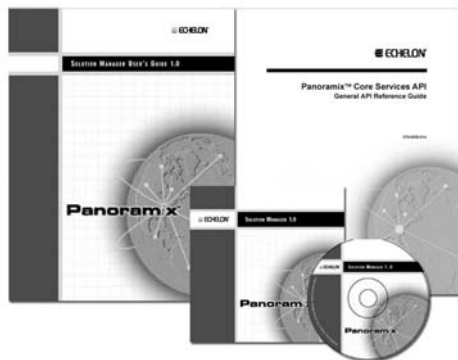


## Enterprise Software

If an organization can tap into the information associated with its core operations, extract the data and forward it to a central site, and integrate it with planning, operating, and other business systems, that company can gain valuable insight into the heart of its business. Company management can better understand where costs are originating and how they can be reduced, identify inefficiencies and recommend how they can best be eliminated, and provide a consistent and high quality customer experience. Better still, a company can understand how its business is operating and make better informed, fact-based decisions that reduce costs and increase profitability.

Echelon's Panoramix platform is a highly scalable, enterprise-grade software application designed to reside in a corporate-owned or hosted data center and communicate across the Internet or a private IP network to as many as tens of thousands of remote sites containing networks of smart devices. Built around open standards, the Panoramix platform provides a powerful Web Services API to enable fast and easy integration into existing business systems. Seamless connectivity to the millions of installed LONWORKS networks lets the Panoramix platform tap into networks of smart devices—thermostats, lighting devices, access control systems, HVAC devices, energy meters, refrigeration cases, and more. The Panoramix platform redefines enterprise-level visibility into operations by turning information trapped in far-flung sites into actionable business intelligence.

## PANORAMIX ENTERPRISE PLATFORM



### Overview

The Panoramix platform is a highly scalable enterprise software solution that enables businesses to collect and manage data from device networks across multiple facilities and turn it into meaningful business intelligence. The Panoramix platform taps into the information in your facilities, forward it to a central site, aggregate it, and integrate it with planning, operating and other business systems to gain insight into the heart of your business.

### Benefits

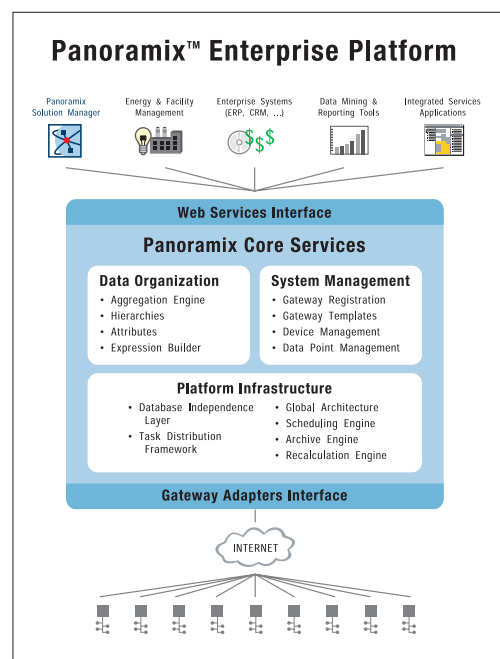
- Identify where costs are originating and how they can be reduced
- Spot inefficiencies and understand how they can be eliminated
- Determine the availability of a consistent and high quality customer experience and determine how it can be improved
- Uncover best practices across the organization
- Discover problems or equipment faults before they impact operations
- Make better informed, fact-based decisions that reduce costs and increase profitability

### Panoramix Core Services

**Data Organization** – Collecting gigabytes of data from thousands of locations is a daunting task without the right management and data interpretation tools. The Panoramix platform tools drill down into the collected data – from a single site to a universe of sites – searching for information based on key criteria.

**System Management** – Tie together disparate sites, integrate thousands of device networks from every corner of the globe, and seamlessly tie them all together into one system.

**Platform Infrastructure** – A scalable, robust infrastructure designed for maximum performance and system availability.

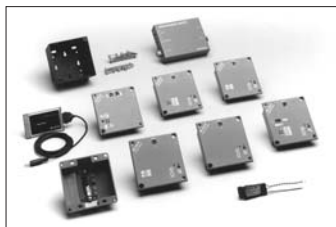


## I/O Devices

The LonPoint family of products is designed to integrate new and legacy sensors and actuators, as well as LONMARK devices, into cost effective, interoperable, control systems for building and industrial applications. In contrast to traditional control networks, which use an hierarchical architecture based on costly, proprietary controllers, LonPoint Modules offers a flat system architecture in which every point performs some control processing. Distributing the processing throughout the network lowers the overall installation and life cycle costs, increases reliability by minimizing single points of failure, and provides the flexibility to adapt the system to a wide variety of applications.

Product	Model	Description
Type 1 Base Plate	40111	Interface between a LonPoint Module and the network, power, and I/O wiring. Used with LonPoint Interface, Scheduler, and Data Logger modules.
Type 2 Base Plate	40222	Interface between a LonPoint LPR Router Module and the network.
DI-10 Digital Input Interface Module	41100	Monitors four digital inputs.
DO-10 Digital Output Interface Module	41200	Controls four digital outputs.
AI-10 Analog Input Interface Module	41300	Monitors five analog inputs.
AO-10 Analog Output Interface Module	41400	Controls five analog outputs.
DIO-10 Digital Input Output Interface Module	41500	Monitors two digital inputs and controls two relay outputs.
SCH-10 Scheduler Module and DL-10 Data Logger	43100	The scheduler application provides a real-time clock, calendar, and system scheduler for coordinating system functions. Alternately, the data logger application may be used to filter, time stamp, and log data for retrieval at a later time.
Terminator	44100	Provides electrical termination for TP/FT-10 free topology channel.
Terminator	44101	Provides electrical termination for TP/FT-10 bus topology channel.
Terminator	44200	Provides electrical termination for TP/XF-78 and TP/XF-1250 bus topology channels.
Type 1D DIN Base Plate	48111	DIN interface between a LonPoint Module and the network, power, and I/O wiring. Used with LonPoint Interface, Scheduler, and Data Logger modules.
Type 2D DIN Base Plate	48222	DIN interface between a LonPoint LPR Router Module and the network.

## LONPOINT PRODUCTS OVERVIEW



### Features

- Seamlessly integrates sensors, actuators, and LONMARK devices into a low cost, distributed, interoperable control system
- LonMaker Integration Tool provides a graphical design, commissioning, operation, and maintenance environment
- LonPoint Interface, Router, Data Logger, and Scheduler Modules interface with sensors and actuators, manage and log system operation, and handle network traffic
- LONMARK, UL Listed, cUL Listed, CE Mark, FCC

### Description

The LonPoint family of LONMARK products is designed to integrate new and legacy sensors and actuators, as well as LONWORKS devices, into cost-effective, interoperable control systems for building and industrial applications. In contrast to traditional control networks which use closed islands of control linked with proprietary gateways, the LonPoint products offer an open distributed system architecture in which every device performs some control processing and can be accessed from any location in the network. Distributed processing lowers overall installation and life cycle costs, increases reliability by minimizing single points of failure, and provides the flexibility to adapt the system to a wide variety of applications.

The LonPoint family of products consists of the LonMaker Integration Tool, the LonPoint Software Plug-In, LonPoint Application Programs, LonPoint Modules, and the *i*.LON 100 Internet Server for scheduling and data logging. All modules include flash memory (to permit reconfiguration or download via the network), a powerful and highly-configurable application program, network access from a front panel jack (to simplify configuration and troubleshooting), and an innovative two piece design (to permit pre-wiring and simplify maintenance).

## AI-10 ANALOG INPUT INTERFACE MODULE - MODEL 41300



### Features

- Seamlessly integrates analog sensors into interoperable LONWORKS networks
- Two 16-bit analog inputs: 0-24mA, 0-10V, 100Ω-15kΩ
- Supports current loop or remotely powered devices
- LNS Plug-In
- LONMARK, UL Listed, cUL Listed, CE Mark, FCC

### Description

The AI-10 Module is a LONMARK device that provides two 16-bit analog inputs that can monitor 0-24mA, 0-10V, and 100Ω to 15kΩ resistive inputs. 0-24mA devices may be powered by the module's current source or from a remote power supply. The module operates from 16 to 30VAC or VDC, allowing it to be powered from the same source as the sensors.

The module's application consists of LONMARK functional blocks that implement input and control functions. An LNS plug-in configures the LONMARK functional blocks.

## AO-10 ANALOG OUTPUT INTERFACE MODULE - MODEL 41400



### Features

- Seamlessly integrates analog actuators into interoperable LONWORKS networks
- Two 12 bit analog outputs: 0-20 mA, 0-10 V
- Two PID Controllers
- LONMARK, UL Listed, cUL Listed, CE Mark, FCC

### Description

The AO-10 Module is a LONMARK device that provides two 12-bit analog outputs that can control 0-20mA or 0-10V actuators. The module operates from 16 to 30VAC or VDC, allowing it to be powered from the same source as the actuators.

The module's application consists of LONMARK functional blocks that implement output and control functions. An LNS plug-in configures the LONMARK functional blocks.

## DI-10 DIGITAL INPUT INTERFACE MODULE - MODEL 41100



### Features

- Seamlessly integrates digital sensors into interoperable LONWORKS networks
- 4 digital inputs: 0-32VDC or dry contact
- Separate status LEDs for each input
- LNS Plug-In
- LONMARK, UL Listed, cUL Listed, CE Mark, FCC

### Description

The DI-10 Module is a LONMARK device that provides 4 digital inputs that can monitor dry contacts or 0-32VDC voltage inputs. Separate status LEDs are provided for each input. The module operates from 16 to 30VAC or VDC, allowing it to be powered from the same source as the sensors.

The module's application consists of LONMARK functional blocks that implement input and control functions. An LNS plug-in configures the LONMARK functional blocks.

## DIO-10 DIGITAL INPUT OUTPUT INTERFACE MODULE - MODEL 41500



### Features

- Seamlessly integrates legacy digital sensors and actuators into interoperable LONWORKS networks
- Two digital inputs support dry contact, 5V, 12V, 24V, 31V
- Two relay outputs rated at 2A continuous and 6A surge at 30VAC or 42VDC
- Status LEDs for each input and output
- Programmable input threshold levels on both digital inputs
- Hand/Off/Auto switches on the front panel for manual control of the two relay outputs
- Hardware support for high-speed (up to 20KHz) frequency measurement on both digital inputs
- LNS Plug-In
- LONMARK, UL Listed, cUL Listed, CE Mark

### Description

The DIO-10 Module is a LONMARK device that provides two digital inputs and two relay outputs. The digital inputs can monitor dry contacts or 31VDC voltage inputs. The two relay outputs are rated at 2A continuous and 6A surge at 30VAC or 42VDC.

Separate status LEDs are provided for each input and output. Separate Hand/Off/Auto switches are provided for each relay output. The module operates from 16 to 30 VAC or VDC, allowing it to be powered from the same source as the sensors.

The module's application consists of LONMARK functional blocks that implement input, output, and control functions. An LNS plug-in configures the LONMARK functional blocks.

## DO-10 DIGITAL OUTPUT INTERFACE MODULE - MODEL 41200



### Features

- Seamlessly integrates digital actuators into interoperable LONWORKS networks
- 4 digital outputs: 0-12VDC
- Separate Hand/Off/Auto switch and status LED for each output
- LNS Plug-In
- LonMark, UL Listed, cUL Listed, CE Mark, FCC

### Description

The DO-10 Module is a LONMARK device that provides 4 digital outputs of 0-12V; 100mA source/sink maximum on any one output; or 110mA source/400mA sink on all outputs combined. Separate Hand/Off/Auto front panel DIP switches and status LEDs are provided for each output. The module operates from 16 to 30VAC or VDC, allowing it to be powered from the same source as the actuators.

The module's application consists of LONMARK functional blocks that implement output and control functions. An LNS plug-in configures the LONMARK functional blocks.

## SCH-10 SCHEDULER MODULE AND DL-10 DATA LOGGER - MODEL 43100



### Features

- Provides time, date, and system state for LONWORKS networks
- Battery-backed real-time clock
- Converts into a DL-10 data logger via software downloading
- LNS Plug-In utilities for configuration and operation
- LONMARK, UL Listed, CE Mark, FCC, cUL Listed

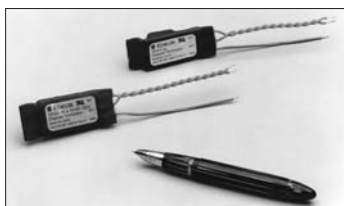
### Description

The SCH-10 Scheduler Module is a LONMARK device that provides a real-time clock, calendar, and system scheduler for coordinating system functions. The clock, calendar, and memory are battery-backed to prevent loss during power outages. The scheduler function can incorporate time, date, preset modes, and status information from other devices in the network. Multiple modules can be chained together for redundancy or for more complex scheduling applications.

The SCH-10 module may be converted into a DL-10 Data Logger by downloading the DL-10 application. The DL-10 Data Logger filters, time stamps, and logs data into any one of three separate data logs for retrieval at a later time by the LonPoint Data Logger Utility. Network variable outputs provide the percentage of remaining storage space in each log. These outputs can be connected to a PC host using the LonMaker tool or can be polled by the PC host without creating a connection. The clock, calendar, and data log memory are battery-backed to prevent loss during power outages.

An i.LON 100 Internet Server may be used in lieu of the SCH-10/DL-10 to provide scheduling, data logging, alarming, and remote notification services.

## TERMINATORS MODELS 44100, 44101, AND 44200



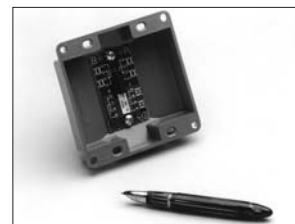
### Features

- Model 44100 for free topology TP/FT-10 channel (one required)
- Model 44101 for bus topology TP/FT-10 channel (two required)
- Model 44200 for bus topology TP/XF-78 and TP/XF-1250 channels (two required)
- Flying wire leads with earth ground wire for electrostatic discharge
- Small size fits easily in junction box or equipment enclosure
- UL Recognized, cUL Recognized, CE Mark

### Description

The Terminator modules provide electrical termination for twisted pair channels. In a free topology TP/FT-10 segment, one Model 44100 Terminator is required and may be placed anywhere on the segment. In a bus topology TP/FT-10 channel, two Model 44101 Terminators are required—one at each end of the bus. Bus topology TP/XF-78 and TP/XF-1250 channels require two Model 44200 Terminators.

## TYPE 1 AND TYPE 2 BASE PLATES MODELS 40111 AND 40222



### Features

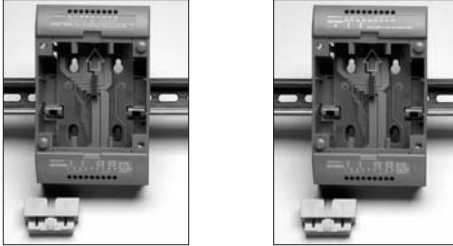
- Base Plates for use with LonPoint Interface, Scheduler, and Router Modules
- Mounts to 4" square x 2" deep electrical boxes
- Allows pre-wiring and cable testing by an electrician prior to installing the electronics
- Color-coded, wire clamp style screw terminals accept 12-24AW (2 to 0.5mm) wire
- Power and network wiring are "looped" through each Base Plate, providing continuity during hot-plugging
- UL Listed, cUL Listed

### Description

The Base Plates provide an interface between a LonPoint Module and the network, power, and I/O wiring. There are two types of Base Plates. The Type 1 Base Plate (Model 40111) is used with LonPoint Interface and Scheduler Modules. The Type 2 Base Plate (Model 40222) is used with LPR Router Modules. The Type 1 and Type 2 Base Plates are keyed to prevent accidental insertion of an incorrect module type.



## TYPE 1D DIN AND TYPE 2D DIN BASE PLATES - MODELS 48111 AND 48222



### Features

- DIN Rail Base Plates for use with the LonPoint Interface, Scheduler, Data Logger, and Router modules
- Jumper Plug speeds connection of adjacent Base Plates
- Allows pre-wiring and cable testing by an electrician prior to installing the electronics
- Numbered wire clamp-style screw terminals accept 12-24 AW (2 to 0.5mm) wire
- Power and network wiring are looped through each Base Plate, providing continuity during hot-plugging
- UL Listed, cUL Listed, CE Mark

### Description

The Type 1D DIN and Type 2D DIN Base Plates provide an interface between a LonPoint Module and the network, power, and I/O wiring. The DIN Rail Base Plates are designed to be installed on either 35mm x 7.5mm or 35mm x 15mm DIN rails or, using the integral keyhole slots, on a wall or panel.

There are two types of DIN Rail Base Plates. The Type 1D DIN Base Plate (Model 48111) is used with LonPoint Interface, Scheduler, and Data Logger Modules, while the Type 2D DIN Base Plate (Model 48222) is used with LonPoint Router Modules.

## Integration Tools

LONWORKS Integration Tools are the premier toolset for building and maintaining LONWORKS device networks. Echelon integration tools are made to speed network design, commissioning, and maintenance tasks.

The **LonMaker Integration Tool** is a software package for designing, installing, operating, and maintaining multi-vendor, open, interoperable LONWORKS networks. Based on Echelon's LNS network operating system, the LonMaker tool combines a powerful client-server architecture with an easy-to-use Microsoft Visio® user interface. The result is a tool that is sophisticated enough to design and commission a distributed control network, yet economical enough to be left behind as an operations and maintenance tool.

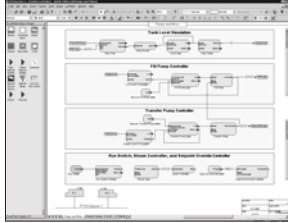
The **LNS DDE Server** is a software package that allows any DDE- and SuiteLink-compatible Microsoft Windows application to monitor and control LONWORKS networks without additional programming. Typical applications for the LNS DDE Server include interfaces with HMI applications, data logging and trending applications, and graphical process displays.

The **LonManager Protocol Analyzer** provides LONWORKS manufacturers, system integrators, and end-users with a rich set of Windows tools and a high performance PC interface card to allow users to observe, analyze, and diagnose the behavior of installed LONWORKS networks. The tool's open architecture allows manufacturers to customize it to their unique needs.

The **DM-20/DM-21 Device Managers** are Neuron Chip-based devices that can install and manage a LONWORKS network. These products differ from conventional network management tools in that they work from a database created using the LonMaker Integration Tool. This allows you to use the PC-based LonMaker tool—and its rich user interface—to design the network and leave the ruggedly built DM device on-site to manage the network.

Product	Model	Description
LonMaker Integration Tool	37000-31 37020-31	Software for designing, installing, operating, and maintaining multi-vendor, open, interoperable LONWORKS networks.
LonManager Protocol Analyzer	33100	Hardware and software network diagnostic tool for system integrators, end-users, and LONWORKS manufacturers.
LNS DDE Server	37200	DDE- and SuiteLink compatible interface to LONWORKS networks. Compatible with many HMI and SCADA tools.
DM-20 Device Manager	43201	Automatically manages up to 128 devices; configured with LonMaker Integration Tool; TP/FT-10 transceiver built-in. Embeddable PCB.
DM-21 Device Manager	43202	Automatically manages up to 128 devices; configured with LonMaker Integration Tool; TP/FT-10 transceiver built-in. LonPoint module form-factor.

## **LONMAKER INTEGRATION TOOL MODELS 37000-31 AND 37020-31**



### **Features**

- Provides graphical design, commissioning, operation, and maintenance for LONWORKS networks
- Includes the LNS network operating system and Microsoft Visio 2002
- Supports remote access via LONWORKS or IP networks
- Includes *i*LON support for easy integration with the Internet and other IP networks
- Simplifies installation with integrated support for LONMARK applications
- Recovers a design from an existing network
- Merges independent networks into a single network
- Includes the LonPoint plug-in for fast and easy configuration of LonPoint devices
- Supports multiple users

### **Description**

The LonMaker Integration Tool Release 3.1 is a software package for designing, installing, operating, and maintaining multi-vendor, open, interoperable LONWORKS networks. Based on Echelon's LNS network operating system, the LonMaker tool combines a powerful client-server architecture with an easy-to-use Microsoft Visio user interface. The result is a tool that is sophisticated enough to design and commission a distributed control network, yet economical enough to be left behind as an operation and maintenance tool.

The LonMaker tool provides comprehensive support for LONMARK devices, *i*LON Internet Servers, and other LONWORKS devices. The tool takes full advantage of LONMARK features such as standard functional profiles, configuration properties, resource files,

network variable aliases, dynamic network variables, and changeable types. LONMARK functional profiles are exposed as graphical functional blocks within a LonMaker drawing, making it easy to visualize and document the logic of a control system.

The LonMaker tool includes an LNS runtime and LNS Server. LNS provides a standard platform for supporting interoperable applications on LONWORKS networks. LNS permits multiple applications and users to manage and interact simultaneously with a network. Multiple LonMaker users can access a shared LNS Server via the LONWORKS network, a local area network, or the Internet.

For more complex monitoring and control applications, the LonMaker is compatible with the LNS DDE Server which is used as an I/O driver for a variety of third-party operator-interface packages such as Wonderware's InTouch®, Intellution FIX®, USDATA FactoryLink®, and National Instruments' LabView® and BridgeView®.

## LONMANAGER PROTOCOL ANALYZER MODELS 33100-10 AND 33100-20



### Features

- Captures all LONWORKS packets on a channel for detailed analysis of network activity and traffic patterns
- Interprets packet contents without the need to interpret raw hex data
- Transaction analysis system simplifies packet log interpretation by associating related packets
- Receive filters reduce the amount of logged data to help isolate problems quickly
- Open interface for user-created receive filters
- Programmatic interface to the packet log permits custom user interfaces and analysis functions
- Comprehensive network statistics and diagnostics provide a detailed analysis of the network's health
- Available in PCI bus (33100-20) and PC card (33100-10) versions. For use with Windows 98 only.

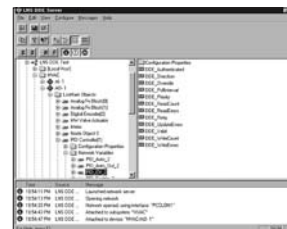
### Description

The LonManager Protocol Analyzer provides LONWORKS manufacturers, system integrators, and end-users with a rich set of Microsoft Windows-based tools and a high-performance PC interface card to allow users to observe, analyze, and diagnose the behavior of installed LONWORKS networks. The tool's open architecture allows manufacturers to customize it to their unique needs.

The LonManager Protocol Analyzer includes three tools for network analysis and monitoring:

- Protocol analysis tool
- Network traffic statistics tool
- Network diagnostics tool

## LNS DDE SERVER / RELEASE 2.1 MODEL 37200



### Features

- Interfaces HMI and visualization applications installed with LNS tools
- Reads and writes network variables, configuration properties, and application messages
- Supports LONMARK functional blocks
- Remote access via LNS or NetDDE
- Supports multiple clients and networks on the same computer or multiple computers
- Provides easy client set-up with a point browser and DDE copy/paste link support
- Used with hundreds of programs that support the Microsoft DDE and WonderWare SuiteLink protocols
- Supports Wonderware FastDDE protocol

### Description

The LNS DDE Server is a software package that allows any DDE- or SuiteLink compatible Microsoft Windows application to monitor and control LONWORKS networks-without programming. Typical applications for the LNS DDE Server include interfaces with HMI applications, data logging and trending applications, and graphical process displays.

By linking LNS and Microsoft's DDE or Wonderware's SuiteLink protocol, DDE- and SuiteLink-compatible Windows applications can interact with LONWORKS devices using any of the following methods:

- Read, monitor, and modify the value of any network variable
- Supervise and change configuration properties
- Receive and send application messages
- Test, enable, disable, and override LONMARK functional blocks
- Test, wink, and control devices

## DM-20 AND DM-21 DEVICE MANAGER MODELS 43201 AND 43202



### Features

- Provides automatic installation, fault detection, and device replacement of a LONWORKS network with up to 128 devices and one router
- Operates autonomously, without a PC, after commissioning
- Holds up to 16 databases
- Supports multiple networks via runtime database selection
- Stores database in flash memory—no batteries required
- Two-piece design cuts installation time, cost
- UL Listed, CE Mark, FCC

### Description

The DM-20 and DM-21 Device Manager Modules permit manufacturers and integrators to manage the operation and maintenance of a control network without an on-site PC. The DMs are ideal for networks with 128 or fewer devices in which automatic, highly reliable network management is required and a PC is impractical to use for this purpose. The DM-20 is supplied as a plug-in circuit card for use in embedded applications. The DM-21 is packaged in a LonPoint housing and is compatible with a Type 1 or 1D Base Plate.

Typical applications include machine tools, printing presses, water treatment systems, light rail vehicles, rail cars and propulsion systems, wayside control networks, airplanes, elevators, power substation systems, semiconductor manufacturing equipment, intelligent highway systems, and robotics equipment.

## Internet Connectivity

LONWORKS networks are the worldwide standard for networking controls and machines in building, industrial, home, transportation, and utility automation applications. Internet Protocol (IP) based data networking is the world-wide standard for moving data over the Internet, local area networks (LANs), and wide area networks (WANs). Echelon's *i.LON* product family seamlessly links together these control and data networking standards. The *i.LON* family of products provides reliable, secure Internet access to everyday LONWORKS devices—lights, appliances, switches, thermostats, motors, meters, valves.

The ***i.LON 10 Ethernet Adapter*** is a cost-effective customer premise equipment (CPE) that provides full access to remote LONWORKS networks. The *i.LON 10 Ethernet Adapter* is designed for applications in which IP connectivity is required for remote monitoring, management and diagnosis of everyday devices such as load controls, lights, appliances, and security systems in homes, apartments, and small buildings. The *i.LON 10* operates as a Remote Network Interface (RNI) in conjunction with LNS based network management and monitoring tools. An external modem option allows dial-up PPP connections to a local ISP or corporate terminal servers.

The ***i.LON 100 Internet Server*** is a high performance SOAP/XML Web Services device that connects LONWORKS networks to corporate IP networks or the Internet. The *i.LON 100 Internet Server* features a built-in Web server that allows Web access to built-in scheduling, alarming, and data logging applications. Local digital and impulse inputs combined with relay outputs, an e-mail application, and a modem option provides a flexible, highly configurable monitoring and control platform. An RNI interface provides direct access to LNS based applications like the LonMaker tool for complete network management capabilities.

The ***i.LON 1000 Internet Server*** combines a Layer 3 tunneling router and a Web server in a single package that offers unparalleled performance and reliability. Certified under the Cisco NetWorks™ program, the *i.LON 1000 Internet Server* integrates Echelon's control networking and routing expertise together with Cisco's Network Foundation Technologies. The *i.LON 1000* seamlessly integrates on this tunnelled IP channel with LNS 3 and higher based applications, including the LonMaker Integration Tool and the LNS DDE Server.

The ***i.LON 600 LONWORKS/IP Server*** is an EIA 852 compliant, LonTalk-to-IP router that provides reliable, secure Internet access to everyday devices like pumps, motors, valves, sensors, actuators, and lights. Offering unparalleled packet throughput, rugged construction, and simple commissioning, the *i.LON 600 LONWORKS/IP Server* is ideal for demanding process control, building automation, utility, transportation, and telecommunications applications.

Product	Model	Description
<i>i.LON 10 Ethernet Adapter</i>	72010	A low-cost, high-performance interface that connects LONWORKS based everyday devices to the Internet, a LAN, or a WAN.
	72011	
<i>i.LON 100 Internet Server</i>	72101	A high performance network interface that connects LONWORKS networks to corporate IP networks or the Internet.
	72102	
	72103	
	72104	
<i>i.LON 1000 Internet Server</i>	72001	A Web server and Layer 3 LONWORKS router in a single package.
	72002	
<i>i.LON 600 LONWORKS/IP Server</i>	72601	An EIA 852 compliant, LonTalk-to-IP router that provides reliable and secure Internet access to everyday devices.
	72602	
	72603	
	72604	



## ***i*.LON 10 ETHERNET ADAPTER MODELS 72010 AND 72011**



### **Features**

- Connects LONWORKS networks to TCP/IP Ethernet networks for residential, commercial, and utility applications
- Power line (PL-20) or twisted pair (TP/XF-FT-10) LONWORKS channel support
- 10 BaseT Ethernet interface
- MD5 secured communications
- Supports PPP remote dial-up to local ISP or corporate terminal servers with optional external modem
- Compatible with NAT for operation behind firewalls
- Static or acquired (DHCP) IP address
- Uses less than 2% of available 10 BaseT bandwidth
- Local or remote configuration via built-in configuration Web page

### **Description**

The *i*.LON 10 Ethernet Adapter is a low-cost interface that connects LONWORKS based everyday devices to the Internet, a LAN, or a WAN. Through the *i*.LON 10 Adapter, everyday devices like appliances, meters, HVAC, load controls, lights, security systems, pumps, and valves can be connected to the Internet via a 10 BaseT broadband connection or PPP dial-up connection using an external modem. A local or remote service center running Echelon's LNS server or any third-party LNS application can then configure, monitor and control the devices—from across the room or across the world.

The *i*.LON 10 Ethernet Adapter is available with a power line (Model 72011) or free topology twisted pair (Model 72010) channel interface.

## ***i*.LON 100 INTERNET SERVER MODELS 72101, 72102, 72103, AND 72104**



### **Features**

- Built-in scheduling, data logging, and alarm management applications
- Local or remote configuration via built-in configuration web pages
- Power line (PL-20) or twisted pair (TP/XF-FT-10) LONWORKS channel support
- Auto-polarity 10/100 BaseT Ethernet interface
- Optional integral dial-in/out modem
- Built-in real-time clock
- SOAP/XML Web Services interface allows easy integration with enterprise systems
- Built-in RNI for integration with LNS applications

### **Description**

The *i*.LON 100 Internet Server provides scheduling, data logging, and alarm management application for any LONWORKS system. User access to these applications is provided through an integrated Web page interface or via SOAP/XML Web services. In addition to these applications and SOAP/XML access, the *i*.LON 100 Internet Server provides an RNI interface for native LONWORKS access from LNS based applications such as the LonMaker Integration Tool.

Available with either a PL-20 power line or TP/FT-10 free topology twisted pair LONWORKS interface, the *i*.LON 100 Internet Server features a standard 10/100 BaseT Ethernet interface and an optional internal 56K V.90 modem for dial-in/out applications, and local hardware for reading pulse meters such as gas, water, or electricity meters. Two digital inputs and two 10A 240V relay outputs are also built in.

## ***i*.LON 1000 INTERNET SERVER MODELS 72001 AND 72002**



### **Features**

- Allows the millions of Internet-ready LONWORKS devices to be monitored, controlled, and configured over the Internet
- Transforms the Internet (or any IP-based LAN or WAN) into a pathway for carrying LONWORKS control information locally, nationally, or around the world
- Built-in password-protected Web server allows secure remote monitoring and control of the LONWORKS network using standard browsers
- MD5 authentication for secure access and password-protected Web server configuration access
- Provides high performance Layer 3 routing of LONWORKS packets
- Integrates on an IP channel with any LNS 3 or higher based application, including LonMaker Integration Tool and LNS DDE Server
- Supports SNMP (MIB II), TCP/IP, UDP, DHCP, ICMP, SNTP, HTTP, and FTP
- Wall, desk, or rack mounting; 24VAC/DC power input
- CE Mark, U.L. Listed, cU.L. Listed, TÜV Certified

### **Description**

The *i*.LON 1000 Internet Server is a breakthrough product that provides reliable, secure Internet access to the everyday devices in your world—lights, appliances, switches, thermostats, motors, meters, valves. By Bringing the Internet to Life, the *i*.LON 1000 puts you in control—letting you monitor, adjust, and reconfigure devices as needed, from wherever you might be.

Certified under the Cisco NetWorks program, the *i*.LON 1000 Internet Server integrates Echelon's control networking and routing expertise together with Cisco's Network Foundation Technologies to bridge the gap between control systems and data networks.

The *i*.LON 1000 Internet Server appears as a true LonTalk router when installed within a LONWORKS network. From an IT perspective, the *i*.LON 1000 Internet Server looks much like a typical Web server and not an IP router.

With the ability to route over 6000 packets per second, the *i*.LON 1000 Internet Server paired with LNS 3.0 or later offers the highest performance available.



***i*.LON 600 LONWORKS/IP SERVER  
MODELS 72601, 72602,  
72603, AND 72604**



### Features

- Security features include MD5 authentication for secure access
- Provides highest performance Layer 3 routing of LONWORKS control packets
- Supports LONWORKS/IP channels up to 256 devices<sup>1</sup>
- Supports multiple units behind NAT firewalls<sup>1</sup>
- EIA-852 & ANSI/EIA 709.1 compliant<sup>1</sup>
- 8T DIN packaging
- 24V AC or DC or 90V-240V AC power input options
- CE Mark, U.L. Listed, cU.L. Listed, TÜV Certified

### Description

The *i*.LON 600 LONWORKS/IP Server is an EIA 852 compliant, LonTalk-to-IP router that provides reliable, secure Internet access to everyday devices like pumps, motors, valves, sensors, actuators, and lights. Offering unparalleled packet throughput, rugged construction, and simple commissioning, the *i*.LON 600 LONWORKS/IP Server is ideal for demanding process control, building automation, utility, transportation, and telecommunications applications. U.L. and cU.L. Listed, TÜV certified, and FCC and CE Mark compliant, the *i*.LON 600 LONWORKS/IP Server meets worldwide regulatory agency requirements.

The *i*.LON 600 LONWORKS/IP Server transforms the Internet – or any 10 or 100 BaseT IP-based LAN or WAN – into a pathway for carrying LONWORKS control information locally or remotely. Secure access is ensured by the use of MD5 authentication, while a 32-bit RISC processor and Echelon's

LONWORKS/IP architecture provide best-of-class performance for high-speed control, display, and monitoring applications.

Up to 256 *i*.LON 600 servers may be used on the same channel<sup>1</sup>, and multiple servers can operate behind a Network Address Translation (NAT) firewall<sup>1</sup>. The *i*.LON 600 LONWORKS/IP Server is backward compatible with the *i*.LON 1000 Internet Server<sup>1</sup>, and both *i*.LON 600 LONWORKS/IP Servers and *i*.LON 1000 Internet Servers can co-exist in the same network. This feature ensures that existing applications can be fully supported while providing an expansion pathway to accommodate adds, moves, and changes.

Both TP/FT-10 and TP/XF-1250 LONWORKS channel options are available. The free topology TP/FT-10 channel provides the greatest wiring flexibility. The TP/XF-1250 channel is most commonly used for high performance industrial controls and high-speed backbone channels, and provides high throughput for applications with a large number of devices.

### NOTE:

<sup>1</sup> These features are not available with LNS. When using the *i*.LON 600 LONWORKS/IP Server with LNS, maximum LONWORKS/IP channel size is limited to 40 devices; devices may not be assigned a translated network address (NATed). Channels that include LNS based devices are not compliant with EIA-852.

## Network Interfaces

LONWORKS Network Interface Cards are available in a variety of form factors including half-length PCI cards (PCLTA-20 series), Type II PC Card (the PCC-10 Adapters), and desk/wall mount SLTA-10 or PL-SLTA RS-232 Adapters and *i*.LON 10 Ethernet Adapters.

Used in conjunction with an LNS application, all Echelon network interface cards and adapters can act as LNS network interfaces. The PCC-10 and PCLTA-20 cards can also act as LNS fast network interfaces (known as virtual network interfaces, or VNIs). When equipped with a network interface, a PC can be used for system-wide monitoring, control, and network management of a LONWORKS network.

The **PCC-10 Network Adapter** is a Type II PC Card (formerly PCMCIA) that provides a high-performance LONWORKS interface for laptop, palmtop, and embedded applications. Its compact form-factor, LNS fast network interface support, downloadable memory, and integral TP/FT-10 free topology transceiver make it well suited for use by installation and maintenance personnel. The LonManager PCC-10 Protocol Analyzer version allows users to observe, analyze, and diagnose the behavior of LONWORKS networks.

The **PCLTA-20 PC LonTalk Adapter** is a half-length PCI bus card that provides access to a LONWORKS network from any PCI bus PC running a compatible operating system. The adapter features an integral TP/FT-10, TP/XF-78, TP/XF-1250, TP/RS-485, or SMX transceiver, downloadable memory, LNS fast network interface support, and Microsoft plug-and-play support.

The **SLTA-10 and PL-SLTA Serial LonTalk Adapters** are integrated LONWORKS network services interfaces that can be used to interface any host equipped with an EIA-232 serial interface to a twisted pair LONWORKS network.

The ***i*.LON 10 Ethernet Adapter** is a cost-effective Ethernet adapter that provides PPP support for use with external modems. Please see the Internet Connectivity Products section for details.

Product	Model	Description
PCC-10 PC Card	73200	Provides both LNS network interface functionality and non-intelligent network interface functionality for use with legacy (non-LNS) tools.
PCLTA-20 PC LonTalk Adapter	7440x	32-bit PCI adapter card for LONWORKS networks
PL-SLTA Serial Network Adapter	76000	Serial EIA-232 interface connects residential gateways, hosts processors, and modems to LONWORKS networks.
SLTA-10 Serial LonTalk Adapter	7335x	Serial EIA-232 interface connects host processors and Hayes-compatible modems to LONWORKS networks.

### **PCC-10 PC CARD MODEL 73200**



#### **Features**

- Type II PC Card for LONWORKS networks
- Integral free topology transceiver supports both free topology and link power channels
- Single-ended and special-purpose mode ports, and current-limited 5VDC power, provided for external transceiver pods
- Downloadable LNS network interface and LNS fast network interface firmware for use with LNS applications
- Two versions: network adapter only and LonManager Protocol Analyzer with network adapter
- Downloadable firmware allows updates without accessing or changing hardware
- User-selectable languages for error messages
- E Mark, UL, CSA, TÜV

#### **Description**

The PCC-10 Network Adapter is a high-performance interface that is ideal for portable installation, maintenance, monitoring, and control tools. Its compact form-factor and integral TP/FT-10-compatible free topology transceiver make it well suited for use by installation and service personnel of industrial automation, building controls, entertainment/lighting systems, and telecommunications systems.

The PCC-10 Network Adapter provides both LNS network interface functionality, for use with LNS tools such as the LonMaker Integration Tool, and non-intelligent network interface functionality for use with legacy (non-LNS) tools. The card can be used with any notebook, palmtop, or embedded PC with a Type II PC Card (formerly PCMCIA) slot and a compatible operating system. The PCC-10 functions under Windows XP, Windows 2000, and Windows 98 operating systems.

### **PCC-10 TP-78 POD AND PCC-10 TP-1250 POD MODELS 73250 AND 73251**



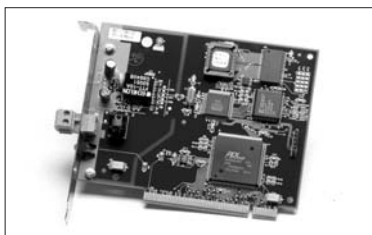
#### **Features**

- Connects a PCC-10 PC Card to TP/XF-78 or TP/XF-1250 channels
- Powered from PCC-10 PC Card
- Channel selection available through software control panel
- CE Mark, UL, CSA, TÜV

#### **Description**

The PCC-10 TP-78 Pod is an external transceiver assembly which allows the PCC-10 PC Card (Models 33100 & 73200) to be attached to a TP/XF-78 channel. The PCC-10 TP-1250 Pod is an external transceiver assembly which allows the PCC-10 PC Card to be attached to a TP/XF-1250 channel.

### PCLTA-20 PC LONTALK ADAPTER MODELS 74401, 74402, 74403, 74404, AND 74405



#### Features

- 32-bit PCI adapter card for LONWORKS networks
- Plug-and-play capability with Windows XP, Windows 2000, and Windows 98
- Downloadable firmware allows updates without accessing or changing hardware
- Integral TP/FT-10, TPT/XF-78, TPT/XF-1250, or TP/RS-485 transceiver; optional SMX transceiver for power line and custom transceivers
- Downloadable LNS network interface and LNS fast network interface firmware supports LNS applications
- CE Mark, UL, cUL

#### Description

The PCLTA-20 PC LonTalk Adapter is a high-performance LONWORKS interface for personal computers equipped with a 32-bit Peripheral Component Interconnect (PCI) interface and a compatible operating system. Designed for use in LONWORKS networks that require a PC to monitor, manage, operate, or maintain the network, the PCLTA-20 adapter is ideal for industrial control, building automation, and process control applications. The PCLTA-20 adapter features either an integral twisted pair transceiver or an SMX transceiver interface, downloadable memory, and compatibility with Windows XP, Windows 2000, and Windows 98.

### PL-SLTA SERIAL NETWORK ADAPTER MODEL 76000



#### Features

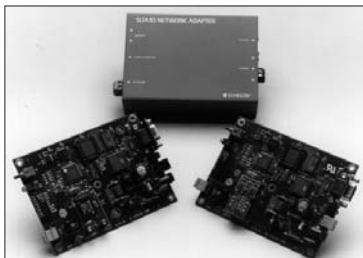
- Serial EIA-232 interface connects residential gateways, host processors, and modems to LONWORKS networks
- 1,200 to 115,200bps selectable bit rate
- Automatic dial-out with compatible modem
- Integral PLT-22 power line transceiver, power supply, and coupling circuit
- Configuration DIP switches accessible without opening chassis
- 100-240V AC 50/60Hz power input via standard line cord
- Plastic enclosure
- Support for both CENELEC and non-CENELEC modes
- Worldwide regulatory compliance for residential, commercial, and utility applications

#### Description

The PL-SLTA (Power Line Serial Network Adapter) is a high-performance LONWORKS interface for use with residential gateways, laptop, desktop, or embedded computers equipped with an EIA-232 serial interface and compatible software. Designed for use in LONWORKS networks that require remote dial-in/dial-out network access or a host processor to monitor, manage, or diagnose the network, the PL-SLTA Network Adapter is ideal for home/building automation, industrial control, and process control applications.

The PL-SLTA Network Adapter provides a LNS network interface for use with Echelon's residential gateway software and PC-based tools, such as the LonMaker Integration Tool.

## **SLTA-10 SERIAL LONTALK ADAPTER MODELS 73351, 73352, AND 73353**



### **Features**

- Serial EIA-232 interface connects host processors and Hayes-compatible modems to LONWORKS networks
- LNS network interface firmware supports LNS applications
- 1,200 to 115,200bps serial bit rate with autobaud detection
- Automatic dial-out with compatible modem
- DIP switch selectable LNS network interface and parallel MIP (SLTA/2 compatible) operating modes
- Integral TP/FT-10, TP/XF-78, or TP/XF-1250 transceiver
- Color-coded, removable screw terminals for network and power wiring
- Configuration DIP switches accessible without opening chassis
- 9-30VAC or DC power input via removable screw terminals or barrel connector
- Metal enclosure for desk or wall mounting
- CE Mark, UL, cUL, TÜV

### **Description**

The SLTA-10 Serial LonTalk Adapter is a high-performance LONWORKS interface for use with Hayes-compatible modems, notebook, desktop, or embedded personal computers equipped with an EIA-232 serial interface and a compatible operating system. Designed for use in LONWORKS networks that require remote dial-in/dial-out network access or a host processor to monitor, manage, or diagnose the network, the SLTA-10 adapter is ideal for industrial control, building automation, and process control applications. Drivers are available for Windows XP, Windows 2000, and Windows 98. LinkManager software simplifies the task of communicating with multiple SLTA-10s from a central location.

## OEM Components

Echelon provides a wide range of cost-effective, high performance OEM components that save development time and lower the productivity costs of LONWORKS devices.

The **PL 3120 and PL 3150 Power Line Smart Transceivers** integrate a Neuron 3120 or Neuron 3150 network processor core with a power line transceiver in one single chip. The Power Line Smart Transceivers offer the most robust, lowest cost means of communicating over AC or DC power lines using low, medium, or high voltage. Designed for use in home, building, factory, and transportation automation applications, the Power Line Smart Transceivers are based on Echelon's proven power line communication technology that has earned a worldwide reputation for reliability.

The **FT 3120 and FT 3150 Free Topology Smart Transceivers** integrate a Neuron 3120 or Neuron 3150 network processor core, respectively, with a 78kbps TP/FT-10 free topology twisted pair transceiver to create a low cost, smart transceiver on a chip. Combined with Echelon's high performance FT-X1 Communication Transformer, the FT 3120 and FT 3150 transceivers set new benchmarks for performance and robust operation.

LONWORKS **transceivers and control modules** are off-the-shelf, safety agency-recognized devices that simplify the development and deployment of interoperable LONWORKS devices. Transceivers provide a physical communication interface between a Neuron Chip and a LONWORKS network, and are available for twisted pair and power line media.



Product	Model	Description
FT 3120 and FT 3150 Free Topology Smart Transceivers	14210-500 14220-800 14230-450	Integrated Neuron 3120 or Neuron 3150 processor core with a free topology twisted pair transceiver; high-performance external transformer.
FTT-10A Free Topology Transceiver	50051	Compatible with FTT-10 and LPT-11 transceivers.
LPI-10 Link Power Interface Module	56210	Couples power from a customer's 48VDC power supply to the link power twisted pair wire.
LPT-11 Link Power Twisted Pair Transceiver	50040-02	Combines power and data on a common twisted wire pair.
LTM-10A LonTalk Module and Motherboard	7335x	Consists of a miniature circuit card containing a Neuron 3150 Chip, 32 Kbytes flash memory, 32 Kbytes RAM, and MIP firmware.
LTS-20 LonTalk Serial Adapter Core Module	65202	Used to build serial LONWORKS adapters that require an LNS network interface or MIP-compatible network interface.
PL 3120 and PL 3150 Power Line Smart Transceivers	15310-1000 15320-960	Integrated Neuron 3120 or Neuron 3150 processor core with a power line transceiver.
PLA-21 Power Line Amplifier	53001	Booster amplifier for use with PLT-22 transceiver.
PLCA-22 Power Line Communications Analyzer	58022	Tool for assessing the performance and effectiveness of the PLT-22 power line transceiver and PLA-21 amplifier.
PLT-22 Power Line Transceiver	50090-03	Includes Dual Carrier Frequency mode and advanced error correction.
PSG/3 Programmable Serial Gateway	7338x	Programmable gateway with an EIA-232C serial interface.
PSG-20 Serial Gateway Core Module	73390	Embedded, programmable serial gateway in a single in-line module (SIM) form factor.
TPM/XF-78 Modular Transceiver	77010	Compatible with TP/XF-78 channels.
TPM/XF-1250 Modular Transceiver	77030	Compatible with TP/XF-1250 channels.
FTM-10 Modular Transceiver	77040	Compatible with TP/FT-10 channels with or without link power.
TPM-RS485 Modular Transceiver	77050	Compatible with TP/RS485 channels.
TP/FT-10 Free Topology Twisted Pair Control Module	55020-01	Includes FTT-10A transceiver; compatible with TP/FT-10 channels (free topology and link power).
TP/FT-10 Flash Free Topology Twisted Pair Control Module	55020-10	Includes FTT-10A transceiver and flash memory socket; compatible with TP/FT-10 channel (free topology and link power).
TP/XF-78 Twisted Pair Control	55010-00	Compatible with TP/XF-78 channels.
TP/XF-78F Flash Twisted Pair Control Module	55010-10	Includes flash memory socket; compatible with TP/XF-78 channels.
TP/XF-1250 Twisted Pair Control Module	55030-10	Compatible with TP/XF-1250 channels.
TPT/XT-1250 Twisted Pair Transceiver	50020-10	Features differential Manchester-encoded signaling. Compatible with TP/XF-1250 channels.

**FT 3120 / FT 3150 FREE TOPOLOGY  
SMART TRANSCEIVERS - MODELS  
14210-500, 14220-800, AND 14230-450**



FT 3120 Free Topology Smart Transceiver in a 44-pin TQFP package

### Features

- Combines an ANSI/EIA 709.3-1999 compliant free topology twisted pair transceiver with a Neuron 3120 or Neuron 3150 network processor core
- Supports polarity insensitive free topology star, daisy chain, bus, loop, or mixed topology wiring
- 78 kilobits per second bit rate for distances up to 500 meters in free topology or 2700 meters in bus topology with double terminations
- High performance Neuron network processor core enables concurrent processing of application code and network packets (40MHz maximum for FT 3120 chip, 20MHz for FT 3150 chip)
- 4Kbytes of embedded EEPROM for application code and configuration data on the FT 3120 Smart Transceiver and 0.5Kbytes of embedded EEPROM for configuration data on the FT 3150 Free Topology Smart Transceiver
- Interface for external memory for nodes with larger memory requirements (FT 3150 Free Topology Smart Transceiver only)
- 2Kbytes of embedded RAM for buffering network data and network variables
- 11 I/O pins with 34 programmable standard I/O modes minimizing external interface circuitry
- Unique 48-bit ID in every device for network installation and management
- Compact external transformer with patent pending architecture providing exceptional immunity from magnetic interference and high frequency common mode noise

### Description

The FT 3120 and FT 3150 Free Topology Smart Transceivers integrate a Neuron 3120 or Neuron 3150 network processor core, respectively, with a free topology twisted pair transceiver to create a low cost, smart transceiver on a chip. Combined with Echelon's high performance FT-X1 Communication Transformer, the FT 3120 and FT 3150 transceivers set new benchmarks for performance, robustness, and low cost.

The free topology transceiver supports polarity insensitive cabling using a star, bus, daisy-chain, loop, or combination topology—freeing the installer from the need to adhere to a strict set of wiring rules. Free topology wiring reduces the time and expense of node installation by allowing the wiring to be installed in the most expeditious and cost-effective manner. It also simplifies network expansion by eliminating restrictions on wire routing, splicing, and node placement.

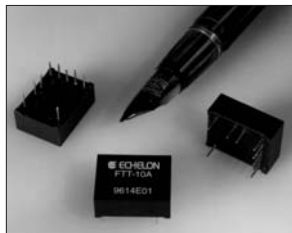
The FT 3120 Free Topology Smart Transceiver is a complete system-on-a-chip that is targeted at cost-sensitive and small form factor designs with a need for up to 4Kbytes of application code. The Neuron 3120 core operates at up to 40MHz, and includes 4Kbytes of EEPROM and 2Kbytes of RAM. The LONWORKS system firmware is pre-programmed in an on-chip ROM. The application code is stored in the embedded EEPROM memory and may be updated over the network. The FT 3120 chip is offered in a 32-lead SOIC package as well as a compact 44-lead TQFP package.

The FT 3150 Free Topology Smart Transceiver includes a 20MHz Neuron 3150 core, 0.5Kbytes of EEPROM and 2Kbytes of RAM. Through its external memory bus, the FT 3150 chip can address up to 58Kbytes of external memory, of which 16Kbytes of external nonvolatile memory is dedicated to the LONWORKS system firmware. The FT 3150 chip is supplied in a 64-lead TQFP package.

Three different versions of the FT 3120 and FT 3150 Free Topology Smart Transceivers are available to meet a wide range of applications and packaging requirements. See data sheet for product offerings and descriptions.



## FTT-10A FREE TOPOLOGY TWISTED PAIR TRANSCEIVER - MODEL 50051



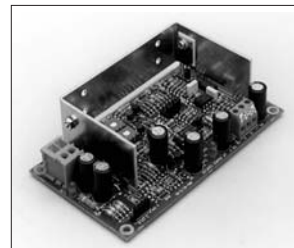
### Features

- Complete LONWORKS transformer-isolated, free topology communication transceiver
- Compatible with the FTT-10 Free Topology Transceiver and LPT-10 Link Power Transceiver; all three transceivers can coexist on a twisted pair cable
- Differential Manchester coded signaling for polarity-insensitive network wiring
- 78 kilobits per second bit rate up to distances of 500 meters (free topology), or 2,700 meters (doubly terminated bus) worst case
- Supports free topology star, bus, and loop wiring
- Automatic clock detection at 5, 10, or 20MHz
- Designed to comply with FCC and EN55022 Level B EMI requirements
- UL, CSA, TÜV Recognized component
- LONMARK certifiable for interoperability

### Description

The FTT-10A Free Topology Twisted Pair Transceiver provides a simple, cost-effective method of adding a LONWORKS transceiver to any Neuron Chip-based device. The FTT-10A transceiver supports polarity-insensitive free topology wiring, freeing the system installer from the need to wire using a bus topology. Star, bus, and loop wiring are all supported by this architecture. Free topology wiring reduces the time and expense of system installation by allowing the wiring to be installed in the most expeditious manner. It also simplifies network expansion by eliminating restrictions on wire routing, splicing, and device placement. Two FTT-10A transceivers may be used back-to-back as a digital repeater should it be necessary to support additional wiring or devices on a channel.

## LPI-10 LINK POWER INTERFACE MODULE - MODEL 56210-01



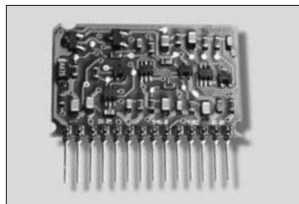
### Features

- Couples power from a customer's 48VDC power supply to the link power twisted wire pair
- Prevents network voltage from exceeding 42.4VDC and protects the power supply from network faults
- Terminates the link power network
- Screw terminals for power supply and network wiring
- DIN rail, panel, or bulkhead mounting
- LED indicators for input and output power
- UL, CSA, TÜV Recognized component
- LONMARK certifiable for interoperability

### Description

Echelon's link power system sends power and data on a common twisted wire pair, and allows the user to wire link power devices with virtually no topology restrictions. Power is supplied by a customer-furnished nominal 48VDC power supply and flows through the LPI-10 Link Power Interface Module onto the twisted wire pair. The LPI-10 module couples power to the system wiring, terminates the twisted pair network, isolates the power supply from network wiring faults, and prevents the network voltage from exceeding 42.4VDC to comply with safety agency regulations' low voltage requirements.

### LPT-11 LINK POWER TWISTED PAIR TRANSCEIVER - MODEL 50040-02



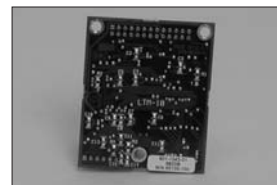
#### Features

- Complete LONWORKS free topology communication transceiver and power supply in a miniature SIP
- Receives both network data and power on a single twisted wire pair
- Provides unmatched electrical noise isolation
- Polarity insensitive network wiring
- 78 kilobits per second network bit rate for distances up to 500 meters (free topology) and up to 2,200 meters (doubly terminated bus topology)
- Supports free topology star, bus, and loop wiring
- Compatible with FTT-10A Free Topology Transceivers, as well as the FT 3120/FT 3150 Smart Transceivers
- Supplies 5VDC @ 100mA maximum for node power
- Meets the requirements of the LONMARK TP/FT-10 channel type

#### Description

The LPT-11 Link Power Twisted Pair Transceiver provides a simple, cost-effective method of adding a network-powered LONWORKS transceiver to any Neuron Chip-based control system. The link power system sends power and data on a common twisted wire pair, and allows the user to install LPT-11 transceivers with virtually no topology restrictions. Power is supplied by a customer-furnished nominal 48VDC power supply, flows through the LPI-10 Link Power Interface Module where it is regulated to 42.4VDC, and then passes onto the twisted wire pair. The LPT-11 transceiver eliminates the need to use a local power supply at each node since node power is sent from a central power supply over the same twisted wire pair that handles network communications.

### LTM-10A LONTALK MODULE AND MOTHERBOARD MODELS 65100-100 AND 65120



#### Features

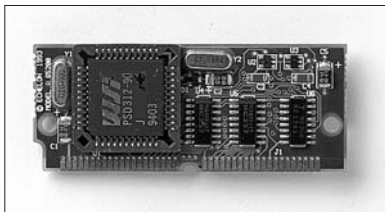
- 32Kbytes flash memory provides non-volatile application memory that can be reprogrammed in the field
- 32Kbytes RAM provides protocol buffer space for applications that receive large bursts of network traffic
- 2 memory maps allow the developer to maximize flash or RAM space
- Built-in Microprocessor Interface Program (MIP)
- 10MHz input clock
- Modular connectors allow modules to be exchanged without soldering
- Supports most standard LONWORKS transceivers

#### Description

The LTM-10A LonTalk Module provides a simple, cost-effective method of adding a LONWORKS processor and interface to any device. The module consists of a miniature circuit card containing a Neuron 3150 Chip, re-programmable 32Kbytes flash memory, 32Kbytes RAM, 10MHz crystal oscillator, and connectors for power, application I/O or host interface, and a transceiver.

The LTM-10A module includes standard Neuron firmware with extensions for automatic configuration of transceiver parameters, output of a packet-transmitted signal, manual device recovery, and a Microprocessor Interface Program (MIP).

## **LTS-20 SERIAL ADAPTER CORE MODULE - MODEL 65202**



### **Features**

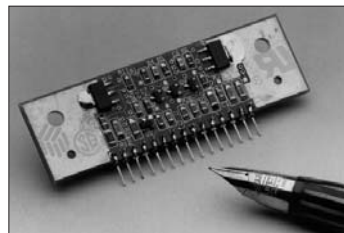
- Compact single in-line module (SIM) form factor
- LNS network interface firmware supports LNS applications
- Supports any host with a standard EIA-232C serial interface
- Transceiver-independent design
- 1,200 to 115,200bps serial bit rate to the host
- Dial-in and dial-out support of compatible modems
- Optional password protection
- Direct replacement for LTS-10 core module

### **Description**

The LTS-20 Serial Adapter Core Module is a compact module used by OEMs to build serial LONWORKS adapters that require an LNS network interface or Microprocessor Interface Program (MIP)-compatible network interface. Any host processor with an EIA-232C (formerly RS-232C) serial interface can implement LNS or LONWORKS applications and communicate with other LONWORKS devices. The host processor may be directly connected to the serial adapter or may be connected over a telephone line using a modem.

The module incorporates LNS network interface firmware that permits the module to be used as the network interface for LNS applications. A cuttable jumper selects between the LNS mode (default) and MIP modes of operation.

## **PLA-21 POWER LINE AMPLIFIER MODEL 53001-01**



### **Features**

- Capable of transmitting a 10V p-p signal with 2A p-p current drive
- Designed for use with the PLT-22 Power Line Transceiver
- UL, CSA, TÜV Recognized

### **Description**

Designed to boost the output level of a PLT-22 Power Line Transceiver, the PLA-21 Power Line Amplifier is intended for commercial and industrial applications such as high rises, manufacturing plants, and utility substations. Capable of transmitting a signal of 10V peak-to-peak (p-p) with 2Ap-p current drive, the PLA-21 amplifier is ideal for driving multiple-phase coupling circuits, high attenuation power circuits, and very low impedance loads near circuit breaker panels and distribution transformers.

## PL 3120 AND PL 3150 POWER LINE SMART TRANSCEIVERS MODELS 15310-1000 AND 15320-960



### Features

- Combines an ANSI-709.2 compliant Power Line Transceiver with an ANSI 709.1 compliant Neuron 3120 or Neuron 3150 processor core
- Designed to comply with FCC, Industry Canada, Japan MPT, and European CENELEC EN 50065-1 power line communications regulations
- Supports CENELEC A-band and C-band operation
- Dual carrier frequency mode and digital signal processing
- 4K Bytes of embedded EEPROM for application code and configuration data on the PL 3120 Smart Transceiver and 0.5K Bytes of embedded EEPROM for configuration data on the PL 3150 Smart Transceiver
- Interface for external memory for applications with larger memory requirements (PL 3150 Smart Transceiver only)
- 2K Bytes of embedded RAM for buffering network data and network variables
- Full duplex hardware UART and SPI serial interfaces
- 12 I/O pins with 38 programmable standard I/O modes to minimize external interface circuitry
- -40 to +85°C operating temperature range

### Description

The PL 3120 and PL 3150 Power Line Smart Transceivers integrate a Neuron processor core with a power line transceiver, making them ideal for appliance, audio/video, lighting, heating/cooling, security, metering, and irrigation applications. Essentially a

system-on-a-chip, the Power Line Smart Transceivers feature a highly reliable narrow-band power line transceiver, an 8-bit Neuron processor core for running applications and managing network communications, a choice of on-board or external memory, and an extremely small form factor—all at a price that is compelling for even the most cost-sensitive consumer product applications.

Compliant with FCC, Industry Canada, Japan MPT, and European CENELEC EN50065-1 regulations, the PL 3120 and PL 3150 Smart Transceivers can be used in applications worldwide.

Intermittent noise sources, impedance changes, and attenuation make the power line a hostile signaling environment. The PL 3120 and PL 3150 Power Line Smart Transceivers incorporate a variety of technical innovations to insure reliable operation:

- Unique dual carrier frequency feature automatically selects an alternate secondary communication frequency should the primary frequency be blocked by noise;
- Highly efficient, patented, low-overhead forward error correction (FEC) algorithm to overcome errors induced by noise;
- Sophisticated digital signal processing, noise cancellation, and distortion correction algorithms. These features correct for a wide variety of signaling impediments, including impulsive noise, continuous tone noise, and phase distortion;
- High output, low distortion external amplifier design that can deliver 1Ap-p into low impedance loads, eliminating the need for expensive phase couplers in typical residential applications.

The combination of these special features enable the Power Line Smart Transceivers to operate reliably in the presence of consumer electronics, power line intercoms, motor noise, electronic ballasts, dimmers, and other typical sources of interference. The Power Line Smart Transceivers can communicate over virtually any AC or DC power mains, as well as unpowered twisted pair, by way of a low-cost, external coupling circuit.

## PLCA-22 POWER LINE COMMUNICATIONS ANALYZER MODEL 58022



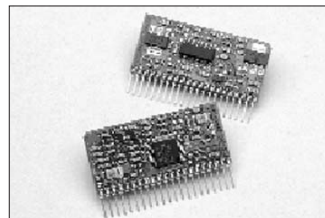
### Features

- High performance, laboratory grade power line communication test tool
- Analyzes power line signaling performance and signal margin of the PLT-22 (Model 50090-03) Power Line Transceiver
- Supports virtually any AC or DC mains voltage or unpowered wire
- Rugged, compact, portable instrument cases
- Dual LED bar graphs display noise levels and received signal strength
- Backlit LCD display shows analyzer status and packet error rate
- Identifies power circuit phase
- EIA-232 port for data logging
- Headphone/oscilloscope jack
- Operates from 100-240VAC or low voltage DC
- UL, cUL, CSA, TÜV, CE Approved

### Description

The PLCA-22 Power Line Communications Analyzer provides a simple means to test the operation and suitability of Echelon's PL-20 power line channel for any application. The user can select between operation in the frequency range of 110kHz to 140kHz (B/C-Band mode) or from 70kHz to 95kHz (A-Band mode). The first frequency range is the standard for most automation applications, while the second range is typically used for meter readings in Europe. By using the PLCA-22 in actual application environments (e.g., residences, commercial buildings, factories), users can quickly determine the performance of the associated power line transceiver as well as the need for routers, conditioning devices such as couplers, or booster amplifiers.

## PLT-22 POWER LINE TRANSCEIVER MODEL 50090-03



### Features

- A robust power line communications solution for applications worldwide
- Dual Carrier Frequency mode and Digital Signal Processing
- 5.4 kilobits per second network bit rate
- Miniature Single In-line Package (SIP)
- Communicates over virtually any AC or DC power mains and unpowered twisted pair
- Uses low-cost coupling circuits and power supplies
- FCC, Industry Canada, Japan MPT, ANSI/EIA 709.2-1999, and European CENELEC EN50065-1 compliant
- Supports optional PLA-21 external amplifier
- Supports CENELEC A-Band and C-Band operation
- UL, cUL, TÜV Recognized
- LONMARK certifiable

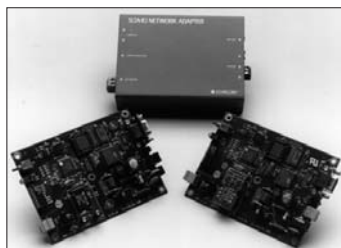
### Description

The PLT-22 Power Line Transceiver provides a simple, cost-effective method of adding LONWORKS power line technology to any device. Network data is broadcast through the power mains, eliminating the need for dedicated wiring and greatly reducing installation costs. The PLT-22 transceiver offers many advanced features including a Dual Carrier Frequency operating mode and enhanced digital signal processing to significantly improve communications reliability and lower node cost.

The PLT-22 transceiver complies with FCC, Industry Canada, Japan MPT, and European CENELEC EN50065-1 regulations for power line signaling. The PLT-22 transceiver is also ANSI/EIA 709.2-1999 compliant. The transceiver can be operated in the CENELEC A-Band for European utility applications, including meter reading.



## PSG/3 PROGRAMMABLE SERIAL GATEWAY - MODELS 73381, 73382, 73383, AND 73384



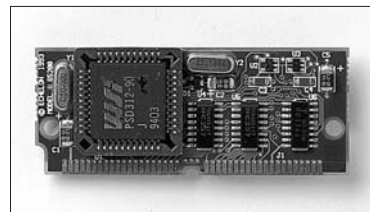
### Features

- Programmable gateway with an EIA-232C interface
- 1,200 to 115,200bps serial bit rate
- Choice of TP/FT-10, TP/XF-78, and TP/ XF-1250 twisted pair channels
- Buffered 16550-compatible UART allows asynchronous processing between the external device and the Neuron Chip on the gateway using a 16-character FIFO in the UART
- 9-30VAC or DC power input via removable screw terminals or barrel connector
- Compatible with LonBuilder and NodeBuilder development tools

### Description

The PSG/3 Programmable Serial Gateway is a compact device used by OEMs to build gateways between LONWORKS networks and devices or systems with serial EIA-232C (formerly RS-232C) interfaces. Typical applications for the PSG/3 include LONWORKS gateways for programmable logic controllers, servo controllers, smart instruments, keypads, displays, and serial gateways to other networks. The PSG/3 includes a motherboard with high-speed UART and EIA-232 drivers, regulator, and a metal enclosure.

## PSG-20 SERIAL GATEWAY CORE MODULE - MODEL 73390



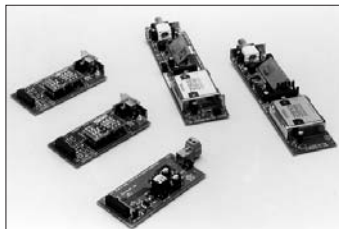
### Features

- Embedded, programmable serial gateway in a single in-line module (SIM) form factor
- Transceiver-independent design connects to any LONWORKS channel with a transceiver interface rate from 9.8kbps to 1.25Mbps
- 1,200 to 115,200bps serial bit rate
- 4Kbytes RAM and up to 42Kbytes application PROM
- Buffered 16550-compatible UART allows asynchronous processing between the external device and the Neuron Chip on the gateway using a 16-character FIFO in the UART
- Compatible with the LonBuilder and NodeBuilder PSG access library

### Description

The PSG-20 Serial Gateway Core Module is a compact module used by OEMs to build gateways between LONWORKS networks and devices or systems with serial EIA-232C (formerly RS-232C) interfaces. Typical applications for the PSG-20 module include LONWORKS gateways for programmable logic controllers, servo controllers, smart sensors, keypads, displays, and serial gateways to other control networks.

**SMX TRANSCEIVERS  
MODELS 77010, 77030, 77040,  
77050, AND 77162**



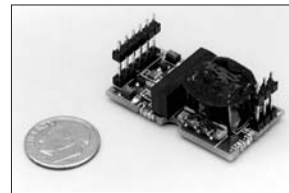
**Features**

- Modular design provides simple means of changing transceiver types
- Built-in transceiver ID output supports automatic configuration of communications parameters
- Metal faceplate with network connector customized for each transceiver

**Description**

The LONWORKS Standard Modular Transceiver (SMX) family provides a modular, flexible solution for interfacing a variety of LonWorks devices to different LONWORKS communications media. LONWORKS devices such as the PCLTA-20 LonTalk Adapter and Development Tools comply with the SMX interface standard to support a wide variety of media types. OEMs may also use these transceivers with other products of their own design.

**TPT/XF-1250 TWISTED PAIR  
TRANSCEIVER - MODEL 50020-10**



**Features**

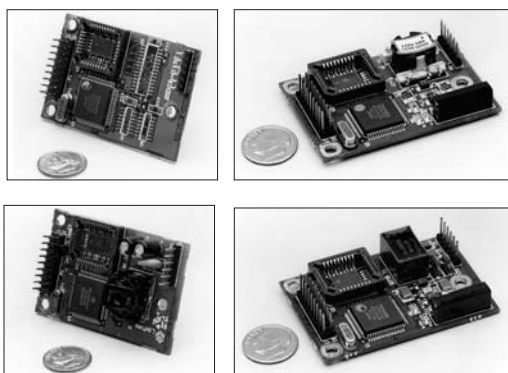
- Complete LONWORKS communication transceiver
- Differential Manchester-encoded signaling for polarity-insensitive network wiring
- Transformer isolation for common mode rejection
- 1.25 megabits per second bit rate at 130 meters worst case
- +5VDC input voltage
- Designed to comply with FCC and VDE Level B requirements
- UL, CSA, TÜV Recognized component
- LONMARK certifiable

**Description**

The TPT/XF-1250 Twisted Pair Transceiver provides a simple, cost-effective method of adding a LONWORKS transceiver to any Neuron Chip-based device. The TPT/XF-1250 transceiver consists of transformer-isolated differential Manchester-encoded communication transceiver and connectors for power, the Neuron Chip communications port (CP) lines, and the twisted pair network data bus. The small size of the transceiver permits it to be mounted almost anywhere on a printed circuit board assembly, either as a socketed or soldered component. The TPT/XF-1250 transceiver can communicate with TP/XF-1250 control modules for those applications using both types of devices.



## TWISTED PAIR CONTROL MODULES MODELS 55010-00, 55010-10, 55020-01, 55020-10, AND 55030-00



### Features

- Neuron 3150 Chip
- Differential Manchester-encoded signaling and transformer-isolation for polarity-insensitive network wiring
- Distances up to 500 meters worst case in free topology (TP/FT-10, TP/FT-10F)
- Distances up to 2,700 meters worst case in doubly terminated bus topology (TP/FT-10, TP/FT-10F)
- Flash memory support on TP/FT-10F and TP/XF-78F
- Common form factor makes control modules interchangeable
- Low power consumption
- Designed to comply with FCC and VDE Level B requirements
- UL, CSA, TÜV Recognized components
- LONMARK certifiable

### Description

Control modules provide a simple, cost-effective method of adding a LONWORKS processor and interface to any device. A control module consists of a miniature circuit card containing a Neuron 3150 Chip, PROM, or flash (TP/FT-10F, TP/XF-78F) memory socket, a communication transceiver, and connectors for power, I/O, and the network. Three transceiver options are available for twisted pair control modules:

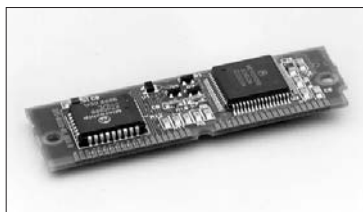
- Free topology, transformer-isolated, 78kbps, differential Manchester-encoded (TP/FT-10, TP/FT-10F)
- Transformer-isolated, 78kbps, differential Manchester-encoded (TP/XF-78, TP/XF-78F)
- Transformer-isolated, 1.25Mbps, differential Manchester-encoded (TP/XF-1250)

## Routers

Transparent support for multiple media is a unique feature of the LONWORKS platform, allowing developers to choose whatever media best suits their needs. Multiple media support is made possible by routers, which adjust bit rate and other communication parameters to accommodate differences between multiple media. Routers can also be used to control network traffic and partition sections of the network from traffic in another section, increasing the total throughput and capacity of the network. LNS network tools automatically configure routers based on network topology, making the installation of routers easy for installers and transparent to the LONWORKS devices.

Product	Model	Description
RTR-10 Router Core Module	61000	Compact router in a single in-line module (SIM)
LPR Router Modules	4210x	Two-channel routers that can interface two different twisted pair channels (TP/FT-10, TP/XF-78, and TP/XF-1250)

## RTR-10 ROUTER CORE MODULE MODEL 61000



### Features

- Compact router in a single in-line module (SIM) form factor
- Transparent multi-channel and multi-media support
- Transceiver-independent design
- Built-in transceiver parameters for standard transceiver types
- Messages forwarded between two channels of the same or different media type or bit rate
- Unlimited number of network variables forwarded
- Default 10MHz operation with a 2 to 2.5ms router delay maximizes system performance of multi-channel networks
- Choice of four routing algorithms allows optimizing tradeoffs between ease of installation and network performance
- Physical isolation between two channels improves system reliability by isolating failures between channels

### Description

The RTR-10 Router Core Module is a compact module used by OEMs to build LONWORKS routers. LONWORKS routers connect two communications channels and route LONWORKS messages between them. The RTR-10 Module consists of the core electronics and firmware on a compact single in-line module (SIM). The RTR-10 router comes pre-configured to support many common LONWORKS transceiver parameters. Pins on the RTR-10 router are used to automatically configure the RTR-10 router for standard and custom transceivers.

The RTR-10 can use one of four routing algorithms: configured and learning modes use routing tables to selectively forward messages based on the destination address; the bridge mode forwards all valid packets that match its domains; and the repeater mode forwards all valid packets.

## LPR ROUTER MODULES MODELS 42100, 42101, 42102, 42103, 42104, AND 4205



### Features

- Router for TP/FT-10, TP/XF-78, and TP/XF-1250 LONWORKS channels
- Screw terminal wiring connections
- 16-30VAC or VDC operation
- Network access from front panel jacks
- Two-piece design cuts installation time, cost
- U.L. Listed, cU.L. Listed, CE Mark, FCC

### Description

The LPR Modules are two-channel LONWORKS routers that can interface two different twisted pair channels (e.g., a high-speed 1.25Mbps TP/XF-1250 backbone and a TP/FT-10 free topology channel) to manage network traffic, increase the total number of LONWORKS devices, or increase the amount of cabling in a system.

LPR Routers can be installed as repeaters, configured routers, or learning routers. Using the LonMaker Integration Tool, the user configures and commissions the LPR routers and other LonPoint modules, as well as third-party LONMARK and LONWORKS devices, to create an interoperable, distributed control system.

## The LONMARK Interoperability Association

One of the hallmarks of LONWORKS technology is support for the design and implementation of open, interoperable control systems. The LONMARK Association's 300+ member companies collaborate to define how devices should interoperate. The LONMARK Interoperability Association and its global membership work together to define the technical attributes and business benefits of interoperability. Interoperable LONMARK systems allow end-users and network integrators to assemble off-the-shelf products from different manufacturers and seamlessly integrate them.

The LONMARK Interoperability Association has compiled functional profiles defining the basic functionality for hundreds of devices. The Association applies the industry defined "Interoperability Guidelines" through a rigorous conformance test, and then certifies those devices that pass the test. Products that conform to the guidelines are eligible to carry the LONMARK logo. This LONMARK logo identifies that a product has successfully completed the LONMARK conformance tests.

LONMARK task groups provide a forum for member companies to work together on technical and marketing related issues. Some LONMARK task groups focus on technical issues related to developing interoperable products for particular applications, such as the development of LONMARK functional profiles for specific control functions. LONMARK profiles are developed through a rigorous analysis and approval process that includes a cross-functional review to ensure that profiles not only interoperate within an individual subsystem, but also provide interoperability with other subsystems. Other LONMARK task groups are marketing oriented involving public relations, exhibitions, seminars, conferences and other activities to promote interoperability for their company products and services.

LONMARK membership is open to any company, organization or individual committed to the development, manufacture, and use of interoperable LONWORKS based products and services. Companies can participate in LONMARK sponsored marketing and technical programs by becoming a LONMARK member. For more information, contact the LONMARK Interoperability Association by phone at +1-408-938-5266, fax +1-408-790-3832, email [info@lonmark.org](mailto:info@lonmark.org), or visit the LONMARK web site at [www.lonmark.org](http://www.lonmark.org).

## **LONWORKS Support Program**

Echelon's support team is comprised of expert LONWORKS applications engineers to assist with LONWORKS device development and integration. Since product and project needs differ, a range of support options is available to fit a wide spectrum of needs.

### **LonSupport™ Annual Support Services**

Annual support programs offer great flexibility and provide support whenever it is needed.

### **LonResponse™ Incident Support Services**

LonSupport Call Packs include a fixed number of incidents that must be used within one year of purchase.

### **Pre-Production Design Review**

Echelon's Pre-Production Design Review enables customers to have the design of a pre-production device, containing one or more select Echelon products, be reviewed by Echelon's engineers. The review includes an analysis of the device's schematic, parts list, and printed circuit board layout in so far as these apply to the proper use of Echelon's products.

### **Project assistance**

Echelon's Project Consulting Assistance provide one eight-hour session with an Echelon application engineer at your job-site, your office, or at one of Echelon's facilities.

Echelon provides global support through Support Centers located in San Jose, London, Beijing, and Tokyo. Questions may be addressed via telephone, fax, or e-mail.

To learn more about our support offerings and the Support Center nearest you, please contact Echelon Sales, your local distributor, or visit the LonSupport Web site at [www.echelon.com/support](http://www.echelon.com/support).

## LonWORKS Training

Echelon's highly regarded training curriculum provides step-by-step, practical, and in-depth knowledge of product design, implementation, and maintenance for the LONWORKS platform. Echelon offers a comprehensive training program for hardware and software developers, network integrators, facility owners, government agencies, trade associations, and standards bodies. Supported by professional trainers worldwide, Echelon's staff is prepared to deliver standard and customized training to fit every need.

Our curriculum includes:

- Designing and implementing a LONWORKS network;
- Designing LONWORKS devices that are interoperable and configurable;
- Developing LNS network tools;
- Effectively using the LonMaker Integration Tool in network design and implementation;
- Integrating the Internet into your LONWORKS network.

These courses feature hands-on laboratory projects and comprehensive training materials for future reference, and are available at your facility or at training centers worldwide.

Visit [www.echelon.com/training](http://www.echelon.com/training) for the latest on-line course, schedule, and registration information.

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For other EBV European sales offices, visit:  
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