

NodeBuilder® 3.1 Development Tool Model 10020



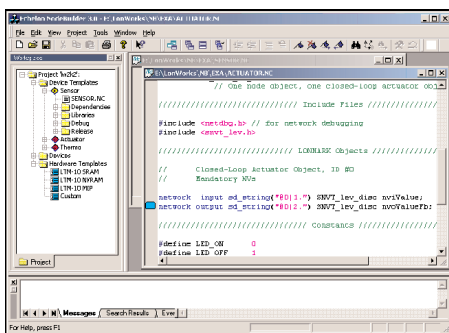
Description

The NodeBuilder 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 the following components:

- ▼ NodeBuilder Software
- ▼ LonMaker Integration Tool
- ▼ LNS DDE Server OEM Edition
- ▼ LTM-10A Platform
- ▼ NodeBuilder Gizmo 4 I/O Board
- ▼ LONWORKS® Module Application Interface

NodeBuilder Software



The NodeBuilder software provides the software tools required to develop a LONWORKS device based on a Neuron Chip or Echelon Smart Transceiver. Device applications are written in Neuron C Version 2.1, a high-level programming language based on ANSI C with extensions to simplify network communication, hardware I/O, and event-driven processing.

- ▼ LTM-10A 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
- ▼ Code editor provides easy editing of device application source code
- ▼ Project manager builds applications and downloads them to the LTM-10A Platform or to any custom device
- ▼ LonMaker™ 3.1 Integration Tool Professional Edition installs development and production devices into networks, simplifying network integration and testing
- ▼ LNS® Device Plug-in Wizard generates Visual Basic code for a complete plug-in that makes a device much easier to install and configure
- ▼ LNS development components support development of LNS device plug-ins
- ▼ LNS DDE Server 2.1 provides a high-performance I/O server for use with third-party human-machine interface (HMI) applications

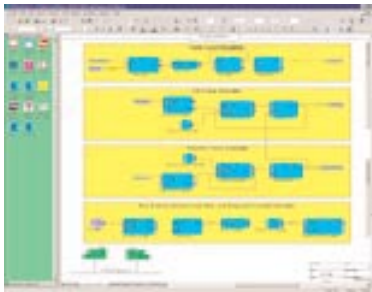
This easy-to-use integrated software for Microsoft Windows includes the following tools:

- ▼ *NodeBuilder Resource Editor* – A tool for viewing standard types and functional profiles, and for defining custom types and functional profiles. Types are stored in LONMARK resource files that are used by the resource editor, code wizard, Neuron C compiler, LonMaker Integration Tool, and plug-in wizard. This ensures all tools have a consistent view of types and profiles, reducing development time. A new unsupported tool for creating Web-based resource file reports is included.
- ▼ *NodeBuilder Code Wizard* – A tool for defining a device's network interface using a simple drag and drop editor and then automatically generating Neuron

C code that implements the device interface. The code wizard saves days of development for every new device.

- ▼ *NodeBuilder Project Manager* – A tool for editing source code for a project; for compiling, building, and downloading application images to the LTM-10A platform or to custom hardware; and for debugging applications running on the LTM-10A platform or custom hardware. When used for debugging, the project manager provides a Neuron C source-level view of the application as it executes, reducing the time required to identify any problems in the source code.
- ▼ *LNS Device Plug-in Wizard* – A tool for automatically writing a Visual Basic application that can be used to configure a device developed with the NodeBuilder tool. The plug-in wizard saves days to weeks of development for every new device. The NodeBuilder tool includes the LNS components required to develop, test, and produce LNS plug-ins. LNS is the standard network operating system for LONWORKS networks.

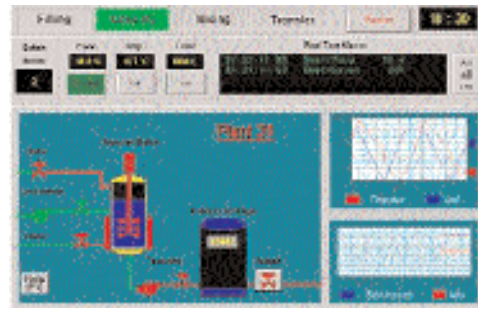
LonMaker Integration Tool Professional Edition



The LonMaker Integration Tool Professional Edition is a software application for designing, installing, and maintaining multi-vendor, open, interoperable LONWORKS networks. Based on the LNS network operating system, the LonMaker tool combines a powerful client-server architecture with an easy-to-use Microsoft Visio® 2002 user interface. The result is a tool that is sophisticated enough to be used to design, commission, operate, and maintain a LONWORKS network yet economical enough to be left behind as an operation and maintenance tool.

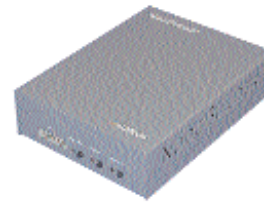
The LonMaker tool is an integral part of the NodeBuilder tool. The LonMaker tool can be used for every phase of network design, installation, commissioning, maintenance, and operation. It is used to install development devices into networks and test the new devices as part of a network. The LonMaker tool includes powerful network browsing features that make it easy to observe the network behavior of devices built with the NodeBuilder tool. The same LonMaker tool can be used to install, maintain, and operate devices in the field, simplifying the transition from development to production.

LNS DDE Server OEM Edition Software



The LNS DDE Server is an I/O driver for human-machine interface (HMI), supervisory control and data acquisition (SCADA), operator interface, and visualization applications. The LNS DDE Server is not required by the NodeBuilder software, but it provides an easy and high-performance way to access your LONWORKS networks and devices from applications that support a DDE, Fast DDE, or SuiteLink interface such as Wonderware® InTouch®, Intellution Fix, or National Instrument BridgeView and LabView.

LTM-10A Platform



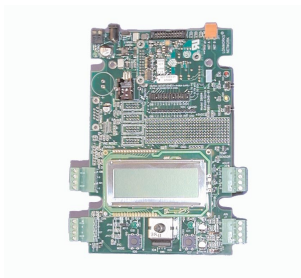
The LTM-10A Platform is a complete LONWORKS device with downloadable flash memory and RAM that can be used for application and prototype I/O hardware testing.

The LTM-10A Platform includes an LTM-10A Flash Control Module that includes a Neuron Chip, 64KByte flash memory, 32Kbyte static RAM, 10MHz crystal oscillator, and custom Neuron firmware. The custom firmware allocates the memory to the Neuron Chip 64Kbyte address space and automatically initializes the transceiver interface for standard transceivers.

The NodeBuilder tool can load application images into the RAM or flash memory of the LTM-10A module, and the NodeBuilder Project Manager can then be used to debug the applications running in the LTM-10A Platform.

The LTM-10A Platform also includes an SMX™ transceiver. The Standard Modular Transceiver (SMX) standard is an open, documented interface standard that OEMs can use with a variety of OEM products including the LTM-10A Platform and the PCLTA-20/SMX PC Interface Card.

NodeBuilder Gizmo 4 I/O Board



The NodeBuilder Gizmo 4 I/O Board is a collection of I/O devices that can be used with the LTM-10A Platform for developing prototype devices and I/O circuits, developing special-purpose devices for testing, or running the NodeBuilder examples.

You can also plug a TP/FT-10 or TP/FT-10F Control Module into the Gizmo 4 to create a self-contained LONWORKS device. This requires separate purchase of the TP/FT-10 or TP/FT-10F Control Module.

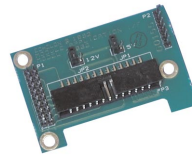
The Gizmo 4 includes the following I/O devices:

- ▼ 4-line x 20-character LCD display
- ▼ Two 10-bit resolution analog inputs with screw terminal connector
- ▼ Two 8-bit resolution analog outputs with screw terminal connector
- ▼ Two digital inputs with screw terminal connector and pushbutton inputs
- ▼ Two digital outputs with screw terminal connector and LED outputs

- ▼ Digital shaft encoder
- ▼ Piezoelectric transducer
- ▼ Real-time clock
- ▼ Temperature sensor

A Gizmo 4 I/O library is included with the NodeBuilder software that provides easy-to-use high-level functions for accessing the display, analog I/O, piezo transducer, real-time clock, and temperature sensor.

LONWORKS Module Application Interface



The LONWORKS Module Application Interface (MAI) is an interface board that is plug compatible with the LONWORKS TP/FT-10, TP/FT-10F, TP/XF-78, TP/XF-78F, TP/XF-1250, and LTM-10 Control Modules. The MAI replaces the control module in a custom device so that the LTM-10A Platform can be used to debug the custom hardware. This simplifies testing since the application can be easily downloaded to the LTM-10A Platform during development and testing. Once the application has been debugged, the MAI can be replaced by the control module with the application programmed into the control module's PROM or flash memory.

Software Specifications

PC requirements	Windows XP, Windows 2000, or Windows 98; Minimum hardware: Pentium 200; 128MB RAM; CD-ROM drive; Super VGA (800x600) or higher-resolution display with 256 colors; mouse or other Windows-compatible pointing device; 440MB available hard drive space; LNS or IP network interface required; Recommended configuration: Windows XP or Windows 2000, Pentium III 500, 256MB RAM, and 1024x768 256-color display minimum
Compatible LNS Network Interfaces and Routers	i.LON® 1000 Internet Server, i.LON 100 Internet Server, i.LON 10 Ethernet Adapter, PCLTA-20 PCI Card, PCLTA-10 ISA Card, PCC-10 PC Card, PCNSI ISA Card, and SLTA-10 Serial LonTalk Adapter
Neuron C I/O Objects	Bit, byte, nibble input/output
	Bitshift input/output
	Dallas Touch input/output
	Dual slope input (for low-cost A/D)
	Edge divide input/output
	Edgelog input (new single timer/counter option)
	Frequency output
	Infrared input
	Infrared pattern output (new)
	PC input/output (enhanced; requires license)
	Level detect input
	Magcard bitstream input (new)

	Magcard track 1 and 2 input (for ISO 7811 input)
	Muxbus input/output (multiplexed address/data)
	Neurowire input/output (National Semiconductor Microwire and Motorola SPI compatible)
	Oneshot output, ontime input, period input, pulsewidth output
	Parallel input/output
	Pulsecount input/output
	Quadrature input
	SCI (UART) Serial input/output* (new)
	SPI serial input/output* (new)
	Serial input/output
	Totalcount input
	Touch input/output (enhanced)
	Triac output
	Triggeredcount output
	Wiegand input
Neuron C Network Communication Extensions	Functional Blocks
	Network Variables
	Configuration Properties
	Application and Foreign-Frame Messages

*For Smart Transceivers and Neuron Chips with hardware SCI and SPI support only.

LTM-10A Platform Specifications

Function	Description
Processor	Neuron 3150 Chip
Processor Input Clock	10MHz
Processor Memory	64Kbyte flash memory and 32Kbyte RAM mapped to 64Kbyte Neuron Chip memory space in 3 memory configurations
Operating Input Voltage	
LTM-10A Platform	+9 to 12VDC unregulated or +5VDC $\pm 5\%$ regulated
Power Supply	100 to 120VAC or 200 to 240VAC; 50 or 60Hz (depending on power option)
LTM-10A Module Operating Input Current	+5V 160mA max
External I/O Power	+5VDC @ 100mA typical
ESD Tolerance	15kV max
Temperature	
Operating	0 to +55°C with enclosure 0 to +70°C in free air
Non-operating	-20 to +65°C
Dimensions	198mm x 145mm x 53mm
EMI Compliance	FCC Level A, En55022B

Documentation

The following documentation is included with the NodeBuilder tool. The documentation provides an overview of the development of LonWorks applications for the Neuron Chip and Echelon Smart Transceiver and of the development of LNS device plug-ins for configuring applications.

Document	Echelon Part Number
Gizmo 4 User's Guide	078-0191-01
LNS DDE Server User's Guide	078-0170-01
LNS Plug-in Programmer's Guide	078-0178-02
LTM-10A User's Guide	078-0132-01
LonMaker User's Guide	078-0168-02
NodeBuilder User's Guide	078-0141-01
Neuron C Programmer's Guide	078-0002-01
Neuron C Reference Guide	078-0140-01 (shipped upon receipt of product registration)

Ordering Information

The NodeBuilder Development Tool is available with two transceiver options and four power supply options. Three LonResponse™ Single Incidents are included. Additional support and training options are available. Contact your local Echelon representative or distributor for details.

Product	Echelon Model Number
NodeBuilder 3/FT-10 Development Tool	10020-31-24P
NodeBuilder 3/PL-20 Development Tool	10020-31-27P

Select P from the following power supply options.

1. U.S. power supply
2. European power supply
3. U.K. power supply
4. Japan power supply

An upgrade to the NodeBuilder 3.1 software is available for licensed owners of the NodeBuilder 3, NodeBuilder 1.5, and LonBuilder® 3.01 development tools. The upgrade requires, but does not include, the LonMaker 3.1 Integration Tool. LonMaker 3.1 and 3.1 SR3 users must download and install a minimum of LonMaker 3.1 Service Pack 3 Update 1. This update is included with LonMaker 3.1 SR3A. The upgrade does not include a development platform — a separate LTM-10A Platform or LonBuilder Emulator used as a custom device is required. The upgrade does not use emulator hardware support for loading and debugging and does not include support or the LNS DDE Server OEM edition.

Product	Echelon Model Number
NodeBuilder 3.1 Upgrade	10030-31

Copyright © 1999-2003 Echelon Corporation. Echelon, LON, LonWORKS, LonMARK, LonBuilder, NodeBuilder, LonManager, LonTalk, LonUsers, LonPoint, Digital Home, Neuron, 3120, 3150, LNS, iLON, LonWorld, the Echelon logo, and the LonUsers logo are trademarks of Echelon Corporation registered in the United States and other countries. LonLink, LonResponse, LonSupport, LONews, ShortStack, LonMaker, Panoramix, Open Systems Alliance, LNS Powered by Echelon, Panoramix Powered by Echelon, and LonWORKS Powered by Echelon are trademarks of Echelon Corporation. Windows is a U.S. registered trademarks of Microsoft Corporation. Other trademarks belong to their respective holders.

Disclaimer

Neuron Chips, Free Topology Twisted Pair Transceiver Modules, and other OEM Products were not designed for use in equipment or systems which involve danger to human health or safety or a risk of property damage and Echelon assumes no responsibility or liability for use of the Neuron Chips or Free Topology Twisted Pair Transceiver Modules in such applications. ECHELON MAKES AND YOU RECEIVE NO WARRANTIES OR CONDITIONS, EXPRESS, IMPLIED, STATUTORY OR IN ANY COMMUNICATION WITH YOU, AND ECHELON SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. 003-0318-01B



www.echelon.com