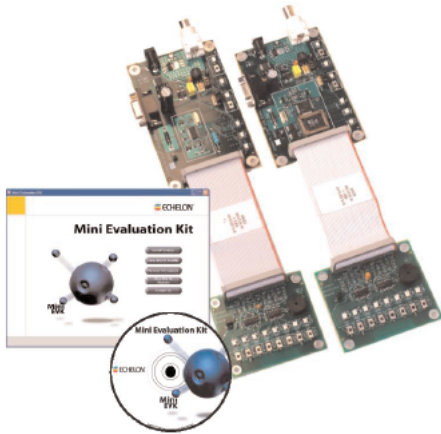


## Mini EVK Evaluation Kit Models 10000R-31-24P and 10000R-32-27



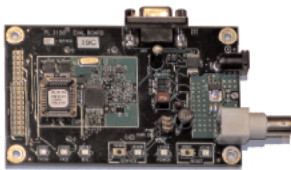
### Description

The Mini EVK is a powerful, low-cost tool for both evaluating and developing LONWORKS control networks. Designed for control system developers, integrators, specifying engineers, educators and students, the Mini EVK combines a flexible hardware platform with sample Neuron C applications and a Neuron C compiler. In just a matter of minutes, users can easily set-up and demonstrate twisted pair or power line control networking, as well as write, compile, and load new applications of their own design.

The Mini EVK makes it affordable for anyone to understand and harness the power of the hugely popular LONWORKS platform, and to develop new devices for the rapidly growing, price-sensitive sensor/actuator mass market. The richly featured Mini EVK may be the only development platform many engineers ever require.

### Hardware

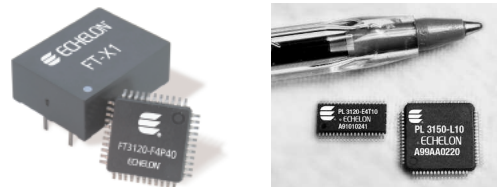
The Mini EVK is comprised of four hardware components: evaluation boards, input/output (I/O) boards, power supplies, and a USB network interface. The evaluation boards are available for use on either twisted pair networks or power line networks. Two evaluation boards are included in every Mini EVK: one based on a Neuron 3120<sup>®</sup> Smart Transceiver core that includes flash memory, RAM, a transceiver, and 3 CPUs



all on one chip; the other based on a Neuron 3150<sup>®</sup> Smart Transceiver core that supports external memory — 64Kbytes of external flash memory are provided.

- ▼ Introduces developers to LONWORKS<sup>®</sup> (ANSI/CEA-709.x) control networking with a rich evaluation and programming environment
- ▼ Includes example applications for device networking, interfacing Windows applications, and self-installation (ad hoc networking)
- ▼ Speeds development of control networks with the powerful Neuron<sup>®</sup> C programming language and a compiler that supports up to 32 network variables and 32 Kbytes of generated code
- ▼ Downloads compiled Neuron C applications to target hardware over the control network
- ▼ Provides easy resource definition and editing with a built-in resource editor
- ▼ Includes two evaluation boards, I/O hardware, and USB interface for fast plug-and-play setup
- ▼ Provides easy migration to the powerful NodeBuilder<sup>®</sup> Development Tool
- ▼ Available in twisted pair and power line versions

The twisted pair versions of the evaluation board use Echelon's Free Topology Smart Transceivers to eliminate wiring topology restrictions, a limitation of older technologies such as RS-485. The power line version utilizes Echelon's Power Line Smart Transceivers to signal over any AC or DC power circuit, eliminating the need for any new wires. The plug-in power supplies provided with the power line evaluation boards pass the network signals directly into the AC



power lines over the same two wires that power the evaluation boards. The power line version of the Mini EVK allows a control network to be created by simply plugging the evaluation boards into electrical outlets.

Two MiniGizmo<sup>™</sup> I/O boards are also included with every Mini EVK, one for use with each evaluation board. The MiniGizmo boards include eight push buttons, eight LEDs, a temperature



sensor, and a piezo transducer. These I/O can be used with the included example applications as well as with new applications developed using the Mini EVK software.

Echelon's U10 Free Topology USB Network Interface or U20



Power Line USB Network Interface

is included with each twisted pair or power line Mini EVK, respectively. The U10 and U20 USB Network Interfaces are supplied with plug-and-play drivers for use with a Windows computer.

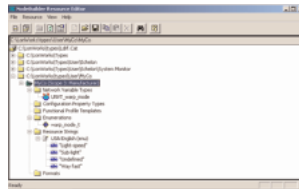
## Software



The Mini EVK includes easy-to-use software for compiling Neuron C applications, and for downloading the compiled applications to any target hardware based on Neuron Chips or Echelon's Smart Transceivers.

The Neuron C compiler can be used to compile applications with up to 32 network variables, and that require up to 32Kbytes of code (including the 16Kbyte Neuron firmware image).

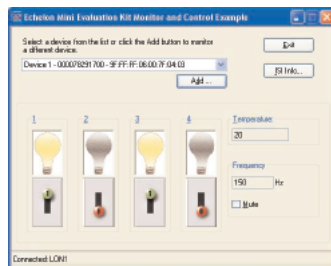
A powerful resource editor is included for displaying and editing functional profile, network variable type, configuration property type, enumeration, and string resources.



## Examples

The Mini EVK includes working example applications that enable prospective developers to begin evaluating the benefits of the LONWORKS platform without writing any code. The example applications demonstrate how control devices can

interact with I/O hardware and exchange data over a control network. The example applications also demonstrate how control networks can be created (self-installed) without the use of any installation tools. The



example applications are compatible with standard LONWORKS installation tools such as the LonMaker® Integration Tool, enabling developers to evaluate the capability of devices to be used in control networks with or without network installation tools.

An example application written in C# is included to demonstrate the simplicity of developing PC applications that interact with LONWORKS devices. The C# application provides a graphical view of one of the example applications running in an evaluation board, and enables the user to control the evaluation board application.

All examples are provided in both executable images and source code. Two of the examples are pre-loaded into the Mini hardware, so that new users can have a control network up and running within minutes of opening the Mini EVK box.

Developers can use the Mini software to modify the Neuron C examples, create new applications based on the Mini examples, or create new examples from scratch. Developers can use the powerful self-installation library included with the examples in custom applications that do not require the use of any installation tools, and yet are fully compatible with standard LONWORKS installation tools such as the LonMaker Integration Tool. Developers with Visual Studio.NET can modify the C# example and develop custom C# examples that interact with control devices over a network.

## Summary

The Mini EVK provides an ideal means to become familiar with the operation and development of LONWORKS control networks. In some cases the kit will be all that is required to teach or learn about LONWORKS networks, or to develop simple, low-cost LONWORKS devices. In other cases, the Mini EVK will be a stepping-stone to Echelon's more fully-featured tools, such as the NodeBuilder Development Tool and LNS® Application Developer's Kit, which include features such as a debugger, project manager, integrated development environment, editor, code wizard, plug-in wizard, and network management API. Developers can begin a project using the Mini EVK, and transition to the NodeBuilder and LNS tools as required.

## Software Specifications

Function	Description
PC Requirements	Windows XP or Windows 2000; 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, 50MB available hard drive space
709.1 Network Interface Requirements	Echelon U10 (TP/FT-10 free topology twisted pair) or U20 (PL-20 power line) USB Network Interface included; The Mini Software is compatible with the Echelon U10, U20, PCC-10, PCLTA-20, PCLTA-21, and SLTA-10 interfaces, and with the <i>i.LON</i> <sup>®</sup> 10 and <i>i.LON</i> 100 servers
Neuron C I/O Drivers	Bit, byte, nibble input/output
	Bitshift, edge divide input/output
	Dallas Touch input/output
	Dual-slope input (for low-cost A/D)
	Edge log input
	Frequency output
	Infrared input/output
	I2C input/output (requires license)
	Level detect input
	Magcard and Wiegand input
	Muxbus input/output
	Neurowire input/output (National Semiconductor Microwire and Motorola SPI compatible)
	Oneshot output, ontime input, period input, pulse width output
	Parallel input/output
	Pulse count input/output, total count input, and triggered count output
	Quadrature input
	SCI (UART), SPI, and software serial input/output
	Triac output
Neuron C Control Network Extensions	Functional blocks, network variables, configuration properties, application messages, foreign-frame messages

## Evaluation Board Specifications

Function	Description
Processor	One Neuron 3150 Smart Transceiver core or one Neuron 3120 Smart Transceiver core
Processor Input Clock	10MHz (20MHz for the FT 3120 EVB)
Processor Memory	56Kbyte flash memory and 2Kbyte on-chip RAM (Neuron 3150 core) and 4Kbyte on-chip flash memory and 2Kbyte on-chip RAM (Neuron 3120 core)
Operating Input Voltage	
Evaluation Board	+9 to 12VDC unregulated (FT); +11 to 17.8VDC unregulated (PL)
Power Supply (included)	100 to 120VAC or 200 to 240VAC; 50 or 60Hz (depending on power option). Includes power line coupler for power line version.
Operating Input Current	150mA max (FT); 250mA max (PL) — not including user I/O
Temperature	
Operating	0 to +40°C
Non-operating	-20 to +65°C
Dimensions	114mm x 70mm x 32mm (excluding connectors)
EMI Compliance	FCC Level A; En55022 Level A

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## MiniGizmo I/O Board Specifications

Function	Description
Digital Inputs	8 pushbuttons
Digital Outputs	8 LEDs
Analog Input	Temperature sensor
Analog Output	Piezo transducer

## Documentation

The following documentation is included with the Mini EVK. The brief Quick Start Guide provides a quick introduction to how to install and use the Mini EVK. It is included in printed and on-line PDF format. All other documents are included only in on-line PDF format.

Document	Echelon Part Number
Introduction to the LONWORKS Platform	078-0183-01
Mini EVK PL Quick Start Guide	078-0301-01
Mini EVK User's Guide	078-0302-01
Mini EVK Hardware Guide	078-0303-01
Neuron C Programmer's Guide	078-0002-02
Neuron C Reference Guide	078-0140-02
ISI Programmer's Guide	078-0299-01
ISI Protocol Specification	078-0300-01
Resource Editor User's Guide	078-0194-01
Resource Report Generator User's Guide	078-0260-01
LONWORKS USB Interfaces User's Guide	078-0296-01

## Ordering Information

The Mini EVK is available in two versions. The FT version can be used for evaluating and developing applications for twisted pair networks. The PL version can be used for evaluating and developing applications for power line networks.

Product	Echelon Model Number
Mini EVK FT Evaluation Kit (US power supply)	10000R-31-241
Mini EVK FT Evaluation Kit (Continental Europe power supply)	10000R-31-242
Mini EVK FT Evaluation Kit (UK power supply)	10000R-31-243
Mini EVK FT Evaluation Kit (Japan power supply)	10000R-31-244
Mini EVK PL-20 Evaluation Kit (100-240VAC 50/60Hz power supply, includes both US/Japan and Continental European Plugs)	10000R-32-27

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