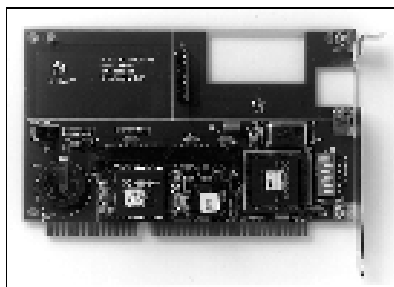# LONMANAGER PCNSI PC INTERFACE CARD
MODEL 35100

FEATURES

- Network services interface (NSI) for use with LNS-compliant applications as well as LonManager® API-based applications

- Half-length ISA bus form factor

- Register-based host interface

- Host controlled interrupt selection from 6 interrupt request (IRQ) lines allows the network driver to control interrupts

- SMX transceiver connector supports interfaces to any LONWORKS communications channel

- Upgrade path from NSS-10, to a remote NSI client, to an NSS for Windows network services server

DESCRIPTION

The LonManager® PCNSI PC Interface Card, combined with software included with the LNS Developer's Kit for Windows, the LNS FASTART package, or LNS Developer's Kit for Microcontrollers, provides a simple and cost effective method of adding LONWORKS network services to an ISA-bus PC-compatible host. These services include installation, maintenance, configuration, monitoring, and control functions.

The PCNSI has two modes of operation – NSI mode and network interface mode. In NSI mode, the host treats the PCNSI card as a smart peripheral device that provides access to an NSS for Windows network services server, either locally on the PC or remotely via the LONWORKS network.

In network interface mode, the host uses the PCNSI card as a standard LONWORKS network interface. In this mode, the PCNSI card can be used with legacy applications that require a LONWORKS network interface such as the LonMaker™ Installation Tool, the LonManager DDE Server, or those based on the LonManager API for Windows.

These two modes translate into three distinct scenarios based on the application programming interface.

When used in NSI mode on a PC with the Windows NT or Windows 95 operating system, the PCNSI card provides the NSI functionality for access to a NSS for Windows network services server, either locally or remotely. The host application is typically written using the LCA Object Server and Data Server, available in the LNS Developer's Kit for Windows and the LNS FASTART Package. In this case, the driver and control panel are part of the LNS Developer's Kit for Windows and ship as part of the LNS-compliant application.

When used in NSI mode on a PC with the Windows 3.1x, DOS, UNIX, OS/2 or other operating system, the PCNSI card provides the NSI functionality for remote access to an NSS for Windows network services server. The host application in this case is written using the LNS Host API, available in the LNS Developer's Kit for Microcontrollers and the LNS FASTART Package. The DOS driver and Windows 3.1x interface, as well as the DOS source code for a sample network driver, are available. Typically this usage only exists when tools based on the PCNSS card's NSS-10 network services server are upgraded to the NSS for Windows network services server or when there is a predominance of PCs that do not support Windows 95 or NT. In almost all cases, writing one application using the LCA Object and Data Server is preferred to writing one application using the LCA Object and Data Server and at least one other application using the LNS Host API, with the multiple driver and operating system support issues.

When used in network interface mode, the PCNSI card can be used with legacy applications such as the LonManager LonMaker installation tool, the LonManager DDE Server, on applications based on the LonManager API for Windows. The DOS driver and Windows 3.1x interface are available, allowing DOS and Windows 3.1x applications to run under the DOS, Windows 3.1x, and Windows 95 operating systems. In addition, the NT driver is available for running DOS and Windows 3.1x applications under Windows NT. The DOS source code for a sample network driver is available on the Echelon web site.

The PCNSI uses LONWORKS SMX™ transceivers to provide a flexible solution for interfacing to any LONWORKS communications media.

The PCNSI card communicates with the attached host through an 8-bit bi-directional data register and an 8-bit status/control register; a single address bit selects the appropriate register. If desired, the host can enable interrupts

on the PCNSI card for a variety of status conditions. Interrupts can be configured by software to use one of six PC interrupt request (IRQs).

The PCNSS network services server module and a PCNSI that operates as a remote client to an NSS for Windows network services server share the same programming interface, called the LNS Host API. This commonality allows for a straightforward migration path from small networks with 62 nodes or fewer using the NSS-10 network services server to larger networks with up to 32,385 nodes using the NSS for Windows network services server as long as the application is written with this path in mind. First, the NSS-10 module is removed from its socket on the PCNSS and replaced with an NSI-10 module, keeping the other node hardware and software the same. Then an NSS for Windows network services server is attached to the network, and the NSS database is recovered from the network. The original PCNSS node has become a remote NSI client node to the NSS for Windows server. To the end-user, there has been no change in the installation tool interface, either hardware or software.

USAGE

Host applications using the NSI mode of the PCNSI card are developed using the LNS Developer's Kit for Windows, the LNS FASTART Package, or the LNS Developer's Kit for Microcontrollers, as described above.

Host applications using the network interface mode of the PCNSI card are developed as described in the *LONWORKS Host Application Programmer's Guide*.

To run the application on a PCNSI card, an SMX transceiver is installed on the PCNSI card, and the PCNSI is then installed in a PC slot.

TECHNICAL SPECIFICATIONS

Throughput per channel		
Unacknowledged	1-byte data	209 packets/sec (1,672bps)
	8-byte data	208 packets/sec (13,312bps)
	32-byte data	204 packets/sec (52,224bps)
	228-byte data	160 packets/sec (291,840bps)
Acknowledged	1-byte data	107 packets/sec (856bps)
	8-byte data	104 packets/sec (6,656bps)
	32-byte data	95 packets/sec (24,320bps)
	228-byte data	55 packets/sec (100,320bps)

Note: 486 100 MHz host; TPM/XF-1250 transceiver, protocol overhead of 9 bytes per message.

Processor	Neuron 3150 Chip
Processor Input Clock	10MHz, 5MHz, 2.5MHz, 1.25MHz, or 625kHz (software configurable)
Transceiver Connector	SMX 10x2 header
Operating Input Voltage	+5VDC ±5%
PC Bus Interface	16-bit ISA slot, half length (2 adjacent slots are required for the PLM-10, 20, and 30 transceivers)
PC Bus I/O Port Addresses	8 contiguous I/O ports starting at 200 hex to 3F0 hex (selected by DIP switch); default 350 hex
PC Bus Interrupts	5, 9, 10, 11, 12, or 15 (software configurable)
Registers	A0=0: Data A0=1: Status/Control
Operating Input Current	
Typical	500mA/2.5W (with TPM/XF-78 XCVR)
Worst case	1000mA/5W (with TPM/XF-78 XCVR)
Temperature	
Operating	0 to +70°C
Non-operating	-40 to +85°C Contact factory for other temperature ranges
Humidity (non-condensing)	
Operating	5 to 95% @70°C
Non-operating	5 to 95% @85°C
Dimensions	178mm x 114mm x 18mm (7.0" x 4.5" x 0.7") *Note: Dimensions include an FTM-10, TPM/XF-78, or TPM/XF-1250 transceiver; dimensions are wider for power line transceivers*
EMI Compliance	
FCC	Designed to comply with Part 15 Level B
VDE	Designed to comply with 0871 Level B

DOCUMENTATION

Documentation is not included with the PCNSI card, and must be ordered separately. The PCNSI card documentation is included in the Connectivity Starter Kit.

Document & Echelon Model Number

LonManager PCNSI and PCNSS PC Interface Card User's Guide	078-0144-01C

Documentation for developing NSI-10 host applications is included with the Model 34303 LNS Developer's Kit for Windows, the Model 34001-00X LNS Developer's Kit for Microcontrollers, and the Model 34304-00X LNS FASTART Package. This documentation consists of the following manuals:

Document & Echelon Model Number

LCA Object and Data Server Programmer's Guide	078-0162-01A
LNS Host API Programmer's Guide	078-0163-01A
LNS Host API Reference Guide	078-0124-01B
NSI-10 and NSS-10 User's Guide	078-0123-01B

ORDERING INFORMATION

A LONWORKS SMX transceiver is required for each PCNSI card. An LNS Developer's Kit for Windows, an LNS Developer's Kit for Microcontrollers, or an LNS FASTART Package is required to develop NSI-10 applications for the PCNSI card.

Product & Echelon Model Number

LonManager PCNSI PC Interface Card	35100

LNS Developer's Kit for Microcontrollers[1]
Select P from one of the following
power supply options:
    1: North America
    2: Europe
    3: U.K.
    4: Japan
	34001-00P

LNS for Windows	34303

LNS FASTART Package[1]
Select P from one of the following
power supply options:
    1: North America
    2: Europe
    3: U.K.
    4: Japan
	34304-00P

TPM/XF-78 Twisted Pair Modular Transceiver	77010[2]
TPM/XF-1250 Twisted Pair Modular Transceiver	77030[2]
FTM-10 Free Topology Modular Transceiver	77040
TPM/RS485 Twisted Pair Modular Transceiver	77050
PLM-10 Power Line Modular Transceiver	77090
PLM-20 C-Band Power Line Modular Transceiver	77160
PLM-30 A-Band Power Line Modular Transceiver	77180

1   The model 34001-00X LNS Developer's Kit for Microcontrollers and Model 34304-00X LNS FASTART Package each include one model 35000-100 NSI-10 module.

2.   TPM/XF-78 and TPM/XF-1250 transceivers are not LONMARK approved.