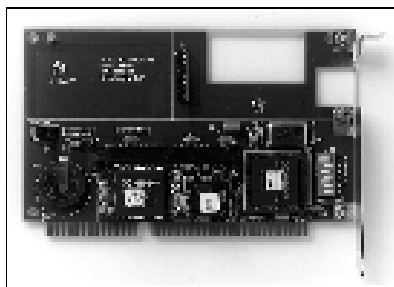


LONMANAGER PCNSS PC INTERFACE CARD

MODEL 34100



FEATURES

- On-board NSS-10 module provides access to all NSS-10 services
- Half-length ISA bus form factor
- Operating system independent design
- Register-based host interface
- Optional status interrupts minimize latency and host processor overhead
- Host controlled interrupt selection from 6 interrupt request (IRQ) lines allows the network driver to control the 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[®] PCNSS PC Interface Card, combined with software included with the 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 PCNSS has two modes of operation – NSS-10 mode and network interface mode. In NSS-10 mode, the host treats the PCNSS card as a smart peripheral device that provides network services for a network with up to 62 application nodes. To use this mode, the host application must be developed using software included with the LNS Developer's Kit for Microcontrollers.

In network interface mode, the host uses the PCNSS card as a standard LONWORKS network interface. In this mode, the PCNSS card can be used with any host application that requires a LONWORKS network interface such as the LonMaker[™] Installation Tool, or the LonManager DDE Server.

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

The PCNSS is a complete LONWORKS network interface combined with a network services server that provides network installation, maintenance, monitoring, and control functions for applications running on the PC host. The NSS-10 module on the PCNSS card provides the heart of a network management, monitoring, and control tool.

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

The PCNSS card provides the majority of the software components required to perform network installation, maintenance, configuration, monitoring, and control functions, freeing the PC host to focus on automating and simplifying application-related tasks.

To perform installation, configuration, and maintenance tasks, the host application sends a buffer to the PCNSS card requesting an action. When the PCNSS receives the request, for example to connect a set of network variables, the PCNSS card expands the request into the required network actions — allocating network resources; building, sending, and processing network messages; keeping a database journal of all changes; performing error checking and recovery — and returns the final result of the request to the host. The PCNSS manages the details, allowing the host to easily accomplish tasks with a minimum of overhead.

During installation, the host uses the PCNSS card to tell each node the system to which it belongs and with which nodes it shares data. This information is stored in each node's internal tables and defines each node's unique network personality. During configuration, the host uses the PCNSS card to customize each node to the particular installation.

This includes setting configuration parameter values and allocating LonTalk® priority message slots. For maintenance, the host uses the PCNSS to add new nodes, replace failed nodes, and re-specify which nodes share data with one another.

Using the network configuration information in the PCNSS card's on-board database, the host can also perform system-level monitoring and control. The host can read or write any network variable on any node, and exchange explicit messages with any node, without the need for a network variable or message tag connection between the host and the node.

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 NSS-10 mode of the PCNSS card are developed using the LNS FASTART Package or the LNS Developer's Kit for Microcontrollers, which contains source code for the LNS Host API. This source code is linked with your PC application to invoke the services on the PCNSS card. These kits also includes source code for a sample NSS-10 host application.

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

A network driver for the PCNSS card is required to access the PCNSS from the host application. A DOS network driver and a Windows 3.1x interface are included with the NodeBuilder Development Tool, and are also available in the Connectivity Starter Kit. Source code is also available on the Echelon web site for porting to other operating systems such as OS/2 or Unix. A Windows NT driver is available for running Windows 3.1x and DOS applications. Contact Echelon for the availability of other drivers.

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

TECHNICAL SPECIFICATIONS

Throughput per channel Unacknowledged	1-byte data	228 packets/sec (1823bps)
	8-byte data	218 packets/sec (13,938bps)
	32-byte data	218 packets/sec (55,808bps)
	228-byte data	159 packets/sec (290,151bps)
Acknowledged	1-byte data	109 packets/sec (873bps)
	8-byte data	106 packets/sec (6790bps)
	32-byte data	97 packets/sec (24,745bps)
	228-byte data	56 packets/sec (102,351bps)

Note: 486DX2-66 host; TPM/XF-1250 transceiver, protocol overhead of 9 bytes per message.

Network Services	Add a new node to the network Define a new node Get the next node Remove a node Load a node's network image Replace a node Copy configuration network variable values Send a command to a node Test a node Create a network variable connection Create a message tag connection Get the hub of the next connection Remove a connection Create a new connection description Get the definition of a connection description Change the settings for a connection description Remove a connection description definition Change a connection's description Get the next member in a connection Start a program loading session Load a portion of an application program End a program loading session Start a program definition session Load a portion of a program definition End a program definition session Remove a program definition Get the value of a property Set a property to a new value Subscribe to events Cancel event subscriptions Add the NSS to the system Remove the NSS from the system Deconfigure all nodes in a system Reset a client Start a transaction Commit a transaction Cancel a client's service and transaction Query the status of a service Cancel the current transaction
Network Events	Service pin message arrived Address table entry changed Message tag connection address changed Network variable connection address changed Network variable selector changed Node network address changed Missed an event notification
Managed Network Objects	Message tag Network variable Node NSS Program System
Modifiable Connection Attributes	Protocol service Layer 4 timing parameters Priority
Network Variable Properties	Address table entry Attributes Length Name Network variable selector Self-documentation Type

Node Properties	Channel ID Error log Error statistics Location Message tag count Network address Network variable count Neuron ID Non-group receive timers Priority slot Program ID Reset cause Self-documentation State
Program Properties	Program ID
System and NSS Properties	Automatic update interval Background discovery interval Domain ID length Domain ID value Network attached Repeat time Retry count Transaction time
Capacity	
Application nodes	62
Connections	383
Domains	1
Network variables per node	255
Network variables per system	767
NSSs	1
Programs	31
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 \pm 5%
Non-volatile RAM	128Kbytes
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 340 hex
PC Bus Interrupts	5, 9, 10, 11, 12, or 15 (software configurable)
Interrupt Sources (software selectable)	Uplink message available Downlink priority buffer available Downlink non-priority buffer available Ready Reset
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") <i>Note: Dimensions include an FTM-10, TPM/XF-78, or TPM/XF-1250 transceiver; dimensions are wider for power line transceivers</i>
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 PCNSS card, and must be ordered separately. The PCNSS card documentation is included in the Connectivity Starter Kit or in the *NodeBuilder User's Guide*, which is included with the NodeBuilder Development Tool.

Document & Echelon Model Number

LonManager PCNSI and PCNSS PC Interface Card User's Guide	078-0144-01C
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The following documentation is included with the Model 34001-00X LNS Developer's Kit for Microcontrollers and the Model 34304-00X LNS FASTART Package.

Document & Echelon Model Number

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 PCNSS card. An LNS Developer's Kit for Microcontrollers or LNS FASTART Package is required to develop NSS-10 applications for the PCNSS card.

Product & Echelon Model Number

LonManager PCNSS PC Interface Card	34100
LNS Developer's Kit for Microcontrollers¹ Select P from one of the following power supply options: 1: North America 2: Europe 3: U.K. 4: Japan	34001-00P
LNS FASTART Package¹ 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	77010²
TPM/XF-1250 Twisted Pair Modular Transceiver	77030²
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 34000-100 NSS-10 module.
2. TPM/XF-78 and TPM/XF-1250 transceivers are not LONMARK approved.

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