LNS DEVELOPER'S KIT FOR MICROCONTROLLERS MODEL 34001

The LNS Developer's Kit for Microcontrollers provides the hardware and software components required to build LNS applications based on any microcontroller, microprocessor, or computer host. These applications can run as a stand-alone network services server (using the NSS-10 module) or as remote clients to an NSS for Windows network services server (using an NSI-10 module, PCC-10, PCNSI, or a custom NSI built using the NSI firmware).

The kit includes the following components:

- *Evaluation motherboard*
- *NSS-10 module*
- *NSI-10 module*
- *NSI firmware license*
- *ANSI C source code license for the LNS Host API and utilities*
- *ANSI C source code for an example LNS host application*
- *LonResponse™ Ten Pack technical support*

FEATURES & BENEFITS

- *Common host-independent API for all microcontroller, microprocessor, or computer hosts for both stand-alone server and remote client applications*
  - Simplifies development and reduces software maintenance costs; only one simple API to port and learn
- *Hardware and firmware-based NSI option*
  - Allows optimization of NSI design based on cost (using the NSI firmware) or compatibility with stand-alone server based design (using the NSS-10 module)
- *ANSI C source code for API library, network interface library, and network driver*
  - Simplifies porting to all hosts
- *ANSI C source code for sample application*
  - Minimizes learning time; reduces development time
- *Evaluation motherboard with SMX-compatible transceiver module connector*
  - Speeds system development for any media by allowing host software development to begin with no hardware development required; supports any LONWORKS communications channel; increases flexibility since the transceiver can be easily changed

DESCRIPTION

The developer's kit includes both hardware and software components. These components allow hardware and software development to proceed in parallel.

The evaluation board can be used with any host processor. It includes a SIM socket for the NSS-10 or NSI-10 module and a connector for a LONWORKS SMX-compatible transceiver module. An SMX-compatible transceiver must be purchased separately. For use with a Motorola 683XX microcontroller host, the evaluation board contains a socket and interface circuitry to connect to a Motorola 683XX BCC and a female DB-9 connector for use with the ASCII terminal used by the 683XX BCC. For an IBM PC-compatible host, the evaluation motherboard contains a female 36-pin Centronics-type connector and interface circuitry to connect to an IBM PC-compatible parallel port. For any other host processor, the evaluation board contains prototyping area where any required host interface circuitry can be added.

The developer's kit software includes source code for all the host software needed to create LNS host applications. Using the supplied source code, developers can begin creating applications immediately, without developing lower-level infrastructure code. The developer's kit includes ANSI C source for the API library, the network interface library, a utility to backup the NSS-10 database to the host, a utility to restore an NSS-10 database from the host, and an example host application. The sample host application shows how to use LNS services to install and configure a network. It also demonstrates how to perform system-level monitoring and control using the services, properties, and events available from the NSS. The libraries, utilities, and example have been compiled with Borland C++ 3.0 and Microsoft Visual C++ 1.5 and tested under DOS 6.2. The developer's kit software also includes source for an MS-DOS NSS-10 and NSI-10 network driver in C and 8086 assembly. The driver source has been compiled with Borland C++ 3.0 and tested under DOS 6.2.

20-PIN SMX HEADER

Name	Function	Pin Number
~BUSY	Busy LED output	18
CLK	Neuron Chip CLK2 output	17
CP0	Neuron Chip communication port 0	10
CP1	Neuron Chip communication port 1	8
CP2	Neuron Chip communication port 2	6
CP3	Neuron Chip communication port 3	12
CP4	Neuron Chip communication port 4	4
~RESET	Neuron Chip reset	16
XID0	Transceiver ID 0 input (LSB)	3
XID1	Transceiver ID 1 input	5
XID2	Transceiver ID 2 input	7
XID3	Transceiver ID 3 input	9
XID4	Transceiver ID 4 input (MSB)	11
V_{CC}	+5VDC output	1, 19
GND	Ground	2, 20
NC	No connect	13, 14, 15

TRANSCEIVER ID

The 5-bit transceiver ID input, XID(4..0), specifies the transceiver type and input clock speed as listed in the following table:

ID	XID [4..0]	Name	Media	Network Bit Rate	Input Clock	Priority Slots
01	00001	TP/XF-78	Transformer isolated twisted pair	78kbps	10MHz	4
03	00011	TP/XF-1250	Transformer isolated twisted pair	1.25Mbps	10MHz	16
04	00100	TP/FT-10	Free topology and link power	78kbps	10MHz	4
05	00101	TP/RS485-39	RS-485 twisted pair	39kbps	10MHz	4
07	00111	RF-10	49MHz radio frequency	4.9kbps	5MHz	4
09	01001	PL-10	Spread Spectrum power line	10kbps	10MHz	8
10	01010	TP/RS485-625	RS-485 twisted pair	625kbps	10MHz	4
11	01011	TP/RS485-1250	RS-485 twisted pair	1.25Mbps	10MHz	16
12	01100	TP/RS485-78	RS-485 twisted pair	78kbps	10MHz	4
16	10000	PL-20C	C-band power line [1]	5kbps	10MHz	6
17	10001	PL-20N	C-band power line [1]	5kbps	10MHz	8
18	10010	PL-30	A-band power line	2kbps	10MHz	12
24	11000	FO-10	Microsym fiber optic	1.25Mbps	10MHz	16
27	11011	DC-78	Direct connect	78kbps	10MHz	0
28	11100	DC-625	Direct connect	625kbps	10MHz	0
29	11101	DC-1250	Direct connect	1.25Mbps	10MHz	0
30	11110	Custom	Custom [2]	N/A	N/A	0

1 PL-20C enables the CENELEC compliant access protocol; PL-20N disables it.

2 Type 30 can be used for any transceiver type; the communications port is initially defined as all inputs to prevent circuit conflicts. The host programs the communications parameters using local network management messages.

TECHNICAL SPECIFICATIONS

LNS Host API

Network Services Library Functions	Invoke service Check service status Get service parameters Send service result Set parameters Cancel service Begin network transaction Commit network transaction Cancel network transaction Create client Get current client Reset client Set current client Terminate client
Network Interface Library Functions	Initialize network interface Reset network interface Send LonTalk message Receive LonTalk message Get next LonTalk message response Send LonTalk message and wait for completion Trace messages Register callback function Handle error
Network Driver Commands	Open Network Interface Read and Write Buffer I/O Control Register Callback Function Close Network Interface

Evaluation Board

Power Supplies	
USA/Canada	120VAC, 60Hz
Continental Europe	220VAC, 50Hz
United Kingdom	240VAC, 50Hz
Japan	100VAC, 50/60Hz
Operating Input Voltage	+9 to 12VDC
Transceiver Connector Type	SMX-compatible 10x2 header
Temperature	
Operating	0 to +70°C
Non-operating (12 hour)	-40 to +85°C
Humidity (non-condensing)	
Operating	5 to 95% @70°C
Non-operating (12 hour)	5 to 95% @85°C

DOCUMENTATION

The following documentation is included with the Model 34001-00X LNS Developer's Kit for Microcontrollers.

Document & Echelon Model Number

LonManager NSS-10 Module Developer's Guide	39700
LonManager NSS-10 Reference Guide	39710

ORDERING INFORMATION

A LONWORKS SMX transceiver is required to use the LNS Developer's Kit for Microcontrollers.

Product & Echelon Model Number

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
TPM/XF-78 Twisted Pair Modular Transceiver	77010
TPM/XF-1250 Twisted Pair Modular Transceiver	77030
FTM-10 Free Topology Modular Transceiver	77040
TPM/RS485 Twisted Pair Modular Transceiver	77050
PLM-10 Power Line Modular Transceiver	77090
PLM-20 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 include one model 34000-100 NSS-10 module and one model 35000-100 NSI-10 Module.