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I/A Series®

LON® Network Controller

The LON Network Controller (LNC-100) is the foundation of scalable I/A Series MicroNet systems, from small buildings to large campuses. The LNC-100 provides the system or the operator with an interface for communicating with any LONWORKS® device, using block programming in combination with the LONTALK® protocol. It offers remote access, trending, alarming, scheduling, Facilities Management System (FMS) functions, and global data passing.

In addition, the LNC-100 provides a highly integrated solution for interfacing an Invensys Energy Solutions (IES) NETWORK 8000® or DMS system with devices on a LONWORKS subnet. Through its RS-485 Application Specific Device (ASD) communication bus, the LNC-100 is also fully compatible with IES's ASD controllers.

Applications

The LNC-100 allows the monitoring and editing of controller setpoints and sequences. In addition to direct digital control applications, the LNC-100 has a complete set of energy and facility management capabilities including maintenance time reminders, energy reports, and trend reports.

Systems Connectivity

The LNC-100 integrates a LONWORKS subnet composed of one or more wiring segments. Each wiring segment may contain up to 62 LONWORKS devices (nodes). This may be expanded with the use of repeaters, by connecting multiple segments to form subnets of up to 127 nodes. The total node count for a subnet includes the LNC-100, although it is not itself a LONWORKS device.

The LNC-100 may be connected to other area controllers in a peer-to-peer network, using optional Ethernet or Echelon® Network Interface Modules (NIMs), to provide system point expansion capacity for any size facility, in a fully modular manner. The LNC-100's two RS-232 device ports allow Graphical User Interface connection, as well as remote access through an auto-dial/auto-answer modem.



LonWorks®

Features —

- Provides an integrating, scalable solution.
- Provides an interface to read/write values in MicroNet LONWORKS controllers.
- Operational with a variety of Human Machine Interfaces (HMIs).
- A single, common, network area controller level integration platform that can coexist on the Ethernet and Echelon LANs of the DMS and NETWORK 8000 systems.
- Supports trend collection and alarm management.
- Built-in daily EMS profile reports and monthly summary reports provide facilities data useful for tenant billing and cost savings.
- Built-in maintenance time reminders ensure that system maintenance requirements are scheduled and annunciated when needed, reducing overall maintenance costs.
- Optional operator interfaces such as the low cost ProView™ provide the flexibility of meeting daily monitoring needs, plus complete database programming and access.

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Hardware Specifications

Dimensions 11-1/4" high x 11-1/4" wide x 2-3/4" deep (286 mm x 286 mm x 70 mm).

Power Supply Input 20.4 Vac to 30.0 Vac, 50/60 Hz.

Maximum Power Consumption 30 VA.

Transient Compliance Meets requirements of ANSI/IEEE C62.41.

Agency Listings
FCC, Part 15, Subpart J, Class A.
UL Listed
- UL-864 (Category UUKL, File # S5381).
- UL-916 (Category PAZX, File # E71385).
- UL Listed to Canadian Safety Standards (CAN/CSA C22.2, File # E71385).

European Community — EMC Directive
- **Emissions** EN55022 Class A
- **Immunity** EN50082-1

Ambient Limits
- **Operating Temperature** 32 to 122°F (0 to 50°C).
- **Shipping and Storage Temperature** -40 to 140°F (-40 to 60°C).
- **Humidity** Up to 85% RH, non-condensing.

Microprocessor 80186, 12 MHz clock frequency, 16 bit word size.

Memory EPROM, EEPROM and RAM memory for operating system, user control program, and data storage sufficient for all functions specified.

Hardware Clock Power fail backup, crystal-driven, automatic engage, accuracy ±60 sec./mo. @ 77°F (25°C).

Battery Backup Maximum 30 day RAM and clock backup via replaceable battery.

Optional User Interface Full alphanumeric and function select keys or menu keys for parameter entry, system configuration and edit functions.

Diagnostic Displays Light Emitting Diode and alphanumeric displays (with optional user interface) annunciate hardware failures and control program errors or problems.

Software Specifications

Operating System Multi-user, multi-tasking.

Message Routing Messages may be routed throughout the network to one of five print groups, to provide segregation of alarms, database changes, etc. to operating personnel.

Local Trend Reports 4 points per trend with user definable sample intervals, titles, quantity of samples, and number of trends.

Maintenance Time Reminders (MTR) User definable MTR messages with event, calendar, elapsed time or number of cycles initiation.

View/Edit/Override Groups Attribute values that are frequently viewed and/or modified can be added to any one of ten View/Edit/Override groups. Each View/Edit/Override group can contain up to 20 attribute values with a 20-character description for each value.

Override Reports Listing of all attribute values that are currently in an overridden state. This report can be viewed and/or printed.

Alarm Processing Features
- **Alarm Response Time** 3 seconds typical.
- **Alarm Priority Levels** 15.

Arithmetic Capacities
- **Calculation Range** 3.4×10^{-38} to 3.4×10^{38} floating point arithmetic.
- **Functions** Add, subtract, multiply, divide, square root.

Support for External Auto-Dial Modem
- **Command Set** DC Hayes-compatible.
  - **Baud Rate** 300, 1200, 2400, 9600.
  - **Auto-Dial Modem Support** Ten phone numbers, three subsets activated by event, calendar or time of day, calling one or multiple users (until answered).

Communications

Ports
- **RS-232C** Dual asynchronous ports for connection to IES operator interface computers, auto-answer/auto-dial modems, video display terminals, printers, or portable service computers, using definable ASCII word size, start bits and stop bits.
  - **Data Rates** 300, 1200, 2400, 4800, 9600 baud asynchronous.
  - **Characters** Non Return to Zero (NRZ) binary encoded. Word size, parity and stop bit definition are user-selectable.
- **Communication Bus 1** 1200 to 19,200 baud asynchronous (selectable). Protocol: packeted data with error checking, supports up to 128 ASD controllers (with repeaters).
- **Communication Bus 2** LNC-100 LON bus, LONTALK protocol. FTT-10 LONWORKS Free Topology network subnet, consisting of one or more wiring segments. Each wiring segment may have up to 62 devices (nodes). Using repeaters, multiple segments may be joined to form a subnet with a maximum of 127 nodes, including the LNC-100 and any devices used for network setup or management.

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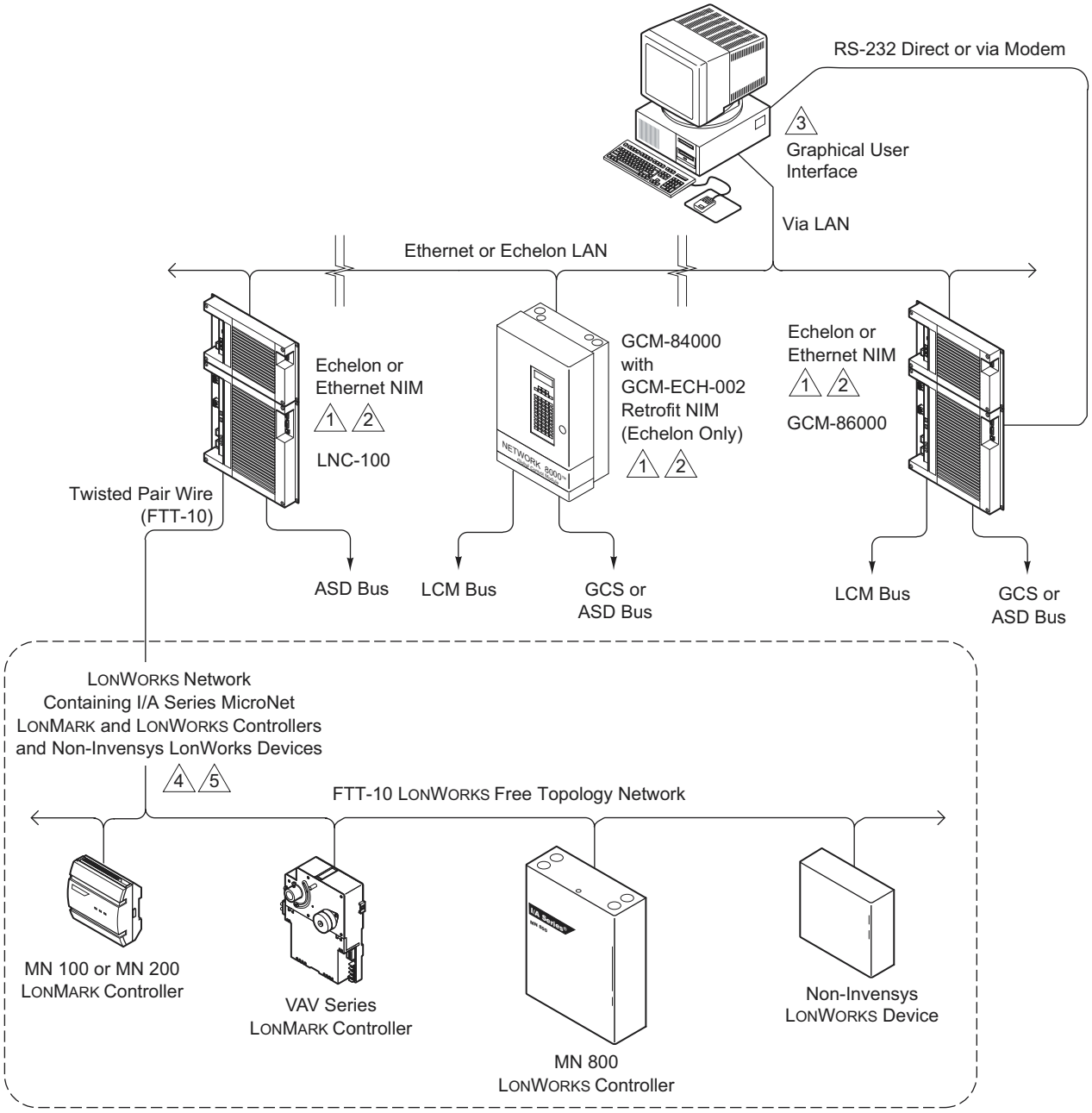
Accessories

ENCL-201-TUB	Control cabinet tub	GCM-ECH-001	Echelon network interface module
ENCL-201-TUB-P	Cabinet tub (plain)	GCM-ETH-001	Ethernet network interface module
ENCL-DOOR-PLA	Control cabinet door (plain)	RPTR-ECH-WW	Echelon network repeaters, wire-to-wire
ENCL-DOOR-PRO	Control cabinet door with ProView	RPTR-ECH-WXF	Echelon network repeaters, wire-to-fiber
PROV-GCM	ProView operator interface (included in the ENCL-DOOR-PRO-1 control cabinet door)	RPTR-WIRE/FIBER	ASD Bus repeaters

Table-1 Software Functional Libraries.

Direct Digital Control Functions	Energy Management System (EMS) Functions	Math and Logic Functions	Facilities Management System (FMS) Functions
• Setpoint Reset • Ramp • Floating ON/OFF • 2-Position ON/OFF • PID Loop • Linear Sequencer • Rotating Sequencer • Binary Sequencer • High/Low Select • Energy Dead Band • Thermostat • Self-Tune PID	• Duty Cycle • Temperature Compensated Duty Cycling • Optimum Start/Stop • Electric Demand Limiting • Weekly Scheduling • Calendar Scheduling • Enthalpy Changeover • Global Control/Monitoring • MICROFLO II™ • MICROZONE II® • MICROZONE II Scheduling • MICROZONE II Holiday Scheduling • MicroNet • MicroNet VAV • SIM	• Add • Subtract • Multiply • Divide • Square Root • AND, OR, XOR, NAND, NOR • Invert • Averaging • Summation • High Value • Low Value • Totalize • Pulse Count Conversion • Time Delay • Sensor Curve Fit • CFM Calculation • BTUH Calculation	• Analog High/Low Alarm • Digital Alarm • Trend Log Reporting • Weekly EMS Report • Monthly EMS Report • Maintenance Time Reminders • BTUH Trend • View/Edit/Override • Current Status Group • LAN Configuration

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1 This diagram shows the LNC-100 being used to interface the LONWORKS network to a NETWORK 8000 system. Similarly, the LNC-100 may also be used to interface a DMS system containing DMS-3500 series controllers, when equipped with the appropriate NIMs.

2 Echelon and Ethernet NIMs must be installed on separate network trunks.

3 Invensys graphical user interfaces use various methods to communicate with the GCM series and LNC controllers. Refer to information in this diagram that is applicable to the chosen user interface.

4 A LONWORKS subnet consists of one or more wiring segments. Each wiring segment may have up to 62 devices (nodes). Using repeaters, multiple segments may be joined to form a subnet with a maximum of 127 nodes, including the LNC-100 and any devices used for network setup or management.

5 The LONWORKS network may use the Doubly-Terminated Bus Topology, with a maximum length of 4,593 feet (1,400 meters), or the Free Topology, with a maximum length of 1,641 feet (500 meters).

Figure-1 LNC-100 System Architecture.

All specifications are nominal and may change as design improvements are introduced. Invensys Energy Solutions shall not be liable for damages resulting from misapplication or misuse of its products.

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