I/A Series®

Global Control Module Version 5

LonWorks®

The Invensys Energy Solutions NETWORK 8000® Global Control Module (GCM™) is a modular, multi-tasking, multi-user, and direct digital area controller. The GCM block programming software provides flexible, pre-tested, and debugged control elements to ensure reliability, compatibility with future system enhancements, and reduced system maintenance costs. Two built-in RS-485 communication trunks support the full complement of NETWORK 8000 controllers. Dual RS-232 ports can be used to connect personal computer-based graphical operator interfaces, VT-100 class terminals, and/or auto-dial/auto-answer modems for remote telecommunications.

Applications

Designed to accomplish the sophisticated control strategies of today's Building Automation Systems (BAS), the GCM in conjunction with a wide variety of stand-alone controllers can be applied to all types of mechanical, electrical, and environmental systems. In addition to direct digital control applications, the GCM has a complete set of energy and facility management capabilities including maintenance time reminders, energy reports, and trend reports.

Systems Connectivity

The GCM interconnects with NETWORK 8000 stand-alone controllers, utilizing two industry standard RS-485 communications trunks, thereby providing a single interface point to the BAS. GCMs may be connected together in a peer-to-peer network by using optional Ethernet or Echelon® Network Interface Modules (NIM) to provide system point expansion capacity, for any size facility, in a fully modular manner.

Features —

- Complete direct digital control, energy management, and facility management software libraries control most building mechanical, electrical, and lighting systems.
- Programming based on the NETWORK 8000 object oriented technique known as block programming provides reliable control operations.
- Battery backed real-time clock allows the GCM to be used in stand-alone and dial-up applications.
- Built-in daily EMS profile reports and monthly summary reports provide facilities data useful for tenant billing and cost savings.
- Built-in maintenance time reminder functions ensure that system maintenance requirements are scheduled and annunciated when needed, reducing overall maintenance costs.
- Auto-dial applications can select up to three subsets of ten phone numbers for the remote reporting of alarms, trend reports, and maintenance reports.
- 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 is password protected and 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 X 10^{-38} to 3.4 X 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

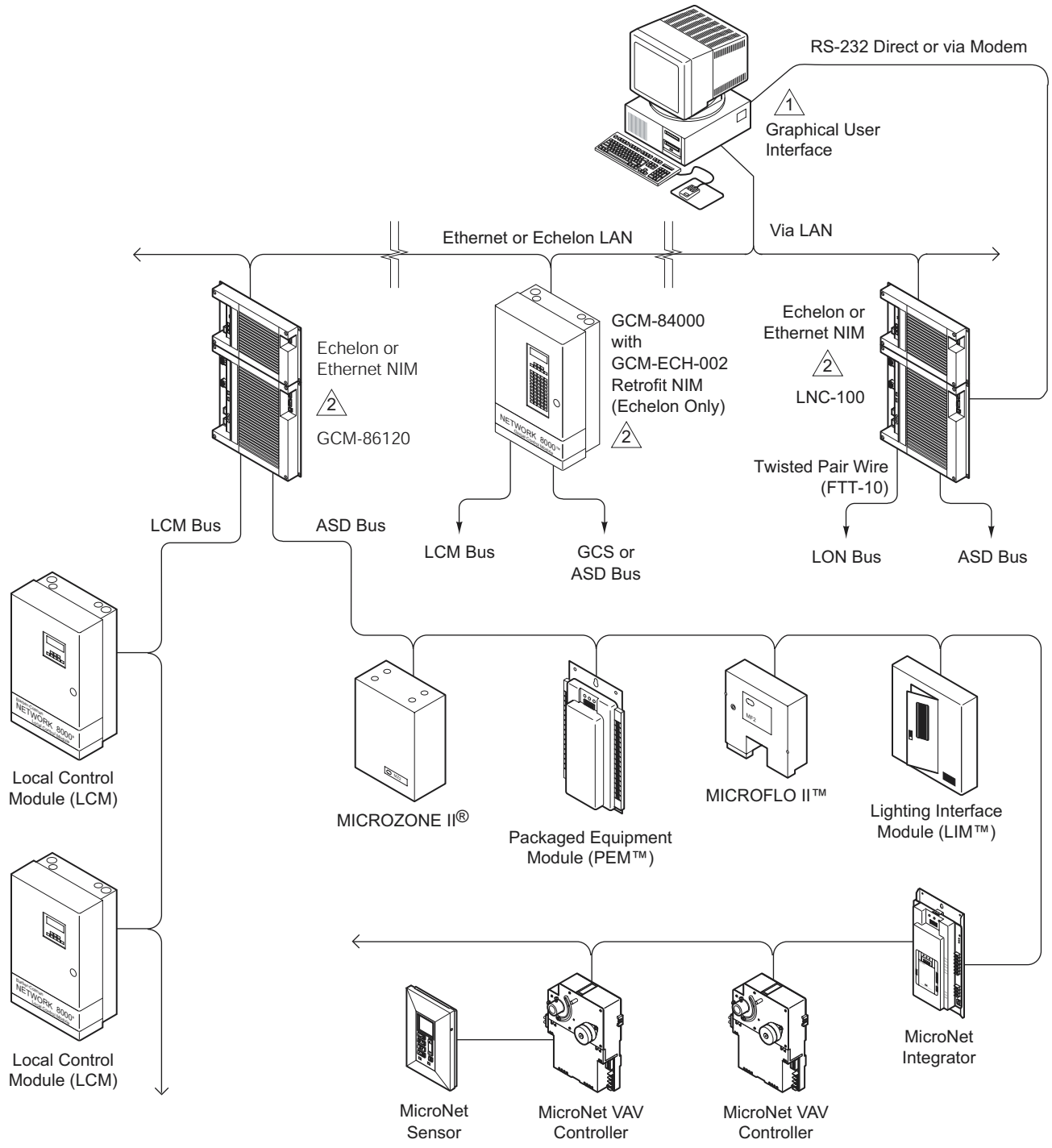
Ports
- **RS-232C** Dual asynchronous ports for connection to NETWORK 8000 operator interface computers, auto-answer/auto-dial modems, video display terminals, printers, or portable service computers, using definable ASCII word size, start bits and stop bits.
  - **Data Rates** 300, 1200, 2400, 4800, 9600 baud asynchronous.
  - **Characters** Non Return to Zero (NRZ) binary encoded. Word size, parity, and stop bit definition are user-selectable.
- **RS-485 LCM Interface Bus** 19,200 baud asynchronous. Protocol: packeted data with error checking.
- **RS-485 Application Specific Device (ASD) Controller Bus** 1,200 to 19,200 baud asynchronous (selectable). Protocol: packeted data with error checking, supports up to 128 ASD controllers (with repeaters).

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-WIRE/FIBER	ASD Bus repeaters
ENCL-DOOR-PRO	Control cabinet door with ProView	PROV-GCM	ProView operator interface (included in the ENCL-DOOR-PRO-1 control cabinet door)

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 • MICROFLO II™ • MICROZONE • MICROZONE II® • MICROZONE II Scheduling • MICROZONE II Holiday Scheduling • MicroNet • MicroNet VAV	• Add • Subtract • Multiply • Divide • Square Root • AND, OR, XOR, NAND, NOR • Invert • Averaging • Summation • 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



1 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.

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

Figure-1 GCM-86120 System Architecture.