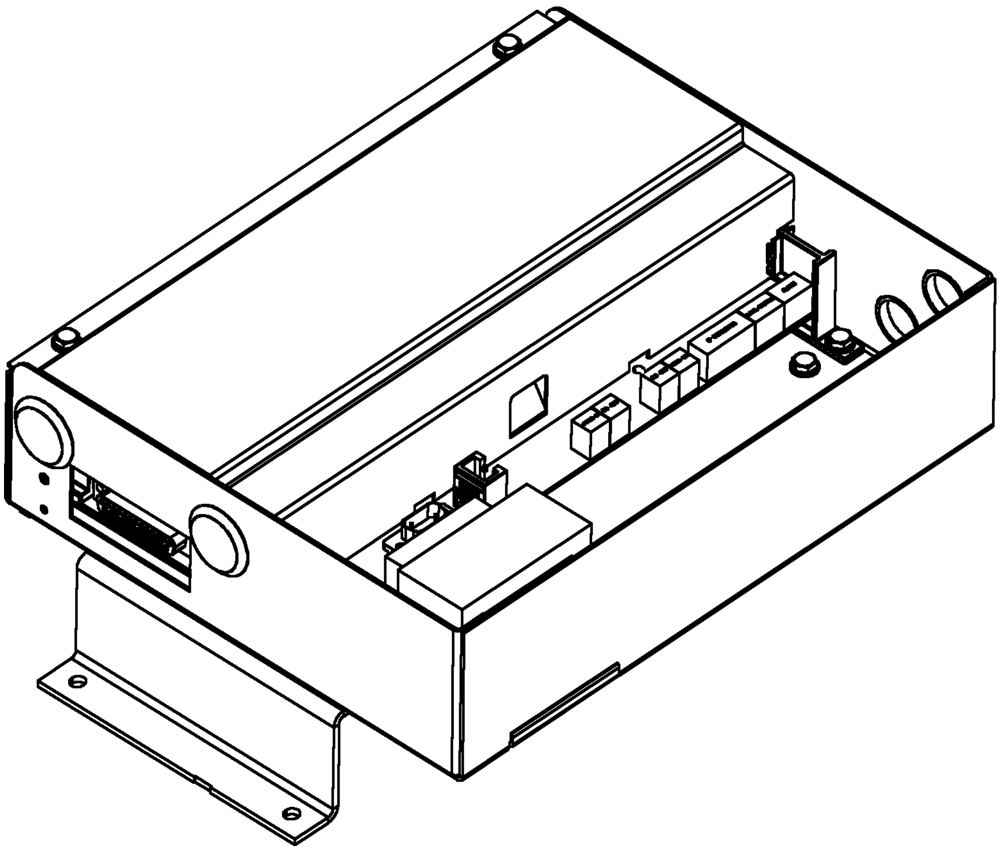
DEH41080 Rev. 1

A Series® Lighting Control Panelboards

A Series® Lighting Controller
Installation and Wiring, Object Application Guide



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Product Description

The A Series® Lighting Controller (cat. no. 10092046P2) is a fully programmable Native BACnet/MODBUS System Controller. Standard communications ports are RS-232 and RS-485, with an Ethernet option. The unit is easily mountable in a GE enclosure and is designed to control up to 66 breakers. The device comes standard with 16 digital inputs for light switch control, three universal (analog) inputs, and one dry contact output. It also contains a second RS-485 subnet port to communicate with expansion modules providing expansion and local programming capability.

Time-of-Day and Day-of-Week Scheduling. The A Series Lighting Controller has an on-board real-time clock calendar, which can be used to control the breaker by time of day and day of week, including daylight savings time, leap year, and astronomical time. The controller has 16 standard schedules, which can have up to eight clock periods per day, 16 ON/OFF transitions, independent programming for the seven days of the week, plus two holidays. Each holiday calendar can have up 90 holiday dates.

Input Control. The Lighting Controller has 16 standard switch inputs. Each input can be configured as two-wire or three-wire with momentary or maintained input. There are also three analog inputs that can be used to control breakers or groups of breakers.

Lighting Zones. The GE Lighting Controller has 16 standard zones or groupings of breakers. The lighting grouping is used to bind Schedules, Breakers, and Inputs to control a group of breakers.

Product Specifications

Power Requirements

- 24 Vac ±15%, Class II
- 50 VA
- 50/60 Hz
- One per controller
- Remote modules powered separately

Ambient Ratings

- –20° t0 70° C
- 10 to 90% RN (noncondensing)

Communication Ports

Ethernet (optional)

- Optional twisted pair (10BaseT) @ 10 Mbps
- Installation onto local Ethernet/IP network should use standard IT installation and security practices. Lighting Controllers must be installed behind a NAT (Network Address Translation) and firewall.

NET1 – Main LAN (BACnet MS/TP)

- BACnet MS/TP Communications Speed @ 9,600, 19,200, 38,400, or 76,800 bps; default 76,800 bps
- MODBUS Communications Speed @ 9,600, 19,200, or 38,400; default @ 9600 bps
- Maximum of 99 nodes per MS/TP segment (50 without a repeater)

NET2 – SubLAN (LINKnet)

- LINKnet @ 76,800 bps
- Maximum of seven LINKnet devices (four Remote Input Expansion Modules, one Standard Input Expansion Module, two dimming modules) per controller plus remote keypad interface.

Serial RS-232

- PC connection for up to 38,400 bps with a serial straight cable. The cable should have DB9 male and female connectors at the ends. Pins 2, 3, and 5 are connected.
- RS-232 baud rate settings can be changed by selecting port3 PTP type in the BACnet Settings object (NET1). The controller must be reset for the changes to take place. Communication with it must use the new settings.

Serial RS-485

- Use 22–24 AWG twisted pair with a termination of 100–120 ohms, capacitance of 17 pF/ft or lower, with a braided shield.
- Maximum length of an RS-485 daisy chain is 4000 ft (1200 m). This will only work reliably for data rates up to 100,000 bps.
- Use maximum data rate of 76,800 bps.

Service Port

- RJ-11 jack for service tool
- LCD keypad directly uses the service port with the enclosed cable.

Inputs

Universal Analog Inputs – Jumper configurable for the following input types:

- 0–5 Vdc
- 0–10 Vdc
- 10 K thermistor
- Dry contact (using 10 K thermistor jumper setting)
- 4–20 mA

Local Override Input and Switch Inputs

- 16 light inputs per module, for use with switches, push button, and/or maintained light switch
- Standard three-wire connection or two-wire with jumper, as illustrated in Figure 1, Figure 2, and Figure 3.

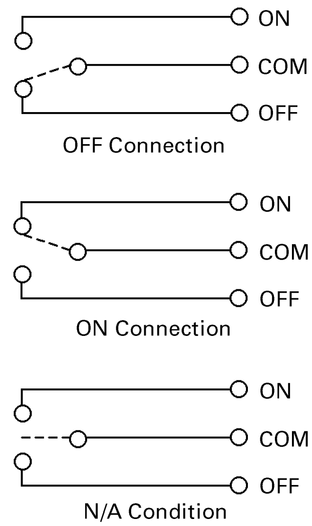

Figure 1. Three-wire maintained connections.

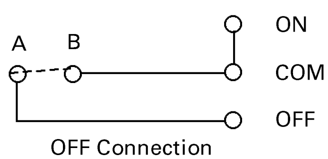

Figure 2. Two-wire maintained connections.

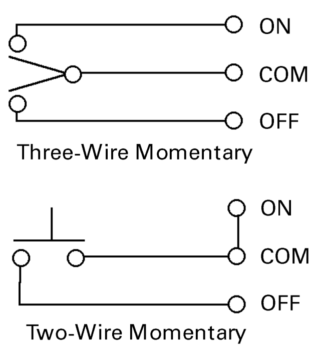

Figure 3. Three-wire and two-wire momentary connections.

Outputs

- Backplane outputs control up to 66 breakers
- One alarm relay output, NO/NC contacts, 24 Vac @ 0.5 A

Device Addressing

- Set via DIP switch and jumpers, DIP switch MAC address range: 0 to 99 per network segment

Physical Parameters

- Size – 10.765" x 6.070" x 2" (27.3 x 14.6 x 5.1 cm)
- Weight – 1 lb (454 gm)

Hardware Overview

Configuration

- 16-bit Processor
- 2 MB(16Mbit) flash memory (software loadable firmware)
- 512 kB SRAM memory (for database)
- Database backup via nonvolatile flash memory
- Real-time clock with lithium battery for clock and SRAM backup
- Visual LED status indication of the CPU

Board Layout

The controller is shown in Figure 4, with major components indicated and identified in Table 1.

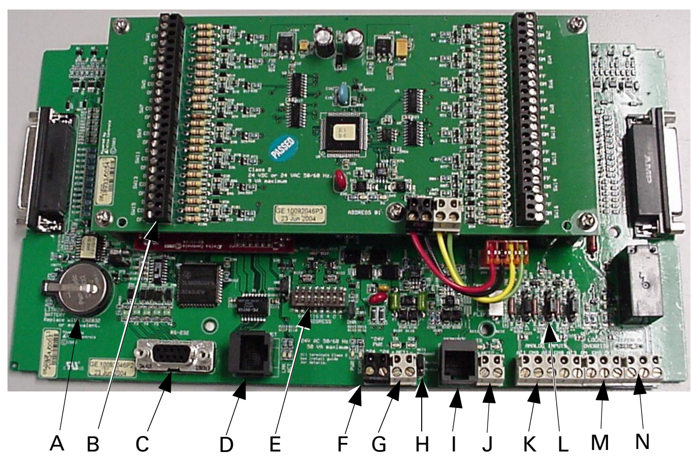

Figure 4. Lighting controller.

Letter	Component
A	Battery
B	Switch inputs
C	RS-232 port
D	Ethernet port
E	Address switch
F	Input power from Class II transformer
G	NET1 primary network connector
H	BACnet/Modbus selector jumper
I	Service port/Programmer connection
J	NET2 subnet connector
K	Analog input ports (3)
L	Analog input configuration jumpers
M	Local override input
N	Analog output dry contact (NO/NC)

Table 1. Components on lighting controller board.

Indicators

The LED indicators on the lighting controller and their functions are listed in Table 2.

LED	Function	Description
Network (Ethernet)	Ethernet Communication Status Indicators LNK and ACT	One LED (LNK) turns on to indicate a cable link is successfully established, and another green LED (ACT) flashes to indicate network activity (incoming or outgoing data) on the port.
Power	Device Power Indicator	This amber LED is lit when control power is present on the device. If no control power transformer is connected, the LED is off.
Scan	CPU Scan Indicator	This red LED flashes at a rate relative to the CPU scan rate of the database within the controller.
Network (NET1)	RS-485 Communication Status Indicators for NET1	A green LED flashes to indicate when the device is transmitting out the associated port and a red LED flashes to indicate when the device is receiving data through the port.
Network (NET2)	RS-485 Communication Status Indicators for NET2	A green LED flashes to indicate when the device is transmitting out the associated port and a red LED flashes to indicate when the device is receiving data through the port.
Alarm Output (BO68)	Output Status Indicator	If the output is activated, a green LED is lit. If the output is not activated, the LED is off.

Table 2. LED indicators on the lighting controller.

Panel Mounting Switch

The panel-mounting switch, illustrated in Figure 5, provides the ability to mount the circuit breaker panel “Service from top” or “Service from bottom.” If the panel is mounted right-side up (the connectors along the bottom of the board), the switch should be set to NORM (default). If the panel is mounted upside down (the connectors along the top of the board), the switch should be set to FLIP. This insures correct breaker addressing. This switch is located near the NET2 connector.

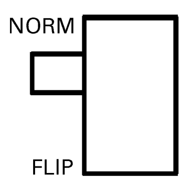

Figure 5. Panel mounting switch.

Jumpers

This section describes the jumper settings on the lighting controller.

Input Signal Type Jumper

The input type is selected by placing the jumper, illustrated in Figure 6, in the correct location on the Input Type Selector Block. The figure shows the factory default selection of 10 kΩ.

- 4–20 mA – for sensors that output a 4–20 mA signal
- 10K – Internally powered for resistance and dry contact measurement.
- 5V – For sensors that output a 0–5 Vdc signal
- 10V – For sensors that output a 0–10 Vdc signal

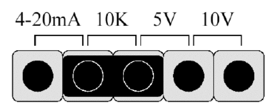

Figure 6. Input signal type jumper.

SRAM Memory Clear Jumper

This jumper, illustrated in Figure 7, is provided to clear the controller database (SRAM). The two positions function as follows:

- RUN – The battery is connected in the circuit and maintains SRAM memory, even when 24 Vac power is removed from the controller, thereby maintaining both the integrity of the database and the internal time of the on-board real-time clock (for as long as the battery lasts). This jumper position is required before applying power for the device to operate properly.
- CLEAR – When the jumper is moved to the CLEAR position (only when the power is off), the SRAM memory is cleared, deleting the database but not resetting the internal time of the on-board real-time clock. This jumper position is recommended if the product will be stored for prolonged periods. The database will be loaded from flash memory.

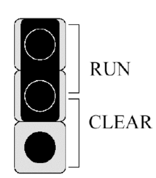

Figure 7. SRAM memory clear jumper.

Device Type Jumper

This jumper, illustrated in Figure 8, configures the lighting controller as one of several device types, representing the network level that it will reside on in the network architecture (area, system, subnet). Other than the one device acting as a router/gateway, all other devices on the same network segment must be configured the same way.

Depending on the model, the lighting controller may be configured as follows:

- Area – Configures the controller as an area-level device, on a network of area devices. This is an option only available on the Ethernet model and is used when the device is connected to an Ethernet network (typically between buildings) and is acting as a router/gateway from one LAN to either a network of system devices or subnet devices.
- System – Configures the controller as a system-level device, on a network of system devices. This is the setting when the device is connected to an Ethernet or BACnet MS/TP network with other system devices, or is a single head-end device for a network of subnet devices. For most applications, this is the recommended setting.
- Subnet – Configures the controller as a subnet-level device on a subnet of similar devices. This is the setting when the device is connected to a BACnet MS/TP network with other subnet devices.

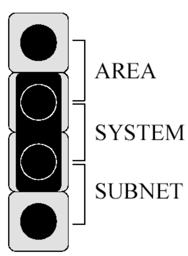

Figure 8. Device-type jumper.

Derived Network Addressing (DNA) Jumper

Derived network addressing (DNA) is a method for organizing and configuring devices on a network segment in an efficient manner. It is a simple scheme whereby area devices can group system devices and system devices can group subnet devices. This setup provides an easy way to monitor and manage the devices attached to a network and provides a manageable representation of the relationships between the devices on the network. One of the controllers on the network segment is set as the area device, which then reconfigures all the devices on the network to follow the address of the area device and network number scheme. The system device appears underneath the area, takes the addresses from the area device, and adds on its own address and network number to reconfigure the subnet devices. Subnet devices follow the same rules as the system devices. The left pane of Navigator displays the devices so that the network architecture level is clear.

Derived network addressing works in conjunction with the device type setting and refers to the ability of inheriting portions of its address from higher-up devices on a BACnet network. It may be enabled or disabled via jumper setting, illustrated in Figure 9, as follows:

- Enabled – With the jumper in place, the controller automatically obtains portions of its overall BACnet device address (as related to area and system) from higher-up devices on the network. This is the preferred method of addressing the controller as device addresses.
- Disabled – With the jumper removed, the device does not obtain any portions of its address from higher-up devices.

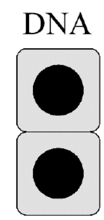

Figure 9. DNA jumper.

Controller Address DIP Switches

The controller address DIP switch, illustrated in Figure 10, has eight individual switches that can be set to ON or OFF. The address is calculated based on the binary number depicted by the ON or OFF position of the switch and their location. For example, if switches 1 and 4 are ON and all other switches are OFF, the address is 9 (= $1*2^0 + 1*2^3$). Depending upon the device type and DIP switch setting, the controller will have a unique address, as shown in Table 3.

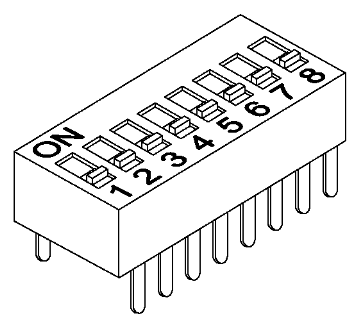

Figure 10. Controller address DIP switch.

DIP Switch Setting	Device Type	Address Calculation	Address
1 ON, 2–8 OFF	Area	$10000*(1*2^0)$	10000
1, 2 ON, 3–8 OFF	Area	$10000*(1*2^0+1*2^1)$	30000
2, 3 ON, 1 OFF, 4–8 OFF	Area	$10000*(1*2^1+1*2^2)$	60000
1 ON, 2–8 OFF	System	$100*(1*2^0)$	100
1, 2 ON, 3–8 OFF	System	$100*(1*2^0+1*2^1)$	300
2, 3 ON, 1 OFF, 4–8 OFF	System	$100*(1*2^1+1*2^2)$	600
1 ON, 2–8 OFF	Subnet	$1*(1*2^0)$	1
1, 2 ON, 3–8 OFF	Subnet	$1*(1*2^0+1*2^1)$	3
2, 3 ON, 1 OFF, 4–8 OFF	Subnet	$1*(1*2^1+1*2^2)$	6

Table 3. Controller address calculation.

Network Cabling Requirements

Requirements for network cabling are as follows:

Cabling – For BACnet MS/TP and LINKnet networks it is recommended that network cabling match the following specifications:

- Balanced 100 to 120 ohm nominal impedance twisted whielded pair (TSP) cable
- Nominal capacitance of 16 pf/ft or lower
- Nominal velocity of propagation of 66% or higher

Topology. Ensure the MS/TP network cable is installed as a daisy-chain from one device to the next.

Maximum nodes. The maximum number of devices per MS/TP network without any repeaters is 50.

Termination boards. A termination board should be installed at both ends of each MS/TP network segment, or two per MS/TP or LINKnet network.

Repeater. A repeater is not necessary unless more than 50 nodes will be installed on a network or the MS/TP network is to be extended beyond 4000 ft (1220 m).

Architecture

The network topology is illustrated in Figure 11. Network communication setup is covered in the following subsections.

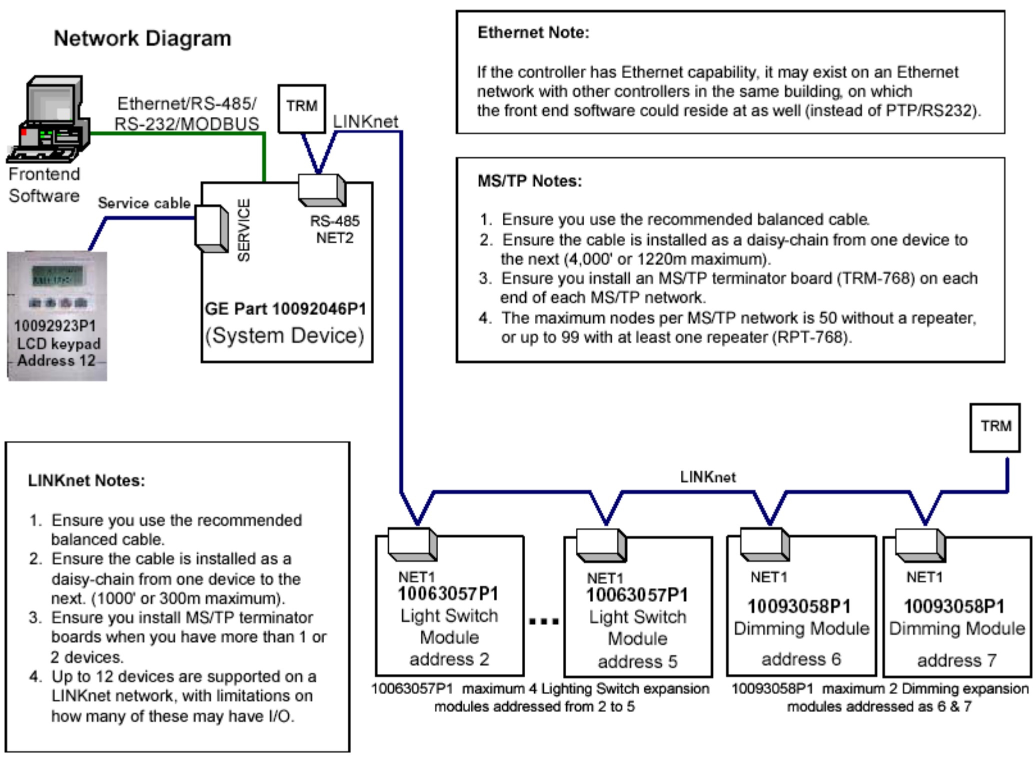

Figure 11. Network topology.

Ethernet

Connect the Ethernet cable from your network hub to the Ethernet port on the lighting controller. If there are multiple controllers (fewer than 100 units), Ethernet cables can be connected to each, or Ethernet cables can be connected to some, with the remaining controllers connected to the Ethernet controllers using NET1-to-NET1 two-wire RS-485 connections. Remember NET1 connections are daisy-chain only – NO LOOPS. See Figure 11.

RS-232

Connect the cable from the PC or workstation directly to the individual controller. The remaining controllers are connected to the RS-232 controller using NET1-to-NET1 2-wire RS-485 connections. Expect slower updates with lower baud rates, especially with multiple controllers.

RS-485

Connect the serial cable from the PC or workstation to the RS-485 adapter, and connect the two-wire output to each controller's NET1 connector using the daisy-chaining method. See Figure 11.

CAUTION: The lighting controller is an electrostatically sensitive device. Proper ESD protection (ground strap) should be used when installing this product to prevent damage.

Default Database

The lighting controller is a BACNet-protocol Device. It contains predefined objects to provide standard features and functions of lighting control. These objects are divided into logical groups: breakers (outputs), inputs, lighting zones, scheduling, events, security, and device information. These objects are specified to assign breakers, schedule, lighting zones, and response to switch inputs. The lighting controller can be configured as a 100% stand-alone device using, the real-time clock calendar, or as a slave device, reacting to switch or software inputs.

The default database contains approximately 600 predefined objects.

Breaker Outputs (BO1–66)

Controlling GE Remote-Operated Circuit Breakers (ROCB) is the primary function of the lighting controller. These breakers are represented in the database as control objects. Breaker outputs and corresponding BACNet objects and Modbus register values are listed in Table 4.

Breakers

The lighting controller supports 12-, 18-, 24-, 30-, 36-, and 42-circuit panels. Binary outputs (BO) are mapped to the possible physical outputs of the lighting controller. Each binary output has a breaker-override binary variable (BV) referenced as the override input field, with a default override time of 120 minutes. Commanding the breaker override BV from OFF to ON triggers the override condition for the given binary output. The breaker override menu in the programmer allows editing of the breaker override BV values. Binary output objects that have no physical remote-operated breaker attached enter Fault mode and their reliability displays as Not Available. These appear on the LCD display with an X.

Local Override

Each controller can be locally overridden by a switch input or by accessing binary output BO67. This feature turns all breakers ON or OFF. Once the switch is deactivated, the breakers remain in this state until commanded to change.

Description	Type	BACNet Object	Modbus Register
Breakers (1–66)		BO1–66	
• Output value	RW	• PresentValue	Fn 1/5/15, 001–066*
• Mode (auto/manual)	RW	• OutOfService	Fn 1/5/15, 201–266
• Feedback status	RO	• Feedback	Fn 2, 001–066
Breaker sweep (ON/OFF)	RW	BO67	Fn 1/5/15, 067

* The value in the Modbus register represents the binary output's present value when read. Writes occur at BACnet priority level 5 (critical equipment control). Writes are only accepted if the 'OutOfService' flag is set for that particular output.

Table 4. Breaker outputs and corresponding BACNet object and Modbus register values.

Inputs

There are two classes of inputs: local and remote. The lighting controller includes three analog Iputs and 16 standard switch inputs. The lighting controller also supports up to four additional remote input modules, increasing the switch input count to 66. Additionally, there are three analog inputs on its main board (IP1–3) represented by analog input objects (AI1–3). These inputs allow additional inputs (such as photosensors) to be used when controlling the lighting.

Local Analog Inputs

Analog input objects AI1 to AI3 refer to the inputs located on the controller's main board, as listed in Table 5.

Description	Type	BACNet Object	Modbus Register
Analog input 1	RO	AI1	Fn 4, 101
Analog input 2	RO	AI2	Fn 4, 102
Analog input 3	RO	AI3	Fn 4, 103

Table 5. Local analog inputs and corresponding BACNet object and Modbus register values.

Local Switch Inputs

The standard lighting controller has 16 switch inputs located on the daughter board. The default database is expandable to 66 switch inputs, with the additional of four remote input modules. Each physical input is referenced to a multistate input (MI) object, as listed in Table 6. The multistate input (MI) objects without an associated physical input module enter Fault mode and their reliability displays as "Not Available." The tristate configuration of the MI object can be tailored to mean any state as governed by its MIC object.

Description	Type	BACNet Object	Modbus Register
Light Switch Inputs GE-1600i	RO	MI101-116	Fn 4, 01 – 16
Light Switch Inputs (1st GE-1600R)	RO	MI201-216	Fn 4, 17 – 32
Light Switch Inputs (2nd GE-1600R)	RO	MI301-316	Fn 4, 33 – 48
Light Switch Inputs (3rd GE-1600R)	RO	MI401-416	Fn 4, 49 – 64
Light Switch Inputs (4th GE-1600R)	RO	MI501-502	Fn 4, 65 – 66
Light Switch State Text/Configuration		MIC1	*

* MIC selected with the LCD Programmer.

Table 6. Local switch inputs and corresponding BACNet object and Modbus register values.

Associated Objects

Analog input configuration (AIC) objects define the scale range translation used to translate the physical analog-to-digital (A/D) value to an analog input's object value (e.g. 0–100%). These objects are listed in Table 7.

Description	Type	BACNet Object	Modbus Register
Photodiode (RPSEN-IN) threshold configuration	RO	AIC1	*
Photosensor (generic) threshold configuration	RO	AIC2	*

* MIC selected with the LCD Programmer.

Table 7. Analog input configuration objects and corresponding BACNet object and Modbus register values.

Lighting Groups

The Lighting Group (LG) objects are used to set up the logical situations for the ROCB outputs. Setup of a Lighting Group configuration is possible with the LCD Programmer. These objects are listed in Table 8.

Lighting Outputs

The Binary Output (BO) or Lighting Group (LG) objects are controlled by the logical situation of the LG. (Note: a Lighting Group object cannot reference itself.)

Light Switch

The Lighting Group is designed to control many outputs, but can be set to work with just one, and a light switch reference allows assigning an object that can transition a single lighting output reference ON or OFF. The Lighting Group and light switch work as "last writers" to the lighting outputs. So if the LG writes ON, all the defined outputs will be ON regardless of the light switch values. After the LG write, if the light switch is transitioned OFF, then the related output is commanded OFF and the remaining outputs stay on.

Group Control

Setup is used for common group control (logical ORing), as follows.

- Lighting Group – When the referenced Lighting Group is ON, the referencing LG is ON. When the referenced Lighting Group transitions from ON to OFF, the referencing LG is relinquished and the logic native to that Lighting Group resumes control. (Note: a Lighting Group object cannot reference itself.)
- Off-time delay – The amount of time after the referenced Lighting Group (LG) transitions from ON to OFF before the referencing Lighting Group is relinquished.

Override Input

Allows an object to override the Lighting Group (LG) for the override time. The LG override is triggered when the override input object transitions from an OFF or N/A to ON. When the override timer expires, it relinquishes the LG and returns to its given logical state.

Schedule Input

Allows Schedule (SCH) object references to control the Lighting Group (LG) object. The Lights On and Lights Off checkboxes set the Schedule to trigger the LG On Only, Off Only, On & Off, or neither Off nor On.

Description	Type	BACNet Object	Modbus Register
Lighting Zones (1–16) • Output value (ON/OFF) • Mode (auto/manual)	 RW RW	LG1–16 • PresentValue • OutOfService	 Fn 1/5/15, 301–316* Fn 1/5/15, 401–416
Setup Properties (see Modbus register map doc) • Override object reference • Photocell object reference • Schedule, Astro ON/OFF times • Lighting outputs • Common groups	RO	Various	Fn 3/6/16, 3001–9999 • 3005–3008 • 3009–3017 • 3018–3027 • 3028–3155 • 3156–3280

Table 8. Lighting groups and corresponding BACNet object and Modbus register values.

Astro

Enabling Astro Lights On commands the lights ON at sunset (± the On Offset Time). Enabling Astro Lights Off commands the lights OFF at sunrise (± the On Offset Time). (Note that for the sunset and sunrise times to be correct, the longitude, latitude, Daylight Savings Time, and UTC offset must be correct for the location of the controller.)

Photocell Input

Allows the user to reference a binary (BI, BV, MI, MV) or analog (AI, AV) input reference. The Lights On and Lights Off checkboxes set the Schedule to trigger the LG On Only, Off Only, On & Off, or neither Off nor On. If an analog object is set as the Photocell Input, then the “Lights On when equal/below” and/or “Lighting Off when equal/above” threshold values must be entered to define at what point LG should be command ON or OFF.

Scheduling

Calendar (CAL) and Schedule (SCH) objects are used for scheduling date and time events. Calendar objects allow selection of days of the year. The Calendar object transitions from OFF to ON when the controller date matches the date selected in the Calendar object. Calendar (CAL) objects can be referenced to Schedule (SCH) objects. Calendar objects are listed in Table 9.

Up to eight ON/OFF intervals per day for each day of the week and two Calendar references can be entered into Schedule (SCH) objects. When day-of-the-week and entered ON time equal that of the controllers, the Schedule object transitions from OFF to ON. When a Calendar is referenced to a Schedule object and the Calendar is ON, the Schedule will only execute the Calendar ON/OFF times. Schedule objects are listed in Table 10.

Events/Data Logging

The Compact Event Log (CEL) can record up to 2000 database events. The Binary Output (BO) Event Enable checkboxes allow customization of which breaker events can be generated. Viewing the kogged events and event enable customization are functions available with the LCD Programmer. The CEL records the following events:

- Command failure
- Breaker tripped
- Breaker ON/OFF
- Reset device
- Device online or offline
- Undervoltage
- Load/save

Event log objects are listed in Table 11.

Description	Type	BACNet Object	Modbus Register
Holiday calendar		CAL1	Fn 3/6/16
• Output value (ON/OFF)	RW	• PresentValue	• 10002
• Mode (auto/manual)	RW	• OutOfService	• 10001
• List of dates*	RO	• Various	• 10003–19999

* Date format is year/month/day/week of day. If the current date matches an entry in the Calendar’s date list, then the Calendar’s value is ON. A calendar object can accommodate 90 dates and a 10-year span.

Table 9. Calendar objects and corresponding BACNet object and Modbus register values.

Description	Type	BACNet Object	Modbus Register
Zone schedules (1–16)		SCH	
• Status (ON/OFF)	RW	• PresentValue	Fn 1/5/15, 501–516
• Mode (auto/manual)	RW	• OutOfService	Fn 1/5/15, 601–616
• Schedule (List of On/Off Times)*	RO	• Various	Fn 3/6/16, 20001–29999

* A schedule consists of eight sets of time entries (Day 1 = Monday, 7 = Sunday, 8 = Calendar). Each set of time entries consists of eight ON/OFF time pairs (1st entry is an OFF time, 2nd entry an ON time, 3rd entry an OFF time, and so on). The first entry is usually 00:00 to indicate an OFF time, in case the previous day ended with an ON time up to midnight. If a day has fewer than eight pairs, the empty pairs are filled with 0xFFFF. Only Function Code 06 can remove an entry (by writing 0xFFFF).

Table 10. Schedule objects and corresponding BACNet object and Modbus register values.

Description	Type	BACNet Object	Modbus Register
Event log		CEL1	Fn 4, 20001–29999
• Event count	RO	• TotalEvents	• 20001–20002
• Alarm acknowledge	RO	• AlarmAck	• 20006
• Event entries (2000 x 8 words each)	RO	• EventQueue	• 20007–36007

* The Compact Event Log stores system events. It uses a FIFO circular buffer of 2000 events. Event count contains the number of events in the Log. Each event record is a block of eight registers.

Table 11. Event log objects and corresponding BACNet object and Modbus register values.

Alarm Relay

The Compact Event Log (CEL) has control of the Alarm Output (BO68). The alarm values in the Alarm Output tab classify what events will trigger the Alarm Output. The enabling Device Statuses alarm when a reset, dead battery, device offline, or undervoltage event occurs. Time Change alarms when a Time Change event occurs. Lighting Statuses alarm when a Status On or a Status Off event occurs. Lighting Alarms alarm when a Command Failure, or a Breaker Tripped event occurs. The Alarm Values option can be edited will the LCD Programmer. The Alarm Relay object is listed in Table 12.

Description	Type	BACNet Object	Modbus Register
Alarm relay	—	BO68	Fn 1/5/15, 068

Table 12. Alarm Relay object and corresponding BACNet object and Modbus register values.

Load Shedding

The Load Shedding (LS) object contains a list of objects that can be shed. Each object has a Shed Level assigned to it. The Shed Level defines what objects are deactivated at a given Shed Level. The Shed Level (a value from 0–5) is written to the Lighting Controller from a Power Management device. The Load Shedding object is listed in Table 13.

Device Information

The Device Information object displays the items listed in Table 14.

Regional Settings

The Regional Setting (RS) object contains a list of cities and the predefined longitude, latitude, daylight savings time (DST) information and Universal Time coordinates (UTC) offset for each. Selecting a given city with the LCD Programmer applies the location settings for the given city to the device. Latitude, longitude, DST, and UTC offset can be edited individually with the LCD Programmer. The Regional Setting object is listed in Table 15.

Description	Type	BACNet Object	Modbus Register
Load shedding • Present Value • Shed Level (0–5) • Shed Duration (minutes)	 RO RW RW	LS1 • PresentValue • ShedLevel • ShedDuration	Fn 3/6/16, 30001–30003

Table 13. Load Shedding object and corresponding BACNet object and Modbus register values.

Description	Type	BACNet Object	Modbus Register
Device Information • Firmware version • Hardware version • Major software version • Last reset time and date • Current time and date	 RO RO RO RO RO	DEVx • FirmwareVersion • HardwareVersion • AppSwVersion • LastResetTime • CurrentTime	Fn 4, 10001–10046 • 10001–10007 • 10008–10014 • 10015–10021 • 10029–10032 • 10033–10038

Table 14. Device Information object and corresponding BACNet object and Modbus register values.

Description	Type	BACNet Object	Modbus Register
Controller Geographic Location • Latitude • Longitude	 RW RW	DEVx • Latitude • Longitude	Fn 4, • 10022–10023 • 10024–10025

Table 15. Load Shedding object and corresponding BACNet object and Modbus register values.

GE Consumer & Industrial

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DEH41080 R01 0804