

## CRESTRON® GREEN LIGHT® GLPP STAND-ALONE ROOM LIGHTING CONTROLS

**The Crestron Green Light Power Pack** is a standalone room controller designed to cohesively communicate with daylight, occupancy, and user data to automatically control lighting in any room. The entire Power Pack family provides cost-effective and powerful lighting control for classrooms, small offices, and open-plan offices. Ideal for new construction as well as retrofitting existing buildings, Power Packs are designed to install and commission quickly and easily.

**Easy Installation** Designed to mount directly over a pair of adjacent 4" square junction boxes, the Power Pack is easy to prepare for—and install. High- and low-voltage connections are made using the labeled color-coded flying-lead wires. Once installed, each unit is instantly operational, providing out-of-the-box default settings adequate for many applications. Further commissioning tweaks are a snap using the IR remote control for setup<sup>[1]</sup>.

**Energy Efficiency** Inputs for occupancy sensors and photocells<sup>[2]</sup> drive potential for significant energy savings. Lights will turn off automatically when the room is vacated, and rooms with adequate daylight will dim automatically. During the simple commissioning process, these cost-saving techniques can be made permanent to prevent users from overriding them.

**Built-in Power Monitoring** Power monitoring, included on all dimming models<sup>[3]</sup>, tracks the real time energy usage of each load, thereby delivering statistics to help control energy costs. By analyzing real data, organizations can make more educated decisions regarding energy resources, which will have greater impact on the bottom line.

**User Interface Options** Control the room ambiance with a discrete wall keypad or use the IR remote anywhere in the space for convenience and versatility. Recall specific scenes or manually adjust light levels with up to two 4-button Power Pack Keypads or the optional handheld IR remote. To help promote installation in existing spaces, keypads can be installed in place of standard toggle switches while utilizing existing switch-loop wiring (two dedicated wires required from keypad location to Power Pack). A flush-mount external IR receiver facilitates smooth operation of the handheld IR remote in any size room.

**Cresnet® Models - Wired Communication** Cresnet provides robust and reliable communications between the Power Pack and a control system over a three-wire databus (shielded twisted pair plus ground). The versatile topology of Cresnet means that installers can home-run, daisy-chain, or mix and match as needed.

**infiNET EX™ Models - Wireless Communication** Crestron infiNET EX wireless technology provides quick, reliable wireless communication between the Power Pack and a central control system. Built on steadfast infiNET™ technology, infiNET EX is the new standard in 2-way wireless connectivity. So robust, infiNET EX can handle installations in even the most urban settings. The redundant nature of its mesh networking technology means that a command will never be missed, resulting in faultless operation—something that is of the utmost importance when it comes to lighting control and building automation.

Crestron is the world's leading manufacturer of advanced control and automation systems, innovating technology and reinventing the way people live and work. Offering integrated solutions to control audio, video, computer, IP and environmental systems, Crestron streamlines technology, improving the quality of life for people in corporate boardrooms, conference rooms, classrooms, auditoriums, and in their homes.

Contact Crestron Electronics, Inc., Rockleigh, NJ 07647, Phone (800)237-2041, Fax: (201)767-1903, [www.crestron.com](http://www.crestron.com), email: [techsales@crestron.com](mailto:techsales@crestron.com).

Specifier: Delete Specifier notes after editing. Section text may be edited using several commercial master specification system software tools.

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Notes:

1. Model GLPPA-REMOTE-PROG
2. Designed to work with Crestron photocell GLS-LOL and occupancy sensor GLS-ODT-C-500.
3. Models with suffix "-PM"

**SECTION 26 09 36.16**  
**MODULAR DIMMING CONTROLS**

PART 1 - GENERAL

1.1 SUMMARY

Specifier: Edit paragraph and subparagraphs below to correspond to components required for this Project.

A. Section Includes:

1. Modular, stand-alone one room lighting [switching or 0-10V dimming and switching] control system with keypad control and remote control of multiple user presets, and room occupancy and daylight sensing for daylight harvesting and energy management.

B. Related Information:

Specifier: Related Information paragraph is optional. If retaining, edit and coordinate list of sections below to correspond to Project requirements.

1. Division 12 Section "Window Treatments" for window treatments controlled by modular dimming control system.
2. Division 25 Section "Integrated Automation Control of Electrical Systems" for software and integration hardware for network lighting controls.
3. Division 26 Section "Common Work Results For Electrical".
4. Division 26 Section "Wiring Devices".
5. Division 26 Section "Lighting Devices" for occupancy sensors controlled by modular dimming control system.
6. Division 26 Section "Interior Lighting" for light fixtures controlled by modular dimming control system.
7. Division 27 Section "Communications Horizontal Cabling" for communications cabling requirements for modular dimming control system.
8. Division 27 Section "Audio-Visual Communications" for communications and network cabling requirements for lighting systems and over all control systems communications.

1.2 REFERENCES

A. California Energy Commission (CEC):

1. CEC CCR Title 24, Part 6: California Energy Efficiency Standards for Residential and Nonresidential Buildings, California's Appliance Efficiency Program: Listed lighting control devices.

B. National Fire Protection Association (NFPA):

1. NFPA 70 - National Electrical Code.

C. Underwriters Laboratories (UL):

1. UL 508 – Industrial Control Equipment.

D. ABBREVIATIONS

1. BAS: Building Automation System.
2. AV: Audio Visual.

1.3 DEFINITIONS

- A. IEEE 802.15.4: A standard which specifies the physical layer and media access control for lowrate wireless personal area networks (LR-WPANS)
- B. Radio Frequency (RF): 2-way RF, 2.4 GHz ISM Channels 11-26 (2400 to 2483.6 MHz), IEEE802.15.4 compliant
- C. Scene: A preprogrammed arrangement for lights, shades, drapery or temperature controls that can be recalled by the push of a button on a central control microprocessor.

1.4 SYSTEM DESCRIPTION

- A. Microprocessor-based, modular dimming and switching devices utilizing preset control software, in an integrated control system package.

Specifier: Edit description below to correspond to Project requirements. Choose [Lighting Controller], [Lighting Controller System with separate master control processor]

1. Lighting Controller: Concealed mounting, self contained [or networked, wired or wireless], multichannel lighting controller with occupancy and photo sensor inputs, user-adjustable controls and network integration capabilities:
  - a. Lighting Loads - One, two or three controlled loads [switched or switched and 0-10V dimmed depending on model selected].
  - b. Wall mounted [keypad, keypads] with multiple lighting presets [and dim up/dim down for dimming models].
  - c. Wireless hand held IR remote control [optional] - multiple lighting presets [and dim up/dim down for dimming models]. Utilizes the same button layout as wall mounted keypads requiring no additional set-up or training.
  - d. Integrated occupancy sensor [optional] – Self-configuring dual technology ultrasonic and passive infrared occupancy sensor provides automatic lighting control based on room occupancy.
  - e. Photo Sensor [optional] – Self calibrating Open-Loop photo sensor provides switching [and dimming for dimming models] control for daylight harvesting.
  - f. System Configuration Remote [optional] – Complete configuration of room lighting control system by wireless handheld configuration remote.
2. Lighting controller system with separate master control processor integrates the following controls:
  - a. Native communication with building wide Audio Visual Systems.
  - b. Emergency Lighting Control when used with UL 924 devices.
  - c. Multiple Lighting Control Systems.
  - d. Touch panel controls.
  - e. Window treatment controls.
  - f. Room-combining partition sensor.

- g. Timed room lighting.
- h. HVAC controls.
- i. Centralized facility management server:
  - 1) Web-accessible, network-connected, Windows-based lighting management software running on a Microsoft Exchange Server communicating over TCP/IP networks to provide lighting and window shade control, daylight harvesting, load shedding, occupancy sensing, and occupied/unoccupied lighting schedules.
  - 2) Store, evaluate and report power usage data.
- j. Energy Monitor – Monitor room power usage.
- k. Building Management Systems Interface – Direct communications through master controller with BACnet, Modbus, LonWorks and Metasys management protocols.

B. Unified System Integration – Controller supports native communication protocol utilized by the AV control system.

- 1. Communication protocol adaptors or translation interfaces between AV control system and lighting control system will not be accepted.

#### 1.5 ACTION SUBMITTALS

Specifier: Action submittals require responsive action by A/E or Owner.

- A. Product Data: For each type of product required for complete modular dimming control system, demonstrating compliance with requirements.
- B. Shop Drawings: Indicate the following:
  - 1. Schematic diagram of controlled circuits and motorized equipment actuators.
  - 2. Circuits and emergency circuits with capacity and phase, control zones, load type and voltage per circuit.

#### 1.6 INFORMATIONAL SUBMITTALS

Specifier: Informational submittals require review, but not response, by A/E or Owner. Edit list below based on project requirements.

- A. Buy American Act certificate.
- B. CEC CCR Title 24 appliance efficiency listing certification.
- C. Sample of manufacturer's warranty.
- D. Load Measurement Report: Submit field test report of finished dimming circuit work.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Operating and maintenance instructions.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualification: Manufacturer of modular controls with minimum [five] years record of satisfactory manufacturing and support of components comparable to basis of design system.
- B. Source Requirements: Provide modular dimming controls hardware and software through a single source from a single manufacturer.

Specifier: Retain paragraph below if Owner allows substitutions but requires strict control over qualifying of substitutions.

- C. Manufacturer Qualifications: Approved manufacturer of modular dimming controls listed in this Section with minimum [five] years record of satisfactory manufacturing and support of components comparable to basis of design system.
  - 1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
    - a. Product data indicating compliance with requirements of this Section.
    - b. Samples of each component.
    - c. Sample submittals from similar project.
    - d. Project references: Minimum of 5 completed installations, with Owner and Architect contact information.
    - e. Sample warranty.
  - 2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
  - 3. Approved manufacturers must comply with separate requirements of Submittals Article.
- D. Electrical Components, Devices, and Accessories: UL listed and labeled.
- E. Regulatory Requirements: Provide components and systems that comply with requirements of the following:
  - 1. NFPA 70.
  - 2. Underwriters Laboratory (UL) standards.
  - 3. Applicable codes and regulations.

Specifier: Retain paragraphs below when Project requirements include compliance with Federal Buy American provisions. Crestron GLPP components comply with requirement.

- F. Buy American Act Certification: Provide products that comply with provisions of the Buy American Act 41 U.S.C 10a – 10d.

Specifier: Retain paragraph below when Project requirements include compliance with California title 24 provisions. Crestron GLPP components comply with requirement.

- G. California Title 24 Appliance Efficiency Listing: Provide products that comply with provisions of CCR Title 24, Part 6.

## 1.9 COORDINATION

Specifier: Edit list below to reference sections controlled by modular dimming controls for Project. Crestron GLPP system is able to integrate with Crestron's Cresnet building-wide automation network, BAS, building security systems, and a variety of equipment and devices.

- A. Coordinate integrated dimming controls with systems and components specified in the following sections:
  - 1. Division 11 Section "Audio-Visual Equipment".
  - 2. Division 12 Section "Window Treatments".
  - 3. Division 23 Section "Instrumentation and Control for HVAC".
  - 4. Division 25 Section "Integrated Automation Control of Electrical Systems".
  - 5. Division 26 Section "Wiring Devices".
  - 6. Division 26 Section "Lighting Devices".
  - 7. Division 26 Section "Interior Lighting".
  - 8. Division 27 Section "Communications Horizontal Cabling".
  - 9. Division 27 Section "Audio-Visual Communications".
  - 10. Division 27 Section "Audio-Video Systems".
  - 11. Division 28 Section "Electronic Access Control and Intrusion Detection".

## 1.10 PROJECT CONDITIONS

- A. Environmental Conditions Range:
  - 1. Temperature: 32 – 104 deg F (0 - 40 deg C).
  - 2. Relative Humidity: 10 – 90 percent, noncondensing.

## 1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of modular dimming controls system that fail in materials or workmanship within the specified warranty period following substantial completion.
  - 1. Warranty Period: Touch screen display and overlay components: 90 days.
  - 2. Warranty Period: Disc drives and other moving parts, pan/tilt heads, and power supplies: 1 year.
  - 3. Warranty Period: Other components, 3 years.
- B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of modular dimming controls system that fail in materials or workmanship within the specified warranty period following substantial completion.
- C. Manufacturer's Extended Support Service: Extended telephone support: Unlimited period.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Manufacturer: Subject to compliance with requirements, provide products of **Crestron Electronics, Inc., Rockleigh, NJ 07647**, Phone (800)237-2041, Fax: (201)767-1903, [www.crestron.com](http://www.crestron.com) [or comparable products from a single manufacturer approved by Architect prior to bidding], with the following components and characteristics.

## 2.2 ROOM LIGHTING CONTROLLER

- A. Lighting Controller: Integrated lighting, dimming, and switching control system, [with power monitoring], in metal enclosure for mounting in concealed space.

Specifier: Retain paragraph below if project design utilizes wired Cresnet communication.

1. Basis of Design Product: **Crestron, Green Light GLPP Integrated Lighting System, Model [GLPP-SWCN] [GLPP-1SW2CN] [GLPP-1SW3CN] [GLPP-DIMFLVCN-PM] [GLPP-1DIMFLVCN2-PM] [GLPP-1DIMFLVCN3-PM].**

Specifier: Retain paragraph below if project design utilizes wireless Crestron EX communication.

2. Basis of Design Product: **Crestron, Green Light GLPP Integrated Lighting System, Model [GLPP-SWEX] [GLPP-1SW2EX] [GLPP-1SW3EX] [GLPP-DIMFLVEX-PM] [GLPP-1DIMFLVEX2-PM] or [GLPP-1DIMFLVEX3-PM].**
- B. Lighting Controller System Characteristics: Provide pre-configured lighting controller, with capabilities for manual setup, and software setup through programming port, configured as follows in layout indicated:
1. [Stand-alone controller] [Controller networked to central lighting control processor specified in Division 26 Section "Central Dimming Controls", "Network Lighting Controls" or Division 27 Section "Audio-Video Systems"].

Specifier: Retain paragraph below if project design utilizes dimming model(s)

- C. Dimmable Load Types: 16A per channel at 100 to 277VAC, 50/60 Hz:

1. 0 – 10V 4-wire fluorescent ballasts.
2. 0 – 10V LED drivers.

- D. Switched Load Types:

1. Fluorescent ballast.
2. Incandescent.
3. Magnetic low voltage.
4. Electronic low voltage.
5. Neon/Cold cathode.
6. High-Intensity discharge.

- E. Power Requirements:

1. Main Power: 100 – 277 VAC, 50/60 Hz.

- F. Input/Output:

Specifier: Select required option in subparagraphs below 1, 2, or 3 channel controller.

1. Line Power Inputs: flying leads, 2 connections.
2. Switch Channel Outputs: [1] [2] [3] channels flying leads.

3. 0 – 10V Dimmer Outputs: [1] [2] [3]: flying leads for [1] [2] [3] dimmer channel outputs, Class 1 or Class 2.
- G. Enclosure: Surface-mounted industrial control enclosure mounts directly on two side by side 4" square electrical junction boxes, suitable for concealed locations.

## 2.3 CONTROL INTERFACES:

Specifier: Both key sets are included with this product, dual position single rocker button and 4-button. Specify use of 2-button or 4-button option or require contractor to determine end user needs.

### A. KEYPAD:

1. Basis of Design Product: **Crestron GLPP Remote Keypad, Model [GLPPA-KP]**
2. Each keypad includes:
  - a. A single rocker button key configuration.
  - b. A four button key configuration.

Specifier: Retain optional IR remote controls below if required.

### B. USER REMOTE CONTROL: Optional handheld infrared remote control device.

1. Basis of Design Product: **Crestron GLPP REMOTE, Model [GLPPA-REMOTE-USER]**
2. Handheld battery operated unit.
3. Pre-programmed at factory, no configuration or programming required.

Specifier: At least one configuration remote required per project or location.

### C. CONFIGURATION REMOTE CONTROL: Handheld infrared remote control device.

1. Basis of Design Product: **Crestron GLPP REMOTE, Model [GLPPA-REMOTE-PROG]**
2. Handheld battery operated unit.
3. Pre-programmed at factory, no configuration or programming required.

### D. IR GATEWAY: Flush-mount infrared receiver.

1. Basis of Design Product: **Crestron GLPP IR Gateway, Model [GLPPA-IRGW-F]**
2. Flush ceiling mount infrared receiver.

## 2.4 SENSORS

### A. OCCUPANCY SENSOR:

1. Basis of Design Product: **Crestron Photocell Model GLS-ODT Series.**
2. Remote Occupancy Sensors: Combination of ultrasonic motion detection and passive infrared detection with internal microprocessor. Sensor independently adjustable for installed conditions. Delayed time off adjustment. Walk-through mode. Adjustable built-in photocell for daylight optimization. Equipped with 4-wire interface for direct connection to controller.
3. Coverage: [180 deg., 500 sq. ft.] [360 deg., 1000 sq. ft.] [360 deg., 2000 sq. ft.] [1200 sq. ft.]



4. Mounting: [Ceiling flush mounted] [Ceiling surface mounted] [Ceiling bracket mounted] [Wall flush mounted] [Wall surface mounted] [Wall bracket mounted] [As indicated].

B. PHOTO SENSOR:

Specifier: **Crestron Photocell Model GLS-LOL** open-loop photocell sensing provides a cost-effective solution for daylight harvesting, allowing multiple lighting zones to be controlled by a single sensor. In a typical office, classroom, or similar space, the photocell is installed on the ceiling near a window, or in the light well of a skylight, directed toward the incoming daylight and away from any electrical lighting fixtures. The system estimates the total amount of ambient lighting in the room according to the light level measured by the photocell.

Requires use of control processor specified below.

1. Basis of Design: **Crestron Photocell Model GLS-LOL**.
2. Photocell Sensor, Open Loop Type: Continually monitors daylight entering window or skylight to enable daylight harvesting applications to provide control of room lighting based on presence of daylight. Equipped with 3-wire interface for direct connection to control system utilizing control processor; 24 VDC power from network control bus.
3. Mounting: [Ceiling flush mounted] [Ceiling surface mounted] [Wall flush mounted] [Wall surface mounted] [As indicated].

2.5 CENTRAL SIGNAL PROCESSOR

Specifier: The **Crestron PAC2** works seamlessly with Crestron's entire line of lighting dimmers and shade controls, keypads and touchpanels, thermostats, wireless gateways, control cards, and expansion modules.

- A. Control Processor: Network connected dual bus programmable control processor for low voltage controls, devices, and subsystems through multiple control interfaces. SNMP support, with built-in firewall, NAT, and router. 4-wire bus providing 24 VDC power to network devices, with two independent sensing inputs. In separate enclosure.
  1. Basis of Design: **Crestron Professional Automation Control System Model PAC2**.
  2. Mounting: [Surface-mounted] [Modular enclosure-mounted, in array indicated].

Specifier: The **Crestron PAC2M** is a compact, low-cost alternative to the PAC2 designed for small lighting and automation applications. At half the size of a PAC2, the PAC2M is perfect for apartments and smaller homes as well as individual meeting rooms and lecture halls.

- B. Control Processor: Integrates sensors and other low voltage controls, devices, and subsystems through multiple control interfaces with control network. Enables addition of relays, 8 separate I/O ports in 2 isolated segments supporting up to 20 devices each, serial COM ports, DTMF interfaces, and shade controllers. MMC memory expansion card slot. 4-wire bus providing 24 VDC power to network devices, with two independent sensing inputs. Use with separate power supply.
  1. Basis of Design: **Crestron Professional Automation Mini-Control System Model PAC2M**.
  2. Mounting: [Surface-mounted] [Modular enclosure-mounted in array indicated].
- C. Control Processor Power Supply: 50W, 24 V regulated power supply with 2: 4-pin network connectors, fuse-protected.

1. Basis of Design: **Crestron Cresnet Power Supply Model GLA-PWS-50.**

## 2.6 SYSTEM ACCESSORIES

Specifier: Retain and edit accessory paragraphs below as required to match system requirements.

Select one of four paragraphs below if touchpanel display is part of system controls. Select display size and mounting type for touchpanel.

Specifier: Retain and edit accessory paragraphs below as required to match system requirements.

- A. Touchpanel: Controls lighting and AV settings along with other modular dimming controller functions.
  1. 5.7 inch active-matrix color LCD touch screen 640 by 480 SVGA resolution display.
    - a. Basis of design: **Crestron Isys TPS-6L Touchpanel.**
  2. 16-bit color graphics, and dual-window HD video, HDTV, and high-resolution RGB streaming multimedia, IP intercom, and web browsing capabilities. Dynamic graphics and text capability. Enables custom control screen programming.
  3. Video display: Scalable display on touchpanel screen.
  4. Pushbutton Controls: 12 engraved backlit tactile pushbuttons for volume, channel, and on-screen menu navigation and programmable functions, snap-on front bezel button cover[, and custom engravable button kit].
  5. Mounting Kit: [Wall] [Rack] [Lectern] mounting kit with power, wired Ethernet and CAT5 video connectivity, with back box and trim ring[, and speaker kit].
  6. Powerpack: 24VDC.
  7. Color: [Almond] [Black] [White].
- B. Touchpanel: Controls lighting and AV settings along with other modular dimming controller functions.
  1. 3.6 inch active-matrix compact color LCD touch screen 320 by 240 QVGA resolution display.
    - a. Basis of design: **Crestron Isys TPS-4L Touchpanel.**
  2. 16-bit color graphics, and dual-window HD video, HDTV, and high-resolution RGB streaming multimedia, IP intercom, and web browsing capabilities. Dynamic graphics and text capability. Enables custom control screen programming.
  3. Video display: Scalable display on touchpanel screen.
  4. Pushbutton Controls: 10 engraved backlit tactile pushbuttons for volume, channel, and on-screen menu navigation and programmable functions, snap-on front bezel button cover[, and custom engravable button kit].
  5. Mounting Kit: [Flush wall] [Lectern] mounting kit with power, wired Ethernet and CAT5 video connectivity, with back box and trim ring[, and speaker kit].
  6. Powerpack: 24VDC.
  7. Color: As selected from manufacturer's full range of minimum 10 colors.

Specifier: **Cameo Series Keypads** are available in 12 designer colors in 2- to 6- button arrays. Faceplates are not furnished by Crestron.

- C. Remote Keypad Controls: Field-configurable remote keypad with auto-adjusting backlight illuminating replaceable, engravable programmable buttons in number indicated, with white LED indicators, configured to fit in standard single-gang box.

1. Basis of Design: **Crestron, Cameo Series Keypad Model C2N-CB (D/F) Series.**
2. Color: As selected from manufacturer's full range of minimum 12 colors.
3. Faceplates: [Insert faceplate description].

Specifier: **Designer Series Keypads** are available with backlit black buttons or standard white or ivory buttons in 2, 4, 6, 8, or 12- button arrays. Textured finish integrated faceplates or optional architectural faceplates are available.

- D. Remote Keypad Controls: Remote keypad with [ backlight illuminating ] replaceable, engravable buttons in number indicated, with amber LED indicators, configured to fit in standard single-gang box.

1. Basis of Design: **Crestron, Designer Series Keypad Model CNX- Series.**
2. Faceplates: [As selected from manufacturer's full line] [Insert faceplate description].

Specifier: **Decorator Series Keypads** are available with black, white, or ivory buttons in 6, 8, or 12-button arrays. Faceplates are not furnished by Crestron.

- E. Remote Keypad Controls: Remote keypad with replaceable, engravable buttons in number indicated, with red LED indicators, 3W, configured to fit in standard single-gang box.

1. Basis of Design: **Crestron, Decorator Series Keypad Model C2N-DB Series.**
2. Faceplates: [Insert faceplate description].

Specifier: **Crestron GLS-OIR Series Occupancy Sensors** utilize passive infrared technology to achieve dependable motion detection with superior immunity to false triggering from air currents, inanimate objects, or movement in an adjacent corridor. Advanced self-adaptive, passive infrared motion sensing affords excellent reliability for control of lighting, climate control and other devices in the room. Sensitivity is adjustable for optimum performance.

- F. Passive Infrared Occupancy Sensors: Passive infrared detection with internal microprocessor. Sensor independently adjustable for installed conditions. Delayed time off adjustment. Walk-through mode. Adjustable built-in photocell for daylight optimization. Equipped with 3-wire interface for direct connection to control system; 24 VDC power from network control bus.

1. Basis of Design: **Crestron Photocell Model GLS-OIR Series.**
2. Mounting and Coverage: [Low profile ceiling surface mounted, 360 deg., 450 sq. ft.] [Low profile ceiling surface mounted, 360 deg., 1500 sq. ft.] [Wall bracket mounted, 360 deg., 2500 sq. ft.] [Ceiling bracket mounted, 360 deg., 2500 sq. ft.] [As indicated].

Specifier: **Crestron Photocell GLS-LCL** is intended for use with closed-loop type daylight harvesting systems. It continually monitors the total ambient light level from all available light sources, enabling precise control of room lighting and window shades to maintain a consistent level of light throughout the day. The best place to install the GLS-LCL in a typical office or similar space is on the ceiling directly above the primary work area. The sensor measures all light within a 60° cone, which consists predominately of reflected light, acquiring the most natural approximation of perceived changes in ambient light levels.

Requires use of control processor specified below.

- G. Photocell Sensor, Closed Loop Type: Continually monitors daylight at work station location to enable daylight harvesting applications to provide control of room lighting based on lighting level at workstation. Equipped with 3-wire interface for direct connection to control system utilizing control processor; 24 VDC power from network control bus.
  - 1. Basis of Design: **Crestron Photocell GLS-LCL**.
  - 2. Mounting: [Ceiling flush mounted] [Ceiling surface mounted] [Wall flush mounted] [Wall surface mounted] [As indicated].

## 2.7 CONDUCTORS AND CABLING

- A. Power Supply Side of Remote-Control Power Sources: Comply with requirements of Division 26 Section "Low-Voltage Electrical Power Conductors."
- B. UTP Cable: 100-ohm, UTP. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
  - 1. Communications Control Cable, Non-Plenum Rated: 22 AWG stranded bare copper data pair, and 18 AWG stranded bare copper power pair, Type CM.
    - a. Basis of Design Product: **Crestron CRESNET-NP**.
  - 2. Communications Control Cable, Plenum Rated: 22 AWG data pair, stranded bare copper and 18 AWG AWG power pair, stranded bare copper, Type CMP, complying with NFPA 262.
    - a. Basis of Design Product: **Crestron CRESNET-P**.
  - 3. Communications High-Power Control Cable, Non-Plenum Rated: 22 AWG stranded bare copper data pair, and 12 AWG stranded bare copper power pair, Type CM.
    - a. Basis of Design Product: **Crestron CRESNET-HP-NP**.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Prior to installation, examine work area to verify measurements, and that commencing installation complies with manufacturer's requirements.

### 3.2 INSTALLATION

- A. Comply with requirements of Division 26 Sections "Common Work Results for Electrical."
- B. Do not install dimming controls until space is enclosed, HVAC systems are running, and overhead and wet work in dimming control work space are complete.
- C. Install dimming controls in accordance with manufacturer's instructions.
- D. Grounding: Provide electrical grounding in accordance with NFPA 70.

- E. Perform setup for each lighting scene, window shade controller, and audio-visual equipment component.

### 3.3 SYSTEM STARTUP

- A. Provide system startup and adjustment to occupied conditions in accordance with manufacturer's recommendations.
- B. Perform operational testing to verify compliance with Specifications. Adjust as required.
- C. Measure and record load on each controlled circuit in each scene. Submit report of load measurements.

### 3.4 CLOSEOUT ACTIVITIES

Specifier: On projects with more complex installations, consider retaining both demonstration and training by manufacturer's authorized representative. Consult Crestron representative for costs associated with these services.

- A. Demonstration: Schedule dimming controls demonstration with Owner to allow verification that dimming controls function as required.
- B. Training: Train Owner's personnel to operate, maintain, and program modular dimming controls.

END OF SECTION 26 09 36.16