

## CRESTRON® GREEN LIGHT® ARCHITECTURAL DIMMING CONTROLS (GLPD)

**Crestron Green Light and Green Light Express Network Dimming Control Systems** are web accessible, network connected dimming control systems that receive digital or analog signals from addressable network devices, assemble signals at a signal processor (Crestron PAC2), and distribute dimming instructions to addressable modules in the GLPD panel to raise or lower lighting levels in individual spaces. This versatile distributed architecture of individual touch screen controls, keypads, photocells, occupancy sensors, and daylight harvesting controls provide a wide range of opportunities for comfort, and energy conservation possibilities. A firmware based astronomical clock program allows on/off events to be precisely timed, or timed to an offset of sunset and sunrise.

**GLPD-DIM Green Light** network dimming panels, available with 30, 42 or 60 circuits per panel, rated for 120/277V loads, are configured with (a) main lug only and integrated branch circuit protection, or (b) optional main breaker and integrated branch circuit protection. Green Light panels incorporate GLX-Dim field replaceable, dimming and relay modules or GLX—DIMFLV8 0-10V fluorescent dimming and relay modules.

**GLPD-DIM-FT and GLPD DIMX-FT Green Light Express** network dimming panels, available with 30, 42 or 60 circuits per panel rated for 120/277V loads, are feed through type with branch circuit protection provided by a separate circuit breaker panel; Green Light Express panels include GLX-DIM field replaceable, dimming modules or GLX—DIMFLV8 0-10V fluorescent dimming modules and relays.

**GLX-DIM** field replaceable dimming modules include incandescent, magnetic low voltage, and 2 and 3-wire fluorescent dimming, with high inrush, zero-cross arcless, mechanical latching relays rated for 1,000,000 on/off lifetime cycles of switching. Module features individual circuit load indicator, mechanical and emergency override and manual line test features. Phase-synchronous Detection Circuitry eliminates lamp flicker. Emergency signal from phase loss sensor (Crestron GLS-PLS) overrides the preset state of the dimming control; and changes it to the preprogrammed emergency condition.

**GLX-DIMFLV8** field replaceable dimming modules include 8 channels of 4-wire, 0-10 Volt fluorescent dimming with high inrush, zero-cross arcless, mechanical latching relays rated for 1,000,000 on/off lifetime cycles of switching. Module features individual circuit load indicator, mechanical and emergency override and manual line test features. Phase-synchronous Detection Circuitry eliminates lamp flicker. Emergency signal from phase loss sensor (Crestron GLS-PLS) overrides the preset state of the dimming control; and changes it to the preprogrammed emergency condition.

**Crestron PAC2 Automation Control Systems** versatile 4-wire bus central processor, programmed with Crestron's suite of development software, database drivers and software applications, works seamlessly with Crestron's entire line of lighting control devices including timed on-off lighting, load shedding devices, occupancy sensors, lighting dimmers, window shade controllers, keypads, touch panels, and thermostats; and provides for the integration of industry devices through a host of sixteen separate I/O interfaces. The PAC2 provides for timed on-off lighting, daylight harvesting controls, and interface to building automation systems and web connected Crestron RoomView server. RoomView Server Edition management software allows the user to monitor, manage and control all Crestron connected equipment throughout the global enterprise. Crestron Control Systems can only be accessed with the correct IP address, port number, user name and password.

Crestron control systems, touchpanels, and RoomView® enterprise management software are certified by Cisco and Microsoft Corporations. After rigorous testing, Cisco and Microsoft have standardized on Crestron technology to manage and control their AV resources worldwide.

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

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**SECTION 26 09 43**  
**NETWORK LIGHTING CONTROLS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Network light dimming controls.
- 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 network dimming control system.
- 2. Division 26 Section "Common Work Results For Electrical".
- 3. Division 26 Section "Wiring Devices".
- 4. Division 26 Section "Lighting Control Devices" for occupancy sensors, photoelectric sensors.
- 5. Division 26 Section "Interior Lighting" for light fixtures controlled by network lighting control systems.
- 6. Division 27 Section "Communications Horizontal Cabling" for communications cabling requirements for network power switching systems.
- 7. Division 27 Section "Audio-Visual Communications" for communications and network cabling requirements for lighting systems and over all control systems communications.

1.2 REFERENCES

Specifier: References Article is optional. If retaining, edit and coordinate list of sections below to correspond to Project requirements.

- 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

1.3 SYSTEM DESCRIPTION

Specifier: Edit description below to correspond to Project requirements.

- A. Web Accessible, network connected, lighting dimming system utilizing control software, central signal microprocessor, lighting control panel including integrated branch circuit protection, and solid-state light dimming modules and relays.
- B. System Components: System includes the following addressable components:
  - 1. Keypad controls.
  - 2. Touch panel controls.
  - 3. Window treatment controls.
  - 4. Occupancy sensors.
  - 5. Daylight compensating lighting controls.
  - 6. Audio visual equipment controls.
  - 7. Interface to facility-wide room management.
  - 8. Interface to building automation system interface.
- C. System Communication:
  - 1. Native communication with building wide Audio Visual Systems.
- D. 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.

#### 1.4 ACTION SUBMITTALS

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

- A. Product Data: For each type of product required for complete network lighting control system, demonstrating compliance with requirements.
- B. Shop Drawings: Indicated the following:
  - 1. Schematic diagram showing complete network lighting control system and accessories.
  - 2. Circuits and emergency circuits with capacity and phase, control zones, load type and voltage per circuit.

#### 1.5 INFORMATIONAL SUBMITTALS

Specifier: Informational submittals require review, but not response, by A/E or Owner.

- 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 completed installation.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Operating and maintenance instructions.

- B. Record drawings.

#### 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualification: Manufacturer of network lighting controls with minimum [five] years record of satisfactory manufacturing and support of components comparable to basis of design system.
- B. Source Requirements: Provide Network Dimming Controls 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 network lighting 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, including certified independent test data indicating compliance with requirements.
    - b. Samples of each component.
    - c. Sample submittal from similar project.
    - d. Project references: Minimum of 5 installations not less than 5 years old, 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 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 Network Lighting Controls components comply with requirement.

- F. Buy American Act Certification: Submit documentation certifying that products 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 Green Light components comply with requirement.

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

## 1.8 COORDINATION

Specifier: Edit list below to reference sections controlled by modular dimming controls for Project. Crestron Green Light 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 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 Facility Controls".
  - 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 28 Section "Electronic Access Control and Intrusion Detection".

## 1.9 PROJECT CONDITIONS

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

## 1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of Network Lighting Controls that fails 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, and power supplies: 1 year.
  - 3. Warranty Period: Other components, 3 years.
- B. 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 SYSTEM CHARACTERISTICS

- A. Web-accessible, network-connected programmable lighting control dimming system that receives digital or analog signals from addressable input devices, assembles signals at central signal processor, and distributes operating signals to addressable control devices that effect a change in state.

1. System utilizes electronic dimming modules incorporating mechanically latching relays for dimming and on-off switching; an automation control system that interprets input signals and issues output signals to devices effecting a change in state; and a built-in hub that provides 8 isolated segments, each supporting up to 3000 feet of cabling, and up to 25 networked devices on each segment.

## 2.3 NETWORK LIGHTING CONTROL PANELS

Specifier: Crestron Green Light Network lighting control panels are expandable from 30, 42 and 60 circuits and are available with main disconnect and branch circuit protection, lug only mains and branch circuit protection, or feed-through type requiring separate branch circuit protection.

Retain panel types required for project.

- A. Circuit Protected Network Lighting Control Panel: Main Lugs or Main Circuit Protected and Branch Circuit Protected.
  1. Basis of Design Product: **Crestron, Green Light Architectural Dimming Control Panel Model GLPD-DIM.**
  2. Main Circuit: [Main Lugs Only] [60 amp main circuit breaker] [80 amp main circuit breaker] [100 amp main circuit breaker] [125 amp main circuit breaker].
  3. Branch Circuit Protection: 120/277 20 amp thermal magnetic type.
  4. Electronic Dimming Load Types: [Incandescent, Magnetic Low-Voltage, Electronic Low-Voltage, Neon/Cold Cathode, Fluorescent Lamp Ballast, High-Intensity Discharge, or Motors] [0-10 Volt 4-Wire Dimmable Fluorescent Ballast].
  5. Switching Relay Rating: Arc-less high inrush, lifetime rated minimum 1,000,000 on/off cycles with air gap off protection.
  
- B. Feed-Through Network Lighting Control Panel: Feed-through Type, No Branch Circuit Protection.
  1. Basis of Design Product: **Crestron Green Light Express Architectural Dimming Control Panel Model No. GLPD-DIM-FT.**
  2. Branch Circuit Protection: Pass through type utilizing separate branch circuit protection indicated on Drawings.
  3. Electronic Dimming types: [Incandescent, Magnetic Low-Voltage, Electronic Low-Voltage, Neon/Cold Cathode, Fluorescent Lamp Ballast, High-Intensity Discharge, or Motors] [0-10 Volt 4-Wire Dimmable Fluorescent Ballast].
  4. Switching Relay Types: Arc-less high inrush, lifetime rated minimum 1,000,000 on/off cycles, with air gap off protection.
  5. Emergency Override: Remote override capability.
  
- C. Feed-Through Network Lighting Control Panel: Feed-through Mains; No Branch Circuit Protection or Module Switching.
  1. Basis of Design Product: **Crestron Green Light Express Architectural Dimming Control Panel Model No. GLPD-DIMX-FT.**
  2. Branch Circuit Protection: Pass through type utilizing separate branch circuit protection indicated on Drawings.
  3. Electronic Dimming types: [Incandescent, Magnetic Low-Voltage, Electronic Low-Voltage, Neon/Cold Cathode, Fluorescent Lamp Ballast, High-Intensity Discharge, or Motors] [0-10 Volt 4-Wire Dimmable Fluorescent Ballast].
  4. Emergency Override: Remote override capability.

## 2.4 DIMMING AND SWITCHING MODULES

- A. Dimming and Switching Module: Incandescent, magnetic low voltage, neon/cold or 2 and 3-wire fluorescent dimming module.
1. Basis of Design Product: **Crestron Dimmer Module Model GLX-DIM.**
  2. Module Description: Field replaceable dimming modules include incandescent, magnetic low voltage, and 2 and 3-wire fluorescent dimming, with high inrush, zero-cross arcless, magnetic latching, and air gap off relays rated for 1,000,000 on/off lifetime cycles of switching. Module features individual circuit load indicator, mechanical and emergency override and manual line test features. Emergency signal from phase loss sensor overrides the preset state of the dimming control; and changes it to the preprogrammed emergency condition. Phase-synchronous Detection Circuitry eliminates lamp flicker.
  3. Channels of Switching: 6 channels of dimming with high inrush, zero-cross arcless, magnetic latching air gap off relays rated for 1,000,000 on/off lifetime cycles of switching.
  4. Maximum Load.
    - a. Lighting: 16A per channel.
    - b. Motor: [1HP at 120V] [2HP at 230/277V] per channel.
- B. Dimming and Switching Module: 0–10V fluorescent ballast dimming module.
1. Basis of Design Product: **Crestron Electronic Power Switching Module Model GLXP-DIMFLV8.**
  2. Module Description: Field replaceable 0-10V fluorescent ballast dimming modules include 8 channels of 4-wire, fluorescent dimming with high inrush, zero-cross arcless, mechanical latching, air gap off relays rated for 1,000,000 on/off lifetime cycles of switching. Module features individual circuit load indicator, mechanical and emergency override and manual line test features. Emergency signal from phase loss sensor overrides the preset state of the dimming control; and changes it to the preprogrammed emergency condition. Phase-synchronous Detection Circuitry eliminates lamp flicker.
  3. Channels of Switching: 8 channel of dimming with switching relays.
  4. Maximum Dimmable Load.
    - a. 0-10V Fluorescent Lighting: 16A per channel.
    - b. Motor: [0.5HP at 120V] [1HP at 230/277V] per channel.

## 2.5 AUTOMATION CONTROL 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: Web accessible, network connected, programmable control processor using manufacturer's software, manufacturer's software applications, and manufacturer's database of industry drivers to work with manufacturer's entire line of lighting dimmers, shade controllers, occupancy sensors, photocells, keypads, contactors, door strikes, touch panels, and thermostats; and provide for the integration of industry devices through eight isolated relays and eight Versiports. Memory expansion up to 4GB Compact Flash Card. 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 photocell sensors, occupancy 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. In separate enclosure.

1. Basis of Design: **Crestron Professional Automation Mini-Control System Model PAC2M.**
2. Mounting: [Surface-mounted] [Modular enclosure-mounted in array indicated].

## 2.6 ACCESSORIES

- 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-C- 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-D Series.**
  2. Faceplates: [Insert faceplate description].

Specifier: Retain optional IR remote control and remote receiver accessories below if required.

- F. Remote Control: Handheld infrared remote control device.
  1. Basis of Design: **Crestron IR Handheld Remote Model CLS-IRHT8.**
- G. Infrared Remote Receiver: Provide integral 36 kHz infrared receiver for use with remote control.

Specifier: **Crestron GLS-O Series Occupancy Sensors** offer dual-technology sensing utilizing both ultrasonic and passive infra-red detection with an internal microprocessor to maintain accurate control of lighting systems, reducing energy costs while maintaining user convenience. Several mounting types and coverage areas are available.

- H. Remote Occupancy Sensor: Detects movement within space while reducing false triggering or shutoffs while space is occupied. 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 3-wire interface for direct connection to control system; 24 VDC power from network control bus.
  - 1. Basis of Design: **Crestron Photocell Model GLS-O Series.**
  - 2. Coverage: [180 deg., 500 sq. ft.] [360 deg., 1000 sq. ft.] [360 deg., 2000 sq. ft.] [1200 sq. ft.].
  - 3. Mounting: [Ceiling flush mounted] [Ceiling surface mounted] [Ceiling bracket mounted] [Wall flush mounted] [Wall surface mounted] [Wall bracket mounted] [As indicated].
  
- I. Occupancy Sensor Interface Device: Integrates occupancy sensors and related sensors with control network. In separate enclosure. 4-wire bus providing 24 VDC power to network devices, with two independent sensing inputs.
  - 1. Basis of Design: **Crestron Sensor Integration Module Model GLS-SIM.**

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.

- J. 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.
  - 1. Basis of Design: **Crestron Photocell Model GLS-LOL.**
  - 2. Mounting: [Ceiling flush mounted] [Ceiling surface mounted] [Wall flush mounted] [Wall surface mounted] [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.

- K. 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].
- L. Emergency Phase Loss Sensor: 120/277V, tripping transfer to emergency state.
1. Basis of Design Product: **Crestron Model No. GLS-PLS-120/277.**
- M. Power Supply: 50W, 24 V regulated power supply with two 4-pin network connectors, fuse-protected.
1. Basis of Design: **Crestron Cresnet Power Supply Model GLA-PWS-50.**

## 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 data pair stranded bare copper, and 18 AWG power pair stranded bare copper, 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 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 that conditions for commencing installation comply with manufacturer's requirements.

### 3.2 INSTALLATION

- A. Comply with requirements of Division 26 Sections "Low-Voltage Electrical Power Conductors and Cables" for low voltage wiring and digital data transmission wiring.
- B. Comply with NECA 1.
- C. Do not install network lighting controls until space is enclosed, HVAC systems are running, and wet work in space is complete.

- D. Size conductors in accordance with network lighting control manufacturer's instructions. Install network lighting controls in accordance with manufacturer's instructions.
- E. Grounding: Provide electrical grounding in accordance with NFPA 70.
- F. Provide panelboard schedule in pocket provided in panel doors.

### 3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Quality Control: Pay for the services of a manufacturer's authorized service representative to inspect installation from the commencement of work of this section, make routine inspections during the installation and perform testing recommended by the manufacturer.
- B. Provide the services of the manufacturer to commission network lighting controls and provide a minimum of 4 call-back visits after the date of substantial completion.
- C. Provide written manufacturer's inspection, commissioning, testing reports and call-back reports.

### 3.4 SOFTWARE

- A. Install and program software to meet the Owner's requirements. Provide current licenses, and backup copies of the software for the Owner's records.

### 3.5 SYSTEM STARTUP

- A. Provide manufacturer's system commissioning.
- B. Switch each load on and off with manual line test feature of the dimming control modules before installing processors.

### 3.6 ADJUSTING

- A. Within 12 months of the date of Substantial Completion provide onsite service to adjust the system to account for actual occupied conditions.

### 3.7 CLOSEOUT ACTIVITIES

- A. Training: Train Owner's personnel to operate, maintain, and program network power switching systems. Allow for a minimum of trips to the jobsite to provide additional training as needed.
  - 1. Furnish set of approved submittals and record drawings of actual installation for Owner's personnel in attendance at training session.

END OF SECTION 26 09 43