

CRESTRON® iLux™ MODULAR DIMMING CONTROLS

Crestron's iLux Integrated Lighting System is a complete, integrated lighting solution designed for wall mount installation in boardrooms, auditoriums, home theaters, or anywhere versatile and cost-effective control of lighting and shades is required. Crestron's reputation for innovation and reliability, combined with high quality, integrated dimming, native shade control, configurable rocker buttons, extensive integration ability with AV systems and many other advanced features make iLux the ideal choice for all types of individual room lighting and shade control applications.

The iLux CLS-C6 features six channels of dimming for incandescent, magnetic low-voltage, neon/cold cathode, and 2-wire dimmable fluorescent loads. On/off switching of many non-dimmable lighting loads is also possible. Larger loads and additional load types can also be supported using Crestron iLux CLS-EXP Series expansion modules.

Using Crestron's networked Shade and Drape Controllers, the CLS-C6 enables versatile control of a roomful of motorized window treatments, screens and lifts in up to 6 shade groups.

One iLux CLS-C6 master will support up to 8 additional CLS-C6 or CLS-C6M units, enabling systems of up to 54 lighting zones and 54 shade groups. Commands for typical functions like scene recall, scene off, master dimming, and occupancy status are shared between the CLS-C6(M) units. Each individual unit can still support a complete assortment of local devices including keypads and shade controllers.

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, email: 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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SECTION 26 09 36.01
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, self-contained lighting dimming [and equipment] control system with multiple presets.

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.

1.3 SYSTEM DESCRIPTION

Specifier: Edit description below to correspond to Project requirements.

- A. Microprocessor-based, modular solid-state dimming and switching devices utilizing preset control software, in an integrated control system including the following:
 - 1. Master Station: Wall mounted, self contained, multichannel controller with user-adjustable dimmer and equipment controls with network and expansion capabilities:
 - a. Integrated lighting, dimming, and switching controls.
 - b. Integrated occupancy sensors.
 - 2. Master station integrates the following accessories:
 - a. Keypad controls.
 - b. Touch panel controls.
 - c. Window treatment controls.
 - d. Remote occupancy sensors.
 - e. Room-combining partition sensor.
 - f. Lighting load shedding.
 - 3. Master station integrates the following separate controls:
 - a. Native communication with building wide Audio Visual Systems.
 - b. Wireless touch panels.
 - c. Timed room lighting.
 - d. Daylight compensating lighting controls.
 - e. Audio visual equipment controls.
 - f. Interface to facility-wide room management.
 - g. Interface to building automation system interface.
 - 4. Expansion Modules: Remote modules allowing master station to control lighting circuits, and circuit loads, while emulating the function of the connected master station control channel.
- 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.

1.4 ACTION SUBMITTALS

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

- A. Product Data: For each type of product required for complete 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.

1.5 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 finished dimming circuit work.

1.6 CLOSEOUT SUBMITTALS

- A. Operating and maintenance instructions.

1.7 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.
 - b. Samples of each component.
 - c. Sample submittal 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 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 iLux 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 iLux 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 iLux 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 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 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. 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 [or comparable products from a single manufacturer approved by Architect prior to bidding], with the following components and characteristics.

2.2 INTEGRATED, MULTIPRESET MODULAR DIMMING CONTROL SYSTEM

- A. Master Station Lighting Dimmer Channels: Six.
1. Dimming Rate: Software adjustable from 1 to 10 seconds.
 2. Scene Fade Time: Software adjustable from 0 seconds to 99 minutes.
- B. System Maximum Capacity:
1. Support multipoint control using up to 16 keypads.
 2. Lighting dimmer channels: Six, expandable up to 54 utilizing up to eight slaved units.
 3. Window treatment motors: Up to 32 in 6 logical groups.
- C. User Set-up Characteristics:
1. User-Settable Scenes: Up to 16.
 2. Front panel manual setup or software setup through programming port.

Specifier: Specify controlled loads in VA or A, not both.

- D. Controlled Lighting Loads, Master Panels:
1. Minimum: [15 VA] [0.125 A] at 120 V, 60 Hz.
 2. Maximum Per Channel: [800 VA] [6.6 A] at 120 V, 60 Hz.
 3. Total Dimming Control Load: [1920 VA] [16 A] at 120 V, 60 Hz.
- E. Controlled Lighting Loads, Expansion Module:
1. Minimum: [15 VA] [0.125 A] at 120 V, 60 Hz.
 2. Maximum: [1920 VA] [6.6 A] at 120 V, 60 Hz.
 3. 120 – 277 V.

Specifier: Edit list below to correspond to Project design. Additional load capacity utilizing expansion modules listed below. System will support up to 80A on a single channel utilizing up to 5 expansion modules on a single channel.

- F. System Load Types, Master Panels:
1. Incandescent.
 2. Magnetic, low voltage.
 3. Neon/Cold cathode.
 4. Two-wire dimmable fluorescent.

5. Non-dimmable lighting.

G. System Load Types, Expansion Modules:

1. 0 - 10 V dimmable fluorescent/LEDs.
2. 3-wire dimmable fluorescent (via expansion module).
3. Electronic low voltage.

2.3 MASTER STATIONS

- A. Master Station: Integrated lighting [, window treatment] [, equipment switching] control system panel, wall mounted, with multiple programmable scene selection buttons with LED display [and wireless link to central control system], sized for installation in standard 4-gang box.

1. Basis of Design Product: **Crestron, iLux Integrated Lighting System Model CLS-C6.**

Specifier: Model CLS-C6RF includes wireless link to central control system.

2. Basis of Design Product: **Crestron, iLux Integrated Lighting System Model CLS-C6RF.**

Specifier: Model CLS-C6M includes built-in motion detector.

3. Basis of Design Product: **Crestron, iLux Integrated Lighting System Model CLS-C6M.**

Specifier: Model CLS-C6MRF includes built-in motion detector and wireless link to central control system.

4. Basis of Design Product: **Crestron, iLux Integrated Lighting System Model CLS-C6MRF.**

- B. Cover: Flip-up cover concealing front-mounted programming and control pushbuttons, programming port, and LED indicators for lighting scene setup and equipment control programming.

1. Station Cover Color: [Almond] [Black] [White].

C. Exposed Controls:

1. Pushbuttons for recalling scenes (six), with customizable label strip.
2. Dedicated on/off switch.
3. Master raise/lower control.

D. Controls Under Cover:

1. Light and shade mode for manual control.
2. Save, Cancel for setup mode system configuration.
3. Up/down buttons used for system configuration.
4. Programming port 3.5 mm mini-phone jack.

- E. Occupancy Sensor: Provide integrated occupancy sensor, passive infra-red, 30 foot range at 4 foot AFF.

Specifier: Specify controlled loads in VA or A, not both.

- F. Power Requirements: 100 – 127 V, 50 – 60 Hz.

2.4 DIMMER EXPANSION MODULES

Specifier: Retain required dimmer expansion module(s) from optional paragraphs below.

- A. Dimmer Expansion Modules, General: Provide expansion modules indicated and as additionally required to control loads indicated on Drawings.
- B. Dimmer Expansion Module: For incandescent, magnetic low-voltage, neon/cathode, and 2-wire electronic fluorescent dimming ballasts, supporting 120, 230, and 277 V loads up to 16 amps. Emulates dimmer characteristics of related master station dimmer, with threshold adjustment for minimum dimming level, built-in air gap relay at output. Wall-mounted or above-ceiling mounted as indicated. Complies with NEC Article 300.22(C) for installation in spaces used for environmental air.
 - 1. Basis of Design Product: **Crestron, iLux Dimmer Expansion Module Model CLS-EXP-DIM.**
- C. 3-Wire Fluorescent Dimmer Expansion Module: For 3-wire electronic fluorescent dimming ballasts, supporting 120, 230, and 277 V loads up to 16 amps. Emulates dimmer characteristics of related master station dimmer, with threshold adjustment for minimum dimming level, built-in air gap relay at output. Wall-mounted or above-ceiling mounted as indicated. Complies with NEC Article 300.22(C) for installation in spaces used for environmental air.
 - 1. Basis of Design Product: **Crestron, iLux 3-Wire Fluorescent Dimmer Expansion Module Model CLS-EXP-DIMFDB.**
- D. 0 to 10V Fluorescent Dimmer Expansion Module: For 0 to 10 V fluorescent dimming ballasts, and switching of non-dimmable loads including incandescent, MLV, ELV, HID, fluorescent ballasts, and motors. Supports 120, 230, and 277 V loads up to 16 amps. Emulates dimmer characteristics of related master station dimmer, with threshold adjustment for minimum dimming level, built-in air gap relay at output. Wall-mounted or above-ceiling mounted as indicated. Complies with NEC Article 300.22(C) for installation in spaces used for environmental air.
 - 1. Basis of Design Product: **Crestron, iLux 0-10V Fluorescent Dimmer Expansion Module Model CLS-EXP-DIMFLV.**
- E. Universal Dimmer Expansion Module: For electronic low-voltage, magnetic low-voltage, 2-wire fluorescent dimming ballasts, and switching of non-dimmable loads including incandescent, MLV, ELV, NCC, fluorescent ballasts, and motors. Supports 120, 230, and 277 V loads up to 16 amps. Emulates dimmer characteristics of related master station dimmer, with threshold adjustment for minimum dimming level, built-in air gap relay at output. Wall-mounted or above-ceiling mounted as indicated. Complies with NEC Article 300.22(C) for installation in spaces used for environmental air.

1. Basis of Design Product: **Crestron, iLux Universal Dimmer Expansion Module Model CLS-EXP-DIMU.**

2.5 CENTRAL SIGNAL PROCESSOR

Specifier: Select control processor from 3 models listed below according to project requirements.

The **Crestron IPAC-GL1** can be used as a pre-programmed or custom programmed control processor supporting virtually any functionality imaginable. It works seamlessly with Crestron's entire line of touchpanels, wireless remotes, lighting dimmers, shade controllers, thermostats, and more. It can also interface with third-party devices and systems such as security and access controls, surveillance cameras, and HVAC for a fully integrated solution.

- A. Control Processor: Wall-mounted lighting control processor enabling user system programming via LCD front panel or PC software, integrating occupancy sensing, daylight harvesting, and remote management. 2 RS-232, 4 digital/analog input, & 4 relay control ports. 3-gang standard box configuration.
 1. Basis of Design: **Crestron Integrated Professional Automation Computer Model IPAC-GL1.**
 2. Mounting: [Room wall mounted, in standard 3-gang box] [Table top kit] [Table top kit with swivel].
 3. Face Color: [Black] [White].

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.

- B. 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.

- C. 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].

2.6 SYSTEM ACCESSORIES

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.
- 5.7 inch active-matrix color LCD touch screen 640 by 480 SVGA resolution display.
 - Basis of design: **Crestron Isys TPS-6L Touchpanel.**
 - 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.
 - Video display: Scalable display on touchpanel screen.
 - 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].
 - Mounting Kit: [Wall] [Rack] [Lectern] mounting kit with power, wired Ethernet and CAT5 video connectivity, with back box and trim ring[, and speaker kit].
 - Powerpack: 24VDC.
 - Color: [Almond] [Black] [White].
- B. Touchpanel: Controls lighting and AV settings along with other modular dimming controller functions.
- 3.6 inch active-matrix compact color LCD touch screen 320 by 240 QVGA resolution display.
 - Basis of design: **Crestron Isys TPS-4L Touchpanel.**
 - 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.
 - Video display: Scalable display on touchpanel screen.
 - 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].
 - Mounting Kit: [Flush wall] [Lectern] mounting kit with power, wired Ethernet and CAT5 video connectivity, with back box and trim ring[, and speaker kit].
 - Powerpack: 24VDC.
 - 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.
- Basis of Design: **Crestron, Cameo Series Keypad Model C2N-CB (D/F) Series.**
 - Color: As selected from manufacturer's full range of minimum 12 colors.
 - 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: Retain optional IR remote control and remote receiver accessories below if required.

- F. Remote Control: Handheld infrared remote control device.
- G. Infrared Remote Receiver: Provide integral 36 kHz infrared receiver for use with remote control.

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.

- H. 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 GLS-ODT 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. Sensors detect movement within space while reducing false triggering or shutoffs while space is occupied. Several mounting types and coverage areas are available.

- I. 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 3-wire interface for direct connection to control system; 24 VDC power from network control bus.

1. Basis of Design: **Crestron Photocell Model GLS-ODT 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].
- J. 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.

- K. 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.

- L. 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].

- M. 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.**

2.7 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 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.

- 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 260936