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SECTION 26 09 43 13

WIRELESS NETWORK LIGHTING CONTROLS

GreenConnect Wireless Controls

This specification is dated **May 5, 2025**.

1. If necessary, revise the product specification section number and title to suit project requirements, specification practices, and section content. Leviton publishes AIA / CSI specifications with both old (1995) and new (2004) section numbers.

While editing this specification, take note of the following:

This document is designed for “delete-only” editing. Some paragraphs require that you select among two or more options. The optional text is bracketed: e.g.: “Section [09000.] [\_\_\_\_\_.]" If your draft copy includes the “[“ or “]” characters, it almost certainly includes too many options. Use Find to locate these sections and edit appropriately.

Occasionally, options include entire paragraphs. Rather than use brackets, the document separates these optional paragraphs an "OR" statement, e.g.:

\*\*\* EITHER \*\*\*

Option A

\*\*\*\* OR \*\*\*\*

Option B

As with brackets, your final specification should not contain any \*\*\* OR \*\*\* notes between paragraphs.

If you need more information on an organization whose standards are referenced within this document text, click on the hyperlink provided.

## **GENERAL**

## RELATED DOCUMENTS

### Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification Sections.

### All contract documents and addenda.

## SuMMARY

### Section Includes:

#### Digital network lighting control system.

### B. Related Sections:

#### 1. Section [262726 — Wiring Devices].

#### Section [265113 — Interior Lighting Fixtures, Lamps, and Ballasts:] LED and Fluorescent lighting ballasts controlled by lighting control system.

#### Section [260923 — Lighting Control Devices:] Occupancy Sensors, Photocells and Digital Switches used in conjunction with lighting control system.

### Contractor responsibilities:

#### Coordinate, receive, mount, connect, and place into operation all equipment. Furnish all conduit, wire, connectors, hardware, and other incidental items necessary for the complete and properly functioning relay lighting control system as described herein and shown on the plans.

NOTE TO SPECIFIER: Edit the following paragraphs to coordinate with other sections in the Project Manual.

## REFERENCES

NOTE TO SPECIFIER: Standards that are not applicable can be deleted.

### American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) ([www.ansi.org](http://www.ansi.org/) and www.ieee.org)

#### C62.41-1991 — Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits.

### ASTM International (ASTM) ([www.astm.org](http://www.astm.org/))

#### D4674 -02a Standard Test Method for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Fluorescent Lighting and Window-Filtered Daylight.

### Canadian Standards Association (CSA) ([www.csa.ca](http://www.csa.ca/)).

#### CSA C22.2 # 14 Industrial Control Equipment

#### CSA C22.2 # 184 Solid-State Lighting Controls

### International Electrotechnical Commission ([www.iec.ch](http://www.iec.ch/)).

#### (IEC) 801-2 Electrostatic Discharge Testing Standard.

#### IEC/EN 60669-2-1 Switches for household and similar fixed electrical installations - electronic switches.

### International Organization for Standardization (ISO) ([www.iso.ch](http://www.iso.ch/)):

#### 9001:2000 — Quality Management Systems.

### National Electrical Manufacturers Association (NEMA) ([www.nema.org](http://www.nema.org/))

#### WD1 (R2005) - General Color Requirements for Wiring Devices.

### Norma Official Mexicana (NOM).

#### NOM-003-SCFI Productos eléctricos - Especificaciones de seguridad (Electrical productos - Safety Specifications)

### Underwriters Laboratories, Inc. (UL) ([www.ul.com](http://www.ul.com/)):

#### 508 (1999) - Standard for Industrial Control Equipment.

#### 924 – Standard for Safety of Emergency Lighting and Power Equipment

### International Energy Conservation Code (IECC).

#### IECC

As referenced in Article 1.3.H, Paragraph 1, if ballasted loads are or will be controlled by any relay cabinet on this project, all cabinets must carry a UL listing that directly addresses ballasted loads. If ballasted loads are controlled, cabinets which bear only a UL916 listing should not be acceptable on this project.

### American Society of Heating, Refrigerating and Air-Conditioning (ASHRAE).

#### ASHRAE 90.1

### California Energy Commission (CEC).

#### Title 24

## SUBMITTALS

NOTE TO SPECIFIER: Edit the following to coordinate with other sections in the Project Manual.

### Submit under provisions of Section [01 33 00] and in accordance with Conditions of the Contract. Submittal Set shall include the following:

#### Bill of Materials: Complete list of all parts needed to fully install selected system components.

#### System One-Line Diagram.

#### Device detail drawings providing wiring details and dimensional data.

#### Product Data Sheets.

## Closeout Submittals

### To be provided within two weeks following system turn-on.

#### Warranty documents specified herein.

#### Operation and maintenance manuals in digital format (PDF format).

#### As-built drawings in digital format (PDF format).

## QUALITY ASSURANCE

NOTE TO SPECIFIER: Edit the following to indicate the minimum level of experience required by architectural lighting control manufacturers.

NOTE TO SPECIFIER: The following applies to all components covered herein.

### Manufacturer Requirements

#### Continuously engaged in the manufacture of architectural lighting controls and relays for no less than ten years.

#### Provide factory-direct technical support hotline 24 hours per day, 7 days per week.

#### Maintain a quality system that is registered to the ISO 9001:2000 Quality Standard.

### Lighting control system components:

#### Listed by [CE] [CSA] [UL] specifically for the required loads or certified by recognized independent testing organizations that test to [CE] [CSA] [UL] standards.

##### UL508

##### UL916 listing not acceptable.

As mentioned in Article 1.6.B Paragraph 1.a, if ballasted loads are or will be controlled by any relay cabinet on this project, all cabinets must carry a UL listing that directly addresses ballasted loads. UL916-listed cabinets are not acceptable when ballasted loads are controlled.

##### UL924

#### Comply with ASHRAE 90.1

#### Comply with CEC Title 24, Part 6

#### Comply with IECC

### Installer Qualifications

#### Experienced in performing the work of this section.

#### Has specialized in installation work similar to that required for this project.

NOTE TO SPECIFIER: Paragraph E below assures continued effective service and warranty support for the Owner.

### Source Limitations

#### To assure compatibility, obtain all system components from a single source with complete responsibility for all lighting controls and accessories specified in this Section and elsewhere in Division 26 Section 09 “Lighting Controls.” The use of subcontracted component assemblers is not acceptable.

## products installed but not furnished under this section

### LED Drivers or Fluorescent Ballasts

#### Supply ballasts that are compatible with the network lighting control system.

#### Accept 0–10V dimming control, phase dimming, DMX or DALI.

### All conduit, wire, connectors, hardware, and other incidental items necessary for the complete and properly functioning Network Lighting Control System as described herein and shown on the plans.

## DELIVERY, STORAGE & HANDLING

### General: Comply with Division 1 Product Requirements Sections.

### Ordering: Comply with manufacturer’s ordering instructions and lead-time requirements to avoid construction delays.

### Delivery

#### Deliver materials in manufacturer’s original, unopened, undamaged packages with intact identification labels.

#### Deliver to other trades in a timely manner.

NOTE TO SPECIFIER: Coordinate Article below with Environmental Specifications sections.

### Storage and Protection: Store materials away from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.

NOTE TO SPECIFIER: Coordinate Article below with Conditions of the Contract and with Division 1 Closeout Submittals (Warranty) Section.

## PROJECT CONDITIONS

### Do not install equipment until the following conditions can be maintained in spaces to receive equipment:

#### Ambient temperature: 0° to 40° C (32° to 104° F).

#### Relative humidity: Maximum 90 percent, non-condensing.

#### Lighting control system must be protected from dust during installation.

NOTE TO SPECFIER: This Leviton Manufacturing Inc. warranty provides the Owner with replacement relay modules for 10 years at no cost. Other manufacturers provide replacements at additional expense, and may require the Owner to pay increasing amounts after Year Two.

## WARRANTY

### Manufacturer’s Warranty

#### Warrant all equipment free of defects in materials and workmanship.

#### Warranty Period

##### Warrant all system components for 25 months from date of shipment, or two years from date of turn-on, whichever occurs first.

##### Make extended warranties available.

As specified in Article 1.10, Paragraph A.3, Leviton Manufacturing Inc.’s GreenMAX warranty includes replacement of relay modules for 10 years at no cost to the Owner. Manufacturers who charge for replacements within the 10 year period, or who require additional payments for warranty support after a two year period, should not be acceptable on this project.

#### Warrant relay modules for a period of 10 years.

##### Provide replacement modules at no cost to Owner.

#### Owner’s Rights: Manufacturer’s warranty is in addition to, not a limitation of other rights the Owner may have under contract documents.

## **PRODUCTS**

## ACCEPTABLE MANUFACTURERS

NOTE TO SPECIFIER: Only manufacturers that meet all specifications herein should be added to the list of Acceptable Manufacturers. Products that fail to meet energy management standards such as CEC Title 24 can affect the Owner’s ability to obtain occupancy or Green certifications. Under Execution (Part 3 of this Section), make the contractor responsible that installed equipment meets all specification requirements. Require that contractor replace, at no charge to the Owner, any equipment that does not meet this specification.

\*\*\* EITHER \*\*\*

### Acceptable Manufacturer: Leviton Manufacturing Co. Inc.

\*\*\*OR\*\*\*

### Basis of design product: Leviton Manufacturing Co. Inc. GreenConnect Wireless or subject to compliance and prior approval with specified requirements of this section, one of the following:

#### Leviton Manufacturing Co. Inc. GreenConnect Wireless

#### <<To specify an alternate manufacturer and product, insert the names here. Otherwise, delete this entire line.>>

### Substitutions: [Not permitted.] [Permitted.]

Note to Specifier: Delete items 1 through 4 if substitutions are not permitted.

#### Show all substitutions as an add or deduct from the base bid price.

##### All substitutions subject to provisions of [Section 00 26 00] [Section 01 25 00] [Section 01 62 00] [Division 1]

#### Clearly delineate all proposed substitutions as such and submit in writing for approval by the design professional a minimum of 10 working days prior to the bid date.

##### Proposed substitutions must be made available to all bidders.

##### Proposed substitutes must be accompanied by a review of the specification noting compliance on a line-by-line basis.

#### Prior to rough-in, provide complete engineered shop drawings, including power wiring, with deviations from the original design highlighted in an alternate color, to the engineer for review and approval.

#### By using pre-approved substitutions, the contractor accepts responsibility and associated costs for all required modifications to circuitry, devices, and wiring.

## Description

### Wireless digital network lighting control system comprised of the following components:

#### Wireless Load Control Devices

##### Including but not limited to wireless power packs, digital switches, digital dimmers, and marked controlled receptacles

#### Wireless Sensor & Photocell

##### Including but not limited to integrated wireless sensor and photocell

As specified in Article 2.2, Paragraph A.5, GreenMAX is available with Return To Closed (RTC) latching relays. RTC relays meet UL924 (Standard for Safety of Emergency Lighting and Power Equipment) because they automatically close when power is lost, the network malfunctions or the Command Module ceases to function for any reason. Systems that are unable to offer RTC relays do not meet UL924 and should not be acceptable on this project. This capability minimizes potential blackouts due to component failure.

## Performance Criteria

As noted in Article 2.3, Paragraph A, GreenMAX is engineered for quick setup and simple operation. The system can implement a variety of control strategies in order to meet energy savings goals for a particular project.

Emergency Operation — overrides all other control inputs.

Daylight Harvesting — allows interior and/or exterior photocells to dim lights and/or ballasts and/or turn them on or off.

Occupancy Sensing — interface with occupancy sensors in spaces where they are utilized.

(1) Manual On/Auto Off — An occupant must manually turn lights on, but the occupancy sensor automatically turns lights off when the space is unoccupied.

(2) Auto On/Auto Off — the occupancy sensor automatically turns lights on and off without the need of a switch.

Wall Station Enable/Disable.

Scheduled Events — meeting energy code requirements with astronomical time clock for automatic daily updates of sunrise/sunset times.

### [Occupancy/Vacancy Sensing] [0-10V Dimming] [Daylight Harvesting] [Partial-ON] [Partial-OFF] [Demand Response] [Receptacle Control] [Manual Switching] to control lighting with the following hierarchy:

#### Emergency: Highest priority overrides all other inputs.

#### Power failure: All RTC relays close upon loss of system power.

#### Bypass Switches: Second priority overrides all other inputs except Emergency.

#### Multi-location switching.

#### Occupancy/vacancy detection.

##### Allow programming of each group with the following operational behaviors:

##### Auto ON / Auto OFF

##### Auto ON /Auto OFF with light hold off

##### Manual ON / Auto OFF with light hold off

##### Manual ON / Auto OFF

##### Manual ON / Manual OFF

##### Manual ON / Manual OFF with light hold off

#### Set Light Hold (delay) Times from thirty (30) seconds to thirty 30) minutes.

#### Multi-zone Daylight Harvesting.

##### No limit to number of Zones.

##### Closed loop daylight harvesting.

##### Delay times of thirty (30) seconds to thirty (30) minutes.

##### ON/OFF behavior.

##### Auto ON with Manual Override.

##### Blink Warn Sequence.

As specified in Article 2.6, Paragraph B.1, GreenMAX photocell inputs have eight pairs of rising and / or falling trigger points, allowing system programmers to use open-loop or closed-loop strategies with photocell daylight sensors. Open-loop sensors integrate the light within the space to maintain average light levels. Closed-loop sensors look at a fixed point, changing the lighting in the space as the status of that fixed point changes. Systems that restrict the programmer’s choices to one mode or the other should not be acceptable on this project.

As specified in Article 2.6, Paragraphs E and F, GreenMAX allows the system designer to configure the switches in each area or zone with delay times. This unique feature can increase energy savings by enabling to adapt the system to a wide variety of use cases within the facility. Systems that do not allow delaying the switch response should not be acceptable on this project.

As specified in Article 2.6, Paragraph G, GreenMAX incorporates native BACnet-compatible scheduling objects. This greatly facilitates interfacing lighting control with Building Management Systems (BMS). Lighting systems that do not include native BACnet scheduling objects will be harder to interface with BMS and may not offer the range of scheduling options built into GreenMAX: they should not be acceptable on this project.

As specified in Article 2.4, GreenMAX natively supports the LumaCAN, Ethernet and BACnet IP networking protocols, without the need for separate interfaces or network adapters. This simplifies configuration, makes startup and commissioning easier, and provides a native interface with Building Management Systems (BMS). Systems that support multiple network protocols through external adapters should not be acceptable on this project.

As specified in Article 2.3, Paragraph B.2.c, GreenMAX control cabinets natively support RS485 master/slave token passing using the BACnet® protocol to facilitate interoperation with building automation systems and other intelligent field devices.

As specified in Article 2.3, Paragraph B.2.e, GreenMAX standard unique object descriptions do not require re-writing via the network — many Building Management Systems don’t support writing to device description properties,

As specified in Article 2.5, GreenMAX uses readily available, easily terminated, cost-effective CAT 5 and / or CAT 6 cable for the network physical layer. Systems that mandate specialized networking cabling will increase the Owner’s costs and should not be acceptable on this project.

NOTE TO SPECIFIER: Edit this heading as appropriate (delete “GreenMAX” if substitutions are allowed).

NOTE TO SPECIFIER: As noted in Article 2.7, Paragraph A, the ability to install relays in the field without voiding the cabinet’s UL listing allows for flexibility during and after the construction process to easily correct or modify issues that arise during the installation process.

NOTE TO SPECIFIER: As noted in Article 2.2.B, Paragraphs 1.a.1 & 1.b.1 allow for snap-in installation of single or dual pole relays without increasing the size of the cabinet or requiring special wiring.

## wireless LOAD CONTROLLERS

### Remotely mounted load control relays allow for a wireless distributed system architecture.

### Performance Criteria

#### Provide 0-10V dimming, phase cut dimming, or switching control for all listed and compatible load types.

#### 20A relay shall be listed for general purpose use on Plug Load circuits.

### Physical

#### Environmental

##### Operating Temperature: 32º to 122º F (0º to 50º C)

##### Storage Temperature: -40º to 185º F (-40º to 85º C)

##### Ambient Humidity 0% to 90% non-condensing

As specified in Article 2.11, Paragraphs C.1.b and D.1.b, GreenMax double pole relays are rated for 30 Amperes with General Fluorescent Ballast loads at up to 480VAC. This industry-leading rating allows the lighting designer to put more lights on these branch circuits, saving time and money for the Owner. Systems offering double relays rated for 20A with ballast loads will require more complicated and costly wiring, and should not be acceptable on this project.

### Electrical

#### Supported and listed loads

##### 120V General Purpose – 20A

##### 120V LED, CFL, Electronic Ballast – 10A, 5A

##### 120V Mark 10® - 800VA

##### 120V Magnetic Ballast 10A, 800W

##### 277V Magnetic Ballast 10A

##### 120V Resistive Tungsten 6.67A

##### 277V Resistive Tungsten 6.67A

##### 120V 1/4HP Motor, 277V 1/3HP Motor

##### 800W Resistive, Magnetic

#### Input Voltage/Frequency

##### 120VAC, 60Hz.

##### 120 – 277VAC, 50/60Hz

#### Network and device connections via Bluetooth

### Product Components:

#### Leviton Wireless 20A ON/OFF Switching Load Controller, model # ZKS00-D0W

#### Leviton Wireless 10A 0-10V Dimming Load Controller, model # ZK700-D0W

#### Leviton Wireless 800W Phase Cut Dimming Load Controller, model # ZKS00-D0W

## WIRELESS switches AND DIMMERS

### Control stations provide wireless local control of digital lighting control system as part of a GreenConnect wireless system.

### Performance Criteria:

#### Used as secondary user interface

#### Can be used for multi-location control

### Physical:

#### Available as an ON/OFF switch or 0-10V dimmer

#### Digital switches shall mount into a standard depth Wallbox

#### Environmental

##### Operating Temperature: 32º to 104º F, (0º to 40º C)

##### Ambient Humidity: 0% to 90% non-condensing

### Electrical

#### Supported and listed loads

##### 120V LED, CFL, Electronic Ballast – 8A, 10A, 1000W

##### 277V LED, CFL, Electronic Ballast – 5A, 10A, 1000W

##### 347V LED, CFL, Electronic Ballast – 4A, 1388VA

##### 120V Magnetic Ballast 8A, 10A, 1000W

##### 277V Magnetic Ballast 10A

##### 347V Magnetic Ballast 3.45A, 1200VA

##### 120V Resistive Tungsten 6.67A, 1000W

##### 277V Resistive Tungsten 6.67A

##### 347V Resistive Tungsten 6.67A

##### 120V 1/4HP Motor, 277V 1/3HP Motor

#### Input Voltage/Frequency

##### 120 – 277VAC, 50/60Hz

##### 347VAC, 50/60Hz.

##### 120VDC, 60Hz

#### Network and device connections via Bluetooth.

### Product Components:

#### GreenConnect 10A ON/OFF Wireless Wall Switch, model # ZBK00-D0Z

#### GreenConnect 0-10V Wireless Wall Dimmer, 120-277VAC, model # ZB700-D0Z

#### GreenConnect 0-10V Wireless Wall Dimmer, 347V, model # ZB700-30Z

#### GreenConnect 0-10V Wireless Low Voltage Wall Dimmer, model # ZB700-L0Z

#### GreenConnect Wireless 1000W Forward Phase Wall Dimmer”

## WIRELESS compaion switches and dimmers

### Control stations provide wireless local control of digital lighting control system as part of a GreenConnect wireless system.

### Performance Criteria:

#### Used as secondary user interface

#### Can be used for multi-location control

### Physical:

#### Available as an ON/OFF switch or dimmer

#### Digital switches shall mount into a standard depth Wallbox

#### Environmental

##### Operating Temperature: 32º to 104º F, (0º to 40º C)

##### Ambient Humidity: 0% to 90% non-condensing

### Electrical

#### CR2025 x2.V Batteries

### Product Components:

#### GreenConnect Wireless Companion Switch, Battery Powered model # ZBK00-CSW

#### GreenConnect Wireless Companion Dimmer, Battery Powered model # ZBK00-CDW

## wireless controled Receptacle

### Provides plug load control

### Performance Criteria

#### Plug load control with top outlet controlled and bottom outlet always on

#### Can be used to comply with energy codes

### Physical

#### Environmental

##### Operating Temperature for Wireless Receptacle: 20A rated up to 25º C, 15A rated up to 45 º C

##### Maximum Humidity ≤85%

### Electrical

#### Supported Listed Loads:

##### 120V General Purpose/Resistive 20A Type 2P; 3W back-wired

##### 125V Incandescent 1500W

##### 125V LED/E-Ballast 5A

##### 125V Motor 1HP

#### Network and device connections via Bluetooth.

### Product Components

#### GreenConnect Wireless 20A Duplex Receptacle with downstream control model # ZBR20-1SW

### Optional 24VDC Power Adapter, model #SLI24-000

## wireless DIGITAL SENSOR & PHOTOCELL

### Provides digital occupancy/vacancy and daylight sensing as part of a larger wireless system to communicate occupancy and/or light levels

### Performance Criteria

#### Occupancy detection using PIR technology with a 1000-2000 sq. ft. field-of-view

### Physical

#### Environmental

##### Operating Temperature for Wireless Sensor & Photocell: 32º to 104º F, (0º to 40º C)

##### Ambient Humidity 0% to 95% non-condensing

### Electrical

#### Wireless Occupancy Sensor & Photocell: Lithium 3.6V non-rechargeable battery (Jauch ER14505J-S, EVE ER14505, or SAFT LS14500)

#### Network and device connections via wireless mesh network.

### Product Components

#### Leviton Wireless PIR Occupancy Sensor & Photocell, 1500 sq. ft., model # ZC015-BIW

#### Optional 24VDC Power Adapter, model #SLI24-000

## **EXECUTION**

## INSTALLATION

### Coordinate, receive, mount, connect, [and place into operation] all equipment.

### Install equipment in accordance with manufacturer’s installation instructions.

### Provide complete installation of system in accordance with Contract Documents.

### Maintain performance criteria stated by the manufacturer without defects, damage, or failure.

### Provide equipment at locations and in quantities indicated on Drawings. Provide any additional equipment required to provide control intent.

As specified in Article 3.1, Paragraph F, interior sensors work mainly with diffused light and have a much higher lighting gain than exterior sensors. Electric light sources can affect these sensors unless the sensors are shielded from the light given off by electric light sources.

### Ensure that daylight sensor placement minimizes sensors view of electric light sources; ceiling mounted, and fixture-mounted daylight sensors shall not have direct view of luminaries.

NOTE TO SPECIFIER: Contractor places equipment into operation unless factory commissioning is specified.

### Furnish all conduit, wire, connectors, hardware, and other incidental items necessary for a properly functioning lighting control and relay system as described herein and shown on the plans. The Electrical Contractor shall maintain performance criteria stated by the manufacturer without defects, damage, or failure.

### Compliance: Contractor shall comply with manufacturer’s product data, including shop drawings, technical bulletins, product catalog installation instructions, and product carton instructions for installation.

### Circuit Testing: The contractor shall test that all branch load circuits are operational before connecting loads to system load terminals, and then de-energize all circuits before installation.

### Application of Power: Power shall not be applied to the relay system during construction and prior to turn-on unless specifically authorized by written instructions from the manufacturer.

NOTE TO SPECIFIER: Delete the following item if factory commissioning is required. If the contractor should include switch programming as part of the installation, delete any switch types that are not included in the project (if both analog low-voltage and digital switches are included, you will delete all brackets in the following item).

## SITE VERIFICATION

### Verify that wiring conditions, which have been previously installed under other sections or at a previous time, are acceptable for product installation in accordance with manufacturer’s instructions.

## FIELD MEASUREMENTS

### The electrical contractor shall be responsible for field measurements and coordinating the physical size of all equipment with the architectural requirements of the spaces into which it is to be installed.

## INSPECTION

### Inspect all material included in this contract prior to installation. The manufacturer shall be notified of unacceptable material prior to installation.

## SITE PROTECTION

### Contractor shall protect installed product and finished surfaces from damage during all phases of installation including storage, preparation, testing, and cleanup.

## COMMISSIONING

As specified in Article 3.6, a lighting control system requires at least one site visit for proper commissioning. If multiple site visits are required, the first ensures that the contractor is trained to install the system correctly. On the second, the factory engineer will start up the system, ensure that it is operating according to specification, and perform initial programming. The third visit is for the purposes of refining the programming, and training the owner/end user on the system.

NOTE TO SPECIFIER: Delete the commissioning option you DO NOT want in this specification.

### Provide factory-certified field service engineer to ensure proper system installation and operation under following parameters:

#### Certified by the equipment manufacturer on the system installed.

\*\*\* EITHER \*\*\*

#### Site visit activities:

##### Verify connection of power feeds and load circuits.

##### Verify connection of controls.

##### Verify system operation control by control, circuit by circuit.

##### Obtain sign-off on system functions.

##### Demonstrate system capabilities, operation and maintenance and educate Owner’s representative on the foregoing.

\*\*\* OR \*\*\*

#### At least three site visits to accomplish the following tasks:

##### Prior to wiring

###### Review and provide installer with instructions to correct any errors in the following areas:

Low voltage wiring requirements

Separation of high and low voltage wiring runs

Wire labeling

Load schedule information

Switching cabinet locations and installation

Physical locations and network addresses of controls

Computer-to-network connections

Load circuit wiring

Connections to other systems and equipment

Placement and adjustment of Occupancy Sensor

##### After system installation

###### Check and approve or provide correction instructions on the following:

Connections of power feeds and load circuits

Connections and locations of controls

Connections of low voltage inputs

Connections of the data network

###### Turn on system control processor and upload any pre-programmed system configuration

###### Verify cabinet address(es)

###### Upload pre-programmed system configuration and information to switching and/or dimming cabinets

###### Check load currents and remove bypass jumpers

###### Verify that each system control is operating to specification

###### Verify that each system circuit is operational according to specification

###### Verify that manufacturers’ interfacing equipment is operating to specification

###### Verify that any computers and software supplied by the manufacturer are performing to specifications

###### Verify that any remote WAN (Wide Area Network) connections are operating properly

###### Have an owner’s representative sign off on the above-listed system functions

##### Before project completion and hand-off

###### Demonstrate system capabilities and functions to owner’s representative

###### Train owner’s representative on the proper operation, adjustment, and maintenance of the system.

### Notification: Upon completion of the installation, the contractor shall notify the manufacturer that the system is ready for formal checkout. Notification shall be given in writing that a minimum of 21 days prior to the time factory-trained personnel are required on site. Each field installed RJ45 connection must be tested prior to system interconnection. A test report must be furnished to the manufacturer prior to scheduling commissioning activity. Manufacturer shall have the option to waive formal turn-on.

### Turn-On: Upon completion of all line, load and interconnection wiring, and after all fixtures are installed and lamped, Manufacturer’s Rep or, if waived, Contractor shall completely check the installation prior to energizing the system. Each installed relay system shall be tested for proper ON/OFF operations, and proper LED illumination. Each installed control cabinet shall be tested verifying that each controlled load adjusts to the selected setting and that all switch LED’s illuminate properly.

### At the time of checkout and testing, the owner’s representative shall be thoroughly instructed in the proper operation of the system.

## MAINTENANCE

### Enable the end user to order new equipment for system expansion, replacements, and spare parts.

### Make new replacement parts available for a minimum of ten years from the date of manufacture.

As specified in Article 3.7, Paragraph D, Leviton Manufacturing provides telephone technical support by factory personnel 24 hours a day, 7 days a week. Project cost overruns and delays can occur without this service. Answering services can add to frustration and delay the resolution of any problems or issues. Manufacturers who do not offer factory-direct technical support on a 24/7 basis should not be acceptable on this project.

### Provide factory-direct technical support hotline 24 hours per day, 7 days per week.

### Offer renewable annual service contracts, to include parts, factory labor, and annual training visits. Make service contracts available up to ten years after date of system commissioning.

END OF SECTION