Lumos Controls Guide Specification

Lumos Controls delivers a simple and scalable interior and exterior lighting control solution. It manages projects from a single room to full buildings and multi-location properties. Lumos Controls offers complete flexibility in lighting design by offering wireless options for manual as well as automated lighting control.

The flexibility of the solution makes it viable for virtually any application. Be it indoor or outdoor, the distributed nature of the system architecture provides economical and versatile solutions that meet energy codes, maximize energy savings, and simplify building operations.

Lumos Controls offers a broad portfolio of controllers, sensors, and interfaces under one platform to address new construction and retrofit lighting applications in a variety of sectors like: commercial, education, healthcare, hospitality, industrial, parking/site, and retail.

Section 260943 DIGITAL NETWORK LIGHTING CONTROLS
System Architecture
Room Controllers
Fixture Controllers
Switches
Sensors
Gateways

SECTION 26 09 43
NETWORK LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1   SUMMARY

A.   Installed system shall be comprised of stand-alone and networked control devices as indicated. System control devices shall include, but are not limited to:
        a.   Room Controllers
        b.   Reverse Phase Dimmers
        c.   Fixture Controllers
        d.   Switches
        e.   Sensors
        f.   Gateways
        g.   Software Interfaces

1.2   SYSTEM DESCRIPTION

A.   The contractor shall provide and install Lumos Controls devices as shown on plans and specified herein. Lumos Controls System shall be designed and configured to send and receive control, monitoring, operating and maintenance signals and commands wired and/or wirelessly to and from networked enabled room controllers, fixture controllers, switches, occupancy and daylight sensors, and other controls devices.

1.3   SUBMITTALS

A.   Prior to fabrication and shipment of lighting control components, manufacturer shall provide submittal documentation for approval.

B.   Submittal documentation shall include:
        1.   Bill of Material including a list of components to be supplied,
        2.   Device specification sheets containing device features, certifications, dimensions, electrical specifications, wiring diagrams, nomenclature, and accessories
        3.   Component schedules: Indicating lighting control device types and locations
        4.   Control cable type and routing requirements,

1.4   QUALITY ASSURANCE

A.   Manufacturer Qualification: Manufacturer of lighting control devices 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 at least 10 days prior to submission of a proposal package. Substitution submitted without the below shall be rejected.
                a.   Submit line-by-line comparison that describes differences, if any, between each lighting control device specified and those being proposed. Comparison shall include differences in size, quantity, quality, method of control, features and functions, control software functions, and installation requirements.

      b.   Product data, including certified independent test data indicating compliance with requirements.

      c.   Samples of each component.

      d.   Project references: Minimum of 3 installations not less than 3 years old, with Owner and Architect contact information.

      e.   Sample warranty.

B.   Factory Assembly: All system components shall arrive at the job site completely pre-wired and ready for installation, requiring only the connection of lighting circuits and network terminations. All connections shall be made to clearly and permanently labeled termination points or by connectorized cable. Systems that require field assembly shall not be acceptable.

C.   Component Testing: All system components and assemblies shall be individually tested prior to assembly. Once assembled, all finished products shall be tested for proper operation of all control functions per specifications prior to shipment.

1.5   SYSTEM COMPLIANCE

A.   Compliance: Where indicated, individual components shall comply with the following requirements:

      1.   Lumos Controls is qualified for the Networked Lighting Controls program created by DLC

      2.   UL Approval: All applicable equipment shall be tested to and listed under UL standard 2043, UL standard 8750, UL standard 916 and shall bare labels to indicate compliance. Systems listed under ETL or other UL sections shall provide documentation proving compliance with UL standards as listed above.

      3.   FCC Emissions: All applicable equipment shall comply with FCC emissions standards specified in Part 15, sub-part j for commercial and residential applications and shall bear labels indicating compliance testing. Equipment that does not meet these standards shall not be acceptable.

1.6   WARRANTY

A.   Manufacturer shall warrant the lighting control system components to be free from defects in material and workmanship for a period of five (5) years from the date of the certificate of building occupancy or proof of installation, whichever occurs first ("Warranty Period"). If the certificate of building occupancy is not available or there is no proof of installation, the Warranty Period shall begin with the Product ship date.

B.   Manufacturer's warranty shall include the repair or replacement product(s) with the same or a functionally equivalent product(s) or component part(s).

C.   Manufacturer shall provide telephone technical support and remote diagnostics where applicable during normal business hours excluding manufacturer holidays.

D.   Upon request, Manufacturer shall provide quotation for manufacturer service contract option(s) which include on-site technician visits for service and repair.

PART 2 - PRODUCTS

2.1   SYSTEM ARCHITECTURE

A.   System consists of wireless, distributed intelligent lighting control devices consisting of but not limited to control modules with ON/OFF, full range dimming and CCT control capabilities, and system input devices including but not limited to occupancy/vacancy sensors, daylight sensors and manual switches.

B.   System shall provide for automatic self-configuration of system devices. Self-configuration shall be accomplished by the devices themselves and provide for control of lighting prior to system custom configuration and programming. Systems that require configuration prior to use shall be considered unacceptable.

C.   To implement lighting control strategies, the system architecture shall facilitate the association of system input devices to control modules. The system shall use the Building/Floor/Zone assignment strategy. The system shall support up to 4000 zones in an account. Each zone shall consist of up to 4000 devices and these devices can be grouped together if required. Each device may be programmed to participate in one group; however, it may belong to up to 32 groups.

D.   System shall provide time-of-day and day-of-the-week clock scheduling. Each Zone shall support up to 32 scheduled events for use in developing schedules. Each schedule shall have the ability to turn a light device ON or OFF or activate a preset lighting scene at a scheduled time. Schedules shall be day-of-week selectable and may be programmed to activate on any combination of days of the week (Sunday through Saturday) or to activate on a specific date/holiday.

E.   System shall support blink identification. This can be used to identify devices during commissioning.

F.   System input devices shall be deployed in a zone to monitor and broadcast changes such as occupancy, daylight levels and manual switch input.

G.   System customization and programming shall be performed from a mobile App and/or web-based configuration and system management tools.

H.   System shall have an intuitive and easy to use mobile app to configure, control, monitor and schedule individual devices or groups of devices.

I.   System shall remain fully functional during the programming process. All programming changes shall take effect immediately as they are programmed.

J.   System shall be capable of being accessed remotely using any standard Internet browser if it has a gateway. System shall not require any special client-side software.

K.   Systems devices shall be capable of communication with each over Wireless – Coordinator-less, Self-Organizing/Self-Healing BLE Mesh
    1.   System shall have a wireless architecture that utilizes wireless mesh radio technology to create a peer-to-peer, self-organizing and self-healing mesh network infrastructure.
    2.   System shall have no single point of failure. A master controller/coordinator or master node shall not be required for proper system operation. All nodes shall be capable of

communicating with each other without the need of these types of single point of failure devices. Systems which utilize a master controller/coordinator shall not be acceptable.

3. System shall be self-organizing. The mesh network of devices shall self-organize automatically without the need to manually set device addresses via dials, DIP switches or other means.

4. System shall be self-healing. System devices within the mesh network shall automatically reroute messages around a failed device to ensure message delivery.

5. System architecture shall facilitate data transmission between wireless devices over the 2.4GHz ISM radio frequency (RF) band with a supported RF range of 100ft between wireless devices indoors and 200ft outdoors with clear Line of Sight.

6. System shall use a wireless mesh radio communication protocol to transmit/receive and negotiate messaging among wireless devices.

7. System shall utilize retransmission and encryption to facilitate robust communication and prevent the unauthorized interception of messages over the air and to comply with FCC requirements.

8. System shall provide the ability to secure messages. When implemented, each device shall use the strong and secure AES-128 (Advanced Encryption Standard) security cipher to encrypt and decrypt messages. System shall also use the secure HTTPS/SSL protocol when users access the system using their Internet browser.

L. System devices shall be capable of having their firmware updated or upgraded over the air through the wireless mesh network.

2.2 ROOM CONTROLLERS

A. Radiar AR10

1. As indicated and where shown on the plans, install Radiar AR10 Controller(s) to control the quantity of lighting and plug loads required.

2. Radiar AR10 Controller(s) shall integrate the functionality of connected control components including wall switch stations, occupancy sensors and daylight sensors to provide the required sequence of operation for the space.

3. Radiar AR10 and associated room control components shall operate in a totally standalone mode and does not require the use of a network, software, computer, or server for local control functions.

4. Radiar AR10 is capable of storing and running up to 16 local schedules.

5. Construction:
   a. Radiar AR10 housing shall be constructed of GSM UL rated 94 5VB plastic approved for use in a return air plenum.
   b. The housing and shall include an integral 1/2" chase nipple for external mounting to standard junction box knockout.

6. Electrical:
   a. Radiar AR10 shall have a single power feed and shall be capable of operation at voltages between 90/277 volts AC, 50/60 Hz.
   b. Output relay (model specific) shall provide for the following load types and ampacity (per relay):
      1) 1800W@120/277 VAC, Tungsten
      2) 16A, Electronic Ballast

    c.   Where indicated provide one or two independent 0-10 volt dimming channels (model specific) for full range dimming control of fixtures equipped with compatible dimmable ballast or driver.

    d.   Each dimming output shall have a source current of 100 mA.

    e.   Radiar AR10 shall be capable of supplying 100 mA of auxiliary 12VDC power for use by wall switch stations, occupancy sensors, and daylight sensors connected to the room controller

    f.   Radiar AR10 shall be equipped with power monitoring circuitry capable of measuring and reporting the total connected load for each room controller.

7.   Functional:

    a.   Default operation for occupancy sensors shall be automatic on at 100% intensity, automatic off for all loads after 20 min.

    b.   Upon connection of a switch, the operation shall automatically change to manual/automatic on, manual/automatic off (vacancy) mode for all loads.

    c.   Provide capability to convert each load independently to automatic on or vacancy mode using the Lumos Controls mobile app.

    d.   Manual override can be used in case automation needs to be disabled for a specified time period after a manual operation using switch/mobile app

    e.   Provide the following set up and configuration functions using the mobile app
   1)   Assign/reassign relays for control by switches,
   2)   Configure relays for occupancy or vacancy operation,
   3)   Assign/reassign dimmers to raise/lower switches,
   4)   Assign dimming channels for response to daylight sensor control,
   5)   Auto calibrate default daylight sensor sequence of operation,
   6)   Save preset scenes.

8.   Radiar AR10 shall support the following specialty modes:

    a.   CCT Control
   1)   Dimmer channels can be set individually to control CCT via 0-10V channel.
   2)   Scheduling can be implemented to mimic the natural transition of light throughout the course of the day.
   3)   Room-based solutions can be implemented to allow occupants to tune color to task.

9.   Radiar AR10 shall be able to work with UL924 load controllers (Like RIB's ESRN) for working with emergency fixtures

B.   Reverse Phase Dimmer – **Omni TED**

1.   Omni TED shall be compatible with trailing edge dimmable loads.

2.   OMNI TED shall dim standard 120V or 277V lighting loads.

3.   OMNI TED shall support up to 250W max load.

4.   Construction:

    a.   Housing: UL rated V-0 ABS plastic

    b.   Size: 1.69 x 1.38 x 0.79 inches

5.   Electrical:

    a.   Input: 120/277VAC, 60Hz – Single feed input connection

    b.   Output: 120/277VAC, 60Hz – Single feed output connection

    c.   Max Load Rating:
   1)   120VAC: 125W
   2)   277VAC – 250W

    d.   Min Load Rating: 24W

     e.   In-rush current protection: 75A

     f.   Surge-transient protection: 4kV

2.3   FIXTURE CONTROLLERS

A.   Radiar AF10

1. As indicated in the specifications and as shown on the plans, install Radiar AF10 series for controlling fixtures individually
2. Radiar AF10 is designed to be installed inside the fixture they control.
3. Radiar AF10 is a distributed intelligent lighting controller capable of functioning independently including time-based scheduling of On/Off and preset events. Sensors and switches as well as other Radiar AF10 controllers shall be capable of being connected to it to create a fully functional lighting control system.
4. Radiar AF10 shall be provided with one SPST relay. Relay shall be supplied with "Zero Cross Switching" control to limit the effects of inrush on the relay contacts.
5. Radiar AF10 shall be compatible with incandescent, magnetic, and electronic lighting loads including LED drivers.
6. Construction:
   a. Housing: GSM UL Rated 94 V-0 Plastic
   b. Mounting: Standard ½ inch chase nipple
7. Electrical:
   a. Line Voltage Versions:
      1) Input: Universal 120-2777VAC, 50-60Hz
      2) Output: One relay output shall provide for the following load types and ampacity (per relay):
         a) 3A, 120-277VAC only Incandescent
         b) 3A, 120-277VAC, Magnetic Ballast
         c) 3A, 120-277VAC, Electronic Ballast
      3) Surge Withstand: 4000V
      4) Peak Inrush: 120A
   b. Radiar AF10 shall be provided with two 0-10VDC control channels for full range dimming control of dimming ballasts and LED drivers. Interface shall be designed to continuously source up to 10mA of current per channel.
   c. Radiar AF10 0-10VDC control interfaces shall be configurable for 0-10VDC dimming, dim to off or color temperature control.
8. Functional:
   a. Radiar AF10 shall be designed to self-configure, automatically to meet energy code requirements as sensors and other devices are associated.
   b. Radiar AF10 shall be rated and tested for an operating temperature range of -40° to 185°F [-30° to 55°C].
   c. Each Radiar AF10 device shall support up to 32 schedules. Schedules shall be loaded using the Lumos Controls App.
   d. Radiar AF10 shall be capable of having its device firmware updated wirelessly over the air.
   e. Radiar AF10 shall include non-volatile memory for retaining device settings during power outages.
9. Radiar AF10 is FCC certified.

2.4   SENSORS

A.   **Cyrus F**: Passive Infrared, Wireless Occupancy & Daylight cum dimmer
1.   As indicated in the specifications and as shown on the plans, install Cyrus F
2.   Cyrus F shall be designed to install directly into or on the fixture housing or lens.
3.   Cyrus F shall integrate seamlessly into Lumos Controls BLE Network.
4.   Cyrus F's Module shall have an RF frequency of 2.4GHz.
5.   Cyrus F shall include Bluetooth and provide connection to the Lumos Controls Network using the Lumos controls Controls App.
6.   Cyrus F's Occupancy/Vacancy sensor shall provide automatic or vacancy switching of lighting load(s) within an area/zone based on the presence of PIR motion detection.
7.   Cyrus F can provide graphical occupancy data.
8.   Cyrus F sensor shall not require any mandatory adjustments of any kind at the time of installation or during operation.
9.   Cyrus F shall have a timer that can be adjusted manually from 1 second to 60 minutes.
10.   Cyrus F Occupancy/Vacancy sensor triggering inteerval shall be adjustable from 1 to 60 seconds.
11.   Cyrus F includes non-volatile memory for retaining device settings during power outages.
12.   Cyrus F has a real time motion indicator LED visible from the front of the unit.
13.   Control devices associated with a Cyrus F sensor may be programmed for active and inactive times.
14.   Cyrus F Occupancy/Vacancy sensor shall be available with the following 360° coverage patterns: SMI/LMI – 1:1 (mounting height to radius) up to 12 feet
15.   Cyrus F sensor shall continually measure the amount of visible light under the lighting fixture in open loop mode to provide dimming control of fixture or group under its control.
16.   Cyrus F daylight sensor can also utilize a closed loop daylight harvesting algorithm to maintain the required light level in response to changes in daylight.
17.   Cyrus F daylight sensor shall have independently programmable transition times to allow the sensor to respond quickly to decrease in daylight and respond more slowly to increase in daylight to minimize the effect of sudden changes in daylight.
18.   Cyrus F daylight sensor shall be capable of being programmed for active and inactive times.
19.   Cyrus F daylight sensor shall include non-volatile memory for retaining device settings during power outages.
20.   Cyrus F can also provide 2 0-10V dimming outputs (15mA source current per channel)

B.   **Cyrus AP**: Passive Infrared, Wireless Occupancy & Daylight Ceiling or Surface Sensor
1.   As indicated in the specifications and as shown on the plans, install Cyrus AP
2.   Cyrus AP is designed to be ceiling or surface mounted with appropriate accessories
3.   Cyrus AP is designed for high-bay and low-bay applications by using the appropriate lens
4.   Cyrus AP shall integrate seamlessly into Lumos Controls BLE Network.
5.   Cyrus AP's Module shall have an RF frequency of 2.4GHz.
6.   Cyrus AP shall include Bluetooth and provide connection to the Lumos Controls Network using the Lumos Controls App.
7.   Cyrus AP's Occupancy/Vacancy sensor shall provide automatic or vacancy switching of lighting load(s) within an area/zone based on the presence of PIR motion detection.
8.   Cyrus AP can provide graphical occupancy data.
9.   Cyrus AP sensor shall not require any mandatory adjustments of any kind at the time of installation or during operation.
10.   Cyrus AP shall have a timer that can be adjusted manually from 1 second to 60 minutes.

11. Cyrus AP Occupancy/Vacancy sensor triggering interval shall be adjustable from 1 to 60 seconds.
12. Cyrus AP includes non-volatile memory for retaining device settings during power outages.
13. Cyrus AP has a real time motion indicator LED visible from the front of the unit.
14. Control devices associated with a Cyrus AP sensor may be programmed for active and inactive times.
15. Cyrus AP Occupancy/Vacancy sensor shall be available with the following 360° coverage patterns: SMI/LMI – 1:3 (mounting height to radius) up to 13 feet with low bay lens
16. Cyrus AP Occupancy/Vacancy sensor shall be available with the following 360° coverage patterns: SMI/LMI – 1:1 (mounting height to radius) up to 45 feet with high bay lens
17. Cyrus AP sensor shall continually measure the amount of visible light under the lighting fixture in open loop mode to provide dimming control of fixture or group under its control.
18. Cyrus AP daylight sensor can also utilize a closed loop daylight harvesting algorithm to maintain the required light level in response to changes in daylight.
19. Cyrus AP daylight sensor shall have independently programmable transition times to allow the sensor to respond quickly to decrease in daylight and respond more slowly to increase in daylight to minimize the effect of sudden changes in daylight.
20. Cyrus AP daylight sensor shall be capable of being programmed for active and inactive times.
21. Cyrus AP daylight sensor shall include non-volatile memory for retaining device settings during power outages.

C. **Cyrus AM**: Microwave, Wireless Occupancy & Daylight Ceiling or Surface Sensor
1. As indicated in the specifications and as shown on the plans, install Cyrus AM
2. Cyrus AM is designed to be ceiling or surface mounted with appropriate accessories
3. Cyrus AM's sensitivity can be configured using the Lumos Controls app.
4. Cyrus AM shall integrate seamlessly into Lumos Controls BLE Network.
5. Cyrus AM's Module shall have an RF frequency of 2.4GHz.
6. Cyrus AM shall include Bluetooth and provide connection to the Lumos Controls Network using the Lumos Controls App.
7. Cyrus AM's Occupancy/Vacancy sensor shall provide automatic or vacancy switching of lighting load(s) within an area/zone based on the presence of PIR motion detection.
8. Cyrus AM can provide graphical occupancy data.
9. Cyrus AM sensor shall not require any mandatory adjustments of any kind at the time of installation or during operation.
10. Cyrus AM shall have a timer that can be adjusted manually from 1 second to 60 minutes.
11. Cyrus AM Occupancy/Vacancy sensor triggering interval shall be adjustable from 1 to 60 seconds.
12. Cyrus AM has non-volatile memory for retaining device settings during power outages.
13. Cyrus AM has a real time motion indicator LED visible from the front of the unit.
14. Control devices associated with a Cyrus AM sensor may be programmed for active and inactive times.
15. Cyrus AM Occupancy/Vacancy sensor shall be available with a detection coverage radius of 29 ft at a mounting height of 20 ft.
16. Cyrus AM sensor shall continually measure the amount of visible light under the lighting fixture in open loop mode to provide dimming control of fixture or group under its control.
17. Cyrus AM daylight sensor can also utilize a closed loop daylight harvesting algorithm to maintain the required light level in response to changes in daylight.

18. Cyrus AM daylight sensor shall have independently programmable transition times to allow the sensor to respond quickly to decrease in daylight and respond more slowly to increase in daylight to minimize the effect of sudden changes in daylight.
19. Cyrus AM daylight sensor shall be capable of being programmed for active and inactive times.
20. Cyrus AM daylight sensor shall include non-volatile memory for retaining device settings during power outages.

D. Lumos Controls enabled Smart Switches – Enocean Switches (Wireless) - **EDRPB**
   1. Enocean switches shall be of the programmable type using the Lumos Controls App.
   2. Smart switch shall have a single/double rocker set up with two/four momentary switches and provide lighting control functions as called out and shown on the plans.
   3. Each button on Enocean Switch (Wireless) shall be programmable with the following switch functions:
       a. On/Off fixture/group
       b. Dim up/Dim down fixture/group
       c. Increase or reduce CCT of fixture/group
       d. Invoke Scenes
       e. Play animations
       f. Pause/Stop/Skip/Previous steps in scene animation
   4. Construction:
       a. Housing: Rugged, high impact, injection molded plastic
       b. Mounting: Switches shall be capable of being mounted directly to wall surfaces and standard wall plate is provided.
   5. Enocean switch is Self-Powered by kinetic energy. It does not need battery or other power source
   6. Enocean Switches (Wireless) shall be available in White.

E. Lumos Controls Smart Switches – **Catron V** (Wireless)
   1. Lumos Controls' Catron V shall be programmable using the Lumos Controls App.
   2. Smart switch shall have 5 buttons and provide lighting control functions as called out and shown on the plans.
   3. Switches can be associated to groups and provide the below options-
       a. ON/OFF fixtures in the group
       b. Dim Up/ Dim Down fixtures in the group
       c. Increase or reduce CCT of the fixtures in the group
   4. Construction:
       a. Housing: Rugged, high impact, injection molded plastic
       b. Mounting: Switches shall be capable of being mounted directly to wall surfaces and standard wall plate is provided.
   5. Catron V switch is battery-Powered; battery typically lasts for 5-6 years
   6. Catron V (Wireless) shall be available in White.

F. Lumos Controls Smart Switches – **Catron AI** (Wireless Switch Interface)
   1. Catron AI can be programmed using the Lumos Controls App
   2. It can be connected to up to 4 push-button or toggle switches and a rotary dimmer if needed

3. Catron AI shall provide lighting control functions as called out and shown on the plans.
4. Each button shall be programmable with the following switch functions:
    a. On/Off fixture/group
    b. Dim up/Dim down fixture/group
    c. Increase or reduce CCT of fixture/group
    d. Invoke Scenes
    e. Play animations
    f. Pause/Stop/Skip/Previous steps in scene animation
5. Construction:
    a. Housing: UL rated V-0 plastic
    b. Mounting: Catron AI shall be capable of being mounted within switch box or junction box
6. Catron AI needs to be connected to a 90-277VAC supply
7. Catron AI can also be connected to dry contact switches

2.5   NETWORK ACCESSORIES

A.   Lumos Controls Gateway with Real Time Clock: **Enor E**

1. Enor E shall provide a wireless communication gateway for device communications to and from the Lumos Controls cloud
2. Enor E can be powered by a 5VDC adapter or mini-USB adapter.
3. Enor E can be easily paired to the lighting network with the Lumos Controls app.
4. Enor E shall feature a real time clock and allow schedules to run in Lumos Controls lighting networks without internet connectivity.
5. Enor E shall feature LED status indicators for BLE and Wi-Fi/Ethernet connections.
6. Enor E shall have an ethernet connection to connect to internet.

2.6   SOFTWARE INTERFACES

A.   Lumos Controls Mobile App
1. Lumos Controls App is available for free download for both iOS and Android devices
2. Lumos Controls app Bluetooth® wireless setup and configuration of Lumos Controls devices and luminaires equipped with Lumos Controls modules and smart sensors.
3. Lumos Controls App shall connect to Lumos Controls devices via Bluetooth BLE.
4. Lumos Controls App shall enable easy setup and configuration of Lumos Controls room devices like controllers, sensors and switches.
5. Lumos Controls App shall enable users to create custom schedules and presets.
6. Lumos Controls App shall globally discover wireless Lumos Controls-enabled luminaires and devices.
7. Lumos Controls app shall allow creation of accounts for each installation
8. Lumos Controls app allows to add users to accounts and configure their level of access to different areas and zones

B.   Lumos Controls Web Dashboard
1. Device Management

        a.   This section allows users to log in to the lighting networks and view devices and manage them

        b.   Devices are listed for each zones

        c.   Devices can be placed on Floor maps of each floor in the installation

        d.   You can create groups and scenes

2. Schedule Automation

        a.   Allows you to create, view and edit schedules remotely for the lighting networks

3. Web reports

        a.   Allows you to see trend of device usage, occupancy and energy consumption

        b.   Perform analytics like comparison of usage, occupancy and energy consumption between zones, groups etc

        c.   View occupancy heatmaps for devices, groups and zones

4. Building management

        a.   Create, view and edit buildings, floors and zones

        b.   Upload floor maps for each floor in a building

5. Smart Emergency via DALI

        a.   Allows you to see a summary of emergency testing in the account

        b.   Configure and view results of function and duration tests configured

        c.   View test result details of why each device failed an emergency test

6. Device Reachability via Gateway

        a.   View reachability of devices in each zone from the cloud via the gateway

        b.   Useful for placement of gateways, while scheduling emergency tests

7. Settings

        a.   Initiate and monitor mesh OTA updates in each account for each device type

        b.   View list of devices of a particular device type

2.7 CONDUCTORS AND CABLING

A. Power Supply Side of Remote-Control Power Sources: Comply with network manufacturer's requirements and requirements of Division 26 Section "Low-Voltage Electrical Power Conductors."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation, contractor shall examine work area to verify measurements, all wire type and routing requirements, and that commencing installation complies with manufacturer's requirements.

B. Where variations from the general specifications or drawings exist, the contractor shall request a clarification prior to rough in or installation

3.2 INSTALLATION

A. Lighting controls shall be installed in accordance with manufacturer's instructions, guidelines and submittal documents provided by the lighting control manufacturer.

B. Lighting control system components shall only be installed in spaces that meet the following environmental conditions:

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

C.   All stored and installed lighting control system components shall be adequately protected from dust and dirt.

3.3   SYSTEM STARTUP

A.   The system manufacturer/ it's representative shall provide a factory authorized field engineer to the project site after installation has been completed and prior to system commissioning for the purpose of testing and adjustment of the system.

B.   The field engineer shall test and verify all system functions and ensure proper operation of the system components in accordance with the specifications and on-site conditions. The installing contractor shall notify the system manufacturer in writing that the system is completely wired and ready to be commissioned and tested 2 weeks prior to scheduling a field engineer for start-up of the system. Should the field engineer arrive on the job site and find the installation incomplete, the installing contractor shall pay the cost of any future visits by the field engineer required to complete the system start-up.

C.   Factory field engineer shall provide a written report of test and outcomes.

3.4   DEMONSTRATION AND TRAINING

A.   Factory field engineer from manufacturer/it's representative shall instruct owner's staff on how to adjust, operate and maintain lighting systems; and provide instruction using the system software.
       1.   Allow for up to 4 hours of on-site training on the use and maintenance of the lighting control system to be scheduled at the completion of startup and configuration of the system.

3.5   TECHNICAL SUPPORT

A.   Manufacturer shall provide reasonable access to factory direct telephone technical support during normal business hours.

END OF SECTION