ROAM Decorative Node Control Specification Guideline
Division 16520

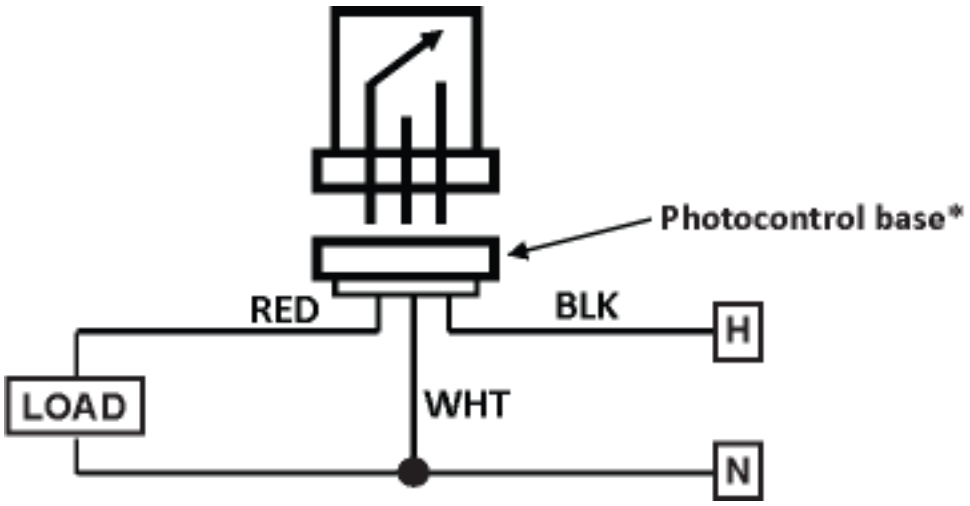
PART 1. GENERAL

1.1 INTRODUCTION

A. The intent of this specification is to provide for furnishing, installing, testing and placing into operation, a networked locking type photocontrol for outdoor luminaire with internal receptacles .

1.2 DESCRIPTION OF WORK

A. Provide a locking type photocontrol for outdoor lighting
B. Requirements are indicated elsewhere in these specifications.
C. Follow the following wiring diagram:



1.3 QUALITY ASSURANCE

A. Manufacturer experience - To insure a uniform installation and single responsibility, all switching equipment described herein shall be supplied by a manufacturer with a minimum of 10 years experience in lighting control systems.
B. Manufacturer shall be:

ROAM
3825 Columbus Rd. SW
Granville, Oh. 43023
800-442-6745
http://www.roamservices.net

C. Manufacturing Location shall be ISO certified.
D. Product shall be ROAM. Alternate products meeting prior approval requirements may be proposed as add or deduct alternate only.

1.4 CODES AND STANDARDS

A. ANSI C136.10
B. FCC part 15

1.5 SUBMITTALS

Prior to fabrication manufacture shall submit the following materials for approval.

A. Manufacturer's published catalog data sheets for the photocontrol.
B. Shop Drawings - Submit detailed drawings and documentation of photocontrols. As a minimum, the shop drawings shall include the following:
    1. Wiring diagrams
    2. Full catalog sheets

PART 2. PRODUCTS

2.1 SYSTEM DESCRIPTION

A. The photocontrol shall control all luminaires on which it is installed.
B. The photocontrol shall be a locking type photocontrol as per ANSI C136.10
C. The photocontrol shall include two components: the base node and an external radio module with the sensors and window
D. The photocontrol location shall be associated with GPS coordinates collected during the activation process
E. The photocontrol shall communicate with other controls and gateway devices via radio signal

2.2 RATINGS

A. Photocontrol shall have a rated line voltage of 72-305 Volts AC at 60 Hertz
B. Photocontrol shall have a maximum load rating of 720VA/400 Watts
C. Photocontrol shall operate all HID, halogen, incandescent, LED, solid state, fluorescent, and relay loads
D. Photocontrol shall consume a maximum of 2.2 Watts at 120 Volts AC
E. Photocontrol shall turn ON in 1.5 ± 0.3 foot candles
F. Photocontrol shall turn OFF at 2.3 ± 0.3 foot candles
G. Photocontrol shall fail ON as per definitions in ANSI C136.10
H. Photocontrol shall have a 2.5-5 second delay before turning ON
I. Photocontrol shall have a 2.5-5 second delay before turning OFF
J. Photocontrol shall operate in -40 degrees to 185 degrees Fahrenheit (-40 degrees to 85 degrees Celsius) ambient temperatures
K. Photocontrol shall withstand an Interface Temperature of 90 degrees Celsius where Interface Temperature is defined in ANSI C136.10

2.3 HARDWARE

A. Photocontrol Housing
    1. The housing shall be 2.24 inches (56.9 millimeters) high and 3.16 inches (80.26 millimeters) in diameter
    2. The photocontrol shall weigh 4.1 ounces (116.2 grams)
    3. Housing of photoelectric control shall be blue or black polycarbonate.
    4. Housing shall be made of an impact and UV resistant material.
        a.) Photocontrol shall have an impact resistance of greater than 1.0 ft-lbs at -20ºC
        b.) Photocontrol shall pass an impact test after 1000 hours in a QUV chamber
            • Color shift shall not be more than one Pantone number after the QUV test
    5. Photocontrol shall withstand a drop of three feet to a concrete floor without causing damage to the casing or changing electrical operation
B. Photocontrol Housing Labeling
    1. Directional arrows marked "INSTALL" and "REMOVE" shall be molded on the top of the casing
    2. The bottom of the photocontrol casing shall be stamped with month and year lists to enable installers to indicate an installation and removal date via pencil hash marks on the casing.
        a.) This stamp shall consist of three concentric partial rings.
        b.) The rings are broken by a small label box spanning all three rings.

c.) The outermost and innermost rings are blank by default.
d.) The center ring includes the numbers 1-12 to the left to indicate month and a list of 10 or more consecutive two digit years to the right.
e.) The label box shall indicate the outer ring is for installation information, the inner ring for removal information, the left side of the center ring is for the month, and the right side of the center ring is for the year. Abbreviations such as “mo” and “yr” are acceptable if space is limited.

C. Base Label
1. The base label shall be affixed to the bottom of the photocontrol casing
2. The base label shall not block or otherwise obscure other information on the casing
3. The base label shall include the following information:
a.) Model number or model description
b.) The month and year of manufacture
c.) Operating voltage nominal rating
d.) Load rating
e.) Manufacturing location

D. Identification Label
1. A label with the MAC ID and the equivalent bar code shall be affixed to the bottom of the photocontrol casing

E. FCC Label
1. An FCC label shall be affixed to the edge of the control
2. The FCC label shall not block or otherwise obscure other information on the casing
3. The FCC label shall include the following information:
a.) FCC ID
b.) Model number
c.) Current FCC verbiage related to interference

F. Window and LEDs
1. Window shall be made of a UV stable and UV blocking acrylic polymer
2. Window area shall contain red and green LEDs located to the left and the right of the center of the window respectively.
a.) Red LED shall turn on for 4 seconds when the control powers on
b.) Red LED shall reset to off each time the related fixture turns on
c.) Red LED shall flash at a rate of 0.1 second on, 1 second off whenever an error state is detected
d.) Green LED shall turn on for 4 seconds when the control powers on
e.) Green LED shall flash at a rate of 1 second on, 1 second off until network communications are established
f.) Green LED shall flash at a rate of 0.1 second on, 1 second off during regular operation of the photocontrol
g.) Green LED shall turn off if the voltage drops below 90 Volts

G. Legs and Gasket
1. All three legs shall be brass. Plated steel legs are not acceptable.
2. Gasket shall be neoprene or similar
3. Gasket must withstand a minimum 90 Celsius at 95% humidity

H. Photocontrol Leads
1. A wire for connection with the ERM shall protrude from the rear of the main photocontrol casing
2. The wire shall be 4.5 inches long
3. The wire shall end in a connector

I. ERM Housing
1. The housing shall be 2.68 inches (68.07 millimeters) long, 1.98 inches (50.29 millimeters) wide, and 0.9 inches (22.86 millimeters) high
2. The back of the housing shall protrude in a nipple
a.) The nipple shall be 0.95 inches (24.13 millimeters) long and 0.23 inches (5.84 millimeters) in diameter
3. The ERM shall weigh 2.3 ounces (65.2 grams)
4. Housing of ERM shall be black polycarbonate
5. Housing shall be made of an impact and UV resistant material.

a.) ERM shall have an impact resistance of greater than 1.0 ft-lbs at -20ºC
b.) ERM shall pass an impact test after 1000 hours in a QUV chamber
- Color shift shall not be more than one Pantone number after the QUV test

6. ERM shall withstand a drop of three feet to a concrete floor without causing damage to the casing or changing electrical operation

J. ERM Labeling
1. ERM shall include an identification label on the edge below the window
2. Label shall include the MAC address and the equivalent bar code

K. ERM Leads
1. A wire for connection with the main photocontrol shall protrude from the bottom of the ERM nipple
2. The wire shall be 4.5 inches long
3. The wire shall end in a connector

L. Window
1. Window shall be made of a UV stable and UV blocking acrylic polymer

M. Identification
1. Photocontrols shall be assigned a unique 16 digit hexadecimal MAC ID
2. Photocontrols shall be GPS locatable upon activation, providing location information identified by that MAC ID

N. Sensors
1. Photocontrols shall use a sealed silicon sensor. Cadmium sulfide cells are not acceptable.

O. Relays
1. Mechanical
a.) Relays shall be securely mounted to the printed circuit board
b.) Relays shall be fully sealed with a dust cover
2. Relay Certification
a.) Relays shall be Underwriters Lab (UL) recognized.
3. Relay Ratings
a.) Relays shall be SPST
b.) Relays shall be normally closed
c.) Relays shall be rated for 3650 operations at full load

P. Surge Protection
1. Surge protection shall be in the form of a Metal Oxide Varistor (MOV) wired line to neutral
a.) MOV shall be rated for a minimum of 320 Joules (8x20 microseconds)
b.) The node shall be rated for a maximum of 9500 Amp surge

L. Networking
1. Photocontrols shall be capable of remote turn off and turn on
2. Photocontrols shall be capable of assignment to groups which can be controlled over the network as a single unit
3. Photocontrols within an installation shall communicate with neighbor controls and gateway devices via 2.4 Gigahertz radio signals within a mesh network
4. Photocontrols shall have a communications range of 1000 feet line of sight
5. Communications between controls shall require a direct line of sight view
6. Data for each control within an installation shall have at least a one hour collection resolution.
7. Data sent from individual controls via radio signals shall be encrypted
8. Photocontrols shall provide troubleshooting information over the network
a.) All troubleshooting reports shall include the MAC number of the associated photocontrol
b.) Fixture malfunctions shall be reported
c.) Cycling fixtures shall be reported
d.) Day burning fixtures shall be reported
e.) Uncommunicative photocontrols shall be reported
f.) Power details for fixtures shall be reported
9. Photocontrol shall operate as a standard standalone photocontrol if networking fails

2.4 PACKAGING

A. Each photocontrol shall be individually packaged inside its own box
1. Each individual box shall be 7.5 inches (190.5 millimeters) long, 3.5 inches (88.9 millimeters)

wide, and 3 inches (76.2 millimeters) high
2. Each individual box, Base Node and ERM shall weigh 11 ounces (311.8 grams)
3. Each individual box shall include a label or be directly printed with the following information
   a.) The label shall include the model number
   b.) The label shall include the voltage rating of the control

PART 3: EXECUTION

3.1 EQUIPMENT INSTALLATION AND DOCUMENTATION

A. Installation - The photocontrol shall be installed and connected as directed by the manufacturer.
   1. Ensure power is turned off in the fixture before beginning photocontrol installation
   2. Ensure the fixture is properly wired as per fixture installation instructions before attempting to install the photocontrol
   3. Ensure that the MAC ID of the locking receptacle and the ERM match exactly
   4. Ensure that the photocontrol eyeport on the fixture is completely open and uncovered
      a.) Remove any transparent cover or lens found in the eyeport
      b.) Remove any silicon adhesive or other residue found in the eyeport
   5. Select a washer that fits the lens hole with good overlap with the surrounding fixture enclosure
   6. Remove the adhesive backing on the washer and place it flat against the interior of the fixture housing, centering it with the center of the lens hole
   7. Remove the vented screw from the end of the ERM
   8. Feed the ERM cabling through the eyeport, placing the vented screw back onto the cabling from the interior of the fixture
      a.) Push the vented screw to the edge of the interior of the fixture
      b.) Screw it tight enough that the washer and fixture wall are captured between the screw and the ERM
   9. Rotate the ERM so the ROAM labeling faces upright
   10. Use a 1 inch open style torque wrench to tighten the vented screw to no more than 35 inch pounds to create a watertight seal at the eyeport
   11. Insert the photocontrol locking receptacle into the locking receptacle inside the fixture
   12. Attach the end of the ERM cable to the end of the mated cable on the photocontrol locking receptacle
      a.) The white arrows on each cable should line up
      b.) Push the locking ring on the receptacle cable toward the ERM cable to ensure proper mating
   13. Reassemble and close the fixture
B. Documentation - The complete product specification shall be available from the manufacturer.

3.2 PRODUCT SUPPORT AND SERVICE

Factory telephone support shall be available at no cost to the owner. Factory assistance shall consist of assistance in solving application issues pertaining to the control equipment.

3.3 WARRANTY

Manufacturer shall provide a three year (3) limited warranty on the photocontrol consisting of a one for one control replacement. The official warranty policy is the following:

ALL ROAM photocontrols are permanently marked with month and year of manufacture as well as a serial number. ROAM undertakes that this product shall operate within its original operating specifications and shall be free of electrical or mechanical defects. ROAM's liability hereunder shall not include removal or installation of the unit nor any consequential damages. This express warranty is in lieu of and excludes all other warranties, guaranties or representations, expressed or implied, including, but not limited to, warranties of merchantability or fitness for a specific purpose, by operation of law or otherwise.

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