

# DTL DSN Itron Ready Networked Photocontrol Specification Guideline

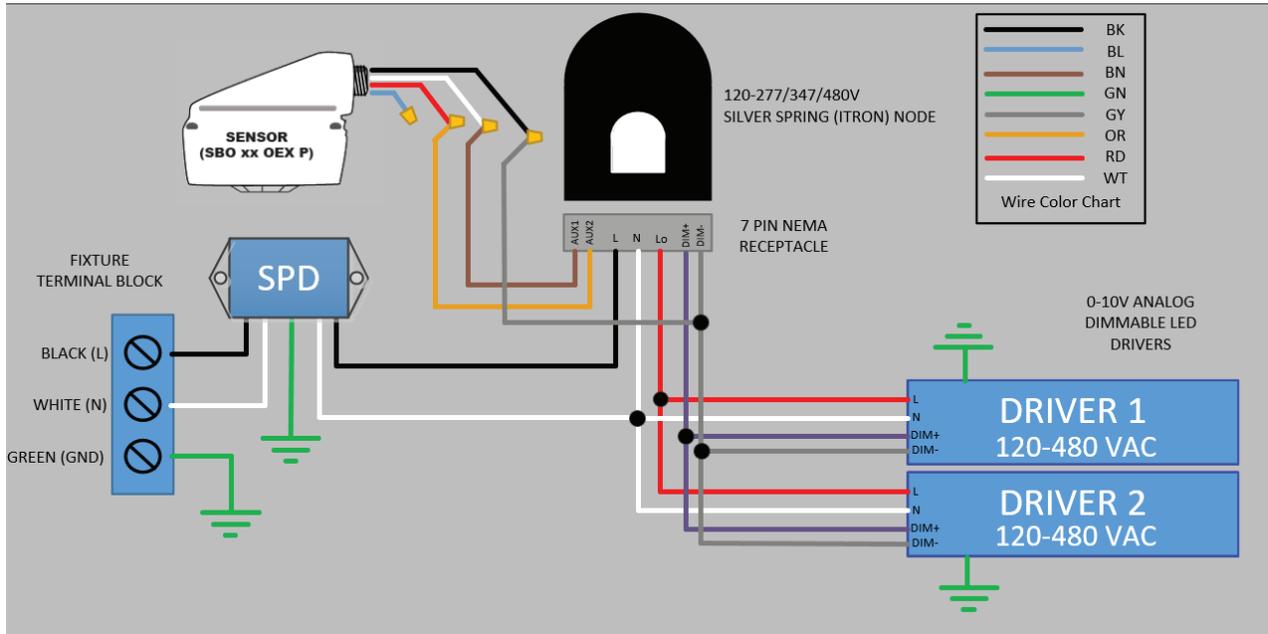
## PART 1. GENERAL

### 1.1 INTRODUCTION

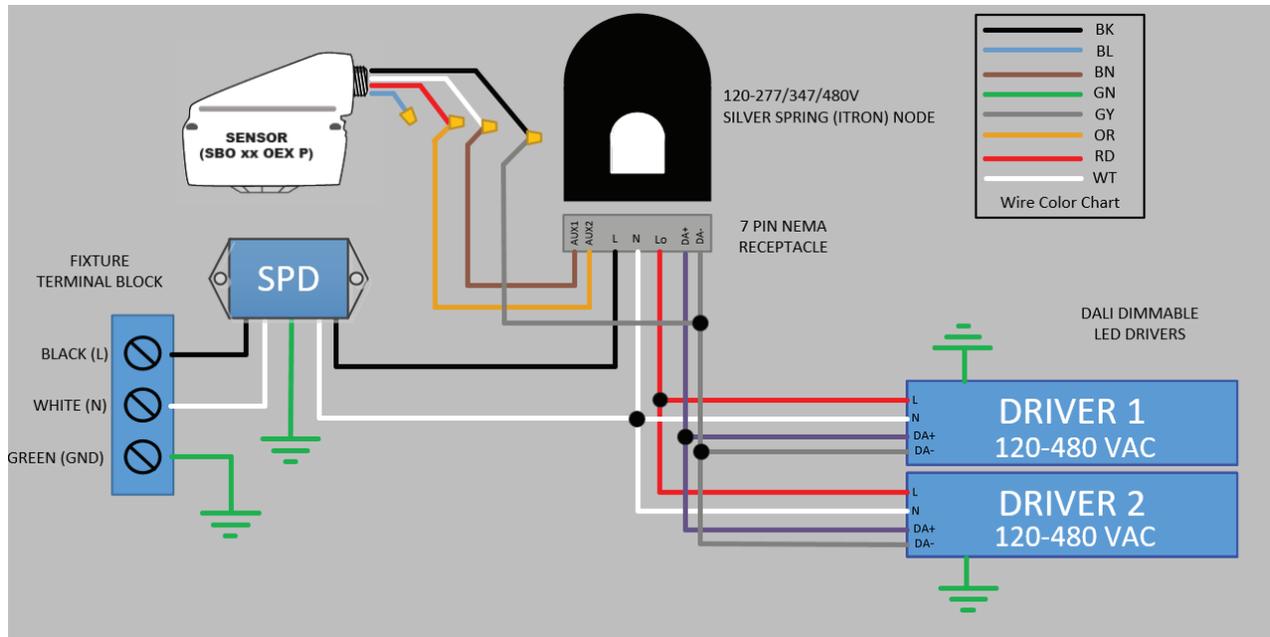
- A. The intent of this specification is to provide for furnishing, installing, testing and placing into operation, an Itron ready networked locking type photocontrol for outdoor luminaire.

### 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 diagrams:



7-Pin NEMA Receptacle Wiring Diagram for 0-10V Analog Dimming



7-Pin NEMA Receptacle Wiring Diagram for DALI Dimming

### 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:

Dark To Light  
3825 Columbus Rd. SW Granville, Oh. 43023  
800-442-6745  
[www.darktolight.com](http://www.darktolight.com)

- C. Manufacturing Location shall be ISO 9001 and 14001 certified.

Product shall be Dark To Light. 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. ANSI C136.41
- C. ANSI C12.20
- D. FCC part 15
- E. cULus

### PART 2. PRODUCTS

## 2.1 SYSTEM DESCRIPTION

- A. The photocontrol shall control the luminaire on which it is installed.
- B. The photocontrol shall be a locking type photocontrol as per ANSI C136.10, C136.41
- C. The photocontrol location shall be associated with GPS coordinates collected during the activation process
- D. The photocontrol shall communicate with other controls and gateway devices via radio signal
- E. The photocontrol shall diagnose the luminaire on which it is installed.
- F. The photocontrol shall perform real-time commands on the luminaire on which it is installed
- G. The photocontrol shall intelligently operate the luminaire despite network connectivity loss
- H. The photocontrol shall communicate with other controls and access points via radio signal
- I. The photocontrol shall accept motion sensor input to be used for individual or group response to sensor input

## 2.2 RATINGS

- A. Photocontrol shall have a rated line voltage of 105-305 / 305-380 / 430-530 Volts AC at 50/60 Hz
- B. Photocontrol shall have a maximum load rating of 1800VA / 1000W
- C. Photocontrol shall have a TRIAC assisted relay switching circuit for LED inrush protection
- D. Photocontrol shall operate all HID, halogen, incandescent, LED, solid state, fluorescent, and relay loads
- E. Photocontrol shall consume a maximum of 2.2 Watts at 120 Volts AC
- F. Photocontrol shall be calibrated to turn ON at  $1.5 \pm 0.5$  foot candles
- G. Photocontrol shall be calibrated to turn OFF at 1.5 times the level it turns ON.
- H. Photocontrol shall fail ON as per definitions in ANSI C136.10
- I. Photocontrol shall have a 2-5 second delay before turning ON
- J. Photocontrol shall have a 2-5 second delay before turning OFF
- K. Photocontrol shall operate in -40 degrees to 158 degrees Fahrenheit (-40 degrees to 70 degrees Celsius) ambient temperatures
- L. Photocontrol shall withstand an Interface Temperature of 90 degrees Celsius where Interface Temperature is defined in ANSI C136.10
- M. Photocontrol shall have an ingress protection rating of IP65
- N. Photocontrol shall support 0-10V or DALI dimming interface
- O. Photocontrol shall accept motion sensor input on pins 6 and 7 to be used for individual or group response to sensor input
- P. Photocontrol shall have an energy measurement accuracy class of 0.5% per ANSI C12.20
- Q. Photocontrol shall have an IR pulse interface for energy meter audit
- R. Photocontrol shall have UV stabilized polycarbonate enclosure for high impact resistance and long life.

## 2.3 HARDWARE

- A. Housing
  1. The housing shall be 4.13 inches (104.9 millimeters) high and 3.5 inches (88.9 millimeters) in diameter
  2. The photocontrol shall weigh 11.11 ounces (315 grams)
  3. Housing of photoelectric control shall be 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 following a 72-hour temperature soak at -29°C (UL773, 24.1)
    - b.) Photocontrol shall pass the same impact test after 1000 hours in an accelerated weathering test chamber (e.g. QUV chamber) (ANSI 136.10 6.3.3 and ASTM G154-12a)
  5. Photocontrol shall withstand a drop of three feet to a concrete floor without causing damage to the casing or allowing access to internal hazardous voltages. (UL773, 26.1-26.4)
  6. The enclosure shall have an ingress protection rating of at least IP65
- B. Housing Labeling
1. Directional arrows marked "INSTALL" and "REMOVE" shall be molded on the top of the casing
  2. A directional arrow marked "NORTH" shall be molded on the top of the casing so an installed knows how to properly line up the photocontrol.
  3. The bottom of the photocontrol casing shall be stamped with date of manufacture, photocontrol nomenclature, voltage rating, load rating, dimming protocol and conformance listings.
  4. The body of the photocontrol shall have UV rated stickers which are printed with, FCC logo, FCC ID and IC information, barcode or QR code with serial number and MAC ID coding, time zone and Daylight-Saving Time information sticker.
- C. Window and LEDs
1. Window shall be made of a UV stable and UV blocking acrylic polymer
  2. Window area shall contain an operational LED indicator
  3. Window area shall contain IR pulse interface for energy measurement calibration
- D. 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
- E. Identification
1. Photocontrols shall be assigned a unique 16-digit hexadecimal MAC ID
  2. Photocontrols location shall be associated with GPS coordinates collected during the activation process and identified by that MAC ID
- F. Ambient Light Sensor
1. Photocontrols shall use a sealed silicon sensor. Cadmium sulfide cells are not acceptable.
  2. Sensor shall have an orientation facing the photocontrol window and the same direction as the NORTH arrow on top of the enclosure.
- G. 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.
- H. Relay Ratings
- a. Relays are preferred to be SPST
  - b. Relays shall be normally closed
  - c. Relays shall be rated for 7300 or better operations at full load
- I. Surge Protection
1. Surge protection shall be in the form of a Metal Oxide Varistor (MOV)
    - a. The summed total rating of MOVs shall be a minimum of 1080 Joules / 36kA

- b. Node shall be rated in excess of ANSI C136.10 Extreme test level (20kV/10kA)
- J. Inrush protection
  - 1. Inrush protection shall be in the form of a TRIAC assisted relay
- K. Networking
  - 1. Photocontrols shall be capable of remote turn off /turn on/dim
  - 2. Photocontrols shall be capable of assignment to geozones which can be controlled over the network as a single unit
  - 3. Photocontrols within an installation shall communicate with neighbor controls and Access Points devices via 902-928 Megahertz radio signals within a mesh network
  - 4. Photocontrols shall have a communications range of 1000 feet to 5 miles line of sight varying with topography, urban sprawl and vegetation.
  - 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 with AES-256 with authentication via scalable X.509 Public Key Infrastructure
  - 8. Photocontrols shall provide troubleshooting information over the network: (I have not been able to validate this entire list.)
    - a. Communication failure
    - b. Day burner
    - c. High node temperature
    - d. High lamp voltage
    - e. Invalid calendar
    - f. Lamp failure
    - g. Low lamp voltage
    - h. Low power factor
    - i. Power supply failure
    - j. Cycling lamp
    - k. External communication failure
    - l. High current
    - m. High power
    - n. Invalid program
    - o. Low current
    - p. Low power
    - q. Open circuit
    - r. Relay failure
    - s. Calendar Commission Failure
    - t. Cycling count
    - u. Device reset count
    - v. Lamp burning hours
    - w. Lamp energy
    - x. Lamp level commend
    - y. Lamp level feedback
    - z. Lux Level
    - aa. Mains current
    - bb. Mains voltage
    - cc. Metered Power
    - dd. Power Factor

- ee. Power Factor Sense
- ff. Supply Losses
- gg. Switch on Counter
- hh. Temperature

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 3.54 inches (89.9 millimeters) long, 3.54 inches (89.9 millimeters) wide, and 4.7 inches (119.4 millimeters) high
  - 2. Each individual box and photocontrol shall weigh 11.3 ounces (320 grams)
  - 3. Each individual box shall include installation instructions on one side
  - 4. Each individual box shall include warranty information on one side
  - 5. Each individual box shall include a label with the following information
    - a) The label shall include the model number
    - b) The label shall include the voltage rating of the control
    - c) The label shall contain cULus marking for US and Canadian models
    - d) The label shall contain CE marking for European models

## PART 3: EXECUTION

### 3.1 EQUIPMENT INSTALLATION AND DOCUMENTATION

- A. Installation - The photocontrol shall be installed and connected as directed by the manufacturer.
  - 1. The photocontrol is a locking type control and shall require no additional field wiring.
- 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 ten year (10) limited warranty on the photocontrol consisting of a one for one control replacement. The official warranty policy is the following:

DTL undertakes that this product shall operate within its original operating specifications and shall be free of electrical or mechanical defects. DTL's liability hereunder shall be limited to providing a replacement unit and shall not cover the costs of 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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