



ROAM DCM127-NX1 Dimming Control Module Requirements & Installation Guide

Fixture Requirements

In order for the DCM to work properly within the ROAM system, the following general requirements must be met:

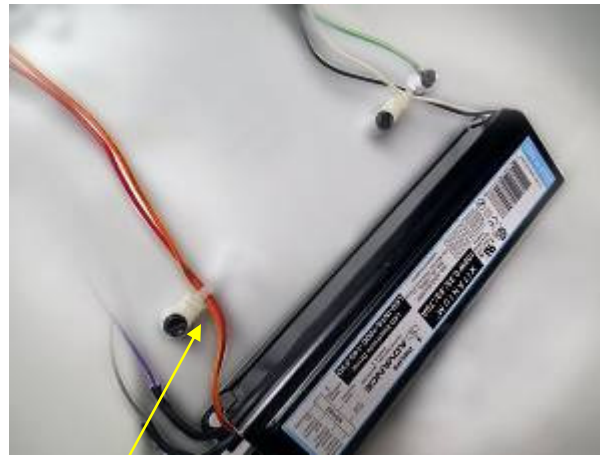
1. DCM must be mounted beneath the NEMA receptacle with a minimum of components blocking line of sight to the underside of the NEMA receptacle.
2. DCM must be powered from “always hot” wiring within the fixture, meaning that it may not derive power from the red lead on the NEMA receptacle.
3. DCM MAC ID label must be visible when the wiring compartment is opened and a clear path sufficient for a barcode scanner to scan the label must be maintained. If this is not possible, a duplicate MAC ID label must be printed and applied to the interior of the fixture in a location that is accessible to a barcode scanner when the electronics enclosure is opened.
4. DCM is rated to 85C ambient, resulting in a 90C case temperature max at the indicated thermocouple point (see datasheet). End applications must ensure that these limits are not exceeded.
5. Do not mount the DCM where it may come into contact with the fixture mounting device during installation.
6. Always use #8 or #10 screws into hard bosses or a suitable bracket to mount the DCM such that it is not subject to excessive vibration that may result from a soft mounting.
7. The DCM should be mounted in an area that does not experience direct exposure to liquid water.
8. DCM must be mounted within a fixture that will have a ROAM photo control device installed to the NEMA receptacle in final application.
9. The minimum (dimmed) and maximum rated fixture Wattage must be known (for ROAM activation).
10. The minimum and maximum dimming input limits (defining the dead-bands) must be known for the target driver. The above min/max Wattages should correspond to application of these voltages. These end-point voltages need to be programmed into the DCM via over-the-air programming after the fixture is installed.

Installation

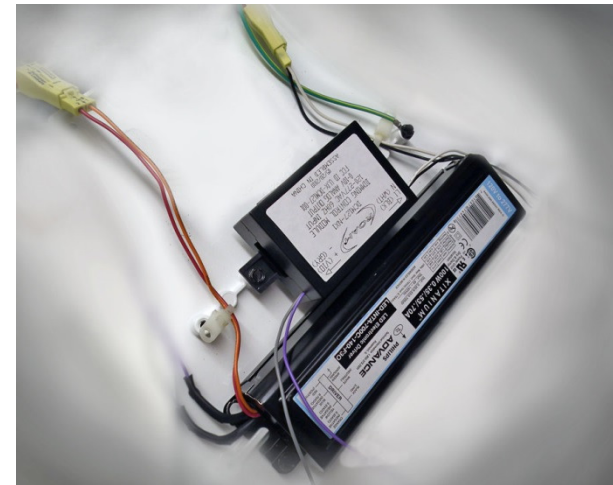
Before starting installation, you will need the following tools:

Volt-Ohm meter, slotted or Philips screwdriver or hex driver as necessary for selected mounting screws, spade terminal crimp tool

1. Ensure the fixture is not powered. Merely removing the photocontrol or shorting cap is not sufficient – power must be disconnected from the field wiring terminal block. Verify power is removed using a working VOM.
2. Open the fixture electronics enclosure (process varies depending on the fixture make/model).
3. Install the DCM (with or without custom mounting bracket specific to the fixture – dependent on make/model of fixture). The DCM enclosure has mounting tabs that will accommodate up to a #10 screw. A #8 or #10 screw are recommended with a lock or star washer. Ideally, the mounting bosses or bracket will position the DCM directly underneath the NEMA receptacle when the fixture is closed.



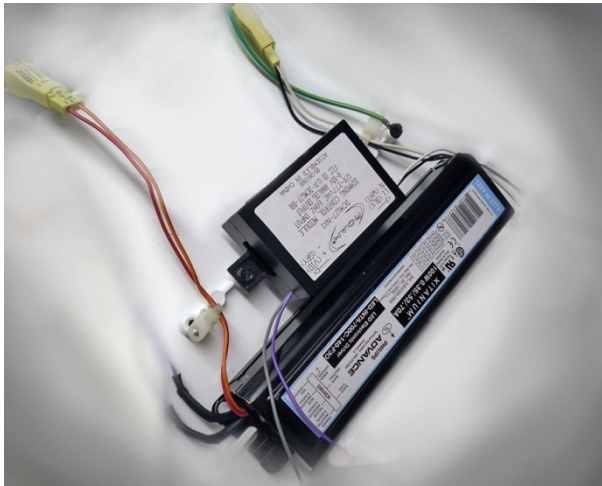
THIS FIXTURE HAS INTEGRAL MOUNTING BOSSES SPACED PERFECTLY FOR THE DCM MOUNTING HOLES. SOME FIXTURES MAY REQUIRE AN ADAPTER BRACKET.



IMPORTANT:

When mounting the DCM per step 3 on the previous page, ensure that the DCM is oriented so that the silver MAC ID barcode label on the side is positioned so that it is visible and easily accessible when the fixture electronics compartment is opened. If this is not possible (as may be the case with some fixture designs), a MAC ID barcode label may need to be installed where accessible on the interior or exterior of the fixture so that it can be scanned properly during field installation of the fixture and activation of the ROAM system.

If the DCM cannot be mounted such that the DCM barcode is accessible, then a duplicate barcode must be generated and applied to the fixture in a location that can easily be scanned during fixture installation and ROAM activation.

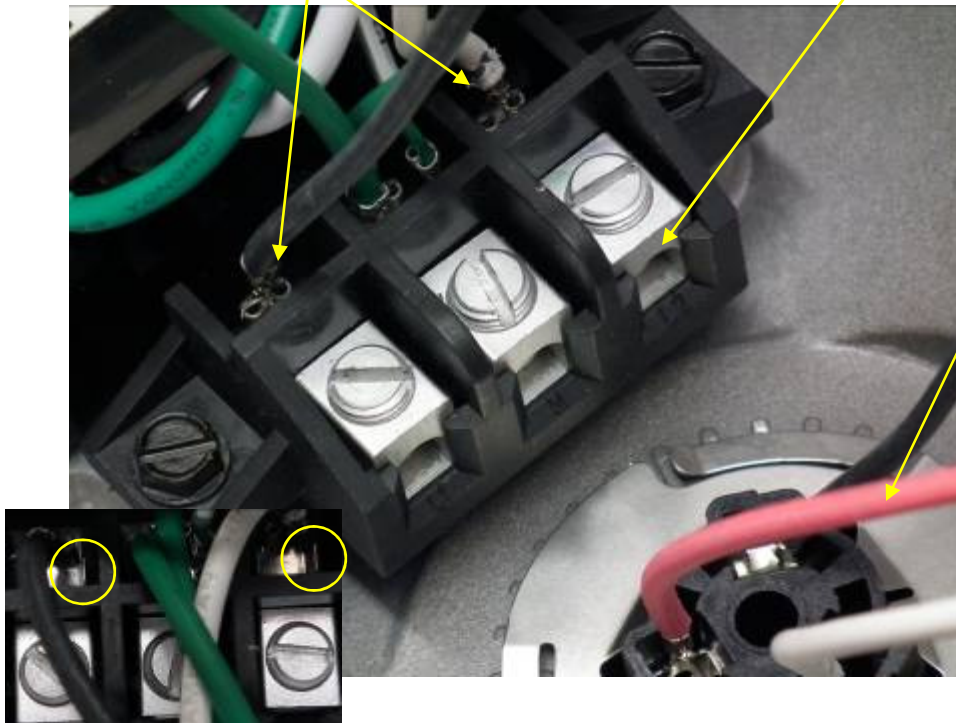


MAC ID BARCODE LABEL EASILY ACCESSIBLE AND NOT OBSTRUCTED BY OTHER COMPONENTS

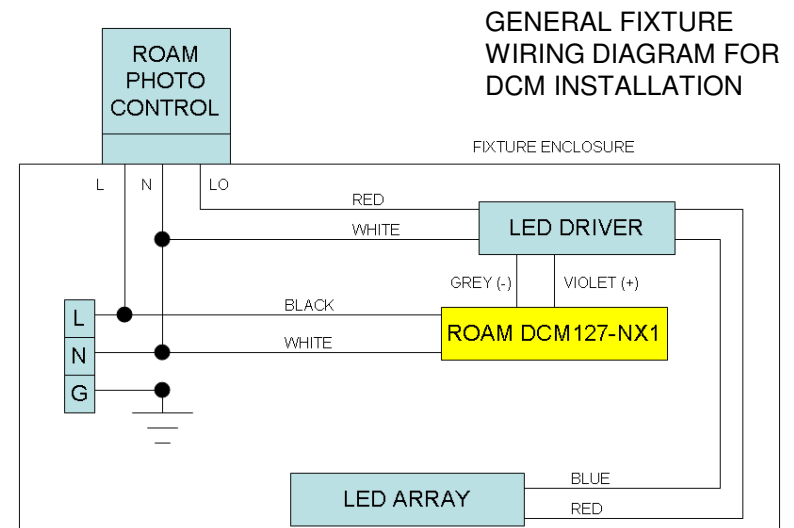
4. Locate the 120-277VAC fixture supply wiring and terminal block. If the fixture wiring adheres to NEC standards, this will be a black/white conductor pair. Verify the intended power source is not switched by the photocontrol (not through the red conductor coming from the NEMA receptacle) rather is supplied directly from the black/white conductor pair coming directly from the field wiring terminal block. This will be the location that supplies power to the DCM.
5. Determine the type of termination needed.
 - If the field wiring terminal block is the only option, then typically 1/4" OR 3/16" QC male spade terminals are used (different fixtures may use different size terminals though). In this case, the matching female QC spade terminals must be installed (crimped) to the DCM power leads.
 - Some fixtures may provide an auxiliary power connector. In this case, the matching type mating connector must be installed to the DCM power input (black and white) leads.
 - Some fixtures may include tool-less quick connect terminations. These will require no additional hardware installation to support DCM provided there are open conductor slots available on terminations that include the wiring described in #4.

DO POWER DCM FROM SPARE TAPS (CIRCLED IN INSERT) AT THESE TERMINATIONS (NOTE THIS EXAMPLE SHOWS A 3/16" QC FASTON TYPE CONFIGURATION)

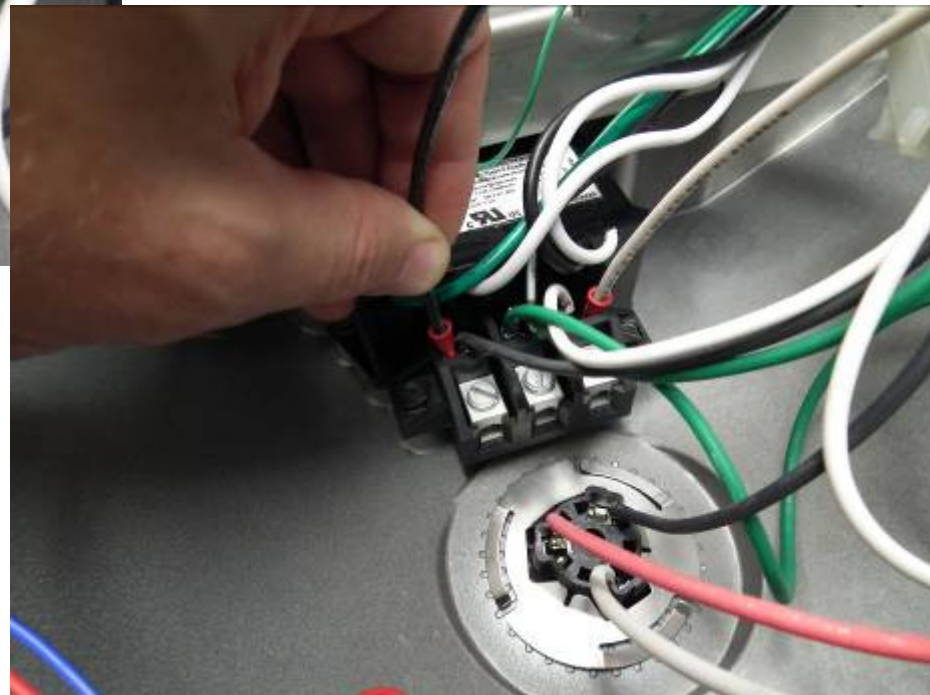
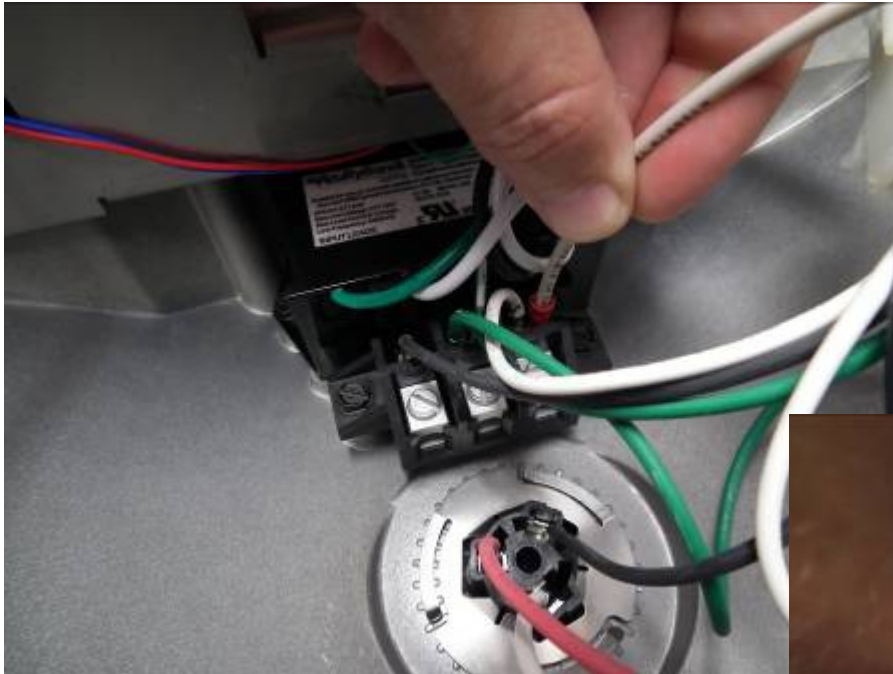
AC POWER IS SUPPLIED TO THE FIXTURE AT THIS TERMINAL BLOCK FROM THE FIELD DISTRIBUTION WIRING



DO NOT POWER DCM FROM THIS RED WIRE – THIS LEAD SHUTS OFF POWER TO THE DRIVER BY THE PHOTO CONTROL.



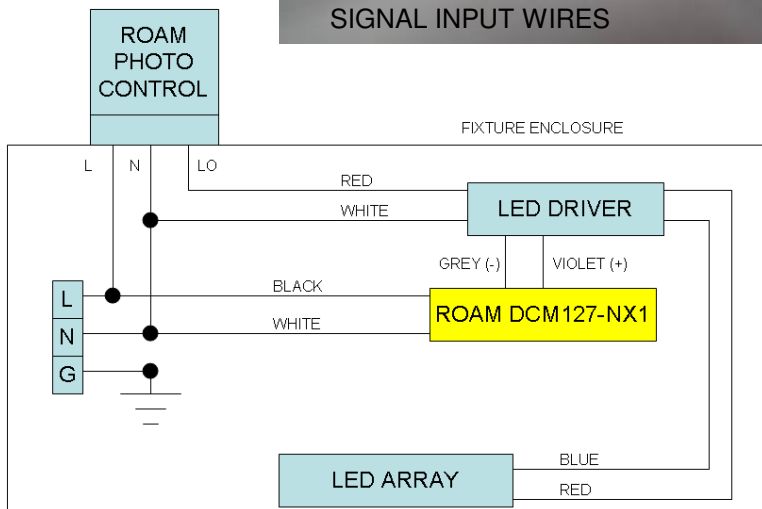
6. Terminate the black and white power supply wires on the DCM to the AC power source as appropriate for the type described in the previous step.



7. Locate the dimming driver/ballast 0-10V input wires (violet and grey) and determine the type of termination needed. If multiple drivers are present within the fixture, there will be multiple pairs of driver dimming inputs to terminate to the DCM output wires. The DCM can control up to 4 drivers in parallel.
 - Typically, tool-less QC connectors are used, these will require no additional hardware to terminate the DCM control wires.
 - Butt splices are also viable since the DCM output wires will be connecting only to the driver input wires. If used, ensure that the butt splice terminals are appropriately sized for #18AWG wire and have proper insulation for the specific fixture application.
8. Terminate the DCM 0-10V output (grey/violet) wires to the ballast/driver 0-10V input wires (grey//violet) assuring that like colors match.



DCM VIOLET AND GREY WIRES CONNECTED TO DRIVER VIOLET AND GREY WIRES (TOOL-LESS TERMINATION STYLE SHOWN)



GENERAL FIXTURE WIRING DIAGRAM FOR DCM INSTALLATION

- Carefully route and wire tie/anchor all DCM wiring as needed to ensure that it cannot be pinched or stripped when the electronics enclosure or fixture access panel is closed. Also try to avoid situations where the DCM wiring (rated 105C) may come into direct contact with extreme heat sources such as LED heat sink assembly, etc. Carefully close the fixture while ensuring that no new wiring is pinched, stripped or disconnected while doing so.
- DCM installation is complete. Different methods may be employed to electrically test the fixture or proof the wiring at this point. Due to differences in manufacturing processes, the remaining steps are included only as an example of possible fixture tests.
- An AC power source can again be installed to the fixture at the field wiring terminal blocks if desired for fixture testing. Preferably, this is a switched source and it can be turned off during installation of the wiring to be made safe.
- Install a shorting cap in the NEMA receptacle and apply power to the fixture.
- When initially powered, the DCM will start at 50% dim command level (5V present on 0-10V output) and will stay that way for 4 seconds. After the 4 second period has elapsed, it will command the driver/ballast to go to full brightness (100% level or 10V present on 0-10V output). The full brightness output voltage level may vary dependant on the dimming input voltage range available on the driver and associated range programmed into the DCM (i.e. the driver may support a minimum of 1.0V and maximum of 7.5V, however the DCM output will still be 5.0V during power-up, which will resolve to slightly more than 50% of rated fixture Wattage. A power meter inline with the fixture supply can validate that the observed Wattage consumption follows this pattern (roughly 50% rated Wattage for 4 seconds, then 100% full rated Wattage after the 4 seconds have elapsed). Refer to the specific fixture design specifications or manufacturer to determine the expected numbers for the installed driver/ballast and light engine at 5V and 10V dimming input commands to the driver.

Appendix -- Auxilliary field wiring

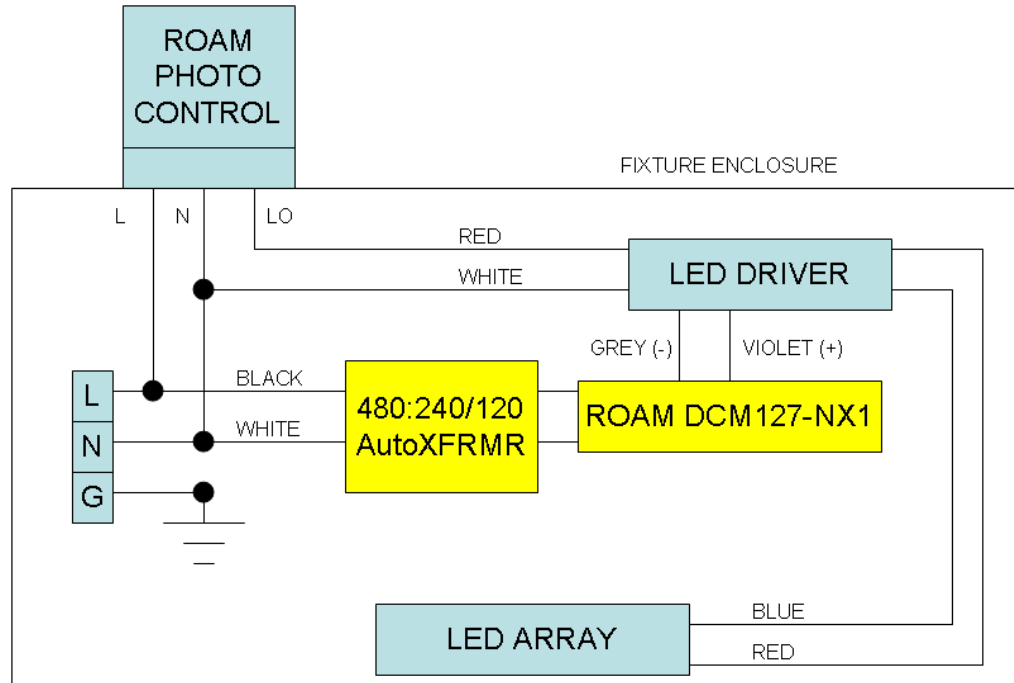
The ROAM DCM is equipped with the following auxiliary ports:

1. Two (2) temperature sensor inputs which support 10k NTC thermistor probes
 - Labeled as "TMP1 IN" and "TMP2 IN" on the DCM field connector plate
 - NTC thermistor must be 3900K B-constant type. 1% tolerance thermistors are suggested for best performance. ROAM suggests the muRata NTSD1XV103 thermistor.
 - The thermistor and crimp/solder joints within the probe assembly should be encapsulated in order to keep moisture from permeating the connections. ROAM suggests two layers of polyolefin heat shrink material with adhesive.
 - A maximum probe length of 36" is recommended.
 - Supported temperature sensing range is -20C to 125C.
 - Factory calibration of the thermistor inputs is performed at the 100C sense point. Using a 1% thermistor, accuracy at this point is 2%. At the endpoints, accuracy is 4%.
 - The mating connector for the DCM thermistor input connectors is a female 2.54mm (0.100"), 2 position connector. ROAM suggests a Tyco 3-640440-2 IDC connector with appropriately sized wire (22AWG in suitable insulation/jacket).
2. One (1) 15VDC supply output which can support external non-line powered occupancy sensors
 - Labeled as "15V OUT +/-" on the DCM field connector plate
 - +15VDC +/-0.5VDC (<50mA ripple), maximum 10mA load
 - The DC output is isolated from mains (1700V isolation). Do not connect to supplies >1000V above/below ground.
 - The mating connector for the DCM 15VDC output connector is a female 2.54mm (0.100"), 2 position connector. ROAM suggests a Tyco 3-640440-2 IDC connector with appropriately sized wire (22AWG in suitable insulation/jacket).
3. One (1) DC input for external occupancy sensors
 - Labeled as "OCC IN +/-" on the DCM field connector plate
 - The DC input is isolated from mains (1700V isolation). Do not connect to supplies >1000V above/below ground.
 - DC input is sinking type (positive voltage across input pins asserts the DCM input and indicates occupancy state is true)
 - DCM occupancy input state tracks input voltage directly (no delay on/off implemented internally). Desired minimum occupancy signal duration and off delay must be set on external occupancy sensor.
 - Input voltage range is 12VDC to 24VDC
 - Minimum input signal pulse duration is 2 seconds for guaranteed detection by DCM.
 - Line powered occupancy sensors with dry contact output may be used with this input if the DCM 15VDC supply above is leveraged.
 - The mating connector for the DCM DC input (occupancy) connector is a female 2.54mm (0.100"), 2 position connector. ROAM suggests a Tyco 3-640440-2 IDC connector with appropriately sized wire (22AWG in suitable insulation/jacket).
4. One (1) AC input for photocontrol interface
 - Labeled as "PHOTOCONTROL INPUT (AC)" on the DCM field connector plate
 - The AC input is isolated from the DCM AC power supply inputs (1700V isolation). Do not connect to supplies >1000V above/below ground.
 - These terminals will not power the DCM – the provided black/white flying lead pair must supply power to the DCM.
 - Input voltage range is 102VAC to 305VAC
 - Presence of AC across the pins asserts the DCM AC input.
 - Functionality is reserved for ROAM expansion features.
 - The mating connector for the DCM photocontrol input (occupancy) connector is a female 2.54mm (0.100"), 2 position connector. ROAM suggests a Tyco 284040-2 pluggable terminal block connector.

Cable and wiring used for any auxilliary field wiring must meet appropriate UL requirements for the end application and must be sized appropriately (voltage and ampacity for the intended use).

Appendix -- Auxilliary Field Wiring 480V Application

ROAM DCM power supply input voltage range is 102VAC to 305VAC. For use in 480VAC applications, an external step-down or autotransformer may be used to generate a DCM-dedicated supply voltage within the appropriate range from the 480VAC source. In this configuration the fixture LED driver and photo control would both be 480VAC powered, but the DCM would receive 120-240VAC. 25VA transformer capacity should be more than ample to supply the DCM, but it is suggested that transformer losses at the extremes of expected operating temperature be reviewed for each fixture application. The suggest wiring configuration appears in the diagram below.



The following list contains some possible transformer component solutions for this wiring configuration:

- Advance #71A9843 (recommended)
- Thomas Research ATX series #480:347:277-125
- Hammond #SP50ACP

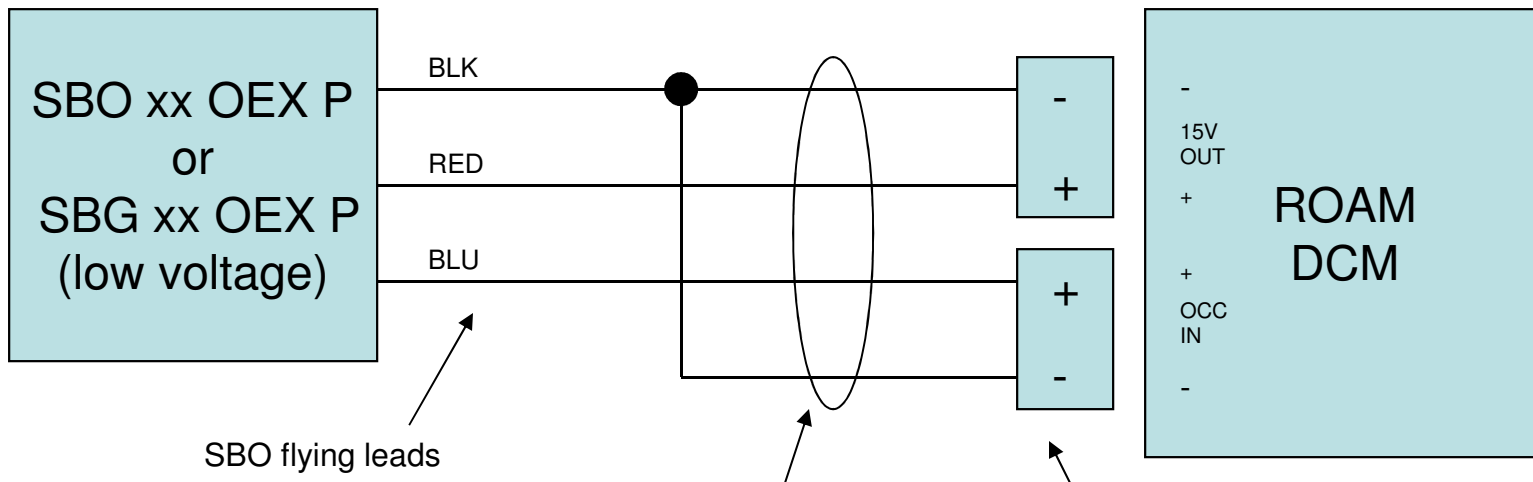
Appendix – Wiring Diagram for Occupancy Sensor Adaptive Lighting Application

ROAM DCM127 with SensorSwitch SBO6/10 OEX P Pole-Mount or SBG6/10 OEX P Fixture-Embedded Occupancy Sensor (low voltage versions)

ROAM DCM will respond to occupancy sensor “presence” signal by commanding dim level to full bright and will continue to do so until the “presence” signal abates. SBO/SBG sensor is powered from the DC source provided by the DCM. SBO/SBG occupancy sensor settings control the detection duration and time delay. Note that the specified sensor models contain a photocell (P option) and will not generate a “presence” signal during daylight hours – this P option is a requirement for use with the DCM. When the presence signal is active, the DCM will be forced to 10V (full bright) output dim control voltage. Following the abatement of the “presence” signal, the DCM will return to previously commanded or scheduled lamp dim command level. One sensor per DCM can be connected.

SBO 6 OEX P and SBO 10 OEX P sensors: <http://www.sensorswitch.com/DataSheets/SBO-6&10-OEX.pdf>

SBG 6 OEX P and SBG 10 OEX P sensors: [http://www.sensorswitch.com/DataSheets/SBG-6&10-\(OEX\).pdf](http://www.sensorswitch.com/DataSheets/SBG-6&10-(OEX).pdf)



SBO flying leads

For pole mount: 4c 600v PVC jacket, 28AWG stranded conductor cable (no shield needed). For fixture-embedded, 600V individual conductors of MW are suitable.

2x Tyco 3-640440-2 connectors (IDC)