Application Note DCL03

WTPDCL51002I

Time/Photo control with four-level selectable daylight harvesting or manual control

Description

The WTPDCL51002I is a Time/Photo control unit which has been wired specifically for selectable, four-level daylight-harvesting (DH) or four-level manual control. It is intended for use in bulk DH applications employing open-loop control techniques. It employs a default, Type-1 RSMDCL with power level control (see cutsheet for RSMDCL01 or RSMDCL51). Various power level commands between OFF and 100% power are sent to the entire field of DEMANDflex ballasts depending on the amount of available, natural light or, when selected) depending on a programmed schedule or manually activated switches. Selection of the control mode is determined by a schedule or manually activated master switch.

Equipment

Major components include the following:

1. One (1) pcs ULT WTPDCL51001I
2. One (1) pcs ULT WPS5527K000I photo-sensor
3. One (1) or more WR8601DGL000I 2-Wire switch for use as a master switch or mode selection device
4. One (1) or more WR8604DGL000I 2-Wire switch (or other switches and/or occupancy sensors)
5. Coverplates for the switches (WN80301DGL000I is plastic and WN97401DGL000I is stainless steel)
6. A DCL lighting control system with DCL circuit control modules and DEMANDflex ballasts

Installation

Warning!

Mounting and power connections must be completed by a licensed electrician an in compliance with national and local electrical codes. Improper installation could lead to injury, death or property damage, including fire.

Mount and make power connections according to the WTPDCL51 installation instructions.

Field Devices & Connections

The photosensor must be a WPS5527K000I. Various switches and occupancy controls are available; the WR8601DGL000I & WR8604DGL000I are used in the example on the following page.

An example of field connections for a photocell and switching devices are shown below on the following page.

Follow manufacturer instructions for mounting field devices. #18 AWG solid copper is recommended for all field control wiring

For the photocell, maximum run is 500ft and connection is polarity insensitive.

Consult Universal for maximum number of override devices and run length restrictions.

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Theory of Operation

The outputs of the time/photo controller, WTP-4408 (internal to the WTPDCL51) drive the RSMDCL inputs (internal to the WTPDCL) based on the states of manual switches, programmed schedules and the sensed light level. Output 4 is the Mode Selection override, outputs 5-8 are the level selections used for manual (or scheduled) control and and outputs 1-3 are driven by the photo-sensor.

A programmed schedule will usually treat output 4 (the mode selector) as the system's primary control element. During normal operation it will usually be schedule-activated to implement photo-control. During off-hours it will be used to activate manual control, after which output 8 (OFF) will we programmed with repeating OFF-sweeps to ensure maximum power savings. At any time the photo-control mode can be de-activated and a fixed operating level of 100%, 70%, 50% or OFF selected for continuous, fixed intensity operation. These actions can be scheduled or implemented with manually activated switches.

Outputs 1-3 should be programmed for photo-control. This will allow them to determine the operating level of the system whenever the photo-control mode is selected In this case, the sensed light level will determine the amount of electrical light production as dictated by the foot-candle transition points programmed for WTP-4408 outputs 1-3.

Each of these 3 outputs has two transition points, ON and OFF (in this case, the terms ON and OFF refer to the state of the output itself, and not to the light produced by the DCL system). Programming rules are:

1. For each output, ON should be programmed to a lower foot-candle level than OFF, and
2. The OFF for each output should be programmed to a lower foot-candle level than ON for the next output

This will ensure that, as sensed light increases (decreases), the output states change sequentially and trigger the RSMDCL to reduce (increase) light and power in a coordinated fashion.

Finally, the response to light level changes is deliberately slow. This prevents the annoyance of abrupt responses to changing natural light conditions and inhibits nuisance shadow responses.

Consult the WTP-4408 operating manual shipped with each WTPDCL51 for programming specifics.