

## PHOTO SENSOR SWITCH

ZCTR-04

### ZCTR-04 Photo Sensor Switch

- 12 or 24 Volt DC Operation
- 96 Watt Handling capability at 12V
- 196 Watt Handling capability at 24V



### SWITCH PLACEMENT

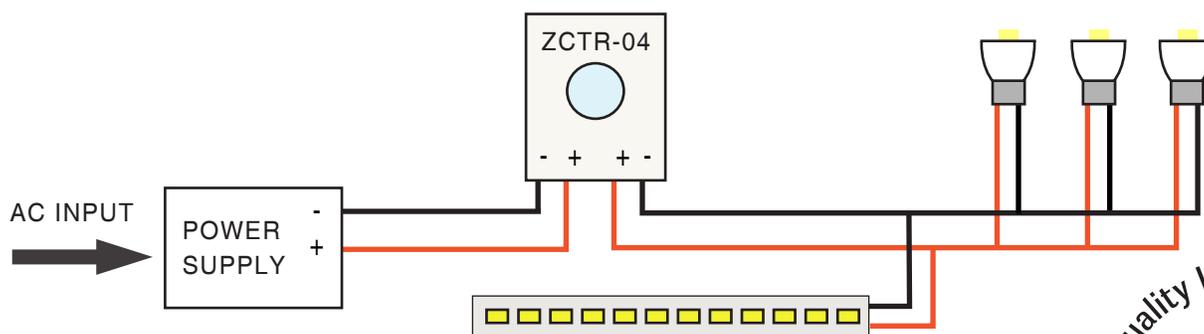
The ZCTR-04 Photo Sensor Switch is a light sensitive switch designed to control low voltage LED lighting for dusk to dawn lighting. This latest generation photo sensor is most responsive to the near infrared (NIR) sunlight spectrum, i.e. light that is above the red color spectrum. The sensor is less sensitive to the visible light spectrum but will respond to very large light levels in this area making it compatible with LED lighting where there is little NIR and large amounts of directional visible light. If the Sensor Switch is placed in close proximity to the LEDs the switch will automatically adjust the sensitivity level.

The ZCTR-04 Switch is covered with a domed diffuser which reduces the visible light to the sensor, supporting the activation of the switch through sunlight over a wide viewing angle. This allows the switch to operate properly from multiple mounting and placement areas.

Light levels vary over the course of the day due to sun angle, clouds, weather conditions (rain, fog, etc.) and dust. These variations effect when the switch turns on and off. Sunlight can vary from 40 lux (lumens per square meter) for a fully overcast sunset or sunrise to 25,000 lux for full daylight without direct sun. To keep the Photo Sensor Switch from flickering there is an offset or hysteresis between the trigger points. The on light levels range from about 30 lux to 110 lux and the off light levels range from 185 lux to 350 lux.

### WIRE CONNECTION

The ZCTR-04 is very easy to install as part of a new system or for an existing lighting system. First: make sure that the power source produces DC voltage out at either 12 volts or 24 volts. Second: make sure that the wire to be used is 20 AWG or larger. (The larger diameter of the wire's gauge the smaller the gauge number will be.) Turn off the power to the power source and connect the output of the power source to the input of the Photo Sensor Switch matching up the positive and negative connections. Connect the output of the switch to the LEDs you want to control.



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**WIRE CONNECTION**  
*cont.*

Make sure the positive wiring goes to the positive output and that the negative goes to the negative output. Finally make sure that you haven't overloaded the switch with too many LED lamps. See the charts below for handling capabilities. Turn the power back on for the power source and temporarily cover the sensor's dome to turn off the switch and ensuring that the LED lamps turn on in the dark.

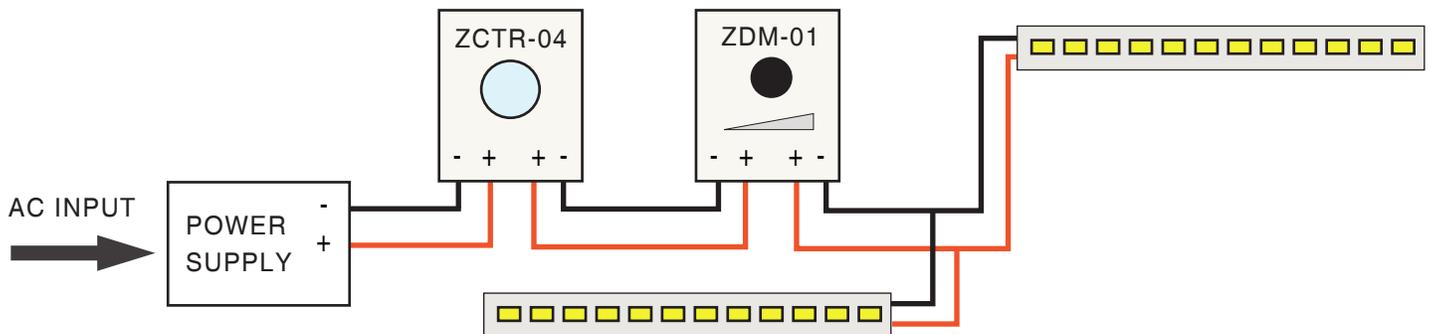
**12VOLT - 8 AMPS**

Model	Description	QTY	Max Length
Z-MR16 -5W	MR -16 Lamp 5 Watt	19	n/a
ZM -1968	3 LED Channel Light	177 mods.	59 feet
ZFS-85020WR -CW/WW	Water Resistant Flex Ribbon	2 Reels	32 feet

**24VOLT - 8 AMPS**

Model	Description	Max Length
ZAF -Multi	Alumiline 24V DC LED Fixture any combination	50 feet
ZWF -Multi	Alumiline 24V DC LED Water Resistant any combination	66 feet
ZLF -Multi 10mm	Alumiline Slim LED Fixture any combination	94 feet
ZLF -Multi 16mm	Alumiline Slim LED Fixture any combination	157 feet
ZLF -Multi 25mm	Alumiline Slim LED Fixture any combination	235 feet

If the lamps are too bright a dimmer can be inserted between the ZCTR-04 and the LED lamps. To do this turn off the power to the power source, disconnect the LED lamps from the switch, and connect the lamps to a dimmer such as the ZDM-01 or -02. Make sure that the lamps are being connected to the output of the dimmer and that the polarity is correct, matching up positive and negative wires. Then a pair of wires can be connected from the switch's output to the dimmer's input.



Turn the power back on and cover the dome on the switch. With the LEDs on adjust the dimmer to set the amount of light desired. When you remove the cover from the switch's dome the lamps should turn off and be ready for the evening.

## **OUTDOOR INSTALLATION**

The Photo Sensor Switch can be mounted indoors or outdoors and still operate properly. Indoors the switch should be placed near a window, preferably north facing, with a clear access to the outdoor sunlight and can be mounted on a wall or table top. North facing light will allow the on/off cycle to be the most even with the evening on time being about the same as the morning off time. A south facing window can be used but expect the on/off cycle to be affected to some degree. The wide angle effect of the dome will minimize this shift in the on/off cycle.

The Photo Sensor Switch is minimally “weather resistant” and if used outside care needs to be taken to protect from direct exposure to water/moisture. Mounting under an overhang is advisable. The connector terminal block should be sealed using a non-corrosive type of RTV silicone such as GE Silicone II (GE500) or Dow Corning 3145 RTV. For areas that are more exposed to moisture, marinas, dock side, and other exposed environments the Photo Sensor Switch can be mounted in a NEMA or IP rated enclosure with a clear polycarbonate sealing cover. These can be purchased separately through McMASTER-CARR, or GRAINGER.

Finally it should be noted that the Photo Sensor switch is not to be used with incandescent lamps, IR illuminators, or around a flame or other heat source. Before turning on any power supplies or transformers make sure that the polarity of the wire connections is correct. Incorrect polarity on the switch can burn out the switch immediately.



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