CES SENSOR

INSTALLATION AND MAINTENANCE MANUAL (IMM)

PLC Multipoint

1 INTRODUCTON

1.1 General

1. *Please read these instructions carefully to prevent any possible injury or equipment damage.*
2. *Installer must be a qualified and experienced service technician.*
3. *Verify the product ratings to confirm that this product will satisfy your requirements and application.*

1.2 Overview

The CES sensor monitors ambient light levels and provides an analog DC signal to microprocessors and energy management systems for the purpose of lighting control.

CES sensors are available in 16 configurations. There are 4 different styles with 4 different possible ranges.

Styles: Indoor, Outdoor, Atrium and Skylight

Ranges: 0-5V, 1-5V, 0-10V & 1-10V

All 16 configurations require a Class 2 Low Voltage Power Supply providing 12-24VDC input power to operate properly. It is also possible to order a CES sensor that operates on 5VDC or 10VDC power, but the full-scale output signal will be reduced to approximately 1V lower than the input voltage. The four different styles of CES sensors have different mounting and installation requirements. **(See Figures 1A-1E)**

2 INSTALLATION

2.1 Indoor Sensor (Ceiling)

Mount the Indoor sensor in a 1/2" diameter hole in the false ceiling tile using the adhesive backing. For most general applications, the sensor should be mounted between 6-8 feet from the window area, central to the area illuminated by the electrical lighting that will be controlled. In all cases the sensor must be mounted so that it is exposed to reflected light only and not at any direct light. **(See Figure 1A)**

2.2 Atrium Sensor

Mount the Atrium sensor in a standard threaded 1/2" diameter conduit or 1/2" diameter knockout. Locate the sensor at the opposite side of the window, against the wall or ideally, in the middle of the atrium glass facing the glass. **(See Figure 1B)**

2.3 Indoor Sensor (Reflecting Wall)

Mount the Indoor sensor at the reflecting wall 18" from the bottom corner of the ceiling. When sconces are installed in the light well, do not to mount sensor at the same level as the sconces. Note that the Fresnel lens will detect light with a field of view that is 1.15 times the distance to the wall. No direct lighting should be within the field of view. **(See Figure 1C)**

2.4 Skylight Sensor

Mount the Skylight sensor in a standard threaded 1/2" diameter conduit or 1/2" diameter knockout. Locate the sensor near the center of the skylight well (at least 12" from the side) that is exposed to full daylight and is not shadowed. For the best results, use unistrut with a 1/4" angle support, making sure the top of the light sensor is level with top of skylight curb. Sensor must be mounted vertically with the domed portion facing up. **(See Figure 1D)**

2.5 Outdoor Sensor

Mount the Outdoor sensor in a standard threaded 1/2" diameter conduit or 1/2" diameter knockout. Locate the sensor on the roof or other location that is exposed to full daylight and is not shadowed or directly exposed to any nighttime illumination. Sensor must be mounted horizontally, facing North, with the hooded portion on top. **(See Figure 1E)**

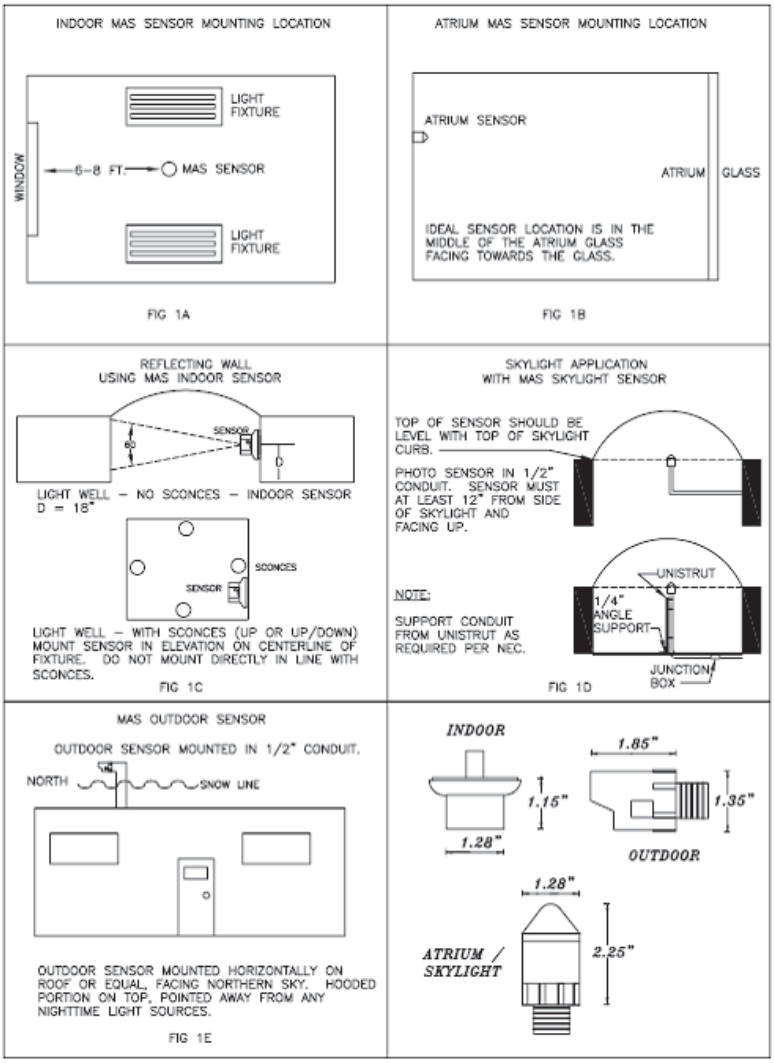

FIGURE 1: CES SENSOR MOUNTING LOCATION

3 CONNECTION

The CES sensor is a three-wire device that can provide analog DC voltage inputs to a variety of controllers and microprocessors. In most cases, a 12-24 VDC power source must be supplied to the RED and BLACK wires on the sensor. The sensor will draw approximately 113mW of power. The DC signal voltage is returned to the controller through the YELLOW wire.

Use 18-22 AWG stranded wire to connect the sensor to the controller. Belden 1036A, #18 AWG Shielded Triad is recommended. Do not route the low voltage wire with or near power wiring. For long wire runs or where there is excessive electrical noise, shielded cable or cable in conduit is required. Cable lengths should not exceed 500 ft, butt splices are recommended but wire nuts are acceptable. Wiring should be performed with all relevant power switched off. **(See Figure 2)**

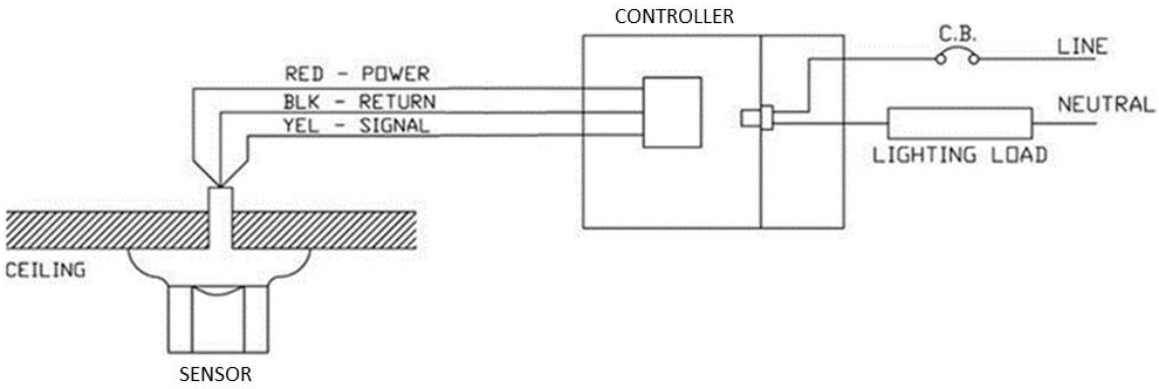

FIGURE 2: CONNECTION DIAGRAM

Observe the following CES sensor wire color designations:

RED: Input Voltage (+12-24VDC)
BLACK: Input Return/Output common (+12-24VDC)
YELLOW: Output Signal to Controller (0-5, 1-5, 0-10, 1-10VDC)
WHITE/GREEN:This wire loop controls the sensor sensitivity gain;(IL versions only). Leave intact for factory set max, cut for a lower range. **(See Table 1 and Figure 3)**

Sensor	Style	Fixed Corresponding fc Min	Adjustable Corresponding fc Ranges	Factory Set Max	Cut Loop Wire
CES/I	Indoor	0fc	70-750fc	100fc	N/A
CES/O	Outdoor	0fc	50-750fc	250fc	N/A
CES/A	Atrium	0fc	200-2,000fc	1,000fc	N/A
CES/S	Skylight	0fc	1,000-7,500fc	2,000fc	N/A
CES/IL	Indoor Low	0fc	40-60fc	40fc	20fc
CES/ILF	Indoor Low	0fc	40-65fc	60fc	25fc
CES/ILD2	Indoor Low	0fc	50-75fc	50fc	25fc
CES/OD	Outdoor Dark	0fc	500-7,500fc	1,000fc	N/A

TABLE 1: CES SENSOR RANGES

Note: The maximum range of a CES sensor should be at least 50% higher than the highest setpoint of interest in the lighting control zone that is controlled by the sensor.

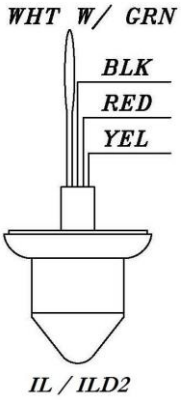

FIGURE 3a:
CES-IL and CES-ILD2 Loop Wire Diagram

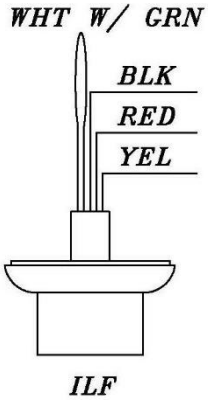

FIGURE 3b:
CES-ILF Loop Wire Diagram

4 CALIBRATION

CES sensors are factory calibrated for their applications as per Table 1 above. Once calibrated, the sensor will need no further adjustment. The CES sensor has a variable gain that can be adjusted by turning the trim pot screw that is accessible through the small hole in the side of the sensor housing, however, making field adjustments is strongly discouraged. If the factory calibration has been altered, a recalibration fee will be charged to return the sensor to factory settings.

5 OPERATION

CES sensor functionality is confirmed when the control system analog status changes as the sensor detects light.

6 MAINTENANCE

Every 2 months wipe the sensor lens clean with a non-scratching clean cloth and ensure that no foreign debris remains. Check the housing for damage such as cracks, burns or other deformations. Check that no moisture has penetrated the sensor, as this will likely render it inoperable.

If you have any questions, please call us toll-free at 1-866-998-5483
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