MAS 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 MAS sensor monitors ambient light levels and provide an analog DC signal to microprocessors and energy management systems for the purpose of lighting control. MAS sensors are available in 4 different styles.

Styles: Indoor, Outdoor, Atrium and Skylight

Range: 4 - 20mA

The MAS sensor requires 18-30VDC input power to operate properly. The four different styles of MAS 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 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)**
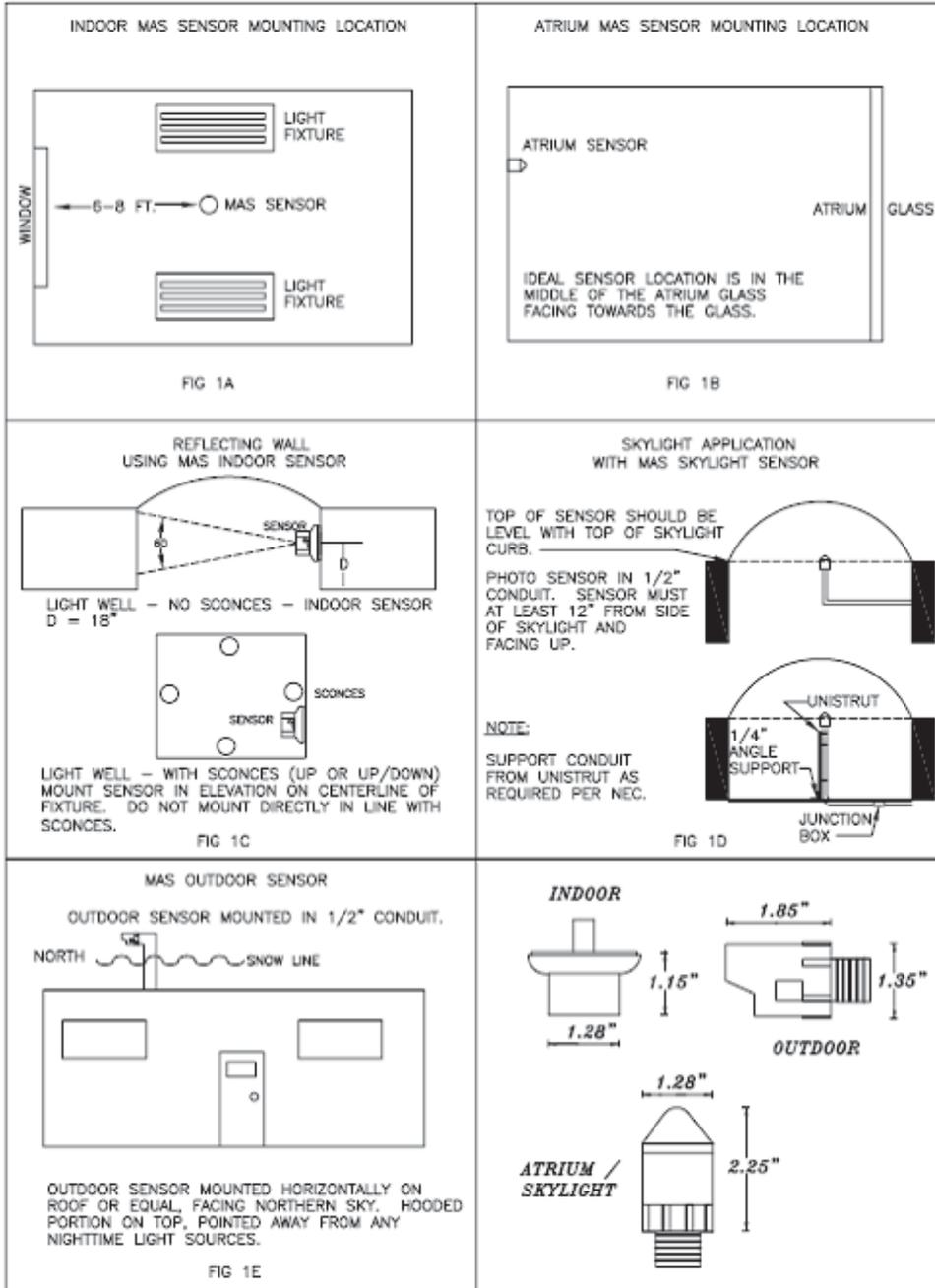

FIGURE 1: MAS SENSOR MOUNTING LOCATION

3   CONNECTION

The MAS sensors is a two-wire device that can provide an analog DC current input to a variety of controllers and microprocessors. In general, the red wire should be connected to a +24 VDC source and the black wire to the analog input terminal of the controller. The sensor will draw less than 4mA of current.

Use 18-22 AWG stranded wire to connect the sensor to the controller. Belden 22417, #18 AWG Shielded, Twisted Pair wire 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 5000ft, Butt splices are recommended but wire nuts are acceptable. Wiring should be performed with all relevant power switched off. **(See Figure 2)**

Observe the following MAS sensor wire color designations:

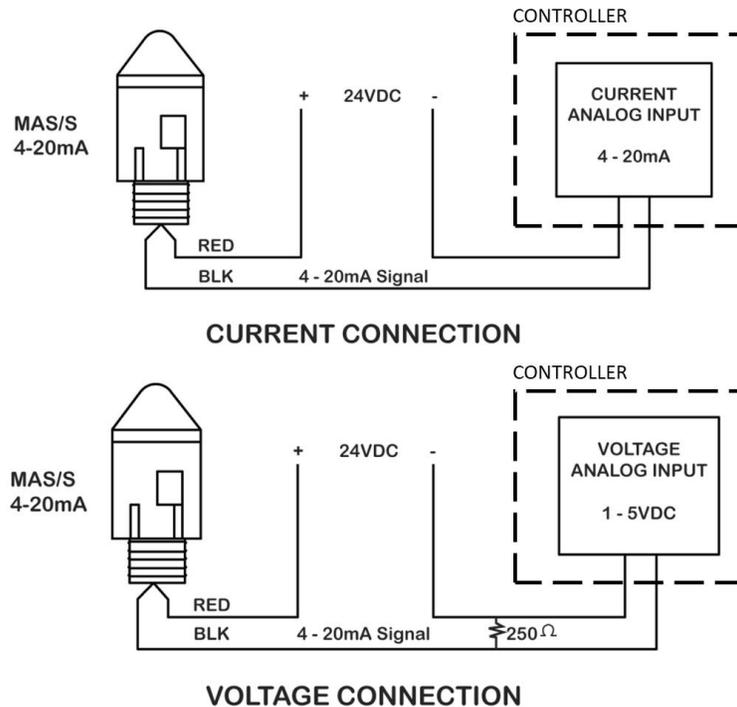RED: Input Voltage (18 - 30VDC)
BLACK: Signal Current (20mA)

FIGURE 2: MAS SENSOR CURRENT AND VOLTAGE CONNECTIONS

4   CALIBRATION

MAS sensors are calibrated at the factory. The footcandle range can be doubled or halved in the field using a FIELD CALIBRATION UNIT as described below. **(See Table 1)**

The factory standards are as follows:

Sensor	Style	Fixed Corresponding Fc. Min.	Factory Set Max		
			1/2X	1X	2X
MAS/I	Indoor	0 Fc	50 Fc	100 Fc	200 Fc
MAS/O	Outdoor	0 Fc	125 Fc	250 Fc	500 Fc
MAS/A	Atrium	50 Fc	500 Fc	1,000 Fc	2,000 Fc
MAS/S	Skylight	100 Fc	2,500 Fc	5,000 Fc	10,000 Fc

TABLE 1: MAS SENSOR RANGES

Calibration values different from the factory standards should be requested when the order is placed.

It is recommended that the maximum range of a MAS sensor should be at least 50% higher than the highest setpoint of interest in the lighting control zone controlled by the sensor. The signal response of a MAS sensor is linear.

The Full-Scale Response Time of the MAS sensor is factory set for 10 minutes, that is, the sensor signal requires 10 minutes to reach the full-scale level for abrupt light level changes (e.g., from 100 to 5,000 fc). The FIELD CALIBRATION UNIT (MAS-CAL), is used to change the Full-Scale Response Time. The selectable times are: immediate response (0T), 10-minute response (1T), and 20-minute response (2T). **(See Figure 3)**
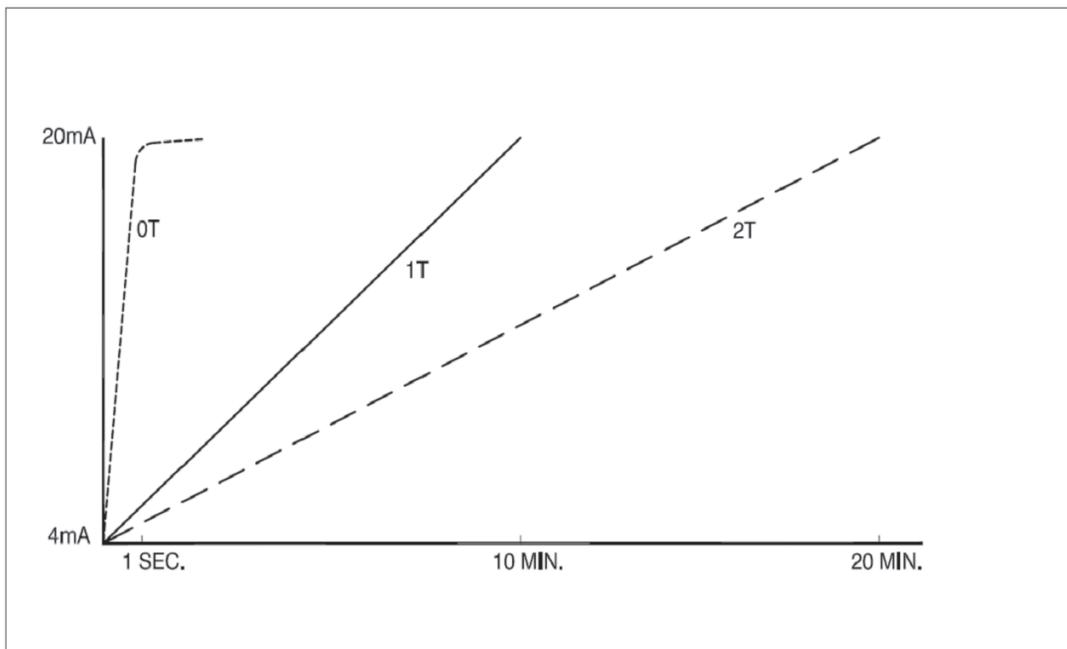

FIGURE 3: MAS SENSOR FULL SCALE RESPONSE TIME

The MAS-CAL can also be used to change the range of the sensor. The factory default range is set at 1X for all sensor types. Selecting 1/2X changes the full-scale range to half of the factory default setting. Selecting 2X will change the full-scale range to twice the factory default setting. **(See Figure 4)**
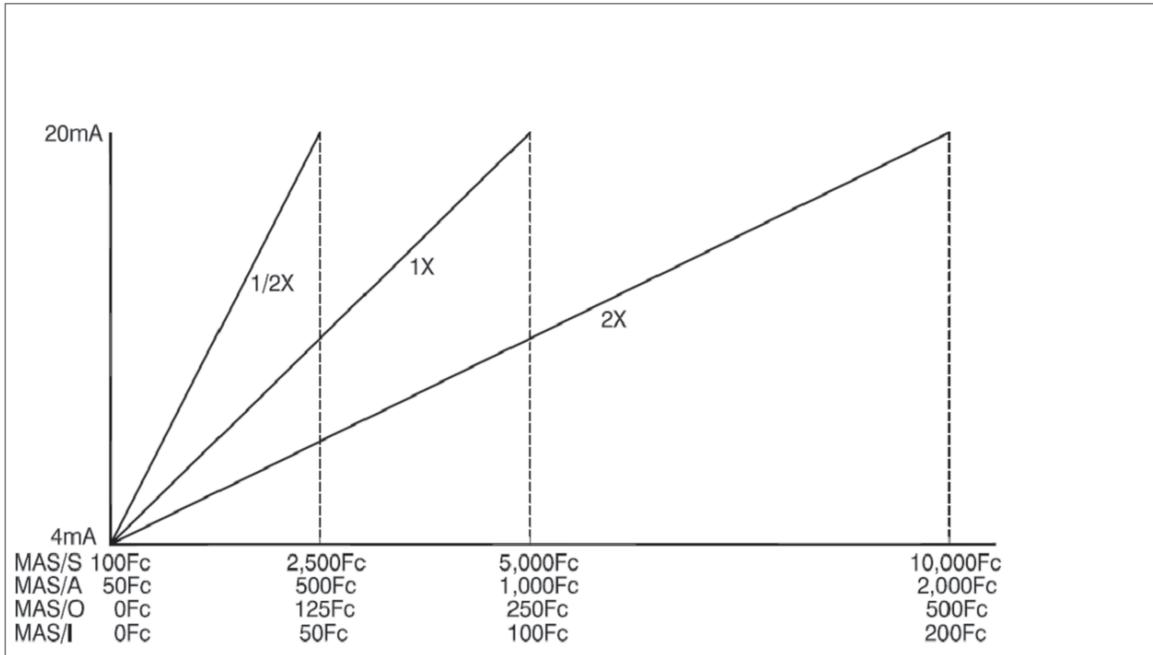

FIGURE 4: FOOTCANDLE RANGE SCALING

5   OPERATION

MAS 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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