PLC-MULTIPOINT CELESTIAL SELF-CONTAINED AMBIENT LIGHT SENSORS

MK7-B SERIES

DESCRIPTION

The **MK7-B Series** Celestial Series Self-contained Sensors develop a variable output voltage that corresponds to the amount of present ambient light. These precise ambient light-level measurement units are designed to detect and transmit, via an analog signal, the amount of light present at their location to the remote analog input point of most Building Automation Controllers. The sensors contain a precision photo-diode type cell that provides an exact, proportional output over a wide range of light levels, allowing for accurate lighting control.

Lighting and Operational Control Systems

MK7-B-CCF
Indoor

MK7-B-CR
Outdoor

MK7-B-CS
Skylight

FEATURES

- ***Factory calibrated***
- ***Analog voltage models***
- ***Wide range of light-level monitoring***
- ***Compatible with most BAS controllers***
- ***Extremely accurate and reliable***
- ***Three basic models for monitoring: indoor light levels (ceiling mount), outdoor light levels (roof mount), skylight light levels (skylight mount)***
- ***Day lighting control for three application zones***

OPERATION

The sensor heads contain patented solid-state circuitry designed to be extremely accurate, adjustable, and flexible over a wide range of input and output voltages. The standard three-wire sensors operate from any input voltage between 12-24 VDC and give a return output signal of 0-5, 1-5, 0-10, 1-10 VDC. The sensors come factory calibrated. The sensor is equipped with a variable range potentiometer, but calibration equipment, such as a foot-candle meter, would be required to change the range of the unit. Note: There is a charge for recalibration of the unit by the manufacturer.

APPLICATION

Sensors allow most building automation controllers to become sophisticated lighting control computers to control any type of lighting at any light level based on the amount of ambient light available. There are three basic types of sensors:

Indoor
Designed to monitor the ambient light levels in offices, schools, etc., the sensor mounts in a 3/8" hole bored in a ceiling tile central to the electrical lighting being controlled. It features an adjustable maximum range from 5-750 fc at the sensor face and a 60° field of view with special flat Fresnel lens configuration.

Outdoor
Designed to mount horizontally in a 1/2" conduit fitting to monitor the outside ambient light levels for parking garages, security lighting, sign lighting, etc., the sensor is generally roof-top mounted facing the northern sky. It features an adjustable maximum range from 5-750 fc at the sensor face. Completely weathertight and temperature stable. At very low ambient temperatures (below 13°F), the sensor will still function but will lose some accuracy and light level sensitivity.

Skylight
Designed to mount vertically in a 1/2" conduit fitting to monitor the ambient light levels from inside a skylight well in warehouses, shopping malls, etc., the sensor features an adjustable maximum range from 1000-7500 fc at the sensor face.

SPECIFICATIONS

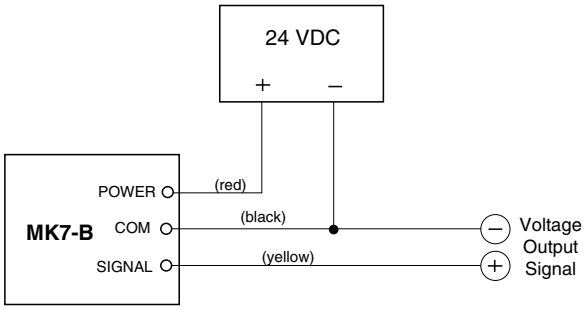
Supply Voltage	12-24 VDC; 20 mA max
Analog Output	4-20 mA (750Ω impedance), 0-10 VDC, 0-5 VDC, 1-10 VDC, 1-5 VDC
Wire Type	Three-wire, 18-gauge, stranded
Calibration	
Indoor	
Factory	0-100 fc
Field Adjustable	0 fc minimum - 750 fc maximum
Outdoor	
Factory	0 - 250 fc
Field Adjustable	0 fc minimum - 750 fc maximum
Skylight	
Factory	10 - 2000 fc
Field Adjustable	10 fc minimum - 7500 fc maximum
Sensor Type	Blue-enhanced photo-diode
Linearity	2%
Protection	Non-Polarized
Repeatability	±0.5%
Operating Temperature	-40° to 140°F (-40° to 60°C)
Temperature Accuracy	±10%
Dimensions	
Indoor	1.5" x 1.5" x 1.7" (38 x 38 x 43 mm)
Outdoor	1.4" x 1.4" x 2.4" (36 x 36 x 61 mm)
Skylight	1.3" x 1.3" x 2.8" (33 x 33 x 71 mm)
Weight	0.13 lb (0.06 kg)
Approvals	ETL, NEC Class 2, RoHS, Title 24
Warranty	2 years

PLC-MULTIPOINT CELESTIAL SELF-CONTAINED AMBIENT LIGHT SENSORS

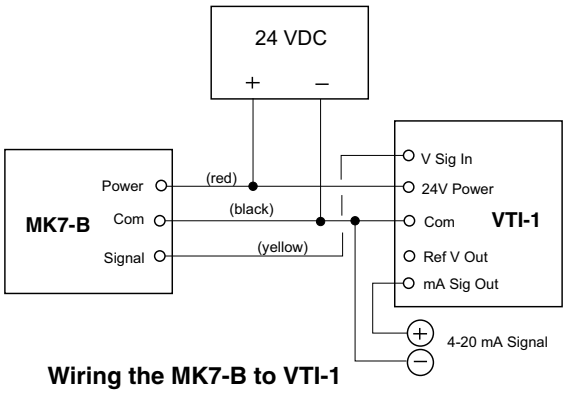
MK7-B SERIES

WIRING / CALIBRATION

The sensors come factory calibrated. Each sensor is equipped with a variable range potentiometer, but calibration equipment, such as a foot-candle meter, would be required to change the range of the unit. Note: there is a charge for recalibration of the unit by the manufacturer. Rotating the potentiometer one way or the other causes the upper limit voltage that the sensor produces to correspond to lower or higher foot-candle readings. For example, with a 5V model at the minimum gain setting, the sensor will deliver 5 VDC at 750 fc; at the maximum setting, the sensor will deliver 5 VDC at 50 fc. The zero light level setting is fixed and will not change. The adjustment procedure allows for precise light level monitoring and can compensate for the physical light sensing location of the unit, which may differ from the actual light level present at the task level. Once the calibration procedure is completed, it will remain constant with no further adjustments. Complete installation instructions are provided with the unit. The lower end output (zero light level) and the upper end light level outputs can be custom-ordered for specific voltages. A range of the standard output voltages supplied are listed in Specifications.



Wiring the MK7-B



Wiring the MK7-B to VTI-1

To prevent electrical shock and possible equipment damage, disconnect power coming from the controller prior to hookup. Wiring from the sensor to the controller should be with 18- or 22-gauge stranded wire. Do not run 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 length should not exceed 500' (152m). Wire the sensor to the appropriate analog port of the controller according to the controller manufacturer's instructions and the specific details of the particular sensor listed on this page.

ORDERING INFORMATION

MODEL	DESCRIPTION
MK7-B	Celestial Ambient Light Sensor
CCF	Indoor
CR	Outdoor
CS	Skylight
	OUTPUT SIGNAL
VTI	4-20 mA
0/5	0-5 VDC
1/5	1-5 VDC
0/10	0-10 VDC
1/10	1-10 VDC

MK7-B – **CCF** – **1/5**

Example: **MK7-B-CCF-1/5** Light sensor, indoor housing, 1-5 VDC output signal