Light Level Sensor Data Sheet

Resource Data Management

RDM Light Level Sensor – Part Number PR0193

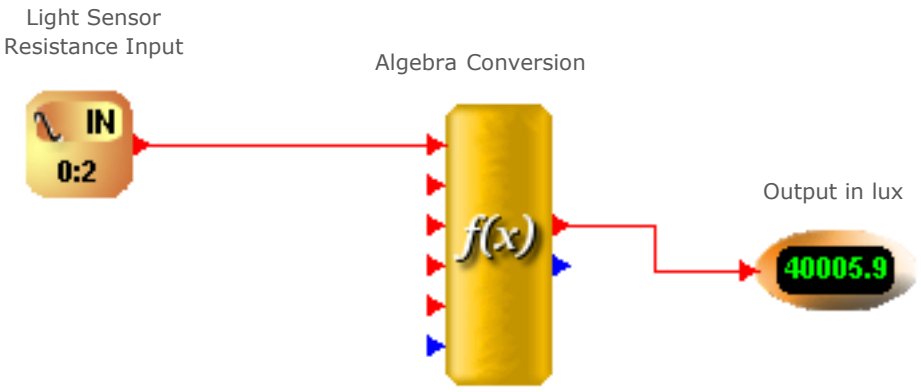
Features

- Robust Water Resistant Housing
- No Power Supply Required
- Simple 2 Wire Connection
- Reliable and Secure Push Terminals
- Low Cost
- Single Mounting Point

The Resource Data Management light level sensor consists of a photodiode housed in a clear water resistant enclosure with two spring loaded connections on the underside. The unit is intended for use with an RDM Data Manager, Intuitive controller or Plant controller range using a TDB application.

The resistance measured across the terminals will vary depending on the light level. This can be easily converted into a lux reading, for example, and used to switch lighting on and off when a particular light level is reached.

When using a Plant TDB controller, resistance measured by the sensor can be converted to an approximate lux value by using the following equation in a TDB algebra block, **(10^((log((5*(10^6))/(3010+(($1*(10^7))/($1+(10^7))))))+2))-100** where $1 is the resistance, an example is shown below.



The probe input block probe type should be set to raw to read resistance.

Please ensure all power is switched off before installing or maintaining this product.

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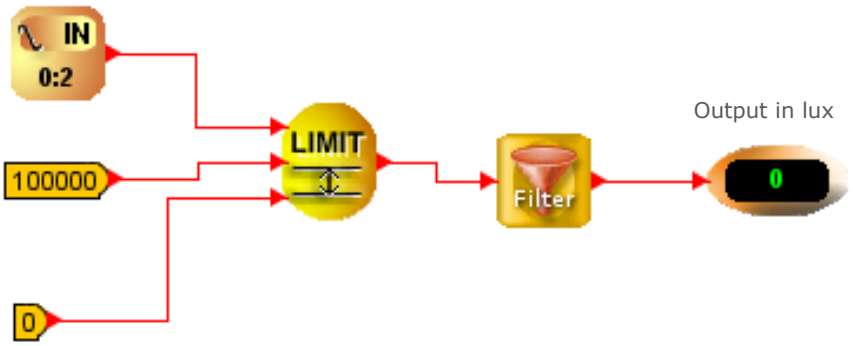
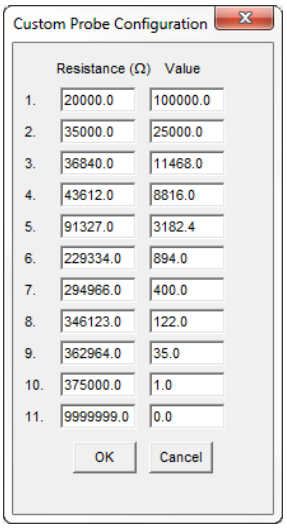
When using a Data Manager to read the light level sensor a 390KΩ resistor needs to be connected across the sensor terminals and a custom probe table entered as shown in the following example. A typical custom probe table is shown on the right. An algebra block is not required in this case.

Light Sensor Resistance Input



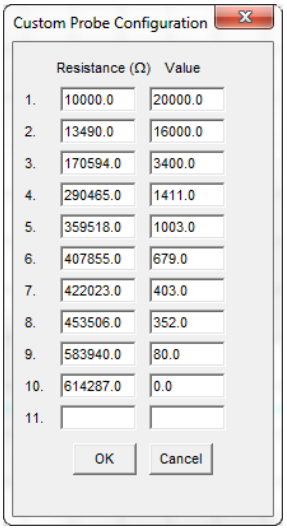


Data Manager Custom Probe Table

During total darkness the resistance output may go off the scale and show an invalid resistance reading, a limit block can be used to keep the lux value within a reasonable range if required.

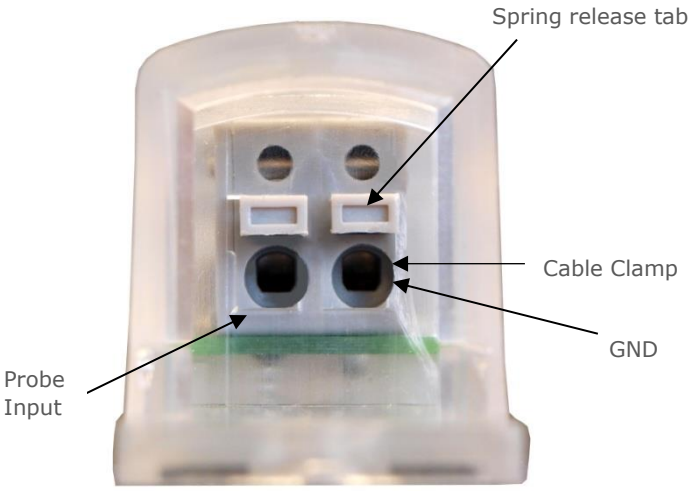
If the lux output is constantly changing, due to variable cloud cover for example, then a filter block can be used to dampen the response of the output, the time constant in the filter block should be set to a low value (10 for example).

When using an Intuitive Mercury TDB controller a 1.8MΩ resistor needs to be connected across the sensor terminals and a custom probe table entered. A typical custom probe table is shown on the right. An algebra block is not required in this case.



Mercury Custom Probe Table

Connections



The light sensor is fitted with spring loaded connections which are less prone to shaking loose than standard screw terminals.

Using an object such as a small terminal screwdriver, push on the spring release tab, this will open up the cable clamp inside the connector.

With the tab still pressed down, insert the stripped cable.

Release the tab to clamp the cable.

A waterproof sealant can be applied to the terminals if the sensor is being fitted in a particularly harsh environment.

The cable can be removed by pushing down and holding the spring release tab and pulling out the cable.

The light sensor connections are polarised, ensure probe input and GND wires are connected to appropriate terminals

The sensor should be mounted with the terminals facing downwards to prevent water ingress.

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Ordering Information

Description	Part Number
Wall Mountable Light Sensor	PR0193
Wall Mountable Light Sensor (Box of 10)	PR0194
Wall Mountable Light Sensor (Box of 100)	PR0195

Specification

Resistance Range: 9.5 kOhm (very bright light) to 9.8 MOhm (darkness)
Measurement Range: 1 lux to 40,000 lux
Storage Temperature: -40ºC to + 75ºC
Operating Temperature: -40ºC to + 75ºC
Protection Rating: IP64
Dimensions: 56mm (H) x 24mm (D) x21mm (W)
Mounting Hole: 4mm diameter
Maximum Cable Size: 2.5mm (14awg)

Typical Resistance and Lux Levels

Resistance	Illuminance (lux)	Typical Conditions
9.8MΩ	1 lux	Nightime with minimal street lighting
9.3MΩ	3.4 lux	Twilight with a clear sky
3.3MΩ	100 lux	Daytime, cloudy and overcast in a shaded area
1.1MΩ	400 lux	Daytime, sunset on a clear day
128kΩ	4000 lux	Daytime, Indoors well lit room
52kΩ	10,000 lux	Daytime, midday scattered cloud
9.5kΩ	40,000 lux	Direct sunlight

Note: due to the nature of photodiode technology, resistance values from one sensor to another can vary, including sensors from the same manufacturing batch, even when exposed to similar lighting conditions. For this reason calibration may be required during the commissioning process on a site by site basis.

TDB Daylight Block

The TDB software application has a daylight block which can be used in conjunction with the light level sensor. By entering the latitude and longitude of any location the Daylight block can be used to provide an indication of daylight and twilight hours for a given geographical location.

Incorporating this block into any TDB program will provide a backup to the light sensor should there be a wiring fault or a sensor failure. Care must be taken when using this feature as current localised events, such as weather conditions, are not taken into account.

Disclaimer

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