LIGHT SENSOR 0513

USER'S GUIDE

Figure 1. The Light Sensor

CENTRE FOR MICROCOMPUTER APPLICATIONS

http://www.cma-science.nl

Description

The Light sensor 0513 uses a photodiode Optrex p.n. OP555C to measure light intensity. The intensity is measured in W/m^2. The output voltage of the sensor is linearly proportional to the intensity of the light falling upon it. The sensor's range is from 0.1 W/m^2 to 10 W/m^2. For comparison: the light intensity on a cloudy day is approximately 8 W/m^2.
The sensor is direction dependent and achieves a maximum output when the end of the probe is pointed directly at the light source.
The sensor is sensitive in the visible and near-infrared (IR) light range. This means that the sensor can be used for measurements of IR emitting diodes as well as visible light sources.
The sensor is designed to work in air only; it is not waterproof.
It has a built-in facility for automatic sensor identification.

Suggestion for experiments

Measurements of changes in the light intensity:

- Darkening of a solution caused by a chemical reaction.
- The rapid changes of the light intensity for example of a computer screen.
- Effects caused by on/off switching.
- Light interference.

Digital application (as a light gate):

- Measuring the acceleration due to gravity (falling stick with slits).
- Measuring the speed of objects undergoing collisions.
- Timing the period of a rotating object.

Calibration

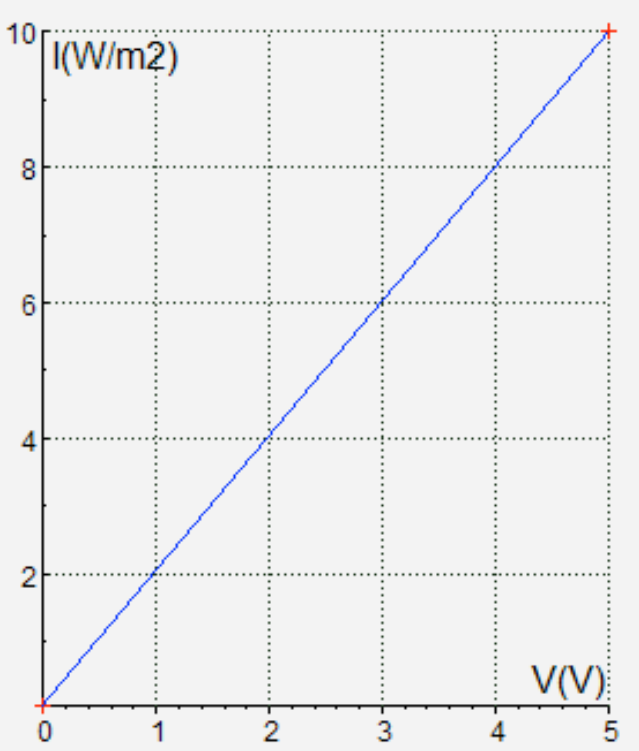

Figure 2. Calibration graph (range 0 .. 10 W/m^2) of the Light sensor in the standard sensor library in the Coach program.

The name of the light sensor in the sensor library of the Coach program is **Light sensor (0513bt) (CMA).**
The sensor has two calibrations between 0..100%, and between 0 .. 10 W/m^2.

Spectral sensitivity of the sensor

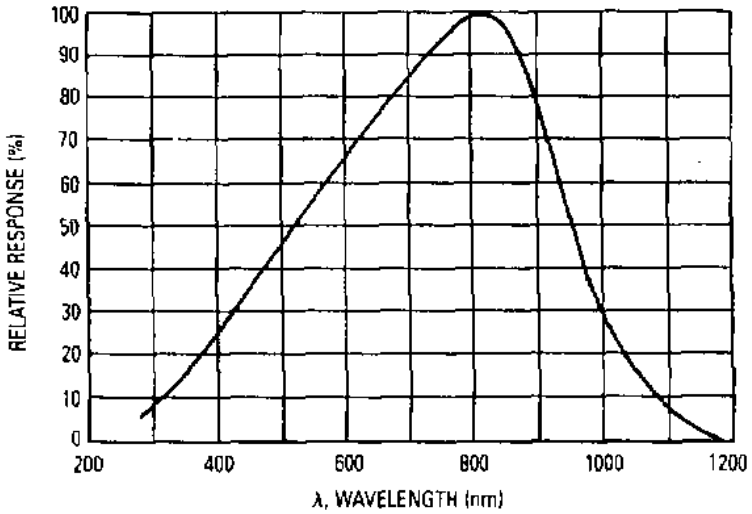

Figure 3. Relative spectral response of the Light sensor

Technical data

Maximum current drain	5 mA
Intensity range	0.1 W/m^2 to 10 W/m^2
Voltage range	0 - 5 V (0V corresponds to 0 W/m^2 , 5V to 10 W/m^2
Spectral response	300 - 1100 nm (not flat)
Chemical tolerance	None (air only)
Calibration curve Coefficients	Intensity = (K_0 * Voltage) + K_1 K_0 = 1.98795; K_1 = 0.0602410
Accuracy	± 20% (calibrated with a Tungsten lamp. Other light sources give an intensity < the real value)
Connection	Right-hand BT (British Telecom) connector

Warranty:

The 0513 Light sensor is warranted to be free from defects in materials and workmanship for a period of 12 months from the date of purchase provided that it has been used under normal laboratory conditions. This warranty does not apply if the sensor has been damaged by accident or misuse.

Note: *This product is to be used for educational purposes only. It is not appropriate for industrial, medical, research, or commercial applications.*
