

## L202 PMS PHOTOMETER

The Macam L202 PMS digital radiometer is a portable instrument designed for accurate measurement of illuminance and screen luminance.

The photometer comprises of a hand held display unit, a detector with connecting cable, a cosine corrected diffuser ring, a luminance probe with shadow rings and an RS232 connection cable.

The luminance probe interchanges with the cosine diffuser ring to enable contact measurements of CRT or LCD screen brightness. A switch within the detector housing automatically reconfigures the photometer calibration between lux and  $\text{cd}\cdot\text{m}^{-2}$  with an LED illuminated to indicate which unit is selected.



### FEATURES

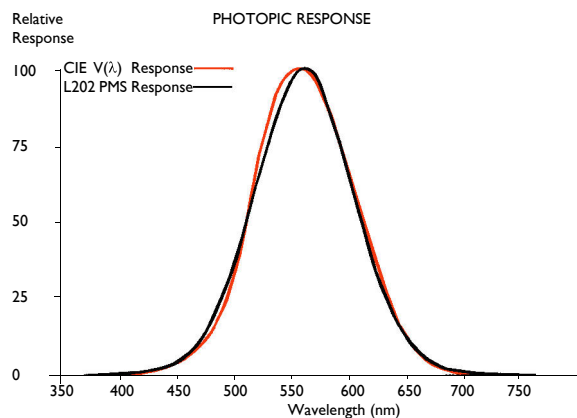
- Accurate measurements are obtained under both natural and artificial lighting conditions.
- Easy to operate with micro-processor control.
- Macam photopic filter is colour balanced to give a response which closely matches the  $\text{CIE}V(\lambda)$  human eye response.
- Profiled diffuser to give accurate cosine corrected angular response.

### APPLICATIONS

- Interior & exterior lighting measurements.
- Quality control measurements.
- Display luminance measurements.

### PHOTOMETRY

Photometry is the measurement of light as the human eye responds to it. The CIE standard response function  $V(\lambda)$ , known as the CIE Photopic Luminous Efficiency Curve, is shown on the graph together with the L202 PMS detector response.



## ILLUMINANCE & LUMINANCE

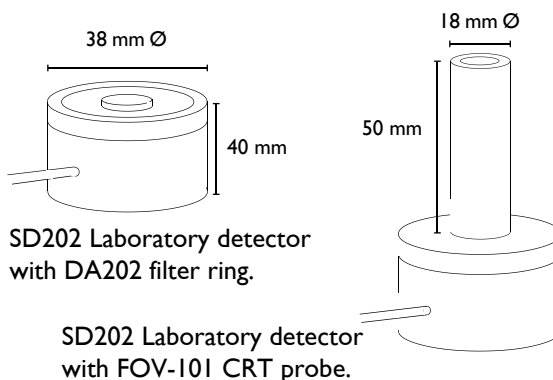
Illuminance is the luminous flux falling per unit area. Units of illuminance are the lux, ( $\text{lm.m}^{-2}$ ) or fc ( $\text{footcandle}$  or  $\text{lm.ft}^{-2}$ ).

Luminance ( $\text{lm.m}^{-2}\text{.sr}^{-1}$ ) or brightness is the photometric measurement of the response from viewing an illuminated object or self-luminous source. Units of luminance are  $\text{cd.m}^{-2}$  or fL ( $\text{footlambert}$  or  $\text{cd}\cdot\pi\cdot\text{ft}^{-2}$ ).

The luminance of a surface or an extended source is measured by replacing the cosine-corrected diffuser ring with the contact luminance probe.

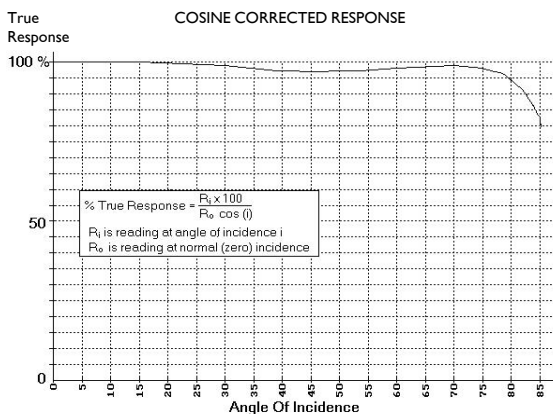
## COSINE CORRECTION

Light incident on a surface may come from all directions and it is necessary to measure the integrated illuminance from the sources in the hemisphere normal to the detector. Accurate measurements will only be obtained if the detector has an angular response which closely follows Lambert's Cosine Law. The Macam illuminance filter ring supplies cosine corrected assemblies accurate to  $\pm 3.5\%$  to  $70^\circ$  from normal incidence.



SD202 Laboratory detector with DA202 filter ring.

SD202 Laboratory detector with FOV-101 CRT probe.



## SPECIFICATION

The Macam model L202 PMS photometer comprises of an L202X display unit with lithium manganese battery, SD202 laboratory detector with integral amplifier and CIE photopic filter, DA202 cosine-correcting diffuser ring, FOV-101 screen contact probe & shadow rings, RS232 connection cable, calibration certificate and CC-2 carrying case.

### DISPLAY UNIT

Model:	L202X
Design:	Portable $\mu$ processor controlled meter with LCD display, key pad operation, battery powered.
Standard Ranges:	3 full scale autoranging decades measuring from: 0 - 199.99 lux / $\text{cd.m}^{-2}$ 0 - 1 999.9 lux / $\text{cd.m}^{-2}$ 0 - 19 999 lux / $\text{cd.m}^{-2}$
Accuracy:	Linearity error $\pm 1\%$ , $\pm 1$ digit.
Keypad Operations:	Power on / off action. Hold display on / off action. Zero stores offset for subtraction from subsequent readings. Store will save current reading. (Max. of 16 stored values possible). Recall displays saved readings. Backlight on / off action.
Display:	4½ digit LCD display with 10mm high numerals. LED back light.
Power Supply:	PP3 Lithium Manganese battery. Operating life 30 to 50 hours.
Calibration:	L202 PMS traceable to BSi & NPL optical metrology standards. Absolute calibration accuracy estimated as $\pm 5\%$ @ $20^\circ\text{C}$ .
Temperature Range:	0 to $40^\circ\text{C}$ . 80% RH.
Dimensions:	80 mm x 27mm x 150 mm. High impact polystyrene.
Weight:	Approximately 0.4 Kg.

### LABORATORY DETECTOR

Model:	SD202
Design:	Silicon photodiode with integral detector amplifier & signal-to-frequency converter. Photopic filter and 1m cable.
Linearity:	Better than $\pm 1\%$ across range.
Spectral Response:	Refer to graph.
Dimensions:	38 mm $\varnothing$ x 35 mm. Black anodised aluminium body.
Temperature Coefficient:	- 0.15 % / $^\circ\text{C}$

### DIFFUSER RING

Angular Response:	$\pm 3.5\%$ to $70^\circ$
Dimensions:	38 mm $\varnothing$ x 5 mm.

### LUMINANCE PROBE

Dimensions:	10 mm int. $\varnothing$ / 18 mm ext
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