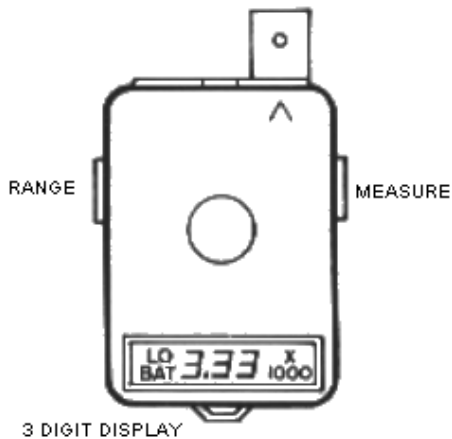


QUANTUM PHOTO-METER LX2

OPERATING INSTRUCTIONS

1. INTRODUCTION



This manual describes operation of Quantum's Photo-Meter LX2. Please read it completely to understand the capabilities of your instrument.

There are two operating controls: **Measure** for taking a reading, and **Range** to adjust the meter display to the light level being measured.

2. MEASURE CONTROL

Depress and hold this control (right side of meter) to turn the meter on and display a light reading. If you fail to obtain a reading, depress the **Range** control repeatedly until numbers appear in the display. (Hold the **Measure** control in when doing this in order to see the result in the display).

The display may show the following signals:

DISPLAY	DESCRIPTION	SIGNIFICANCE
...	Three decimal points only displayed	Overrange reading. Adjust Range .
000,001 or 01	Zero or very low reading	Underrange reading. Adjust Range .
9.62 X 1000	Good reading (X 1000 will light up)	Display reads in 1,000's, i.e., 9,620 (footlamberts or footcandles).
LO BAT 9.62	Good reading (LO BAT will light up)	Change batteries soon.

When **Measure** is released the display **will freeze and show the last reading for about 5 seconds**. This feature allows viewing a reading when taking measurements in difficult viewing situations.

3. RANGE CONTROL

This control sets the readout range of the digital display. Each time **Range** is depressed the meter reads the next higher range, until it reaches the highest range. Then the **Range** control will recycle the meter to the lowest (most sensitive) range.

The table below explains how the ranges work. The arrows signify the action when **Range** is depressed.

When the $\overset{X}{1000}$ indicator is lit in the display, the reading is shown in thousands. In that case, the decimal point becomes the "comma" in the number. For example, a display of $6.43 \overset{X}{1000}$ is quickly recognized as 6,430 since 3 digits always follow a comma. In the same manner, the display $0.43 \overset{X}{1000}$ becomes 430. (This reading could have been displayed more accurately on range 2).

Range No.	Display	Meaning
1	0.01 to 9.99	As shown
2	00.1 to 99.1	As shown
3	001 to 999	As shown
4	0.01 $\overset{X}{1000}$ to 9.99 $\overset{X}{1000}$	10 to 9,990
5	00.1 $\overset{X}{1000}$ to 99.9 $\overset{X}{1000}$	100 to 99,900

The readings above are in units of lux (candela per square meter).

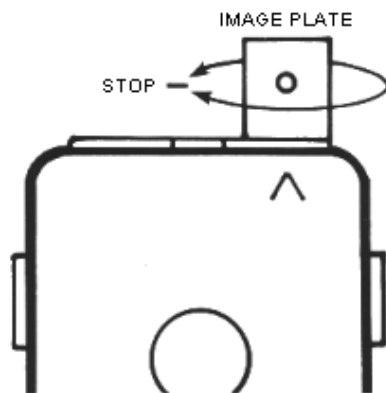
Once a range is selected the meter will maintain that range whether **Measure** is depressed or not. (**Measure** need not be depressed to change ranges). No damage will occur if the meter is switched to a sensitive range under strong illumination.

Since there are 5 ranges, depressing **Range 4** times in quick succession has the effect of selecting the next more sensitive range.

4. MODE OF MEASUREMENT

A turret is located on top of the instrument and is comprised of a sensor housing with a white image plate. The sensor housing rotates 360°.

The hole in the center of the image plate is the exact location of the light measurement.

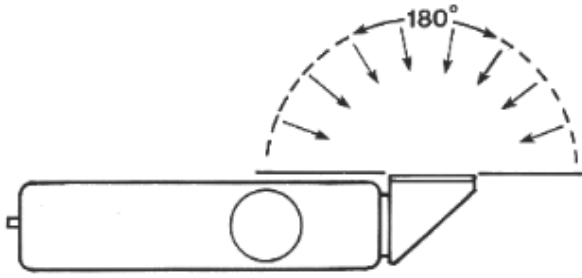


5. MEASURING TECHNIQUE

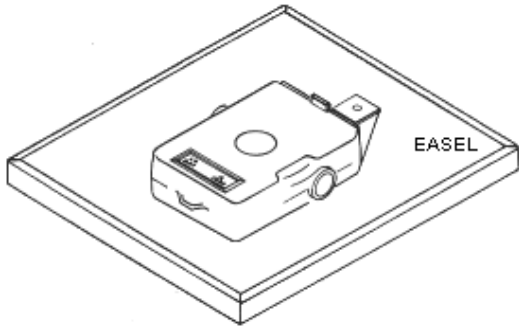
Illuminance - lux

Illuminance is the amount of light energy incident upon a surface. The surface is defined by the geometric plane of the white image plate. Light sources within the 180° hemisphere in front of the image plate will be measured.

For best accuracy do not block light sources in the 180° hemisphere. The orientation of the image plate for Lux measurements is designed to minimize the effect of the operator's presence in the reading.



For darkroom measurements the white image plate should be parallel to the easel.



6. MISCELLANEOUS

Photo-Meters are very sensitive instruments that respond to slight changes in illumination. This is especially true when measuring fluorescent lights.

Fluorescent illumination varies in brightness at twice the rate of the AC line frequency (50 or 60 hz). This variation is not apparent to the human eye, but it will be apparent in readings with Photo-Meters. A slight drift in the reading of the instruments might indicate the condition of fluorescent illumination. The average of the highest and lowest reading is the effective light value.

Conversion factors are shown below for other units of measurement.

$$\text{lux} = \text{footcandles} \times 10.8$$

$$\text{footcandles} = \text{lux} \times .093$$

$$\text{cd/m}^2 \text{ (nit)} = \text{footlamberts} \times 3.43$$

$$\text{footlamberts} = \text{cd/m}^2 \times .292$$

To determine candlepower (luminous intensity) of a light source, measure illuminance at a known distance from the source. Preferably, the distance (d) should be 10 times (or more) greater than the size of the source. Then multiply the square of the distance by illuminance to obtain candlepower in candela.

$$\text{candlepower} = \text{lux} \times \text{m}^2 = \text{ft. candle} \times \text{ft.}^2$$

The amount of candela calculated above is the intensity of light emitted in the direction of the measurement position. It is sometimes called beam candlepower.

Electric lamps are frequently specified in terms of lumens output. This figure is not so useful as beam candlepower for predicting footcandles at the area of interest, since the beam pattern of the lamp is usually not known. Also, lamp housings, reflectors, and lenses can have a great effect on beam candlepower. For detailed definitions of the terms of light measurement you may consult the various books available, including RCA's Electro-Optics Handbook, RCA, Harrison, N.J. 07029, especially Section 2.

7. BATTERIES

When the batteries are weak the LO BAT signal in the display window will be continuously lit from behind when **Measure** is pushed. If LO BAT stays lit with the display, change the batteries. If LO BAT lights intermittently it is only a warning.

To change batteries, loosen the battery door screw with a coin. Handle the new batteries with tissue paper to avoid corrosion of the contacts. Replacement battery types are listed under Specifications.

Cold temperatures may temporarily cause the battery voltage to drop, thereby lighting LO BAT.

If the instrument will not operate, clean all batteries and contacts as most problems are caused by poor electrical connections. Also observe proper battery polarity (+ , -).

8. SPECIFICATIONS

Capabilities: Illuminance in lux

Readout: Three digit L.E.D. display.

Range: 0.01 to 99,900.

Repeatability: Within 7% of full scale range for 2500°k to 5400°k light sources.

Sensor: Silicon photodiode with photometric filter.

Batteries: Type A-76 alkaline button cells, or silver oxide types MS-76, 10L14, RW-42, 357.

Size: 10 x 7 x 2.5 cm.

Weight: Approx. 110 g.

Supplied with: Case, neck cord, operating instructions.

ADDENDUM

Photo-Meters now are equipped with a "freeze" feature to store readings in the display. Upon releasing the **Measure** control, the display will freeze and show the last reading for about 5 seconds. This feature allows viewing a reading after taking a measurement from a difficult viewing position.

The low battery signal operation has been modified (see Section 7 - Batteries). The battery check circuits are engaged when **Measure** is released, and until the display goes blank. Other instructions in Section 7 about battery signals apply.