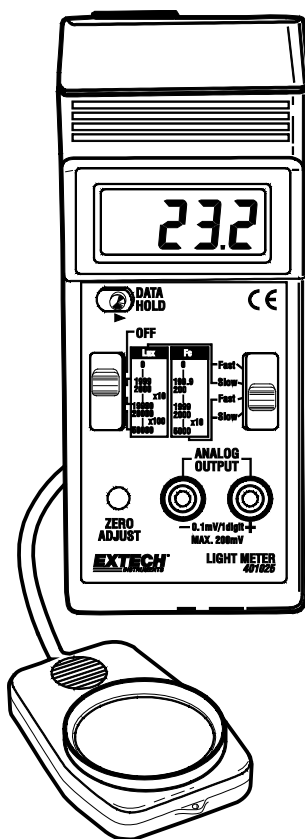


# EXTECH<sup>®</sup>

## USER MANUAL

### Model 401025

### Digital Light Meter

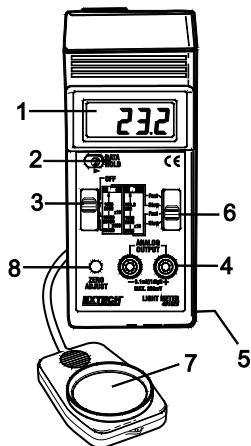


## Introduction

Congratulations on your purchase of the Extech Digital Light Meter. This device is shipped fully tested and calibrated and, with proper use, will provide years of reliable service. Please visit our website ([www.extech.com](http://www.extech.com)) to check for the latest version of this User Manual, Product Updates, and Customer Support.

## Meter Description

1. Display (LCD)
2. Data Hold switch
3. Power / Range switch
4. Analog output terminal
5. Battery compartment (rear)
6. LUX / Fc Units and Response selector
7. Light sensor
8. Zero adjustment



## Operation

1. Select the Units (Lux or Ft-candles) and the Response Time (Fast or Slow) using the slide switch. Use the Fast setting for quick attack sounds such as gunfire or a drum strike. Use the Slow setting for continuous sound, such as a machine hum or running motor.
2. Select the maximum range using the range switch.
3. Face the light sensor toward the light source to be measured.
4. The display will indicate the measured value. When measuring in the 20,000 and 50,000 Lux ranges or in the 5000 Fc range, note the display multipliers (x10 and x100), see notes and illustrations below.
5. To hold (freeze) a measurement, slide the Data Hold switch to the **HOLD** position. The reading will freeze until the switch is released.

Note 1: Over-range indication is "1\_\_". Switch to a higher range when this occurs.

Note 2: For measurements in the Fc 5000 range, the displayed reading must be multiplied by 10.

Note 3: For measurements made on the Lux 20,000 or 50,000 ranges the displayed reading must be multiplied by 10 and 100 respectively.

Note 4: The meter can indicate readings above the maximum range, but the accuracy of these readings is not specified.

Range Display Multipliers		
Range	Units	Multiplier
200	Fc	Direct reading
2000	Fc & Lux	Direct reading
5000	Fc	Reading x10
20,000	Lux	Reading x10
50,000	Lux	Reading x100

Using the range and unit selector switches. The switch on the left selects the range. The switch on the right selects the unit. Note the factor of 10 and 100 in the higher ranges. For example, if a measurement in the 5000 Fc range displays 350, the actual measurement is:  $350 \times 10 = 3500$  Fc.

## Measurement Range Considerations

The meter has three measurement ranges for each unit of measure (0-200, 0-2000, and 0-5000 Fc) and (0-2000, 0-20000, and 0-50000) Lux). Selecting the correct range will provide the highest accuracy. Always select the range that produces the maximum number of digits without exceeding the range. For example, a reading of 1456 Fc should be read in the 2000 Fc range, not the 5000 Fc range.

## Zero procedure

To zero the display, follow the steps below. The display may drift due to temperature changes and battery draining, so zero the display often.

1. Set the range switch to the lowest Lux or Fc range.
2. Completely cover the sensor to ensure that no light reaches it.
3. With the sensor covered, use a small screwdriver to adjust the zero screw to set a zero reading.
4. The right-most digit may fluctuate slightly. This is normal and does not affect the accuracy.

## Analog Output

The analog output jacks on the front panel produce a 0.1 mV DC per digit signal that can be used for recording and datalogging purposes. The maximum output is 200 mV DC.

## Lighting Type Correction Factors

The meter is calibrated using a precise standard tungsten light source of 2856°K. If the meter is to be used to measure a different type of light, refer to the correction factor table, below. Multiply the reading by the factor, shown in the table for the specific light type.

Mercury	x 1.14
Fluorescent	x 0.92 to 1.12
Daylight	x 1.00
Sodium	x 1.22
Metal Halide	x 1.00

## Replacing the Battery

When the **LO BAT** icon appears, replace the battery promptly.

1. Open the rear battery compartment and remove the old battery.
2. Replace with a new 9V battery (observing correct polarity).
3. Secure the battery compartment before use.

**Safety:** Please dispose of batteries responsibly and in accordance with all applicable laws and regulations; never dispose of batteries in a fire, batteries may explode or leak.

## Specifications

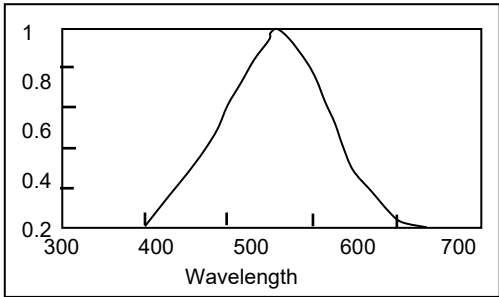
### General Specifications

Display	0.5 in. (13 mm) LCD
Measurement units	Lux, Ft-candle (Fc)
Ranges (see range table below)	Lux: 0 to 50,000 Lux in 3 ranges Foot-candle: 0 to 5,000 Fc in 3 ranges
Sensor	Photo diode with cosine and color correction, designed to meet CIE
Zero adjust	Manual front panel adjustment
Sampling time	Approx. 0.4 seconds
Response Time	Fast: 0.4 seconds; Slow: 2 seconds
Over input indication	Indication of "1__"
Analog Output	0.1 mV per digit (maximum: 200 mV DC)
Operating Temperature	32°F to 122°F (0°C to 50°C)
Operating Humidity	80% RH maximum
Power Supply	9V DC battery
Power Current	Approx. 2 mA DC
Weight	0.52 lbs. (220 g)
Dimensions	Main instrument: 6.4 x 2.8 x 1.2 in. (163 x 70 x 30 mm) Sensor: 3.2 x 2.2 x 0.5 in. (85 x 55 x 12 mm)

### Range Specifications

Lux			
Range	Display range	Resolution	Accuracy (Full Scale)
2,000 Lux	0 to 1,999 Lux	1 Lux	± (5% + 2digits)
20,000 Lux	2,000 to 19,990 Lux	10 Lux	± (5 % + 2digits)
50,000 Lux	20,000 to 50,000 Lux	100 Lux	± (5 % + 2digits)
Foot-candle (Fc)			
Range	Display range	Resolution	Accuracy (Full Scale)
200 Fc	0 to 199.9 Fc	0.1 Fc	± (5% + 2digits)
2,000 Fc	200 to 1,999 Fc	1 Fc	± (5% + 2digits)
5,000 Fc	2,000 to 5,000 Fc	10 Fc	± (5% + 2digits)

## Frequency Spectrum



## Appendix A - Typical Light Levels

Lux	Foot Candles		Lux	Foot Candles	
		<b>Factories</b>			<b>Home</b>
20-75	2-7	Emergency Stairs, Warehouse	100-150	10-15	Washing
75-150	7-15	Exit/Entrance Passages	150-200	15-20	Recreational Activities
150-300	15-30	Packing Work	200-300	20-30	Drawing Room, Table
300-750	30-75	Visual Work: Production Line	300-500	30-50	Makeup
750-1,500	75-150	Typesetting: Inspection Work	500-1,500	50-150	Reading, Study
1,500-3,000	150-300	Electronic Assembly, Drafting	1,000-2,000	100-200	Sewing
		<b>Office</b>			<b>Restaurant</b>
75-100	7-10	Indoor Emergency Stairs	75-150	7-15	Corridor Stairs
100-200	10-20	Corridor Stairs	150-300	15-30	Entrance, Washroom
200-750	20-75	Conference, Reception Room	300-750	30-75	Cooking/Dining Room
750-1,500	75-150	Clerical Work	750-1,500	75-150	Show Window
1,500-2,000	150-2000	Typing, Drafting			
		<b>Store</b>			<b>Hospital</b>
75-150	7-15	Indoors	30-75	3-7	Emergency Stairs
150-200	15-20	Corridor/Stairs	75-100	7-10	Stairs
200-300	20-30	Reception	100-150	10-15	Sick Room, Warehouse
300-500	30-50	Display Stand	150-200	15-20	Waiting Room
500-750	50-75	Elevator	200-750	20-75	Medical Exam Room
750-1,500	75-150	Show Window, Packing Table	750-1,500	75-150	Operating Room
1,500-3,000	150-300	Storefront, Show Window	5,000-10,000	500-1000	Eye Inspection

## Appendix B - Common Terms and Conversion Factors

Illuminance (Visible Flux Density)	1 lm/m <sup>2</sup> =	1 lux (lx)
		10 <sup>-4</sup> lm/cm <sup>2</sup>
		10 <sup>-4</sup> phot (ph)
		9.290 x 10 <sup>-2</sup> lm/ft <sup>2</sup>
		9.290 x 10 <sup>-2</sup> foot-candles
Luminance (Visible Flux Density per Solid Angle)	1 lm/m <sup>2</sup> /sr =	1 candela/m <sup>2</sup>
Luminous Intensity (Visible Flux per Solid Angle)	1 lm/sr =	1 candela
Luminous Flux (Visible Flux)	1 lumen (lm) =	1.464 x 10 <sup>-3</sup> watts @ 555 nm

## Two-year Warranty

**Teledyne FLIR warrants this Extech brand instrument to be free of defects in parts and workmanship for two years from date of shipment. To view the full warranty text please visit:**  
<https://www.flir.com/support-center/warranty/instruments/extech-product-warranty/>

## Calibration and Repair Services

**Teledyne FLIR offers calibration and repair services for the Extech brand products we sell. We offer NIST traceable calibration for most of our products.**

## Customer Support

**Local Telephone Support List:** <https://support.flir.com/contact>

**Return Material Authorization (RMA):** <https://customer.flir.com/Home>

**Customer Service:** <https://support.flir.com/ContactService>

**Technical Support:** <https://support.flir.com>

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