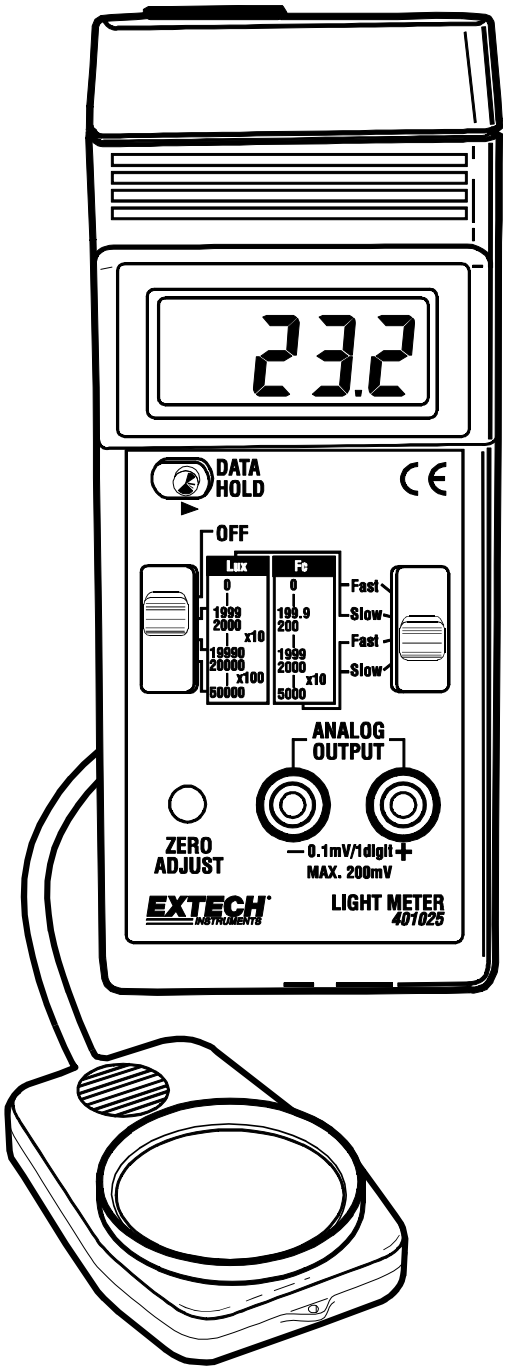
EXTECH INSTRUMENTS

USER MANUAL

Model 401025

Digital Light Meter



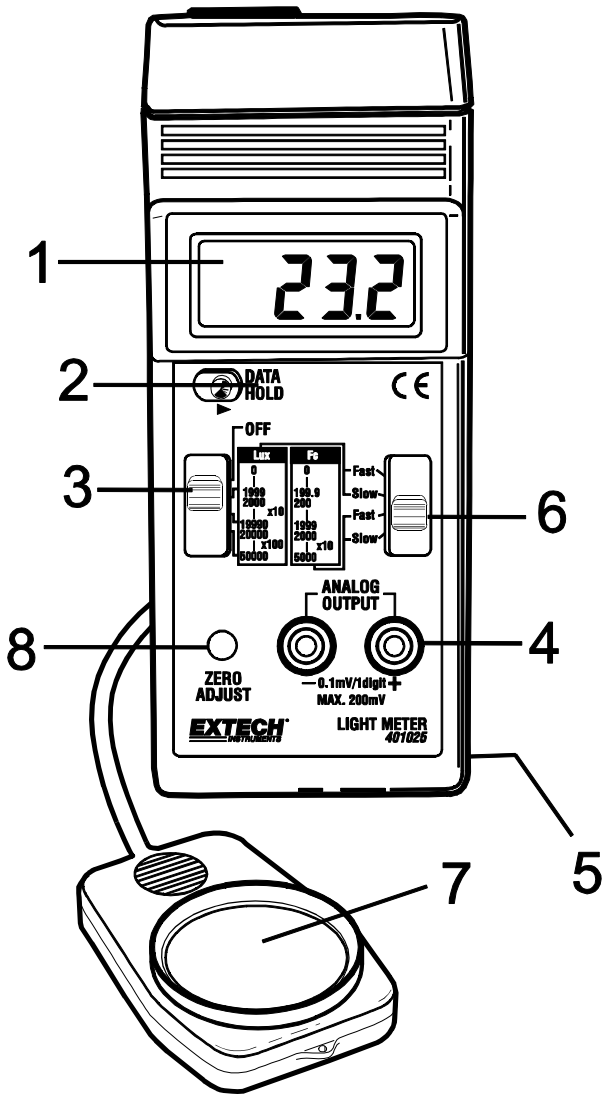
Additional User Manual Translations available at www.extech.com

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) to check for the latest version of this User Guide, Product Updates, and Customer Support.

Meter Description

1. LCD Display
2. Data Hold Switch
3. Power Off/Range Switch
4. Analog Output Terminal
5. Battery Compartment (rear)
6. LUX/Fc Switch & Response Switch
7. Light Sensor
8. Zero adjust



Operation

1. Select Units (Lux or Ft-candle) and the Response Time (Fast/Slow) using the slide switch. Typical selection is Slow and Fc using the gray lettering.
2. Select the maximum range using the Range Switch.
3. Hold the Light Sensor so that the sensor faces the light source to be measured.
4. The display will indicate measured values. Use a range display multiplier if on the Lux 20,000 and 50,000 ranges or on the Fc 5000 range (see notes below).
5. To hold (freeze) a measurement, slide the Data Hold Switch to the Hold position. The reading will freeze in the display until the Data Hold Switch is released.

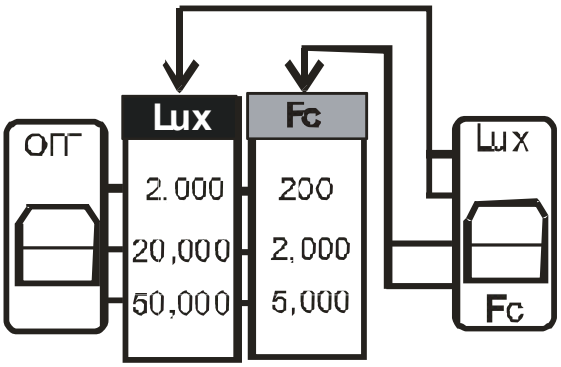
Note 1: An Over Range indication is a display of "1__ ". If this occurs, switch to a higher range.

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

Note 3: For measurements made on the Lux 20000 or 50000 ranges the displayed reading must be multiplied by 10 and 100 respectively.

Note 4: The meter will indicate values above the maximum ranges. The accuracy of these measurements is unknown.

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



Example: If a measurement on the 5000 Fc range displays 350 the actual measured value is: 350 x 10 = 3500 Fc.

Selecting a Measurement Range

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). The proper range selection will produce the most accurate reading. Always select the range that produces the maximum number of digits without exceeding the maximum count for that particular range. For example, a reading of 1456 Fc should be read on the 0 - 2000 range, not the 0-5000 range.

Zero procedure

The meter zero (display with no light input) may change with time. Occasional checking and adjustment may be required.

1. Completely cover the sensor to block out any light.
2. Set the range switch to the lowest Lux or Fc range.
3. Using a small screwdriver, adjust the Zero control for a zero display. The last digit may change slightly. This is normal and does not affect the accuracy of the meter.

Analog Output

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

Lighting Type Correction Factors

The 401025 light meter is calibrated under a precise Standard tungsten light source of 2856^{O}K. If the meter is to be used under a different type of light the correction factor of from the table below should be applied to the readings obtained.

Mercury Lamp	x1.14
Fluorescent Lamp	X0.92 to 1.12
Daylight	x1.00
Sodium	x1.22
Metal Halide	x1.00

Replacing the Battery

When the left corner of the LCD display shows LO BAT the battery output is below the design limit and the battery needs to be replaced. However, reliable measurement can still be taken for several hours before the tester becomes inaccurate or switches off.

1. Open the Battery Cover at the back of the tester and remove the old battery.

2. Replace with a new 9V battery and install the cover securely.

Never dispose of used batteries or rechargeable batteries in household waste. As consumers, users are legally required to take used batteries to appropriate collection sites, the retail store where the batteries were purchased, or wherever batteries are sold.

Disposal: Do not dispose of this instrument in household waste. The user is obligated to take end-of-life devices to a designated collection point for the disposal of electrical and electronic equipment.

Specifications

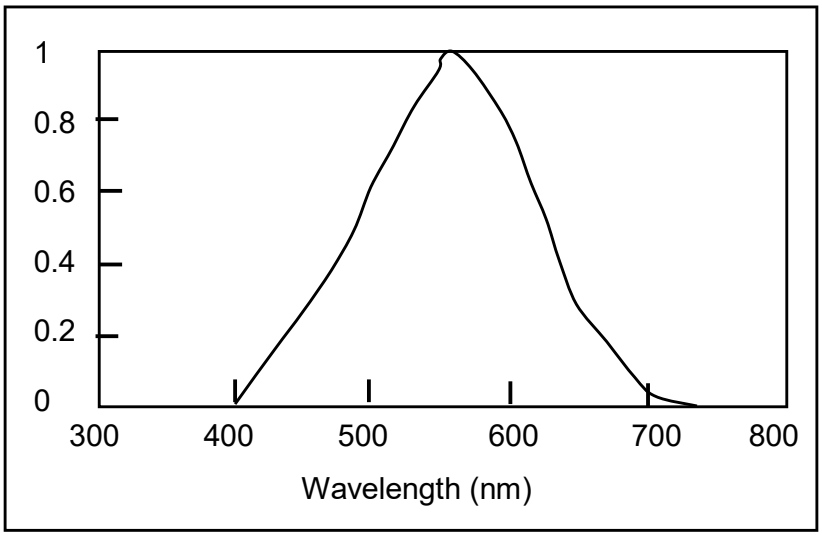
General Specifications

Display	13mm (0.5") LCD (Liquid Crystal Display)
Measurement types	Lux, Ft-candles (Fc)
Ranges (see range table below)	Lux: 0 to 50,000 Lux in 3 ranges Foot-candles: 0-5,000 Fc in 3 ranges
Sensor	Exclusive photo diode & color correction filter, spectrum designed to meet C. I. E.
Zero Adjust	Manual 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/1 digit (maximum output: 200mV)
Operating Temperature	0^{O}C to 50^{O}C (32^{O}F to 122^{O}F)
Operating Humidity	Less than 80% RH
Power Supply	9V DC battery
Power Current	Approx. 2 mA DC
Weight	220 g (0.52 lbs.)
Dimensions	Main instrument: 163 x 70 x 30 mm (6.4 x 2.8 x 1.2”) Sensor Probe: 85 x 55 x 12 mm (3.2 x 2.2 x 0.5”)
Optional Accessories	Vinyl pouch carrying case (Part Number 409996)

Range Specifications

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

Frequency Spectrum



Appendix A - Typical Light Levels

Lux	Foot Candles		Lux	Foot Candles	
		Factories			**Home**
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
		Office			**Restaurant**
75-100	7-10	Indoor Emergency Stairs	75-150	7-15	Corridor Stairs
100-200	10-20	Corridor Stairs	150-300	15-30	Entrance, Wash Room
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			
		Store			**Hospital**
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^2 =	1 lux (lx)
		10^{-4} lm/cm^2
		10^{-4} phot (ph)
		9.290 x 10^{-2} lm/ft^2
		9.290 x 10^{-2} foot-candles
Luminance (Visible Flux Density per Solid Angle)	1 $lm/m^2/sr$ =	1 $candela/m^2$
Luminous Intensity (Visible Flux per Solid Angle)	1 lm/sr =	1 candella
Luminous Flux (Visible Flux)	1 lumen (lm) =	1.464 x 10^{-3} watts @ 555 nm

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