EXTECH INSTRUMENTS

INSTRUCTION MANUAL

Models 401020 (Lux) and 401021 (Fc) Light Meter Adapters

- Connects to standard DMM for display
- Measures Tungsten, Fluorescent, Sodium, Mercury, and Daylight
- Status LED for power and low battery
- Battery operated

1. INTRODUCTION

Congratulations on your purchase of Extech's Light Adapter. This professional device, with proper care, will provide years of safe reliable service.

2. SPECIFICATIONS

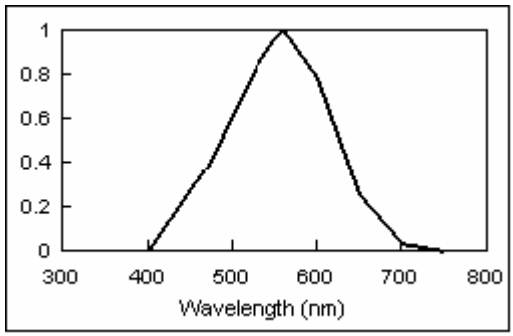
2.1 Electrical Specifications

Accuracy	± (5% + 1mV)
Sensor	Exclusive photo diode & color correction filter spectrum designed to meet C. I. E.
Operating Temperature/humidity	32°F to 122°F (0C to 50°C) / <90% RH
Power Supply	006P DC 9V battery
Power Consumption	Approx. 6 mA DC
Low battery indication	Status LED on Front panel of Adaptor
Dimensions / Weight	3.9x1.9x1" (100x50x25mm) / 0.33 lbs. (150g)

2.2 Range Specifications

	401020		**401021**	
Range	*Measurement*	*Output to DMM*	*Measurement*	*Output to DMM*
1	0 to 2000 Lux	0.1mV per 1 Lux	0 to 200 Fc	1mV per 1 Fc
2	2000 to 20,000 Lux	0.1mV per 10 Lux	200 to 2000 Fc	0.1mV per 1 Fc
3	20k to 50k Lux	0.1 mV per 100 Lux	2000 to 5000 Fc	0.1mV per 10 Fc

2.3 Frequency Spectrum



3. FRONT PANEL DESCRIPTION

1 Power ON status LED
2 Low battery status LED
3 Power ON / Range select switch
4 Light sensor
5 Meter to sensor connect cable
6 DMM banana connector plugs

4. OPERATION

4.1 Insure that a fresh battery is installed in the adapter by moving the Power/Range Select switch from the OFF position to one of the range select positions. If the Power ON light doesn't glow or if the Low Battery LED does glow, check the battery.

4.2 Connect the adapter to the COMMON and VOLTAGE inputs of a multimeter via the adapter's banana plugs. The polarity of the connection should be reversed if a negative light level reading is indicated on the multimeter.

4.3 Set the mulitmeter to the mV or higher DC voltage position. Adjust the range to suit your display needs. Do not use autorange if possible.

4.4 Select the maximum range via the Range Select Switch and move lower in range as needed.

4.5 Hold the Light Sensor so that it faces the light source to be measured. The multimeter's display will indicate light level readings. Refer to Sections 5 and 6 for additional measurement considerations.

5. CORRECTION FACTOR FOR DIFFERENT TYPES OF LIGHTING

The light adapter is calibrated using a precise "Standard tungsten light source of 2856^{O}K". If the meter is to measure a different type of lighting, the correction factor table, below, should be applied to the readings. Multiply the multimeter readings by the factors in the right column for a particular lighting type shown in the left column.

Lighting Type	Multiplication Factor
MERCURY LAMP	x1.14
FLUORESCENT LAMP	x1.08
DAYLIGHT	x1.00
SODIUM	x1.22
METAL HALIDE	x1.00

6. RANGE SELECTION

The meter has three measurement ranges (0-200, 0-2000, and 0-5000 Fc) or (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.

7. BATTERY REPLACEMENT

When the Low Battery status LED glows, replace the battery as soon as possible. Open the Battery Compartment by removing the rear screw. Remove the battery, replace it with a fresh 9V battery and re-assemble the meter.

8. CALIBRATION / REPAIR SERVICES

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

9. WARRANTY

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 for authorization. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product.

The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

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 Room, Dining Table
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

COMMON 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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