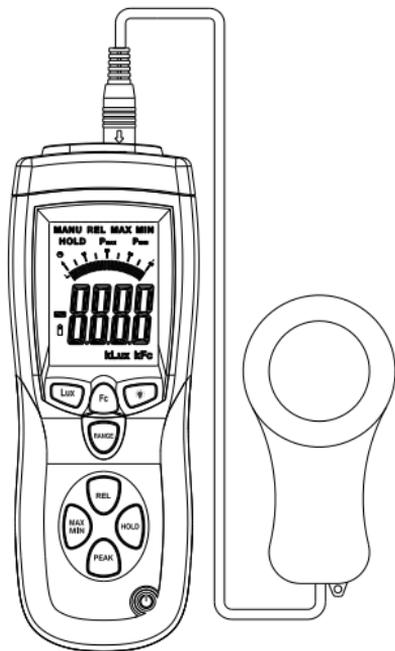


# protech



## Pro 400K Lux Meter

### With Case

QM1584

User Manual

## **I INSTRUCTION**

- The digital illuminance meter is a precision instrument used to measure illuminance (lux, footcandle) in the field.
- It is meet CIE photopic spectral response.
- It is fully cosine corrected for the angular incidence of light.
- The illuminance meter is compact, tough and easy to handle owing to its construction.
- The light sensitive component used in the meter is a very stable, long-life silicon photo diode and spectral response filter.

## **II FEATURES**

- Light-measuring levels ranging from 0.01lux~0.1klux/0.01fc~0.01kfc, repeatedly.
- High accuracy and rapid response.
- Data-hold function for holding measuring values.
- Unit and sign display for easy reading.
- Automatic zeroing.
- Meter corrected for spectral relative efficiency.
- Correction factor need not be manually calculated for

non-standard light sources.

- Short rise and fall times.
- Peak-hold function for tracing the peak signal of light pulse with least duration  $10\mu\text{s}$  and keep it.
- Capable of selecting measuring mode in lux or fc scale alternatively.
- Auto power off 30 minutes.
- Maximum and minimum measurements.
- Relative reading & Reset function.
- Easy to read large backlit display

### III SPECIFICATIONS

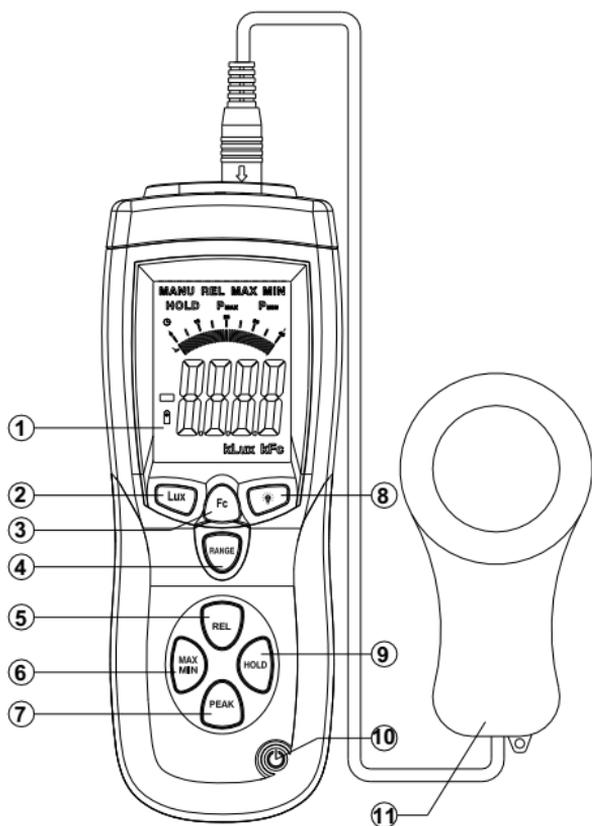
- Display :3-3/4 digit LCD with high speed 41 segment bargraph.
- Measuring Range:40.00 lux,400.0 lux,4000 lux,40.00 Klux and 400.0 Klux /40.00 fc,400.0 fc,4000 fc,40.00 Kfc.

NOTE:  $1\text{fc}=10.76\text{lux}$ ,  $1\text{Klux}=1000\text{lux}$ ,  $1\text{Kfc}=1000\text{fc}$

- Overrange Display: LCD will show "OL" symbol.
- Spectral Response: CIE Photopic. (CIE human eye response curve).
- Spectral Accuracy: CIE  $V\lambda$  function  $f_1' \cong 6\%$

- Cosine Response:  $f_2' \cong 2\%$
- Accuracy:  $\pm 5\%$  rdg  $\pm 10d.$  ( $<10,000\text{Lux}$ )  
 $\pm 10\%$  rdg  $\pm 10d.$  ( $>10,000\text{Lux}$ )
- Repeatability:  $\pm 3\%$
- Sampling Rate: **1.5 times/sec** of analog bar-graph indication; **1.5 times/sec** of digital display.
- Photo Detector: One silicon photo diode and spectral response filter.
- Operating temperature & Humidity :  
 $0^\circ\text{C}$  to  $40^\circ\text{C}$  ( $32^\circ\text{F}$  to  $104^\circ\text{F}$ ) & 0% to 80% RH.
- Storage Temperature & Humidity :  
 $-10^\circ\text{C}$  to  $50^\circ\text{C}$  ( $14^\circ\text{F}$  to  $140^\circ\text{F}$ ) & 0% to 70% RH.
- Power Source: 1 piece 9V battery.
- Photo detector Lead Length: 150cm (approx.);
- Photo detector Dimensions: 115L  $\times$  60W  $\times$  20H (mm);
- Meter Dimensions: 203L  $\times$  75W  $\times$  50H;
- Weight: 280g.
- Accessories: Carry case, instruction manual, battery.

## IV NAME OF PARTS AND POSITIONS



1. LCD Display: 3-3/4 digit displays with a maximum reading of 3999, and the indicating signs of measured values, unit function symbols and decimal points etc are display.

2. Lux key: Pressing the lux key selects taking measurement of illuminance in lux scale
3. Fc key: Pressing the fc key selects taking measurement of illuminance in footcandle scale; and, 1 footcandle= 10.76lux.
4. RANGE Selector key: It indicates 40.00 lux, 400.0 lux,4000 lux,40.00 Klux and 400.0 Klux /40.00 fc,400.0 fc,4000 fc,40.00 Kfc total 5 ranges for lux and 4 ranges for fc.
5. REL key: Relative reading control key.
6. MAX/MIN key: Maximum and minimum reading recorder control key.
7. PEAK Hold key: Peak Hold recorder control key.
8. BACK-LIGHT key: Back light control key.
9. Data-HOLD key: Data Hold control key.
10. Power Control key: The power switch key turns the illuminance meter ON or OFF.
11. Photo detector.

## **V OPERATING INSTRUCTIONS**

1. Power-up: Press the power key to turn the meter ON or OFF.

2. connect the photo detector.
3. Selecting the lux or fc scale: Set the range selection switch to desired lux or fc range.
4. Remove the photo detector cap and face it light source in a horizontal position.
5. read the illuminance nominal from the LCD display.
6. Overrange: If the instrument only displays "OL", the input signal is too strong, and a higher range should be selected.
7. Data-Hold mode: Press the hold key to select Data-Hold mode. When HOLD mode is selected, the illuminance meter stops all further measurements. Press the HOLD key again to exit Data-Hold mode. Then it resumes normal operation.
8. Peak-Hold recorder mode: Press and hold down PEAK key until display shown the "CAL" letter, then press PEAK key cycle through Pmax and Pmin recorder mode, and expose the photo detector to light pulse measuring field. Press and hold down PEAK key 2 seconds to exit PEAK recorder mode, then the meter will resume normal operation.
9. Maximum and Minimum recorder mode: Press

MAX/MIN key to cycle through Maximum(MAX) reading, Minimum(MIN) reading and current reading(MAX/MIN blink) recorder mode. Press MAX/MIN key two seconds to exit this mode.

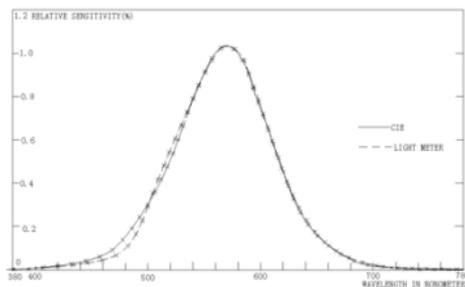
10. Relative reading mode: Press REL key to enter Relative mode. The display shown zero value and the current reading will be stored as a zero-in value. Press again to exit this mode.
11. Back-light function: Press the Backlight key to turn on. Press again to turn off.
12. When the measurement is completed, replace the photo detector cap and turn the meter off.

## **VI BATTERY CHECK-UP & REPLACEMENT**

1. As the battery power is not sufficient, LCD will display low battery, and replacement of one new battery is required.
2. After turning off the meter, disconnect the battery cover with a screwier.
3. Disconnect the battery from the instrument and replace it with a standard 9V battery and go for the cover.

## VII SPECTRAL SENSITIVITY CHARACTERISTIC

- To the detector, the applied photo diode with filters makes the spectral sensitivity characteristic almost meet C.I.E.(INTERNATIONAL COMMISSION ON ILLUMINATION) Photopic curve  $V(\lambda)$  as the following chart described.



## VIII MAINTENANCE

1. The white plastic disc on the top of the detector should be cleaned with a damp cloth when necessary.
2. Do not store the instrument where temperature or humidity is excessively high.
3. The reference level, as marker on the face plate, is the tip of the photo detector globe.
4. The calibration interval for the photo detector will vary according to operational conditions, but generally the sensitivity decreases in direct proportion to the product

of luminous intensity by the operational time. In order to maintain the basic accuracy of the instrument, periodic calibration is recommended.

## IX RECOMMENDED ILLUMINATION

1fc=10.76Lux

LOCATIONS		Lux	fc
OFFICE	Conference, Reception room	200~750	18~70
	Clerical work	700~1,500	65~140
	Typing drafting	1,000~2,000	93~186
FACTORY	Visual work at production line	300~750	28~70
	Inspection work	750~1,500	70~140
	Electronic parts assembly line	1,500~3,000	140~279
	Packing work, Entrance passage	150~300	14~28
HOTEL	Public room, Cloakroom	100~200	9~18
	Reception	200~500	18~47
	Cashier	750~1,000	70~93

STORE	Indoors Stairs Corridor	150~200	14~18
	Show window, Packing table	750~1,500	70~140
	Forefront of show window	1,500~3,000	140~279
HOSPITAL	Sickroom, Warehouse	100~200	9~18
	Medical Examination Room	300~750	28~70
	Operating room, emergency treatment	750~1,500	70~140
SCHOOL	Auditorium, Indoor Gymnasium	100~300	9~28
	Class room	200~750	18~70
	Laboratory, Library, Drafting, room	500~1,500	47~140

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