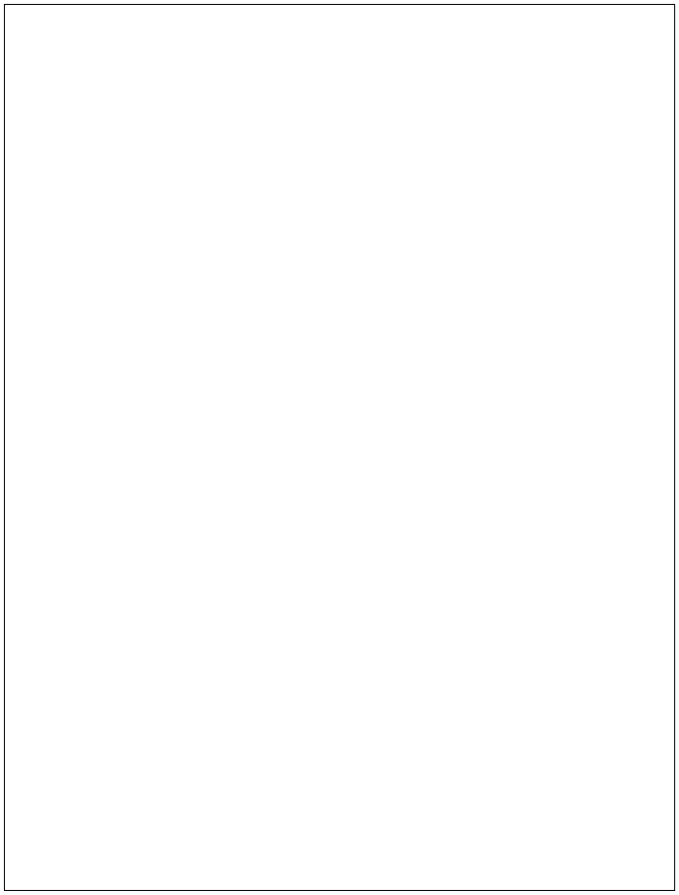
DIGITAL
LIGHT METER



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1. FEATURES

* Microprocessor circuit ensure high accuracy, and also and also provides special functions and features.
* Super large LCD display with contrast adjustment for best viewing angle.
* Dual function display.
* Heavy duty & compact case.
* Records Maximum, Minimum and Average readings.
* Data hold.
* Auto power off saves battery life.
* Operates from 9V battery.
* RS 232 PC serial interface.
* Spectrum of photo sensor meets C.I.E..
* Wide range measurement both for LUX & Foot Candle units.
* Relative % light measurement.
* User selectable lighting type (Tungsten, Fluorescent, Daylight or Mercury).
* Zero adjustment by push button.

2. SPECIFICATIONS

2-1 General Specifications

Circuit	Custom one-chip microprocessor LSI circuit.
Display	13 mm(0.5") Super large LCD display with contrast adjustment for best viewing angle.
	Dual function display.
Lighting Type Selection	Daylight, Tungsten, Fluorescent, Mercury lamp.

Measurement & ranges	LUX	0 - 50,000 LUX, 3 ranges.
	Foot-candle	0 -5,000 Ft-cd, 3 ranges.
	Relativity	0 to 1999 %. (Relative to the range selected and the measured value)
Sensor	The exclusive photo diode & color correction filter, spectrum designed to meet C. I. E.	
Memory Recall	Records Maximum, Minimum and Average readings with RECALL facilities.	
Sample Time	Approx. 0.4 sec.	
Zero Adj.	By push button.	
Power off	Manual off by push button, or Auto shut off after 10 minutes.	
Data Output	RS 232 PC serial interface.	
Over Load Indication	"- - - -"	
Operating Temperature	0 蚓 to 50 蚓(32 蚌 to 122 蚌).	
Operating Humidity	Max. 80% RH.	
Power Supply	006P DC 9V battery(heavy duty) or equivalent.	
Power Current	Approx. DC 5.3 mA.	
Weight	335 g/0.77 LB (included batteries)	
Size	Main instrument: 180 x 72 x 32 mm(7.1 x 2.8 x1.3 inch).	
	Sensor probe: 85x55x12 mm(3.2x2.2x0.5 inch).	
Accessories	Instruction manual. Sensor with protective cover.	

2-2 Electrical Specifications (23 5 蚓)

Measurement	Range	Max. In-range Display
LUX	2,000 Lux	0 - 1,999 Lux
	20,000 Lux	1,800 - 19,990 Lux
	50,000 Lux	18,000 - 50,000 Lux
Foot-candle	200 Ft-cd	0 - 186.0 Ft-cd
	2,000 Ft-cd	167 - 1,860 Ft-cd
	5,000 Ft-cd	1,670 - 5,000 Ft-cd

Range	Resolution	Accuracy
2,000 LUX	1 Lux	4 % + 2 dgt)
20,000 LUX	10 Lux	
50,000 LUX	100 Lux	
200 Ft-cd	0.1 Ft-cd	
2,000 Ft-cd	1 Ft-cd	
5,000 Ft-cd	10 Ft-cd	
Note : Accuracy tested by a standard parallel light tungsten lamp of 2856 袁 temperature.		

Measurement	Range	Resolution
Relativity	0 to 1999 %	1 %

3. FRONT PANEL DESCRIPTION

Fig. 1

3-1 Display
3-2 Power Off/On Button
3-3 Data Hold Button
3-4 LUX/FC(Ft-cd) Button
3-5 LCD Contrast Adjust
3-6 Memory "Record" Button
3-7 Memory "Call" Button
3-8 Light Source Select Button
3-9 Zero Button
3-10 % Button (Relativity)
3-11 Range Switch
3-12 Light Sensor
3-13 Sensor Cover
3-14 Light Sensor Plug
3-15 Light Sensor Input Socket
3-16 RS-232 Output
3-17 Battery Compartment/ Cover

4. MEASURING PROCEDURE

(1) Push the "Power Off/On Button"(3-2, Fig. 1) to switch the instrument on.

(2) Zero Adjust Procedures

* Cover the Light Sensor(3-12, Fig, 1) using the Sensor Cover provided (3-13, Fig. 1).
* Slide the "Range Switch"(3-11, Fig. 1) to the 2000 LUX position.
* Push the "Zero Button"(3-9, Fig. 1), then display will show zero values.
* Upon completion, remove the sensor cover.

(2) Select the desired measuring unit by pressing the "LUX/FC Button"(3-4, Fig. 1). The display will indicate the selected unit of "LUX" or "Ft-cd".

(3) Determine the lighting type (Daylight, Tungsten, Fluorescent or Mercury lamp) by pressing the "Light Source Select Button"(3-8, Fig. 1)

* The LCD will indicate the selected lighting type using the following symbols :

  L = Tungsten, F = Fluorescent

  S = Day Light, C = Mercury

(4) Select the max. range using the "Range Switch"(3-11, Fig. 1).

* If the display shows "- - - - ", it indicates an overload condition, select the next higher range.
* If the display shows "_ _ _ _ ", it indicates an out-of-range, select the next lower range.

(5) Position the Light Sensor(3-12, Fig. 1) directly under the light source.

(6) * On the 20000 LUX range, the last digit will be shown on the lower line of LCD display.

* On the 50000 LUX range, the last two digits will show on the lower line of LCD display.

* For example :

On the 20000 range, if the display sho

1562 LUX
0

that means the real display is 15620 LUX.

* Please note the digits on the lower display are multipliers only (i.e. x10 & x 100 respectively). These digits will not change, and will only inducate 0.

(7) Data Hold :

* During measurement, pushing the "Data Hold Button"(3-3, Fig. 1) will hold the display values & the LCD will show the "D.H" symbol.
* To cancel the Data Hold function, Press the Data Hold Button, once more.

(8) Relative % light measurement :

* During measurement, press the "% Button"(3-10, Fig. 1). The current measured value will be indicated as " 100 % ".
* All the subsequent measurements will be indicated as a percentage, relative to the value when the button was pressed.

The formula used is as shown below :

$$\frac{\textit{The new light values}}{\textit{The light values when the " \% " button was pressed}} \times 100$$

* To de-activated this feature, Press the "% Button" (3-10, Fig. 1) again

(9) Data Record(Max., Min., Average reading)

* The DATA RECORD function displays the maximum, minimum and average readings. To start the DATA RECORD function, press the "Record Button"(3-6, Fig. 1) once. "REC" marker will appear on the LCD display.

**** With the "REC" symbol indicated on the display***

(a) Push the "CALL Button"(3-7, Fig. 1) once, then the "Max" symbol with the maximum values recorded will appear on the LCD display.

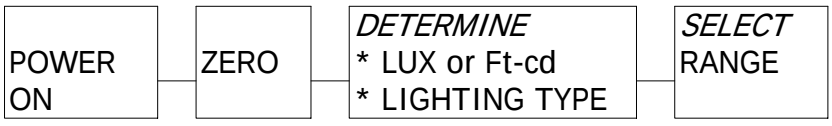
(b) Push the "CALL Button" once again, the "Min" symbol with the minimum values recorded will appear on the LCD display.

(c) Push the "CALL Button" once more, the "AVG" symbol with the average values will appear on the LCD display.

(d) To de-activate the Data Record function, Press the "Record Button" (3-6, Fig. 1) once again. All associated anunciators will disappear from the display.

(10) For quick measurement, follow the procedures shown below :

Main procedures :



Optional measuring procedures :

DATA HOLD | MEMORY RECORD (Max., Min. AVG) | RS232 OUTPUT

Power management

AUTO POWER OFF (Not activated during Memory Record Selection) or MANUAL POWER OFF under memory record function

5. ADDITIONAL FEATURES

(a) The instrument has built-in "Auto Power Shut-off" in order to prolong battery life. The meter will switch off automatically if none of the buttons are pressed within 10 min.
To de-activate this feature, Select the memory record function during measurement, by pressing the "RECORD" button(3-6, fig.1).

(b) The instrument also features the ability to adjust the contrast of the display.
This is achieved by controlling the "LCD Contrast Adjust" pot (3-5, fig. 1).

6. RS232 PC INTERFACE

The instrument features an RS232 output via 3.5 mm Terminal (3-13, Fig. 1).
The connector output is a 16 digit data stream which can be utilized to the user's specific application.

An RS232 lead with the following connection will be required to link the instrument with the PC serial input.

Meter (3.5 mm jack plug)	PC (9W 'D" Connector)
Center Pin	Pin 2
Ground/shield	Pin 5

The 16 digit data stream will be displayed in the following format :

D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0

Each digit indicate the following status :

D0	End Word		
D1 to D4	Upper Display reading, D1=LSD, D4=MSD		
D5 to D8	Lower Display reading, D5=LSD, D8=MSD		
D9	Decimal Point(DP) for Upper display. 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP		
D10	Decimal Point (DP) for lower display 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP		
D11 & D12	Anunuciator for Upper Display		
	00 =No Symbol	07 = mg/L	14 =mS
	01 =C	08 = m/s	15 =Lux
	02 =F	09 = Knots	16 =Ft-cd
	03 = %	10 = Km/h	17 =dB
	04 = % RH	11 = Ft/min	18 =mV
	05 = % PH	12 = mile/h	
	06 = % O 2	13 = uS	
D13	Anunuciator for Lower Display		
	0 = No Symbol	1 =C	2 = F
D14	Reading Polarity for the Display 0 = Both upper & lower display value are "+". 1 = Upper "-", Lower "+". 2 = Upper "+", Lower "-". 3 = Both upper & lower display value are "-".		
D15	Start Word		

7. BATTERY REPLACEMENT

(1) When the left corner of LCD display show "LBT", it is necessary to replace the battery. However, in-spec measurement may still be made for several hours after low battery indicator appears before the instrument become inaccurate.

(2) Slide the Battery Cover(3-17, Fig. 1) away from the instrument and remove the battery.

(3) Install a 9V battery(PP3 type) and replace the cover.