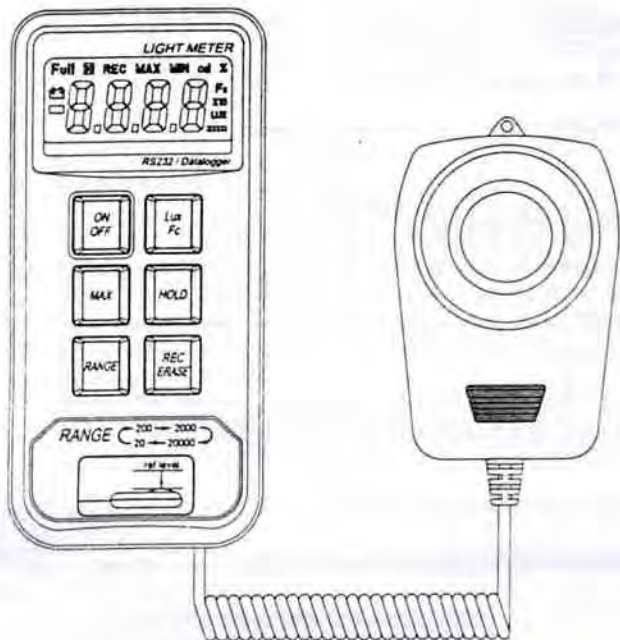


LIGHT METER

INSTRUCTION MANUAL



7). REC / ERASE :

•Record - ON. To record one set of record, press this button once, and the * REC * will be displayed.

To record data continuously, press and hold the button for 3 seconds, * REC * flash 1 time/sec in the display. Pressing the button again to stop recording.

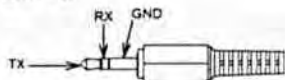
To set the sampling time of recording, refer to page 13 (figure 7).

•Reset Memory : Keep pressing and hold the button before the power is turned on. Press the ON / OFF button to turn the power on then let go the ON / OFF button. The LCD display * dEL *.

Note: * Full * displays when memory is full.

8). RS-232 Terminal.

9). ZERO : Adjust 0.0 Lux / Fc.



10). Photo Detector.


11). Tilt stand.

4.MEASUREMENT PREPARATION

1). Battery Loading

Remove the cover on the back and put in one 006p 9V Battery. (Note : Take care to observe battery polarity).

2). Battery Replacement

When the battery voltage drops below the operating voltage, mark  appears and flashes . If it appears, battery should be replaced with new one.

1.SAFETY INFORMATION

- ❑ Read the following safety information carefully before attempting to operate or service the meter.
- ❑ Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.

Environment conditions

- ① Altitude up to 2000 meters
- ② Relatively humidity 80% max.
- ③ Operation Ambient 0~40°C
- ④ Indoor use only

Maintenance & Clearing

- ① Repairs or servicing not covered in this manual should only be performed by qualified personnel.
- ② Periodically wipe the case with a dry cloth. Do not use abrasives or solvents on this instruments.

Safety symbols



Meter is protected throughout by double insulation or reinforced insulation. When servicing, use only specified replacement parts.



Comply with EMC

2.SPECIFICATIONS

- Display : 3-1/2 digit LCD.
- Measuring Range : 20, 200, 2,000 and 20,000 Lux/Fc
(20,000 Lux/Fc range reading × 10)
- Overrange Display : * OL * is displayed.

1

5.OPERATING INSTRUCTIONS

- 1).Power-up : Press the power button to turn the meter ON or OFF.
- 2).Selecting the Lux scale : Set the range selection switch to desired Lux or Fc range.(1Fc=10.76Lux)
- 3). Remove the photo detector cap and face it to light source in a horizontal position.
- 4).Read the illuminance nominal from the LCD display.
- 5).Over range : If the instrument only display * OL * the input signal is too strong, and a higher range should be selected.
- 6).If 20000 range then real value is LCD valuex 10.

6.SPECTRAL SENSITIVITY CHARACTERISTIC

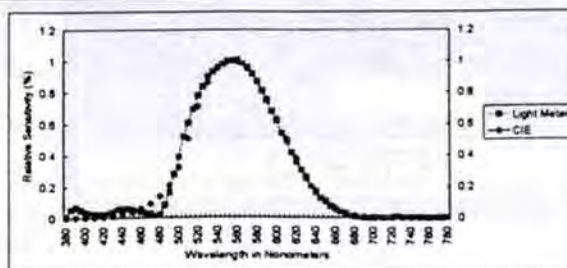


Figure-2

- Accuracy : \pm (3%rdg + 5dgt).
- Repeatability : \pm 2% .
- Temperature Characteristic : \pm 0.1% / $^{\circ}$ C.
- Measuring Rate : 2.5 time / sec.
- Photo detector : One silicon photo diode.
- Memory Capacity : 16000 records data. Utmost 255 sets of results.
- Serial Interface Baud Rate : 9600bps.
- Operating Temperature and Humidity : 0° C to 40° C (32° F to 104° F)
10 to 80% RH.
- Storage Temperature and Humidity : -10° C to 60° C (14° F to 140° F)
10 to 70% RH.
- Power Source : One 9 Volt battery, NEDA 1604 or JIS 006P or IEC6F22.
- Battery Life (typical) : 50hours (Alkaline Battery).
- Photo Detector Lead Length : 150 cm (approx.).
- Photo Detector Dimensions : 87.5Lx 60Wx 29H (mm).
- Dimensions : 146Lx 70Wx 39 (mm).
- Weight : 300g.
- Accessories : Carry case, instruction manual, battery, RS-232 cable, 9 pins to 25 pins gender charger, software for windows, screwdriver.

2

3.NAME OF PARTS AND POSITIONS

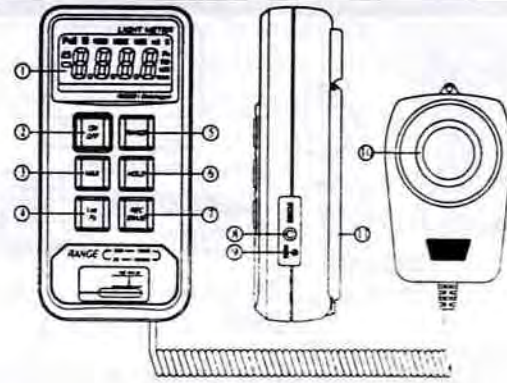



figure 1

- 1). LCD Display : 3-1/2 Digits with a maximum reading of 1999, and the indicating sign of * Lux *, * Fc *, * MAX *, * H *, Range *20,000 *, * x10 * (reading by ten), *  *, * REC *, * Full *.
- 2). Power Button : The power button turns the illuminance meter ON or OFF.
- 3). MAX Button : Pressing the button, then the maximum value will displayed and updated.
- 4). Lux / Fc Button : Press this button will change the light scale between * Lux * and * Fc *.
- 5). Range Button : Pressing the range button changes 20, 200, 2,000 and 20,000 Lux / Fc ranges, circularly.
- 6). Hold Button : Once this button is pressed, the reading will be hold on the LCD.

3

7.RECOMMENDED ILLUMINATION

You may easily obtain the desired illuminance nominal about footcandle from the product of the recommended lux, offered below in the field, divided with the factor 10.76.

| LOCATIONS | Lux |
|--------------------------------|--------------|
| • OFFICE | |
| Conference, Reception room. | 200 ~ 750 |
| Clerical work | 700 ~ 1,500 |
| Typing drafting | 1000 ~ 2,000 |
| • FACTORY | |
| Visual work at production line | 300 ~ 750 |
| Inspection work | 750 ~ 1,500 |
| Electronic parts assembly line | 1500 ~ 3,000 |
| Packing work, Entrance passage | 150 ~ 300 |
| • HOTEL | |
| Public room, Cloakroom | 100 ~ 200 |
| Reception | 200 ~ 500 |
| Cashier | 750 ~ 1000 |

6

| | |
|-------------------------------------|--------------|
| • STORE | |
| Indoors Stairs Corridor | 150 ~ 200 |
| Show window, Packing table | 750 ~ 1,500 |
| Forefront of show window | 1500 ~ 3,000 |
| • HOSPITAL | |
| Sickroom, Warehouse | 100 ~ 200 |
| Medical Examination room | 300 ~ 750 |
| Operating room | |
| Emergency Treatmet | 750 ~ 1,500 |
| • SCHOOL | |
| Auditorium, Indoor Gymnasium | 100 ~ 300 |
| Class room | 200 ~ 750 |
| Laboratory, Library, Drafting, room | 500 ~ 1,500 |

7

8. HARDWARE SETUP

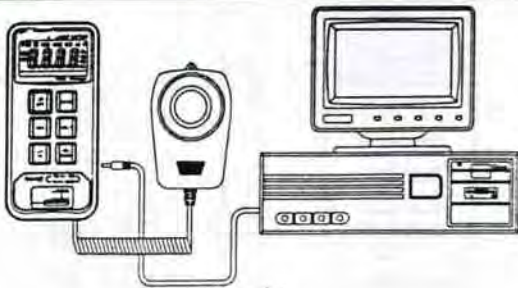


Figure-3

Connect the METER to a PC

Referring to Figure-3, connect the RS-232 plug connector to the METER, and connect the 9 pins female connector to the 9 pins COM1 of PC. If COM1 is used by mouse(usually), then connect 25 pins female connector to the 25 pins COM2 of PC (Of course, you need a 9 pins to 25 pins adapter). Most note-book computer has only one RS-232 port, COM1. But it always comes with a system mouse. So you can use 9 pins COM1 for communication.

For desktop computer, there are two RS-232 ports, COM1, and COM2. Most of the time, COM1 is used for mouse. So you have to use COM2(25 pins).

9. SOFTWARE

(1) Software and Hardware

- 386 IBM compatible personal computer or better.
- One 3.5" high density disk driver.
- Two serial port(one for mouse, the other for LIGHTMETER).
- 4M bytes of memory or better.

8

- Hard disk with at least 4M Bytes available storage space.
- EGA or VGA monitor.
- Windows 95 or higher version.
- 3-button or 2-button Microsoft compatible mouse. 486 personal computer is recommended for displaying all the windows on the screen at a fast sampling interval such as 1 second. If 386/25 PC is used, you can only open one of the LIST or GRAPHIC DISPLAY at 1 second sampling interval.

(2) Installation of the Windows Application Program

When you setup LIGHTMETER software, it will copy files necessary to your hard disk automatically. (You'd better make your windows system with 600x 480)

- install LIGHTMETER software to hard disk
 - a). Start Microsoft Windows
 - b). Close all application.
 - c). Insert disk in drive A(or B).
 - d). From the Program Manager, select File menu and choose Run.
 - e). Type a:\ setup(or b:\ setup) and press Enter key.
- Start LIGHTMETER program:
 - a). Start Windows
 - b). Use mouse or keyboard to start LIGHTMETER
- Use mouse to start LIGHTMETER :
 - a). Move mouse to LIGHTMETER program group and choose LIGHTMETER
 - b). Double click left button of mouse
- Use keyboard to start LIGHTMETER:
 - a). Hold Ctrl and press TAB to choose LIGHTMETER group and choose LIGHTMETER program
 - b). Press Enter

9

— List

| | Date | Time | Value | Unit | Range |
|----|------------|----------|-------|------|-------|
| 31 | 11-18-1998 | 11:16:29 | 7560 | Fc | 200 |
| 32 | 11-18-1998 | 11:16:31 | 8680 | Fc | 200 |
| 33 | 11-18-1998 | 11:16:33 | 9450 | Fc | 200 |
| 34 | 11-18-1998 | 11:16:35 | 9.46 | Fc | 20 |
| 35 | 11-18-1998 | 11:16:37 | 9.44 | Fc | 20 |
| 36 | 11-18-1998 | 11:16:39 | 94.4 | Fc | 200 |
| 37 | 11-18-1998 | 11:16:41 | 94.4 | Fc | 200 |
| 38 | 11-18-1998 | 11:16:43 | 94.3 | Fc | 200 |
| 39 | 11-18-1998 | 11:16:45 | 94.3 | Lux | 200 |
| 40 | 11-18-1998 | 11:16:47 | 94.3 | Lux | 200 |
| 41 | 11-18-1998 | 11:16:49 | 94.4 | Lux | 200 |
| 42 | 11-18-1998 | 11:16:51 | 94.3 | Lux | 200 |
| 43 | 11-18-1998 | 11:16:53 | 106 | Lux | 200 |
| 44 | 11-18-1998 | 11:16:55 | 106.7 | Lux | 200 |
| 45 | 11-18-1998 | 11:16:57 | 1064 | Lux | 200 |
| 46 | 11-18-1998 | 11:16:59 | 1063 | Lux | 200 |
| 47 | 11-18-1998 | 11:17:01 | 1062 | Lux | 200 |

Figure-6

Menu command

- Pause - pause the list data
- Continue - continue to list data
- Save - save list data to file
- Exit - Exit current window

11. DATA DOWNLOAD

Memory

| MEMORY | REMAINING |
|--------|-----------|
| 16.0 K | 14.4 K |

| TIME OF METER | ID CODE | SAMPLING |
|-------------------|---------|----------|
| 98-12-16 16:23:10 | 12345 | 1.0 sec |

| NUMBERS OF SETS | TIME OF RECORDING | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|----------|------|------|---|----------|----------|---|----------|----------|---|----------|----------|---|----------|----------|---|----------|----------|---|----------|----------|---|----------|----------|
| 7 | <table border="1"> <thead> <tr> <th>SET</th> <th>DATE</th> <th>TIME</th> </tr> </thead> <tbody> <tr><td>1</td><td>98-12-03</td><td>15:36:54</td></tr> <tr><td>2</td><td>98-12-03</td><td>15:37:06</td></tr> <tr><td>3</td><td>98-12-03</td><td>15:37:09</td></tr> <tr><td>4</td><td>98-12-03</td><td>15:37:13</td></tr> <tr><td>5</td><td>98-12-07</td><td>11:32:26</td></tr> <tr><td>6</td><td>98-12-07</td><td>11:32:28</td></tr> <tr><td>7</td><td>98-12-16</td><td>11:01:21</td></tr> </tbody> </table> | SET | DATE | TIME | 1 | 98-12-03 | 15:36:54 | 2 | 98-12-03 | 15:37:06 | 3 | 98-12-03 | 15:37:09 | 4 | 98-12-03 | 15:37:13 | 5 | 98-12-07 | 11:32:26 | 6 | 98-12-07 | 11:32:28 | 7 | 98-12-16 | 11:01:21 |
| SET | DATE | TIME | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 98-12-03 | 15:36:54 | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 98-12-03 | 15:37:06 | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 98-12-03 | 15:37:09 | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 98-12-03 | 15:37:13 | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 98-12-07 | 11:32:26 | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 98-12-07 | 11:32:28 | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 98-12-16 | 11:01:21 | | | | | | | | | | | | | | | | | | | | | | | |

| CHOOSE NO OF SET | NUMBERS OF REC |
|------------------|----------------|
| 7 | 1541 |

Figure-7

◆ In this sample figure, there are 7 sets recorded in memory, the NO. 7 set got 1541 records.

If you want to change ID CODE or Sampling Time, use mouse to drag, then enter or change the figures, click the button ID CODE.

Memory size: 16K

Load memory: When you want to load data from the memory of the meter you recorded previously, follow these steps.

Step1: connect your meter to PC and turn on the power, and click MEMORY.

(3) Software Communication

- a). Please check the connection between meter and computer. If there is no connection, screen will show "No COM" on the left bottom corner .
- b). No matter there is connection between meter and computer or not , under normal circumstance that the Panel will still show up.
- c). When you turn meter power off, the connection will be off.

- Save as : Click here to open a file to record data.
- Open file : Open file to read data.
- File name : When you open a file to record data, filename will display here
- Start recording : After opening a file, click it to start recording.
- Stop recording : Stop recording and close the file.

10.METER WINDOWS

Control Panel



Figure-4

- Time : Current time of computer
- Value : Current value of meter
- PC Sampling : Time interval of graph and list
- Min : The minimum value ever recorded.
- Reset : Clear minimum and maximum value recorded.
- Max : The maximum value ever recorded.

10

menu function

- Display
- Graph

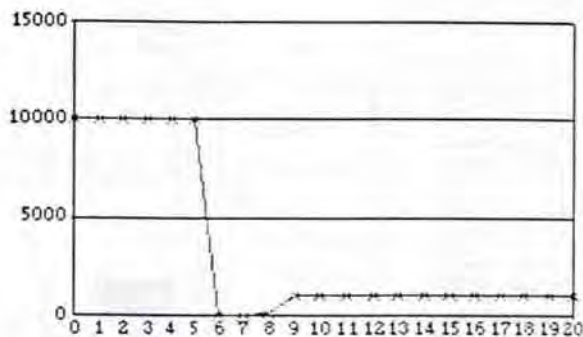


Figure-5

11

- Step2: click the button named * NUMBERS OF SETS *, then will show the amount of sets (TIMES) you recorded.
- Step3:use mouse to click the button named * TIME OF RECORDING * then will show the time of each set you recorded.
- Step4.Fill in the blank to choose the No. of set and then will show you how many records in this set.
- Step5:For more details, click the button named " SHOW DATA ",

12.MEASUREMENT OF LUMINOUS INTENSITY (cd MODE)

Lighting

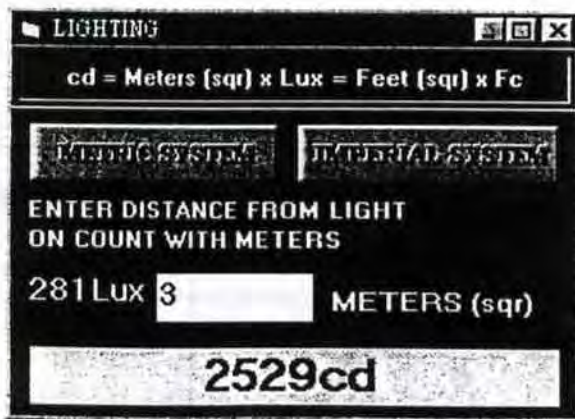


Figure-8

◆ To calculate lighting with * cd * unit, choose the button of which system you are now using then it will automatically calculate the * cd * values.