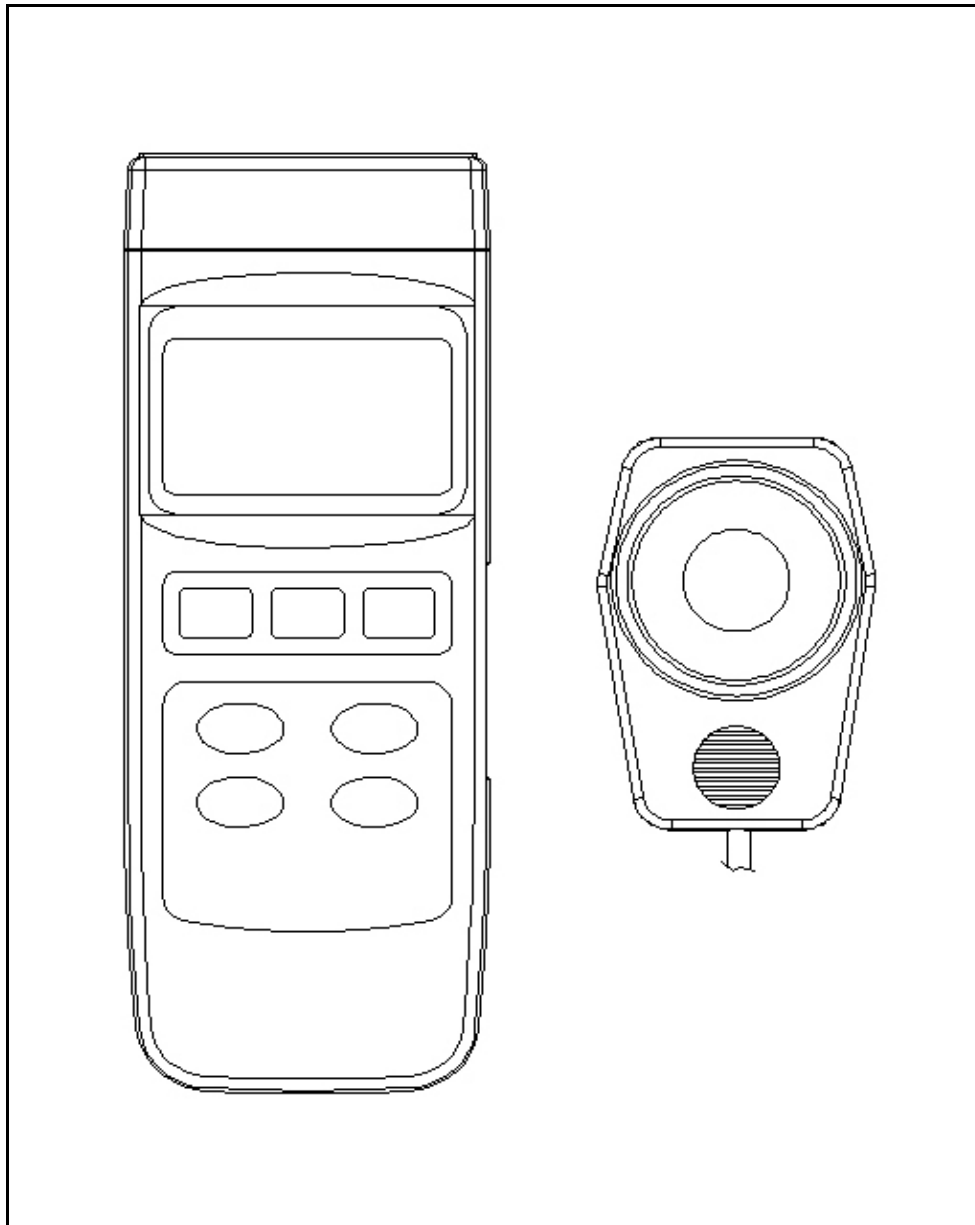*200/2,000/20,000/100,000 Lux, LUX/Feet-candle*
Real time data logger, 16000 Data logger no., RS232

LIGHT METER

Model : YK-2005LX

TABLE OF CONTENTS

1. FEATURES

* Wide range, 200/2,000/20,000/100,000 LUX.
* LUX & Foot Candle unit selection.
* Spectrum of photo sensor meets C.I.E..
* 4 kinds selection lighting type (Tungsten, Fluorescent, Sodium or Mercury light).
* Zero adjustment by push button.
* Auto range or manual range can be defaulted.
* Real time data logger, build in clock (hour-min.-sec., year-month-date).
* Auto or manual data record, 16,000 Data logger no.
* Wide sampling time adjustment range from two seconds to 8 hours 59 minutes 59 seconds.
* RS232 computer interface.
* Can default auto power off or manual power off.
* Can default the display unit to LUX or Ft-cd.
* Super large LCD display with contrast adjustment for best viewing angle.
* Data hold, record max. and min. reading.
* Microcomputer circuit provides special function & offer high accuracy.
* Power by UM3 (1.5 V) x 4 batteries or DC 9V adapter.
* RS232 PC serial interface.
* Separate probe, easy for operation of different measurement environment.

2. SPECIFICATIONS

2-1 General Specifications

Circuit	Custom one-chip of microprocessor LSI circuit.	
Display	LCD size : 58 mm x 34 mm.	
Measurement Unit	LUX, Feet candle (Ft-cd)	
Lighting Type Selection	Normal (Tungsten) light Fluorescent light Sodium light Mercury light	
Light Sensor Structure	The exclusive photo diode & color correction filter, spectrum designed to meet C. I. E.	
Zero Adj.	By push button.	
Sampling Time of Data Logger	Manual	Push the data logger button once will save data one time. *@Set the sampling time to 0 second*
	Auto	2 sec to 8 hour 59 min. 59 sec.
Data Hold	Freeze the display reading.	
Memory Recall	Maximum & Minimum value.	
Power off	Auto shut off saves battery life or manual off by push button. *@Can default auto power or manual power off.* *@When default auto power function, power will off automatically after 10 min., if no button be pressed.*	

| Sampling Time of display	Approx. 1 second.
Data Output	RS 232 PC serial interface.
Operating Temperature	0 to 50 ℃.
Operating Humidity	Less than 80% R.H.
Power Supply *main instrument*	DC 1,5 V battery (UM3) x 4 PCs, (Heavy duty type). DC 9V adapter input. @ AC/DC power adapter is optional.
Power Current	Approx. DC 19.0 mA
Weight	406 g/ 0.89 LB. @ Battery is included.
Dimension	*Main instrument :* 2000 x 762 x 368 mm *Light Sensor Probe :* 85x55x12 mm(3.2x2.2x0.5 inch).
Accessories Included	Instruction manual.....................1 PC Light sensor with protective cover...................................... 1 PC Carrying case............................1 PC
Optional Accessories	Type K thermocouple probe. AC to DC 9V adapter. RS232 cable, UPCB-02. Data Acquisition software,SW-U801-WIN. Data Logger software, SW-DL2005.

2-2 Electrical Specifications (23± 5 ℃)

Measuremen	Range	Max. In-range Display
LUX	200 LUX	0 - 199.9 LUX
	2,000 LUX	180 - 1,999 LUX
	20,000 LUX	1,800 - 19,990 LUX
	100,000 LUX	18,000 - 100,000 LUX
Feet-candle	20 Ft-cd	0 - 18.6 Ft-cd
	200 Ft-cd	16.7 - 186.0 Ft-cd
	2,000 Ft-cd	167 - 1,860 Ft-cd
	10,000 Ft-cd	1,670 - 10,000 Ft-cd

Range	Resolution	Accuracy
200 LUX	0.1 LUX	± (4 %+2 dgt)
2,000 LUX	1 LUX	
20,000 LUX (2000x10)	10 LUX	
100,000 LUX (1000x100)	100 LUX	
20 Ft-cd	0.01 Ft-cd	
200 Ft-cd	0.1 Ft-cd	
2,000 Ft-cd	1 Ft-cd	
10,000 Ft-cd (1000x10)	10 Ft-cd	
Note : Accuracy tested by a standard parallel light tungsten lamp of 2856 K degree temperature.		

@Above specification tests under the environment RF
  Field Strength less than 3 V/M & frequency less than
  30 MHz only.

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3. FRONT PANEL DESCRIPTION

3-1

3-2
3-3
3-4

3-5
3-6
3-7
3-8

3-11
3-9
3-10

3-12
3-13
3-14
3-15

3-16

5
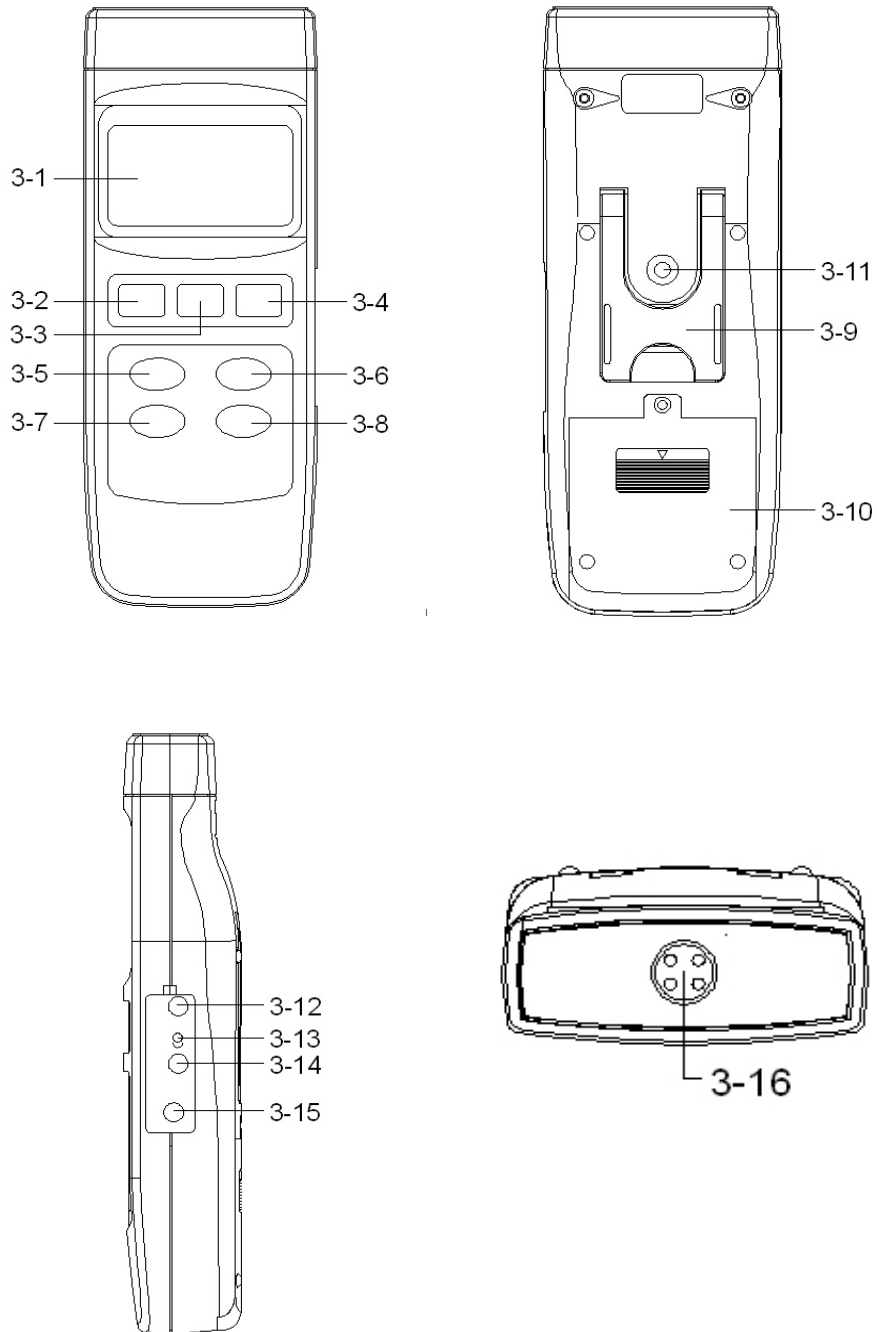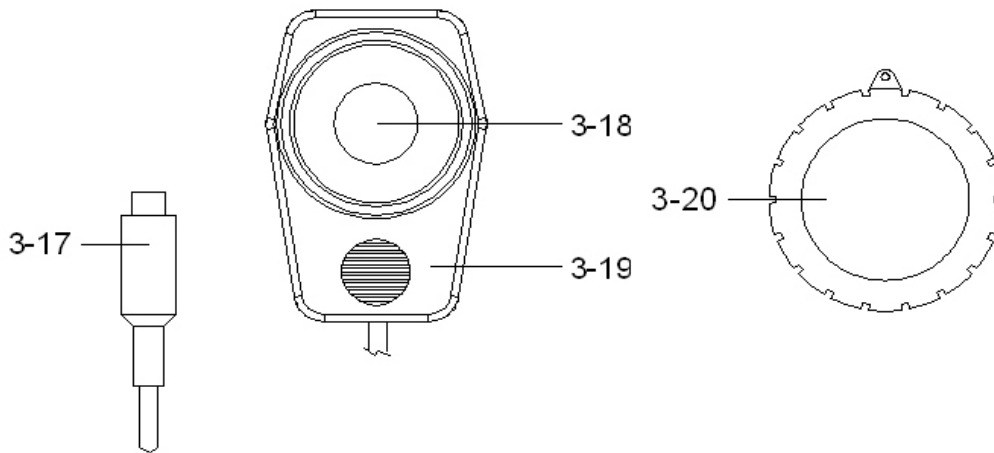
3-1   Display
3-2   Power Button
3-3   HOLD Button (ESC Button)
3-4   REC Button (Enter Button)
3-5   SOURCE/ZERO (▲ Up Button
3-6   Range Button (▼ Down Button)
3-7   Send Button (Clock Button)
3-8   SET Button (Logger Button)
3-9   Stand
3-10 Battery Compartment/Cover
3-11 Tripod Fix Nut
3-12 LCD Brightness Adjust VR
3-13 System Reset Switch
3-14 RS-232 Output Terminal
3-15 DC 9V Power Adapter Input Socket
3-16 Probe Input Socket
3-17 Probe Plug
3-18 Light Sensor
3-19 Sensor Handle
3-20 Cover of Light Sensor

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4. GENERAL MEASURING PROCEDURE

> **The meter default function are following :**
> * The display unit is LUX.
> * Auto range.
> * Auto power off.
> * The light type is Normal (Tungsten).
> * The sampling time of data logger function is 2 seconds.

4-1 Light measurement

1) Install the " Probe Plug " (3-17, Fig. 1) into the " Probe Input Socket " (3-16, Fig. 1).

2) Power on the meter by pressing the " Power Button " (3-2, Fig. 1). The display will show the " LUX " unit , at the same time the bottom display will show the light type " Normal (Tung.) ".
Now the meter is ready for make the measurement.

3) Use the fingers to hold the " Sensor Handle " (3-19), face the " Light Sensor " (3-18, Fig.1) against to the measurement light source directly. The display will show the light measurement value in LUX unit.

 * If display show x 10 (x 100) marker, then it should multiply the display value by 10 (100).

Measurement Consideration

1) Light type selection
   The light meter is calibrated under a precision
   " Standard light tungsten incandescent source of 2856 K
   degree ". Meter light type is selected is to " Normal (
   Tungsten.) " .

   *The meter default light type is Normal " Tung. "
   type. For the general application, it is not
   necessary to change the light type selection to
   any other type.*

   If intend to make precision measurements under
   a different light source from :

         MERCURY LIGHT
         FLUORESCENT LIGHT
         SODIUM LIGHT

   It can press the " Light Source Button " (3-5, Fig. 1)
   to select the desired light type , the light type name
   will present on the lower display. When set the different
   light type beyond the " Normal (Tungsten) ", the
   system will automatically multiply a minor correction
   factor to make the compensation precisely.

   **For the unknown light type, just select the light
   type to Normal (Tung.) "**

2) If intend to change the display unit from LUX to Ft-cd
   (feet candle), please refer page 15, chapter 5-6 (Unit
   Default Setting)
3) The meter is defaulted to auto range function.
   However if intend to use the meter under manual
   range, please refer page 15, chapter 5-7
   (Auto/Manual Default Setting)

   For the manual range operation, press the " RANGE
   Button " (3-6, Fig. 1) will change the range.
   * 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.

4) Zero adjustment :
   If blank the Light Sensor (3-18, Fig. 1) by " Sensor
   Cover " (3-20 , Fig. 1), the dsiplay not show zero
   value, press the " ZERO Button " (3-5, Fig. 1) display
   will show zero value. Upon completion, remove the
   sensor cover.

4-2 Data Hold

Dι Press the " Hold Button " once again will release the data
Fiς hold function.
display a " HOLD " symbol.

4-3 Data Record (Max., Min. reading)

* The data record function records the maximum and
  minimum readings. Press the " REC Button " (3-4, Fig.
* 1) once to start the Data Record function and there
  will be a " REC. " symbol on the display.

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* With the " REC. " symbol on the display :
  a) Press the " REC Button " (3-4, Fig. 1) once, the "
     REC. MAX. " symbol along with the maximum value
     will appear on the display.
     If intend to delete the maximum value, just press
     the " Hold Button " (3-3, Fig. 1) once, then the
     display will show the " REC. " symbol only & execute
     the memory function continuously.
  b) Press the " REC Button " (3-4, Fig. 1) again, the
     " REC. MIN. " symbol along with the minimum value
     will appear on the display.
     If intend to delete the minimum value, just press
     the " Hold Button " (3-3, Fig. 1) once, then
     the display will show the " REC. " symbol only &
     execute the memory function continuously.
  c) To exit the memory record function, just press the
     " REC " button for 2 seconds at least. The display will
     revert to the current reading.

4-4 Data Logger

The data logger function can save 16,000 measuring
data with the clock time (Real time data logger, build
in clock (hour-min.-sec., year-month-date).

The data logger procedures are as following :
a) If push the Logger Button " (3-8, Fig. 1) once will
   show the sampling time value on the bottom left
   display then disappeared.
b) Press the " REC Button " (3-4, Fig. 1) once to
   start the Data Record function and there will be a
   " REC. " symbol on the display.

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c) **Auto Data Logger (Sampling time set from 2 seconds to 8 hours 59 minutes 59 seconds)**

Press the " Logger Button " (3-8, Fig. 1) once to start the Auto Data Logger function, at the same the bottom right display will show the indicator " Recording.... ", now the Data Logger function is executed. The upper display will show " DATA " indicator along with " REC " marker.

d) **Manual Data Logger (Sampling time set to 0 second)**

Press the " Logger Button " (3-8, Fig. 1) once will save the data one time into the memory, at the same time the bottom right display will show the indicator " Recording.... " a while. Now the Data logger function is executed. The upper display will show " DATA " indicator along with " REC " marker.

e) **Memory full**

Under execute the data logger, if the bottom right display show the " Full ", it indicate the memory data already over 16,000 no. and the memory is full.

f) During the Data Logger function is executed, press the " Logger Button " (3-8, Fig. 1) once will stop to execute the data logger function, the " DATA " indicator will be disappeared.
If press the " Logger Button " (3-8, Fig. 1) once again will continuous the Data Logger function.

Remark :

1) If intend to change the data logger sampling time, please refer chapter 5-4.

2) If intend to know the space of balance data numbers into the memory IC, please refer chapter 5-1.

3) If intend to clear the saving data from the memory please refer chapter 5-2.

5. ADVANCED ADJUSTMENT PROCEDURES

When execute the following Advanced Adjustment Procedures should cancel the " Hold function " and the " Record function " first. The display will not show the " HOLD " and the " REC " marker.

a. Press the " SET Button " (3-8, Fig. 1) at least two seconds until the lower display show

XXXXX   Memory Space

If push the " ESC Button " (3-3, Fig. 1) will escape the selecting function and return to the normal
 * measuring display.

b. One by one to press the " Set Button " (3-8, Fig. 1)
   once a while to select the ten main function, at the
   same time lower display will show on the lower
   display will show on the lower display as :

   Memory Space
   Clear Memory
   Date/Time Set
   Sample Time
   Auto Power Off
   Temp. Unit
   Auto/Manual Set
   ESC→Finish

c. When make Advanced Adjustment Procedure
   will use the following key buttons :

   ESC Button (3-3, Fig. 1), Enter Button (3-4, Fig. 1)
   ▲ Up Button (3-5, Fig. 1), ▼ Down Button (3-6, Fig. 1)
   SET Button (3-8, Fig. 1), SEND Button (3-7, Fig. 1)

5-1 Check Memory Space

To check the balance data numbers that exist into the
memory (allow memorize data no.).

XXXXX　　　Memory Space

@ XXXXX is the balance data numbers, for example
   XXXXX=15417.

5-2 Clear Memory

* To delete the existing save data numbers from the
  memory.
* Push ENTER Button once, then push ENTER Button
  to confirm.
* Press the ESC Button once to quite and return to
  the main measurement manual.

5-3 Date/Time Setting

* Use ▲ Up Button, ▼ Down Button and
  Enter (→) Button to select the expect Date
  (year-month-date) and the time (HOUR-MIN.-SEC.).
* After finish the Date/Time adjustment,

  Push the " Enter Button " , then press the " ESC Button "
  will quite and save the clock data into the memory.

5-4 Sample Time Setting

* Use ▲ Up Button, ▼ Down Button and Enter (→)
  Button to select the expect Sample Time (HOUR-MIN.-SEC.).
* After finish the Sample Time adjustment,
  Push the " Enter Button " , then press the " ESC Button "
  will quite and save the clock data into the memory.

5-5 Auto Power Off Default Setting

* Use ▲ Up Button, ▼ Down Button to select " 1 " or
  " 0 ".

  | 1 = Auto power On. |
  | 0 = Auto power Off. |

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* After finish the Auto Power Off adjustment,
  push the " Enter Button " , then press the " ESC Button "
  will quite and return to the normal measurement
  display.

5-6 Unit Default Setting
* Use ▲ Up Button, ▼ Down Button to select the
  default unit as : LUX, Ft-cd (Feet candle)

* After finish the unit adjustment,
  push the " Enter Button " , then press the " ESC Button "
  will quite and return to the normal measurement
  display.

5-7 Auto/Manual Setting
* Use ▲ Up Button, ▼ Down Button to select " 1 " or
  " 0 ".

> **1 = Auto range**
> **0 = Manual range**

* After finish the Auto Power Off adjustment,
  push the " Enter Button " , then press the " ESC Button "
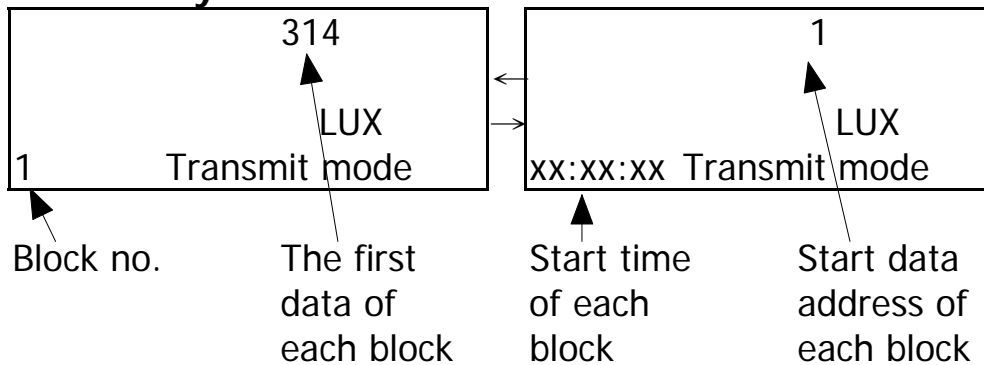 will quite and return to the normal measurement

5-8 Escape from the SETTING function
Press the " ESC Button " once a while will quite and
return to the normal measurement display.

6. HOW TO SEND THE DATA OUT FROM THE METER

1) If intend to send the data out from the meter, it should cancel the " Hold function " and the " Record function " first. The display will not show the " HOLD " and the " REC " marker.

2) Press the " SEND Button " (3-7, Fig. 1) at least 2 seconds until the bottom right display show " Transmit mode ", then release the button.

LCD display will show the fowling screen alternately.

314	1
▲	▲
LUX	LUX
1 Transmit mode	xx:xx:xx Transmit mode

Block no.   The first   Start time   Start data
              data of   of each   address of
              each block   block   each block

Use ▲ Up Button, ▼ Down Button to select the different data memory block no. (1 to 250).

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**The meter can save 16,000 data max. , those
data will saved into 250 memory block max.**

 * The data that save into one routine Data Logger
   procedures (Push " REC " button , following push
   the " Logger " button to save the data, the display
   will show the " REC " and " DATA " . After save the
   data push the " Logger " button, following push
   the " REC " button, will exist the Data Logger
   function. The " REC " and " DATA " indicator of LCD
   will be disappeared). Please refer Chapter 4-6,
   page 12.

Block 1	Data 1
	to
	Data X

↓

Block 2	Data X+1
	to
	Data Y

↓

………………
………………

↓

Block 250	Data Z
	to
	Data 16,000
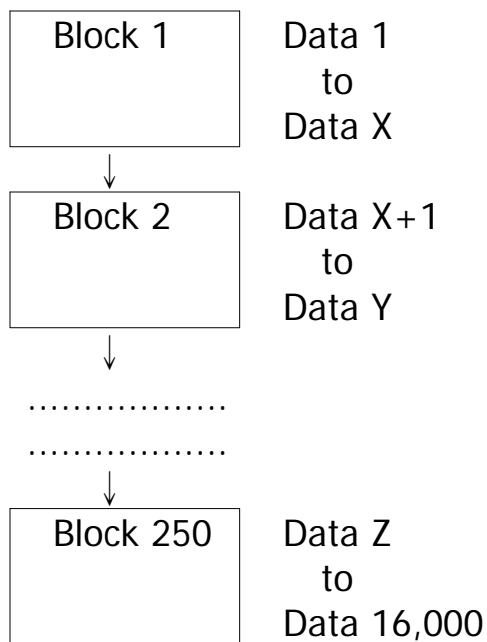
3) Until the desired Memory Block no. be selected.
Push the " Send Button " (3-7, Fig. 1) once, the
data in the Memory Block will send out.
During the data send out, the bottom right display will
show the " Sending Data ! " indicator. When data
already send out completely, the bottom right display
will show the Transmit mode " indicator again.

5) Push the " ESC Button " (3-3, Fig. 1) will exist
the data sending function and return to the normal
display.

Remarks :
@If intend up load the data to the computer,
then should connect the RS232 cable
(optional, model : UPCB-02) and apply the
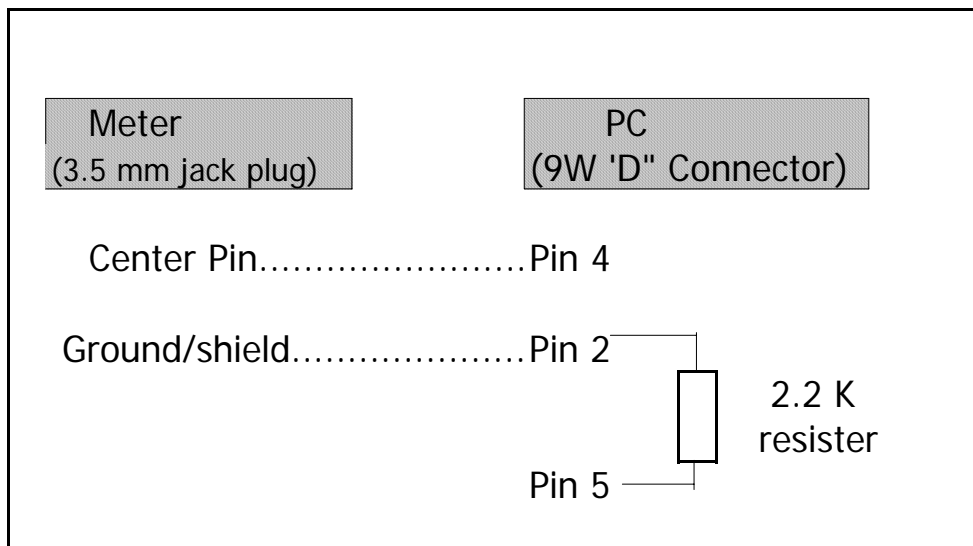*Data Logger software (optional, Model :*
SW-DL2005).
@When sending the data, each time just can
send one Memory Block data out. for example
block 1 data, block 2 data... or block 250 data.

7. RS232 PC SERIAL INTERFACE

The instrument has RS232 PC serial interface via a 3.5 mm terminal (3-14, Fig. 1).

The data output is a 16 digit stream which can be utilized for user's specific application.
A RS232 lead with the following connection will be required to link the instrument with the PC serial port.

Meter	PC
(3.5 mm jack plug)	(9W 'D" Connector)

Center Pin........................Pin 4

Ground/shield....................Pin 2

Pin 5

2.2 K resister

The 16 digits 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 indicates the following status :

D0	End Word = 0D

D1 & D8	Display reading, D1 = LSD, D8 = MSD
	For example :
	   If the display reading is 1234, then D8 to
	   D1 is : 00001234

D9	Decimal Point(DP), position from right to the left 0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP
D10	Polarity 0 = Positive 1 = Negative
D11 & D12	Annunciator for Display <table><tr><td>LUX = 15</td><td>Ft-cd = 16</td><td></td></tr></table>
D13	When send the upper display data = 1 When send the lower display data = 2
D14	4
D15	Start Word = 02

RS232 setting

Baud rate	9600
Parity	No parity
Data bit no.	8 Data bits
Stop bit	1 Stop bit

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8. BATTERY REPLACEMENT

1) When the left corner of LCD display show "　　　", it
   is necessary to replace the batteries (UM3/1.5 V x 4 PCs).

2) Slide the " Battery Cover " (3-7, Fig. 1) away from the
   instrument and remove the battery.
3) Replace with batteries (UM3/1.5 V x 4 PCs)
   and reinstate the cover.
4) Make sure the battery cover is secured after changing
   the battery.

9. SYSTEM RESET

If the meter happen the troubles such as :

   *CPU system is garbled (for example, the key button can
   not be operated.....).*

Then make the system RESET will fix the problem.
The system RESET procedures will be either following
method :

**During the Power On, used a pin tool to push
the " System Reset Switch " (3-13, Fig. 1) once**

10. OPTIONAL ACCESSORIES

RS232 cable UPCB-02	* Isolated RS232 cable. * Used to connect the meter to the computer
Data Logger software SW-DL2005	* Software the used to download the data logger (data recorder) from the meter to computer.
Data Acquisition software SW-U801WIN	* The SW-U801-WIN is a multi displays (1/2/4/6/8 displays) powerful application software, provides the functions of data logging system, text display, angular display, chart display, data recorder high/low limit, data query, text report, chart report.. .xxx.mdb data file can be retrieved for EXCEL, ACESS.., wide intelligent applications.

11. SPECTRUM of LIGHT SENSOR

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