

DIGITAL LUXMETER

CANA-0010

INSTRUCTION MANUAL

TOKYO PHOTOELECTRIC CO., LTD.

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Overview

Thank you for purchasing the digital lux meter.

This user's manual primarily explains the handling precautions and basic operations of the digital lux meter.

To ensure correct use, please read this manual thoroughly before beginning operation.

The **CANA-0010** is light and small, enabling Lx measurements with the light detector with a liquid crystal display(LCD) for ease of reading.

The features newly available from this model are data-hold function, timer hold function, automatic power-off function, RS232C serial communication.

After reading this manual, keep it in a safe place.

Notes:

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functionality. The figures given in this manual may differ from the actual screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest Tokyo Photoelectric Co.,Ltd. (Tokyokoden K.K.) dealer.

Trademarks

- In this manual, the ® and TM symbols do not accompany their respective registered trademark or trademark names.
- Other company and product names are registered trademarks or trademarks of their respective companies.

Safety Precautions

The general safety precautions described herein must be observed during all phases of operation. If the instrument is used in a manner not specified in this manual, the protection provided by the instrument may be impaired. Tokyo Photoelectric Co.,Ltd. assumes no liability for the customer's failure to comply with these requirements.

Conventions Used in This Manual

Notes and Cautions

The notes and cautions in this manual are categorized using the following symbols. Improper handling or use can lead to injury to the user or damage to the instrument.



This symbol appears on the instrument to indicate that the user must refer to the user's manual for special instructions.

WARNING Calls attention to actions or conditions that could cause serious or fatal injury to the user, and precautions that can be taken to prevent such occurrences.

CAUTION Calls attention to actions or conditions that could cause light injury to the user, or cause damage to the instrument or user's data, and precautions that can be taken to prevent such occurrences.

Note : Calls attention to information that is important for the proper operation of the instrument.

**Make sure to comply with the precautions below.
Not complying might result injury or death.**

WARNING

Use the instrument Only for Its Intended Purpose

The lux meter is for measuring illuminances.
Do not use this meter for any other purpose.

Check the Physical Appearance

Do not use the meter if there is a problem with its physical appearance.

Do Not Disassemble

Only qualified Tokyo Photoelectric Co.,Ltd. personnel may disassemble this product.

Do Not Operate in an Explosive Atmosphere

Do not use this meter in the presence of flammable gases or vapors. Doing so is extremely dangerous.

CAUTION

- The meter is for domestic use (Class B) and meets the electromagnetic compatibility requirements.
- Do not drop the meter or strike it against hard objects.
- Avoid storing the meter in direct sunlight or in a humid environment.
- Using the meter in an low-temperature environment (–10°C to 0°C) may slow down the display's response.
- Avoid using the meter in a dirty or dusty environment or in an environment with salt or corrosive gases.
- Do not wipe the meter with organic solvents.
Dirt or dust adhering to the light-detecting surface of the meter decreases measurement accuracy.
Wipe the surface clean with a soft, dry cloth.
- Do not wet. The meter is not water proof.

Before Use

Checking the Contents of the Package

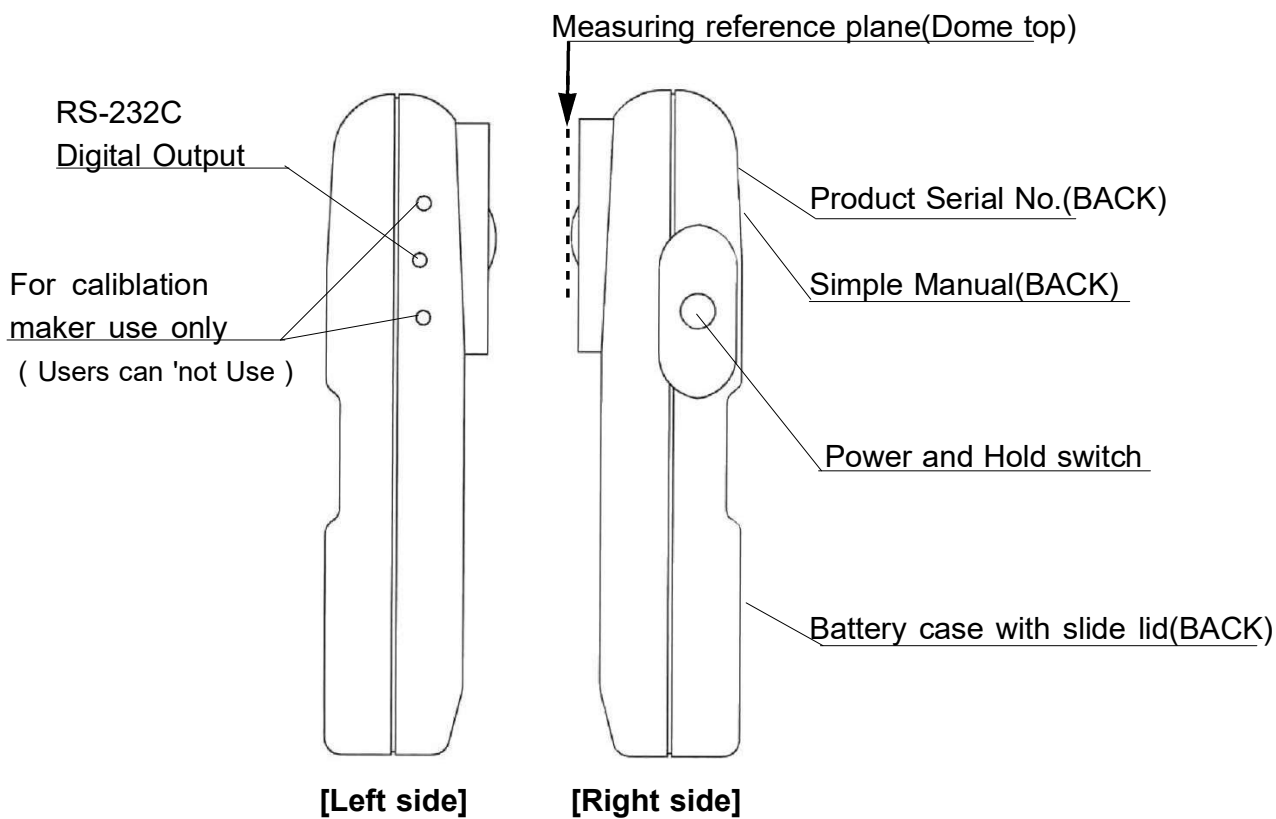
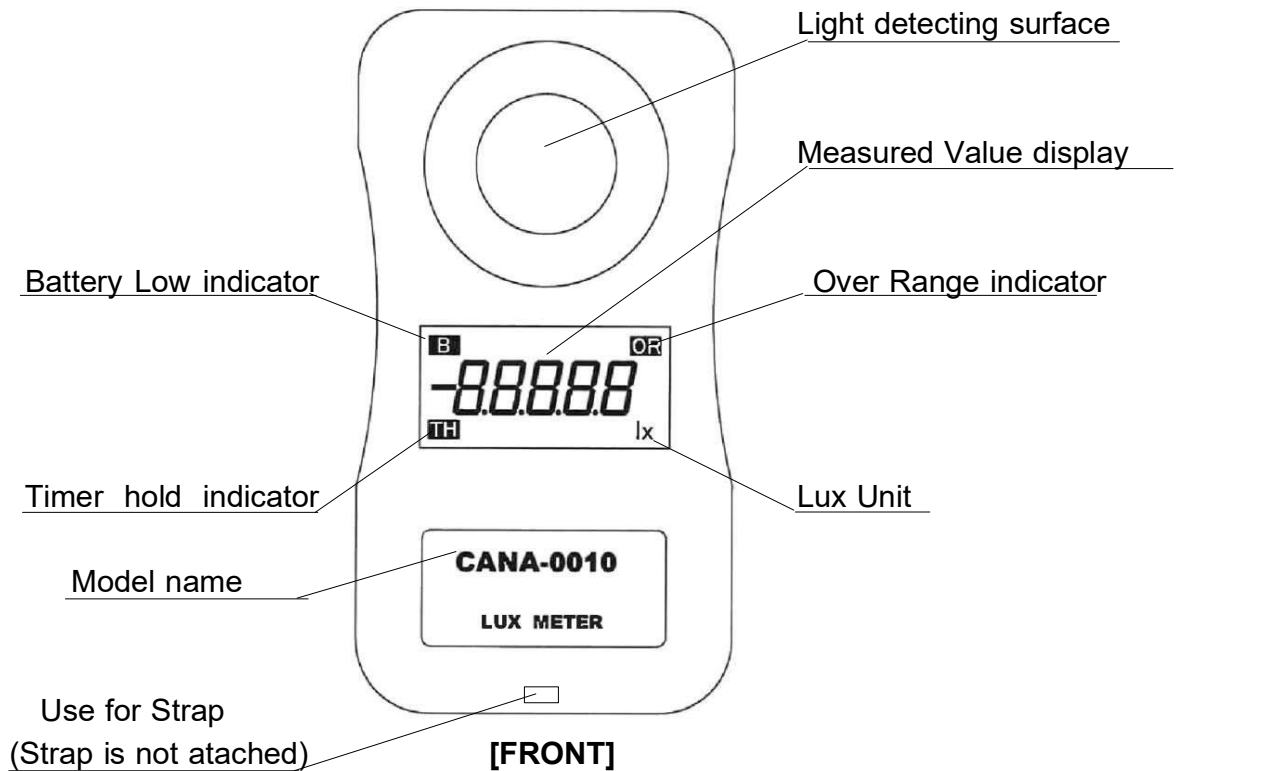
Unpack the box and check the contents before operating the instrument. If the wrong items have been delivered, if items are missing, or if there is a problem with the appearance of the items, contact your nearest Tokyo Photoelectric Co.,Ltd. (Tokyokoden K.K.) dealer.

Standard Accessories

AAA-size alkaline batteries	2
Soft-sided case	1
User's Manual (Japanese or English)	1

* AAA-size alkaline batteries for accessories are for checking of equipment.

1 . Component Names and Functions



[Front]

Light detecting surface

Measured Lux that received light at this plane.

Measured Value display

Display measured Lux value

Over Range indicator

When a measured value is beyond 40000Lx, this mark is blinking.
and shows it is out of a measurement range.

Unit display

displayunit is lx(Lux).

Blinking means continuous Measurement.

and Lights means that indicate value is hold value.

Battery Low indicator

Lights when the battery voltage is low.

Timer hold indicator

Blinking is in hold timer action and Lighting indicate value is hold value.

Use for Strap

Strap is not attached.

please attach your strap or a commercial selling.

[Right side]

Measuring reference plane(Dome top)

This instrumens calibrete at Measuring reference plane(Dome top).

Power and Hold switch

This switch use for Power on, Data hold, Timer hold,
return to measure and Power off

* First push Power on and act continuous Measurement.

* When Power is on,

Short time push again activate value hold.

Long time push again(about 3second) activate Timer hold.

* When Measured Value display indicate hold value ,

Push return to continuously Measurement.

[Left side]

RS-232C Digital Output

Digital Output for RS232C

connect to the Data cable sold separately.

For calibration maker use only

Ther are for maker calibration. User cannot use them.

[Back]

Product Serial No.

Product serial number printed here.

Simple Manual

Simple use manual printed.

Battery case with slide lid

Two AAA size battery is stored.

For battery exchange lid is lightly pushed and pulled down.

2 . Measurement

2.1 [Before Operation]

Checking and Replacing Batteries if need.

Replace the battery when **B** appears in the display area to indicate battery exhaustion, or when nothing is displayed even if you push the right side button.

In replacement, make sure the polarity(+ , -)connection is accurate .
Use two AAA type 1.5V alkaline dry cell battely.

2.2 [Measurement]

Turning the Power On, and starting continuously measurement

Push right side button for an instant.

Display will appear and continuously Lux measurement will be starting.
you can read Lux value in continuously.

* If measured value exceed 39999 lx, then **OR** indicator will blinking.

Turning the value hold

Push right side button again for an instant.

Display will fix measurement value.

Return to measurement

Push right side button again for an instant.

Display will return to continuously measurement.

Turning the timer value hold

The timer hold function makes measurements (holds the value) after the specified time elapses.

If where you are or what you are wearing is going to affect the measurement, you must move away from the meter. This function enables you to set the time needed for you to move away from the meter so that you can make accurate measurements.

In continuously Lux measurement, Push right side button again for a while(about 3seconds). **TH** is light and Display will turn [111111]brinking. That's means going Timer Hold. After 10seconds, Measured value will be fixed and hold.

Turning the Power Off,

Push right side button again for a while(over 6seconds), then power will be off.

(when it's in hold mode, power will be off more shortly.)

Automatic Power Off

The meter has an automatic power-off function to prevent unnecessary battery usage when you forget to turn off the power.

If there is no key activity for about 5 minutes, the meter automatically turns off.

Pressing side key while the meter is beeping extends the time until the power turns off for another 5 minutes.

The automatic power-off function is disabled while the RS232C a plug is inserted in the RS232C output connector function is being executed.

3. Communication Functions

3.1 Cable Connection and Interface Specifications

You can send measured values for a PC through RS232C digital communication output.

If you want to use USB communication port on a PC, Please buy both our RS232C connection cable (We sold separately) and RS232C to USB conversion cable(sold commercial) together.

For serial communication via a virtual COM port on PC, Please obey the instructions of the instruction manual of the conversion cable.

Communication settings

Baud rate: 9600 bps

Parity: None

Stop bits: 1 bits

Data length: 8 bits

Handshaking: None

Received delimiter: Cr Lf

Transmitted delimiter: Cr Lf

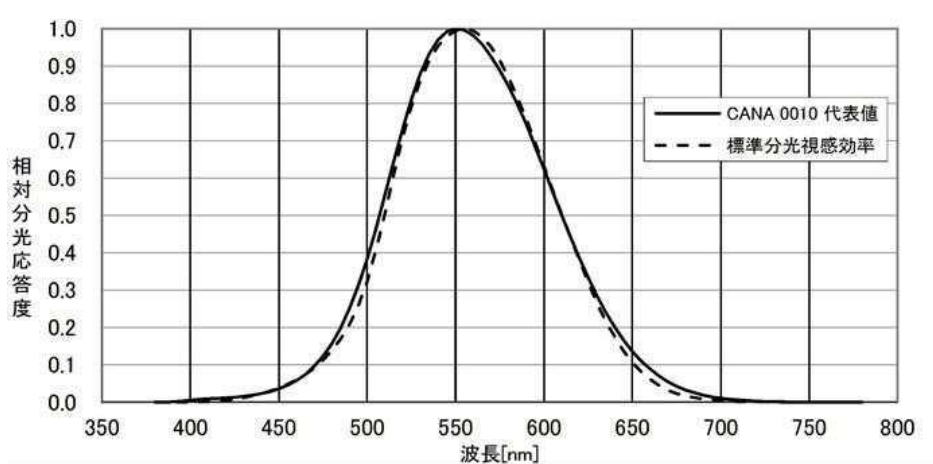
3.2 List of Commands

- 1] Data send request : 'Q',Cr,Lf
answer from PC : a a a a a . a , Cr, Lf [in every second]
[a : ASCII numeric]
- 2] Data send stop request : 'E',Cr,Lf
- 3] Request of stop [Auto Power Off] function : 'A','X',Cr,Lf
- 4] Request of act [Auto Power Off] function : 'A','O',Cr,Lf

These commands ignored at force power off by side switch

4. Characteristics of Relative Visible-Spectrum Response

The visible spectrum of light for human beings is from approximately 360nm to 830nm. Even within this narrow range, the sensitivity to light varies greatly depending on the wavelength. This phenomenon is called the standard spectral luminous efficiency and is indicated by $V(\lambda)$. The characteristics of relative visible-spectrum response of lux meters play an important role in illuminance measurement. It is important to approximate the relative visible-spectrum response to $V(\lambda)$. These characteristics are stipulated in engineering standards (JIS C1609-2006) for certified lux meters. The relative spectral response of an illuminance meter $S(\lambda)$ is measured at 5-nm intervals for 95 wavelengths to calculate the deviation ($f1'$) from $V(\lambda)$. This method of evaluation is based on the performance evaluation of the Commission Internationale de l'Eclairage (International Commission on Illumination; CIE). There are various light sources such as white light, fluorescent lamps, and mercury lamps, and LED lamps on the market. Normally, the relative spectral response of a lux meter is slightly off from $V(\lambda)$. So when a light source with a different spectral distribution than the source that was used to calibrate the lux meter is measured, the readings will be slightly off. The color correction factor is used to correct this error. To make accurate measurements, we recommend that you correct the readings by multiplying the color correction factor of the light source under measurement. The following figure shows the characteristics of the relative spectral response.



5. Characteristic of Oblique Incident Light

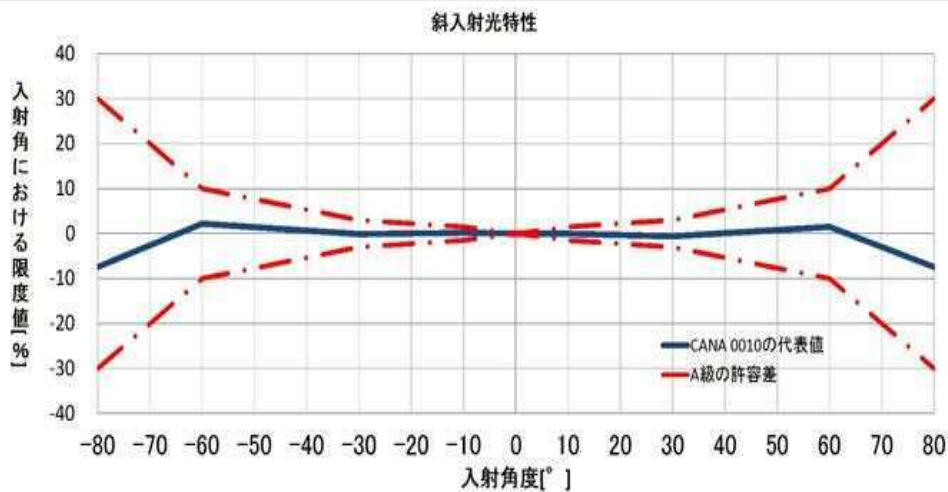
When reading a book at night, the brightness differs between reading under a light and reading a little farther from the light. In such a case, you probably noticed that the book was easier to read when you faced the book toward the light.

If the angle between the incident light and the line perpendicular to the illuminated surface is defined to be θ , the illuminance of the surface is proportional to $\cos \theta$.

This characteristic is standardized.

If the lux meter does not meet the standard, illuminance of oblique incident light cannot be measured accurately.

The following figure shows the characteristic of oblique incident light.



6 . Specifications

JIS_Class : Conforms to Class A of JIS C 1 6 0 9 - 1 : 2 0 0 6

Photoelectric element : Silicon photodiode

Display : 6 -digit liquid crystal display (LCD) with unit displays
Maxmum: 3 9 9 9 9 lx

(When under 1 0 0 0 lx with hold: 9 9 9 . 9)

Overrange display: [O R]

Low battery voltage display: [B]

Timer hold display [T H]

Measurement cicle : 2times/s

Automatic power-off:

When the RS232C output plug is inserted approx. 5minutes
after the last key activity.

Can be disabled by inserting of RS232C plug or sending command.

Disital output : mini stereo jack can be used for Rs232C digital output.
(Rs232C connection cable sold separately)

For USB this need bouth our RS232C connection cable and
RS232C to USB conversion cable(sold commercial) together.

Operating temperature and humidity :

-10°C ~ 40°C、 80% RH or less (no condensation)

Storage temperature and humidity:

-25°C ~ 70°C、 5 to 95% RH (no condensation)

Power supply : Two AAA dry cells

(Ni-MH rechargeable battery can be used)
or power supply units (Sold separately)

Battery life: : Approx. 50 h (when using alkaline dry cells)

Input rating : Approx. 2.5v to 5v DC \pm 5% (0.5 W)

Dimensions : Approx. 6 1 (W) \times 1 1 5 (H) \times 2 9 (D)mm

Weight : Approx. 1 0 0 g(including batteries)

Sold separately option :

* Rs232C connection cable

* power supply units for 100V AC or for USB power supply

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