USER GUIDE

TR-74Ui-S

T&D

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Illuminance UV Recorder
TR-74Ui / TR-74Ui-S

Introductory Manual

Thank you for purchasing our product.
Carefully read this instruction manual before using this Unit.

This "Introductory Manual" explains in a simple manner how to set up the TR-74Ui and some of its basic operations. For details about the functions and features of the software "Illuminance UV Recorder for Windows" and how to use them, please refer to the "Operation Guide (Help)" included in the software.

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Software User Agreement

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This device complies with Part 15 of the Federal Communications Commission (FCC) rules. Operation is subject to the following two conditions: (1)This device may not cause harmful interference, and (2)this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:
TandD US, LLC
Santa Fe, New Mexico
https://tandd.com/

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Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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Basic Procedures

The following outline shows the basic procedures for getting ready, making settings and using the product.

1. Getting Ready (provided in this manual)

1. Install the software "Illuminance UV Recorder for Windows" and "T&D Graph"
2. Get the TR-74Ui ready to use
3. Install the USB device driver and confirm its operation

NOTE:

Only the first procedure “Getting Ready" is covered in this Introductory Manual.

2. Making the TR-74Ui Unit Settings (using the software) and Starting Recording

1. Make Settings for Device Names, Recording Intervals and Recording Modes
2. Start Recording

3. Downloading Data and Displaying Graphs

1. Connect the TR-74Ui with a USB cable to a computer
2. Download Data via Software
3. Display Graphs via Software

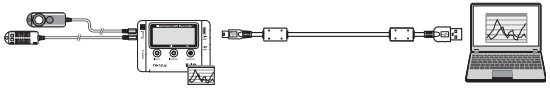
NOTE:

Details about "Making TR-74Ui Unit Settings" and "Downloading Data" (the second and third processes) are in the "Operation Guide (Help)" in the software. Please make sure to refer to the "Operation Guide (Help)" for all details about how to use the software.

What is TR-74Ui Illuminance UV Recorder?

The TR-74Ui Illuminance UV Recorder is a data logger designed to simultaneously measure and record Illuminance, UV Light, Temperature and Humidity. Storage capacity is up to 8000 readings (one reading is a set of data which includes Illuminance, UV Light, Temperature, and Humidity measurements), and it is also capable of displaying Cumulative Illuminance and Cumulative Amount of UV Light in the LCD display. The data recorded into the TR-74Ui Units can then be downloaded quickly to your computer whereby with our exclusive software you can process the data into graphs, tables, and/or print it out to help you analyze that data.

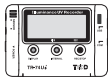
For downloading recorded data, connect a TR-74Ui Unit directly to your computer with a USB cable.



Package Contents

The following items are included in the package:

TR-74Ui



Illuminance UV Recorder
TR-74Ui

Illuminance-UV Sensor
ISA-3151
(cable length: 1.5 m)

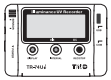
Temperature-Humidity Sensor
THA-3151
(cable length: 1.5 m)

AA Alkaline
Battery

USB Communication Cable
US-15C
(cable length: 1.5 m)

Manual Set
(Warranty Included)

TR-74Ui-S

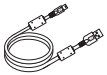


Illuminance UV Recorder TR-74Ui

Illuminance-UV Sensor
ISA-3151
(cable length: 1.5 m)

Temperature-Humidity Sensor
SHA-3151 (High-Precision Type)
(cable length: 1.5 m)

AA Alkaline
Battery

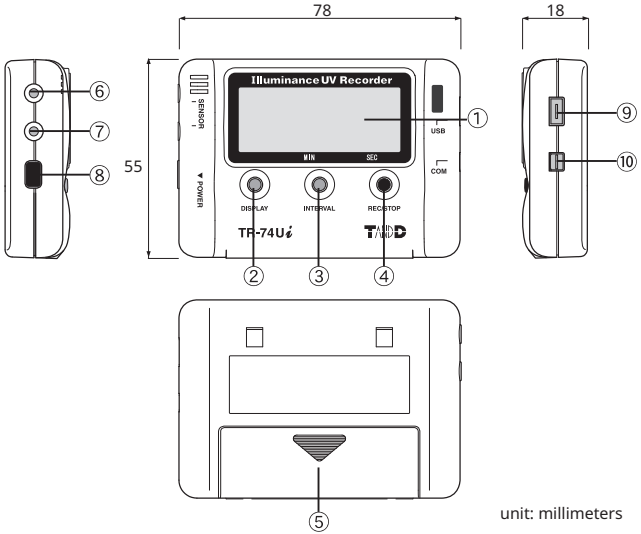


USB Communication Cable
US-15C
(cable length: 1.5 m)

Manual Set
(Warranty Included)

TR-74Ui Appearance Diagram and Part Names

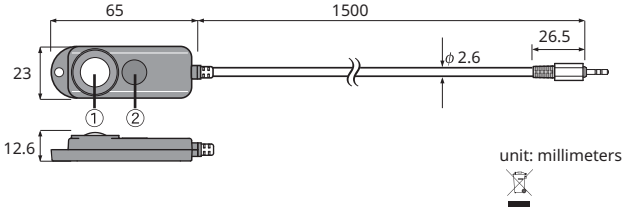
Main Unit



unit: millimeters

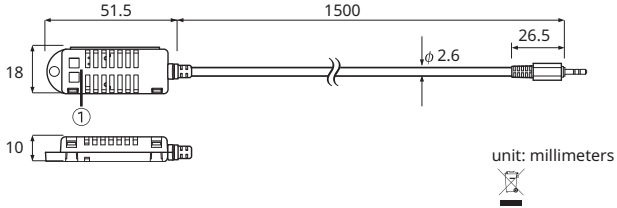
① LCD Display
② DISPLAY Button: Pressing this button will change the LCD Display Pattern.
③ INTERVAL Button: Pressing this button will make it possible to make or change Recording Interval settings.
④ REC/STOP Button: Pressing this button will Start or Stop Recording.
⑤ Battery Cover
⑥ Sensor Jack
⑦ Sensor Jack
⑧ POWER Button
⑨ USB Connector (Mini-B)
⑩ Serial Connector

Illuminance-UV Sensor (ISA-3151)



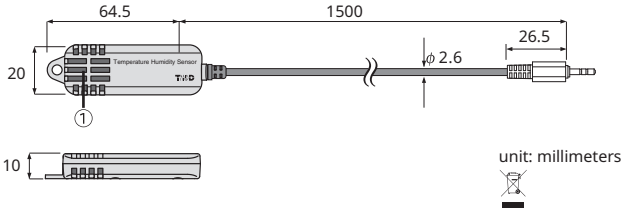
① Illuminance Sensor Area ② Ultraviolet Sensor Area

Temperature-Humidity Sensor (THA-3151)



① Temperature-Humidity Sensor Area

Temperature-Humidity Sensor (SHA-3151)



① Temperature-Humidity Sensor Area

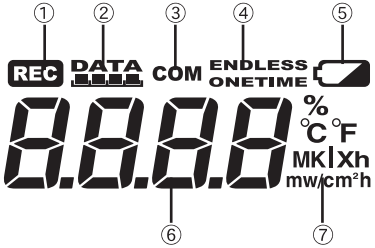
⚠ Cautions about using the Illuminance-UV Sensors

- Do not connect the ISA-3151 sensor to any data logger other than the TR-74Ui.
- Use the sensor within the operating environment specifications.
- When measuring ultraviolet light or other light which may cause damage or injury to your eyes or skin make sure to use protection such as safety glasses or some type of light-proof shield.
- Do not expose the sensor to a strong impact. Cracks or scratches in the Illuminance sensor and/or in the UV sensor will adversely affect the measurement accuracy. Also, a broken sensor may result in injury.
- This sensor is not waterproof. By all means do not allow it to get wet.
- Do not use in any environment that is exposed to corrosive gas and organic solvents. Also, do not use in areas near fire or exposed to excessive heat.
- When the Illuminance-UV sensor is not being used, please store it in a place with a normal temperature and without condensation.
- If the sensor surface gets dirty, wipe it with a soft cloth. If the sensor surface accumulates impurities (dirt), it will cause a decrease in the sensor's accuracy and sensitivity.
- If you wish to extend the length of the sensor cable, please purchase our optional sensor extension cable separately.
- "Adjustment Settings" made in the software are saved to the sensor. Therefore, when a sensor is replaced, it is necessary to re-make any desired adjustment settings before using the new sensor.

⚠ Cautions about using the Temperature-Humidity Sensors

- Use the sensor within the operating environment specifications.
- If extremely severe temperature changes occur, the humidity measurements may appear abnormal. Once the sensor's temperature becomes stable, the measurements will return to normal.
- This sensor is not waterproof. Only use in an environment where there is no condensation or possibility of becoming wet. Do not use in water or near areas where high-pressure water is flowing.
- Do not expose to condensation, dampness, corrosive gases, or organic solvents.
- When using the THA-3151 or THA-3001 (option) in an environment where the humidity is under 30%RH, the measurements may sometimes fluctuate. This is not abnormal.
- When the sensor is not to be used for a long period of time, please store it at normal temperature and humidity.
- Continued use may cause a decrease in the sensor's accuracy and sensitivity even under normal operational conditions. If the sensor is being used in a bad environment (smoky or dusty places) it may be necessary to change the sensor sooner.
- If you wish to extend the length of the sensor cable, please purchase our optional sensor extension cable.
- "Adjustment Settings" made in the software are saved to the sensor. Therefore, when a sensor is replaced, it is necessary to re-make any desired adjustment settings before using the new sensor.

Reading the LCD Display



①	Recording Mark	The recording status will appear. ON: Recording in progress. BLINKING: Waiting for programmed start. OFF: Recording has been stopped.
②	Data Capacity Scale	After every 2,000 readings the scale will be marked from left to right. Storage capacity is 8000 readings.
③	COM Mark	Normally, this mark will not be displayed. When a Unit is connected to the computer with a USB communication cable, this will appear. Also, this mark will blink rapidly when a Unit is in communication with the computer via USB communication.
④	Recording Mode	ENDLESS: Upon reaching storage capacity of 8000 readings, the oldest data is overwritten and recording continues. ONETIME: Upon reaching storage capacity of 8000 readings, recording will automatically stop.
⑤	Battery Life Warning Signal	If there is ample battery power, this will not appear. When it is time for the battery to be replaced, this signal will appear. (See page 13)
⑥	Current Readings and Messages Area	Normally, the current readings will appear. Depending on the Unit's status, operational messages will be displayed. (See page 9)
⑦	Unit of Measurement	%: Humidity °C / °F: Temperature lx, klx: Illuminance lxh, klxh, Mlxh: Cumulative Illuminance mW/cm²: UV Intensity mW/cm²h, W/cm²h: Cumulative Amount of Ultraviolet Light

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Main Display Messages

The following are the main display messages that appear on the LCD display.

FULL (Storage Capacity FULL)

Upon reaching storage capacity of 8000 readings, "FULL" will appear on the LCD display. When this message appears, recording has been stopped. (Only when recording in ONETIME mode will this be displayed.)

Sensor Error

This will be displayed when a sensor has not been connected, has not been completely inserted or the wire has been broken. Measurement and recording will continue so battery power will be consumed.

- Measurement and recording will continue so battery power will be consumed.
- If after re-connecting the sensor, measurements are still not displayed, it is very possible that the Sensor or the Unit is defective or has been damaged.

SLP (Sleep Mode)

If the battery is not changed and power becomes extremely low, this message will appear on the LCD display. When this appears, recording has been stopped in order to save the already recorded data. See "Changing the Battery" on page 13 and change the battery.

Nothing Appears

If after going into sleep mode above, the battery is further left unchanged the display will automatically shut off. If that occurs, all recorded data will be lost. See "Changing the Battery" on page 13 and change the battery.

Operations via Buttons on TR-74Ui

NOTE:

- If no operations can be performed using buttons on the TR-74Ui Unit, it means the buttons have been deactivated via the software.

POWER Button: Turning ON / OFF the Power

- During recording, the power cannot be turned off by pressing the button on the Unit. Please stop recording first and then turn off the power.
- If there is ample battery power remaining in the Unit, even if the power has been turned off, the recorded data will be saved.

Upon purchase, first install the software, and then turn the power ON.
Please see "Getting the TR-74Ui Ready to Use" on page 14

REC/STOP Button: Starting / Stopping Recording

- By starting a new recording session, all data currently saved in the Unit will be erased.

Start Recording

Even if the Unit is waiting for a programmed recording to start via the software, it is possible to start recording.

Press the REC/STOP button until the [REC] mark appears in the display.

Stop Recording

During a recording session, press the REC/STOP button until the [REC] mark disappears from the display to stop recording.

Interval Button: Setting / Checking Recording Interval

- During recording or while waiting for a programmed recording to start via the software, recording interval settings cannot be made or changed.
- The factory default setting for the recording interval is 10 seconds.

Setting the Recording Interval

1. Press the INTERVAL button until the recording interval time appears on the LCD display.
2. There are 15 recording intervals to select from:

1, 2, 5, 10, 15, 20 and 30 seconds / 1, 2, 5, 10, 15, 20, 30 and 60 minutes

EX1: 15 seconds

EX2: 15 minutes

3. With each pressing of the INTERVAL button the recording interval time will change. When the desired recording interval appears, stop pressing the button.
4. The current measurement readings will return to the LCD display.

Checking the Recording Interval

By pressing the INTERVAL button during recording or while waiting for a programmed recording to start via the software, the currently set recording interval will be displayed.

Display Button: Changing the LCD Display Pattern

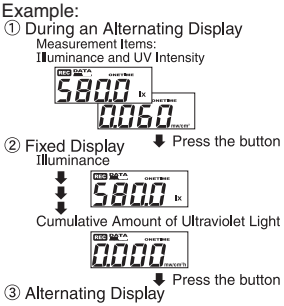
There are two LCD display patterns for current readings:
An Alternating Display and A Fixed Display.

Alternating Display:
The LCD display shows all or selected multiple measurement items. Make settings for measurement items to be displayed via the software.
If the setting has been made so as to display all measurement items, the items will be shown alternatingly in the following order:
Illuminance (lx, klx) >> UV Intensity (mW/cm^2) >> Temperature (°C) >> Humidity (%) >> Cumulative Illuminance (lxh, klxh, Mlxh) >> Cumulative Amount of Ultraviolet Light (mW/cm^{2}h, W/cm^{2}h) >>

Fixed Display:
The LCD display shows one measurement item specified by pressing the button on the Unit.

❗ The factory default setting is an alternating display between Illuminance and UV Intensity.

Example:



① By pressing the button when the Unit has been set to an Alternating Display, the LCD display mode will change to a Fixed Display.

② With each pressing of the button the item for the Fixed Display will change.

③ The LCD display mode will change to an Alternating Display.

About Cumulative Illuminance and Cumulative Amount of UV Light.

Cumulative Illuminance and Cumulative Amount of UV Light are numerical values for the total amount measured while recording. These measurements change each time the LCD is refreshed.

Changing the Battery

❗ Besides the Unit's LCD display, the battery level can be displayed on the computer screen via the software if a Unit is connected to the computer with a USB cable.

❗ If a Unit is left without a battery for some time, all data may be lost, so please work quickly when changing the battery.

When a battery life warning signal appears, try to replace the battery with a new one as soon as possible.

1. When it is time for the battery to be replaced, a battery life warning signal will appear.

- If, at this time you change the battery, recording will continue uninterrupted and all data will be saved for downloading.

2. If the battery is not changed but it remains in use, [SLP] will appear in the LCD display. Recording will stop in order to protect already recorded data.

- If you change the battery at this point, it is still possible to download all saved recorded data.

3. If the battery is further left unchanged, the display will automatically shut off and all previously recorded data will be lost.

About Battery Life

A TR-74Ui Unit can be used continuously for about six months with one AA Alkaline Battery.

- Battery life varies depending upon the type of battery, the battery performance, the measuring environment, and the frequency of communication.

Installation Setup and Recording Procedures

Installing the Software

Download Illuminance UV Recorder for Windows and T&D Graph from the T&D Website and install to your PC.

https://tandd.com/software/

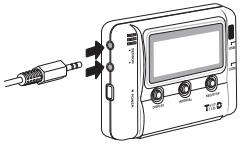
After installation, Illuminance UV Recorder for Windows and T&D Graph will appear in the Windows Start Screen or Start Menu.

Note:

- If you have no internet access or prefer to install using a software DVD, "T&D Software SO-TD1" is also available as an option.
  Please contact your distributor for details.
  https://tandd.com/purchasing/
- For details about operations please see the "Help" menu in the software.

Getting the TR-74Ui Ready to Use

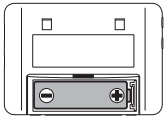
1. Connect the Sensor.



The Sensor Jacks are common for both sensors. The Temperature-Humidity Sensor or the Illuminance-UV Sensor can be connected to either of the Sensor Jacks.

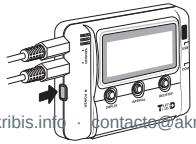
* To avoid poor connections, be sure to push the sensor connector securely into the jack.

2. Install the Battery.



- Make sure not to mistake + / -.
- Always use new batteries.

3. Turning ON the Power.



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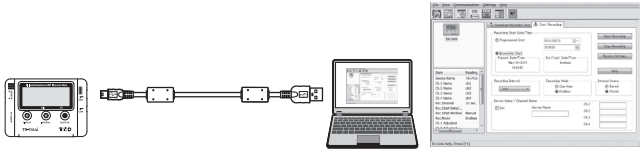
4. The measurement will be displayed on the LCD screen.

Under Normal Conditions:

During Sensor Error (no sensor connected / improper connection / sensor damaged):

Starting Recording

1. Open Illuminance UV Recorder for Windows and connect your device via USB to the computer.



* The USB driver installation will start automatically.

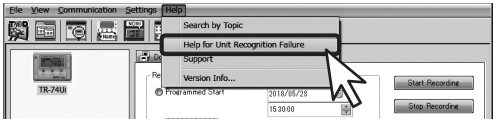
* When the USB driver installation is completed, a setting window will automatically open.

* For details of the operations of Illuminance UV Recorder for Windows refer to the "Operation Guide" which is available from the "Help" menu in the software.

2. After making necessary settings, start recording.

If your computer does not recognize the device:

After connecting your device to the computer, if the icon of the TR-74Ui does not appear in the Device List in the main window of Illuminance UV Recorder for Windows, refer to the "Operation Guide" or "Help for Unit Recognition Failure".



FAQ

Q1 The power doesn't come on, what may be the problem?

A Check to make sure that the battery has been properly installed, and there is also sufficient battery power.
Check to make sure that the battery is installed in the proper direction.
If after checking and trying the above the power still does not come on, please contact the distributor from which you purchased the product.

Q2 I want to use the Unit outdoors, is the Unit waterproof, moistureproof and dustproof?

A The TR-74Ui is not waterproof, moistureproof or dustproof.
If you wish to use the Unit outdoors or in areas where the Unit may come into contact with moisture, water or excessive dust, it will be necessary to place the Unit in a vinyl bag or wrap the Unit in plastic wrap with a drying agent.

Q3 What is the expected life of the Unit itself?

A Except for the battery, there are no parts needing periodic replacement. However, if a Unit is repeatedly used in both very cold and hot environments, the LCD operational life will be greatly shortened. You can expect a new Unit to last about five years when used at a normal temperature.

Q4 Is it possible to use other companies' sensors with a TR-74Ui?

A No, the TR-74Ui Unit is not compatible with other companies' sensors. If you wish to replace a sensor, please purchase one of our optional sensors.

Q5 The TR-74Ui is not recognized by my computer, what is the problem?

A Check the TR-74Ui
- Make sure that the TR-74Ui and your computer are properly connected.
- Make sure that there is sufficient battery power in the TR-74Ui in question.

Check your Computer
- Make sure that the software has been installed properly and is working.
- Use your computer's Device Manager to check whether or not the USB device driver has been installed properly.
- Connect a different USB device (mouse, digital camera, etc...) to your computer and see if it operates properly.
- If your computer has more than one USB port, try connecting the USB cable to a different port.
- If you have access to another computer, try seeing if communication works with the other computer.
- Please try to run a search for the TR-74Ui.

For more details, refer to [Help for Unit Recognition Failure] which can be found in the Help menu of the software.

Specifications

	TR-74Ui		TR-74Ui-S	
Temperature-Humidity Sensor (External)	THA-3151		SHA-3151 (High-Precision Type)	
	Thermistor	Polymer Resistance	Thermistor	Polymer Resistance
Measurement Channels	Temperature 1ch	Humidity 1ch	Temperature 1ch	Humidity 1ch
Units of Measurement	°C, °F	%RH	°C, °F	%RH
Measurement Range	0 to 55 °C	10 to 95 %RH	-25 to 70 °C	0 to 99 %RH (*1)
Accuracy	±0.5 °C	±5 %RH at 25 °C, 50 %RH	±0.3°C at 10 to 40 °C ±0.5°C all other temperatures	±2.5 %RH at 15 to 35 °C, 30 to 80 %RH
Measurement Resolution	0.1 °C	1 %RH	0.1 °C	0.1 %RH
Responsiveness	Response Time (90%): Approx. 7 min.		Response Time (90%): Approx. 7 min.	

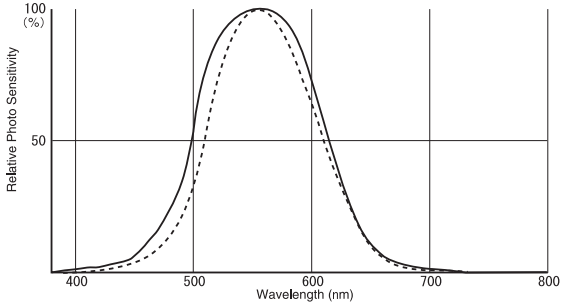
Illuminance-UV Sensor	ISA-3151
Measurement Channels	Illuminance: 1ch UV Intensity: 1ch
Units of Measurement	Illuminance: lx, klx UV Intensity: mW/cm^2
Measurement Range	Illuminance: 0 lx to 130 klx UV Intensity: 0 to 30 mW/cm^2
Units of Cumulative Measurement	Cumulative Illuminance: lxh, klxh, Mlxh Cumulative amount of UV Light: mW/cm^{2}h, W/cm^{2}h
Display Range of Cumulative Measurement	Illuminance: 0 lxh to 90 Mlxh UV Intensity: 0 mW to 62 W/cm^{2}h
Accuracy	Illuminance 10 lx to 100 klx: ±5 % at 25 °C, 50 %RH UV Intensity 0.1 to 30 mW/cm^2: ±5 % at 25 °C, 50 %RH (*2)
Relative Spectral Response	Illuminance: Approximated to the CIE standard response function V (λ) UV Intensity: 260 to 400 nm (UVA/UVB)
Measurement Resolution	Illuminance: Minimum of 0.01 lx UV Intensity: Minimum of 0.001 mW/cm^2
Responsiveness	Response Time (90 %): 3 sec. at recording interval of 1 sec. or 6 sec. at other intervals

Logging Capacity	8000 data sets (One data set consists of readings for all channels in that type of unit.)
Recording Interval	Select from 15 choices: 1, 2, 5, 10, 15, 20, 30 sec. or 1, 2, 5, 10, 15, 20, 30, 60 min.
Recording Mode	Endless (Overwrite oldest data when capacity is full) or One Time (Stop recording when capacity is full)
Communication Interfaces	USB Communication (Mini-B connector) Serial Communication (*3)
Power	AA Alkaline Battery LR6 x 1
Battery Life (*4)	Approx. 6 months
Dimensions	H 55 mm x W 78 mm x D 18 mm
Weight	Approx. 40 g
Operating Environment	Temperature: -10 to 60 °C Humidity: 90 %RH or less (no condensation)
Software (*5)	PC Software (Windows) Illuminance UV Recorder for Windows, T&D Graph

*1: When continually used in environments with temperatures above 60°C, accuracy of humidity measurements will decrease over time. Also, humidity cannot be measured at temperatures below -20 °C.
*2: Compared to the value measured by the T&D standard sensor for calibration under our calibration light source.
*3: Customers wishing to write their own software, please contact your local distributor for the serial communications protocol specifications. (Note: Optional serial communication cable TR-07C is also required.)
*4: Battery life varies depending upon multiple factors including ambient temperature, recording interval, frequency of communication, and battery performance. All estimates are based on operations carried out with a new battery and are in no way a guarantee of actual battery life.
*5: Free software download and information on OS compatibility is available on the Software page of our website at https://tandd.com/software/.
The specifications listed above are subject to change without notice.

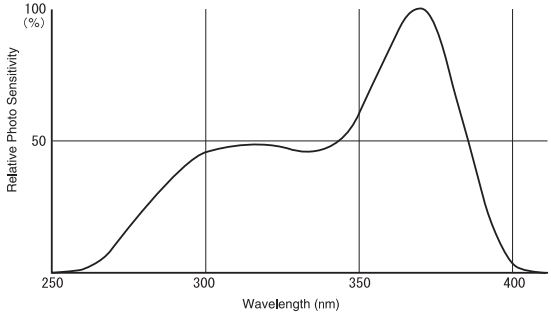
Relative Spectral Response Characteristics Graph (Illuminance)

Broken line: the CIE standard response function V (λ)
Solid line: ISA-3151



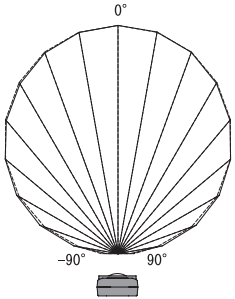
Relative Spectral Response Characteristics Graph (UV)

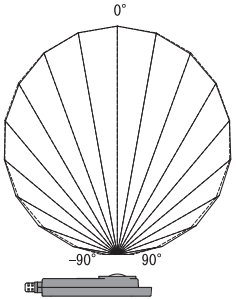
ISA-3151



Cosine Correction Characteristics (Illuminance)

Broken line: cos θ
Solid line: Measurement Value

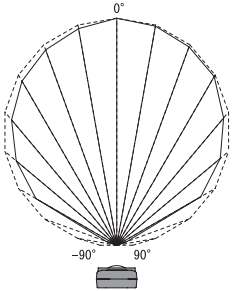


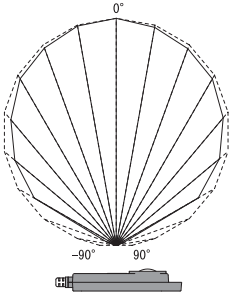


Cosine Correction Characteristics (UV)

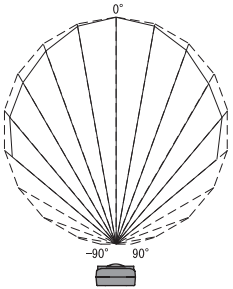
Two variations of the sensor are available. They are identified by the serial number (0206XXXX or 0207XXXX) located on the back of the sensor.

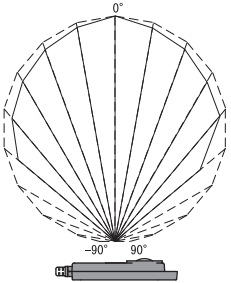
Sensor with No.0206XXXX
Broken line: cos θ
Solid line: Measurement Values





Sensor with No.0207XXXX
Broken line: cos θ
Solid line: Measurement Values





Product Support

For support, please contact the distributor from which you purchased the product.

A list of distributors can be found at:
https://tandd.com/purchasing/

Product Information

Product information can be found at:
https://tandd.com/product/

Illuminance UV Recorder TR-74Ui Introductory Manual

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