



uSpectrum PC Software

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- * Per garantire la convalida della garanzia, inserire il timbro dell'agente nella casella e compilare la data di acquisto. Se non è possibile fornire il timbro dell'agente e la data di acquisto, il periodo di garanzia si baserà sulla data di fabbricazione del prodotto.
- * Para garantizar la validación de la garantía, coloque el sello del agente en la caja y rellene la fecha de compra. Si el sello del agente y la fecha de compra no se pueden suministrar, el periodo de garantía se basará en la fecha de fabricación del producto.

Original / Authorized Agent Stamp

Product Serial Number : _____

Purchase Date : _____

52-72-00016-0100 V1.0

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PG100N

手持式分光光譜計 • SPECTRAL PAR METER • ライトアナライザー

使用説明書
User Manual
簡易取扱説明書

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To get more information related to operation, firmware upgrade and warranty terms; online application for correction and repair service, please visit www.uprtek.com to download the complete version.

1.1 Product Overview

Your Spectral PAR Meter PG100N is a palmtop photon meter that measures range of light sources in multiple modes. It may measure PPF(Photosynthetic Photon Flux Density) of plant light source Spectral PAR Meter PG100N comes with 3.5" touch control screen. User friendly smart interface enables fast and easy use of this product. Removable optical sensor design enables remote measuring and keeping measurements in SD card.

Connect this product to a PC by USB cable enables easy data management with exclusive software.

1.2 Packing Contents

Please ensure the following are included in package of this product: In case of any flaw and/or loss please call the dealer or this Company for help.



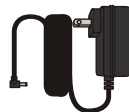
Case



PG100N
Spectral PAR Meter



Lithium Battery



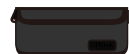
Power Adaptor



USB Cable



3M Type-C USB Cable
(remote measurement)



Protection Bag



Cap Strap



Screen Wiper



SD Card



Tripod /
Stand Bracket



User Manual



Warranty Card



WiFi Wing
wireless remote control card
(It is used to connect with APP.)

1.3 Appearance Introduction



1. If the system crashes, please press the power key for 3 seconds to turn off the system.
2. If the problem still can't be fixed, please use a pin to press the reset key to turn off the system.

1.4 Annual Product Calibration

As the product is a high-precision instrument, please use it cautiously. To ensure the accuracy of measurements, annual calibration is recommended. Please consult the agent or the customer service department for the calibration service.

1.5 Product Notes and Precautions

1. PG100N Spectrometer is a high-precision instrument. Please unpack with care. Any vibration or collision may cause instrument damage. If the product doesn't work normally or needs repair, please don't attempt any repairs. All repairs must be performed by the authorized customer service agent.
Most LCD screens have a very small and inconsequential defective pixel rate (usually less than 0.1%). This results in occasional pinpoints of white or other colors but will not affect the accuracy of measurements.
- 2.



Precautions / Warnings

Please read the following precautions to avoid fire, excessive heat, chemical leakage and explosion :

- Do not disassemble or modify the battery.
- Do not expose the battery to heat (fire) or water/moisture.
- When disposing used/old batteries, wrap with insulation tape to shield the battery from electrical contact with metallic objects, which might ignite a fire or explosion.
- If the unit is plugged into the power adapter and the battery seems to be overheating, or if there is smoke or peculiar odors emanating from the unit, unplug immediately to avoid the possibility of fire.
- However, do not touch the cables if there is heat emanating from near the cables as melted or deformed cables could expose wiring and result in burns or electric shock.
- Do not use cloth or anything to wrap or cover the equipment while charging – this could cause the unit to overheat, melting the casing or causing fire.
- If the unit is accidentally immersed in water, or if moisture has seeped inside, or metal objects have dropped into the casing, immediately remove the battery to avoid fire or electric shock.
- Do not operate or store the battery in high-temperature environments-it will cause battery leakage and/or shorten the life of the battery .
- Do not use paint thinner, benzene or other organic solvents to clean the equipment – this may damage the exterior finish or touch screen, and may even ignite fire.

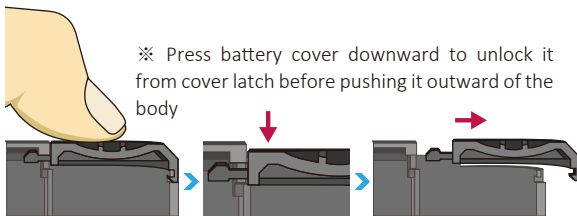
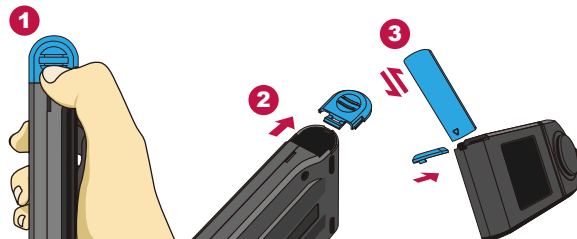
2.1 Preparing Before Use

Battery installation :

Step1. Hold PG100N, then press the battery cover.

Step2. Press the battery cover down to remove it.

Step3. Install the battery after removing battery cover.



※ Press battery cover downward to unlock it from cover latch before pushing it outward of the body



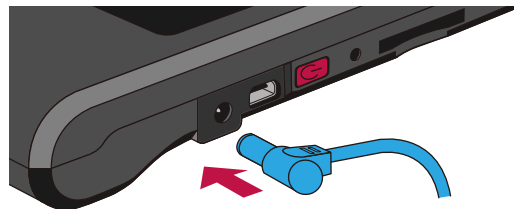
1. Charge the battery full for 6 hours before using it for the first time.
2. To prevent power outage during using this product, please check whether the red light has turned off (fully charged) according to instructions given in next page item1. Once this product is enabled keep an eye on indicator of balance of battery charge at upper right corner of screen.
3. In case a battery goes exhausted soon after fully charged then its life cycle has ended. Please call your dealer for replacement with new one.
4. Time span your battery can last varies with its life cycle. Newly shipped battery after full charge may last around 5 hours.

2.1 Preparing Before Use

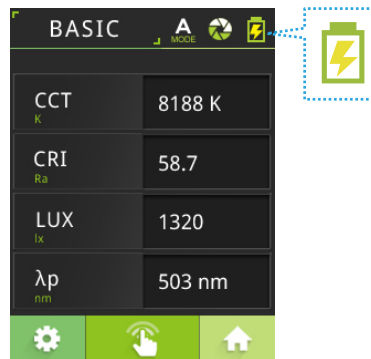
Charge your battery :

Connect charger to charging port of this product to start charging its battery.

1. Product in off mode: The power key lights red during battery charging and turns off after it is fully charged.



2. Product in on mode: A flash symbol displays at upper right corner of screen of this product during charging and disappears after it is fully charged.

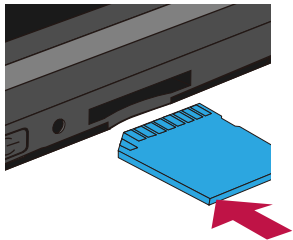


2.1 Preparing Before Use

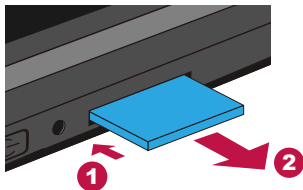
Install SD card :

You may save measurement data in file of Excel (xls) format and image data (spectrum and chromaticity coordinates diagram) in format of (JPG) in SD card with capacity at 1GB or more.

※ Insert SD card in direction as indicated



※ Press to remove SD card

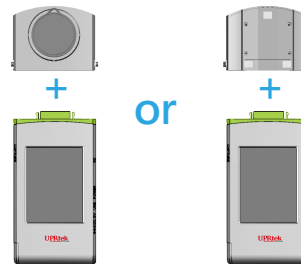


1. The SD card features a card latch design to prevent it from loosening. You may feel that the SD card is stuck when it is inserted in or removed. In case it is like this, pull or push it a little harder to get it in place or removed. To remove SD card: Press it as shown in step ①, pull it out after it ejecting a little as shown in step ②.

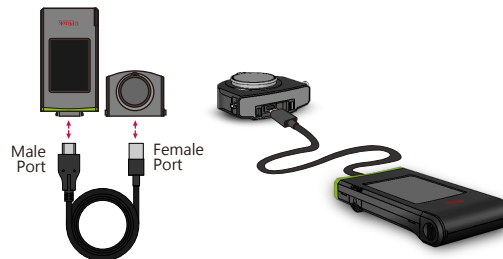
2.1 Preparing Before Use

Connect optical sensor to host :

See diagram below for reverse installing your optical sensor. Please power off this product before removing optical sensor from host then turn around before inserting in host. Power on this product again after it is fully installed.



Use Type-C USB cable for remote measurement as shown in diagram below. Power off product before connecting Type-C USB cable to it. Power it on again afterwards.

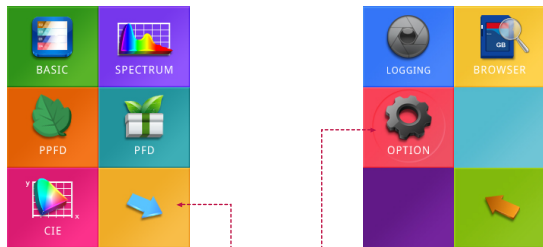


1. Optical sensor and host are paired before shipment to you. DO NOT use either of the two with any other PG100N device. If you have more than one PG100N product, DO NOT mix using these two.
2. Please power off this product before getting optical sensor installed to or uninstalled from host.
3. Please run background calibration before using it after power on.

2.1 Preparing Before Use

Set up date and time

Set up date and time before taking any measurement.

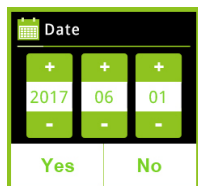


Press lower right arrow icon to enter the next page.

1

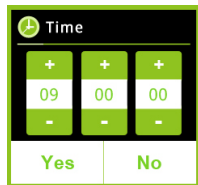
2

Click "Option" icon.



4

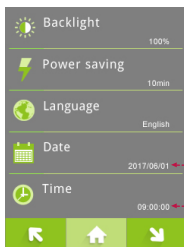
Once date is set, press Yes to exit to setup option page.



5

Once time is set, press Yes to exit to setup option page.

3



Press "Date" and "Time" for its settings.

2.2 Taking a Measurement

Precautions on optical sensor installation

Make sure optical sensor latch is well connected to host.



Dark calibration

1

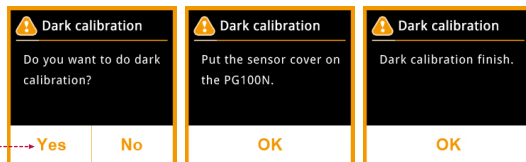
Once this product is powered on the power key lights in green and the screen prompts with message for dark calibration.

3



2

The "Do you want to do dark calibration?" dialog box displays, click Yes to proceed.



3

Click OK once the cover is well replaced.

Once message "Dark calibration finish" prompts, click OK and the main menu displays.

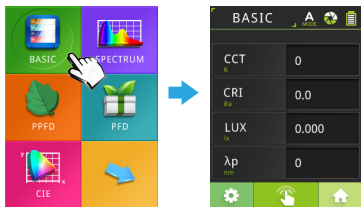
4

1. Press and hold power key for 1 second to power on this product.
2. Press and hold power key for 3 seconds to power it off.
3. Please run dark calibration after each power on of this product.

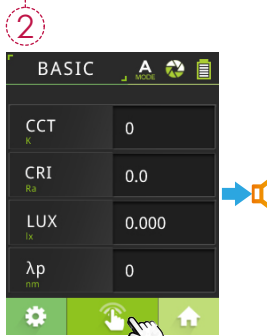
2.2 Taking a Measurement

Measurement

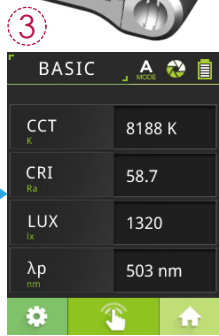
Click "BASIC" mode to enter measurement page.



1 Point optical sensor to light source to be tested.



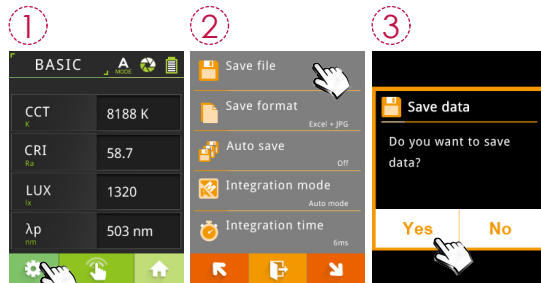
2 Press the measurement button at bottom center of screen or the measurement key at left hand side to measure. (You can press measurement key at both sides.)



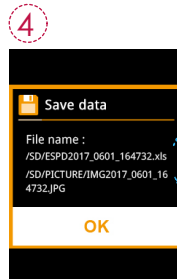
3 This product beeps once after measurement is done and displays results on screen.

2.2 Taking a Measurement

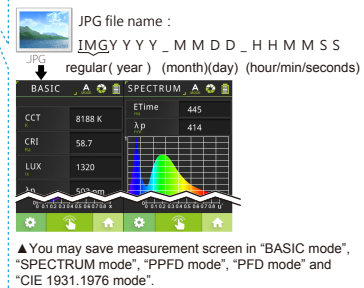
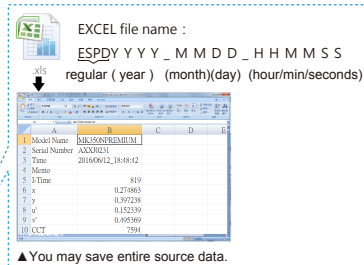
Save measurement data



Press the setup button at lower left corner. Click "Save file"

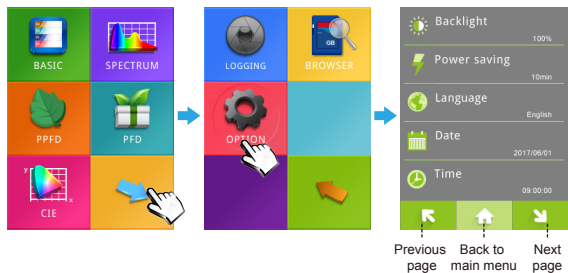


Measurement data is now saved in SD card. You may note down file name if necessary.

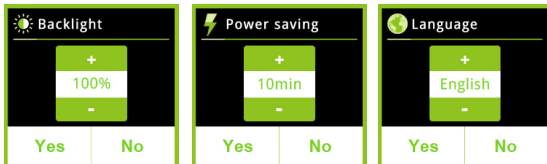


2.3 Setup Items in OPTION

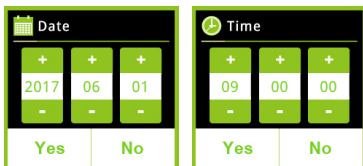
Click OPTION icon in main screen to set up this product.



- Backlight Setting
- Power Saving Setting
- Language Setting

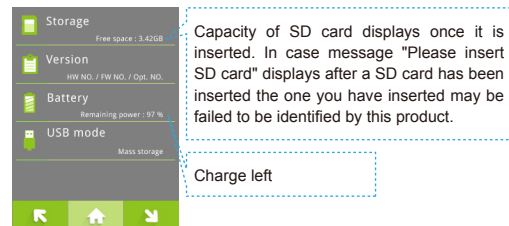


- Date Setting
- Time Setting

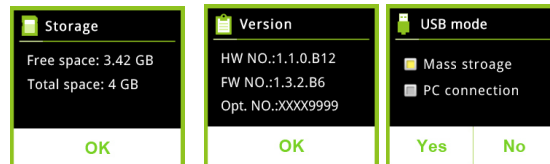


+ / - : Adjust key

2.3 Setup Items in OPTION



- Check Storage Device
- Check Version
- USB Mode Setting



Please refer 5.2 for USB mode setup.



1. You cannot set up battery. The screen remains intact after you tap it.

3.1 BASIC Mode

Click "BASIC" icon in main screen to display measurement readings.

Integration mode
A : Auto
M : Manual

Capture function
 : one time
 : Continuous
 : Continuous measurement in progress

Charge left
 : Charging
 : Charge left indicator
 : Low charge indicator

BASIC **A**

CCT <small>K</small>	8188 K
CRI <small>Ra</small>	58.7
LUX <small>lx</small>	1320
λp <small>nm</small>	503 nm

This screen shows 4 items of measurements recorded.

3.1 BASIC Mode

Customize the four measurement items in BASIC mode.

The 4 items on the Basic list can be customized with different units of measure according to your preference.

①

BASIC **A**

CCT <small>K</small>	0
CRI <small>Ra</small>	0.0
LUX <small>lx</small>	0.000
λp <small>nm</small>	0

Click the item to be changed.

②

LUX	fc	CCT
Duv	λpV	x
y	u'	v'
Δx	Δy	$\Delta u'$
$\Delta v'$	λp	λpV
λd	Purity	IRR
CRI	R 1	R 2

List of available items displays, click down arrow key "⏴" to scroll down to next page.

③

R 3	R 4	R 5
R 6	R 7	R 8
R 9	R 10	R 11
R 12	R 13	R 14
R 15	PPFD	PFD
PFD-UV	PFD	PFD-G
PFD-R	PFD-FR	

Click items to be shown in position ①. Click "⏴" key at bottom of screen to back to last page without selecting any item.

④

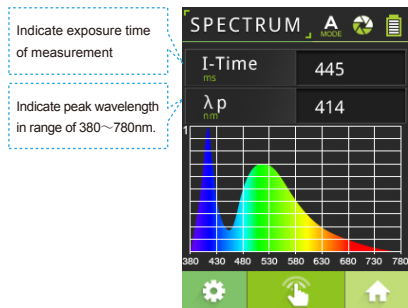
BASIC **A**

CCT <small>K</small>	0
PPFD <small>$\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$</small>	0.0000
LUX <small>lx</small>	0.0000
λp <small>nm</small>	0

Default item changed. Follow the same steps to change other default items.

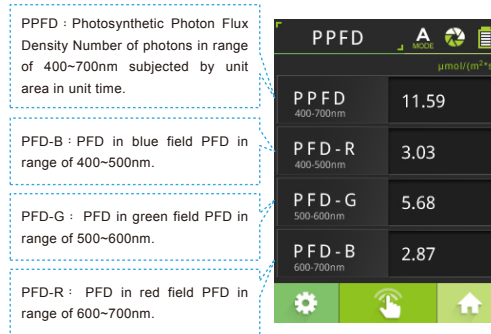
3.2 SPECTRUM Mode

Click "SPECTRUM" icon in main menu to display spectrum in range of 380~780nm.



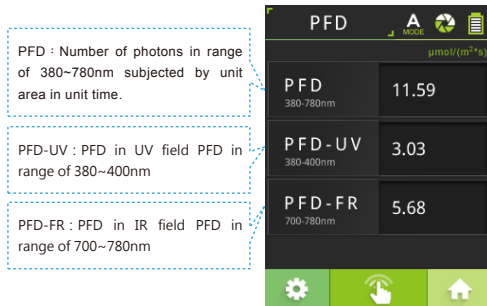
3.3 PPF Mode

Click "PPFD" icon in main menu to validate Photosynthetic Photon Flux Density (PPFD) measurement as well as PFD measurement of red, green, and blue light.



3.4 PFD Mode

Click "PFD" icon in main screen to validate measurement of PFD (Photon Flux Density) in range of 380~780nm.



3.5 CIE Mode

Click "CIE" icon in main screen to validate CIE 1931 and CIE 1976 chromaticity coordinates chart.

Click chromaticity coordinates chart to switch between CIE1931 / CIE1976.

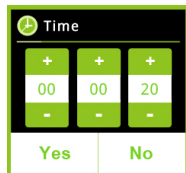
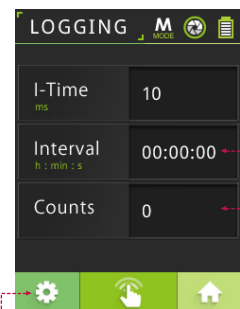


3.6 LOGGING Mode

Click "LOGGING" icon to start continuous measuring and save readings in Excel file format automatically.

Set up operation conditions

Set up ETime (exposure time), measurement interval, count (recurrences)

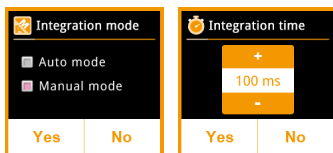
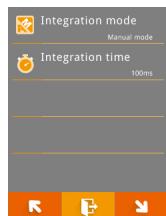


2 Click "Interval" to set up time span between two measurements. Scope: 00(hh):00(mm):00(ss)~23:59:59



3 Click "Counts" to set up number of measurements (recurrence count). Scope: 1~4000

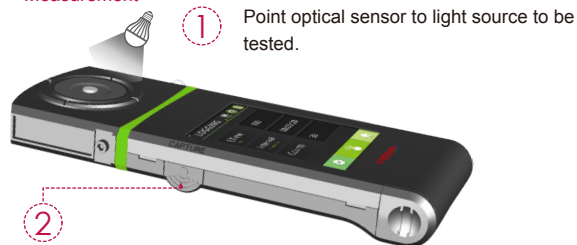
1 Click icon at lower left corner of screen to set up in details.



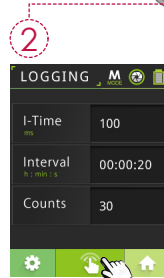
※ Exposure mode can have exposure time set up in manual mode only.

3.6 LOGGING Mode

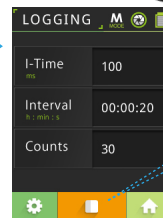
Measurement



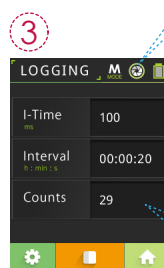
1 Point optical sensor to light source to be tested.



2 Press the measurement button at bottom center of screen or the measurement key at left hand side to measure. (You can press measurement key at both sides.)

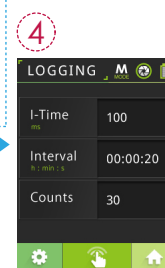


Indicating continuous measurement is in progress



3 ※ Icon at the upper right corner spins continuously in case the continuous measurement is in progress.

The count field displays balance of measurements.

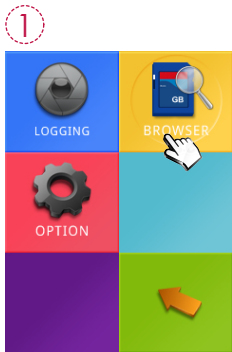


Press the key at bottom center of screen to stop measurement.

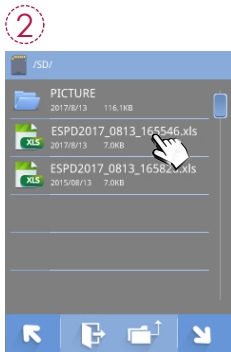
The Count option will reset to its default settings after measurement is done.

3.7 BROWSER Mode

The Browser (on Home Screen) allows you to review historical data that was previously saved to the SD card.

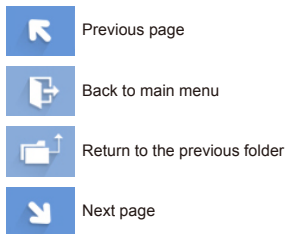


Press the "BROWSER" icon.

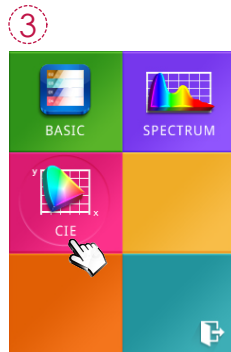


A file browser will show the files on the SD card.

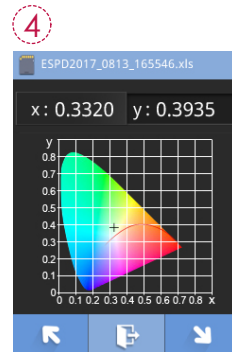
If you select an excel file, a review menu will be displayed.



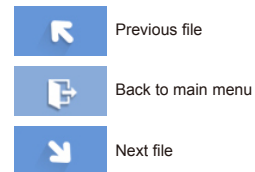
3.7 BROWSER Mode



Press any of the icons to review the data.

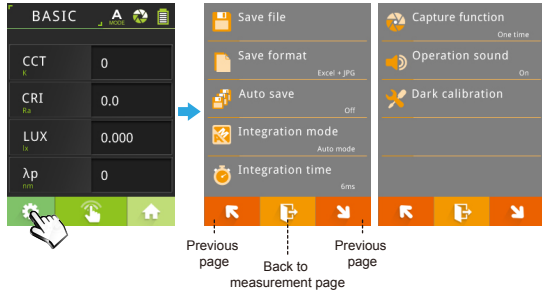


Displaying the data of excel file.

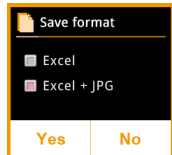


4.1 Measurement Settings

In mode of "BASIC", "SPECTRUM", "PPFD", "PFD", "CIE" you may click icon at lower left corner for settings in details.

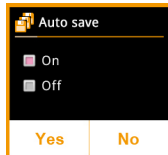


■ Save format



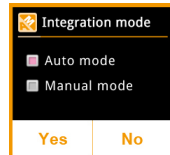
You may opt to save measurement data of Excel file only or both Excel and JPG files.

■ Auto save



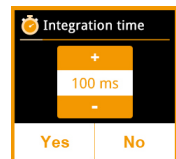
Opt to select auto save measurements or not.

■ Integration mode



Select auto or manual mode. Exposure time need be set in case manual mode is chosen.

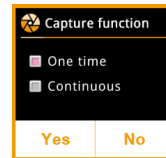
■ Integration time



Exposure time may set in unit of microsecond (0.001 second). Valid range: 2~1000ms at step of ± 1 ms when exposure time is less than 100ms and ± 20 ms otherwise.

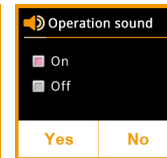
4.1 Measurement Settings

■ Capture function



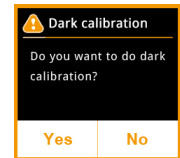
Select for one time or continuous measurement. In case continuous measurement is set, press Measurement / Local Measurement key to start auto measurement at frequency of once per 3 seconds. Press Measurement / Local Measurement key again to stop continuous measurement. (See Section 4.2: Continuous measurement for reference.)

■ Operation sound



Select to on/off operation sound. Set operation sound on to beep once after measurement operation (enabled by pressing the Measurement / Local Measurement key) completed.

■ Dark calibration



This product is default to run background calibration after power on. This operation enables running background calibration any time.



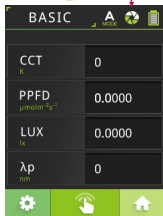
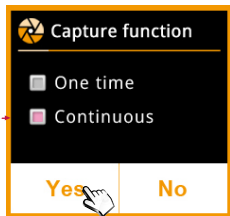
About auto save:

1. Measurements are auto saved (Excel + JPG) in case this operation is set on. In case there is no SD card inserted when measurement is running, this product prompts warning messages while keep on measuring.
2. Measurements are saved only by clicking Save icon in case this operation is set off.

4.2 Continuous Measurement Settings

① Click icon at lower left corner of “BASIC” screen, click “Capture function”, “Continuous”, “Yes”.

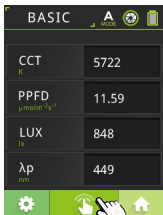
Click icon at bottom center of screen to back to “BASIC” indicators with icon ② change to “



③ Point optical sensor to light source.



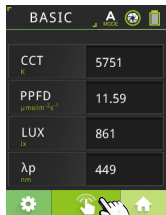
④



⑤

※ Status indicator spin continuously in case the continuous measurement is in progress.

Auto measurement at frequency of once every 3 seconds.



Press measure key or click measurement button at bottom center of screen to start continuous measurement.

Click measurement button or press measure key again to stop continuous measurement.



- Users cannot save the measurement data while processing continuous measurement.
- Adjust the integration time is only allowed in the manual mode.

5.1 Connecting with Mobile APP

WiFi Wing wireless remote control card

Insert WiFi Wing card to the system. At IOS or Android platform, download PG100N APP and install it on your mobile. Then you can connect with system for the measurement of wireless control.



※ For more operation, please refer to Wing user manual. Please visit UPRtek official site, <http://www.uprtek.com> → Support → Download Center.

Install APP

Download and install the PG100N APP on your Mobile.



② Select WiFi UPRtek_Wing.



Measure



WiFi connection



5.2 Connecting with uSPECTRUM

Install uSPECTRUM PC software

Please visit UPRtek official site, <http://www.uprtek.com>→Support→Download Center, Download and install uSPECTRUM software on the PC. Then you can connect it with the system for USB control of measurement.



Set USB PC connection mode

You may connect this product to a Windows PC with USB (rather than Type-C USB) cable.

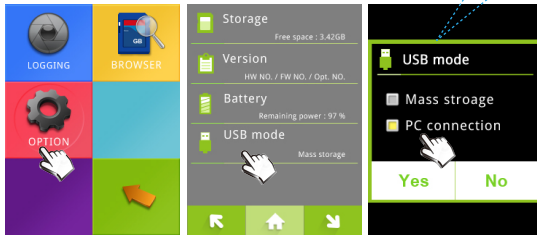
Note: Please select PC connection in USB mode in items of OPTION mode.

Mass storage :

Save measurement data in SD card of PG100N.

PC connection :

Connection PG100N to PC via USB cable for measurement use with LIGHT ANALYZER.



1

Select "OPTION".

2

Select "USB mode".

3

Select "PC connection" and press Yes.

5.2 Connecting with uSPECTRUM

Measure

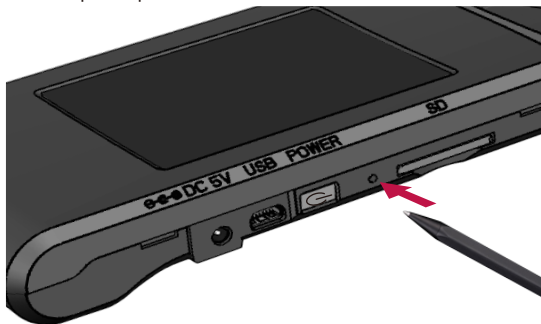
After connection, the PG100N screen will display as shown.



5.3 Troubleshooting

In case of system failure or stuck (screen gets locked) please press and hold the power key for 3 seconds to shut down this product. Then power it on again and see does it back to normal. In the problem persists, run steps below to reset this product.

To reset this product : Reset this product by pressing the reset key with sharpened pencil.



1. DO NOT use sharp point objects with diameter less than 1mm (e.g., paper clip and ball pen) to press the key as it may lead to board circuit induction or damage and failure to this product.
2. DO NOT use pencils with broken point to press the key as the pigment core may jam the key for reset or lead to damage and failure to this product.

Spectrum		
Sensor	CMOS Linear Image Sensor	
Illuminance meter class	Conforms to JIS C 1609-1:2006 for General Class AA. Conforms to DIN 5032 Part 7 Class B.	
Wavelength Range	380~780 nm	
Wavelength Data Increment	1 nm	
Spectral Bandwidth	Approximately 12 nm (Half Bandwidth)	
Wavelength Reproducibility	$\pm 1 \text{ nm}^{*1}$	
Measurement Range	1. 70 ~ 150,000 lx 2. 0.5~1,000 W/m ² (Irradiance) 3. 1~3,000 $\mu\text{mol}/(\text{m}^2\cdot\text{s})$ (PPFD)	
Illuminance Accuracy	$\pm 5\%$	
Illuminance Repeatability (2 σ)	0.2%	
Color Accuracy	Illuminant A @ 2,856 K at 20,000 lx ^{*2}	± 0.0025 in CIE 1931 x,y
Color Repeatability(2 σ)		x y : 0.0005
CCT Accuracy	$\pm 2\%$	
CRI Accuracy @ Ra	$\pm 1.5\%$	
Stray Light	-25 dB max. ^{*3}	
Integration Time Range	2 to 1,000 ms	
Digital Resolution	16 bits	
Feature		
Capture Function	One time / Continuous	
Operation Mode	Standalone Mode / WiFi Mode ^{*4} / USB Mode (MSC Mode ^{*5} + PC connection)	
Integration Mode	Auto / Manual	
Measuring Modes	1. Basic Mode 2. Spectrum Mode 3. CIE 1931 / CIE 1976 Chromaticity Mode 4. PFD Mode	

	5. PPF Mode
	6. Logging Mode
	7. Data Browser Mode
	8. Option Mode
Measuring Capabilities	1. Illuminance (LUX) / Foot Candle (fc)
	2. Correlated Color Temperature (CCT)
	3. CIE Chromaticity Coordinates
	(1) CIE 1931 x,y Coordinates
	(2) CIE 1976 u',v' Coordinates
	4. Δx , Δy , $\Delta u'$, $\Delta v'$
	5. Delta uv (Duv)
	6. Dominant Wavelength (λ_d)
	7. Excitation Purity
	8. Color Rendering Index (CRI , Ra) / R1 ~ R15
	9. Spectral Power Distribution (SPD) mW/m ²
	10. Peak Wavelength (λ_p)
	11. Peak Wavelength Value (λ_pV)
	12. Intergration Time (I-Time)
13. Irradiance (380nm~780nm) W/m ²	
14. Photosynthetically Active Radiation (PAR)	
(1) PPF(400nm~700nm)	
(2) PFD-R(600nm~700nm)	
(3) PFD-G(500nm~600nm)	
(4) PFD-B(400nm~500nm)	
(5) PFD(380nm~780nm)	
(6) PFD-UV(380nm~400nm)	
(7) PFD-FR(700 - 780nm)	
System Configurations	
Display	3.5" 320X240 Resistive Touch LCD

Max. Files	≒ 68,000 Files @ 8GB SD Card (Excel + JPG)
Battery Operation Time	≦ 5 hours / Fully Charged
Power	Adapter : 2500 mAh / (3.7V Rechargeable Li-ion Battery)
Data Output Interface	SD Card (SD2.0 , SDHC / up to 32G) / Mini USB Port (USB 2.0) / WiFi SD Card compatible with iOS and Android
Data Format	Compatible Excel / JPG
Dimensions	200 x 77.7 x 2.2 mm (H x W x D)
Weight (with Battery)	276 g ± 20 g
Operating Temperature	0 ~ 35 °C , relative humidity 70% or less without condensation
Storage Temperature	-10 ~ 40 °C , relative humidity 70% or less without condensation
Display languages	English / Traditional Chinese / Simplified Chinese / Japanese / Spanish / German / French / Italian / Russian

*1 : Input source must be a stable light source.

*2 : Temperature 23±2°C and relative humidity 50% or less.

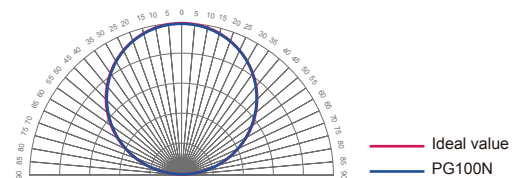
*3 : Input the 550nm monochromatic light and measure the stray light ratio at 550nm ± 40nm.

*4 : It can be connected to mobile phones and tablet computer.

*5 : MSC Mode- Mass Storage Class.

The company reserves the right to change product specifications at any time without prior notice.

Figure 1 : Cosine Correction



6.2 General Attributes

Abbreviation	Full Name	Unit
CCT	▶ Correlated Color Temperature	K
The color temperature is the color radiated by a black-body radiator under different temperatures. CCT has the color that is the closest to the ideal black-body radiator.		
CRI (Ra)	▶ Color Rendering Index	
As defined by CIE, R1~R8 represent the value of eight standard colors, while CRI(Ra) is the average value of R1~R8. The value 100 indicates the best quality of light source, while the value 0 indicates the worst quality of light source.		
R1 ~ R2....R15		
Varieties of color rendering index It represents the quality of light source, with the indexes corresponding to 15 standard colors, including: R1: light grey-red; R2: dark grey-yellow; R3: saturated yellow-green; R4: middle yellow-green; R5: light yellow-green; R6: light blue; R7: light purple-blue; R8: light red-purple; R9: saturated red; R10: saturated yellow; R11: saturated yellow; R12: saturated yellow; R13: white skin color; R14: Leaf green; and R15: yellow skin color.		
Lux	▶ Illuminance	lx
It is the light flux received by each unit area.		
λ_p	▶ Peak Wavelength	nm
It is the wavelength with the highest power in the measured spectrum.		
λ_pV	▶ Peak Wavelength Value	mW/m ²
It is the highest power in the measured spectrum.		
λ_d	▶ Dominate wavelength	nm
The dominant wavelength is used to express the color of the measured light. It could be hybridized by the spectrum color of the wavelength and the standard illuminant E(x,y = 0.333, 0.333).		
I-Time	▶ Integration time	ms
The integration time measured by the spectrometer.		
x,y,X,Y,Z	▶ CIE1931 color coordinate	
Chromaticity chart CIE1931 by Commission International de l'Eclairage (CIE) Represent light color with plane (2-dimension) coordinates (x, y).		
u',v'	▶ CIE1976 color coordinate	
Chromaticity chart CIE1976 by CIE Represent light color with plane (2-dimension) coordinates (u', v').		

6.2 General Attributes

Abbreviation	Full Name	Unit
Duv	▶ CIE1960 uv color coordinate difference	
It is the uv distance between CIE1960 coordinate and the Planck's blackbody radiation with the same color temperature. The value close to 0 indicates the color temperature and color are closer to that of the blackbody radiation. The positive value indicates it is above the blackbody radiation, while the negative value indicates it is below the blackbody radiation.		
Δx	▶ CIE1931 color coordinate difference	
It is the x difference between CIE1931 coordinate and the Planck's blackbody radiation with the same color temperature.		
Δy	▶ CIE1931 color coordinate difference	
It is the y difference between CIE1931 coordinate and the Planck's blackbody radiation with the same color temperature.		
$\Delta u'$	▶ CIE1976 color coordinate difference	
It is the u' difference between CIE1976 coordinate and the Planck's blackbody radiation with the same color temperature.		
$\Delta v'$	▶ CIE1976 color coordinate difference	
It is the v' difference between CIE1976 coordinate and the Planck's blackbody radiation with the same color temperature.		
fc	▶ Footcandle	fc
It is based on the unit of lm/ft ² .		
Purity	▶ Color purity	%
It is the percent of the dominant wavelength in the standard illuminant. The closer the color purity is to 100%, the closer it is to the dominant wavelength.		
IRR	▶ Irradiance	W/m ²
It is the irradiance within the range of the wavelength specified in the specification.		
PPFD	▶ Photosynthetic Photon Flux Density	$\mu\text{mol}/(\text{m}^2\cdot\text{s})$
It is the Photosynthetic Photon Flux Density defined in 400~700nm.		
PFD-R	▶ PFD in red field	$\mu\text{mol}/(\text{m}^2\cdot\text{s})$
PFD in range of 600~700nm.		
PFD-G	▶ PFD in green field	$\mu\text{mol}/(\text{m}^2\cdot\text{s})$
PFD in range of 500~600nm.		
PFD-B	▶ PFD in blue field	$\mu\text{mol}/(\text{m}^2\cdot\text{s})$
PFD in range of 400~500nm		

6.2 General Attributes

Abbreviation	Full Name	Unit
PFD	▶ Photosynthetic Photon Flux Density	$\mu\text{mol}/(\text{m}^2\cdot\text{s})$
Number of photons in range of 380~780nm subjected by unit area in unit time.		
PFD-UV	▶ PFD in UV field	$\mu\text{mol}/(\text{m}^2\cdot\text{s})$
PFD in range of 380~400nm		
PFD-FR	▶ PFD in FR field	$\mu\text{mol}/(\text{m}^2\cdot\text{s})$
PFD in range of 700~780nm		

7.1 Q&A

The following situations are not fault. Please double check it before requesting for repair. If it doesn't work normally after the inspection, it could be caused by fault of the device. In this case, please take out the battery and contact the seller or the vendor for repair.

State : Power-on failure (No display)

1. Check whether the battery is installed correctly.
 - ▶ Please don't install the battery inversely, or push it in violently, which may destroy the battery spring.
2. Check whether the battery runs out of power.
 - ▶ Please charge the battery for 6hours for the first use. (Please refer to 2.1)
3. Check whether the battery connector is dirty.
 - ▶ Please wipe it with dry cloth.

Why I feel the card is stuck when inserting and unplugging it?

- ▶ It is the anti-shedding function designed specially. It prevents SD card shedding in case of collision under external force, which may cause write-in error.

What is the function of dark calibration?

- ▶ The dark calibration is also known as zero calibration. As the temperature change of the environment affects the measurement results, the user is suggested performing dark calibration before measurement, so as to improve the measurement accuracy.

Why my SD card can't be used on PG100N?

- ▶ The SD card should be formatted into FAT before being inserted into PG100N Premium. Moreover, the memory of SD card is required to be 1G or higher.

Appendix

Product warranty

Warranty Policy

UPRTEK provides the service of repairing or changing equivalent products for the customer in case of the material or functional defect and fault during the product warranty period.

1. Changing new product :

- If the consumer finds any functional defect or fault or finds any part missing within 7 days after purchasing the product, it should consult the original seller and report to the vendor immediately. Moreover, it should leave the contact information, so the customer service personnel of the original vendor will check it out and generate the number of changing new product for the customer. In this case, the original vendor provides the service of "changing new product" within 7 days.
- The customer should return the product to the original vendor within 30 days after getting the repair number. As for the international customer, it permits the flexibility of logistical time and expands the time for returning the product to the original vendor.

Remarks : It requires complete package when returning the product to the original vendor. There should be no part missing or scratch on the surface unless the part is found missing when the product is delivered. Under this circumstance, the original vendor reserves the ultimate right to determine whether to change new product.

2. Repair service :

- If it exceeds the period for changing new product (seven days), the functional non-compliance or defect found on the product should go through RMA workflow. When any product needs to be returned to the original vendor for repair, it should consult the business service personnel via Email, fax or phone call to apply for repair number before returning the product to the original vendor for repair service.
- After the original vendor receives the returned product, the internal engineer of the Company will check it initially and confirms the causes for product defect. If it is within the warranty period and it is the functional fault of the product, it should follow the general repair workflow. However, if the engineer checks it is human damage rather than functional fault, it is inapplicable to the warranty term.

Remarks : To avoid damage during the product transportation, we strongly recommend choosing international express service and protecting the product carefully.

Limited Warranty

The warranty term is inapplicable to the damage caused by unnatural

or external factors, such as the following circumstances :

1. When the fault is caused by the natural disaster and improper human operation rather than the product itself.
2. When the product is repaired or disassembled by others rather than the technician authorized by the company.
3. When the warranty volume label or disassembly-proof volume label is modified, damaged or gone.
4. When the product serial number is wrong, damaged or unclear.

Exemption from Liabilities

- UPRTEK is not liable to the product defect or damage caused by any factor during the transportation of sending PG100N series product for repair. It is recommended taking out the storage device, packing and transporting the product properly on your own before sending the product for repair.
- UPRTEK is not liable to the compensation for the operation loss, expected cost loss, data loss caused by or related to the usage of the product of the Company, as well as any other indirect, accident or derivative loss or damage provided it is permitted by the laws.

Applicable Subjects for Warranty Terms

UPRTEK's warranty service terms are only applicable to the consumers who purchase the company products through formal or legal sales channels.

Warranty Period

1. Host of PG100N series product :

UPRTEK provides two years of warranty service for all PG100N series products, with free calibration service for one time.

2. Product supplies and related accessories :

The product suppliers and the related accessories such as battery, tripod and neck strap, are excluded from the warranty service.

Services Provided by Authorized Agent or Distributor

- The qualified agent or distributor may receive or deliver the host of MK350N Premium series product for basic inspection, so as to confirm whether the device needs to be returned to the original vendor for further calibration service.
- URL of qualified agents or distributors: www.uprtek.com.
- The basic inspection service provided for the consumer is charged based on the announcement made by UPRTEK.

Other Notes

UPRTEK doesn't produce or manufacture all materials and parts of the product. If the target material and part is discontinued within the warranty period, UPRTEK is entitled to replace it with equivalent alternative to finish repair.

Delivery Methods

UPRTEK doesn't produce or manufacture all materials and parts of the product. If the target material and part is discontinued within the warranty period, UPRTEK is entitled to replace it with equivalent alternative to finish repair.

Sending for Repair

Consumer may send the product back to the original vendor RMA repair service through either of the following two methods :

- The consumer sends the product to UPRTEK's agent or distributor which will return it to the original vendor for repair.
- The consumer sends the product to UPRTEK for repair directly.

Service after Warranty Period

If any damage or fault occurs to PG100N series product after two years of warranty period, the consumer may still return the product to UPRTEK for repair. However, the repair service should be charged based on the product fault or damage condition. If the engineer finds the following situations, it is suggested purchasing new product :

- The MK350N Premium series product or part is not available anymore.
- The functions of the device can't be recovered due to the damage caused by water, strong collision, serious contamination or corrosion.
- The product is deformed due to falling or strong collision, and the functions can't be recovered even if the main parts are replaced.
- The product is aging or used in adverse environment, so many parts don't work normally. In this case, it has to be changed.
- The part is not available even if it is in the warranty period.