

# Model PVS01 Sensor kit

## User Manual

# Interference Information

## **FCC Caution:**

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

This device complies with part 15 of the 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.

## **IMPORTANT NOTE:**

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## **FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

If necessary, you may reach us to clarify on this matter.

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## Introduction

This multi function device is powered by any CE or UL certified 5Vdc powerbank for low load supply. A powerbank with at least 4400 mAh rating on full charge can operate the device for at least 12 hours or more on a continuous basis.

Its UV resistant casing is designed to withstand the UV whitening effects on its enclosure. It is water resistant from light rain but not waterproof. It is NOT designed for use as a permanent outdoor installation.

All data is transmitted wirelessly via Espressif ESP32 microprocessor module to any compatible receiver e.g. mobile app etc via radio transmission in the 2.4GHz covering the Bluetooth and wifi frequency range.

Its features include header board add-on e.g. SD card (optional add on), other sensors or peripheral detectors via inter-integrated circuit interface (I2C) or serial (I2S) interfaces, and optional universal asynchronous receiver-transmitter (UART) communication to allow on board programming of the microprocessor unit.

For purpose of CE and FCC certification, we have a photo diode sensor connected as an integrated device to transmit the measured irradiance value to receiver at regular intervals.

## Important safety warning

Appropriate safety cautionary notes depends on the sensor connected. Since our initial version has a photo diode sensor for use outdoors, the precautions highlight will correspond to this application.

Placement of device at an unshaded location and level to the desired orientation to begin operation.

### **Precaution #1**

Work from height or rooftops. Follow your national Workplace Safety and Health (Work at Heights) Regulations. For example three-point contact when using ladder, drink lots of water when working in hot outdoor environments, wear proper sunshade or sun tan lotion etc

### **Precaution #2**

In event of weather with imminent rain and lightning, dusty or smoky environments, please refrain from operating this device until the environmental conditions improved. Continued use under such conditions will render inaccurate readings and unnecessary soiling of device sensor and its enclosure.

### **Precaution #3**

Our device circuitry is designed with low power use. Please do not modify or conduct unauthorized connections within our device. Doing so will render the warranty void and may compromise the proper functioning of the device.

## Unpacking and overview

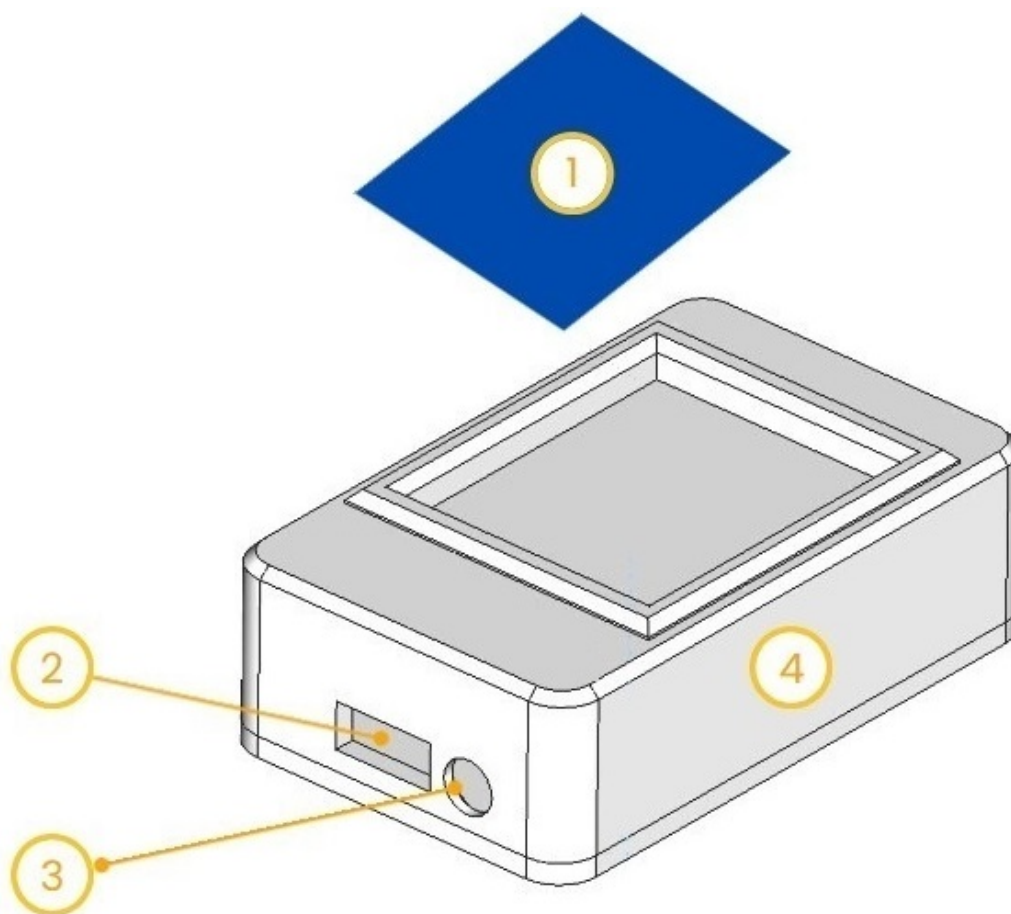
Product is enclosed in its customized box. We strive to use environmentally friendly packaging materials. Please disposed of the packaging materials according to your national disposal requirements.

Before use, please check the items. Ensure nothing inside is damaged. You should expect the following items in the package:

- Printed Circuit Board (PCB) integrated in enclosure with photo diode sensor
- USB type C (male interface) cable

We recommend you use a CE or UL certified powerbank to operate the device.

## Product overview:



*Figure 1. Device enclosure illustration  
(Actual product dimensions and design may change)*

### Legend

- 1) Photo-diode sensor
- 2) USB-C port (female connection)
- 3) LED
- 4) Enclosure

## Powering up and Operation

This is firmware dependant. PCB has a tri-color LED in Blue, Red or Green.

Power up the device from a 5Vdc powerbank or equivalent power source to the device via a USB-C male cable.

During first power up, you should the device with blinking LED in Blue colour.  
The device is functioning and will begin transmitting the measured data wirelessly.

You can view data from our mobile App. On your phone, simply scan the wifi,Bluetooth for 'PVAP-XXX' and select to connect. Once connection is successfully established, the data should be displayed on our app. You may shine a torchlight or bring the device towards the sun to see if the value changes.

Under ideal line of sight case, the wifi signal can theoretically reach up to 100m but many factors such as terrain with many metal or concrete structures, high power wifi or nearby telecommunication emitting sources may affect the device transmission effective distances. Our field tests in urban conditions showed decent reach distance of 30m to 50m.

After the desired operation, user simply disconnect or turn off the power bank supply to the device.



## Maintenance and cleaning

This device with a photo-sensitive sensor, is designed to be used outdoors but not on permanently installed use basis. It is water resistant from light rain and not waterproof. In event of rain, please cease operating it and retrieve both the device and powerbank.

If device is wet from rain or dust ingress is visible, you may unscrew the four screws to remove the lid to dry out the inner enclosure of water &/or blow clean any dust within the enclosure. Please refrain from removing the PCB as the interconnects with sensor may be affected.

For the sensor and enclosure, please DO NOT use abrasives or solvents such as thinner, Iso-Propyl Alcohol (IPA) or acetone to clean. Simple use a lint free cloth with mild non abrasive soap and water will suffice. Avoid scratching the sensor surface and store it in a lint free pouch for later use.

## Troubleshooting

Indicator lights: RED, BLUE and GREEN

Colour and sequence change in colour is again dependant on the firmware installed.

RED blinking implies some error detected with message usually displayed in our mobile app.

BLUE blinking indicates normal operation in Access Point mode.

GREEN blinking indicates normal operation in user defined wifi network.

The measured reading will be shown in mobile app during BLUE or GREEN blinking mode with readings refreshed at intervals of one to three seconds.

For technical support, you may contact us at [info@pvbuddy.com](mailto:info@pvbuddy.com)

# Specifications

## DESCRIPTION

Model	PVS01
Power input (DC)	5 Vdc from powerbank or power source <sup>+</sup>
Irradiance	200 to 1200 W/m <sup>2</sup>
Accuracy	+/- 5%

## PHYSICAL

Dimension L * W * H (mm)	Approximately 60 * 38 * 20
Net weight	< 30 gram

## INTERFACE

USB-C Female	Yes
I2C (Inter-Integrated Circuit)	Yes
I2S (Inter-IC Sound)	Yes
UART communication <sup>++</sup>	Optional

## SENSOR

Multi-crystalline or mono-crystalline	Solar cell
Spectral range (nm)	350 to 1100

## OPERATING ENVIRONMENT

Humidity	0 to 90% (non condensing)
Operating temperature	0 to 85 degC

+ Recommended to use UL, FCC and CE certified powerbank or power source.

++ Universal Asynchronous Receiver Transmitter.