Reference Indoor Photovoltaic Cell

Lightricity provides advanced testing solutions designed to deliver accurate and realistic measurements of photovoltaic (PV) devices and IoT PV-powered systems under indoor light conditions. The Reference Indoor PV Cell is an essential tool for calibrating artificial light sources prior to evaluating device performance. Unlike filtered reference cells, it provides an excellent spectral match with indoor artificial light spectra, such as white LED and fluorescent light sources.

Features

- Reference PV cell for the light intensity calibration of indoor artificial light sources
- Compliant with the IEC standards TS 62607-7-2:2023 and 60904-2
- Spectral response engineered for indoor artificial light (360 – 830 nm), with no response in the NIR and IR regions and no need for optical filters
- Excellent linearity, starting from 1 lux
- Standard LEMO cable for 4-wire measurement of the PV cell with external source meter (SMU)[1]
- Light and temperature monitoring via software[2] (USB-C)
- Protective quartz window
- Warranty of 1-year (extension available upon request)
- Designed and manufactured in the United Kingdom

[1] External SMU compatible with GPIB communication. GPIB-USB cable not included.
[2] Default compatibility with Keithley 2400/01 and Keysight 2900. SMU customisation available.

Technical Specifications

Outer dimensions and weight	65 mm x 65 mm x 25 mm / 195 g
Non-linearity	<0.1% starting from 1 lux
Deviation from cosine response	<1%
Temporal stability	<0.1% (over 30 mins)

The Reference Indoor PV Cell has been tested by the UK's National Physical Laboratory (NPL) against IEC standard 60904-2.

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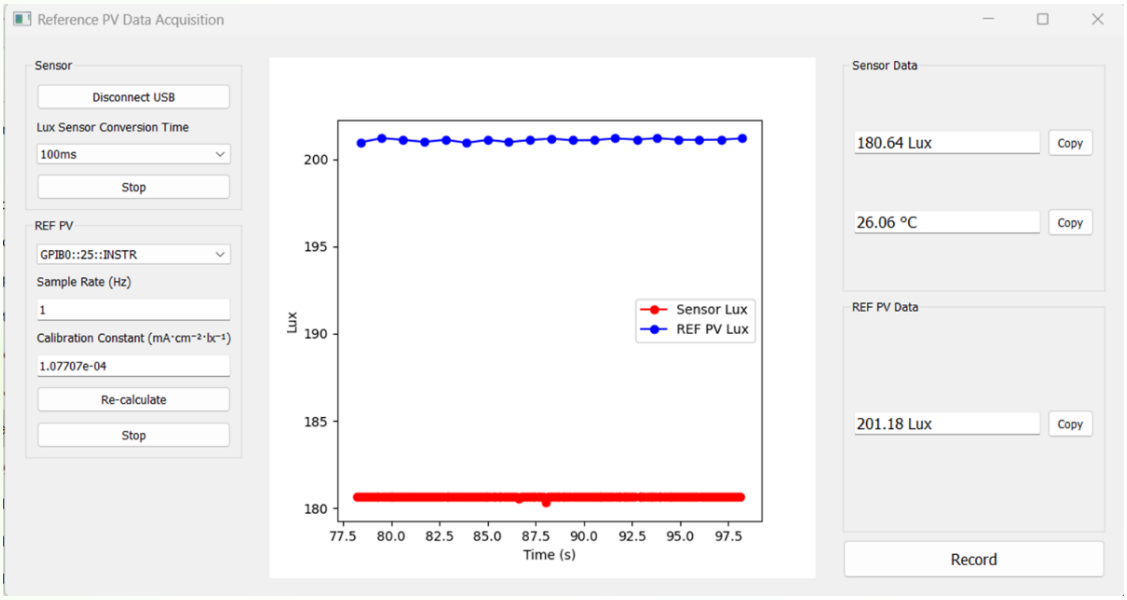
Reference Indoor PV Cell Software

The Reference Indoor PV Cell includes a Windows software application (provided with perpetual licence, compatible with Windows 10 and above) for monitoring and locally saving the following parameters, as function of time:

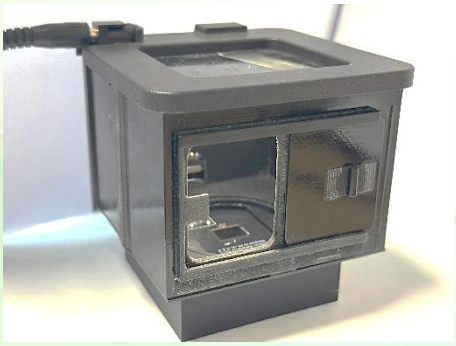
1. **calibrated light intensity** (lux): light intensity computed based on calibration constant
2. **non-calibrated light intensity** (lux): from built-in, digital ambient light sensor (for redundancy)
3. **temperature** (°C): from built-in digital temperature sensor



The calibrated light intensity is calculated by dividing the current (A) measured by the external source meter (SMU) connected with the LEMO cable to the reference PV cell (in 4-wire mode) by the calibration constant ($mA \cdot cm^{-2} \cdot lux^{-1}$) based on the light source spectrum.

The Reference Indoor PV cell is already calibrated with a **white LED 5000K** with spectral match **SA** according to IEC standard "TS 62607-7-2:2023" (**factory calibration**). In addition, the spectral distribution from any light source can be uploaded in .csv format to adjust the calibration constant under different light conditions.

Compatible with LightBox Indoor Light Simulator



- The Reference Indoor PV cell is fully compatible with the LightBox, Lightricity's calibrated benchtop tool for the characterisation of solar cells under indoor light:
  - Calibrated light intensity can be set directly in the LightBox with the Reference Indoor PV cell
  - IV measurement accuracy enhanced by real-time calibration of the light intensity
  - Fully compatible with all LightBox versions (STD and XL)

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