

# Reference Solar Cell

## USER MANUAL

Manual version: 1.0.2  
Product code: G3100A  
Product Version: 1.0



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# 1. EU Declaration of Conformity

**We**

**Company Name:** Ossila BV

**Postal Address:** Biopartner 3 building, Galileiweg 8

**Postcode:** 2333 BD Leiden

**Country:** The Netherlands

**Telephone number:** +31 (0)718 081020

**Email Address:** [info@ossila.com](mailto:info@ossila.com)

**declare that the DoC is issued under our sole responsibility and belongs to the following product:**

**Product:** Reference Solar Cell (**G3100A1**)

**Serial number:** G3100A1- xxxx

**Object of declaration:**

Reference Solar Cell (**G3100A1**)

**The object of declaration described above is in conformity with the relevant Union harmonisation legislation:**

EMC Directive 2014/30/EU

RoHS Directive 2011/65/EU

**Signed:**



**Name:** Dr James Kingsley

**Place:** Leiden

**Date:** 11/11/2025

**Декларация за съответствие на ЕС**

Производител: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Декларира с цялата си отговорност, че посоченото оборудване съответства на приложимото законодателство на ЕС за хармонизиране, посочено на предходната(ите) страница(и) на настоящия документ.

**[Čeština] Prohlášení o shodě EU**

Výrobce: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Prohlašujeme na vlastní odpovědnost, že uvedené zařízení je v souladu s příslušnými harmonizačními předpisy EU uvedenými na předchozích stranách tohoto dokumentu.

**[Dansk] EU-overensstemme Iserklæring**

Producent: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Erklærer herved, at vi alene er ansvarlige for, at det nævnte udstyr er i overensstemmelse med den relevante EU-harmoniseringslovgivning, der er anført på den/de foregående side(r) i dette dokument.

**[Deutsch] EU-Konformitätserklärung**

Hersteller: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Wir erklären in alleiniger Verantwortung, dass das aufgeführte Gerät konform mit der relevanten EU-Harmonisierungsgesetzgebung auf den vorangegangenen Seiten dieses Dokuments ist.

**[Eesti keel] ELi vastavusavaldus**

Tootja: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Kinnitame oma ainuvastutuse, et loetletud seadmed on kooskõlas antud dokumendi eelmisel lehelküljel / eelmistel lehekülgedel ära toodud asjaomaste ELi ühtlustamise õigusaktidega.

**[Ελληνικά] Δήλωση πιστότητας ΕΕ**

Κατασκευαστής: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Δηλώνουμε υπεύθυνα ότι ο αναφερόμενος εξοπλισμός συμμορφώνεται με τη σχετική νομοθεσία εναρμόνισης της ΕΕ που υπάρχει στις προηγούμενες σελίδες του παρόντος εγγράφου.

**[Español] Declaración de conformidad UE**

Fabricante: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Declaramos bajo nuestra única responsabilidad que el siguiente producto se ajusta a la pertinente legislación de armonización de la UE enumerada en las páginas anteriores de este documento.

**[Français] Déclaration de conformité UE**

Fabricant: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Déclarons sous notre seule responsabilité que le matériel mentionné est conforme à la législation en vigueur de l'UE présentée sur la/les page(s) précédente(s) de ce document.

**[Hrvatski] E.U izjava o sukladnosti**

Proizvođač: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Izjavljujemo na vlastitu odgovornost da je navedena oprema sukladna s mjerodavnim zakonodavstvom EU-a o usklađivanju koje je navedeno na prethodnoj(nim) stranici(ama) ovoga dokumenta.

**[Italiano] Dichiarazione di conformità UE**

Produttore: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Si dichiara sotto la propria personale responsabilità che l'apparecchiatura in elenco è conforme alla normativa di armonizzazione UE rilevante indicata nelle pagine precedenti del presente documento.

**[Latviešu] ES atbils tības deklarācija**

Ražotājs: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

Ar pilnu atbildību paziņojam, ka uzskaitītais aprīkojums atbilst attiecīgajiem ES saskaņošanas tiesību aktiem, kas minēti iepriekšējās šī dokumenta lapās.

**[Lietuvių k.] ES atitikties deklaracija**

Gamintojas: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.

atsakingai pareiškia, kad išvardinta įranga atitinka aktualius ES harmonizavimo teisės aktus, nurodytus ankstesniuose šio dokumento

**[Magyar] EU-s megfeleléségi nyilatkozat**

Gyártó: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
Kizárólagos felelősségünk mellett kijelentjük, hogy a felsorolt eszköz megfelel az ezen dokumentum előző oldalán/oldalain található EU-s összehangolt jogszabályok vonatkozó rendelkezéseinek.

**[Nederlands] EU-Conformiteitsverklaring**

Fabrikant: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
Verklaart onder onze uitsluitende verantwoordelijkheid dat de vermelde apparatuur in overeenstemming is met de relevante harmonisatiewetgeving van de EU op de vorige pagina(s) van dit document.

**[Norsk] EU-samsvarserklæring**

Produsent: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
Erklærer under vårt eneansvar at utstyret oppført er i overholdelse med relevant EU-harmoniseringslovverk som står på de(n) forrige siden(e) i dette dokumentet.

**[Polski] Deklaracja zgodności Unii Europejskiej**

Producent: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
Oświadczamy na własną odpowiedzialność, że podane urządzenie jest zgodne ze stosownymi przepisami harmonizacyjnymi Unii Europejskiej, które przedstawiono na poprzednich stronach niniejszego dokumentu.

**[Por tuguês] Declaração de Conformidade UE**

Fabricante: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
Declara sob sua exclusiva responsabilidade que o equipamento indicado está em conformidade com a legislação de harmonização relevante da UE mencionada na(s) página(s) anterior(es) deste documento.

**[Română] Declarație de conformitate UE**

Producător: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
Declară pe proprie răspundere că echipamentul prezentat este în conformitate cu prevederile legislației UE de armonizare aplicabile prezentate la pagina/paginile anterioare a/ale acestui document.

**[Slovensky] Vyhlásenie o zhode pre EÚ**

Výrobca: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
Na vlastnú zodpovednosť prehlasuje, že uvedené zariadenie je v súlade s príslušnými právnymi predpismi EÚ o harmonizácii uvedenými na predchádzajúcich stranách tohto dokumentu.

**[Slovenščina] Izjava EU o skladnosti**

Proizvajalec: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
s polno odgovornostjo izjavlja, da je navedena oprema skladna z veljavno uskladitveno zakonodajo EU, navedeno na prejšnji strani/prejšnjih straneh tega dokumenta.

**[Suomi] EU-vaatimusten mukaisuusvakuutus**

Valmistaja: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
Vakuutamme täten olevamme yksin vastuussa siitä, että tässä asiakirjassa luetellut laitteet ovat tämän asiakirjan sivuilla edellisillä sivuilla kuvattujen olennaisten yhdenmukaistamista koskevien EU-säädösten vaatimusten mukaisia.

**[Svenska] EU-försäkran om överensstämmelse**

Tillverkare: Ossila BV, Biopartner 3 building, Galileiweg 8, 2333 BD Leiden, NL.  
Vi intygar härmed att den utrustning som förtecknas överensstämmer med relevanta förordningar gällande EU-harmonisering som finns på föregående sidor i detta dokument.

## 2. Safety

### 2.1 Warning

- Do NOT connect a power supply to the Reference Solar Cell's USB port. It should only be connected to the USB port of a PC via a USB type-C cable.
- The maximum input/output voltage of the Reference Solar Cell's digital pins is 5V

### 2.2 Use of Equipment

The Ossila Reference Solar Cell is designed to be used as instructed. It is intended for use under the following conditions:

- Indoors in a laboratory environment (Pollution Degree 2)
- Altitudes up to 2000m
- Temperatures of 5°C to 60°C; maximum relative humidity of 80% up to 31°C.

### 2.3 Servicing

If servicing is required, please return the unit to Ossila Ltd. The warranty will be invalidated if:

- Modification or service has been carried out by anyone other than an Ossila engineer.
- The Unit has been subjected to chemical damage through improper use.
- The Unit has been operated outside the usage parameters stated in the user documentation associated with the Unit.
- The Unit has been rendered inoperable through accident, misuse, contamination, improper maintenance, modification, or other external causes.

## 3. Requirements

Table 3.1 details the requirements for the Reference Solar Cell, and the minimum computer specifications for the software (if any).

Table 3.1. Ossila Reference Solar Cell requirements.

Power	5 VDC USB (supplied with the system)
Connectivity	USB 2.0

## 4. Unpacking

### 4.1 Packing List

The standard items included with the Ossila Reference Solar Cell are:

- The Ossila Reference Solar Cell.
- USB type-A to type-C cable.
- Rubber feet (x4)
- USB Memory Stick with user manual and calibration certificate



Figure 4.1. Ossila Reference Solar Cell.



Figure 4.2. USB type-A to type-C cable.

### 4.2 Damage Inspection

Examine the components for evidence of shipping damage. If damage has occurred, please contact Ossila directly for further action. The shipping packaging will come with a shock indicator to show if there has been any mishandling of the package during transportation.

## 5. Specifications

The Ossila Reference Solar Cell specifications are shown in **Table 5.1**.

**Table 5.1.** Ossila Reference Solar Cell specifications.

Accuracy (@ 25°C)	< 0.01 + 0.15%
Precision	± 0.03 mW/cm <sup>2</sup>
Thermal Drift (@ 10 – 50 °C)	0.3 mW/cm <sup>2</sup> , peak-to-peak
Display resolution	0.1 mW/cm <sup>2</sup> (@ $x \geq 100$ mW/cm <sup>2</sup> ) 0.01 mW/cm <sup>2</sup> (@ $100 > x \geq 10$ mW/cm <sup>2</sup> ) 0.001 mW/cm <sup>2</sup> (@ $10 > x \geq 0.000$ mW/cm <sup>2</sup> )
Spectral Range of Calibration	350 nm – 1000 nm
Spectral Range of Flattening Filter	400 nm – 1100 nm
Dimensions (L x W x H)	131 mm x 55 mm x 23 mm (5.04" x 2.17" x 0.91")
Weight	88g (3.1oz)

## 6. Installation

Connect the unit to your PC using a USB-C cable.

## 7. Operation

### 7.1 Quick Start Guide

1. Remove the anti-static film covering the aperture before taking measurements. You may reuse this when storing the device.
2. The device will display the measured irradiance values in mW/cm<sup>2</sup>.
3. When positioned at the centre of a solar simulator beam at the correct working distance (measured from the top flat surface of the reference solar cell) in a dark room, it should read ~100 mW/cm<sup>2</sup> (1 sun).

## 7.2 Command Library

The Ossila Reference Solar Cell can be communicated with using a serial command library. When connected to a PC, the device will appear as a COM port, to which the serial commands can be sent. This section describes the command protocol and lists the available commands.

### 7.2.1 Command Format

Commands should be sent to the reference solar cell in ASCII format, and responses from the reference solar cell will also be in ASCII format.

All commands sent to the reference solar cell have a start and end delimiter, < and > respectively. Only commands enclosed by these delimiters will be acknowledged by the device. If any invalid commands are sent between delimiters, the system will return <Invalid Command>.

Commands have the format <command?>.

Query commands allow the user to find current system settings without modifying them. If a query command is successfully interpreted, the system will return <command value>.

Values will be one of the following types depending on the command:

- float – Floating-point number
  - l. These can be sent in scientific notation (for example, 123e4 or 123E4).
- int – Integer
  - l. If a floating-point number is sent instead, it will be rounded down to an integer.
- bool – Boolean (0 or 1)
  - l. Non-zero integers or floating-point numbers will be interpreted as 1.
- str – String
  - l. Only used as returns in some query commands.

## 7.2.2 Query Commands

Command	Returns	Function
<power?>	<power <i>float</i> >	Returns the measured irradiance value.
<temp?>	<temp <i>float</i> >	Returns the measured temperature near the photodiode.
<device?>	<device <i>str</i> >	Returns the product code of the reference solar cell.
<serial?>	<serial <i>int</i> >	Returns the serial number of the reference solar cell.
<firmware?>	<firmware <i>int.int.int</i> >	Returns the firmware version of the reference solar cell in the format <i>major.minor.patch</i> .

## 7.2.3 Error codes

The following error codes may be returned by the <power?> query.

Code	Meaning
-10000001	The light irradiance is above the maximum irradiance that the device was calibrated to.
-10000002	An error occurred whilst performing interpolation using the calibration table.

## 8. Maintenance

The top face of the filter may occasionally need cleaning with compressed air, or IPA and a microfiber cloth.

When not in use, store the device with the aperture covered to avoid build-up of dust or particulates. You may re-use the original antistatic film wrapped around the aperture.

## 9. Troubleshooting

Most of the issues that may arise will be detailed here. However, if you encounter any issues that are not detailed here, then contact us by email at [info@ossila.com](mailto:info@ossila.com). We will respond as soon as possible.

Problem	Possible Cause	Action
No power/display Cannot connect to the system via USB	The USB cable may not be connected properly.	Ensure the USB cable is firmly plugged in at both ends.
	The USB cable may not be connected to a working USB port.	Try connecting the unit to a different USB port on the computer.
	The USB cable is defective.	Try using a different USB-A to USB-C cable, and contact Ossila if necessary.
“Err” message on display	Non-specific error	For a more specific error code, send the <power?> serial command to the device and read the response. More detail can be found in chapter 7.2.3.
“HI” message on display	The measured irradiance is above the maximum irradiance of that the device was calibrated to.	Ensure that the irradiance from the light source is less than ~137 mW/cm <sup>2</sup> .  Ensure that the solar simulator is at the correct working distance (measured from the top flat face of the reference solar cell).

## 10. Related Products



### Solar Simulator

High-quality, low cost light source with AAA classification over a 15 mm diameter circular area.

Product code: G2009B1



### Automated Solar Cell Testing Kit

Simplify solar cell testing with a complete and integrated system.

Product code: T3003B3