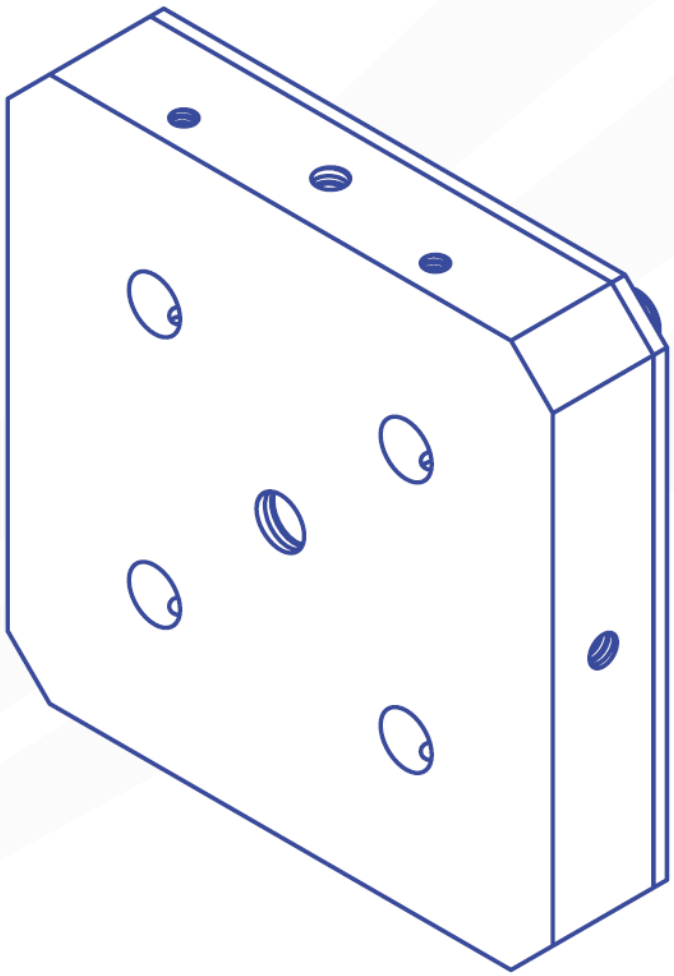
Ossila
enabling science

SILICON PHOTOMULTIPLIER
USER MANUAL

Manual version: 1.0.0
Product code: G3002
Product Version: 1.0
Software version: 1.0



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Contents

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)71 3322992

Email Address: info@ossila.com

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

Product: USB Silicon Photomultiplier (G3002A1)

Serial number: G3002A1-xxxx

Object of declaration:

USB Silicon Photomultiplier (**G3002A1**)

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: 01/03/2026

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

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[Slovensky] **Vyhlásenie o zhode pre EÚ**
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[Svenska] **EU-försäkran om överensstämmelse**
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Vi intygar härmed att den utrustning som förtecknas överensstämmer med relevanta förordningar gällande EU-harmonisering som fmns på föregående sidor i detta dokument.

2. Safety

2.1 Use of Equipment

The Ossila USB Silicon Photomultiplier 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 40°C; maximum relative humidity of 80% up to 31°C.

2.2 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.

2.3 Health and Safety – Servicing

Servicing should only be performed by an Ossila engineer. Any modification or alteration may damage the equipment, cause injury, or death. It will also void your equipment's warranty.

3. Requirements

Table 3.1 details the requirements for the Ossila USB Silicon Photomultiplier, and the minimum computer specifications for the Ossila Photodetector Console software.

Table 3.1. Ossila USB Silicon Photomultiplier and Ossila Photodetector Console requirements.

Power	USB
Operating Systems	Windows 11 (64-bit)
CPU	Dual Core 2 GHz
RAM	4 GB
Available Hard Drive Space	183 MB
Monitor Resolution	1280 x 720
Connectivity	USB-C 2.0

4. Unpacking

4.1 Packing List

The standard items included with the Ossila USB Silicon Photomultiplier are:

- The Ossila USB Silicon Photomultiplier.
- USB-C cable.
- USB memory stick loaded with software installer, and user manual.

Figure 4.1. Ossila USB Silicon Photomultiplier.

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 USB Silicon Photomultiplier specifications are shown in **Table 5.1**.

Table 5.1. Ossila USB Silicon Photomultiplier specifications.

Spectral Range	200 nm – 1000 nm
Irradiance Measurement Range	1 nW/cm^2 – 10 µW/cm^2
Photodetection Efficiency	Up to 35%
Maximum Counts	16777215
Signal-to-Noise Ratio	>50,000:1
Maximum Data Rate	30 Hz
Detection Area	3 mm x 3 mm
Dimensions	65 mm (L) x 65 mm (W) x 14 mm (D)
Weight	100 g

6. Operation

The Ossila USB Silicon Photomultiplier can be controlled either programmatically using serial commands, or through the Ossila Photodetector Console software.

6.1 Command Library

The primary interface of the Ossila USB Silicon Photomultiplier is the 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.

6.1.1 Command Format

Commands should be sent to the silicon photomultiplier in ASCII format, and responses from the silicon photomultiplier will also be in ASCII format.

All commands sent to the silicon photomultiplier 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 are either action commands with the format `<command>` or setting commands with the format `<command value>`. Setting commands can also be queried using the format `<command?>`.

Setting commands that have a corresponding query command list both commands together. In these cases, the set command `value` and query command return `value` have the same format.

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

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

6.1.2 Action Commands

Command	Returns	Function
`<read>`	`<read int>`	Reads the photodetector and returns the current value.
`<zero>`	`<zero int>`	Automatically sets the baseline to make the current reading approximately 0.02% of the full scale.

6.1.3 Setting Commands

Command	Values/Returns	Function
`<tcomp X>` `<tcomp?>`	***X*** – bool – temperature compensation state	1 sets the SiPM to apply temperature compensation to measurements, 0 turns temperature compensation off.
`<baseline X>` `<baseline?>`	***X*** – int – baseline value	Sets an offset to measurements. Can be set between -10000 and 10000. These values are arbitrary, **not** measured counts.
`<precision X>` `<precision?>`	***X*** – int – precision level (1, 2, 3)	Sets the precision of the silicon multiplier to: 1 – low 2 – medium 3 – high Higher precision decreases measurement noise and speed.
`<temp?>`	<temp *float*>	Returns the temperature of the silicon photomultiplier in °C.
`<serial?>`	`<serial int>`	Returns the serial number of the silicon photomultiplier.
`<firmware?>`	`<firmware int.int.int>`	Returns the firmware version of the silicon photomultiplier in the format `major.minor.patch`.

6.2 Photodetector Console

Figure 6.1. Ossila Photodetector Console.

Ossila provides free software to allow for simple use of the silicon photomultiplier. A Windows installer is provided on the USB drive supplied with the system and can be downloaded from our website at www.ossila.com/pages/software-drivers.

To install the software simply run the installer and follow the on-screen instructions.

6.2.1 Control Tool Bar

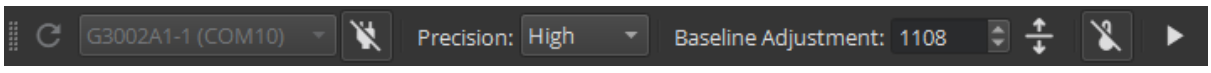
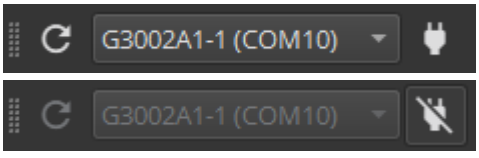


Figure 6.2. Photodetector Console control tool bar.

The control tool bar has the following sections:

(I) Connection Controls



The drop-down box lists the serial numbers and addresses of any connected Ossila USB Silicon Photomultipliers.

To connect to the selected silicon photomultiplier, click the button. To disconnect click the button.

To search for connected Ossila USB Silicon Photomultipliers, click the ↻ button. If only a single silicon photomultiplier is detected the software will automatically connect to it.

(II) Photodetector Controls

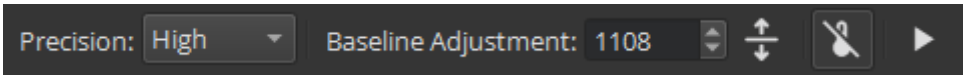


Figure 6.3. Silicon photomultiplier controls.

Precision	Set the precision of the silicon photomultiplier.
Baseline Adjustment	Set the baseline adjustment of the silicon photomultiplier.
	Automatically sets the baseline to make the current reading approximately 0.02% of the full scale.
	Toggle temperature compensation on or off.
	Start or stop reading data from the silicon photomultiplier.

(III) Plot Controls

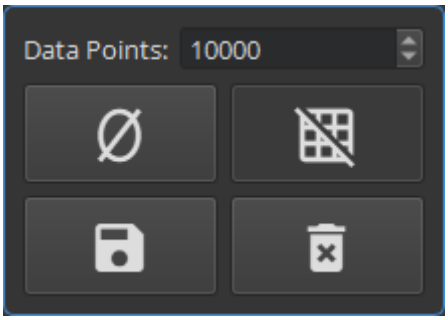


Figure 6.4. Photodetector Console plot controls.

Data Points	Set the number of data points to display in the plot.
	Zeroes all data to the most recent data point. Click again to restore raw values.
	Toggle displaying a grid on the plot.
	Save the data in the plot to a .csv (comma-separated value) or .txt (text) file.
	Clear all data from the plot.

Plot Display Controls

By default, the plots will automatically scale the axes to display all the data within it. The view can be controlled manually using the following mouse controls:

- Left or middle click and drag – pan the axes.
- Right click and drag – scale the axes.
- Scroll wheel – scale the axes.

A specific axis can be controlled by using these controls on the axis labels. The axes can be reset by clicking the 'A' button in the bottom-left of the plot, shown in **Figure 6.5** (note, this button will only appear whilst the mouse cursor is over the plots).

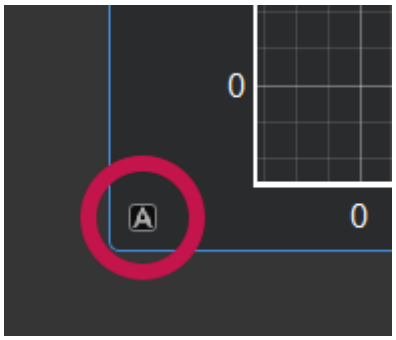


Figure 6.5. Button to reset plot axes.

Axis scales and automatic scaling can also be set by right-clicking on the plot and selecting the appropriate options in the context menu.

(IV) Data Display

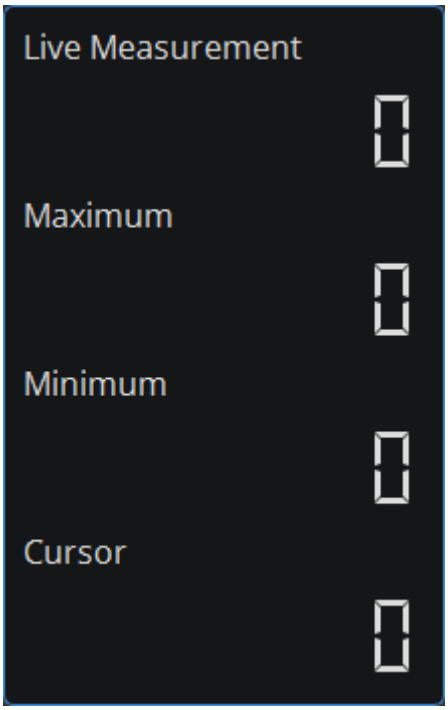


Figure 6.6. Photodetector Console data display.

Live Measurement	The most recent data point to be read from the silicon photomultiplier.
Maximum	The maximum value displayed in the plot.
Minimum	The minimum value displayed in the plot.
Cursor	The value of the data point closest to the cursor's position.

All values are in counts and are relative to the zero value if the data has been zeroed.

6.2.2 Menu Bar

(I) File Menu

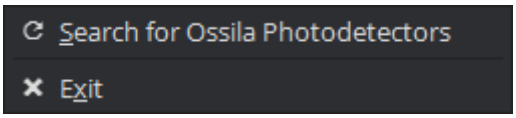


Figure 6.7. File menu.

Search for Ossila Photodetectors	Search the USB ports and network for Ossila USB Silicon Photomultipliers. Discovered units will be displayed in the drop-down box in tool bar.
Exit	Close the software.

(II) View Menu

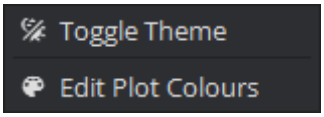


Figure 6.8. View menu.

Toggle Theme	Switch the software between light and dark themes.
Edit Plot Colours	Open the edit plot colours settings dialog (see **Figure 6.9**).

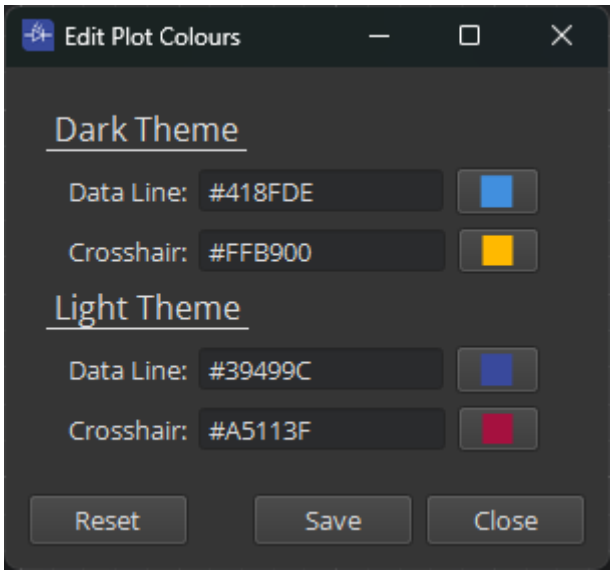


Figure 6.9. Edit plot colours dialog.

(III) Help Menu

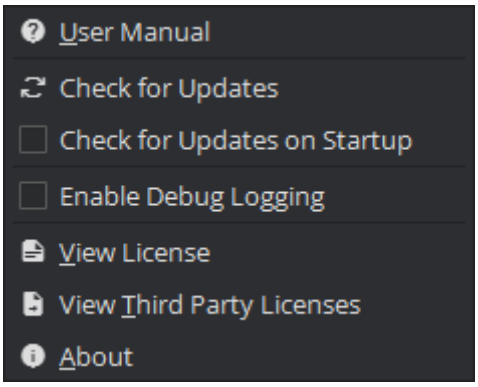


Figure 6.10. Help menu.

User Manual	Open the user manual in your default web browser.
Check for updates	Check whether a newer version of the software is available to download and install. If an update is available a message will be displayed in the status bar with the latest version number. Clicking the message will take you to **Ossila's website** where you can download the new version.
Check for Updates on Startup	When checked the software will automatically check for software updates each time it starts.
Enable Debug Logging	When checked, the software will write more information to the log file. The log file is written to the temporary directory which can be accessed by typing **%temp%** into the file explorer's address bar.
View License	Display software license information.
View Third Party License	Display the license information of third-party software that has been used in the software.
About	Display information about the software.

7. 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. We will respond as soon as possible.

Problem	Possible cause	Action
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 system to a different USB port on the computer. If using a USB hub, try plugging the unit into a port directly on the PC.
	The USB cable is defective.	Try using a different USB cable
Software does not start	The wrong version of Windows is installed on the computer.	Install the software on a computer with Windows 11.
	The software has not installed properly.	Try reinstalling the software.

8. Related Products

Monochromator

Isolate specific wavelengths between 380 – 1000 nm with <1 nm accuracy.

Product codes: G3001A1

Tunable LED Light Source

Source variable monochromatic light between 380 and 1000 nm to <1 nm accuracy.

Product code: G3006A1

LED Light Source

Powerful and consistent 380 – 1000 nm light for your spectroscopy experiments.

Product codes: G3003A1

Adjustable Slit

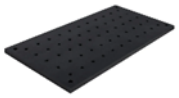
A manual variable slit with a width range of 50 µm to 6 mm.

Product code: G3004A1

Optical Filters

Longpass and shortpass filters in a range of wavelengths.

Product code: G2101 / G2102



Optical Breadboard Plate

Solid anodized metric aluminium optical breadboard plate.

Product codes: G2007A1