

MULTI WAVELENGTHS PHOTODEVICE SYSTEM

MANUEL

SOLARTECH SIMULATOR ALL-IN-ONE Device and Software Installation Guide

1. DEVICE INSTALLATION

1.1 Power Connection

2.



1. Locate the **POWER** connector on the back of the device.
2. Plug the power cable into the connector.
3. Turn the power switch to the “I” position to switch on the device.

⚠️ **Note:** Make sure the device is connected to the correct voltage line.

2. SOFTWARE INSTALLATION

2.1 Running the Installation File

1. Open the **LedScannerSoftware** folder on your computer.
2. Click on the **Installer** folder inside it.
3. In the opened folder, run the **LedScannerSoftwareInstaller** file.
4. In the window that appears, click the **INSTALL** button.
5. The installation will be completed automatically.
6. When the installation is finished, click the **EXIT** button.

Once the installation is complete, a shortcut to the software will be automatically created on the desktop.

2.2 Creating a Manual Shortcut (If Necessary)

If a desktop shortcut is not created:

1. Open the **C:** drive.
2. Navigate through the following folders:

```
PROGRAM FILES
├── FYApps
│   └── LedScannerSoftware
```

3. Click and hold the left mouse button on the **LedScannerSoftware** application and drag it to the desktop.
4. Select the **Create shortcut** option.

You can now run the software by clicking the **LedScannerSoftware** shortcut on your desktop.

3. DEVICE – SOFTWARE CONNECTION

3.1 USB Connection

1. Connect the device's USB cables to your computer.
2. Launch the software.
3. In the opened program, click the **COMMUNICATION** tab located in the upper-left corner.

3.2 Connection Check

1. Under the **SOLARTECH SIMULATOR ALLINONE** heading, click the **Use this configuration** option.
2. Then press the **CHECK CONNECTIONS** button.

The computer will automatically scan the ports.

The following message will appear on the screen:

ALL CONNECTIONS ARE OK

The screenshot displays the 'COMMUNICATION' tab of the SOLARTECH SIMULATOR ALLINONE software. The interface includes several configuration panels for different hardware components:

- KEI SourceMeter:** Port Number (dropdown), Baud Rate (57600), and a radio button for 'Use this instrument'.
- DP & DM SOURCEMETER:** DP USB (dropdown), DM USB (dropdown), and a radio button for 'Use this instruments'.
- SOLARTECH SOURCEMETER:** SOLARTECH SOURCEMETER Port (dropdown), DM USB (dropdown), and a radio button for 'Use this instruments'.
- Solartech Card Device:** Port Number (dropdown), Baud Rate (9600), Channel (smu1), Range (1), and a radio button for 'Use this instrument'.
- Solartech SourceMeter:** Port Number (dropdown), Baud Rate (9600), and a radio button for 'Use this instrument'.
- SOLARTECH SOLAR SIMULATOR:** Port Number (dropdown) and a radio button for 'Use this power supply'.
- Solartech Source & Solartech Meter:** Solartech Source (dropdown), Solartech Meter (dropdown), and a radio button for 'Use this instruments'.
- SOLARTECH SOLAR SIMULATOR ALLINONE:** Radio button for 'Use this configuration', a 'CHECK CONNECTIONS' button (highlighted with a checkmark), a 'Refresh Ports' button, and buttons for 'Go Home Position' and 'Save'.
- Solartech Heating Controller:** Port Number (dropdown), Baud Rate (9600), and a checked radio button for 'Exclude Controller'.
- Calibration:** Calibration Value (52), 'Get Calibration' button, and 'Set Calibration' button.

4. CALIBRATION PROCESS

1. Click the **Get Calibration** button.
 2. The device will automatically determine the calibration value.
Note: In the sample image, the value appears as 52.
Your device may display a different calibration value.
 3. Click **GOTO Home**. When the device reaches the home position, the red LED at the output will light up.
 4. Click the **SAVE** button.
-

5. STARTING THE MEASUREMENT

After the calibration is saved, the device is ready for measurement.
You can now start your measurements.

I-V CHARACTERISTICS MEASUREMENT GUIDE

AT DIFFERENT WAVELENGTHS

1. DEFINITION OF I-V PARAMETERS

Before performing the I-V (Current-Voltage) measurement, the following parameters must be entered:

- **Start Voltage:** Initial voltage value
- **Stop Voltage:** Final voltage value
- **Step:** Voltage increment step
- **Solar Cell Area:** Active area of the solar cell (cm²)

4. CALIBRATION PROCESS

5. Click the **Get Calibration** button.
 6. The device will automatically determine the calibration value.
Note: In the sample image, the value appears as 52.
Your device may display a different calibration value.
 7. Click **GOTO Home**. When the device reaches the home position, the red LED at the output will light up.
 8. Click the **SAVE** button.
-

5. STARTING THE MEASUREMENT

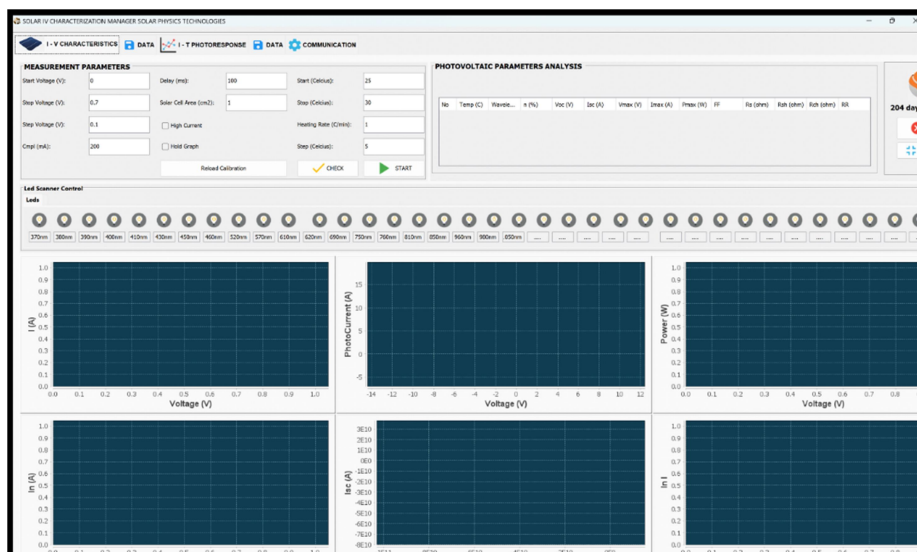
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2. EXAMPLE MEASUREMENT PARAMETERS

(Sample values for a standard solar cell)

Parameter	Value
Start Voltage	0 V
Stop Voltage	0.6 V
Step	0.1 V

Note: The Stop Voltage value may vary depending on the solar cell used.

3. WAVELENGTH SELECTION

1. Select the wavelength from the measurement screen.
 2. For example, choose the **520 nm** wavelength.
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4. STARTING THE MEASUREMENT

1. Check the measurement parameters.
2. Click the **START** button.

The device will automatically:

- Switch to the selected **520 nm LED**.
- Activate the LED.
- Perform the I-V measurement at the defined voltage steps.

When the measurement is completed, the following will be displayed on the screen:

- All current-voltage values
- I-V graph
- Calculated characteristic parameters

To save the measurement results:

1. Click the **DATA** button next to the **IV Characteristics** section.
2. Enter a file name in the opened save window.
3. Choose the folder where you want to save the file.
4. Click the **SAVE** button.

The data will be saved to your computer.

6. MEASUREMENT COMPLETION

The saved data can later be used for analysis, reporting, and comparison.

For the next wavelength:

- Select the new wavelength
 - Repeat the same steps
-

I-T (Current-Time) Photoresponse Measurement Guide

1. I-T Measurement Parameters

Before performing the I-T (Current-Time) measurement, the following parameters must be entered:

- **Bias Voltage:** Bias voltage applied to the device
 - Enter **0 V** for a solar cell
 - **CMPL:** Current limit value
 - Keep it at **200 mA** (do not change)
 - **Measurement Time:** Total measurement duration (in seconds)
 - **Pulse Width:** LED on/off duration
 - Can be entered in **ms** or **s**
 - Example: 500 ms
-

2. DARK CURRENT (I_{dark}) MEASUREMENT

Before starting the measurement, the device's dark current (I_{dark}) must be measured.

Steps:

1. Completely cover the device to prevent any light exposure.
2. Check the **Bias Voltage** value (0 V for a solar cell).
3. Press the **START** button.

The device will automatically measure the dark current.

4. When the measurement is complete, note the value displayed on the screen.
 - Example: 1E-6 A
5. Enter this value in the **I_{dark}** field on the software.

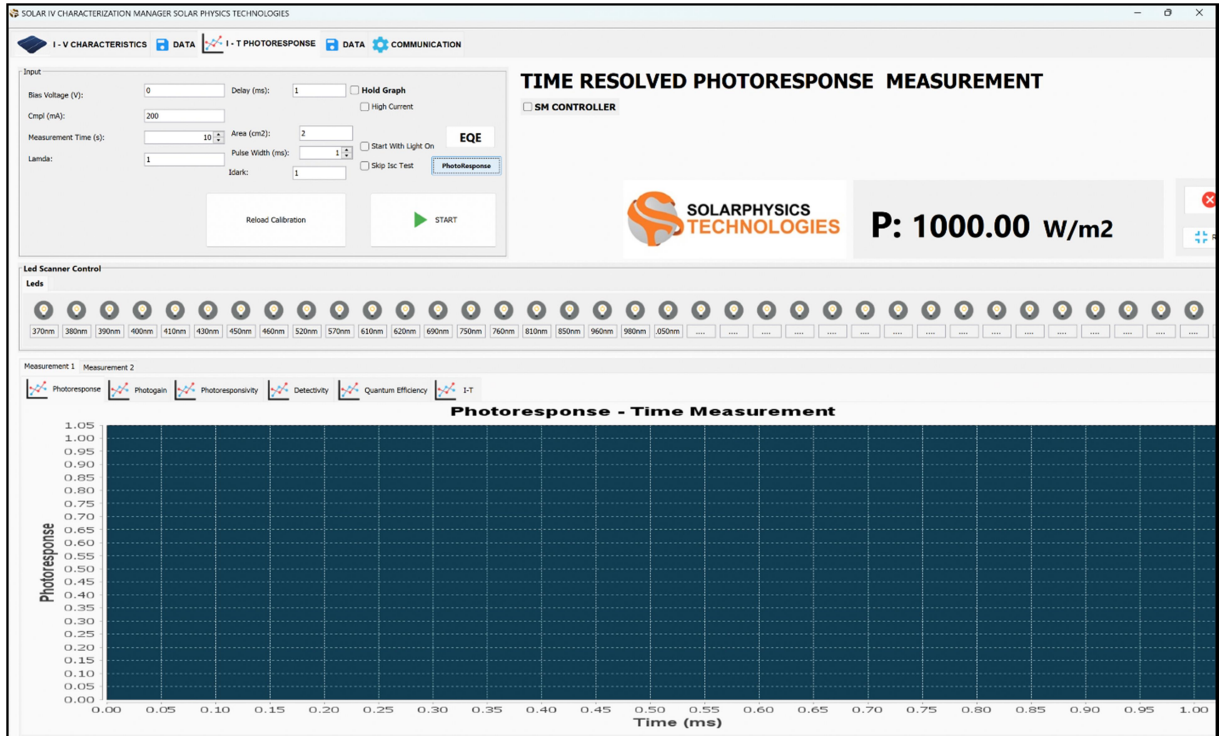
Note: Entering the correct I_{dark} value is essential for accurate photoresponse analysis.

3. PHOTO RESPONSE MEASUREMENT

1. Select the LED wavelength for which you want to perform the measurement.
 - Example: 520 nm
2. Check the **Measurement Time** and **Pulse Width** values.
3. Press the **START** button.

The device will automatically:

- Activate the selected LED
- Turn the LED on and off according to the defined pulse duration
- Perform the current-time (I-T) measurement



4. MEASUREMENT RESULTS

When the measurement is complete, the following will be displayed on the screen:

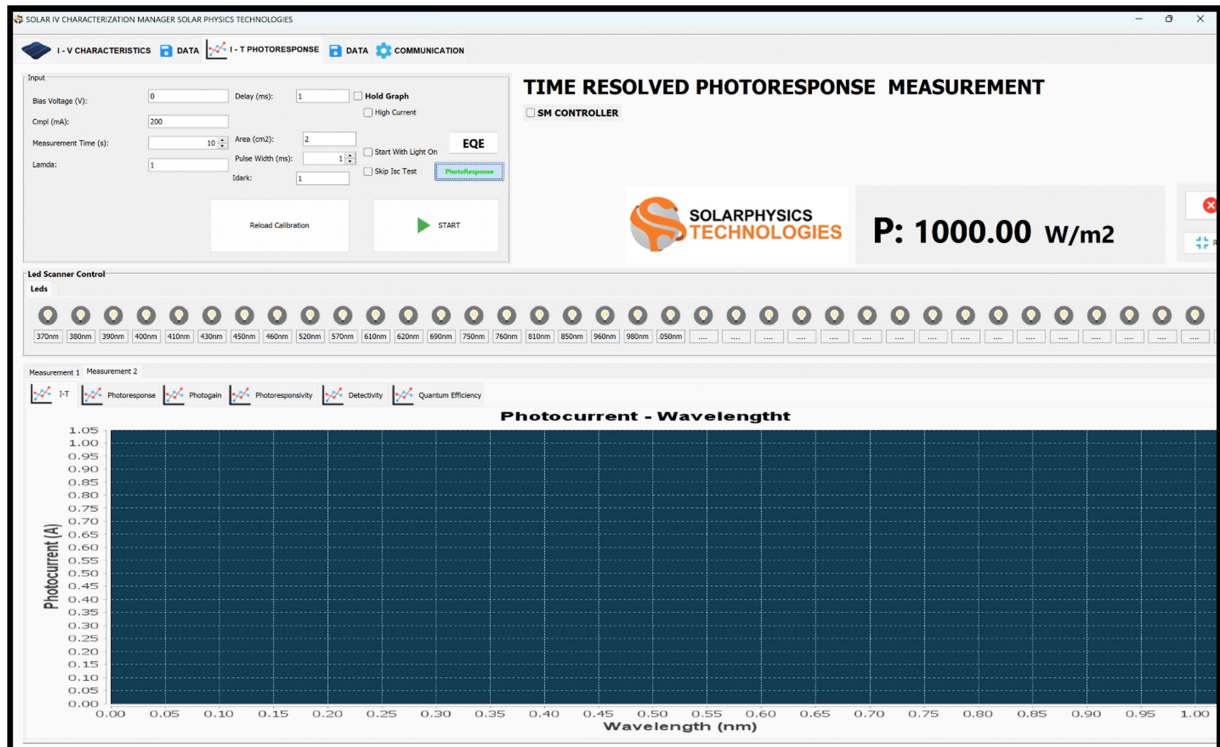
- Current-Time graph (I-T curve)
- Current values in the ON/OFF states
- Photoresponse behavior

5. REPEATING THE MEASUREMENT

For different wavelengths:

1. Select the new LED wavelength.
 2. Check the same measurement parameters.
 3. Press the **START** button again.
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I–Wavelength (Current–Wavelength) Photoresponse Measurement Guide



1. Entering the Measurement Screen

To start the I–Wavelength (Current–Wavelength) photoresponse measurement:

1. Click the **PHOTORESPONSE** option in the software.

After this, the I–Wavelength measurement screen will open.

2. Wavelength Selection

1. Select the wavelengths for which you want to measure the photocurrent:
 - Single selection is possible.
 - Multiple wavelengths can also be selected.

The selected wavelengths will be scanned automatically by the system.

3. Starting the Measurement

1. Check the selected wavelengths.
2. Press the **START** button.

The device will automatically:

- Switch sequentially to the selected wavelengths.
 - Activate the LED at each wavelength.
 - Measure the photocurrent values.
 - Collect Current–Wavelength ($I-\lambda$) data.
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4. Measurement Results

When the measurement is complete, the following will be displayed on the screen:

- Photocurrent–Wavelength graph ($I-\lambda$ curve)
 - Current values for each wavelength
 - Spectral response behavior
-

5. Repeating the Measurement

For a different wavelength range:

1. Select the new wavelengths.
 2. Press the **START** button again.
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Technical Support

If you experience any installation or connection issues, please contact technical support.