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Sola Check Manual

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PART NUMBER
51702010001

Sola-Check Manual version 1.1
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WARNINGS

Mains Voltage – Shock Hazard!

A 115 or 240 VAC mains supply is required to charge the Solatell Sola-Scope 2000 unit.

UV Hazard!

The system is designed to measure high intensity ultra violet light. Strong UV light represents a hazard to human skin and eyes.

Normal precautions should be taken when working with the UV lamps themselves – if in doubt, refer to manufacturer.

When working with the instrument under normal working conditions, there should be no exposure at all to UV light. However, the probe locators installed at the monitoring points will transmit small, but intense amounts of UV light whenever a reading is taken.

This UV light emission from the probe locators should be treated with caution, and one should never look into the entry of the locator tube with unprotected vision.

It is recommended that UV absorbing glasses or visors should be used to protect eyes and UV absorbing gloves should be used to protect hands whenever working with UV.

Medical advice should be sort immediately if any skin reddening or irritation of the eyes is experienced after working with UV.

Care of Cables

Proper care of the interface and power cables is essential for the overall safety and efficiency of the instrumentation.

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1 Quick Start

1.1 ⏻ On / Off

Press ⏻ button to switch on. Press and hold for 2 seconds to switch off.

1.2 ICONS at top of screen

The top part of your screen displays a number of symbols to keep you informed about battery level, stored data, range meter and time as follows:

Icon	Function
	Indicates battery level – the more black the better the battery. If power supply is plugged in the icon indicates a filling battery .
	This icon is displayed when the data on the screen is the stored or reference data.
	Indicates whether you need to re-sample using auto-ranging (see later for full explanation)
12:41	Real-time clock or count-down when sampling.

1.3 User Interface

Key	Function
F1 and F2 keys	the function keys or soft keys. Their function changes in accordance with the text on the screen above the keys.
	The stored data button allows you to store and view reference data.
	The sample key
	Multi functioned Arrow keys for scrolling, selecting and editing.

1.4 Altering the Contrast

In Gauge mode (see section 1.6), press ▲ ▼ keys to alter the contrast of the screen.

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1.5 Radiometer Mode

Figure 1 illustrates the Radiometer Mode. If your instrument is in the Gauge Mode, press F2 to change modes.

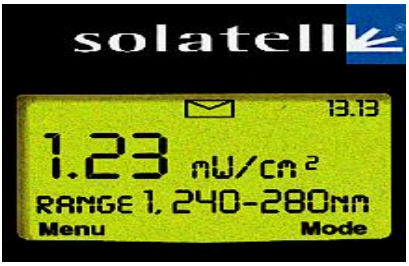


Figure 1 Radiometer Mode

The top part of the screen gives information in the form of icons about battery level, range meter, saved data and time.

The middle section gives the current data displayed as large numbers in the Radiometer Mode. The large numbers give the intensity (area) within the wavelength range noted below – in this case 240 – 280nm.

To scroll between area 1, area 2 and their ratio and thermocouple data (if using thermocouple probe) press the ▲ ▼ buttons.

The bottom section of the screen has the labels for the function keys F1 and F2.

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1.6 Gauge Mode

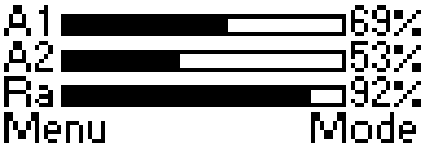


Figure 2 Gauge Mode

If your instrument is in the Radiometer Mode, press F2 to change modes. The Gauge Mode shows how the current UV lamp data compares with the stored or reference lamp data for Area 1, Area 2 and the Ratio.

1.7 Making a UV Measurement

To take your first sample, position instrument in appropriate place and press and hold ✸ key for 2 seconds, then release. The Sola–Check will now Auto-Range (work out the exposure time required) and take a sample.

For subsequent readings of the same lamp or same type of lamp at the same or similar distance, you will only need to press the sample key briefly as the instrument has now learnt the exposure time required.

Note. Positioning of the Sola Check is critical. Probes should be locked in place with a probe locator. If no probe is being used, the Sola-Check should be positioned on a flat surface and clamped in place.

1.8 Warning LED Lights

There are three coloured warning lights on the front of the instrument. These change colour depending on how the current lamp data compares with the stored reference lamp.

?? A green LED indicates that all the areas and ratios for the current data are above the alarm level.

?? An amber LED indicates that either an area or the ratio for the current data is below the amber alarm level but above the red alarm level.

?? A red LED indicates that either an area or the ratio for the current data is below both the amber and the red alarm levels.

2 Menu Control

The menus allow the user to configure the Sola-Check exactly as required. To enter the menu system press F1 (when it says ‘menu’ above it). To navigate the menu system, press the▲ ▼ keys to highlight an item, then press F1 to select the item; press F2 to exit the current menu.

The menu allows you to view or change the following (*italics show range, **bold shows default***):-

For **help** whilst in menu control press ✉

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To change an item use the ▲ ▼ keys.

Menu Name	Sub Menu	Function
Set range 1 *short wavelength*	Min. wavelength *235 – 470 nm*, **240** Max. wavelength *235 – 470 nm*, **320**	Allows user to change the wavelength band width for wavelength-range-1
	Amber alarm level *0 – 100%,* **75%** Red alarm level *0 – 100%,* **50%**	Allows user to change alarm levels for wavelength-range-1 as a percentage of current reading vs stored reading. Coloured LED will light up when current reading falls below the % set.
Set range 2 *long wavelength*	Min. wavelength *235 – 470 nm*, **320** Max. wavelength *235 – 470 nm*, **400**	Allows user to change the wavelength band width for wavelength-range-2
	Amber alarm level *0 – 100%,* **75%** Red alarm level *0 – 100%,* **50%**	Allows user to change alarm levels for wavelength-range-2 as a percentage of current reading vs stored reading. Coloured LED will light up when current reading falls below the % set.
Set ratio *short / long*	Amber alarm level *0 – 100%,* **75%** Red alarm level *0 – 100%,* **50%**	Allows user to change alarm levels for ratio as a percentage of current reading vs stored reading. Coloured LED will light up when current ratio falls below the % set.
Set Intensity Range		Use ▲ ▼ keys to manually change intensity range of lamps being measured. Use if auto-ranging is not appropriate eg when lamps are varying in intensity over time.

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To change an item use the ▲ ▼ keys.

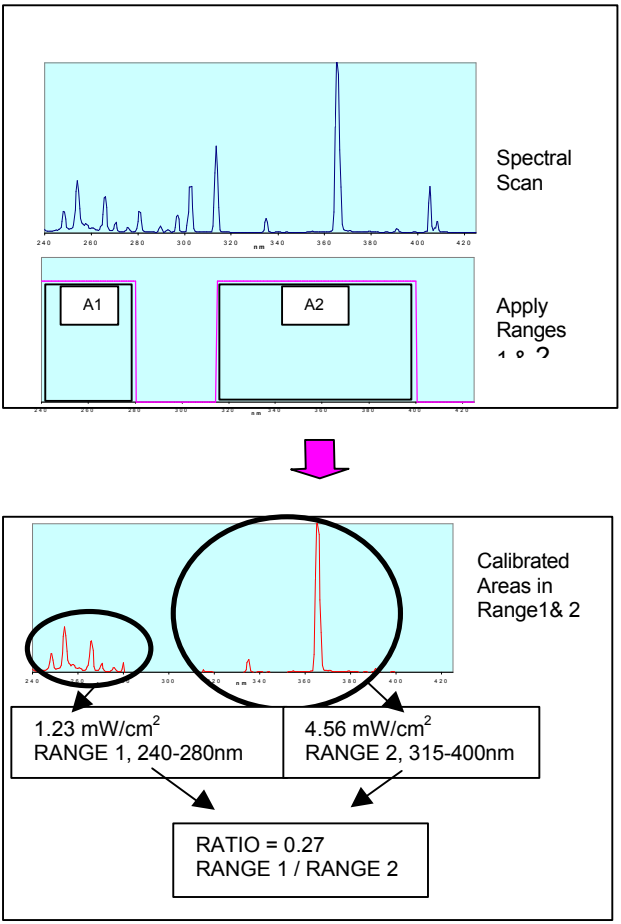
Settings	Logging *On / Off*	When *On* sends the following data to RS232 (PC or printer): Log time (hh:mm:ss); date; UV data; temperature.
	Set Clock *hh:mm:ss:dd:mm:yy*	Allows user to change date and time of real-time clock.
	Cont. scan interval *1 – 60 min;* ***0***	Set interval *mm* between samples when in continuous scan mode.
	Optimisation *1-7*, **3**	Number of scans taken to construct a Smart-Scan (see section 4.3).
	Lock *On / off*	When on prevents accidental alteration of baseline, ranges and alarms.
Information	Stored data	Gives date, time, and sampling info of the stored reference data.
	Last data	Gives date, time, and sampling info of the current data (the last sample).
	Product Info.	Sola-Check software version and serial number; Attachment part number and serial number; Environmental temperature and visible light.
	Real-Time data	Gives current date, time, temperature etc.
Lock	*On/Off*	Allows all settings to be locked so that the reference data and all settings can not be changed accidentally.
Cont. scan *Start / stop*		Once started, will automatically scan every time interval (*mm* as selected in “Cont. scan interval” – see above)

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3 The Facts behind the Figures

3.1 Radiometer Mode

The radiometer mode is in fact three separate screens. The first screen shows the intensity within the wavelength-range-1 and is labeled Area-1. The range for Area 1 can be changed in the menu as described in section 2. The reason it is known as the area is because it is the sum of the intensities for each wavelength within the range – in other words the area under the curve.



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3.2 Gauge Mode

The gauge mode compares the current data with the stored data and represents the comparison in the form of a bar.

The top bar represents the current intensity (or "area") within wavelength-range-1 as a percentage of the same area of the stored data and is labeled A1.

For example, if the intensity in the 240-280nm range (Area 1) for the *current data* is 0.849mW/cm^2 and the intensity of the *stored data* in the range 240-280nm is 1.23mW/cm^2, then the percentage would be calculated as follows:-

$$^{0.849}/_{1.23} * 100 = 69\%$$

The middle bar represents the intensity (or "area") within wavelength-range-2 for the *current data* as a percentage of the same area of *stored data* and is labeled A2.

The bottom bar represents the ratio of current Area 1/Area 2 as a percentage of the stored ratio.

For example, if for the *current data* the intensity for Area 1 is 0.849mW/cm^2 and the intensity for Area 2 is 2.34mW/cm^2 then the ratio for the current data is

$$^{0.849}/_{2.34} = 0.363$$

If, also, for the *stored data* the intensity for Area 1 is 1.23 mW/cm^2 and the intensity for Area 2 is 3.12mW/cm^2 then the ratio for the stored data is

$$^{1.23}/_{3.12} = 0.394$$

The percentage would then be calculated as follows:-

$$^{0.363}/_{0.394} * 100 = 92\%$$

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3.3 Range meter

The Sola-Check measures UV in a similar way to a camera taking a photograph. In other words to get a sharp and accurate picture of the UV the “exposure time” or sample time is critical. When you use auto-ranging the Check is finding the correct sample time.

The five bars at the top of the display (between the store icon and alarm icon) indicate how good your “signal” is. For example, if there is insufficient UV for the sample time then only 1 bar shows. The data is not of good enough quality if there are fewer than three bars.

The ‘range meter’, therefore, is a very good gauge as to whether you are using the correct ‘sample time’, i.e. if a new auto-ranging scan is required or, if you have used auto-ranging, whether there is too little UV for the instrument to read.

3.4 The Store Key 

There are two ‘memories’ in the Sola-Check, i.e. two places to store complete scans with all their information. One is used to store the ‘current’ data, the other is accessed using the store key. When in radiometer mode, if you press and hold the store key, the stored area will be displayed; also the store icon will be displayed. When you release the held key, the current measurement will return.

To store the current measurement, press and hold the store key, then press the sample key – this can be done in radiometer mode or gauge mode. If this is done in gauge mode, the gauges will all read 100%. If this is done in radiometer mode, no difference will be seen when you press the store key (except the store icon). The message “saving baseline scan…please wait” is displayed.

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4 Advanced Explanations

4.1 Taking measurements

There are three possible ways to make the Sola-Check take a sample of the UV:

1. **Auto-ranging scan** : Hold sample  for 2 seconds, then release.
2. **Simple scan**: Press sample  briefly – this takes a scan using the same 'intensity range' as the previous scan. The intensity range can also be altered manually using the "**Set Intensity Range**" option in the menu.
3. **Cont. scan** : Select from menu – this takes scans at the user-defined interval. If the interval is set to zero then the Sola-Check takes readings as fast as it can. To change the interval first select from menu **Settings** / *Cont. scan interval* .

4.2 Auto-range vs. simple scan

Auto-ranging automatically finds the correct "exposure" for the lamp. There is a sequence of events associated with taking an auto-ranging scan. These are listed below and can take a little longer than a simple scan.

To take an auto-ranging sample, the user presses and holds the sample button for two seconds, then releases it.

1. If in radiometer mode, the last reading is shrunk to normal sized text. If in gauge mode, the ratio bar is temporarily removed. In the space provided 'Auto-ranging' is displayed.
2. The attachment's calibrations are read.
3. The Sola-Check tries several scan times or "exposures" then calculates the exact one required, i.e. auto-ranging is performed.
4. The 'Auto-ranging' message is replaced with 'SCANNING'.
5. The clock is cleared and replaced with a countdown timer indicating time remaining until the sample is complete.
6. The electronics are initialised.
7. A 'Smart-Scan' is commenced (see section 4.3).
8. When the scan is complete, the various calibrations are applied.
9. The time, date, temperature, visible light, dark current, stray light, live zero, etc. etc. are recorded.
10. All the collected information is stored.
11. Area 1, area 2 and ratio are calculated, then alarms set as required (LEDs, etc.).
12. The display is updated (radiometric values, gauge, range meter, etc.).
13. The sample is complete and the current time returns to the display in place of the countdown timer.

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If the user just presses sample  (i.e. uses the same intensity range as the previous scan) and the intensity range is inappropriate (too low or too high) then a warning message is displayed.

4.3 Smart-Scan : Optimising

Smart-Scan increases the ”definition” between low and high intensity wavelengths (like better focus of a camera). The greater the difference between the intensity of the short and long wavelengths (UVC and UVA) the higher the number of Smart-Scans required in **Settings Optimisation**. For first time users it is suggested that a high number of scans should be used. With experimentation the user can find the smallest number of scans that gives a consistent reading, thus decreasing the time to collect sample data to the minimum possible.

5 Real time clock

The real time clock is set in the **settings** menu item. The time is always displayed in the top right of the display, except during a scan when the time remaining of the scan is displayed.

6 Charging

To charge the Sola-Check, connect the external PSU to the DC-in connector. The Sola-Check can be on or off and still charge. When fast charging the battery indicator cycles around the segments. When ‘topping off’ the battery the top battery segment flashes.

7 Warranty, Service and Support

To receive support, please ensure you return your warranty registration card.

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