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Operating Instruction for Solar Irradiance Survey Meter

Instruction Manual for SL104

Please read this manual before switching the unit on. Important safety information.

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I. Certificate of conformity

As the manufacturer of the instrument listed below, we declare under our sole responsibility that the product:

Di-LOG SL104

To which this declaration relates is in conformity with the relevant clauses of the following standards:

EMC
EN 61326-1:2013

The instrument has been factory-calibrated during its manufacturing process, ensuring it fully conforms to our rigorous quality assurance procedures. This guarantees exceptional accuracy and reliability for all your measurement needs.

The safety and performance of this instrument is assured when operated within the specifications detailed in this instruction manual.

The product identified above conforms to the requirements of the UK and EU directives for electrical Electromagnetic Compatibility Regulations 2016 (EMC Directive 2014/30/EU).

II. Safety Notices

- Do not exceed the maximum allowable input range of any function.
- Set the function switch OFF when the meter is not in use.

CAUTIONS

- Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter.
- Always remove the external temperature probe before replacing the batteries.
- Inspect the condition of the external probe and the meter itself for any damage before operating the meter. Repair or replace any damage accessories before use.
- Remove the battery if the meter is to be stored for long periods.
- Do not expose the tester to extreme temperatures or high humidity.
- When using the compass function to measure orientation, avoid placing mobile phones and other electronic devices that could greatly impact the magnetic field close to the tester. This can cause excessive error in the measured value.
- If the magnetic field in the measuring environment is too large, the instrument may require recalibration, please refer to the self recalibration process in section 11.
- If the tester has not been used for a long time or if there have been significant environmental changes, please recalibrate the instrument. Please refer to the self recalibration process in section 11.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

It is important to check the state of the battery before use and to replace it if necessary.

The meter has been designed in accordance with the safety regulations for electronic measuring instruments:

- **EN 61326-1:2013**

The meter may only be inspected and repaired by a qualified service technician for calibration and repair, please refer to section 7 for further information.

III. Instrument & Manual Symbols

Symbols displayed on the instrument and in the instruction manual:

CE Symbol of conformity confirms conformity with relevant EU directives. The meter complies with EMC directives (2004/08/ EC).

UKCA Symbol of conformity confirms conformity with relevant UK regulations. The meter complies with EMC regulations (SI 2016 No. 1091).

The SL104 meets the standard (2012/19/EU) WEEE Directive in the UK & EU. This marking indicates that this product should not be disposed with other household wastes throughout the European Commission (EC). To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use your local authority return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.

The instruction manual contains information and references, necessary for safe operation and maintenance of the instrument. Prior to using the instrument, the user is kindly requested to thoroughly read the instruction manual and comply with it in all sections.

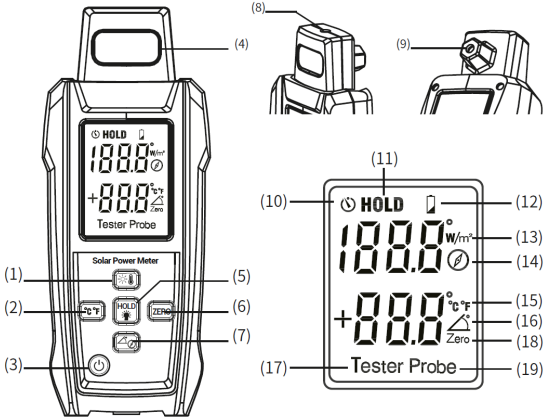
Failure to read the instruction manual or to follow the warnings and references contained herein can result in serious bodily injury or instrument damage. The respective accident prevention regulations established by the professional associations are to be strictly enforced at all times.

IV. Description: SL104 Specification

SL104 Solar Irradiance Survey Meter	
	SL104
Irradiance Range	0 - 1400 W/m^2
Resolution & Accuracy	1 W/m^2 ±(5% + 5 Digits)
Meter Temperature Range	-10°C to 50°C (14°F to 122°F)
Probe Temperature Range	-30°C to 100°C (-22°F to 212°F)
Resolution & Accuracy	±1.5°C (±2.7°F) @-10°C to 75°C (14°F to 167°F) ±2°C(±3.6°F) @-30°C to -10°C (-22°F to 14°F) ±2.5°C(±4.5°F) @75°C to 100°C (167°F to 212°F)
Compass Measurement	0° to 360° (1° Resolution)
Dimensions	176mm x 70mm x 40mm
Weight (net)	390g (inc probe & batteries)
Power supply	4 x AA Battery (LR6/GLR6A) supplied
Supplied with	Temperature Probe & Case
Warranty	2 year
EAN	5060082544729

Display	2000 Count Backlit LCD
Operating Int Temperature	-10 to 50°C (14 to 122° F)
Operating Ext Temperature	-30 to 100°C (-22 to 212° F)
Storage Temperature	-30 to 60°C (-22 to 140° F)
Operating Humidity	Max 80%
Operating Altitude	7000 ft. (2000 metres) maximum
Battery	4 x AA Zinc Carbon Battery
Safety	For use and in accordance with IEC 61010-1 Pollution Degree II

V. Meter Description & LCD Display Symbols



1. Function keys for irradiance and temperature measurement
2. Celsius and Fahrenheit Switch Button
3. On/Off Button
4. Photovoltaic Irradiance Sensor
5. LCD backlight key and HOLD key (Press and hold for three seconds to turn the backlight on or off)
6. Angle Reset Button
7. Function keys for compass and angle measurement
8. External Temperature Probe Input
9. Integrated Temperature Sensor for Solar Panel Surface Measurement
10. Auto power off symbol
11. Hold indicator
12. Battery Level Indicator
13. Irradiance Units and Function Indicator
14. Compass Function Indicator
15. Temperature Unit Indicator (Celsius / Fahrenheit)
16. Angle Function Indicator
17. Integrated Temperature Sensor Indicator
18. Angle Reset Indicator
19. External Temperature Probe Indicator

1. Operation

- Briefly press the power button of the SL104. The instrument is set by defaul to measure Irradiance and Surface Temperature in °C.
- The instrument is set to Auto Power Off after 30 minutes if left unattended. To temporarily disable the Auto Power Off feature, press and hold the power button when the instrument is switched on for >2s. The instrument will reset back to the default Auto Power Off when the meter is powered off.

NOTICES: **Read and understand all warning and precaution statements listed in the safety section of this operation manual prior to using this meter. You should always turn the instrument Off when the meter is not in use.**

2. Solar Irradiance & Temperature Measurement

2.1 Solar Irradiance & Surface Temperature with in-built sensor

- Follow the steps highlighted in section 1. The SL104 is default set to measure Irradiance and Surface Temperature in °C.
- If conducting an initial solar survey, place the instrument onto the pitch of the roof or a surface of similar angle and direction to attain the real-time irradiance measurement.
- If conducting a real-time measurement on a solar array, place the instrument directly onto the PV panel making sure you are not shading the irradiance sensor. If the pitch of the array is steep, then place the instrument with the base resting on the lower frame of the panel.
- Please make sure the internal temperature sensor is making contact with the PV panel to measure the cell surface temperature.
- The measured Irradiance and Temperature value will be indicated on the main LCD the display.

2.2 .Solar Irradiance & Surface Temperature with external probe

- Follow the steps highlighted in section 1. The SL104 is default set to measure Irradiance and Surface Temperature in °C.
- If conducting an initial solar survey, place the instrument onto the pitch of the roof or a surface of similar angle and direction to obtain the real-time irradiance measurement.
- If conducting a real-time measurement on a solar array, connect the external temperature probe using the 3.5mm jack on the temperature probe. Once connected, the icon at the bottom of the screen will change from “Tester” to “Probe”, indicating that the external temperature probe has been successfully connected.
- Place the instrument either above, adjacent or directly onto the PV panel making sure you are not shading the irradiance sensor. If placing directly onto the array, place the instrument with the base resting on the lower frame of the panel.
- Suction cup the external temperature probe directly onto lower cells of the PV panel.
- Please make sure the external temperature sensor is making contact with the PV panel as the in-built sensor is immobilised.
- The measured Irradiance and sensor Probe Temperature value will be indicated on the main LCD the display.

2.3. Temperature Unit Adjustment

- To switch between Celsius and Fahrenheit, momentarily press the button labelled [°C °F] . The SL104 will default reset back to °C when the instrument is switched off.

3. Tilt Angle and Magnetic Compass Measurement

With the SL104 switched on, momentarily press the  button, this will switch from the default Solar Irradiance & Temperature measurement to the Tilt Angle and Geomagnetic Compass Direction measurement.

3.1. Tilt Angle Measurement

Note: It is recommended that the Instrument is calibrated to a flat-level surface before use and at regular intervals. Place the SL104 on a flat-level surface, one that is known to be 0º, a completely flat-level surface can be verified with a spirit level. Once placed, press and hold the “ZERO” until “0º” is recorded on the LCD display.

- With the SL104 switched on, momentarily press the  button, this will switch from the default Solar Irradiance & Temperature measurement to the Tilt Angle and Geomagnetic Compass Direction measurement.
- Place the instrument directly onto the Photovoltaic (PV) panel making sure that the instrument has previously been adjusted to zero on a known level surface. If the pitch of the array is steep, place the instrument with the base resting on the lower frame of the panel.
- The instrument will record the inclination of the panel with the tilt angle being displayed on the LCD screen.

3.2. Geomagnetic Compass Measurement

Note: Due to the potential interference from external influences caused mainly by metal objects, reinforced concrete surfaces and electronic devices, it is advised that the magnetic direction measurement is conducted away from the Photovoltaic (PV) Array.

- With the SL104 switched on, momentarily press the  button, this will switch from the default Solar Irradiance & Temperature measurement to the Tilt Angle and Geomagnetic Compass Direction measurement.

3.2. Geomagnetic Compass Measurement (continued)

- Place the instrument on a flat surface pointing the top of the meter in the direction that the PV array faces. This surface angle on which the instrument is place on must be between 0º and 20º to attain an accurate compass direction. If the angle is more than the 20º limit, the LCD screen will display “OL”.
- The instrument will record the magnetic compass direction of the array with the measurement value being displayed on the LCD screen.

4. Data Hold and Backlight

To maintain the current test value and prevent the display from updating with new measurements, briefly press the “hold” button once. Press the HOLD button again to exit this mode and display the real-time measured values.

To turn the backlight for the LCD display on and off, press and hold the HOLD button for a minimum of 3 seconds.

5. Battery Replacement

Before replacing the instrument batteries, please make sure the SL104 is switched off.

1. Carefully unscrew the battery cover screw on the back of the tester and open the battery cover.
2. Replace the existing batteries with 4 x AA 1.5V Zinc Carbon batteries.
3. Close the battery cover carefully.
4. Tighten the screws on the battery cover until they feel tight, please do not over-tighten.

Note: when inserting the battery for the first time, please remove the white rectangular safety strip before installing the battery.

6. Geomagnetic Compass Calibration

If the tester has not been used and stored for a lengthy period, or the environmental conditions have changed significantly during the storage period, please recalibrate the geomagnetic Compass feature. The calibration process is as follows:

1. Restart the SL104 by pressing the on/off button (section 1), once the instrument has restarted, press and hold the compass inclinometer button  until the screen displays “444444”. To confirm that you want to enter the calibration mode, momentarily press the  button. If the LCD still displays “444444”, then the instrument is ready to follow the calibration process.
2. Place the instrument on a flat surface or flat on the palm of your hand and rotate slowly with your other hand. Try to keep at a constant speed as far as your hand will allow in one rotation. Continue to rotate, completing a minimum of six revolutions for at least a one minute period.
3. Once the calibration process had been completed, momentarily press the to confirm the calibration and return to normal operational mode.

Note: If the calibration process fails or there are any issues with the process, please repeat steps one to three above.

7. Warranty & Calibration

Di-LOG instruments are subject to stringent quality controls. If in the course of normal daily use a fault occurs we provide a 24-month warranty (only valid with proof of purchase). Faults in manufacture and material defects will be rectified by us free of charge, provided the instrument has not been tampered with and returned to us unopened. Damage due to dropping, abuse or misuse are not covered by the warranty.

Product Support

support@dilog.co.uk

To maintain the specified accuracy of the measurement results, the instrument must be recalibrated at regular intervals. Di-LOG's service partner, Re-CAL Calibration, are the only authorised agent with the facility to adjust and service the SL104 Solar Irradiance Survey. We recommend an annual recalibration period from the date of purchase.

Service & Calibration

www.recal.biz

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Solar Irradiance Survey Meter

Register your product with us to keep in contact with the latest updates and service reminders.

www.dilog.co.uk/register

Stay connected with us and be the first to know about our latest news and updates by following us on our social media channels.