

TECHNICAL DATA

# Fluke IRR1-SOL, IRR2-BT Solar Irradiance Meter, PV Site Surveyor



## HIGH PRECISION MONO-CRYSTALLINE SOLAR SENSOR

Instantaneous irradiance measurements up to 1400 W/m<sup>2</sup>

## TWO OPTIONS FOR TEMPERATURE MEASUREMENT

Use the built-in temperature sensor or the external suction mount temperature probe to measure ambient and panel temperature

## INTEGRATED COMPASS

Measure and document roof or site orientation

## INCLINATION SENSOR

Know roof and PV panel tilt when surveying, installing, or adjusting the installation

## MOUNTING SOLUTION

Ensure proper irradiance measurements with solar panel mounting, included with the IRR2-BT kit.

## INSTANT I-V CURVE READINGS

Part of the Fluke solution for I-V curve measurements, the IRR2-BT wirelessly communicates with the SMFT-1000 for instant and accurate readings.

**Make the critical measurements needed for installing, testing, maintaining, and reporting on solar panels or photovoltaic systems with one, easy-to-use tool.**

The Fluke IRR1-SOL and IRR2-BT Irradiance Meters have been designed from the ground up to simplify the installation, commissioning, and troubleshooting of photovoltaic arrays, measuring irradiance, temperature, inclination and direction of the solar array in a single handheld tool. With a rugged, compact design, a protective carrying case, and an easy-to-read, high-contrast LCD screen to read measurements in direct sunlight, these comprehensive PV site surveyors can go where you go. The simple user interface, instantaneous solar irradiation measurements and built-in temperature sensor make it easy to meet the IEC 62446-1 requirements for testing, documenting, and maintaining photovoltaic systems. Additionally, the integrated compass and inclination sensor allow you to quickly measure and document roof and site orientation, pitch, and panel tilt while surveying, installing, or adjusting an installation.

Whether working on a roof-mounted system or on a large field installation, Fluke Irradiance Meters are the single-handed solution that every solar installer and technician needs in their tool bag.

## Use the Fluke Irradiance Meters for:

### Photovoltaic system design and surveying

To find the expected production at a site, determine your solar resource while taking shading into account. The solar resource is measured in peak sun hours: the number of hours per day with 1,000 watts generated per square meter of solar array. Location, time of day, season, and weather conditions all influence peak sun hours. Determine the actual solar irradiance (Watts/m<sup>2</sup>) and shading at the site to develop a baseline.

### Measuring

Once your system is installed, make sure it is operating as designed by measuring its electrical characteristics and the actual power output of the array. The performance of a photovoltaic array is based on its current-voltage (I-V) curve. Use the irradiance meter to obtain the amount of solar irradiance necessary to calculate the I-V curve of the power output. The IRR2-BT features wireless communication of recorded irradiance and temperature measurements with the Fluke SMFT-1000 Solar Multifunction PV Analyzer to instantly determine the I-V curve of the panels under test.

Even when installed correctly, a photovoltaic system may not be producing the expected electrical output. In order to produce the expected output the system needs to receive the correct amount of irradiance energy to generate the DC voltage that is fed into the inverter.



## Specifications

### Irradiance

Measuring Range	50 to 1400 W/m <sup>2</sup>
Resolution	1 W/m <sup>2</sup>
Measuring Accuracy	± (5 % + 5 Digit)

### Temperature Measurement

Measuring range (°C)	-30 °C to 100 °C (-22 °F to 212 °F)
Resolution	0.1 °C (0.2 °F / 1 °F @ >100 °F)
Measuring Accuracy	±1 °C (±2 °F @) -10 °C to 75 °C (14 °F to 167 °F), ±2 °C (±4 °F @) -30 °C to -10 °C (-22 °F to 14 °F) and 75 °C to 100 °C (167 °F to 212 °F)

Note: Temperature measurement response time: ~30 sec.

### Inclination Angle

Measuring Range	-90° to +90°
Resolution	0.1°
Measuring Accuracy	± 1.5° @ -50° to +50°, ±2.5° @ -85° to -50° and +50° to +85° ±3.5° @ -90° to -85° and +85° to +90°

### Compass

Measuring Range	0° to 360°
Resolution	1°
Measuring Accuracy	± 7°

Note: a) Measurements valid for device inclination between -20° and +20° to horizontal. Outside that range on LCD will be shown "----".  
b) Result is referred to magnetic north.

### Temperature

Operating Temperature IRR1-SOL & IRR2-BT	-20 °C to 50 °C (-4 °F to 122 °F) (humidity <80 %), noncondensing
Operating Temperature 80PR-IRR	-30 °C to 100 °C (-22 °F to 212 °F)
Storage Temperature	-30 °C to 60 °C (-22 °F to 140 °F) (humidity <80 %)
Altitude	0 m to max. 2000 m

### Wireless Radio Module (IRR2-BT only)

Frequency Range	2.402 GHz to 2.480 GHz
Output Power	8 dBm

### Memory (IRR2-BT only)

Type	EEPROM
Size (kB/records)	64 kB/6400
Recording Time	17 hours
RTC	Yes (super CAP supply)
Communication	BT: BL653 module (only with SMFT-1000)

**Specifications continued**

Electromagnetic Compatibility (EMC)	
International	IEC 61326-1: Portable Electromagnetic Environment CISPR 11: Group 1, Class A Group 1: Equipment has intentionally generated and/or uses conductively-coupled radio frequency energy that is necessary for radio frequency energy that is necessary for the internal function of the equipment itself. Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network that supplies buildings used for domestic purposes. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted and radiated disturbances. Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.
Korea (KCC)	Class A Equipment (Industrial Broadcasting & Communication Equipment) Class A: Equipment meets requirements for industrial electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.
USA (FCC)	47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103.
Protection	
IP Protection	IP40
Power Supply & Battery Life	
Batteries	4 AA Alkaline Batteries
Battery Life (typical)	50 hours (> 9000 readings)
Auto Power Off	30 minutes
Dimensions	
L x W x H	150 x 80 x 35 mm (5.90 x 3.14 x 1.37 in) 231 g (0.5 lb)
Weight	0.5 lb (231 g)

**Ordering information**

**Fluke IRR2-BT Solar Irradiance Meter Pro**

Includes: FLK-IRR2-BT Solar Irradiance Meter Pro, FLK- 80PR-IRR External Temperature Probe with Suction Cup, MB1-IRR Mounting Bracket, Carrying Case with Shoulder Strap, (4) AA Alkaline Batteries, User Manual.

**Fluke IRR1-SOL Solar Irradiance Meter**

Includes: FLK-IRR1-SOL Solar Irradiance Meter, FLK-80PR-IRR External Temperature Probe with Suction Cup, C250 Carrying Case with Shoulder Strap, (4) AA Alkaline Batteries, User Manual.

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