

The solar measurement module SUSE 5.23

for measuring the irradiance S of light in W/m^2
with test jacks to pick off a measurement voltage $100\text{ mV} = 1000\text{ W/m}^2$



The measurement module SUSE 5.23 seen from the back side. At the top the operation switch is located, below the display for the display of the irradiance S in W/m^2 .

Below that 2 test jacks are located, at which the measurement voltage can be picked off, $100\text{ mV} = 1000\text{ W/m}^2$. The measurement voltage can be processed further and saved e.g. in an interface.

On the front side of the device the solar cell SUSEmod2 is located, used as a measuring cell.

The display in the picture – 258 W/m^2 - is typical for the radiation on a day with a clouded sky.

The **photovoltaics experimental device SUSE 5.23** is a special device for measuring the **irradiance S** of solar radiation or light radiation, **directly displayed digitally on a display in the international standard unit W/m^2 (Watts per m^2), tolerance $\pm 4\%$.**

The solar radiation shows a great fluctuation outdoors, from approx. 1000 W/m^2 with bright sunshine down to 30 W/m^2 with heavy clouding, indoors S is $< 20\text{ W/m}^2$. Shadowing by clouds strongly decreases the radiation. If the direct solar radiation is shadowed, the diffuse radiation of the bright sky can also be measured.

Function: The short-circuit current of the solar cell, that is proportional to S , is adjusted with an electric shunt, so that with 1000 W/m^2 a voltage drop of exactly 100.0 mV is applied, which is displayed on the digital voltmeter with the value $1000 = 1000\text{ W/m}^2$.

The calibration can be conducted by oneself with a halogen lamp (e.g. **halogen spotlight SUSE 5.16**) or an overhead projector.

The device is constructed with a 8 mm stand for the operation on the optical bench **SUSE 5.0alu** or on any common optical bench.

An additional jack pair below the solar cell allows for the operation with PC measurement systems, e.g. for long-term measurements. Here a voltage proportional to the irradiation is applied ($100\text{ mV} = 1000\text{ W/m}^2$).

To take measurements the device is turned on (switch pointing towards the display: ON) and held in a way, that the solar cell points in the measurements direction.

For operation a 9 V battery is necessary, that is included in delivery.

Simple replacement of the 9 V monobloc battery: After unscrewing the 4 screws of the device back side and opening the device the battery can be removed from the support and be replaced. For experiments with SUSE 5.23 an **extensive experimentation manual** is available.