

innovative Solarsysteme für Schule und Ausbildung  
innovative solar- systems for school, college, technical education

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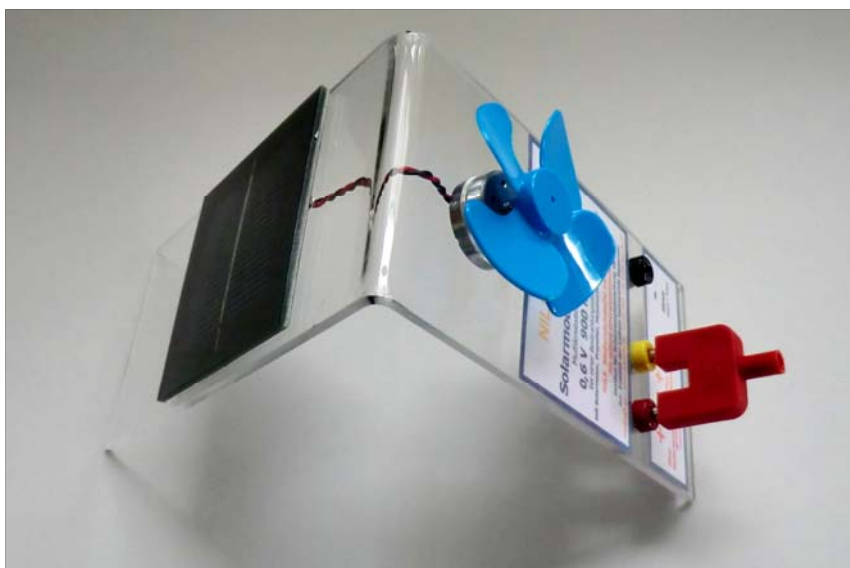
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## The solar module SUSE CM4MBV

High-performance solar module 0.6 V / 900 mA for beginners

Particularly appropriate for student orientated experimental educational application in SEK I (ISCED-level 2)



### View from above onto the solar module SUSE CM4MBV

On the left-hand side of the roof-shaped plexiglas base plate the robust and high-performance solar module with a solar cell 0.6 V / 900 mA is visible. On the right-hand side the solar motor with the (fast rotating) propeller is located, below the 3 sockets and the red connective plug.

### The solar module SUSE CM4MBV

On the roof-shaped module base plate made of plexiglas (overall dimension 310 x 80 mm) on the right-hand side the solar electric motor with the blue propeller is visible, below the 3 connective sockets red – yellow – black and the red connective plug. On the other side of the 'roof' of the plexiglas plate the high quality solar module with a open-circuit voltage of 0.6 V and a short circuit current of 900 mA and an electrical power of 432 mW are glued on. (All data at an irradiation of sunlight of 1000 W/m<sup>2</sup>.)

The electric motor and the solar cell are connected electrically through a connective plug, they can be separated for certain experiments.

**The module is well suitable for photovoltaic experiments in class levels 4-10 (ISCED-levels 1 and 2), simple experiments in elementary school and advanced high-class experiments in SEK I (ISCED-level 2).**

With this device the conduction of basic experiments in photovoltaic, solar cells and solar modules is realizable in guided student experiments. Additionally experiments can be conducted with the electric motor,



### View onto the front side

At the top on the front the solar motor under the blue propeller is visible.

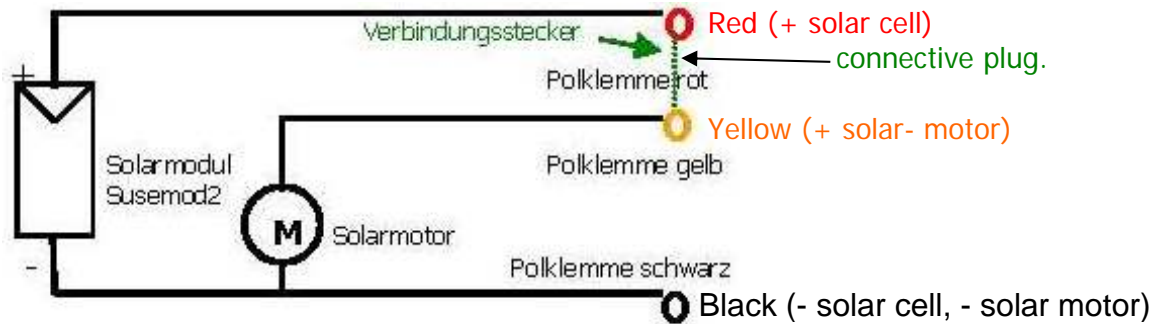
Below the type plate the 4 mm sockets for the connection of lab wires to the module are located (red = positive solar cell, yellow = positive electric motor and black = shared negative socket).

The positive poles of the solar cell and the electric motor are connected through a connective plug which is easily removed to separate motor and solar cell electrically for specific experiments.

The connective plug contains a test jack to ensure measurement and experimentation in the connected status.

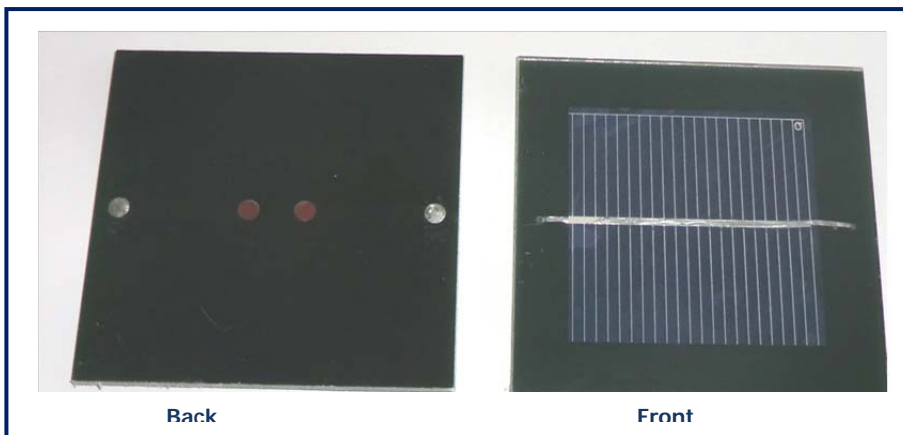
it can be used as a generator as well. The solar module is very sensitive and works very well even with a cloudy sky. If the solar motor is turned off by the removal of the connective plug, experiments with the solar cell independent from the motor can be conducted. Multimeters can be connected to the test jacks. Also multiple solar modules SUSE CM4MBV can be connected in series. With 6 devices in series connection a 3 V radio for example can be operated in daylight (e.g. SUSE solar radio) or LEDs in all colors. With 3 devices in series connection a red shining LED can be operated in daylight (e.g. SUSE 4.15). The device is available as prefabricated device or construction kit. A detailed experimental instructions manual is included in delivery.

### The electrical wiring of the solar module SUSE CM4MBV



The solar module Susemod2 consists of 1 solar cell that is embedded robustly and break-proof. At a solar irradiation of 1000 W/m<sup>2</sup> (bright sunshine with deep blue sky) the open-circuit voltage is 0.6 V, the short circuit current 900 mA. The solar motor can be separated or connected through the connective plug.

### Technical data of the solar module:



Below the laminated and encapsulated surface the actual solar cell 52 x 52 mm is visible. The stripes are the silver conductors of the front side contact grid. On the back of the module there are 2 soldering points + and - for the soldering of electrical connection lines. The module is glued accurately fitting with double-faced adhesive tape onto a smooth surface.

The photo shows the **solar module SUSEMod2**, a very high quality and robust solar module, laminated and encapsulated with transparent synthetics, consisting of a solar cell 52 x 52 mm, the module itself has the dimensions 75 x 75 mm.

At a solar irradiation of  $S = 1000 \text{ W/m}^2$  the open-circuit voltage is 0.6 V and the short circuit current is 900 mA. Multiple modules can be connected in series, thereby increasing the voltage by 0.6 V each! **Three modules connected in series substitute an 1.5 V battery.**

Application outside in natural daylight, bright sunshine or with cloudy sky. Inside the solar modules should be placed on an overhead projector or get irradiated by a halogen lamp (no energy-saving lamp!). The surface is covered by a protective sheet, this must be removed before first use.

#### Technical data:

**Module:** Synthetic base plate square-cut 75 x 75 mm with high transparency surface, mechanically very robust

**Solar cell:** High quality polycrystalline solar cell 52 x 52 cm, square-cut, efficiency factor about 16.5 %

#### Data at irradiation of 1000 W/m<sup>2</sup> AM 1.5 (bright sunshine in the summer sun)

##### Solar cell:

Open-circuit voltage: typ. 0.60 V = 600 mV  
 Short circuit current: typ. 0.90 A = 900 mA  
 Efficiency factor: typ. 16%

**Solar motor:** Supply voltage 0.3 ....5.0 V DC  
 higher voltage destroys the motor