

The 6 LED module SUSE 5.9-6

Optoelectronic module with 6 crystal clear LEDs

UV 400nm, blue 470 nm, green 528 nm, yellow 590 nm, red 626 nm, IR 950 nm
For experiments on light emission and light absorption



6 Switches
to turn on each
individual LED

6 LEDs
From UV at the
top to IR at the
bottom

6 test jacks
For each LED
1 test jack

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The upper photo shows the experimentation device, supplemented with information, that shows the individual elements with arrows. The 6 crystal clear LEDs are located to the right of the colored test jacks respectively.

At the bottom the screw fitting for the optical bench SUSE 5.0 or optical benches common in schools is visible, above in a vertical line the 6 LEDs with the black negative jack, the test jack consistent with the LED color and the switches S. At the top there is the red-black jack pair for the operating voltage in experiments on light emission for 3.5 – 5 V DC, power supply or connection to solar modules with $V = 3.6$ V.

The 6 LED module SUSE 5.9-6 is suited for experiments on **light emission** and **light absorption**.

For **light emission** a direct voltage of 3.5 V – 5 V is applied to the upper red-black jack pair, the LEDs are switched on by their respective switches S (to the left, next to the colored jacks). (ON = directed towards jack). They emit nearly monochromatic light of the wavelengths **400nm** (UV, topmost LED), **470 nm** (blue), **528 nm** (green), **590 nm** (yellow), **626 nm** (red) and **950 nm** (IR, lowermost LED). They therefore cover the whole light spectrum.

With the naked eye the infrared light of the LED 950 nm is not detectable, if the LED is observed through a digital camera or cell phone camera however, its glowing can be seen in a white-rose tone, because these cameras display up to 1000 nm in the infrared scope, an interesting physical effect!! With the UV LED fluorescent safety features on banknotes can be detected for example.

With a diffraction grating the wavelengths can be measured experimentally. Also the Planck constant h can be determined with this module.

Between the black negative jack and the colored test jacks the drift voltages V_D of the 6 LEDs can be measured, each LED can be switched on or off individually with the toggle switch.

For **light absorption** the 6 LEDs are irradiated with light – sunlight or the light of a light source - , they then act like small solar cells, at the red LED a voltage of approx. 1.5 V can be read, at the IR LED a voltage of approx. 1 V etc. It is important, that they are exactly adjusted towards the light, so that the light reaches the semiconductor crystal centrally because of the lens effect.

The amount of voltage depends on the the band gap of the used semiconductor, it is higher for a red LED than for an IR LED, highest for the blue LED and the UV LED.

Additionally **experiments on quantum physics** are possible with this module. For the experiments with SUSE 5.9-6 an extensive experimentation manual is available.