Biomed
USB
Photometer-module

Absorbance –Photometer
Specifications

biomed
dr wieser gmbh

General description

The photometer-module is a complete photometer for the measurement of optical density of liquids at one or two wavelengths, depending on version.

In detail, the photometer module consists of a compact unit comprising the entire mechanism, the optical system (including the LED light sources and narrow band optical interference filter), the electronics and the operating firmware.
The circuit is built next to the preamp and A / D converter from the microchip, the driver for the serial communications and the preparation of the operating voltages for the amplifiers and LEDs.

- Power Supply is supported directly through the Mini-USB-cable.

- LED - Light sources for the photometric measurements are used. The spectrum of the light source is also cut with a narrow-band interference filter.

- A part of the light flux is deflected to a reference-channel to compensate temperature drifts.

- The power consumption of a single LED light source is max. 100 mW, so no additional cooling or ventilation is required.

- The module can be used in normal daylight without additional optical shielding.

Physical basis

The module's firmware calculates and returns the optical density:

$$OD = \log\left(\frac{1}{Transmission}\right)$$

whereas:

$$Transmission = \frac{optical\ intensity\ light - optical\ intensity\ dark}{optical\ intensity\ measurement - optical\ intensity\ dark}$$

Optical intensity light:	Measurement with a neutral object to be measured (solvent)
Optical intensity dark:	Measurement with LED off
Optical intensity:	Measurement with reagent etc.

Through oversampling in the A/D-conversion a high resolution (16-bit) is achieved - as well as a good signal to noise ratio compared to the 50Hz interference (mains frequency).

Technical information

Principle	1 or 2-channel filter photometer with reference channel, µ-controller and serial USB interface
Light source	1 or 2 LEDs and narrow-band interference filter
Range	0 to 2,7OD
Display range	max. 4,8 OD
Resolution	0,0001 OD (0,1mOD)
Linearity	1% between 0,2 OD and 2,5OD
Wavelengths	standard between 400nm and 900nm, (other wavelength on request)
Interface	Asynchronous serial data transmission RS-232 (TTL level) translated to USB
Voltage Power consumption	5V via USB Max. 200 mA