

# Optical Power Meter (OPM)

## 1. General Description

This measuring instrument is used to determine the optical power of a light source (LED or laser) and to measure the attenuation of an optical fiber in combination with a stabilized light source. Due to the micro-processor technology applied, this measuring instrument makes it possible to measure two wavelengths and the power displayed in  $\mu\text{W}$  and dBm, as well as the attenuation in dB.

An interchangeable adapter system allows the connection of all standard optical fiber connectors. The measured values can be recorded on a microSD card or transferred directly to a text or table file via a USB connection.



Figure 1:  
Optical power meter (OPM)

## 2. Applications

The positive features and precise coupling to assembled optical fibers via the interchangeable adapter system allow the use of this measuring device in a variety of applications:

- Laboratory testing
- Installation control
- Quality control
- Testing of optical transmitters
- Attenuation measurements of optical fibers

## 3. Block Diagram

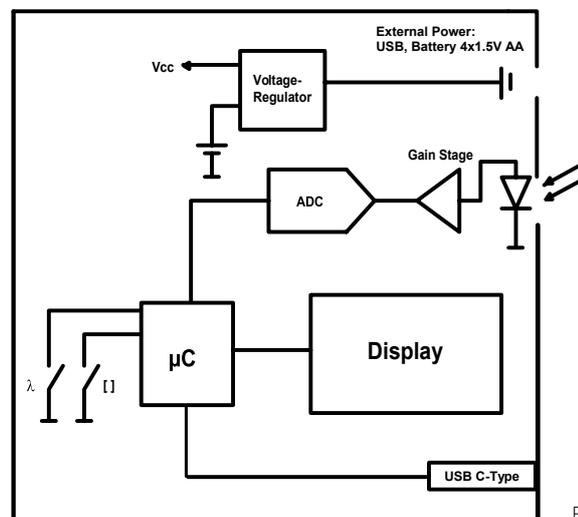


Figure 2: Drawing

#### 4. Features

- Optical power meter
- 660 nm and 850 nm calibrated wavelengths
- M12 interchangeable adapter connection
- USB-C socket
- microSD card slot
- USB power supply; battery operation
- 36 mm x 48 mm TFT color display
- Plastic housing with protective guard
- Metal handle
- User-friendly operation

#### 5. Ordering Information

Design: Basic unit (without adapter)

Please order suitable interchangeable adapters for different fiber optic connectors separately.

#### 6. Keyboard/Symbol Description

Nr.	Key/ symbol display	Function/description
1		Wavelength selection
2		Selection of display of measured value and adjustment for zero
3		Storage of the current measured value on microSD card
4		Transfer of the current measured value via USB connection
5		Cursor up – Key not assigned
6		Enter – Key not assigned
7		Cursor down – Key not assigned
8		Shift key – Activate display
9		ON/OFF button
10		Control LED
11		Battery full
12		Low battery power
13		Battery empty



## 7. Operation

Screw the required interchangeable adapter onto the detector.

Figure 3 shows the meter with an F-ST adapter.

Press and hold the on/off button  until the green LED lights up. The instrument is automatically adjusted for zero when it is switched on. When zeroing is complete, the instrument displays a sample value, the set wavelength, and the measured power in  $\mu\text{W}$ :

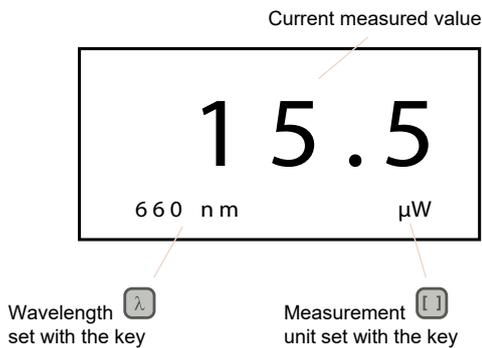


Figure 4: Device display



Figure 3:  
Detector with interchangeable adapter

By pressing the wavelength button , the wavelength can be switched between 660 nm and 850 nm. The wavelength to be set is determined by the adapter used for the transmitter and the fiber to be tested:

- 660 nm for plastic optical fibers (POFs)
- 850 nm for multimode glass optical fibers (GOFs)

By pressing the measuring unit key , the display of the measured value of the optical power can be switched from  $\mu\text{W}$  to dBm. By pressing the key  twice, it can be switched to optical attenuation in dB. The reference value is set to zero.

### Performing a measurement (see item 8):

- Set up the measurement assembly for zeroing or referencing, switch on the instrument, and adjust for zero by pressing the key  twice. The value now displayed is the zero value or the reference value in dB.
- Loosen the measurement assembly and connect the test object. The value now displayed is the attenuation increase caused by the test object (i.e., the attenuation of the test object in dB).

If the measured value is outside the displayable range, four dashes will appear in the display:

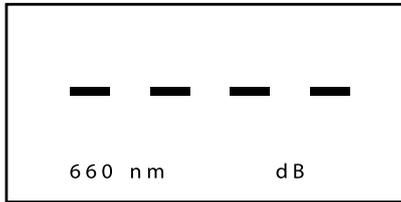


Figure 5: Current measured value is outside the measuring range

If the supply voltage of the batteries drops below 4.8 V in battery operation, the display **flashes a warning message**. The diode of the transmitter adapter can no longer be supplied with sufficient power:

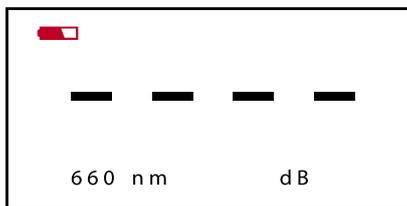


Figure 6: Measuring device display, battery power too low

The display switches off automatically in **battery mode** if key commands are not entered for more than two minutes. In this operating state, the red control LED  flashes, but the measuring mode is still active in the background.

The display can then be reactivated via the shift key . The device switches off completely if key commands are not entered for more than thirty minutes and must be switched on again using the ON/OFF key .

If the test receiver is connected to a PC or a power source with an appropriate USB cable, the battery supply is disconnected and power is supplied via the USB connection. The display shows the following:

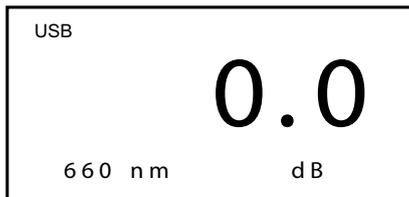


Figure 7: Device display – USB display

The measured value can be stored in the set measuring unit on a microSD card or transferred directly to an active text or table file field via a USB connection.

When the microSD card is inserted, the display shows the following:

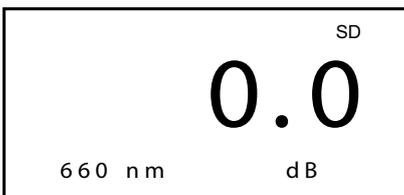


Figure 8: Device display – microSD display

**Storage of Measurement Results:**

- To store the measurement results on the microSD card, which has been inserted prior to starting measurement, press the save button  after measurement.
- To transfer the measurement results to the active text or table file field, press the return key  after measurement.

**Attention:**

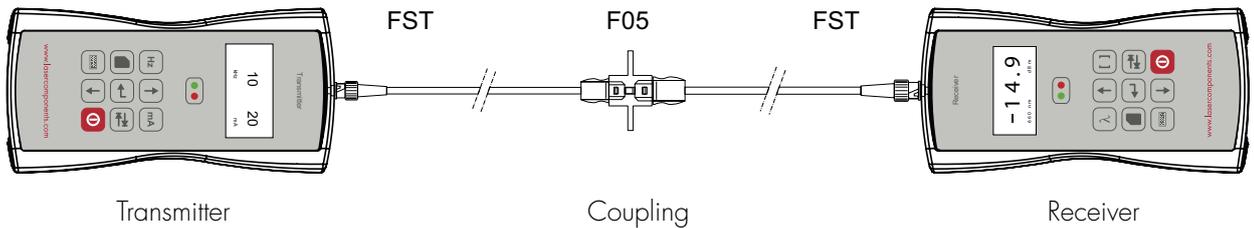
When the power is turned off, the reference value is NOT retained. After switching on the instrument again, the reference value must be reset!



Figure 9:  
USB interface and microSD card slot

**8. Measurement Setup**

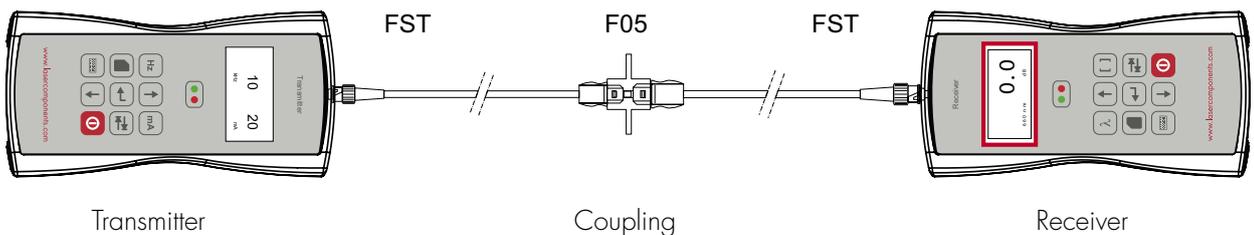
Test Sequence Step 1: Reference cable



The measured value of the receiver, modulation frequency, and forward current of the transmitter is only displayed as an example!

Test Sequence Step 2: Adjusting for zero

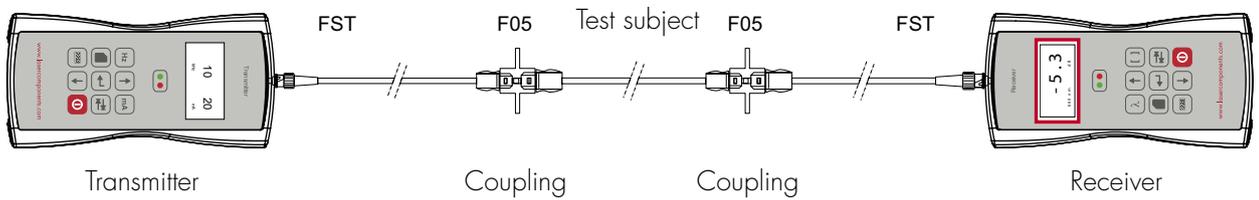
- Carrying out measured value calibration/zeroing of the measuring receiver with the appropriate key 



**Test Sequence Step 3:** Disconnecting the reference cable and inserting the second coupling



**Test Sequence Step 4:** Attenuation measurement of the test sample



9. Threshold Values

Supply voltage	USB-C 5 V / Battery 6 V
Storage temperature	-20 ... +70 °C
Operating temperature	0 ... +50 °C

Loads exceeding the limits specified as 'limit values' may permanently damage the measuring device.

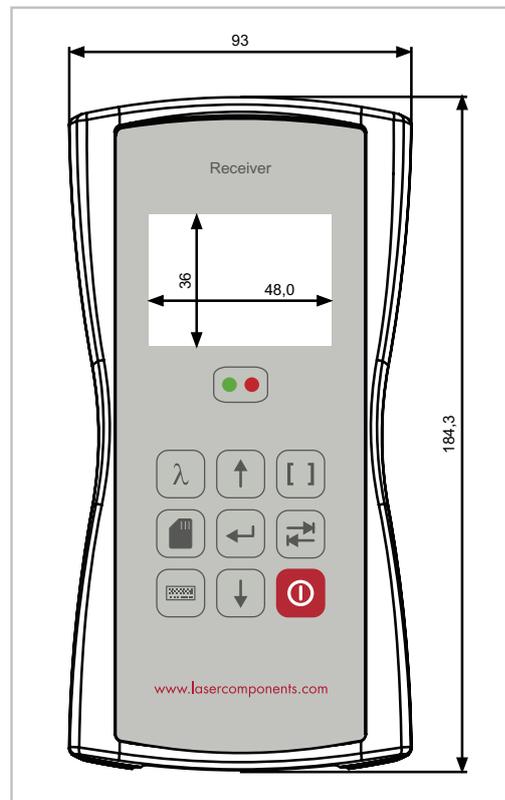
The limit values represent the load limits of the device.

Permanent operation of the measuring device with these values is not recommended as the reliability of the device may suffer.

## 10. Technische Daten

Optical connection	Interchangeable adapter, screwable for all standard fiber optic connectors
Optical detector	Silicon PIN diode
Detector area	2,65 x 2,65 mm
Measuring ranges	$\mu\text{W}$ 0,01 – 2000 dBm -50,0 – +3 dB -50 – +33 (depending on the reference value)
Operating voltage	External connection via USB-C plug, 4x1,5 V AA battery operation
Power consumption	340 mA
Battery-conservation mode	170 mA
Housing	Plastic, metal handle
Dimensions	184,3 x 93 x 51/28 mm (LxWxH), without metal handle
Protection class	IP20
Weight	0,35 kg without batteries
Temperature range	0 ... +50 °C (Operation)

## 11. Scale Drawing



## 12. Adapter



Interchangeable adapter:  
660 nm



Interchangeable adapter:  
850 nm



Interchangeable adapter  
for OPM1



Interchangeable adapter:  
HFBR 4506 4516



Interchangeable adapter:  
HFBR connection

All information has been prepared to the best of our knowledge and belief. It is regularly checked and updated. We are not liable for any errors or mistakes that may still exist. Data is subject to change without notice.