Optical Power Meter OPM

1 General

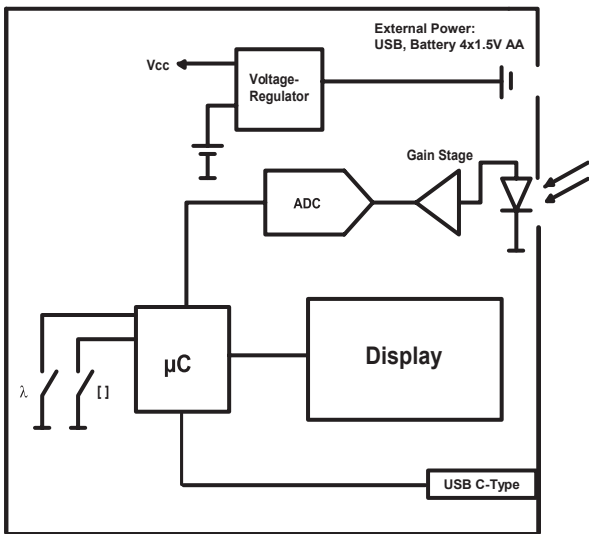
The measuring device is used to determine the optical power of a light source (LED or laser) or to measure the attenuation of an optical fiber in connection with a stabilized light source.
Thanks to the applied microprocessor technology, the measuring device allows the measurement of two wavelengths and the display of the power in µW or dBm, as well as the attenuation in dB.
An interchangeable adapter system allows all common fiber optic connectors to be connected.
The measured values can be recorded on a microSD card or transferred directly to a text or table file via a USB connection.

2 Applications

The good properties and the precise coupling through the interchangeable adapter system to assembled fiber optic cables enable the measuring device to be used in a variety of applications:

- Laboratory tests
- Installation control
- Quality control
- Check of opitcal reveiver
- Attenuation measurements on optical fibers

3 Block Diagram



Pic. 1 *Drawing*

Pic. 2 *Optical Power Meter OPM*

4 Features

- Optical power meter
- 660nm and 850nm calibrated wavelengths
- M12 changeable adapter connection
- USB-C socket
- microSD card slot
- USB power supply, battery operation
- 36mm x 48mm TFT color display
- Plastic desk case with protective cover
- Metal handle
- Simple operation

5 Ordering Information

Type	Order number
Basic device (without adapter)	9MPM-OPM1-2020USB-01

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

Attention: For further information please see data sheet of the interchangeable adapters: **909PMADASM001**.

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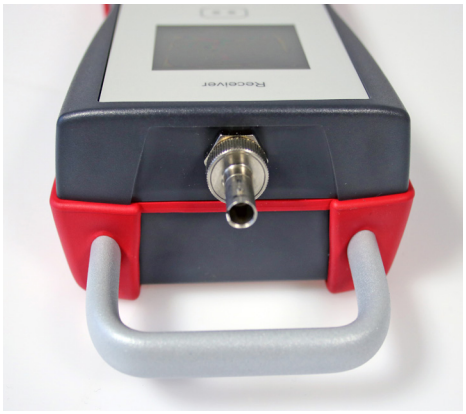
6 Keyboard/Symbol Description

No.	Key / Symbol Display	Function / Description
1	λ	Selection of wavelength
2	[ ]	• Selection of measured value display • zero value adjustment
3		Storage of the current measured value on a microSD card
4		Transfer of the current measured value via USB connection
5		Cursor up **Key is not used**
6		Enter **Key is not used**
7		Cursor down **Key is not used**
8		Shift key, activate display
9		ON / OFF button
10		Control-LED
11		Full battery power
12		Low battery power
13		No battery power

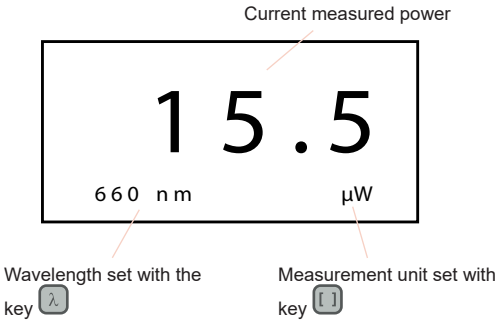
7 Operating

Screw the required change adapter onto the detector. Pic. 3 shows the measuring device with the F-ST adapter 909PMADAST001.



Pic. 3 *Detector with interchangeable adapter*

Press and hold the On / Off button until the green LED lights up. An automatic zero adjustment is carried out when the device is switched on. After adjustment, the device shows an exemplary value, the set wavelength and the measured power in µW:



Pic. 4 Device *display*

The wavelength can be changed between 660nm and 850nm by pressing the wavelength button λ. The wavelength setting is determined by the adapter that is used for the measuring transmitter and the fiber that has to be tested:

- 660nm for plastic fibers (POF)
- 850nm for multimode glass fibers (GOF)

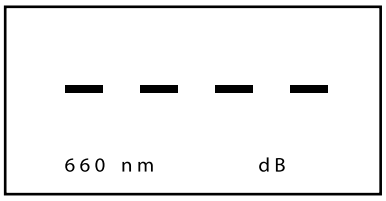
By pressing the measuring unit key [ ], the measured value display of the optical power can be changed from µW to dBm. Pressing the button [ ] twice switches to optical attenuation in dB and sets the reference value to zero.

Carrying out a measurement (see point 8):

- Set up the measurement setup for the zero adjustment or referencing, switch on the device and carry out the zero adjustment by pressing the key [ ] twice. The value now displayed is the zero value or the reference value in dB.

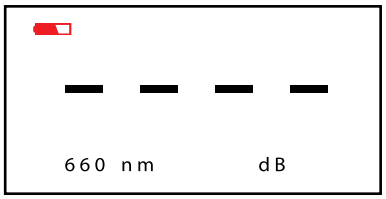
- Loosen the measurement setup and interpose the test object. The value now displayed is the increase in attenuation, created by the test object, i.e. the attenuation of the test object in dB.

If the measured value is outside the displayable range, four lines appear on the display:



Pic. 5 *The current measured value is outside the measuring range*

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



Pic. 6 *Power meter display, low battery power*

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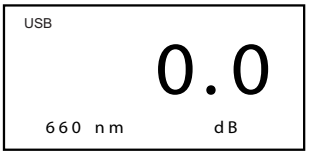
The display switches off automatically in battery mode if no key commands have been entered for more than 2 minutes. In this operating state, the red control LED flashes, but the measuring mode is still active in the background.
The display can then be reactivated using the shift key. The device switches off completely if no keyboard commands are entered for 30 minutes and must then be switched on again with the ON / OFF button.

If the measuring receiver is connected to a PC or to a power source with an appropriate USB cable, the battery supply is interrupted and the power supply takes place via the USB connection.

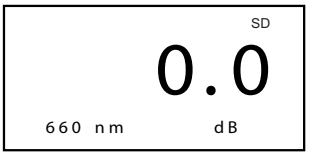
The display shows:



Pic. 7 *Device display USB mode*

The determined measured value can be saved 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:



Pic. 7 *Device display microSD card mode*

Pic. 8 *USB interface and microSD card slot*

Storage of measurement results:

- To save the measurement result on the microSD card that is to be inserted before starting, press the save button after the measurement.
- To transfer the measurement result to the active text or table file field, press the transfer key after the measurement.

Attention:
Attention: The reference value is NOT retained when the measuring instrument is switched off. After switching on the device again, the reference value must be set again!

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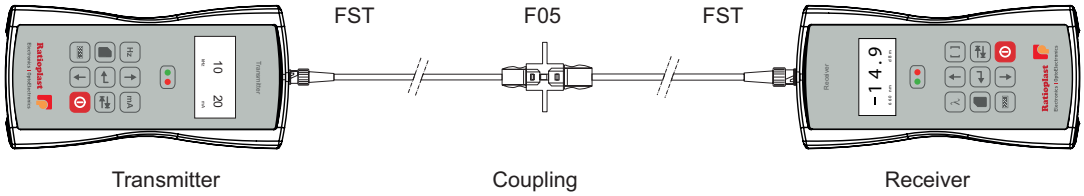
8 Measurement Setup

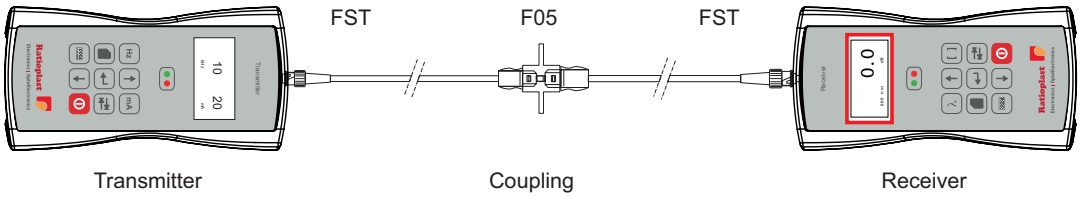
Test sequence step 1: Reference cable



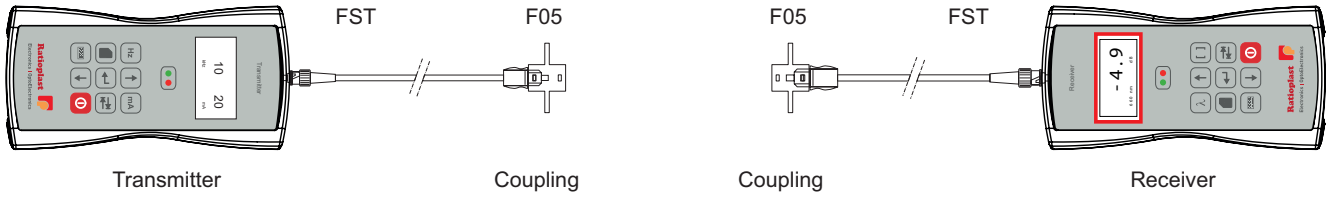
Representation of measured values of the receiver, as well as modulation frequency and forward current of the transmitter are only examples!

Test sequence step 2: Zero adjustment

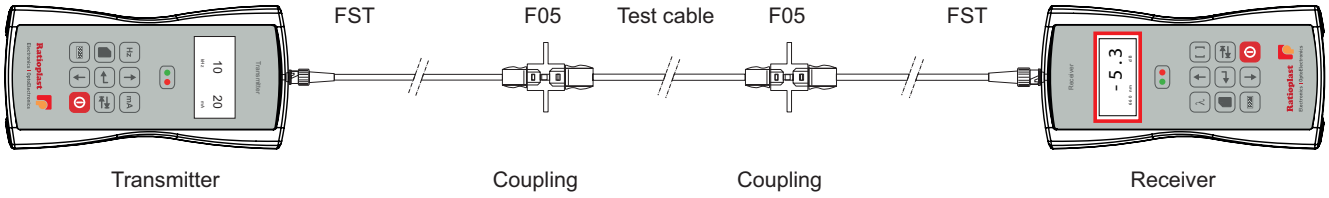
- Carry out measured value adjustment / zeroing of the measuring receiver with the key [ ]



Test sequence step 3: Disconnect reference cable and insert second coupling



Test sequence step 4: Attenuation measurement of the test cable



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9 Maximum Ratings

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

Stresses beyond those listed under ´Maximum Ratings´ may cause permanent damage to the device. Listed values are stress limits only and functional operation of the device at these conditions is not recommended. Exposure to maximum rating conditions for extended periods may affect the device reliability.

10 Technical Data

Optical port: Interchangeable adapter, screwable for all common fiber optic connetors

Optical detector: Silicon PIN Diode
Detector area: 2.65 x 2.65 mm

Measuring ranges
(depending on the reference value)

µW	0,01 - 2000
dBm	-50,0 - +3
dB	-50 - +33

Power supply: external power supply via USB-C socket and 4x1,5V AA battery operated

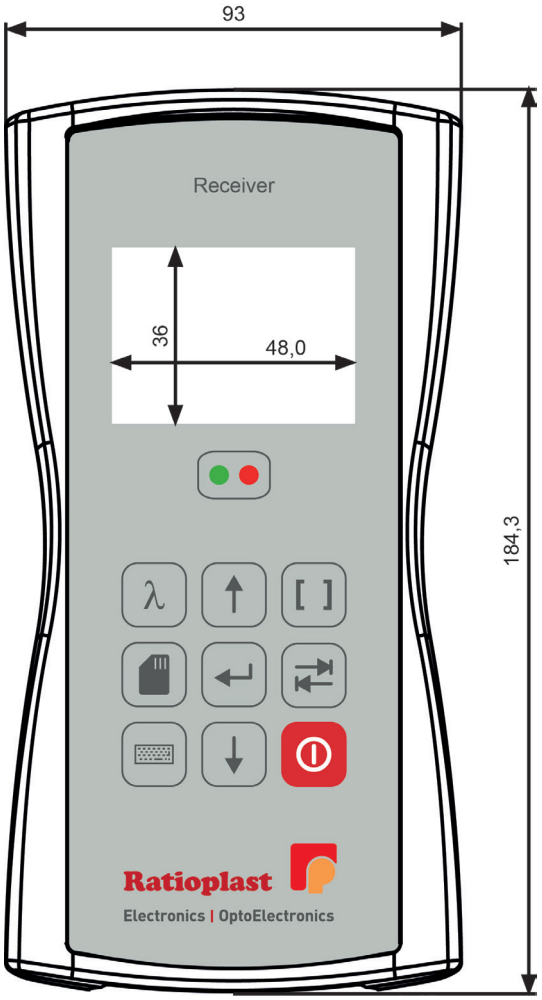
Current consumption: 340mA
Battery saving mode: 170mA

Case: Plastic, metal handle
Dimensions: 185 x 93 x 51/28 mm (LxBxH), without handle

Protection class: IP20
Weight: 0.35kg without batteries

Temperature range: 0 ... +50°C (Operation)

11 Drawing



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