

Optical Transmitter Module (OTM)

1. General Description

An optical transmitter module (OTM) is used to determine the sensitivity and function of an optical receiver (e.g., photodiode) or to measure the attenuation of an optical fiber in combination with an optical power meter. The output of the transmitter is a modulated current source with a selectable forward current, which generates a stabilized optical output power level by means of an LED adapter.

The interchangeable adapter system allows the connection of a variety of optical fiber connectors. The adapters are available with different wavelengths.

The transmitter parameters can be recorded on a microSD card or transferred directly to a text or table file via a USB port.



Figure 1:
Optical transmitter module (OTM) basic unit
with a BNC socket

2. Applications

Its positive features and precise coupling to preassembled optical fibers via the interchangeable adapter system allow the transmitter to be used in a variety of applications:

- Laboratory testing
- Installation control
- Quality control
- Testing of optical receivers
- Attenuation measurement of optical fibers

3. Block Diagram

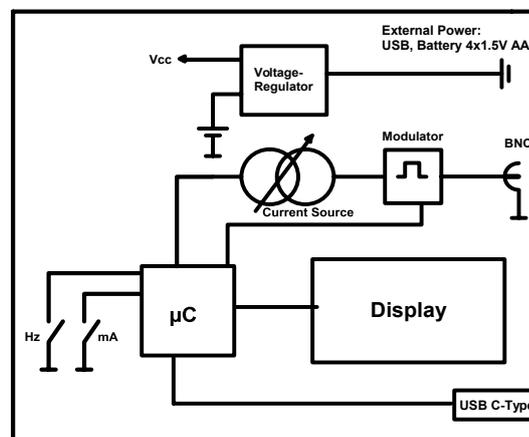


Figure 2: Drawing

4. Features

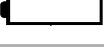
- Stabilized power source
- Variable forward current: 10/20/30/40/50 mA
- Variable modulation frequency: 0/1/10/20 kHz
- USB-C socket
- microSD card slot
- USB power supply; battery operation
- 36 mm x 48 mm TFT color display
- Plastic desk housing with protective guard
- Metal handle
- User-friendly 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		Selection of modulation mode
2		Forward current selection
3		Storage of current transmitter parameters on microSD card
4		Transfer of present forward current 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

Plug the required 660 nm or 850 nm interchangeable adapter into the BNC socket.

- The 660 nm wavelength is for the measurement of plastic optical fibers (POFs).
- The 850 nm wavelength is for the measurement of multimode glass optical fibers (GOFs).

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

Press and hold the on/off button  until the green LED lights up. After turning on the power, the device performs an initialization routine.

After initialization, the transmitter starts with the modulation in the off position (corresponding to 0 kHz) and a forward current of 10 mA.



Figure 3: BNC socket with F-ST adapter



Figure 4: Transmitter display, modulation frequency, and forward current

By pressing the appropriate key , the modulation frequency can be set to 1 kHz, 10 kHz, or 20 kHz. Pressing the key  again after 20 kHz has been selected will switch the modulation frequency off (corresponding to 0 kHz).

By pressing the appropriate key , the forward current can be adjusted from 10 mA to 20 mA, 30 mA, 40 mA, or 50 mA.

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

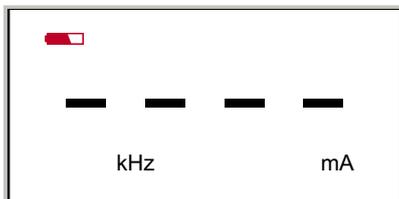


Figure 5: Transmitter display, battery power too low

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



Figure 6: Device display – USB display

The set transmitter parameters can be stored 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:

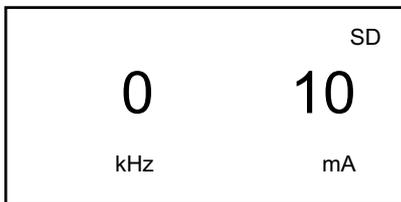


Figure 7: Device display – microSD display

Storage of Parameters:

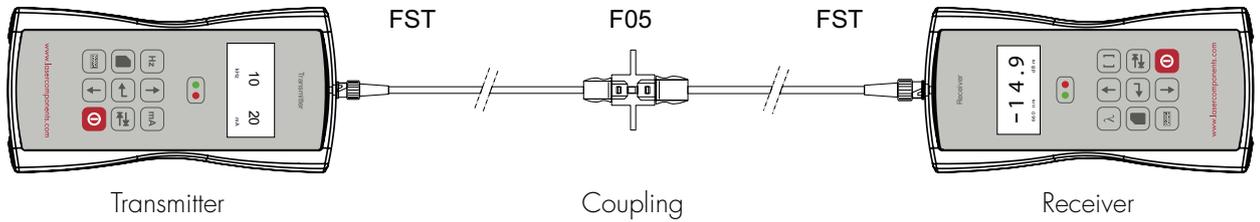
- Press the save button  to save such transmitter parameters as date, time, modulation frequency, and forward current to the inserted microSD card.
- Press the transfer key  to transfer the set forward current value to the active text or table file field.



Figure 8:
SB interface and microSD card slot

8. Measurement Setup

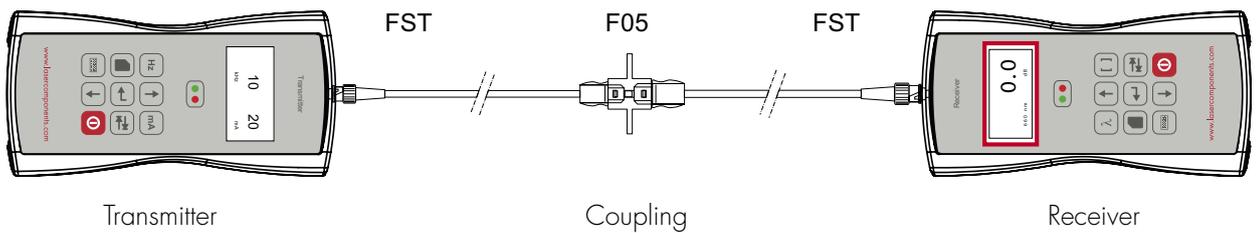
Test Sequence Step 1: Reference cable



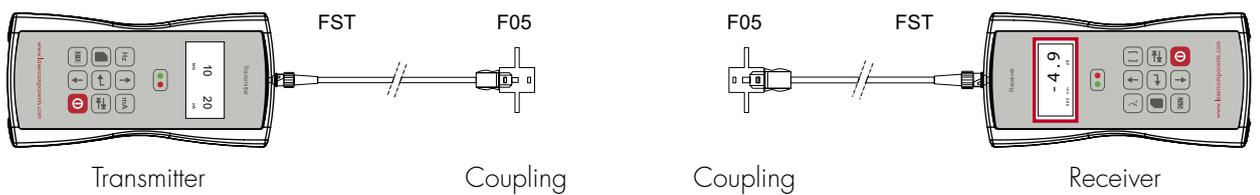
The measured value of the receiver, modulation frequency, and forward current of the transmitter is only displayed as an example!

Test Sequence Step 2: Adjusting for zero

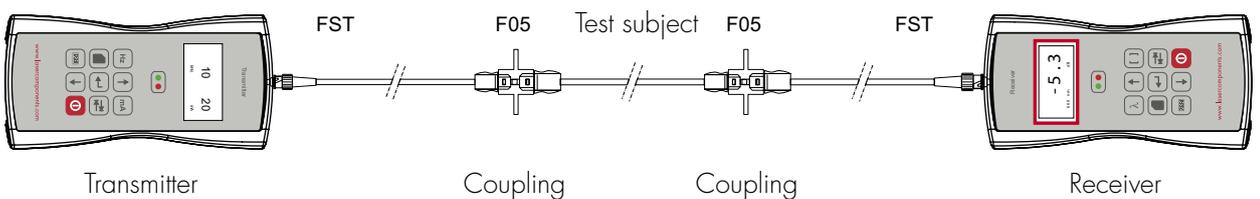
- Carrying out measured value calibration/zeroing of the measuring receiver with the appropriate key  mA



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

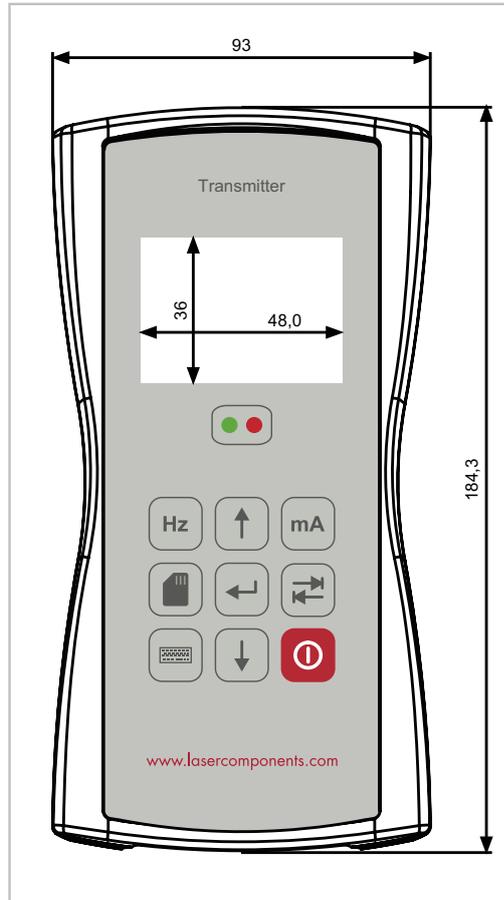
Supply voltage	USB-C 5 V / Battery 6 V
Output load resistance	min. 10 Ω
Storage temperature	-20 ... +70 °C
Operating temperature	0 ... +50 °C

Loads exceeding the limits specified as 'limit values' can permanently damage the transmitter. The limit values represent load limits of the transmitter. Permanent operation of the transmitter with these values is not recommended as the reliability of the device may suffer.

10. Technical Data

Signal connection	BNC interchangeable adapter for all standard fiber-optic connectors
Current output	Switchable 10 mA 20 mA 30 mA 40 mA 50 mA
Frequency modulation	Initial state 0 kHz 1 kHz 10 kHz 20 kHz
Current deviation	μ max. ± 1 mA
Temperature drift	0,02%/°C
Operating voltage	External connection via USB-C plug, 4 x 1,5 V AA battery operation
Power consumption (specifications without interchangeable adapter)	350 mA
Battery-conservation mode	210 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

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