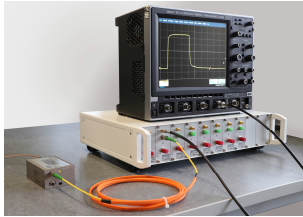


# Shielded optical Transmission link DC-500 MHz



Montena MOL500T optical link is designed for real-time measurement of electric signals from DC up to 500 MHz in harsh electromagnetic environment.



The shielded optical transmitter has a 1 M $\Omega$  / 50  $\Omega$  BNC input which enables connecting any sensing device (current probe, HV probe or specific means for HF measurements). It also makes an ideal oscilloscope front-end for the remote measurement of floating potentials in industrial applications and ensures a total galvanic insulation of the operator, for safe operation in high voltage areas.

The input electric signal is conditioned and converted into an optical signal in the transmitter module and sent to the receiver module through a single mode fibre. The receiver module converts back the optical signal into an electric signal. The optical signal transmission is regulated with an automatic level control that maintains precise and constant performance independently of the optical losses.

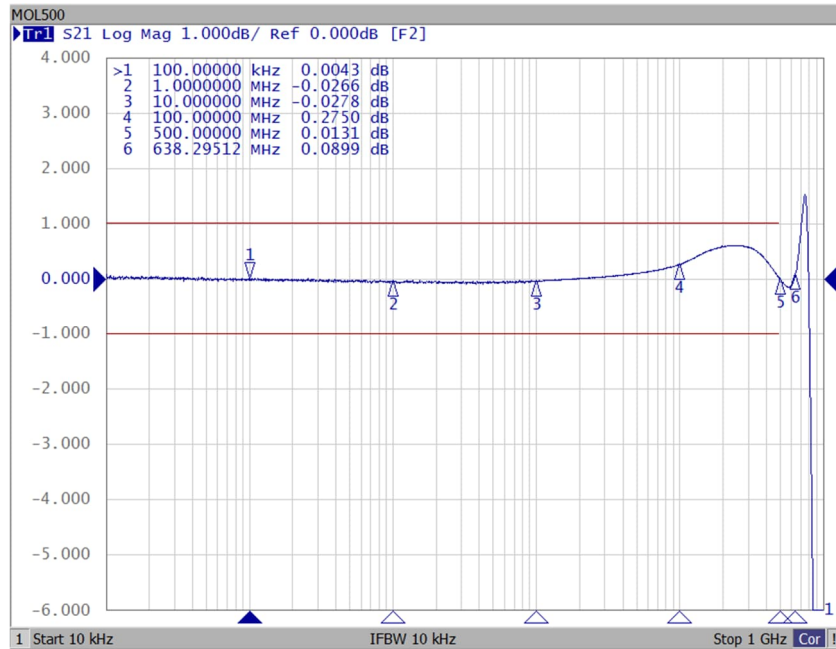
The battery powered optical transmitter comprises a remote-controlled attenuator stage (1:1 / 10:1 / 100:1) to adjust the received signal level for an optimal use of the dynamic range. The transmitter can remotely be put in a low power standby mode to save battery power when not used. A LED indicator shows the operating state.

Configurable settings can be remote controlled using either FibREmote software for PC or a set of API commands.

| SYSTEM                                  | SPECIFICATIONS   |
|---|--|
| Type                                    | <b>MOL500T</b>   |
| Bandwidth                               | DC to 500 MHz  |
| Flatness                                | $\pm 1$ dB   |
| System attenuations                     | 1:1 / 10:1 / 100:1 , remotely selectable   |
| Input impedance                         | 1 M $\Omega$ or 50 $\Omega$ , remotely selectable                                      |
| Output impedance                        | 50 $\Omega$  |
| Maximum output dynamic                  | $\pm 0.7$ Vp   |
| Instantaneous dynamic range             | 58 dB  |
| Output noise floor                      | -139 dBm/Hz  |
| Output noise level                      | 0.6 mV typ.  |
| TX input to RX output propagation delay | Typ. 1.5 ns + propagation delay of the fibre (~5 ns/m)                                 |
| Optical losses compensation             | Automatic  |
| Laser diodes wavelength (TX / RX)       | 1310 nm / 1550 nm  |
| Optical power in fibre                  | 5 mW (laser class 1)   |
| Immunity to external electric fields    | > 500 kV/m (pulse acc. to MIL-STD 461 RS105).<br>More information available on demand. |
| Maximum link distance                   | $\geq 1$ km  |

## Typical frequency response

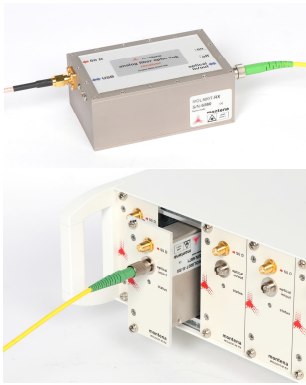
The plot below shows the typical bandwidth between 10 kHz and 1GHz. Under 10 kHz, the frequency response is flat down to DC.



The compact optical transmitter is battery powered and especially shielded for a very high immunity to electromagnetic fields.

| OPTICAL TRANSMITTER                       | SPECIFICATIONS  |
|---|---|
| <b>Type</b>                               | <b>MOL500T-TX</b>   |
| Number of channels per module             | 1   |
| Input attenuator ratios                   | 1:1 / 10:1 / 100:1 , remotely selectable                            |
| Input impedance                           | 50 $\Omega$ or 1 M $\Omega$ //16pF , remotely selectable            |
| Max. input power (CW)                     | 0.4 W (input = 50 $\Omega$ )  |
| Absolute max. input voltage <sup>1)</sup> | 1:1 $\pm$ 3 Vp<br>10:1 $\pm$ 30 Vp<br>100:1 $\pm$ 125 Vp            |
| Input clamping voltage <sup>1)</sup>      | 1:1 $\pm$ 0.7 Vp<br>10:1 $\pm$ 7 Vp<br>100:1 $\pm$ 70 Vp            |
| Power supply                              | by internal LiPo batteries or by the power supply adapter           |
| Battery autonomy                          | 50 hours. Standby: about 5 months                                   |
| Built-in test generator                   | 500 Hz, 0 V - 0.5 V bipolar square signal                           |
| RF input connector                        | BNC female (option: SMA female; see chapter 'Ordering information') |
| Laser diodes wavelength (TX / RX)         | 1310 nm / 1550 nm   |
| Optical power in the fibre                | 5 mW max. (laser Class 1)   |
| Optical connector                         | FC/APC  |
| Operating temperature                     | -10 $^{\circ}$ C to +50 $^{\circ}$ C                                |
| Dimensions                                | 99 x 64 x 41 mm (L x W x H), excluding connectors                   |
| Weight                                    | 380 gr  |

1) Value at the input connector (i.e., the transfer function of the probe that may be connected to the input is not included).



The optical receiver is available in two versions:

A compact stand-alone receiver for point-to-point application, battery powered and especially shielded for a very high immunity to electromagnetic fields. It has one USB interface for system configuration and supervision.

A plug-in module to be inserted in a single or multi-slot MOL-MF-xx chassis. Each module is powered and controlled from the chassis backplane.

| OPTICAL RECEIVER                             | SPECIFICATIONS  |   |
|--|---|---|
| Type   | MOL500T-RX (stand-alone receiver)   | MOL500T-RX (plug-in receiver)   |
| Number of channels per module                | 1   | 1   |
| RF output connector                          | BNC female / 50 Ω   | SMA female / 50 Ω   |
| Output power <sup>1</sup> at 1dB compression | < 10 kHz : +9 dBm<br>10 kHz - 200 MHz : +10 dBm<br>200 - 500 MHz : +2 dBm | < 10 kHz : +9 dBm<br>10 kHz - 200 MHz : +10 dBm<br>200 - 500 MHz : +2 dBm |
| Output noise floor                           | -139 dBm/Hz   | -139 dBm/Hz   |
| Output noise level                           | 0.6 mV typ.   | 0.6 mV typ.   |
| Maximum output dynamic                       | ± 0.7 Vp  | ± 0.7 Vp  |
| Power supply                                 | by internal LiPo batteries  | by the MOL-MF-xx chassis  |
| Battery autonomy                             | 50 hours. Standby: about 3 months   | n/a   |
| Optical signal                               | 1550 nm / 2 mW max. (laser Class 1)                                       | 1550 nm / 2 mW max. (laser Class 1)                                       |
| Optical losses compensation                  | automatic   | automatic   |
| Optical connector                            | FC/APC  | FC/APC  |
| Control connector                            | Mini-USB  | USB Type A on MOL-MF-xx chassis   |
| Operating temperature                        | -10 °C to +50 °C  | -10 °C to +50 °C  |
| Dimensions (excluding connectors)            | 99 x 64 x 41 mm (L x W x H)   | 40 x 172 x 84 mm (2U)   |
| Weight                                       | 380 g   | 240 g   |

Note 1: for input power, add transmitter attenuation to input level



The MOL-MF-10 is a 19" chassis 2U for up to ten plug-in receiver modules. The modules are powered and controlled from the chassis backplane.



The MOL-MF-1 chassis enables stand-alone operation of one plug-in receiver module.

| CHASSIS                | SPECIFICATIONS         |                                     |
|------------------------|------------------------|-------------------------------------|
| Type                   | MOL-MF-10              | MOL-MF-1                            |
| Number of slots        | 10                     | 1                                   |
| Control connector      | USB Type A             | USB Type A                          |
| Dimensions (W x D x H) | 448 x 356 x 110 mm     | 50 x 200 x 110 mm (W x D x H)       |
| Power rating           | 85 - 264 V, 47 - 65 Hz | 100 - 230 V, external power adapter |
| Weight                 | about 5 kg             | about 500 g                         |



The system is delivered with montena FibREmote software for PC. The application allows simple configuration and monitoring of the optical link(s).

Configurations can be stored and recalled at any time to facilitate the configuration of large test setups.

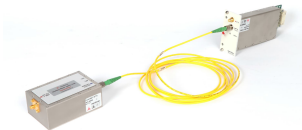
## Ordering information

### Standalone point-to-point link



| TYPE             | DESCRIPTION  |
|------------------|--|
| <b>MOL500T-B</b> | Single channel point-to-point optical link DC – 500 MHz, <u>BNC</u> inputs/ outputs, including one optical transmitter on battery, one optical receiver on battery, two battery chargers 90-264 V, one FibREmote software for PC, and one carrying case    |
| <b>MOL500T-S</b> | Single channel point-to-point optical link DC – 500 MHz, <u>SMA(f)</u> inputs/ outputs, including one optical transmitter on battery, one optical receiver on battery, two battery chargers 90-264 V, one FibREmote software for PC, and one carrying case |

### Optical link with plug-in receiver module



| TYPE              | DESCRIPTION  |
|-------------------|--|
| <b>MOL500T-MB</b> | Single channel optical link for chassis MOL-MF-xx, DC - 500 MHz, <u>BNC</u> inputs / <u>SMA(f)</u> outputs, incl. one optical transmitter on battery, one optical plug-in receiver module and one battery charger 90-264 V |
| <b>MOL500T-MS</b> | Single channel optical link for chassis MOL-MF-xx, DC - 500 MHz, <u>SMA(f)</u> inputs/outputs, including one optical transmitter on battery, one optical plug-in receiver module and one battery charger 90-264 V          |

### Chassis for plug-in receiver modules



| TYPE             | DESCRIPTION  |
|------------------|--|
| <b>MOL-MF-10</b> | 19" chassis 2U for up to 10 plug-in receiver modules, 85 - 264 V, including one power supply cable, one USB cable and one FibREmote software for PC.                                     |
| <b>MOL-MF-1</b>  | Chassis for one plug-in receiver module, including one power supply adapter 100 - 230 V with 3 mains plugs for US/Japan, Europe and UK, one USB cable and one FibREmote software for PC. |

### Fibre optic cables



| TYPE              | DESCRIPTION   |
|-------------------|---|
| <b>FCLBxxx</b>    | Fibre optic cable, diameter: 3 mm<br>xxx = the cable length<br>Available lengths are 10, 20, 50, 100, 200, 500, 1000 m          |
| <b>FCLBxxx-RU</b> | Rugged fibre optic cable, diameter: 7.5 mm<br>xxx = the cable length<br>Available lengths are 10, 20, 50, 100, 200, 500, 1000 m |

### Related products / accessories



| TYPE                | DESCRIPTION  |
|---------------------|--|
| <b>MOL-CRG-DCDC</b> | Optional DC/DC charger for one transmitter or receiver module, $V_{in}$ : 10-30 Vdc<br><i>Enables long term operation using an external 12V or 24V battery</i> |