

Quick Guide – Catenary Measuring Instrument FM4-LO

Preparing for measurements

- Push together the optional two-part measuring bar and clamp the locking lever (1, Fig. 1) on both sides.
- When using the optional universal measuring bar, it may be necessary to undo the locking screws (1, Fig. 2) with a hexagon wrench (SW5) on both sides of the measuring bar, then adjust the legs to the corresponding track gage and tighten the locking screws on both sides of the measuring bar.

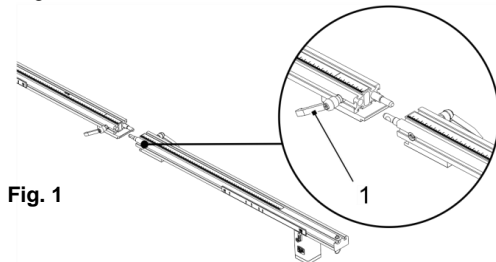


Fig. 1

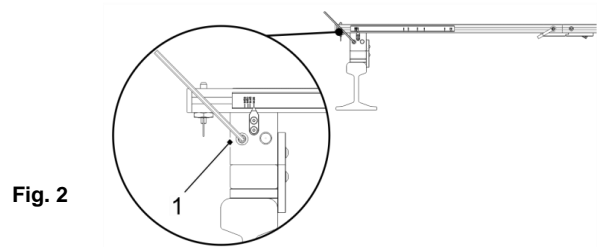


Fig. 2

- Place the measuring bar (1, Fig. 8) perpendicularly above the track with the insulated stop onto a rail.
- Adjust the feet of the FM4-LO in the guide slots of the measuring bar (2, Fig. 3). Here, pull the locking bolt (2, Fig. 3) downward.



Avoid hard stops of the FM4-LO at location pins.

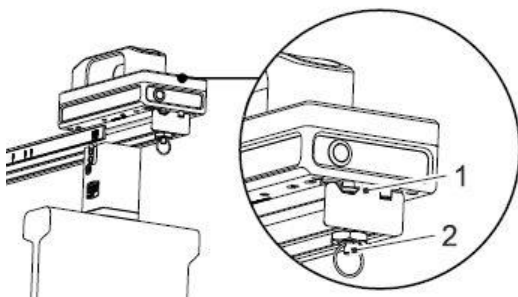


Fig. 3

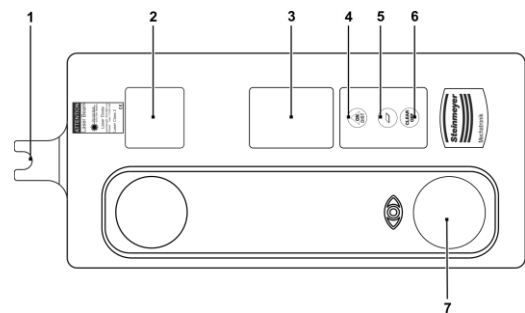


Fig. 4

Measuring the catenary height above the top of the rail

- Slide the FM4-LO on the measuring bar until the aimed contact wire appears in the crosshairs under the viewing aperture (7, Fig. 4).
- Press the ON/DIST button (4, Fig. 4). The laser beam emerges vertically from the glass pane (2, Fig. 4). Normally the laser point is visible on the catenary and in the crosshairs under the viewing aperture. Laser glasses increase the visibility of the red laser point.



Observe the safety instruction for laser beam.

- Press the ON/DIST button again. The measured value appears on the display (3, Fig. 4).
- To switch on the continuous measurement function, press the ON/DIST button for approx. 2 seconds.
- Press the ON/DIST button again to end the continuous measurement. The last measured value is shown on the display.



It is possible to change the measurement units (m, ft, in). Press therefor the measurement unit button for 2 seconds (5, Fig. 4).

Measuring the catenary stagger to the perpendicular bisector of the track center

- Measure the catenary stagger directly after measuring the catenary height or position the FM4-LO again.
- Slide the FM4-LO on the measuring bar until the aimed contact wire appears in the crosshairs under the viewing aperture (7, Fig. 4).
- Press the ON/DIST button (4, Fig. 4). The laser beam emerges vertically from the glass pane (2, Fig. 4). Normally the laser point is visible on the catenary and in the crosshairs under the viewing aperture.
- Read off the catenary stagger on the measuring bar scale at the measuring mark (1, Fig. 4).



If necessary, perform a cross-check. Therefore align the catenary measuring instrument and measuring turned 180° on the rail and perform the measurement again. The measured tolerance should not exceed +/- 5 mm.

Optional: Measurement of the distance from the track center to the pole front edge (PFE dimension)

- Place the mirror attachment (1, Fig. 5) on the two pins on the upper side of the FM4-LO and tighten the knurled knob.
- Slide the FM4-LO on the measuring bar until it reaches the marker MVK-FM4-LO (Fig. 6).
- Press the ON/DIST button (4, Fig. 4). The laser beam is deflected horizontally through the mirror attachment.
- Fix the laser point on the pole.
- Press the ON/DIST button. The measured value is shown on the display (3, Fig. 4).

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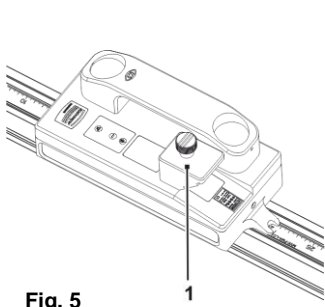


Fig. 5

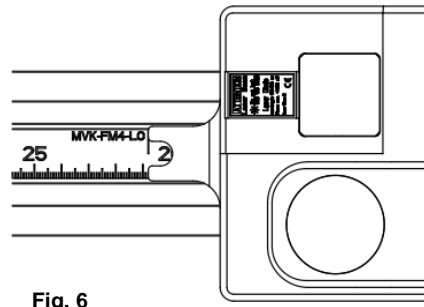


Fig. 6

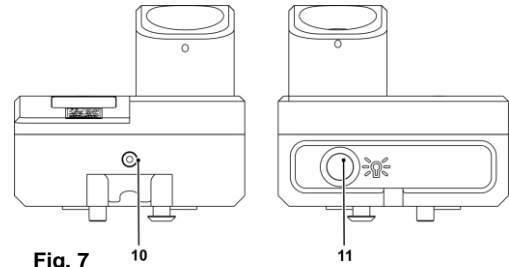


Fig. 7

Power supply / Battery changing



The integrated laser module, the yellow LED (10, Fig. 7) for the scale illumination of the measuring bar and the green LED for the cross-hair illumination of the optics were supplied by two AAA 1.5 V batteries or 1.2 V rechargeable batteries.

- The LED button (11, Fig. 7) activates both LED lamps parallel for the time of pushing the button.
- Necessary battery change or charging is indicated by a flashing battery symbol on the display.
- To change the batteries or rechargeable batteries, loosen the two captive screws with the enclosed hexagon wrench (SW2) of the battery protection cap. Replace batteries. Fasten protection cap.
- Press CLEAR- / OFF button (6, Abb. 4) for 2 seconds to switch off the FM4-LO.

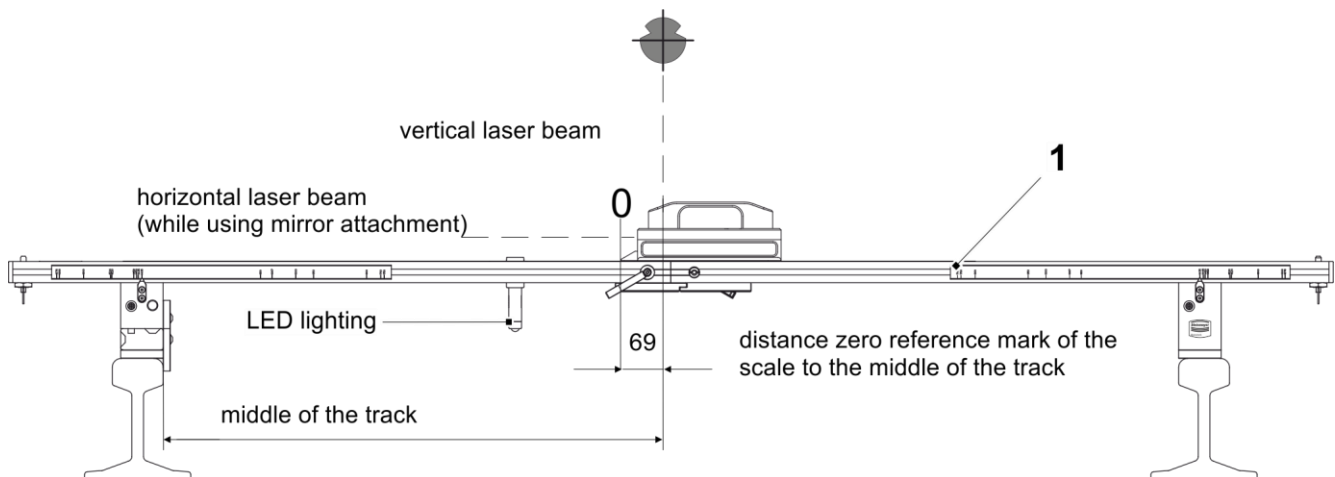


Fig. 8

Notes

Laser radiation:

The FM4-LO is a class 2 laser device. Do not look directly into the laser beam (warning sign on the FM4-LO).

Hints for use:

Keep the FM4-LO clean and dry. It is particularly important to keep the glass plates clean. Avoid dropping the unit and other forms of mechanical damage. Acclimatize the FM4-LO unit before using it, and avoid large jumps in temperature.

Operator responsibility:

The operator is responsible for making sure that the unit is used properly and for the operational safety and reliability of the equipment, as well as for compliance with applicable safety requirements, accident prevention regulations, environmental regulations and occupational health and safety regulations.

Control measurements:

Regular control and reference measurements to determine the measurement tolerances should be performed. To determine the tolerance for the catenary stagger, align the FM4-LO with measuring bar rotated through 180° on the track and perform the measurement again.

Repairs:

All repairs and inspection work are performed by technical personnel at the manufacturer.

Inspection interval:

The inspection interval is 2 years. Observe the test report and the test sticker on the FM4-LO.

Further information:

Refer to the additional information provided in the operating instructions of the FM4-LO. Further documents are available on request.