USER MANUAL

TESLAMETER

PCE-MFM 2400 / 2400+

ENGLISH



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski) can be found via our product search on:
www.pce-instruments.com

SAFETY NOTES

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, ...) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.
- Make sure the Hall sensor is not exposed to strong force or pressure and that the sensor tip is not bent as otherwise measuring deviations and offsets of the characteristic curve may occur.

We do not assume liability for printing errors or any other mistakes in this manual.
We expressly point to our general guarantee terms which can be found in our general terms of business.
If you have any questions please contact PCE Instruments. The contact details can be found at the end of this manual.

SPECIFICATIONS

Specifications of the meter PCE-MFM 2400 and PCE-MFM 2400+

Specification	Description
Measurement range	0 ... 200 mT 200 ... 2400 mT 0 ... 2000 Gs 2000 ... 24000 Gs
Accuracy	±1 % of rdg.
Resolution	0,01 mT 0,1 Gs
Measuring direction	transversal (PCE-MFM 2400) axial (PCE-MFM 2400+)
Magnetic field	static (DC)
Unit	mT, Gs
Power supply	1 x 9 V (DC) battery block automatic shutdown after 5 minutes of inactivity
Mode	HOLD mode, measuring mode
Display	backlight digital 4-digit value display
Operating temperature	0 ...+50 °C
Storage temperature	-20 ...+50 °C
Dimensions	185 x 97 x 40 mm
Weight	310 g
Sensors	Hall sensor transversal, cable length approx. 1 m Hall sensor axial, cable length approx. 2 m

Delivery contents
1 x Teslameter PCE-MFM 2400 or Teslameter PCE-MFM 2400+
1 x Hall sensor
1 x user manual
1 x service bag
1 x 9 V battery block

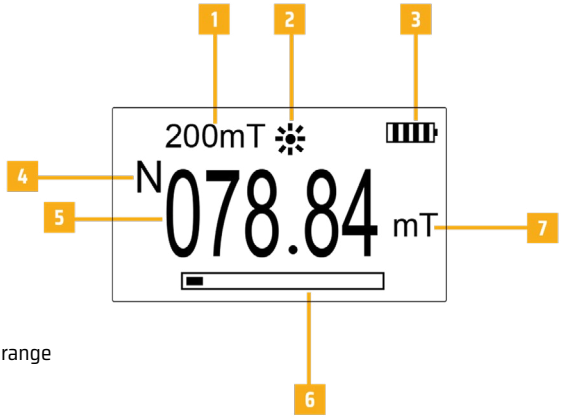
Optional accessories
Carrying case
ISO calibration certificate

SYSTEM DESCRIPTION



Device

1 - Display
2 - Membrane keypad
3 - Battery compartment
4 - Transversal sensor
5 - Axial sensor
6 - Connection socket



Display

1 - Current measurement range
2 - Backlight
3 - HOLD mode
4 - Current reading
5 - Magnetic polarity
6 - Percentage bar
7 - Unit (mT/Gs)
8 - Percentage display of the measuring range

Function keys

Key	Description	Function
	On/off	Turn meter on/off
	Hold	By pressing this key, the measured maximum value will be held in the display. **Hold** will be displayed. When the key is pressed again, the measurement will be continued normally and the **Hold** icon disappears.
	Light	Turn backlight on/off
	Zero	Zero point adjustment
	Unit	Switch unit to mT or Gs (1 mT = 10 Gs)

GETTING STARTED

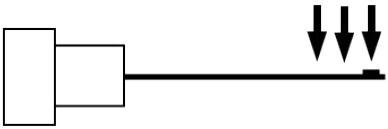
Power supply
For power supply, a 9 V block battery is required. Before replacing these, turn off the meter. The battery compartment is located at the rear side of the meter. Loosen the cover and insert the battery as marked. Then close the battery compartment cover.

Preparation
To start the meter, press POWER until the display reacts. After charging the meter, the measuring screen will be visible. To turn off the meter, press POWER again. Screw the included Hall sensor into the connection socket of the meter. Make sure that the plug is in the right position. The measuring tip with Hall sensor is below the cover.

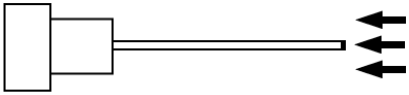
OPERATION

Zero point adjustment
A zero point adjustment should be carried out before each measurement. To do so, remove the cover and raise the measuring tip up in the air or use a zero field chamber. Make sure no magnetic fields or electromagnetic interference occur in the environment. If the reading is not 0.0 mT/Gs, press the ZERO key. The meter will be adjusted and should then display 0.0 mT/Gs.

Measurement
Before making a measurement, make sure the sensor reaches the environmental temperature. The cover must be removed to be able to make a measurement. Place the tip (Hall sensor) in the centre of the magnetic field you wish to measure. The farther the sensor is away from the centre of the magnetic field, the lower the magnetic flux density will be. As you can see in the picture below, the transversal sensor must be placed vertically to the flux vector. If you are using the axial sensor, the flux vectors must be axial to the measuring tip. Allow some time for the reading to stabilise. If the display shows **Over Range,** the measured value is outside the measurement range.



Orientation of transversal sensor



Orientation of axial sensor

The maximum magnetic flux density is measured when the flux vector (see arrows) is vertical to the sensor plane. The following chart shows the measuring deviation in line with the angle between the flux vector and the sensor plane.

Sensor's angle to the flux vector	Deviation in per cent
10°	2,5%
20°	7%
30°	15,2%
45°	30,3%

Auto Power Off
When no entries have been made for 5 minutes, the meter will turn off automatically to save energy. If you wish to use the meter again after Auto Power Off, press to turn it back on.

Display functions
Hold
To enable the user to read the maximum value correctly, the meter has a Hold function. To activate this function, press the HOLD key . As you can see in the display description above, a **Hold** icon will appear in the upper right corner of the display. The meter will now always display the absolute value of the measured positive and negative maximum value.

Polarity
The meter can display the direction of incidence of the magnetic field lines. If the magnetic field lines touch the front side of the Hall sensor, the meter will display a positive value along with an N. On the other hand, if the magnetic field lines touch the rear side of the Hall sensor, the reading will be negative and displayed with an S.

Measurement range
The meter can automatically switch between two measurement ranges. When the current reading is within the range 0 ... 200 mT, it will apply the 200 mT measurement range. When 200 mT are exceeded, the meter will automatically switch to 2000 mT. The current measurement range is shown in the display. In both ranges, the percentage bar will show the percentage of the current reading from the measurement range. The percentage bar has 10 boxes which stand for a portion of 10 % each. If the reading is higher than 2400 mT and the percentage bar is full, the meter will display **Over Range.**

DISPOSAL

For the disposal of batteries in the EU, the (EU) 2023/1542 directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose. In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law. For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations. If you have any questions, please contact PCE Instruments.

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