

# USER MANUAL

## MAGNETIC FIELD METER

PCE-MFM 3500



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](http://www.pce-instruments.com)

## 1 INTRODUCTION

- » Measurement for the magnetic field generated from Direct Current (DC, with display by N/S Magnetic polarity) or Alternating Current (AC in 40 ... 500Hz).
- » Measurement for the residual magnetic after processing of mechanical parts
- » Measurement for the magnetic field strength of magnetic applications
- » Measurement for the residual magnetic generated from the stress after processing of stainless material
- » Measurement for the magnetic force of magnetic materials
- » Measurement for the various steel materials with natural magnetism
- » Measurement for the magnetic field strength of motors in various electrical appliances
- » Measurement for the magnetic field strength of permanent magnets
- » Detection for the magnetic field of leakage generated from superconductive magnets

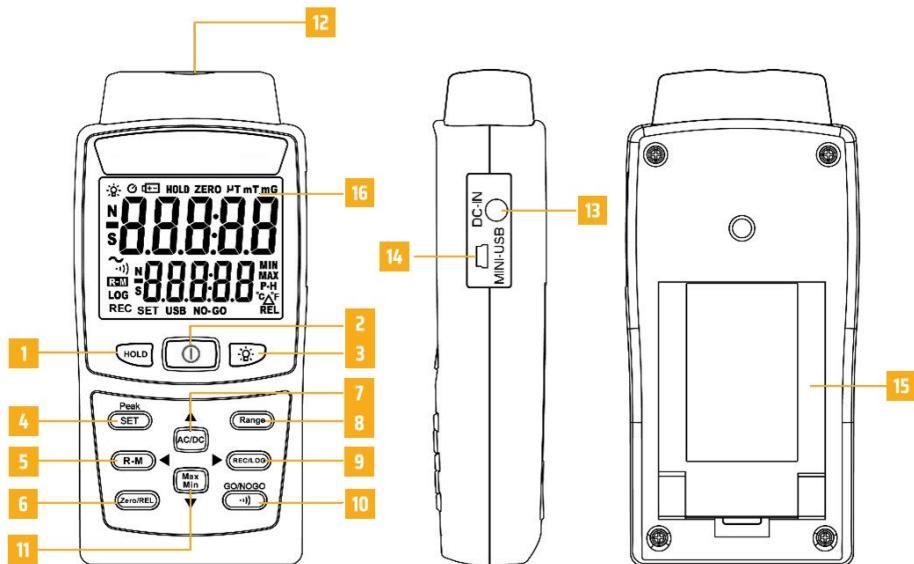
## 2 SAFETY PRECAUTION

	Caution! Please refer to this manual. Improper use may damage the meter and its components.
	Complies with European Directive.

- » Do not operate in environments with flammable gas or humid environments.
- » Operating altitude: up to 2000M.
- » Operating environment: Indoor use; Pollution degree 2.
- » Clean with soft cloth when dirty, such as glasses cloth.
- » Do not clean with chemicals and other solvents.
- » EMC: EN61326-1: CISPR 11: Group 1, Class B

Class B - Equipment for use in all establishments other than domestic.  
Group 1 - RF energy generated is needed for internal functioning.



### 3 INSTRUMENT DESCRIPTION



- |   |   |
|---|---|
| 1. Data hold                                | 9. Manual record (REC)/ Auto record (LOG) |
| 2. Power                                    | 10. Buzzer/GO & NO-GO                     |
| 3. Backlight button                         | 11. The max. & min. value hold/Down       |
| 4. SET/Peak value hold                      | 12. Probe connector                       |
| 5. Read the record data from RAM (R-M)/Left | 13. External power DC 9V input            |
| 6. Set to Zero (Zero)/ Relative Value (REL) | 14. USB data output jack                  |
| 7. AC/DC switch/Up                          | 15. Battery cover and tilt stand          |
| 8. Manual range mode/Automatic range mode   | 16. LCD display                           |

## 4 OPERATION

1. Press the POWER button to turn on or turn off.
2. Remove the cap of probe.
3. Move the HALL ELEMENT which is located on the tip of probe close to the magnet under test and start measuring. Please refer to Fig. 1.
4. Read the measured value from the LCD display.
5. Cover the cap of probe back.

	If the probe not inserted into the host or not inserted completely, <b>Err0</b> will appear. Please turn power off and ensure to insert the probe into the host; again, turn power on.
	If the probe is disconnected with the host while working, <b>Err5</b> will appear for warning.

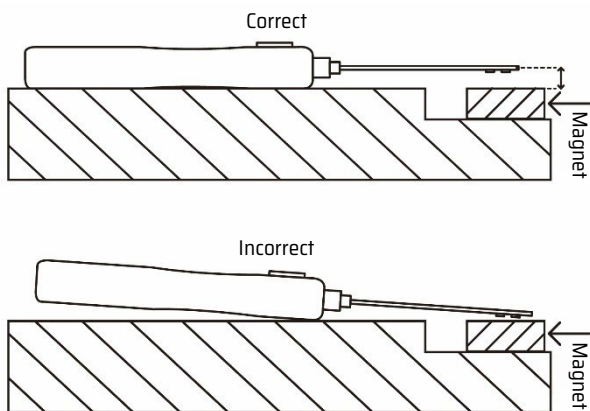





Fig. 1

4.1 Zeroing


Move the probe away from the magnetic field and press ZERO/REL, ZERO will appear on the LCD. After zeroing completed, the ZERO disappears.

	If more than 3G or 0.3mT, <b>Err2</b> will appear to prevent from erroneous zeroing the value in measuring. (from PC)
	If more than 3G or 0.3mT, <b>Err3</b> will appear to prevent from erroneous zeroing the value in measuring. (from HOST)
	The zeroing function is unavailable for temperature.

4.2 Peak Measurement

Move the probe away from the magnetic field, then press and hold PEAK/SET for ≥2 seconds to start Peak Measurement. The upper digit row presents the instant measuring; the lower digit row presents the peak value x.x **P-H**

Again, press and hold PEAK/SET to quit this function.

	Zeroing will run automatically in prior to Peak Measurement. If more than 3G or 0.3mT, <b>Err4</b> will appear to prevent from erroneous zeroing the value in measuring.
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4.3 Relative Value Measurement

Press and hold ZERO/REL for ≥2 seconds to start Relative Value Measurement.

The difference between the two magnetic fields can be compared here. For instance, the 1<sup>st</sup> magnetic field is measured to be 100. At the time, press “REL” button, and the LCD displays 0; again, measure the 2<sup>nd</sup> magnetic field. If the measured value of the 2<sup>nd</sup> magnetic field is 120, the LCD will display 20 (120-100=20).

Again, press and hold ZERO/REL to quit this function.

4.4 Turn on backlight

Press  to turn the backlight on or off.

When connected to an external power supply, the backlight will automatically illuminate and stay on.



**Note:** The backlight will automatically turn off after being lit for 30 seconds when not connected to an external power supply.

4.5 Manual Record for One Log

Press REC/LOG to save one log of data, the LCD will show “REC” and the number of logs. For instance, if the current number is 10, it will be increased by 1 at each pressing. The number of logs is limited to be 200; if exceeded, the LCD will show “Full”.

#### 4.6 Auto Record

Press and hold REC/LOG, LCD displays **LOG**, and the auto-recording function is enabled. Again, press REC/LOG to quit this function.

	The record is setup on PC via USB connection.
	If the power is insufficient when recording in logs, <b>Err6</b> will appears.

#### 4.7 Read the record data from RAM

Press R-M for the reading mode, and **R-M** appears on the LCD. Press UP or DOWN to select the log number for reading. Press and hold R-M to quit this mode.

#### 4.8 Data Hold

Press HOLD to enable or disable the data hold function.

#### 4.9 The Max./Min. Values Hold

Press MIN/MAX to enable MIN/MAX function; again, press MIN/MAX to show the MAX and MIN values by turns. Press and hold MIN/MAX to quit. The measured data can be held and updated as the measured the MAX and MIN values.

#### 4.10 Disable Auto Power Off Function

With power off mode, keep pressing HOLD and press POWER to turn on power, LCD will show „n-SL“ that means to disable auto power off function. Re-starting will reset to the auto power off function. The function will be disabled when an external power is detected.

#### 4.11 Stopping buzzer

Press  to stop the buzzer's beep.

#### 4.12 Manual range mode / Automatic range mode

Press RANGE to operate in the manual range mode with the LCD showing **M**. This can change into two different range modes.

Press and hold RANGE for  $\geq 2$  seconds to return to automatic range mode with LCD showing **A**.

#### 4.13 AC/DC Switching magnetic field

Press AC/DC to switch the measurement between AC magnetic field and DC magnetic field.

#### 4.14 Setup: Step 1 ... Step 8

Press SET to enter the setup procedure from step 1 to step 8, while **SET** flashes on the LCD.

##### » Step 1 Setup unit G or mT

1. Press UP or DOWN to select the unit G or mT.
2. Again, press SET to go to Step 2.

##### » Step 2 Setup unit °C or °F

1. Press UP or DOWN to select the unit °C or °F.
2. Again, press SET to go to Step 3.

##### » Step 3 Set up the upper limit (Max.) for alarm GO / NO-GO

1. The default value is 20000G (2000.0mT). Press UP or DOWN to modify and setup the default value.
2. Again, press SET to go to Step 4.

##### » Step 4 Set up the lower limit (Min.) for alarm GO/NO-GO

1. The default value is 0G (0.0mT). Press UP or DOWN to modify and setup the default value.
2. Again, press SET to go to Step 5.



If the min. value is more than the max. value,  
**Err 1** appears.

##### » Step 5 Setup the measurement interval of alarm GO/NO-GO

1. The default value is 2 seconds. Press UP or DOWN to modify and setup the default value.
2. Again, press SET to go to Step 6.

##### » Step 6 Setup year/month/date

1. Go to the mode to setup the year/month/date.
2. Press LEFT or RIGHT to select the item to modify, the digits of the selected item will flash.
3. Then, press UP or DOWN to correct the value.
4. Again, press SET to go to Step 7.

##### » Step 7 Setup hour/minute

1. Go to the mode to setup the hour/minute.
2. Press LEFT or RIGHT to select the item to modify, the digits of the selected item will flash.
3. Then, press UP or DOWN to correct the value.
4. Again, press SET to go to Step 8.

##### » Step 8 Clear the manual record

1. Go to the mode to clear the manual record LCD shows **CLrn**
2. Press UP or DOWN to select **y** or **n** where the default value is **n**
3. If the record is not cleared, press SET again to return to the measurement mode when the LCD shows **n**
4. If **y** is selected, press SET to return to the measurement mode and clear the record while LCD shows „CLEAR“.

## 5 SOFTWARE INSTALLATION:

Windows 10 / Windows 11 operating systems

- » Place the CD included with this meter into the CD/DVD-ROM drive of the PC to connect to and install the desktop program
- » Run the desktop application:




- » Connect the USB cable included with this meter to the PC, as shown in the figure below.

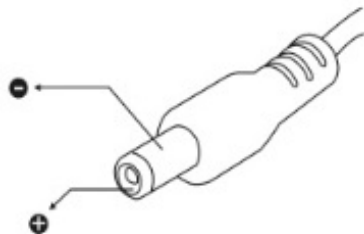


- » Execute the PC desktop software program:  
Double-click the left mouse button on the desktop program (Thermometer Meter) to execute the desktop program.



## 6 GENERAL SPECIFICATIONS

- » Liquid crystal display (LCD) of 5 digits with the displaying value up to 30000.
- » Backlight
  - Manual Operation:** The user can manually turn on/off. When turned on, it will remain lit for 30 seconds and then automatically turn off.
  - External Power Supply:** When connected to an external power supply, the backlight will remain continuously lit until the power supply is disconnected.
- » Enable and disable auto power off function (default 15 minutes).
- » Measurement range: 0 ... 3000mT (milli Tesla) / 0 ... 30000G (Gauss); Auto Range function (with Automatic Measurement).
- » Conversion of units: 1mT (milli Tesla) = 10G (Gauss)
- » Relative value/Peak hold/Real time Zeroing function.
- » Enable and disable auto power off function (default power off is 15 minutes from the last operation).
- » DATA HOLD(Data hold)
- » MAX/MIN (Maximum hold/ Minimum hold)
- » The GO and NO-GO alarm function and its settings that can be applied to detect good and defective products on the production line.
- » Unit switch for Gauss/Tesla.
- » The maximum, minimum, and average values:  
auto export the top 10 max./top 10 min./ average values based on the data which is recorded and downloaded to the computer.
- » As connected to a PC, press REC to record the real-time data in the PC.
- » Overload display: "OL".
- » Manual recording: up to 200 logs.
- » Automatic recording: up to 7000 logs where the record interval shall be setup with PC.
- »  : detection for battery low
- » Battery life: Approximately 100 hours.
- » Operation temperature and humidity: 5°C ... 40°C (41°F ... 104°F), < 80%RH
- » Storage temperature and humidity: 0°C ... 50°C, relative humidity under 70%.
- » Weight: Approximately 320 grams (with battery)
- » Dimensions: 156 (L) x 73 (W) x 35 (H) mm
- » **AC to DC Adaptor**  
External AC 100 ... 240V to DC 9V/0.5A power supply  
Plug: The pin in the center connects to the positive electrode and the outer case is negative electrode  
Diameter: 5.5mm; internal diameter: 2.1mm



## 7 ELECTRICAL SPECIFICATION

Accuracy is indicated as [% rdg + dgt] at 23°C ± 5°C with RH < 80%.

Specifications	Range	Resolution	Accuracy
DC milli Tesla	300.00 mT	0.01 mT	±(4% + 10dgt)
	2000.0 mT	0.1 mT	
	2000.1 ... 3000.0 mT	0.1 mT	N/A
DC Gauss	3000.0G	0.1G	±(4% + 10dgt)
	20.000G	1G	
	20.001 ... 30.000 G	1G	N/A
AC milli Tesla	150.00mT	0.01 mT	±(5% + 20dgt)
	1500.0mT	0.1 mT	
AC Gauss	1500.0G	0.1G	
	15.000G	1G	

### Temperatures:


Range	-20 ... 50°C / -4 ... 122°F
Resolution	±0.1°C / ±0.1°F
Tolerance	±1.0°C / ±1.8°F

## 8 ACCESSORIES

- 1 x Meter
- 1 x AC/DC magnetic probe
- 1 x User's Manual
- 6 x Battery 1.5V (UM4/AAA)
- 1 x Carrying case
- 1 x Power adapter DC 9V
- 1 x USB cable and Installation disk

## 9 MAINTENANCE OR REPAIR

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1. When the  symbol is displayed on the LCD, it means that there is insufficient power; please change the battery immediately in order to ensure its accuracy.
2. Do not place the meter in locations that have high temperature, humidity or that are exposed to direct sunlight.
3. Remember to turn off the power after usage; remove the battery if not used for a long period of time in order to prevent battery leakage and causing damages to internal components.
4. When the instrument failure, only by the authorized service provider or return the original repair.

## 10 BATTERY REPLACEMENT

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1. Turn off the power.
2. Open the frame and battery cover at the back of the meter, remove the batteries.
3. Insert 6 pcs of new AAA 1.5V batteries according to the battery polarity.
4. Put the battery cover and frame back in place.

## 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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