USER MANUAL

EMF TESTER

PCE-EMF 10

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

PRODUCT INTRODUCTION

The PCE-EMF 10 is a precision handheld electronic device with a built-in sensor that captures EF, MF, and RF radiation signals. These signals are processed by integrated circuitry and displayed digitally or graphically to show radiation levels and trends, with alarms triggering when measurements exceed preset thresholds.
This product features four alarm modes: audible, visual, vibration, and on-screen display. Users can assess and mitigate electromagnetic radiation exposure based on the alarm alerts and detection results.
To ensure optimal performance, please read this manual thoroughly before use.

APPLICATIONS

This device monitors ambient electromagnetic radiation levels, enabling users to identify and avoid excessive exposure. Typical applications include:

- This device is used to measure electromagnetic radiation in various environments including living spaces, offices, computer rooms, power distribution rooms, and near transmission towers.
  Including: measuring radiation levels in daily activity areas (sofas, bedrooms, work desks); Testing electromagnetic radiation from rooftop communication base stations. When radiation levels exceed safety standards, the device can help locale the radiation source for proper relocation to a saler position.
- This device is designed for functional testing of electromagnetic radiation protection products.
  Including: evaluating the shielding effectiveness of EMF protective clothing and computer radiation screens; monitoring RF signais in secure rooms or shielded enclosures.
- This device is used for measuring the intensity of various radiofrequency (RF) electromagnetic radiation.
  Including: testing electromagnetic emissions from wireless communication devices (mobile phones, radios, routers); measuring RF radiation from transmitting equipment like microwave ovens; analyzing radiation intensity levels from different electromagnetic wave sources.

EMF EXPOSURE LIMITS

Exposure limit standards for elecIromagnetic radiation vary by country and region, with their establishment based on multiple factors including: EMF frequency,duration of exposure,affected body parts. The following are EMF exposure limits published by selected countries and international organizations. Note that standards from IEEE and most Western European countries place greater emphasis on long-term exposure dosage. For detailed specifications, please refer to the table below.

	50HZ / 60HZ		2GHZ
	EF (V/m)	MF (mG)	RF (mW/m^2)
China [1]	3333	833	400
Russia [2]	500	100	100
ICNIRP [3 4]	4167	2000	10000
IEEE [5 6]	5000	9040	10000

1 - GB 8702-2014 Electromagnetic Environment Control Limits
2 - SanPiN 2.1.2.1002-00 Sanitary and Epidemiological Requirements for Residential Buildings and Premises
3 - ICNIRP Guidelines: Limits for Exposure to Time-Varying Electric and Magnetic Fields (1Hz ... 100kHz)
4 - ICNIRP Guidelines: Limits for Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (up to 300GHz)
5 - IEEE Standard C95.6™-2002, Safety Levels with Respect to Human Exposure to Electromagnetic Fields (0 ... 3kHz)
6 - IEEE Standard C95.1™-2005, Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields (3kHz ... 300GHz)

FUNCTIONAL CHARACTERISTICS

- The device can simultaneously measure and display three types of electromagnetic radiation: electric field (EF), magnetic field (MF) and radio frequency (RF).
- The device can measure the EF\MF\RF value and display the real-time value, maximum value and average value as well as the line chart of the dynamic change of the measurement data. The line chart can be expanded or shrunk adaptively according to the measurement value, and the part exceeding the threshold will change color automatically. The historical measurement data point within 18 seconds from the current moment can be recorded.
- The device is equipped with high-precision wide-band RF sensors.
- Magnetic field detection using a three-axis sensor, the detection is faster and more accurate.
- The 2.4-inch high resolution TFT color screen, clear display, more rich content.
- The device has sound, light, vibration, screen display four alarm modes, support font/curve color warning.
- The device has alarm status, working mode, timing shutdown switch and data retention memory function.
- The device has the function of one-key hold and peak detection.
- The device has a key to open and close timing shutdown function.
- The device has the function of switching the magnetic field unit μT/mG with one key.
- When the current electromagnetic radiation value exceeds the measurement limit, it has the blocking alarm warning function (Display the maximum range, alarm rhythm is rapid).
- The device has the battery power continuous monitoring function, and with low power state prompt;
- The device built-in large capacity lithium battery life longer.
- The device can use the external Type-C interface to power and charge the device.

TECHNICAL DATA

Liquid Crystal Display	2.4-inch TFT LCD Screen
Measuring Range	EF 1 ... 1999 V/m
	MF 0.1 ... 999.9 mG / 0.01 ... 99.99 μT
	RF 0.1 ... 999.9 mW/m²
Sensitivity	EF 1 V/m
	MF 0.1 mG / 0.01 μT
	RF 0.1 mW/m²
Measurement Accuracy	±5%
Measurement Bandwith	40Hz ... 10GHz
Timed Shutdown	The default is 15 minutes, which can be manually enabled or disabled with one click
Power Source	3.7V Rechargeable Lithium Battery, 1800mAh
Power Dissipation	<0.1W
Temperature and Humidity	-10-45°C, <80%RH
Overall Dimension	127x65.27 mm
Weight (Battery Included)	<165g

Alarm Threshold			
	EF (V/m)	MF (mG)	RF (mW/m²)
Low	<250	<50	<50
Medium	250 ... 500	50 ... 100	50 ... 100
High	>500	>100	>100

BUTTON DESCRIPTION

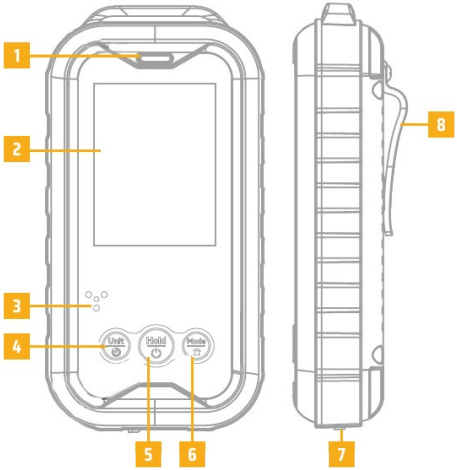
Unit Switch/Timed Shutdown
Short press to switch magnetic field units µT and mG (Only on the home screen),
Long press to turn on/off the timed shutdown function for 15 minutes.

Hold/Switch
Short press to turn on/off data hold
Long press switch.

Mode Switch/Alarm Type Switch
Short press to switch the display interface
Long press to switch the alarm type combination.

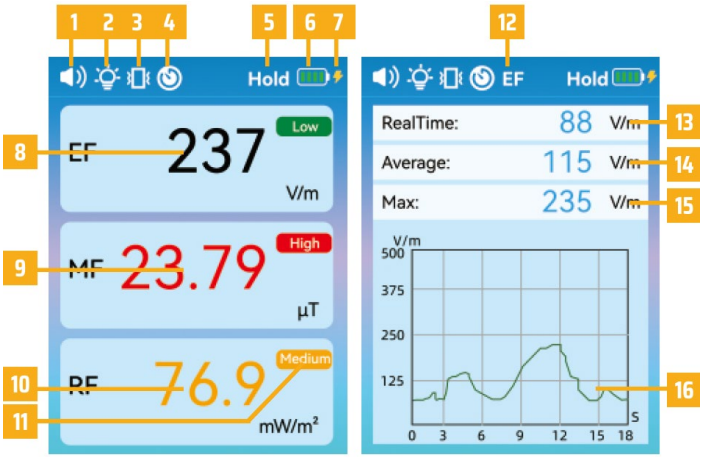
DEVICE DESCRIPTION

1 - Indicator Light
2 - TFT LCD Display
3 - Buzzer
4 - Unit Switch/Timed Shutdown
5 - Hold/Switch
6 - Mode Switch/Alarm Type Switch
7 - Type-C Interface (Bottom)
8 - Clip Head



DISPLAY DESCRIPTION

1 - Sound Alarm Icon (In Alarm Off mode, the mute icon appears here)
2 - Alanm Light Icon
3 - Vibration Alarm Icon
4 - Auto Shutdown Timer Icon
5 - Hold (Data Hold)
6 - Battery Level
7 - Charging Indicator
8 - Real-Time Electric Field (EF) Measurement
9 - Real-Time Magnetic Field (MF) Measurement
10 - Real-Time Radio Frequency (RF) Measurement
11 - Alarm Status Indicators: Low, Medium, High
12 - Graph Display Icon
13 - Real-Time Measurement Value
14 - Historical Average Value
15 - Historical Peak Value
16 - Dynamic Measurement Curve



OPERATION INSTRUCTIONS

Power On/Off

» Power On: When the device is off, press and hold the Hold/Power button for 1 second to turn on.

» Power Off: When the device is on, press and hold the Hold/Power button for 3 seconds to shut down.

EF/MF/RF Radiation Detection

After startup, the device automatically enters detection mode (Retaining the last used mode before shutdown). Slowly move the sensor head closer to the test object. The Gloser the distance, the more accurate the EF/MF/RF readings.

Alarm Indicators:

» Low : No alarm.

» Medium: Slow alarm beep.

» High: Medium-speed alarm beep.

» Over Range: Fast alarm beep (If values exceed measurement limits).

Unit Switch

The magnetic field measurement supports mG (milligauss) and μT (microtesla). Press the Unit/Timer button briefly on the main screen to toggle between units.

Data Hold Function

Press the Hold/Power button briefly in any mode to freeze the current reading (status bar shows Hold).

Display Mode Switch

This instrument can display measurement results and data trends in numerical and graphical forms.
When powered on for the first lime, the device will default to the Numerical display home screen (subsequent startups will maintain the same interface as the last shutdown). EF/MF/RF measurement results are displayed simultaneously.
In this mode, briefly press the Mode/Alarm button to sequentially enter:
EF->MF->RF graphical display interfaces, with corresponding EF-MF->RF icons displayed in the top status bar.
The home screen and graphical display interfaces can be cycled through by briefly pressing the Mode/Alarm button.

Alarm Mode Configuration
Press and hold the Mode/Alarm button to cycle through alarm preset combinations (see detailed mapping below).

Alarm Type / Alarm Mode	Audible Alarm	Visual Alarm	Vibration Alarm	On-Screen Alert
Normal	√	√	√	√
Mute	x	√	√	√
Vibration	x	x	√	√
Silent	x	√	x	√
Off	x	x	x	√
Note: During vibration alarm Mode, the screen brightness will automatically dim.				

Device Charging
The USB charger of 5V/≥0.5A can be used to charge or power the device; the green indicator is on when charged.
Note: When charging the device with a charger, it will cause interference to the device's electric field detection!

IMPORTANT NOTES

- Microwave signais have high frequency and short wavelength, characterized by poor penetration but strong transmission capability. For example: when measuring radiation from cell towers, readings differ significantly between open outdoor areas and indoor spaces with walls. If metal abjects are present near the measurement point, microwaves may reflect and amplify, potentially distorting readings. Always ensure no metal or other conductive materials are near the test area to avoid inaccurate results.
- Appliances with metal casings (e.g., washing machines, refrigerators, air conditioners, rice cookers, computer towers) that lack strong electric field-generating circuits will effectively shield electric field radiation when properly grounded. If such devices show high electric field readings, verify the power outlet's grounding. Conversely, appliances like microwaves, induction cookers, CFL bulbs, CRT monitors, humidifiers, ionizers, and laser printers emit stronger electric fields due to internai high-voltage circuits, even when grounded. Maintain a safe distance from these devices.
- Most radio communication devices (e.g., cell phones, walkie-talkies, cordless phones, broadcast towers, WiFi routers) emit intermittent or variable-power signais.
  For instance: Phones in standby mode primarily receive signais with minimal transmission.
  Cell tower output adjusts based on network load/weather.
  Receive-only devices (e.g., satellite TV antennas) emit no radiation. Understand the radiation source's operating mode to interpret readings correctly.
- The device must be held in hand during measurement, as ils readings are calibrated for handheld operation. After approaching the test abject, maintain a stable position and avoid rapid movement to allow for proper instrument response lime.
- The high-sensitivity sensor is located at the front housing. Grip the rear (below the screen/keypad) without touching the sensor area or display, as body/conductive contact may induce interference.
- In real-world environments, EF/MF/RF frequencies constantly mix and fluctuate. EMF meters vary in design and frequency ranges. Normal operation includes continuous minor reading variations within expected ranges.

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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