User Manual

TRIPLETT

EMF85
Triple Axis EMF Meter

CE

Introduction

Electromagnetic Pollution: Electromagnetic pollution refers to the interference of natural and man-made electromagnetic waves and harmful electromagnetic radiation. Due to the development of radio, television, and microwave technology, the power of radio frequency equipment has doubled, leading to increased electromagnetic radiation posing a direct threat to human health. Excessive electromagnetic radiation causes electromagnetic pollution.

Electric Field Intensity (E): A vector field in which charge feels the force constitutes the electric field. The strength of the electric field at any point is defined as the force exerted on the unit of positive charge at that point, measured in volts per meter (V/m).

Magnetic Field Intensity (H): Similar to the electric field, it is a vector field where charge feels the force. Measured in volts per meter (V/m).

Power Density (S): The power per unit area on the vertical plane of the direction of propagation of an electromagnetic field, often measured in watts per square meter (W/m) or milliwatts per square centimeter (mW/cm^2).

Electromagnetic Field Characteristic (S): The electromagnetic field propagates as a wave and travels at the speed of light (c). The wavelength (λ) is inversely proportional to frequency (f). If the distance source is less than 3 wavelengths, it is considered to be in the near-field region; if greater, it's in the far-field region.

1-2 Application

The RF Electromagnetic Wave Tester is used in areas with emitted electromagnetic fields, such as radio stations. It's crucial to avoid hazardous levels of electromagnetic radiation. National and international regulations provide allowable power density limits for different frequency ranges and signal forms.

1-3 Features

This table is designed for wide-band monitoring of high-frequency radiation (50MHz to 8G). It provides non-directional electric field testing with high sensitivity, measuring electric and magnetic field strength. It displays results in terms of electric field intensity and power density.

This table can be set to display the average measured value and the maximum average measured value.The maximum average measurement can be used as a directional test, for example when entering an exposed area for the first time.
Detect the frequency range of 50MHz to 8GHz.
Isodirectional electromagnetic field measurement.
Nondirectional measurements look at the triaxes and measurements.
High dynamic range view XYZ direction measurements.
Programmable alarm limit and storage function.
Overload display OL.

Specifications

2-1 General specifications

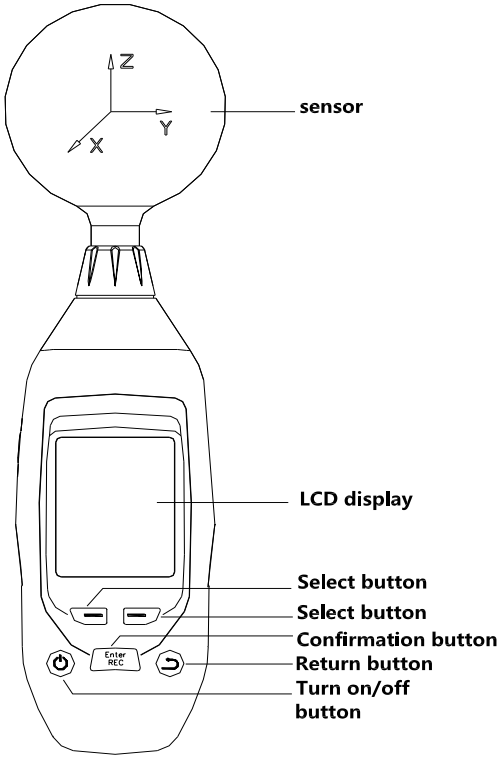
Measurement method	Digital display、Three axis measurement
Measuring gear	A continuous gear
reaction time	1s
Sound warning	Buzzer
unit	uW/m², mW/m², W/m², uW/cm², mW/cm², mV/m , V/m
Display value	Average maximum average
Operating temperature	0℃ ~ 50℃
Operating humidity	0% ~ 75%RH
Storage temperature	-10℃ ~ 60℃
Storage humidity	0% ~ 80%RH

2-2 Electrical specifications

Directivity characteristic	Isotropic. three-axis
Measuring mode	High frequency electric field
Display resolution	0.1mV/m 0.1uW/m2 0.001uW/cm2
Frequency range	50MHz~8GHz
Measuring range	1uW/m²~26.52W/m² ,0uW/cm²~2.652mW/cm² ， 20mV/m~100V/m
Dynamic range	45dB
Frequency response	±1.0dB(50MHz to 1.9GHz),±2.4dB(1.9GHz to 8GHz)
Overload limit	2.652mW/cm² (100V/m)

三、Operating instructions

3-1 Front panel and button description



（1）.If the power off, press and hold  button, until the LCD is on, then the unit will power on.If the power on, press and hold  button, until the LCD is off then the unit will power off.

（2）. In the state of the main interface, long press the 

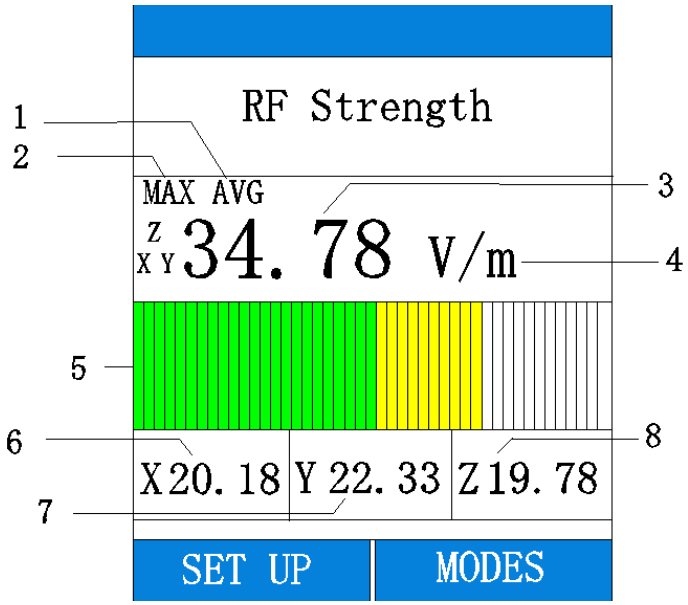
button to enter the interface of historical data saving（If you've saved the data）。

（3）. Under the state of the main interface, press the  button to enter the menu selection interface.

（4）. Under the state of the main interface, press the  button to enter the data saving interface.

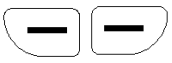
（5）.  is the back button.

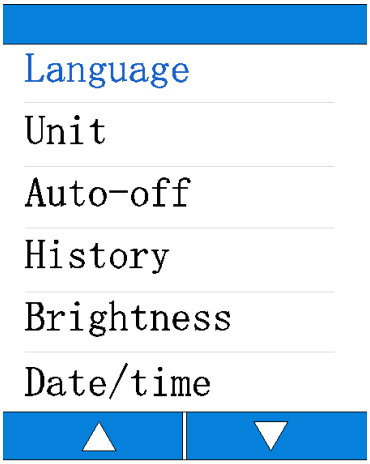
3-2 Main interface display content description



1. Represents the average measured value.
2. Represents the maximum average measured value.The initial interface only displays AVG, and the displayed value is the average value. Press the Enter REC button, and MAX AVG will be displayed, and the displayed value is the maximum average value. Pressing the Enter REC button again will switch to display the average value.
3. Represents the average value of X.Y.Z triaxial composite
4. Denotes a unit of measurement.mV/m, V/m(Electric field intensity) uW/m^2 ,mW/m^2 ,W/m^2 $uWcm^2$,mW/cm^2 (Power density)
5. Degree representation of triaxial composite value.
6. X-axis direction value.
7. Y-axis direction value.
8. Z-axis direction value.

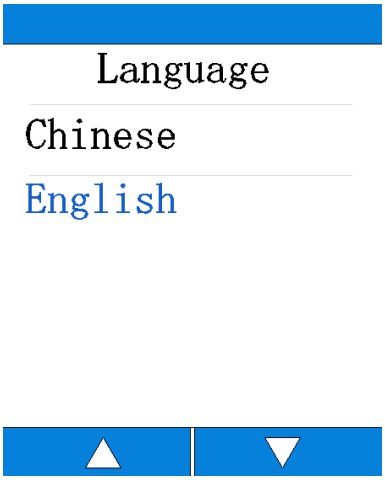
3-3 Menu

Press the "SET UP" button to enter the menu Settings interface.Eight set a "Language", "Unit", "Auto-off", "History", "brightness", "Date/time", "Alarm", "Calibration".Select and switch by  button and press Enter REC button to enter the corresponding Settings.



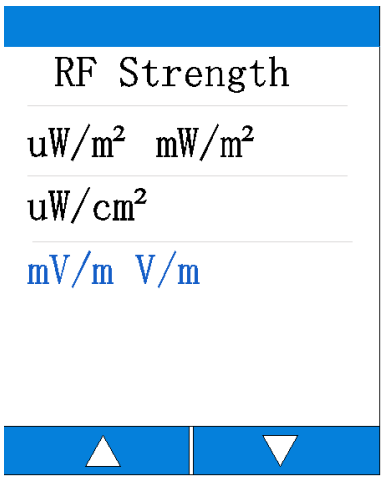
（1）Language

Select the language you want to display by  or  , press  to confirm the selection or press  to exit the selection.



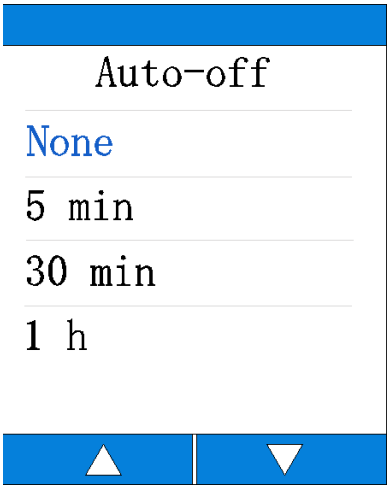
（2）Unit

Select the unit to be changed by  or  button, press  button to confirm the selection or press  button to exit the selection.



（3）Auto-off

This option is used to set the automatic shutdown time of the device.There are 5 minutes, 30 minutes and 1 hour to choose from.If no button is pressed within the automatic shutdown time range, the device will automatically shut down.Select "None" and the device will continue to work until the low power shutdown occurs.

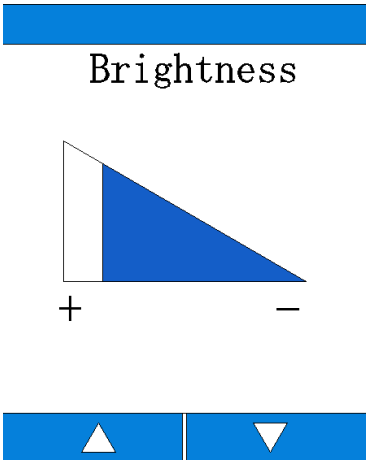


（4）History

This option is used to view the device's historical data.The data are arranged in record order, listing the record time.Press the  or  buttons to select the data you want to view The saved data is stored on the device and can be viewed through a history page or opened on the computer via USB.All records are separated into CSV files based on different dates.Each CSV file contains all the records for each day.

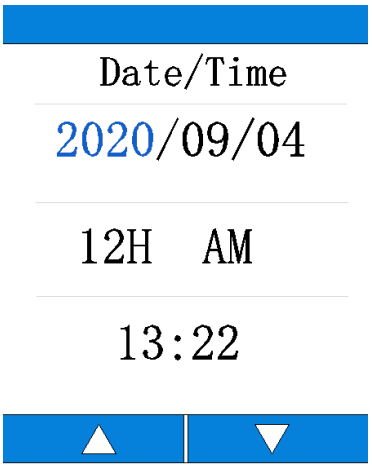
（5）Brightness

This option is used to set screen brightness and has four brightness levels.Press the button to increase brightness and the button to reduce brightness.



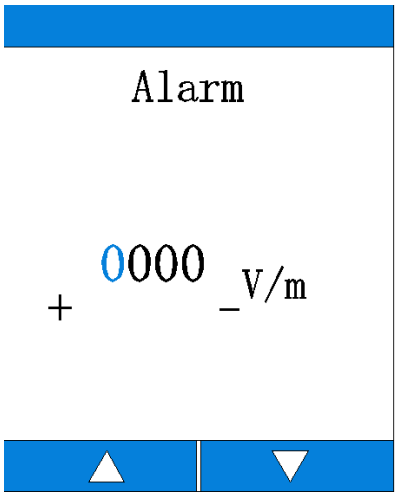
（6） Date/time

After entering the time/date setting mode, press or button to adjust the set value, and press Enter REC button to set the next value.After setting, please press or Enter REC button to exit the time/date setting mode and return to the system setting interface.



（7）Alarm

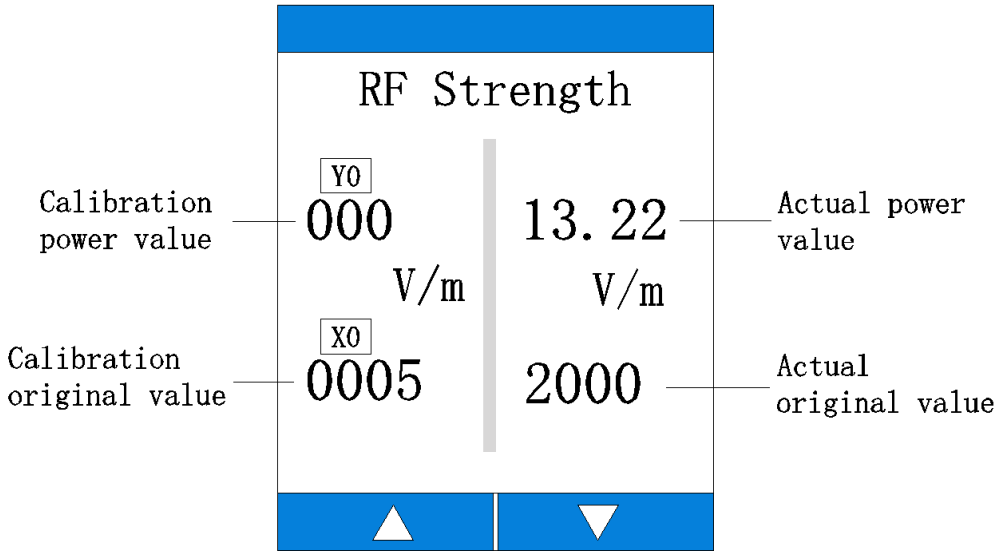
This option is used to set alarm related Settings.If you enter the alarm setting, you can choose to turn it on or off. If you choose to turn it off, you will exit the alarm setting interface and return to the system setting interface.Select the alarm function to enter the alarm setting interface. The setting value can be adjusted by  or  button. The minimum setting value is 1V/m.Press the  button to select digit values.The set alarm value will be compared with the X.Y.Z. triaxial composite value. A continuous beeping alarm will occur if the value is greater than the set value.Press  or  to exit the alarm setting after completing the setting.
Tip: This function needs to be set in V/ M units.



（8）Calibration

This option is used for device calibration related Settings.Please calibrate under V/ M units of measurement.Calibration is divided into linear and frequency response.Linear calibration is the accuracy of the measured data, and frequency response calibration is the difference of the measured data at different frequencies.The equipment needs to be placed in a standard calibration environment before it can be calibrated.

First of all, linear calibration, select linear, press Enter REC button to enter linear calibration, there are three directions X, Y and Z optional, select X direction, press Enter REC button to enter the calibration interface, ready to start calibration.



Description:

Calibration power value: Preset calibration power value.

When calibrating, the standard environmental value should be adjusted to match the calibrated power value.The calibrated power values of y0-y7 are eight points, namely 0,1,2,5,10,20,50,100.Unit of V/m.

Calibration original value: at each calibration point, after calibration, the actual original value shall be equal to the calibration original value.The calibration point X0-X8 corresponds to the power value Y0-y8.

Actual original value: The actual original value will be changed according to the standard environment set power value changes.

Actual power value: After calibration, the actual power value will be equal to the standard environment set power value.

Calibration should start from small to large order y1-Y7.At the initial interface, observe that the first calibration power value Y0 is 0 V/m. Press Button — to adjust the calibration point to Y1, and then Y1 is 1V/m.Set the standard environment at 1V/m, observe the actual original value, wait for the actual original value to be relatively stable, press the Enter REC button, and then the actual original value will be equal to the calibration original value.The actual power value will jump around 1V/m, at which time the calibration is successful.So on, then calibrate the second and third points, until the final point Y7 is completed.When the calibration is finished, press button ⮌ to exit the calibration.

After the completion of the calibration in the X direction, return to the main interface to observe whether the Y and Z direction values are consistent with the X direction at each calibration

point. If there is a large difference, it needs to be calibrated; if there is a small difference, there is no need for calibration.

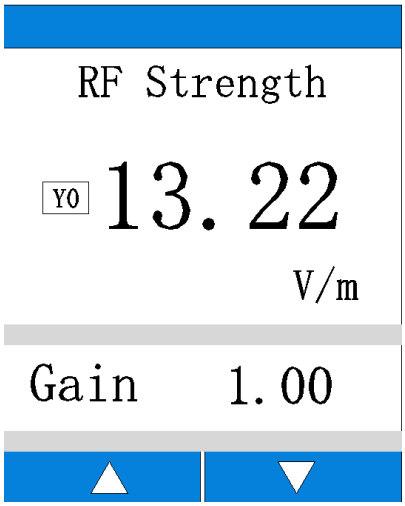
After the linear calibration is completed, the frequency response is then calibrated.The wireless electromagnetic wave of this device measures the broadband power signal, and the measurement range is 50MHZ-8ghz. The same power value and different frequencies will have certain differences.The initial value of Gain, the calibration value, is 1.00.The power value is multiplied by the calibration value to obtain the power value of the corresponding frequency.

Select the frequency response through the  button, press Button 

to enter the frequency response calibration, select the X direction, select the corresponding frequency through the  button, put it into the standard calibration environment of the corresponding frequency, press button 

to enter the frequency response calibration interface, and adjust the calibration value through the  button.Short press adjust value is small, long press adjust value is big.Press  button to exit after calibration.

Note: If the calibration is done incorrectly, please press the  button in the calibration mode to restore factory Settings.



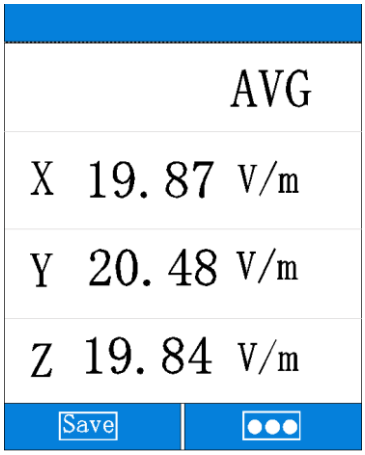
3-4Data saving

（1）AVG mode

Press the "Mode" button in the main interface to enter the data saving interface.

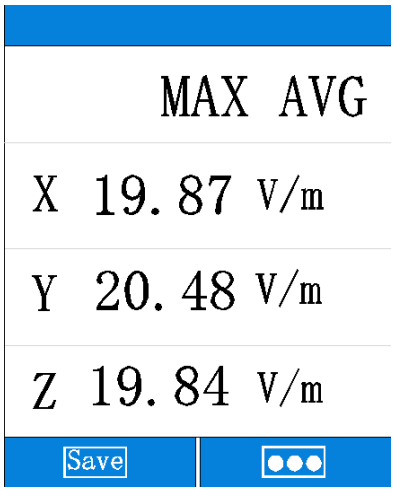
In AVG mode, the device calculates the average data showing the X,Y, and Z axes.

Users can press the Save function button on the left to save the current measurement results.



（2）MAX AVG mode

In AVG mode, users can press the  function button on the right to switch to MAX AVG mode.In MAX AVG mode, the device calculates the maximum average data showing the X,Y, and Z axes.Users can press the  function button on the left to save the current measurement results.The saved data can be viewed in the data record or on the computer via USB when the device is turned off.



Measurement instructions

4-1 All electric field intensity meters should pay attention to the following effects

If a fast-moving electric field sensor displays a large electric field intensity value, the display value does not represent the actual electric field intensity, which is caused by electrostatic discharge.

Suggestion: Stabilize the table when measuring.

4-2 Short time measurement

Maximum mode is used to determine the characteristics and direction of the unknown field when entering an electromagnetic field exposure area.It is very important to take several measurements at different locations around the area you want to measure, if you know nothing about the field.Pay special attention to making some measurements of nearby potential sources of radiation.Components other than radiation sources also emit electromagnetic fields.For example, electrical cables used in current diathermy medical devices may also emit electromagnetic energy, so the maximum electric field intensity at the operating position is found in the area adjacent to the knee.Note that metallic objects in the field area may concentrate or amplify the field from a source of radiation at a distance.

4-3 Long time measurement

Place this meter between your work position and the possible source of radiation, and take measurements at your body's closest point to the source.

You can fix the watch on a board.

4-4 Safety instructions for measurement

In some cases, working near powerful sources of radiation can be life-threatening.

Note that secondary radiation (such as metal wall reflectors) can amplify the electric field.

Note that the intensity of the electric field near the source increases inversely to the third power of the distance, so that large current intensities are immediately felt near small sources (e.g. waveguide leakage, induction furnace).

When the spectral component of the electric field goes beyond this frequency range, it will generally produce incorrect assessment and tends to be underestimated. Therefore, before using the electric field strength tester, it should be determined that all its measured components are within the frequency range specified by the meter.