TRIFIELD®

EMF Meter Model TF2
Instruction Manual

Made in USA

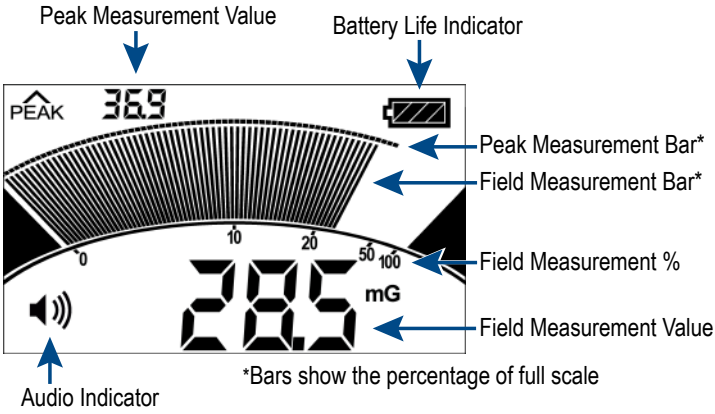
www.trifield.com

Thank you for purchasing the TriField® EMF Meter Model TF2! You now own the best all-in-one EMF meter available.

Features:

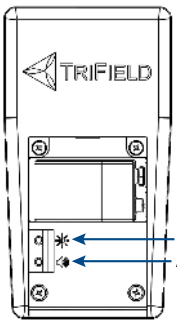
- Detects all three types of EMF pollution: AC magnetic, AC electric, and RF/microwave.
- Special frequency weighted mode emphasizes frequencies above 60Hz to represent the actual current induced into the body.
- AC Magnetic Mode covers 40Hz - 100kHz with a range of 0.1-100 milligauss.
- AC Electric Mode covers 40Hz - 100kHz with a range of 1-1,000 Volts per meter.
- RF Mode covers 20MHz - 6GHz with a range of 0.001-19.999 milliwatts per square meter.
- 3-Axis AC Magnetic Measurements enable quick readings regardless of meter orientation.
- Large liquid crystal display (LCD) displays field data both numerically and visually to help pinpoint sources of EMF.
- Handy backlight for use in low-light environments.
- Peak Hold captures fast pulsing digital RF signals.
- More than 20 hours constant operation with included 9volt battery and low battery indicator.

1. Reading the LCD Display:



The Field Measurement Value (note the large numbers located in the bottom center of the LCD screen) displays the field being measured in real time. These numbers correspond to the Field Measurement Bar that displays this same number visually in percentages, although the bar responds more quickly than the number, especially in RF mode.

The Peak Measurement Value (the numbers in the upper left corner of the LCD screen) displays the value of the highest instant pulse. It holds that number for 3 seconds unless a stronger pulse occurs. These numbers correspond to the Peak Measurement Bar. For reading radio fields (cell phones and cell towers, Wifi routers, Bluetooth devices, and smart meters), the peak numbers and the corresponding bar are more useful, because they both show the rapid pulses from these devices. The PEAK number is always higher than the Field number, especially in RF mode.



You can turn a backlight on or off and enable sound by pressing the small green buttons located in the battery compartment. The TF2 sound is proportional to the field strength for Magnetic, Electric and RF measurements (the sound pitch gets higher as the field strength increases). The meter must be 'on' when doing this (Hold the battery in place if necessary). This setting is remembered after the TF2 is turned off.

2. Measuring Fields



To measure AC Magnetic (MAG) Fields in milligauss (mG), turn the knob to Standard MAG or Weighted* MAG. Common sources of magnetic fields include power lines, motors, wiring in walls, and appliances.

Magnetic readings depend on the location of the TF2 meter itself, not how you point the meter. You may find high magnetic fields in locations such as near circuit breaker boxes, motors or appliances. However, to determine personal exposure, measure in locations where you normally stand, sit, or sleep. A typical low-field area will read less than 3.0 milligauss on Standard MAG and less than 5.0 milligauss on Weighted MAG.



To measure AC Electric (ELEC) Fields in Volts per meter (V/m), turn the knob to Standard ELEC or Weighted* ELEC. Electric fields are directional. Point the top of the TF2 meter toward the object you wish to measure and note the Field Measurement Value located in the bottom center of the LCD display. Common sources of high AC electric fields include power lines, wall outlets (mains), fluorescent lighting, light switches, power cords, and anything plugged into the wall outlet, whether turned on or not. Exposure to electric field is not as concerning as exposure to magnetic field or RF. However, high electric field over 50 V/m on a metal object, such as the door of a refrigerator, indicates a shock hazard because of improper ground (earthing), If both the metal door and ground are touched at the same time, serious injury may occur. High electric fields are always present near wall outlets or electric cords, but being insulated, they are not usually shock hazards. Areas with low electromagnetic fields typically have electric fields averaging less than 50V/m over a 24-hour period.

***NOTE**: The TF2 can display "Weighted" versions of magnetic or electric fields, empasizing frequencies above 60Hz to represent the actual electric current induced into the body. AC magnetic and electric fields will produce an AC current in the body. The Standard MAG and ELEC settings simply read the strength of the fields. The Weighted MAG and ELEC settings read the product of the field strength multiplied by frequency, which is proportional to the electric current induced in the human body from these fields. For pure 60Hz (or 50Hz) fields, the Standard and Weighted readings will be similar numbers.



To measure Radio/Microwave (RF) frequencies in milliwatts per square meter (mW/m²), turn the knob to RF. RF is directional. Point the top of the TF2 meter toward the source to be measured.

2. Measuring Fields (con't):

Common sources of RF are cell phones, cell towers, WiFi routers, Bluetooth devices, microwave ovens, radio and television stations, wireless landline phones or walkie talkies, and power company smart meters. WiFi routers, cell towers and cell phones (when transmitting) emit pulses (or packets) of RF power. These brief pulses can be seen as the PEAK bar jumps up several times per second. The PEAK number will display the RF power of the peak of each pulse (and will hold that number for 3 seconds or until a stronger pulse occurs). The Field number will instead display the overall average of the RF power. Therefore, the PEAK number is usually much higher than the Field number. The TF2 detects all cell phone frequencies up to 6GHz, including low-band and common mid-band 5G. The experimental 5G millimeter wave is not measured. (At present, no consumer meters are available that measure all 5G bands). Power company smart meters only pulse about once per minute when a signal is sent. Watch for the peak number. A low-RF area will typically have less than 1.000 mW/m² as a peak, while the main field measurement numbers should read less than 0.200 mW/m².

For Electric (ELEC) & Radio (RF) field measurements, hold the bottom half of the meter below this point.



Do not block the top of the meter with your hand. Point the meter outward, away from your body. The reading may be higher when holding the meter than if it is set down. This is because the body concentrates the field. Therefore, hold the meter to get a true reading of your full exposure.

3. Recommended Tips for Shielding Magnetic, Electric and RF Fields

Radio waves and microwaves (RF) can be reflected off a metal sheet in exactly the same way that light reflects from a mirror. The metal sheet can be very thin and can even have holes in it, like fine wire mesh. Therefore, aluminum foil, aluminum screen door material, or even Mylar space blankets will reflect radio waves. Aluminum siding also works. If an outdoor cell tower is transmitting microwaves, and you hang a metal sheet on the wall between the cell tower and you, the direct microwave radiation will be reflected back outdoors. Of course there still may be some microwaves getting indoors because of reflection off of structures in back of you. (Think of it this way: if you were outdoors and stood under an umbrella to shield yourself from direct sunlight, some indirect light would still be present.) It is not necessary to ground the sheet.

3. Recommended Tips for Shielding Magnetic, Electric and RF Fields (con't)

Like RF, **AC Electric Fields** can be shielded by any metal sheet or metal mesh. However, unlike RF, shielding should be connected to ground through a wire. One side of the wire should be connected to the center screw of a wall outlet, light switch cover, or to cold water plumbing, and the other side of the wire is connected to the thin metal sheet.

Unlike Electric Field and RF, thin sheets of metal or mesh have no effect on **AC Magnetic Fields.** Much thicker metal sheets are required. Generally, a 1/8" thick sheet (or more) of a conductive metal, like aluminum, or a magnetic metal, like steel, will reduce the magnetic field significantly. The sheet must be large (at least as wide as the distance between the source and the sheet), and placed between you and the magnetic field source. For example, if you sleep two feet away from a window air conditioning unit, you will need at least a two foot square piece of metal to shield the magnetic field. If the source of the magnetic field is a small object such as an AC wall adapter, then only a small amount of metal is needed to shield it, because the adapter is small and the metal sheet can be placed close to the wall adapter to properly block the magnetic field. Unlike AC Electric Fields, there is no need to ground the metal sheet as grounding will have no effect on magnetic fields.

Another aspect of magnetic fields to consider when installing shielding is the direction of the field. Thick aluminum sheet is quite good at shielding magnetic field that is perpendicular to the sheet surface, while steel is better at shielding parallel magnetic field. Therefore, the best overall shielding is achieved by using both sheet steel *and* aluminum sheets stacked together. If only one type of metal is used it should be soft steel, the thicker the better, the type to which magnets are strongly attracted (NOT stainless steel). Experiment with the angle, size and location of the metal sheet, measuring with the Trifield® TF2 meter before and after each adjustment to find the best shielding placement to minimize the field.

Other methods of reducing RF, AC Electric, and AC Magnetic field exposure include: avoiding high-field areas (of course), by distancing yourself from the source, and turning off or unplugging appliances when not in use. Also, you might try using an extension cord to connect an appliance such as a refrigerator to a different outlet. Measure using your TF2 meter to see whether this reduces the field.

4. Safe Levels

Electric and Magnetic measurements are usually performed using the Standard setting. When organizations and researchers mention field levels, these are almost always 'Standard' fields. Standard MAG or ELEC measures the strength of the field regardless of frequency (40Hz-100kHz). Weighted MAG and ELEC settings emphasize the higher frequencies above 60Hz, up to 500Hz.

Absolute safe levels for magnetic, electric and RF exposure have not been established, though many different EMF exposure limit standards have been proposed and published by various institutions (the ICNIRP or IEEE, for example). The variables that determine the basis of these standards include: EMF frequency, length of exposure, and the affected body part(s). For more detail, links to such sources are available at trifield.com/faq/.

The maximum exposure limits proposed by these scientific institutions are much higher than levels you would typically encounter in an average home or office. Some practitioners may recommend different levels for health and safety, but currently there is no concensus on precise safe levels. Generally, when measuring in average home or office spaces, only the areas where people spend time are important. Measurements near a device or outlet (mains) are not important unless your head or chest, etc. are at that location for long periods of time. In the middle of a typical, average home or office, magnetic field is usually less than 3.0 mG, electric field is usually less than 50V/m, and RF is less than 0.200 mW/m² (Field) or 1.000 mW/m² (PEAK).

Therefore, we recommend staying below these levels:

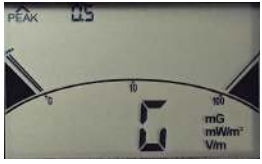
- 3mG Standard Magnetic or 5mG Weighted Magnetic
- 50V/m Standard or Weighted Electric
- 0.200 mW/m² RF (field measurement) or 1.000 mW/m² (peak measurement)

*All above numbers are to be averaged over 24 hours.

5. Troubleshooting

The Trifield® EMF meter model TF2 is usually very dependable, but may experience minor performance issues from time to time. If you have any of these known issues occur with your TF2 meter, we have included some tips for fixing the problem and get your meter up and running ;)

If the display freezes, goes blank, or all or some of the display turns on like the examples shown here this is likely due to a static shock. This does not harm the meter, and is easily fixed by turning the meter off and then back on again.



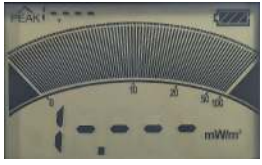
However, if the display *slowly* goes blank, the issue is probably a low or dead 9 volt battery. Replacing the battery will fix the issue (see instructions later in this manual).



A static shock may also turn the backlight and or sound on. Simply remove the battery door on the back of the meter and press the green buttons to turn the backlight and sound off again.



If the display reads 1--.- mG (on MAG), 1---- V/m (on ELEC) or 1-.--- mW/m² (on RF), then measurement for that type of field is over-range, meaning fields are above one hundred milligauss on magnetic or one thousand volts per meter on electric or twently milliwatts per square meter on RF. This does not harm the meter.



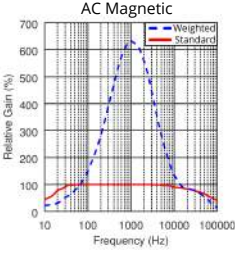
Dark Streaks may appear on the display due to static electricity. These streaks will disappear quickly or you can breathe on the display to 'fog' the surface and remove the static.

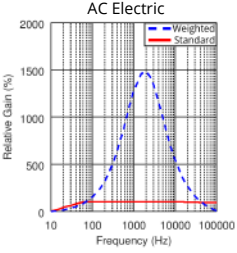


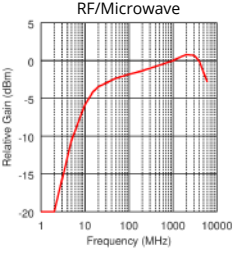
6. Specifications

Function	TriField® EMF Meter	
AC Magnetic		3 - axis
	Frequency Range	40 Hz - 100 kHz
	Accuracy	±4% @ 50/60 Hz
	Maximum Range	100.0 mG
	Resolution	0.1 mG
	Frequency Response	See plot below
AC Electric		1 - axis
	Frequency Range	40 Hz - 100 kHz
	Accuracy	±5% @ 50/60 Hz
	Maximum Range	1000 V/m
	Resolution	1 V/m
	Frequency Response	See plot below
RF/Microwave		1 - axis
	Frequency Range	20 MHz - 6 GHz
	Accuracy	±20% @ 1 GHz
	Maximum Range	19.999 mW/m^2
	Resolution	0.001 mW/m^2
	Frequency Response	See plot below
Battery		9V alkaline battery
	Battery Life Backlight Off	> 20 hrs
	Battery Life Backlight On	> 12 hrs

Frequency Response



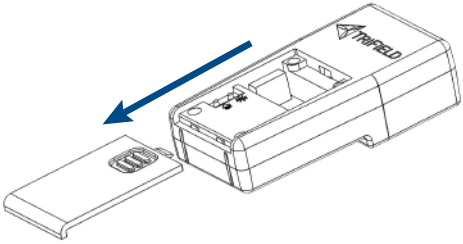




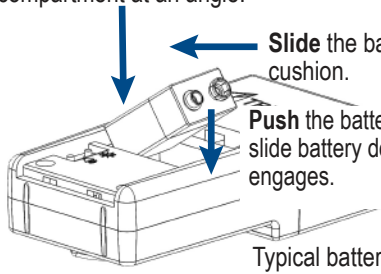
7. Battery Installation

To replace the battery (when the battery icon in the upper right corner of the LCD display drops to zero bars or the display does not turn on):

Press and Slide the rear battery door downward. Note the battery polarity and remove expended battery. (If the battery is installed backwards, this will not harm the meter, but the meter will not work until the battery is correct.



Insert the bottom of the new 9 volt battery into the center of the compartment at an angle.



Slide the battery horizontally into the foam cushion.

Push the battery top down to make contact and slide battery door upward again until the latch engages.

Typical battery life is 20 hours. The battery is not drained when turned off.

8. Warranty

All AlphaLab, Inc. meters come with a one-year limited warranty from the date of purchase under normal use and service. This warranty is valid to the original purchaser only and is non-transferable. The consumer forfeits the benefits of this warranty if the product's main assembly is opened or tampered with by anyone other than an authorized AlphaLab, Inc. technician.
Please visit trifield.com/support or email trifield@trfield.com for more information.

The Trifield Meter® TF2 is Made in the USA by:

ALPHALAB INC.

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Phone: 801-487-9492 Email: mail@trifield.com

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