



RF Guard[®]



CONSUMER RF SAFETY MONITOR

- Frequency range: 30 MHz-60 GHz.
- Power density range Indication: 0.01%-100%.
- Corresponding field range: 0.6-60 V/m.
- RF safety standard level (General Public):
- 100% corresponds to 1 mW/cm² @ 2.45 GHz.
- Battery life: 2,000 hours in benign electromagnetic environment.
- Dim. (in sleeve): 93x48x15mm; 3.7"x1.9"x0.6".
- Weight: 60 g; 2 oz.
- Operating Temperature Range: -5°C to +40°C.
- Warranty 1 year.
- Designed and made in the USA. EMC Test Design, Sarasota, FL 34233, USA.

RF Guard[®]

The RF Guard[®] is a simple, compact field strength monitor designed specifically for consumer use. It allows individuals to detect and evaluate the presence of strong RF sources, providing peace of mind and ensuring RF safety. Please note that while suitable for everyday consumer monitoring, this unit is not recommended for professional use.

How to use RF Guard[®]?

- Push the red button once to activate the unit. The LCD display will show software revision, coin battery voltage, and average power density in %. Your RF Guard[®] is now in Normal Mode and ready for use.
- RF Guard[®] is energy-efficient, allowing it to remain on for many months once activated. However, you can extend the battery life further by shutting it down when not in use.
- The display will indicate 0.00-0.01% when no measurable RF field is present, increasing to 99% at the highest measurable field, and then displaying "HI" to indicate overload. In Normal mode, the unit averages power with a SLOW time constant of about 1 sec, providing RMS values of power density level.
- The color LED will illuminate Green-Yellow-Red as the average RF field value crosses 0.1%, 1%, and 10% thresholds, respectively.
- An audible alarm will sound when the display reading exceeds 1%. If the reading surpasses 10%, the alarm intensity will rise to alert you of high RF fields.
- To locate the source of relatively high RF fields, push the red button again to switch to Explore Mode. In this mode, the display shows peak power density level, measured with a FAST time constant of about 40 usec, capturing pulsed RF signals.
- Explore mode utilizes Sample and Hold (S/H) feature to measure the peak power density of digital communication sources, with S/H times of 10 usec./1 sec. The LED detects RF field spikes typical for cellphone and Wi-Fi operation.
- After 2 minutes in Explore mode, the unit automatically returns to Normal Mode. You can switch back to Normal Mode at any time by pushing the red button.
- For a complete shutdown, press and hold the red button for 3 seconds. The unit will emit a descending sound to indicate it is OFF.
- The battery lifespan in a benign electromagnetic environment is approximately 2000 hours. If two blinking dots appear instead of numbers, the battery needs replacement. A CR2032 coin cell battery can be easily purchased from most stores.

How to carry and hold RF Guard[®]?

- RF Guard[®] features built-in dual antennas that primarily detect RF fields from the unit's back and, to a lesser extent, from the front. When holding the unit with the display facing you, it measures RF fields primarily from sources located in front of you.
- While placing the unit in your front shirt pocket may seem convenient, be aware that the human body absorbs RF radiation, resulting in lower readings.
- When holding the unit, ensure your fingers are positioned at the lower part of the RF Guard[®] body (below the display) to prevent shielding the antennas.
- Additionally, keep the RF Guard[®] away from metal conductive surfaces, as they can create undesirable resonances that may affect the accuracy of the readings.

What does the RF Guard[®] reading mean?

The RF Guard[®] display consistently presents the average RF radiation power, calibrated to reflect a 100% reading corresponding to 1 mW/cm² at 2.45 GHz. But what does this mean?

The RF safety standards established in the last century primarily aimed to safeguard individuals from the thermal heating effects of strong RF fields, such as radars and powerful transmitter



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such as radars and powerful transmitters. The pivotal consideration was the magic number of 1 mW/cm², which roughly equates to human tissue heating of 1°C.

Following this definition, a 100% reading at 2.45 GHz is considered unsafe and should be avoided. However, the question arises: Are lower levels safe? A reading of 10% may suggest heating of 0.1°C, seemingly safe. Unfortunately, modern digitally modulated RF signals exhibit peak powers significantly higher than their average power, potentially interfering with various physiological processes in the human body. In essence, even signals deemed "safe" might pose risks in specific cases, leading to functional health disorders rather than permanent damage. This is particularly relevant for individuals with "RF Hypersensitivity."

Hence, the RF Guard® was created to provide you with a measuring device, empowering you to exercise the Precautionary Principle – "The lower the level of RF radiation, the better." Please refer to the table below for further guidance.

ELECTROMAGNETIC FIELD DENSITY AND HEALTH EFFECTS			
RF Guard Reading	Power Density (uW/cm ²)	RF Field Strength (V/m)	Safety Level Estimate for General Public, based on present studies (2023)
100 %	1000	60	100% level corresponds to official FCC RF safety level, established long ago for thermal heating only. This level is considered unsafe for long term exposure. Multiple studies link long exposure to levels 10%-100% to cancers and other serious health problems.
10 %	100	20	
1 %	10	6	Modern cellphone towers producing levels above 1% may cause serious neurological disorders. Some people with high sensitivity to electromagnetic fields can experience these disorders at lower levels, down to 0.1%.
0.1 %	1	2	
0.01 %	0.1	0.6	Levels below 0.01% are considered safe for most people. But using a precautionary principle, it is desirable that living areas, where people spend more than half of their lives, have even lower levels, especially for children and pregnant women.

Disclaimer:

Every RF Guard® unit undergoes calibration at 2.45 GHz frequency, with a typical frequency response provided across the 30 MHz-60 GHz range. While offering an ultrawide detection frequency range, it's essential to note that the frequency response isn't flat or compliant with FCC/ICNIRP shaped probe curve. This means that readings may vary across frequencies, showcasing higher or lower levels than actuality. This is an inherent limitation of the technology used, typical for consumer products with built-in antennas. If RF Guard® repeatedly indicates high RF levels (10-100%) or displays "HI," it's advisable to vacate the area and consult a licensed RF safety professional for further analysis using professional-grade test instruments. EMC Test Design, LLC cannot be held responsible for any damages resulting from such applications.

How to take care of RF Guard®?

- Keep RF guard clean and dry. Do not expose it to the rain or submerge in water.
- Do not clean it with strong chemicals - use damp cloth with windows washer.
- Dispose the CR2032 battery properly. **Keep it out of hands of small children(!).**
- Do not disassemble the unit - there are no user serviceable parts.
- To replace the coin battery - slide down the battery cover and use small screwdriver to pry the battery.

Features Summary:

- Designed for portable use, allowing users to detect, notify, and warn about the electromagnetic environment.
- Features dual mode operation: Normal and Explore.
- In Normal mode (Slow), the display and 3-color LED indicate the average power density level (as a percentage of the standard safety level), with dual sound alarms activating when levels exceed 1% and 10%.
- In Explore mode (Fast), the display shows peak power density level, while the 3-color LED and variable pitch sound signal pulse signals for RF source location and identification.
- Operation controlled by a single button: Normal - Explore - Normal - (Long Push) OFF. After 2 minutes in Explore mode, the unit automatically returns to Normal mode to conserve battery.
- Features a special hole on the left side for hand strap lanyard attachment, with lanyard included.
- Supplied with a premium quality non-slip sleeve for secure hand grip and protection.
- Sold in a custom carton box with a short User's Manual printed on the insert inside.



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