Vulcan RFID Power Mapper

VULCAN RFID

The Vulcan RFID Power Mapper is a worldwide, battery-free UHF RFID Power Meter for Gen 2 Systems.

Features:

- No battery – powered by RF waves
- Compact size
- -7 dB attenuation switch for antenna testing
- Wide frequency range
- Works with all Gen2 UHF RFID Readers

Functionality:

- Shows null and dead spots in the RF signal
- Detects which antenna is transmitting
- Shows approximate radiated power (EiRP or ERP)
- dB scale for comparison power measurements
- Accurately maps the RFID field 15+ meters range
- Test polarization of antennas - linear, circular, and cross-polarized
- Ideal for beam angle measurements and antenna direction setup
- Pulses to show notify time and other transmit interruptions
- Oscilloscope output to show modulation or for data logging the signal strength
- Detects cable faults and poor connections easily
- Outstanding research and teaching tool
- Permanently mountable in the RF field to monitor or data log the RF power

Specifications:

- Frequency range of 850 MHz to 940 MHz for Europe, USA, and Far East frequencies
- Tested with dipole, linear, circular, patch, and cross-polarized antennas
- Tested for use to EN302 208, 866 MHz EU standard
- Tested for use with 915 MHz US FCC approved RFID readers
- Tested for use at 922.5 MHz China
- Runs on harvested RF power (infinite battery life)
- CE marked and conforms to all known radio standards
- The Vulcan RFID Power Mapper contains no banned substances, RoHs compliant
- The Vulcan RFID Power Mapper does not transmit or radiate any RF signals
- Height 109 mm, Width 70 mm, Depth 41 mm
- The antenna is hand-tuned to 908 MHz center frequency

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Instructions:

Hold the Vulcan RFID Power-Mapper between your finger and thumb, then move the meter slowly around the area you want to test. In general, RFID tags take about 1 uW to power up, so when mapping the RF field, a reading on the Power Mapper of less than 1 indicates that a standard Gen 2 tag may not be readable.

Rotate the Power Mapper 90 degrees to measure power in the horizontal polarization plane. A linear antenna will give a very low reading in this orthogonal plane.

To test circular polarized antennas for dead spots, use the meter horizontally at 3 to 5 meters range, the dead zone can then be measured and avoided.

The Vulcan RFID Power Mapper V5 has a -7 dB attenuator switch for antenna testing and close to antenna measurements. This meter is very sensitive and is capable of showing clearly the constructive and destructive interference patterns caused by ground bounce or metal objects within the RFID field.

With the -7 dB attenuator switched in a 2 W ERP or a 4 W EIRP transmission, it will give full scale at a range of approximately 1 meter (3 feet). For a circular polarized antenna, this may reduce to 0.74 meters, unless the reader has increased power to compensate for the loss in the circular polarized antenna.

An Oscilloscope can be connected across the data out terminals to show the signal modulation; or, a data logging device can be used to record the RF amplitude over time. A capacitor can be added across the output terminals; 47 uF; this will change the meter to peak detect the RF signal level (A screw kit is supplied with the meter for various attachments).

dB value measurements: Set the meter to read about 100% (0 dB) by moving the meter away from the antenna. (Switch in the -7 dB attenuator for high level signals.) Now turn down the reader power by -3 dBm, the meter will show a -3 dB reduction in radiated power.

Alternatively, if the antenna is changed from an 8 dBi antenna to, for example, a 4 dBi antenna, the meter will show a decrease of approximately -4 dB. It is useful to know that a -3 dB reduction in radiated power will give approximately 25 percent reduction in range; this is due to the square law of power with distance effect.

Also, the plastic fixing screws can be extended for better stability when placed horizontally. The front center screw sets the meter zero.

Tip: It is good practice for a Power Mapper to be left at every installation, for antenna and system verification, by onsite staff. We hope you find the results from this meter useful, interesting, and educational.

Safety Regulations state that you should not work within 25cm or 9.5" of a 4 W EiRP transmission for long periods.