Radman / Radman XT
RF Personal Monitors

- 1 MHz to 40 GHz
- Shaped Frequency Response Matched to Your Standard
- Multi-Function Tool – Personal Monitor, Leakage Detector, Simple Measurement Instrument
- Simultaneous E- and H-Field Measurement
- Data Logger Records Continuously (Radman XT)
- Four LED Level Indicators
- Isotropic Response when used Off the Body
- Optical Interface can be used "Real Time"
- Patented Design

Description

All RadMan monitors share the same compact housing, dual electric (E) and magnetic (H) field detection, and wideband shaped frequency response. The "shaped" frequency response means that the monitor has frequency-selective sensitivity that matches your standard – all major standards are supported. The alarm criteria and the output information are incorporated in the "Percent of Standard."

Narda Safety Test Solutions' latest RF personal monitor is the Series ESM-30 RadMan XT. This "Extended Technology" monitor is very similar to the ESM-20 Series monitors that have been available since 1997 with one very important difference: the RadMan XT continuously records the field strength that it measures. Since the monitor has both electric and magnetic (E and H) field sensors, it records six different values for every data point: Maximum, Minimum, and Average values during the averaging period for both the E field and the H field. The time and date of each data point is also stored. This data may be retrieved at any time using the optional ESM-TS Interface Set which includes a fiber optic cable, adapter circuit, and software. The software permits the user to download the data that the monitor has collected, analyze the data, and set the monitor's internal clock. The data logger is always on – it simply stores the newest data in place of the oldest data.

All RadMan monitors are multi-function tools. With the RF absorber cap off, the RadMan functions as a simple instrument with isotropic detection and four level indicator LEDs that provide an approximate indication of field strength. The RadMan can also be used as a simple area monitor. The fiber optic interface and available software can be used to continuously monitor the detected field strength levels from both the electric field and magnetic field sensors.

Applications

RadMan RF monitors are generally usable over their entire rated frequency range with two limitations:

- The RadMan XT ELF Immune Series is specifically designed for use in strong ELF fields, such as where wireless antennas are mounted on towers that carry high voltage 50/60 Hz utility power. RadMan and RadMan XT Series models are not designed for this environment and false alarms may occur.
- Standard RadMan monitors are not recommended for use with radar signals. "Fast" RadMan monitors are available for applications where peak detection of radar signals is desired.

There are three series of RadMan RF monitors. Within each series, the specifications are essentially identical except for the sensor "shaping." Each specific standard or guidance requires some differences in the sensor design

and calibration. The specified frequency range of each model can vary depending on the difficulty in shaping the frequency response of the monitor to match the standard. The three RadMan series are:

RadMan XT:
This is the full-featured RadMan monitor. It operates over the maximum frequency range and contains both E and H field sensors. Monitors are generally shaped to match the higher level of two-tier standards, i.e., the "Controlled," "Occupational," or "RF Worker" limits. The data-logger can log more than 1,600 sets of data that can be used to analyze personnel exposures in order to improve operations. Or it can be used in the same way a Flight Data Recorder is used on board an aircraft – the logged data can be reviewed whenever there is a need to determine an individual's level of exposure.

RadMan XT ELF Immune:
These monitors are very similar to the RadMan XT series except that the inside of the housing has a special conductive coating. This coating blocks the ELF signals, reducing the frequency range of these monitors at the low end.

RadMan PC Interface Set

Allows you to monitor both E and H fields in real time via fiber optic cable when monitor is used off the body. You can download and analyze logged data from RadMan XT monitors.

Interface Set ESM-TS includes:
- Windows® compatible User's Software
- Interface Module that connects directly to the COM port of your PC
- Fiber optic cable to connect module to RadMan

ONE TRANSFER KIT PER LOCATION IS RECOMMENDED

Model Selection Guide

Select the model based on standard/guidance and the product series (RadMan XT, RadMan XT ELF Immune or RadMan). The frequency rating is for the E-field sensor. The H-field sensor is rated 1 MHz to 1 GHz for most models. Exceptions are noted.

STANDARD / GUIDANCE	RADMAN XT	RADMAN XT, ELF Immune	RADMAN
Canada Safety Code 6 99-EHD-237 RF Workers	2251/10 1 MHz to 40 GHz	2251/80 27 MHz to 40 GHz	2250/60[b] 1 MHz to 40 GHz
BGV B11, 2001, Exp. 1 Occupational	2251/01[b] 1 MHz to 40 GHz	2251/71 27 MHz to 40 GHz	2250/51[b] 1 MHz to 40 GHz
ENV 50166-2 Occupational	2251/04 1 MHz to 40 GHz[c]	—	2250/54[b] 1 MHz to 40 GHz[c]
FCC 1997 Occupational / Controlled	2251/02 3 MHz to 40 GHz[d]	2251/72 27 MHz to 40 GHz[d]	2250/52[b] 3 MHz to 40 GHz[d]
ICNIRP 1998 Occupational	2251/06[a] 1 MHz to 40 GHz[c]	2251/76 27 MHz to 40 GHz[c]	2250/56[b] 1 MHz to 40 GHz[c]
ICNIRP 1998 General Public (E-Field Only)	2251/16[b] 1 MHz to 40 GHz[d]	2251/86 27 MHz to 40 GHz[d]	2135/16[b] 1 MHz to 40 GHz[d]
IEEE C95.1-1999/ANSI C95.1-1992 Controlled	2251/05 3 MHz to 40 GHz[d]	—	2250/55[b] 3 MHz to 40 GHz[d]
Japan RCR-38 Controlled	2251/03 3 MHz to 40 GHz[d]	—	2250/53[b] 3 MHz to 40 GHz[d]
ÖNORM S 1120, 1992 Occupational	2251/09 1 MHz to 40 GHz[d]	2251/79 27 MHz to 40 GHz[d]	2250/59[b] 1 MHz to 40 GHz[d]

NOTES: [a] "Fast" model
[b] "Fast" model available. For example, Model 2250/06 is the "Fast" version of the RadMan for the ICNIRP Occupational Standard
[c] The H-field sensor is rated from 27 MHz to 1 GHz
[d] The H-field sensor is rated from 3 MHz to 1 GHz

Detecting Peak Radar Signals

Most RadMan XT, RadMan XT ELF Immune and RadMan monitors use a one-second averaging time for their alarm criteria. “Fast” Radman models (see Model Selection Guide) have a 30-millisecond averaging period for the electric field sensor. These monitors detect the peaks of sharp, narrow radar pulses. The ICNIRP standard, for example, requires peak detection when the ratio of peak to average power is greater than 30 dB.

Specifications

SERIES	RADMAN XT	RADMAN XT, ELF IMMUNE	RADMAN
Frequency Range	See Model Selection Guide		
Frequency Sensitivity (Typical) **H-field** **E-Field**	±3 dB ±3 dB (up to 3 GHz) +4/-3 dB (3 GHz to 10 GHz) +6/-3 dB (10 GHz to 18 GHz) +6/-10 dB (18 GHz to 40 GHz)		
Sensors	E and H Field (Diode)		
Alarm Threshold	50% of Standard[a]		
LED Indicators	12 1/2%, 25%, 50%, and 100% of Standard[b]		
CW Overload	20 dB but not more than 10 kV/m or 26.5 A/m		
Peak Overload	+40 dB for pulse widths < 10 µsec		
Isotropy, typical	+4/-2 dB (27 MHz to 500 MHz)		
Memory **Number of Data Points (six values per data point)[c]** **Logging Intervals** **Logging Time @ rate of 1/min**	1638 1 sec., 2 sec., 5 sec., 10 sec., 1 min., 3 min. 27.3 hrs.		—
ELF Immunity	1,000 V/m	100,000 V/m	1,000 V/m
Battery Type **Life**	2 x AAA Alkaline 200 hrs. with LEDs and Audio Alarm OFF		
Temperature Operating **Non-operating**	-10°C to +55°C -40°C to +70°C		
Weight (including cap and batteries)	130 g. / 4.6 oz.		
Size without cap **with cap as absorber** **with cap as handle**	26 mm x 36.4 mm x 157 mm / 1.0" x 1.4" x 6.2" 37 mm x 41 mm x 163 mm / 1.5" x 1.6" x 6.4" 37 mm x 41 mm x 197 mm / 1.5" x 1.6" x 7.8"		
Color	Black with Yellow Cap		
Accessories Supplied	Earphone, Operating Manual, Soft Case, Batteries		
Optional Accessories	PC Transfer Set[d], Extension Rod for Hand-Held Use (BN 2250/92.02), Hard Case (BN 2250/92.03) and Tripod (BN 2244/90.31)		

Notes: [a] The alarm threshold is set to 50% of Standard ±1 dB at the calibration frequency.

[b] The percent of standard ratings refer to equivalent power density.

[c] Each data point includes the maximum, minimum and average values for both the E-field and the H-field.

[d] The ESM-TS Interface Set (BN 2251/90.50) can be used to output data from the E- and H-field sensors in real time to a PC. The interface set can also be used to download stored data from the RadMan XT and Radman XT ELF Immune.