ER9000

EMI Receiver

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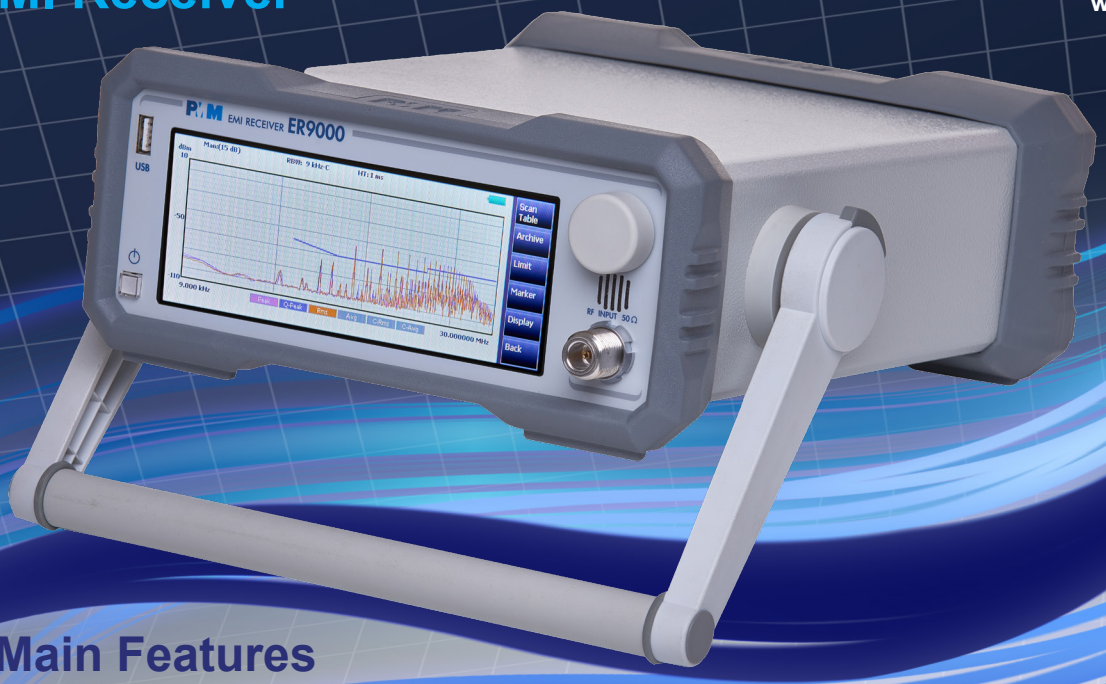

Main Features

- ER9000 Opt.00: 10 Hz to 30 MHz frequency range
- ER9000 Opt.01: 10 Hz to 3 GHz frequency range
- Compliant with CISPR 16-1-1, MIL-STD-461, ANSI C63.2 and FCC
- Compliant with CISPR 14-1 when in conjuction with CA0010
- Conducted and radiated emission tests
- Direct analog to digital conversion up to 30 MHz
- Combination of EMI test receiver and spectrum analyzer
- Operates gapless FFT
- Very fast measuring time
- User port for driving external LISNs and ancillaries
- Internal CW generator and CISPR pulse generator
- 140 dBµV (2 W) maximum input level without damage
- Touchscreen color display
- Free PES PMM Emission Suite Software with Smart Detector function
- Robust, compact construction, battery operated

Top performance and superb accuracy make the full CISPR 16-1-1 compliant EMI receiver PMM ER9000 the ideal instrument for any conducted and radiated measurement from 10 Hz up to 3 GHz. Despite its compact size,the PMM ER9000 features a built-in battery and touch-screen color display, making it even easier and faster to use this portable receiver for debugging and certification tests in any EMC laboratory.

A full compliant span as fast as two seconds in band B and as fast as one minute in bands C+D is the result of a state-of-the-art design featuring FFT architecture to optimize measurement speed.

Other technical improvements include an extremely effective front end with efficient preselector and two-stage preamplifier for lower noise or lower saturation, for outstanding performance, and a user port suited for external devices like LISNs and switching boxes for even faster testing times.

Very easy to operate, the PMM ER9000 features an internal CW generator that can be used for self-calibration routines and for generating RF signals (e.g. for EUT testing), and a CISPR pulse generator perfect for assessing receiver performance in accordance with CISPR standards. Effective communication is ensured by a traditional Ethernet port as well as a fiber optic port. An external DDA Click Analyzer makes the use of this measurement system more attractive and profitable than ever.

The compact size and rugged yet lightweight design make the PMM ER9000 the perfect solution for in-situ testing.

PMM Emission Suite software (included free of charge) is the ideal companion for this high performance receiver, featuring a full set of user-friendly functions and spectrogram for all EMI applications, test measurement and EUT debugging.

The receiver can be ordered with two different frequency ranges: 10 Hz to 30 MHz (PMM ER9000 opt. 00), or 10 Hz to 3 GHz (PMM ER9000 opt. 01). Users can upgrade from version opt. 00 to version opt. 01 at any time.

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ER9000

EMI Receiver

SPECIFICATIONS

Frequency range Range Resolution Reference frequency	10 Hz to 30 MHz (Opt. 00) 10 Hz to 3 GHz (Opt. 01) 0.1 Hz; 10Hz above 30 MHz < 1 ppm				
Spectrum method analysis	FFT, size up to 8192, minimum overlap 89%				
RF Input VSWR 10 dB RF att. 0 dB RF att. Attenuator Preamplifier gain Pulse limiter	Zin 50 Ω, N fem. < 1.2; < 2 above 1 GHz < 1.6; < 2 above 30 MHz 0 dB to 55 dB (5 dB steps) 20 dB; 10 dB above 30 MHz Low saturation preamplifier (after preselector) 20 dB; 10 dB above 30 MHz Low noise preamplifier (before attenuator) Built in (selectable) below 30 MHz				
Max input level (without equipment damage Sinewave AC Voltage pulse spectral density Max. pulse voltage Max. DC voltage	140 dBµV (2 W); 137 dBµV (1 W) above 30 MHz 176 dBµV/MHz below 150 kHz; 130 dBµV/MHz below 30 MHz; 97 dBµV/MHz below 1 GHz 200V (≤ 20 µs) 25V; 50V above 1 kHz				
Preselector Frequency ranges	(Thirteen BP filters – 7.5 / 15 MHz BW to ADC) 10 Hz to 9 kHz 1 kHz to 9 kHz 9 kHz to 150 kHz 150 kHz to 7.5 MHz 7.5 MHz to 15 MHz	150 kHz to 15 MHz 15 MHz to 22.5 MHz 22.5 MHz to 30 MHz 15 MHz to 30 MHz	30 MHz to 96.6 MHz tracking 96.6 MHz to 311 MHz tracking 311 MHz to 1000 MHz tracking 1 GHz to 3 GHz		
IF bandwidth 3 and 6dB CISPR 16-1-1	10 Hz, 20 Hz, 30 Hz, 50 Hz, 100 Hz, 200 Hz, 300 Hz, 500 Hz, 1 kHz, 2 kHz, 3 kHz, 5 kHz, 10 kHz, 20 kHz, 30 kHz, 50 kHz, 100 kHz, 200 kHz, 300 kHz, 500 kHz, 1 MHz, 2 MHz, 3 MHz 200 Hz, 9 kHz, 120kHz, 1 MHz				
Displayed Average Noise Level Preselector OFF, preamplifiers OFF, Ht 1s 9 kHz to 150 kHz (200 Hz RBW) < -17 dBµV 0.15 MHz to 30 MHz (9 kHz RBW) < 0 dBµV 30 MHz to 300 MHz (120 kHz RBW) < 4 dBµV 300 MHz to 3 GHz (120 kHz RBW) < 10 dBµV	Preselector OFF, low noise preamplifiers ON, Ht 1s 9 kHz to 150 kHz (200 Hz RBW) < -32 dBµV 0.15 MHz to 30 MHz (9 kHz RBW) < -19 dBµV 30 MHz to 300 MHz (120 kHz RBW) < -9 dBµV 300 MHz to 3 GHz (120 kHz RBW) < -4 dBµV	Preselector ON, preamplifiers OFF, Ht 1s 9 kHz to 150 kHz (200 Hz RBW) < -14 dBµV 0.15 MHz to 30 MHz (9 kHz RBW) < 3 dBµV 30 MHz to 300 MHz (120 kHz RBW) < 1 dBµV 300 MHz to 3 GHz (120 kHz RBW) < 6 dBµV	Preselector ON,low sat. preamplifiers ON, Ht 1s 9 kHz to 150 kHz (200 Hz RBW) < -27 dBµV 0.15 MHz to 30 MHz (9 kHz RBW) < -14 dBµV 30 MHz to 300 MHz (120 kHz RBW) < -5 dBµV 300 MHz to 3 GHz (120 kHz RBW) < 0 dBµV	
Detectors	Peak, Quasi-Peak, Average, RMS, RMS-Average, C-Average. Smart Detector function above 30 MHz				
Scan time SWEEP MODE (CISPR: preselector ON, QP detector) ANALYZER MODE (preselector OFF, Peak detector, Hold time lowest)	A band (9 kHz to 150 kHz) 200 Hz RBW < 2 s (Hold time 1 s) < 3 s (Hold time 2 s) < 50 ms (Hold time 27 ms)	B band (150 kHz to 30 MHz) 9 kHz RBW < 3 s (Hold time 1 s) < 5 s (Hold time 2 s) < 10 ms (Hold time 525 µs)	C band (30 MHz to 300 MHz) 120 kHz RBW < 20 s (Hold time 1 s) < 40 s (Hold time 2 s) < 100 ms (Hold time 32 µs)	D band (300 MHz to 1 GHz) 120 kHz RBW < 40 s (Hold time 1 s) < 80 s (Hold time 2 s) < 500 ms (Hold time 32 µs)	E band (1 GHz to 3 GHz) 1 MHz RBW < 160 s (Hold time 1 s) < 320 s (Hold time 2 s) < 400 ms (Hold time 4 µs)
Level measuring time (Hold time)	CISPR 16-1-1 as default. 2 us to 120 s				
Measurement accuracy S/N > 20 dB	10 Hz to 9 kHz ± 1.0 dB (typ.) 9 kHz to 30 MHz ± 0.8 dB 30 MHz to 1 GHz ± 1.0 dB 1 to 3 GHz ± 1.5 dB				
Stand alone main measure function Or with free system SW PMM Emission Suite	Manual, spectrum analyser and sweep modes, Waterfall Standard and user definable limits Conversion and correction factors Control of DDA (Click) analyser, LISNs and other accessories. Auto diagnosis, Auto calibration, Test reporting				
Units (80 to 200 dB selectable dynamic)	dBm, dBµV, dBµA, dBpW, BµV/m, dBµA/m, dBpT				
Demodulation	AM – FM Internal loudspeaker				
RF output Tracking (manual mode) & CW generator Frequency range Level range Level accuracy CISPR pulse generator PFR PRF uncertainty	Zout 50 Ω, BNC fem. 10 Hz to 30 MHz 60 to 90 dBµV (0.1 dB step) 0.5 dB 1 to 1000 Hz < 0.1%				
Autocalibration	Internal reference source				
Display	Color 6.2" TFT LCD touch panel				
I/O Interface	RS-232 DB9, USB 2.0 type B, User port DB15 (Drives PMM LISNs and accessories), USB type A for memory stick, Serial Optical interface RP02, Ethernet 10/100 BaseT RJ45				
Operating temperature	-5° to 45°C				
Power supply	10 - 15 Vdc, 2.5A with AC universal adapter/charger; Li-Ion rechargeable & replaceable battery				
Dimensions	235 x 105 x 300 mm				
Weight	5.0 kg				

Ordering information:

ER9000 Option 00 (10 Hz to 30 MHz)
ER9000 Option 01 (10 Hz to 3 GHz)
Includes: RS232 cable, USB-RS232 serial converter, USB cable, BNC-BNC cable, N-m to BNC-f adapter, 10 m plastic fiber optic for PC, USB-fiber optic adapter, AC/DC power adapter, PES PMM Emission Suite Software, soft carrying case, user's manual, standard calibration certificate

Optional accessories:

9010/RAV RMS-Avg detector
9010-RMA rack mount adapter for 19" rack
9010/CC Rigid Carrying Case.
Upgrades:
ER9000/00/UP/01 from ER9000 Opt. 00 to ER9000 Opt. 01 (10 Hz to 3 GHz)

Related products

Receivers

- 7010/01: EMI Receiver 9 kHz to 1 GHz
- 7010/02: EMI Receiver 9 kHz to 30 MHz
- 7010/03: EMI Receiver 9 kHz to 3 GHz
- 9010F: EMI Receiver 10 Hz to 30 MHz
- 9010/03P: EMI Receiver 10 Hz to 300 MHz
- 9010/30P: EMI Receiver 10 Hz to 3 GHz
- 9010/60P: EMI Receiver 10 Hz to 6 GHz
- 9030: EMI Receiver 30 MHz to 3 GHz
- 9060: EMI Receiver 30 MHz to 6 GHz
- 9180: EMI Receiver 6 GHz to 18 GHz
- ER8000/00: EMI Receiver 9 kHz to 30 MHz
- ER8000/01: EMI Receiver 9 kHz to 3 GHz
- FR4003: Field Receiver 9 kHz to 30 MHz
- CA0010: Click Analyzer 150 kHz to 30 MHz

Antennas

- BC-01: Biconical Antenna 30 to 200 MHz
- BL-01: Biconical Log Periodic Antenna 30 MHz to 6 GHz
- DR-01: Double-ridged Horn Antenna 6 to 18 GHz
- LP-02: Log Periodic Antenna 200 MHz to 3 GHz
- LP-03: Log Periodic Antenna 800 MHz to 6 GHz
- LP-04: Log Periodic Antenna 200 MHz to 6 GHz
- VDH-01: Van der Hoofden Test Head 20 kHz to 10 MHz
- TR-01 / TR-01 A: Antenna Tripod
- Antenna Set AS-02 / AS-03 / AS-04 / AS-05 / AS-06 / AS-07 / AS-08
- RA-01: Rod Antenna 9 kHz to 30 MHz
- RA-01-HV: Rod Antenna 150 kHz to 30 MHz
- RA-01-MIL: Rod Antenna 9 kHz to 30 MHz

LISN/Probes

- L2-16B: single phase AMN, 16 A
- L3-32: 4 lines, 3-phase AMN, 32 A
- L3-64: 4 lines, 3-phase AMN, 63 A
- L3-64/690V: 4 lines, 3-phase AMN, 63 A
- L3-100: 4 lines, 3-phase AMN, 100 A
- L1-150M: single-path, 50 Ohm AMN, 150 A
- L1-150M1: single-path, 50 Ohm AMN, 150 A
- L1-500/690V: single phase AMN, 500 A
- L3-500/690V: 4 lines, 3-phase AMN, 500 A
- SBRF4: RF Switching Box
- SHC-1/1000: Voltage probe, 1000 Vac, 35 dB
- SHC-2/1000: Voltage probe, 1000 Vac, 30 dB

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