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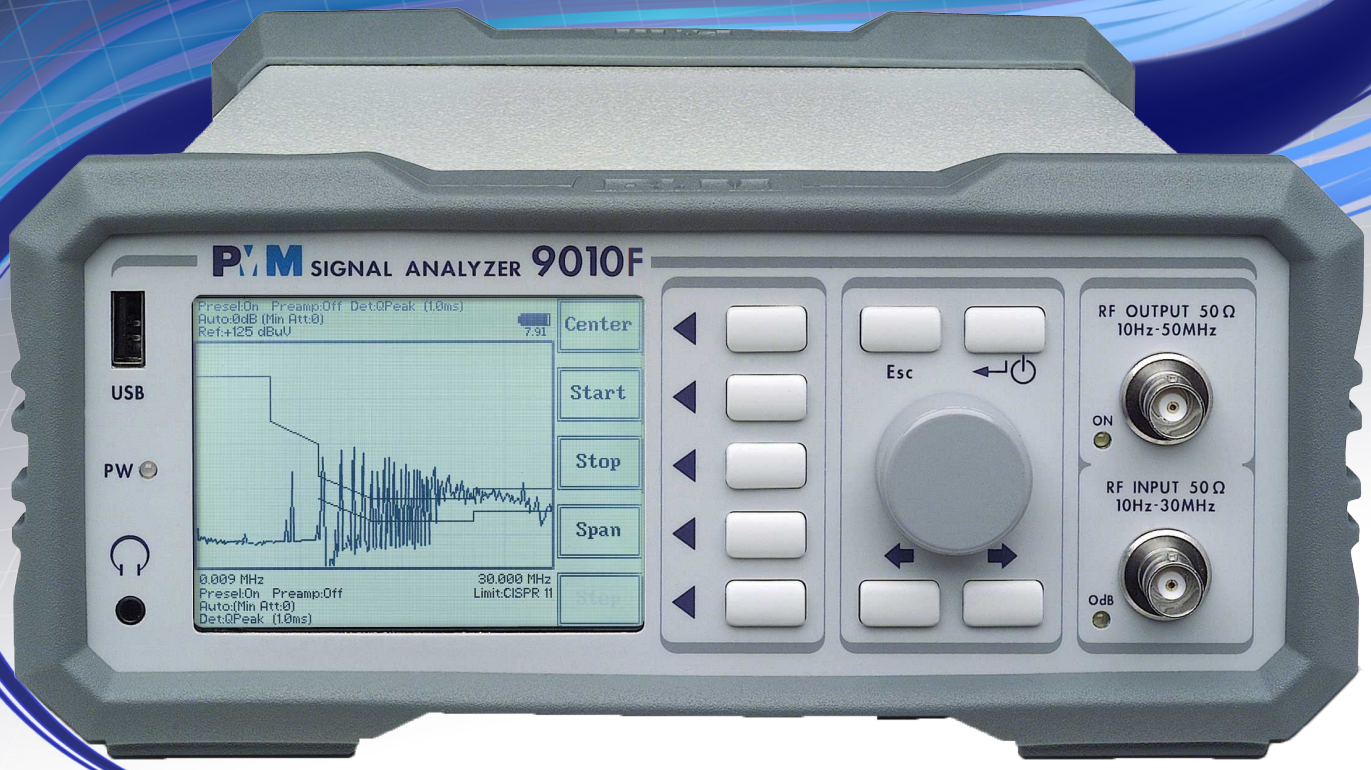
Safety Test Solutions®
an L3 Communications Company



9010F
FTT Time Domain Digital EMI Receiver & Real Time Analyzer

- FFT-based, gapless EMI receiver & Analyzer, 10 Hz – 30 MHz
- Full compliance to CISPR 16-1-1
- Reduces test time from hours to seconds
- Real-time spectrum analysis
- Rugged, light weight, small size, internal battery for best portability
- User-friendly in stand-alone and with the powerful PMM Emission Suite
- Expandable to higher frequencies

Applications
Measurement of conducted and radiated emissions of EUT in full compliance to CISPR, IEC-EN standards.
Analyzing the emissions in short time is particularly suitable for EUT with short operation cycles, e.g. electric tools, food machinery and in general all appliances with electric motors subjected to over-heating if run for too long time.
Fast and reliable tests provide the designer of an immediate feedback in the try-and-test process, an effective contribution to reduce the product time-to-market.

Description
The new EMI Receiver 9010F is based on very advanced analog to digital conversion and data processing technology that applies the FFT frequency spectrum analysis in full compliance with all the tests required by the standard CISPR 16-1-1.
Same modular construction, compact size and low power consumption of the other renowned models in PMM's Digital Receivers family: 9010, 9010/03P, 9010/30P.

Measurement speed
CISPR detectors as the Q-Peak, C-RMS and C-AVG detectors are characterized by a long settling time: measurements must be performed with a long observation time (hold time) of 1 - 2 seconds for each frequency step; setting hold times lower than 1s can reduce the test time but at the cost of possible severe errors and under-estimation of the levels.
9010F overcomes this limitation by scanning the entire spectrum in less than 25 seconds with hold time of 1 second and for all detectors, instead of nearly 5 hours (*).
Such methods for reducing the test time e.g. pre-testing, Smart Detectors and Frequency Tables are no more needed.

Noise and sensitivity
The 9010F's very advanced design provides outstanding performances not only in terms of measurement speed, but also in terms of noise floor level.
In a typical conducted emissions test configuration:
Hold time: 1 s
Detector: QP
Preselector: ON - Preamplifier OFF
the noise floor is less than -7 dBµV in the band A (9 – 150 kHz) and 5 dBµV in the band B (0,15 – 30 MHz), corresponding to less than -137 and -141 dBm/Hz respectively.
When a higher sensitivity is required, the internal preamplifier reduces the noise floor to less than -24 dBµV in band A, and -7 dBµV in band B, corresponding to less than -154 dBm/Hz in both cases.

Analyzer mode
The Analyzer mode is particularly useful in EUT development, and is even faster: it features real-time spectrum analysis over a full span of 30 MHz (RBW 300 kHz) or 1,84 MHz (RBW 9 kHz CISPR).

PMM Emission Suite (PES)
Easy, user-friendly, always updated PC software supplied with the 9010F for real-time measurements, save, recall and edit settings, factors, limits, scans etc. Specific functions automatize the measurements. Reporting and data import-export included.

Ancillaries
9010F together with the PES drives all the PMM ancillaries like LISN and RF switches.

Implementations and upgrading
Like all the models of the family, the 9010F can be expanded in frequency - up to 18 GHz - and added of the options very easily and safely by the user itself. Details provided in the last page.

Service
Designed having in mind the EMC real world, PMM receivers are very difficult to damage. Should the case, immediate and effective support is provided by the International Sales Network.

Calibration
Almost all of the receiver is calibration-free, lifetime. The internal reference provides for auto-calibrating RF front-end - attenuators, preselector, preamplifier - and A/D conversion. Accredited calibration certificate available (option).

(*) Considering a frequency step of 1/4 RBW

SPECIFICATIONS

Frequency range Resolution Frequency accuracy	30 MHz to 300 MHz 0.1 Hz < 1 ppm			
RF input VSWR 10 dB RF att. 0 dB RF att. Attenuator Preamplifier Gain Pulse limiter	Zin 50 Ω, N fem. < 1.2 < 1.6 0 dB to 35 dB (5dB steps) 20 dB (after preselector) Built in (selectable)			
Max input level (without equipment damage) Sinewave AC voltage Pulse spectral density	 137 dBµV (1 W) 97 dBµV/MHz			
Preselector	One LP and six BP filters			
IF bandwidth	6 dB bandwidth CISPR 16-1-1	1, 3, 10, 30, 100, 300 kHz 200 Hz, 9 kHz		
Noise level @ hold time 1s			Quasi-peak (dBµV)	Average (dBµV)
Preselector OFF, Preamplifier OFF	9 kHz to 150 kHz (200 Hz RBW) 0.15 30 MHz (9kHz RBW)		< -13 < 5	< -16 < 0
Preselector OFF, Preamplifier ON	9 kHz to 150 kHz (200 Hz RBW) 0.15 30 MHz (9kHz RBW)		< -27 < -9	< -30 < -14
Preselector ON, Preamplifier OFF	9 kHz to 150 kHz (200 Hz RBW) 0.15 30 MHz (9kHz RBW)		< -7 < 5	< -10 < 0
Preselector ON, Preamplifier ON	9 kHz to 150 kHz (200 Hz RBW) 0.15 30 MHz (9kHz RBW)		< -24 < -7	< -27 < -12
Spurious response	Peak, Hold time 100 ms		< -7 dBµV, < 3 dBµV, above 150 kHz	
Detectors	Peak, Quasi-Peak, Avarage, RMS, RMS-Avarage, C-Avarage, APD			
Scan time SWEEP MODE FUll CISPR: preselector ON, QP detector	A band (9 - 150 kHz) B band (150 kHz - 30 MHz)	< 5 s < 20 s	Hold time 1 s, 200 Hz RBW Hold time 1 s, 9 kHz RBW	
ANALYZER MODE preselector OFF, Peak detector	A band (9 - 150 kHz) B band (150 kHz - 30 MHz)	< 0.5 s 1 s 1 s < 0.1 s	Hold time 2.2 s, 200 Hz RBW Hold time 1 s, 200 Hz RBW Hold time 50 ms, 9, 10 kHz RBW Hold time AUTO, 30 kHz RBW	
Level measuring time (Hold time)	CISPR 16-1-1 as default 0.1 ms to 120 s			
Stand alone & measure functions	Marker, marker peak, marker to center, highest peaks, move peak to Analyzer & Manual modes.			
	Store load: - up to 11 traces (sweep mode) - two panels - 4 conversion factors		Built-in limits: CISPR 11, 14, 22. Battery charge and voltage. Display style, contrast, backlight. Click functions (optional) (1)	
Display units Stand Alone With PMM Emission Suite software	 dBm, dBµV dBm, dBµV, dBµA, dBpW, dBµV/m, dBµA/m, dBpT		 (80 to 120 dB display dynamic) (80 to 120 dB display dynamic)	
Measurement accuracy S/N > 20dB	10 Hz to 9 kHz 9 kHz to 30 MHz	± 1.0 dB Typ ± 0.8 dB		
RF output Frequency range Level range Level accuracy (10 Hz to 30 MHz)	Tracking (manual mode) & CW generator, Zout 50 Ω,BNC fem. 10 Hz to 50 MHz 60 to 90 dBµV (0.1 dB step) 0.5 dB			
Autocalibration	Internal refernce source			
I/O interface	RS-232 High speed Optical (2 channels) USB rear (front for future extension)		User port (Drives PMM LISNs and accessories) Bluetooth (optional) IEEE-488 (optional)	
Operating temperature	-5° to 45°C			
Power Supply	10 - 15 Volt DC, 2,5A; Li-Ion rechargeable & interchangeable battery (8h avg. duration) AC universal adaper / charger			
Dimensions	235 x 105 x 335 mm			
Weight	4.3 kg			

Ordering Information

9010F	EMI receiver 10 Hz - 30 MHz CISPR 16 - 1 - 1 full-compliance	
	Including:	
	- Internal generator 10 HZ - 30 MHz	- RS232/USB adapter
	- AC adapter (mod. 9010/AC)	- N-BNC adapter
	- PC software PMM Emission Suite	- Contro, cable (USB, RS-232), BNC-BNC cable
	- Standard Calibration Certificate	

Optional Accessories and functions

9010/MIL	MIL-STD-461F RBW Filters
9010/RAV	CISPR RMS-AVG detector
9010/CLICK	1-channel Click Analyzer function, CISPR 14-1: 2005 full-compliance, including: - Switching Operation Box, control cables - 2x20 dB attenuator
9010/BTA	RS-232 to BlueTooth adapter for 9010F
BP01	Spare Li-Ion Battery Pack for 9010F, 9030, 9060, 9180
9010/AC	AC adapter/charger for BP01, 9010F, 9030, 9060, 9180
9010/CC	Rigid carrying case for 9010F
9010/UKAS UKAS	CISPR-16-1-1 accredited calibration certificate for 9010F
9010/UKAS-Click	UKAS accredited calibration certificate for 9010F + 9010/Click according to CISPR-16-1-1 & CISPR-14-1

Frequency upgrades

9030	Extension unit 30 MHz - 3 GHz, full compliant to CISPR 16-1-1 (UKAS accredited calibration on option)
9060	Extension unit 30 MHz - 6 GHz, full compliant to CISPR 16-1-1 (UKAS accredited calibration on option)
9180	Extension unit 6 - 18 GHz, full compliant to CISPR 16-1-1 (UKAS accredited calibration on option)

Ancillary equipments

LISN controlled by the 9010F receiver to automatically the lines to measure	• L1-150M: Single line LISN, 150A	• L3-64: Four lines, 3-phase + neutral, 64A LISN
	• L1-500/690V: Single line LISN, 500A/690V LISN	• L3-64/690V: Four lines, 3-phase + neutral, 64A/690V LISN
	• L2-16B: Two lines, Single phase, 16A LISN	• L3-100: Four lines, 3-phase + neutral, 100A LISN
	• L3-32: Two lines, Single phase, 32A LISN	• L3-500/690V: Four lines, 3-phase+neutral, 500A/690V LISN
CISPR 16-1-2	• SHC-1: 35 dB CISPR Voltage probe, 1500 Ω	• SHC-2: 30 dB CISPR Voltage probe, 1500 Ω
Antennas	• RA-01: Rod Antenna 10 kHz – 30 MHz	• LP-02: Log Periodic Antenna 200 MHz-2700 MHz
	• BC-01: Biconical Antenna 30-200 MHz	• LP-03: Log Periodic Antenna 800 MHz-6000 MHz
	• DR-01: Double-ridged Antenna 6 - 18 GHz	• TR-01:Wooden tripod for PMM Antennas
EN55015 (CISPR 15) components	• F-330M-16: CDN 150 kHz - 30 MHz; 250VAC - 16A; 50/60 Hz for power circuitry testing with phase, neutral and PE	• RF-300: 3-axis Loop Antenna System For CISPR 15 EN55015
	• TRF-1: Balance/unbalnce transformer	• RF-300C: Calibration kit for RF-300
	• VDH-01: Van der Hoofden test-haed for IEC 62493 (human exposure to emf generated by lighting equipment	• DL-xx: Dummy lamps according to the standard

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