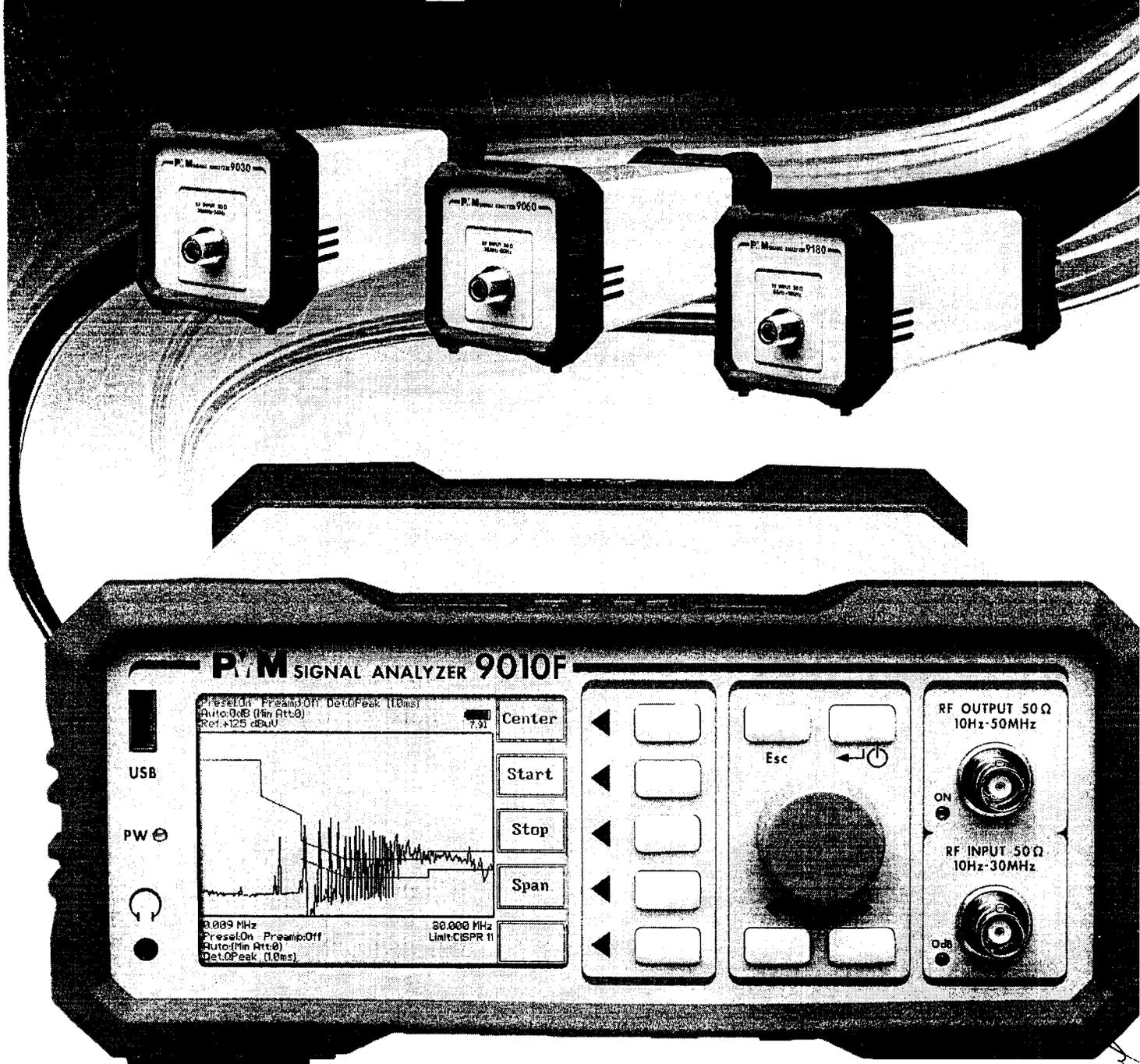# narda
Safety Test Solutions

an L3 Communications Company

Информацията в този документ е заличена на основание чл. 37 от ЗОП

Real time EMI receiver & Analyzer 10 Hz - 18 GHz

Operating Principle

is a real-time, gapless, direct conversion EMI measuring receiver based on FFT (Fast Fourier Transform), a calculation lied to a set of samples acquired in time domain, that outputs in a single shot the frequency contents of the input set frequency band.

means that the FFT calculation is as fast as the incoming data are sampled, so that no data are missed in the analyze

ans that the consecutive time windows are sampled without time gaps between each other.

In addition, the receiver computes the RBW filters and detectors in full compliance with CISPR and MIL-STD requirements. Th purpose is reducing the measurement time in reference to conventional receivers, in full compliance with CISPR and MIL- ST standards.

FFT Applied To Emi

To measure the EMI (electromagnetic interferences) with the required repeatability and uncertainty, receivers must comply t the relevant standards: CISPR 16-1-1, MIL-STD 461. The statement of full compliance implies that all the tests as prescribe by the standards have been passed, whatever technology the receiver is based on. Frequency preselection by a set of filters a the receiver input is not an option but it's essential to provide the receiver of the dynamic range required for passing all the tests including the single pulse, thus accurate, repeatable measuements of disturbances are ensured in all circumstances. Withou preselection filters, artifact signals may appear as if generated by the EUT, providing incorrect test results.

The 9010F and the frequency extension modules are all equipped of automatic frequency preselectors.

Observation Time (Hold Time), Frequency Step And Test Time

The Hold Time is the minimum time the receiver must "watch" at each frequency step: its amount varies according to the standards and to the nature of disturbances, from the minimum required by the RBW filters' settling time up to tens of seconds Such detectors based on time integration (Quasi-peak, C-Average etc.) require the minimum hold time not to be set below a certain value, typically of one second, otherwise measurements are consistently incorrect if not meaningless.

The frequency step is the amount the receiver increases the tuning frequency: it must be lower than the RBW filter.

The test time is the total time required for scanning the frequency band. In conventional receivers the test time corresponds approximately to the number of frequency steps the band is divided in, multiplied by the Hold Time and multiplied by the number of detectors used, when not processed in parallel.

In conducted emission tests the test time shall be multiplied for the number of LISN's AC lines, e.g. 2x for single-phase and 4x for three-phase EUT.
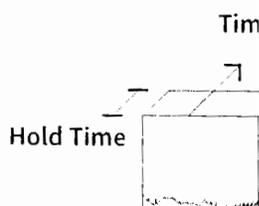
FFT Frequency Band And Measurement Time

FFT processes several frequencies at once in a single block, whose the duration in time corresponds to the set hold time theoretically, the wider the frequency block the shorter the measurement time. However, the required full compliance to CISPR and MIL-STD and cost per benefit considerations make the frequency band calculated by FFT not arbitrarily wide. Thanks to an optimal design based on state-of-art digital hardware, parallel processing of all detectors and high-speed digital communication with the frequency extension modules, the 9010F dramatically reduces the test time in all applications.

Direct Conversion And FFT

The 9010F is a true digital receiver: the signals are directly sampled and digitized after the RF front-end by an A/D converter o very high dynamic range, matching the severe criteria for full compliance. Within these requirements, current technology allows for direct conversion of bands up to tens of megahertz; the 9010F features the direct conversion up to 30 MHz, covering the A - B CISPR and MIL-STD 461 bands typical of conducted emission tests. Among the many advantages of this technique respec to conventional receivers, it is worth to mention the higher level of protection against overloading and possible damages. FFT is applied directly to the time-domain digitized signals.

FFT At Higher Frequencies

Extending the application to frequencies in the range of gigahertz needs changing the design in the direction of the heterodyne frequency conversion principle: after the RF front-end, signals are down-converted in the frequency range suitable for the direc analog to digital conversion as described above. Then FFT processes the whole band - e.g. 30 MHz to 3 GHz - in "blocks" where al the frequencies are calculated at once, each block corresponding to the set hold time. The blocks are the ether to ob the whole band spectrum in much shorter time respect to a conventional scanning receiver or sweepir ing the 9010F gapless, no signal parts are lost during the processing of each block.

Tim

Hold Time

Frequency

narda
## Safety Test Solutions®
an L3 Communications Company

PFS: PMM Emission Suite PC Software

Emission Suite comes with 9010F EMI receiver to expand its applications:

- control of all auto and manual Receiver func-
  s
- l-time display on PC
- -click operating mode change : Scan/Sweep, An-
  er, Manual
- Import and creation of Limits
- Import and creation of Correction Factors Tables for ancillary equipment (antennas, cables etc.)
- Retrieve, save, recall and compare measurements
- Simultaneous Marker on all Detectors and Zoom

- "n" Highest Peaks Finder and Scan Table generation
- Measured LISN lines scrolling by mouse wheel
- Functions specific to Lighting Equipment (IEC/EN55015, IEC62493)
- 2D - 3D Waterfall and time analysis (option)
- GTEM correlation to OATS (for radiated measurements)
- Warning messages for incorrect settings
- Report generation
- Import-export of complete measurements
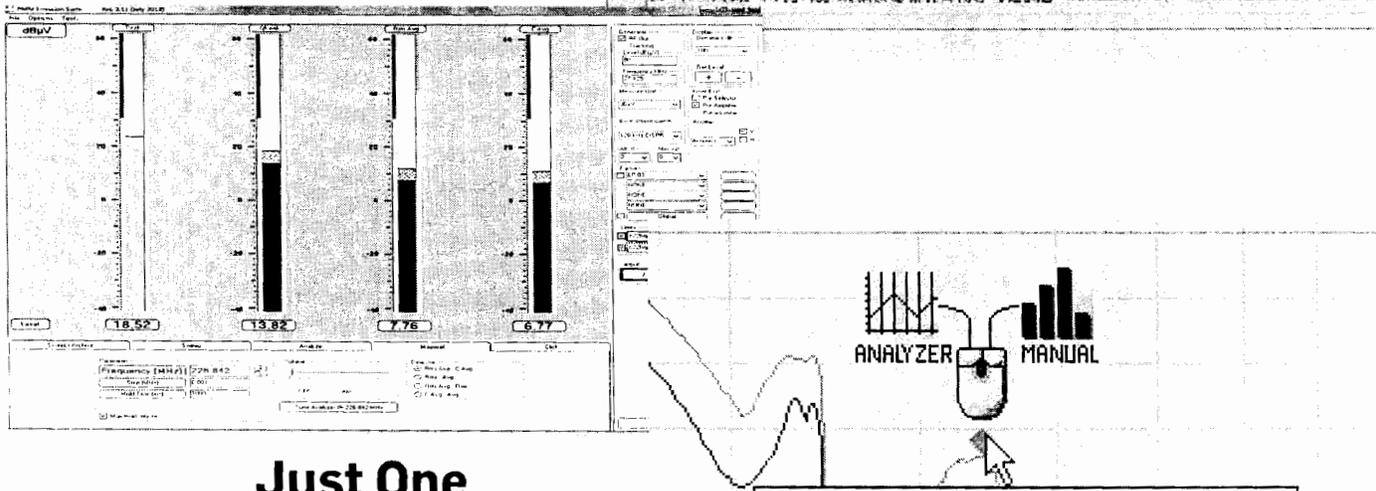- *Antenna mast - turntable control (option)*

Sweep/Scan Mode
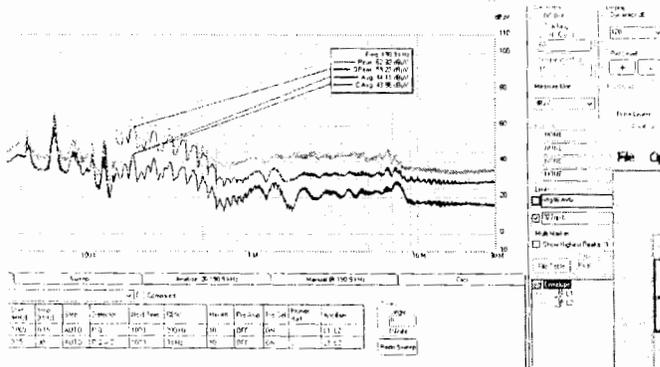
Spectrum Analyzer Mode

Manual Mode
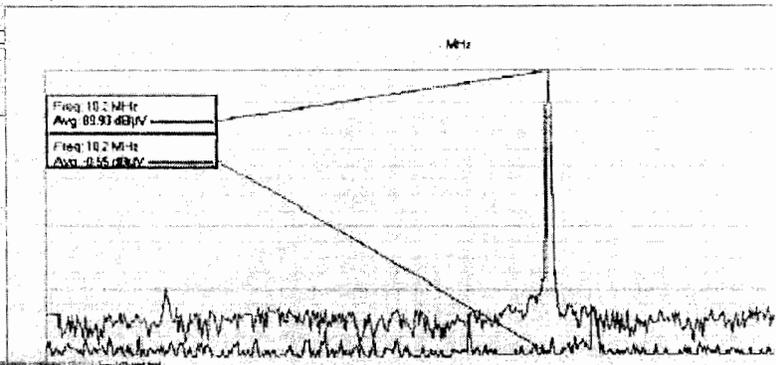
Freq: 0.34223 MHz, (6°) Peak: 43.02 dBµV

Just One
Click To
Across Fu