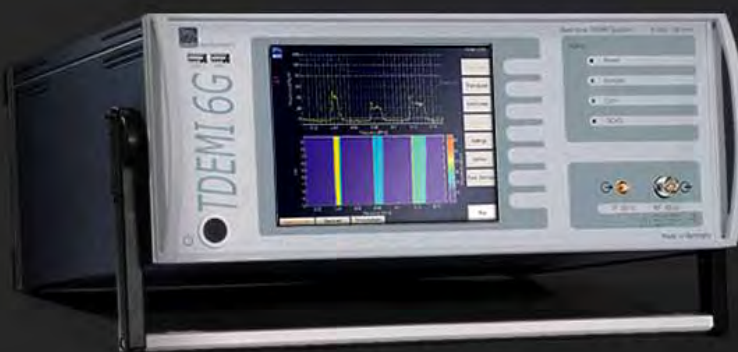


TDEMI 6G

- 4000x faster than conventional EMI receiver
- Measurement according to EN55022
- Analysis of Wi-Fi, Bluetooth



The TDEMI 6G covers the complete frequency range from 9 kHz to 6 GHz and is especially designed for the measurement of multimedia equipment, IT equipment, consumer electronics and devices for telecom applications. By the spread use of electronic systems and wireless communication systems the spectrum up to 6 GHz is more and more dense occupied by various services. Thus it is getting more and more important to reduce the overall testing time during EMC measurements for product certification as well as product development. As EMC tests are critical during the early design phase of a product fast and reliable testing is mandatory to save money and to make later product changes obsolete. By the weighted spectrogram mode, which is real-time displaying the emission over time, an excellent tool is provided for detection of potential EMI sources and investigations of EMI reduction methods. The weighted spectrogram mode is available in all TDEMI Measurement Systems and allows to measure and record frequency bands up to 162.5 MHz in a fully gapless manner. For evaluation peak, average and rms detectors are available. This tool provides a novel method to investigate instationary and intermitting signals.

The pioneering technology of the TDEMI and the achieved reduction of test times up to a factor of 4000 makes the receiver mode of the TDEMI most suitable for extremely fast measurements with excellent accuracy. The test results can be used for preinvestigations as well as for full compliance

measurements. With the optional report generator test protocols can be generated automatically. The measurement results can be evaluated according to the appropriate standard, e.g. CISPR 16-2-1 and CISPR 16-2-2.

The noise floor above 1.15 GHz is typically below 3 dB μ V (1 MHz IF bandwidth, average detector) which is lower than the noise floor of a state-of-the-art superheterodyne EMI receiver. By an optional low-noise amplifier the noise floor can be further reduced. The TDEMI uses an auto attenuator in order to set up the optimum attenuation. Further an overload indication comes with the TDEMI instrument.

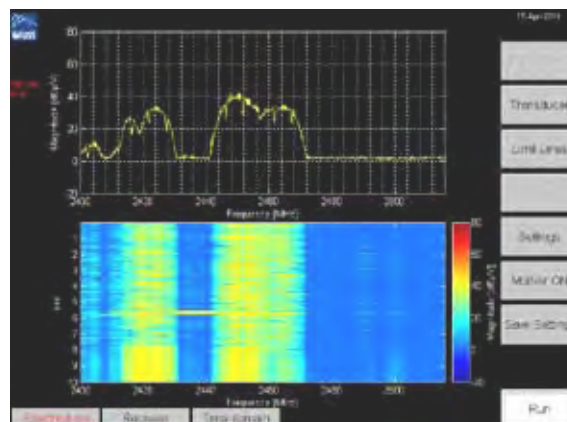


Fig. 27 – Measurement of Wi-Fi activity around 2.4 GHz. Lower part shows the changes of the emissions over the last 10 s recorded by the TDEMI.

TDEMI 6G Specifications

FREQUENCY RANGE

9 kHz - 6 GHz

REFERENCE (OCXO)

| | | |
|---|------------------------|-------------|
| Aging | < ± 3.5 ppm / 15 years | |
| Temperature Drift (0 .. 60° C) | ± 1 x 10e-8 | |
| SSB Phasen Noise (1 Hz BW) (typ. @ 12.8 MHz) | 1 Hz | -95 dBc/Hz |
| | 10 Hz | -120 dBc/Hz |
| | 100 Hz | -140 dBc/Hz |
| | 1 kHz | -145 dBc/Hz |

RECEIVER MODE (CISPR Standard)

IF Bandwidth 200 Hz Band A

IF Filter: Gaussian Shaped Filter, Specifications according to CISPR 16-1-1, Bandwidth Deviation < 10 %
 Detector Modes: Peak, Quasi-Peak, Average, RMS, CISPR-AV
 Displayed Average Noise Level (Input Level < 85 dBµV Sinus): < 0 dBµV (typ. -3 dBµV)
 Measurement at about 700 Frequencies in parallel
 Frequency Step < 100 Hz

IF Bandwidth 9 kHz

IF Filter: Gaussian Shaped Filter, Specifications according to CISPR 16-1-1, Bandwidth Deviation < 10 %
 Detector Modes: Peak, Quasi-Peak, Average, RMS, CISPR-AV
 Displayed Average Noise Level (Input Level < 65 dBµV Sinus): < -15 dBµV (typ. -19 dBµV)
 Measurement at 4096 Frequencies in parallel
 Frequency Step < 400 Hz

IF Bandwidth 120 kHz

IF Filter: Gaussian Shaped Filter, Specifications according to CISPR 16-1-1, Bandwidth Deviation < 10 %
 Detector Modes: Peak, Quasi-Peak, Average, RMS, CISPR-AV
 Displayed Average Noise Level (Input Level < 65 dBµV Sinus): < -3 dBµV (typ. -6 dBµV)
 Measurement at 1024 Frequencies in parallel
 Frequency Step < 800 Hz

IF Bandwidth 1 MHz

IF Filter: Gaussian Shaped Filter, Specifications according to CISPR 16-1-1, Bandwidth Deviation < 10 %
 Detector Modes: Peak, Average, RMS, CISPR-AV
 Displayed Average Noise Level (Input Level < 65 dBµV Sinus): < 6 dBµV 1 MHz – 1 GHz
 < 8 dBµV 1 GHz – 1.15 GHz
 < 3 dBµV (< 6 dBµV with SW - UG) 1.15 GHz – 6 GHz
 Measurement at 128 Frequencies in parallel
 Frequency Step < 800 Hz

WEIGHTED REAL-TIME SPECTROGRAM

| | |
|------------------------------|--|
| Weighted Spectrogram Mode | Peak, Average, RMS |
| Time-domain | Fully gapless |
| Frequency Step | 158 kHz for 120 kHz 1.2 MHz for 1 MHz |
| Frequency Step Interpolation | 40 kHz for 120 kHz 300 kHz for 1 MHz |
| Frequency Span | > 150 MHz |
| IF Bandwidths CISPR | 200 Hz, 9 kHz, 120 kHz, 1 MHz |
| Minimum Time Step | 50 ms |

TIME-DOMAIN ANALYSIS (RF)

| | |
|--------------------|---------------|
| Bandwidth | 1 GHz |
| Sampling Rate | 2.6 GS/s |
| Acquisition Memory | 32000 Samples |

ABSOLUTE MAXIMUM RATINGS (ATTENUATION 0 dB)

| | |
|-------------------------------|----------|
| Maximum DC Input Level, Pulse | 6 V |
| RF-CW Signal | 120 dBµV |

INDICATION (ATTENUATION 0 dB)

| | |
|-------------------------------|---------|
| Maximum DC Input Level, Pulse | 5 V |
| RF-CW Signal | 65 dBµV |

ATTENUATOR

0 - 75 dB, 5 dB Steps, Auto Attenuation
 max. Input Power for Attenuation > 15 dB: 1 W CW

INTERMODULATION, NONLINEARITIES

| | |
|--|-------------------------|
| CW Signals: Two Tone | < -40 dB (typ. -53 dB) |
| Harmonics (> 40 dBµV, > 1 MHz) | < -40 dB (typ. <-50 dB) |
| Inherent Reception Points | < -40 dB (typ. <-50 dB) |
| Total Dynamic Range (120 kHz IF Bandwidth) | > 140 dB |

INHERENT RECEPTION POINTS (ATTENUATION 0 dB)

Inherent Reception Point 1/4 ADC Sampling Rate:
 << 25 dBµV (using Multi-sampling < -15 dBµV)
 Further Inherent Reception Points
 << 5 dBµV (using Multi-sampling < -15 dBµV)

MEASUREMENT TIME

1 ms – 60 s (Average, RMS)
 1 ms – infinite (Peak, Quasi-Peak)

MEASUREMENT ACCURACY

Sinusoidal Signals (9 kHz - 1 GHz) ± 1 dB
 Sinusoidal Signals (1 GHz - 6 GHz) ± 2 dB
 Pulses according to CISPR 16-1-1

RF INPUT

50 Ohm
 VSWR < 3.0 (typ. 2.0), 1 GHz - 6 GHz
 VSWR < 1.2 typ., 9 kHz - 1 GHz, with 10 dB Attenuation

REMOTE CONTROL

Ethernet (LAN), Commands according to SCPI Standard

DISPLAY

XGA 8,4" 800 x 600 True Color
 Touchscreen

PC

Intel Celeron M 1.86 GHz, 1 GB RAM, 160 GB Hard Disk
 Interface: USB, Ethernet, VGA, serial, IEEE 1394, Audio
 Windows XP

POWER SUPPLY

230 V, 50 Hz or 110 V, 60 Hz

WEIGHT

ca. 25 kg

MAIN OPTIONS

| | |
|----------------|---|
| LN - UG6G | Low-noise Preamplifier (1 GHz - 6 GHz) |
| PRE - UG | Preselection Band A |
| SW - UG | Preselection Band B |
| MIL/DO - UG | Frequency Extension down to 10 Hz, IF Bandwidths 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz |
| LISN - UG | Controller for Measuring Accessories (TTL, 5V) |
| LISNCable - UG | Customized Control Cable for Accessories, e.g. LISN |
| TG - UG | Carrying Handle |
| PC - UG | Intel Core 2 Duo, 2.16 GHz, 2 GB RAM, 320 GB Hard Disk |
| KB - UG | Compact Keyboard incl. Touchpad |
| RG - UG | Report Generator |
| CAL - UG | Manufacturer Calibration with Certificate |
| CALD - UG | DKD Calibration with Certificate |
| CLICK - UG | Click Rate Analyzer, fully integrated |
| SLIDE - UG | Software for Disturbance Power Measurements |