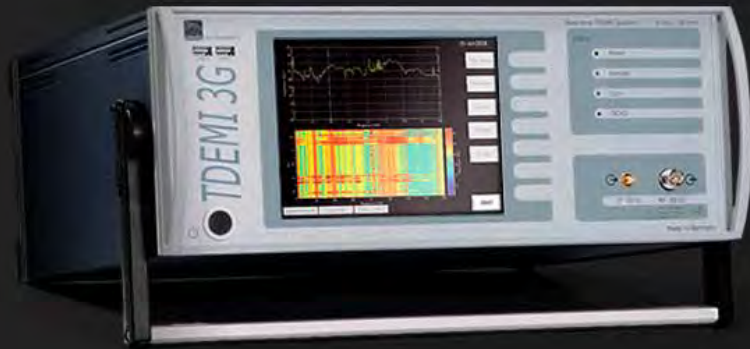


# TDEMI 3G

- 4000x faster than conventional EMI receivers
- Measurement according to CISPR 25
- Analysis of single events



The TDEMI 3G provides all features and technological advantage of a TDEMI 1G and extends these features and benefits in the frequency range up to 3 GHz. The TDEMI 3G is used for EMC measurements in the frequency range from 9 kHz up to 3 GHz and covers all automotive tests.

In the frequency range above 1 GHz the TDEMI 3G provides a significant lower noise floor than conventional superhetrodyne based EMI receivers. With a selected IF bandwidth of 1 MHz the typical noise floor is below 3 dB $\mu$ V. An external pre-amplifier is not necessary for this frequency range. This avoids a potential unrecognized overload of such an external preamplifier, which may invalidate the result of the emission measurement. The TDEMI uses an auto attenuator in order to set up the optimum attenuation. Further an automatic indication of an overload occurring during the measurement is available in the standard configuration.

The level of inherent spurious can be reduced further by using the TDEMI feature multisampling which has been developed by GAUSS INSTRUMENTS. This feature comes with the standard configuration of all TDEMI Measurement Systems. By activating this method a second measurement is performed. During the second measurement the sampling frequency as well as the local oscillator frequency is slightly changed. Thus all the position of inherent spurious are changed. By this way spurs originating from analog-to-digital converters as well as from mixing stages are com-

pletely suppressed down to a level of -15 dB $\mu$ V. Each frequency can be measured with highest sensitivity.

By the extremely fast measurement speed of the TDEMI it is possible to perform economically measurements in the upper frequency range with highest frequency resolution, e.g. 120 kHz or 9 kHz, for the first time. By the optional pre-selection for band B (Option PRE - UG) and the ultra-fast RF switching unit it is possible to perform automated high resolution measurements over the complete frequency range from 9 kHz to 3 GHz below one minute.

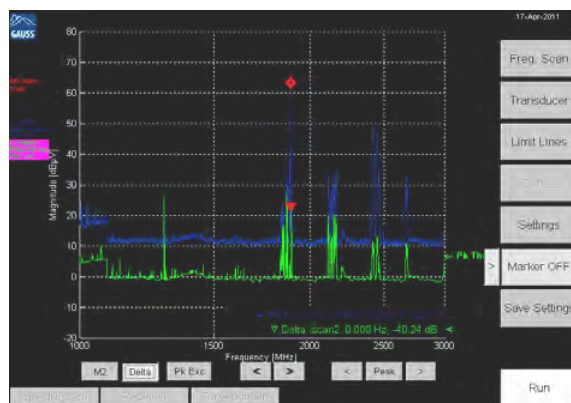


Fig. 25 – **Measurement of ambient noise** in the frequency range from 1 GHz to 3 GHz. Red marker shows the E-Service network of the GSM cell phone net.

# TDEMI 3G Specifications

## FREQUENCY RANGE

9 kHz - 3 GHz

## REFERENCE (OCXO)

|  |                        |             |
|--|------------------------|-------------|
| Aging  | < ± 3.5 ppm / 15 years |             |
| Temperature Drift (0 .. 60° C)                 | ± 1 x 10e-8            |             |
| SSB Phase Noise (1 Hz BW)<br>(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 - 3 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<br>1.2 MHz for 1 MHz |
| Frequency Step Interpolation | 40 kHz for 120 kHz<br>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 µs - 60 s (Average, RMS)  
 1 µs - infinite (Peak, Quasi-Peak, CISPR-Average, CISPR-RMS-AV (Option))

## MEASUREMENT ACCURACY

|                                    |        |
|------------------------------------|--------|
| Sinusoidal Signals (9 kHz - 1 GHz) | ± 1 dB |
| Sinusoidal Signals (1 GHz - 3 GHz) | ± 2 dB |
| Pulses according to CISPR 16-1-1   |        |

## RF INPUT

50 Ohm  
 VSWR < 3.0 (typ. 2.0), 1 GHz - 3 GHz  
 VSWR < 1.2 typ., 9 kHz - 1 GHz, with 10 dB Attenuation

## REMOTE CONTROL, INTERFACES

Remote control command set according to SCPI Standard  
 Ethernet/LAN, USB, RS232, GPIB (Option GPIB-UG), PS/2, VGA, HDMI, Audio

## DISPLAY, USER INTERFACE

Resolution 800 x 600 pixels, 8.4", True Color (16.78 Mio. colors)  
 Touchscreen

## PC

Intel Core i, 2 GB RAM, 120 GB Hard Disk or higher  
 Operating system: Windows XP or Windows 7

## POWER SUPPLY

230 V +/-20%, 50 Hz or 110 V +/-10%, 60 Hz

## WEIGHT

ca. 25 kg

## MAIN OPTIONS

|                |  |
|----------------|--|
| 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        | Powerful multicore processor (Intel Core i or comparable) for advanced computing power, doubled hard disk capacity, doubled RAM size |
| KB - UG        | Compact Keyboard incl. Touchpad  |
| RG - UG        | Report Generator   |
| CAL - UG       | Manufacturer Calibration with Certificate  |
| CALD - UG      | DAkks Calibration with Certificate   |
| CLICK - UG     | Click Rate Analyzer, fully integrated  |
| SLIDE - UG     | Software for Disturbance Power Measurements  |