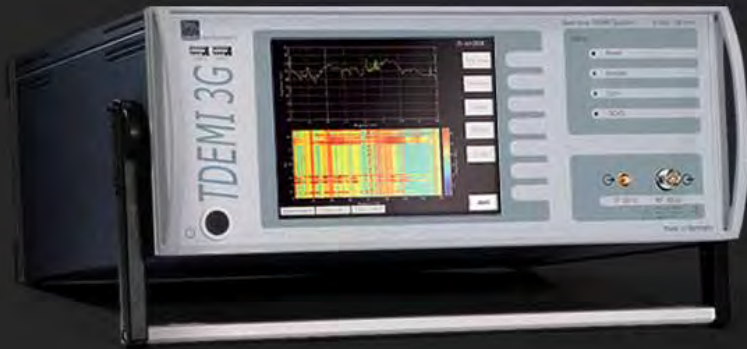


# TDEMI 3G

- 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 noise floor is below 3 dBµV. 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 dBµV. 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.

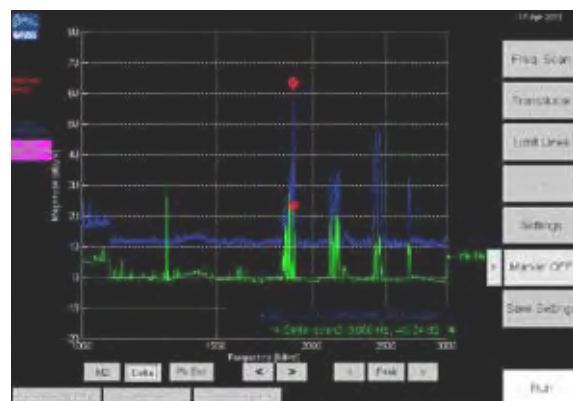


Fig. 25 – **Measurement of ambient noise** in the frequency range from 1 GHz to 3 GHz. Red marker shows the E-Service network of the GSM cell phone net.

# 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) (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 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 - 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

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

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