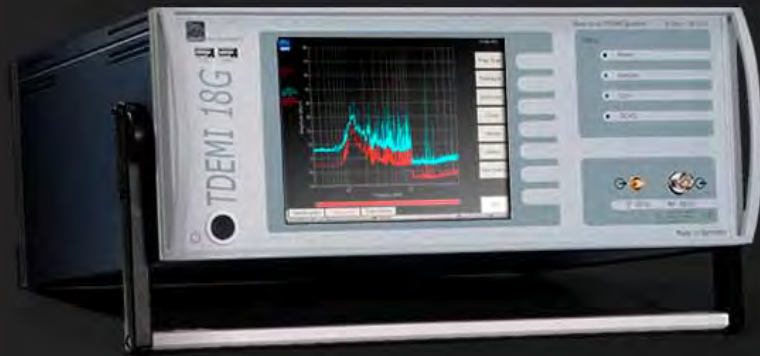


TDEMI 18G

- 4000x faster than conventional EMI receiver
- Measurement of ISM devices
- Analysis of harmonics of microwave ovens



The TDEMI 18G covers the frequency range 9 kHz - 18 GHz and enables the emission measurements according to CISPR/EN and FCC Standards. For measurements of household appliances, IT equipment and industrial scientific and medical (ISM) the TDEMI 18G provides all typical features as well as all known advantages of the technology of the TDEMI product line. With the TDEMI 18G completely unexpected possibilities are provided to the user in the range up to 18 GHz, e.g. during the measurement of the harmonics of microwave ovens. An automated measurement at all frequencies can be performed in less than 2 minutes.

For the measurement of pulse modulated signals with highest sensitivity the option LN-UG18G is recommended for the frequency range 6 GHz - 18 GHz. With this option a further improved noise floor below 15 dB μ V is achieved. The TDEMI uses an auto attenuation controller in order to set up the optimum attenuation. An indication of an overload occurring during the measurement comes with all the TDEMI Systems by the standard configuration. By the parallel measurement at several thousand frequencies an excellent ratio of dwell time and overall testing time is achieved. This enables fast scans with much longer dwell times. Due to the increasing complexity of the systems, as well as the number of operation modes and instationary behaviour fast and reliable measurement methods are mandatory during product development and product certification. Due to the measurement at all frequencies and a sufficient high

selection of the dwell time the measurement uncertainty is reduced significantly. Such scans with long dwell times as required by the EMC standards can be performed in reasonable times with the TDEMI. The automated evaluation and documentation according to CISPR 16-2-1 and 16-2-2 can be performed by the report generator.

By the weighted spectrogram mode with a gap-less real-time analysis bandwidth of 162.5 MHz the TDEMI is an excellent tool for preinvestigations in order to detect potential EMI sources and investigate methods to reduce the electromagnetic interference. Such methods can be applied to devices while the result can be shown in real-time.

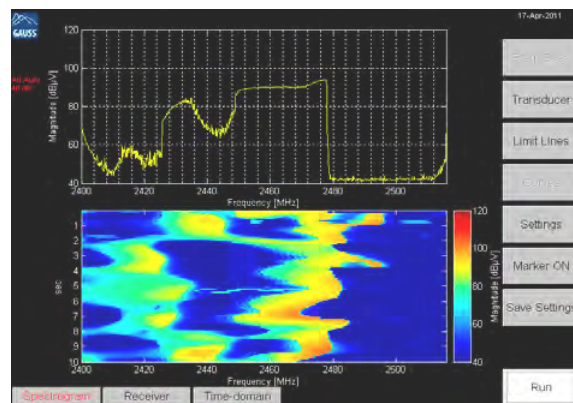


Fig. 29 – Measurement of the magnetron of a microwave oven. Lower graph shows the changes of the emission over time within an interval of 10 s.

TDEMI 18G Specifications

FREQUENCY RANGE

9 kHz - 18 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 1.15 GHz - 6 GHz
 < 15 dBµV 6 GHz - 18 GHz (with LN - UG18G)
 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	6V
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 - 18 GHz) ± 2 dB
 Pulses according to CISPR 16-1-1

RF INPUT

50 Ohm
 VSWR < 3.0 typ., 1 GHz - 18 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

LN - UG18G	Low-noise Preamplifier (6 GHz - 18 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	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	DAKs Calibration with Certificate
CLICK - UG	Click Rate Analyzer, fully integrated
SLIDE - UG	Software for Disturbance Power Measurements