# TDEMI® X

TDEMI® X – 64 000 TIMES FASTER THAN CONVENTIONAL EMI RECEIVERS

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The novel product line TDEMI® eXtreme (short form: TDEMI® X) is the latest and most advanced level of full digital measurement equipment for emission testing on the fast lane. It is based on the unrivaled and well approved technology of GAUSS INSTRUMENTS.

By the use of the leading-edge analog-to-digital converters with the best ratio of signal to noise power density available on the market, most modern high-speed FPGAs with a calculation power of about 250 state-of-the-art PCs and in-house designed high performance microwave circuits highest measurement accuracy and highest measurement speed is achieved over the entire frequency range starting from DC up to 40 GHz.

The new TDEMI® eXtreme is easily upgradeable in its frequency range by different extensions which can be integrated into the instrument subsequently.

The frequency ranges are 1 GHz, 3 GHz, 6 GHz, 18 GHz, 26.5 GHz or 40 GHz respectively. The frequency ranges of the instruments start at 9 kHz by standard configuration and can be extended down to 10 Hz by the optional Option MIL/DO-UG. A large variety of configurable options make the TDEMI® X to the customized solution perfect fitting to your application according to all civil standards (e.g. CISPR, EN, FCC, or ANSI), military (MIL-461) as well as avionic standards (DO-160). The TDEMI® X measurement system offers in its standard configuration a fully integrated spectrum analyzer mode and also a real-time spectrum analyzer mode. An overview of the available options is given on the page following to the detailed technical specification. Furthermore we offer a customized adaptation to your specific application and needs upon request.

The option OSC-UG provides a two-channel oscilloscope, extending the frequency range even down to DC. The new and highest performance product line TDEMI® X can be used in a vast range of applications due to its spectrum analyzer mode and real-time spectrum analyzer and can be used also for measurements according to telecommunication standards such as ETSI standards e.g. or for general analysis of signals - and all this can be done fully in real-time with an absolutely unique instantaneous bandwidth of 325 MHz and even up to 645 MHz as well as an unrivaled measurement speed and dynamic range of 100 dB (without attenuator) or even up to 170 dB with attenuator.

At a Glance

TDEMI® X

- 64 000 times faster than conventional instruments
- 100 dB dynamic range (@ 0dB Att.)
- multifunctional and upgradeable
- conventional and FFT-based leading-edge technology
- lowest noise floor
- additional integrated preselection (Option)
Receiver Mode

The TDEMI® eXtreme provides a traditional superhet mode for sure, which is implemented fully digital in the frequency range up to 1 GHz. Above 1 GHz there is an ultra broadband down-conversion to the digital IF level, with an FFT bandwidth of 325 MHz. The instruments can be configured with an AM/FM demodulator and output to headphones (Option DM-UG).

Moreover the receiver mode of the TDEMI® X provides a fully CISPR 16-1-1 compliant Shortterm-FFT (STFFT) implementation, which speeds up your EMC measurements by a factor up to 32000. Thus scan times - and with it overall testing times - can be realized now which are much shorter and setting new standards in product certification. For example a full scan with quasi-peak detector in the range from 30 MHz to 1 GHz is carried out in less than 10 seconds.

So it is possible to measure and characterize fluctuating disturbances and equipment under test changing between different operation modes very easily and much more precise and reliable. An excellent noise floor makes the TDEMI® X perfect suited for radiated, conducted as well as measurements with absorbing clamp or CDN.

APD Function and Histogram

The measurement systems of the TDEMI® eXtreme series can be equipped with a measuring mode for the amplitude probability distribution (APD) and with a colored histogram display by the option APD-UG.

The APD measuring function for example is used for testing of ISM (industrial, scientific, medical) equipment. Especially for such measurements like APD function the vast advantages of the most modern technology of the TDEMI® X become aware, when a highly parallel measurement and calculation is saving a huge amount in time and money.

Moreover the histogram function, by its color depth of 16.78 million, enables the user to analyse and distinguish intermittent narrow- and broadband disturbances as well as to detect masked signals very easily.
Real-time Spectrogram Mode

The real-time spectrogram mode of the TDEMI® eXtreme is absolutely unique in its performance and unique particularly because of the full conformance with the standards CISPR 16-1-1, ANSI C63.2, MIL-461, and DO-160 respectively. The real-time spectrogram offers the perfect combination of full compliance and analysis capabilities in fully gapless real-time, observing what is going on there in your circuitry, component, device or equipment under test.

The remote control commands according to SCPI standard enables the use in a fully automated lab and certification environment. Evaluation capabilities, e.g. several markers, display in 2D or 3D allow to analyse disturbances and evaluate them regarding to conformity. The measurement is carried out over a frequency range of 162.5 MHz, 325 MHz (Option QCDSP-UG) or even up to 645 MHz (Option 645M-UG) in real-time. Up to 16000 frequency points are measured in parallel.

Spectrum Analyzer

Also in spectrum analyzer mode the TDEMI® X is equipped with a traditional superhet mode. It is implemented digital and provides 145 IF bandwidths beginning from 1 Hz going up to 30 MHz in 1, 2, 3, 5 steps as well as small sized steps in between.

By the innovative multi-channel technology the measurement speed is increased by a factor up to 64000. It corresponds to a Shortterm-FFT based set of 64000 full digital superheterodyne receivers. In conjunction with the parallel implementation of video filters and detectors all measurements according to standards are sped up by the factor 64000 and the user is enabled to analyse non-stationary phenomenons much more precisely and reliable.

Due to the available 6 dB bandwidths and the full compliance to CISPR 16-1-1 as well as ANSI C63.2, in particular e.g. the very essential requirement regarding the dynamic range for pulses, the TDEMI® X can be applied for pre- and final measurements with peak and average detector. Also it is in full conformance with ANSI C63.4, MIL-461 and DO-160. A large number of additional functionalities allow the use in a wide range of applications for the analysis of analog and digital communication signals.
Real-time Spectrum Analyzer

The real-time spectrum analyzer mode comes along with a real-time bandwidth of 162.5 MHz in the standard configuration of the TDEMI® X instruments and can be extended to 325 MHz real-time bandwidth by the option QCDSP-UG which is absolutely unique in the test and instrumentation market.

The real-time spectrum analyzer mode provides all bandwidths and settings already known from spectrum analyzer mode and also provides the full dynamic for pulses required by CISPR 16-1-1.

This operation mode of the TDEMI® X series combines all advantages of conventional superhet analyzers with the advanced evaluation capabilities and vast advantages of the real-time capabilities based on the leading-edge technology provided by GAUSS INSTRUMENTS. The unrivaled real-time bandwidth of 325 MHz opens up absolutely new possibilities regarding the analysis, characterization and observation of all kinds of signals.

Time-domain Mode

The time-domain mode of the TDEMI® eXtreme provides a real-time bandwidth of 1 GHz and enables a broadband acquisition of signals with highest resolution in its class at the same time. Digitally implemented hardware triggering combined with an extremely high dynamic range allow triggering on CISPR 16-1-1 pulses and display with a unique precision of 16 bit.

By the easy and intuitive user interface and control via touchscreen, the operator can set and vary trigger levels for example directly with a touch on the screen of the instrument.
GAUSS INSTRUMENTS introduced a novel Multi-GHz real-time scanning feature for the TDEMI® eXtreme receiver series providing a several Gigahertz real-time bandwidth.

By the newly designed very powerful hardware module, measurements across several Gigahertz can be performed in the real-time spectrum analyzer mode. E.g. in the frequency range from 1 GHz to 40 GHz all frequency points can be directly measured with a very high resolution in time and the result can be maximized instantaneously.

Over the entire frequency range the results are displayed in real-time. Thus the final maximization can be performed at all frequencies in just one step. The detectors peak, average, and RMS are available in this mode. Further the video bandwidths, which are required according to the standards, can be applied.

Of course all the measurements according to CISPR, ANSI C63.4, FCC Part 15, MIL 461, DO 160 as well as many other national and international standards are fully covered.
Preselection Low Noise Amplifier System

The TDEMI® X contains a combination of a preselection, ultra high linear input stage, and high resolution ADCs to achieve a maximum performance e.g. for pulses and pulse modulated carriers that supersedes prior art technology.

By this technology during all operating modes optimum image rejection, and full CISPR 16-1-1 compliance is ensured, of course.

For the measurement of transmitting devices, e.g. below 1 GHz, it is often necessary to measure harmonics of these devices with a performance up to 90 dBC. The optional Preselection Low Noise Amplifier System (PRLNA-UG) allows suppressing the fundamentals while the harmonics are measured. The option can be activated during measurements in receiver mode. While the preselection is active an instantaneous real-time bandwidth of 162.5 MHz is available. Additional auxiliary equipment, such as external notch filters are not needed anymore during the measurement of such devices.

Lowest noise floor

The world’s fastest EMI receivers – the TDEMI® eXtreme series (TDEMI® X) of GAUSS INSTRUMENTS covering the frequency range from DC – 40 GHz and providing unique features as 645 MHz CISPR compliant real-time bandwidth, Multi-GHz Real-time Scanning and the lowest displayed average noise level at 40 GHz can be equipped also with additional ultra-low noise pre-amplifiers for the frequency range 30 MHz – 1 GHz, 3GHz, 6 GHz, 18 GHz, 26.5 GHz and 40 GHz.

This novel preamp provides lowest noise figure and highest dynamic range - both at the same time. High linearity and lowest displayed inherent noise is achieved by a patented technology using pre-amps with low noise figure, pre-selectors and a special circuit monitoring the linearity reserve of the pre-amp.
The IQ data consists of two components of a signal – I and Q data. The I data refers to the In-phase component and Q data refers to the Quadrature component of the signal. The phase offset between the two components is always 90°.

Owing to the various advantages they offer, IQ based signal processing has become popular in recent years. Also, in modern day communications, IQ based modulation/demodulation methods have taken center stage as they offer several benefits over traditional methods like increased bandwidth utilization and simpler processing.

The IQ Data Capture option, available for all TDEMI® X systems, allows the user to capture such IQ data over the entire operating range of the system. The so captured IQ data can be directly used to perform Time Domain Analysis. In addition, the user can use this IQ data to perform any further customized processing (not included in this option) as desired. For instance, the user can perform detailed analysis by measuring crucial signal parameters like jitter, signal/symbol period, plotting eye diagrams or constellation diagrams etc.

The optional available click rate analyzer expands the existing TDEMI® Measurement System to a fully integrated click rate analyzer. So the combination of a receiver, as the TDEMI®, according to CISPR 16-1-1, a click rate analyzer and advanced evaluation methods, as the spectrogram mode, is available in a single box solution. The click rate measurement is performed at all four frequencies in parallel. Hereby, the total testing time is reduced significantly compared to sequential measurements performed by a conventional heterodyne receivers. By using the same digital data base of the TDEMI® System as in its receiver mode the calibration of the click rate analyzer is covered automatically by the standard calibration of the TDEMI® System. The click rate analysis is operated by an own graphical user interface. The software measures and displays the current signal at all four frequencies in parallel as peak and quasi-peak value each. Both detector values are fully stored and evaluated. After finishing testing every single disturbance can be selected from a list and the response of the IF signal and the quasi-peak value can be displayed and a test report can be automatically created, so there is no need anymore to repeat a measurement for a certain click or time.
EMI 64k Automation Software Suite

The EMI 64k automation software suite of GAUSS INSTRUMENTS, allows to embed your TDEMI® and TDEMI® X EMI Receiver in a fully automated test environment. A full automation of EMI testing according to all commercial and military standards is available with this software suite. Using the capabilities of the TDEMI® X with a fully gapless processing and full Quasi-peak detection the EMI 64k is the only software that provides a full automation even under conditions of sporadic interferences or drifting emissions. This unique technology avoids manual searching of peaks and improves the overall test quality. In addition the complete radiation pattern is measured at all frequencies with Quasi-peak detector.

The EMI 64k supports conducted emissions, measurement of disturbance power, radiated emission measurements in a full anechoic room or at an open area test site as well as in a semi anechoic chamber. For all these typical test setups the EMI testing is fully automated. Also measurements with your GTEM cell, which is a very effective approach to test small devices, are possible with the EMI 64k software to speed up the measurement using the Quasi-peak detector for a scan with a scan time between 3s (TDEMI® X) and 64 s (TDEMI® M). The measurement is carried out at all 3 axis and the calculation of an OATS equivalent result is performed.

The EMI 64k automation software is available for all TDEMI® product families and can be hosted on your TDEMI® System or from a separate work station via an external PC or Laptop.

The EMI 64k is a bundle of packages that can be configured according to the customer requirements. The great advantage is the following: You only pay for the features that you need and you can upgrade anytime later with additional features that you need for future tests.
## TDEMI® X Specifications

### Frequency Range

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDEMI® X1</td>
<td>9 kHz – 1 GHz</td>
<td>extended down to 10 Hz - 9 kHz, with Option MIL/DO-UG</td>
</tr>
<tr>
<td>TDEMI® X3</td>
<td>9 kHz – 3 GHz</td>
<td>extended down to DC, 2-Channel, with Option OSC-UG</td>
</tr>
<tr>
<td>TDEMI® X6</td>
<td>9 kHz – 6 GHz</td>
<td></td>
</tr>
<tr>
<td>TDEMI® X18</td>
<td>9 kHz – 18 GHz</td>
<td></td>
</tr>
<tr>
<td>TDEMI® X26</td>
<td>9 kHz – 26.5 GHz</td>
<td></td>
</tr>
<tr>
<td>TDEMI® X40</td>
<td>9 kHz – 40 GHz</td>
<td></td>
</tr>
</tbody>
</table>

### Reference Oscillator (OCXO)

<table>
<thead>
<tr>
<th>Details</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aging</td>
<td>+/- 3.5 ppm / 15 years</td>
</tr>
<tr>
<td>Temperature drift (0 – 60° C)</td>
<td>&lt; +/- 1 x 10^-8</td>
</tr>
<tr>
<td>SSB phase noise (1 Hz BW)</td>
<td>1 Hz (-95 dBc/Hz), 10 Hz (-120 dBc/Hz), 100 Hz (-140 dBc/Hz), 1 kHz (-145 dBc/Hz)</td>
</tr>
</tbody>
</table>

### Receiver Mode

- Analog and Digital Superheterodyne Receiver
- STFFT-based Receiver Mode (Multichannel Mode)
- Trace Point > 8.000.000

### Receiver Mode (CISPR 16-1-1, ANSI C63.2)

#### IF Bandwidth 200 Hz

- IF Filter: Gaussian Shaped Filter, Specification according to CISPR 16-1-1, Bandwidth Deviation < 10%
- Peak, Average, CISPR-Average, Quasi-Peak, RMS, CISPR-RMS-AVG Detector (Option CRMS-UG)
- Measurement at > 1400 Frequencies in parallel, >2400 Frequencies in parallel (with Option QCDSP-UG)
- Frequency Step < 100 Hz

#### IF Bandwidth 9 kHz

- IF Filter: Gaussian Shaped Filter, Specification according to CISPR 16-1-1, Bandwidth Deviation < 10%
- Peak, Average, CISPR-Average, Quasi-Peak, RMS, CISPR-RMS-AVG Detector (Option CRMS-UG)
- Measurement at 8192 Frequencies in parallel, 16384 Frequencies in parallel (with Option QCDSP-UG)
- Frequency Step < 400 Hz

#### IF Bandwidth 120 kHz

- IF Filter: Gaussian Shaped Filter, Specification according to CISPR 16-1-1, Bandwidth Deviation < 10%
- Peak, Average, CISPR-Average, Quasi-Peak, RMS, CISPR-RMS-AVG Detector (Option CRMS-UG)
- Measurement at 2048 Frequencies in parallel, 4096 Frequencies in parallel (with Option QCDSP-UG)
- Frequency Step < 400 Hz

#### IF Bandwidth 1 MHz

- IF Filter: Gaussian Shaped Filter, Specification according to CISPR 16-1-1, Bandwidth Deviation < 10%
- Peak, Average, CISPR-Average, RMS, CISPR-RMS-AVG Detector (Option CRMS-UG)
- Measurement at 256 Frequencies in parallel, 512 Frequencies in parallel (with Option QCDSP-UG)
- Frequency Step < 800 Hz

### Noise Floor (Receiver Mode) without Option PRLNA-UG

- Preselection (in front of preamp) active, Average Detector, typical

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range</th>
<th>Noise Floor (dBµV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDEMI® X1</td>
<td>9 kHz – 150 kHz (200 Hz IF)</td>
<td>&lt; -20 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 MHz – 30 MHz (9 kHz IF)</td>
<td>&lt; -15 dBµV</td>
</tr>
<tr>
<td></td>
<td>30 MHz – 1 GHz (120 kHz IF)</td>
<td>&lt; -8 dBµV</td>
</tr>
<tr>
<td>TDEMI® X3</td>
<td>9 kHz – 150 kHz (200 Hz IF)</td>
<td>&lt; -20 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 MHz – 30 MHz (9 kHz IF)</td>
<td>&lt; -15 dBµV</td>
</tr>
<tr>
<td></td>
<td>30 MHz – 1 GHz (120 kHz IF)</td>
<td>&lt; -8 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 GHz – 1.1 GHz (1 MHz IF)</td>
<td>&lt; 1 dBµV</td>
</tr>
<tr>
<td></td>
<td>1.1 GHz – 3 GHz (1 MHz IF)</td>
<td>&lt; 2 dBµV</td>
</tr>
<tr>
<td>TDEMI® X6</td>
<td>9 kHz – 150 kHz (200 Hz IF)</td>
<td>&lt; -20 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 MHz – 30 MHz (9 kHz IF)</td>
<td>&lt; -15 dBµV</td>
</tr>
<tr>
<td></td>
<td>30 MHz – 1 GHz (120 kHz IF)</td>
<td>&lt; -8 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 GHz – 1.1 GHz (1 MHz IF)</td>
<td>&lt; 1 dBµV</td>
</tr>
<tr>
<td></td>
<td>1.1 GHz – 6 GHz (1 MHz IF)</td>
<td>&lt; 2 dBµV</td>
</tr>
<tr>
<td>TDEMI® X18</td>
<td>9 kHz – 150 kHz (200 Hz IF)</td>
<td>&lt; -20 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 MHz – 30 MHz (9 kHz IF)</td>
<td>&lt; -15 dBµV</td>
</tr>
<tr>
<td></td>
<td>30 MHz – 1 GHz (120 kHz IF)</td>
<td>&lt; -8 dBµV</td>
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<tr>
<td></td>
<td>1 GHz – 1.1 GHz (1 MHz IF)</td>
<td>&lt; 1 dBµV</td>
</tr>
<tr>
<td></td>
<td>1.1 GHz – 3 GHz (1 MHz IF)</td>
<td>&lt; 2 dBµV</td>
</tr>
<tr>
<td></td>
<td>3 GHz – 9 GHz (1 MHz IF)</td>
<td>&lt; 10 dBµV</td>
</tr>
<tr>
<td></td>
<td>9 GHz – 13 GHz (1 MHz IF)</td>
<td>&lt; 10 dBµV</td>
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<tr>
<td></td>
<td>13 GHz – 18 GHz (1 MHz IF)</td>
<td>&lt; 15 dBµV</td>
</tr>
<tr>
<td>TDEMI® X26</td>
<td>9 kHz – 150 kHz (200 Hz IF)</td>
<td>&lt; -20 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 MHz – 30 MHz (9 kHz IF)</td>
<td>&lt; -15 dBµV</td>
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<tr>
<td></td>
<td>30 MHz – 1 GHz (120 kHz IF)</td>
<td>&lt; -8 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 GHz – 1.1 GHz (1 MHz IF)</td>
<td>&lt; 1 dBµV</td>
</tr>
<tr>
<td></td>
<td>1.1 GHz – 6 GHz (1 MHz IF)</td>
<td>&lt; 2 dBµV</td>
</tr>
<tr>
<td></td>
<td>6 GHz – 9 GHz (1 MHz IF)</td>
<td>&lt; 10 dBµV</td>
</tr>
<tr>
<td></td>
<td>9 GHz – 13 GHz (1 MHz IF)</td>
<td>&lt; 10 dBµV</td>
</tr>
<tr>
<td></td>
<td>13 GHz – 18 GHz (1 MHz IF)</td>
<td>&lt; 15 dBµV</td>
</tr>
<tr>
<td></td>
<td>18 GHz – 26.5 GHz (1 MHz IF)</td>
<td>&lt; 10 dBµV</td>
</tr>
<tr>
<td>TDEMI® X40</td>
<td>9 kHz – 150 kHz (200 Hz IF)</td>
<td>&lt; -20 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 MHz – 30 MHz (9 kHz IF)</td>
<td>&lt; -15 dBµV</td>
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<tr>
<td></td>
<td>30 MHz – 1 GHz (120 kHz IF)</td>
<td>&lt; -8 dBµV</td>
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<tr>
<td></td>
<td>1 GHz – 1.1 GHz (1 MHz IF)</td>
<td>&lt; 1 dBµV</td>
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<tr>
<td></td>
<td>1.1 GHz – 6 GHz (1 MHz IF)</td>
<td>&lt; 2 dBµV</td>
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<tr>
<td></td>
<td>6 GHz – 9 GHz (1 MHz IF)</td>
<td>&lt; 10 dBµV</td>
</tr>
<tr>
<td></td>
<td>9 GHz – 13 GHz (1 MHz IF)</td>
<td>&lt; 10 dBµV</td>
</tr>
<tr>
<td></td>
<td>13 GHz – 18 GHz (1 MHz IF)</td>
<td>&lt; 15 dBµV</td>
</tr>
<tr>
<td></td>
<td>18 GHz – 26.5 GHz (1 MHz IF)</td>
<td>&lt; 10 dBµV</td>
</tr>
<tr>
<td></td>
<td>26.5 GHz – 33 GHz (1 MHz IF)</td>
<td>&lt; 18 dBµV</td>
</tr>
<tr>
<td></td>
<td>33 GHz – 40 GHz (1 MHz IF)</td>
<td>&lt; 20 dBµV</td>
</tr>
</tbody>
</table>
**Noise Floor (Receiver Mode) with Option PRLNA-UG**

Preselection (in front of preamp) active, Average Detector

<table>
<thead>
<tr>
<th>Attenuator</th>
<th>Mechanical: 0 – 70 dB, 10 dB Steps; or 0 – 75 dB, 5 dB Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDEMI® X1</td>
<td>9 kHz – 150 kHz (200 Hz IF): &lt; -20 dBµV</td>
</tr>
<tr>
<td></td>
<td>1 MHz – 30 MHz (9 kHz IF): &lt; -15 dBµV</td>
</tr>
<tr>
<td></td>
<td>30 MHz – 1 GHz (120 kHz IF): &lt; -8 dBµV</td>
</tr>
<tr>
<td></td>
<td>1.1 GHz – 6 GHz (1 MHz IF): &lt; 1 dBµV</td>
</tr>
<tr>
<td></td>
<td>1.1 GHz – 6 GHz (1 MHz IF): &lt; 2 dBµV</td>
</tr>
</tbody>
</table>

| TDEMI® X3        | 9 kHz – 150 kHz (200 Hz IF): < -20 dBµV                   |
|                  | 1 MHz – 30 MHz (9 kHz IF): < -15 dBµV                     |
|                  | 30 MHz – 1 GHz (120 kHz IF): < -8 dBµV                    |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 1 dBµV                      |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 2 dBµV                      |

| TDEMI® X6        | 9 kHz – 150 kHz (200 Hz IF): < -20 dBµV                   |
|                  | 1 MHz – 30 MHz (9 kHz IF): < -15 dBµV                     |
|                  | 30 MHz – 1 GHz (120 kHz IF): < -8 dBµV                    |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 1 dBµV                      |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 2 dBµV                      |

| TDEMI® X18       | 9 kHz – 150 kHz (200 Hz IF): < -20 dBµV                   |
|                  | 1 MHz – 30 MHz (9 kHz IF): < -15 dBµV                     |
|                  | 30 MHz – 1 GHz (120 kHz IF): < -8 dBµV                    |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 1 dBµV                      |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 2 dBµV                      |

| TDEMI® X26       | 9 kHz – 150 kHz (200 Hz IF): < -20 dBµV                   |
|                  | 1 MHz – 30 MHz (9 kHz IF): < -15 dBµV                     |
|                  | 30 MHz – 1 GHz (120 kHz IF): < -8 dBµV                    |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 1 dBµV                      |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 2 dBµV                      |

| TDEMI® X40       | 9 kHz – 150 kHz (200 Hz IF): < -20 dBµV                   |
|                  | 1 MHz – 30 MHz (9 kHz IF): < -15 dBµV                     |
|                  | 30 MHz – 1 GHz (120 kHz IF): < -8 dBµV                    |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 1 dBµV                      |
|                  | 1.1 GHz – 6 GHz (1 MHz IF): < 2 dBµV                      |
## TDEMI® X Specifications

### Preselection without Option PRLNA-UG

<table>
<thead>
<tr>
<th>TDEMI® X1</th>
<th>DC – 9 kHz</th>
<th>9 kHz – 150 kHz</th>
<th>150 kHz – 30 MHz</th>
<th>30 MHz – 300 MHz</th>
<th>30 MHz – 1.15 GHz</th>
<th>1.15 GHz – 3 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDEMI® X3</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
<tr>
<td>TDEMI® X6</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
<tr>
<td>TDEMI® X18</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
<tr>
<td>TDEMI® X26</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
<tr>
<td>TDEMI® X40</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
</tbody>
</table>

### Preselection with Option PRLNA-UG

<table>
<thead>
<tr>
<th>TDEMI® X1</th>
<th>DC – 9 kHz</th>
<th>9 kHz – 150 kHz</th>
<th>150 kHz – 30 MHz</th>
<th>30 MHz – 300 MHz</th>
<th>30 MHz – 1.15 GHz</th>
<th>1.15 GHz – 3 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDEMI® X3</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
<tr>
<td>TDEMI® X6</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
<tr>
<td>TDEMI® X18</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
<tr>
<td>TDEMI® X26</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
<tr>
<td>TDEMI® X40</td>
<td>DC – 9 kHz</td>
<td>9 kHz – 150 kHz</td>
<td>150 kHz – 30 MHz</td>
<td>30 MHz – 300 MHz</td>
<td>30 MHz – 1.15 GHz</td>
<td>1.15 GHz – 3 GHz</td>
</tr>
</tbody>
</table>
| TDEMI® X26 | DC – 9 kHz  
|           | 9 kHz – 150 kHz  
|           | 150 kHz – 30 MHz  
|           | 30 MHz – 162.5 MHz  
|           | 162.5 MHz – 325 MHz  
|           | 325 MHz – 487.50 MHz  
|           | 487.50 MHz – 650 MHz  
|           | 650 MHz – 812.50 MHz  
|           | 812.50 MHz – 975 MHz  
|           | 975 MHz – 1 GHz  
|           | 1 GHz – 3 GHz  
|           | 3 GHz – 6 GHz  
|           | 6 GHz – 9 GHz  
|           | 9 GHz – 13 GHz  
|           | 13 GHz – 15 GHz  
|           | 15 GHz – 18 GHz  
|           | 18 GHz – 22 GHz  
|           | 22 GHz – 26.5 GHz  
|           | 26.5 GHz – 29.2 GHz  
|           | 29.2 GHz – 33 GHz  
|           | 33 GHz – 40 GHz  
| TDEMI® X40 | DC – 9 kHz  
|           | 9 kHz – 150 kHz  
|           | 150 kHz – 30 MHz  
|           | 30 MHz – 162.5 MHz  
|           | 162.5 MHz – 325 MHz  
|           | 325 MHz – 487.50 MHz  
|           | 487.50 MHz – 650 MHz  
|           | 650 MHz – 812.50 MHz  
|           | 812.50 MHz – 975 MHz  
|           | 975 MHz – 1 GHz  
|           | 1 GHz – 3 GHz  
|           | 3 GHz – 6 GHz  
|           | 6 GHz – 9 GHz  
|           | 9 GHz – 13 GHz  
|           | 13 GHz – 15 GHz  
|           | 15 GHz – 18 GHz  
|           | 18 GHz – 22 GHz  
|           | 22 GHz – 26.5 GHz  
|           | 26.5 GHz – 29.2 GHz  
|           | 29.2 GHz – 33 GHz  
|           | 33 GHz – 40 GHz  |

**Low Noise Preamplifier without Option PRLNA-UG**

| TDEMI® X1 | Fixed between Preselection and ADC  
|           | 150 kHz – 1.15 GHz  
|           | (Gain 20 dB, NF typ. 2.5 dB)  
| TDEMI® X3 | Fixed between Preselection and Mixer, ADC respectively  
|           | 150 kHz – 1.15 GHz  
|           | (Gain 20 dB, NF typ. 2.5 dB)  
|           | 1.15 GHz – 3 GHz  
|           | (Gain 20 dB, NF typ. 2.0 dB)  
| TDEMI® X6 | Fixed between Preselection and Mixer, ADC respectively  
|           | 150 kHz – 1.15 GHz  
|           | (Gain 20 dB, NF typ. 2.5 dB)  
|           | 1.15 GHz – 6 GHz  
|           | (Gain 20 dB, NF typ. 2.0 dB)  
| TDEMI® X18 | Fixed between Preselection and Mixer, ADC respectively  
|           | 150 kHz – 1.15 GHz  
|           | (Gain 20 dB, NF typ. 2.5 dB)  
|           | 1.15 GHz – 6 GHz  
|           | (Gain 20 dB, NF typ. 2.0 dB)  
|           | 6 GHz – 9 GHz  
|           | (Gain 17 dB, NF typ. 1.6 dB)  
|           | 9 GHz – 13 GHz  
|           | (Gain 21 dB, NF typ. 1.8 dB)  
|           | 13 GHz – 18 GHz  
|           | (Gain 19 dB, NF typ. 2.2 dB)  
| TDEMI® X26 | Fixed between Preselection and Mixer, ADC respectively  
|           | 150 kHz – 1.15 GHz  
|           | (Gain 20 dB, NF typ. 2.5 dB)  
|           | 1.15 GHz – 6 GHz  
|           | (Gain 20 dB, NF typ. 2.0 dB)  
|           | 6 GHz – 9 GHz  
|           | (Gain 17 dB, NF typ. 1.6 dB)  
|           | 9 GHz – 13 GHz  
|           | (Gain 21 dB, NF typ. 1.8 dB)  
|           | 13 GHz – 18 GHz  
|           | (Gain 19 dB, NF typ. 2.2 dB)  
|           | 18 GHz – 26.5 GHz  
|           | (Gain 22 dB, NF typ. 2.0 dB)  
| TDEMI® X40 | Fixed between Preselection and Mixer, ADC respectively  
|           | 150 kHz – 1.15 GHz  
|           | (Gain 20 dB, NF typ. 2.5 dB)  
|           | 1.15 GHz – 6 GHz  
|           | (Gain 20 dB, NF typ. 2.0 dB)  
|           | 6 GHz – 9 GHz  
|           | (Gain 17 dB, NF typ. 1.6 dB)  
|           | 9 GHz – 13 GHz  
|           | (Gain 21 dB, NF typ. 1.8 dB)  
|           | 13 GHz – 18 GHz  
|           | (Gain 19 dB, NF typ. 2.2 dB)  
|           | 18 GHz – 26.5 GHz  
|           | (Gain 22 dB, NF typ. 2.0 dB)  
|           | 26.5 GHz – 33 GHz  
|           | (Gain 22 dB, NF typ. 2.0 dB)  
|           | 33 GHz – 40 GHz  
|           | (Gain 17 dB, NF typ. 2.1 dB)  

<https://example.com>
TDEMI® X Specifications

Low Noise Preamplifier with Option PRLNA-UG

<table>
<thead>
<tr>
<th>Model</th>
<th>Switchable on/off</th>
<th>Frequency Range</th>
<th>Gain (db)</th>
<th>NF (typ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDEMI® X1</td>
<td></td>
<td>150 kHz – 1.15 GHz</td>
<td>20</td>
<td>2.0</td>
</tr>
<tr>
<td>TDEMI® X3</td>
<td></td>
<td>150 kHz – 1.15 GHz</td>
<td>20</td>
<td>2.0</td>
</tr>
<tr>
<td>TDEMI® X6</td>
<td></td>
<td>150 kHz – 1.15 GHz</td>
<td>20</td>
<td>2.0</td>
</tr>
<tr>
<td>TDEMI® X18</td>
<td></td>
<td>150 kHz – 1.15 GHz</td>
<td>20</td>
<td>2.0</td>
</tr>
<tr>
<td>TDEMI® X26</td>
<td></td>
<td>150 kHz – 1.15 GHz</td>
<td>20</td>
<td>2.0</td>
</tr>
<tr>
<td>TDEMI® X40</td>
<td></td>
<td>150 kHz – 1.15 GHz</td>
<td>20</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Dynamic, Nonlinearities
- Preamp active, Preselection active/inactive, Attenuator: 0 dB
- Image Frequency Rejection: typ. 70 dBc (100dBc Multisampling)
- IF Rejection: 70 dBc, (100dBc Multisampling)
- Display Level Range: Noise floor – 120 dBµV (13dBm)
- split into 2 Measurement Ranges
- Automatical Switching between Measurement Ranges
- Image Frequency Rejection: typ. 70 dBc, (100dBc Multisampling)
- IF Rejection: > 120 dBµV, P1dB Mixer 5 dBm
- IP3: > 142 dBµV (typ. 155 dBµV)

Display Accuracy
- Measurement Uncertainty: < 0.5 dB (100 MHz) typ. 0.15 dB
- Resolution: 0.01 dB
- f < 1 GHz: +/- 1 dB
- 30 GHz > f > 1 GHz: +/- 1.5 dB
- 40 GHz > f > 30 GHz: +/- 2 dB
- Pulse Indication according to CISPR 16-1-1

Measurement time
- 1 µs – 60 s (Average, RMS)
- 1 µs – infinite (Peak, Quasi-Peak, CISPR-Average, CISPR-RMS-Average)

Maximum input level (RF1)
- 0 dB Attenuator: 122 dBµV
- 6V Pulses
- 10 dB Attenuator: 132 dBµV
- 18V Pulses

Maximum input level (RF2)
- 0 dB Attenuator: 132 dBµV
- 18V Pulses

Marker and Evaluation (Receiver Mode)
- Marker Functions: Marker, Delta, Peak Left, Peak Right, Left, Right, Marker
- to Trace, ...
- Save and Load Measurements
- Report Generator (Option RG-UG) for automated Evaluation against Limit Lines, incl. Subranges

Demodulation (Receiver Mode) (Option DM-UG)
- Amplitude Modulation (AM)
- Frequency Modulation (FM)
- “Tune to Marker” Function
Analog-Digital-Converter System
- Number of bit per A/D Converter: 12
- Sampling rate: 2.6 GS/s
- Number of Analog-Digital-Converter (multiresolution): 2
- Full number of bit (real-time bandwidth 162.5 MHz): 22
- P1dB (ADC1) typ.: 13 dBm (without preamp)
- P1dB (ADC2) typ.: 40 dBm Peak (pulses)

EMI Receiver FFT-based Measuring Instrument
- Frequency segment processed in parallel 162.5 MHz
- Frequency segment processed in parallel 325 MHz (with Option QC DSP-UG)

Scanning Speed (Receiver Mode typ.)
- Band A, Quasi-Peak, dwell time 1 s: 3 s
- Band A, Quasi-Peak, dwell time 1 s: 5 s (QC DSP-UG)
- Band B (150 kHz - 30 MHz) 9 kHz peak detector, dwell time 100 ms: 0.1 s
- Band B, Quasi-Peak, dwell time 1 s: 3 s
- Band B, Quasi-Peak, dwell time 1 s: 5 s (QC DSP-UG)
- Band C/D (30 MHz - 1 GHz) 120 kHz peak detector, dwell time 10 ms: < 1 s
- Band C/D (30 MHz - 1 GHz) 9 kHz, peak detector, dwell time 10 ms: < 2 s
- Band C/D Quasi-Peak, dwell time 1 s: 20 s
- Band C/D Quasi-Peak, dwell time 1 s: 10 s (QC DSP-UG)
- Band E (1 GHz - 6 GHz), dwell time 100 ms: 4 s
- Band E (1 GHz - 6 GHz), dwell time 100 ms: 2 s (QC DSP-UG)

Weighted real-time Spectrogram (Receiver Mode)
- Real-time bandwidth 162.5 MHz
- Peak, Quasi-Peak, Average, CISPR-Average, and RMS detector
- Time-domain fully gapless
- Frequency Step: Half of Bandwidth
- Minimum resolution in time 5 ms (depending on number of points)
- Zoom & Pan to Select Frequency band of interest
- Spectrum (2D & 3D), 16.78 m. colors
- Time-domain, Frequency Domain (Marker selectable)
- Delta-Marker in Time- and Frequency Domain
- Save and Load Measurements, Visualization, Post-processing and Evaluation

Time-domain Analysis (RF - Oscilloscope)
- Bandwidth 1 GHz
- Sampling rate 2.6 GS/s
- 16 Bit resolution
- 32000 Samples
- Trigger, Post- and Pre- Trigger function, Amplitude Trigger

Tracking generator (Option MG-UG)
- MG-UG1G: 9 kHz – 1 GHz
- MG-UG3G: 9 kHz – 3 GHz
- MG-UG6G: 9 kHz – 6 GHz
- MG-UG20G: 9 kHz – 20 GHz
- MG-UG40G: 9 kHz – 40 GHz
- MG-UG XE: Control of external signal generator
- Synchronous and fast swept
- Normalization for Transducer Factors (export function)

Remote control / Interfaces
- Ethernet/LAN (1 GBit and 100 MBit)
- Remote Control Command Set according to SCPI Standard
- USB 2.0, RS232, PS/2, Audio out for AM/FM Demodulation, VGA, HDMI
- GPIB (with Option GPIB-UG)

Display / User Interface
- Resolution 800 x 600 Pixel, 8.4", True Color (16,78 m. colors)
- Touchscreen

Power Supply
- 230 V +/- 20% 50 Hz, 110 V +/- 10% 60 Hz
- Power consumption (typ.): 120 W to 150 W

Temperature range / EMC
- 15° - 40° C (min.)
- Emissions according to DIN EN 55011
- Immunity according to DIN EN 61000-6-2 (10V/m)
- Inputs matched
- Mains harmonics according to EN61000-3-2

Mechanical stress
- Sinusoidal vibration: 5 Hz to 150 Hz, max. 1.8 g
- Random vibration: 0.5 g from 55 Hz to 150 Hz, in line with EN 60068-2-6
- Shock: 40 g shock spectrum, in line with MIL-PRF-28800F, class 3

Weight (ca.)
- TDEMI® X1: 15 kg
- TDEMI® X3: 18 kg
- TDEMI® X6: 18 kg
- TDEMI® X18: 20 kg
- TDEMI® X26: 20 kg
- TDEMI® X40: 25 kg

1 FFT-based measuring instrument according to CISPR 16-1-1, MIL-461 and other EMC standards. Sometimes called time-domain scan.
TDEMI® X Specifications

**Spectrum Analyzer**

**IF Bandwidths**
- 3 dB Bandwidth: 1 Hz – 30 MHz
- 1, 2, 3, 5 Steps
- Small Step Size (145 Steps) for Channel Measurements
- 6 dB Bandwidths: CISPR, ANSI: 200 Hz, 9 kHz, 120 kHz, 1 MHz
- 6 dB Bandwidths MIL/DO, ANSI: 10 Hz, 100 Hz, 1 kHz, 100 kHz, 1 MHz

**Video Filter**
- Relative IF Bandwidth:
  1, 1/2, 1/5, 1/10, 1/20, 1/50, 1/100, 1/10000
- Detectors: MaxPeak, MinPeak, Sample

**Detector**
- Maxpeak, Average, RMS
- (Video Filter off) Dynamic Requirements according to CISPR 16-1-1 (Peak, AVG)

**Sweep time**
- Traditional Mode: 10 µs – 1000 s
- Multi-Channel Mode: 10 µs – 1000 s
- Definition via dwell time: 10 µs – 150 s
- Autoset Function

**Typical sweep time for Scanning**
- 30 MHz – 1 GHz: 40 ms (dwell time 2 ms) (120 kHz)
- 1 GHz – 6 GHz: 1 s (dwell time 0.5ms) (1 MHz)
- 30 GHz – 40 GHz: 3 s (dwell time 0.1ms) (120 kHz)

**Multi-Channel Mode**
- Speeding up the Measurement by:
  - Factor 32768
  - Factor 65536 (Option QCDSP-UG)
- Number of Points measured in parallel:
  - 32768
  - 65536 (Option QCDSP-UG)
- Reduction of Dead time:
  - Factor 32768
  - Factor 65536 (Option QCDSP-UG)
- Real-time Analysis and Evaluation Bandwidth:
  - 162.5 MHz
  - 325 MHz (Option QCDSP-UG)

**Display and analysis Functions**
- Measurements against Masks and Limit Lines
- Parameters as carrier to noise ratio, occupied bandwidth, spurious emission, APD, CCDF
- Export of Data
- Analysis of IQ Data (Option IQ-UG)
- Trace Points 8.000.000

**Real-time Spectrum Analyzer**

**Analysis Settings**
- Automatic Selection of the Settings
- STFFT Resolution: 32768 Points
- STFFT Resolution: 65536 Points (Option QCDSP-UG)
- Real-time Analysis Bandwidth 162.5 MHz
- Real-time Analysis Bandwidth 325 MHz (Option QCDSP-UG)
- Time-domain fully gapless
- Frequency Step: Half of Bandwidth
- Minimum resolution in time 5 ms (depending on number of points)
- Zoom & Pan to Select Frequency band of interest
- Analysis of History

**Display and analysis Functions**
- Spectrogram (2D & 3D), 16.78 m. colors
- Time-domain, Frequency Domain (Marker selectable)
- Delta-Marker in Time- and Frequency Domain
- Save and Load Measurements

**IF Bandwidths**
- 3 dB Bandwidth: 1 Hz – 30 MHz
- 1, 2, 3, 5 Steps
- Small Step Size (145 Steps) for Channel Measurements
- 6 dB Bandwidths CISPR, ANSI: 200 Hz, 9kHz, 120 kHz, 1 MHz
- 6 dB Bandwidths MIL/DO, ANSI: 10 Hz, 100 Hz, 1 kHz, 100 kHz, 1 MHz

**Video Filter**
- Relative IF Bandwidth:
  1, 1/2, 1/5, 1/10, 1/20, 1/50, 1/100, 1/1000, 1/10000
- Detectors: MaxPeak, MinPeak, Sample

**Detector**
- Maxpeak, Average, RMS
- (Video Filter off) Dynamic Requirements according to CISPR 16-1-1 (Peak, AVG)

**Noise Floor**
- Preselection (in front of preamp) active, Average Detector
  - 9 kHz – 150 kHz: < -150 dBm
  - 1 MHz – 30 MHz: < -162 dBm
  - 30 MHz – 1 GHz: < -166 dBm
  - 1 GHz – 6 GHz: < -165 dBm
  - 6 GHz – 9 GHz: < -157 dBm
  - 9 GHz – 13 GHz: < -157 dBm
  - 13 GHz – 18 GHz: < -152 dBm
  - 18 GHz – 26.5 GHz: < -147 dBm
  - 26.5 GHz – 33 GHz: < -149 dBm
  - 33 GHz – 40 GHz: < -147 dBm
- LNA on, Preselection on/off, Average Detector
  - 9 kHz – 150 kHz: < -150 dBm
  - 1 MHz – 30 MHz: < -162 dBm
  - 30 MHz – 1 GHz: < -166 dBm
  - 1 GHz – 1.1 GHz: < -163 dBm
  - 1.1 GHz – 6 GHz: < -165 dBm
  - 6 GHz – 9 GHz: < -157 dBm
  - 9 GHz – 13 GHz: < -157 dBm
  - 13 GHz – 18 GHz: < -152 dBm
  - 18 GHz – 26.5 GHz: < -147 dBm
  - 26.5 GHz – 33 GHz: < -149 dBm
  - 33 GHz – 40 GHz: < -147 dBm
# TDEMI® X Options

## Main Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>F, Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSC-UG</td>
<td>2-Channel oscilloscope function, DC – 1 GHz, Frequency range extension down to DC</td>
<td></td>
</tr>
<tr>
<td>MIL/DD-UG</td>
<td>Start frequency 10 Hz, decade bandwidths: 10 Hz, 100 Hz, 1 kHz, 10 kHz, 1 MHz</td>
<td></td>
</tr>
<tr>
<td>QCDSP-UG</td>
<td>Enhanced DSP Unit, boosting system calculation power, Increase of measurement speed for receiver and spectrum analyzer, Extension of real-time analysis bandwidth to 325 MHz.</td>
<td></td>
</tr>
<tr>
<td>MIL/DO-UG</td>
<td>Start frequency 10 Hz, decade bandwidths: 10 Hz, 100 Hz, 1 kHz, 10 kHz, 1 MHz</td>
<td></td>
</tr>
<tr>
<td>645M-UG</td>
<td>Real-time Bandwidth 645 MHz, Quasi-Peak and CISPR-AVG parallel in real-time spectrogram mode More increase of measurement speed (Requirement: Option QCDSP-UG)</td>
<td></td>
</tr>
<tr>
<td>ULNA-UG</td>
<td>Ultra Low Noise Amplifier, additionally integrated for ultra low noise floor</td>
<td></td>
</tr>
<tr>
<td>PRLNA-UG</td>
<td>Preselection Low Noise Amplifier System</td>
<td></td>
</tr>
<tr>
<td>MG-UG</td>
<td>Tracking generator</td>
<td></td>
</tr>
<tr>
<td>LSN-UG</td>
<td>Controller for measuring accessories, TTL signals (+5V), e.g. for automated control of LISN</td>
<td></td>
</tr>
<tr>
<td>LISNCable-UG</td>
<td>Customized cable for auxiliary measurement equipment, e.g. LISN or triple loop antenna</td>
<td>H, Z</td>
</tr>
<tr>
<td>KB-UG</td>
<td>Compact keyboard incl. touchpad</td>
<td>H</td>
</tr>
<tr>
<td>TT-UG</td>
<td>Transport trolley for TDEMI</td>
<td>H</td>
</tr>
<tr>
<td>DM-UG</td>
<td>AM/FM demodulator</td>
<td>S</td>
</tr>
<tr>
<td>ZF-UG</td>
<td>IF analysis</td>
<td>S</td>
</tr>
<tr>
<td>IQ-UG</td>
<td>IQ data analysis</td>
<td>S</td>
</tr>
<tr>
<td>RG-UG</td>
<td>Report generator including analysis of subranges</td>
<td>S</td>
</tr>
<tr>
<td>CRMS-UG</td>
<td>CISPR-RMS-AVG detector</td>
<td>S</td>
</tr>
<tr>
<td>APD-UG</td>
<td>APD measuring function according to CISPR 16-1-1, report generator, limit lines</td>
<td>S</td>
</tr>
<tr>
<td>CLICK-UG</td>
<td>Click rate analyzer, measurement of 4 frequencies in parallel</td>
<td>S</td>
</tr>
<tr>
<td>CAL-UG</td>
<td>Calibration by the manufacturer according to ISO17025, incl. certificate and documentation of values 24 Months</td>
<td></td>
</tr>
<tr>
<td>CALD-UG</td>
<td>DAkkS Calibration by accredited lab according to DAkkS, incl. certificate and documentation of values 24 Months</td>
<td></td>
</tr>
<tr>
<td>EM64k</td>
<td>Automation Software Suite</td>
<td></td>
</tr>
</tbody>
</table>

additional customized options are possible upon request  M

F: Upgradeable, integration at manufacturer site necessary
Z: Additional costs for exchange
H: Delivery of hardware
S: Software installation
M: e-mail request to info@tdemi.com

Calibration interval: 24 Months (given only due to the request of customer)
FULL & PRE COMPLIANCE

X&G Series

**SPECIAL FEATURES**
- Real-time Spectrum Analyzer
- Oscilloscope
- Signal Analyzer

**INFO**
- [X] Extreme
- [G] Standard

**PRE COMPLIANCE**
- TDEMI® EMI Receiver
- Upgradeable to Full Compliance

**FULL COMPLIANCE**
- TDEMI® EMI Receiver

**SPECIAL FEATURES**
- Real-time Spectrum Analyzer
- 12V Power Supply & Battery Pack

**INFO**
- [M] Mobile
- [M+] Mobile Plus

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**X&G Series**

**Multi GHz** 645 MHz

Real-Time Scanning [X Series] Real-Time Bandwidth [X Series]

325 MHz 162.5 MHz

Real-time Bandwidth [X Series] Real-Time Bandwidth [X&G Series]

**INFO**

DC - 1/3/6/18/26.5/40 GHz

Frequency Ranges

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**M&M+ Series**

162.5 MHz

Real-Time Bandwidth [M&M+ Series]

10 Hz -1/3/6 GHz

Frequency Ranges [M&M+ Series]
Established in the year 2007, the company GAUSS INSTRUMENTS is manufacturer of highest performance EMC test equipment and provides advanced EMI test solutions pushing your product development and testing capabilities ahead, and speeding up your time to market cycles. With GAUSS putting the turbo in EMC since 2007, product certifications as well as pre-certification tasks have become as simple as they had never been before. Across all over the world we provide our unrivaled products, advanced test solutions, and services – together with a local service partner of our worldwide network of highly qualified and dedicated team and partners.

GAUSS INSTRUMENTS traces its technical roots to basic research on short time Fourier analysis and synthesis begun in the 70’s. In the early 2000’s the founders of GAUSS INSTRUMENTS invented a measurement technology combining time-domain and FFT based techniques and superheterodyne technology in a massively parallel topology - the so called TDEMI® Technology which has become the new state-of-the-art in the world of EMI testing in the meanwhile. TDEMI® Technology is a registered brand and patented technology of GAUSS INSTRUMENTS. It is provided to you only by GAUSS or its’ official certified local partners. Joint research projects were performed in the field of time-domain measurements of electromagnetic interferences (EMI) together with well-respected research institutes and universities. Official metrology labs, testing and certification institutes, as well as leading automotive OEMs and many other blue chip companies selected GAUSS as innovative cooperation partner and reliable solution provider for their demanding test requirements during market certification as well as product development but also research investigations. Over the past two decades about 100 publications, technical papers, white papers and journal articles were published on selected topics of time-domain EMI measurements and EMC testing as well as intelligent methods for automated testing. As inventor of the TDEMI® Measurement Systems which use ultra high-speed analog-to-digital converters and pretty much advanced real-time digital signal processing methods we enable ultra fast tests and measurements for electromagnetic compliance that fulfill the increasing demands for measurements of today’s ever increasing density and complexity of electronic equipment and systems.

And our innovation continues - combining our deep knowledge of real-time digital signal processing, millimeter, and microwave technologies to develop receiver and analyzer solutions combining and blurring the lines between previously discrete test instruments while delivering speeds and analysis capabilities several orders of magnitude greater than any other measurement equipment available. Combining both the advantages of the ‘old’ analog and the ‘new’ digital world we keep your testing up-to-date and beyond - pushing it to the next level and ready prepared for the future coming.

Today GAUSS offers a wide range of solutions from DC to 40 GHz for all kind of test requirements in the world of emission testing – full compliance solutions as well as pre-certification solution or even customized solution perfectly fitting to your specific requirements pushing your testing capabilities ahead. We provide customized signal processing solutions based on our well-proven hardware and DSP platforms, as well as unique software solutions. With a strong knowledge in real-time and digital technology, millimeterwave and microwave technology we develop systems that are absolutely outstanding in the field of test and measurement. E. g. the fastest real-time FFT based measuring instruments on the planet with a full compliance real-time analysis bandwidth of 645 MHz as well as classical superheterodyne technology to name a few only of our outstanding and outperforming features for full compliance testing and signal analysis.

It is our true passion to develop and to produce highest quality and highest performance instruments made in Germany. With leading-edge technology we’re fulfilling all the today’s requirements of complex measurement tasks and beyond. Our dedicated goal and ultimate passion is to provide our customers with all the additional benefits and full competitive advantages of accelerated testing, the optimum measurement procedures, unrivaled measurement speed and accuracy - all together at the same time. Empowered by our leading test solutions and patented TDEMI® Technology, we’re boosting the capabilities of today’s product development and significantly speeding up the time to market of your products. Thus, your product certification as well as pre-certification challenges become just a walk-over now!

Feel the experience and make your life easy!

Driven by our ultimate mission: Smarter testing for a smarter world.
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