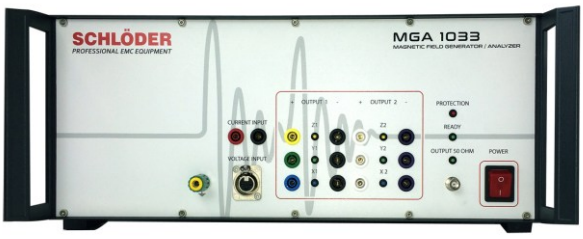
MGA 1033

Magnetic Field Generator - Analyzer

IEC / EN 61000-4-8, ISO 11452-8,
MIL-STD-461, Automotive a. o.

- Magnetic field tests and measurement DC to 250 kHz
- Complies to all relevant EMC, automotive and military standards
- Magnetic field strength up to 1000 A/m at 1000 Hz
- Fully automated tests with optional triaxial Helmholtz coil.



With self-calibration!
Integrated spectrum analyzer!

Overview

The MGA 1033 is a compact test system for generating and measuring magnetic fields in the frequency range from DC to 250 kHz. The integrated high-power amplifier allows the high field strengths required by numerous military and automotive standards to be easily achieved.

In combination with the triaxial Helmholtz coil MGA HCST 50-28, field strengths of 1000 A/m can be generated in the frequency range from DC to 1 kHz. The test is extremely convenient: due to the triaxial design, the fields are generated fully automatically in all three spatial axes - the test object no longer needs to be rotated.

The MGA 1033 consists of three main modules:

- Signal generator (DC - 250 kHz)
- Power amplifier (800 W output power, DC - 1 MHz bandwidth)
- Spectrum analyzer (16 bit, 1 MS/s sampling rate)

All modules can be used like single units. Although originally developed for the measurement and generation of magnetic fields, the MGA 1033 can be used for a wide range of measurement and testing applications.

Key facts

- Consisting of the following modules: signal generator (DC - 250 kHz), power amplifier (800 W output power, DC - 1 MHz bandwidth) and spectrum analyzer (16 bit, 1 MS/s sampling rate)
- **Tests with magnetic field requirements for the following standards:** ISO 11452-8, MIL-STD-461, IEC/EN 61000-4-8, SAE J1113-2, SAE J1113-22, Ford ES-XW7T-1A278-AC, PSA B217110, Renault 36-00-808, DC-11224, DC-10614 and similar standards. **Standards are subject to constant adaptations and extensions. Therefore, please ask which requirements are placed on your device and we will check whether and with which additional devices these requirements can be realized.**
- Measurements and tests according to the following **standards** additionally implemented **in the application software:** MIL-STD-461 (CE101, CS101, CS109), EN 61000-4-16 and IEC / EN 61543
- **Application software** for Microsoft Windows with preset parameters/limit values, transfer of own routines possible, data transfer from external multimeter via serial port
- Extensive range of accessories: coils, adapters, coupling devices

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Technical data

Analyzer

Voltage input (Analyzer)	
Frequency range	DC - 250 kHz
Input impedance	1 MΩ / 50 Ω switchable
Connector	XLR, unbalanced (1 ground, 2 +, 3-)
Max. input voltage	100 V continuous (attenuator autoset at overvoltage); 10 V at 50 Ω
Gain	-20/0/20/40 dB preamplifier 0/20 dB ADC amplifier self-calibration with ultra stable on-board reference
Current input	
Frequency range	DC - 250 kHz
Shunts	10 mΩ / 1 Ω / 100 Ω
Max. input current	20 A continuous (overload protection) 1 Ω and 100 Ω shunt are protected additionally by an 1.5 A fuse
Connector	4 mm safety jack (+, -)
Measurement range	20 A, 10 A, 1 A, 100 mA, 10 mA, 1 mA automatic offset and gain self-calibration with ultra stable on-board reference
AD-converter	
Resolution	16 Bit
Sampling rate	1.0 MS/s
Aliasingfilter *(filter may be switched off)*	0.01dB Tschebyscheff filter, fg = 260 kHz;

Generator	
Frequency range	DC - 250 kHz
Output impedance	50 Ω
Connector	BNC, unbalanced
Signal	sine wave / square wave / triangular / DC
Amplitude	0 – 10V AC, -10V - +10V DC
Resolution	12 Bit (2.5 mV) switchable -20 dB attenuator Self-calibration with ultra stable on-board reference
Amplifier	
Frequency range	DC – 1 MHz
Connector	4 mm safety jacks (output) BNC, unbalanced (input)
Current	16 Arms
Voltage	50 Vrms / 75 V_{DC}
Distortion (DC – 100 kHz, load ≥ 4 Ohm)	< 0.10 %
Voltage amplification	10 ± 0.1 % (± 0.01 % / °C)

General data

EUT control / Connector	9-pin Sub-D; RS-232
Connection to PC	USB
Temperature range	0 to 40 °C
Warm-up time	15 min
Housing	19“ subrack or desktop case
Mains voltage	115 / 230 VAC ± 10%, 50-60 Hz
Dimensions (W x H x D)	449 mm x 177 mm x 580 mm
Weight (shipping)	approx. 40 kg (net 34 kg)

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Options – Accessories	
Coupling transformer	As an accessory for the MGA 1033, the **MGA CT B-50/100** is the complete solution for immunity testing. It can be used universally **for MIL-STD-461 CS101** as well as for other standards such **as DO-160**. In addition to the usual 50 A variant, a 100 A type is also available. A coupling transformer is used for testing conducted immunity on mains cables in accordance with MIL-STD-461 CS 101. Due to the high DC voltage on the mains side, a differential amplifier is built into the coupling transformer, which enables simple measurement of the coupled differential voltage.
Loop sensor/ radiating loops	Field coils are required to generate magnetic fields. Magnetic fields are measured using sensor coils. The coils are manufactured according to the definitions in MIL-STD 461.
Hall sensor	A **Hall sensor** is available for measuring the DC magnetic field generated by the standard **MGA RL-120** and the **MGA RL 120-80** modified for high field strengths. The sensor is built into the round sensor housing and can be plugged directly onto the 50 mm spacer. The measurement and supply is realized with the basic device MGA 1033 via a fixed connection cable.
Helmholtz coils	Helmholtz coils are the ideal instruments for generating homogeneous magnetic fields. The **MGA HCS 50-28** and **HCST 50-28** models generate field strengths from 1000 A/m to 1 kHz. This requires the MGA 1033 with the optional compensation board.
Further accessories	Other coupling transformers etc.

Options – Accessories	
Coupling transformer	
MGA CT B-50 MGA CT B-100	Coupling transformers for tests according to **MIL-STD-461 CS101 and DO-160** with MGA 1033; contains differential amplifier; incl. plug-in power supply and cabling
MGA CT El 192	Coupling transformer for tests according to **MIL-STD-46 CS101 and DO-160** with the MGA 1033
Loop sensor/ radiating loops	
MGA LS 040	40 mm Sensorspule nach **MIL-STD-461 (RE101);** inkl. Kabel 3 m
MGA RL 120	140 mm radiating loop (Ø-Outer) acc. **MIL-STD-461 (RS101);** incl. cable 3 m
MGA RL 120-80	200 mm radiating loop (Ø-Outer) acc. **MIL-STD-461 (RS101);** incl. cable 3 m
MGA Hall sensor	Hall effect sensor with fixed connection cable for **MGA RL 120** and **MGA RL 120-80**
MGA LS 133	133 mm loop sensor acc. **MIL-STD-461 (RE101);** incl. cable 3 m
MGA RLS 133	133 mm loop sensor/radiating loop, incl. cable set

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Options	
Helmholtz coils	
MGA HCS 125-75	Helmholtz coil (1 axis) with centre tap; for tests acc. to **MIL-STD-461, SAE J1113-22 and others;** incl. cable set 3 m
MGA HCS 100-60	Helmholtz coil (1 axis), for tests according to **MIL-STD-461, SAE J1113-22 and others**, incl. cable set 3 m
MGA HCS 50-28	Helmholtz coil (1 axis) with centre tap; for tests according to **MIL-STD-461, SAE J1113-22 and others**; incl. cable set 3 m
MGA HCST 50-28	Triaxial Helmholtz coil with center tap; for tests according to **MIL-STD-461, SAE J1113-22 and others**, incl. cable set 3 m
Divers	
MGA 1032	Compensation board for MGA 1033; for compensating the coil inductance of **MGA HCS 50-28** and **MGA HCST 50-28** (for field strengths up to 1000 A/m up to 1000 Hz)
MGA ISS-19	Coupling device for tests according to **DO-160**, Section 19 (19.3.1, 19.3.2, 19.3.3, 19.3.4) in connection with MGA 1033; incl. power supply and cabling
MGA SO CE101	Software plug-in **MIL-STD-461 CE101**
MGA SO CS101	Software plug-in **MIL-STD-461 CS101**
MGA SO CS109	Software plug-in **MIL-STD-461 CS109**
MGA SO 4-16	Software plug-in **EN 61000-4-16**
MGA IT – 06/-16/-20	Isolation transformers 6 /16/20 A, **MIL-STD-461**
Coupling networks & accessories for tests according to **EN 61000-4-16**, please request separate data sheet!	

Scope of delivery	
MGA 1033	Generator/Analyzer incl. power cable, USB stick with software, XLR/BNC cable, USB cable, 100 Ohm/2 W resistor, 2 cables with MC connectors, user manual

All information regarding appearance and technical data correspond to the current state of development at the time of release of this data sheet. Errors and technical changes excepted. 092606