EM TEST

Welcome to the world of EMC

The Company

EM TEST

From its foundation in1987, EM TEST is known world-wide for high quality, customer-oriented EMC testing products. The integration of customers' requests, new test standards, and new technology has led to the growing success of our equipment. At EM TEST, we focus our considerable knowledge and experience on our testing equipment and application support for the benefit of our customers.

Our sales network, based on local representatives and partners. Headquartered in Reinach, Switzerland, and Kamen, Germany, EM TEST has sales and service facilities in Switzerland, Germany, France, Great Britain, Ireland, Italy, the United States, Sweden, Japan and China as well as 50 agents and 25 distributors in al,pst every continent.

The continuous growth and success of EM TEST is proof that we are on the right path. Today, EM TEST is one of the leading suppliers of EMC generators for conducted immunity testing in the world.

The idea

EM TEST was founded on July 1st, 1987. Uwe Flor, Germano Taddio and Harald Kunkel, 3 people with several years of experience in development, production, application and sales of EMC test generators formed a team to unite their knowledge in one company. From the beginning, innovation was the guideline for all their efforts; they wanted to supply test generators built on the latest level of technology and different from any competitor's devices. To this day, an EM TEST generator is immediately recognisable.

The founders agreed: it is not the test generator that is of interest but the test set-up, the test itself, and the test results

Manager team Switzerland:
Germano Taddio, Harald Kunkel

El.-Eng. Harald Kunkel was working for Haefely from 1980 until 1987. He was in charge of the development of high voltage impulse generators and the commissioning of these installations world-wide. The first Burst generator with an output voltage of 8kV was developed by Harald Kunkel as well.

Manager Germany: Uwe Flor

El.-Eng. Germano Taddio was working for Sprecher & Schuh from 1979 until 1981 as a development engineer. The following three years he was working for W+W Elektronik. In 1984 he joined Haefely and was leading the International Sales Support until 1987 when EM TEST was founded.

EM TEST Organisation

EM TEST AG

Tasks	Development Production Quality assurance Service, Calibration
Sales	South Europe North & South Amerika Application support
Service	Repair Calibration
EMC Lab.	Customer Service EMC Engineering Training &Seminars
Standard work	National International

EM TEST GmbH

Tasks	Development Marketing Design Service, Calibration
Sales	Germany North-Europe Asien
Service	Repair Calibration
EMC Lab.	Customer Service EMC Engineering Training &Seminars
Standard work	National

EM TEST GmbH, Germany

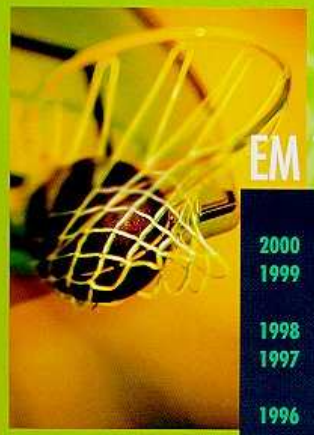
EM TEST GmbH, Kamen

MessTec, Berlin

Scopes	Automotive Industrial Receiver CISPR 16 Artificial Networks Antenna
Tasks	Development Production Quality assurance Service, Calibration Application support
Service	Repair Calibration
Standard work	National

For the historians

We set important Steps in the Development of EMC Test Equipment



EM TEST - for more than 10 years

2000 EM TEST will continue its innovations in EMC test technology.

1999 Modular Surge Simulator VCS500-M for up to 8kV test voltage (or up to 4kA peak current) IEC 61000-4-5.

1998 The UCS500-M/6 is the first modular-built compact simulator for up to 6.6kV.

1997 The UCS500-M/4, first modular-built compact simulator for conducted immunity testing up to 4.4kV (IEC 61000-4-2/ -4/ -5/ -8/ -9/ -11/ -12).

1996 CWS500 Simulator for RF conducted disturbances induced by radio-frequency fields.

1995 UCS500, the first compact simulator for conducted immunity testing (IEC 61000-4-4/ -5/ -11).

1994 The 200 series, automotive test generators with an innovative operation philosophy.

1993 The 500 series, generators with the innovative operation philosophy for industrial electronics.

1992 The first fully electronic Burst simulator for up to 8kV test voltage (IEC 61000-4-4).

1991 The first fully remote-controlled test set-up for conducted immunity testing (IEC 61000-4-4/ -5/ -11).

1990 The first fully remote-controlled test set-up for automotive electronics (ISO 7637, DIN 40839).

1989 The first fully electronic Burst simulator for up to 4.5kV (IEC 61000-4-4).

1987 The first Burst simulator with sphere gap for up to 8kV (IEC 801-4).
The first simulator for electrostatic discharges with exchangeable discharge circuits (IEC 801-2).

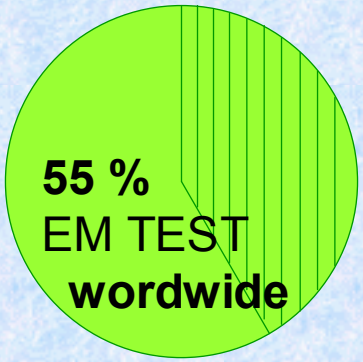
Leading position
... each product a world news

EM TEST

The history of EM TEST

EM TEST is known world-wide for high quality, customer-oriented EMC testing products. The integration of customers' requests, new test standards, and new technology has led to the growing success of our equipment. Our development department works very closely with our experienced application engineers. We also put great emphasis on customer feedback as well. Not only do these factors provide for excellent user-interfacing, they also allow us to adopt to specific customer requirements and needs. Please, take a look at the history of EM TEST for an example of the highly innovative spirit of our company.

Market share

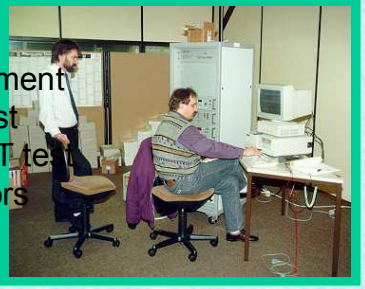


Highlights that testify the progress

10 Years of EM TEST

1997

Foundation



Development of the first EM TEST test generators

Innovation

Innovation

Most compact ESD tester of the world

2000

Presence at exhibitions world-wide...

...introducing new concepts

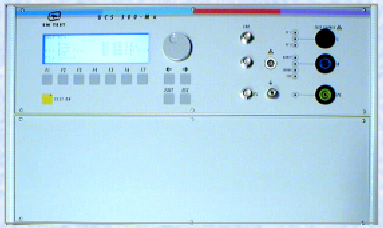
1st fully automated test set-up 1990

1st Burst generator 1987

1st ESD Simulator 1987

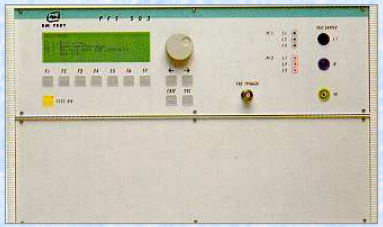
Largest Range of Immunity Testers World-wide

- **more than 40 different standard simulators**
- **special custom-made simultors**
- **turn-key projects**
- **full service**
- **more than 30 seminars + workshop each year**



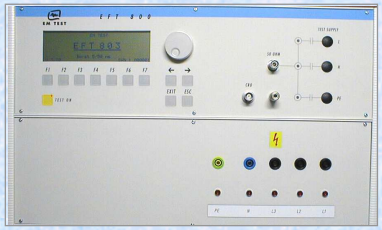
UCS 500 M6 Compact Simulator

VCS 500 M6 Surge Simulator



PFS 503 Power Fail Simulator

TSS 500 Surge Simulator, Telecom



EFT 503 Burst /3 phase coupling network

ITP, Immunity Test Probes

Capacitive Coupling Clamp

dito, electrostatic discharge simulator

AN 200 acc. to ISO 7637/DIN 40839 part 1

Innovative Technology

- Use of state-of-the-art technology
- Compact design
- Modular built test systems
- Integrated measurement facilities, pre-programmed test routines
- Use of semi-conductive switches for all test pulses
- Integrated safety features (interlock, warning lamp)

Fully Automatic Analysing System for Harmonics and Flicker

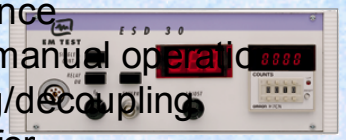
Application-oriented Testing

- The technical data not only meet the standard requirements but allow to test the real phenomena.
- Most compact design - easy to carry
- little space required in the laboratory
- Large-size LCD displays
- All test parameters visible at one glance
- Easiest manual operation
- Coupling/decoupling networks for

CWS 500, Continuous Wave Simulator

MPG 200, Micropulse Simulator

EFT 200, Burst Simulator acc. ISO 7637



ESD 30, Electrostatic Discharge Si

Our Industrial Test Products

- The Compact Solution for Conducted RF Immunity Testing CWS 500
  We are sure that our CWS 500 will convince you to perform conducted RF immunity tests with this highly efficient and convenient method.

EM TEST

PRODUCTS

- Compact Simulator IEC Standards UCS 500 M
  The most efficient, most application-focused, smallest, light-weighted compact generator for conducted immunity tests. Read more about testing the conducted immunity according to EN 50082 and EN / IEC 61000-4-2/ -4/ -5/ -8/ -9/ -11/-12/ -29.

- Electrostatic Discharge Simulator ESD 30
  Versatile, mains powered electrostatic discharge simulator according to IEC/EN 61000-4-2 with modular discharge circuits for other specifications such as VDE, ECMA and NAMUR to generate air discharge pulses of up to 30 kV and contact discharge pulses up to 9 kV.

- Electrical Fast Transients / Burst Simulator EFT 500/800
  A family of dedicated, high-efficient test generators to simulate the most common EMC phenomenon, the Electrical Fast Transients/Burst. This phenomenon is caused by switching of relays and switching in the mains power supply system both in the public low voltage supply as well as in the medium and high voltage supply networks. As a matter of fact the repetition frequency of the single spikes within a burst can go up to some hundred kHz. This has been encountered when we have designed our burst generators. Their spike frequency can be set to 500 kHz (EFT800) or even 1 MHz (EFT500). This enables you to properly test the susceptibility level of microprocessor controlled electronic devices to assure the quality of your products even far above the EMC standard requirements.

- Surge Test Generators VCS 500
  Surge transients occur e.g. due to lightning strokes or due to switching of big loads in the public power supply system. These transients are high-energy pulses and may have a destructive influence to devices or components exposed to such transients. Our VCS500M series are designed to generate these transients up to 8 kV/4 kA. In its different versions it is suitable for component tests and for tests on power supply lines, signal/data lines and telecom lines acc. to various standards.

S 500

elecom industry EM TEST offers different generators and options to cover standards such CCITT, ETSI etc. Read more about the different models and there area of application. 503 No matter if you have to test single phase or three phase products we have a most ese applications.

Other Industrial Test Products

Our range of products covers a wide spectrum of testing procedures:

ESD acc. to IEC 61000-4-2	UCS 500, ESD 30
Burst acc. to IEC 61000-4-4	EFT 500, EFT 800, UCS 500
Surge acc. to IEC 61000-4-5	UCS 500, VCS 500
Telecom Surge acc. to IEC 61000-4-5, ETSI 300 046,	ETSI 300 047 and CCITT TSS 500
Power frequency magnetic fields acc. to IEC 61000-4-8	UCS 500
Pulsed magnetic fields acc. to IEC 61000-4-9	UCS 500
Power Fail acc. to IEC 61000-4-11 and IEC 61000-4-29 (draft)	PFS 500, PFS 503, UCS 500
CE marking	Harmonics & Flicker acc. to IEC 61000-3-2 /-3 /-4/-5

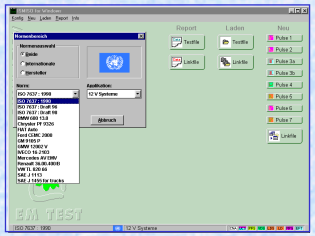
Development and Production
EM TEST Switzerland

EM TEST

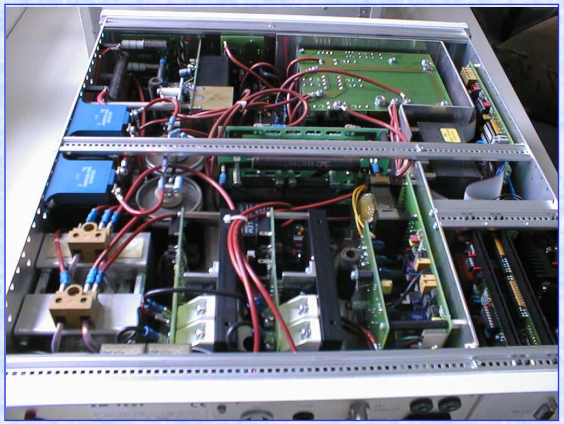
Technical assistance and customer support

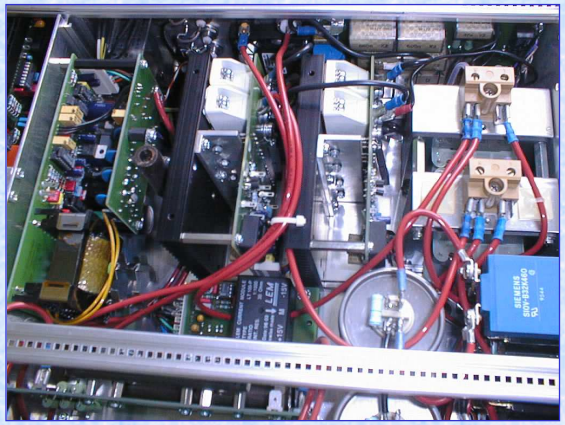
In the future, EM TEST will continue to be the optimum solution for your testing needs, always offering you the most efficient, most economic, and most exacting test equipment. Our innovative spirit is alive.

Generators



Windows Soft





EM TEST

Nothing to hide
- have a look inside -

Top-Level Quality Demand

- Production acc. to ISO 9001
- Long-duration tests in a heat chamber at 38 d
- all necessary safety requirements are well cor
- Carefully selected components are extensivel their suitability
- EM TEST run their own calibration and service

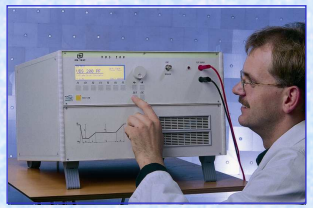
Service

EM TEST

EMC Services

Laboratories in Switzerland and Germany

- Emission measurements and immunity testing acc. to IEC, EN, ISO, FCC, ...
- PCB layout design
- Product design
- Grounding/shielding conception
- Component evaluation
- On-site services



EMC Seminars and Workshops

Both, in Switzerland and Germany, seminars for IEC und ISO, harmonic and flicker are held regularly

Customer specific or application oriented seminars and workshops

Topics: CE marking,immunity test procedures, PCB laout design, conducted radiation measurement

Harmonics and Flicker

ISO 7637

Workshop

Calibration

EM TEST operates calibration laboratories in Switzerland and Germany. Fully traceable calibraiton of pulse generators of all manufacturers acc. to EN 61000-4-x, ISO 7637 and 12TR. We take the respnsiblity for the supervision of the measuring equipment according to DIN EN ISO 9001-4/11. We offer calibration cerificates including measuring data record list

EM TEST and national / international device standards

Mr. Flor is an activ member of German national standards **VDE.**

He is also activ in **special commitees** and **workinggroups**

Mr. Kunkel is an activ member of international standards **IEC, IEC TC 77** and **ISO 7637**

Mr. Taddio is an activ member of Swiss national standards **CES**

He is also activ of the European standards **CENELC**, **IEC TC 77** and **CISPR**

International standards play an import-ant role in EM TEST development efforts. EM TEST is an active member of both national and international standard development committees.

This allows a head-start in the develop-ment of new products and the redesign of existing products, ensuring that EM TEST will always offer you the solution for both existing and upcoming standard requirements.

World-wide sales

Our sales network based on local representatives and partners, has reached almost every continent. The continuous growth and success of EM TEST is proof that we are on the right path.

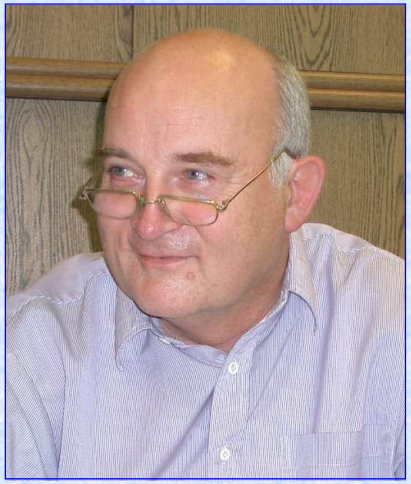
Today, EM TEST is one of the leading suppliers of EMC generators for con-

Mr. Liu Xiaohua
Manager EM TEST

Mr. Roland Spriess
Support internation

messtec

EM TEST



Mr. Schiemann is the General Manager of MessTec GmbH.

He has over 25 years of experience in emission testing

Messtec is a subsidiary company of EM TEST Germany and is engaged in developing and manufactoring of full compliance test receivers, i.e. the **Ultra Compact Receiver UCR 3000M**.

3 Examples of Custom-made Test Equipment / Test Systems

EM TEST

<u>Regulierungsbehörde für Telekommunikaton und Post, Germany</u>
Central test laboratory in Germany for the supervision of the CE conformity declaration. EM TEST was selected from all offering suppliers and delivers a system for the measuring of harmonics and flicker as well as a fully automated test set-up for conducted immunity to this customer in September 2000.
Particulars: - 3-phase harmonics and flicker analyzing system with a nominal current of up to 32A.
- Fully automated test set-up for tests acc. IEC 61000-4-4/-5/-8/-9/-11 for test objects with a nominal current of up to 32A.

<u>Nokia in Finland and Germany</u> (Manufacturer of mobile phones)
EM TEST has delivered several fully automated test set-up‘s to Nokia in 1999.
Particulars: Fully automated test set-ups acc. to ISO 7637 and other international car manufacturers‘ specifications. Nominal current of the test object of up to 100A.

<u>Salt Mining, Strassbourg, France</u> (Big French minig company)
EM TEST delivers several test generators to the test laboratory of Salt Mining in August 2000.
Particulars: Burst generator up to 8 kV
Surge generator up to 10 kV / 5 kA
3-phase coupling/decoupling network for power supply voltages of up to 1,000V.

messtec

EM TEST

A great assortment of accessories

- Artificial networks up to 350 A, 1000 V
- BiLog Antennas
- Log Periodic Antennas
- Loop Antennas, activ and passiv
- Passive Probes
- Absorbing clamp
- Etc.

International Reference List

EM TEST

Automotive

Audi AG, Germany
BMW AG, Germany
Jaguar, **Daimler Chrysler AG**, Germany, USA
Ford, USA, **Jaguar**, United Kingdom
General Motors GM, USA
Mira, United Kingdom
Porsche AG, Germany
Rolls Royce, United Kingdom
VW AG, Germany
Fiat, Italy
Magnetica Marelli, Italy
Valeo, France + Italy
Iveco, Italy
Siemens Rolm, USA
Philips, France
KIA, Korea
ITT Automotive Europe GmbH, Germany, USA
Dewoo, Korea

Household & Industry

Siemens AG, Germany + Switzerlan
Canon GmbH, Germany
Cetecom GmbH, Germany
Matsushita Kotobuki, Japan
Matra Marconi Space, United Kingd
Assemssment Service, United King
Panasonic GmbH, Germany
Sony Manufacturing, United Kingdo
PTB, Germany
ABB, Switzerland
TOCHIGI Prefecture Inst. of Indust
Samsung Electronics Co. Ltd., Ge
Senton GmbH, Germany
VDE, Germany
CESI, Italy
Schindler, Switzerland
Philips DAP, Netherland
BCIQ, Taiwan