

Editorial

Dear emv-customers,

Promptly for this year's *electronica* in Munich, we have prepared the english issue of our company magazine. This is especially intended for our international customers. In the time of globalization, emv GmbH has not stood still. We too have thought of the future and reacted flexibly to the international situation. In this way, emv will remain as a reputable and expert supplier for many companies, who extend their development and production abroad.

Currently the headlines are full of the international financial crisis. In these times of turbulences at the international financial markets, quality products and innovative technology once more could turn out as critical factors for solid business development. Visit us at *electronica* and learn more about our latest innovations and new product lines. We are looking forward to seeing you!

Your emv Team

electronica 2008: Focus on AC-DC-Power and Test Systems for Hybrid and Electric Drives

Besides the core topic of EMC and RF Testing our presentation at *electronica* 2008 (11th - 14th November) dedicated to our AC-DC-Power product line. emv-partners AeroVironment and California Instruments will be co-exhibiting at our joint booth in hall A1, A1.660.

Spotlight on AC-DC-Power

California Instruments (CI) is a leading manufacturer of programmable power sources for laboratory applications and present amongst others the model MX45 with extended functionality. Our Partner AeroVironment delivers High Power DC-Test systems for hybrid vehicle and battery testing and will show a demo unit for the first time at a trade show in Europe.



electronica 2008
components | systems | applications

EMC and RF Testing

In this field we will present the extended TDEMI product family, as novel series of measurement instruments for fast emission measurements in time-domain. The TDEMI-Series is developed and manufactured by GAUSS Instruments, a Spin-Off of the Technical University of Munich. emv-Partner AR RF/Microwave Instrumentation will present their comprehensive program including rf and microwave amplifiers and instrumentation program at the neighbouring booth A1.563.

System competence: Whenever it gets complicated

With the rising complexity of electronic products the complexity of requirements for test stations and measurement systems rises too. In opposition to this, companies are facing less and less resources, cost pressure and shortage of technically qualified staff. emv reacts to this by providing individually tailored system solutions, not only in the field of EMC. Also in the field of AC-DC-Power

we deliver turnkey battery test stations, including DC Source, Measurement Instrumentation, Software and climatic chamber. We take over the technical concept of the system, project management, system integration, software modifications and supplier management for our customers. Customer's staff is released from tasks not pertaining to their original field. The emv-Project manager is acting as single point of contact for the customer. Learn more about our system service and visit us at *electronica* in Munich in **hall A1, booth A1.660**.

emv international: One Source for Standardized Measurement Instrumentation

emv now represents many of our partner manufacturers not only in Germany, where our company headquarter is located, but also in many Central and East European countries, e.g. Czech Republic, Slovakia, Poland, Romania and Hungary. Many of our customers operate increasingly internationally, with production and development going on in different countries. Such customers benefit particularly from our international sales scope.

With production and development centers in different countries, it is often necessary to build identical measurement sites with standardized measurement technique. This ensures that test measurements and results are directly comparable throughout the company. With emv GmbH as

partner such international projects can be implemented reliably by a single supplier. Your experienced polyglot contacts for projects in Central and East Europe are Zuzana Wood (sales engineer, left) and Beate Anderl (sales assistant, right).



International Websites

The two internet sites www.emvgmbh.com and www.ac-dc-power.de have pages in German and English.

The English versions are particularly for the benefit of our customers in Central and East Europe, who can find there complete information about our products and services.

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Fast Emission Measurements in Time-Domain

By means of Time Domain Measurement Systems with real-time analysis, the time needed for emission measurements can be drastically shortened, compared to traditional measurement methods. This doesn't just save time for the EMC measurements throughout the development process. Additionally, intermittent disturbances that are hardly detectable with the traditional methods can be reliably recognized and evaluated. So the use of EMC time domain measurement systems also greatly improves the measurement quality.



TDEMI-System

EMI-Measurements Dramatically Faster

TDEMI, compared to conventional measurement systems, speeds up interference emission measurements up to 1 GHz by up to 4.000 times (dependent on bandwidth). Traditional radio interference measurement receivers capture the radio signal stepwise at one frequency after another. So emission measurement from 30 MHz up to 1 GHz can take as much

as 8 hours, according to the test plan. With a time domain measurement system the same measurements take only 2 minutes! This is accomplished by continuous evaluation of interfering signals for several thousand frequencies in real-time.

Measurement time is a vital factor for EMC test houses and the EMC laboratories of e.g. OEM manufacturers in the automobile industry, not just because the test costs are reduced. The reduced time for measurement makes it practicable to carry out control measurements during the development process, so that EMC problems get detected much sooner. Much shorter time-to-market can be achieved and delays in introducing new products to the market can be avoided. At the same time costs are reduced, since superfluous EMC corrections are avoided and the test costs for accredited laboratories are reduced.

Intermittent Interference Reliably Detected

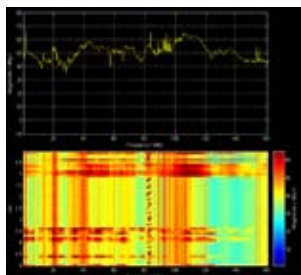
Intermittent interference signals cannot be reliably detected and measured using traditional radio interference measurement receivers, which need 20 or 30 minutes for a scan. With a time domain measurement system with real-time analysis (TDE-

MI) such reliable detection and measurement is achieved. Spectrogram mode enables real-time analysis in peak, average, rms, and detector modes with CISPR band widths. Such interferences are captured and reported, however briefly they show up.

These measurement methods are particularly important for laboratories involved in the evaluation of test objects such as microwave ovens and induction heating hobs, where intermittent interference is known to occur. The conventional method normally consists of a quick first measurement scan followed by checks of the quasi peak values. This method does not currently allow correct measurement of brief interferences or of interferences with drifting frequencies. The TDEMI system performs a single measurement for all frequencies, with detection of quasi peaks, in a couple of minutes. The capture time is a matter of seconds. This makes complete high quality measurement of such short intermittent disturbances possible within a couple of minutes.

Quick Checks for Various Operating Conditions

For products like household appliances and fluorescent lamps, with variable operating conditions, interference emissions can be measured using the traditional time consuming method only at great cost (if at all). Some machines, for instance kitchen mixers, would hardly survive constant operation for hours at a time. Emissions caused by switching, as with a washing machine, could only be detected by chance, or by extremely time consuming measurements. The time domain measurement system TDEMI enables measurement of such a test object in any operating environment in next to no time. The brief measurement time avoids the undesirable effects of test object warming. TDEMI permits highly accurate measurement of broadband and narrow band interference. The TDEMI system is produced by GAUSS Instruments, a spin-off from the Technical University Munich. emv GmbH is the international sales partner for the TDEMI Series. The TDEMI is available in two version from 9 kHz to 30 MHz for conducted emissions and from 150 kHz to 1 GHz.



Spectrogram mode

Interference-free Data Transmission: now for ESD and BCI Tests

Two new options significantly extend the usage of interference-free data transfer systems of the DOtech product family. With the new options, these systems can also be used for ESD and BCI tests.

The ESD option permits ESD handling and function tests up to 8 kV (contact) and 15 kV (air) discharges. The BCI option permits BCI interference robustness tests up to 400 mA interfering current. Customers already using one of these

models can upgrade their existing devices with the new options. The BCI option can be installed on site by customer staff. Each transmission system comprises two send/receive units, connected by a fibre optic cable. Signals can be passed in both directions. The DOtech product line was originally developed from experience in the automotive industry for low-feedback measurements and for signal transfer under extreme EMC conditions. Further Information and all technical data sheets can be found at www.emvgmbh.com.



DOtech Type K73
send / receive unit

Constructing Testbeds for High Performance Batteries

The increasing importance of batteries in hybrid and electric vehicles has brought enormous investment in research and development of high performance batteries. Besides the requirements of the tests themselves, the high performance means that many safety and economic aspects must also be taken into account.

Requirements for Test Set Up

Depending on the application, testbeds for high performance batteries must satisfy various requirements. In one case high energy density and low cost are required, in another case rapid development of high power input and output. Or again an optimum compromise between these is required. Before the tests themselves, during the formatting of the cells, extensive sensor technology and data capture and automated power switches are needed. High performance DC-sources and DC-loads often have to cover the needs of multiple laboratories and test objects, in order to use them economically. Batteries for hybrid and electric vehicles are required to give good reliable performance in all expected usage scenarios. So batteries are tested at temperatures from deep in the minus degrees up to sweltering heat. In general, many different systems have to be connected with a central control computer. In the automobile, this usually functions via a CAN-Bus. The high performance DC systems must simulate rapid load change in accordance with the partly standardized CAN-Bus usage cycle. Alternative software environments include Vector, dSpace, and LabVIEW.

Safety Requirements

The high voltages (up to 900 V with the AV900 test system) and currents (up to 1000 A with the ABC-1000 test system) and the high electrical energy in

the battery packs require redundant buffered layout of safety-relevant components, such as power switches and monitoring and control electronics. Loading and discharging resistors with appropriate performance are used. They support particularly high current surge robustness of the battery packs for energy input (when braking), and energy output (when accelerating). The driving cycles and test programs last hours or even days, so automated testing must run reliably without being monitored. Staff and laboratory equipment must be at least as well protected as the test object and the testbed. The very high voltages and in case of an electric arc the direct currents that are hard to stop, the high energy capacity of the batteries and above all the potential danger of a lithium fire or explosion must be completely controlled through appropriate isolation and other measures taken in advance. Sensor technique, protective gas, cooling, fire extinguishing systems, automatic fire brigade alarming and further measures permit safe working.

Economic Considerations

When large assemblies or complete vehicles with HEV batteries undergo EMC testing, the vehicles must be supplied with electric power in an EMC laboratory under reproducible conditions. This supply can come from high performance DC sources. If the EMC lab and the battery testbed are close together, the same sources can supply both, thus avoiding double investment. With these battery testbeds, a lot of power is usually wasted, and must then be disposed of by the air conditioning. The high performance DC systems from AeroVironment can feed 90% back into the mains supply, with considerable cost savings for power and air conditioning.



DC Test system ABC-170CE

Short delivery time:

The high power dc test systems from AV have a current delivery of ca. 10 weeks.

MX Series as Simulation and Test Tool for Drives and Solar Inverters

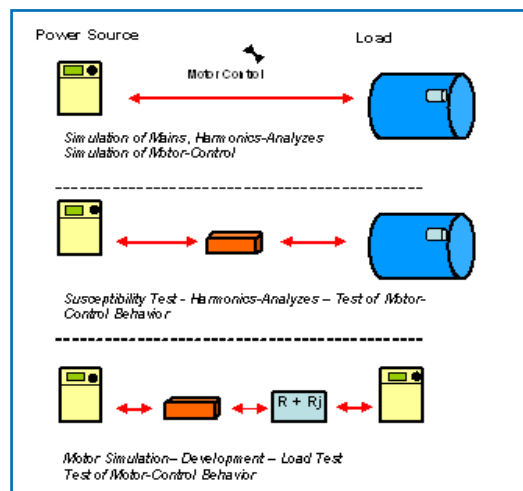
The MX Series AC/DC source, based on a 4-quadrant amplifier, can feed back flowing energy from a device under test into the mains. This saves costs for testing of high power equipment and systems in drive and inverter engineering.

The outputs of the 4-quadrant amplifiers are potential-free, so that reciprocal switching of the outputs is possible. Parameterization of voltage, frequency, phase, maximum current and (within limits) impedance gives the user every freedom.

The MX-Series can power, test and simulate every component of a complex dynamic systems. Particularly in the development of rapidly rotating drive systems, simulation tools serve to avoid excessive

expenditure in the development environment. The sources are used for photovoltaic / inverters and also provide the required high degree of frequency precision (within 0.01 Hz).

With MX sources, you can simulate and test all parts of a complete electric power supply system even down to the minimum power.



emv GmbH is certified according to ISO 9001:2000

The VDE has certified our Quality Management System according to the international standard ISO 9001:2000. The certificate attests, that emv has initiated and uses a quality management system that satisfies the requirements of this standard.

It is valid for project management and sales of electronic measurement systems, measurement instrumentation and accessories, as well as for technical service of such equipment. The standard ISO 9001:2000 describes the requirements on a quality management system to guarantee the quality of products and service. The aim of the standard is to

help companies efficiently to organize effective processes, to suit them to the needs and wishes of the customers and to keep improving them.

„With this Certification, we see the consciousness of quality, which has always been cultivated in emv, objectively confirmed by an outside agency. Even if certification according to ISO 9001:2000 is unusual for a sales company of our size, this certification represents a major step towards meeting future even more stringent requirements of our customers, towards increasing our system business and mastering growth.“ (Dr. Wolfgang Winter, Head of Quality) ■

Extended Issue of the „Orange Book of Knowledge“ from AR

The first issue of this comprehensive handbook on EMC and Radio Frequency measurement techniques came out in May 2007 and was quickly out of print. Now the new, reworked and extended issue is available.

Honestly ... Can you say at once how many Watts make 50 dBm and what changes IEC61000-4-3 edition 3 introduced? The Orange Book of Knowledge from AR answers these questions and many more. Besides technical and application reports on various themes from EMC and radio frequency measurement technique, the latest issue now contains a DVD with video product demonstrations. The contents include practical information e.g. about test configuration for pre-compliance tests during development and EMC tests according to



standards, and about the basics of amplifier construction. They also include practical tools such as a conversion table Watt/dBm/Volt.

The Orange Book of Knowledge is a useful reference book for

any EMC or RF engineer. Amplifier Research has led the world for 35 years in the development of RF and microwave amplifiers. The Orange Book of Knowledge is provided free by emv GmbH. (Order by using our fax form or under www.emvgmbh.com) ■

Reliable Solid State Amplifiers up to 20 GHz

AR RF/Microwave Instrumentation has produced dramatic new developments in their S-Series microwave amplifiers. They now replace the TWT amplifiers up to 20 GHz. Two new models cover frequencies continuously from 8 GHz to 20 GHz using solid state technology.

The new amplifiers are available in two performance classes with 5 Watts (5S8G20) and 20 Watts (20S8G20). They generate reduced harmonics compared with TWT amplifiers and have 100 % load tolerance. This makes them ideal for EMC and mobile phone test applications. Until now, frequencies over 10 GHz could only be amplified using TWT amplifiers. These require

much more maintenance than solid-state amplifiers. They must be used regularly to avoid „gassing“ of the traveling wave tubes. Solid state amplifiers are also more reliable than TWT amplifiers and do not need expensive spare parts, such as a traveling wave tube. So they greatly reduce the cost-of-ownership. Frequencies up to 8 GHz are covered by the S4G8-Series and up to 10.6 GHz by the S4G11-Series, giving power ranges from 1 to 120 Watts.



For 22 years, emv GmbH in Taufkirchen, Germany has been responsible for sales and service of AR Amplifiers in Germany. More recently this has been extended to include Central- and East European countries. ■



Clever thanks to emv!

We will gladly inform you by email about current offers and news about emv GmbH. Please complete our response fax.



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Please visit us on the Internet:

- www.emvGmbH.com
- www.emscreen.com
- www.ac-dc-power.de

Specialists for measurably better solutions



Please send technical information:

AR Orange Book of Knowledge

EMC and RF Testing Instrumentation

- RF Amplifiers
- Microwave Amplifiers
- Amplifier Modules
- Directional Couplers
- Pre-Amplifiers
- Antennas
- Antenna Masts / Tripods
- Turntables
- Dynamometers
- Field Probes
- Emission Measurement Instrument TDEMI
- Coupling Networks (Current Probes, BCI, CDN, Tube Couplers)
- Power Meters
- Magnetic Field Test Systems (EN61000-4-8/-9/-10)
- Line Impedance Stabilization Networks (LISN)
- EMC Scanner EMSCAN®
- EMC Software RadiMation®
- EMC Measurement and Control System RadiCentre®
- EUT Monitoring (DOtech)
- TEM-Cells/Stripline
- Lightning Test System (LTS)
- Signal Generators

Others:

Turnkey EMC Measurement Systems

Mobile Radio Testing Instrumentation

- Analyzers for Passive Intermodulation
- Filters/Bandpass Filters
- EMF Measurement Systems
- Spectrum Management and Interference Analysis Software

AC / DC Power Sources

- AC Power Sources
- DC Power Sources
- combined AC/DC Power Sources
- Electronic Loads
- High Power DC Sources/ Loads / EV Test Systems

Semiconductor Testers

- ESD
- Latch-Up
- TLP

Antenna Measurement Systems

- Near-field
- Far-field

High Power Amplifiers and Subsystems

- High Power Amplifiers
- Subsystems (High Power Microwave, High Power Electronics, High Voltage, Liquid Power Cooling)

We are planning to buy

- within 3 months
- within 3 to 6 months
- within 6 to 12 months

Budget

- is available
- is requested
- has not been planned yet

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- California Instruments
- Dare!!
- EMSCAN
- ETM
- FCC
- GAUSS Instruments
- HF-Technologie
- IDK
- Kathrein Austria
- MBtech EMC
- Nearfield Systems
- NK Elektronik
- RFspin
- Summitek Instruments
- Sunol Sciences
- ThermoFisher Scientific

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Please send technical information:

- Eavesdropping protected rooms
- Eavesdropping secured rooms
- Absorber Cabins
- Electromagnetic shielded Cabins
- Magnetic Shielding
- Mode-stirred Chambers
- Shielded Boxes
- Shielded Windows
- Shielded Tents

Services

- Shielding effectiveness measurements according to IEEE 299
- Maintenance
- Consulting

Others:

We are planning to buy

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- AST Hinderthür GmbH
- AST S.L.
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- Schirmtechnik Nord
- Schrödl Venhofen GmbH
- Statex Produktions- und Vertriebs GmbH

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