



ECAT[®]

EXPERT
COMPUTER-AIDED
TESTING

For Pulsed EMI
Immunity



KeyTek[®]

A **Thermo Voltek** Company

EMC: A BUSINESS ISSUE

As of January 1, 1996, virtually all electrical and electronic products sold in Europe must pass stringent electromagnetic compatibility (EMC) tests, per the European Union's EMC Directive.

The EMC Directive marks the beginning of EMC compliance requirements which are rapidly becoming global. Furthermore, these regulations are not static; they are already evolving in direct response to market pressures and new technologies.

EMC - A Primer

Today's electronic products - computers, communications equipment and other electronic goods - offer unprecedented performance. The speed and data capacity of these products are due in large part to high speed, low voltage digital circuitry used in most sophisticated electronics. As speeds increase, these high performance circuits become increasingly vulnerable to pulsed electromagnetic interference (EMI).

Historically associated only with radio frequency interference, today the definition of EMC has been expanded to include pulsed EMI threats such as ESD, EFT, SURGE and newer Power Quality Failure (PQF™) threats.

Without question, it is far less expensive to design EMC measures into products at the onset of development, than it is to re-design them later.

Pulsed EMI disturbances such as ESD, EFT, SURGE and PQF, both visible and invisible, range in intensity from lightning bolts to normal switch arcing, to small but potentially disastrous electrostatic discharges from the human touch, or even furniture. The blips and bumps caused by these sparks, typically involve very high power or extremely fast rise times. Switching operations and faults in the power distribution system may impact the very quality of ac power mains voltage on which virtually all electronic equipment depends.

KeyTek's ECAT® - Expert Computer-Aided Test - system and its totally integrated, upgradable modular architecture is the *only EMC test system available* today providing the means to address on-going global EMC regulations in a manner that's both technically advanced and economically feasible.

The precision with which ECAT® pulsed EMI tests are performed reduces overtest which may indicate unnecessary re-engineering and increased unit production expense due to over protection; it also eliminates undertest which can leave your equipment open to user rejection when standards are not met.

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MODULAR, FULL CAPABILITY EMC TEST SYSTEMS AND INSTRUMENTS FOR ESD, EFT, SURGE & PQF™

A result of over two decades of pioneering experience in the field of Pulsed EMI simulation and measurement, ECAT® - Expert Computer-Aided Testing - is a powerful test system for measuring and analyzing the vulnerability of electronic equipment and components to pulsed EMI hazards.



Basic ECAT® systems can simulate EFT, SURGE, PQF™ (Power Quality Failure) and ESD.

ECAT® is a truly unique and cost effective approach. It features a totally integrated modular architecture which enables manufacturers and designers of computers, communications equipment and other electronic products to easily and rapidly test for all pulsed EMI threats including pre-compliance, production sampling and final compliance.

ECAT® Gives You Flexible, Ready To Use Test Options

ECAT® gives you the option to purchase a complete integrated system for all pulsed EMI tests, or individual test modules which can be used as stand-alone testers. If you need to test for additional threats, or as standards change, ECAT® can be easily expanded or upgraded, reducing costly equipment obsolescence.

ECAT® systems and modules are delivered ready for immediate EMC testing and provide an unprecedented level of operating ease, accuracy and safety.



- **Proprietary Windows®-based Software Applications Package** - With ECAT®, it is no longer necessary to spend hours programming in order to run meaningful, accurate compliance tests. It is flexible enough to allow the user to quickly implement routines to meet both international and national compliance.
- **Virtual Front Panel™** - Retains all key operating parameters on screen during set-up and testing for manual operation.
- **FiberCom™** - Non-metallic fiber-optic interconnect eliminates risk of incorrect test results from detrimental field effects in the test area. Most importantly, it safely isolates the computer and the operator from the potentially hazardous test environment.
- **Multi-Level System Interlock Architecture** - Secure interlock system provides maximum safety via traditional hardwired external interlock, internal door and remote interlock control (for use on test chamber doors, etc.). Activating any of these will result in the removal of hazardous high voltage and EUT ac power supply. In addition, the system is capable of interrupting the power to the EUT in a flashover condition.
- **Single Output Port/Instant Mode Switching** - With this feature, an EUT is connected to a single output port for all pulsed EMI tests in certain sequences. Certain sequences will restrict sequence options. The need for re-booting the EUT or re-cabling to perform different tests is eliminated, providing the user with enormous flexibility and a substantial savings in test time.
- **AC Mains Current Monitoring** - System can monitor instantaneous, peak and rms values of EUT power mains input current before and after application of test pulses for valuable diagnostic and safety data.

Larger ECAT® systems can simulate multiple Pulsed EMI threats without re-configuring either the simulator or the EUT.

- **Accurate, Automatic Report Generation** - Hardware/software structure allows ECAT® to automatically generate complete, detailed test documentation, saving time and reducing the possibility of error.
- **Flexible, Economically Upgradable Modular System** - Stand-alone ECAT® instruments can be upgraded to additional capabilities at any time with the addition of economical modules; eliminating costly equipment obsolescence and redundancies.



Fully-expanded, multi-bay systems provide total capability - for ESD*, EFT, SURGE and PQF.

**via KeyTek's MiniZap ESD Simulator*

KEYTEK: THE PIONEER AND LEADER IN EMC TEST TECHNOLOGY

Because of the tremendous efforts of many competent EMC engineers, most electronic products rarely fail. Since 1975, KeyTek has been supporting quality and reliability efforts by supplying test equipment that faithfully reproduces many EMC threats.

Today there is a quiet revolution taking place in our industry. Product reliability has moved beyond the task of facing the threat of lightning and surge events towards the more demanding and subtle problems experienced by the proliferation of micro-based and software controlled products. This presents a new set of challenges for the EMC engineer. Specifically, the issue today is more than one of gross failure, but more importantly, one of product upset from data corruption.

All of us rely on very sophisticated systems every day. For example, data corruption from the use of a cellular phone could have potentially devastating consequences within an airplane's navigation system. The impact to a patient resulting from the electrostatic discharge disrupting a medical device is front page news. EMC in today's world means compatibility with the real world environment.

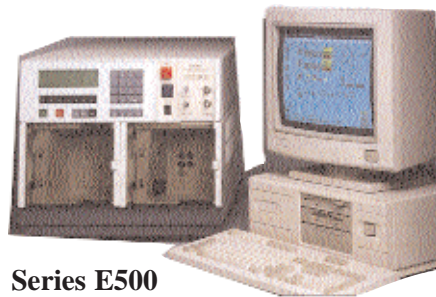
KeyTek provides EMC test systems that meet today's testing challenges.

ECAT[®] TEST SYSTEM COMPONENTS AND MODULES

Series E500 SURGE Simulators

KeyTek's Series E500 SURGE simulators provide repeatable, SURGE pulses with real waveform integrity.

- Waveforms meet all present mainstream standards including IEC 61000-4-5, ANSI C62.41, Bellcore 1089 and UL 1449. New modules are developed regularly.
- Peak voltage and current measurements accurate at the EUT.
- Automatically switches coupling modes on ac/dc lines including data and I/O communication SURGE testing.
- Surges can be placed at any point with respect to the ac voltage phase to insure repeatable, worst case scenario testing.



**Series E500
SURGE Simulators**

Series E400 EFT Simulators

KeyTek's Series E400 EFT simulators subject the EUT to EFT tests on the ac/dc mains as well as input and output cables.

- Accurately generates EFT pulse bursts with the correct exponential waveforms and test pulse durations to meet national and international standards, such as IEC 61000-4-4 and ANSI C62.41.
- Full control of pulse frequency within each burst and of burst repetition rate provides unparalleled coverage of EUT sensitivity.
- Unique Chirp[™] and 2 MHz burst frequency options simulate real world EFT events beyond the requirements of the standards.

MiniZap and Series 2000 ESD Simulators

ESD is the most common cause of failure in computer-based equipment. KeyTek's MiniZap and Series 2000 ESD simulators provide the means for a company-wide ESD test program throughout the R&D, QC, manufacturing and field engineering stages.

- Generates pulses which conform to the strictest verification procedures for national and international standards including IEC 61000-4-2.
- Allows worst case, real world True ESD[™] tests, as well as testing to standards.
- Provides both contact mode and air discharge testing, plus optional E & H Field diagnostics for comprehensive product testing.
- Vertical and horizontal planes for indirect ESD testing; real, direct and indirect furniture simulation are available options.

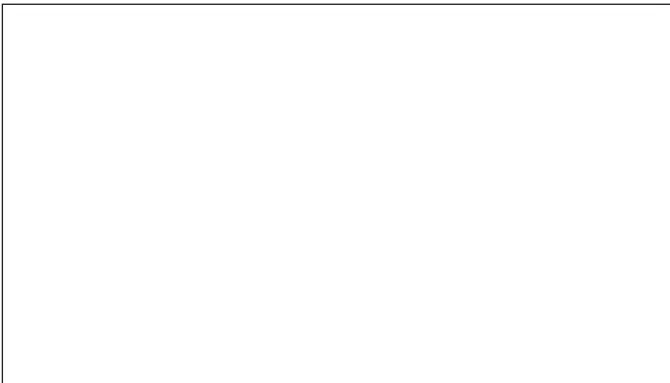
Series PQF[™] Power Simulators

Series PQF test instruments simulate and measure power mains voltage dips, interrupts, notches and swells.

- Complete capabilities for PQF immunity to national and international standards such as IEC 61000-4-11.
- No external equipment, such as variacs, is required.
- Supports real world inrush currents and switch times, eliminating invalid test results.
- Built-in automatic inrush line qualification for determining the ability of the ac mains to supply high inrush currents, in accordance with IEC 61000-4-11.

**Windows[®]
PQF Ware[™] Screen**

AUTHORIZED REPRESENTATIVE



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