



# Transient 3000

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# Brief Overview of Phenomena

Transient 3000 Test System generates EMC events that can be observed in the low power distribution system, telecommunication or data lines.

Transient 3000 Test System replicates the following phenomena:



## - Electrostatic Discharges (ESD)

A person becomes electrostatically charged by walking over an insulating floor surface. The capacity of the body can be charged to several kilovolts and is discharged when contact is made with an electronic unit or system. The discharge is visible as a spark in many cases and can be felt by the person concerned, who receives a „shock“. The discharges are harmless to humans, but not to sensitive, electronic equipment. The resulting currents cause interference or even component damage.



## - Electric Fast Transients (EFT) / Burst

Industrial measurement and control equipment nearly always use conventional control units containing relays or other electro-mechanical switching devices. Fluorescent lamp ballast units, insufficiently suppressed motors (hair dryers, vacuum cleaners, drills, etc.) are found everywhere in the public power supply. All of these are primarily inductive loads which generate interference when switched on or off. EFT events, can cause microprocessor units to malfunction or reset, with corresponding disruption to normal operation.



## - Combination Wave Generator (CWG)

Surge events can be generated by lightning phenomena, switching transients or the activation of protection devices in the power distribution system. A surge itself is influenced by the propagation path taken so that impulses from the same event may have different forms depending upon where a measurement is taken. Combination Wave Generators (CWG) simulate a surge event in power lines close to or within buildings. Mostly the disturbances are tolerable because they are single events.



## - Voltage Dips/Interrupts

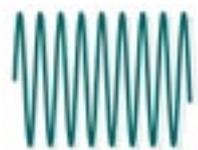
Voltage failures occur following switching operations, short-circuits, response of fuses and when running up heavy loads.

The quality of the electrical power supply is increasingly becoming a central topic of discussion. The interference sources in the mains, caused by electronic power control with non-linear components e.g. thyristors are used more frequently in domestic appliances such as hotplates, heating units, washing machines, television sets, economy lamps, PCs and industrial systems with speed-controlled drives.



## - Voltage Variations

Voltage variations are caused by continuously varying loads connected to the power network. The voltage change takes place over a short period of time and depends upon the load. Abrupt variations have the characteristic of a voltage dip with a slow return to nominal voltage.



## - Power Frequency and Pulse Magnetic Fields

AC current generates a steady magnetic field so that equipment, such as monitors, close to AC power lines could suffer interference.

Lightning strokes or short circuit fault currents in the power network can generate high level short duration magnetic fields.



## - Common Mode

Common mode disturbances originate from power line currents and return leakage currents in the earthing system. The disturbances are transmitted into equipment interfaces through capacitive, inductive or resistive coupling. The interference can appear on power and signal ports. Disturbance levels can be relatively high compared to the nominal value but are usually only of short duration.

# Applicable Standards

## International Electrotechnical Committee (IEC)

IEC 61000-4-2 (Ed2:2008): Testing and measurement techniques - Electrostatic discharge immunity test.

IEC 61000-4-4 (Ed2:2004): Testing and measurement techniques - Electrical fast transient / burst immunity test.

IEC 61000-4-5 (Ed2:2005): Testing and measurement techniques - Surge immunity test.

IEC 61000-4-8 (Ed2:2009): Testing and measurement techniques - Power frequency magnetic field immunity test.

IEC 61000-4-9 (Ed1.1:2001): Testing and measurement techniques - Pulse magnetic field immunity test.

IEC 61000-4-11 (Ed2:2004): Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests.

IEC 61000-4-16 (Ed1.2:2009): Testing and measurement techniques - Test for immunity to conducted, common mode disturbances in the frequency range 0Hz to 150kHz.

IEC 61000-4-29 (Ed1:2000): Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests.



## European Standard (EN)

The same standards are applicable as for IEC (see above).



## International Telecommunications Union (ITU)

K.44 (2003): Resistibility tests for telecommunications equipment exposed to overvoltages and overcurrents - Basic recommendation

K.20 (2000): Resistibility of telecommunication equipment installed in a telecommunications centre to overvoltages and overcurrents

K.21 (2003): Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents.

K.45 (2003): Resistibility of telecommunication equipment installed in the access and trunk networks to overvoltages and overcurrents.



## American National Standards Institute (ANSI)

C62.41 (1991): IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

# Test System Overview

## Test System Features

Transient 3000 CE Test System has many unique and outstanding features:

- Modular design, user configurable
- Environmentally friendly
- Humidity, pressure and temperature sensor measure lab environment
- Automatic frequency detection for mains synchronisation (50 to 400Hz)
- Internal web server
- Ethernet Port for control, communication and report generation
- USB Port: Secure transfer of files, test reports and service data
- Common Mode Disturbances DC to 150kHz 30V continuous, 300V short duration
- ESD 16kV air / 10kV contact discharge
- ESD 16kV continuous firing mode.
- EFT/Burst up to 4kV
- CWG surge up to 4kV/2kA
- AC Magnetic Field up to 1000A/m (with external antenna)
- Impulse Magnetic Field 1200A/m
- AC Interrupt 260V/16A
- AC DIP and VARIATION with internal, external variac or PS3 power supply
- DC Interrupt 110V/16A
- RS485 Port for control of external accessories
- Control of up to two external PS3 power supplies

## User Benefits

The technical excellence and many unique features translate directly into benefits for the user:

- Optimized investment. Feature expansion by on-site upgrades
- No down time: Modules removed for calibration
- Unparalleled reliability and system up-time
- Display information in any operating system with any web browser
- Customized test report, logo import, graphics, time and date
- Test report includes laboratory environmental conditions
- No proprietary software needed: HTML Report viewable with all browsers
- Active energy control system: Low power consumption, less noise, less heat
- Backwards compatibility: Existing accessories can be used with all models
- 400Hz CDN use for military and avionics testing
- Optimized for CE transient testing: Fulfills IEC basic standard requirements
- Clear menu overview: Structure automatically adjusts to hardware configuration
- Expansion to 3-phase test system up to 100A
- Operating history stored in generator for service
- Modern communication interfaces connect TRA3000 to the world
- Save operator time with the automated test routines and test report facility

## Generator

Transient 3000 is a technically advanced CE tester. The revolutionary design reinforces EMC PARTNER's position as a leading technology innovator in the field of EMC transient immunity testers.

### - Environmentally Friendly

With less than 50VA power consumption in standby mode and an energy management system that ensures only active circuits are powered, TRA3000 has an extremely low energy footprint. An optimized power consumption also ensures less heat is generated. Coupled to a ventilator with active speed control, noise emissions are drastically reduced. At only 28kg with all modules fitted, TRA3000 also requires less fuel for transportation. The completely modular design, reduces shipping requirements as only specific hardware needs to be sent for calibration. All components and circuits are fully RoHS compliant.

### - Modular Architecture

10 different configurations are possible. The unique system architecture enables a "plug-and-play" approach. On-board software automatically recognises the hardware and re-configures the menu structure, downloading module calibration data to ensure generator outputs are always correct. Capable of being equipped with ESD up to 16kV (requires EXT-TRA3000 E), EFT, CWG up to 4.4kV, common mode tests, AC dips/interrupts & variations plus DC interrupts.

### - Interface with the World

TRA3000 includes an Ethernet port for communication. It is no longer necessary to use proprietary software. Any PC with Ethernet port and internet browser can access test report and service data. An integrated web server presents data in a clear and easily manageable format. Secure data transfer can also be made using the USB interface and a memory stick.

### - Common Mode tester

A module of TRA3000, common mode hardware can be added on site to expand test capability to include IEC61000-4-16. The internal module uses a novel technique to generate common mode interference up to 30V in the range DC to 150kHz. Continuous mode testing can be programmed at fixed frequencies or as a sweep between 9kHz and 150kHz. Test levels are freely programmable to facilitate fault finding during the development phase. External hardware extends common mode levels to 300V for short duration tests.

### - Full range of accessories

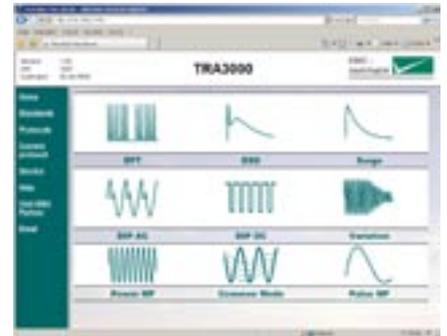
Backwards compatibility with all existing EMC PARTNER accessories. No redundancy ensures the best possible return on investment. A broad range of accessories enable testing to many applications including:

- Three phase EFT and SURGE up to 100A
- Three phase DIPS/Interrupts up to 75A
- Telecom signal lines, power contact and power induction
- Railway electronics and signaling testing
- Power sub-station control and protection tests
- Electricity meter tests
- and much more.....

TRA3000 includes control capability for up to two PS3 power sources. This easy to use power supply for common voltage/frequencies is directly controlled from TRA3000. Outputs can be selected between 230V/50Hz, 115V/60Hz, 230V/16.7Hz and 115V/400Hz and DC. PS3 can be used as the primary power source for any EUT.



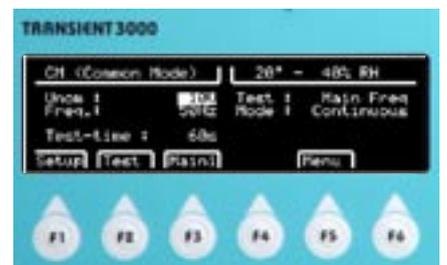
TRA3000



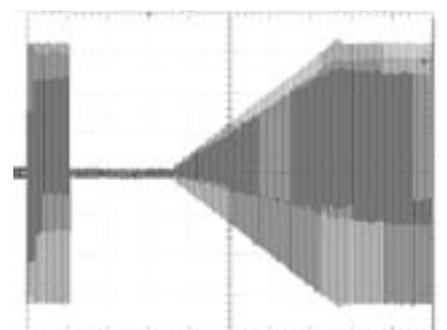
Integrated Web server



Ethernet and USB Ports



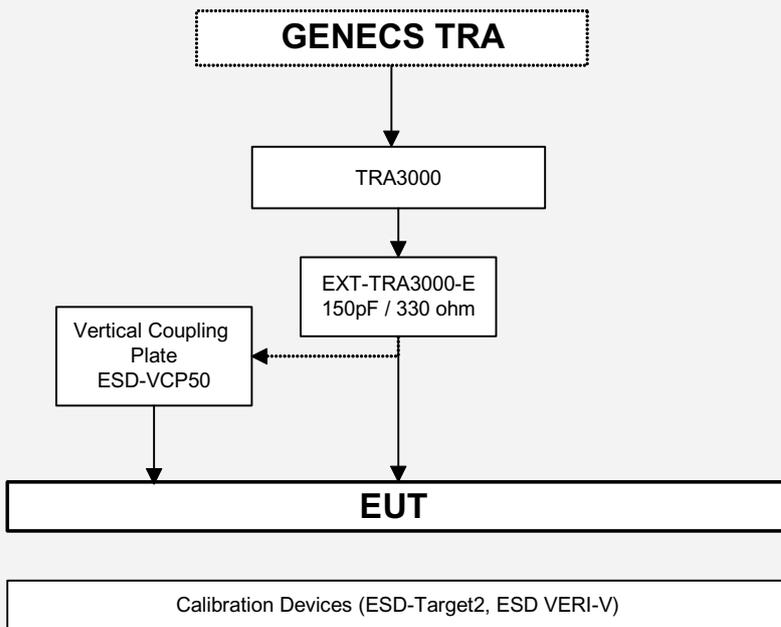
Common Mode Menu



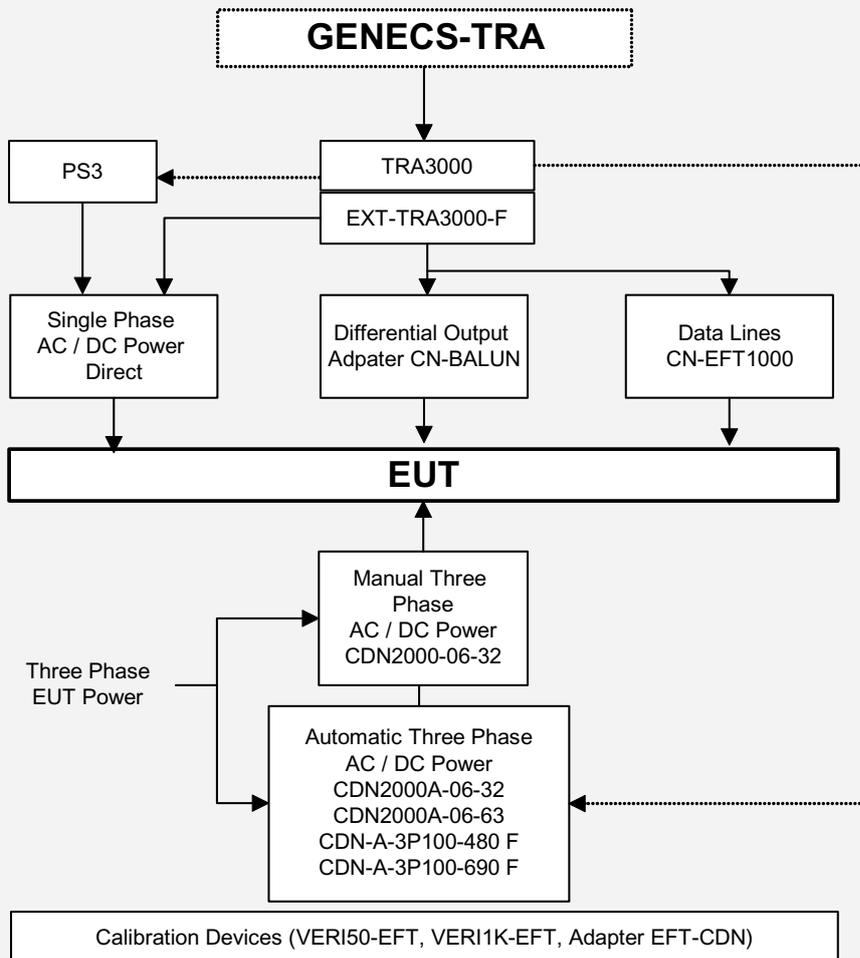
Variations with abrupt and slow changes

## Flowcharts

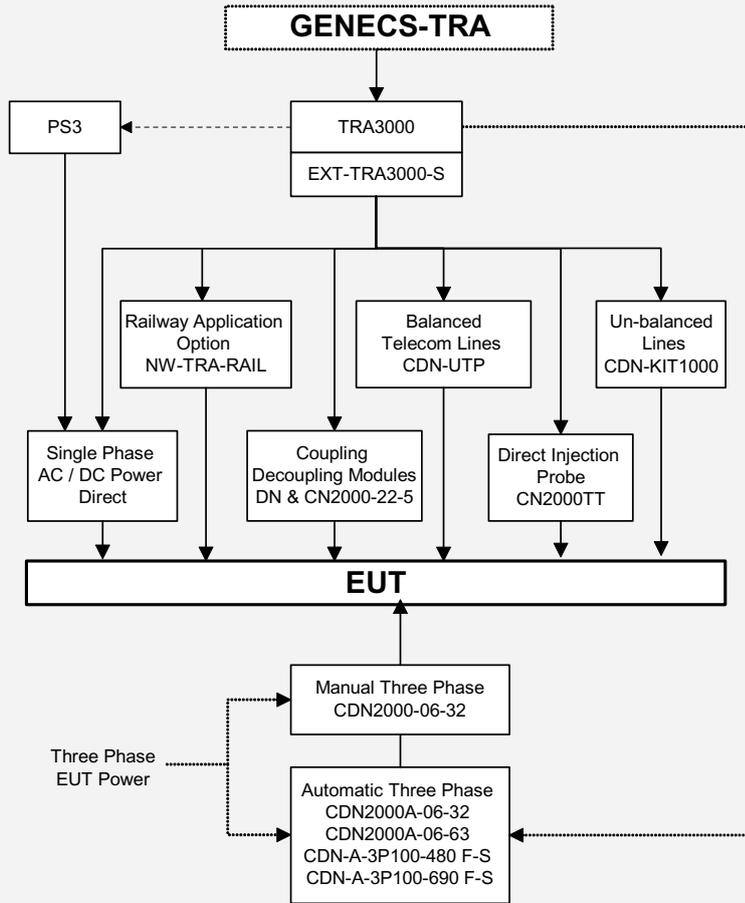
### ESD



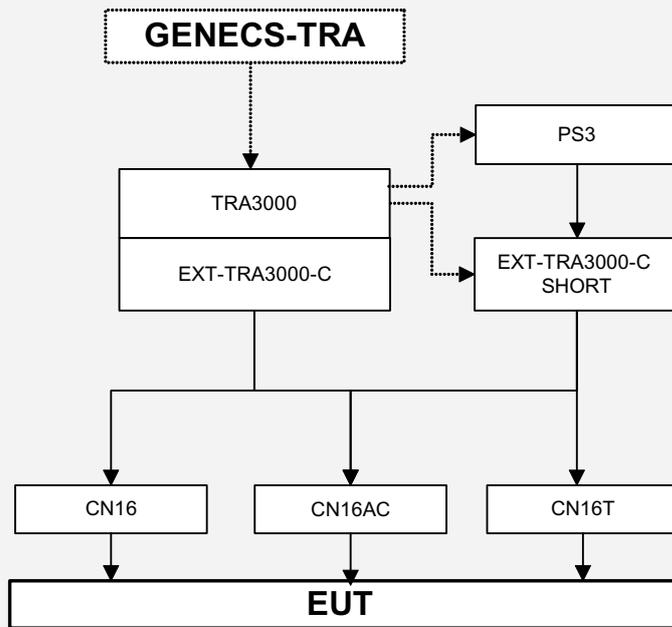
### EFT



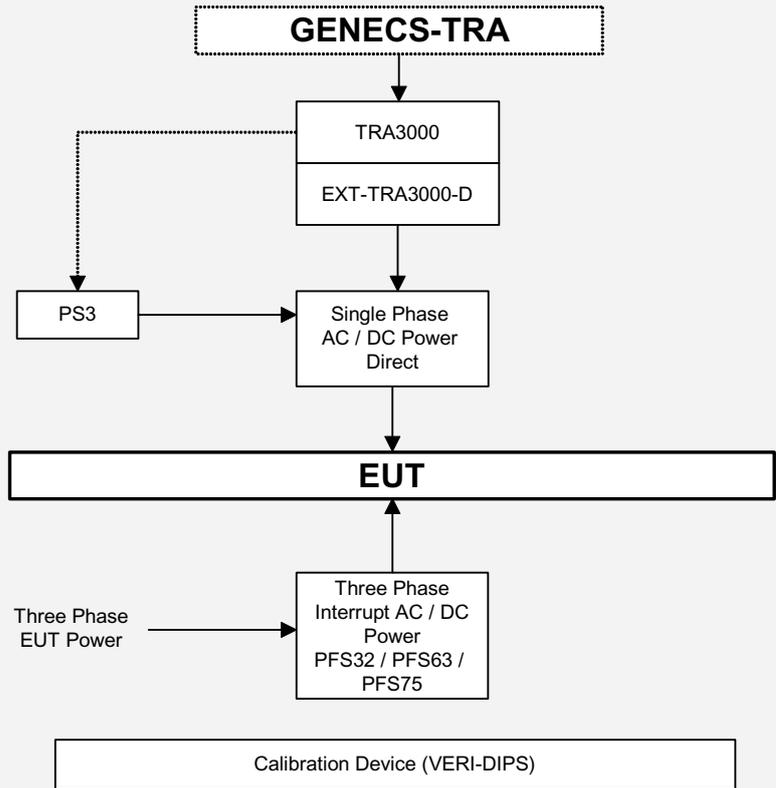
**CWG**



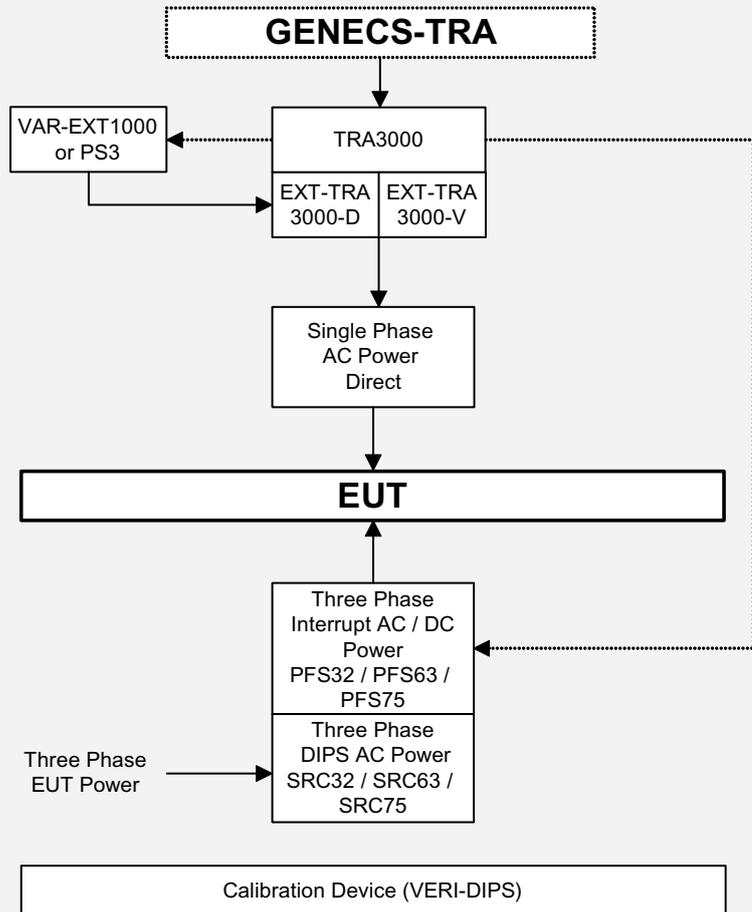
**Common Mode**



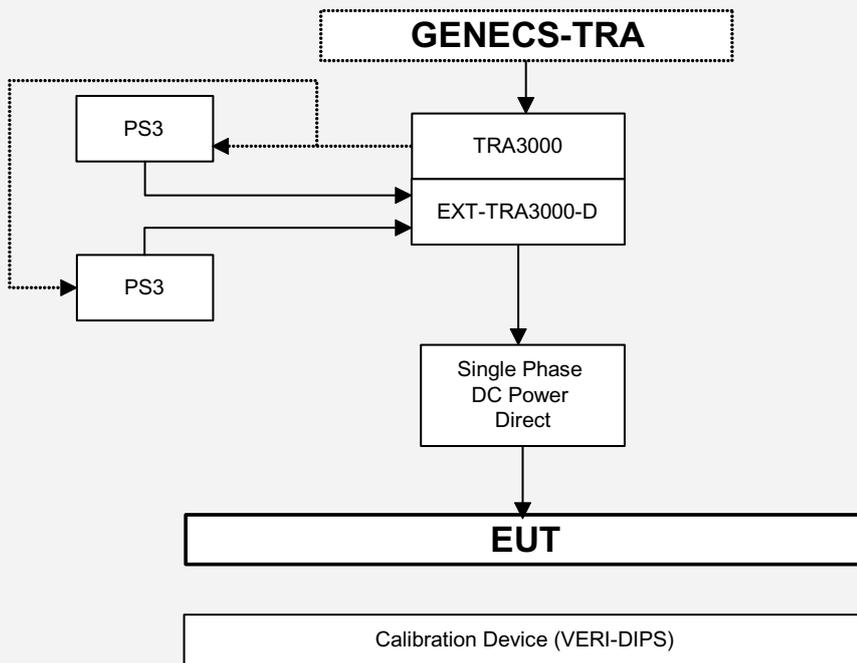
### AC and DC Interrupts



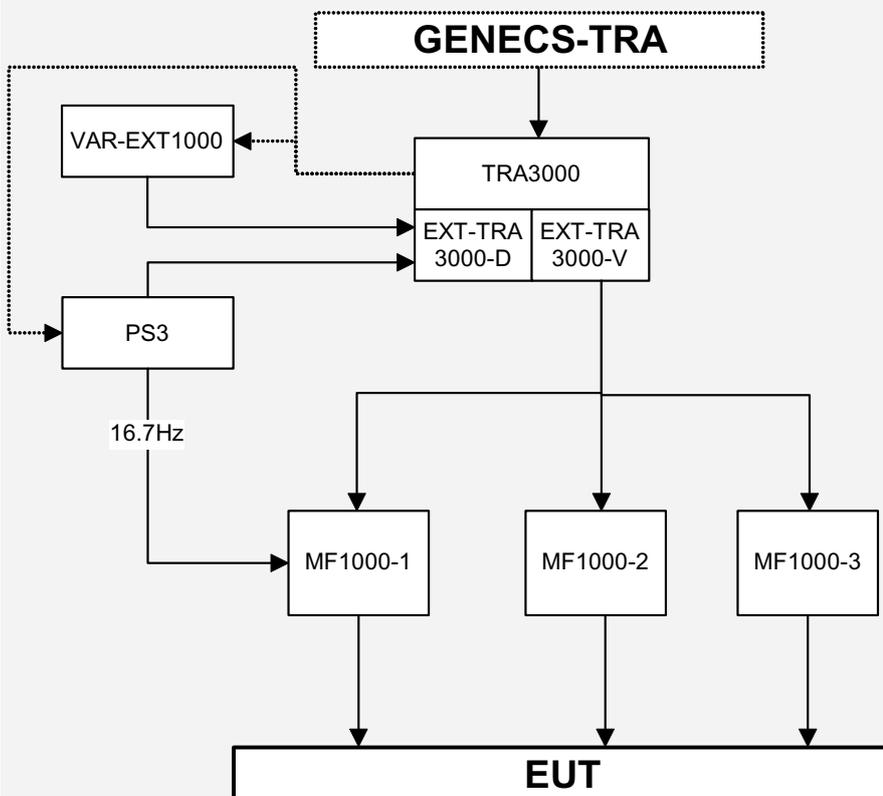
### AC DIPS



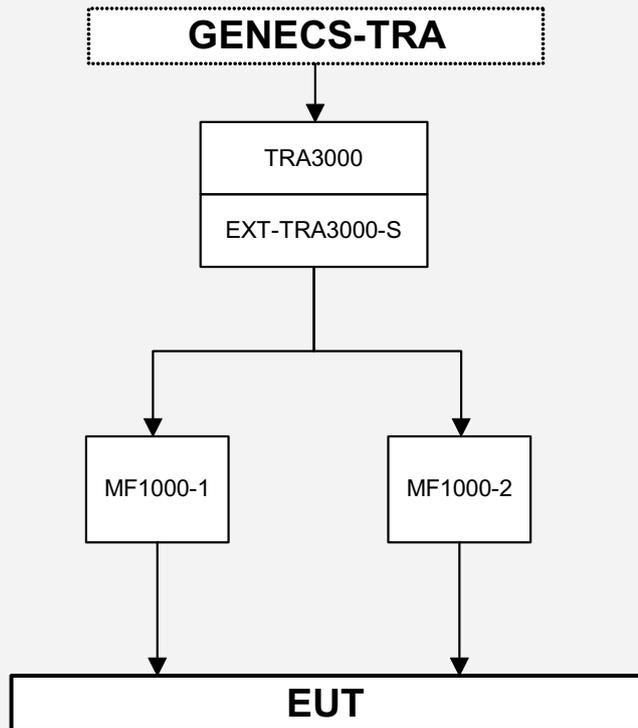
## DC DIPS



## AC MAGNETIC FIELDS



## IMPULSE MAGNETIC FIELDS



# Generator Specifications

## Module Guide

TRA3000	Modules
TRA3000	BASIS
EXT-TRA3000 C	COMMON MODE
EXT-TRA3000 D	AC & DC INTERRUPTION
EXT-TRA3000 E	ELECTROSTATIC DISCHARGE
EXT-TRA3000 F	ELECTRIC FAST TRANSIENT
EXT-TRA3000 S	SURGE
EXT-TRA3000 V	AC VARIATION

### TRA3000 BASE

Supply voltage range	80 to 260V / 50Hz & 60Hz
Standby current	50VA
Internal CDN voltage rating	280Vac & 110Vdc
Internal CDN current rating	16Aac & 16Adc
Internal CDN frequency range	50 to 400Hz
Power frequency synchronisation	16Hz up to 400Hz
Coupling path selection EFT	L, N, PE, L+N, L+PE, N+PE, L+N+ PE
Coupling path selection surge	L - N, L - PE, N - PE
Internal web server	
Communication Interfaces	Ethernet, USB & RS232
Accessory control interface	RS485

Memory locations	
Atmospheric measurement	Temperature & Humidity
Test report format	HTML
PS3 control	DC, 16.7Hz, 50Hz, 60Hz, 400Hz
EUT Power monitor	10V = 400Vac
Surge voltage monitor	10V = 4kV
Surge current monitor	10V = 2kA
Trigger	BNC maximum 12V
Trigger mode	Auto, manual
Synchro source	Power, external
Power synchro on/off	0 - 360°
Power switching before / after test	0 up to 60min.

### COMMON MODE

Long Duration Voltage Tests	up to 35Vrms
Voltage setting range	0.1 to 35V
Source Impedance	50ohm
Sync turn on for AC	0°
DC switching time	1 up to 5µs
Power frequency tests	DC, 16.7Hz, 50Hz & 60Hz
Power harmonic tests	1Hz up to 150kHz
Sweep time	1 decade / 10 up to 1000s
Step size	2 up to 10%
Short duration tests (with accessories)	up to 300Vrms

### DIPS (Interrupt) AC

Voltage range	0 up to 260Vrms
Frequency range	48 up to 60Hz
Rated current	16A (100% to 0% UT)
DIP current 80%	20A (100% to 80% UT & external variac)
DIP current 70%	23A (100% to 70% UT & external variac)
Switching time	1 up to 5µs
DIP modes	< 1 period, > 1 period
Event duration < 1 period	1 up to 29999 dips
Event duration > 1 period	1 up to 29999ms
Inrush current	> 500A
Phase angle switching	0 to 360°
Interrupt type	Synchronous and Asynchronous
Dip impedance	High & Low

### DIPS (Interrupt) DC

Voltage range	0 up to 110V
Rated Current	16A
Switching time	1 up to 5µs
Event duration	1 up to 29999ms
Dip impedance	High & Low

### FAST TRANSIENT

Voltage range	0.25 up to 4.4kV
Source impedance	50ohm
Pulse front time at 50ohm	5ns
Pulse duration at 50ohm	50ns
Spike repetition frequency	up to 1MHz
Programmable parameter ramps	voltage, spike frequency, burst duration, synchronisation
Spike distribution	IEC burst pattern and random
Burst duration	0.01 up to 30ms
Burst repetition	1 up to 1000ms

Polarity	Positive and Negative
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### SURGE Combination Wave Generator (CWG)

Voltage Range	0.25 up to 4.1kV
Pulse front time at open circuit	1.2µs
Pulse duration at open circuit	50µs
Source Impedance	2ohm
Current range	0.125 up to 2.05kA
Pulse front time at short circuit	8µs
Pulse duration at short circuit	20µs
Pulse repetition	up to 20 pulses per minute
Programmable parameter ramps	voltage, polarity, synchronisation

### VARIATION

Voltage range	0 up to 260V
Rated current	6A (100% to 0% UT)
Test modes	Abrupt, Adjust
Switching time abrupt	1 up to 5µs
Ramp transition time	25 up to 999 periods

### EXT-TRA3000 E

Air discharge	0.5 up to 16kV
Contact discharge	0.5 up to 10kV
Voltage increment resolution	1 volt steps
Contact discharge repetition interval	0.05 to 30s
Continuous firing mode (Air)	0.5 up to 16kV
Discharge detection	every pulse or real discharges only
Discharge counter	1 to 29999
Discharge polarity	positive, negative and alternating
Holding time	5s
Programmable parameter ramps	voltage, polarity
Discharge trigger	manual or automatic

STANDARDS	COMMON MODE (INT)						COMMON MODE (EXT)						
	TRA3000 BASE	EFT/Burst	SURGE	DIPS (INTERRUPT)	VARIAC	COMMON MODE (INT)	VAR-EXT1000	MF1000-1	CN16 (T)	CN-EFT1000	PS3	EXT-TRA3000 E	COMMON MODE (EXT)
IEC61000-4-2	●											●	
IEC61000-4-4	●	●								●			
IEC61000-4-5	●		●				□						
IEC61000-4-8	●				□			●			□ <sup>1</sup>		
IEC61000-4-9	●		●					●					
IEC61000-4-11	●			●	□ <sup>2</sup>		□ <sup>2</sup>				□ <sup>3</sup>		
IEC61000-4-16	●					●			●				□
IEC61000-4-29	●			●							● <sup>4</sup>		

● = necessary      □ = options

1. PS3 can be used for magnetic field testing including 16.7Hz
2. Internal and external variac >500A inrush current
3. PS3 ca. 100A inrush current

## TRA2000 PRODUCTS

TRA3000 is specifically designed as an optimum price / performance CE tester. For other applications, EMC PARTNER offer two generators which compliment the TRA3000.

### TRA2004 E-F-S-T-D-R

Included as standard are EFT and CWG up to 4kV, AC dips/interrupts & variations plus DC interrupts. TRA2000IN4 brings enhanced capability in the form of a 10/700 $\mu$ s surge impulse for telecom testing up to 4kV and the 100kHz ring wave for ANSI C62.41 and IEC61000-4-12, up to 6kV. As option, ESD2000 can be added up to 16kV. TRA2000IN4 features, an automatic integrated single phase CDN which enables EUT power to be supplied continuously even when switching between test types.

### TRA2006 E-F-S-T-D-R

Included as standard are EFT up to 4kV, CWG, 100kHz ring wave and 10/700 $\mu$ s surge impulse for telecom testing up to 6kV, AC dips/interrupts & variations plus DC interrupts. As option, ESD2000 can be added up to 16kV. TRA2000IN6 features an automatic integrated single phase CDN including both IEC and ANSI coupling modes. TRA2000IN6 is the most complete compact generator available. Offering in a single unit phenomenal power and unparalleled capability.



TRA2004 E-F-S-T-D-R



TRA2006 E-F-S-T-D-R

## SELECTION GUIDE

TRA2000	Models	Upgrade	Option
TRA2004 E-F-S-T-D-R	ESD, EFT, surge, 10/700, dips, ring	No	-
TRA2004 F-S-T-D-R	EFT, surge, 10/700, dips, ring wave	No	-
TRA2006 E-F-S-D-R	ESD, EFT, surge, dips, ring wave	No	10/700 $\mu$ s
TRA2006 F-S-D-R	EFT, surge, dips, ring wave	No	10/700 $\mu$ s
TRA2006 S-D-R	surge, dips, ring wave	No	10/700 $\mu$ s
TRA2006 F-S	EFT, surge	No	10/700 $\mu$ s
TRA2006 E-S	ESD, surge	No	10/700 $\mu$ s
TRA2006 E-F-S-R	ESD, EFT, surge, ring wave	No	10/700 $\mu$ s

## SPECIFICATIONS UNIQUE TO TRA2004 AND TRA2006

### 10/700 $\mu$ s

Voltage range	0.25 up to 4kV (6kV for TRA2006)
Current range	16.6 up to 266A for TRA2004 / 400A for TRA2006
Source impedance	15ohm + 25ohm
Pulse front time at open circuit	10 $\mu$ s
Pulse duration at open circuit	700 $\mu$ s
Pulse front time at short circuit	4 $\mu$ s (40ohm)
Pulse duration at short circuit	300 $\mu$ s (40ohm)
Pulse repetition	up to 4 pulses per minute

### 100kHz Ring Wave

Voltage range	0.25 up to 6kV
Current range	20 up to 500A
Source impedance	12ohm & 30ohm
Pulse front time at open circuit	0.5 $\mu$ s
Pulse oscillation frequency	100kHz



# Accessories and Options



CDN2000-06-32

## CDN2000-06-32 for Three Phase Coupling

Add three phase capability with automatic or manual three phase coupling networks. The CDN2000A-06-32 and CDN2000-06-32, can be used for EFT, CWG surge and ring wave. Coupling path selection is either automatic under software control, or manual on the CDN front panel. All coupling networks fulfill the requirements laid down in the IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-12 (ring wave) and ANSI C62.41 standards.

280V Lx to N/PE, 480V Lx-Lx, 480V Lx/N-PE

OPTION 480V / CMC enables coupling according to ANSI C62.41 L1+L2+L3+N to PE.



CDN2000-06-63

## CDN2000A-06-63 for Three Phase Coupling

Add higher current three phase capability with automatic coupling network CDN2000A-06-63. This can be used for EFT, CWG surge and ring wave. Coupling path selection is automatic under software control. This coupling network fulfills the requirements laid down in the IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-12 (ring wave) and ANSI C62.41 standards.

280V Lx to N/PE, 480V Lx-Lx, 480V Lx/N-PE



CDN-A-3P100-480 F-S

## CDN-A-3P100-480 F / F-S for 100A three Phase Coupling

Three phase CDN with line voltages L to N/PE=280V and L to L=480V, line current 100A per phase. Automatic coupling path selection for EFT or EFT and SURGE controlled by TRA2000, TRA2004, TRA2006, TRA3000.

## CDN-A-3P100-690 F / F-S for 100A three Phase Coupling

Three phase CDN with line voltages L to N/PE=398V and L to L=690V, line current 100A per phase. Automatic coupling path selection for EFT or EFT and SURGE controlled by TRA2000, TRA2004, TRA2006, TRA3000 and MIG0603INx.



CDN2000-06-25

## CDN2000-06-25 Three Phase Coupling

CDN2000-06-25 can be used for Combination wave, Ring wave and EFT testing. With an EMC PARTNER oscillatory wave tester, power and up to four data lines using the 100kHz and 1MHz oscillatory waves can be tested according to IEC61000-4-18.



CN16-450C

## CN16-450C

Single phase CDN for superimposing surge and EFT into power lines. EUT power supply up to 16A at 115V 400Hz. For use ONLY with TRA2004 or TRA2006.



CN2000TT MC

## CN2000TT MC

Test pistol for direct current injection of surge and 10/700µs according to IEC 61000-4-5. Cable length 1.5m with MC plugs. The test pistols can be used together with MIG system equipped with MC plug outputs on front panel or networks (NW).

## TEST SETUP

Test package for EFT testing. This includes 1m cable with 2 x 470kOhm resistors and mechanical connections to the EFT reference plane.



CABLE 2 x 470kOhm

## VERI50EFT

50ohm termination with high voltage BNC connector and integrated divider for EFT calibration / verification in accordance with IEC 61000-4-4 Ed2.



VERI50EFT

## VERI1KEFT

1kOhm termination with high voltage BNC connector and integrated divider for EFT calibration / verification in accordance with IEC 61000-4-4 Ed2.



VERI1KEFT

## CN-EFT1000

Capacitive coupling clamp 100ohm according to IEC 61000-4-4 including 1m coax cable with BNC connectors.



CN-EFT1000

## CN-BALUN

Balanced/unbalanced transmission line transformer for EFT and 1MHz damped sine according to ANSI/IEEE C.37.90. Including coaxial cable with HV-BNC plugs (3x 0.5m), test tip + HV-BNC adapter (1 red, 1 black) and HV-BNC connector (2x).



CN-BALUN

## ESD2000

ESD discharge network to fulfill IEC 61000-4-2 requirements. For full details, please refer to brochure "ESD Testers". For use ONLY with TRA2004 or TRA2006.



ESD2000

## EXT-TRA3000E

ESD discharge module to fulfill IEC 61000-4-2 requirements. Self contained unit with high voltage generation. For full details, please refer to brochure "ESD Testers". For use ONLY with TRA3000.



EXT-TRA3000 E

## ADAPTER EFT-CDN

Adapter cable which enables EFT impulses to be measured at the output of either a single or three phase CDN as required by IEC 61000-4-4 Ed.2.

## CDN-UTP

The CDN-UTP is a sophisticated coupling and de-coupling network for superimposing surge impulses on balanced communication lines in accordance with IEC 61000-4-5 (Figure 12: unshielded symmetrical interconnection lines), ITU-K20, K21 and FCC part 68.

It is designed for 1.2/50µs and 10/700µs pulses up to 6.6kV.

CDN-UTP is also available with 4 pairs (8 lines) as the CDN-UTP8 version.



CDN-UTP



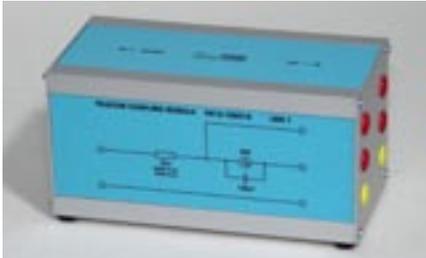
CDN-KIT1000



OPTION  
NW-TRA-RAIL



DN2000-22-5



CN2000-22-5



VAR-EXT1000



VERI-DIPS



DIPS100E



ATS

## CDN-KIT1000

Surge coupling-decoupling network for data lines according to IEC 61000-4-5. Comprises one universal coupling module, one low frequency and one high frequency decoupling module.

## NW-TRA-RAIL

Applicable standards are IEC 60571 Ed. 2.0b, EN 50155 and RIA12.

TRA2000 and option NW-TRA-RAIL fulfill the waveform A impulse requirement.

Waveform A: 5/50 $\mu$ s (1.8kV), Zout 100ohm.

In combination with the ESD3000DM8 which generates the higher level waveform B impulse.

## DN2000-22-5

Decoupling module for IEC 60255-22-5 applications. 20mH inductance, 275V varistor to protect auxilliary equipment.

## CN2000-22-5

Coupling module for IEC 60255-22-5 applications. 40ohm resistor and 0.5 $\mu$ F capacitor for coupling surge.

## VAR-EXT1000

External 16A variac module extends the internal capability for higher powered EUTs.

## VERI-DIPS

Measuring set for calibration/verification of the EUT inrush current.

## DIPS100E

100ohm non-inductive resistor for calibration of dips/interrupts switching times.

## ATS

Humidity Temperature and Pressure sensor connects to TRA3000 front panel in series with ESD module. Atmospheric conditions are registered for inclusion in the test report.

## PFS

PFS extends the Transient Test System to include three phase testing of AC and DC interrupts up to 480V and 32A in accordance with IEC 61000-4-34.

Available with different current ratings:

- PFS32 for interruptions up to 32A per phase
- PFS63 for interruptions up to 63A per phase
- PFS75 for interruptions up to 75A per phase

## SRC

SRC extends the Transient Test System to include three phase testing of AC dips up to 480V and 32A in accordance with IEC 61000-4-34. Requires one RFS unit.

Available with different current ratings:

- SRC32 for dips up to 32A per phase
- SRC63 for dips up to 63A per phase
- SRC75 for dips up to 75A per phase



PFS32 and SRC32

## MF1000-1, MF1000-2 and MF1000-3

Applicable standards are IEC 61000-4-8 for a.c. and IEC 61000-4-9 for impulse magnetic fields.

Coil antenna MF1000-1 and MF1000-2 can be mounted on stands that facilitate testing in all axis.

Antenna	Coil dimensions	AC magnetic fields (50/60Hz)	Impulse magnetic fields (8/20µs)
MF1000-1	1m x 1m	1 up to 130A/m	0.1 up to 1.5kA/m
MF1000-2	1m x 2.6m	1 up to 110A/m	0.1 up to 1.1kA/m
MF1000-3	1m x 1m	0.3 up to 1kA/m	

MF1000-1 and MF1000-2 antenna can also be used with the damped oscillatory wave generators to fulfill the IEC61000-4-10 requirement. For further details please refer to the Oscillatory Wave Test System brochure.



MF1000-1, MF1000-2, MF1000-3

## NW-K44PC

Power contact network for telecom testing in accordance with ITU-T K44, K20, K21. For use with DIPS circuit of TRA3000, TRA2004 and TRA2006.

### TRA OPTION NW-K44PI

Power induction network for telecom testing in accordance with ITU-T K44, K20, K21.

Requires NW-K44PC.



NW-K44 PC with TRA OPTION NW-K44PI

## PCPI160E

Power contact current limiting resistor network for telecom testing in accordance with ITU-T K44, K20, K21.

For use with NW-K44PC.

Two PCPI160E units may be required for 4 wire testing.



PCPI160E (one unit shown)



PS3



PS3 SOFT-EXT

### PS3

Easy to use power supply for common voltage/frequencies. Control from TRA3000. Output selected between 230V/50Hz, 115V/60Hz, 230V/16.7Hz and 115V/400Hz. 3000W capability.

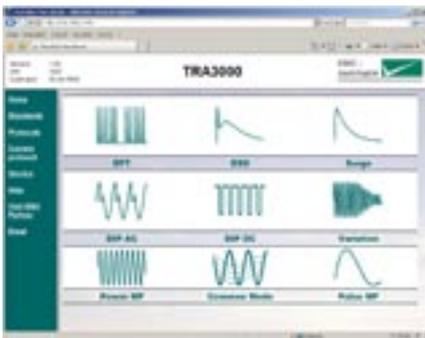
For use with TRA3000 for AC and DC DIPS testing.

### PS3SOFT-EXT

PS3SOFT-EXT extends PS3 for applications such as IEC 61000-4-28 and magnetic field at 16.7Hz.

## Software

Software is an integral part of every modern test system. TRA3000 introduces a new dimension to transient test equipment. Two layers of software increase user access and comfort.



### Web Server

Use any PC with any operating system and internet browser to connect to the internal web server. This enables access to test report and service data either directly on a PC internet browser or using the USB memory stick. Customize the test report by uploading company logo and test information from the USB memory stick. This will be applied to every report generated by TRA3000. Conversely, by simply selecting the GOTO USB button, test report and service information can be saved directly to the USB memory stick. Communication with a PC is by Ethernet, which again reduces dependency on obsolete or expensive interfaces.



Remote control from a PC is best achieved with the OPTICAL LINK and the GENECS-TRA software package.

### GENECS-TRA

Providing backwards compatibility with all existing EMC PARTNER test instrumentation, GENECS-TRA accepts ethernet IP addresses. GENECS-TRA has been extended to include test sequencing and enhanced reporting functionality enabling complex sequences of up to 99 tests to be linked. In addition to remote programming and control of the generators, test report information is available to word processing or other evaluation programs such as EXCEL.



### OPTICAL LINK

The 10m long fibre optic cable provides EMC isolation between TRA3000 and a remote control PC. The remote control PC will not be disturbed by the impulses generated by TRA3000 and the operator can locate the PC in a less hostile environment. The optical isolation allows up to 4 TRA3000 generators with Ethernet connections to be linked to one PC.

# EMC PARTNER's Product Range

The Largest Range of Impulse Test Equipment up to 100kA and 100kV.

## Immunity Tests

Transient Test System can be used to perform all EMC tests on electronic equipment. ESD, EFT, surge, AC dips, AC magnetic field, surge magnetic field, common mode, damped oscillatory and DC dips tests are available as stand-alone or combined test instruments. A large range of accessories for different applications is available: three phase couplers up to 690V/100A, telecom and data line couplers, verification sets, magnetic field coils. Immunity test systems fulfill IEC and EN 61000-4-2, -4, -5, -8, -9, -11, -12, -16, -18, -29.

**TRA3000 and ESD3000** ideal for CE testing  
Easily extended to meet other applications



## Lightning Tests

A range of test equipment and accessories for aircraft, military and telecom applications. Complete solutions including all hardware and software to meet the requirements of RTCA / EUROCAE DO160 / ED14 for indirect lightning on aircraft systems, MIL-STD-461 tests CS106, CS115, CS116, for military vehicles, ITU-T .K44 basic and enhanced tests for impulse, power contact and power induction, FCC part 68 for telecom equipment testing.

**MIG2000-6** – a flexible solution for military and avionic applications



## Component Tests

Modular impulse generators (MIG) for transient component testing on: varistors, gas discharge tubes (GDT), surge protective devices (SPD), X Y capacitors, circuit breakers, watt-hour meters, protection relays, insulation material, suppressor diodes, connectors, chokes, fuses, resistors, emc-gaskets, cables, etc. Manual or fully automated solutions are available up to 100kA (8/20us) and 144kV (1.2/50us).

**MIG1212CAP** – an automatic  
8 bank capacitor test system



## Emission Measurements

One unit performs all measurements on the power supplies of electronic equipment and products for the CE-Mark. HAR1000 uses a novel technique to deliver clean power source for the EUT in a compact and lightweight form. The system includes all hardware and software including line impedance networks, control and evaluation software. A basic 1-phase system can be easily extended to 3-phase by adding 2 further phases. HARCS Immunity software further expands the system by adding interharmonic tests, voltage variation and ripple on DC tests. Complies with IEC / EN 61000-3-2, -3 IEC / EN 61000-4-13, -14,

**HAR1000-3P and HARCS software**  
a complete test system



## System Automation

In addition to the basic generators, a range of accessories are available to enhance capability. Test cabinets, test pistols, adapters and software, simplify interfacing with the EUT.

PS3 programmable source is an EMC hardened supply for frequencies from 16.7Hz to 400Hz. Frequency variation tests can be made using the PS3-SOFT-EXT. Complies with IEC / EN 61000-4-28

**PS3 - programmable source**  
ideal for EMC applications



For further information please do not hesitate to contact EMC PARTNER's representative in your region. You will find a complete list of our representatives and a lot of other useful information on our website:

**[www.emc-partner.com](http://www.emc-partner.com)**

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### **Your local representative**

