Technical Specifications

KeyTek EMCPro® PLUS

Advanced EMC test system for compliance testing to 6 IEC/EN standards

The newly configured KeyTek EMCPro® PLUS test system features resident capabilities for EMC CE Mark compliance testing to 6 IEC/EN standards, and fully addresses new requirements for a 100 kHz burst rate per IEC 61000-4-4, Edition 2 (EFT) and 80% dip per IEC 61000-4-11, Edition 2 (PQF™).

Portable and low cost, the KeyTek EMCPro PLUS is the answer to manufacturers' demand for a mid-range, multi-capability EMC immunity tester. It's ideal for companies who require flexibility, versatility, and the highest test level-to-cost ratio instrument on the market.

Portable, mid-range EMC test system

Resident capabilities for compliance testing to 6 IEC/EN standards

Addresses ANSI/IEEE, ITU, ETSI & UL standards

Surge testing to 6.6kV with the combination, telecom, & ring waves

Monitors surge voltage & current at the output terminals

Monitors output of the coupling unit & automatically switches connections according to coupling mode

Highest test levels, widest selection of tests & lowest in-use costs

Upgradable as standards change

Technical Specifications

Model PRO-BASE

EMCPro PLUS Base Unit

System Voltage	90-240VAC, 50/60Hz
INTEGRATED EUT MAINS COUPLER/DECOUPLER	
AC Voltage	1 phase, 50 - 250VAC. 50/60Hz
AC Current	16A max.**
DC Voltage	100VDC max.
DC Current:	10A max.
Frequency	50/60Hz
EUT Connectors	Nema, British, Schuko
CONTROL INTERFACE	
Interface	RS232 Fiber-optic
SAFETY FEATURES	External Interlock for users Interlock for CCL connector External stop input

ENVIRONMENTAL OPERATING CONDITIONS	
Temperature	15°- 40°C
Humidity	10-75%, non-condensing
Altitude	8000 ft. max.
PHYSICAL	
Height	22.9cm (8.7 in)
Width	43.4cm (17.1 in)
Depth	64.8cm (25.5 in)
Weight	39kg (85 lbs.)
CE MARKING	Safety and EMC Directives

Model PRO-ESD

ESD per IEC 61000-4-2 and EN 61000-4-2

Trigger Modes	One shot manual, multi-shot tripod
Repetition Rate	Single shot, 1pps or 20pps
Air Discharge Voltage	500V - 8.8kV ±10%
Contact Discharge Voltage	500V - 4.4kV ±10%
Discharge Capacitor	150pF ±10%
Discharge Resistance	330Ω ±10%
Charging Resistance	50MΩ - 100MΩ
Polarity	Front panel or software controlled
Shot Counter	1 - 999 discharges
Energy Storage	5.8mJ @ 8.8kV

Model PRO-EFT

EFT per IEC 61000-4-4 Edition 2, EN 61000-4-4 and ANSI C62.41

Voltage Waveform	5/50ns ±30%
Peak Voltage	250V - 4.4kV ±5%
Burst Period	300ms ±10%
Burst Duration	15ms ±20%, for pulse frequencies uo to 5kHz, 0.75ms above 5kHz
Frequency	1-100kHz, in 0.5kHz steps, ±10%
DC Blocking Capacitor	10nF (internal)
Options	**Model CM-3CD-16/32:** 16 or 32 Amp, 3 phase EFT & surge coupler/decoupler **Model CM-CCL:** Capacitive coupling clamp **Model CM-CCLC:** Coupling clamp cover **Model EFT-ATTN:** EFT attenuator for oscilloscope monitoring

Model PRO-SURGE

Surge for compliant testing per IEC 61000-4-5, EN 61000-4-5, ANSI C62.41 Category B and UL 1449

Voltage Waveform	1.2/50µs
Peak Voltage	250V - 6.6kV ±5%, 12Ω mode 250V - 6.0kV ±5%, 2Ω mode
Peak Current	125A - 3.3kA ±10%
Additional 10Ω Resistor	Software selectable
Repetition Rate	Up to 4 per minute
Open-circuit Voltage	Front time: 1.2µs ±30% Duration: 50 µs ±20%[1] Undershoot: ≤ 30%
Short-circuit Current	Front time: 8.0µs ±20%
Duration*	50µs ±20%
Undershoot	≤ 30%
Line sync accuracy	±15%, 50 - 277VAC
Options	**Model CM-3CD-16/32:** 16 or 32 Amp, 3 phase EFT & surge coupler/decoupler **Model CM-I/OCD:** External 8 line coupler/decoupler for I/O signal lines **Model CM-I/OCD-HS:** High speed I/OCD option for testing data rates to >100kHz

* Durations are reduced in 12Ω mode and when coupling multiple lines to PE

Model PRO-RING**

Ring Wave Surge per ANSI C62.41 Cat. A, B, and UL 864

Voltage Waveform	100kHz damped cosine
Peak Voltage	250 - 6.6kV ±5%
Repetition Rate	<4/minute at 6kV, faster at lower voltages
Open-circuit Voltage	Rise Time: 0.5µs ±30%
Short-circuit Current	Vp/Ip: 12Ω ± 3Ω or 30Ω ± 8Ω software selectable
Options	**Model CM-3CD-16/32:** 16 or 32 Amp, 3 phase EFT & surge coupler/decoupler

Model PRO-TELECOM**

Surge Telecom compliant testing per IEC 61000-4-5, EN 61000-4-5, FCC Part 68, ITU K.17, K.20, K.21 and ETSI

Voltage Waveform	10/700µs (9/720µs FCC Part 68)
Peak Voltage	250V - 6.6kV ±5%
Peak Current	6.25 - 165A +10/-0%, 40Ω mode
Repetition Rate	Up to 4 per minute
Open-circuit Voltage	Front time: 7.0µs to 11.7µs Duration: 576µs to 840µs
Short-circuit Current	Front time: 3.5µs to 6.5µs Duration: 256µs to 384µs
Options	**Model CM-TELCD:** External coupler for telecom lines

Surge Waveform Monitoring

Lines Monitored	Monitors are automatically switched to match generator coupling mode
Open-circuit Voltage	1000:1 ±10%
Short-circuit Current Attenuation	200:1 ±7%

Model PRO-HPOWER

Power Frequency Magnetic Field for compliant testing per IEC 61000-4-8 and EN 61000-4-8

Field Frequency	50Hz/60Hz
Field Amplitude	0.5 - 4A/m, in 0.25A steps, ±10% (with CM-HCOIL) up to 100A/m with optional external HPOWER-EXT
AC Source	Internal
Resolution	0.25A minimum
Coil Factor	0.65 to 1.00
Coil Resistance	0.05Ω maximum
Options	**Model CM-HMON:** Measurement probe for power frequency magnetic fields **Model CM-HCOIL:** 1m x1m magnetic field coil **Model HPOWER - EXT:** External generator for power frequency magnetic field to 30A/m

** PRO-TELECOM and PRO-RING can not be installed in same unit.

Model PRO-HPULSE

Pulse Magnetic Field for compliant testing per IEC 61000-4-9 and EN 61000-4-9

Field Pulse	8/20µs
Field Amplitude	100A/m - 1000A/m, ±10%
Resolution	5A/m
Coil Factor	0.65 to 1.00
Options	**Model CM-HMON:** Measurement probe for power frequency magnetic fields **Model CM-HCOIL:** 1m x 1m magnetic field coil

Model PRO-PQF

Dips and Interrupts for compliant testing IEC 61000-4-11 Edition 2, and EN 61000-4-11

Dips	40%, 70%, 80%
Interrupts	0% (short and open)
Transition Time	1µs - 5µs
Inrush	Minimum 250Amps @ 100 - 120V, Minimum 500Amps @ 220 - 240V
AC Voltage	50 - 250VAC, 50/60Hz
AC Current	16A max.**
PQF Sync Output	5V signal occurs at each dip or interrupt transition
Options	**Model PQF-QUAL:** Circuit per IEC 61000-4-11 for testing PQF generator inrush capability

PQF Waveform Monitoring

Voltage Input Connection	Fixed, L1 to L2
Voltage Attenuation	100:1 ±5%
Current Input Connection	Fixed, L1
Peak Current	Minimum 500A inrush into 1700µF
Current Attenuation	200:1 ±5%

OPTIONAL COUPLERS/DECOUPLERS

Model CM-3CD-16 & CM-3CD-32*

Semi-automatic, stand alone, three-phase AC/DC mains coupler/decouplers for EFT & Surge per IEC 61000-4-4, Edition 2 and IEC 61000-4-5

ELECTRICAL

Waveforms	EFT: 5/50ns, per IEC 61000-4-4 Surge: Combination wave: 1.2/50µs open-circuit voltage, 8/20µs short-circuit current, per IEC 61000-4-5
Maximum Surge Voltage & Current	6.6kV, 3.3kA
Maximum EFT Voltage	4.4kV
Coupling Modes	EFT: L1, L2, L3, N or PE Surge Hi: L1, L2, L3 or N Surge Lo: L1, L2, L3, N or PE

* Not available for delivery until October 2004

COUPLER/DECOUPLERS

AC Voltage	50 to 250V, 50/60Hz line to ground, 50 to 433V line to line
AC Current	**CM-3CD-16**: 16A/phase continuous **CM-3CD-32:** 32A/phase continuous
DC Current	**CM-3CD-16:** 16A up to 48V 8A up to 110V 1.2A up to 220V 0.3A up to 440V **CM-3CD-32:** 25A up to 48V 8A up to 220V 1.2A up to 220V 0.3A up to 440V
EUT Mains Output Connectors	Safety Sockets

POWER REQUIREMENTS

Input Voltage	90-250VAC, 50/60Hz
Input Current	1A at 120VAC; 0.5A at 240VAC

Model CM-I/OCD

I/O coupler/decoupler - provides the ability to couple surges from EMCPro PLUS or any surge simulator, to I/O or data lines per IEC 61000-4-5

ELECTRICAL

Waveforms	Designed to couple combination waves of 1.2/50µs open-circuit voltage, 8/20µs short-circuit current supplied by option PRO-SURGE with the KeyTek EMCPro PLUS
Repetition Rate	Up to 5 per minute at 4.4kV
Data Line Frequency	To greater than 100kHz without significant degradation when CM-I/OCD-HS is installed. Option CM-I/OCD-HS is recommended for data line frequencies greater than 1kHz
Number of Lines	Eight lines - any line can be surged to any other line or ground
Maximum Surge Voltage	4.4kV
Maximum Signal Line Voltage	200V
Maximum Signal Line Current	1A AC or DC
Clamping	Selectable built-in clamps of 20V and 220V; external bias input for other clamp levels
Available Options	**CM-I/OCD-HS:** Internally-installed option provides selectable parallel resistors (400s, 200s, 100s) - highly recommended for data line frequencies greater than 1kHz.

Model CM-TELCD

Telecom line coupler/decoupler - provides the ability to couple both the telecom wave and combination wave per IEC 61000-4-5

ELECTRICAL

Waveforms	Designed to couple 1.2/50µs combination or 10/700µs telecom waves
Telecom Line Frequency	To 100kHz without significant degradation
Number of Lines	Up to four lines - one or two pairs of balanced Telecom lines
Maximum Surge Voltage	4.4kV
Maximum Signal Line Voltage	200V
Maximum Signal Line Current	1A AC or DC
Clamping	Selectable built-in clamps of 20V and 225V: external bias input for other clamp levels

Single Source, Total EMC Test Solutions

Experience the many benefits of working with recognized experts in the field of EMC (Electromagnetic Compatibility) testing. Our commitment to the discipline is wide ranging; we actively participate on global standards committees, and have helped define test methodologies to achieve regulatory standards such as CE Mark requirements, as well as company and market-driven product quality objectives,.

Our goal is to support you with lifelong service — from applications support, calibration services and preventative maintenance scheduling to full tactical field support.

Thermo can help you reach the next level of success.

Please see the KeyTek EMC Test System Options & Accessories data sheet for additional KeyTek EMCPro PLUS test system options and accessories.

Specialists who understand the challenges you face. Innovative ideas. Leading technologies. Breadth of EMC test equipment. Thermo–your EMC test solutions partner. Contact us today for details.

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