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UCS 500N7

MULTIFUNCTIONAL TESTGENERATOR FOR TRANSIENTS (EFT/BURST, SURGE & POWER FAIL) UP TO 7KV

FOR TESTS ACCORDING TO ...

› IEC 61000-4-4
› IEC 61000-4-5
› IEC 61000-4-8
› IEC 61000-4-9
› IEC 61000-4-11
› IEC 61000-4-12
› ECE-R10
› EN 61000-6-1
› EN 61000-6-2
› EN 61543
› IEC 60255-22-5
› IEC 61000-4-29
› IEC 61008-1
› IEC 61009-1
› IEC 61326
› IEC 61850-3
› IEEE 1547
› ITU-T K.20
› ITU-T K.21
› ITU-T K.45
› UL 1741
› UL 244
› UL 943

UCS 500N7 - MOST ENHANCED ULTRA COMPACT TESTER AS PER IEC 61000-4-X AND ANSI/IEEE C62.41

The UCS 500N7 ultra-compact simulator is the most versatile tester to cover transient and power fail requirements according to international standards (basic and generic standards) and product/ product family standards with voltage capability of up to 7.0 kV. Apart from the IEC/EN 61000-4-5 standard for surge testing it also complies to ANSI/IEEE C62.41 for surge and ringwave testing.
The UCS 500N7 not only represents the most economic solution for full-compliant immunity tests and CE Marking but goes far beyond. Having a built-in CDN for single phase DUTs it can be extended for testing three-phase DUTs by means of an automatically controlled external coupling network up to 100A.
EM TEST supplies a large range of accessories for the various applications.

HIGHLIGHTS

› **Ultra-Compact Simulator up to 7.0kV**
› **Burst module (IEC/EN 61000-4-4)**
› **Surge module (IEC/EN 61000-4-5 Ed 3.0/-9)**
› **PowerFail module (IEC/EN 61000-4-11)**
› **Ringwave module (IEC/EN 61000-4-12) optional**

APPLICATION AREAS

INDUSTRY
BROADCAST
COMPONENTS
TELECOM
MEDICAL
RESIDENTIAL

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TECHNICAL DETAILS

BENEFITS

ALL IN ONE AND MORE - ALL WHAT YOU NEED FOR TESTS UP TO 7KV

The UCS 500N7 includes everything necessary to conduct fully compliant tests at levels that go far beyond common test requirements.
Surge can be test up to 7.0kV either according to IEC/EN 61000-4-5 or ANSI/IEEE C62.41. The UCS 500N7 offers an integrated Ringwave module (optional) as per ANSI/IEEE C62.41 and IEC/EN 61000-4-12 for ringwave tests on mains supply lines.
The UCS 500N7 can be operated manually from the front panel or by remote via the built-in USB or GPIB interface.
Fail inputs allow to control an ongoing test sequence based on the status of the DUT. Monitoring outputs (BNC) are offered for easy signal measurement and verification.
Safety features such as interlock and warning lamp control are available.
Pre-programmed Standard Test routines allow highest user convenience. Still the UCS 500N7 offers the Quick Start test routine where parameters can be changed on-line during the test to evaluate the susceptibility level of an individual DUT, a most appreciated benefit for tests at development stage.

OPERATION

EASY TO OPERATE

Front panel menu and function keys enable the user to program his test routines quickly and accurately. The cursor allows fast control of all test parameters of the programmed routine, thus test procedures are simplified and confidence is generated that every step is carried out correctly.

SOFTWARE

IEC.CONTROL SOFTWARE FOR CONTROL AND DOCUMENTATION

Outstanding user convenience, clearly structured windows and operation features and the EM TEST standards library along with the flexibility to generate user specific test sequences very easily are the main features of iec.control software.

The software is automatically configured according to the connected EM TEST generators. Extensive reporting capabilities help the user to create test reports that meet international requirements.

iec.control is supported by Windows XP, Windows Vista, Windows 7 and Windows 8. Remote control is achieved either via USB or GPIB. iec.control supports a wide range of GPIB cards of National Instruments.

OTHER MODELS

UCS 500N SERIES - COMPACT TESTERS UP TO 7.0 KV

The UCS 500N ultra-compact testers for EFT/Burst, Surge and Power Fail are available in two different models; with voltage capability up to 5.5kV or up to 7.0kV.

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TECHNICAL DETAILS

AUXILIARY DEVICES

CNI 503 - 3PHASE COUPLING/DECOUPLING NETWORKS FOR BURST AND SURGE

EM TEST offers a range of fully automatic 3-phase coupling/decoupling networks for burst and surge to extend the test capability for three-phase DUTs. The networks have a rated current of up to 100A.

MV 2616 - MOTORISED VARIAC FOR VOLTAGE VARIATION

A motorised variac is offered as an alternative to the tapped autotransformers for voltage dips/interruptions and voltage variation tests as per IEC 61000-4-11. The motorised variac can also be used for automated magnetic field tests.

V 4780 - TAPPED VOLTAGE TRANSFORMER FOR VOLTAGE DIPS AND INTERRUPTIONS

The V 4780 tapped autotransformer is designed to supply the required voltages as per IEC/EN 61000-4-11 Ed.2:2004 to perform voltage dips and interruptions.

V 4780S2 - TAPPED VOLTAGE TRANSFORMER FOR VOLTAGE DIPS AND INTERRUPTIONS

The V 4780S2 tapped autotransformer is designed to supply the required voltages as per IEC/EN 61000-4-11 Ed.2:2004 to perform voltage dips and interruptions. Compared to the manually operated V 4780 the V 4780S2 model offers automatic change of taps according to the selected voltage level.

CNV 504/508 N- AND T-SERIES - SURGE COUPLING/DECOUPLING NETWORKS FOR SIGNAL/DATA LINES

CNV 504/508 N- and T-series coupling/decoupling networks are available to perform surge tests on I/O lines, signal/data lines and telecom lines as per IEC/EN 61000-4-5 Ed 3.0.

ACCESSORIES

MS 100N - MAGNETIC FIELD COIL FOR POWER-FREQUENCY AND PULSED MAGNETIC FIELDS

The MS 100N is a 1sqm magnetic field coil as specified in IEC/EN 61000-4-8 and IEC/EN 61000-4-9. Its design allows easy moving of the coil. The field coil is adjustable in height and allows for 360degr rotation.
To generate power-frequency magnetic fields in the lower range the current transformer MC 2630 is used while high-field strength above 100A/m requires the MC 26100 current transformer.

HFK - CAPACITIVE COUPLING CLAMP

The HFK is a fully compliant capacitive coupling clamp as per specification of IEC/EN 61000-4-4.

ITP - IMMUNITY TEST PROBES

ITP is a tool being used for development test. It consists of a variety of electrical field probes. The probes allow to locate weak points within a system or on a PCB. The burst pulse is used to generate the disturbance signal.

CA EFT KIT - VERIFICATION KIT FOR EFT/BURST PULSES

As per IEC/EN 61000-4-4 Ed.2 the characteristic of the burst generator needs to be verified with two different loads, 50ohm and 1,000ohm. EM TEST offers a calibration kit consisting of the two loads and an adapter to verify the pulses at the DUT output.

CA HFK KIT - VERIFICATION KIT FOR CAPACITIVE COUPLING CLAMP

The IEC/EN 61000-4-4 Ed 3.0 published 2012 recomends the calibration of the capacitive coupling clamp into a 50ohm coaxial load.
The capacitive coupling clamp (HFK) is connected to the 50 ohm output of the EFT generator. A flexible insulated plate inside the HFK is connected to a coaxial 50 ohm load resistor for verificate the EFT / Burst wave of the capacitive coupling clamp.

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TECHNICAL DETAILS

ELECTRICAL FAST TRANSIENTS

BURST MODULE, EFT/N7	
	As per EN/IEC 61000-4-4 and EN 61000-6-1, -6-2
Test voltage	200V - 5,500 V ± 10%; 100V - 2,750 V ± 10% into 50 ohm
Pulse shape	5/50 ns into 50 ohm and 1,000 ohm
Rise time tr	5 ns ± 30% into 50 ohm; 5 ns ± 30% into 1,000 ohm
Pulse width td	50 ns ± 30% into 50 ohm; 50 ns -15/+100 ns into 1,000 ohm
Source impedance	50 ohm
Polarity	Positive, negative

TRIGGER CIRCUIT	
Trigger of bursts	Automatic, manual, external
Synchronization	0° - 360°, resolution 1° (16 - 500 Hz)
Burst duration	td = 0.10 ms - 999 ms
Repetition rate	tr = 10 ms - 9,999 ms
Spike frequency	f = 0.1 kHz - 1,000 kHz
Test duration	T = 0:01 min - 99:59 min T › 99:59 min --› endless

OUTPUTS	
Direct	Via 50 ohm coaxial connector
Coupling mode	L, N, PE; all combinations
DUT supply	AC: 300 V/16 A; 50/60 Hz DC: 300 V/16 A
CRO trigger	5 V trigger signal for oscilloscope

ELECTRICAL FAST TRANSIENTS

TEST ROUTINES	
Quick Start	On-line adjustable parameters, easy-to-use
Standard Test routines	As per IEC 61000-4-4, Levels 1 - 4 As per EN 61000-6-1, -6-2 Manual Standard Test routine
User Test routines	Synchronous burst release Random burst release Change voltage after T Frequency sweep within one burst Frequency sweep with constant number of pulses Frequency sweep with constant burst duration Change polarity after T

OPTIONS	
HFK	Capacitive coupling clamp as per IEC 61000-4-4
KW50	100:1 divider, 50 ohm
KW1000	500:1 divider, 1,000 ohm
CA EFT kit	Kit for burst pulse verification consisting of KW50, KW1000 and adapter for DUT port in a plastic case for storage
CA HFK kit	Adapter set for capacitive coupling clamp calibration included: - Transducer plate as per IEC/EN 61000-4-4 Ed 3.0 - Support for positioning the KW 50 adapter on 100mm height as the capacitive coupling clamp
CA MC F	Adapter to match KW 50 load resistor to the EUT supply of 3-phase N-series coupling network
A6dB	6dB attenuator, 50 ohm
ITP	Immunity test probes (electrical field generation)
ITP/H	Immunity test probes (magnetic field generation)

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TECHNICAL DETAILS

COMBINATION WAVE / SURGE

SURGE MODULE, VCS/N7	
	As per EN/IEC 61000-4-5 Ed 3.0 and EN 61000-6-1, -6-2
Voltage (o.c.)	250 V - 7,000 V ± 10%
Pulse front time	1.2 us ± 30%
Pulse time to half value	50 us ± 20%
Current (s.c.)	Max. 3,500 A ± 10%
Pulse front time	8 us ± 20%
Pulse time to half value	20 us ± 20%
Polarity	Positive, negative, alternating
Counter	1 - 30,000 or endless, selectable

TRIGGER CIRCUIT	
Release of pulses	Automatic, manual, external
Synchronization	0° - 360°, resolution 1°
Repetition rate	Max. 0.5 Hz (2 s - 999 s)

OUTPUTS	
Direct	Via HV connectors for external coupling networks (Zi = 2 ohm with optional adapter IMN 2)
Coupling modes	As per IEC 61000-4-5: Line to line with 2 ohm Line(s) to ground with 12 ohm
	As per ANSI/IEEE C62.41 Line to line with 2ohm Line(s) to ground with 2ohm
DUT supply	AC: 300 V/16 A; 50/60 Hz DC: 300 V/16 A
CRO trigger	5 V trigger signal for oscilloscope

MEASUREMENTS	
CRO Û-monitor	10 Vp at 7,000 V
CRO Î-monitor	10 Vp at 3,500 A
Peak voltage	7,000 V in the LCD display
Peak current	3,500 A in the LCD display
Overcurrent protection	Breaks the Sureg test when the surge current is over the limit, Limitter for differential mode, Limitter for common mode

COMBINATION WAVE / SURGE

TEST ROUTINES	
Quick Start	One-line adjustable parameters, easy-to-use
Standard Test routines	As per IEC 61000-4-5, Levels 1 - 4 As per EN 61000-6-1, -6-2 Manual Standard Test routine
User Test routines	Change polarity after n pulses Change coupling after n pulses Change voltage after n pulses Change phase angle after n pulses
Pulsed Magnetic Field	As per IEC 61000-4-9 Test levels 100, 300 and 1,000 A/m Test level steplessly adjustable under Quick Start

OPTIONS	
CNV 504Nx	Coupling network for 4 signal/data lines as per IEC 61000-4-5 Ed 3.0
CNV 508Nx	Coupling network for 8 signal/data lines as per IEC 61000-4-5 Ed 3.0
CNI 508N2 Assembly	Set of coupling/decoupling and protection networks for testing unshielded and shielded high-speed communication lines (Ethernet lines)
IMN 2	Impedance matching adapter to match direct output to 2ohm source impedance

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TECHNICAL DETAILS

POWER FAIL, DIPS & INTER-RUPTIONS, VOLTAGE VARIATIONS

POWER FAIL MODULE, PFS/N7	
	As per EN/IEC 61000-4-11 and EN 61000-6-1, -6-2
Channel PF1/PF2	AC voltage: max. 300 V AC current: max. 16 A
Frequency	16 Hz - 500 Hz
Switching time	‹ 5us into a 100ohm resistive load
Inrush current	› 500 A
Protection	Both channels are protected against short-circuit conditions.

TRIGGER CIRCUIT	
Trigger of events	Automatic, manual, external
Synchronization	0° - 360°, resolution 1° (16 - 500 Hz)
Repetition rate	10 ms - 9,999 s
Event duration	20 us - 9,999 s

OUTPUTS	
DUT terminals	L, N and PE
CRO trigger	5V trigger signal for oscilloscope

MEASUREMENTS	
DUT voltage	In the LCD display
DUT current	In the LCD display
MON V	Measurement of the DUT voltage; built-in 100:1 divider
MON I	Measurement of the DUT current; 10 mV/A; max. 1,000 A

POWER FAIL, DIPS & INTER-RUPTIONS, VOLTAGE VARIATIONS

TEST ROUTINES	
Quick Start	On-line adjustable parameters, easy-to-use
Standard Test routines	As per IEC 61000-4-11 for AC supplies As per IEC 61000-4-29 for DC supplies As per EN 61000-6-1, -6-2 Manual Standard Test routine
User Test routines	Voltage variation, external variac control Change phase angle after n events Change event duration after n events Inverse mode
50/60Hz magnetic field	As per EN/IEC 61000-4-8 Test levels 1, 3, 10 and 30A/m with external current transformer MC2630 Test levels 100, 300 and 1,000A/m with external current transformer MC26100

OPTIONS	
V 4780	Tapped autotransformer as per IEC 61000-4-11 Ed.2
V 4780 S2	Tapped autotransformer as per IEC 61000-4-11 Ed.2 with automatic change of tap
MV 2616	Motorised variac (0 - 260 V, 16 A)
MS 100N	Magnetic field coil, 1m x 1m
MC 2630	Current transformer for magnetic fields up to 30 A/m
MC 26100	Current transformer for magnetic fields up to 1,000 A/m
CA PFS	Calibration box for inrush current verification as per IEC 61000-4-11

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TECHNICAL DETAILS

RINGWAVE

RINGWAVE MODULE, RWG/N7 (OPTIONAL)	
	As per ANSI/IEEE C62.41 and EN/IEC 61000-4-12
Test voltage	250 V - 6,000 V ± 10%
Voltage	Wave shape (open circuit)
Rise time	0.5 us ± 30% (first peak)
Oscillation frequency	100 kHz ± 10%
Decaying	Peak 2 to peak 1 = 40 - 110% Peak 3 to peak 2 = 40 - 80% Peak 4 to peak 3 = 40 - 80%
Current	Wave shape (short circuit)
Rise time	<= 1.0 us
Oscillation frequency	100 kHz ± 10%
Source impedance	12 ohm, 30 ohm
Peak current	As per selected source impedance
Polarity	Positive, negative

RINGWAVE MODULE, RWG/N7.1 (OPTIONAL)	
	As per UL 244, UL 1741, ANSI/IEEE C62.41 and EN/IEC 61000-4-12
Test voltage	250 V - 6,000 V ± 10%
Voltage	Wave shape (open circuit)
Rise time	0.5 us ± 30% (first peak)
Oscillation frequency	100 kHz ± 10%
Decaying	Peak 2 to peak 1 = 40 - 110% Peak 3 to peak 2 = 40 - 80% Peak 4 to peak 3 = 40 - 80%
Current	Wave shape (short circuit)
Rise time	<= 1.0 us
Oscillation frequency	100 kHz ± 10%
Source impedance	12 ohm, 30 ohm, 50 ohm
Peak current	As per selected source impedance,
Polarity	Positive, negative

RINGWAVE

TRIGGER CIRCUIT	
Release of pulses	Automatic, manual, external
Synchronization	0° - 360°, resolution 1°
Repetition rate	max. 1 Hz (1 s - 999 s)

MEASUREMENTS	
CRO Û-monitor	10 Vp at 7,000 V
CRO Î-monitor	10 Vp at 3,500 A

OUTPUTS	
Direct	Via HV-safety lab connectors
Coupling mode	L, N, PE; line to line and line(s) to ground
DUT supply	AC: 300 V/16 A; 50/60 Hz DC: 300 V/16 A
CRO trigger	5 V trigger signal for oscilloscope

TEST ROUTINES	
Quick Start	On-line adjustable parameters, easy-to-use

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TECHNICAL DETAILS

TELECOM SURGE

TSURGE MODULE, TSURGE7 (OPTIONAL)	
Test voltage (o.c.)	250 V - 7,000 V ± 10%
Energy storage capacitor	20 uF
Polarity	Positive, negative, alternating
Counter	1 - 30,000 or endless, selectable
	As per ITU and ETSI recommendations
Front time	10 us ± 30%
Pulse duration	700 us ± 20%
	As per FCC part 68, Pulse B
Front time	9 us ± 30%
Pulse duration	720 us ± 20%
Output current @25 ohm output	6 A - 175 A (short circuit)
Rise time	5 us ± 30%
Pulse duration	320 us ± 20%
	As per IEC 61000-4-5
Rise time	10 us ± 30%
Pulse duration	700 us ± 20%
Output current @25 ohm output	6 A - 175 A (short circuit)
Rise time	5 us ± 20%
Pulse duration	320 us ± 20%

TELECOM SURGE

TRIGGER CIRCUIT	
Trigger of events	Automatic, manual, external
Repetition rate	max. 0.33 Hz (3 s - 999 s)

OUTPUTS	
As per ITU	For 2-wire T1/T2 with 25 ohm each
As per FCC part 68	For 2-wire T1/T2 with 25 ohm each
As per IEC 61000-4-5 Ed 3.0	For 4-wire T1/T2/T3/T4 with 25 ohm each
	For other requirements special output configurations are available

OPTIONS	
CNV 504T5	Coupling/decoupling network for unshielded symmetrical lines (communication lines) as per IEC/EN 61000-4-5 Ed.3 (fig. 10) for 4 lines.
CNV 508T5	Coupling/decoupling network for unshielded symmetrical lines (communication lines) as per IEC/EN 61000-4-5 Ed.3 (fig. 10) for 8 lines.

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TECHNICAL DETAILS

GENERAL DATA

INTERFACES	
Serial interface	USB
Parallel interface	IEEE 488, addresses 1 - 30
Analog output	0 - 10 VDC to control an external transformer
CN interface	15pin SubD connector to control an external coupling network
Fail inputs	DUT monitoring via Fail1 and Fail2 input (one each)

DIMENSIONS	
Housing	19", 6 HU
Weight	Approx. 29 kg

MAINS	
Supply voltage	115 / 230 VAC +10%/-15%
Power consumption	Approx. 75 W
Frequency	50/60 Hz
Fuses	2x 2 AT (230 V) or 2x 4 AT (115 V)

GENERAL DATA

SAFETY	
Safety standard	EN/IEC 61010
Security circuit	Control input (24 VDC)
Warning lamp	Floating contact (max. 230 V/6 A)

ACCESSORIES INCLUDED	
Mains supply cable	Plug depends on the country of use
DUT supply cable	Plug depends on the country of use
DUT adapter	Socket depends on the country of use
	Operation manual, Calibration certificate, iec.control remote control software

OPTIONS

OPTIONS	
CNI 503Bx	3-phase coupling/decoupling networks as per IEC 61000-4-4 and -4-5 up to 100A per phase
iec.control 1	Remote control and documentation software, including standard test routines and reporting capabilities.
OptoLink	Optical interface Opto link, 3 m cable USB A connector, replaces the USB interface

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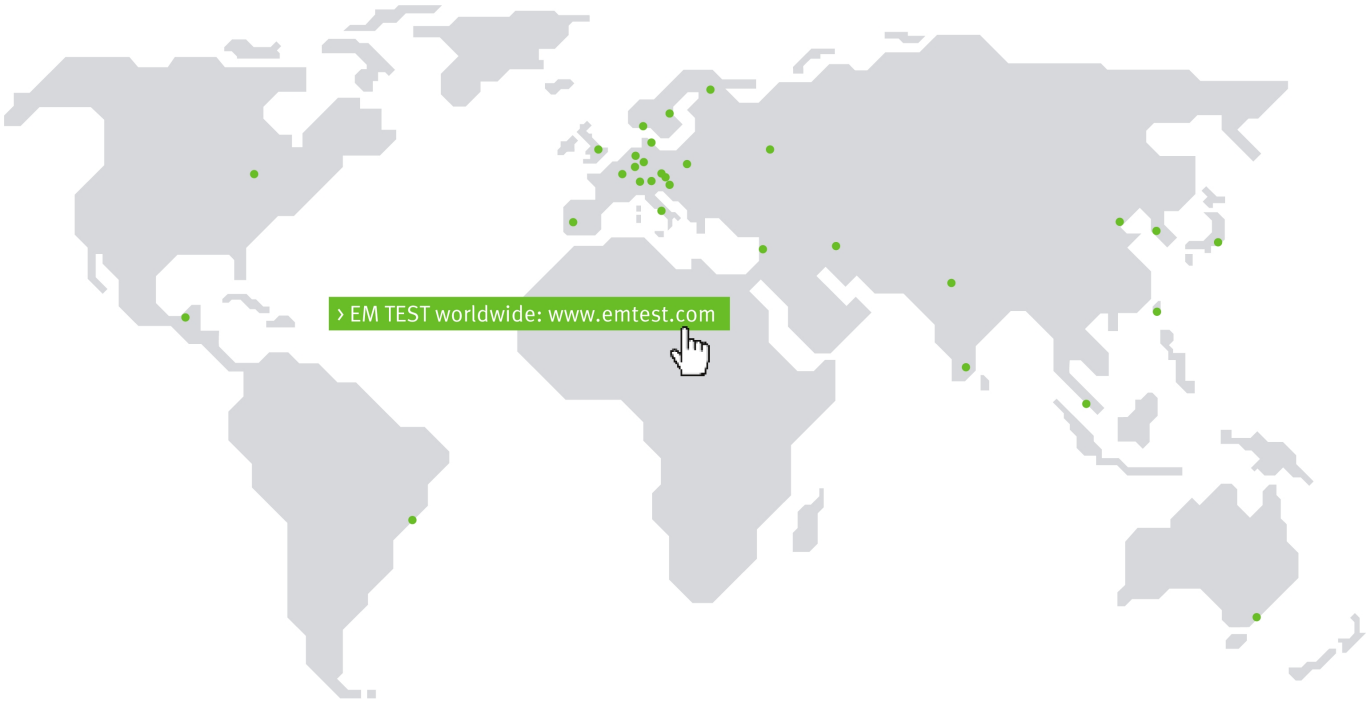
COMPETENCE WHEREVER YOU ARE



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