

## UCS 500N7

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



#### FOR TESTS ACCORDING TO ...

- > ANSI/IEEE C62.41
- > EN 61000-4-11
- > EN 61000-4-12
- > EN 61000-4-29
- > EN 61000-4-4
- > EN 61000-4-5
- > EN 61000-4-8
- > EN 61000-4-9
- > EN 61000-6-1
- > EN 61000-6-2
- > EN 61543
- > IEC 60255-22-5
- > IEC 61000-4-11
- > IEC 61000-4-12
- > IEC 61000-4-29
- > IEC 61000-4-4
- > IEC 61000-4-5
- > IEC 61000-4-8
- > IEC 61000-4-9
- > IEC 61008-1
- > IEC 61009-1
- > ...

#### 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 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)**
- > **PowerFail module (IEC/EN 61000-4-11)**
- > **Ringwave module (IEC/EN 61000-4-12) optional**

#### APPLICATION AREAS

- |  |   |
|--|---|
|  INDUSTRY   |  BROADCAST   |
|  COMPONENTS |  TELECOM     |
|  MEDICAL    |  RESIDENTIAL |

**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 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 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.

**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 2000, Windows XP, Windows Vista and Windows 7. 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 7.0KV**

The UCS 500N ultra-compact testers for EFT/burst, Surge and Power Fail are available in two different models; with voltage capability up to 4.4kV or up to 7.0kV.

**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.



**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 - MOTORIZED 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.

**CNV 504N/508N - SURGE COUPLING/DECOUPLING NETWORKS FOR SIGNAL/DATA LINES**

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

**TECHNICAL DETAILS****ACCESSORIES****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 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 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.

**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 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 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.

## 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 - 5,500V $\pm$ 10%; 100V - 2,750V $\pm$ 10% into 50ohm
Pulse shape	5/50ns into 50ohm and 1,000ohm
Rise time tr	5ns $\pm$ 30% into 50ohm; 5ns $\pm$ 30% into 1,000ohm
Pulse width td	50ns $\pm$ 30% into 50ohm; 50ns -15/+100ns into 1,000ohm
Source impedance	50ohm
Polarity	Positive, negative

## TRIGGER CIRCUIT

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

## OUTPUTS

Direct	Via 50ohm coaxial connector
Coupling mode	L, N, PE; all combinations
DUT supply	AC: 300V/16A; 50/60Hz DC: 300V/10A
CRO trigger	5V trigger signal for oscilloscope

## 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, 50ohm
KW1000	500:1 divider, 1,000ohm
CA EFT kit	Kit for burst pulse verification consisting of KW50, KW1000 and adapter for DUT port in a plastic case for storage
A6dB	6dB attenuator, 50ohm
ITP	Immunity test probes (electrical field generation)
ITP/H	Immunity test probes (magnetic field generation)

## TECHNICAL DETAILS

## COMBINATION WAVE / SURGE

## SURGE MODULE, VCS/N7

	As per EN/IEC 61000-4-5 and EN 61000-6-1, -6-2
Voltage (o.c.)	250V - 7,000V ± 10%
Pulse front time	1.2us ± 30%
Pulse time to half value	50us ± 20%
Current (s.c.)	Max. 3,500A ± 10%
Pulse front time	8us ± 20%
Pulse time to half value	20us ± 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. 0.5Hz (2s - 999s)

## OUTPUTS

Direct	Via HV connectors for external coupling networks ( $Z_i = 2\text{ohm}$ with optional adapter IMN 2)
Coupling modes	As per IEC 61000-4-5: Line to line with 2ohm Line(s) to ground with 12ohm
	As per ANSI/IEEE C62.41 Line to line with 2ohm Line(s) to ground with 2ohm
DUT supply	AC: 300V/16A; 50/60Hz DC: 300V/10A
CRO trigger	5V trigger signal for oscilloscope

## MEASUREMENTS

CRO $\hat{U}$ -monitor	10Vp at 7,000V
CRO $\hat{I}$ -monitor	10Vp at 3,500A
Peak voltage	7,000V in the LCD display
Peak current	3,500A in the LCD display

## 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 1,000A/m Test level steplessly adjustable under Quick Start

## OPTIONS

CNV 504Nx	Coupling network for 4 signal/data lines as per IEC 61000-4-5
CNV 508Nx	Coupling network for 8 signal/data lines as per IEC 61000-4-5
IMN 2	Impedance matching adapter to match direct output to 2ohm source impedance

## TECHNICAL DETAILS

## POWER FAIL, DIPS & INTERRUPTIONS, 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. 300V AC current: max. 16A
Frequency	16Hz - 500Hz
Switching time	< 5us into a 100ohm resistive load
Inrush current	> 500A
Protection	Both channels are protected against short-circuit conditions.

### TRIGGER CIRCUIT

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

### 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; 10mV/A; max. 1,000A

### 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

V4780	Tapped autotransformer as per IEC 61000-4-11 Ed.2
V4780 S2	Tapped autotransformer as per IEC 61000-4-11 Ed.2 with automatic change of tap
MV2616	Motorised variac (0 - 250V, 16A)
MS100N	Magnetic field coil, 1m x 1m
MC2630	Current transformer for magnetic fields up to 30A/m
MC26100	Current transformer for magnetic fields up to 1,000A/m
CA PFS	Calibration box for inrush current verification as per IEC 61000-4-11

## TECHNICAL DETAILS

## RINGWAVE

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

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

OUTPUTS	
Direct	Via HV-safety lab connectors
Coupling mode	L, N, PE; line to line and line(s) to ground
DUT supply	AC: 300V/16A; 50/60Hz DC: 300V/10A
CRO trigger	5V trigger signal for oscilloscope

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

## TELECOM SURGE

TSURGE MODULE, TSURGE7 (OPTIONAL)	
Test voltage (o.c.)	250V - 7,000V ± 10%
Energy storage capacitor	20uF
Polarity	Positive, negative, alternating
Counter	1 - 30,000 or endless, selectable
	As per ITU and ETSI recommendations
Front time	10us ± 30%
Pulse duration	700us ± 20%
	As per FCC part 68, Pulse B
Front time	9us ± 30%
Pulse duration	720us ± 20%
Output current	6A - 175A (short circuit)
Rise time	5us ± 30%
Pulse duration	320us ± 20%
	As per IEC 61000-4-5
Rise time	6.5us ± 30%
Pulse duration	700us ± 20%
Output current	6A - 175A (short circuit)
Rise time	4us ± 20%
Pulse duration	300us ± 20%

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

OUTPUTS	
As per ITU	For 2-wire T1/T2 with 25ohm each
As per FCC part 68	For 2-wire T1/T2 with 25ohm each
As per IEC 61000-4-5	For 4-wire T1/T2/T3/T4 with 100ohm each
	For other requirements special output configurations are available

OPTIONS	
CNV 504S1	Coupling network for 4 telecom lines as per IEC 61000-4-5
CNV 508S1	Coupling network for 8 telecom lines as per IEC 61000-4-5

## TECHNICAL DETAILS

### GENERAL DATA

#### INTERFACES

Serial interface	USB
Parallel interface	IEEE 488, addresses 1 - 30
Analog output	0 - 10VDC 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", 6HU
Weight	Approx. 29kg

#### MAINS

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

#### SAFETY

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

#### 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

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.



# COMPETENCE WHEREVER YOU ARE



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