

# UCS 500N7.2

## MULTIFUNCTIONAL TRANSIENT SIMULATOR FOR RENEWABLE ENERGY



### FOR TESTS ACCORDING TO ...

- › ANSI/IEEE C62.41
- › ECE-R10
- › EN 61000-4-11
- › 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 61000-4-29
- › IEC 61000-4-4
- › IEC 61000-4-5
- › IEC 61000-4-8
- › IEC 61000-4-9
- › IEC 61008-1
- › IEC 61009-1
- › IEC 61326
- › ...









### UCS 500N7.2 - MOST ENHANCED ULTRA COMPACT TESTER AS PER IEC 61000-4-X AND ANSI/IEEE C62.41

The UCS 500N7.2 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 testing. The UCS 500N7.2 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)
- › Telecom Surge Module (IEC/EN 61000-4-5) optional

### APPLICATION AREAS

- |  |  |
|--|--|
|  INDUSTRY   |  TELECOM          |
|  COMPONENTS |  RESIDENTIAL      |
|  MEDICAL    |  RENEWABLE ENERGY |
|  BROADCAST  |  AUTOMOTIVE       |

**TECHNICAL DETAILS**

**BENEFITS**

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

The UCS 500N7.2 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 500N7.2 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 500N7.2 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.

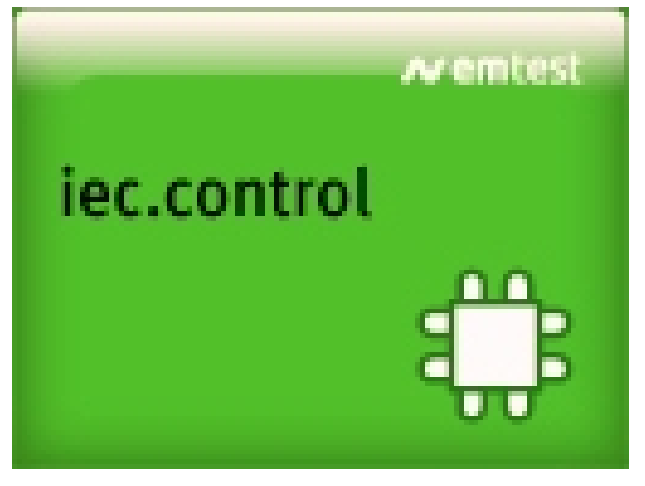


**SOFTWARE**

**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 7, Windows 8 (64 Bit) and Windows 10. 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 5.5kV or up to 7.0kV.

## TECHNICAL DETAILS

### AUXILIARY DEVICES

#### **CNI 50X SERIES - COUPLING/DECOUPLING NETWORKS FOR BURST AND SURGE**

EM TEST offers a range of fully automatic 1-phase and 3-phase coupling/decoupling networks for burst and surge to extend the test capability for DUTs up to 3x480V / 690V AC. The networks have a rated current of up to 100A.

#### **VARIAC NX-1-260-16 - 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/EN 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/EN 61000-4-5.

### 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/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.

#### **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.

#### **CCI - CAPACITIVE COUPLING CLAMP**

The CCI 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.

## TECHNICAL DETAILS

## ELECTRICAL FAST TRANSIENTS

## BURST MODULE, EFT/N7

	As per IEC/EN 61000-4-4 and IEC/EN 61000-6-1, -6-2
Test voltage	200V - 5,500V ± 10%; 100V - 2,750V ± 10% into 50ohm
Pulse shape	5/50ns into 50ohm and 1,000ohm
Rise time tr	5ns ± 30% into 50ohm; 5ns ± 30% into 1,000ohm
Pulse width td	50ns ± 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
CRO trigger	5V trigger signal for oscilloscope

## ELECTRICAL FAST TRANSIENTS

## TEST ROUTINES

Quick Start	On-line adjustable parameters, easy-to-use
Standard Test routines	As per IEC/EN 61000-4-4, Levels 1 - 4 As per IEC/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

CCI	Capacitive coupling clamp as per IEC/EN 61000-4-4
KW 50	100:1 divider, 50ohm
KW 1000	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
CCI PVKIT 1	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 100 mm 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, 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 IEC/EN 61000-4-5 Ed 3.0 and IEC/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 (Zi = 2ohm with optional adapter IMN 2)
Coupling modes	As per IEC/EN 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
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
Overcurrent protection	Breaks the Sureg test when the surge current is over the limit, Limiter for differential mode, Limiter for common mode

## COMBINATION WAVE / SURGE

TEST ROUTINES	
Quick Start	One-line adjustable parameters, easy-to-use
Standard Test routines	As per IEC/EN 61000-4-5, Levels 1 - 4 As per IEC/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/EN 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/EN 61000-4-5 Ed 3.0
CNV 508Nx	Coupling network for 8 signal/data lines as per IEC/EN 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

## TECHNICAL DETAILS

## POWER FAIL, DIPS &amp; INTERRUPTIONS, VOLTAGE VARIATIONS

## POWER FAIL MODULE, PFS/N7

	As per IEC/EN 61000-4-11 and IEC/EN 61000-6-1, -6-2
Channel PF1/PF2	AC voltage: max. 400V 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
Overcurrent protection	Breaks the Sureg test when the surge current is over the limit, Limiter for differential mode, Limiter for common mode

## POWER FAIL, DIPS &amp; INTERRUPTIONS, VOLTAGE VARIATIONS

## TEST ROUTINES

Quick Start	On-line adjustable parameters, easy-to-use
Standard Test routines	As per IEC/EN 61000-4-11 for AC supplies As per IEC/EN 61000-4-29 for DC supplies As per IEC/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 MC 2630 Test levels 100, 300 and 1,000A/m with external current transformer MC 26100

## OPTIONS

V 4780	Tapped autotransformer as per IEC/EN 61000-4-11 Ed.2
V 4780 S2	Tapped autotransformer as per IEC/EN 61000-4-11 Ed.2 with automatic change of tap
variac NX-1-260-16	Motorised variac (0 - 260V, 16A)
MS 100N	Magnetic field coil, 1m x 1m
MC 2630	Current transformer for magnetic fields up to 30A/m
MC 26100	Current transformer for magnetic fields up to 1,000A/m
CA PFS	Calibration box for inrush current verification as per IEC/EN 61000-4-11
CA PFS-100R	100 ohm low inductive load resistor, for rise and fall time verification

## TECHNICAL DETAILS

## 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	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/EN 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 25ohm each
As per FCC part 68	For 2-wire T1/T2 with 25ohm each
As per IEC 61000-4-5 ED 3.0	For 4-wire T1/T2/T3/T4 with 25ohm each

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.

## TECHNICAL DETAILS

## GENERAL DATA

## INTEGRATED COUPLING/DECOUPLING NETWORK

DUT supply	max. 400V/16A (AC); 50/60Hz max. 300V/16A (DC)
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## 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", 9HU
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	IEC/EN 61010
Security circuit	Control input (24VDC)
Warning lamp	Floating contact (max. 230V/6A)

## ACCESSORIES

## 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

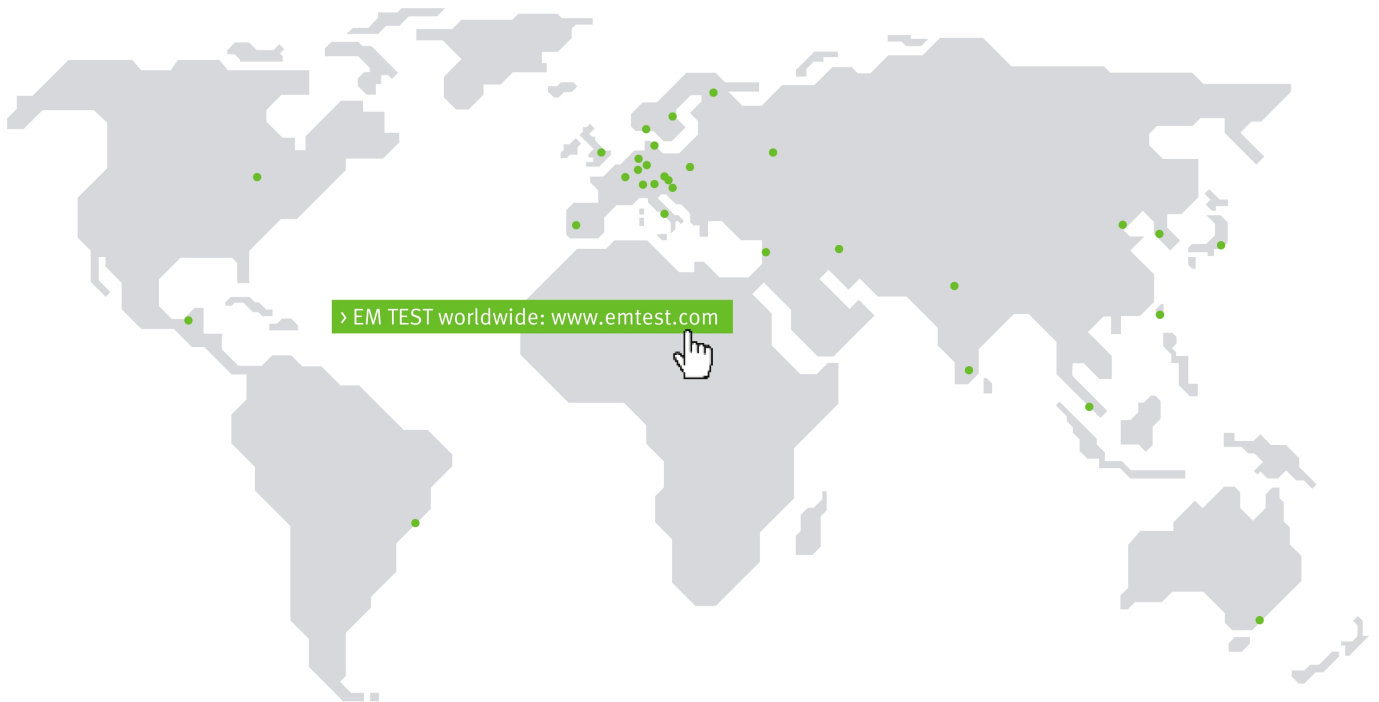
## OPTIONS

## OPTIONS

CNI 503Bx	3-phase coupling/decoupling networks as per IEC/EN 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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Information about scope of delivery, visual design and technical data correspond with the state of development at time of release. Subject to change without further notice.