



MULTIFUNCTION GENERATORS N5 + N7

# N-SERIES

# IGNORE EMC EARLY PAY THE PRICE LATER: OVERVIEW.



Telecommunications

Components & Safety

Industrial electronics

Many natural phenomena and those caused by electronic equipment result in serious EMC problems, if EMC is not considered from the very beginning.



Broadcast electronics

Medical technology

Residential electronics

Renewable energy

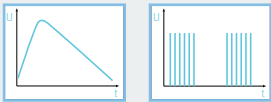
# THE WHOLE WORLD HAS STANDARDS. WE HAVE A SYSTEM.



The standards — are you familiar with all of them? Whether basic standard, generic standard, or product family standard — stipulated by law or demanded from the manufacturer: EM TEST has integrated all of them. Take advantage of the EM TEST test system. It knows what's what and focuses specifically on your requirements.



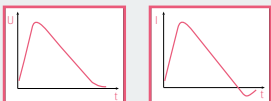
#### BURST



##### IEC/EN 61000-4-4 – Fast transients, bursts

Switching operations of inductive loads result in interferences in supply networks. The fast, low-energy interference pulses are simulated with the generator and superimposed to the supply voltage and/or signal/data lines of the EUT.

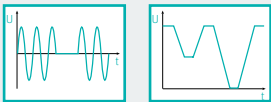
#### SURGE



##### IEC/EN 61000-4-5 – Surge voltages

Atmospheric discharges may damage electronic devices. A qualified test must be performed to check resistance to such high-energy interferences.

#### POWER FAILURE



##### IEC/EN 61000-4-11 – Voltage dips/short interruptions/voltage variations

“Dips” is a term used to describe brownouts and voltage drops occurring in the supply network due to short-circuits or by sudden large changes of connected loads.

#### RINGWAVE



##### IEC/EN 61000-4-12 – Interference resistance to damped oscillatory waves

Switching operations in inductive circuits, short-circuits, or lightning strikes can cause oscillatory transients, also called ringwaves, in building installations. This affects power as well as signal/data and control lines. To check the immunity of such lines, the optional ringwave module is used.

#### DAMPED OSCILLATORY MAGNETIC FIELD



##### IEC/EN 61000-4-10 – Interference resistance to damped oscillatory magnetic fields

This international standard refers to requirements for immunity to damped oscillatory magnetic fields as occur in low-voltage and high-voltage power supply systems.

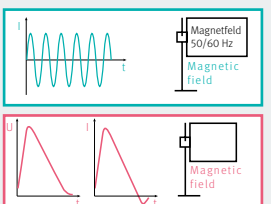
#### TELECOM-SURGE



##### IEC/EN 61000-4-5, CCITT, FTZ 12TR1

Telecommunication networks are exposed to lightning strikes and their associated effects. All telecommunication systems linked with lines installed outdoors therefore require reliable protection which needs to be tested.

#### MAGNETIC FIELDS



##### IEC/EN 61000-4-8 – Magnetic fields with a frequency of 50/60 Hz,

##### IEC/EN 61000-4-9 – Pulsed magnetic fields

Electronic devices and installations in residential and industrial areas can be affected by magnetic fields with low frequencies. Lightning strikes to buildings, antenna masts, and transient impacts due to faults in low-voltage, medium-voltage, and high-voltage systems can cause pulsed magnetic fields. These phenomena can be simulated with the generator and the magnetic field coil (optional), thereby providing interference resistance proof.



A THOUSAND WISHES,  
ONE SOLUTION ...

- › **Logical:** Easy, intuitive operation
- › **Relaxed:** Possible to set all parameters even during the test
- › **Direct:** Select from standard test levels
- › **Exact:** Statistical test options (random distribution)
- › **Viable:** Long-term viability regardless of standards
- › **More powerful:** Standard parameters must be exceeded (high performance reserves)
- › **Inclusive I:** Integrated interfaces (IEEE, USB)
- › **Inclusive II:** Integrated measuring technology (measured I/U values in display and CRO connection)
- › **Low cost:** Very good price/performance ratio
- › **Exemplary:** EM TEST service with accredited calibration labs



# MODULAR ALL-IN-ONE ALL-ROUND TALENT! THE UCS 500N SERIES.







We present the compact and most powerful EM TEST test system of all times. Be ready for the future. For the best future of all times.

# COMPACT POWER. THE N5.

## 01 MODULAR DESIGN

Up to 5 modules in one unit:

SURGE MODULE WITH 5,000 V, 1.2  $\mu$ s/50  $\mu$ s | 8  $\mu$ s/20  $\mu$ s

BURST/EFT MODULE WITH 5,500 V, 5 ns/50 ns | 1 MHz

POWER FAIL MODULE WITH 300 V

MAGNETIC FIELD, 1,000 A/m | 2,200 A/m

+ OPTIONAL TSURGE MODULE 5,000 V, 10  $\mu$ s/700  $\mu$ s

## 02 em.flow OPERATING CONCEPT

- > Extremely easy to operate
- > Possible to set all parameters even during the test
- > Select directly from standard test levels
- > Statistical test options
- > Predefined tests

## 03 HIGH-RESOLUTION DISPLAY

- > Integrated measuring technology
- > Integrated I/U measurement

### OUR INNOVATIONS:

- > Displays I/U values
- > Displays surge voltages and current during surge test
- > Magnetic field test:  
Easy configuration and automatic parameter calculation

05

08

03





## 04 CURRENT LIMITER em.safe

> EUT protection during surge test

## 05 FULL SET OF INTERFACES

> USB, IEEE 488, CN, analog input/outputs

## 06 EASY TO CONNECT

- > External motor variac
- > Magnetic field coil, IEC/EN 61000-4-8/-9
- > Three-phase coupling/decoupling networks (burst/surge)
- > Coupling filter for I/O lines



- > Safety circuit
- > Warning lamps

## 07 PRICE

Never before was so much so affordable!

## 08 VIABLE IN THE FUTURE

The device can be retrofitted and the software upgraded. When EM TEST performs the calibrations, an extended warranty is provided.

# PURE POWER. THE N7.

## 01 MODULAR DESIGN

Up to 6 modules in one unit:

SURGE MODULE WITH 7,000 V, 1.2  $\mu$ s/50  $\mu$ s | 8  $\mu$ s/20  $\mu$ s

BURST/EFT MODULE WITH 5,500 V, 5 ns/50 ns | 1 MHz

POWER FAIL MODULE WITH 300 V

MAGNETIC FIELD, 1,000 A/m | 3,000 A/m

+ OPTIONAL RINGWAVE MODULE 6,000 V, 100 kHz

+ OPTIONAL TSURGE MODULE 7,000 V, 10  $\mu$ s/700  $\mu$ s

## 02 em.flow OPERATING CONCEPT

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- > Safety circuit
- > Warning lamps

## 07 PRICE

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# BORN TO TEST: em.flow





Does not shy away from any type of test –  
the UCS 500N-series

Experience the em.flow: More efficient testing. Use standard and guideline libraries to quickly compile and start test sequences. Becoming one with the device — because it is easy. And easy is brilliant. Still have some wishes?

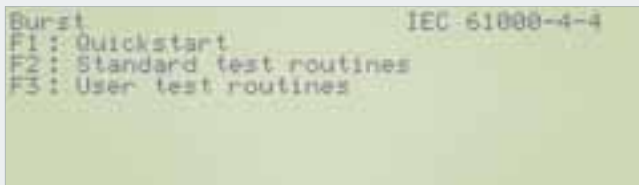


# SIMPLY GET GOING!

## WITH em.flow

Comfortable one glance info: The multifunction display makes you a test champion. Easy navigation, right to the target! This is how working is fun.

### YOUR CHOICE



#### NOTHING BUT CLARITY

For example, if you decided to carry out a burst test, use the function keys next to select either Quickstart, standard test routines, or user test routines.

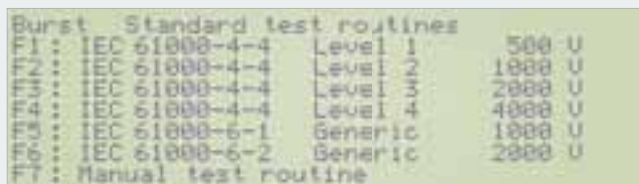
### QUICKSTART: NOTHING IS FASTER!



#### THE MOST IMPORTANT SETTINGS ARE ALREADY PREDEFINED

- > All generator parameters at a single glance
- > Immediate test start
- > Each parameter can be changed during the test

### STANDARD PROGRAMS

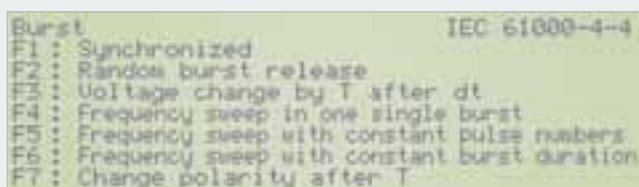


#### THE MOST COMPREHENSIVE STANDARD PROGRAM OF THE INDUSTRY

Instead of the Quickstart, you can also load any current standard from the integrated standards and guideline library and easily conduct tests based on the preset parameters.

Of course, regular library updates are available from EM TEST.

### USER PROGRAMS



#### CHOOSE FROM PRE-CONFIGURED TEST PARAMETERS

You prefer your own test sequences? No problem: The UCS offers comprehensive setting options. Just select what you want.

Easy as pie: Thanks to the EM TEST operating concept utilizing function keys and control dials, handling the device is unbelievably simple.



This much ease of use requires  
no additional explanations...

# THREE INNOVATIONS. MADE BY EM TEST.

## 1<sup>ST</sup> INNOVATION: CURRENT LIMITER em.safe

em.safe – AS SURE AS DEATH AND TAXES

```
Surge IEC 61000-4-5/9
F1: Quickstart
F2: Standard test routines
F3: User test routines
F4: Pulse magnetic fields
F7: Setup current limiter
```

F1 F2 F3 F4 F5 F6 **F7**

```
SETUP Current Limiter
F1: I-Limiter Differential Mode C_D
F2: I-Limiter Common Mode C_C
I_D I_C
2500 1250
```

F1 F2 F3 F4 F5 F6 **F7**

### CONFIGURABLE CURRENT LIMITER

Reliable testing with em.safe. An EUT is easily overloaded. And if this EUT is also a prototype, costs will rise in addition to the time delay as well.

### em.safe – PROTECTION FOR YOUR EUT

You probably do not pay attention to such details in the course of your everyday work routine but check to see how many devices actually feature such a protective function. You will be surprised.



Without em.safe



With em.safe

## 2<sup>ND</sup> INNOVATION: I/U DISPLAY

I/U DISPLAY

```
Surge Quickstart
U = 5000 U W = 274 grd
+/- = + cpl = L+H-PE
tr = 10 s tri = Auto
n = 36 pulses
Uset = 5000 U U = +4710 U Counter
STOP 7 s I = + 225 A 13
```

### CURRENT AND VOLTAGE DISPLAY

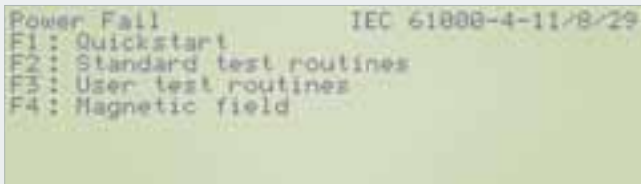
Information about current and voltage levels is important to you as user when performing surge tests. Of course, you also want these values depicted quickly and whenever you need them. The UCS is ready to satisfy your demands.



Of course, all these innovations are found in both, the N5 and the N7 – no doubt.

### 3<sup>RD</sup> INNOVATION: MAGNETIC FIELD TESTS

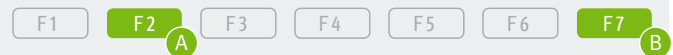
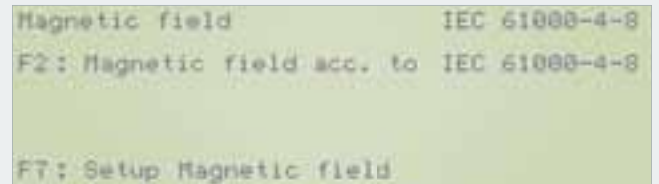
#### EXAMPLE: MAGNETIC FIELD TEST



#### SIMPLY SWITCH ON AND SELECT THE RIGHT MODULE

The coil and transformer correction factor must be considered when performing the magnetic field test. The complexity of this process is no longer a problem because the UCS does the calculating for you! Use the F4 function key to access the magnetic field menu directly.

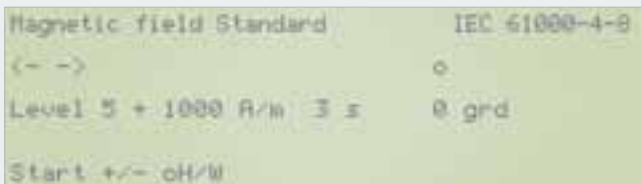
#### SELECTING THE MAGNETIC FIELD PROGRAM OF STANDARDS



#### SIMPLIFIED MAGNETIC FIELD TESTING

The parameters of the standard, level 1 to level 5, are already preset and can be selected immediately with the rotary selector.

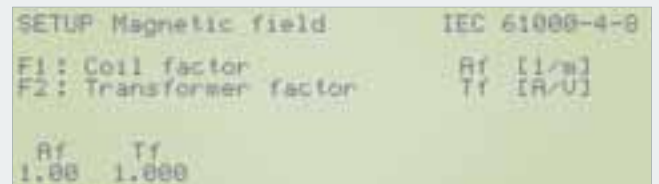
#### A ADJUSTING THE PARAMETERS OF THE STANDARD



#### ADJUSTING THE TEST PARAMETERS

One more step and you already have a choice of the preset program of standards for magnetic fields (F2) or the easy magnetic field setup (F7).

#### B SETTING COIL AND TRANSFORMER FACTOR



#### ADJUSTING THE TEST PARAMETERS

You select, the UCS calculates. Formula compilation tables and pocket calculator stay on the shelf. That's what we call "easy"!

#### OLD MANUAL METHOD:

COIL FACTOR (F<sub>coil</sub>)

$$F_{\text{Coil}} = \frac{H \text{ Field [A/m]}}{I \text{ Coil [A]}}$$

TRANSFORMER FACTOR (F<sub>Trafo</sub>)

$$F_{\text{Trafo}} = \frac{I \text{ Coil [A]}}{U \text{ Prim Transformer [V]}}$$

# CUSTOMIZED FOR EVERY TEST: THE iec.control



Our software concept is consistently user-friendly. Nothing is simpler – the same applies to the device. Just switch your computer on. And then – here we go!

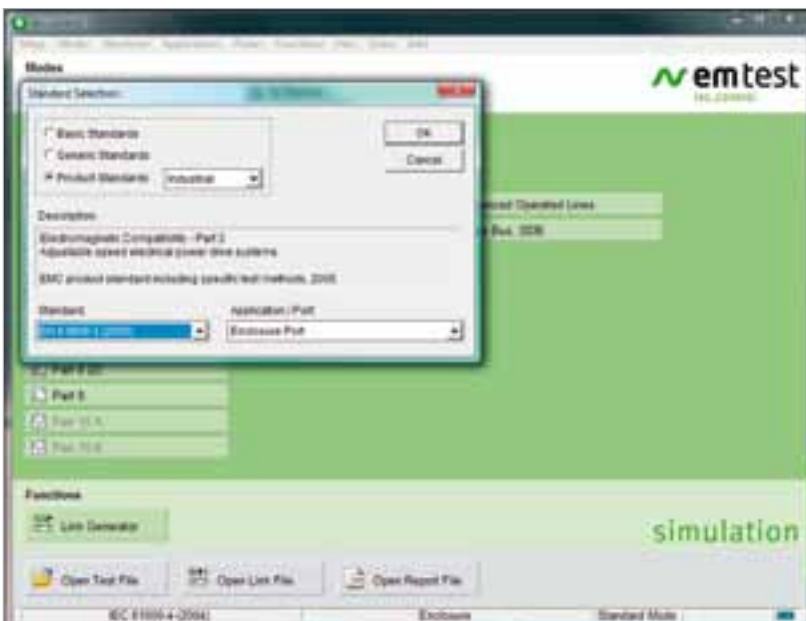


Even more functions with  
[iec.control](#)



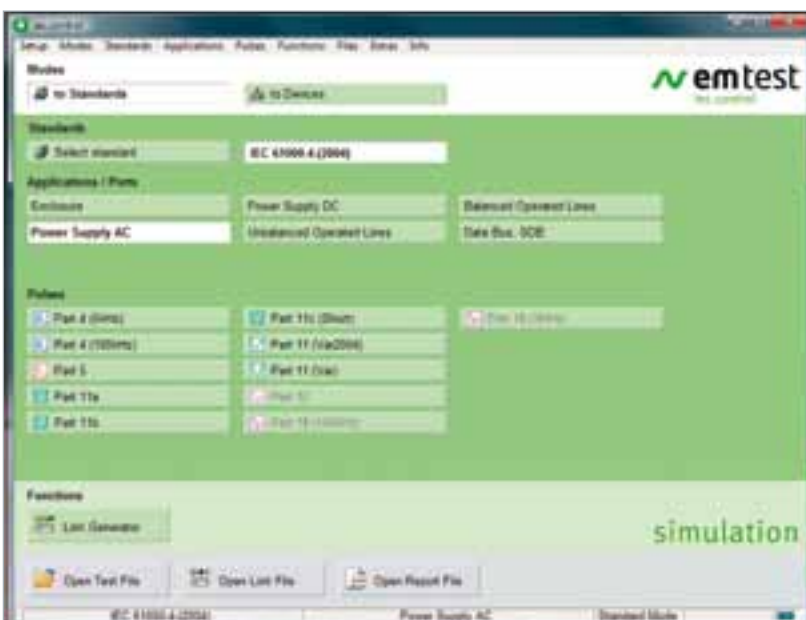
# iec.control – THE TESTWARE.

MANUFACTURER STANDARDS: BE IN THE KNOW WITH ONE OF THE LARGEST LIBRARY OF STANDARDS AND GUIDELINES



## STANDARD SELECTION

- > Selection based on basic/generic/product standards
- > Product standards are divided into categories to provide a clearer overview
- > Standards can be adjusted/changed
- > Password protection for EASY/EXPERT mode



## APPLICATION SELECTION

- > Easy to navigate Desktop view of all functions
- > Quickstart by selecting standard, application, or test pulse directly
- > Functions such as TEST, LINK, or REPORT files are available
- > Status bar depicts all of the important information
- > All functions also selectable from the MENU



Master all processes with iec.control. At a single glance. Never before was it this easy to generate test sequences. And everything can be configured or modified with the computer.



## SPECIFIC TEST SEQUENCES: EASILY GENERATE AND SAVE YOUR OWN TEST SPECIFICATIONS



### DETAIL SETTINGS

- > Informal test pulse graphic with parameter description
- > Directly selectable standard level
- > Any parameter setting in SPECIAL mode
- > Control buttons effectively placed at always the same position
- > Never loose sight of the test time

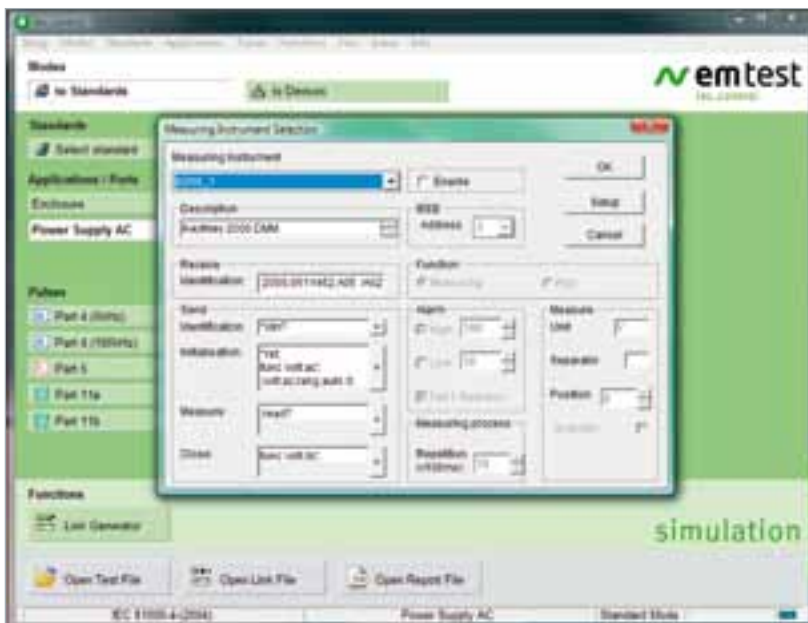


### LINK FILE GENERATOR

- > Individual TEST files are combined into LINK files
- > LINK files can be repeated as often as desired using the event counter
- > The incurred total test time is calculated and displayed
- > All files can be saved to and loaded from the computer network
- > Pause times and test information can be inserted between the individual test routines
- > A comment can be entered after each test, which is then inserted automatically into the test report



## MEASURING EQUIPMENT: INTEGRATION AND MANAGEMENT OF EXTERNAL MEASURING AND TESTING INSTRUMENTS



### MEASURING INSTRUMENT SELECTION

- > Any kind of measuring instruments and oscilloscopes can be integrated using IEEE/GPIB
- > Testing instruments can thus monitor the EUT
- > Oscilloscopes can integrate a plot to monitor the pulse
- > Alarm levels can be configured for the optimal measuring sequence control
- > EUT monitoring is realized with the logged measured values and trigger the fail function in an emergency to terminate the test



### TEST SEQUENCE

- > Display of all relevant data during the test
- > A clear overview of all finished and still pending tests at all times
- > Measuring instrument information is depicted and alarms are identified
- > All data are prepared in the background for documentation purposes
- > The status bar informs which test simulator is currently active
- > Continuous logging of the measured values during testing and also depicted in the test window. The plot with the last pulse of the test is prepared during the pulse monitoring and then inserted into the test report if desired.

From the first standard selection to the finished test report, iec.control provides with everything you could wish for from an easy to use EMC test software.  
A brilliant match for the EM TEST hardware.



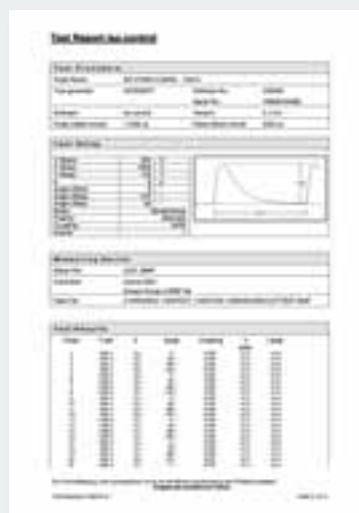
## REPORT GENERATION: EASILY MANAGE, PRINT OUT TESTS AND UPDATE STANDARDS



### REPORT GENERATION

- > Layout templates for individual test report designs
- > Complete documentation acc. to DIN EN ISO/IEC 17025
- > Clearly structured overview due to graphic with parameter configuration
- > If desired, documents are immediately formatted as RTF files
- > The test report is generated automatically during the test and is finished as soon as the test is completed
- > Complete test report with plot mapping  
The test report template can be customized and features your own company logo

### TEST REPORT



# EXTENDED CAPABILITIES: ACCESSORIES





MAGNETIC FIELD COIL



The **magnetic field coil** can be used for more than just standard tests. When combined with the UCS 500N5/N7, it is possible to simulate any field strengths up to 1,000 A/m. The magnetic field coil (1 m x 1 m) with a 4 cm<sup>2</sup> cross-section meets the requirements of IEC 61000-4-8 Ed. 2:2009 and IEC/EN 61000-9. A special model with wheels is available as an option.

- Type MS 100N: 1,000 A/m, pulsed up to 3,200 A/m
- MC 2630 current transformer for magnetic fields up to 40 A/m acc. to IEC/EN 61000-4-8
- MC 26100 current transformer for magnetic fields up to 1,000 A/m acc. to IEC/EN 61000-4-8

THREE-PHASE COUPLING NETWORKS FOR BURST AND SURGE PULSES ACC. TO IEC 61000-4-4/-5, EN 61000-4-4/-5



The **three-phase coupling network CNI 503** is a combination of burst and surge coupling filters and serves to superimpose the interference pulses over the three phase power supplies. Coupling networks of 16 A to 200 A/AC per phase can be provided. Special versions are available, e.g., 690 VAC (L-L) to 100 A and 1,000 VDC / to 63 A for the area of renewable energies (solar technology – inverter technology).

- Series CNI 503 to 5 kV: Type: CNI 503Ax, 3 x 480 V / 16 A, 32 A, 63 A\*, 100 A\*, 200 A\*
- Series CNI 503 to 7 kV: Type: CNI 503Bx, 3 x 480 V / 16 A, 32 A, 63 A\*, 100 A\*, 200 A\* (ANSI / IEC couplings)
- Series CNI 501/503 to 7 kV: 3 x 690 VAC / max.100 A and 1,000 VDC / max. 63 A \* delivered in rack

E AND H FIELD SENSORS TO TRACK DOWN INTERFERENCE RESISTANCE FLUCTUATIONS



**E and H field sensors** help users find weak points as early as the development phase resulting in a considerable cost saving. Application areas range from circuitry to enclosure development.

- Type ITP: Broadband sensor set for E fields, type ITP/H: Field sensors for H fields

CAPACITIVE COUPLING CLAMP



The standardized **capacitive coupling clamp (Type HFK)** makes it possible to couple burst pulses onto control and signal lines without galvanic connection.

- Type HFK: Acc. to IEC/EN 61000-4-4

TRANSFORMERS AND VARIACS

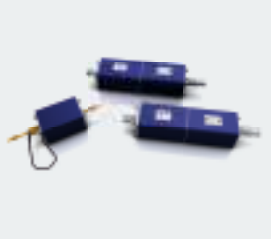


**Auto transformers and motor variacs**

Auto transformers are optionally available for voltage dips and interruptions acc. to IEC/EN 61000-4-11. Various optional motor variacs are available to support voltage variations (IEC/EN 61000-4-11) and magnetic field tests (IEC/EN 61000-4-8).

- Type V 4780, Type V 4780S2, Type MV 2616

CALIBRATION KIT



Our calibration kit to verify the generator at the coaxial output as well as at the coupling network output acc. to IEC/EN61000-4-4, Edition 2. The calibration kit includes the load resistors KW 50 and KW 1000 as well as an adapter to measure the coupling network

- Type CA EFT Kit



# UCS 500N5

## TECHNICAL DATA



## BURST-MODUL, EFT/N5

Electrical fast transient simulator

BURST MODULE, EFT/N5	
Test voltage	200 V – 5,500 V ± 10%, 100 V – 2,750 V ± 10% (50 T)
Pulse shape	5/50 ns at 50 T and 1,000 T
Rise time (tr)	5 ns ± 30% at 50 T, 5 ns ± 30% at 1,000 T
Pulse duration	50 ns ± 30% at 50 T, 50 ns –15/+100 ns at 1,000 T
Source impedance	50 T
Polarity	Positive/negative
TRIGGER (BURST)	
Pulse trigger	Automatic, manual, external
Synchronization	0° – 360°, resolution 1° (16 – 500 Hz)
Burst duration (td)	td = 0.10 ms – 999 ms
Repetition rate (tr)	tr = 10 ms – 9,999 ms
Burst frequency	f = 0.1 kHz – 1,000 kHz
Test duration	T = 0:01 min. – 99:59 min. T > 99:59 min. -> infinite
OUTPUTS	
Direct	Via 50 T coaxial
Coupling modes	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
TEST ROUTINES	
Quickstart	Parameter adjustable online, easy handling
Standard test routines	Acc. to IEC/EN 61000-4-4 Acc. to IEC/EN 61000-6-1/-2 Manual standard test routine
User-defined test routines	Synchronous burst triggering Random burst release Changing voltage after T Frequency sweep (single burst) Frequency sweep (constant pulse number) Frequency sweep (constant burst duration) Changing polarity after T
ACCESSORIES (BURST)	
HFK	Capacitive coupling clamp Acc. to IEC/EN 61000-4-4
KW 50	100:1 load resistor, 50 T
KW 1000	500:1 load resistor, 1,000 T
CA EFT kit	Calibration kit for pulse verification Consists of KW 50, KW 1000 and adapters
A6dB	6 dB attenuator, 50 T
ITP	Field sensor kit to generate electrical fields
ITP/H	Field sensor kit to generate magnetic fields

## SURGE-MODUL, VCS/N5

Combination wave simulator

MODUL SURGE, VCS/N5	
Voltage (o.c.)	160 V – 5,000 V ± 10%
Rise time	1.2 µs ± 30%
Decay time to half value	50 µs ± 20%
Current (s.c.)	Max. 2,500 A ± 10%
Rise time	8 µs ± 20%
Decay time to half value	20 µs ± 20%
Polarity	Positive/negative/alternating
Counter	1 – 30,000 or endless, adjustable
TRIGGER	
Pulse trigger	Automatic, manual, external
Synchronization	0° – 360°, resolution 1°
Repetition rate	Max. 1 Hz (1 s – 999 s)
OUTPUTS	
Direct	Via HV connectors, Zi = 2 T
Couplings	Line to line Line to ground (PE)
DUT supply	AC: 300 V/16 A; 50/60 Hz DC: 300 V/16 A
CRO trigger	5 V trigger signal for oscilloscope
MEASURING EQUIPMENT	
CRO Ū monitor	10 Vp/5,000 V
CRO Ī monitor	10 Vp/2,500 A
Peak voltage	5,000 V in LC display
Peak current	2,500 A in LC display
TEST PROCEDURES	
Quickstart	Parameter adjustable online, easy handling
Standard test routines	Acc. to IEC/EN 61000-4-5 Acc. to IEC/EN 61000-6-1/-2 Manual standard test routines
User-specific test routines	Changing coupling after n pulses Changing voltage after T Changing phase angle after n pulses
Pulsed magnetic field	Acc. to IEC/EN 61000-4-9 Test level 100, 300 and 1,000 A/m, test level variable adjustable using Quickstart
ACCESSORIES (COUPLING NETWORKS)	
CNV504N	Coupling network for 4 signal/data lines acc. to IEC/EN 61000-4-5
CNV508N	Coupling network for 8 signal/data lines acc. to IEC/EN 61000-4-5



## POWER FAIL MODULE PFS/N5

Power fail simulator

POWER FAIL MODULE, PFS/N5	
Channel PF1/PF2	AC voltage: max. 300 V AC current: max. 16 A DC voltage: max. 300 V DC current: max 16 A (IEC/EN 61000-4-29)
Frequency	16 Hz – 500 Hz
Switching time	< 5 µs at 100 T resistive load
Inrush current	> 500 A
Protection	Both channels short-circuit protected

TRIGGER	
Trigger	Automatic, manual, external
Synchronization	0° – 360°, resolution 1° (16 – 500 Hz)
Repetition rate	10 ms – 9,999 s
Test time	20 µs – 9,999 s

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

MEASURING EQUIPMENT	
DUT voltage	In display
DUT current	In display
MON V	Measuring DUT voltage with integrated divider 100:1
MON I	Measuring DUT current 10 mV/A; max. 1,000 A

TEST ROUTINES	
Quickstart	Parameter adjustable online, easy handling
Standard test routines	Acc. to IEC/EN 61000-4-11 for AC supply Acc. to IEC/EN 61000-4-29 for DC supply Acc. to IEC/EN 61000-6-1, -6-2 man. test routines
User-specific test routines	Voltage variations Controlling external variacs Changing phase angle after n events Changing event duration after n events Inverse mode
50/60 Hz magnetic field	Acc. to IEC/EN 61000-4-8 Test level 1, 3, 10 and 30 A/m with external current transformer MC2630 Test level 100, 300 and 1,000 A/m with current transformer MC26100

ACCESSORIES	
V4780	Auto transformer with taps acc. to IEC/EN 61000-4-11 Ed. 2
V4780 S2	Auto transformer with automatically switched taps acc. to IEC/EN 61000-4-11 Ed.2
MV2616	Motor variac (0 – 260 V, 16 A)
MS100N	Magnetic field coil, 1 m x 1 m
MC2630	Current transformer for magnetic fields up to 30 A/m
MC26100	Current transformer for magnetic fields up to 1,000 A/m
CA PFS	Calibration box to verify the inrush current acc. to IEC/EN 61000-4-11

## TELECOM SURGE MODULE\*

Telecom surge simulator – TSurge5

TSURGE5 MODULE	
Test voltage	160 V – 5,000 V ± 10%
Storage capacitor	20 µF
Polarity	Positive, negative, alternating
Counter	1 – 30,000 or infinite, adjustable acc. to ITU and ETSI recommendations
Rise time	10 µs ± 30%
Pulse duration	700 µs ± 20% Acc. to FCC part 68, pulse B
Rise time	9 µs ± 30%
Pulse duration	720 µs ± 20%
Output current	6 A – 125 A (short-circuit)
Rise time	5 µs ± 30%
Pulse duration	320 µs ± 20% Acc. to IEC/EN 61000-4-5
Rise time	6,5 µs ± 30%
Pulse duration	700 µs ± 20%
Output current	6 A – 125 A (short-circuit)
Rise time	4 µs ± 20%
Pulse duration	300 µs ± 20%

TRIGGER	
Trigger	Automatic, manual, external
Repetition rate	Max. 0.5 Hz (2 s – 999 s)

OUTPUTS (TELECOM SURGE)	
Acc. to ITU	For 2-conductor T1/T2, 25 T each
Acc. to FCC part 68	For 2-conductor T1/T2, 25 T each
Acc. to IEC/EN 61000-4-5	For 4-conductor T1, T2, T3 and T4, 100 T each

OPTIONS	
CNV 504S1	Coupling filter for 4 telecommunication lines (IEC/EN 61000-4-5)
CNV 508S1	Coupling filter for 8 telecommunication lines (IEC/EN 61000-4-5)

\*Optionally available

## GENERAL DATA

CONNECTIONS/PORTS	
Serial interface	USB
Parallel interface	IEEE 488, addresses 1 – 30
Analog output	0 – 10 VDC to control external transformers
CN interface	15-pin SubD connector to control external couplers
Fault inputs	DUT monitoring via Fail 1 and Fail 2 input (each 1)

DIMENSIONS AND WEIGHTS	
Dimensions	19"/3 HU, 19"/6 HU (with TSurge5 module)
Weight	Approx. 25 kg

MAINS	
Line voltage	115/230 V AC (+10%/–15%)
Power	Approx. 75 W
Frequency	50/60 Hz
Fuses	2xT2A (230 V)/2xT4A (115 V)

SAFETY	
Safety standard	IEC/EN 61010
Safety circuit	Control input (24 VDC)
Warning lamps	Potential-free (230 V / 6 A)

SCOPE OF DELIVERY	
Power cable	Acc. to destination country
Cable to DUT supply	Acc. to destination country
DUT adapter	Acc. to destination country
User manual	
Calibration certificate	
USB cable (USB A/B 3 m)	
Control software iec.control	

ACCESSORIES	
CNI 503Ax	3-phase coupling network Acc. to IEC/EN 61000-4-4 and 4-5 Up to 200 A per phase
CNI 508N1	Coupling network for fast communication lines acc. to IEC/EN 61000-4-5.
iec.control 1	Control and documentation software Incl. standard test routines and report options Integration of any measuring equipment and oscilloscopes using IEEE-GPIB commands.

Information about delivery scope, design, performances, capacities, dimensions, and weights correspond with the data available at the time of printing. Subject to change.

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# UCS 500N7

## TECHNICAL DATA



## BURST MODULE, EFT/N7

Electrical fast transient simulator

BURST MODULE, EFT/N7	
Test voltage	200 V – 5,500 V ± 10%; 100 V – 2,750 V ± 10% (50 T)
Pulse shape	5/50 ns at 50 T and 1,000 T
Rise time (tr)	5 ns ± 30% at 50 T, 5 ns ± 30% at 1,000 T
Burst range (td)	50 ns ± 30% at 50 T, 50 ns –15/+100 ns at 1,000 T
Source impedance	50 T
Polarity	Positive/negative
TRIGGER	
Burst triggering	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
Burst frequency	f = 0.1 kHz – 1,000 kHz
Test duration	T = 0:01 min – 99:59 min T > 99:59 min --> infinite
OUTPUTS	
Direct	Via 50 T coaxial
Coupling modes	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
TEST ROUTINES	
Quickstart	Parameter adjustable online, easy handling
Standard test routines	Acc. to IEC/EN 61000-4-4, Acc. to IEC/EN 61000-6-1/-2 Manual standard test routines
User-defined test routines	Synchronous burst triggering Random burst release Changing voltage after T Frequency sweep (single burst) Frequency sweep (constant pulse number) Frequency sweep (constant burst duration) Changing polarity after T
ACCESSORIES	
HFK	Capacitive coupling clamp Acc. to IEC/EN 61000-4-4
KW 50	100:1 load resistor, 50 T
KW 1000	500:1 load resistor, 1,000 T
CA EFT Kit	Calibration kit for pulse verification consisting of KW 50, KW 1000 and adapters
A6dB	6 dB attenuator, 50 T
ITP	Field sensor kit to generate electrical fields
ITP/H	Field sensor kit to generate magnetic fields

## SURGE MODULE, VCS/N7

Combination wave simulator

SURGE MODULE, VCS/N7	
Voltage (open)	250 V – 7,000 V ± 10%
Rise time	1.2 µs ± 30%
Decay time to half value	50 µs ± 20%
Current (short-circuit)	Max. 3,500 A ± 10%
Rise time	8 µs ± 20%
Decay time to half value	20 µs ± 30%
Polarity	Positive, negative, alternating
Counter	1 – 30,000 or endless, adjustable
OUTPUTS	
Direct	Via HV connectors, Zi = 2 T
Couplings	Acc. to IEC/EN 61000-4-5 Line to line with 2 T Line to ground with 12 T Acc. to ANSI/IEEE C62.41 Line to line with 2 T Line(s) to ground with 2 T
DUT supply	AC: 300 V / 16 A; 50/60 Hz DC: 300 V / 16 A
CRO trigger	5 V trigger signal for oscilloscope
MEASURING EQUIPMENT	
CRO Ū monitor	10 Vp at 7,000 V
CRO ↑ monitor	10 Vp at 3,500 A
Peak voltage	7,000 V in LC display
Peak current	3,500 A in LC display
TEST ROUTINES	
Quickstart	Parameter adjustable online, easy handling
Standard test routines	Acc. to IEC/EN 61000-4-5 Acc. to IEC/EN 61000-6-1/-2 Manual standard test routines
User-specific test routines	Changing polarity after n pulses Changing coupling after n pulses Changing voltage after T Changing phase angle after n pulses
Magnetic field, pulsed	Acc. to IEC/EN 61000-4-9 Test level 100, 200 and 1,000 A/m, test level variable adjustable using Quickstart
ACCESSORIES (COUPLING NETWORKS)	
CNV504N	Coupling network for 4 signal/ data lines acc. to IEC/EN 61000-4-5
CNV508N	Coupling network for 8 signal/ data lines acc. to IEC/EN 61000-4-5

## POWER FAIL MODULE PFS/N7

Power fail simulator

POWER FAIL MODULE, PFS/N7	
Channel PF1/PF2	AC voltage: max. 300 V AC current: max. 16 A DC voltage: max. 300 V DC current: max 16 A (IEC/EN 61000-4-29)
Frequency	16 Hz – 500 Hz
Switching time	< 5 us at 100 T resistive load
Inrush current	> 500 A
Protection	Both channels short-circuit protected

TRIGGER	
Trigger	Automatic, manual, external
Synchronization	0° – 360°, resolution 1° (16 – 500 Hz)
Repetition rate	10 ms – 9,999 s
Test time	20 μs – 9,999 s

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

MEASURING EQUIPMENT	
DUT voltage	In display
DUT current	In display
MON V	Measuring DUT voltage with integrated divider 100:1
MON I	Measuring DUT current; 10 mV/A; max. 1,000 A

TEST ROUTINES	
Quickstart	Parameter adjustable online, easy handling
Standard test routines	Acc. to IEC/EN 61000-4-11 for AC supply Acc. to IEC/EN 61000-4-29 for DC supply Acc. to IEC/EN 61000-6-1, 6-2 man. test routines
User-specific test routines	Voltage variation, external variac control Changing phase angle after n events, Changing event duration after n events, Inverse mode
50/60 Hz magnetic field	Acc. to IEC/EN 61000-4-8 Test level 1, 3, 10 and 30 A/m with external current transformer MC2630 Test level 100, 300 and 1,000 A/m with external current transformer MC26100

ACCESSORIES	
V4780	Auto transformer with taps acc. to IEC 61000-4-11 Ed. 2
V4780 S2	Auto transformer with automatically switched taps acc. to IEC 61000-4-11 Ed.2
MV2616	Motor variac (0 – 260 V, 16 A)
MS100N	Magnetic field coil 1 m x 1 m
MC2630	Current transformer for magnetic fields up to 30 A/m
MC26100	Current transformer for magnetic fields up to 1,000 A/m
CA PFS	Calibration box to verify the inrush current acc. to IEC/EN 61000-4-11

## RINGWAVE MODULE\* RWG/N7

Oscillatory wave simulator

RINGWAVE MODULE, RWG/N7	
Test voltage	250 V – 6,000 V ± 10%
Voltage	Pulse shape (open circuit)
Rise time	(1st peak) 0.5 μs ± 30%
Oscillation frequency	100 kHz ± 20%
Decay values	Peak 2 to Peak 1 = 40 – 110% Peak 3 to Peak 2 = 40 – 80% Peak 4 to Peak 3 = 40 – 80%
Current	Pulse shape (short-circuit)
Rise time	≤ 1.0 μs
Oscillation frequency	100 kHz ± 20%
Source impedance	12 T and 30 T
Peak current	Acc. to selected source impedance
Polarity	Positive/negative

TRIGGER	
Pulse triggering	Automatic, manual, external
Synchronization	0° – 360°, resolution 1°
Repetition rate	Max. 1 Hz (1 s – 999 s)

OUTPUTS	
Direct	Via HV connector
Coupling types	L, N, PE; line to line and line 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	
Quickstart	Parameter adjustable online, easy handling
Standard test routines	Acc. to ANSI/IEEE C62.41 Acc. to IEC/EN 61000-4-12

\*Optionally available

# TELECOM SURGE MODULE\*

Telecom surge simulator – TSurge7

TSURGE MODULE, TSURGE7	
Test voltage (open)	250 V – 7,000 V ± 10%
Storage capacitor	20 µF
Polarity	Positive, negative, alternating
Counter	1 – 30,000 or infinite, adjustable acc. to ITU and ETSI recommendations
Rise time	10 µs ± 30%
Pulse duration	700 µs ± 20% Acc. to FCC part 68, pulse B
Rise time	9 µs ± 30%
Pulse duration	720 µs ± 20%
Output current	6 A – 175 A (short-circuit)
Rise time	5 µs ± 30%
Pulse duration	320 µs ± 20% Acc. to IEC/EN 61000-4-5
Rise time	6.5 µs ± 30%
Pulse duration	700 µs ± 20%
Output current	6 A – 175 A (short-circuit)
Rise time	4 µs ± 20%
Pulse duration	300 µs ± 20%

TRIGGER	
Trigger	Automatic, manual, external
Repetition rate	Max. 0.33 Hz (3 s – 999 s)

OUTPUTS	
Acc. to ITU	2-conductor T1/T2, 25 T each
Acc. to FCC part 68	2-conductor T1/T2, 25 T each
Acc. to IEC 61000-4-5	4-conductor T1/T2, 100 T each

OPTIONS	
CNV 504S1	Coupling filter for 4 telecommunication lines (IEC/EN 61000-4-5)
CNV 508S1	Coupling filter for 8 telecommunication lines (IEC/EN 61000-4-5)

\*Optionally available

# GENERAL DATA

CONNECTIONS/PORTS	
Serial interface	USB
Parallel interface	IEEE 488, addresses 1 – 30
Analog output	0 – 10 VDC to control external transformers
CN interface	15-pin SubD connector to control external coupling networks
Fail inputs	DUT monitoring via Fail1 and Fail2 inputs

DIMENSIONS AND WEIGHTS	
Housing	19", 6 HU, L = 532 mm
Weight	Approx. 29 kg

MAINS	
Supply voltage	115/230 VAC +10%/–15%
Power	Approx. 75 W
Frequency	50/60 Hz
Fuses	2 x T2A (230 V) or 2 x T4A (115 V)

SAFETY	
Safety standard	IEC/EN 61010
Safety circuit	Control input (24 VDC)
Warning lamps	Potential-free (230 V/6 A)

SCOPE OF DELIVERY	
Power cable	Acc. to destination country
Cable to DUT supply	Acc. to destination country
DUT adapter	Acc. to destination country
User manual	
Calibration certificate	
USB cable (USB A/B 3 m)	
Control software iec.control	

ACCESSORIES	
CNI 503Bx	3-phase coupling/decoupling networks Acc. to IEC/EN 61000-4-4/-5 as well as ANSI/IEEE C62.41 up to 200 A per phase
CNI 508N1	Coupling network for fast communication lines acc. to IEC/EN 61000-4-5.
iec.control	Control and documentation software Incl. standard test routines and report options Integration of any measuring equipment and oscilloscopes using IEEE-GPIB commands.

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