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COMPACT NX7 SERIES

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

FOR TESTS ACCORDING TO ...

› ANSI/IEEE C62.41
› IEC 61000-4-4
› IEC 61000-4-5
› IEC 61000-4-8
› IEC 61000-4-9
› IEC 61000-4-11
› IEC 61000-4-12
› IEC 61000-4-29
› EN 61000-6-1
› EN 61000-6-2
› ECE-R10
› EN 300329
› EN 300340
› EN 300342-1
› EN 300386 V1.3.2
› EN 301489-1
› EN 301489-17
› EN 301489-24
› EN 301489-7
› ITU-T K.41

COMPACT NX7 - COMPACT TESTER FOR EFT/BURST, SURGE AND POWERFAIL

The compact Next Generation NX7 is the most versatile tester to address transient and power fail requirements for both international and commercial standards.
Featuring an easy-to-use color touch screen, the NX7 provides an economical solution for pre-compliance immunity testing as well as full-compliance testing and CE Marking. Its internal single-phase Coupling/Decoupling Network (CDN) can be extended for testing three-phase EUTs by means of an automatically controlled external CDN up to 200 A per phase. AMETEK CTS supplies a large range of accessories for various applications such as magnetic field tests and more.

HIGHLIGHTS

› **Smallest compact generator with 7" touch screen**
› **Burst 5.5 kV, Surge & Ringwave 7.0 kV ,Power Fail**
› **Selective test library adapted to the EUT setting**
› **Built-in single phase CDN 400 V/32 A**
› **Manual front panel operation with setup pictures**
› **Separate key for START/STOP operation with LED**
› **Monitor outputs for peak voltage and current**

APPLICATION AREAS

INDUSTRY
COMPONENTS
MEDICAL
BROADCAST
RESIDENTIAL
RENEWABLE ENERGY
TELECOM
AUTOMOTIVE

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TECHNICAL DETAILS

BENEFITS

ALL IN ONE - ALL YOU NEED FOR YOUR TESTS

The compact NX7 is a standalone generator which includes everything necessary to perform fully compliant tests. With separate power mains supply inputs, it allows the utilization of different EUT supply voltages for maximum flexibility.

The NX7 can be operated manually from the intuitive front touch screen or remotely via its built-in Ethernet, USB or optical interface. Failure inputs allow control of an ongoing test sequence based on the state of the EUT. Monitoring outputs (BNC) offer easy signal verification and measurements. For enhanced safety requirements, features like interlock and a warning lamp are available.

NX7 is the first generator that recognizes the connected EUT power configuration. Only coupling selections to active lines are enabled. Non existing lines will be disabled from the menu settings. Pre-programmed routines with common Test Standards allow maximum user convenience. Quick Start Test routines where parameters can be changed during susceptibility level evaluation are also available.

OPERATION

EASY TO OPERATE

An innovative color touch screen with intuitive menu structure and defined keys for Start / Stop / Break, indicated by LED bars, enables the user to program test routines quickly and accurately. The touch screen and knob allow fast control of all test parameters of the programmed routine, ensuring that test procedures are simplified and confidence is high that every step is carried out correctly.

SOFTWARE

IEC.CONTROL SOFTWARE FOR CONTROL AND DOCUMENTATION

Outstanding user convenience, clearly structured windows and operation features, EM TEST's comprehensive standards library along with the flexibility to easily generate user specific test sequences are the main features of iec.control software. The software will be automatically configured in accordance with the connected EM TEST generators. Extensive reporting capabilities help the user to create test reports that meet international requirements.
The iec.control is supported by Windows 7, Windows 8 and Windows 10. Remote control is achieved either via Ethernet or optical interface with USB connector at the PC side.
The iec.control supports various interfaces for the communication to external measuring devices.

OTHER MODELS

COMPACT NX5/NX7 SERIES - COMPACT TESTERS UP TO 5 KV OR 7 KV

The compact NX series simulators for Burst, Surge, Telecom Surge and Power Fail are available in two different versions, with a maximum test voltage of up to 5.5 kV or 7.0 kV.

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TECHNICAL DETAILS

AUXILIARY DEVICES

COUPLING NX7 - 3PHASE COUPLING/DECOUPLING NETWORKS FOR BURST AND SURGE

AMETEK CTS offers a range of fully automatic 3-phase coupling/decoupling networks for burst, surge and ringwave to extend the test capability for three-phase EUTs. The networks have a rated current of up to 200 A.

VARIAC NX 1-260-16 - MOTORISED VARIAC FOR VOLTAGE VARIATION

A motorized 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 motorized variac can also be used for automated magnetic field tests.

V 4780 - TAPPED VOLTAGE TRANSFORMER FOR VOLTAGE DIPS

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

V 4780S2 - TAPPED STEP TRANSFORMER AUTOMATIC FOR VOLTAGE DIPS

The V 4780S2 is an automatic tapped auto transformer, designed to supply the required voltages as per IEC/EN 61000-4-11 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 1m x 1m 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 360 degree rotation.
To generate power-frequency magnetic fields in the lower range the current transformer MFT 30 is used while high-field strength above 100 A/m up to 1000 A/m requires the MFT 100 current transformer.

CCI - CAPACITIVE COUPLING CLAMP

Capacitive coupling clamp as per specification 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.

PVF BKIT 1 - VERIFICATION KIT FOR EFT/BURST PULSES

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

CCI PVKIT 1 - VERIFICATION KIT FOR CAPACITIVE COUPLING CLAMP

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

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TECHNICAL DETAILS

ELECTRICAL FAST TRANSIENTS

BURST MODULE	
	As per IEC/EN 61000-4-4 and EN 61000-6-1, -6-2
Test voltage	200 V - 5,500 V ± 10%; 100 V - 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)	td = 0.10 ms - 9,999 ms
Repetition rate (tr)	tr = 10 ms - 9,999 ms
Spike frequency	f = 1 Hz - 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
EUT supply	AC: 300 V / 400 V, 50/60 Hz DC: 300 V / 400 V, Current: 16 A / 32 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/EN 61000-4-4, Levels 1 - 4 As per IEC/EN 61000-6-1, -6-2 As per ECE R-10 Rev5
Extended Test routines	Change voltage after T, Frequency sweep within one burst, Frequency sweep with constant number of pulses, Frequency sweep with constant burst duration, Synchronous burst release, Random burst release

OPTIONS	
CCI	Capacitive coupling clamp as per IEC/EN 61000-4-4
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 PVF 50 on 100 mm height as the capacitive coupling clamp, - PVF AD 3 to match the Transducer plate to the PVF 50
PVF 50	100:1 divider, 50 ohm
PVF 1000	500:1 divider, 1,000 ohm
PVF BKIT 1	Kit for burst pulse verification consisting of PVF 50, PVF 1000 and adapter for EUT port in a plastic case for storage
PVF AD 1	Adapter to match PVF 50 load resistor to the EUT supply of NX-series coupling network, 3-phase coupling network
ITP	Immunity test probes (electrical field generation)
ITP/H	Immunity test probe (magnetic field generation)

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TECHNICAL DETAILS

COMBINATION WAVE / SURGE

SURGE MODULE	
	As per IEC/EN 61000-4-5 and IEC/EN 61000-6-1, -6-2
Voltage (o.c.)	250 V - 7,000 V ± 10%
Pulse front time	1.2 µs ± 30%
Pulse duration	50 µs ± 20%
Current (s.c.)	Max. 3,500 A ± 10%
Pulse front time	8 µs ± 20%
Pulse duration	20 µs ± 20%
Polarity	Positive, negative, alternate

TRIGGER CIRCUIT	
Release of pulses	Automatic, manual, external
Synchronization	0° - 360°, resolution 1°
Repetition rate	max. 1 Hz (1 s - 9,999 s)
Event counter	1 - 99,999, selectable

OUTPUTS	
Direct	Via HV connectors for external coupling networks
Coupling mode	Line to line Line(s) to ground
EUT supply	AC: 300 V / 400 V, 50/60 Hz DC: 300 V / 400 V, Current: 16 A / 32 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 touch display
Peak current	3,500 A in the touch display
Overcurrent protection	Breaks the Surge test when the surge current is over the limit, Limiter for differential mode, Limiter for common mode
EUT current	RMS current, Range 50 A, ‹ ±5%
EUT overcurrent protection	Breaks the test when the EUT current is over the limit,

COMBINATION WAVE / SURGE

TEST ROUTINES	
Quick Start	One-line adjustable parameters, easy-to-use
Standard Test routines	As per IEC/EN 61000-4-5, As per IEC/EN 61000-6-1, As per IEC/EN 61000-6-2, Manual Standard Test routine
Extended Test routines	Voltage iteration after n pulses, Angle iteration stepwise, Phase angle randomiteration, Change coupling 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 continuously adjustable under Quick Start

OPTIONS	
DCD 7 sr-4-x	Coupling network for 4 signal/data lines as per IEC/EN 61000-4-5 Ed 3.0
DCD 7 sr-8-x	Coupling network for 8 signal/data lines as per IEC/EN 61000-4-5 Ed 3.0
DCD 7 st-4-1	Coupling/decoupling network for 4 unshielded symmetrical lines (communication lines) as per IEC/EN 61000-4-5 Ed 3.0 (fig. 10)
DCD 7 st-8-1	Coupling/decoupling network for 8 unshielded symmetrical lines (communication lines) as per IEC/EN 61000-4-5 Ed 3.0 (fig. 10)
HSC 4-8	Coupling/decoupling network for testing unshielded and shielded high-speed communication lines (Ethernet lines)
SPN 508N1	Surge protection network to reduce the surge voltage ‹10 V at the AE

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TECHNICAL DETAILS

POWER FAIL, DIPS & INTER-RUPTIONS, VOLTAGE VARIATIONS

POWER FAIL MODULE

As per	IEC/EN 61000-4-11, IEC/EN 61000-4-29 and IEC/EN 61000-6-1, -6-2
Channel PF1/PF2	AC voltage: max. 300 V / 400 V AC current: max. 16 A / 32 A DC voltage: max. 300 V / 400 V DC current: max. 16 A / 32 A
Frequency	16 Hz - 500 Hz and DC
Switching time	› 1 µs ‹ 5 µs into a 100 ohm resistive load (SVP 100)
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	10 µs - 99.999 s
Event counter	1 - 99,999, selectable

OUTPUTS

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

MEASUREMENTS

EUT voltage (rms)	In the touch screen
EUT current (rms)	In the touch screen
MON V	Measurement of the EUT voltage, built-in divider: 300 V: 42,5:1, 10 V =425 Vpk, 400 V: 56.6:1, 10 V =566 Vpk
MON I	Measurement of the EUT current, 16 A: 7 A/V; 10 V =70 Apk, 32 A: 10 A/V; 10 V =100 Apk

POWER FAIL, DIPS & INTER-RUPTIONS, 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 EN 61000-6-1, -6-2 Manual Standard Test routine
Extended Test routines	Voltage variation, control of an external variac, Phase angle iteration, Reduced time iteration, Angle inverse mode, Random by step and list Inverse mode
50/60 Hz magnetic field	As per IEC/EN 61000-4-8 Test levels 1, 3, 10 and 30 A/m with external current transformer MC 2630, Test levels 100, 300 and 1,000 A/m with external current transformer MC 26100

OPTIONS

V 4780	Tapped autotransformer as per IEC/EN 61000-4-11 Ed 2.0
V 4780S2	Tapped autotransformer as per IEC/EN 61000-4-11 Ed 2.0 with automatic change of tap
variac NX 1-260-16	Motorized variac (0 - 250 V, 16 A)
variac NX 1-260-32	Motorized variac (0 - 250 V, 32 A)
MS 100N	Magnetic field coil, 1 m x 1 m, up to ›1000 A/m
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/EN 61000-4-11
CA PFS-100R	100 ohm low inductive load resistor, for rise and fall time verification

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TECHNICAL DETAILS

RINGWAVE

RINGWAVE MODULE	
	As per ANSI/IEEE C62.41 and EN/IEC 61000-4-12
Test voltage	250 V - 7,000 V ± 10%
Voltage	Wave shape (open circuit)
Rise time	0.5 µs ± 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	0.2 µs ‹ tr ‹= 1.0 µs
Oscillation frequency	100 kHz ± 10%
Source impedance	12 ohm, 30 ohm, 50 ohm
Peak current	As per selected source impedance
Polarity	Positive, negative, alternate

RINGWAVE

TRIGGER CIRCUIT	
Release of pulses	Automatic, manual, external
Synchronization	0° - 360°, resolution 1°
Repetition rate	max. 1 Hz (1 s - 9999 s)
Event counter	1 - 99,999, selectable

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 / 400 V, 50/60 Hz DC: 300 V / 400 V, Current: 16 A / 32 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	500 V - 7000 V in the touch display

OPTIONS	
DCD 7 sr-4-x	Coupling network for 4 signal/data lines as per IEC/EN 61000-4-12 Ed 3.0
DCD 7 sr-8-x	Coupling network for 4 signal/data lines as per IEC/EN 61000-4-12 Ed 3.0
HSC 4-8	Coupling/decoupling network for testing unshielded and shielded high-speed communication lines (Ethernet lines)
SPN 508N1	Ringwave protection network to reduce the surge voltage ‹10 V at the AE

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TECHNICAL DETAILS

TELECOM SURGE

TSURGE MODULE, (OPTIONAL)	
Test voltage (o.c.)	250 V - 7,000 V ± 10%
Energy storage capacitor	20 µF
Polarity	Positive, negative, alternating
	As per ITU and ETSI recommendations
Front time	10 µs ± 30%
Pulse duration	700 µs ± 20%
	As per FCC part 68, Pulse B
Front time	9 µs ± 30%
Pulse duration	720 µs ± 20%
Output current @25 ohm output	6 A - 189 A (short circuit)
Rise time	5 µs ± 30%
Pulse duration	320 µs ± 20%
	As per IEC 61000-4-5
Rise time	10 µs ± 30%
Pulse duration	700 µs ± 20%
Output current @25 ohm output	6 A - 189 A (short circuit)
Rise time	5 µs ± 20%
Pulse duration	320 µs ± 20%

TELECOM SURGE

TRIGGER CIRCUIT	
Trigger of events	Automatic, manual, external
Repetition rate	max. 0.33 Hz (3 s - 999 s)
Event counter	1 - 99,999, selectable

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	
DCD 7 st-4-1	Coupling/decoupling network for unshielded symmetrical lines (communication lines) as per IEC/EN 61000-4-5 Ed.3 (fig. 10) for 4 lines.
DCD 7 st-8-1	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	2 x USB A for memory stick, 1 x USB B for service only, Opto - Link to USB for remote
Lan	Ethernet for remote
Analog output	0 - 10 VDC to control an external transformer
Sys.link	26 pin high density connector to control an external coupling network
Fail inputs	EUT monitoring via input (one each) EUT Monitor 1 EUT Monitor 2
Ext. Trigger	BNC Ext. Trigger IN pos slope 5 V
Ext. Sync Input	Differential input, 50 V - 690 VAC, 2 x 4 mm MC Safety connectors

DIMENSIONS AND WEIGHT	
16 A models	19"/6 HU, 500 mm deep, 19"/9 HU, with telecom module, approx. 30 kg
32 A models	19"/6 HU, 500 mm deep, 19"/9 HU, with telecom module, approx. 40 kg

GENERAL DATA

ENVIRONMENT	
Temperature	10 °C to 35 °C
Humidity	30 % to 75 %, non condensing
Atmospheric pressure	86 kPa (860 mbar) to 106 kPa (1,060 mbar)

MAINS	
Supply voltage	85 V - 264 V
Frequency	50/60 Hz
Power	approx. 75 W
Fuses	115 V: 2 x 4 A slow blow, 230 V: 2 x 2 A slow blow

SAFETY	
Safety standard	IEC/EN 61010
Security circuit	Control input (24 VDC)
Warning lamp	Floating contact (max. 60 V/2 A)

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TECHNICAL DETAILS

ACCESSORIES AND OPTIONS

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

OPTIONS	
coupling NX7	3-phase coupling/decoupling networks as per - IEC/EN 61000-4-4 and - IEC/EN 61000-4-5 up to 200 A per phase
iec.control	Remote control and documentation software, including standard test routines and reporting capabilities. included: UOC USB-Optolink Converter
UOC	USB-Optolink Converter, Optical Fibre cable, 5 m

MODELS

AVAILABLE MODELS: 300 V	
Compact NX7 series	Compact simulator with
compact NX7 bsp-1-300-16	Burst, Surge, Power Fail, 300 V, 16 A
compact NX7 bspr-1-300-16	Burst, Surge, Power Fail, Ringwave 300 V, 16 A
compact NX7 bspt-1-300-16	Burst, Surge, Power Fail, Telecom Surge 300 V, 16 A
compact NX7 bsprt-1-300-16	Burst, Surge, Power Fail, Ringwave, Telecom Surge 300 V, 16 A
compact NX7 bs-1-300-16	Burst, Surge 300 V, 16 A
compact NX7 bst 1-300-16	Burst, Surge, Telecom Surge 300 V, 16 A
compact NX7 sp-1-300-16	Surge, Power Fail, 300 V, 16 A
compact NX7 st-1-300-16	Surge, Telecom Surge 300 V, 16 A

AVAILABLE MODELS: 400 V	
compact NX7 bsp-1-400-16	Burst, Surge, Power Fail, 400 V, 16 A
compact NX7 bspr-1-400-16	Burst, Surge, Power Fail, Ringwave, 400 V, 16 A
compact NX7 bspt-1-400-16	Burst, Surge, Power Fail, Telecom Surge, 400 V, 16 A
compact NX7 bsprt-1-400-16	Burst, Surge, Power Fail, Ringwave, Telecom Surge, 400 V, 16 A

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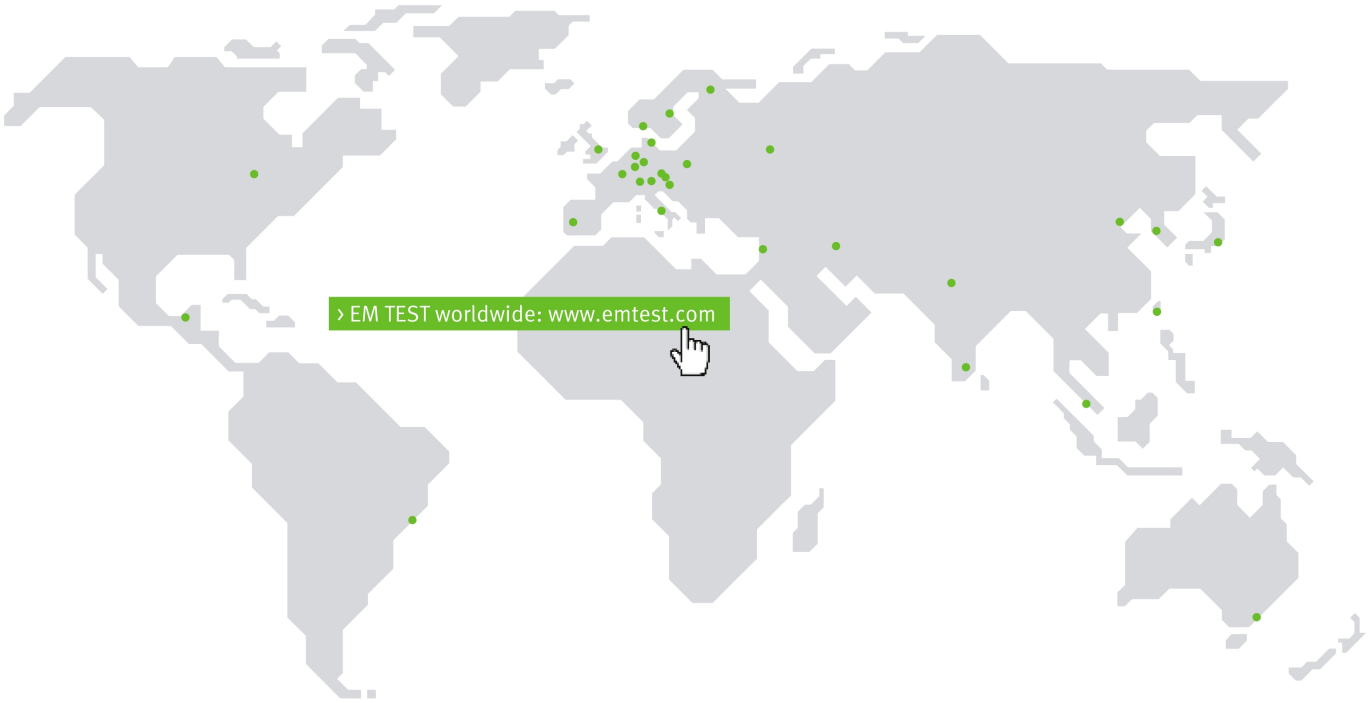
COMPETENCE WHEREVER YOU ARE



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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.