test systems

Modula 6100 System
Multifunction Generator

SCHAFFNER
safety for electronic systems

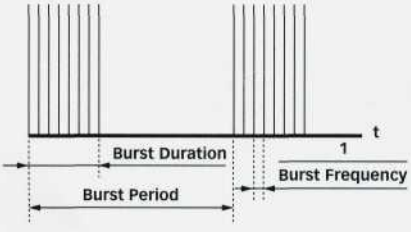
Modula, the easiest way to test EMC.

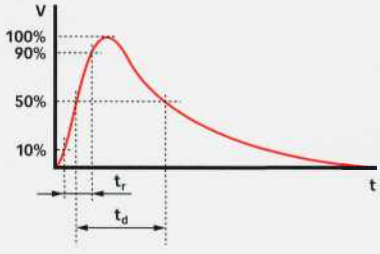
Modula represents the latest technology for pulse generators and systems intended for investigating the immunity of products to electromagnetic interference.

- Flexible and easy testing with PDA
- Professional and time saving test report generator
- Modern Wireless LAN technology
- Ethernet control interface
- Tailored solutions in LabView environment
- Open and modular architecture for custom system configuration
- Free, downloadable test library
- Handy and ultra-mobile

Comprehensive immunity testing concept.

Modula is the most convenient multifunction generator to simulate electromagnetic interference effects for immunity testing in conformity with international, national and in-house standards including the new IEC/EN standard. Modula is based on an innovative operating concept and an open and modular architecture.





Efficient, convenient and flexible. With its hand-held Wireless LAN PDA controller, the Modula offers an expediency and unprecedented efficiency in testing with greater operator convenience.

Besides the generation of the classic interference pulses such as Burst and Surge as well as Power Quality simulations, further functions can also be readily incorporated in the system configuration. Modula features a well considered and wide assortment of accessories.

Open architecture system, expandable and obsolescence-proof. Modula is an open architecture system concept that can be designed in various configurations depending on its intended use and customers' needs.

Individual function modules can be assembled as necessary to meet customer needs. Supplementary functions can be added at any time by the user. When modules are exchanged there is no need to send the whole generator for calibration, since the single module comes already calibrated with all correction data on it. Modula is expandable and obsolescence-proof. Upgrades to accommodate amendments to the standards are easily achieved with minimum expenditure thanks to the clearly structured modular configuration.

All system components are defined as function modules. This means the system configuration, corresponding parameters and interrelationships are precisely defined and are automatically made available to the user. The use of an industry standard system bus as an internal and external interface to every function module, the Ethernet control interface, the Wireless LAN interface, and a software concept based on the LabView standard running under Windows, provides the greatest possible freedom and flexibility for expansion.

Operational testing efficiency.

Efficiency is a golden rule in the laboratory, the test facility, in manufacturing and quality assurance. Modula features all the prerequisites to ensure easy and intuitive operation and to simplify test tasks through pre-programmed test routines. Test reports are produced in real time in an editable form as the test executes, thereby lightening the administrative workload of the test engineer.

PDA for mobility, easy handling and testing. Modula features a new approach to the man-machine interface. The use of a conventional PDA in combination with a built-in Wireless LAN access point results in significant advantages for the user.

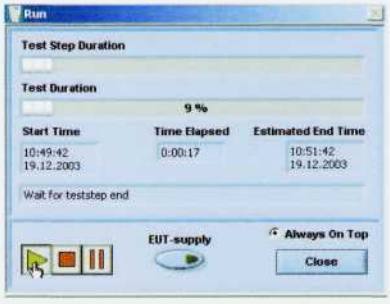
Space around an EMC test setup can be rather tight. The requirement to use short cables and defined grounding points means that quite often the generator cannot be placed in a very user-friendly position. Some standards even call for the test generator to be placed on a reference ground plane on the floor. Modula's compact case with convenient handles combined with the WLAN PDA makes Modula one of the most mobile test systems.

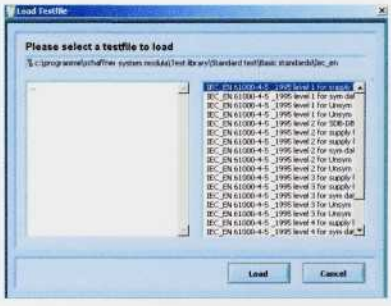
The large, color touch screen of the PDA displays a large quantity of test information in a clear manner. Important standard tests can be called up from a library and user-specific tests can be stored for later use. Command inputs are made using the PDA's conventional means: keypad, stylus or index finger. Furthermore, virtual slide bars are included so that parameters such as voltage or phase angle can be dynamically adjusted during a test.

The user interface presented on the mobile hand-held controller is available as a simplified application program which runs under Windows 95/98/ME/2000 and XP. This basic software is included with each Modula system.

WIN Modula software for automation, convenience, file handling and report generation.

WIN Modula is a comprehensive test software package that features a library of pre-programmed test routines to meet relevant standards and allows the creation of custom test suites. WIN Modula is an optional package that offers functionality far beyond the basic control software that is delivered with each Modula system.



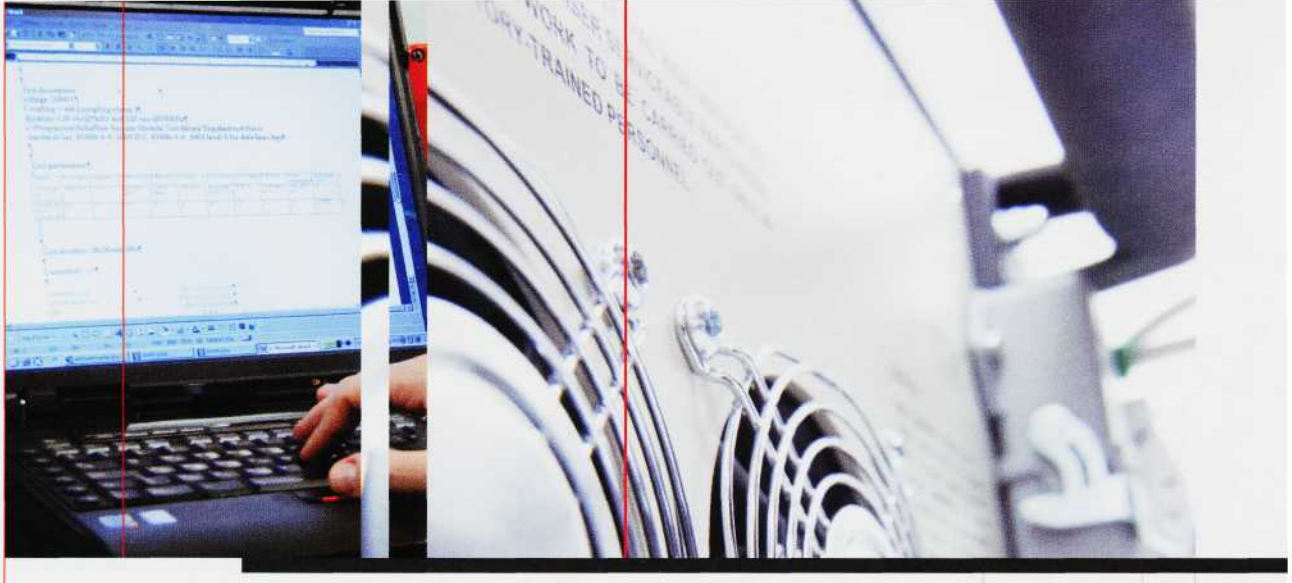


Modula is easily connected to any PC using a standard Ethernet cable. Optionally an optical cable can be used to provide electrical noise isolation between the Modula and the PC or network. Since the Ethernet interface is already integrated into the Modula master controller setup is quick and easy.

WIN Modula's test library can be continually updated to keep in step with the relevant standards. Standard tests from the library often form the basis for users to create their own individual test routines. Just like the pre-programmed standard tests, product-specific test sequences can be stored for later use.

Taking the form of a database, each complete pulse definition is recorded as a profile and subsequently executed on command, assembled into simple or complex sequences and expanded with further process control commands. This provides a factual and clear presentation of the test conditions and progress during the test setup phase and while the test is running.

WIN **Modula is a** Windows 95/98/ME/2000 and XP compatible program, and can be configured by the user to run in several different languages.

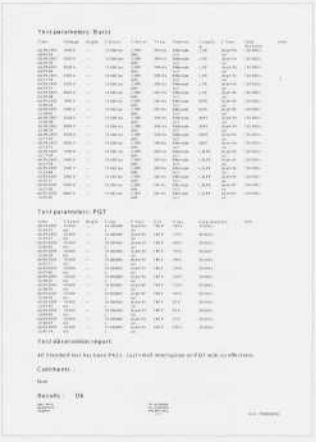


Easy reporting and high flexibility.

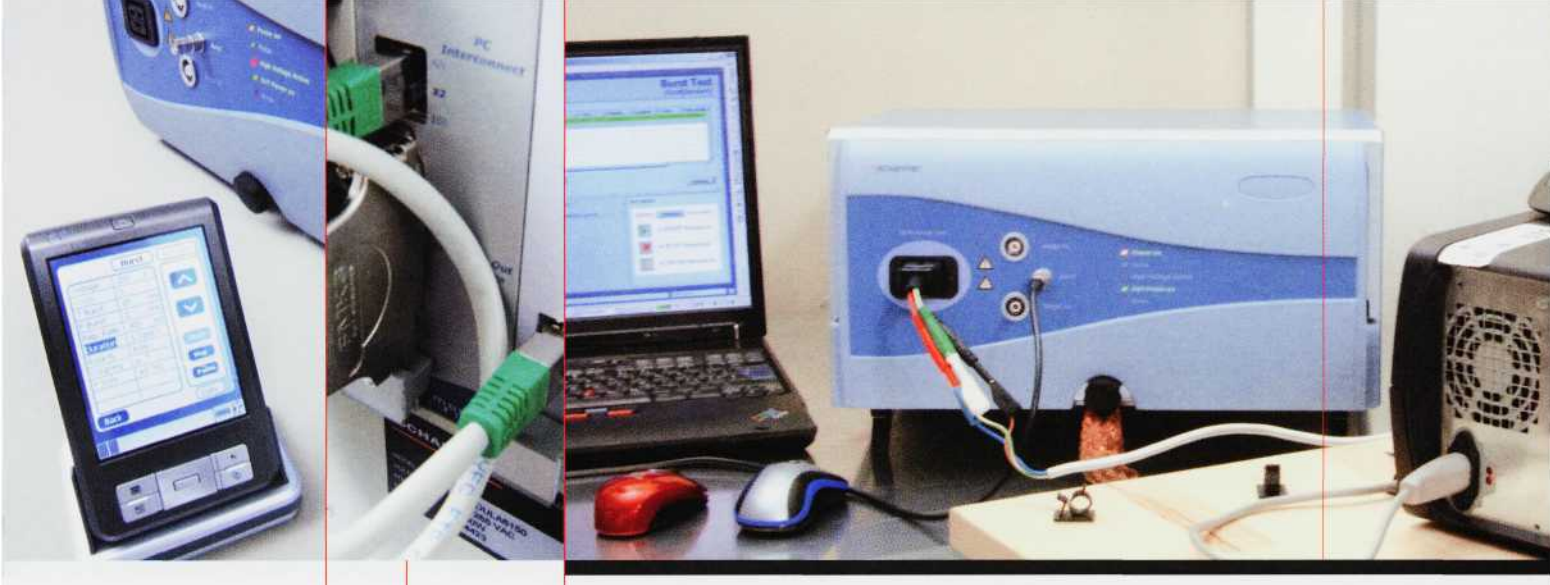
Automatically prepared test reports. WIN Modula prepares test reports automatically, including EUT reactions, if the electrical monitoring facility is used. In many cases the pre-prepared report format is directly suitable for the technical documentation, quality assurance purposes and certification of EMC conformity.

The test data can also be stored and exported in an MS Word compatible format, which simplifies any subsequent editing to suit customers' requirements.

Both data and test results including comments and time markers are also exportable in text format with delimiter characters. Database compatibility is therefore assured.



Comments can be appended interactively to a report even while a test procedure is running. Users can record observations on EUT behavior and make notes regarding test setup adjustments "on the fly". With the added time stamps, this information is compiled in a comprehensive report that requires no further editing.



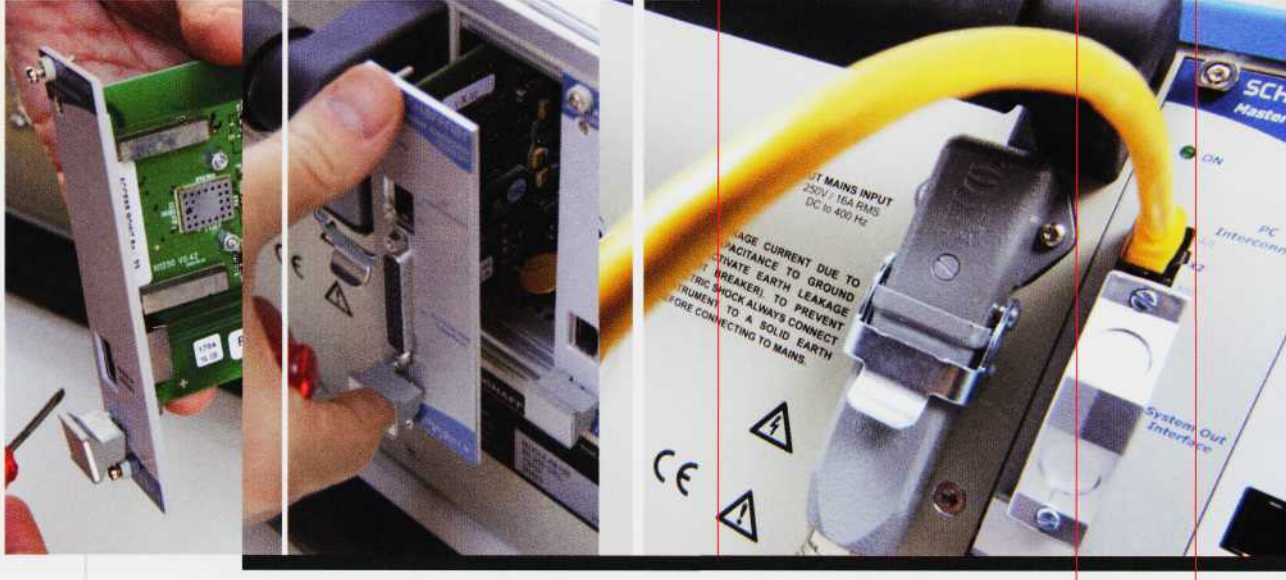
Thinking in industrial standards.

Wherever possible, industrial standards as well as commercially available products and technologies have been utilized so that the Modula concept blends seamlessly with today's work areas, complex system structures and communications networks.

System bus compatibility, communications protocol and Ethernet connectivity are combined in an open architecture to provide the ideal basis for system expansions or integration into other test automation systems.

Even the function modules of Modula communicate via the Interbus. This system bus is a widely used field bus with solid and interference-free components intended for use in an industrial environment. This allows the user to uniquely configure his test installation to monitor items under test, perform automatic operations or to harmonize with other processes.

LabView, an international standard, provides the basis for WIN Modula test management and control software. This allows the customer to integrate the operation of Modula with other test processes. Therefore the command structure and the communication protocol are freely available.



Standards in safety and network capability.

Greatest active and passive safety. Traditionally, Schaffner test equipment ensures the greatest active and passive safety for the user. Achieving this entails correctly specified industrial connectors, an interlock system to link in with safety circuits, constant status monitoring and display, the provision for remote operation and last but not least a remote safety switch. All the instrumentation is tested to ensure compliance with the safety requirements of IEC/EN 61010.

Industrial quality connectors. Connectors are type approved for the voltages and currents involved and meet laboratory and manufacturing area safety requirements.

Largest networking capability. Modula utilizes Ethernet as its communications interface. This provides the necessary basis for networking in conjunction with other lab instrumentation and with the existing computer infrastructure. Networking can also facilitate the distributed execution of test procedures and simplify the evaluation of results. An Internet link can provide remote diagnostic facilities for service and maintenance purposes, as well as convenient access to updates with new standard tests.

Modula accessories

INA 6501
Manual step transformer

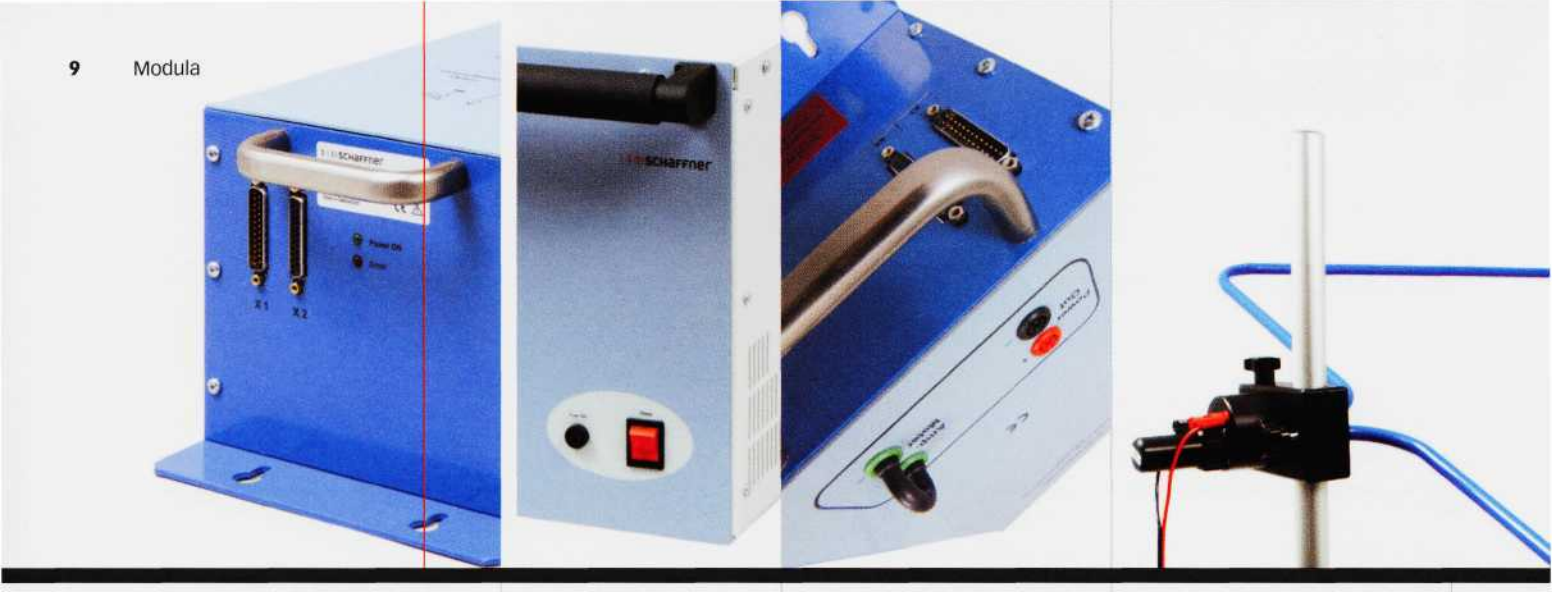
INA 6502
Automatic step transformer

NSG 438
ESD generator
up to 30kV

NSG 435
ESD generator
up to 15kV

CDN 8014/CDN 8015-M
Coupling clamp

CDN 163
Burst coupling network



VAR 6501
Automatic variac

VAR 6502
Automatic double variac

MFO 6501/MFO 6502
Manual or automatic interface/amplifier for magnetic antennas

INA 701/INA 702/INA 752
Antennas for magnetic fields

MD 200A
High voltage differential probe

CDN 253
3-phase coupling network 100A

Other accessories available

VAR 6503	Manual variac
CDN 133/153-M	3-phase coupling network 25A
CDN 6503	3-phase coupling network 32A
CDN 128	Coupling clamp light
CDN 117-M	Data line coupling network for surge pulses
CDN 118-M	Telecom coupling network for surge pulses
CAS 3025	Verification set for burst pulses

Modula 6100 System

Technical specifications

Mainframe	Housing	Table top unit with rack mounting option - Handles in front and back
	Dimensions	H x W x D 238 x 440 x 491mm (9.4 x 17.3 x 19.3")
	Weight	25kg (55lbs) approx.
instrument power		85–265VAC, 47 to 63Hz; IEC-connector, power switch, fuses
Operating elements/Connectors	Back panel	• EUT supply: Harting connector with pins for power line and aux. supply
		• Additional ground connector
	Front panel	• EUT connector IEC 320 / HV coaxial connectors surge high & low
		• HV coaxial connector burst - out / HF ground connection
		• Status LEDs for power, pulse, high voltage, EUT supply, output coupling, error
Environmental conditions		+5° to 40°C, 20 to 80% relative humidity (non condensing), 68 to 106kPa pressure, temperature controlled ventilators
Safety standards		IEC/EN 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use
EMC standards		IEC/EN 61000-6-2 Electromagnetic compatibility: Generic standard - Immunity for industrial environments
Master controller		System controller for configuration, real-time tasks, pulse library, test memory, user interface and communication Connector for system enhancement (Interbus), oscillation trigger, EUT fail signal, end of test signal and remote pulse trigger Communications interface (Ethernet TCP/IP) RJ 45 and optical
Coupling network		Burst/Surge coupling network according to IEC/EN 61000-4-4/-5. Up to 260VAC or DC, 16A continuous, 25A short term

Mobile hand-held controller **MHC 6550**

Mobile hand-held controller in plastic shell using a standard PDA (Toshiba e3xx, Windows CE), with control software and graphical user interface.

Data transmission	WLAN up to 30m
Keyboard/Display	Graphical color display and touch panel
Operating software	Multilingual • Controls all present parameters (according to configuration) • Dynamic parameter setting during execution of test • Load and store of (standard) tests • Graphical display of run time status
Miscellaneous	Can run other PocketPC-based applications

Surge generator **SRG 6501**

Generator according to IEC/EN 61000-4-5/plug-in module.

Pulse voltage (open circuit)	± 200V to 4.4kV; 1.2/50µs in 10V steps
Pulse current (short circuit)	± 100A to 2.2kA; 8/20µs
Impedance	2/12Ω
Pulse repetition	10 to 6QQs in 1s steps
Coupling	L→N; L→PE; N→PE; L&N→PE; coaxial pulse outputs
Modes of operation	Single pulses, test duration, continuous
Phase synchronization	Asynchronous, synchronous 0 to 359° in 1° steps

Burst generator **EFT 6501**

Generator according to IEC/EN 61000-4-4/plug-in module.

Pulse amplitude	± 200V to 4.8kV in 10V steps; open circuit ± 100V to 2.2kV in 10V steps; 50Ω matching system
Pulse data	Rise time: 5ns (10 to 90%) Pulse width: 50Ω load: 50ns ± 30% 1kΩ load: 50ns -15/+100ns
Burst frequency	100HZ to 1 MHz/single pulses
Pulses per packet	1 to 600 pulses
Burst period	100ms to 100s in 10ms steps
Coupling	L; N; PE; L&N; L&PE; N&PE; L&N&PE to reference ground
Modes of operation	Single pulses packages, continuous
Phase synchronization	Asynchronous, synchronous 0 to 359° in 1° steps

Power quality tester **PQT 6501**

Generator according to IEC/EN 61000-4-11 & -29/plug-in module.

EUT current	**Up to 16A rms continuous, 25A short term**
EUT voltage	**Up to 260VAC/DC**
Output voltage change under load	**0 to 16A: <5% (for 230V supply)**
Peak inrush current capability	**500A (at 230V)**
Phase angle synchronization	0 to **359° in 1° steps**
Switching times	**1 to** 5µs (100Ω **load)**
Event timing	20µs **to 70min**
Event repetition timing	40µs **to 70min**

Ordering information

Standard multifunction configuration

Modula 6100	Multifunction generator for immunity testing in accordance with the EN/IEC 61000-4-x series. With burst generator EFT 6501, surge generator SRG 6501, power quality tester PQT 6501, mobile hand-held controller MHC 6550, single-phase coupling network CDN 6501 (260V/16A AC/DC) including LAN (TCP/IP) interface and PC software WIN Modula light.

Custom configurations

MFR 6510	Modula mainframe incl. CDN 6501 (260V/16A AC/DC), with mobile hand-held controller MHC 6550 and LAN (TCP/IP) interface, ready to be configured in any combination of SRG 6501, EFT 6501, PQT 6501.
EFT 6501	Burst generator module for subsequent expansion.
PQT 6501	Power quality tester module for subsequent expansion.
SRG 6501	Surge generator module for subsequent expansion.

Options

WIN Modula	Test and test management software with test program library, automatic test report generation, test sequencer, access manager, etc.
INA 6501	Step transformer 0%, 40%, 70%, 80%, for switched voltage variations, 16A AC. Manual settings by rotary switch.
INA 6502	Step transformer 0%, 40%, 70%, 80%, for switched voltage variations, 16A AC. Automatic.
VAR 6501	Automatic motorized variac (250V/7.5A) for the simulation of under- and over-voltages and voltage variations.
VAR 6502	Automatic motorized double variac (250V/16A continuous) for the simulation of under- and over-voltages and voltage variations.
VAR 6503	Manual controlled variac (250V/7.5A) for the simulation of under- and over-voltages.
INA 701	Magnetic field antenna for pulsed magnetic fields up to 1300A/m with INA 752 and power line magnetic fields up to 4A/m with MFO 6501.
INA 702	Magnetic field antenna for pulsed magnetic fields up to 1300A/m with INA 752 and power line magnetic fields up to 40A/m with MFO 6501.
INA 752	Pulse shaping adaptor to INA 701 or INA 702 for pulsed magnetic fields up to 1300A/m.
MFO 6501	Manual interface and amplifier unit for power line frequency magnetic tests with antennas INA 701 or INA 702.
MFO 6502	Automatic interface and amplifier unit for power line frequency magnetic tests with antennas INA 701 or INA 702.
CDN 8014	Capacitive coupling clamp for data line testing with burst generators.
CDN **8015-M**	Capacitive coupling clamp with safety interlock for data line testing with burst generators.
CDN 163	Burst coupling network.
CDN 128	Capacitive coupling clamp (light version).
CDN **133/153-M**	3-phase coupling network 25A.
CDN 6503	3-phase coupling network 32A.
CDN 253	3-phase coupling network 100A.
CDN **117-M**	Data line coupling network for surge pulses.
CDN **118-M**	Telecom coupling network for surge pulses.
CAS 3025	Verification set for burst pulses.
MD 200	Differential high voltage probe for surge pulse verifications up to 3500V.
MD 200A	Differential high voltage probe for surge pulse verifications up to 7000V.
INA 6561	Burst measurement adaptor.
INA 6581	Remote safety switch.

Ask your nearest Schaffner sales organization for further configurations, options and availability.

safety for electronic systems

world-wide fast and cost effective calibration and customer services.

For fast-turnaround calibration and repair of all your commonly used EMC test equipment, choose Schaffner's calibration and customer services. The most extensive, single-source service for the calibration of RF and conducted EMI test equipment in the world, Schaffner provides test laboratories with a fast, reliable, high quality service.

Schaffner's extensive worldwide EMC calibration and repair capability is built on our own high quality standards and longstanding engineering experience. Most of our calibration centers are accredited to national and international standards, and all have full test and repair facilities for our EMC equipment. We test and calibrate other manufacturers' equipment as well.

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