

Test systems

## Modula 6100 System Multifunction Generator

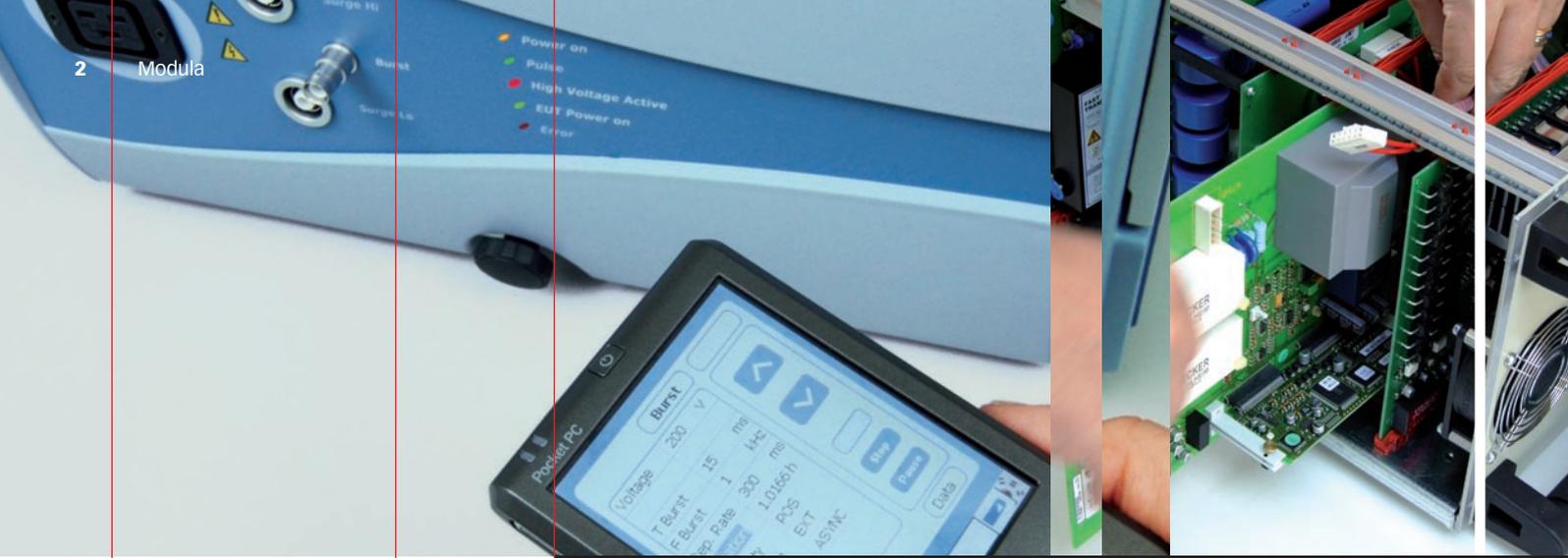
**SCHAFFNER**

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

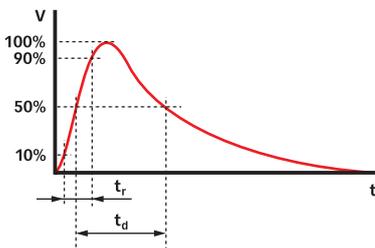
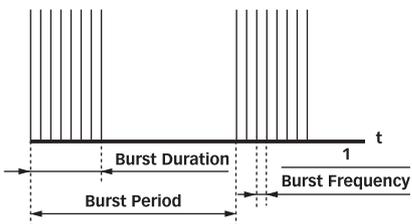
features a well considered and wide assortment of accessories.

**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.

**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



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.



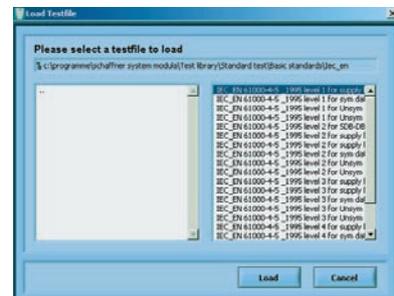
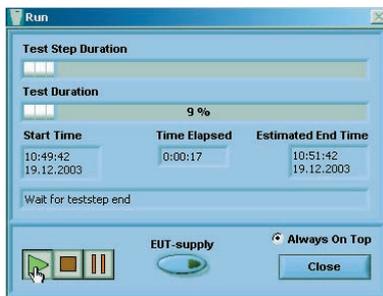
conventional means: keypad, stylus or index finger. Furthermore, virtual slide bars are included so that parameters such as voltage or phase angle can be dynamically adjusted during a test.

**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.

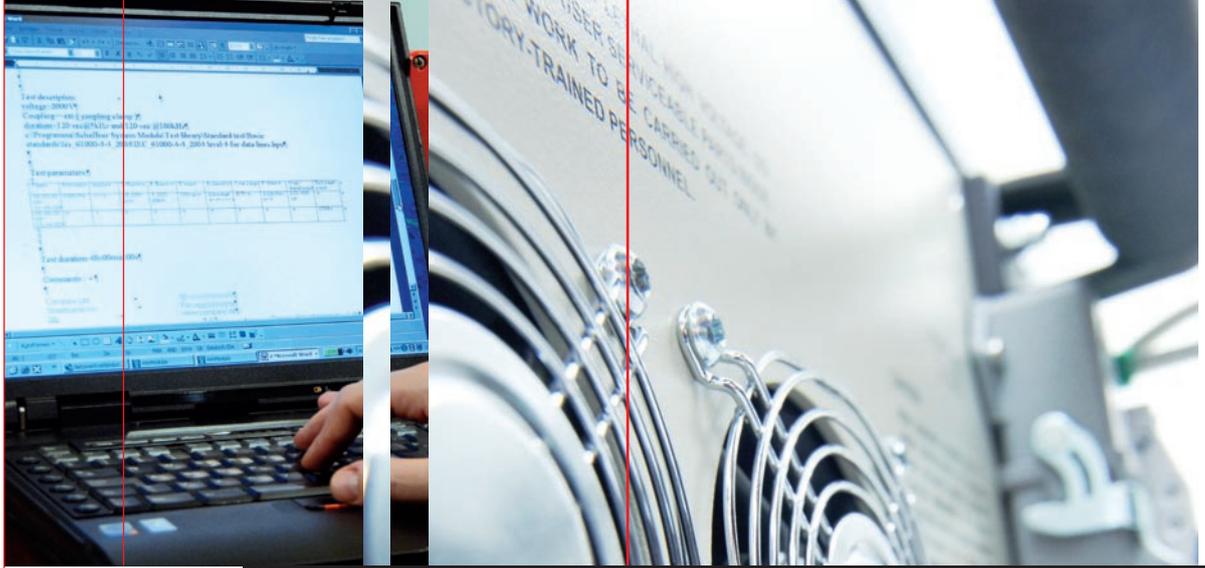


Modula is easily connected to any PC using a standard Ethernet cable. Optionally an optical cable can be used to provide electrical noise isolation between the Modula and the PC or network. Since the Ethernet interface is already integrated into the Modula master controller setup is quick and easy.

**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.

**Mufotec Ltd**  
Switching systems

- TEST REPORT -  
Immunity to EMC Pulses

Customer:	Mufotec Ltd
Company:	Blackfriars Street 41
Street:	Zone 18
Town:	DN 18900 Grandville
UK:	01 352 804600
EU:	01 352 8045 503
Mail:	g.mufota@mufotec.com

Equipment tested	Personnel
EMC100	EMC100

Standards	Limit	Criteria	Result
EN 61000-4-2	3	1	PASS
EN 61000-4-3	3	1	PASS
EN 61000-4-4	3	1	PASS

Tested by: Bob Hanley  
EMC Engineering

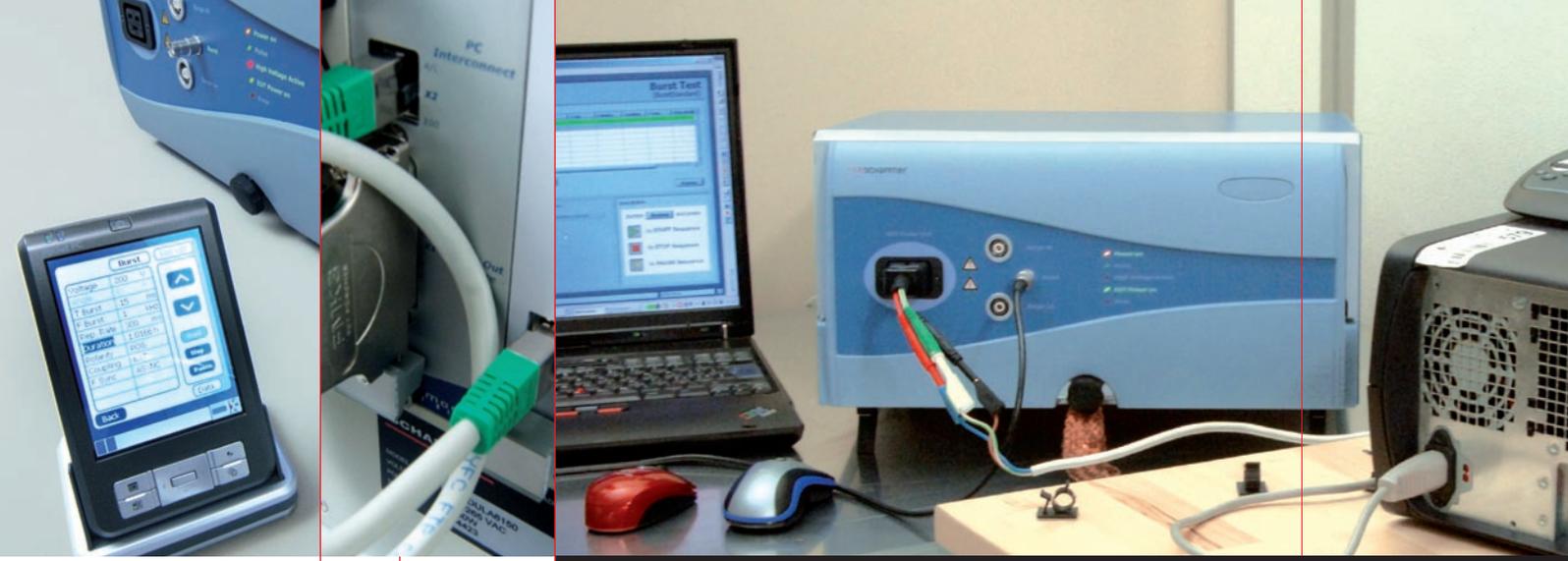
Date: 09/09/05 Signature:

Test parameters: Burst

Time	Value	Unit	Event			
09:00:00	1000	V	1000	1000	1000	1000
09:00:01	1000	V	1000	1000	1000	1000
09:00:02	1000	V	1000	1000	1000	1000
09:00:03	1000	V	1000	1000	1000	1000
09:00:04	1000	V	1000	1000	1000	1000
09:00:05	1000	V	1000	1000	1000	1000
09:00:06	1000	V	1000	1000	1000	1000
09:00:07	1000	V	1000	1000	1000	1000
09:00:08	1000	V	1000	1000	1000	1000
09:00:09	1000	V	1000	1000	1000	1000
09:00:10	1000	V	1000	1000	1000	1000
09:00:11	1000	V	1000	1000	1000	1000
09:00:12	1000	V	1000	1000	1000	1000
09:00:13	1000	V	1000	1000	1000	1000
09:00:14	1000	V	1000	1000	1000	1000
09:00:15	1000	V	1000	1000	1000	1000
09:00:16	1000	V	1000	1000	1000	1000
09:00:17	1000	V	1000	1000	1000	1000
09:00:18	1000	V	1000	1000	1000	1000
09:00:19	1000	V	1000	1000	1000	1000
09:00:20	1000	V	1000	1000	1000	1000
09:00:21	1000	V	1000	1000	1000	1000
09:00:22	1000	V	1000	1000	1000	1000
09:00:23	1000	V	1000	1000	1000	1000
09:00:24	1000	V	1000	1000	1000	1000
09:00:25	1000	V	1000	1000	1000	1000
09:00:26	1000	V	1000	1000	1000	1000
09:00:27	1000	V	1000	1000	1000	1000
09:00:28	1000	V	1000	1000	1000	1000
09:00:29	1000	V	1000	1000	1000	1000
09:00:30	1000	V	1000	1000	1000	1000
09:00:31	1000	V	1000	1000	1000	1000
09:00:32	1000	V	1000	1000	1000	1000
09:00:33	1000	V	1000	1000	1000	1000
09:00:34	1000	V	1000	1000	1000	1000
09:00:35	1000	V	1000	1000	1000	1000
09:00:36	1000	V	1000	1000	1000	1000
09:00:37	1000	V	1000	1000	1000	1000
09:00:38	1000	V	1000	1000	1000	1000
09:00:39	1000	V	1000	1000	1000	1000
09:00:40	1000	V	1000	1000	1000	1000
09:00:41	1000	V	1000	1000	1000	1000
09:00:42	1000	V	1000	1000	1000	1000
09:00:43	1000	V	1000	1000	1000	1000
09:00:44	1000	V	1000	1000	1000	1000
09:00:45	1000	V	1000	1000	1000	1000
09:00:46	1000	V	1000	1000	1000	1000
09:00:47	1000	V	1000	1000	1000	1000
09:00:48	1000	V	1000	1000	1000	1000
09:00:49	1000	V	1000	1000	1000	1000
09:00:50	1000	V	1000	1000	1000	1000
09:00:51	1000	V	1000	1000	1000	1000
09:00:52	1000	V	1000	1000	1000	1000
09:00:53	1000	V	1000	1000	1000	1000
09:00:54	1000	V	1000	1000	1000	1000
09:00:55	1000	V	1000	1000	1000	1000
09:00:56	1000	V	1000	1000	1000	1000
09:00:57	1000	V	1000	1000	1000	1000
09:00:58	1000	V	1000	1000	1000	1000
09:00:59	1000	V	1000	1000	1000	1000
09:01:00	1000	V	1000	1000	1000	1000

Test parameters: PQT

Time	Value	Unit	Event									
09:00:00	1000	V	1000									
09:00:01	1000	V	1000									
09:00:02	1000	V	1000									
09:00:03	1000	V	1000									
09:00:04	1000	V	1000									
09:00:05	1000	V	1000									
09:00:06	1000	V	1000									
09:00:07	1000	V	1000									
09:00:08	1000	V	1000									
09:00:09	1000	V	1000									
09:00:10	1000	V	1000									
09:00:11	1000	V	1000	1000	V	1000	1000	V	1000	1000	V	



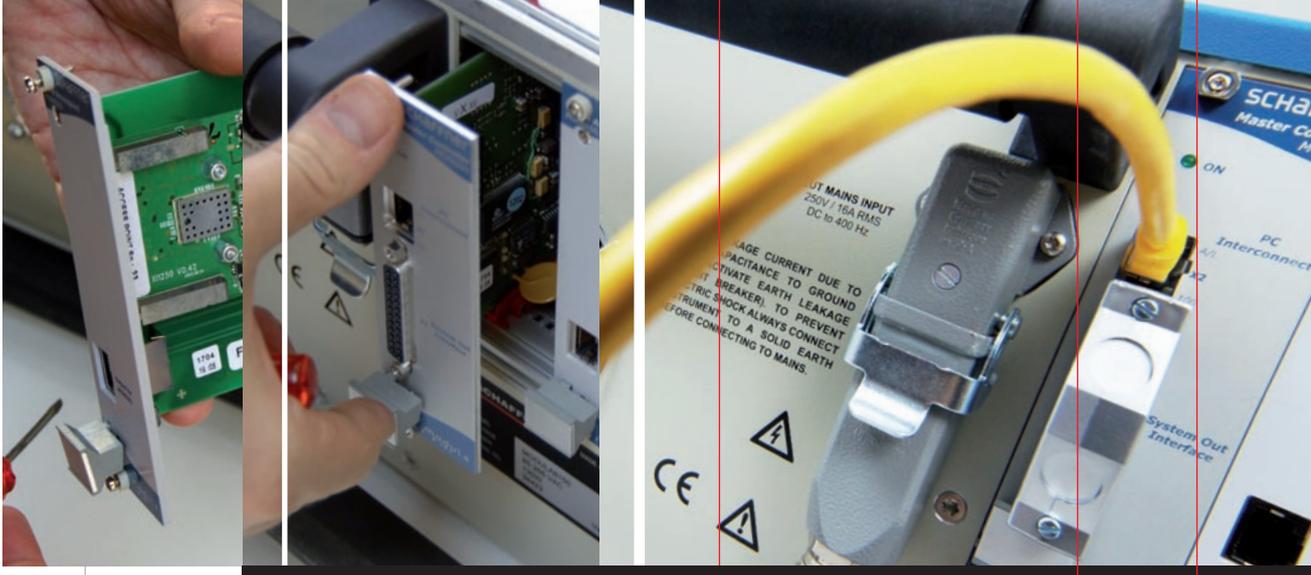
## Thinking in industrial standards.

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.

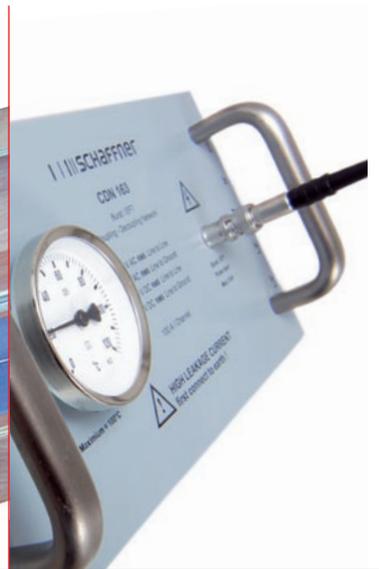




## Modula accessories

**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



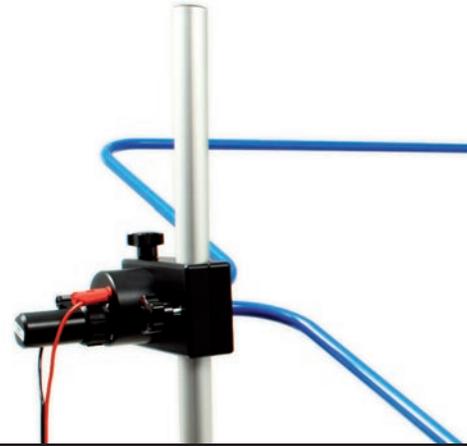
**VAR 6501**  
Automatic variac



**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



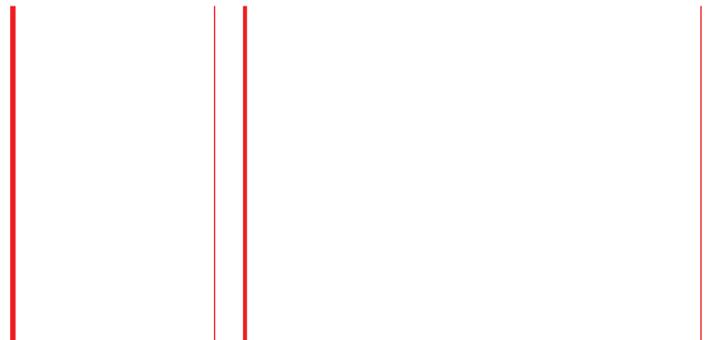
**MD 200A**  
High voltage  
differential probe



**CDN 253**  
3-phase coupling  
network 100A

**Other accessories available**

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





## Modula 6100 System

### Technical specifications

<b>Mainframe</b>	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.
<b>Instrument power</b>		85–265VAC, 47 to 63Hz; IEC-connector, power switch, fuses
<b>Operating elements/Connectors</b>	Back panel	<ul style="list-style-type: none"> <li>■ EUT supply: Harting connector with pins for power line and aux. supply</li> <li>■ Additional ground connector</li> </ul>
	Front panel	<ul style="list-style-type: none"> <li>■ EUT connector IEC 320 / HV coaxial connectors surge high &amp; low</li> <li>■ HV coaxial connector burst – out / HF ground connection</li> <li>■ Status LEDs for power, pulse, high voltage, EUT supply, output coupling, error</li> </ul>
<b>Environmental conditions</b>		+5° to 40°C, 20 to 80% relative humidity (non condensing), 68 to 106kPa pressure, temperature controlled ventilators
<b>Safety standards</b>		IEC/EN 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use
<b>EMC standards</b>		IEC/EN 61000-6-2 Electromagnetic compatibility: Generic standard – Immunity for industrial environments
<b>Master controller</b>		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
<b>Coupling network</b>		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

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

### MHC 6550

<b>Data transmission</b>	WLAN up to 30m
<b>Keyboard/Display</b>	Graphical color display and touch panel
<b>Operating software</b>	Multilingual <ul style="list-style-type: none"> <li>■ Controls all present parameters (according to configuration)</li> <li>■ Dynamic parameter setting during execution of test</li> <li>■ Load and store of (standard) tests</li> <li>■ Graphical display of run time status</li> </ul>
<b>Miscellaneous</b>	Can run other PocketPC-based applications

### Burst generator

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

### EFT 6501

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

### Surge generator

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

### SRG 6501

<b>Pulse voltage (open circuit)</b>	± 200V to 4.4kV; 1.2/50μs in 10V steps
<b>Pulse current (short circuit)</b>	± 100A to 2.2kA; 8/20μs
<b>Impedance</b>	2/12Ω
<b>Pulse repetition</b>	10 to 600s in 1s steps
<b>Coupling</b>	L→N; L→PE; N→PE; L&N→PE; coaxial pulse outputs
<b>Modes of operation</b>	Single pulses, test duration, continuous
<b>Phase synchronization</b>	Asynchronous, synchronous 0 to 359° in 1° steps

### Power quality tester

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

### PQT 6501

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

## Ordering information

### Standard multifunction configuration

<b>Modula 6100</b>	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

<b>MFR 6510</b>	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.
<b>EFT 6501</b>	Burst generator module for subsequent expansion.
<b>PQT 6501</b>	Power quality tester module for subsequent expansion.
<b>SRG 6501</b>	Surge generator module for subsequent expansion.

### Options

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

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

## 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.



### Headquarters

**Schaffner EMV AG**  
 CH-4542 Luterbach, Switzerland  
 T +41 32 681 66 26  
 F +41 32 681 66 41  
 sales@schaffner.com  
[www.schaffner.com](http://www.schaffner.com)

### China

**Schaffner Beijing Liaison Office**  
 T +86 10 6510 1761  
 chinasales@schaffner.com

### France

**Schaffner EMC S.A.S.**  
 T +33 1 34 34 30 60  
 francesales@schaffner.com

### Germany

**Schaffner Electrotest GmbH**  
 T +49 30 5659 8835  
 desales@schaffner.com

### Italy

**Schaffner Electrotest S.r.l.**  
 T +39 030 710 0299  
 tsitalysales@schaffner.com

### Japan

**Schaffner EMC K.K.**  
 T +81 3 5456 8929  
 japansales@schaffner.com

### Singapore

**Schaffner EMC Pte Ltd.**  
 T +65 6377 3283  
 singapore-sales@schaffner.com

### Switzerland

**Schaffner EMV AG**  
 T +41 32 681 66 26  
 sales@schaffner.com

### UK

**Schaffner Ltd.**  
 T +44 118 97 70 07 0  
 uksales@schaffner.com

### USA

**Schaffner EMC Inc.**  
 T +1 732 225 9533  
 Toll free 800 367 5566  
 usasales@schaffner.com

To find your local partner within Schaffner's global network, please go to

[www.schaffner.com](http://www.schaffner.com)

690-775D December 2005  
 Printed in Germany

© 2005 Schaffner EMC. Specifications subject to change without notice. All trademarks recognized.

Schaffner is an ISO-registered company. Its products are designed and manufactured under the strict quality and environmental requirements of the ISO 9001 and ISO 14001 standards.

This document has been carefully checked. However, Schaffner does not assume any liability for errors or inaccuracies.