

# Conducted Immunity EMC Test System

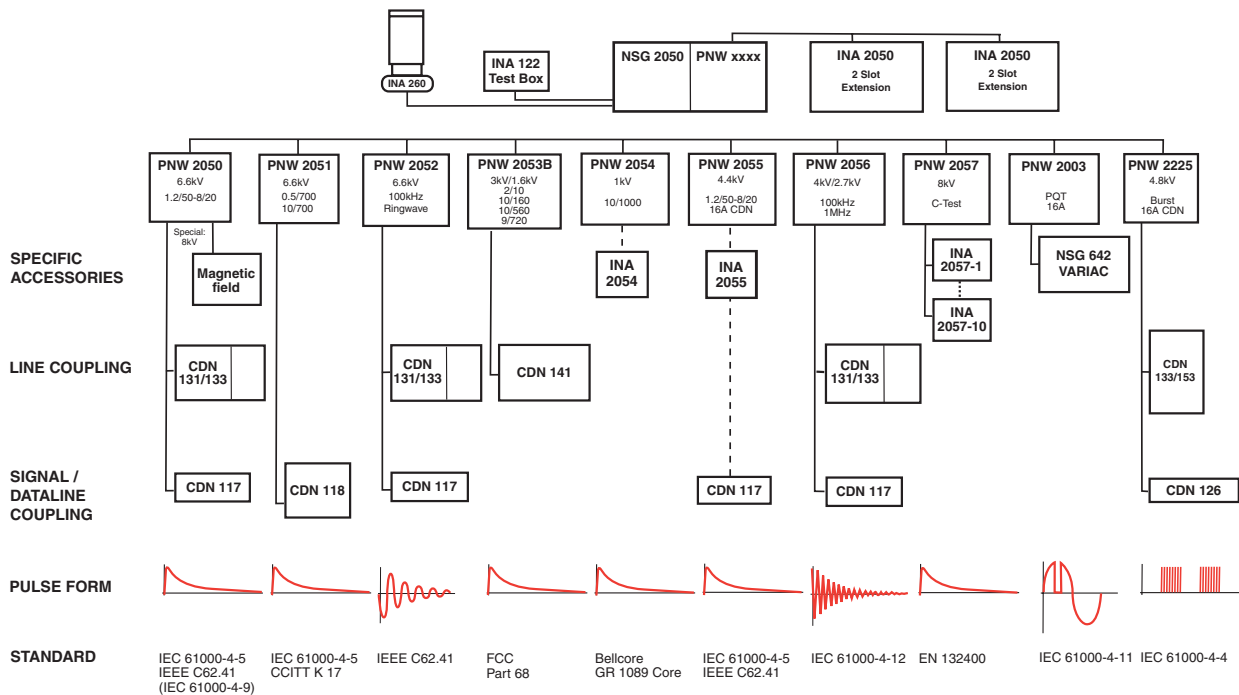
## System 2050

- Modular concept
- Wide range of pulse networks conforming to IEC, ANSI, FCC etc
- Industrial/telecom test applications
- Professional test management software

System 2050 is a highly versatile, modular, multi-role EMC test facility adaptable to meet a wide variety of test specifications, from compliance with basic national and international standards, through detailed design characterisation to compliance with manufacturers' own, more exacting EMC specifications. Its modularity offers each test lab a configuration to suit its test needs cost-effectively while remaining expandable so that, as test needs grow and change, System 2050 can be extended accordingly, thereby protecting investment.



System 2050



Technical Specifications		NSG 2050
Power: 100 to 240Vac, 50/60Hz		Safety interlock
Microprocessor control recognises all system elements		Emergency stop to IEC safety regulations
Operation with keypad and display		Interface to coupling networks
Pulse output via 10kV connectors		RS 232 computer interface
Oscilloscope trigger output		Table top unit or rack mount
Remote pulse trigger output		Dimensions 310 x 449 x 510mm
Voltage / current monitor		Weight approx 20kg
Peak current detector		Interfaces extension chassis for pulse and control
EUT fail input with program control		Houses one PNW at any time in system mainframe
Line synchronization input		Houses up to five PNW at a time with extension chassis
End of test signal		

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## System 2050

### Intelligent Mainframe

At the heart of System 2050 is the NSG 2050 mainframe unit, consisting of a micro-processor based control unit, a high voltage source and accommodation for user selected plug-in pulse networks. Each of the System 2050 plug-in modules and extension units comes complete with its own firmware, so that the system automatically recognises its presence and presents the user with the appropriate software menus and front-panel options. Intelligent control is effected either through the front panel controls and display or via a PC.

Further, System 2050 is designed for inter-compatibility, using open-architecture principles and modular Windows control software. As such, it can be combined seamlessly with any of Schaffner's specialist test and measurement instrumentation and with third party products, including radiated interference test equipment, in a complete ProfLine test system to meet the most demanding test needs.

### A Complete Conducted Immunity Test System

System 2050 offers a complete set of plug-in networks for full compliance testing to basic, generic and product standards, for single-phase and three-phase power lines as well as data and telecom lines. The mainframe unit and three plug-in networks (PNW 2055 surge and PNW 2225 fast transient pulse generators and PNW 2003 a power quality module) make up a complete, integrated system for testing susceptibility to conducted interference on single-phase power lines.

System 2050 may include just one or several modules and each of these provides a self-contained test facility that requires no external coupling unit for single-phase power line immunity tests to the basic standard. As requirements change in the future, System 2050 remains expandable with further networks and extensions for new applications.

### PNW 2055

is a basic surge generator complying with IEC 61000-4-5 that provides a hybrid surge pulse of 1.2/50µs - 8/20µs, with built-in coupling for single-phase equipment up to 16A.

### PNW 2225

generates burst pulses according to IEC 61000-4-4 and offers a range of additional test parameters. It includes a built-in processor-controlled 16A coupling network.

### PNW 2003

is a versatile power network quality simulator which generates drop-outs, dips, interruptions and variations. The correct functions for compliance testing are pre-programmed and no external device is needed.

An additional wide range of high current, high voltage pulse generator plug-in networks and external single- and three-phase extension units is available for more demanding industrial test applications. These can be used to create a complete user-defined system for testing to, and beyond, the full IEC, ANSI, IEEE, VDE standards and European Norms.



Technical Specifications			2055 / 2225 / 2003
<b>PNW 2055</b>	Hybrid pulse	1.2/50µs - 8/20µs, 200V to 4400V up to 2200A	IEC 61000-4-5 EN 50082
	Impedance	2Ω and 12Ω	EN 61000-4-5
	Pulse rep	10s to 10000s	ANSI/IEEE C62.41
	Coupling	built in coupling network, 20V to 230Vac, 16A synch or asynch to power line	
<b>PNW 2225</b>	Burst pulse	5/50ns, 200V to 4800V	IEC 61000-4-4 EN 50082
	Frequency	100Hz to 1MHz	EN 61000-4-4
	Spikes	1 to 250 per package and continuous	
	Coupling	built in coupling network, 12V to 250Vac, 16A switched output for coupling clamp	
<b>PNW 2003</b>	Power quality	drop out 2ms to 99s dips to 40% and 70% of U nominal. synch or asynch to power line variable dips and voltage with external variac	IEC 61000-4-11 EN 50082 EN 61000-4-11
	EUT power	12V to 250V, 16A nominal, AC and DC	

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## PNW 2050

provides high energy hybrid surge pulses of 1.2/50µs - 8/20µs with an extended voltage range as required by IEC, ANSI-IEEE and many other standards. It is used with single- and 3-phase power-line coupling networks or data-line couplers. The network can also be used, in conjunction with an antenna, for pulsed magnetic field testing, e.g. to IEC 61000-4-9.

## PNW 2051

provides a 10/700µs pulse, as specified in telecom applications and also required in some industrial electronics standards, e.g. IEC 61000-4-5. For higher test specifications, PNW 2051 also provides the sharper pulse rise time of 0.5µs. The matching pulse networks, required in some applications, are available.

## PNW 2052

generates a 100kHz ringwave, as required by the ANSI-IEEE standard. It can be used with external coupling unit CDN 131 or CDN 133 for single-or three-phase testing up to 25A.

## PNW 2056

is a high frequency pulse generator which produces damped oscillatory waves of 100kHz and 1MHz with amplitudes up to 4kV.

## Coupling Units

A comprehensive range of couplers and extension units is available for single- and three-phase power-line and data-line testing. Full technical details are outlined on page 46.

## CDN 131 and CDN 151

are designed to couple surge pulses and fast transient pulses respectively to single-phase power lines. They can be used with all the surge and fast transient pulse generator networks, for testing up to 240Vac and 25A.

## CDN 133 and CDN 153

are providing three-phase coupling for tests up to 440Vac (phase to phase) and 25A continuous operation. All combinations of coupling modes are selectable under software control. There are separate inputs for high energy surge pulses and high frequency burst pulses with one common output to the equipment under test.

## NSG 642

is an automated variable AC source which can be used as a second supply with the drop-out simulator PNW 2003 to generate a wide range of dynamic voltage variations including over-voltage, ramps and dips. Meets the requirements of IEC 61000-4-11.

Technical Specifications			CDN 131 / 133		
<b>CDN 131</b>	Surge Coupling	single-phase coupling network 20V to 230Vac, 50/60Hz 25A continuous, 30A for 0.5 hour	<b>CDN 133</b>	Surge Coupling	3-phase coupling network 3 x 20V to 440V ac, 50/60Hz 25A continuous, 30A for 0.5 hour
	Burst Coupling	CDN 151 option		Burst Coupling	CDN 153 option, 3-phase
	Mechanical	310 x 449 x 510, 22kg approx		Mechanical	310 x 449 x 510, 32kg approx

Technical Specifications			2050 / 2051 / 2052 / 2056 / NSG 642		
<b>PNW 2050</b>	Hybrid pulse	1.2/50µs - 8/20µs, 200V to 6600V up to 3300A	<b>PNW 2056</b>	Damped osc.	0.5µs/100kHz up to 4000V 75ns/100kHz up to 2700V 75ns/1MHz up to 2700V
	Impedance	2Ω and 12Ω		Rep rate	40Hz at 100kHz, 400Hz at 1MHz
	Pulse rep	10s to 10000s			
<b>PNW 2051</b>	Telecom	10/700µs and 0.5/700µs, 200V to 6600V up to 440A	<b>NSG 642</b>	Power quality	motor driven transformer extension 1 to 280Vac 16A continuous, 25A for 1min.
	Impedance	15Ω and 40Ω		Speed	up to 120V/s
	Pulse rep	10s to 10000s		mechanical	310 x 449 x 510, 35kg approx
<b>PNW 2052</b>	Ring wave	0.5µs/100kHz, 200V to 6600V up to 550A			
	Impedance	12Ω, 30Ω and 200Ω			
	Pulse rep	10s to 10000s			

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## Telecom Test System

A range of specialist telecom test plug-in networks for System 2050 is available for testing to current telecom standards around the world, including CCITT, FCC, IEC, Bellcore and ETSI. There is also a full set of coupling units available, for coupling fast transient and surge pulses to two-wire, four-wire, multi-wire PABX and ISDN lines.



### PNW 2051

generates 10/700µs and 0.5/700µs test pulses as used in telecom specs such as CCITT. Normally applied in non-powered test arrangements, it can also be used with coupling networks for powered system tests.

### PNW 2053B

provides all pulses required by the new FCC part 68 standard in one device. FCC part 68 specifies the test methods for all classes of terminal equipment in the telecommunication environment.

The test arrangement includes a dedicated coupling unit, CDN 141, with a decoupling network for the 2/10µs power line test pulse and coupling facilities for telecom line test applications.

### PNW 2054

generates the 10/1000µs pulse and is complemented by coupling elements to ease the user's task of building the Bellcore test set-up. This US test specification, which originates from Bell Laboratories, has global recognition.

### ISDN

A dedicated set of coupling elements, as specified by ETSI for ISDN installation testing, is available to complement the generator modules.

## Components' Test System

Components are often tested in, or close to, the manufacturing area. System 2050 offers the required safety standards and operating flexibility, as well as ready to use adapters.



Test sequences are prepared by the system administrator then simply called into operation by the operator. Manipulation errors are avoided and the test results can be recorded automatically. The system can be used as a platform for a wide range of test rigs from a self-contained test bench arrangement, to complex computer controlled set-ups with integration of power sources and measuring equipment.

### PNW 2057

is a module for capacitor tests according to IEC 384-14 and EN 132400 with extended range up to 8kV. It includes discharge networks for group a and b tests. Ten plug-in adapters provide the correct adaptation to the different values of capacitors under test.

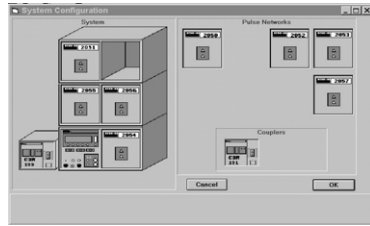
Technical Specifications			PNW 2051 / 2053 / 2054 / 2057 / CDN 200-203		
PNW 2051	CCITT	10/700µs and 0.5/700µs, 200V to 6600V up to 440A	PNW 2054	Bellcore	10/1000µs (open/short-circuit) >100A at 1000V
	Impedance	15Ω and 40Ω		Pulse rep	60s to 10000s INA 2054 impedance matching box required for test set-up
PNW 2053B	FCC	2/10µs up to 2600V / 1150A	PNW 2057	Capacitor test	1.2/46µs up to 8000V (Cx 0.01µF)
		10/160µs up to 2500V / 220A			1.5/47µs up to 8000V (Cx 0.1µF)
		10/560µs up to 950V / 110A			10 adapter networks available according to value of capacitor under test
		9/720µs up to 2500V / 50A			Component test box as a accessory Automatic fixtures on request
			CDN 200 - 203	ISDN	Set of networks for ISDN testing consisting of line impedance network, coupling network and terminating network

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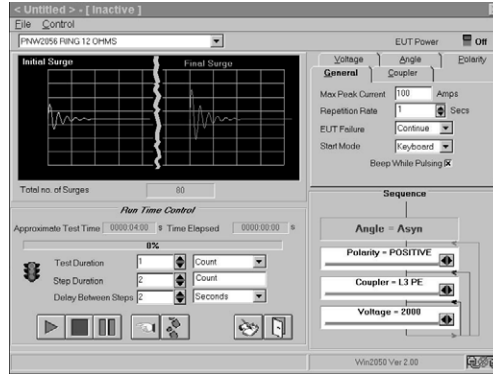
## Test Management Software

The Windows-based software control module WIN 2050 provides real-time remote control of the entire System 2050, whatever plug-in modules and extension units are installed. Access to a whole suite of test sequencing, editing, saving and reporting tools is provided. Engineers can use the software to set up and control entire auto-sequences - using any or all of the plug-in modules, coupling networks and extension units - in a single uninterrupted test program. Professional test engineering reports - for compliance purposes, design characterisation or quality records - can be produced at the touch of a button, saving hours of skilled engineering time.



## Efficient Test Management WIN Software

Entire auto-sequence test routines can be set up and controlled in a single, uninterrupted test program. All the functionality of every instrument in the system is available through the WIN software, allowing engineers to select standard pulses, customise pulses and test procedures, sequence, step-through and save whole test programs for repetitive use.



## System Overview

NSG 2050 system mainframe	Base unit with processor, local controls and PC interface to accommodate one pulse network
INA 2050 extension frame	Accommodates another two pulse networks Up to two INA 2050 and a total of five pulse networks are handled by the system at one time
PNW 2003	Power quality test generator to IEC 61000-4-11
PNW 2050	Hybrid surge pulse 1.2/50µs - 8/20µs to IEC 61000-4-5
PNW 2051	Telecom surge pulse 10/700µs to IEC 61000-4-5 and CCITT
PNW 2052	Ringwave 0.5µs/100kHz to ANSI/IEEE C62.41
PNW 2053B	Telecom surge pulses to FCC part 68
PNW 2054	Telecom surge pulse to Belcore GR-1089-Core
PNW 2055	Hybrid surge pulse 1.2/50µs - 8/20µs with built in coupling network to IEC 61000-4-5
PNW 2056	Damped oscillatory wave 100kHz and 1MHz to IEC 61000-4-12
PNW 2057	Capacitor test generator to IEC 384-14
PNW 2225	Burst pulse generator with built in coupling network to IEC 61000-4-4
INA 702/ 750	Magnetic coil option and adapter for pulsed magnetic fields to IEC 61000-4-9
CDN 117	Data-line coupling unit to IEC 61000-4-5
CDN 118	Communication line coupling unit to IEC 61000-4-5
CDN 126	Capacitive coupling clamp to IEC 61000-4-4
CDN 200 - 203	ISDN coupling networks to ETSI
CDN 131	Single-phase surge coupling unit
CDN 151	Single-phase burst coupling option to CDN 131
CDN 133	Three-phase surge coupling unit
CDN 153	Three-phase burst coupling option to CDN 133
CDN 141	Dedicated coupling network to PNW 2053B
NSG 642	Motorized variac extension for PNW 2003
WIN 2050	WINDOWS-based application software package, includes all pulse networks and power-line CDNs