IEC61000 TEST EMC SYSTEMS

IEC61000-3-2
IEC61000-3-3
IEC61000-3-11
IEC61000-3-12
IEC61000-4-11
IEC61000-4-13
IEC61000-4-17
IEC61000-4-29

Newtons4th Ltd

UKAS CALIBRATION
7949

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2010

TÜV NORD ISO 9001 · UKAS QUALITY MANAGEMENT 005

EMC Test Soltutions from the worlds leading IEC61000 test system Manufacturer

N4L EMC Test Systems - The most comprehensive ISO17025 Harmonics and Flicker Calibration coverage in the market

EMC Test Systems

Newtons4th(N4L) design and manufacture a wide range of EMC test systems to meet the needs of modern test laboratories. N4L's high quality instrumentation, accompanied by customized intuitive test software provide highly accurate measurements presented in a clear and consise manner to the user. Sophisticated reporting functions allow the user to rapidly and efficiently export data to excel, producing detailed, proffessional test reports for end customers.

UKAS ISO17025 Accreditation

N4L PPA55xx series of power analyzers and impedance networks provide fully compliant Harmonics and Flicker test solutions, with direct accreditation available via N4L's internal UKAS ISO17025 calibration laboratory. Certified by NPL (National Physical Laboratory) in the UK, the N4L PPA55xx provides reliable, accurate measurements compliant to the latest test standards (IEC61000-3-2/3 and IEC61000-3-11/12).

In combination with an N4L Impedance Network and a compliant AC Source, you will be equipped to provide fully compliant Harmonics and Flicker measurements.

UKAS CALIBRATION
7949

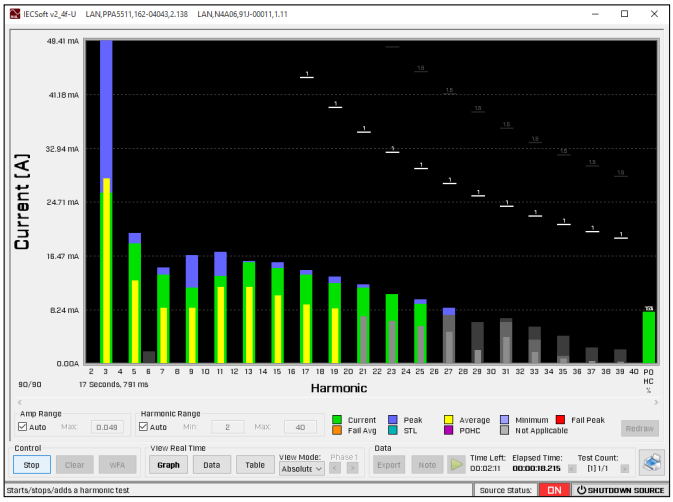
The level and coverage of accreditation available from the N4L UKAS ISO17025 test laboratory is unrivalled in the industry, the scope of accreditation includes the following;
IEC61000-4-15: Pinst (Sinusoidal and Rectangular Modulation), Pst, Frequency Changes, Distorted Voltage with Multiple Zero Crossings, Harmonics with Sidebands, Phase Jumps, Rectangular Changes with Duty Cycle
IEC61000-4-7: Current Harmonic Amplitude

IEC61000-3-2 / IEC61000-3-12 (Current Harmonics)

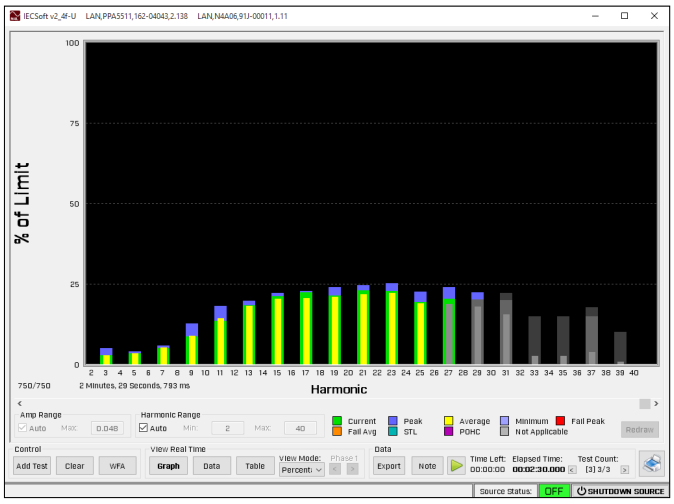
The IEC61000-3-2 and IEC61000-3-12 standards refer to the measurement technicques described within the IEC61000-4-7 measurement standard. IEC61000-4-7 details the exact measurement techniques and principles required of an instrumentation manufacturer. The PPA55x1 complies to all aspects of the IEC61000-4-7 standard, thus the PPA55x1 inherently complies to IEC61000-3-2 and IEC61000-3-12. UKAS ISO17025 accreditation is also available from N4L's internal ISO17025 accredited laboratory, this provides the highest level of calibration for an IEC61000-3-2/3-12 harmonics analyzer.

"IECSoft" Software - Harmonic Test Interface

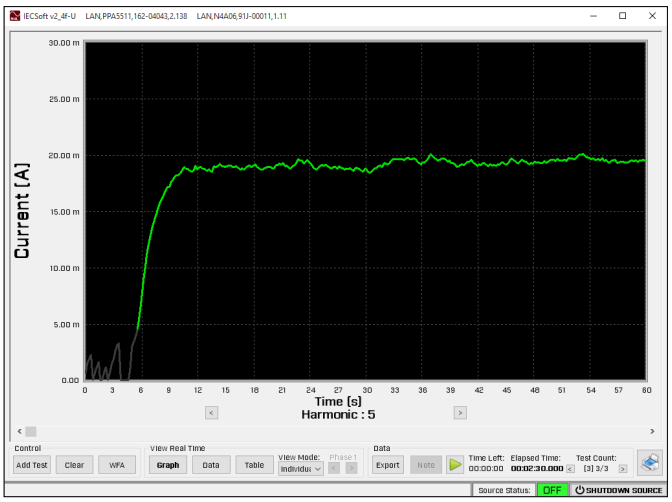
An important aspect of any compliant test system is the HMI(Human Machine Interface), N4L have spent many years developing and improving the IEC61000-3-2/12 user interface which has matured into an intuitive, comprehensive analysis and review mechanism for the test engineer. Features such as real time pass/fail flags, live graphical update of limit levels, data point export for complete test "replay", as well as a thorough reporting function.



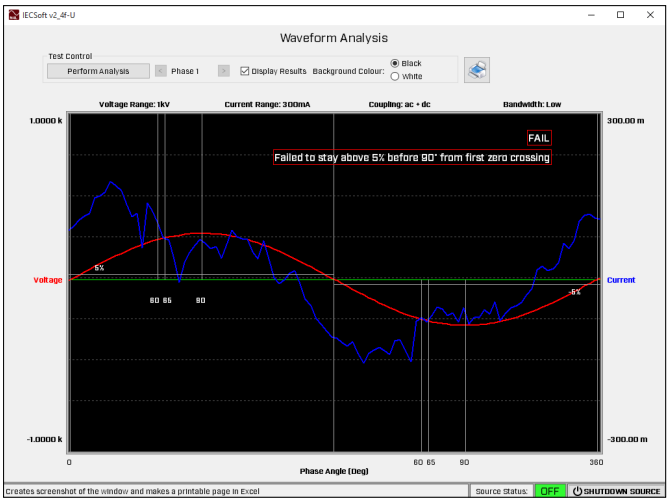
Real time update of colour coded graphical display, including active limit indication



Percentage of limit view normalises each harmonic result to 100% of limit



Individual Harmonics graphed, providing a deeper understanding of DUT behaviour



Unique "Wafeform Analysis" mode, providing automated pass/fail result

Harmonics Export Function

The export function integrated into the IECSoft EMC test software suite is a vital aspect of any EMC compliance measurement. IECSoft provides a comprehensive export function directly to excel, this enables the user to edit the report as required to meet internal procedural requirements.

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IEC61000-3-2:2014
Fluctuating Harmonics

Instrument Details	
Instrument Model	PPA5511
Instrument Serial	162-04043
Instrument Firmware	2.138
Instrument Last Calibrated	02nd February 2015
Instrument Version	Standard
Source Model	N4A06
Source Serial	91J-00011
Source Frequency	50.000 Hz
Source Voltage RMS	230.000 V
Source Settling Time	10 s

Test Settings	
Class	Class D
Mode	Measure

Equipment Under Test	
Brand	Unbranded
Model	TRW211WS
Serial	3434908
Impedance Network ID	91G-11335

Test Conditions	User Entered	Measured
Rated Voltage	230.000 V	230.069 V
Rated Current	4.600 A	992.193 mA
Rated Frequency	50.000 Hz	49.999 Hz
Rated Power	400.000 W	181.809 W

Additional Test Information	
Measured Power Factor	0.6199
Max Current THD	17.75%
Max THC	0.0536A
Max Power	288.051 W
Max F.Current	1.277 A
Average F.Current	874.781 mA
Minimum Current	3A
Test Duration	2.5 minutes

Additional Test Details	
Operator	Applications
Lab Name	N4L
Location	Leics, UK
Notes	
Signature	

Results	Phase 1: FAIL - AVERAGE & PEAK

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IEC61000-3-2:2014 Fluctuating Harmonics

Instrument Details	
Instrument Model	PPA5511
Instrument Serial	162-04043
Instrument Firmware	2.138

Equipment Under Test	
Brand	Unbranded
Model	TRW211WS
Serial	3434908

Harmonic Difference

Harmonic	Lowest Average (A)	Lowest Test #	Highest Average (A)	Highest Test #	Limit Allowance (A)	Limit Difference (A)	Status
2	0	1	0.000004	3	0	0.000004	PASS
3	0.026425	1	0.026948	3	0.046233	0.000523	PASS
4	0	1	0	3	0	0	PASS
5	0.01827	1	0.018691	3	0.025836	0.000421	PASS
6	0	3	0.000014	1	0	0.000014	PASS
7	0.013636	1	0.014261	3	0.013598	0.000625	PASS
8	0	1	0	3	0	0	PASS
9	0.01171	1	0.012132	3	0.006799	0.000422	PASS
10	0	1	0.000001	3	0	0.000001	PASS
11	0.01351	1	0.013681	3	0.004759	0.000171	PASS
12	0	1	0	3	0	0	PASS
13	0.014495	1	0.014659	3	0.004027	0.000164	PASS
14	0	1	0	3	0	0	PASS
15	0.013833	1	0.014275	3	0.00349	0.000442	PASS
16	0	1	0	3	0	0	PASS
17	0.012738	3	0.012796	1	0.00308	0.000058	PASS
18	0	1	0	3	0	0	PASS
19	0.011593	3	0.011857	1	0.002755	0.000264	PASS
20	0	1	0	3	0	0	PASS
21	0.010707	1	0.010911	3	0.002493	0.000204	PASS
22	0	1	0	3	0	0	PASS
23	0.009389	1	0.010102	3	0.002276	0.000713	PASS
24	0.00005	3	0.000069	1	0	0.00002	PASS
25	0.008008	3	0.008477	1	0.002094	0.000469	PASS
26	0.000023	3	0.000051	1	0	0.000028	PASS
27	0.006877	1	0.007284	3	0.001939	0.000407	PASS
28	0	1	0	3	0	0	PASS
29	0.003537	1	0.006486	3	0.001805	0.002949	FAIL
30	0	1	0	3	0	0	PASS
31	0.00464	1	0.005309	3	0.001689	0.00067	PASS
32	0	3	0.000001	1	0	0.000001	PASS
33	0.000872	3	0.002616	1	0.001586	0.001744	FAIL
34	0	1	0	3	0	0	PASS
35	0.000607	1	0.000843	3	0.001496	0.000236	PASS
36	0	1	0	3	0	0	PASS
37	0.000334	1	0.001104	3	0.001415	0.00077	PASS
38	0	1	0	3	0	0	PASS
39	0.000231	3	0.000275	1	0.001342	0.000044	PASS
40	0	1	0	3	0	0	PASS

Key:

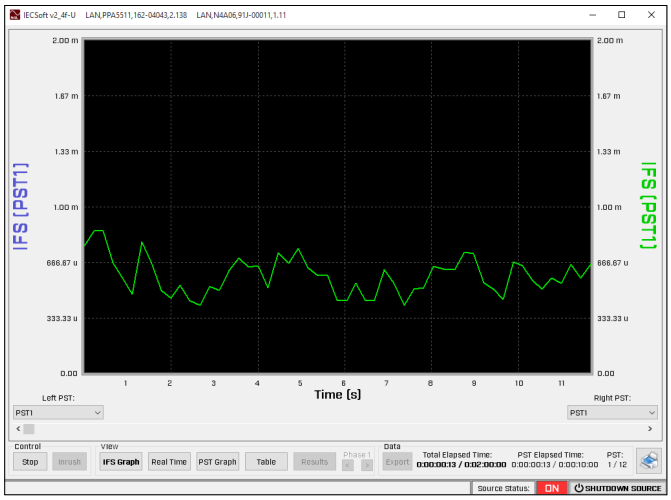
Allowance	Maximum Difference allowed in Amps
Good	The difference is less than 50% of the allowance
OK	The difference is between 50% of the allowance and 75% of the allowance
Poor	The difference is between 75% of the allowance and 100% of the allowance
Fail	The difference has exceeded the allowance

IEC61000-3-3 / IEC61000-3-11 (Flicker IEC61000-4-15)

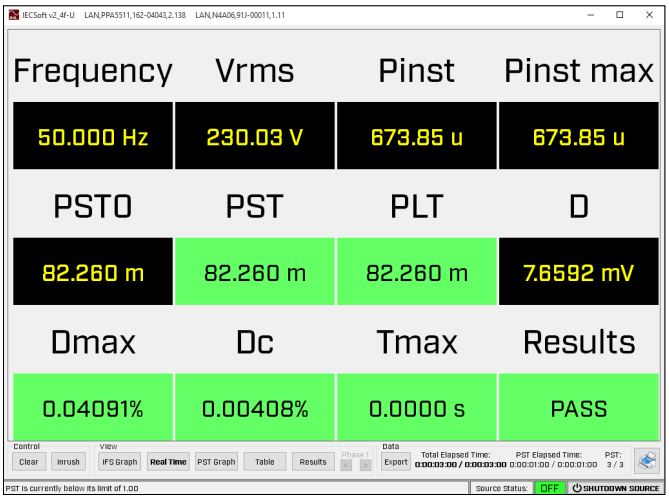
N4L provide complaint measurements to the latest test protocols/limits specified within IEC61000-3-3 and IEC61000-3-11. The PPA55x1 Precision Power Analyzer complies fully with IEC61000-4-15 which dictates both the hardware and firmware requirements for compliance to IEC61000-3-3/11. N4L are currently the only Flickermeter manufacturer in the world* to offer complete coverage of the IEC61000-4-15 standard with ISO17025 accreditation. This optional ISO17025 calibration procedure is performed within N4L's ISO17025 UKAS calibration laboratory and covers all aspects of the IEC Flicker test standards.

"IECSoft" Software Flicker Test Interface

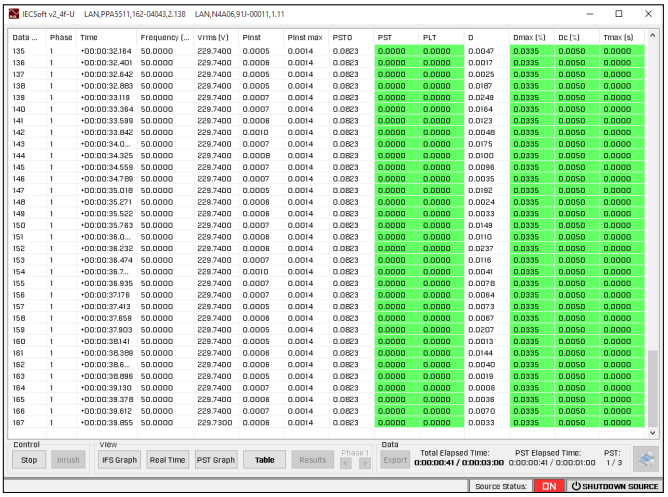
IECSoft's Flicker measurement mode incorporates an intuitive step by step style setup procedure, guiding the user through the test configuration. Remote control of the N4L N4A AC Power Source is handled automatically by IECSoft, test procedures include selection of d[t] parameters and calculation of Z_{test} if necessary. Pinst, IFS, PST, PLT, D, Dmac, Dc and Tmax are also updated during any test.



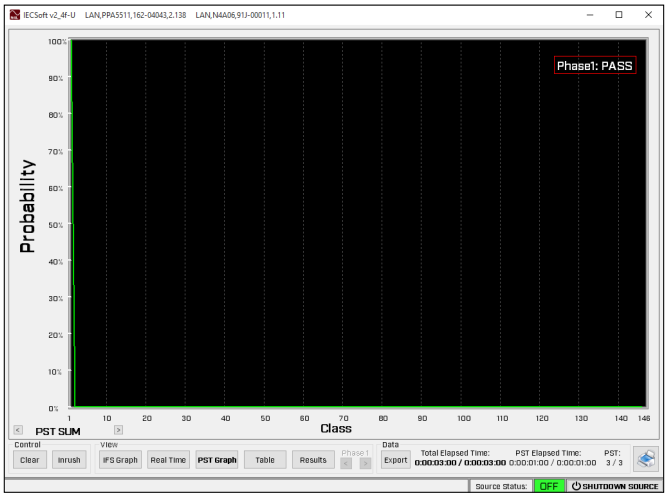
IFS recorded real time, for in depth post test analysis



Real time display indicating current test status



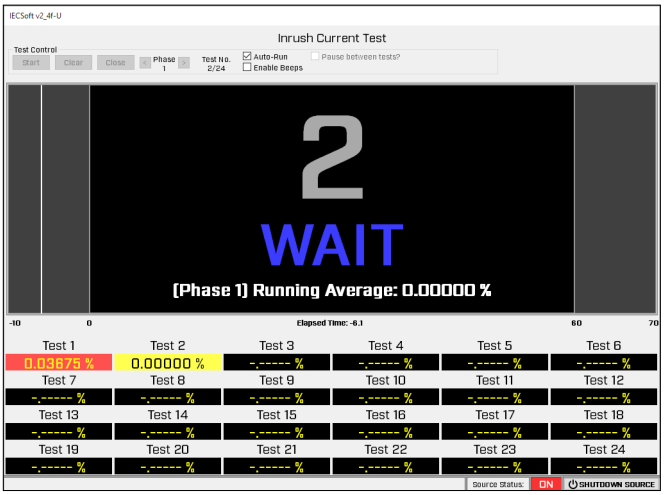
Every data return is recorded and saved within the IECSoft software package



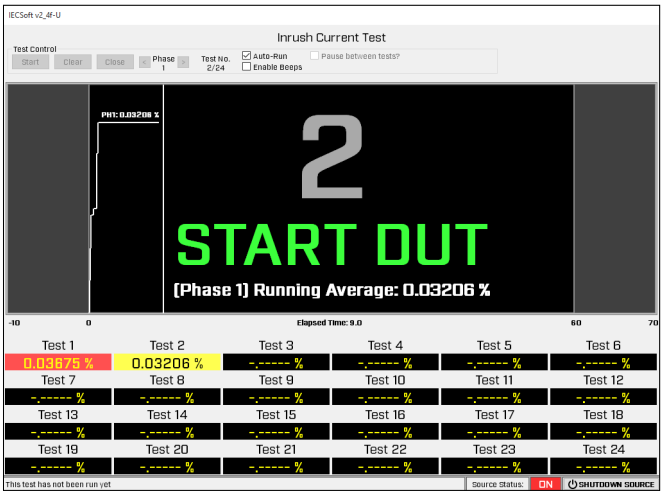
Classifier Probability Graph

Inrush Testing (dmax)

For products utilising manual switching as a method of initiating and ending operation, a “dmax” test known as the “Inrush test” is required. This involves a succession of 24 switching events that are recorded and the arithmetic mean (excluding the highest and lowest dmax values) is calculated. An intuitive user interface has been developed for this task which guides the test engineer through the process and provides prompts to perform the switching event. Statistical analysis is also automated within the software, removing this burden from the user. This results in reduced test times and eliminates the risk of a mathematical error.



Wait command indicated by the “Inrush test” user interface

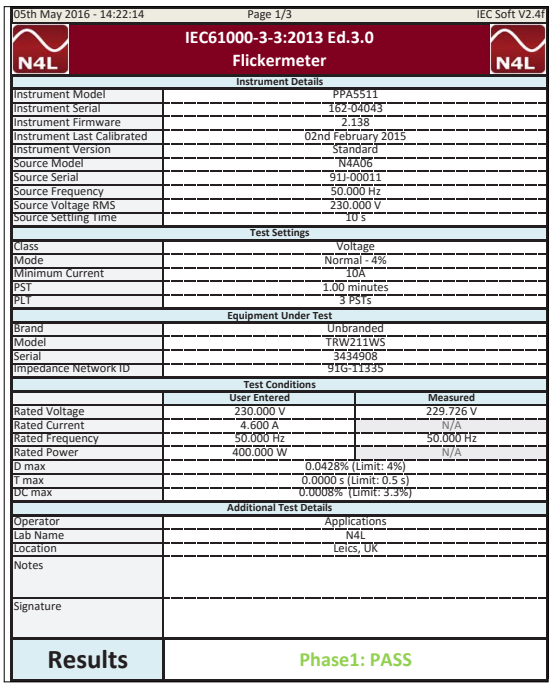


“Start DUT” Command to prompt user to operate manual switch

Flicker Export Function

The flicker export function exports all recorded data including DUT test data and flicker results, export options include the ability to lock the exported spreadsheet as well as formatting the report into a single or multiple worksheet. The user also has the ability to import their own company logo, which is exported within the final report.

Export user interface



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IEC61000-3-3:2013 Ed.3.0
Flickermeter

Instrument Details	
Instrument Model	PPA5511
Instrument Serial	162-04043
Instrument Firmware	2.138
Instrument Last Calibrated	02nd February 2015
Instrument Version	Standard
Source Model	N4A06
Source Serial	91J-00011
Source Frequency	50.000 Hz
Source Voltage RMS	230.000 V
Source Settling Time	10 s

Test Settings	
Class	Voltage
Mode	Normal - 4%
Minimum Current	10A
PST	1.00 minutes
PLT	3 PSTs

Equipment Under Test	
Brand	Unbranded
Model	TRW211WS
Serial	3434908
Impedance Network ID	91G-11335

Test Conditions	User Entered	Measured
Rated Voltage	230.000 V	229.726 V
Rated Current	4.600 A	N/A
Rated Frequency	50.000 Hz	50.000 Hz
Rated Power	400.000 W	N/A
D max	0.0428% (Limit: 4%)	
T max	0.0000 s (Limit: 0.5 s)	
DC max	0.0008% (Limit: 3.3%)	

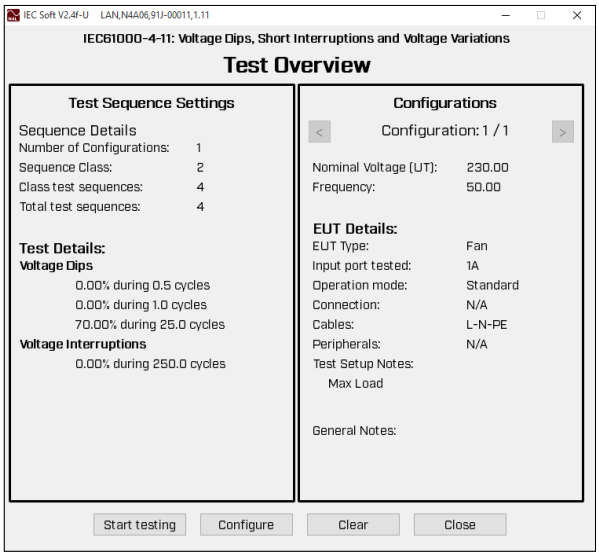
Additional Test Details	
Operator	Applications
Lab Name	N4L
Location	Leics, UK
Notes	
Signature	
Results	Phase1: PASS

IEC61000-4-15 - Flicker Simulation

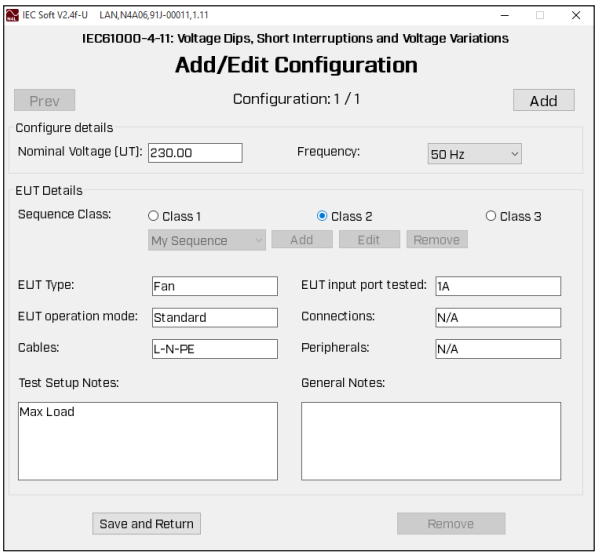
N4A power sources are able to simulate flicker waveforms in order to test flickermeters for correct operation. This mode can also be used to create an environment in which products are tested for susceptibility against flicker on the supply line, this is useful as voltage modulations on the supply line can cause instability within input regulation circuitry.

IEC61000-4-11 - Voltage Dips, Short Interruptions and Voltage Variations

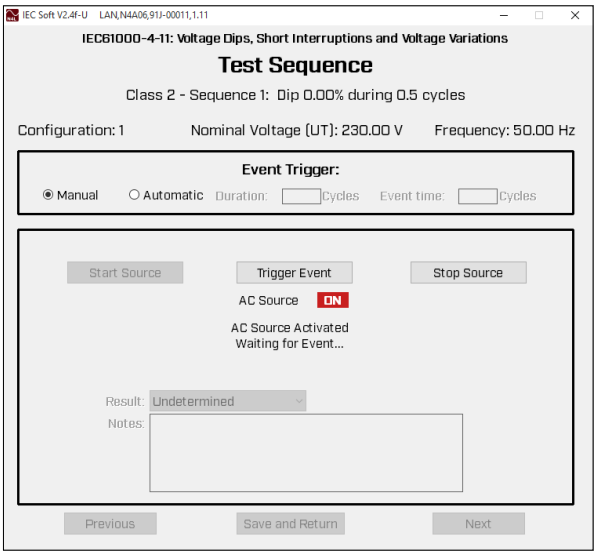
IEC61000-4-11 defines test protocols and measurement techniques for electrical and electronic equipment connected to low-voltage supply networks. IECSoft provides an easy to configure user interface, in which a number of product configurations can be added to the test sequences. Covering all classes, including class “X” - the software offers the flexibility required for product committees to define a wide range of test levels.



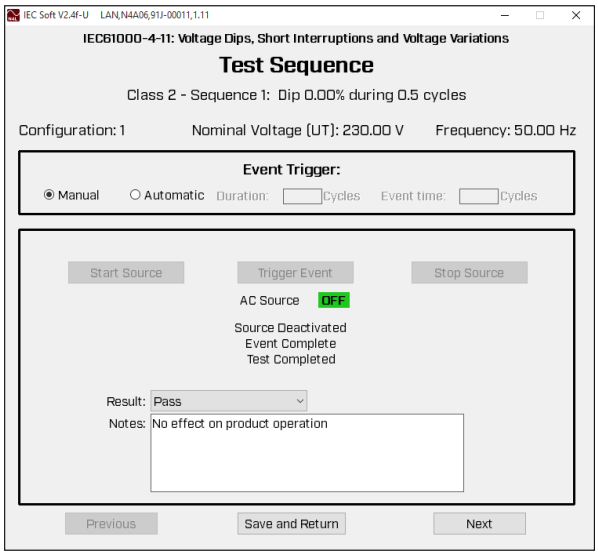
Test overview interface - Detailing the class, number of sequences and test details



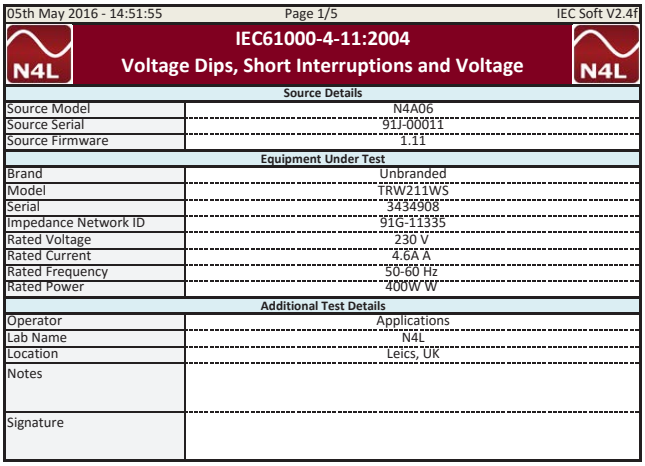
Configuration interface - Select class, product details and nominal voltage/frequency



Test sequence - AC Source ON awaiting manual initiation of test sequence.



Test Complete - DUT passed



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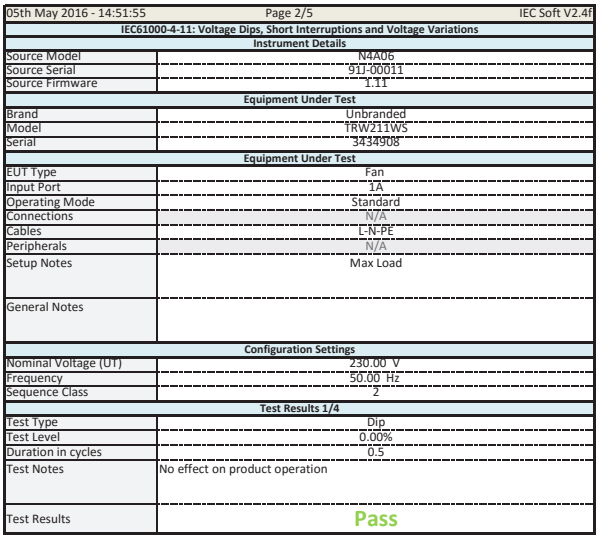
IEC61000-4-11:2004
Voltage Dips, Short Interruptions and Voltage

Source Details	
Source Model	N4A06
Source Serial	91J-00011
Source Firmware	1.11
Equipment Under Test	
Brand	Unbranded
Model	TRW211WS
Serial	3434908
Impedance Network ID	91G-11335
Rated Voltage	230 V
Rated Current	4.6A A
Rated Frequency	50-60 Hz
Rated Power	400W W
Additional Test Details	
Operator	Applications
Lab Name	N4L
Location	Leics, UK
Notes	
Signature	

Test report for IEC61000-4-11



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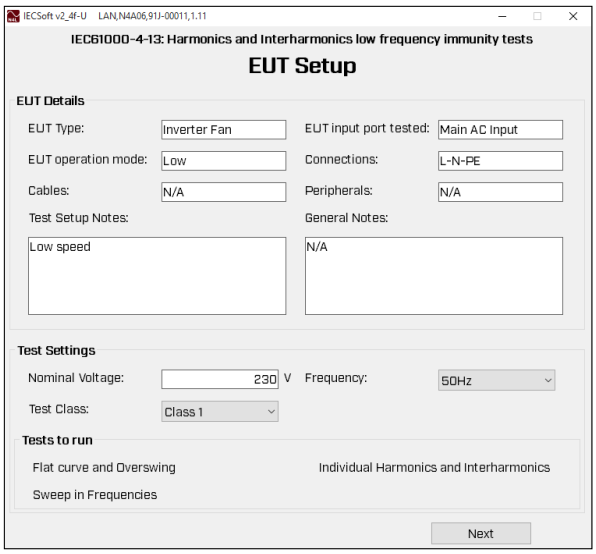
IEC61000-4-11: Voltage Dips, Short Interruptions and Voltage Variations

Instrument Details	
Source Model	N4A06
Source Serial	91J-00011
Source Firmware	1.11
Equipment Under Test	
Brand	Unbranded
Model	TRW211WS
Serial	3434908
Equipment Under Test	
EUT Type	Fan
Input Port	1A
Operating Mode	Standard
Connections	N/A
Cables	L-N-PE
Peripherals	N/A
Setup Notes	Max Load
General Notes	
Configuration Settings	
Nominal Voltage (UT)	230.00 V
Frequency	50.00 Hz
Sequence Class	2
Test Results 1/4	
Test Type	Dip
Test Level	0.00%
Duration in cycles	0.5
Test Notes	No effect on product operation
Test Results	Pass

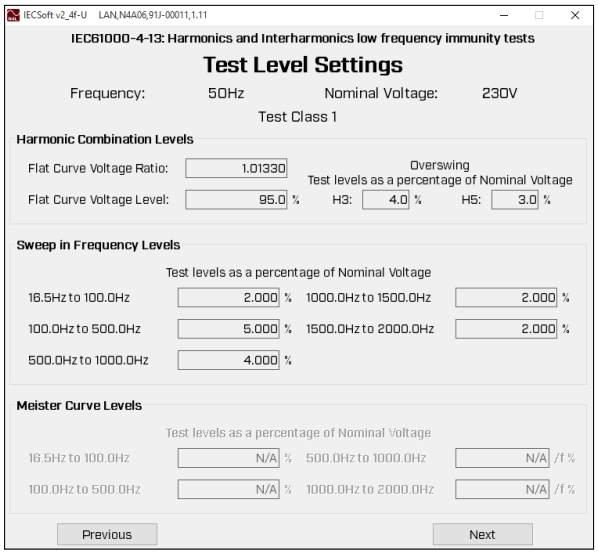
IEC61000-4-11 Test Details

IEC61000-4-13 - Harmonic and Interharmonic Susceptibility

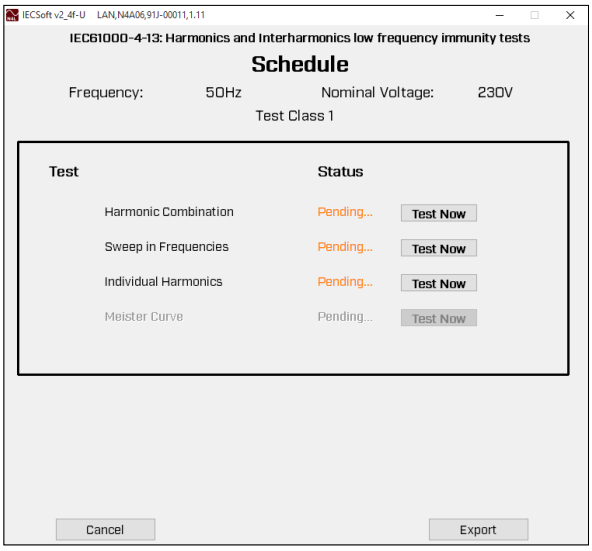
As mains supply lines can suffer from harmonic and interharmonic interference, IEC61000-4-13 defines the harmonic and interharmonic levels upon which products must be tested. IECSoft provides a simple user interface to create test programmes for each class of product.



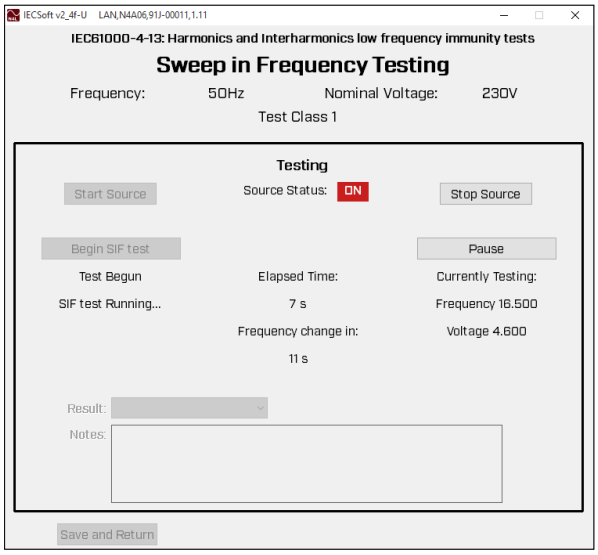
IEC61000-4-13 EUT Setup interface including class selection



Test programme details including harmonic combination and frequency sweep



IEC61000-4-13 Test Schedule



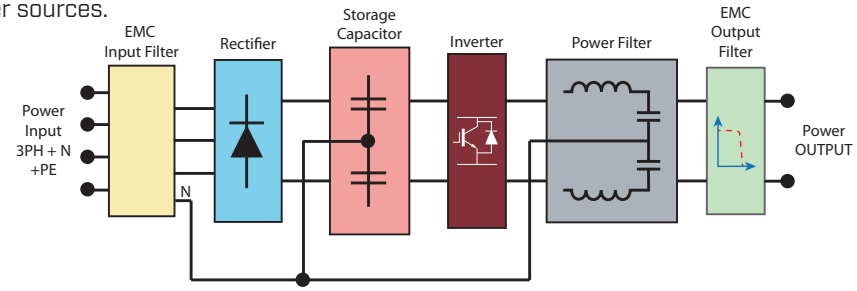
Sweep in Frequency test in progress

Waveforms

As mains supply lines can suffer from harmonic and interharmonic interference, IEC61000-4-13 defines the harmonic and interharmonic levels upon which products must be tested. IECSoft provides a simple user interface to create test programmes for each class of product.

Power Source Schematic

N4A Advanced Power Amplifiers feature proprietary noise suppression analgoue electronics known as "6 leg modulation" topology which produces an output waveform during high loads with less than 0.1% THD. This level of distortion has only previously been possible with linear power sources.



IEC61000 EMC TEST SYSTEM SPECIFICATION:

PPA55x1 Harmonics and Flicker Analyzer

		PPA55x1 Harmonics and Flicker Analyzer		
Bandwidth				
		DC,10mHz～1MHz - PPA55x1 - Low Impedance Shunt (50Arms)		
IEC61000 Voltage Input				
	Range	300mVpk～3000Vpk(1000Vrms) in 9 ranges		
		0.01% Rdg+0.038% Rng+(0.004%×kHz)+5mV		
	Range	300μVpk～3Vpk in 9 ranges【BNC connector 3Vpk max input】		
		0.01%Rdg+0.038%Rng+(0.004%×kHz)+3μV		
IEC61000-3-2 Compliant Current Input, including Harmonic Accuracy				
	Low Impedance (Fully Compliant) 3mΩ Max 50Arms		100mApk～1000Apk(50Arms)	
			0.01% Rdg+0.038% Rng+(0.004%×kHz)+ 900μA	
External input (External shunt Current sensor)	BNC Connector (Max input 3Vpk)		300μVpk～3Vpk in 9 ranges	
			0.01% Rdg+0.038% Rng+(0.004%×kHz)+ 3μV	
Phase Accuracy				
	0.005deg+(0.01deg×kHz)【PPA5500-LC(10Arms), PPA5500(30Arms)】 0.01deg+(0.02deg×kHz)【PPA5500-HC(50Arms)】			
IEC61000-3-3 + IEC61000-3-11 Flicker Accuracy				
Pst	3%			
Plt	3%			
Pinst	5%			
d(c), d(max), d(t)	3%			
IEC61000-3-2 + IEC61000-3-12 Harmonics Accuracy				
	0.1% of rms current			
Power Accuracy				
	[0.03%+0.03%/pf+(0.01%×kHz)/pf] Rdg+0.03%VA Rng			
40-400Hz	[0.03%+0.03%/pf+(0.01%×kHz)/pf] Rdg+0.02%VA Rng			
General				
Crest Factor	20(Voltage and Current)			
Sample Rate	2.2Ms/s on all channels, No-Gap			
IEC Modes	IEC61000 Harmonics and Flicker (PPA5500), IEC62301 Standby Power			
Application Modes	PWM Motor Drive, Ballast, Inrush, Power Transformer, Standby Power, Fluctuating Harmonics, Flicker Meter			
CMRR - Common Mode Rejection Ratio				
	250V @ 50Hz - ≥ 1mA (150dB)			
	100V @ 100kHz - ≥ 3mA (130dB)			

Measurement Parameters	
	W, VA, Var, pf, V & A - rms, rectified mean, AC, DC, Peak, Surge, Crest Factor, Form Factor, Star to Delta Voltage
	Frequency (Hz), Phase (deg), Fundamentals, Impedance
	Harmonics, THD, TIF, THF, TRD, TDD
	Integrated Values, Datalog, Sum and Neutral values
Datalog - Up to 4 user selectable measurement functions (60 with optional PC software)	
Datalog Window	No-Gap analysis, Minimum window 2ms
Memory	10M records into flash RAM (Non-Volatile)

Communication Ports	
RS232	Baud rate up to 38.4kbps, RTS/CTS flow control
LAN	10/100 Base-T Ethernet auto sensing
GPIB	IEEE488.2 compatible
USB	USB 2.0 and 1.1 compatible
Analogue Output	Bipolar ±10V(BNC)
Speed Input	BNC Bipolar±10V or Pulse count 1Hz to 1MHz 0.01% Rdg
Torque	BNC Bipolar±10V or Pulse count 1Hz to 1MHz 0.01% Rdg
Sync	4～6 Phase measurement (Master/Slave)
Extension	4～6 Phase (Master/Slave) + Auxiliary
Standard Accessories	
Leads	Power, RS232, USB, GPIB
Connection Cables	36A 1.5m long 4mm stackable terminals 1x red, 1x yellow and 2x black per phase (1x red, 1x black with HC version)
Connection Clips	4mm terminated aligator clips - 1x red, 1x yellow and 2x black per phase (1x red and 1x black per phase with PPA5500-HC version)
CD-ROM	IECSoft, CommView2 (RS232/USB/LAN), Command line, Script based communication software
Documents	User manual, Communications manual, Calibration certificate, Quick start guide
Mechanical/Environmental	
Display	320×240 dot full colour TFT, White LED Backlit
Dimensions	130H×400W×315D mm excluding feet
Weight	5.4kg(1 Phase), 6kg(3 Phase)
Safety Isolation	1000Vrms or DC(CATII), 600Vrms or DC(CATIII)
Power supply	90～265Vrms, 50～60Hz, 40VAmax

IMPEDANCE NETWORK SPECIFICATION

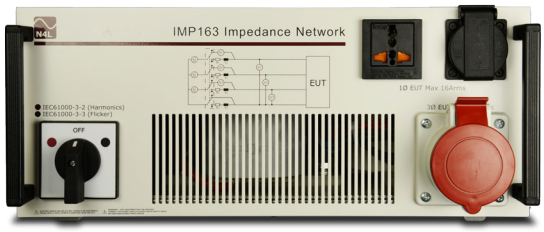
	IMP161/3(16Arms) , IMP321/3(32Arms) and IMP753(75Arms) models available
IMP161/3	Fully Compliant to IEC61000-3-3
IMP321/3 & IMP753	Fully Compliant to IEC61000-3-11
Impedance Specification	
	R_A = 0.24Ω jX_A = 0.15Ω @ 50Hz R_N = 0.16Ω jX_N = 0.10Ω @ 50Hz
Current Rating	
IMP16x	16Arms per phase
IMP753	75Arms per phase

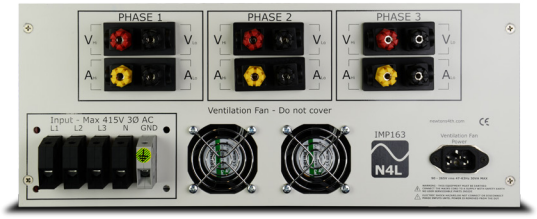
PPA5531 Harmonics and Flicker Analyzer

AC POWER SOURCE SPECIFICATION

	N4A03 (1 Phase)	N4A06 (1 Phase)	N4A18 (3 Phase)	N4A30 (3 Phase)	N4A67 (3 Phase)
Nominal Output Power	3,000VA	6,000VA	18,000VA	30,000VA	67,500kVA
Compliant Standards	IEC61000-3-2:2014 (Single Phase) IEC61000-3-3:2013 (Single Phase) IEC61000-4-11:2004 (Single Phase) IEC61000-4-13:2009 (Single Phase) IEC61000-4-17:2009 (Single Phase) *IEC61000-4-29:2001 (Single Phase)		IEC61000-3-2:2014 (Single/Three Phase) IEC61000-3-3:2013 (Single/Three Phase) IEC61000-3-12:2005 (Single/Three Phase) IEC61000-3-11:2000 (Single/Three Phase) IEC61000-4-11:2004 (Single/Three Phase) IEC61000-4-13:2009 (Single/Three Phase) IEC61000-4-17:2009 (Single Phase) *IEC61000-4-29:2001 (Single Phase)		
Output					
Output Voltage (AC)	0-300Vrms				
Output Voltage (DC)	0-425V DC				
Maximum Continuous Output Power (AC)	3000VA	6000VA	18,000VA	30,000VA	67,500VA
Maximum Inrush (3 Second) Output Power (DC)	6000VA	12000VA	36,000VA	60,000VA	90,000VA
Maximum Output Current (Continuous)	10Arms	20Arms	20Arms (Per Phase)	32Arms (Per Phase)	75Arms (Per Phase)
Maximum Output Current (Inrush)	20Arms	40Arms	40Arms (Per Phase)	64Arms (Per Phase)	100Arms (Per Phase)
Output Frequency	DC - 1kHz	DC - 1kHz	DC - 1kHz	DC - 1kHz	DC - 1kHz
Min Slew Rate	3V/us	3V/us	3V/us	3V/us	3V/us
Output Voltage Stability	Better than 0.1%				
Output Voltage Accuracy	Better than 0.5%				
THD	Better than 0.3%*				
Output Noise	<500mVrms				
Recovery Time of Output Waveform	Better than 50us				
Max Compensated drop on wires (w.r.t voltage setting)	5%				
Recovery Time of Drop on Wires	Less than 200ms				
Maximum Crest Factor	[Inrush Imax*1.41]/RMS Load Current				
General					
Dimensions	281mm x 471mm x 513mm		1785mm x 930mm x 755mm	1785mm x 930mm x 755mm	1800mm x 1200mm x 800mm
Weight	30kg	45kg	740kg		1300kg
Input Voltage	230V AC +/- 10% 1PH	400V AC +/- 10% 3PH			
Input Frequency	45-65Hz				
Operating Temperature	0-35degC				
Input Current	24Arms	16Arms Phase / 27A Neutral	60A continuous 120A inrush / Phase	80A continuous 160A inrush / Phase	160A continuous 220A inrush / Phase
Efficiency	Better than 80%				

*Pre-Compliant due to rise/fall time of generator

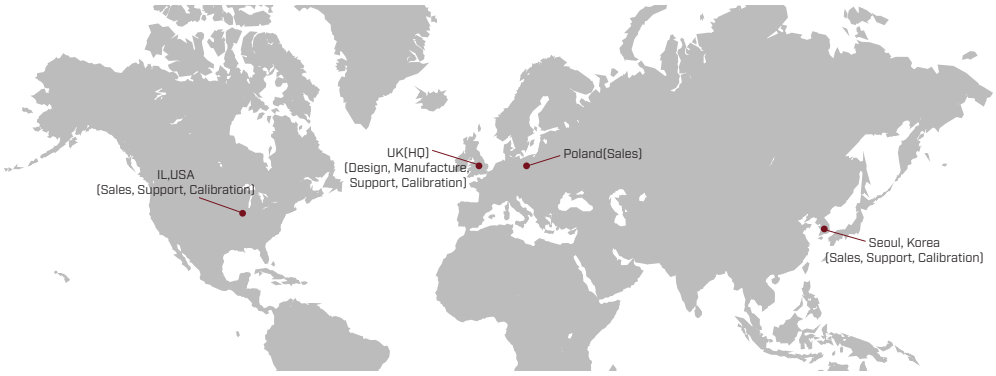




IMP163 3 Phase 16Arms/Phase Impedance Network

Overview of IEC61000 Test Systems

	IEC61000 Test Systems		
System Configuration			
Overall System Description	Single Phase 16A IEC61000 EMC Test System	Single+Three Phase 16A IEC61000 EMC Test System	Single+Three Phase up to 75A IEC61000 EMC Test System
Power Source	N4A06	N4A18	N4A67
Harmonics and Flicker Analyzer	PPA5511 Combined Harmonics and Flicker + Power Analyzer	PPA5531 Combined Harmonics and Flicker + Power Analyzer	PPA5531 Combined Harmonics and Flicker + Power Analyzer
Optional Impedance Network (For compliant Flicker testing)	IMP161	IMP163	IMP753
Standards (Limits)	IEC61000-3-2:2014 (Single Phase) IEC61000-3-3:2013 (Single Phase) IEC61000-4-11:2004 (Single Phase) IEC61000-4-13:2009 (Single Phase) IEC61000-4-17:2009 (Single Phase) *IEC61000-4-29:2001 (Single Phase)	IEC61000-3-2:2014 (Single/Three Phase) IEC61000-3-3:2013 (Single/Three Phase) IEC61000-3-12:2005 (Single/Three Phase) IEC61000-3-11:2000 (Single/Three Phase) IEC61000-4-11:2004 (Single/Three Phase) IEC61000-4-13:2009 (Single/Three Phase) IEC61000-4-17:2009 (Single Phase) *IEC61000-4-29:2001 (Single Phase)	IEC61000-3-2:2014 (Single/Three Phase) IEC61000-3-3:2013 (Single/Three Phase) IEC61000-3-12:2005 (Single/Three Phase) IEC61000-3-11:2000 (Single/Three Phase) IEC61000-4-11:2004 (Single/Three Phase) IEC61000-4-13:2009 (Single/Three Phase) IEC61000-4-17:2009 (Single Phase) *IEC61000-4-29:2001 (Single Phase)
Measurement Standards	IEC61000-4-7 IEC61000-4-15	IEC61000-4-7 IEC61000-4-15	IEC61000-4-7 IEC61000-4-15
Output Power	6kVA	18kVA	67kVA
Software Included	IECSoft IEC61000 Test Suite		
Accreditation	Optional UKAS ISO17025 IEC61000 Harmonics and Flicker Certifcation of PPA5511	Optional UKAS ISO17025 IEC61000 Harmonics and Flicker Certifcation of PPA5531	Optional UKAS ISO17025 IEC61000 Harmonics and Flicker Certifcation of PPA5531
Power Measurement Parameters	W, VA, Var, pf, V & A - rms, rectified mean, AC, DC, Peak, Surge, Crest Factor, Form Factor, Star to Delta Voltage Frequency (Hz), Phase (deg), Fundamentals, Impedance Harmonics, THD, TIF, THF, TRD, TDD Integrated Values, Datalog, Sum and Neutral values		
Impedance Network	IMP161 Single Phase 16A Impedance Network	IMP163 Three Phase 16A Impedance Network	IMP753 Three Phase 75A Impedance Network
ISO17025 UKAS Cetification	Optional - Power Analyzer Calibration	Optional - Power Analyzer Calibration	Optional - Power Analyzer Calibration
Integration of Equipment	Analyzer + Impedance Network fully integrated into rack system		



All specifications at 23˚C ± 5˚C . These specifications are quoted in good faith but Newtons4th Ltd reserves the right to amend any specification at any time without notice

Newtons4th

Contact your local N4L Distributor for further details

Newtons4th Ltd (abbreviated to N4L) was established in 1997 to design, manufacture and support innovative electronic equipment to a worldwide market, specialising in sophisticated test equipment particularly related to phase measurement. The company was founded on the principle of using the latest technology and sophisticated analysis techniques in order to provide our customers with accurate, easy to use instruments at a lower price than has been traditionally associated with these types of measurements

Flexibility in our products and an attitude to providing the solutions that our customers really want has allowed us to develop many innovative functions in our ever increasing product range

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2010

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