

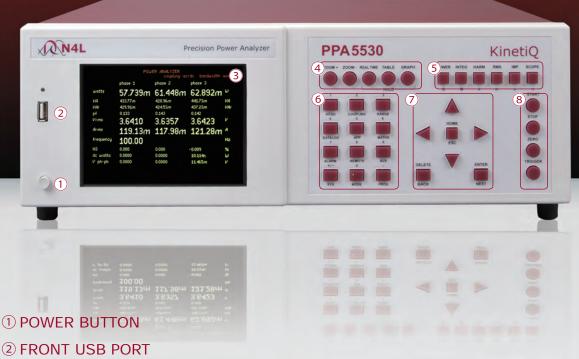
Precision Power Analyzers

PPA4500 Series PPA5500 Series

Vicingie 3000 Aronge 50048 Alexandre Consum PH1 ted for an		
Leading wideband accuracy	Basic 0.01% (PPA5500) with class leading high frequency performance	
Wide frequency range	DC, 10mHz to 2MHz	-
Fast sample rate and No-Gap	2.2M samples/s 0.005 Degrees plus 0.01 degrees per kHz	_
Leading phase accuracy		_
Versatile interfaces	10Arms, 30Arms or 50Arms with up to 1000Apk direct plus a wide range of external sensors	_
Range of PC software options	RS232, USB, LAN, GPIB as standard (PPA5500) plus direct torque and speed Remote control, monitoring and recording of real time data, tables and graphs	_
		_
PWM Motor Drive Measurements	Highest performance Analyzer on the market for PWM Motor Drive Evaluation	_
External Voltage BNC Connector	Unique External BNC connector with high sensitivity to interface with external High Voltage Probes	_

PPA5530 Precision Power Analyzer

FRONT VIEW



USB memory port allows data or screendumps to be saved directly to a USB pen drive

③ DISPLAY SCREEN

White LED backlight colour TFT display with high contrast and wide viewing angle

(4) SCREEN DISPLAY OPTIONS

Zoom, Real time, Table and Graph options

⑤ MEASUREMENT FUNCTION SELECTION BUTTONS

- POWER ANALYZER
- POWER INTEGRATOR
- HARMONIC ANALYZER
- TRUE RMS VOLTMETER and AMMETER
- IMPEDANCE METER
- OSCILLOSCOPE



Measurement Mode Control

6 MEASUREMENT SETTINGS BUTTONS

Acquisition settings - Sets wiring configuration,

Smoothing and data logging

Coupling - Set coupling to AC, DC or AC+DC, also set bandwidth

Range - Internal or external attenuator, autoranging settings, scale factors

Application mode - PWM, ballast, inrush current, power transformer, standby power, IEC61000 (PPA5500)

Plus direct configuration of - Alarm, Auxiliary, Remote, System and Program functions

⑦ MENU SELECTION AND CURSOR CONTROL

⑧ START, STOP, ZERO AND TRIGGER

Trigger button refreshes measurement, Zero resets datalog or allows an offset trim Start and Stop buttons provide manual control of a measurement period

REAR VIEW



9 PHASE INPUTS

Direct voltage Input: 3kVpk (1kVrms) in 9 ranges* Direct current Input: 300Apk (30Arms) Standard Model, 30Apk (10Arms) Low Current Model, 1000Apk (50Arms) High Current Model

External voltage and current sensor inputs to 3Vpk in 9 ranges* - BNC Connector

10 SYNC CONNECTOR

All PPA models can offer up to 12 phase analysis using the PPALoG PC program Additionally two PPA45/5530's can be connected via the extension port and sync BNC connector to form a 6 phase analyzer when a PC is not available

11 EXTERNAL SENSOR INPUTS

+/-10V or pulsed input from torque and speed sensors provides direct measurement of mechanical power + analogue output

12 PC INTERFACE CONNECTIONS

Standard interfaces RS232 + USB + LAN + GPIB (Standard on PPA5500, LAN + GPIB optional on PPA4500)

13 LOW NOISE COOLING FANS

Air bearing low noise fans are utilized to ensure minimum audible and electrical noise while maintaining a stable operating temperature for the high precision low inductance internal current shunts

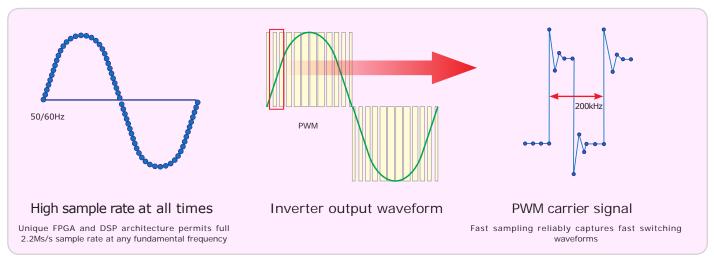


*PPA4500 - 8 ranges

FEATURES

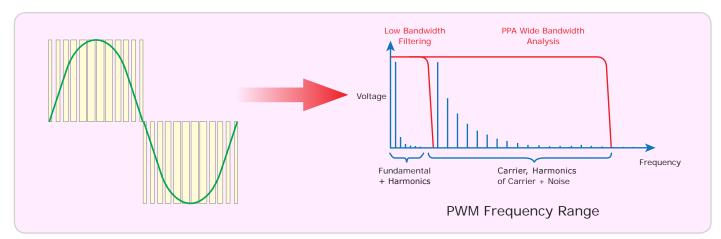
High Speed Power Measurement - 2ms* Datalog Interval PPA5500 PPA4500

Measurements include all frequency components in power waveforms for example, fundamental, harmonics of the fundamental and the carrier of a PWM inverter output by maintaining 2.2Ms/s sampling at any drive frequency *PPA4500 10ms datalog interval



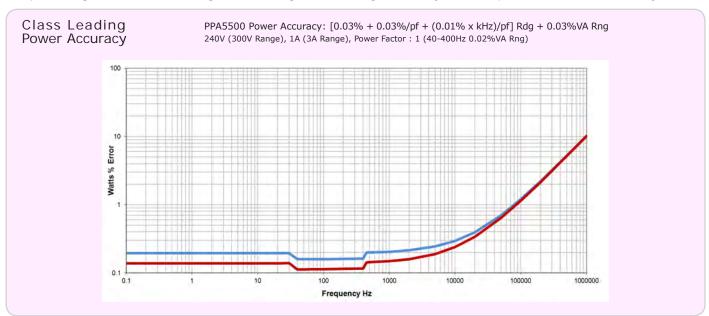
2MHz Wideband Frequency Response PPA5500 PPA4500

With 2MHz bandwidth and exceptionally flat response, the PPA provides precision analysis of total power in applications such as lighting ballasts or PWM drives that involve a wide range of frequency components. Proprietary to N4L, a digital process called Expanded Nyquist Sampling ensures no alias components



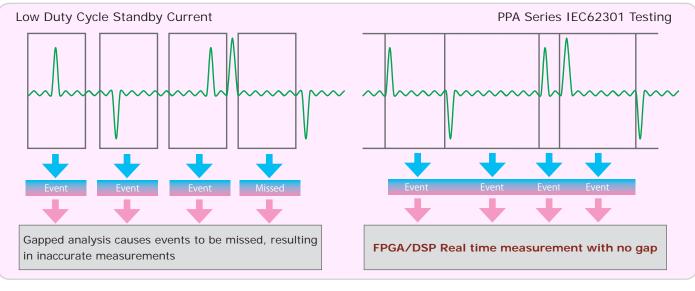
High Accuracy PPA5500 PPA4500

Unique voltage and current analogue card design ensures high accuracy for both power and harmonic analysis



DFT Real Time No Gap Analysis PPA5500 PPA4500

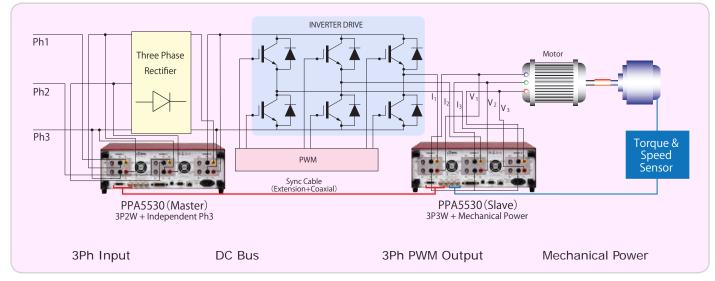
Many power applications have fast changing asynchronous current pulses which are not suited to fixed data length FFT analysis. The PPA series combine a real time DFT (Discrete Fourier Transform) technique with variable window no gap analysis to ensure the optimum speed and accuracy at all times



- Missing data compromises power accuracy
- Long term measurement integration achieves approximately correct average power
- Real Time No Gap analysis ensures correct
 power measurement
- Simultaneous fundamental and pulse frequency synchronization quickly obtains the correct power

Up to 6 Phase Analysis PPA5500 PPA4500

Master/Slave mode enables two PPA45/5530's to be fully synchronized into a single 6 phase measurement system *4 or more phase measurements provided via N4L PC software or master slave mode



Advantages of Dual PPA vs Single instrument

- Twice the processing power as one unit
- Flexibility between different applications
- Units fully synchronized giving single point of control

Measurement parameter examples

- Input/Output power measurement
- Efficiency of the inverter
- Inverter output voltage harmonics
- Motor drive characteristics



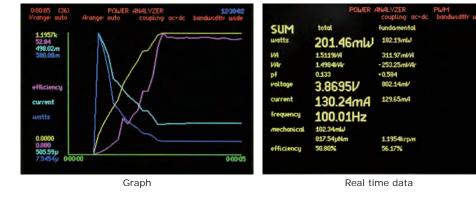
FUNCTIONS

Input Torque and Speed Sensor PPA5500 PPA4500

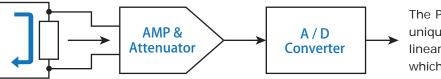
Direct measurement of torque and speed from dedicated inputs that are fully synchronized with the voltage and current channels permits true real time power conversion efficiency to be evaluated



①TORQUE Bipolar±10V / pulsed
 ②SPEED Bipolar±10V / pulsed
 ③ANALOGUE Analogue output of selected function ±10V



Built in Amplifier and Unique Shunt Resistor PPA5500 PPA4500



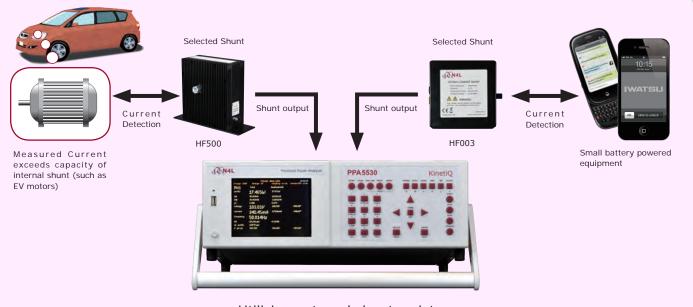
The PPA series use a single shunt resistor unique to N4L that combines exceptional linearity and no need for relay switching which can cause measurement errors

Model	Low Current Model	Low Current Model Standard Model	
PPA5500	9 ranges: 3mApk - 30Apk (10Arms)	9 ranges: 30mApk - 300Apk (30Arms)	9 ranges: 100mApk - 1000Apk (50Arms)
PPA5500	100mΩ Shunt	10mΩ Shunt	3 mΩ Shunt
PPA4500	8 ranges: 10mApk - 30Apk (10Arms)	8 ranges: 100mApk - 300Apk (30Arms)	8 ranges: 300mApk - 1000Apk (30Arms)
PPA4500	100mΩ Shunt	10mΩ Shunt	3mΩ Shunt

External shunt options

(DC \sim 1MHz, 0.1% Accuracy, Inductance<1nH)

	, 0.170 Accuracy	, inductance < 1			
Model	Maximum	n Current	Bandwidth	AQN4L	
woder	Rated A	Peak	Bandwidth	HF100m CURRENT SHUNT	
HF500	500Arms	5000Apk		Contribution Contract. SA mini misi Programso Rampin do do 2016	
HF200	200Arms	2000Apk		WARNING Hoph willings rises bit purchast at that cadeat terminal - an exaculated advectation softw	
HF100	100Arms	1000Apk	DC ~ 1 MHz		4.A.A.
HF020	20Arms	200Apk	DC /~ IMITZ		
HF006	6Arms	60Apk			
HF003	3Arms	30Apk		HF003	HF500



Utilising external shunt resistors

Power Analysis PPA5500 PPA4500

Any parameters can be enlarged with the zoom function

PH1	Arange: 30A total	coupling: ac+dc fundamental	bandwidth: wid-	Vrange: 300V	POWER ANALYZER Arange: 30A coupling: ac+dc	16:26:42 bandwidth: wide
watts	3.2513kW	3.2510kW		PH1		
VA VAr	3.2513kVA 1.0000VAr	3.2510kl/A 3.1755ml/Ar		total watts	3.2513k	ω
pf voltage	1.000 1111.13V	-1.000 111.131/	+000.00"	rms voltage	111.13	ν
current	29.257A	29.256A	-360.00*	Pollage		
frequency	59.895Hz			rms current	29.257	A
	-252.97nW	-0.000%		current	EO.EOI	
dc watts V ph-ph	148.76mW 157.15V	15.831mV	-000.24	frequency	59.895	Hz

Zoom function enabled on total watts, rms voltage, rms current and frequency

	POL	VER ANALYZER coupling: ad	t+dc bandwidth	6:26:44 wide
	phase 1	phase 2	phase 3	
watts	3.2514k	3.2566k	3.2748k	ω
VA	3.2514k	3.2566k	3.2748k	VA
VAr	1.7321	1.7321	2.0000	VAr
pf	1.000	1.000	1.000	
Vrms	111.13	111.11	111.48	V
Arms	29.257	29.309	29.376	A
frequency	59.895			Hz
H3	-0.000	0.000	0.000	%
dc watts	148.52m	147.88m	150.44m	w
V ph-ph	157.15	157.40	157.41	ν

All power measurement and RMS values are computed simultaneously allowing measured values to be selected and viewed during analysis

Here, three phase total power is selected with all primary power functions in each phase plus frequency, a selected harmonic, dc watts and phase to phase voltage

Mechanical power, Maths and Efficiency functions can also be added to this screen giving real time analysis of electrical or electrical to mechanical systems

3 Phase analysis display selectable in both Total and Fundamental values

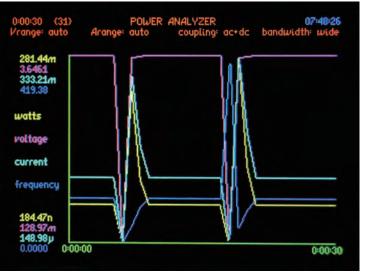
MEMORY

Large 1GB (PPA5500 series) internal memory, data logging from 2ms intervals with synchronization to the fundamental frequency and no gap between measurements

Datapoint storage up to 10M in the PPA5500 series

Alternatively the data can be stored in an external USB pen drive or directly to PPALoG PC software

Voltage, Current, Frequency and Power - Examples of graph mode



Trend analysis

Power Integrator (power consumption) Mode, RMS Meter Mode and

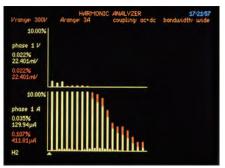
Impedance Meter Mode PPA5500 PPA4500

0.01:44	POWE	R INTEGRATOR coupling: ac	+dc bandwidth	wide		TRUE RMS VOLT	METER 17:24:46		IMP	EDANCE METER		17:25:51
VAr hours	15.790m 15.460m 0.190 3.5951	phase 2 3.1055m 15.862m 15.556m 0.196 3.5885 4.4203m	16.477 m 16.095m 0.201 3.5975	VAh VAch V	Vranger 3000/ PH1 rms dc oc peak: crest factor surge rectified mean form factor frequency	Arange: 3A coup voltage 104.25V 37.028mV 104.25V 104.25V 147.8V 1.42 148.0V	Ling oc dc bandwidth wide current 550.07mA 792.17.04 550.07mA -1.930A 3.62 -2.088A 266.1mA 2.057	impedan resistan reoctanc phase frequenc	phase 1 20 343.9 20 334.8 0 -78.54 -013.20	phase 2	oc-dc bandwik phase 3 92.222 -94.31 -97.37 -203.90 1.7870M	ath wide Q Q Q Hz
	Power In	tegrator m	node			RMS Voltmeter	mode		Impedan	e meter r	node	

Note

In addition to detailed measurements of the phase power parameters, you can check the balance of power between the phases and observe computed neutral current when 3 phase 4 wire connection is selected

Harmonic Analyzer and Oscilloscope PPA5500 PPA4500



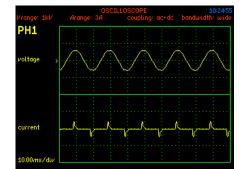
Harmonic analyzer (Bar graph)



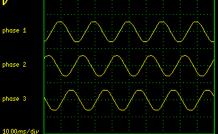
		ARMONIC	ANALYZER	17:23:20
Prange: 300	V Arange:	3A	coupling: ac+dc	bandwidth wide
PH1	Polt	age	curre	ent
1	104.081/	100.0%	361.81mA	100.0%
# ॷॖॖॖॖज़ ᆍ ᢧ᠖ᆺ <mark>ᢁ</mark> ज़य़य़ॷय़ॖॾॖय़ॖ	66.942ml/	0.064%	1.0017 mA	0.290%
3	1.06861/	1.027%	315.02mA	93.05%
4	60.454mi/	0.058%	1.2036mA	0.335%
5	814.66mV	0.783%	243,59mA	83.14%
6	59.873ml/	0.058%	1.3168mA	0.443%
7	1.11441/	1.071%	164.94mA	70.85%
8	48.725ml	0.047%	1.2627 mA	0.595%
9	264.27 mV	0.254%	97.590mA	55.75%
10	45.601ml/	0.044%		0.708%
11	415.46mV	0.400%	65.228mA	42.16%
12	29.432mV	0.028%	1.1449mA	0.740%
13	363.67m	0.350%	62.921mA	29.11%
14	17.176mV	0.017%	1.0909mA	0.705%
15	285.74mV	0.275%	60.453mA	20.28%
16	18.224mV	0.018%	1.4858mA	0.628%
17	228.83ml/	0.220%	48.863mA	15.01%
18	16,639ml/	0.016%	1.9997 mA	0.553%
19	148.15mV	0.143%	37,549mA	12.24%

Harmonic

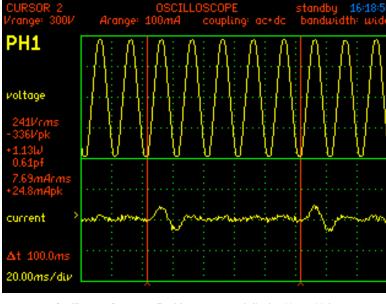








Three phase display of voltage or current



Oscillosope Cursors - Enable cursors and display Vrms, Vpk, Watts, Power Factor, Arms and Apk

Note

In Harmonic Analyzer Mode, the PPA4500 provides up to 100 Harmonics with real time, table or bar graph presentation. Measurements are in absolute magnitude and percentage of fundamental with harmonic phase also available. The PPA5500 extends the harmonic range to 417 for aerospace applications and also includes a DFT based interharmonic analysis mode for aircraft standards testing (TVF105)

ACQUISITION SETTINGS

Auto-Ranging, Range Up Only or Manual PPA5500 PPA4500

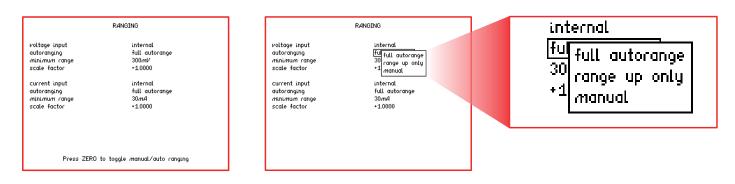
Range modes are selectable

①Auto-Ranging

Performs automatic switching of voltage and current ranges up and down depending on the level of the measured value with all inputs linked or ranged independently to ensure optimum accuracy Performs automatic ranging when the input is 120% of range, ranging up only

②Range up only③Manual

No automatic ranging, user specifies the range in which to operate (used when input voltages and currents are known) or during inrush current testing



Independently Set Input Coupling PPA5500 PPA4500

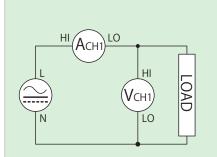
Independently set input coupling so different methods of sensing can be implemented. Such as a CT on phase 1 and shunt sensing on phases 2 + 3



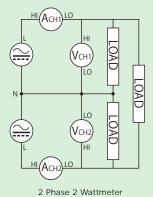
Wiring Settings PPA5500 PPA4500

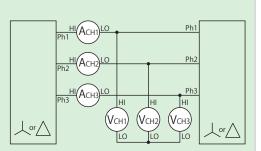
	ISITION CONTROL
wiring speed smoothing smoothing response frequency reference phase reference low frequency	ind single phase 1 me 2 phase 2 wattmeter no 3 phase 2 wattmeter au 3 phase 3 wattmeter vo single phase 2 vo single phase 3 of 3 phase 2 wattmeter + PH3 independent

Various wiring arrangement settings to satisfy a complete range of setups found in power analysis



1 Phase 1 Wattmeter





3-phase 3 Wattmeter(Reference to neutral)

ACQUISITION SETTINGS

Bandwidth Settings PPA5500 PPA4500

DC(DC-5Hz) Low(DC-200kHz)

Wide(DC-2MHz)

DC measurements up to 5Hz Basic power (50/60Hz) including harmonics of the fundamental while rejecting high frequency noise Wideband applications such as PWM inverter drives

Wideband applications such as PWM inverter drives including all power components for true total power



Example of independent wiring configuration showing 3 phase individual coupling settings

The PPA45/5500 series includes a programmable digital filter that allows users to set a preferred bandwidth

Display Settings, Smoothing Response and Frequency Reference PPA5500 PP

①Display update rate

Various settings for the display update rate ($2ms \sim 100s$) which also increases the smoothing when used together with the smoothing option. A 'window' option permits direct control of the measurement window size (Note: Minimum window size for PPA4500 - 10ms)

②Smoothing settings

Working in conjunction with the speed setting, a smoothing filter can then be applied to the measurements. Normal and slow options are available which apply an increasing time constant to the output of the measurement window

	ACQUISITION CO	ONTROL	
wiring speed window smoothing smoothing response frequency reference phase reference low frequency	10 10 8 8	iependent very slow slow medium fast very fast window	_

ACQUI	SITION CONTROL
wiring speed smoothing smoothing response frequency reference phase reference low frequency	3 phase 3 wattmeter medium no normal vo none votrogy off

	ACQUISITION CONTROL
wiring	independen window
window	1.0000 s
smoothing smoothing response frequency reference phase reference low frequency	

Example of setting the window, eg (50Hz set to 20ms)

speed	update rate	normal time constant	slow time constant
Very Fast	1/80s	0.05s	0.2s
fast	1/20s	0.2s	0.8s
medium	1/3s	1.5s	6s
slow	2.5s	12s	48s
very slow	10s	48s	192s

Display update speed settings

Setting the filter (normal/slow)

Frequency Reference PPA5500 PPA4500

When making a precision measurement of ac power, correct synchronization with the fundamental frequency is essential. The PPA series provides a solution to frequency synchronization in a wide range of applications including Standby Power, Variable Speed Drives, Electronic Ballasts and DC to AC Inverters with the option to select voltage, current, speed or ac line input as the frequency reference. The PPA45/5500 series also provide fully independent frequency detection an all phase inputs

wiring	3 phase 3 wattmeter
speed	medium
smoothing	normal
smoothing response	auto reset
frequency reference phase reference	Vo Voltage
low frequency	of current
tow medgeney	sheed mbor
	ac line

Frequency Reference

Vranje 1kV Aranje 100mA coupling: ac+dc bandwidth wide PH1 voltage current 20.00ms/dw

1:5 cycle (10Hz standby current period) Power measurements synchronized to low duty cycle current pulses of a power supply in standy mode

Vrange: 300V	POWER Arange: 100mA	ANALYZER coupling: ac+d	standby c bandwidth wide
PH1	total	fundamental	
wotts	1.3360W	1.3323W	
VA	2.0951VA	1.33231/4	
VAr	1.6138VAr	2.6926ml/Ar	
pf	0,638	-1.000	
voltage	244.761	244.531	·000.00*
current	8.5597mA	5.4486mA	-359.88*
frequency	50.071Hz		10.014Hz
H3	211.88	0.015%	
dc watts	-2.1145pld		

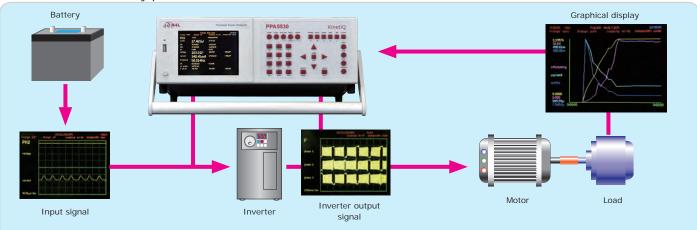
1:5 duty cycle standby power measurement cycle

Vrange: 300V	Arange: 100mA	coupling: act	dc bandwidth wide
PH1	total	fundamental	
watts	628.64mW	626.74mW	
VA	926.50ml/A	626.75mVA	
VAr	680.59ml/Ar	2.0889ml/Ar	
pf	0.679	-1.000	
voltage	244.561/	244.434	+000.00*
current	3.7884mA	2.5642mA	-359.81"
frequency	50.105Hz		1.0021Hz
H3	93.046	0.015%	
dc watts	-601,00nW		

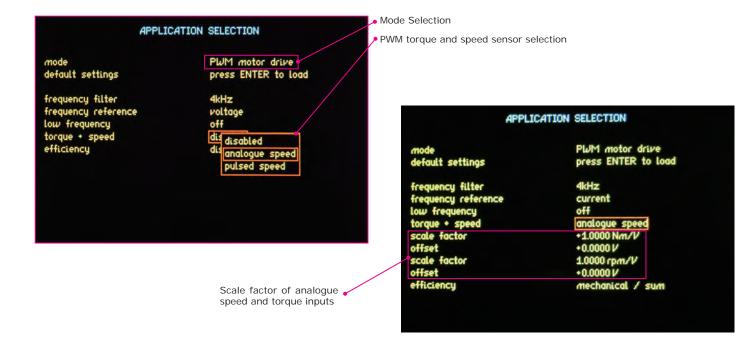
1:50 low duty cycle (1Hz) power measurement

Application Modes PPA5500 PPA4500

In addition to the usual power measurements, various modes are pre programmed into the instrument including "PWM motor drive", "ballast lighting system", "inrush current", "power transformer", "Harmonics and Flicker*", "TVF105*" and "standby power" *PPA5500 only

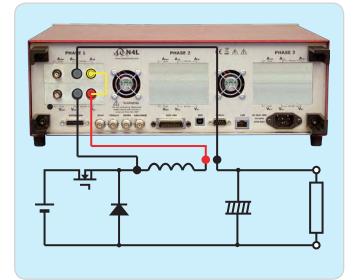


Example setup when measuring inverter output with respect to load



Inductance Loss Analysis PPA5500 PPA4500

An example of analysis of dynamic inductance losses

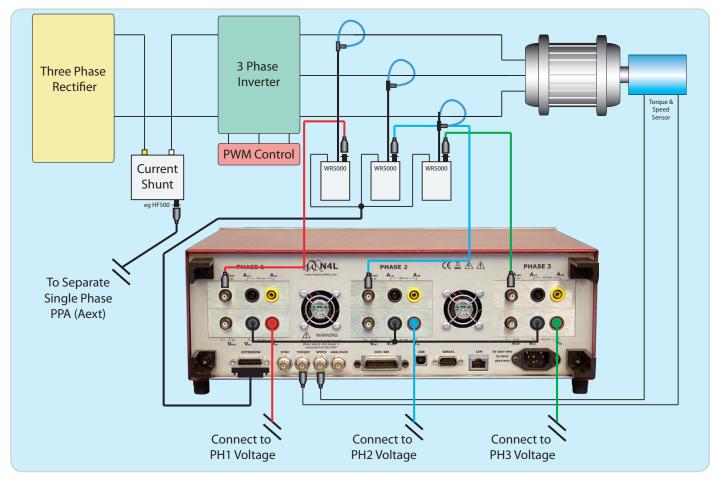


Vrange: 30V	POWER Arange: 300mA	ANALYZER coupling: ac+dc	17:23:56 bandwidth: wide
PH1	total	fundamental	
watts	23.813mW	11.320mW	
VA	325.76mVA	193.59mVA	
VAr	324.89mVAr	-193.26mVAr	
pf	0.073	+0.058	
voltage	3.6878V	2.28991/	+000.00ª
current	88.335mA	84.539mA	-086.65°
frequency	30.000kHz		
H3	4.9618mW	43.83%	
dc watts	لهاير 838.83		

Real time data

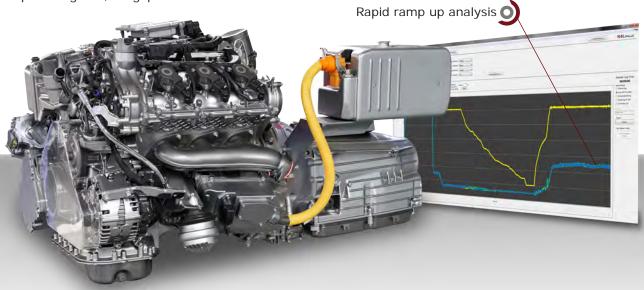
PWM Motor Drive Evaluation PPA5500 PPA4500

The PPA5500 is the perfect solution for Inverter Drive evaluation and analysis. Utilising proprietary digital filtering algorithms, the N4L power analyzer range offers unrivalled performance. The PPA5500 can be used in conjunction with external current sensors such as the WR5000 - a 1MHz 5000A Rogowski Coil in high current applications. Inverter efficiency is available via either 3 Phase 2 Wattmeter method + CH3 (utilising CH3 for the DC Bus measurement). Alternatively a second single phase PPA can be connected to the DC Bus and the two analyzers are configured in a Master Slave arrangement, all data is available via N4L Software.



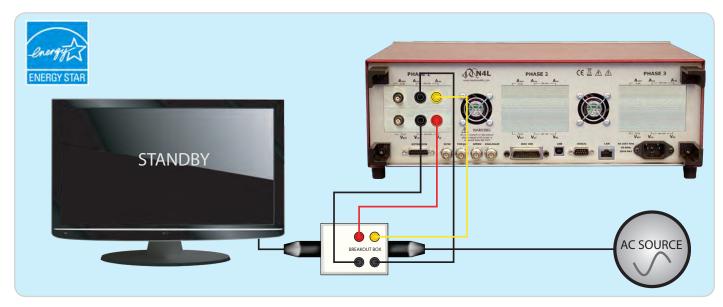
High Speed Analysis PPA5500

The PPA5500 features the fastest signal processing on the market, this enables high speed tracking of changing inverter drive frequencies and power parameters during ramp up and ramp down conditions, for example in electric vehicle applications. N4L's free to download software package (PPALoG) offers datalog intervals down to 5ms, providing fast, no-gap real-time data direct to software.



Standby Power (IEC62301 Ed 2.0) PPA5500 PPA4500

The PPA4520 and PPA5520 units offer unrivalled dynamic range which enables the user to comply with IEC62301 and Energy Star testing standards. Utilising "Standby Power Mode" the PPA employs proprietary standby power signal processing algorithms to provide accurate no gap analysis of high crest factor (CF) signals, importantly the entire N4L power analyzer range benefit from a guaranteed accuracy specification up to a crest factor of 20.



Guaranteed Accuracy up to Crest Factor 20 PPA5500 PPA4500

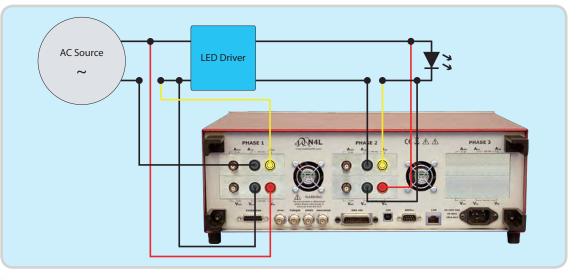
As stated in IEC62301, typical standby power current waveform crest factors can exceed values of 10. In such cases it is important for the Power Analyzer to guarantee accuracy at crest factors expected of the application under test.



Newtons4th are the only Power Analyzer Manufacturer in the world* to provide ISO17025 calibration certificates on all new Power Anlayzers as standard. Our ISO17025 Schedule of Accredition includes Voltage, Current, Phase, Power, Harmonics and Flicker. With traceable certification of power accuracy down to 0.5W, N4L offer the ideal measurement solution for certified standby power measurement.

LED Driver Efficiency PPA5500 PPA4500

The PPA4520 and PPA5520 offer an ideal solution for LED driver efficiency measurements, dimming techniques such as reverse phase control are easily analyzed by the N4L Power Analyzers.



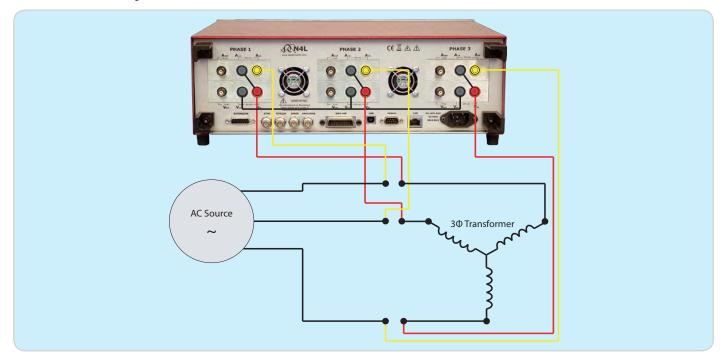
Efficiency can be viewed either directly on the PPA display using the "Phase/Next Phase" efficiency option or calculated in PPALoG software.

00000

000

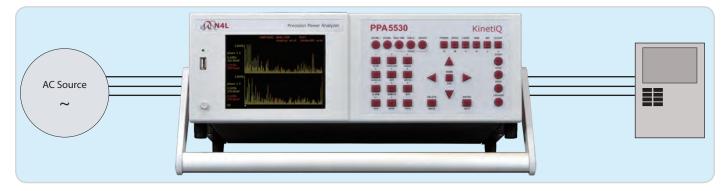
Power Transformer Loss Testing PPA5500 PPA4500

The PPA4500 and PPA5500 series of Power Analyzers exhibit the best phase accuracy on the market, with a basic accuracy of 0.005°, low power factor core loss testing of transformers is both accurate and repeatable. This is achieved as a result of both sophisticated analogue input design and proprietary digital signal processing techniques. Low power factor certification to UKAS ISO17025 is also available directly from N4L's accredited calibration laboratory.

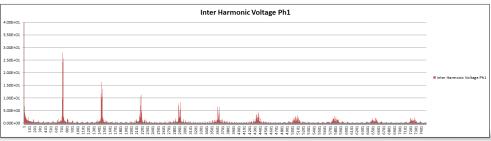


Aircraft Avionics Industry - 417 Harmonics + Interharmonics PPA5500

The PPA5500, featuring high speed FPGA and DSP processors is able to compute up to 417 Harmonics and also meet interharmonic measurement requirements of ABD0100.1.8. The Harmonic Analyzer mode and special TTVF105 Interharmonic mode in the PPA5500 offer the Avionics Engineer an accurate, simple to use solution.



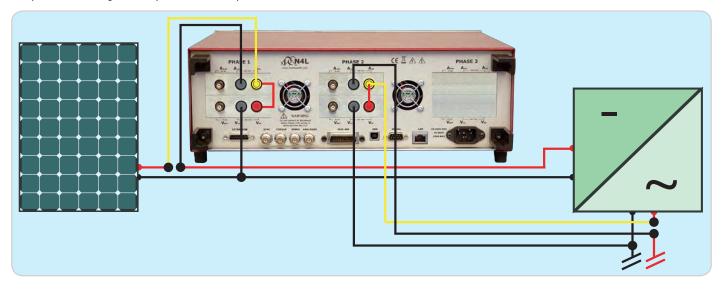
Example ABD0100.1.8 Interharmonic Results, up to 150kHz (Sample Waveform analyzed for illustration)



Note: PPA4500 up to 100 Harmonics

Solar Inverter Performance Analysis PPA5500 PPA4500

The PPA5500 and PPA4500 provide a highly accurate solar inverter analysis and evaluation solution, featuring independant frequency detection N4L Power Analyzers exhibit the ability to synchronise to the 50/60Hz output signal along with with the DC input signal from the solar array. Both efficiency of the inverter, quality of the AC output and many other performance parameters can be recorded.

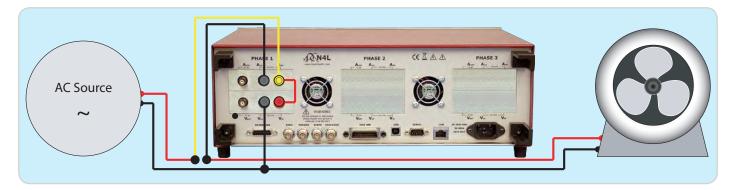


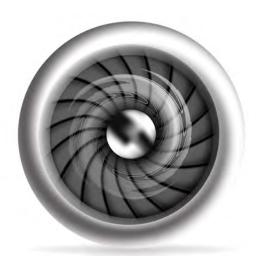
Inrush Current PPA5500 PPA4500

Accurate inrush current measurements rely upon two factors aside from fundamental measurement accuracy, these are gapless measurement and a high sampling rate;

1. Gapless Measurement - Inrush waveforms by their nature are transient; gapless measurement is vitally important in order to ensure that inrush waveform data is not missed.

2. High Sampling Rate - When working with mains frequencies, many power analyzers have low sample rates due to the computation of measured values from a data block of finite size. The PPA4500 and PPA5500 utilise a proprietary real time signal processing technique that maintains full 2.2Ms/s sample rate irrespective of the measured load frequency, ensuring that high frequency events are captured without aliasing.





3.00E+00 2.00E+00 0.00E+00 0.00E+

Example Inrush current data, datalogging at nominally 20ms intervals directly to PPALoG

Calibration and ISO17025 Certification

UKAS PPA5500 PPA4500

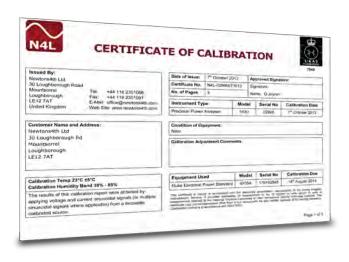
Newtons4th are an accredited UKAS Calibration laboratory, all PPA4500 and PPA5500 Power Analyzers are supplied with an ISO17025 UKAS Calibration Certifcate as standard. Calibration of N4L Power Analyzers is an integral and important part of our service to our clients, we offer quick turnaround times at a competitive price. Re-Calibration is also available at our international offices and various distributors throughout the world*.



Schedule of Accreditation PPA5500 PPA4500

N4L's schedule of accreditation to ISO17025 is wide ranging and an overview of the schedule is detailed below, for more specific information please see the UKAS website to view the full accreditation schedule.

	ISO17025 UKAS Accreditation Sch	nedule
	Signal Amplitude	Frequency Range
Voltage Sine Amplitude	1V to 1008V	16Hz to 850Hz
Voltage Harmonic Amplitude	0V to 302V	16Hz to 6kHz
Current Sinewave Amplitude	100mA to 48A	16Hz to 850Hz
Current Harmonic Amplitude	OA to 15A	16Hz to 6kHz
Current to Voltage Phase Angle	-180° to +180°	16Hz to 850Hz
Apparent Power (VA Product)	100mVa to 48.4kVA	16Hz to 850Hz
AC Power	OW to 48.4kW	16Hz to 850Hz
Current Harmonic Amplitude to IEC61000-4-7	OA to 6A	16Hz to 6kHz
	Pinst(Sinusoidal Modulation)	
	Pinst(Rectangular Modulation)	
	Pst	
Flicker to IEC61000-4-15	Frequency Changes	As per IEC61000
FIICKEI LO IECO 1000-4-15	Distorted Voltage with Multiple Zero Crossings	AS per recorooo
	Harmonics with Sidebands	
	Phase Jumps	
	Rectangular Changes with Duty Cycle	





Due to the specialist nature of Power Measurement Instrumentation Calibration, N4L utilise both commercially available calibration equipment (such as the Fluke 6105A for UKAS Certification) along with N4L bespoke designed signal generation equipment in order to calibrate our instruments over the full frequency range (up to 2MHz). Calibration over the full frequency range is uncommon given that such signal generation equipment is not commercially available. When supplied with an N4L analyzer, all customers will receive a calibration certificate covering the complete frequency range.

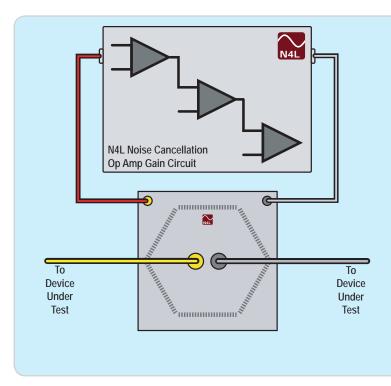


*UKAS Calibration is available from N4L UK HQ only, details for calibration performed at other locations is subject to local accreditation, please contact your local office for more details.

Ranging Principles

9 Stage Solid State Ranging System - PPA5500 PPA4500

Combining highly linear voltage attenuator and current shunt designs with a proprietary 9 stage (PPA5500) or 8 stage (PPA4500) solid state ranging system on every phase input, the PPA series achieve a uniquely wide dynamic range, with no need to switch between voltage attenuators or current shunts when ranging up or down.



Design features:

Single attenuator on each voltage input High impedance low capacitance Single shunt on each current input

Low impedance low inductance

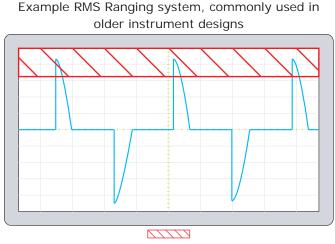
Auto peak detect High speed solid state ranging High Noise rejection Auto DC offset trimming

Benefits:

Overload protected on any range Low shunt affect on voltage connections Low voltage burden on current connections Market leading phase accuracy Peak detect ranging ensures no signal clipping Low attenuator/shunt operating temparature Fast range switching Constant frequency response on all ranges Signal can be applied with instrument powered off

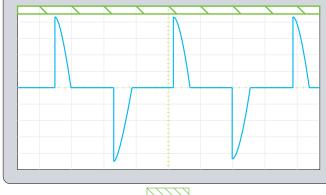
Auto Peak Ranging Ensures Complete Waveform Analysis PPA5500 PPA4500

It is often overlooked that for an instrument to correctly calculate power parameters, the entire waveform must be digitised for analysis. The Peak Ranging system employed by all N4L Power Analyzers ensures that the entire waveform is digitised and the correct power parameters are calculated.





Modern Peak Ranging System, implemented on all



Waveform within red hashed area is clipped by an RMS ranging system and fixed crest factor setting

Peak Ranging system auto-detects the peak of the input signal and selects the ideal range

Note

An RMS Ranging system requires the user to have prior knowledge of the crest factor which in many applications is not practical, either because the user cannot reasonably be expected to know this value before a measurement, or because the crest factor is changing during a measurement period. The ideal ranging system is therefore based upon peak detection which does not require the user to be concerned with a crest factor setting. While many RMS ranging systems are only guaranteed to support a Crest Factor of 6, all N4L Power Analyzers guarantee to auto-range with any crest factor and maintain full accuracy with a CF of at least 20. While waveforms with a true CF above 20 are very unusual, 'auto range up' or 'manual' ranging combined with a market leading range sensitivity enables the PPA to achieve a dynamic range equal to a CF >300.

PC CONTROL AND DATA ACQUISITION

PC Software PPA5500 PPA4500

Analysis carried out by the instrument can easily be transferred to a PC via USB, RS232 or LAN

① **PPALoG** Exceptional flexibility and ease of use with all the functions included in the orginal PPAcomm program plus multiple instrument control for 4-12 phase applications and data export to Text file, Excel, Bitmap or Clipboard

Control:	PPAT	PPA2	s	ETTINGS: READ	IPPA SET UP PPA	0	HIDE SETTINGS	AN4L
Control: PPA1			Configuration: Acquisition Ci	ontrol				
ACQU	COUPLING	RANGE	Witing	3 phase 3 wattreete 💌	Frequency Reference	egalicy	•	
DATALOG	APP	MATHS	Speed	last -	Frequency Reference	phase 1	*	
ALARM .	GENOTE	AUX	Smoothing	wola	Phase angle reference	votage	*	
SYS	MODE	9800	Smoothing Response	fixed time ·	Low Frequency	ott	-	Advanced options >
PPA1 -	PPA2 Muter	S	Vev		RESULTS	EAR LOG	Interval (s) 1	Elapsed Log Time: 00:18:23 Data Satings Elagge Deabled
PPA1 -	RESULT	S	Vev	Ful PPA2 -	Langestand (1975	EAR LOG	E Freeze Daplay	00:18:23 Data Settings
PPA1 - 	RESULT:	al Landa	View 32.233 14.2	Fall PPA2 -	RESULTS	EAR LOG	E Freeze Daplay	00: 18:23 Data Satings Logge Dashed a Lornal time table Deect log to CSV
PPA1 - 	RESULT: 	5 	Uk dent Uk vi 32.233 14.2 1.00 Mer 1.300	Fial PPA2 - PPA2 - PPA2 - Wetts PPA2 - Wetts	RESULTS		Freeze Deplay	00:18:23 Data Settings Logger Deabled Logger Deabled
PPA1 - 	RESULT: 132.76m poor face Pri 896.64m best Pri 1995.2	5 28.901 7. sam Perf 27.210 web Perf	UK first Ukers 32,233 1,42 30,265 132 30,265 132 30,265 39 19	Fill PPA2 - Pril watts Ref 28.5	RESULTS PHI m 920 24	s V PH1 12.84	Wee Ful Wee Ful mul 1 PH1 132.87m	00: 18:23 Data Satings Logge Dashed a Lornal time table Deect log to CSV
PPA1 - 	RESULT: 	5 28.901 7. sam Perf 27.210 web Perf	UK first Ukers 32,233 1,42 30,265 132 30,265 132 30,265 39 19	Fill PPA2 - Peri 272 watts 283 253 261 frequen	RESULTS PH1 m 220 24 cy PH1 power	s V PH1 2.84 factor PH1	Freeze Deplay Vere Full mis 1 PH1 132.87m vette PH2	00:18:23 Data Steting Loggy Deathed Loggy Deathed Log real free table Deect log to CSV SELECT PILE SAVE LOG TO CSV
PPA1 - 	RESULT: 	S appendix 28.901 Crass Prot 27.210 avec Prot 28.900 Crass Prot	Ukert Uker 32.235 3.0.265 30.265 32.227 14.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Field PPA2 - httl westls 272 westls 283 283 ma 283 frequence 493 247 493	RESULTS PH1 m 220 24 cy PH1 power	s V PH1 12.84	Wee Ful Wee Ful mul 1 PH1 132.87m	00:18:23 Data Settings Loggy Deatled Unreal time table Deect log to CSV SELECT FILE
- ma V 244 242.78 Recurry Pht 49.968 .ma (1943 242.79 Microsoft	RESULT: 	- uppe first 28.901 7.000 757 27.210 uppe first 28.900 7.000 752 27.211	United United 32,233 14.2 30,265 13.2 30,265 13.3 32,227 14.2 15,892 13.4 30,265 13.4 31,264 13.5 30,264 13.5 15,892 16.4 30,264 13.5 15,892 16.7	PPA2 - hei 272 283 253 ^{ma} 281 frequen ^{ma} 49.9 247 270 ms V	RESULTS PH1 mm 920 24 cy PH1 power 969 89 PH2 we	s V PH1 2.84 factor PH1	Freeze Deplay Vere Full mis 1 PH1 132.87m vette PH2	00:18:23 Data Sating Degy Dataled Deed log to CSV SELECT FILE SAVE LOS. TO CSV Expert To Excel

a. Measurement parameters are chosen by the user from tick box options b. Real time results can be displayed as latest value, table or graph

c. Datalogging results are then saved in the selected format

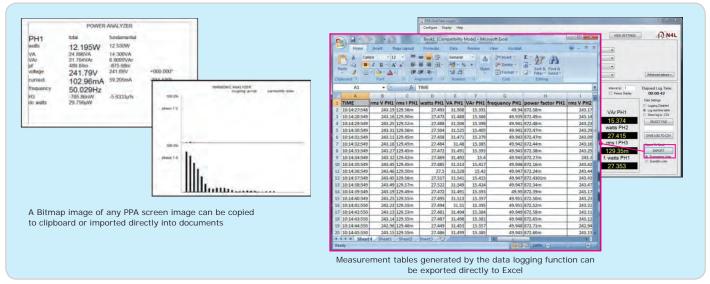
PPA1-RES	SULTS		Vex 7.4	PPA2-P	RESULTS	-	Ve
entis Pirit - + Ina 2Pirit - + Ina 2Pirit - + Inaparity Piri - + Entisti				mail Pitt.			
-	PHI-PTAD	PHL-PPAD	WEDS FIRST-	TRPHI-	VIN-PHI-	frequency PHI - PFAIL	PHU-PPAD
H 12.26-1228	245.30	132.73m	28.868	32.987	15.063	45.255	886.70m
H U 28 11 28	245.50	132.73e	28.868 28.948	32,557	15.053	49.205	
17 12:25 14:228 112:25 19:228							886.70m
07 12:25 14:228 18 12:25 15:228 19 12:25:16:228	245.50	132.91+	21.944	32.638	15.012	49.901	886.75m 886.83m
17 12.25 14.228 18 12.25 16.228 19 12.25 16.228 10 12.25 17.228	245.50 245.30	132.9%x	28.984 28.889	32 638 32 581	15.082	49.901 49.312	886 70e. 886 80e 886 80e
17 12.28 14.228 18 12.25 16.228 19 12.25 16.228 10 12.25 17.228 11 2.25 17.228 12 25 18.228 13 12.25 18.228	245.50 245.36 245.25	132.91e 132.79e 132.73e	28.544 28.885 28.867	32 638 32 581 32 594	15.082 15.064 15.050	49.901 49.312 49.305	806 70e 806 80e 806 60e 806 70e
17 12.25 14.228 18 12.25 19.228 19 12.25 17.228 10 12.25 17.228 11 12.25 19.228 12 19.12 19.228 12 19.12 19.228 12 19.228 19.228	245.50 245.30 245.28 245.25	132.9% 132.7% 132.7% 132.84m	28.944 28.895 28.897 28.892	12 618 12 581 12 554 12 554 12 554	15.082 15.084 15.050 15.050	49.901 49.912 40.905 49.906	886 70m 886 80m 886 80m 886 70m 886 80m
12 12.25 14.228 11 12.25 19.228 12 25 19.228 13 12.25 19.228 14 25 19.228 15 12.25 19.228 16 12.25 19.228 17 12.25 19.228 18 12.25 19.228 17 12.25 19.228 18 19.228 19.228 19 12.25 19.228	245.50 245.30 245.25 245.25 245.25 245.37	132,5% 132,7% 132,7% 132,3% 132,8%	28.944 28.989 28.987 28.982 28.989	32.638 32.561 32.554 32.554 32.600 32.601	15.082 15.064 15.050 15.056 15.076	49.901 49.912 49.905 49.905 49.906 49.915	886 73e 896 83e 896 85e 896 85e 896 73e 886 83e 886 83e
12 12 14 228 12 25 14 228 10 12 25 14 228 10 12 25 14 228 11 12 15 16 228 12 25 16 228 17 228 12 25 19 228 17 228 12 25 19 228 17 228 12 25 26 228 17 228 14 12 26 26 228 17 228 14 12 26 27 228 17 228	245.58 245.39 245.25 245.25 245.25 245.37 245.45 245.48 245.48	132.5% 132.7% 132.7% 132.84 132.84 132.86 132.90 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.95 133.05 133.05 13	28.984 28.985 28.987 28.987 28.985 28.999 28.999 28.929	32.638 32.561 32.561 32.560 32.601 32.601 32.625 32.660 32.600 32.633	15.042 15.044 15.050 15.050 15.050 15.059 15.059 15.055 15.055 15.055	48.501 49.312 49.300 49.506 49.315 49.315 49.317	206 72a 206 82a 206 82a 206 72a 206 72a 206 72a 206 72a 206 72a 206 72a 206 72a 206 72a 206 72a
7 12:25:14:228 81 12:25:19:228 91 12:25:19:228 91 12:25:19:228 91 12:25:19:228 91 12:25:19:228 92 12:25:19:228 93 12:25:19:228 94 12:25:228 95 12:25:228 94 12:25:228 95 12:25:228	245.58 245.39 245.25 245.25 245.25 245.45 245.45 245.48 245.47 245.49	132 5%s 132 7%s 132 7%s 132 84m 132 84m 132 80m 133 92m 133 92m 133 92m	28 544 28 885 28 885 28 882 28 882 28 505 28 505 28 505 28 565 28 595 28 595	32 638 32 551 32 554 32 554 32 601 32 601 32 605 32 600 32 643 32 653	15.002 15.004 15.056 15.056 15.056 15.009 15.089 15.080 16.060 15.060	43 501 43 512 43 505 45 506 43 515 43 515 43 517 45 512 43 514 49 500	005 70e 005 70e 005 50e 005 70e 005 70e 005 70e 005 70e 005 70e 005 70e 005 70e 005 70e 005 70e
7 12,25 14,28 8 12,25 19,228 9 12,25 19,228 9 12,25 19,228 9 12,25 19,228 10 12,25 19,228 11 12,25 19,228 12 12,25 19,228 12 12,25 19,228 12 12,26 19,228 12 12,26 19,228 12 12,26 19,228 14 12,95 12,28 15 12,95 12,28 14 12,95 12,28 15 12,95 12,28 15 12,95 12,28 16 12,95 12,28	245.50 245.30 245.25 245.25 245.25 245.45 245.45 245.45 245.40 245.40 245.50	102.5% 102.7% 102.7% 102.7% 102.84 102.84 102.90 102.90 103.90 103.90 103.90 103.90 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 103.00 10	28.944 28.869 28.867 28.867 28.862 28.909 28.909 28.909 28.909 28.909 28.799	12 618 12 561 12 554 12 554 12 554 12 554 12 555 12 660 12 660 12 663 12 653 12 683	15.002 15.004 15.056 15.056 15.059 15.089 15.089 15.080 15.000 15.104 15.027	49.901 49.312 43.305 43.305 43.315 43.317 43.317 43.912 49.912 49.910 49.930	005 70e 005 80e 005 80e 005 70e 005 70e 005 70e 005 70e 005 70e 005 70e 005 70e 005 50e 005 50e
7 12.25 14.238 81 12.25 15.238 92 12.25 15.238 92 12.25 15.238 92 12.25 15.238 92 12.25 15.238 92 12.25 15.238 92 12.26 12.28 92 12.26 12.28 92 12.26 12.28 92 12.26 12.28 92 12.26 12.28 92 12.26 12.28 92 12.26 12.28 92 12.26 12.28 92 12.26 12.28 92 12.26 12.28 92 12.25 12.28 92 12.25 12.28 92 12.25 12.28 92 12.25 12.28 92 12.25 12.28 92 12.25 12.28	246.50 245.36 245.28 245.25 245.45 246.46 246.47 246.47 246.47 246.47 246.27	112 516 112 736 112 736 113 536 113 536 113 536 113 536 113 536 113 536 113 536 113 536 113 536 113 536	28 944 28 989 28 987 28 987 28 987 28 987 28 987 28 989 28 998 28 999 28 999 28 999 28 999 28 999 28 999	12 638 32 541 32 554 32 554 32 655 32 655 32 655 32 655 32 648 32 653 32 488	15,002 15,004 15,000 15,000 15,000 15,000 15,000 15,000 15,002 15,002 15,002	40 501 40 302 40 302 40 305 40 305 40 315 40 317 40 310 40 310 40 320	885 72e 885, E3e 885, E3e 885 72e 885 52e 885 52e 885 52e
7 12.25 14-238 8 12.25 19-238 9 12.25 19-238 12.25 19-238 12.25 19-238 12.25 19-238 12.26 19-238 12.25 19-238 12.26 19-238 12.26 29-238 12.26 29-238 12.26 29-238 12.26 29-238 12.26 29-238 12.26 29-238 12.26 29-238 12.26 29-238 12.25 29-2328 12.26 29-238 12.25 29-2328 12.26 29-238 12.25 29-2328 12.26 29-238 12.25 29-2328 12.26 29-238 12.25 29-24 208 12.26 29-238 12.25 29-24 208 12.26 29-238 12.25 29-24 208 12.26 29-238 12.25 29-24 208 12.26 29-238 12.25 29-24 208 12.26 29-238 12.25 29-24 208 12.28 29-2428 12.25 29-24 208 12.28 29-2428	245.55 245.36 245.25 245.25 245.37 245.46 246.46 246.47 245.40 245.40 245.20 245.20 245.20 246.27 246.30	112,5% 112,7% 112,7% 112,7% 112,84 112,94 112,94 113,95 113,95 113,95 113,95 113,95 113,95 113,95 113,7%	28 944 28 889 28 887 28 887 28 887 28 887 28 890 28 890 28 890 28 990 28 991 28 992 28	12 638 12 534 12 554 12 554 12 554 12 655 12 665 12 665 12 653 12 653 12 653 12 653 12 653 12 653 12 563 12 563	15,02 55,064 55,050 15,050 15,050 15,050 15,050 15,050 15,154 15,052 15,068 15,075	49.501 49.312 49.305 49.315 49.315 49.317 49.317 49.312 49.317 49.312 49.310 49.303 49.305	886 72m 896, E3m 896, E3m 896 53m 896 72m 896 72m 896 72m 896 73m 896 73m 896 73m 896 53m 896 55m 896 55m 896 55m 896 55m 896 55m
1 12.25 14.209 1 12.25 15.209 1 12.25 15.209 1 12.25 15.209 1 12.25 17.209 1 12.25 17.209 1 12.26 17.209 1 12.26 19.209 1 12.26 19.209 1 12.26 19.209 1 12.26 19.209 1 12.26 12.202 14 12.26 12.209 15 12.26 12.209 16 12.26 12.209 17 12.26 12.209 18 12.26 12.209 19 12.26 12.209 19 12.26 12.209 19 12.26 12.209 19 12.26 12.209 19 12.26 12.209 19 12.26 12.209	245.55 245.36 245.35 245.35 245.37 245.45 245.46 246.57 245.48 245.50 246.50 246.50 246.50 246.50	112 5% 112 7% 113 7% 113 84 113 84 113 84 113 85 113 85 115 115 115 115 115 115 115 115 115 1	28 944 28 989 28 987 28 982 28 982 28 985 28 985 28 985 28 995 28 995 29	12 638 12 534 12 534 12 534 12 534 12 535 12 635 12 635 12 635 12 635 12 542 12 542	15,002 15,004 15,000 15,005 15,005 15,005 15,005 15,005 15,004 15,004 15,004 15,004 15,004	49.501 49.312 49.305 49.305 49.315 49.317 49.317 49.312 49.313 49.320 49.320 49.325 49.325 49.325	886 70s 886 80s 886 80s 886 72s 886 82s 886 82s 886 72s 886 72s 886 73s 886 73s 886 73s 886 73s 886 53s 886 53s 886 53s 886 53s 886 53s 886 13s
122514228 122514228 12251928 12251928 12251928 12251728 1225128 1225128 1225128 1225128 1225128 122528 122528 122528 122528 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 1225228 122528 122528 122527 122527	245.55 245.36 245.36 245.25 245.25 245.45 245.45 245.45 245.45 245.45 245.40 245.37 245.46 245.37 245.20	112 5% 112 5% 112 7% 112 7% 112 8% 112 8% 112 8% 112 8% 112 8% 112 8% 112 8% 112 8%	28 544 28 585 28 885 28 887 28 882 28 595 28 595 29	12 638 12 581 12 584 12 584 12 585 12 685 12 685 12 685 12 685 12 685 12 685 12 585 12 585 12 585 12 582 12 582 12 582 12 582	15,002 55,004 15,006 15,006 15,006 15,006 15,006 15,006 15,007 15,007 15,007	49.901 49.312 49.306 49.306 49.315 49.317 49.912 49.913 49.901 49.901 49.901 49.501 49.505 49.505 49.505 49.505	465 73% 205 73% 205 75% 205
12 12 14 228 14 228 14 228 15 228 15 228 12 228 15 228 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 14 14 15 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12 12	245.55 245.36 245.35 245.35 245.37 245.45 245.46 246.57 245.48 245.50 246.50 246.50 246.50 246.50	112 5% 112 7% 113 7% 113 84 113 84 113 84 113 85 113 85 115 115 115 115 115 115 115 115 115 1	28 944 28 989 28 987 28 982 28 982 28 985 28 985 28 985 28 995 28 995 29	12 638 12 534 12 534 12 534 12 534 12 535 12 635 12 635 12 635 12 635 12 542 12 542	15,002 15,004 15,000 15,005 15,005 15,005 15,005 15,005 15,004 15,004 15,004 15,004 15,004	49.501 49.312 49.305 49.305 49.315 49.317 49.317 49.312 49.313 49.320 49.320 49.325 49.325 49.325	886 70s 886 80s 886 80s 886 72s 886 82s 886 82s 886 72s 886 72s 886 73s 886 73s 886 73s 886 73s 886 53s 886 53s 886 53s 886 53s 886 53s 886 13s

Capture up to 60 measured functions per line

Simultaneous display of master and slave units

Real time Datalog

Data Export options



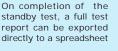
② **PPA Standby Power** Full compliance testing to IEC62301. Meets or exceeds the requirements and methodology of U.S. EPA (Energy Star), U.S.DOE, California Energy Commission (CEC), among others.



N4L	5	ewtons4th Ltd. Standby POWER		Connected to PP
Standby Power Power (W)	Present Reading	Min Reading 1.17228	Max Reading 1.18173	Test Result
Creet Factor Average Power (W)	1.41526	1.41272	1.41651	PASS
Accmulated Power (Whr) Monitor Vime 230.048	0.098448 Total Power F		Supply Frequency (Hz)	
Arms 0.0164522 Test - Automatic Mins.	Apparent Pow	er (VA) 3.78463 Bapsed Time	Load Duty Cycle (Hz) Test - Manual Start	49.9975 Stop

Standby power test screen with real time update of IEC62301 criteria

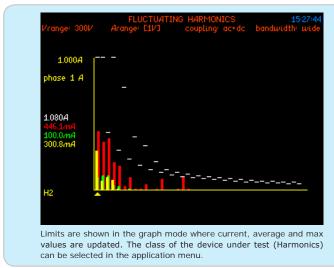
	 Standby Pow 	Test Details	-	
Device Under Test				
Brand	Company ABC			
Model	123 ABC			
Senal No.	10001			
Rated Voltage (Virns)	2307			
Rated Current (Arms)	200mA			
Rated Frequency (Hz)	50-60Hz			
Rated Power (W)	46W			
DUT Notes	5 minute DUT war	m op before and		
Test Environment	A			
Lab Narrie .	N-SL Laib			
Location	Mountsprint, Loug	hiborough, LE12 74	AT, GMC	
Date	10/01/2009			
Time	09:26			
Temperature.	22.C			
Humidity	35%			_
Tell No.	1			
Test Notes	Test made with Al	SOUTER		
Measurement Instrument				
Minufacturer	NEWTONSATH			
Model	PPA2530 Kinet/O			
Serial No.	306			
Ferniware Level	1.70			
1.1.1		al Test Constitutes	2	
Voltage (V)	230,317			
Trequency (Hz)	49.9938			11.0.000
11.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	Measured Value		Upper Gmit	Test Resso
Vand (m)	0.0822019	0	7	PASS
Crest Factor	1.41316	1.34	1.49	PASS
to an		Test Results :		
Monitor				
Wind-	230,048			
Arma	0.01545			
Total Power Factor	0.81126			
Apparent Power (VA)	3.78463			
Supply Frequency (Hz)	43.9925			
Load Duty Cycle (Ho)	49.9975			
Elapsed Time (mm333)	05:00			
Mainthy Fower	-			0
	Measured Value	Lower Linit	UpperLimit.	Test Result
Power (W)	1.17804	1.17228	1.38171	STABLE
Crest Factor	1.41526	1.41272	1.41651	PASS
Avertagić Power (MI)	1.17746			2.1
Adversalitiest Present (Why)	O DEBAKE			



PC CONTROL AND DATA ACQUISITION

Fully Compliant IEC61000-3-2/3-3 Harmonics and Flicker Testing PPA5500

The PPA55xx series Power Analyzers provide fully compliant ISO17025 certified Harmonics and Flicker testing, Newtons4th offer the ability to display the results of many tests within the instrument and all tests to PC software.



PH1	voltage	current
ms	238.531/	177.98mA
frequency	50.000Hz	
weighted fluctuation	-0.059%	
IFS	0.008	0.008
Pst	0.082	0.082
PLE	0.541	12
	PASS	

can be controlled and monitored in software.

More information is available in a separate IEC61000 Harmonics and Flicker brochure. Dedicated models called the PPA5511 and PPA5531 include low impedance shunts (see ** on page 20) and adjusted filter response for full compliance testing.

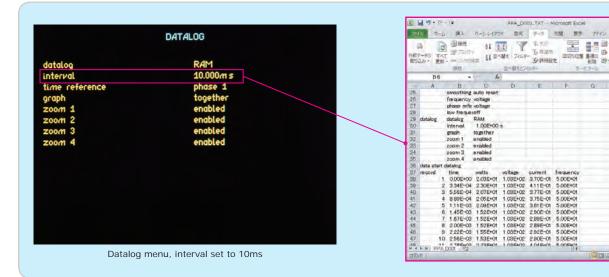
Connection Interface PPA5500 PPA4500

RS232 (standard), USB (standard), LAN (standard on PPA5500), GPIB (standard on PPA5500)



Data Logging PPA5500 PPA4500

Utilizing sophisticated frequency detection techniques, synchronization with the fundamental AC waveform is automatically achieved. Datalog intervals can be set from 2ms with measurements saved to a PC or internal memory.



40000

⇒ ブループ解除

ホックル ホックル ショー ショー ショー ショー ・ クループに ・ クループに ショー ショー ・ クループに ・ クループに ・ クループに ・ クループに

5.00E+0 5.00E+0

00E+0

SPECIFICATION

			PPA4500		PPA5500		
Frequenc	cy R <u>ange</u>		FFA4500		PPA5500		
		DC,10mHz~2MHz - PF DC,10mHz~1MHz - PF	PA4500-LC(10Arms), PPA4500(30Arms) PA4500-HC(50Arms)		2MHz - PPA5500-LC(10Arms), PPA5500(30Arms) 1MHz - PPA5500-HC(50Arms)		
Voltage I	Input						
Internal	Range		~ 3000Vpk(1000Vrms) in 8 ranges thin 300Vpk range, using 20% overange)	300mVpk ~ 3000Vpk(1000Vrms) in 9 ranges (240Vrms within 300Vpk range, using 20% overange)			
	Accuracy				0.01% Rdg+0.038% Rng+(0.004%×kHz Rdg)+5mV		
External F	Range	1mVpk ~ 3Vpk in 9 ranges [BNC connector 3Vpk max input]			300µVpk ~ 3Vpk in 9 ranges [BNC connector 3Vpk max input]		
Current I	Accuracy	0.03%Rdg	g+0.04%Rng+(0.004%×kHz Rdg)+3μV	0.01%Rdg+0.038%Rng+(0.004%×kHz Rdg)+3µV			
	mpor	10Arms Low Current	Ranges 10mApk \sim 30Apk(10Arms) in 8 ranges	Ranges	3mApk ~ 30Apk(10Arms) in 9 ranges		
		(PPA5500-LC) 4mm safety connectors	Accuracy Rdg)+ 30µA	Accuracy	0.01% Rdg+0.038% Rng+(0.004%×kHz Rdg)+ 30μA		
		30Arms Current	Ranges 100mApk ~ 300Apk(30Arms) in 8 ranges	Ranges	30mApk ~ 300Apk(30Arms) in 9 ranges		
Internal		(PPA5500) 4mm safety connectors	Accuracy	Accuracy	0.01% Rdg+0.038% Rng+(0.004%×kHz Rdg)+ 300µA		
		50Arms High Current	Ranges 300mApk ~ 1000Apk (50Arms) in 8 range	Ranges	100mApk ~ 1000Apk(50Arms) in 9 ranges		
		(PPA5500-HC) **	Accuracy 0.03% Rdg+0.04% Rng+(0.004%×kHz Rdg)+ 900µA	Accuracy	0.01% Rdg+0.038% Rng+(0.004%×kHz Rdg)+ 900µA		
External i (External		BNC Connector (Max	Ranges 1mVpk ~ 3Vpk in 8 ranges	Ranges	300μVpk ~ 3Vpk in 9 ranges		
Current s	ensor)	input 3Vpk)	Accuracy Accuracy Rdg)+ 3μV	Accuracy	0.01% Rdg+0.038% Rng+(0.004%×kHz Rdg)+ 3µV		
Phase Ac Power Ac			0.005deg+(0.01deg×kHz)【PPA45 0.01deg+(0.02deg×kH				
		[0.04%+0.05%/pf+(0.0	1%×kHz)/pf] Rdg+0.04%VA Rng	[0.03%+0.03%/pf+(0.01%×kHz)/pf] Rdg+0.03%VA Rng			
40-400Hz	z	[0.03%+0.04%/pf+(0.0	1%×kHz)/pf] Rdg+0.03%VA Rng	[0.02%+0.03%/pf+(0.01%×kHz)/pf] Rdg+0.02%VA Rng			
General Crest Fac	tor		20(Volta	ige and Current)			
Sample R				all channels, No-Gap			
IEC Mode	es		IEC62301 Standby Power		C61000 Harmonics and Flicker, IEC62301 Standby Power		
Applicatio			Ballast, Inrush, Power Transformer, Standby Power	PWM Motor Drive, Ballast, Inrush, Power Transformer, Standby Power, Fluctuating Harmonics, Flicker Meter, TVF105 Interharmonics			
CMRR - (Common	Mode Rejection Ratio		Iz - ≥ 1mA (150dB)			
Measure	ment Par	ameters	100V @ 100l	Hz - ≥ 3mA (130dB) rge ,Crest Factor ,Form Factor ,Star to Delta Voltage, +ve Pk, -ve Pk leg), Fundamentals, Impedance			
Measurer	ment run		r ,pf ,V & A - rms ,rectified mean ,AC ,DC ,Peak ,Su				
			· · · · · · · · · · · · · · · · · · ·	ID, TIF, THF, TRD, TDD			
Datalog	- Un to 4	user selectable measure	Integrated Values, Da ement functions (30 with optional PC software)	talog, Sum and	Neutral values		
Datalog V			p analysis, Minimum window 10ms				
Memory			16,000 records	No-Gap analysis, Minimum window 2ms 10M records into flash RAM (Non-Volatile)			
Commun	nication P	orts					
RS232			Baud rate up to 38.				
			10/100 Base-T Ethernet auto sensing	()	(Eitted as standard) 10/100 Base-T Ethernet auto sensing		
GPIB USB		(0	ption G) IEEE488.2 Compatible USB 2.0 a	nd 1.1 compatil	(Fitted as standard) IEEE488.2 Compatible		
Analogue	Output			ar ±10V(BNC)			
Speed In			BNC Bipolar±10V or Puls		1MHz 0.01% Rdg		
Torque			BNC Bipolar±10V or Puls	e count 1Hz to	1MHz 0.01% Rdg		
Sync			$4\sim 6$ Phase mea		•		
Extension			4 ~ 6 Phase (M	aster/Slave) + /	Auxilary		
Standard Leads	d Accesso	nes	Power, RS232, USB		Power, RS232, USB, GPIB		
Connectio	on Cables		36A 1.5m long 4 1x red, 1x yellow and 2x black p		terminals		
Connectio	on Clips	4mm term			x red and 1x black per phase with PPA5500-HC version)		
CD-ROM			CommView2 (RS232/USB/LAN), Comm	<u> </u>			
Documen	nts		User manual, Communications man	al, Calibration	certificate, Quick start guide		
	cal/Enviro	onmental					
Display			320×240 dot full co				
Dimensio	ns		130H×400W×3		-		
Weight Safety Iso	olation		5.4kg(1 Ph 1000Vrms or DC(CA	ase), 6kg(3 Pha	-		
Power su				50 ~ 60Hz, 40			
Operating		23°C ±	5°C Ambient Temperature (or air intake temperatur				
	าร		Temperature coefficient ±0.01%				

SPECIFICATION

	PPA4500	PPA5500				
Harmonic Specific	cation					
Bandwidth	DC,10mHz ~ 2MHz - PPA4500-LC(10Arms), PPA4500(30Arms)	DC,10mHz ~ 2MHz - PPA5500-LC(10Arms), PPA5500(30Arms)				
	DC,10mHz ~ 1MHz - PPA4500-HC(50Arms)	DC,10mHz ~ 1MHz - PPA5500-HC(50Arms)				
No. of Harmonics	100	417				
Sampling Frequency	21	Ms/s				
Signal Processing	DFT (Discreet Fourier Transform)					
Crest Factor	20					
Power Factor	0 to 1					
Harmonic Accurac	Cy					
Voltage	0.03% Rdg+0.04% Rng+(0.004%×kHz)+5mV	0.01% Rdg+0.038% Rng+(0.004%×kHz)+5mV				
	PPA4500-LC 0.03% Rdg+0.04% Rng+(0.004%×kHz Rdg)+10uA	PPA5500-LC 0.01% Rdg+0.038% Rng+(0.004%×kHz Rdg)+10uA				
Current	PPA4500 0.03% Rdg+0.04% Rng+(0.004%×kHz Rdg)+300uA	PPA5500 0.01% Rdg+0.038% Rng+(0.004%×kHz Rdg)+300uA				
	PPA4500-HC 0.03% Rdg+0.04% Rng+(0.004%×kHz Rdg)+900uA	PPA5500-HC 0.01% Rdg+0.038% Rng+(0.004%×kHz Rdg)+900uA				
	Harmonic Accuracy (above) still applies w	vith Frequency Filter set				
IEC61000 Harmo	nic Accuracy					
Voltage	- ·	0.2% Rdg+0.038% Rng+(0.004%×kHz Rdg)+5mV				
		PPA5500-LC 0.2% Rdg+0.038% Rng+(0.004%×kHz Rdg)+10uA				
Current		PPA5500 0.2% Rdg+0.038% Rng+(0.004%×kHz Rdg)+300uA				
		PPA5500-HC 0.2% Rdg+0.038% Rng+(0.004%×kHz Rdg)+900uA				
	alysis direct to PC - 2Ms/s sample rate (Window setting)					
Data Rate	10ms	5ms				
	alysis direct to Internal RAM - 2Ms/s sample rate					
Data Rate	10ms	2ms				
	Overload Capability					
20ms	4.2kVpk (3kVrms)	4.2kVpk (3kVrms)				
5s	3.1kVpk (2.2kVrms)	3.1kVpk (2.2kVrms)				
Continuous	3kVpk (1kVrms)	3kVpk (1kVrms)				
	Measurement at Full Accuracy					
PPA5500-LC	45uArms	45uArms				
PPA5500	220uArms	220uArms				
PPA5500-HC	700uArms	700uArms				

ACCESSORIES SUPPLIED AS STANDARD

Leads and Interfacing	
Туре	Specification
36A Connection lead set	1.5 Meter - 36A lead set with 4mm stackable safety terminals 1x Red, 1x Yellow and 2x Black per phase plus alligator clips
36A 4mm to spade (Option)	1.5 Meter - 36A lead set with 4mm to spade for HC terminals
RS232 cable	RS232 9pin serial Cable
USB cable	USB 2 Meter A male to B male
USB to 9-pin RS232 (Option)	USB \sim 9-pin RS232 Serial Converter
Master-Slave cable (Option)	Leads for connecting 2x PPA5500 in master/slave mode
GPIB Cable (PPA5500)	GPIB Interface Cable

Documents (Standard) Specification Туре Calibration/Test & Inspection Certificate PPA Certificate of Calibration UKAS ISO17025 Certificate UKAS ISO17025 Certificate of Calibration User manual Spare set of manuals Comms manual

connection and extension port accessories (Optional)				
Туре	Specification			
Breakout box	Simple analyzer connection between source and DUT			
PCIS	10Arms 300Apk rated Phase Controlled Inrush Switch			
GPIB Communication	GPIB Communication Cable Option (Port Fitted as			
Cable	standard on PPA5500)			

Breakout Box

Rack Mount Kit (Optional)

Rack Mount brackets

Interface (Optional)

Rack Mount panel

PPA-LAN interface

PPA-GPIB interface

Туре

Туре



PC Software (Optional CD, Free to Download)				
Туре	Specification			
PPALoG	PC control and data acquisition of 1 \sim 12 phases with selectable Real Time data, Graphing, Datalog and versatile export options			
PPAcomm	Basic PC Control, Data storage, Print features			
PPA Standby Power	Standby power measurements and reporting to IEC62301			
PPAsoft PC software	LabView based software, PC Control, Data storage and Print			
IECSoft	IEC61000 Testing Software			
Carry cases (Optional)				
Туре	Specification			

Carry cases (Optional)	
Туре	Specification
Soft carrying case	Black nylon with shoulder strap
Hard flight case	Hard case with moulded lining suitable for shipping

PPA Series Hard Carrying Case



PPA500/1500 MODELS

For more details see separate brochure

Phases	Model	Specification
1 Ph	PPA1510/510*	DC,
2 Ph	PPA1520/520*	10mHz ~ 1MHz 100mApk ~ 300Apk
3 Ph	PPA1530/530*	(20Arms)
1 Ph	PPA1510/510-HC*	DC,
2 Ph	PPA1520/520-HC*	10mHz ~ 1MHz 300mApk ~ 1000Apk
3 Ph	PPA1530/530-HC*	(30Arms)

*PPA500 DC, 10mHz \sim 500kHz





Specification

PPA26/5500 19in rack mount brackets (model specific)

Specification

Option L - LAN Interface - (Standard on 55 series) Option G - GPIB(IEEE488)Interface - (Standard on 55

PPA2500 19in rack fascia panel

PPA1500 3 Phase model

series)

ACCESSORIES

High Performance Voltage Attenuating Probes					
Model	Voltage Range	Frequency Range	Details		
TT-HV250	2500Vpk	300MHz	High Voltage Probe (Passive) 2.5kVpk 100:1		
TTV-HVP	1500Vpk	50MHz	High Voltage Probe (Passive) 15kVpk 1000:1		
ATT10	30Vpk	30MHz	10:1 Voltage Attenuator Box (For use in conjunction with HV Probes when output voltage of probe is >3Vpk, BNC Input/BNC Output)		
ATT20	60Vpk	30MHz	20:1 Voltage Attenuator Box (For use in conjunction with HV Probes when output voltage of probe is >3Vpk, BNC Input/BNC Output)		
ULCP	3000Vpk	2MHz	1000:1 Ultra Low Capacitance Probe (Active), For use in applications such as Ballast Testing (<1pF Capacitance)		



High Performance External Current Measurment Options						
Model Number	Measuring Range	Frequency Range	Basic Accuracy	Phase Accuracy	Details	
HF003	3Arms - 30Apk	DC - 2MHz	470mΩ (±0.1%)	0.0001° / kHz	3Arms External Current Shunt, BNC Output (Use with PPA External Input)	
HF006	6Arms - 60Apk	DC - 2MHz	100mΩ (±0.1%)	0.001° / kHz	6Arms External Current Shunt, BNC Output (Use with PPA External Input)	
HF020	20Arms - 200Apk	DC - 2MHz	10mΩ (±0.1%)	0.01° / kHz	20Arms External Current Shunt, BNC Output (Use with PPA External Input)	
HF100	100Arms - 1000Apk	DC - 2MHz	1mΩ (±0.1%)	0.05° / kHz	100Arms External Current Shunt, BNC Output (Use with PPA External Input)	
HF200	200Arms - 2000Apk	DC - 2MHz	0.5mΩ (±0.1%)	0.1° / kHz	200Arms External Current Shunt, BNC Output (Use with PPA External Input)	
HF500	500Arms - 5000Apk	DC - 2MHz	0.2mΩ (±0.1%)	0.1° / kHz	500Arms External Current Shunt, BNC Output (Use with PPA External Input)	



External Shunt HF-003



External Shunt HF-100



External Shunt HF-200



External Shunt HF-500

Probe/Current Clamp Transformer: AC						
Model Number	Measuring range	Frequency range	Accuracy	Details	Clamp diameter	Category
M3 UB 50A-1V	100mA ~ 50A	40Hz ~ 5kHz	1%	100mA to 50A AC Current Clamp	15mm×17mm	600V CATIII
M3 U 100A-1V	$1A \sim 100A$	40 Hz \sim 5kHz	1%	1A to 100A AC Current Clamp	15mm×17mm	600V CATIII
S UE 200A-1V	1A~200A	40Hz ~ 5kHz	1%	1 A to 200A AC Current Clamp	50mm ø	600V CATIII
S UE 250 500 1000-1V	1A~250A/500A/1000A	40Hz ~ 5kHz	1%(250A) 0.5%(500+1000A)	1 A to 250/500/1000A AC Current Clamp	50mm ø	600V CATIII
US UE 1000A-1V	$1A \sim 1000A$	40 Hz \sim 5kHz	1%	1A to 1000A AC Current Clamp	43mm ø	600V CATIII
SM UE 1000A-1V	0.5A~1000A(1%>100A)	15Hz ~ 15kHz	1%	0.5A to 1000A AC Current Clamp	54mm ø	600V CATIII
SM UB 1000A-1V	0.5A~1000A(0.5%>10A)	$15 \text{Hz} \sim 15 \text{kHz}$	0.5%	0.5A to 1000A AC Current Clamp	54mm ø	600V CATIII
P32 UE 1000A-1V	5A ~ 1000A	40Hz ~ 5kHz	1%	5 A to 1000A AC Current Clamp	83mm ø (125mm×47mm or 100m m×58mm)	600V CATIII
P32 UE 3000A-1V	5A~3000A	40Hz ~ 5kHz	1%	5 A to 3000A AC Current Clamp	83mm ø	600V CATIII



Current Clamp M3-UB 50A-1V



Current Clamp S-UE 200A-1V



Current Clamp SM-UB 1000A-1V



Current Clamp P32-UE 1000A-1V

Probe / Current Cl	Probe / Current Clamp (Hall effect): AC + DC					
Model number	Measuring range	Frequency range	Accuracy	Details	Clamp diameter	Category
SC 3C 100A-1V	1A~100A	$DC \sim 5 kHz$	2%	1A to 100A AC+DC Current Clamp	50mm ø	600V CATIII
SC 3C 1000A-1V	$1A \sim 1000A$	$DC \sim 2kHz$	1%	1A to 1000A AC+DC Current Clamp	59mm ø	600V CATIII
P20 3C 2000A-2V	40A~1000/2000A	$DC \sim 2kHz$	1%	40A to 2000A AC+DC Current Clamp	83mm ø	600V CATIII
P40 3C 4000A-2V	40A~2000/4000A	DC ~ 2kHz	1.5%	40A to 4000A AC+DC Current Clamp	83mm ø	600V CATIII
P50 3C 5000A-2V	$50 {\rm A} \sim 1000/5000 {\rm A}$	DC ~ 2kHz	1.5%	50A to 5000A AC+DC Current Clamp	83mm ø	600V CATIII



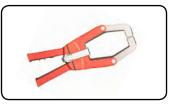
Current Clamp SC 3C 100A-1V



Current Clamp SC 3C 1000A-1V



Current Clamp P20 3C 2000A-2V



Current Clamp P50 3C 5000A-2V

Rogowski Current	Rogowski Current Transducer: AC / Zero Flux Current Transducer: AC+DC					
Model number	Measuring range	Frequency range	Accuracy	Details	Coil/Through Hole Circumference	Category
WR5000 Rogowski	1A~5000A	$1 { m Hz} \sim 1 { m MHz}$	0.05%	1A to 5000A AC Rogowski Coil	600mm	600V CATIII
WR10000 Rogowski	1A~10000A	$1 { m Hz} \sim 1 { m MHz}$	0.05%	1A to 5000A AC Rogowski Coil	600mm	600V CATIII
Zero Flux Current Transducer	0A~200A	$DC \sim 250 kHz$	0.01%	200A Zero Flux Current Transducer	27.6mm	600V CATIII
Zero Flux Current Transducer	0A~600A	DC ~ 250kHz	0.01%	600A Zero Flux Current Transducer	27.6mm	600V CATIII



WR5000 Rogowski Coil

PPA5500 SERIES MODELS

Phases	Model	Specification
1 Ph	PPA5510-LC	
2 Ph	PPA5520-LC	DC,
3 Ph	PPA5530-LC	$10 \mathrm{mHz} \sim 2 \mathrm{MHz}$
4 Ph	PPA5540-LC	3mApk ~ 30Apk
5 Ph	PPA5550-LC	(10Arms)
6 Ph	PPA5560-LC	
	1 Ph 2 Ph 3 Ph 4 Ph 5 Ph	1 Ph PPA5510-LC 2 Ph PPA5520-LC 3 Ph PPA5530-LC 4 Ph PPA5540-LC 5 Ph PPA5550-LC

Phases	Model	Specification
1 Ph	PPA5510	
2 Ph	PPA5520	DC,
3 Ph	PPA5530	10mHz ~ 2MHz
4 Ph	PPA5540	30mApk ~ 300Apk
5 Ph	PPA5550	(30Arms)
6 Ph	PPA5560	

Touchproof 50A screw connectors used on PPA5500-HC versions

Phases	Model	Specification
1 Ph	PPA5510-HC	
2 Ph	PPA5520-HC	DC.
3 Ph	PPA5530-HC	$10 \mathrm{mHz} \sim 1 \mathrm{MHz}$
4 Ph	PPA5540-HC	100mApk ~ 1000Apk
5 Ph	PPA5550-HC	(50Arms)
6 Ph	PPA5560-HC	





PPA5500 3 Phase model



Danisense DS600

PPA4500 SERIES MODELS

Phases	Model	Specification
1 Ph	PPA4510-LC	
2 Ph	PPA4520-LC	DC,
3 Ph	PPA4530-LC	10mHz~2MHz
4 Ph	PPA4540-LC	10mApk ~ 30Apk
5 Ph	PPA4550-LC	(10Arms)
6 Ph	PPA4560-LC	

Phases	Model	Specification
1 Ph	PPA4510	
2 Ph	PPA4520	DC,
3 Ph	PPA4530	10mHz ~ 2MHz
4 Ph	PPA4540	100mApk ~ 300Apk
5 Ph	PPA4550	(30Arms)
6 Ph	PPA4560	

Touchproof 50A screw connectors used on PPA4500-HC versions

Phases	Model	Specification
1 Ph	PPA4510-HC	
2 Ph	PPA4520-HC	DC.
3 Ph	PPA4530-HC	10mHz ~ 1MHz
4 Ph	PPA4540-HC	300mApk ~ 1000Apk
5 Ph	PPA4550-HC	(50Arms)
6 Ph	PPA4560-HC	



PPA5500 units in Master/Slave mode, synchronised for 4-6 Phase measurements

	PRO	DUCT COMP	ARISON	
	PPA500	PPA1500	PPA4500	PPA5500
Basic Accuracy				
/, A rdg error	0.05%	0.05%	0.03%	0.01%
Power rdg error	0.10%	0.10%	0.04%	0.03%
hase Options		' · · · · · · · · · · · · · · · · · · ·		
nternal	1~3	1~3	1~3	1~3
Master/Slave operation	_	_	4~6	4~6
andwidth				
0 & 30A Shunt	DC \sim 500kHz	$ m DC \sim 1 MHz$	—	—
0 & 30A Shunt	_	_	$ m DC\sim 2MHz$	$ m DC\sim 2MHz$
i0A Shunt	_	_	$ m DC \sim 1 MHz$	$ m DC \sim 1 MHz$
oltage Input				
lax input voltage	2500Vpk	2500Vpk	3000Vpk	3000Vpk
lo. of ranges	8	8	8	9
irect Current Input				
0Arms model	_	_	0	0
0Arms model	0	0	<u> </u>	_
0Arms model	Ō	Ō	0	0
0Arms model	_	_	Ō	Ó
lo. of ranges	8	8	8	9
eatures				
cope and Graph Modes	_	0	0	0
ISB Memory port	0	0	0	0
AN Port	<u> </u>	0	0	0
SPIB Port	_	-	0	0
S232 Port	0	0	0	0
eal time clock	0	0	0	0
9in Rack mount option	<u> </u>	•		<u> </u>
	<u> </u>	<u> </u>	<u> </u>	<u> </u>
9in Rack mount option orque and Speed EC61000 Mode				
orque and Speed EC61000 Mode		-	0	Ŏ
C61000 Mode WM Motor Drive Mode				0 0
orque and Speed EC61000 Mode WM Motor Drive Mode Iscilloscope		- - 0	0 - 0	0 0 0
orque and Speed EC61000 Mode WM Motor Drive Mode Iscilloscope ransformer Mode		- - 0 0	- - 0 0	0 0 0
orque and Speed EC61000 Mode WM Motor Drive Mode Oscilloscope ransformer Mode WM Filter Options				0 0 0 0
orque and Speed EC61000 Mode WM Motor Drive Mode scilloscope ransformer Mode WM Filter Options peed/Harmonics/Sec				0 0 0 0 0 7
orque and Speed EC61000 Mode WM Motor Drive Mode scilloscope ransformer Mode WM Filter Options peed/Harmonics/Sec nternal Datalogging				0 0 0 0 7 1800/sec
orque and Speed C61000 Mode WM Motor Drive Mode scilloscope ansformer Mode WM Filter Options peed/Harmonics/Sec tternal Datalogging atalog Records				© © © 0 7 1800/sec 16 Parameters
orque and Speed C61000 Mode WM Motor Drive Mode scilloscope ansformer Mode WM Filter Options peed/Harmonics/Sec tternal Datalogging atalog Records BD0100.1.8 Mode				© © © 0 7 1800/sec 16 Parameters 10M
orque and Speed C61000 Mode WM Motor Drive Mode scilloscope ansformer Mode WM Filter Options peed/Harmonics/Sec tternal Datalogging atalog Records BD0100.1.8 Mode tternal Memory				© © © 0 7 1800/sec 16 Parameters 10M
orque and Speed EC61000 Mode WM Motor Drive Mode scilloscope ansformer Mode WM Filter Options peed/Harmonics/Sec atternal Datalogging atalog Records BDD100.1.8 Mode atternal Memory armonics				© © 0 0 7 1800/sec 16 Parameters 10M 0 1GB
orque and Speed				© © 0 0 0 16 Parameters 10M 0 1GB 417

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

The N4L product range also includes Frequency Response and Impedance Analyzers, Selective Level Meters and Laboratory Power



Applications



- Power supply phase margin and gain margin (FRA)
- Inductance, Capacitance and Resistance (LCR)
- Analysis of mechanical vibration (HARM)
- Phase Angle Voltmeter (PAV)

Contact your local N4L Distributor for further details

Newtons4th

Newtons4th Ltd (abbreviated to N4L) was established in 1997 to design, manufacture and support innovative electronic equipment to a world-wide 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.



Newtons4th Ltd are ISO9001 registered, the internationally recognised standard for the quality management of businesses

Distributed by:



nbn Elektronik AG Birmensdorferstrasse 30 CH-8142 Uitikon

Tel. +41 (0)44 404 34 34 Fax +41 (0)44 493 50 32 sales@nbn-elektronik.ch



Newtons4th Ltd 30 Loughborough Road Mountsorrel Loughborough LE12 7AT UK Phone: +44 (0)116 230 1066 +44 (0)116 230 1061 Fax: Email: sales@newtons4th.com www.newtons4th.com Web:

In recognition of the technical innovation and commercial success of the PPA series, N4L received the "Innovation 2010" Queen's award for enterprise