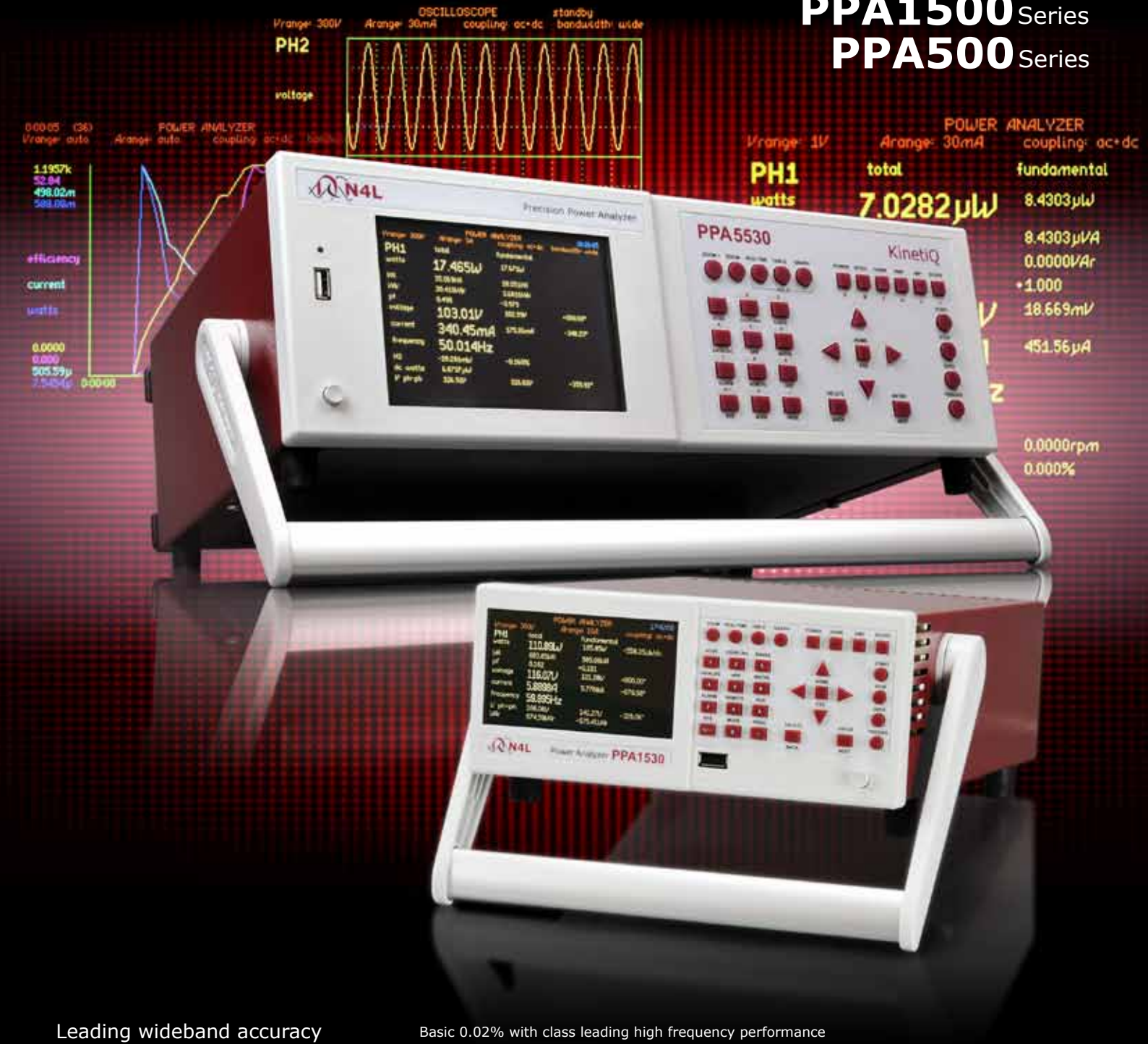
Precision Power Analyzers

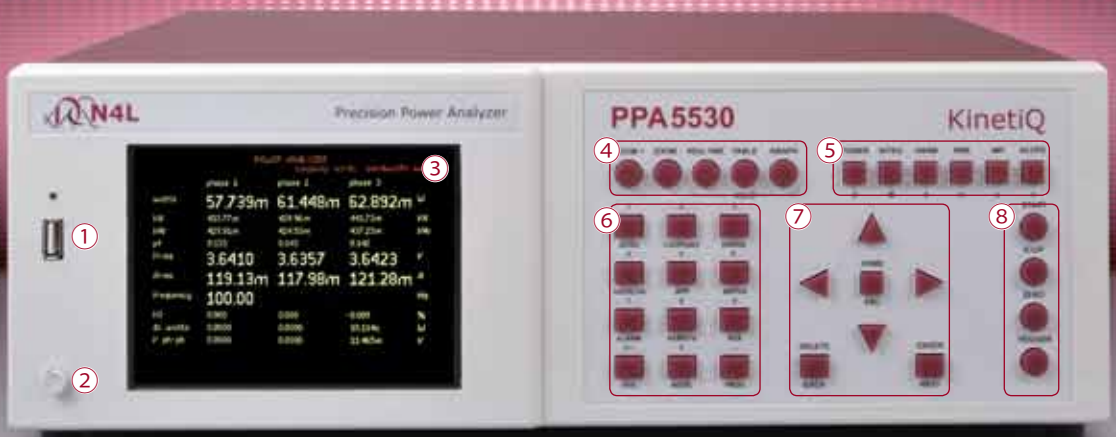
PPA5500 Series
PPA1500 Series
PPA500 Series



Leading wideband accuracy	Basic 0.02% with class leading high frequency performance
Wide frequency range	DC, 10mHz to 2MHz - PPA5500 / DC, 10mHz to 1MHz - PPA1500 / DC, 10mHz to 500kHz - PPA500
Fast sample rate and No-Gap	2.2M samples/s - PPA5500,1M samples/s - PPA1500/500,High accuracy in noisy applications
Leading phase accuracy	0.005 Degrees plus 0.01 degrees per kHz
Built in high precision current shunt	10Arms, 30Arms or 50Arms with up to 1000Apk direct plus a wide range of external sensors
Versatile interfaces	RS232, USB, GPIB, LAN plus direct torque and speed
Range of PC software options	Remote control, monitoring and recording of real time data, tables and graphs

PPA5530 Precision Power Analyzer

FRONT VIEW



① FRONT USB PORT

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

② POWER BUTTON

③ DISPLAY SCREEN

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

④ SCREEN DISPLAY OPTIONS

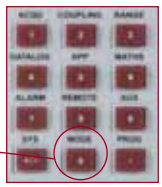
Zoom, Real time, Table and Graph options

⑤ MEASUREMENT FUNCTION SELECTION BUTTONS

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

PPA5500 SERIES

PPA1500 SERIES



MODE SELECTION

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

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

PPA5530 (3 Phase)

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

PPA1500/500: 300Apk (20Arms) direct current input, PPA1500/500-HC: 1000Apk (30Arms)

⑩ SYNC CONNECTOR

All PPA models can offer 6 phase analysis using the PPA dual data log PC program Additionally two PPA5530's can be connected via the extension port and sync BNC connector to form a 6 phase analyzer when a PC is not available (PPA5500 only)

⑪ EXTERNAL SENSOR INPUTS

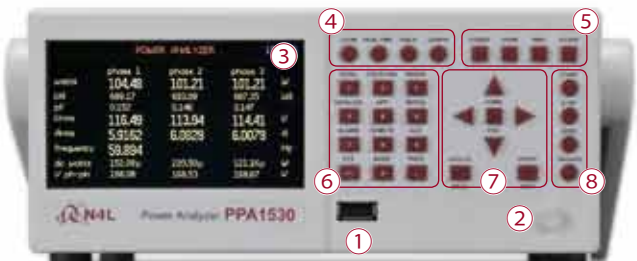
+/-10V or pulsed input from torque and speed sensors provides direct measurement of mechanical power + Analogue output (PPA5500 only)

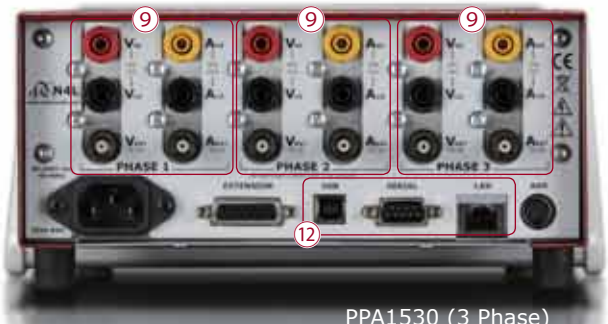
⑫ PC INTERFACE CONNECTIONS

Standard interfaces RS232 + USB + LAN (Optional) + GPIB (Optional on PPA5500 only)

⑬ LOW NOISE EFFICIENT 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



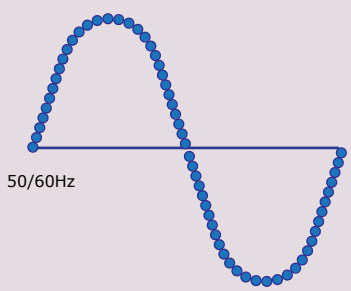


PPA1530 (3 Phase)

■ High Speed Power Measurement PPA5500

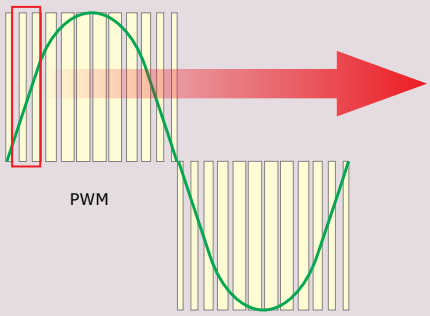
Measurements include all frequency components in power waveforms for example, fundamental, harmonics of the fundamental and the carrier of a PWM inverter output by maintaining 2.2Ms/s sampling at any drive frequency

※PPA1500/PPA500 sample rate 1MS/s

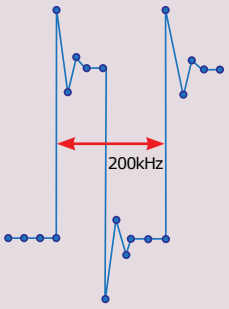


High sample rate at all times

Unique FPGA and DSP architecture permits full 2.2Ms/s sample rate at any fundamental frequency



Inverter output waveform

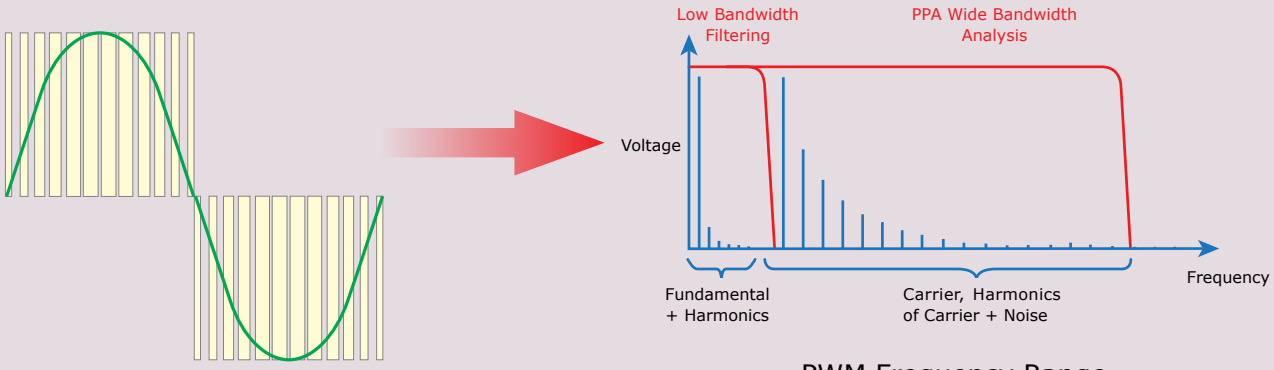


PWM carrier signal

Fast sampling reliably captures fast switching waveforms

■ 2MHz Wideband Frequency Response PPA5500

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



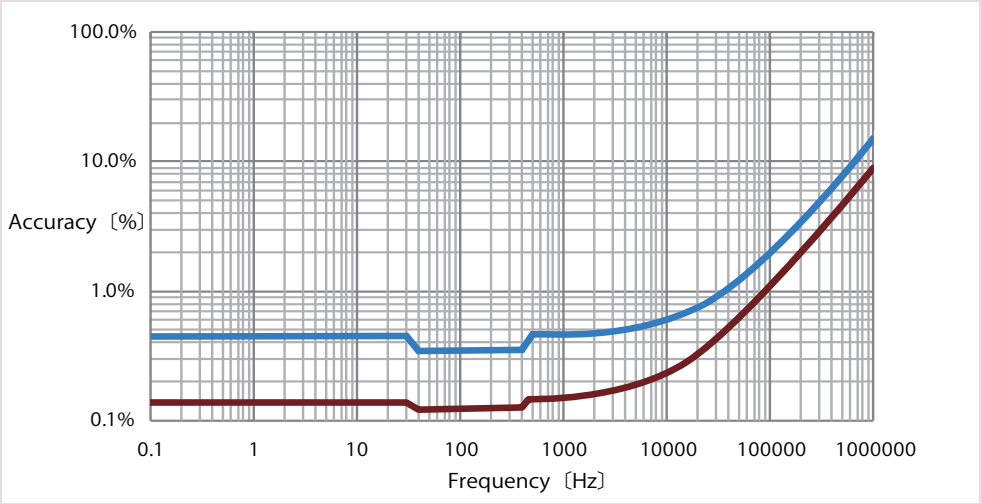
PWM Frequency Range

■ High Accuracy PPA5500 PPA1500 PPA500

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

Class Leading Power Accuracy

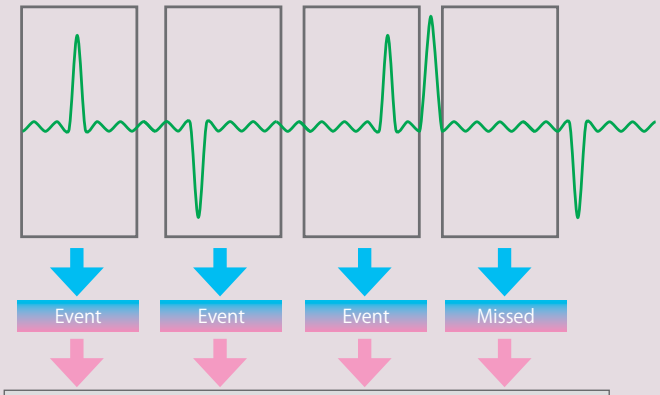
Power Accuracy: [0.03% + 0.03%/pf + (0.01% x kHz)/pf] Rdg + 0.03%VA Rng
240V (300V Range), 1A (3A Range), Power Factor : 1 (40-400Hz 0.02%VA Rng)



■ DFT Real Time No Gap Analysis PPA5500 PPA1500 PPA500

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

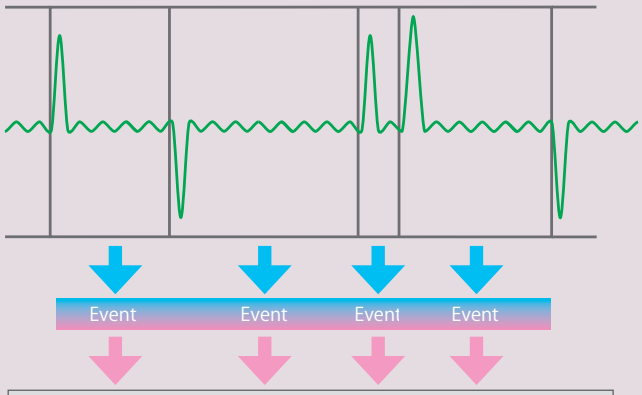
Low Duty Cycle Standby Current



Gapped analysis causes events to be missed, resulting in inaccurate measurements

- Missing data compromises power accuracy
- Long term measurement integration achieves approximately correct average power

PPA Series IEC62301 Testing



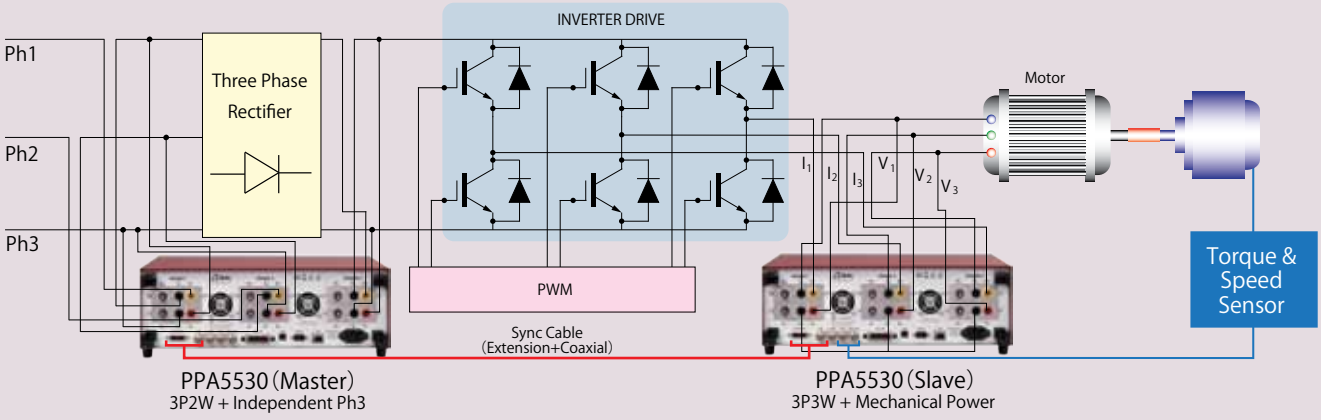
FPGA/DSP Real time measurement with no gap

- 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

Master/Slave mode enables two PPA5530'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



3Ph Input DC Bus 3Ph PWM Output Mechanical Power

Advantages of Dual PPA vs Single instrument

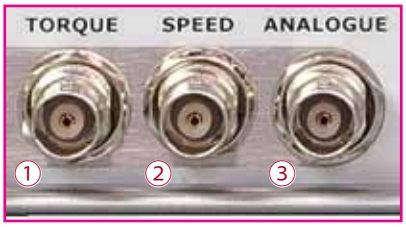
- Twice the processing power as one unit
- Flexibility between different applications
- Units fully synchronized giving single point of control

Measurement parameter examples

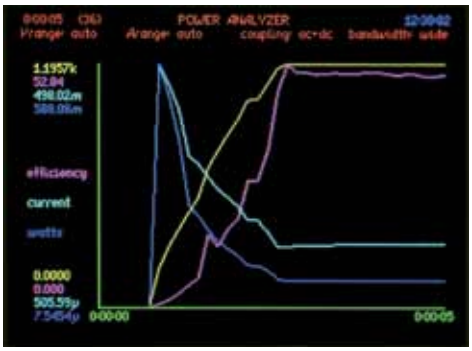
- Input/Output power measurement
- Efficiency of the inverter
- Inverter output voltage harmonics
- Motor drive characteristics

Input Torque and Speed Sensor PPA5500

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



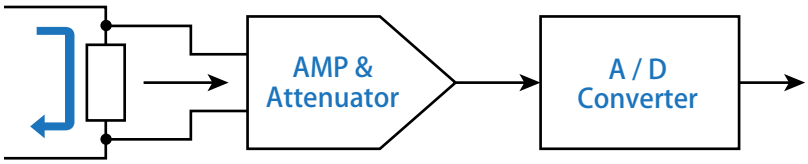
①TORQUE Bipolar±10V
②SPEED Bipolar±10V / pulsed
③ANALOGUE Analogue output of selected function ±10V



Graph

Real time data

Built in Amplifier and Unique Shunt Resistor PPA5500 PPA1500 PPA500



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	Standard Model	High Current Model
PPA5500	9 ranges: 3mApk - 30Apk (10Arms) 100mΩ Shunt	9 ranges: 30mApk - 300Apk (30Arms) 10mΩ Shunt	9 ranges: 100mApk - 1000Apk (50Arms) 3 mΩ Shunt
PPA1500/ PPA500	–	8 ranges: 100mApk - 300Apk (20Arms) 10mΩ Shunt	8 ranges: 300mApk - 1000Apk (30Arms) 3mΩ Shunt
		x10 Mode - 10mApk - 30Apk	x10 Mode - 30mApk - 100Apk

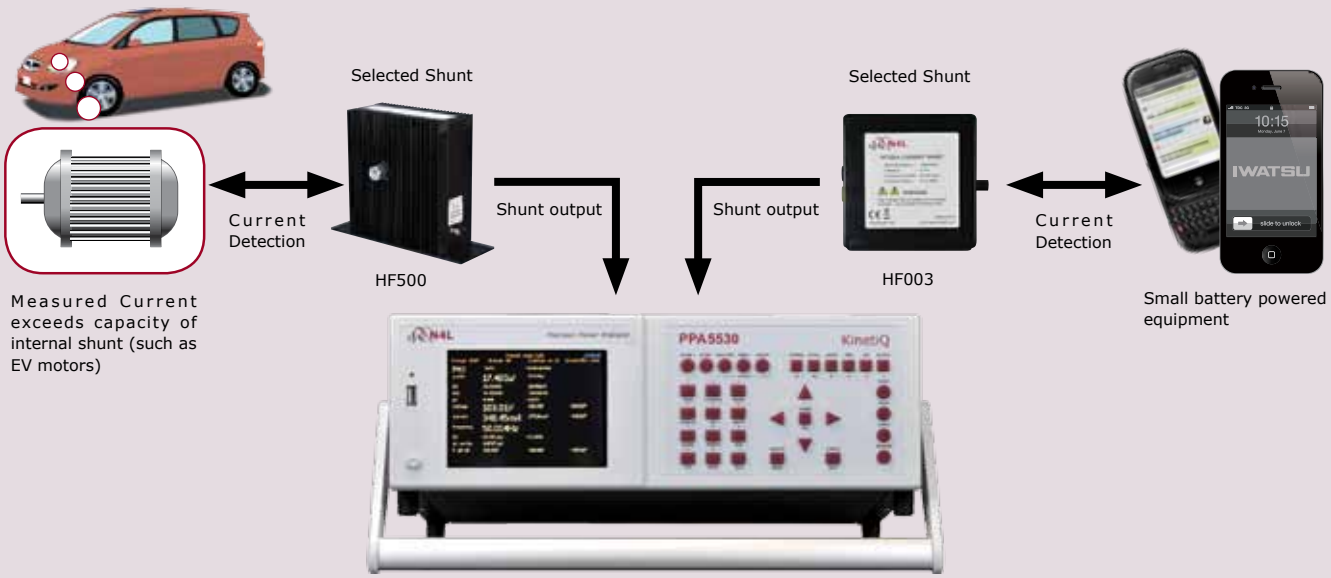
External shunt options

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

Model	Maximum Current		Bandwidth
	Rated A	Peak	
HF500	500Arms	5000Apk	DC ～ 1MHz
HF200	200Arms	2000Apk	
HF100	100Arms	1000Apk	
HF020	20Arms	200Apk	
HF006	6Arms	60Apk	
HF003	3Arms	30Apk	

HF003

HF500

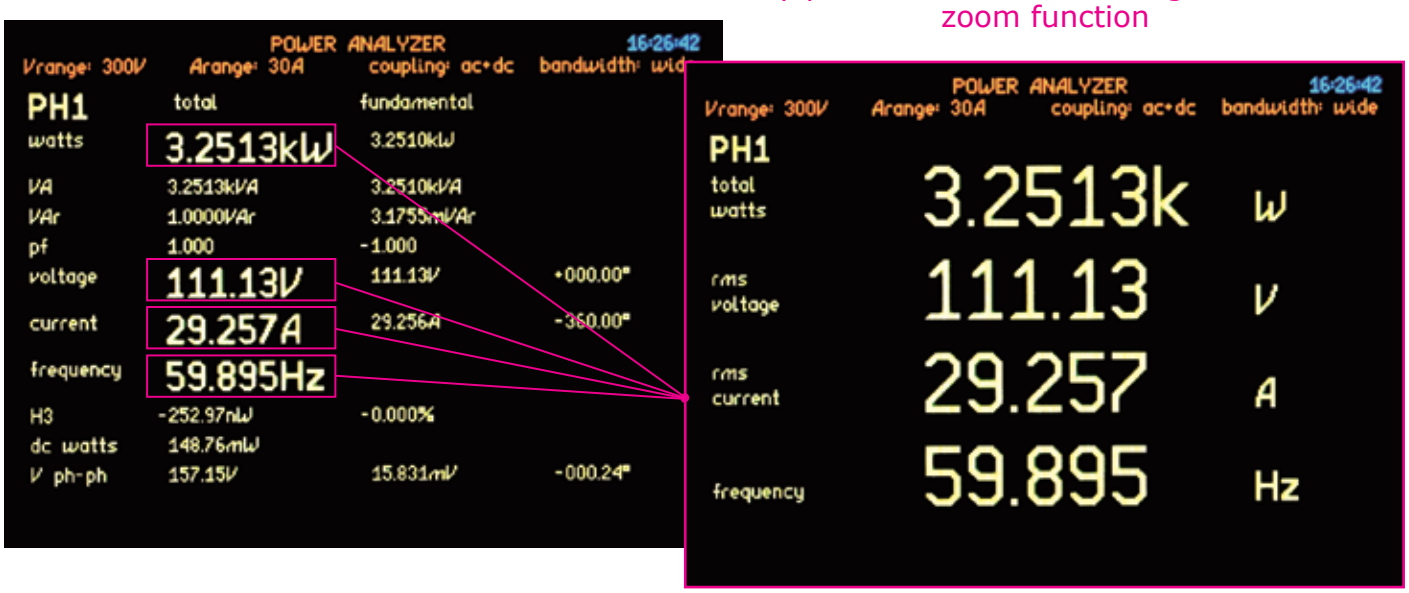


Utilising external shunt resistors

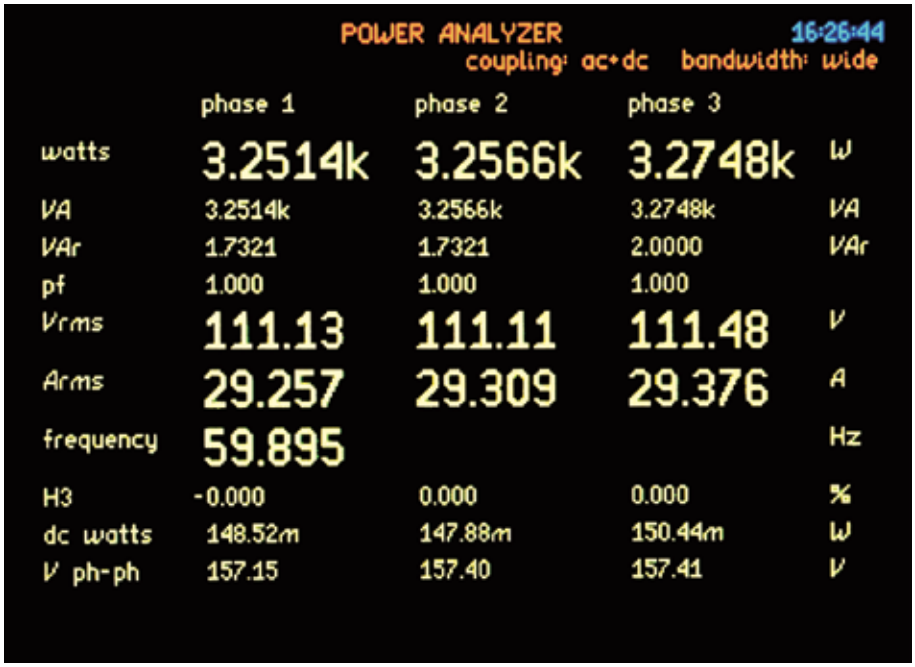
MEASUREMENT DISPLAY

Power Analysis PPA5500 PPA1500 PPA500

Any parameters can be enlarged with the zoom function



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



3 Phase analysis display selectable in both Total and Fundamental values

All power measurement and RMS values are computed simultaneously allowing any measured value 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 all electrical or electrical to mechanical systems

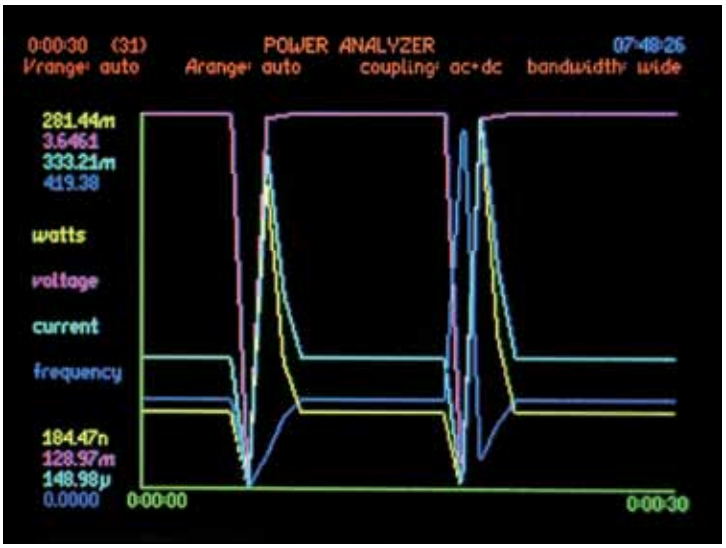
MEMORY

Large 1GB (PPA5500 series) internal memory, data logging from 10ms intervals with synchronization to the fundamental frequency and no gap between measurements

Datapoint storage up to 10M in the PPA5500 series and 16k in the PPA1500/500 series

Alternatively the data can be stored in an external USB pen drive or directly to PPA Dual Data Logger PC software

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



Trend analysis *No Graph function in PPA500

MEASUREMENT MODES

■ Power Integrator (power consumption) Mode, RMS Meter Mode and Impedance Meter Mode PPA5500 PPA1500 PPA500

Power Integrator mode

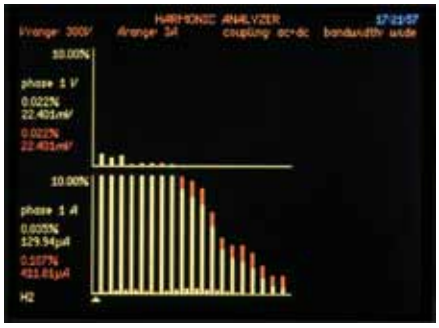
RMS Voltmeter mode

Impedance meter mode

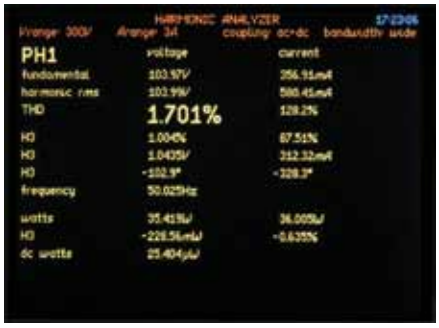
Note

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

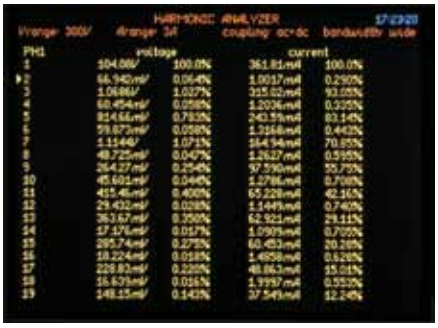
■ Harmonic Analyzer and Oscilloscope PPA5500 PPA1500 PPA500



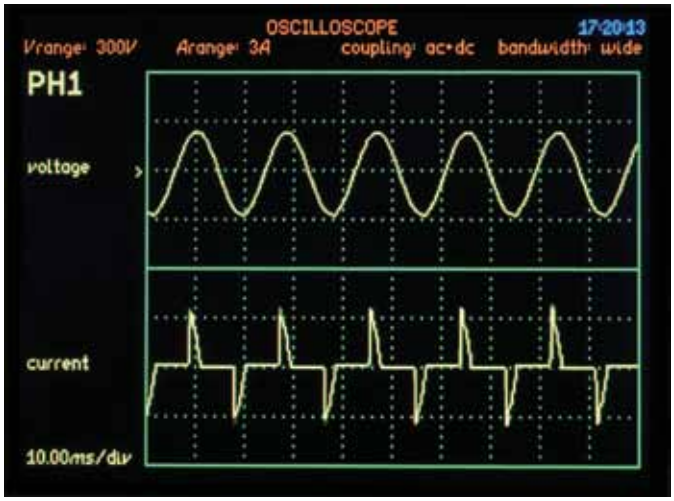
Harmonic analyzer (Bar graph)
*No Graph function in PPA500

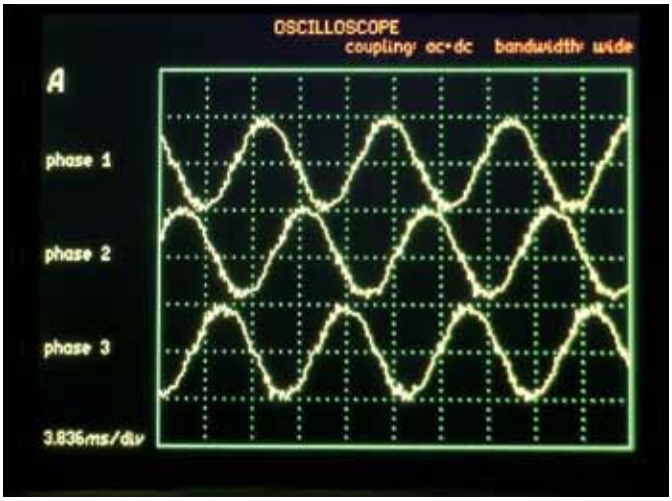


Harmonic analyzer summary page



Harmonic analyzer table





Oscillosope - Voltage and Current display, Phase 1,2 and 3
*No Scope function in PPA500

Note

In Harmonic Analyzer Mode, the PPA1500/PPA500 provides up to 50 Harmonics with real time, table or bar graph presentation(*No Graph presentation in PPA500). Measurements are in absolute magnitude and percentage of fundamental with harmonic phase also available. The PPA5500 extends the harmonic range to 375 for aerospace applications and also includes an FFT spectrum mode for analysis of interharmonics

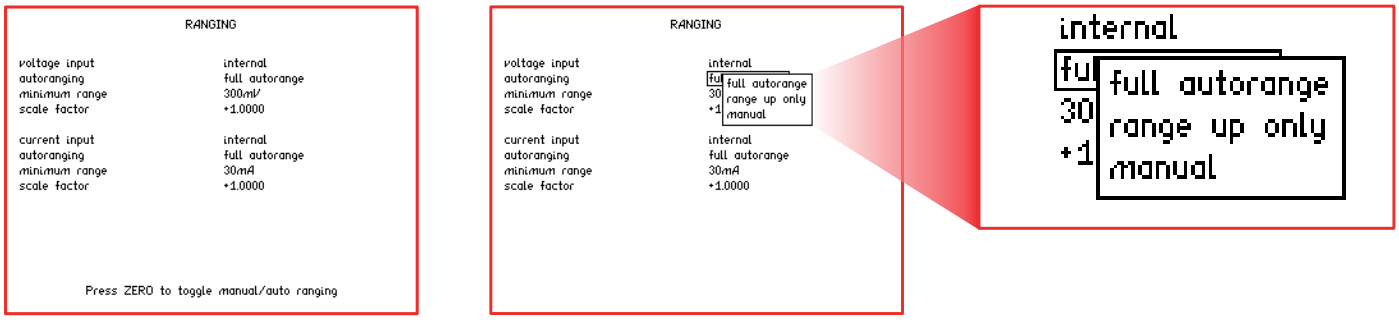
■ Auto-Ranging, Range Up Only or Manual PPA5500 PPA1500 PPA500

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

②Range up only　Performs automatic ranging when the input is 120% of range, ranging up only

③Manual　No automatic ranging, user specifies the range in which to operate (Used when input voltages and currents are known)

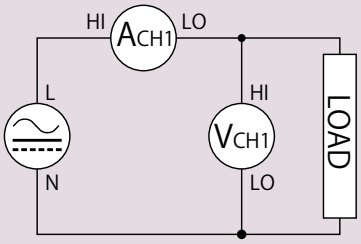


■ Independently Set Input Coupling PPA5500

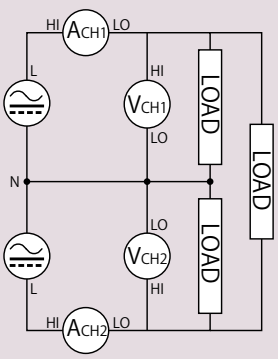
Independently set input coupling so different methods of sensing can be implemented. Such as a CT on phase 1 and shunt sensing on phases 2 + 3

■ Wiring Settings PPA5500 PPA1500 PPA500

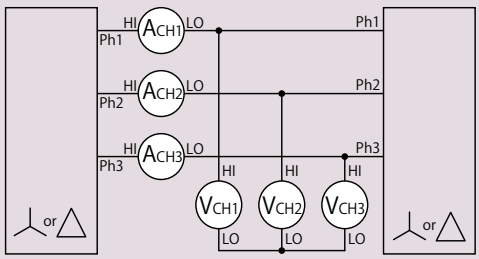
Various wiring arrangement settings to satisfy a complete range of setups found in power analysis



1 Phase 1 Wattmeter



2 Phase 2 Wattmeter



3-phase 3 Wattmeter(Reference to neutral)

ACQUISITION SETTINGS

■ Bandwidth Settings PPA5500

DC(DC-5Hz) DC measurements up to 5Hz

Low(DC-30kHz) Basic power (50/60Hz) including harmonics of the fundamental while rejecting high frequency noise

Wide(DC-2MHz) 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

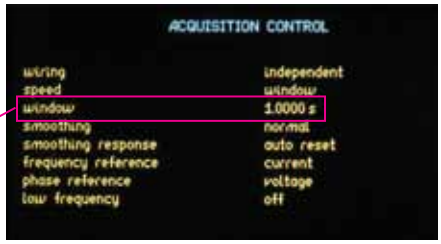
Note

The PPA5500 series includes a programmable digital filter that allows users to set a preferred bandwidth

■ Display Settings, Smoothing Response and Frequency Reference PPA5500 PPA1500 PPA500

①Display update rate

Various settings for the display update rate (12.5ms ～ 10s) which also increases the smoothing when used together with the smoothing option. A 'window' option permits direct control of the measurement window size



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

②Smoothing settings

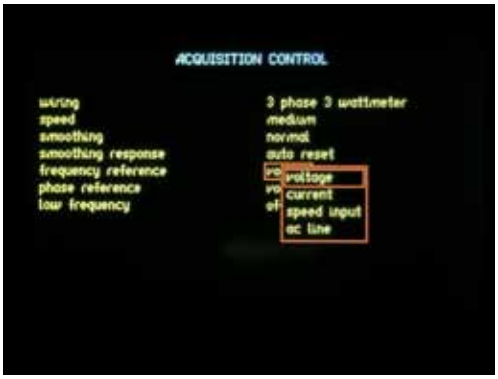
Working in conjunction with the speed setting, a smoothing filter can then be applied to the measurements. Normal and slow options are available which apply an increasing time constant to the output of the measurement window

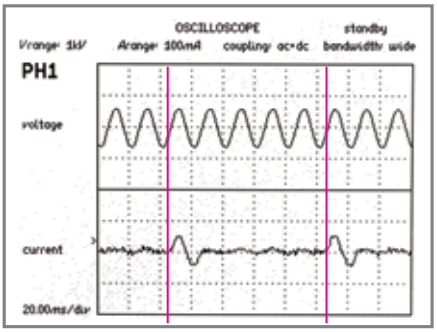
speed	update rate	normal time constant	slow time constant
Very Fast	1/80s	0.05s	0.2s
fast	1/20s	0.2s	0.8s
medium	1/3s	1.5s	6s
slow	2.5s	12s	48s
very slow	10s	48s	192s

・Display update speed settings
・Setting the filter (normal/slow)

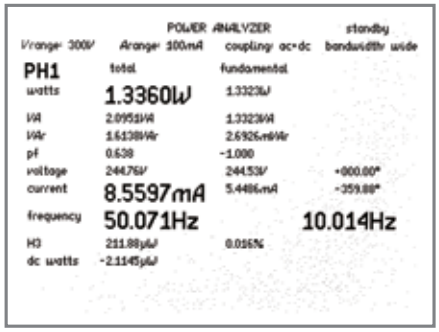
■ Frequency Reference PPA5500 PPA1500 PPA500

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 PPA5500 series also provides fully independent frequency detection an all phase inputs

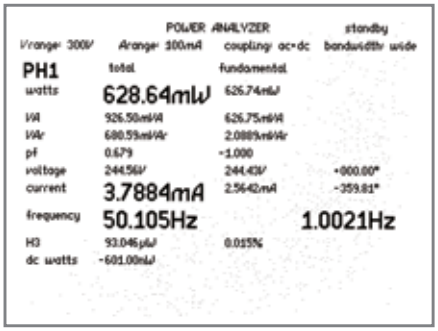




1:5 cycle (10Hz standby current period)
Power measurements synchronized to low duty cycle current pulses of a power supply in standy mode



1:5 duty cycle standby power measurement cycle

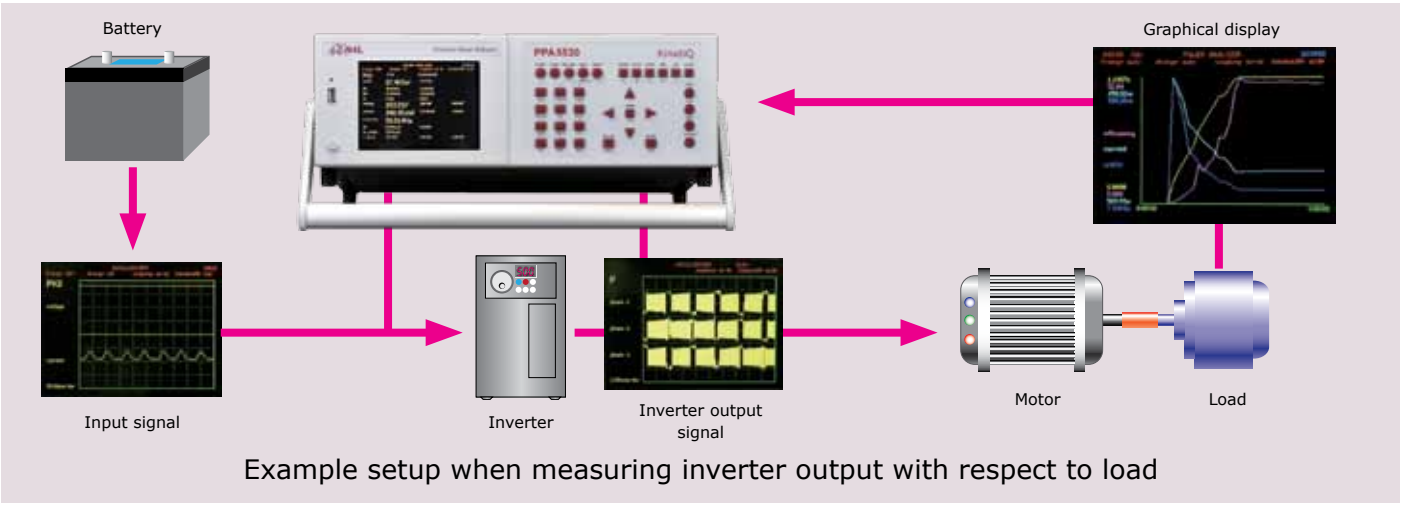


1:50 low duty cycle (1Hz) power measurement

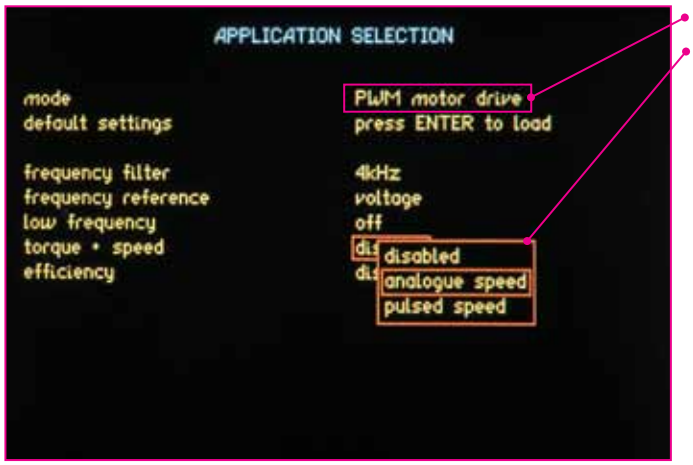
Application Modes PPA5500 PPA1500 PPA500

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*" and "standby power"

*PPA5500 only

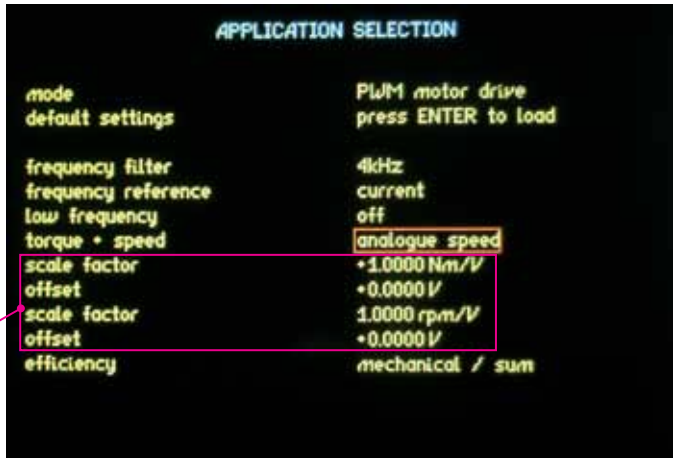


Example setup when measuring inverter output with respect to load



Mode Selection

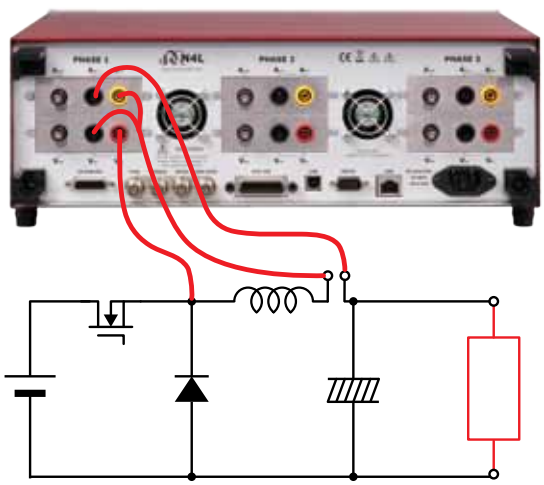
PWM torque and speed sensor selection



Scale factor of analogue speed and torque inputs

Inductance Loss Analysis PPA5500 PPA1500 PPA500

An example of analysis of dynamic inductance losses

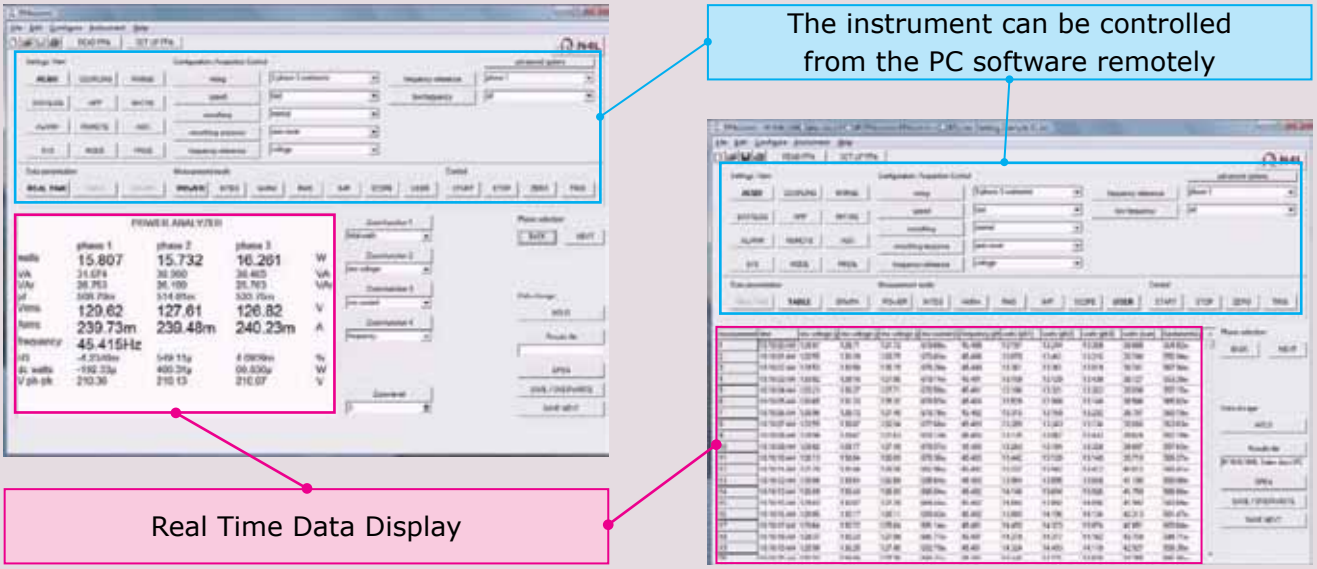


Real time data

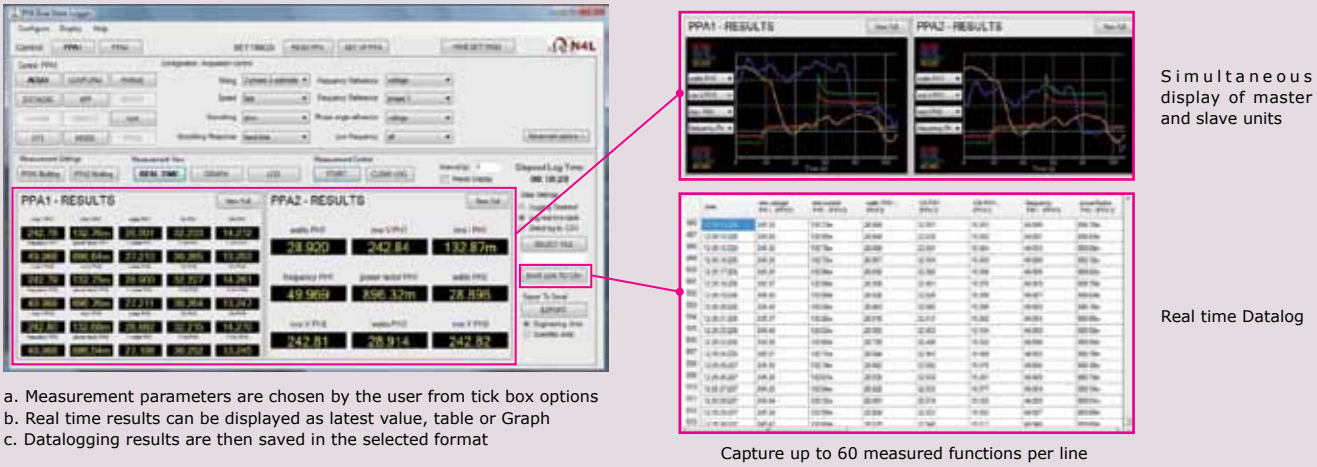
■ PC Software PPA5500 PPA1500 PPA500

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

① **PPAcomm** PC control, data storage and print



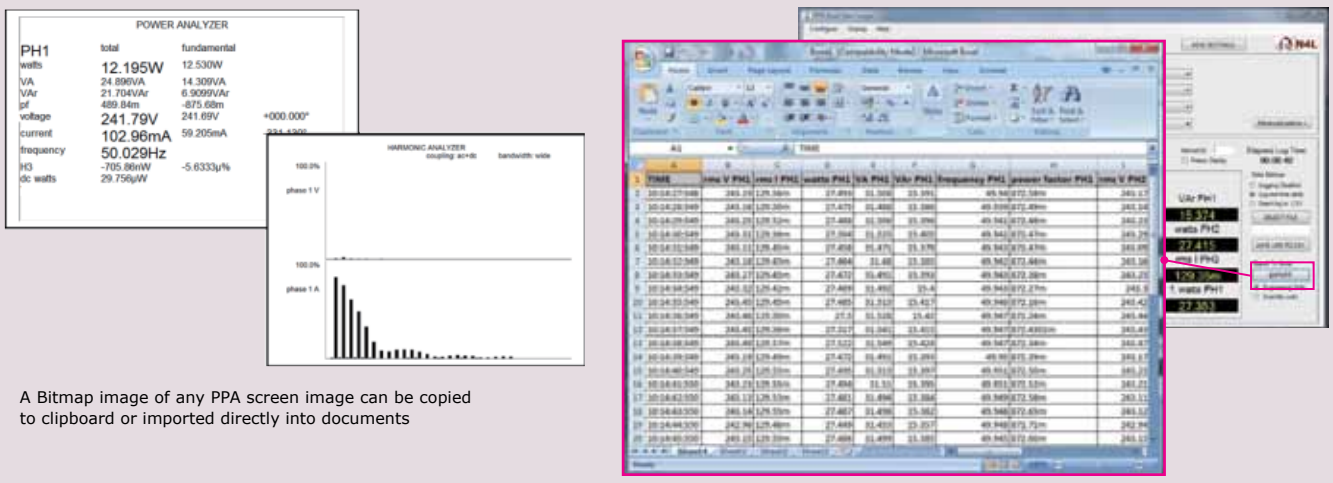
② **PPA Dual Data Logger** Exceptional flexibility and ease of use with all the primary functions of PPAcomm plus master/slave mode for 4-6 phase applications and data/image export to Text file, Excel, Bitmap or Clipboard



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

Capture up to 60 measured functions per line

Data Export options

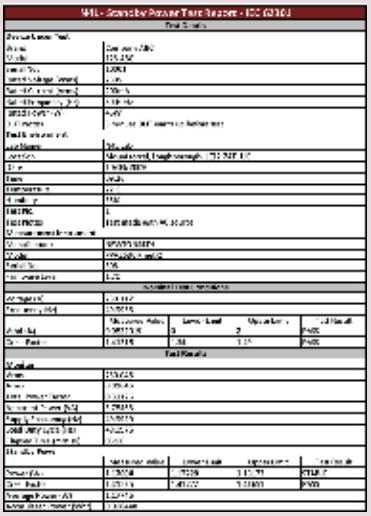


A Bitmap image of any PPA screen image can be copied to clipboard or imported directly into documents

Measurement tables generated by the data logging function can be exported directly to Excel

③ **PPA Standby Power**.　Full compliance testing to IEC62301

Standby power test screen with real time update of IEC62301 criteria



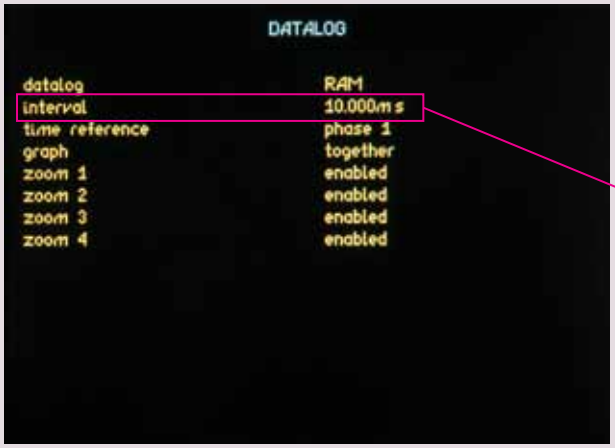
On completion of the standby test, a full test report can be exported directly to a spreadsheet

■ Connection Interface PPA5500 PPA1500 PPA500

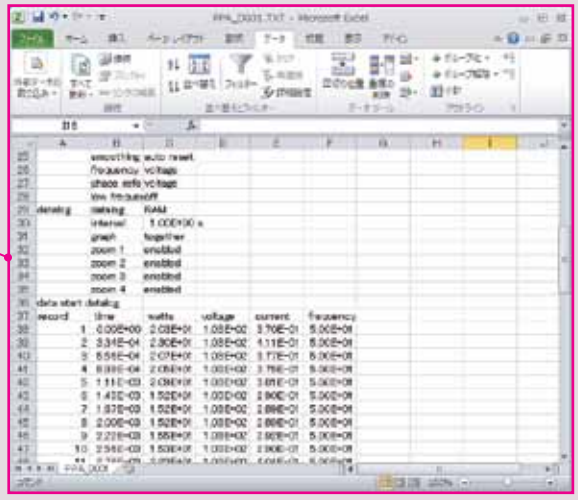
RS232 (standard), USB (standard), LAN (optional), GPIB (option for PPA5500 series)

■ Data Logging PPA5500 PPA1500 PPA500

Utilizing sophisticated frequency detection techniques, synchronization with the fundamental ac waveform is automatically achieved. Datalog intervals can be set from 10ms with measurements saved to a PC or internal memory



Datalog menu, interval set to 10ms



SPECIFICATION

	PPA5500	PPA1500/PPA500
General		
Crest Factor	20(Voltage and Current)	
Sample Rate	2.2Ms/s on all channels, No-Gap	1Ms/s on all channels, No-Gap
Standby Power	IEC62301 Compliance	
Application Modes	PWM Motor Drive, Ballast, Inrush, Power Transformer, Standby Power	Ballast, Inrush, Standby Power
Frequency Range		
	DC,10mHz～2MHz - PPA5500-LC(10Arms), PPA5500(30Arms) DC,10mHz～1MHz - PPA5500-HC(50Arms)	Normal: PPA1500 DC,10mHz～1MHz/ PPA500 DC, 10mHz～500kHz x10: DC,10mHz～100kHz
Voltage Input		
Internal – Range	300mVpk～3000Vpk(1000Vrms) in 9 ranges (240Vrms within 300Vpk range, using 20% overange)	Normal: 1Vpk～2500Vpk(1000Vrms) in 8 ranges x10: 100mVpk～300Vpk in 8 ranges
Internal – Accuracy	0.02% Rdg+0.03% Rng+(0.004%×kHz)+1mV	Normal: 0.05% Rdg+0.1% Rng+(0.005%×kHz)+5mV x10: 0.05% Rdg+0.1% Rng+(0.01%×kHz)+1mV
External – Range	300μVpk～3Vpk in 9 ranges【BNC connector 3Vpk max input】	1mVpk～3Vpk in 8 ranges【BNC connector 3Vpk max input】
External – Accuracy	0.02%Rdg+0.03%Rng+(0.004%×kHz)+1μV	0.05%Rdg+0.1%Rng+(0.005%×kHz)+5μV
Current Input		
Internal – 10Arms Low Current (PPA5500-LC) 4mm safety connectors – Ranges	3mApk～30Apk(10Arms) in 9 ranges	
Internal – 10Arms Low Current (PPA5500-LC) 4mm safety connectors – Accuracy	0.02% Rdg+0.03% Rng+(0.004%×kHz)+10μA	
Internal – 30Arms Current (PPA5500) 4mm safety connectors – Ranges	30mApk～300Apk(30Arms) in 9 ranges	
Internal – 30Arms Current (PPA5500) 4mm safety connectors – Accuracy	0.02% Rdg+0.03% Rng+(0.004%×kHz)+100μA	
Internal – 50Arms High Current (PPA5500-HC) Touch proof screw terminal – Ranges	100mApk～1000Apk(50Arms) in 9 ranges	
Internal – 50Arms High Current (PPA5500-HC) Touch proof screw terminal – Accuracy	0.02% Rdg+0.03% Rng+(0.004%×kHz)+300μA	
Internal – 20Arms (PPA1500) Shunt 4mm Safety Connectors – Ranges		Normal: 100mApk～300Apk(20Arms) in 8 ranges x10: 10mApk～30Apk in 8 ranges
Internal – 20Arms (PPA1500) Shunt 4mm Safety Connectors – Accuracy		Normal: 0.05% Rdg+0.1% Rng+(0.005%×kHz)+500μA x10: 0.05% Rdg+0.1% Rng+(0.01%×kHz)+100μA
Internal – 30Arms (PPA1500-HC) Shunt 4mm Safety Connectors – Ranges		Normal: 300mApk～1000Apk(30Arms) in 8 ranges x10: 30mApk～100Apk in 8 ranges
Internal – 30Arms (PPA1500-HC) Shunt 4mm Safety Connectors – Accuracy		Normal: 0.05% Rdg+0.1% Rng+(0.005%×kHz)+1mA x10: 0.05% Rdg+0.1% Rng+(0.01%×kHz)+300μA
External input (External shunt Current sensor) – BNC Connector (Max input 3Vpk) – Ranges	300μVpk～3Vpk in 9 ranges	BNC connector (Max input 3Vpk) – Ranges: 1mVpk～3Vpk in 8 ranges
External input (External shunt Current sensor) – BNC Connector (Max input 3Vpk) – Accuracy	0.02% Rdg+0.03% Rng+(0.004%×kHz)+1μV	BNC connector (Max input 3Vpk) – Accuracy: 0.05% Rdg+0.1% Rng+(0.005%×kHz)+5μV
Phase Accuracy		
	0.005deg+(0.01deg×kHz)【PPA5500-LC(10Arms), PPA5500(30Arms)】 0.01deg+(0.02mdeg×kHz)【PPA5500-HC(50Arms)】	Normal: 0.01deg+(0.01deg×kHz) x10: 0.01deg+(0.02deg×kHz)
Power Accuracy		
	[0.03%+0.03%/pf+(0.01%×kHz)/pf] Rdg+0.03%VA Rng	Normal: [0.1%+0.1%/pf+(0.01%×kHz)/pf] Rdg+0.1%VA Rng x10: [0.1%+0.1%/pf+(0.02%×kHz)/pf] Rdg+0.1%VA Rng
40-400Hz	[0.03%+0.03%/pf+(0.01%×kHz)/pf] Rdg+0.02%VA Rng	40-400Hz: As above with range error reduced from +0.1%V,A,VA Rng to +0.05%V,A,VA Rng
CMRR - Common Mode Rejection Ratio		
	250V @ 50Hz - Typical 1mA (150dB) 100V @ 100kHz - Typical 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 (30 with optional PC software)		
Datalog Window	No-Gap analysis, Minimum window 10ms	
Memory	10M records into flash RAM (Non-Volatile)	RAM up to 16,000 records
Communication Ports		
RS232	Baud rate up to 38.4kbps,RTS/CTS flow control	
LAN(Option L)	10/100 Base-T Ethernet auto sensing	
GPIB(Option G)	IEEE488.2 Compatible	—
USB	USB 2.0 and 1.1 compatible	
USB	USB memory port	
Analogue Output	Bipolar ±10V(BNC)	—
Speed Input	Analogue bipolar±10V or Pulse count(BNC)	—
Torque	Bipolar ±10V(BNC)	—
Sync	4～6 Phase measurement (Master/Slave)	—
Extension	4～6 Phase (Master/Slave) + Auxilary	Auxilary Port
Standard Accessories		
Leads	Power, RS232, USB	
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)	20A (Std version) or 30A (HC version) 1.5m long 4mm stackable terminals 1x red, 1x yellow and 2x black per phase
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	CommView2 (RS232/USB/LAN), Command line, Script based communication software	
Instruction Manual	User manual, Communications manual	
Other Documents	Calibration certificate, Quick start guide	
General		
Display	320×240 dot full colour TFT, White LED Backlit	480×272 dot full colour TFT, White LED Backlit
Dimensions	130H×400W×315D mm excluding feet	92H×215W×312D mm excluding feet
Weight	5.4kg(1 Phase), 6kg(3 Phase)	3.3kg(1 Phase), 4kg(3 Phase)
Safety Isolation	1000Vrms or DC(CATII), 600Vrms or DC(CATIII)	
Power supply	90～265Vrms, 50～60Hz, 40VAmax	

MODELS

PPA5500 Series

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

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

Phases	Model	Specification
1 Ph	PPA5510-HC	DC, 10mHz～1MHz 100mApk～1000Apk (50Arms)
2 Ph	PPA5520-HC	
3 Ph	PPA5530-HC	
4 Ph	PPA5540-HC	
5 Ph	PPA5550-HC	
6 Ph	PPA5560-HC	

Touchproof 50A screw connectors used on PPA5500-HC and PPA2600-HC versions

PPA5500 3 Phase model

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

PPA1500/PPA500 Series

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

*PPA500 DC, 10mHz～500kHz

PPA1500 3 Phase model

Accessories

Leads and Interfacing	
Type	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～9-pin RS232 Serial Converter
Master-Slave cable (Option)	Leads for connecting 2x PPA5500 in master/slave mode

Interface (Optional)	
Type	Specification
PPA-LAN interface	Option L - LAN Interface
PPA-GPIB interface	Option G - GPIB(IEEE488)Interface - PPA25/26 and 55 series

PC Software (Optional)	
Type	Specification
PPA Dual Data Logger	PC control and data acquisition of 1 to 6 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

Connection and extension port accessories (Optional)	
Type	Specification
Breakout box	Simple analyzer connection between source and DUT
PCIS	10Arms 300Apk rated Phase Controlled Inrush Switch

Rack Mount Kit (Optional)	
Type	Specification
Rack Mount brackets	PPA26/5500 19in rack mount brackets (model specific)
Rack Mount panel	PPA2500 19in rack facia panel

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

Documents (Standard)	
Type	Specification
Calibration/Test & Inspection certificate	PPA Certificate of calibration
Spare set of manuals	User manual Comms manual

PRODUCT COMPARISON

	PPA1500/PPA500	PPA2500/PPA2600	PPA5500
Basic Accuracy			
V, A rdg error	0.05%	0.04%	0.02%
Power rdg error	0.10%	0.05%	0.03%
Phase			
Internal	1～3		
Master/Slave operation	—	4～6	
Voltage Input			
Max input voltage	2500Vpk	3000Vpk	
No. of ranges	8	8	9
Direct Current Input			
10Arms model	—	○	○
20Arms model	○	—	—
30Arms model	○	○	○
50Arms model	—	only PPA2600	○
No. of ranges	8	8	9

	PPA1500/PPA500	PPA2500/PPA2600	PPA5500
Frequency Band			
20A & 30A Shunt	DC～1MHz/500kHz	—	—
10A & 30A Shunt	—	DC～2MHz	DC～2MHz
50A Shunt	—	DC～1MHz	DC～1MHz
Features			
USB Memory port	○	—	○
Real time clock	○	—	○
19in Rack mount option	—	only PPA2600	○
Other features			
Speed-Harmonics/sec	300	300	1,800
Non-volatile memory	192kB	192kB	1GB
Internal data logging	4	4	16(4 X 4)
Torque and speed Input	—	○	○
Dimensions - Excl. Feet H x W x D (mm)	92 x 215 x 312	125 x 355 x 250 125 x 430 x 250	130 x 400 x 315
Weight	3.3 - 4kg	5 - 6kg	5.4 - 6kg

Accessories

External Shunt Resistor (DC ~ 1MHz)				
Model number	Basic accuracy	Phase accuracy	Maximum current	
			Continuous	Peak
HF500	0.2mΩ (±0.1%)	0.1° / kHz	500Arms	5000Apk
HF200	0.5mΩ (±0.1%)	0.1° / kHz	200Arms	2000Apk
HF100	1.0mΩ (±0.1%)	0.05° / kHz	100Arms	1000Apk
HF020	10mΩ (±0.1%)	0.01° / kHz	20Arms	200Apk
HF006	100mΩ (±0.1%)	0.001° / kHz	6Arms	60Apk
HF003	470mΩ (±0.1%)	0.0001° / kHz	3Arms	30Apk

External Shunt HF-003

External Shunt HF-500

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

Current Clamp SC 3C 1000A-1V

Probe / Current Clamp (Hall effect): AC + DC				
Model number	Measuring range	Frequency range	Clamp diameter	Category
SC 3C 1000A-1V	1A ~ 1000A	DC ~ 2kHz	59mm ø	CATIII
P20 3C 2000A-2V	40A ~ 1000/2000A	DC ~ 2kHz	83mm ø	CATIII
P40 3C 4000A-2V	40A ~ 2000/4000A	DC ~ 2kHz	83mm ø	CATIII
P50 3C 5000A-2V	50A ~ 1000/5000A	DC ~ 2kHz	83mm ø	CATIII

Current Clamp P20 3C 2000A-2V

High Performance Probes			
Model	Voltage range	Frequency range	Specification
ULC Probe	~ 1000Vrms	DC ~ 2MHz	Ultra-low capacitance probe, 1000: 1, 1.5pF
ATT20 probes	—	—	20:1 HV Attenuator
ATT10 probes	—	—	10:1 HV Attenuator
TT-HV15 High Voltage probe	15kVpk	—	TT-HVP 15HF , 1000:1

HV Probe TT-HV15

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 includes Frequency Response and Impedance Analyzers, Selective Level Meters and Laboratory Power Amplifiers

Phase Sensitive Multimeters

PSM1735
10µHz ~ 35MHz

PSM1700
10µHz ~ 1MHz

Applications

- Power supply phase margin and gain margin (FRA)
- Inductance, Capacitance and Resistance (LCR)
- Analysis of mechanical vibration (HARM)
- Phase meter calibration (VVM)

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

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2010

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

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