

### No matter what your needs or budget there is probably a PowerSight model that is right for you

**There are four PowerSight models to choose from:** the PS5000 Graphical Power Quality Analyzer, the PS4550 Power Quality Analyzer, the PS3550 Energy Analyzer, and the PS2500 Power Monitor.

- The PS5000 provides complete analysis in power quality applications (swell / dip / inrush / hi-speed transient / harmonic analysis) in addition to supplying exact measurements for all common power quantities. Logs, trends, waveforms, phasors, and harmonic graphs can be displayed on its ¼ VGA color graphics display.
- The PS4550 provides all the benefits of the PS5000, but without the color graphical user interface and graphical presentations. It has a backlit 2 line LCD display.
- The PS3550 is oriented toward complete power analysis and reporting with limited power quality capabilities. Thousands of the PS3550 and its PS3500 and PS3000 predecessors are in service all over the world.
- The PS2500 provides basic power analysis and is best suited for occasional use or for those with a limited budget.

Our models offer combinations of price, performance, size, and ease of use that are unequalled in the industry.

### Comparison Table between PowerSight models\*\*

The following table lists key features and how they apply to each model. Features that end with an asterisk (“\*”) have explanatory notes in the next section.

Cells with a Green background are features that compare more favorably with the other models. Cells with a Red background are features that compare less favorably with the other models.

Basic Measurement Abilities	PS2500	PS3550	PS5000 / PS4550
Basic sampling rate*	16usec	16usec	8usec
Samples per cycle (@ 60Hz)	130	130	2083
Basic RMS measurement rate*	once per second	every cycle of every channel	every cycle of every channel
True 3-phase*	Yes, 7 channels	Yes, 7 channels	Yes, 7 channels
Setup of power configuration	automatic	automatic	automatic
Single phase measurements	Yes	Yes	Yes
Split phase measurements	Yes	Yes	Yes
Three phase wye and delta	Yes	Yes	Yes
4 wire delta measurements	Yes	Yes	Yes



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Basic Measurement Abilities (cont'd)	PS2500	PS3550	PS5000 / PS4550
Open delta measurements	Yes	Yes	Yes
optional 2CT/2PT & 2 wattmeter method power modes	Yes	Yes	Yes
AC/DC voltage and current measurement*	Yes	Yes	Yes
400 Hz system measurements	No	Yes	Yes

Logging	PS2500	PS3550	PS5000 / PS4550
Logging capacity	Essentially unlimited with SD card	Essentially unlimited with SD card	Essentially unlimited with SD card
Logging variables	61 default	68 default	68 default
Logging rate set by user (time between summarizing 1 second measurements)	1 second - 99 minutes	1 second - 99 minutes	1 second - 99 minutes
Start/Stop at programmed time	Yes	Yes	Yes
Pause/Resume of Logging	Yes	Yes	Yes
Max/Min/Ave/Present value of V,A,W, etc	Yes	Yes	Yes
Localized Trending on Meter*	No	No	PS5000: Yes PS4550: No
Pause/Resume of Trending	No	No	PS5000: Yes PS4550: No

Power Quality	PS2500	PS3550	PS5000 / PS4550
Swell (surge) triggering/capture*	check each second	check each second	Check every 1/2 cycle of every input
Dip (sag) triggering/capture*	check each second	check each second	Check every 1/2 cycle of every input

Power Quality (cont'd)	PS2500	PS3550	PS5000 / PS4550
Inrush current capture*	check each second	check each second	Check every 1/2 cycle of every input
Swell/Dip/Inrush capacity	view consumption log	view consumption log	Up to 15000 records, standard
Swell/Dip/Transient triggered waveform capture	No	No	Up to 100 graphs of 12 cycles, standard
RMS graph of swell/dip by 1/2 cycle	No	No	Up to 2000 graphs of 100 cycles, standard
Simultaneous measurement of power / harmonics / swell / dip / transients*	No	No	Yes
High speed transient capture*	No	No	Record every 8 microsecond on every input
Transient capacity	No	No	Up to 15000 in log, 100 wavesets
Adjust Thresholds via Keypad	No	No	PS5000: Yes PS4550: No

Harmonics	PS2500	PS3550	PS5000 / PS4550
Harmonics analysis capability	1-50th on PC, 25th on unit, with HAO option	1-50th on PC, 25th on unit, to the 7 <sup>th</sup> at 400Hz	PS5000: Color Bar Graph on screen showing 1-50th , to the 31st at 400Hz PS4550: 1-50th on PC, THD to 50th on meter, THD to the 31st at 400Hz on meter
Harmonics direction	Yes, in software	Yes, in software	Yes, in software
THD calculation	4 seconds/channel	all channels each second	every cycle of every channel
K factor	Yes	Yes	Yes

Voltage Measurement	PS2500	PS3550	PS5000 / PS4550
Provision for input ratios for PTs/CTs*	Yes	Yes	Yes
Direct measure of RMS voltage	1-1000 Vrms	1-1000 Vrms	1-1000 Vrms
Peak voltage measurement	1500 V	1500 V	1500 V
DC voltage	1-1000 Vdc	1-1000 Vdc	1-1000 Vdc
Voltage measurement with standard and optional medium voltage probes*	1-15,000 Vrms	1-15,000 Vrms	1-15,000 Vrms
Voltage measurement with input ratios	0.5-999 MVRms	0.5-999 MVRms	0.5-999 MVRms
Voltage measurement accuracy*	+/-0.5%	+/-0.2%	<b>+/-0.1%</b>
Display resolution (100-400V)	1V	0.1V	0.1V

Current Measurement	PS2500	PS3550	PS5000 / PS4550
AC/DC current measurement*	Yes	Yes	Yes
Neutral current measurement	Yes	Yes	Yes
AC Amp direct measurement with accessories*	1 A	0.005 - 6000 ARMS	0.005 - 6000 ARMS
DC Amp direct measurement with accessories*	10 - 600 ADC	5 - 2000 ADC	5 - 2000 ADC
Amp measurement with input ratios	1 ma - 999 MArms	1 ma - 999 MArms	1 ma - 999 MArms
Current measurement accuracy*	+/-0.5%	+/-0.2%	<b>+/-0.1%</b>
Display resolution (100-400A)	1 A	0.1 A	0.1 A
Automatic current probe identification and scaling	Yes	Yes	Yes
Flex, DC, and all other probes do not require batteries	Yes	Yes	Yes

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Power Related	PS2500	PS3550	PS5000 / PS4550
True power measurement (W)	Yes	Yes	Yes
Apparent power measurement (VA)	Yes	Yes	Yes
Reactive power measurement (VAR)	Yes	Yes	Yes
Power measurement accuracy*	+/-1.0%	+/-0.5%	<b>+/-0.25%</b>
True power factor (TPF)	Yes	Yes	Yes
Displacement power factor (DPF)	Yes, via PC	Yes	Yes
Phasors, magnitude and angle	Yes, via PSM software	Displacement angles and Vrms / Arms magnitudes	<b>PS5000: Color phasors on screen with measurements</b>
			PS4550: Displacement angles and Vrms / Arms
Phasor diagram display	Yes, via PSM-A software	Yes, via PSM-A software	<b>PS5000: Color phasors on screen with measurements</b>
			PS4550: Yes, via PSM-A software
Voltage unbalance	Yes, via PC	Yes	Yes
Current Unbalance	Yes, via PC	Yes	Yes
Energy measurement (KWH)	Yes, via PC	Yes	Yes
Cost measurement	Yes, via PC	Yes	Yes

Other Key Features	PS2500	PS3550	PS5000 / PS4550
Internal memory	4M, compressed	4M or 16M with MEM2 option	<b>PS5000: 16M</b>
			PS4550: 4M or 16M with MEM2 option

High frequency spectrum analysis*	No	No	5KHz - 100KHz, FAO option
Removable memory	yes, SD (SDHC) card up to 32GB	yes, SD (SDHC) card up to 32GB	yes, SD (SDHC) card up to 32GB

Other Key Features (cont'd)	PS2500	PS3550	PS5000 / PS4550
Detection of errors in connections and wiring*	SureStart™ errors in plain English	SureStart™ errors in plain English	SureStart™ errors in plain English
Connections AI Wizard (SureStart™)*	Yes, automatic	Yes, with key press	Yes, with key press
Advanced Test Plan Management (TestPlan Manager™)*	Yes in software, but not integrated into meter	Fully integrated in meter and software	Fully integrated in meter and software
DataSetup Wizard™	Yes, via PSM-A software program	Yes, via PSM-A software program	Yes, via PSM-A software program
Changing the Data Setup from the keypad	No	Yes, most basic settings	PS5000: Almost all settings
			PS4550: Yes, most basic settings
Automated Report Writer (ReportWriter Wizard™)	Yes, via PSM-A software program	Yes, via PSM-A software program	Yes, via PSM-A software program
Auto-Detection of New Software and Firmware	Yes, via PSM-A software program	Yes, via PSM-A software program	Yes, via PSM-A software program
Firmware update via email	Yes	Yes	Yes
Data into Excel Spreadsheet	one step	one step	one step

Other Measurements	PS2500	PS3550	PS5000 / PS4550
Fundamental frequency measurement*	45-66, 360-440Hz, DC	45-66, 360-440Hz, DC	22-200Hz, 360-440Hz, DC
Voltage Unbalance	Yes, via PSM-A	Yes	Yes
Current Unbalance	Yes, via PSM-A	Yes	Yes
Duty cycle / on-off cycles*	Yes, via PSM-A	Yes	PS5000: No
			PS4550: Yes

Input / Output	PS2500	PS3550	PS5000 / PS4550
Display	text characters, hi res graphics on PC	Backlit Text, hi res graphics on PC	PS5000: Color graphics, 1/4 VGA



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			PS4550: Backlit Text, hi res graphics on PC
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Input / Output (cont'd)	PS2500	PS3550	PS5000 / PS4550
<b>Analysis software</b>	PSM-A included	PSM-A included	PSM-A included
<b>Automated Report Writer</b>	included	included	included
<b>Screen update rate</b>	1 second	1 second	1 second
<b>Scope Mode</b>	No	Yes, on PC	PS5000: Yes, color graphics PS4550: Yes, on PC
<b>Manual waveform sets (7 signals) capture*</b>	via PC	4 via keypad and PC	Up to 100 via keypad and PC
<b>Screen snapshot mode</b>	unlimited via software	unlimited via software	unlimited via software
<b>Printing</b>	Yes, via PC	Yes, via PC	Yes, via PC
<b>Wireless Communications</b>	Bluetooth wireless	Bluetooth (Wi-Fi optional)	Bluetooth (Wi-Fi optional)
<b>Wireless Communications speed*</b>	9600 bps	57.6 kbps	460.8 kbps
<b>USB connection</b>	No	Yes	Yes
<b>Internet connection</b>	No	via Wi-Fi option	via Wi-Fi option
<b>Integration with automated systems</b>	Yes	Yes	Yes
<b>Multi-lingual</b>	No	Yes	PS5000: No PS4550: Yes
<b>Keyboard</b>	1 button	Yes, 24 keys	Yes, 24 keys
<b>Real-time clock</b>	Yes	Yes	Yes

Power Requirements	PS2500	PS3550	PS5000 / PS4550
<b>Rechargeable battery type</b>	NiMH	Li-ion	Li-ion



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<b>Run-time on Battery</b>	8-12 hours (depending on probes attached)	8-12 hours (depending on probes attached)	6-10 hours (depending on probes attached)
<b>Charging Time Required</b>	12 hours max	<b>7 hours max.</b>	<b>7 hours max.</b>
<b>Display of battery capacity</b>	No	No	<b>Yes</b>

<b>Power Requirements (cont'd)</b>	<b>PS2500</b>	<b>PS3550</b>	<b>PS5000 / PS4550</b>
<b>Power requirement</b>	12VDC @ 200ma	12VDC @ 500ma	12VDC @ 500ma
<b>Power itself from the line</b>	Yes, with Line-to-DC (LDC4) option	Yes, with Line-to-DC (LDC4) option	Yes, with Line-to-DC (LDC4) option

<b>Environmental/Safety</b>	<b>PS2500</b>	<b>PS3550</b>	<b>PS5000 / PS4550</b>
<b>Size</b>	4" x 7.75" x 1.75"	3.85" x 7.6" x 1.60" to 2.07"	3.85" x 7.6" x 1.60" to 2.07"
<b>Weight</b>	1 lb (0.5KG)	2 lb (0.9KG)	2 lb (0.9KG)
<b>Operating temperature</b>	0 - 50 C (32 - 122 F)	0 - 50 C (32 - 122 F)	0 - 50 C (32 - 122 F)
<b>Operating humidity limit</b>	70% non-condensing	70% non-condensing	70% non-condensing
<b>Vibration Testing</b>	standard industry	standard industry	70% non-condensing PS5000: standard industry <b>PS4550: MIL-PRF-28800F</b>
<b>Designed to meet safety standard</b>	EN 61010 1000V CAT III, 600V CAT IV	EN 61010 1000V CAT III, 600V CAT IV	EN 61010 1000V CAT III, 600V CAT IV

<b>Price</b>	<b>PS2500</b>	<b>PS3550</b>	<b>PS5000 / PS4550</b>
<b>Cost of analyzer, without current probes or hardshell carrying cases</b>	<b>US\$1495</b>	US\$2495	PS5000: US\$5995 PS4550: US\$4995

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### Notes and Explanations of the Comparison Table\*\*

**Basic sampling rate.** This is the basic rate at which inputs are sampled. However, most samples are not needed for most measurements so many may not be used except for transient detection, depending on the model. The PS2500 uses samples sufficient to do RMS measurements of voltage and current including the components of the first 25 harmonics. All models use samples sufficient to analyze harmonics to the 50<sup>th</sup> harmonic of a 60 Hz fundamental when creating waveforms. The PS4550 continuously uses its 8 microsecond rate to simultaneously measure transients, swells, dips, harmonics, and power measurements on all channels, using over 2000 samples per cycle on its power quality measurements.

**Basic RMS measurement rate.** The PS2500 looks at 2 cycles of each channel every second and do complete measurements of relevant parameters during normal operating modes. Thus one measurement is generated every second, regardless of the recording (logging) rate. The PS3550, PS4550, and PS5000 do complete RMS measurements of every cycle of every channel, regardless of the recording rate. Therefore, the PS3550/PS4550/5000 miss nothing in their measurements. All models are inherently more accurate than competing products that only do measurements when they are about to create a new record in their log.

**True 3-phase.** PowerSight is a true 3-phase meter. This means that all three phases and totals are accurately measured, regardless of the shape of the waveform. Voltage, current, power, and power factor are not estimated. Instruments with only one voltage and one current channel cannot measure 3-phase power without making assumptions that are usually not true in the real world.

**Works with all power systems.** PowerSight models are meant to be used on any power system anywhere in the world. They can accurately measure single phase, split-phase, three phase wye, three phase delta, 4-wire delta, grounded delta, open delta, DC, 2CT/2PT, 3CT/3PT, regenerative, 50Hz, 60Hz, 400Hz, DC, variable frequency, phase-phase, phase-neutral, 69/120V, 120/208V, 200V, 240V, 277/480V, 600V, 1000V systems. Accessories are available for direct connection to voltages as high as 15,000V, to bus bars, and multiple cable pairs.

**Voltage measurement accuracy.** Accuracy for PS2500 is stated as a percent +/- 0.2V between 0.5-399.9V, +/-2V between 400-3,999V. Accuracy for the PS3550, PS4550, and PS5000 is stated as a percent of reading +/-0.3V.

**Current measurement accuracy.** Accuracy for PS2500 is stated as a percent +/- 0.2A between 0.1-399.9A, +/-2A between 400-3,999A for an HA1000. Add to

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the stated accuracy the percentage for any other probe that is used. Accuracy for the PS3550, PS4550, and PS5000 is stated as a percent of reading +/- the accuracy of the probe (other than an HA1000).

**Power measurement accuracy.** Add to the stated accuracy the percentage for any probe used, other than the HA1000.

**Trending.** Trending is similar to logging except it is intended for short-term in-hand measurement. While logging or not, the user can begin a trend session and see just the measurements that have occurred during the trend session, viewing real-time measurements either graphically or tabularly as they are occurring. The maximum, minimum, and average of the measurements is also updated and displayed so the user can get a good sense of how the circuit is operating while they are observing.

**Swell (surge) triggering/capture.** Triggering on voltage and current swells occurs when a trigger threshold is exceeded. The voltage threshold can be set manually or automatically by the meter. Automatic voltage triggering occurs when the RMS voltage exceeds a set percent greater than the nominal supply voltage. This automatic “percent to standard” trigger point can be adjusted by the user. The user sets the trigger point for current directly. Individual voltage and current channels can be enabled or disabled for triggering. The PS4550 and PS5000 detect swells lasting as little as  $\frac{1}{2}$  cycle and measure every  $\frac{1}{2}$  cycle of every channel. When detected, the swell event can be recorded to a file, can have its RMS profile captured and graphed for every  $\frac{1}{2}$  cycle for the length of the swell (up to 10 seconds), and/or can have 12 cycles of the waveform captured for the swell. The PS2500 and PS3550 are not good choices for detecting brief swells, since they have no triggering or capture ability. Longer swells can be detected in the data log when looking at the maximum voltage or current graphs. The PS3550, PS4550, and PS5000 will record the maximum RMS cycle of voltage and current in the data log if the logging period is 1 second. This is helpful for easy viewing of peak voltage swells.

**Sag (dip) triggering/capture.** Triggering on voltage and current sags occur when a half cycle RMS measurement is less than the trigger threshold. The voltage threshold can be set manually or automatically by the meter. Automatic voltage triggering occurs when the RMS voltage sags below a set percent less than the nominal supply voltage. This automatic “percent to standard” trigger point can be adjusted by the user. The user sets the trigger point for current directly. Individual voltage and current channels can be enabled or disabled for triggering. The PS4550 and PS5000 detect sags lasting as little as  $\frac{1}{2}$  cycle and measure every  $\frac{1}{2}$  cycle of every channel. When detected, the sag event can be recorded to a file, can have its RMS profile captured and graphed for every  $\frac{1}{2}$  cycle for the length of the sag (up to 10 seconds), and/or can have 12 cycles of

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the waveform captured for the sag. The PS2500 and PS3550 are not good choices for detecting brief sags, since they have no triggering or capture ability. Longer sags can be detected in the data log when looking at the minimum voltage or current graphs. The PS3550, PS4550, and PS5000 will record the minimum RMS cycle of voltage and current in the data log if the logging period is 1 second. This is helpful for determining “off” current and easy viewing of lowest full-cycle voltage sags.

**Inrush current capture.** Triggering on current inrush occurs when a current RMS measurement exceeds the trigger threshold. The user sets the trigger point directly. Typically, it is a number slightly above the normal “on” current being monitored. Individual current channels can be enabled or disabled for triggering. The PS4550 and PS5000 detect inrush lasting as little as  $\frac{1}{2}$  cycle and measure every  $\frac{1}{2}$  cycle of every channel. When detected, the inrush event can be recorded to a file, can have its RMS profile captured and graphed for every  $\frac{1}{2}$  cycle for the length of the inrush (up to 10 seconds), and/or can have 12 cycles of the waveform captured for the inrush. The PS2500 and PS3550 are not good choices for detecting inrush current, since they have no triggering or capture ability. Typically the peak inrush is much higher than the average RMS for the second, so it does not show up well in a data log.

**High speed transient capture.** The PS4550 and PS5000 detect high speed transients on all channels simultaneously, while doing all other measurement functions simultaneously. The transient threshold can be set in 1V increments and can be set to detect absolute values or relative values (where the fundamental periodic waveform is removed). When a transient is detected, the transient information of time/date, maximum value, and duration can be added to a log and a waveform can be captured to a file. Transients of at least 16 usec can be measured in 8usec increments.

**Simultaneous measurement of power / harmonics / swell / dip / transients.** The PS2500 and PS3550 performs power measurement on all channels simultaneously. The PS2500 pauses to do harmonics during logging. The PS4550 and PS5000 perform power, harmonic, swell, dip, and transient analysis simultaneously on all channels.

**AC/DC voltage and current measurement.** All PowerSight models use the same probes interchangeably. This includes AC and DC current measurement and direct voltage measurement up to 15,000 Vrms with the 15KVP.

**Fundamental frequency measurement.** All models can operate in fixed 50Hz, fixed 60Hz. All but the PS2500 can operate in fixed 400Hz, and 360-440Hz frequency modes. The PS2500 and PS3550 can also track frequencies between 45 and 66 Hz, whereas the PS4550 and PS5000 can also track frequencies

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between 22 and 200 Hz, for tracking the output of a variable speed drive. In the 400 Hz modes, the PS4550 and PS5000 calculate harmonics to the 31<sup>st</sup>.

**Duty cycle / on-off cycles.** The PS3550 and PS4550 can determine the duty cycle of operation. This is the proportion of time that a unit under test is “on”. The user sets the value of current considered to be the “on” value. In addition, estimates of number of on-off cycles per hour, per week, and per month are continually estimated during monitoring.

**Provisions for input ratios for PTs and CTs.** PowerSight automatically identifies each current probe when it is connected and assigns the correct input ratios for correct measurements. In addition, the user can enter ratios to be used for specific measurement sessions. These ratios can be entered via our PSM-A software or entered directly using the keypad with the PS3550, PS4550, and PS5000.

**Voltage measurement with accessories.** Special high voltage probes can be used for direct measurement of voltages to 15,000Vrms. However, these probes require the user to enter an input ratio.

**Current measurement with accessories.** A wide range of current probes are available for measuring AC currents from 5 ma to 6,000A and DC currents from 5A to 2,000A. They are interchangeable and self-identifying so no input ratio needs to be entered into the meter. New current probes are added as the need arises.

**High Frequency Spectrum Analysis.** This option for the PS4550 and PS5000 allows detecting very small magnitudes of voltage and current frequencies up to 100,000 Hz. This is useful for seeing effectiveness of power line filters and detecting potential interfering frequencies on the power line.

**Detection of errors in connection.** All PowerSight analyzers have our patented SureStart™ feature that uses artificial intelligence to analyze the connections, wiring, and setup parameters in order to report what problems are likely to exist before you begin monitoring.

**Connections AI Wizard.** This rule-based AI feature examines the inputs to the meter to determine what sort of power system is attached. It then judges what possible errors in the connections and setup there may be and presents these possible errors to the user to correct. Minimizes the chance of having incorrect data when the test is done, a month later.

**Advanced Test Plan Management.** Allows formulating a multi-point test plan for power or process monitoring. Conflicts in time and resources can be spotted



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and corrected up front. Then the entire plan is downloaded into all the meters to be used in the study. When the meters are attached to a test point, the test point is identified and all data is assigned to that point. Retrieval of data becomes dramatically more time efficient and the risk of data misidentification is eliminated.

**Carrying cases.** There are various carrying case options including soft cases, hard cases, and weather-resistant cases. The meter may be operated and carried in the weather-resistant carrying case and in the SCAS2 soft case.

**Comparable cost.** This is a cost comparison of meters without option or accessories. Actual systems will usually cost more than shown, depending on the options chosen. The PS2500 system is usually purchased with a set of current probes. The PS3550, PS4550, and PS5000 are usually purchased with a set of current probes and a carrying case.

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