

# Power Supply Functional Test System

## Adapter/Converter Test 400 Series

- ❑ Full-capability test system in an instrument chassis
- ❑ Configurable with interchangeable load and DC source modules
- ❑ Waveform digitizer measurements

### APPLICATION

The S400 Power Supply Test System is a PC-controlled, full-capability system intended for rapid testing of low-power products such as DC-DC converters, AC-DC supplies, adapters, and chargers. All the measurement, control, reporting and test executive capability found in upright, cabinet-sized ATE is contained within the instrument-sized S400. The system is configurable with upper power limits in the range of 600 W and 4 to 6 outputs. Within these limits, it is an ideal solution for manufacturers that require comprehensive test capability and enterprise network compatibility, together with minimum unit test times.

### COMPLETE TEST SOLUTION

The tester is available in two models: the S430 for DC-DC testing and the S440 for AC-DC testing. All stimulus and measurement instrumentation, along with a multiplexer, digital stimulus, comparators, timers and relays, are contained within a single chassis. The entire test capability and software features found on the most advanced full-sized production testers are included. The user only needs to add cabling and a test fixture in order to start testing.

### CONFIGURABLE WITH INTERCHANGEABLE POWER MODULES

A key to flexibility, as well as compact design, is the Modular Power Subsystem that has been a



S430 DC-DC Test System

fundamental component of larger NHR test systems for many years. This is the portion of all testers where flexibility is most often required. What makes this subsystem unique is that the 6-slot chassis will accept any combination of electronic loads and/or DC-source modules, as shown on the accompanying chart. Additional flexibility is gained through the ability to synchronously parallel modules from within a test program to match each supply-under-test's specific stimulus requirements. In this manner, it is possible to configure a wide range of virtual loads & sources within the chassis limits. All modules also have wide operating ranges and constant power operating envelopes to allow covering a maximum range of requirements through a minimum group of modules.

### EMBEDDED DIGITIZING MEASUREMENT SYSTEM

A highly advanced measurement system is contained within the chassis. This system digitizes analog signals for DSP analysis, allowing the extraction of both static and transient measurements from a single waveform capture. In this manner, one circuit replaces the essential functions of a Voltmeter, Timing/Noise Analyzer, Power Analyzer, and Oscilloscope, along with associated signal matrixing and interconnect wiring. Beyond the capability, size, and cost advantages, the system's architectural simplicity yields much faster test times and improved tester reliability.

# S430/440 SPECIFICATIONS

## EMBEDDED MEASUREMENT SYSTEM

MEASUREMENT	RANGE/BANDWIDTH	RESOLUTION	ACCURACY
DC Volts, DC Peak	±2.0, 20, 200, 500 V	0.003%	0.01% + 0.01%
RMS Noise	0 - 1.4 Vrms, 10 Hz - 99 kHz	0.003%	1.5% + 1.5%
Peak to Peak Noise	0 to 0.2, 2.0 V	0.003%	3% at 1 MHz
Frequency	10 Hz-20 MHz, 35 kHz-20 kHz	100 nsec	0.02%
Timing	100 nsec-100 sec	100 nsec	100 nsec-1µsec + 0.02%
Waveform Display	DC to 25 kHz	0.003%	1% of range
Input Channels	12, external, selectable, differential inputs for UUT measurements		
Threshold Detector	1, ± full DCV range with programmable reference		
Digital Outputs	7, open collector, isolated, 300 mA/100 VDC/1 W-rated		
Digital Inputs	8, four with ± 10 V programmable reference, four with logic level reference		
GP Relays	8, SPDT, 175 VAC/0.25 A/3 W-rated		
Frequency Generator	10 kHz to 2 MHz, programmable pulse width		

## POWER MODULES OPTIONS

MODULE TYPE	AC SOURCE	DC SOURCES				DC LOADS	
MODEL NO.	5400	6102	6104	6108	6145	4100	4200
Programability							
Power	700 VA/500 W/1 $\phi$	450 W	450 W	450 W	450 W	300 W	300 W
Voltage Ranges	0 to 140/280/350 Vrms	0-20 V	0-40 V	0-80 V	0-450 V	2.1* to 450 V	0.7* - 6, 60, 120 V
Current Ranges	5.0/2.5/2.0 A	0-60 A	0-30 A	0-15 A	0-8 A	0-60 A	0-0.6, 6, 60 A
Frequency	40 to 500 Hz					*Current reduces linearly to 0.1 V	
Measurements							
Voltage							
Ranges	0 to 175/350 Vrms	0-10, 20 V	0-20, 200 V	0-20, 200 V	0-20, 200, 500 V	0 to 120/450 V	0-6, 60, 120 V
Accuracy	0.1% + 0.1%	0.05%+ 0.05%	0.05%+ 0.05%	0.05%+ 0.05%	0.05%+ 100 mV	0.01%+ 0.01%	0.01%+ 0.02%
Resolution	0.005% FS	0.005%	0.005%	0.005%	0.005%	0.002%	0.002%
Current							
Ranges	0-0.25, 0.5, 2.5, 5.0 Arms	0-6, 60 A	0-3, 30 A	0-1.5, 15 A	0-0.8, 8 A	0-0.6, 6, 60 A	0-0.6, 6, 60 A
Accuracy	0.1% + 0.1%	0.1%+ 0.1%	0.1% + 0.1%	0.1% + 0.1%	0.1% + 0.1%	0.03%+ 0.07%	0.05%+ 0.05%
Resolution	0.005%	0.004%	0.004%	0.005%	0.004%	0.002%	0.002%
Power							
Ranges	70, 700 VA	60, 120, 600 W	60, 600 W	30, 300, 3000 W	16, 160, 400, 1600 W	0-50, 500 W	0-3.6, 36, 72, 360 W
Accuracy	0.1% + 0.2%	0.15%+ 0.15%	0.15%+ 0.15%	0.15%+ 0.15%	0.15%+ 0.15%	0.5%+ 0.5%	0.06%+ 0.07%
Resolution	0.005%	0.005%	0.005%	0.005%	0.005%	0.5%	0.005%
Instrument Features	Additional measurements: peak current, crest factor and power factor Programmable cycle drop-outs, turn-on phase angle, cycle transient and current limit Line & load regulation: 0.1%+0.1% with remote sense 4:1 Crest Factor Non-repetitive peak current in 140 V range: 20 A 1% THD @ 50/60 Hz Load power factor: 0-1, lead or lag Protection: OC, OV, OP, OT, SC	Additional measurements: In-rush Current, DIN state and time, Overshoot, Undershoot, Rise Time, Fall Time, Settling Time, Hold Up Time, AC RMS, AC+DC RMS, Trigger In Parallel operation Programmable slew rates, current limit, current trip Waveform display: voltage, current, DIN state, trigger-in time 100-step programmable Transient Mode Constant Power operating envelope Parallelable (like modules) for higher power Protection: OC, OV, OT Optional very low current measurement shunt				Modes: Constant Current, Constant Voltage, Constant Resistance, Constant Power, Auto, Short Circuit, Pulse/Transient. Remote Sense Parallelable (like modules) for higher power Protection: OC, OV, OT, RV Model 4200 additional measurements: Parallel timing, voltage and current waveform capture/measurements	

All accuracies ± (% of reading + % of range), resolutions % of range

System Controls: ≥ 3.3GHz Intel processor, ≥ 500GB hard drive, Windows 10



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