

STANFORD RESEARCH SYSTEMS

SR850

The Stanford Research Systems SR850 is a high-performance 100 kHz DSP-based lock-in amplifier designed for high dynamic reserve, low drift, and outstanding phase resolution. Utilizing an innovative digital signal processing (DSP) architecture, it replaces traditional analog components with precise digital calculations, featuring an 18-bit A/D converter, integrated data logging, and versatile data analysis capabilities.

SPECIFICATIONS

General

Interfaces	GPIB, RS-232, 3.5" floppy disk drive
Display	Flat panel display (CRT on older revisions)
Auto-Functions	Auto-gain, auto-phase, auto-reserve, auto-offset
Preamplifier Power Output	±15 VDC, 100 mA (rear panel connector)

Physical

Power Supply	100/120/220/240 VAC, 50/60 Hz, 60 W
Operating Temperature	0 °C to 40 °C °C
Dimensions (W×H×D)	432 mm × 159 mm × 495 mm mm
Weight	18.1 kg kg

Reference Channel

Frequency Range	1 mHz to 102.4 kHz
Phase Resolution	0.001°
Reference Signal Options	External sine, external square, or internal digitally synthesized
Harmonic Detection	Any integer harmonic of reference frequency
External Reference Acquisition Time	2 cycles + 5 ms or 40 ms (whichever is greater)
Channel Orthogonality	Within 0.001°
Reference Phase Drift	<0.01°/°C (below 10 kHz), <0.1°/°C (above 10 kHz)
Reference TTL Input Range	≥1.2 V pk
Phase Noise	Internal: <0.0001° rms @ 1 kHz; External: <0.005° rms @ 1 kHz (100 ms, 12 dB/oct)

Signal Channel

Dynamic Reserve	>100 dB (without band-pass tracking filters)
A/D Converter	18-bit precision
Input Signal Digitization Rate	256 kHz
Input Configuration	Differential (A-B) or Single-ended (A)
Input Noise	6 nV/√Hz at 1 kHz
Input Impedance	10 MΩ + 25 pF
Full-Scale Input Sensitivity	2 nV to 1 V
Current Input Gains	10 ⁶ V/A or 10 ⁸ V/A
Line Interference Filters	50/60 Hz and 100/120 Hz (2× line filter)
Gain Stability	<5 ppm/°C (DC coupled), <50 ppm/°C (AC coupled)

Demodulator & Filtering

Time Constants	10 μs to 30 ks
Low-Pass Filter Rolloff	6, 12, 18, or 24 dB/octave
Synchronous Filtering	Available below 200 Hz
Signal Demodulator Type	Digital DSP-based calculations

Displays & Measurements

Data Logging Memory	65,536 points
Data Processing	Savitzky-Golay smoothing, curve-fitting, statistical analysis
Data Acquisition Rate	Up to 512 Hz
Display Formats	Numeric, bar graph, polar plot, strip chart

Internal Oscillator

Oscillator Distortion	-80 dBc (f < 10 kHz), -70 dBc (f > 10 kHz)
Oscillator Frequency Resolution	0.1 mHz
Oscillator Amplitude Resolution	2 mV
Internal Oscillator Sweeps	Linear or logarithmic
Oscillator Frequency Accuracy	±25 ppm + 30 μHz
Oscillator Amplitude Accuracy	±1%
Oscillator Amplitude Stability	50 ppm/°C

Auxiliary Inputs & Outputs

Auxiliary A/D Inputs	4 channels, ±10.24 V, 16-bit resolution
Auxiliary D/A Outputs	4 channels, ±10.24 V, 16-bit resolution

Oscillator

Oscillator Amplitude Range	4 μVrms to 5 Vrms
Oscillator Output Impedance	50 Ω

Data Storage

Internal Memory Disk Drive	3.5" MS-DOS compatible, 1.44 MB or 720 kB
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Inputs & Outputs

CH1 and CH2 Outputs	±10 V full scale, 40 Ω source impedance, 10 mA max
Auxiliary A/D Input Impedance	1 MΩ
Auxiliary D/A Output Impedance	40 Ω

Interfaces

Printer Interface	Centronics parallel port
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Power

Power Consumption	60 W
Line Voltage Options	100 / 120 / 220 / 240 V AC (selectable), 50/60 Hz

TECHNOLOGY

DSP (Digital Signal Processing)

APPLICATIONS

Precision signal recovery, phase-sensitive detection, and low-level signal measurement

Generated by SpecAtlasHub (specatlashub.com). Specifications are compiled from available sources and are subject to change — verify critical values against the manufacturer before purchase.