

STANFORD RESEARCH SYSTEMS

SR780

The Stanford Research Systems SR780 is a high-performance, two-channel dynamic signal analyzer (FFT analyzer) covering the frequency range of DC to 102.4 kHz with a 90 dB dynamic range. It is designed for demanding applications in acoustics, vibration, electronic design, and control systems, offering real-time dual-channel octave analysis, swept-sine measurements, order tracking, and a low-distortion signal source.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE-488.2), RS-232, Parallel (Printer), 3.5" MS-DOS floppy drive
Display	7-inch monochrome CRT (640 × 480 resolution)
Standard Memory Size	8 MSamples
Memory Expansion Option	32 MSamples (with Option 01)
Built-in Floppy Drive	3.5-inch, 1.44 MB MS-DOS compatible format

Physical

Power Supply	100 / 120 / 220 / 240 VAC (±10%), 50/60 Hz, 150 W
Operating Temperature	0 °C to 50 °C °C
Dimensions (W×H×D)	432 × 210 × 565 mm (17" × 8.25" × 22.25") mm
Weight	25.4 kg kg

Frequency Specifications

Frequency Range	488 µHz to 102.4 kHz (both channels)
Frequency Resolution	100, 200, 400, 800 lines
Frequency Accuracy	±25 ppm (0 °C to 50 °C)
Real-Time Bandwidth	102.4 kHz (single channel)
Frequency Span	195.3 mHz to 102.4 kHz
Phase Accuracy	±0.5° (DC to 51.2 kHz), ±1.0° (DC to 102.4 kHz)
Amplitude Accuracy	±0.15 dB (excluding window effects)

Performance

Dynamic Range	90 dB typical, 80 dB guaranteed
A/D Converter	16-bit, 262 kHz delta-sigma
Crosstalk	<-145 dB (DC to 102.4 kHz, 50 Ω source)
Noise Floor	<-160 dBVrms/rtHz typical (>1 kHz, -50 dBV range)
Spurious Response	<-80 dBc
Harmonic Distortion	<-90 dBc (<15 kHz), <-80 dBc (<102.4 kHz)
Intermodulation Distortion	<-90 dBc (two tones at -6.02 dBV)
Two-Channel Real-Time Bandwidth	51.2 kHz
Swept-Sine Dynamic Range	145 dB (with auto-ranging)
Warm-Up Time	30 minutes

Signal Input Channels

Number of Channels	2
Input Configuration	Single-ended or differential
Input Coupling	AC, DC, or ICP (4 mA / 24 V source)
Input Impedance	1 M Ω + 50 pF
Maximum Input Level	50 Vp
Input Sensitivity Range	-50 dBV (3.16 mVrms) to +34 dBV (50.1 Vrms)
CMRR	90 dB at 60 Hz, 80 dB at 1 kHz

Signal Source Output

Source Types	Sine, Two-Tone, Swept-Sine, White Noise, Pink Noise, Chirp, Arbitrary
Source Frequency Range	DC to 102.4 kHz
Source Amplitude Range	0.1 mVp to 5 Vp
Source Amplitude Accuracy	± 1 dB (0.1 mVp to 5 Vp)
Source Output Impedance	< 5 ..
Source Distortion	<-80 dBc (f < 10 kHz, 1 Vp)
DC Offset Range	± 5 V

Measurement Modes and Analysis

Measurement Modes	FFT, Octave, Swept-Sine, Order Tracking, Time Capture
Window Functions	Uniform, Flattop, Hanning, Kaiser, Force/Exponential, User-defined
Averaging Types	RMS, Vector, Peak Hold
Octave Analysis Bandwidth	1/1, 1/3, 1/12 octave bands
Octave Real-Time Bandwidth	Up to 40 kHz (1/1, 1/3, 1/12 octave)
Time Capture Buffer Size	8 MB (expandable to 32 MB)
Waterfall Depth	Up to 2048 traces
Swept-Sine Frequency Range	1 mHz to 102.4 kHz
Swept-Sine Sweep Type	Linear or Logarithmic
Order Tracking Maximum Order	Up to 64 orders

Triggering

Trigger Source	Free Run, Internal, External (Analog or TTL), Source
External Trigger Level Range	± 5 V in 40 mV steps (Analog) or TTL level
Trigger Delay	Pre-trigger up to 8192 samples, Post-trigger up to 100,000 samples

Display and User Interface

Trace Configurations	Single, Dual, Horizontal, Vertical, Waterfall
Y-Axis Units	V, V ² , V ² /Hz, V/rHz, dBV, dBp, dBV/rHz, user-defined engineering units
X-Axis Units	Hz, s, Degrees, Rad, Orders
Marker Functions	Dual, Track, Band, Sideband, Harmonic, Peak Search

Connectivity and Storage

File Formats Supported	SDF (Standard Data Format), ASCII, binary
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Power and Physical Specifications

Storage Temperature	-20 °C to 60 °C
Relative Humidity Range	95% non-condensing (maximum)

Compliance and Standards

Calibration Interval	1 year
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Inputs & Outputs

Transducer (ICP) Power Source	4.8 mA current source, 24 V compliance
Preamplifier Power Port	± 15 V, 100 mA maximum, 7-pin DIN connector
External Sampling Input	TTL level, up to 262.144 kHz
Preamplifier Power Outputs	± 15 V at up to 100 mA
ICP Transducer Output	4.8 mA @ 24 VDC

Source

Arbitrary Source Resolution	16-bit
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Power

Line Frequency Range	47 Hz to 63 Hz
Power Consumption	150 W

Signal Source

Source D/A Converter Resolution	16-bit
Arbitrary Source Memory Length	2 MSamples (standard), up to 8 MSamples (memory option dependent)

Trigger

Maximum Pre-trigger Delay	8192 samples
Maximum Post-trigger Delay	150,000 samples
Trigger Delay Resolution	1 sample

Standards & Compliance

Octave Analysis Standards Compliance	ANSI S1.11-1986 (Order 3, Type 1-D), IEC 225-1966
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Interfaces

GPIO Interface Capabilities	SH1, AH1, T6, L4, SR1, RL1, PP0, DC1, DT1, C0, E2
RS-232 Maximum Baud Rate	115.2 kbps
Hardcopy Output Formats	PostScript, HP-GL, PCX, GIF

TECHNOLOGY

FFT Analyzer

APPLICATIONS

Acoustics, vibration, noise analysis, electronic testing, and control systems

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