

SPS-8

CW and Pulse

USB Power Sensor



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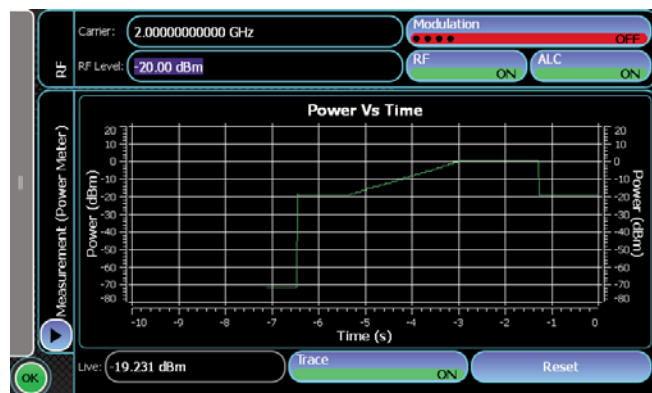
Fast, compact and rugged high performance power sensor for use with S-Series or stand-alone

- 10 MHz to 8 GHz (functional to 10 GHz)
- -60 dBm to +20 dBm
- 1.95% total error*
- 1.15:1 VSWR
- Fast measurements
- Ruggedized USB connector
- Fully calibrated over temperature
- No zero, no call!
- Plug & play with S-Series signal generator
- CW and average measurements: average power, duty cycle-corrected pulse power, data logging
- Pulse power measurements: duty cycle, measured pulse power, peak power, crest factor

* 1 GHz, -20 dBm, from a well-matched DUT

Description

Selected for use with the S-Series, the SPS-8 is an easy to use, high performance, general purpose and pulse power meter and sensor in one. High speed measurements and temperature compensated accuracy provide superior in-class performance. The SPS-8 is capable of making real-time measurements with 2000 readings per second.

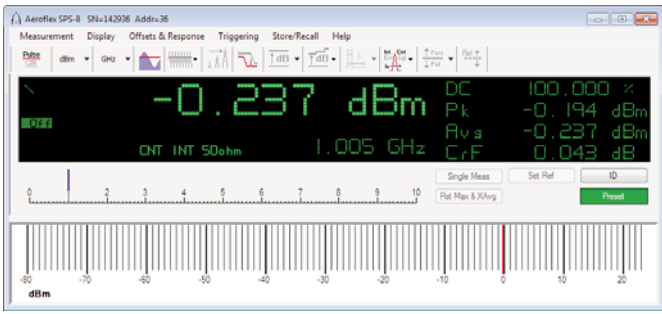


SPS-8 user interface on an S-Series SGA Signal Generator

When used with S-Series signal generators, the presence of the power sensor is detected by the signal generator and an embedded user-interface is available, independent of the settings of the signal generator.

For the full selection of features and capabilities, PC based soft front panels enable the user to perform pulse measurements, peak power and crest factor as well as utilizing the powerful data logging application.

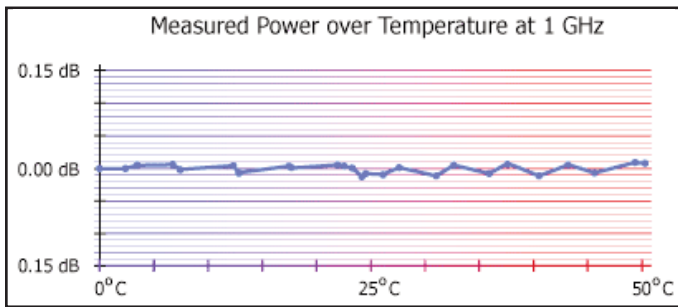
The power sensors may be easily integrated into Lab View, C, VB and other programming environments using the supplied drivers and programming examples.



SPS-8 soft front panel

No Zero No Cal™

Integration and usability are further simplified because calibration and zeroing are not required before each use or periodically during use. These time-consuming activities are a thing of the past as the SPS-8 is temperature compensated resulting in less than 10 mdB of variation over a 0°C to 50°C temperature range.



Applications

- General purpose scalar measurements
- Average and pulse RF and microwave power measurements requiring leading edge accuracy:
 - CW and pulsed signals
 - Narrow and wide band signals: CDMA, W-CDMA, QAM, OFDM, GSM, TDMA, QPSK, FSK, AM, FM, etc.
 - Recorders, power monitoring, ALC loops, servo loops, amplifier characterization
- Research and development and manufacturing
- Maintenance, repair, installation and service
- Radar, wireless, satellite, radio links.

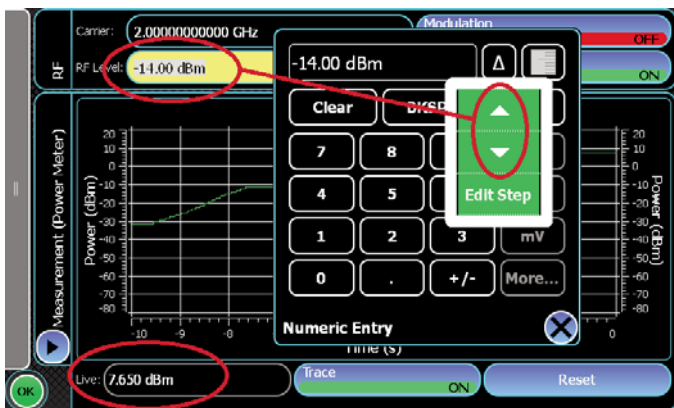
Use with S-Series

Use the SPS-8 to characterize system gain/loss in an S-Series test system employing the SCO RF Combiner and/or SPA wideband power amplifier. Gain/loss correction data obtained using the SPS-8 may be entered into an RF level offset table in the signal generator. Additional RF level offset tables may be created for each signal path and recalled as required.

This application can be extended to include gains and losses in any signal path in any test system.



Example RF level offset table



Simultaneous RF level output control and live power meter measurement

SPS-8 SPECIFICATIONS

FREQUENCY RANGE	10 MHz to 8 GHz (functional to 10 GHz)
DYNAMIC RANGE	
10 MHz to 6 GHz	-60 dBm to +20 dBm
6 GHz to 8 GHz	-50 dBm to +20 dBm
ACCURACY	Total Error (RSS) = $\sqrt{(Mm^2 + CF^2 + L^2 + N^2 + T^2 + Z^2)}$ Note 1
10 MHz to 100 MHz	7.0%
100 MHz to 500 MHz	4.0%
500 MHz to 8 GHz	1.7%
Linearity (Note 3)	
100 MHz to 2 GHz	
+15 to +20 dBm	7.0%
+10 to +15 dBm	5.0%
-60 to +10 dBm	3.0%
2 GHz to 8 GHz	
+15 to +20 dBm	5.0%
+10 to +15 dBm	3.0%
-60 to +10 dBm	2.0%
Noise (1 second integration)	
-30 to +20 dBm	
10 MHz - 100 MHz	0.22%
100 MHz - 6 GHz	0.02%
6 GHz - 8 GHz	0.04%
-50 to -30 dBm	
10 MHz - 100 MHz	0.22%
100 MHz - 6 GHz	0.04%
6 GHz - 8 GHz	0.15%
-60 to -50 dBm	
10 MHz - 100 MHz	0.44%
100 MHz - 6 GHz	0.11%
Zero Offset (Note 3)	$\{(0.35 \text{ nW @ } 25^\circ\text{C}) + \Delta T \times (0.025 \text{ nW / } ^\circ\text{C})\} \pm 0.005 \text{ nW / month}$ Note 2
Match	
10 MHz to 8 GHz	1.15:1 VSWR (23 dB return loss)
Temperature (°C)	
40 – 50	1.00% (plus 1%, 0 dBm to 10 dBm; plus 3%, 10 dBm to 20 dBm)
30 – 40	0.75% (plus 1%, 0 dBm to 10 dBm; plus 3%, 10 dBm to 20 dBm)
20 – 30	0.00%
10 – 20	0.75% (plus 1%, 0 dBm to 10 dBm; plus 3%, 10 dBm to 20 dBm)
0 – 10	1.00% (plus 1%, 0 dBm to 10 dBm; plus 3%, 10 dBm to 20 dBm)

MAXIMUM INPUT LEVELS	
Maximum Average Power	+20 dBm (100 mW)
Damage Level	+23 dBm (200 mW)
Maximum Pulse Power	+20 dBm (100 mW)
Damage Level	+23 dBm (200 mW)
Maximum Peak-to-Average Ratio	
100 MHz to 6 GHz	80 dB
6 GHz to 8 GHz	70 dB
GENERAL	
Video Bandwidth	10 MHz
Time Base	±50 ppm
Effective Sample Rate	48 MS/second
Measurements	2000/second
Pulse (Modulation) Power Measurements	Duty cycle, measured pulse power, peak power, crest factor (peak-to-average ratio)
Average Power Measurements	Average power, duty cycle-corrected pulse power, data logging
Recommended Calibration Cycle	1 year
ENVIRONMENT, OPERATING	
Temperature	0 °C to 55 °C
Humidity	15% - 95% non-condensing
Altitude	10,000 feet (3,000 meters)
ENVIRONMENT, STORAGE	
Temperature	-25 °C to 85 °C
Humidity	15% to 95% non-condensing
Altitude	50,000 feet (15,000 meters)
PHYSICAL	
Weight	78 g (2.75 oz), plus connector weight
Size - Body	40 mm by diameter by 57 mm long plus connector length
	SPS-8-OPT1 connector length is 14 mm
	SPS-8-OPT2 connector length is 40 mm

1 Error term definitions: Mm (Mismatch); CF (Cal Factor); N (Noise); L (Linearity); T (Temperature); Z (Zero Offset). All error terms are converted to percentages for RSS calculation.

2 Use the following formula to determine Zero Offset error (%): $Z = (\text{Zero Offset Power} / \text{Measured Power}) \times 100$.

3 Linearity and Zero Offset are measured as a combined specification as no meter zeroing or reference calibration is required before use.

ORDERING INFORMATION

SPS-8-OPT1	CW wide dynamic range power sensor with N-type male connector
SPS-8-OPT2	CW wide dynamic range power sensor with extended N-type male connector (recommended for use with S-Series)

Supplied Accessories

- USB cable (2-meter length)
- USB flash drive containing software, operating manual
- Quick Start Guide
- Calibration certificate

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.