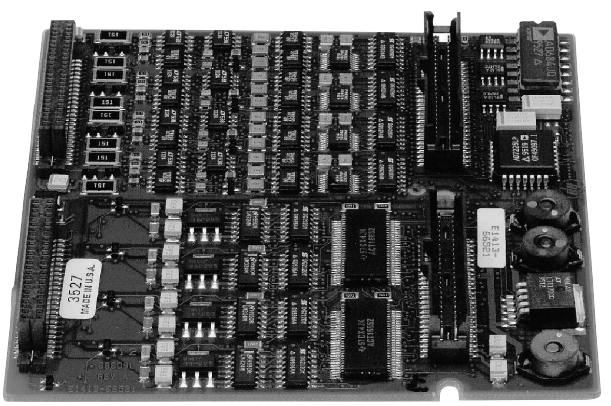
Agilent E1511A
4-Channel Transient Strain SCP

Data Sheet

- **Use with Agilent E1413C/E1415A/E1419A**
- **4 channels of sample/hold strain measurements**
- **4 channels of programmable excitation voltages**
- **Bridge excitation voltages of 1 V, 2 V, 5 V, or 10 V**



Agilent E1511A

Description

The Agilent E1511A 4-Channel Transient Strain SCP provides four channels of strain measurements. It provides strain completion circuitry and excitation voltages, a programmable filter, and sample and hold circuitry. The sample and hold inputs sample all four channels simultaneously to reduce the skew introduced by scanning.

The low-pass filter on each sample and hold channel is a 6th order Bessel active RC filter used to provide alias protection and noise reduction. The filter cutoff frequencies are 1 kHz, 500 Hz, 250 Hz, 100 Hz, and 15 Hz.

The SCP can be wired for measuring excitation voltages at the bridge connection (remote sense) or locally (terminal module). Excitation voltages of 0 V, 1 V, 2 V, 5 V, or 10 V are available on each channel.

The SCP provides a voltage gain of 0.5, 8, 64, or 512 for each channel. This SCP takes two adjacent slots in the VXI module.

Use the E1511A with the following VXI modules:

Model	Description
E1413C	64-Channel Scanning A/D Converter
E1415A	Algorithmic Closed Loop Controller
E1419A	Multifunction Measurement and Control Module

Refer to the Agilent Technologies Website for recent product updates, if applicable.

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Product Specifications

These specifications for the E1511A reflect the combined performance of the scanning A/D and the E1511A SCP.

Measurement Ranges

DC Volts: ± 8 V Full Scale

Input Characteristics

Maximum input voltage (normal mode plus common mode):
- **Operating:** <± 8 V peak
- **Damage level:** >± 42 V peak

Maximum common mode voltage:
- **Operating:** <± 16 V peak
- **Damage level:** >± 42 V peak

Common mode rejection (0 to 60 Hz):
- **x0.5 gain:** >60 dB
- **x8 gain:** >78 dB
- **x64 gain:** >100 dB
- **x512 gain:** >100 dB

Input impedance: >100 MΩ

Maximum Tare Cal Offset

Maximum tare cal offset depends on A/D range and SCP gain.

Gain	Maximum Offset
x0.5	± 25% of full scale
x8	± 90 mV
x64	± 95 mV
x512	± 95 mV

Filter Characteristics (6-pole Bessel filter)

Normal mode rejection:

15 Hz filter:
- **15 Hz:** –3 dB
- **50 Hz:** >33 dB
- **60 Hz:** >43 dB

100 Hz filter:
- **100 Hz:** –3 dB
- **400 Hz:** >43 dB

250 Hz filter:
- **250 Hz:** –3 dB
- **1000 Hz:** >43 dB

500 Hz filter:
- **500 Hz:** –3 dB
- **2000 Hz:** >43 dB

1000 Hz filter:
- **1000 Hz:** –3 dB
- **4000 Hz:** >43 dB

Sample Time Skew Between Channels

Because the low-pass filter precedes the sample and hold, the interchannel sample time skew is primarily determined by the matching of the filter propagation delay times. The table below lists the propagation delay for a step function input (measured at 50% of the final value) for each filter setting, as well as the matching between channels programmed to the same filter setting.

Bandwidth	Step propagation delay (nominal)	Delay matching (± from nominal)
1 kHz:	427.5 µsec	10 µsec
500 Hz:	854.9 µsec	20 µsec
250 Hz:	1.710 µsec	40 µsec
100 Hz:	4.275 msec	100 µsec
15 Hz:	28.50 msec	670 µsec

Maximum Filter Overshoot
< 1% of input step size

Measurement Accuracy DC Voltage

For autorange, add .05% of reading for input voltages >± 4 V.

Accuracy — Gain x0.5

Range ± FS	Linearity % of Reading:	Offset Error:	Noise 3σ:
125 mV:	0.02	488 µV	1.5 µV
0.5 mV:	0.02	488 µV	1.5 µV
2.0 V:	0.02	488 µV	1.5 µV
8.0 V:	0.02	488 µV	1.5 µV
Temperature Coefficients:	*add tempco error to above table*		
Gain:	10 ppm/°C (after *CAL)		
Offset:			
0-30 °C:	0 µV/°C		
30-55 °C:	0.75 µV/°C		

Accuracy — Gain x8

Range ± FS	Linearity % of Reading:	Offset Error:	Noise 3σ:
7.8 mV:	0.02	30.5 µV	95 µV
31.25 mV:	0.02	30.5 µV	95 µV
125 mV:	0.02	30.5 µV	95 µV
0.5 V:	0.02	30.5 µV	95 µV
Temperature Coefficients:	*add tempco error to above table*		
Gain:	10 ppm/°C (after *CAL)		
Offset:			
0-30 °C:	0 µV/°C		
30-55 °C:	0.75 µV/°C		

Accuracy — Gain x64

Range ± FS	Linearity % of Reading:	Offset Error:	Noise 3σ:
3.9 mV:	0.02	15 µV	12 µV
15.6 mV:	0.02	15 µV	12 µV
62.5 mV:	0.02	15 µV	12 µV
Temperature Coefficients:	*add tempco error to above table*		
Gain:	10 ppm/°C (after *CAL)		
Offset:			
0-40 °C:	0.14 µV/°C		
40-55 °C:	0.38 µV/°C		

Accuracy — Gain x512

Range ± FS	Linearity % of Reading:	Offset Error:	Noise 3σ:
7.81 mV:	0.04	15 µV	2 µV
Temperature Coefficients:	*add tempco error to above table*		
Gain:	10 ppm/°C (after *CAL)		
Offset:			
0-40 °C:	0.14 µV/°C		
40-55 °C:	0.38 µV/°C		

Current Requirements (Amps)

5 V max	24 V max	-24 V max
0.55	0.145	0.143

Ordering Information

Description	Product No.
4-Channel Transient Strain SCP	E1511A

Related Literature

2000 Test System and VXI Catalog CD-ROM,
Agilent Pub. No. 5980-0308E (detailed specifications for VXI products)

2000 Test System and VXI Catalog,
Agilent Pub. No. 5980-0307E (overview of VXI products)

1998 Test System and VXI Products Data Book,
Agilent Pub. No. 5966-2812E

Online

Internet access for Agilent product information, services and support
www.agilent.com/find/tmdir

VXI product information
www.agilent.com/find/vxi

Defense Electronics Applications
www.agilent.com/find/defense_ATE

Agilent Technologies VXI Channel Partners
www.agilent.com/find/vxichanpart

Agilent Technologies' HP VEE Application Website
www.agilent.com/find/vee

Agilent Technologies Data Acquisition and Control Website
www.agilent.com/find/data_acq

Agilent Technologies Instrument Driver Downloads
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Agilent Technologies Electronics Manufacturing Test Solutions
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