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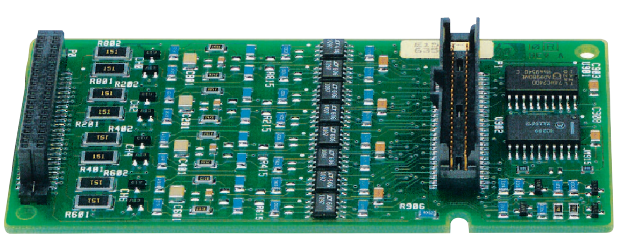
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Find the *Keysight / Agilent E1512A* at our website: *Click HERE*

Agilent E1512A
8-Channel 25 Hz Fixed Filter SCP
Data Sheet

- **Use with Agilent E1413C/E1415A/E1419A**
- **Fixed 25 Hz filter per channel**
- **± 16 V inputs with over-voltage protection**
- **Open transducer detection**



Agilent E1512A

Description

The Agilent E1512A 8-Channel 25 Hz Fixed Filter SCP provides eight fixed low-pass filters with a 3 dB cutoff frequency of 25 Hz. It also provides input over-voltage protection and open transducer detection on each channel.

Use the E1512A 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.

Voltage Measurements

The E1512A is ideal for measuring signals from sensors with full-scale voltage outputs from 62 mV to 16 V. The 2-pole, low pass filter reduces sensor based noise in the measurement.

Temperature Measurements

The E1512A can be used to make temperature measurements with thermocouples, thermistors, or RTDs. The E1512A can directly read thermocouples, however, the E1503A/E1508A/E1509A SCPs provide higher accuracy thermocouple measurements.

Temperature measurements with thermistors or RTDs require the E1505A 8-Channel Current Source SCP. Engineering units conversion to degrees C are made on-card at full speed.

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Resistance Measurements

Resistance is measured using the E1505A 8–Channel Current Source SCP with the E1512A SCP. Measurements are made by applying a dc current to the unknown and measuring the voltage drop across the unknown. The current source is provided through the E1505A. The recommended application is as shown here using four-wire Ω connections. Two-wire Ω measurement is possible but not recommended since two 150 Ω series resistors protecting the input FET multiplexer are included in the measurement.

Strain Measurements

The E1512A can be used to make strain measurements when combined with either the E1506A or E1507A Strain Completion SCPs. Refer to the E1506A/E1507A *Technical Specifications* for more information.

Temperature Measurement Accuracy

The thermocouple specifications following this description include the errors due to measuring the voltage output of the thermocouple, and the algorithm errors due to converting the thermocouple voltage to temperature or the Measurement/ Conversion Error (MCE). To this error the Reference Junction Measurement Error (RJME) must be added due to measuring the reference junction temperature with an RTD or thermistor (this measurement requires an E1505A). Also, the Isothermal Reference Gradient Errors (IRGE) must be added due to gradients across the isothermal reference. If an external isothermal reference panel is used, consult the manufacturer's specifications. If Agilent terminal blocks are used as the isothermal reference, see the notes below.

Total Temperature Error = $[(MCE)^2 + (RJME)^2 + (IRGE)2]^{1/2}$

NOTES:

1) When using the Terminal Block as the isothermal reference, add ± 0.6 °C to the thermocouple accuracy specs to account for temperature gradients across the Terminal Block. The ambient temperature of the air surrounding the Terminal Block must be within ± 2 °C of the temperature of the inlet cooling air to the VXI mainframe.

2) When using the Agilent E1586A Rack Mount Terminal Panel as the isothermal reference, add ± 0.2 °C to the thermocouple accuracy specs to account for temperature gradients across the E1586A. The E1586A should be mounted in the bottom part of the rack, below and away from other heat sources, for best performance.

The following temperature accuracy specifications include instrument and firmware linearization errors. The linearization algorithm used is based on the ITS-90 transducer curves. Add your transducer accuracy to determine total measurement error.

Thermistors

2252 Ω

A/D Filter:	0 to 30 °C:	30 to 70 °C:	70 to 80 °C:	80 to 100 °C:
OFF	0.012 °C	0.013 °C	0.014 °C	0.024 °C
ON*	0.010 °C	0.012 °C	0.010 °C	0.014 °C

5 kΩ

A/D Filter:	0 to 30 °C:	30 to 70 °C:	70 to 85 °C:
OFF	0.014 °C	0.027 °C	0.048 °C
ON*	0.011 °C	0.017 °C	0.027 °C

5 kΩ Reference

A/D Filter:	–10 to 65 °C:	65 to 85 °C:
OFF	0.011 °C	0.021 °C
ON*	0.0095 °C	0.0115 °C

10 kΩ

A/D Filter:	0 to 30 °C:	30 to 60 °C:	60 to 90 °C:	90 to 115 °C:
OFF	0.015 °C	0.024 °C	0.034 °C	0.059 °C
ON*	0.013 °C	0.016 °C	0.021 °C	0.032 °C

RTDs

100 Ω

A/D Filter:	–200 to 75 °C:	75 to 300 °C:	300 to 600 °C:	600 to 970 °C:
OFF	0.19 °C	0.37 °C	0.43 °C	0.53 °C
ON*	0.11 °C	0.21 °C	0.36 °C	0.46 °C

100 Ω Reference

A/D Filter:	–125 to 75 °C:
OFF	0.75 °C
ON*	0.36 °C

Thermocouples

Type E

A/D Filter:	–200 to 0 °C:	0 to 200 °C:	200 to 400 °C:	400 to 800 °C:
OFF	2.25 °C	0.65 °C	0.50 °C	0.45 °C
ON*	1.65 °C	0.34 °C	0.24 °C	0.23 °C

Type E Extended

A/D Filter:	–200 to 0 °C:	0 to 200 °C:	200 to 600 °C:	600 to 800 °C:
OFF	14.7 °C	0.80 °C	0.50 °C	0.80 °C
ON*	13.8 °C	0.49 °C	0.30 °C	0.45 °C

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Type T A/D Filter:	–200 to –100 °C:	–100 to 0 °C:	0 to 200 °C:	200 to 400 °C:
OFF	3.40 °C	1.90 °C	0.90 °C	0.70 °C
ON*	2.25 °C	0.78 °C	0.46 °C	0.33 °C
Type S **A/D Filter:**	**0 to 100 °C:**	**100 to 200 °C:**	**200 to 800 °C:**	**800 to 1750 °C:**
OFF	8.00 °C	5.60 °C	4.45 °C	3.30 °C
ON*	5.20 °C	3.25 °C	2.40 °C	1.60 °C
Type R **A/D Filter:**	**0 to 100 °C:**	**100 to 200 °C:**	**200 to 600 °C:**	**600 to 1000 °C:**
OFF	6.90 °C	5.00 °C	4.00 °C	3.10 °C
ON*	3.80 °C	2.60 °C	1.95 °C	1.70 °C
Type K **A/D Filter:**	**–200 to 0 °C:**	**0 to 400 °C:**	**400 to 800 °C:**	**800 to 1400 °C:**
OFF	4.30 °C	0.90 °C	0.85 °C	1.10 °C
ON*	3.35 °C	0.50 °C	0.40 °C	0.52 °C
Type J **A/D Filter:**	**–200 to 0 °C:**	**0 to 200 °C:**	**200 to 600 °C:**	**600 to 775 °C:**
OFF	2.65 °C	0.75 °C	0.63 °C	0.63 °C
ON*	2.00 °C	0.38 °C	0.32 °C	0.32 °C

Product Specifications

These specifications for the E1512A reflect the combined performance of the scanning A/D and the E1512A SCP.

Measurement Ranges

DC Volts: ± 62.5 mV to ± 16 V Full Scale

Temperature:

- **Thermocouples:** –200 to + 1700 °C
- **Thermistors: *** –80 to + 160 °C
- **RTD's: *** –200 to + 850 °C

Resistance:** 128 Ω to 131K Ω FS

Strain:** 25,000 με or limit of linear range of strain gage

* Requires Agilent E1505A.
** Requires Agilent E1506A/E1507A.

Input Characteristics

Maximum input voltage (normal mode plus common mode):

- **Operating** <± 16 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:** –100 dB

Input impedance: >100 MΩ differential

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Maximum Tare Cal Offset

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

A/D Range ±V F. Scale	Maximum Offset
16	3.2213
4	.82101
1	.23061
0.25	.07581
0.0625	.03792

Measurement Accuracy DC Volts

If autoranging is ON, add ± .02% FS to accuracy specifications.

A/D Range ±V F. Scale	Linearity % of Reading	Offset Error	Noise 3σ	Noise* 3σ
.0625	0.01%	7.2 µV	34 µV	15 µV
.25	0.01%	12.2 µV	60 µV	28 µV
1	0.01%	33 µV	110 µV	92 µV
4	0.01%	122 µV	450 µV	366 µV
16	0.01%	488 µV	1.8 µV	1.5 µV

**A/D filter ON (min sample period ≥145 µs: ≤100 Hz scan rate 64 ch).*

Temperature Coefficients:

	Temp Range	Tempco
Gain:		10 ppm/°C
Offset:	0-30 °C	No additional error
	30-40 °C	0.1 µV/°C
	40-55 °C	2.4 µV + 0.27 µV/°C

Normal Mode Rejection

25 Hz LP filter:

25 Hz:	–3 dB
60 Hz:	>–20 dB

Common Mode Rejection

0 to 60 Hz:

Typical:	>108 dB
Minimum:	>100 dB

Current Requirements (Amps)

5 V max	24 V max	-24 V max
0.01	0.02	0.02

Ordering Information

Description	Product No.
8-Channel 25 Hz Fixed Filter SCP	E1512A

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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
www.agilent.com/find/inst_drivers

Agilent Technologies Electronics Manufacturing Test Solutions
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Get assistance with all your test and measurement needs at
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