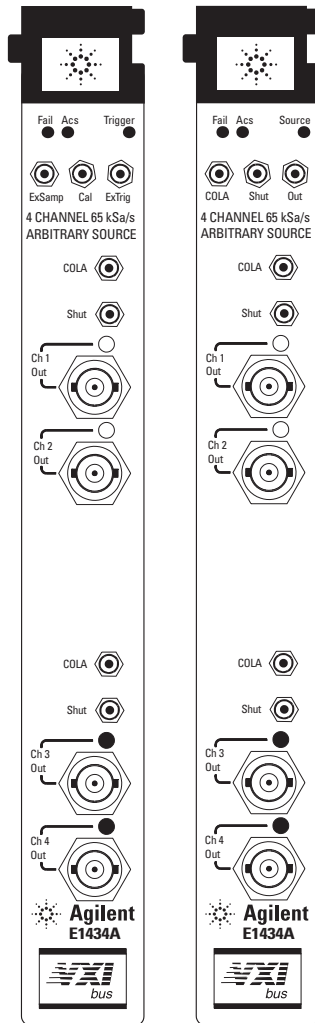
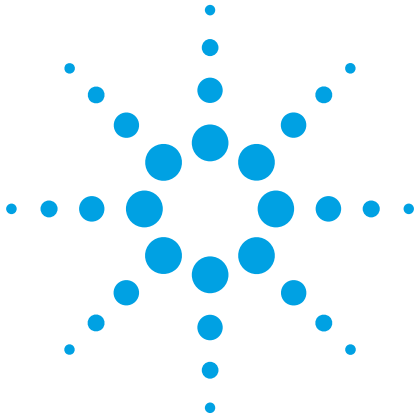


# Agilent E1434A

## 4-Channel 25.6 kHz Arbitrary Source

### Technical Specifications



Agilent E1434A

Agilent E1434A  
with additional  
Arbitrary Source  
Option 1D4

The Agilent E1434A 4-Channel 65 kSa/s Arbitrary Source is a C-sized VXI module. It provides a maximum signal data rate of 65,536 samples per second, per channel.

The E1434A may contain one or two 2-channel source assemblies so that the module may have a total of up to four outputs. In addition, if option 1D4 is installed, it provides one additional output for a total of five output channels.

This intelligent module provides arbitrary waveform output capability with both loop mode and continuous arbitrary waveforms, using dynamic updating of data.



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## Specifications

### General

<b>Output Modes</b>	Sine, burst sine Pseudo random noise, with burst and band translation Arbitrary waveform with loop or continuous output and burst
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### Operating Modes

#### 16-Bit Mode

Number of channels	2, 4, or 5
Maximum signal frequency	25.6 kHz
Output data rate (Fs)	48.00 kHz to 65.536 kHz

#### 20-Bit Mode

Number of channels	1 or 2, 3 with optional source
Maximum signal frequency	6.4 kHz
Output data rate (Fs)	12.00 kHz to 16.384 kHz

<b>Frequency Accuracy</b>	± 0.012% (120 ppm)
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### Signal Output

<b>Number of Output Channels</b>	2, 4, or 5, depending on option selected
<b>Maximum Amplitude</b>	10 Vp nominal
<b>Output Impedance</b>	< 0.5Ω (typical)
<b>Maximum Output Current</b>	100 mA (typical)
<b>Maximum Capacitive Load</b>	0.01 μF (typical)

### Amplitude Control

(*signal amplitude = amplitude range × amplitude scale factor*)

Maximum signal amplitude	10 Vp nominal
Amplitude ranges	10 Vp to 79 mVp in 0.375 dB steps
Amplitude scale factor	1.0 to 0.0, with 16-bit or 20-bit resolution

### Residual Output Noise Voltage

1 Vp Range, Freq > 500 Hz	< 500 nV/√Hz
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### Residual DC Offset

Offset after autozero	± 2 mV
Offset after shutdown	± 20 mV

### Channel-to-channel Crosstalk

(at sine frequency of generating channels, all channels same range)

Signal amplitude ≥ 1.0 Vp	< -80 dB
Signal amplitude < 1.0 Vp	< -80 dBVp (100 μVp)

<b>Output Overload Trip</b>	> 17V (typical)
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<b>Amplitude Ramp-down Time</b> (programmable)	0 to 30 seconds
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### Shutdown

Shutdown input signal	TTL levels
Shutdown time	< 5s
Shutdown time, ac fail	< 4 ms

## Sine Output Mode

### Sine Frequency (65.536 kHz Fs)

Frequency range	0 to 25.6 kHz
Frequency resolution	
Sine frequency $\leq 1$ kHz	244 $\mu$ Hz
1 kHz < sine frequency $\leq 10$ kHz	2.384 mHz
10 kHz < sine frequency $\leq 25.6$ kHz	6.10 mHz

### Amplitude Accuracy

(1 kHz sine wave,  $\geq 200\Omega$  load)

10 Vp to 0.158 Vp ranges	$\pm 0.20$ dB (2.3%)
0.152 Vp to 79 mVp ranges	$\pm 0.40$ dB (4.7%)

<b>Flatness</b> (relative to 1 kHz)	$\pm 0.5$ dB
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### Harmonic and Aliased-harmonic Distortion

( $\geq 1$  k $\Omega$  load)

1 Vp range, 1.0 scale factor, 0 to 6.4 kHz (20 bit mode)	< -80 dBc
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2 to 10 Vp range, 0.05 to 1.0 scale factor, 0 to 25.6 kHz (16-bit mode)	< -70 dBc
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<b>Spurious Responses</b>	< -60 dBVp
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<b>Channel-to-channel Phase Match at 1 kHz</b>	$\pm 1.0$ deg
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### Noise Output Modes

<b>Frequency Spans</b>	see table: Noise/Arb Frequency Spans
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<b>Passband Flatness</b> (Measurement BW >1% of span)	< 1.2 dB (typical)
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<b>Crest Factor</b>	4.1 (typical)
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<b>Percent In-band Energy</b>	> 90% (typical)
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### Frequency Band Translation (Zoom)

(16 and 20 bit modes):

For Fs=	Maximum Span	Maximum Center Frequency
65,536 kHz (channels 1 and 3 active, only)	5.12 kHz	5.12 kHz
64,000 kHz (channels 1 and 3 active, only)	5.00 kHz	5.00 kHz
51,200 kHz	4.00 kHz	4.00 kHz
48,000 kHz	3.750 kHz	3.750 kHz
40.96 kHz	2.200 kHz	2.200 kHz

Minimum span: Maximum Span  $\div 2^{16}$

Center frequency settibility:

Sine frequency $\leq 1$ kHz	244 $\mu$ Hz
1 kHz < sine frequency $\leq 5$ kHz	1.22 mHz

**Noise/Arb Frequency Spans**

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<b>Mode</b>	<b>Sample Rate (Hz)</b>	<b>Bandwidth (Hz)</b>
16-bit	65536	25600
16-bit	64000	25000
16-bit	51200	20000
16-bit	48000	18750
16-bit	40960	16000
16-bit	32768	12800
16-bit	32000	12500
16-bit	25600	10000
16-bit	24000	9375
16-bit	20480	8000
16,20-bit	16384	6400
16,20-bit	16000	6250
16,20-bit,zoom	13107.2	5120
16,20-bit,zoom	12800	5000
16,20-bit	12000	4687.5
16,20-bit,zoom	10240	4000
16,20-bit,zoom	9600	3750
16,20-bit,zoom	8192	3200
16,20-bit	8000	3125
16,20-bit,zoom	6553.6	2560
16,20-bit,zoom	6400	2500
16,20-bit	6000	2343.75
16,20-bit,zoom	5120	2000
16,20-bit,zoom	4800	1875
16,20-bit,zoom	4096	1600
16,20-bit	4000	1562.5
16,20-bit,zoom	3276.8	1280
16,20-bit,zoom	3200	1250
16,20-bit	3000	1171.875
16,20-bit,zoom	2560	1000
16,20-bit,zoom	2400	937.5
16,20-bit,zoom	2048	800
16,20-bit	2000	781.25
16,20-bit,zoom	1638.4	640
16,20-bit,zoom	1600	625
16,20-bit	1500	585.9375
16,20-bit,zoom	1280	500
16,20-bit,zoom	1200	468.75
16,20-bit,zoom	1024	400
16,20-bit	1000	390.625
16,20-bit,zoom	819.2	320
16,20-bit,zoom	800	312.5
16,20-bit	750	292.9688
16,20-bit,zoom	640	250
16,20-bit,zoom	600	234.375
16,20-bit,zoom	512	200
16,20-bit	500	195.3125
16,20-bit,zoom	409.6	160
16,20-bit,zoom	400	156.25
16,20-bit	375	146.4844
16,20-bit,zoom	320	125
16,20-bit,zoom	300	117.1875
16,20-bit,zoom	256	100
16,20-bit	250	97.65625
16,20-bit,zoom	204.8	80
16,20-bit,zoom	200	78.125
16,20-bit	187.5	73.24219
16,20-bit,zoom	160	62.5
16,20-bit,zoom	150	58.59375
16,20-bit,zoom	128	50
16,20-bit	125	48.82813
16,20-bit,zoom	102.4	40
16,20-bit,zoom	100	39.0625
16,20-bit	93.75	36.62109
16,20-bit,zoom	80	31.25

### Noise/Arb Frequency Spans

Mode	Sample Rate (Hz)	Bandwidth (Hz)
16,20-bit,zoom	75	29.29688
16,20-bit,zoom	64	25
16,20-bit	62.5	24.41406
16,20-bit,zoom	51.2	20
16,20-bit,zoom	50	19.53125
16,20-bit	46.875	18.31055
16,20-bit,zoom	40	15.625
16,20-bit,zoom	37.5	14.64844
16,20-bit	32	12.5
16,20-bit	31.25	12.20703
16,20-bit,zoom	25.6	10
16,20-bit,zoom	25	9.765625
16,20-bit	23.4375	9.155273
16,20-bit,zoom	20	7.8125
16,20-bit,zoom	18.75	7.324219
16,20-bit,zoom	16	6.25
16,20-bit	15.625	6.103516
16,20-bit,zoom	12.8	5
16,20-bit,zoom	12.5	4.882813
16,20-bit	11.71875	4.577637
16,20-bit,zoom	10	3.90625
16,20-bit,zoom	9.375	3.662109
16,20-bit,zoom	8	3.125
16,20-bit	7.8125	3.051758
16,20-bit,zoom	6.4	2.5
16,20-bit,zoom	6.25	2.441406
16,20-bit	5.859375	2.288818
16,20-bit,zoom	5	1.953125
16,20-bit,zoom	4.6875	1.831055
16,20-bit,zoom	4	1.5625
16,20-bit	3.90625	1.525879
16,20-bit,zoom	3.2	1.25
16,20-bit,zoom	3.125	1.220703
16,20-bit	2.929688	1.144409
16,20-bit,zoom	2.5	0.976563
16,20-bit,zoom	2.34375	0.915527
16,20-bit,zoom	2	0.78125
16,20-bit	1.953125	0.762939
16,20-bit,zoom	1.6	0.625
16,20-bit,zoom	1.5625	0.610352
16,20-bit	1.464844	0.572205
16,20-bit,zoom	1.25	0.488281
16,20-bit,zoom	1.171875	0.457764
16,20-bit,zoom	1	0.390625
16,20-bit	0.976563	0.38147
16,20-bit,zoom	0.8	0.3125
16,20-bit,zoom	0.78125	0.305176
16,20-bit	0.732422	0.286102
16,20-bit,zoom	0.625	0.244141
16,20-bit,zoom	0.585938	0.228882
16,20-bit,zoom	0.5	0.195313
16,20-bit	0.488281	0.190735
16,20-bit,zoom	0.4	0.15625
16,20-bit,zoom	0.390625	0.152588
16,20-bit	0.366211	0.143051
16,20-bit,zoom	0.3125	0.12207
16,20-bit,zoom	0.292969	0.114441
16,20-bit,zoom	0.25	0.097656
16,20-bit	0.244141	0.095367
16,20-bit,zoom	0.2	0.078125
16,20-bit,zoom	0.195313	0.076294
16,20-bit	0.183105	0.071526
16,20-bit,zoom	0.15625	0.061035
16,20-bit,zoom	0.146484	0.05722
16,20-bit,zoom	0.125	0.048828

# VXI System Level Specifications

## Arbitrary Output Mode

<b>Maximum signal bandwidth</b>	25.6 kHz
<b>Buffer size</b>	40,960 samples x 2 buffers
<b>Continuous Arb Data Rate</b>	The Noise/Arb Frequency Spans table gives the continuous rate at which a user must supply data for a given span.

## Constant Level Output

<b>Output Level at 1 kHz</b> (after 1 second settling, amplitude scale factor is > 0.001)	1 Vp (nominal)
<b>Output Impedance</b>	1.2 k $\Omega$ (typical)
<b>Flatness</b>	
25 Hz to 5 kHz, amplitude scale factor 0.001 to 1.0	1.13 Vp to 0.50 Vp (+10, -6.0 dB) (typical)
5 Hz to 20 kHz, amplitude scale factor 0.01 to 1.0	1.13 Vp to 0.44 Vp (+10, -7.0 dB) (typical)
5 Hz to 20 kHz, amplitude scale factor 0.1 to 1.0	1.13 Vp to 0.88 Vp ( $\pm$ 1.0 dB) (typical)
<b>Sine Wave Distortion</b> (at 1 kHz, amplitude scale factor 0.1 to 1.0)	-40 dBc (typical)
<b>Residual dc Offset</b>	< 5 mV (typical)
<b>Summer Input</b> (optional 5th channel only)	
<b>Maximum Input</b>	Level 10 Vp
<b>Gain, Summer Input to Signal Output</b>	0 $\pm$ 0.5 dB at 1 kHz
<b>Input Impedance</b>	> 10 k $\Omega$ (typical)
<b>Flatness, dc to 25.6 kHz</b>	$\pm$ 0.5 dB (typical)
<b>Sine Wave Distortion</b>	-80 dBc (typical)
<b>Residual dc Offset</b>	1 mV (typical)

## Features

<b>VXI Standard Information</b>	<p>Conforms to VXI revision 1.4</p> <p>C-size, single slot width</p> <p>Register-based programming</p> <p>"Slave" Data Transfer Bus functionality</p> <p>A24 address capability</p> <p>D32 data capability</p> <p>Optional Local Bus capability</p> <p>SUMBUS driver and receiver</p> <p>Requires 2 or 4 TTLTRG_ lines for multi-module synchronization</p>
<b>Signal Processing</b>	<p>33 MHz Motorola 96002 DSP</p> <p>Two banks of 128K word static RAM</p> <p>128 Kbytes Flash ROM</p> <p>Direct Memory Access (DMA) data transfer</p> <p>4 Mbytes dynamic RAM with option ANM</p> <p>32 Mbytes dynamic RAM with option ANC</p>
<b>Software Drivers</b>	
<b>Driver Type</b>	C libraries with source code
<b>Supported Operating Systems</b>	Microsoft Windows <sup>®</sup> 95 and Windows NT <sup>®</sup> , and HP-UX 10.20
<b>Supply Media</b>	CD-ROM
<b>VXI Plug &amp; Play Compliance</b>	C libraries support MS Windows 95 and Windows NT and HP-UX 10.20.

HP-UX 10.X for HP 9000 Series 700 and 800 computers are X/Open Company UNIX 93 branded products.

MS Windows and Windows NT are U.S. registered trademarks of Microsoft Corporation.



## Specification Note

Specifications describe warranted performance over the temperature range of 0° to 50 °C, after a 15-minute warm-up from ambient conditions. Supplemental characteristics identified as “typical” provide useful information by giving non-warranted performance parameters. Typical performance is applicable from 20° to 30 °C.

## Abbreviations

**F<sub>s</sub>** = sample rate of ADC.

**F<sub>c</sub>** = cut off frequency of high pass or low pass filters.

**dB<sub>fs</sub>** = dB relative to full scale amplitude range.

**dB<sub>c</sub>** = dB relative to carrier amplitude.

**Typical** = typical, non-warranted, performance specification included to provide general product information.

## Warranty Information

This product is distributed, warranted, and supported by Agilent Technologies. The E1434A comes with a three year warranty. During that period, the unit will either be replaced or repaired, at Agilent Technologies' option, and returned to the customer without charge.

## Related Agilent Literature

Agilent E1432A/33B/34A  
Product Overview  
5965-9834E

[http://www.tm.agilent.com/tmo/pia/data\\_acq/PIATop/English/index.html](http://www.tm.agilent.com/tmo/pia/data_acq/PIATop/English/index.html)

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