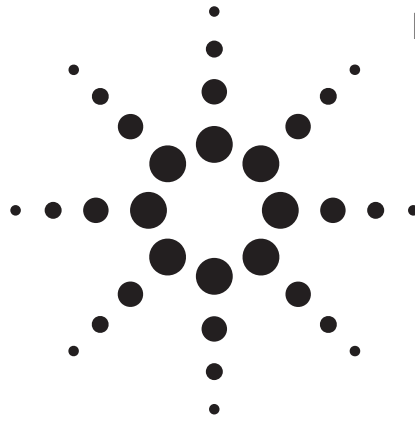


Agilent 34970A Data Acquisition/Switch Unit

Product Overview



**Agilent performance
at a fraction of the cost
of other standalone
data acquisition systems**



Customize your Agilent 34970A with-plug-in modules

A complete selection of plug-in modules gives you high-quality measurement, switching, and control capabilities to choose from. Modules include both low-frequency and RF multiplexers, a matrix switch, a general-purpose switch, and a multifunction module that includes digital input/output, analog output, and totalizer capabilities. You can mix and match modules to get just the functionality you need right now—then change or add more channels later as your application grows.

Modules for the 34970A are designed to make your testing easier, faster, and more reliable. Here's how:

Higher throughput

Our unique architecture incorporates a high-performance microprocessor on each module, off-loading the mainframe processor and minimizing backplane communications for faster throughput.

More channels in less space

Surface mount construction and a highly integrated design minimize the space required for relay drive and interface circuitry. High density on-module connectors save both board and connector space normally required by a terminal block. We use the latest technology to squeeze the most out of the remaining board space, giving you up to 40 single-ended channels in roughly the same space used by many data acquisition system terminal blocks.

Convenient connections

On-module screw-terminal connectors make wiring more convenient. Built-in strain-relief cable routing and cable tie points keep your wiring secure and safe from accidental tugs and pulls. An internal analog bus routes signals from any of the low-frequency multiplexers directly to the internal DMM, without the need for external connections.

Use the chart below to help you pinpoint the modules that meet your needs.

Agilent Modules-at-a-Glance Selection Guide

Model Description	Type	Speed (ch/sec)	Max Volts	Max Amps	Bandwidth	Thermal Offset	Comments	Page
34901A 20 ch Multiplexer	2-wire armature (4-wire selectable)	60	300 V	1A	10 MHz	< 3 μ V	Built-in cold junction reference 2 additional current channels (22 total)	18
34902A 16 ch Multiplexer	2-wire reed (4-wire selectable)	250	300 V	50 mA	10 MHz	< 6 μ V	Built-in cold junction reference	19
34903A 20 ch Actuator/GP Switch	SPDT/form C	120	300 V	1A	10 MHz	< 3 μ V		20
34904A 4 x 8 Matrix	2-wire armature	120	300 V	1A	10 MHz	< 3 μ V		20
34905A Dual 4 ch RF Mux 50 Ω	Common Low (unterminated)	60	42 V	0.7 A	2 GHz	< 6 μ V	1 GHz bandwidth through BNC-to-SMB adapter cable	21
34906A Dual 4 ch RF Mux 75 Ω	Common Low (unterminated)	60	42 V	0.7 A	2 GHz	< 6 μ V	1 GHz bandwidth through BNC-to-SMB adapter cable	21
34907A Multifunction Module	Two 8-bit digital I/O ports 26-bit Event Counter Two 16-bit Analog outputs		42 V 42 V \pm 12 V	400 mA 10 mA	100 KHz dc		Open drain Selectable input threshold Max 40 mA total output per frame	22
34908A 40 ch Single-Ended Mux	1-wire armature (common low)	60	300 V	1A	10 MHz	< 3 μ V	Built-in cold junction reference No four-wire measurements	19

Accuracy Specifications \pm (% of reading + % of range)^[1]

Includes measurement error, switching error, and transducer conversion error

	Range ^[3]	Frequency, etc.	24 Hour ^[2] 23°C \pm 1°C	90 Day 23°C \pm 5°C	1 Year 23°C \pm 5°C	Temperature Coefficient 0°C–18°C, 28°C–55°C
DC Voltage						
	100.0000 mV		0.0030 + 0.0035	0.0040 + 0.0040	0.0050 + 0.0040	0.0005 + 0.0005
	1.000000 V		0.0020 + 0.0006	0.0030 + 0.0007	0.0040 + 0.0007	0.0005 + 0.0001
	10.00000 V		0.0015 + 0.0004	0.0020 + 0.0005	0.0035 + 0.0005	0.0005 + 0.0001
	100.0000 V		0.0020 + 0.0006	0.0035 + 0.0006	0.0045 + 0.0006	0.0005 + 0.0001
	300.0000 V		0.0020 + 0.0020	0.0035 + 0.0030	0.0045 + 0.0030	0.0005 + 0.0003
True RMS AC Voltage^[4]						
	100.0000 mV to 100.0000V	3 Hz–5 Hz	1.00 + 0.03	1.00 + 0.04	1.00 + 0.04	0.100 + 0.004
		5 Hz–10 Hz	0.35 + 0.03	0.35 + 0.04	0.35 + 0.04	0.035 + 0.004
		10 Hz–20 kHz	0.04 + 0.03	0.05 + 0.04	0.06 + 0.04	0.005 + 0.004
		20 kHz–50 kHz	0.10 + 0.05	0.11 + 0.05	0.12 + 0.05	0.011 + 0.005
		50 kHz–100 kHz	0.55 + 0.08	0.60 + 0.08	0.60 + 0.08	0.060 + 0.008
		100 kHz–300 kHz ^[5]	4.00 + 0.50	4.00 + 0.50	4.00 + 0.50	0.20 + 0.02
	300.0000V	3 Hz–5 Hz	1.00 + 0.05	1.00 + 0.08	1.00 + 0.08	0.100 + 0.008
		5 Hz–10 Hz	0.35 + 0.05	0.35 + 0.08	0.35 + 0.08	0.035 + 0.008
		10 Hz–20 kHz	0.04 + 0.05	0.05 + 0.08	0.06 + 0.08	0.005 + 0.008
		20 kHz–50 kHz	0.10 + 0.10	0.11 + 0.12	0.12 + 0.12	0.011 + 0.012
		50 kHz–100 kHz	0.55 + 0.20	0.60 + 0.20	0.60 + 0.20	0.060 + 0.020
		100 kHz–300 kHz ^[5]	4.00 + 1.25	4.00 + 1.25	4.00 + 1.25	0.20 + 0.05
Resistance^[6]						
	100.0000	1 mA current source	0.0030 + 0.0035	0.008 + 0.004	0.010 + 0.004	0.0006 + 0.0005
	1.000000 k	1 mA	0.0020 + 0.0006	0.008 + 0.001	0.010 + 0.001	0.0006 + 0.0001
	10.00000 k	100 μA	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0006 + 0.0001
	100.0000 k	10 μ A	0.0020 + 0.0005	0.008 + 0.001	0.010 + 0.001	0.0006 + 0.0001
	1.000000 M	5.0 μ A	0.002 + 0.001	0.008 + 0.001	0.010 + 0.001	0.0010 + 0.0002
	10.00000 M	500 nA	0.015 + 0.001	0.020 + 0.001	0.040 + 0.001	0.0030 + 0.0004
	100.0000 M	500 nA/10 M	0.300 + 0.010	0.800 + 0.010	0.800 + 0.010	0.1500 + 0.0002
Frequency and Period^[7]						
	100 mV to 300 V	3 Hz–5 Hz	0.10	0.10	0.10	0.005
		5 Hz–10 Hz	0.05	0.05	0.05	0.005
		10 Hz–40 Hz	0.03	0.03	0.03	0.001
		40 Hz–300 kHz	0.006	0.01	0.01	0.001
DC Current (34901A only)						
	10.00000 mA	<0.1 V burden	0.005 + 0.010	0.030 + 0.020	0.050 + 0.020	0.002 + 0.0020
	100.0000 mA	<0.6 V	0.010 + 0.004	0.030 + 0.005	0.050 + 0.005	0.002 + 0.0005
	1.000000 A	<2 V	0.050 + 0.006	0.080 + 0.010	0.100 + 0.010	0.005 + 0.0010
True RMS AC Current (34901A only)						
	10.00000 mA and ^[4] 1.000000 A	3 Hz–5 Hz	1.00 + 0.04	1.00 + 0.04	1.00 + 0.04	0.100 + 0.006
		5 Hz–10 Hz	0.30 + 0.04	0.30 + 0.04	0.30 + 0.04	0.035 + 0.006
		10 Hz–5 kHz	0.10 + 0.04	0.10 + 0.04	0.10 + 0.04	0.015 + 0.006
	100.0000 mA ^[8]	3 Hz–5 Hz	1.00 + 0.5	1.00 + 0.5	1.00 + 0.5	0.100 + 0.06
		5 Hz–10 Hz	0.30 + 0.5	0.30 + 0.5	0.30 + 0.5	0.035 + 0.06
		10 Hz–5 kHz	0.10 + 0.5	0.10 + 0.5	0.10 + 0.5	0.015 + 0.06
Temperature						
	Thermocouple^[10]	Type	1-Year Accuracy^[9]		Extended Range 1-Year Accuracy^[9]	
		B	1100°C to 1820°C	1.2°C	400°C to 1100°C	1.8°C
		E	-150°C to 1000°C	1.0°C	-200°C to -150°C	1.5°C
		J	-150°C to 1200°C	1.0°C	-210°C to -150°C	1.2°C
		K	-100°C to 1200°C	1.0°C	-200°C to -100°C	1.5°C
		N	-100°C to 1300°C	1.0°C	-200°C to -100°C	1.5°C
		R	300°C to 1760°C	1.2°C	-50°C to 300°C	1.8°C
		S	400°C to 1760°C	1.2°C	-50°C to 400°C	1.8°C
		T	-100°C to 400°C	1.0°C	-200°C to -100°C	1.5°C
						0.03 °C
	RTD	R ₀ from 49 Ω to 2.1 k Ω	-200°C to 600°C	0.06°C		
						0.003 °C
	Thermistor	2.2 k, 5k, 10k	-80°C to 150°C	0.08°C		
						0.002 °C

[1] Specifications are for 1 hr warm-up and 6½ digits, Slow ac filter

[2] Relative to calibration standards

[3] 20% over range on all ranges except 300 Vdc and ac ranges and 1 Adc and ac current ranges

[4] For sinewave input > 5% of range. For inputs from 1% to 5% of range and < 50 kHz, add 0.1% of range additional error

[5] Typically 30% of reading error at 1 MHz, limited to 1×10^8 V Hz

[6] Specifications are for 4-wire ohms function or 2-wire ohms using Scaling to remove the offset. Without scaling, add 4 Ω additional error in 2-wire Ohms function

[7] Input > 100 mV. For 10 mV to 100 mV inputs multiply % of reading error x 10

[8] Specified only for inputs > 10 mA

[9] For total measurement accuracy, add temperature probe error

[10] Thermocouple specifications not guaranteed when 34907A module is present

Measurement Characteristics^[8]

DC Voltage

Measurement Method	Continuously Integrating Multi-slope III A-D Converter
A-D Linearity	0.0002% of reading + 0.0001 % of range
Input Resistance	
100 mV, 1 V, 10 V ranges	Selectable 10 M Ω or > 10,000 M Ω
100 V, 300 V ranges	10 M Ω \pm 1%
Input Bias Current	< 30 pA at 25°C
Input Protection	300 V all ranges

True RMS AC Voltage

Measurement Method	AC coupled True RMS — measures the AC component of the input with up to 300 Vdc of bias on any range
Crest Factor	Maximum of 5:1 at Full Scale
Additional Crest Factor	
Errors (non-sinewave)	Crest Factor 1-2 0.05 % of reading Crest Factor 2-3 0.15 % of reading Crest Factor 3-4 0.30 % of reading Crest Factor 4-5 0.40 % of reading
Input Impedance	1 M Ω \pm 2% in parallel with 150 pF
Input Protection	300 Vrms all ranges

Resistance

Measurement Method	Selectable 4-wire or 2-wire Ohms
Offset Compensation	Current source referenced to LO input
Maximum Lead Resistance	Selectable on 100 Ω , 1k Ω , 10k Ω ranges
Input Protection	10% of range per lead for 100 Ω and 1 k Ω ranges. 1 k Ω on all other ranges
Input Protection	300 V on all ranges

Frequency and Period

Measurement Method	Reciprocal counting technique
Voltage Ranges	Same as AC Voltage function
Gate Time	1s, 100 ms, or 10 ms
Measurement Timeout	Selectable 3 Hz, 20 Hz, 200 Hz LF limit

DC Current

Shunt Resistance	5 Ω for 10 mA, 100 mA; 0.1 Ω for 1 A
Input Protection	1A 250 V fuse on 34901A module

True RMS AC Current

Measurement Method	Direct coupled to the fuse and shunt. AC coupled True RMS measurement (measures the ac component only)
Shunt Resistance	5 Ω for 10 mA; 0.1 Ω for 100 mA, 1 A
Input Protection	1A 250 V fuse on 34901A module

Thermocouple

Conversion	ITS-90 software compensation
Reference Junction Type	Internal, Fixed, or External
Open thermocouple Check	Selectable per channel. Open >5k Ω

Thermistor

44004, 44007, 44006 series

RTD

$\alpha = 0.00385$ (DIN) and $\alpha = 0.00391$

Measurement Noise Rejection 60 (50) Hz^[1]

dc CMRR	140 dB
ac CMRR	70 dB
Integration Time	Normal Mode Rejection^[2]
200 plc/3.33s (4s)	110 dB ^[3]
100 plc/1.67s (2s)	105 dB ^[3]
20 plc/333 ms (400 ms)	100 dB ^[3]
10 plc/167 ms (200 ms)	95 dB ^[3]
2 plc/33.3 ms (40 ms)	90 dB
1 plc/16.7 ms (20 ms)	60 dB
< 1 plc	0 dB

Operating Characteristics^[4]

Single Channel Measurement Rates ^[5]

Function	Resolution ^[9]	reading/s
dcV, 2-wire Resistance	6 $\frac{1}{2}$ digits (10 plc)	6 (5)
	5 $\frac{1}{2}$ digits (1 plc)	57 (47)
	4 $\frac{1}{2}$ digits (0.02 plc)	490
Thermocouple	0.1°C (1 plc)	49 (47)
	(0.02 plc)	280
RTD, Thermistor	0.01°C (10 plc)	6 (5)
	0.1°C (1 plc)	47 (47)
	1°C (0.02 plc)	280
acV	6 $\frac{1}{2}$ Slow (3 Hz)	0.14
	6 $\frac{1}{2}$ Med (20 Hz)	1
	6 $\frac{1}{2}$ Fast (200 Hz)	8
	6 $\frac{1}{2}$ ^[6]	100
Frequency, Period	6 $\frac{1}{2}$ digits (1s gate)	1
	5 $\frac{1}{2}$ digits (100 ms)	9
	4 $\frac{1}{2}$ digits (10 ms)	70

System Speeds ^[7]

INTO Memory	ch/s
single channel dcV	490
34902A scanning dcV	250
34907A scanning digital in	250
34902A scanning dcV with scaling & 1 alarm fail	220
34907A scanning totalize	170
34902A scanning temperature	160
34902A scanning acV ^[6]	100
34902A scanning dcV/Ohms on alternate channels	90
34901A/34908A scanning dcV	60
INTO and OUT of memory to GPIB or RS-232 (init, fetch)	
34902A scanning dcV	180
34902A scanning dcV with timestamp	150
OUT of memory to GPIB^[10]	
Readings	800
Readings with timestamp	450
Readings with all format options ON	310
OUT of memory to RS-232	
Readings	600
Readings with timestamp	320
Readings with all format options ON	230
DIRECT to GPIB or RS-232	
single channel dcV	440
34902A scanning dcV	200
single channel MEAS DCV 10 / MEAS DCV 1	25
single channel MEAS DCV/ MEAS OHMS	12

[1] For 1 K Ω unbalance in LO lead

[2] For power line frequency \pm 0.1%

[3] For power line frequency \pm 1% use 80 dB or \pm 3% use 60 dB

[4] Reading speeds for 60 Hz and (50 Hz) operation

[5] For fixed function and range, readings to memory, scaling and alarms off, AZERO OFF

[6] Maximum limit with default settling delays defeated

[7] Speeds are for 4 $\frac{1}{2}$ digits, delay 0, display off, autozero off.

Using 115 kbaud RS-232 setting

[8] Isolation voltage (ch - ch, ch - earth) 300 Vdc, ac rms

[9] 6 $\frac{1}{2}$ digits = 22 bits, 5 $\frac{1}{2}$ digits = 18 bits, 4 $\frac{1}{2}$ digits = 15 bits

[10] Assumes relative time format (time since start of scan)

System Specifications

Scanning Inputs

Analog	34901A, 34902A, and 34908A multiplexer channels
Digital	34907A digital in and totalize
Scan list	Scans channels in ascending order

Scan Triggering

Source	Interval, external, button press, software, or on monitor channel alarm
Scan count	1 to 50,000 or continuous
Scan interval	0 to 99 hours; 1ms step size
Channel delay	0 to 60 seconds per channel; 1 ms step size
External trig delay	<300 μ s. With monitor on <200 ms
External trig jitter	<2 ms

Alarms

Analog inputs	Hi, Lo, or Hi + Lo evaluated each scan
Digital inputs	34907A digital in maskable pattern match or state change 34907A totalize: Hi limit only
Monitor channel	Alarm evaluated each reading
Alarm Outputs	4 TTL compatible Selectable TTL logic Hi or Lo on fail
Latency	5 ms (typical)

Memory

Readings	Battery backed, 4 year typical life ^[1] 50,000 with timestamp Readable during scan
States	5 instrument states with user label
Alarm Queue	Up to 20 events with channel number, reading, and timestamp

System Features

Per-channel Math	Individual Mx + B scaling and Min/Max/Average calculated real time
Power Fail Recovery	Resumes scanning automatically
Relay maintenance	Counts each relay closure and stores on module User resettable
Real-time clock	Battery-backed, 4-year typical life ^[1]

General Specifications

Power Supply	100V/120V/220V/240V \pm 10%
Power Line Frequency	45 Hz to 66 Hz automatically sensed
Power Consumption	12 W (25 VA peak)
Operating Environment	Full accuracy for 0°C to 55°C Full accuracy to 80% R.H. at 40°C -40°C to 70°C ^[1]
Storage Environment	Net: 3.6 kg (8.0 lbs)
Weight	
Safety	Conforms to CSA, UL-1244, IEC 1010 Cat I
RFI and ESD	CISPR 11, IEC 801/2/3/4

Software

Agilent BenchLink Data Logger 3

(not included with Option 001)

System Requirements^[2]

Operating System	Windows 98SE, NT [®] 4.0 SP6a, 2000 SP4, XP SP2, Adobe [®] Acrobat [®] Reader V5.0 or higher (to view documentation) Microsoft [®] Internet Explorer V6.0 or higher (required when using Windows NT)
Controller	Recommend Pentium [®] 4, 800 MHz or greater, Min: Pentium III, 500 MHz
RAM	Recommend 256MB or greater, Min 128MB
Disk Space	Recommend 200MB, Min 100MB
Display	Recommend 800x600 resolution, 256 colors
Computer Interfaces^[3]	
GPIB	Agilent and National Instruments PCI-GPIB
LAN-to-GPIB	E5810A
USB-to-GPIB	82357A
	RS-232 (Serial Port) PC COM 1-4

Agilent BenchLink Features

Configuration	Spreadsheet-like channel configurations page. Upload and Download instrument configurations. Computed channels using + - * /, dB, dBm, dBV, x^2 , \sqrt{x} and full, $1/2$, or $1/4$ bridge strain Real-time and historical data displays Add, delete, size, and configure real time Strip chart with markers and alarm indication, bar and scatter charts, Histogram with statistics, Bar meter, and Data table
Graphical Displays	Sliders, switches, buttons, and LED lights Start/Stop scanning on alarm condition Control 34903A relay state or 34907A digital output on alarm
Graphical Controls	Real time streamed (saved) to disk Automatically export data and configurations Copy data or graphics to windows clipboard Export your selected data to .CVS, .XML, or .TXT formats
Alarm / Limit testing	Automatic entry of alarms and errors
Data	
Event logging	

Instrument Driver Support for Programming Languages

Universal Instrument Driver ^[5]	Compatible with Windows 95 and NT Agilent VEE 3.2 or greater Visual Basic 4.0, LabWindows CVI 4.0, LabVIEW 7.0
Labview Driver (VI)	LabVIEW 7.0

[1] Storage at temperatures above 40°C will decrease battery life

[2] Software provided on CD-ROM and includes utility to create floppy disks for installation

[3] Interface and driver must be purchased and installed separately

[4] 90 MHz Pentium, 20 MB RAM

[5] Requires VISA command library for IEEE-488

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Modules Specifications

The Agilent-34970A accuracy specifications already include the switching offset and reference junction errors shown below. These errors are listed separately for determining system error with external measurement devices.

Up to three modules, in any combination, can be inserted into a single mainframe. The 34970A's internal DMM connections are accessible only

through the 34901A, 34902A, and 34908A low-frequency multiplexers.

On-module screw terminals accept wire sizes from 16-gage to 22 gage. Twenty-gage wire is recommended for high channel count applications. The 34905A and 34906A RF Multiplexers use SMB connectors. A standard set of (10) BNC-to-SMB adapter cables is provided with each RF module for convenient BNC connections.

	Multiplexer			Actuator	Matrix	RF Multiplexer		Multifunction
	34901A	34902A ^[1]	34908A	34903A	34904A	34905A	34906A	34907A
General								
Number of Channels	20 + 2 2/4 wire	16 2/4 wire	40 1 wire	20 SPDT	4 x 8 2 wire	Dual 1 x 4 50Ω 75Ω		See page 22 for module specifications
Connects to Internal DMM	•	•	•					
Scanning Speed	60 ch/s	250 ch/s	60 ch/s					
Open/Close Speed	120/s	120/s	70/s	120/s	120/s	60/s		
Input								
Voltage (dc , ac rms) ^[2]	300 V	300 V	300 V	300 V	300 V	42 V		
Current (dc , ac rms)	1A	50mA	1A	1A	1A	0.7A		
Power (W , VA)	50 W	2 W	50 W	50 W	50 W	20 W		
DC Characteristics								
Offset Voltage ^[3]	< 3uV	< 6uV	< 3uV	< 3uV	< 3uV	< 6uV		
Initial Closed Channel R ^[3]	< 1Ω	< 1Ω	< 1Ω	< 0.2Ω	< 1Ω	< 0.5Ω		
Isolation ch-ch, ch-earth	> 10 GΩ	> 10 GΩ	> 10 GΩ	> 10 GΩ	> 10 GΩ	> 1 GΩ		
AC Characteristics								
Bandwidth ^[4]	10 MHz	10 MHz	10 MHz	10 MHz	10 MHz	2 GHz ^[5]	2 GHz ^[5]	
Insertion Loss (dB)	10 MHz	—	—	—	—	-0.1	-0.1	
	100 MHz	—	—	—	—	-0.4	-0.4	
	500 MHz	—	—	—	—	-0.6	-0.5	
	1 GHz	—	—	—	—	-1	-1	
	1.5 GHz	—	—	—	—	-1.2	-1.5	
	2 GHz	—	—	—	—	-3	-2	
SWR	10 MHz	—	—	—	—	1.02	1.02	
	100 MHz	—	—	—	—	1.05	1.05	
	500 MHz	—	—	—	—	1.20	1.25	
	1 GHz	—	—	—	—	1.20	1.40	
	1.5 GHz	—	—	—	—	1.30	1.40	
	2 GHz	—	—	—	—	1.40	2.00	
ch-ch Cross Talk (dB) ^[4]	10 MHz	-45	-45	-18 ^[6]	-45	-33	-100	-85
	100 MHz	—	—	—	—	—	-85	-75
	500 MHz	—	—	—	—	—	-65	-65
	1 GHz	—	—	—	—	—	-55	-50
	1.5 GHz	—	—	—	—	—	-45	-40
	2 GHz	—	—	—	—	—	-35	-35
Risetime							< 300 ps	
Signal Delay							< 3 ns	
Capacitance	HI - LO	< 50 pF	< 50 pF	< 50 pF	< 10 pF	< 50 pF	< 20 pF	
	LO - Earth	< 80 pF	< 80 pF	< 80 pF	< 80 pF	< 80 pF	—	
Volt-Hertz limit							10 ¹⁰	
Other								
T/C Cold Junction Accuracy ^[3]	(typical)							
Switch Life	No Load (typical)	0.8°C	0.8°C	0.8°C ^[8]	100M	100M	5M	5M
	Rated Load (typical) ^[7]	100k	100k	100k	100k	100k	100k	100k
Temperature	Operating			all cards — 0°C to 55°C				
Humidity	Storage			all cards — -20°C to 70°C				
	(non-condensing)			all cards — 40°C/80% RH				

[1] Not recommended for connection to ac line without external transient suppression

[2] Channel-to-channel or channel-to-earth

[3] Errors included in DMM measurement accuracy specifications

[4] 50Ω source, 50Ω load

[5] Bandwidth direct to card SMB connectors

[6] Isolation within channel 1 to 20 or 21 to 40 banks is -40 dB

[7] Applies to resistive loads only

[8] Thermocouple measurements not recommended with 34908A module due to common lo configuration

Multiplexer Selection-Guide

Choose between the broad functionality of the 34901A, the-high speed scanning of the 34902A, or the single-ended density of the 34908A. These three modules are the only way to connect to the 34970A internal DMM. They can be used to scan with external instruments as well.

All multiplexer modules employ break-before-make scanning, ensuring only one closed channel (or channel pair) at a time. Multiple channel closures are allowed on the 34901A and 34902A modules when not configured for scanning.

The 34908A does not allow multiple channel closures at any time.

	34901A	34902A	34908A
Number of Channels	20 + 2	16	40
Max scan speed	60 ch/s	250 ch/s	60 ch/s
Number of contacts	2 or 4	2 or 4	1

Temperature			
Thermocouple	•	•	•
2-wire RTD	•	•	•
4-wire RTD	•	•	•
Thermistor	•	•	•
dc Volts	•	•	•
ac Volts	•	•	•
2-wire Ohms	•	•	•
4-wire Ohms	•	•	•
Frequency	•	•	•
Period	•	•	•
dc current	•		
ac current	•		

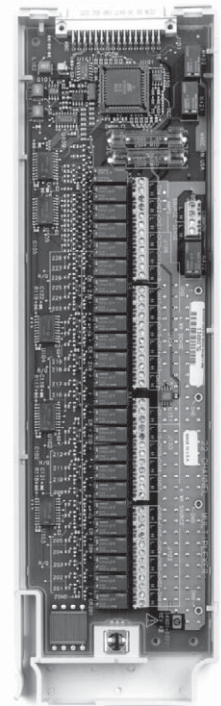
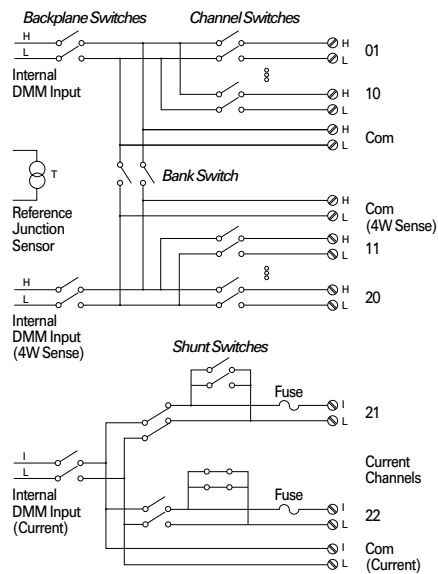
34901A

20-Channel General-Purpose Multiplexer

- 60 ch/s scanning
- Two- and four-wire scanning
- Built-in thermocouple reference junction
- 300 V switching

The Agilent 34901A is the most versatile multiplexer for general purpose scanning. It combines dense, multifunction switching with 60-channel/second scan rates to address a broad spectrum of data acquisition applications.

Two- and four-wire channels can be-mixed on the same module. Two-additional fused inputs (22-channels total) route up to 1A-of-current to the internal DMM, allowing ac and dc current measurements without the need for external shunt resistors.



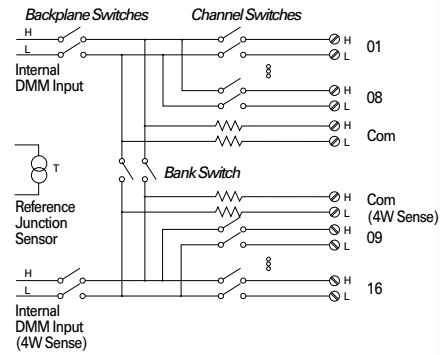
34902A

16-Channel High-Speed Multiplexer

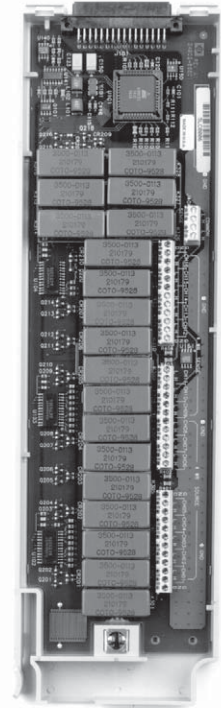
- 250 ch/s scanning
- Two- and four-wire scanning
- Built-in thermocouple reference junction

The Agilent 34902A employs reed relays-to achieve scan rates up to 250 channels per second. Use this module for high-throughput automated test applications as well-as high-speed data logging and monitoring tasks.

Sixteen two-wire inputs switch up to 300-V. Two- and four-wire channels may be mixed on the same module. User provided shunt resistors are required for current measurements.



Note: Not recommended for connection to ac-line without external transient suppression.



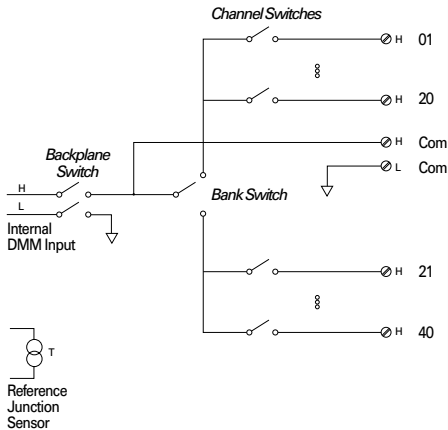
34908A

40-Channel Single-Ended Multiplexer

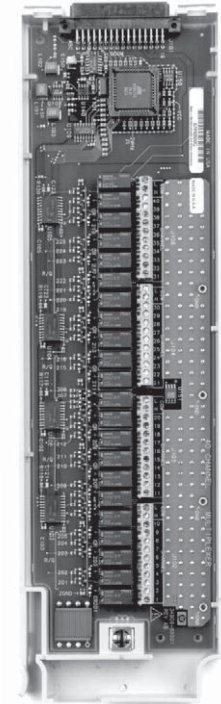
- 60 ch/s scanning
- Single-wire switching for common-low applications
- Built-in thermocouple reference-junction

Use the Agilent 34908A for the greatest density in common-low applications, such as battery test, component characterization, and benchtop testing.

Each module switches 40 one-wire inputs. All two-wire internal measurements except current are supported. The module low connection is isolated from earth and can float up to 300 V.



Note: Thermocouples must be electrically isolated from each other to avoid current loops and subsequent measurement errors.

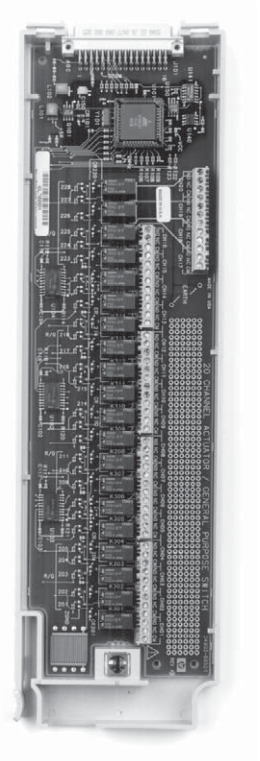
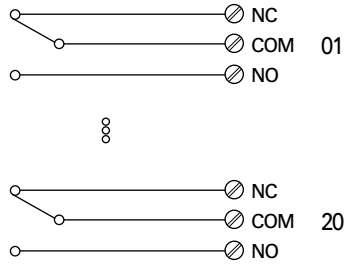


34903A

20-Channel Actuator/General Purpose Switch

- SPDT (Form C) latching relays
- 300 V, 1A actuation and control

This general-purpose switch module has 20 independent single-pole, double-throw (SPDT) relays. Use it to cycle power to products under test, control indicator and status lights, and to actuate external power relays and solenoids. Combine it with matrix and multiplexer modules to build custom switch systems. Its 300 V, 1A contacts can handle up to 50 W, enough for many power line switching applications.



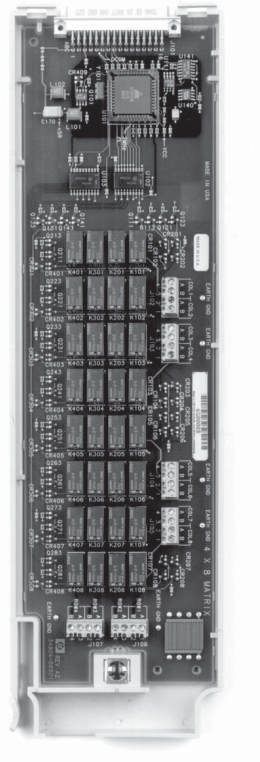
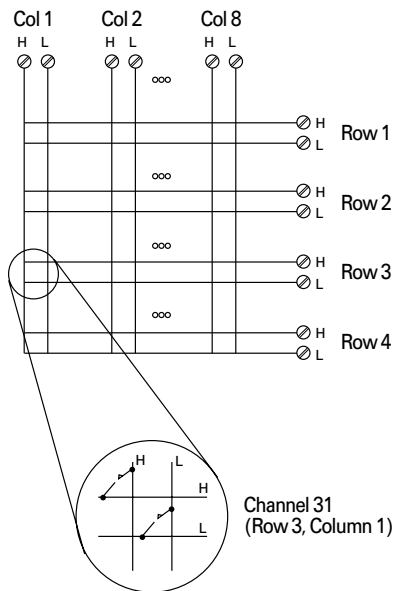
34904A

4x8 Two-wire Matrix Switch

- 32 two-wire crosspoints
- 300 V, 1A switching

The Agilent 34904A gives you the most flexible connection path between your device under test and your test equipment, allowing different instruments to be connected to multiple points on your DUT at the same time.

Rows or columns may be connected between multiple modules to build 8x8, 4x16 or larger matrices, with up to 96 crosspoints in a single frame.



34905A 50Ω

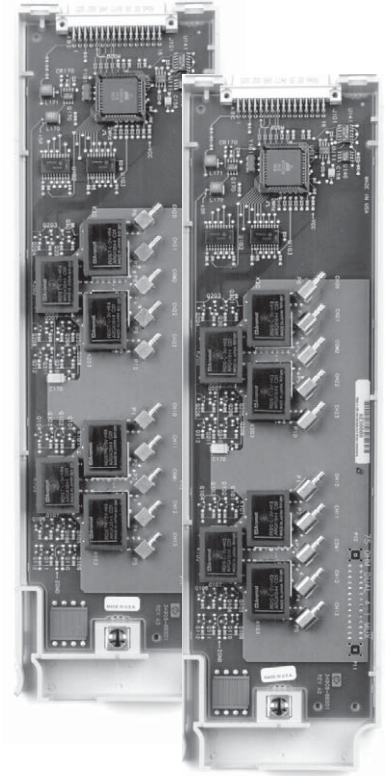
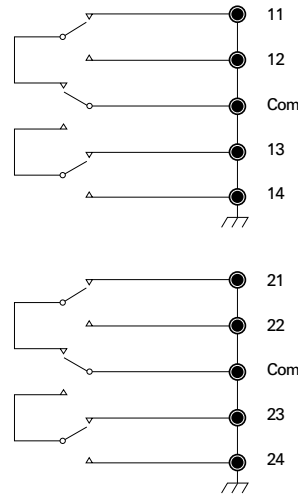
34906A 75Ω

Dual 4-channel RF Multiplexers

- 2 GHz bandwidth
- BNC to SMB adapter cables-included

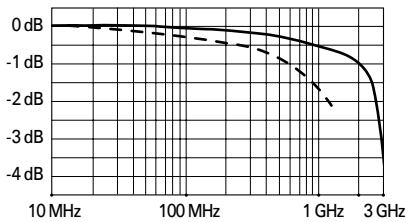
The Agilent 34905A and 34906A RF multiplexers offer broadband switching capabilities for high-frequency and pulsed signals. Use them to route test signals between your device under test and your signal generator, oscilloscope, spectrum analyzer, or other instrumentation.

The RF multiplexers are arranged as two independent 1x4 multiplexers, each with a common shield and a switched center conductor. Connections can be made directly to SMB inputs with 2-GHz usable bandwidth, or to the BNC-to-SMB adapters provided with 1 GHz bandwidth. Multiple banks may be cascaded together for applications requiring even larger topologies—create a stubless 16:1 multiplexer in a single frame.

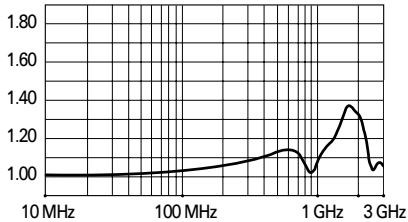


50Ω MUX Typical AC Performance Graphs

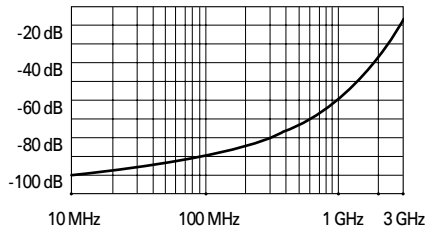
Insertion Loss



VSWR

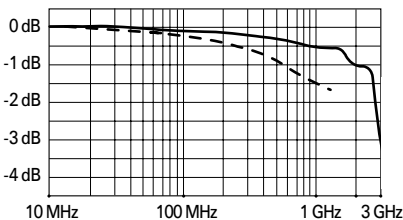


Crosstalk

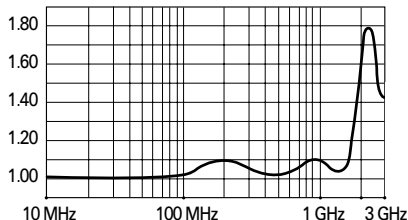


75Ω MUX Typical AC Performance Graphs

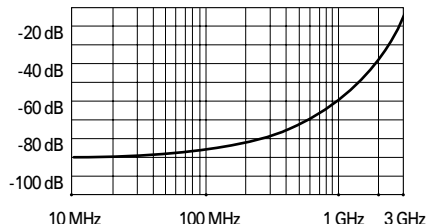
Insertion Loss



VSWR



Crosstalk



- direct to card
- using provided adapter cables

Ordering Information

Mainframe

34970A Data Acquisition/Switch Unit

Includes internal 6½ digit DMM, Operating and Service Manuals, Test Report, power cord, and Quick Start package (includes Agilent Benchlink Data Logger II software, RS-232 cable, thermocouple, and screwdriver). Modules are purchased separately and are required to operate.

Option 001 Delete Internal DMM

Same as above but deletes DMM and Quick Start package.

Order 34970-80010 to retrofit DMM at a later time.

Option 1CM Rack mount kit

Option A6J ANSI Z540 compliant calibration

Option 0B0 Delete manual set

Option AB0 Taiwan: Chinese manual

Option AB1 Korea: Korean manual

Option AB2 China: Chinese manual

Option ABA English: English manual

Option ABD Germany: German manual

Option ABE Spain: Spanish manual

Option ABF France: French manual

Option ABJ Japan: Japanese manual

Option ABZ Italy: Italian manual

Modules

34901A 20-Channel armature multiplexer

34902A 16-Channel reed multiplexer

34903A 20-Channel actuator/general purpose switch

34904A 4 x 8 Two-wire matrix switch

34905A Dual 4-Channel RF multiplexer, 50 Ohms

34906A Dual 4-Channel RF multiplexer, 75 Ohms

34907A Multifunction module

34908A 40-Channel single-ended multiplexer

Accessories

34307A 10-pack of J-type thermocouples

34308A 5-pack of 10 kΩ thermistors

34161A Accessory pouch

34131A Hard carrying case (transit case)

E5810A LAN/GPIB gateway

82357A USB/GPIB

34970-80010 DMM field installation kit. Fully calibrated with test report and Quick Start kit

34905-60001 Kit of 10 SMB-to-BNC adapter cables, 50Ω

34906-60001 Kit of 10 SMB-to-BNC adapter cables, 75Ω

Related Literature

Pub. number

Accessories for the 34970A Data Acquisition/Switch Unit, data sheet 5966-4443EN

Practical Temperature Measurements, application note 5965-7822E

Agilent 34980A Multifunction Switch/Measure, data sheet 5989-1437EN

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Get assistance with all your test and measurement needs at:

www.agilent.com/find/assist

Agilent's IO Libraries Suite ships with the 34970A to help you quickly establish an error-free connection between your PC and instruments – regardless of the vendor. It provides robust instrument control and works with the software development environment you choose.

For additional description of Agilent's IO Libraries Suite features and installation requirements, please go to:

www.agilent.com/find/iosuite-datasheet



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