Data Acquisition / Switch Solutions

CATALOG

KEYSIGHT

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DAQ970A / DAQ973A
Data Acquisition
System and Modules

Sample more signals, faster and dynamically

Get the next-generation data acquisition (DAQ) system with a three-slot mainframe and your choice of nine plug-in modules. The Keysight DAQ970A / DAQ973A DAQ system has high-quality switching and an advanced built-in 6½-digit multimeter that allows you to measure fast and accurately.

DAQ970A / DAQ973A DAQs offer these features:

- fastest reading measurements — up to 50,000 readings / sec — and scan rates up to 450 channels / sec
- ability to measure very low current ranges (1 μA DC and 100 μA AC) and very high resistance range (1,000 MΩ)
- auto-calibration that compensates for internal drifts caused by time and temperature changes
- 3497XA-compatible, program and configuration
- onboard temperature reference
- LAN and USB for easy PC connectivity (DAQ973A includes additional GPIB)

Technical overview	DAQ970A	DAQ973A
Module slots available	3	3
Measurement resolution	22 bits	22 bits
Types of measurements	• capacitance and diode test • temperature with thermocouples • RTDs and thermistors • DC / AC volts • 2- and 4-wire resistance • frequency and period • DC/ AC current • direct strain and bridge strain	• capacitance and diode test • temperature with thermocouples • RTDs and thermistors • DC / AC volts • 2- and 4-wire resistance • frequency and period • DC/ AC current • direct strain and bridge strain
Connectivity	• USB 2.0 • built-in LAN • BenchVue / TestFlow • LXI-compliant • USB flash memory drive • USB data logging and data mirroring • remote web interface	• GPIB • USB 2.0 • built-in LAN • BenchVue / TestFlow • LXI-compliant • USB flash memory drive • USB data logging and data mirroring • remote web interface
	Get a Quote >	**Get a Quote >**

Modules for DAQ970A and DAQ973A systems

A complete selection of plug-in modules gives you a choice of high-quality measurement, switching, and control capabilities. Mix and match modules to get the functionality you need right now. Modules for the DAQ970A / DAQ973A make testing easier, faster, and more reliable. Buy only what you need — and add more modules as your application grows.

Table 2. DAQ970A / DAQ973A modules

Module number	Description	Speed (ch / sec)	Max (volts)	Max (amps)	
DAQM900A	20-channel solid-state multiplexer	450	120 V	0.02 A	Get a Quote >
DAQM901A	20-channel multiplexer (2/4-wire) module	80	300 V	1 A	Get a Quote >
DAQM902A	16-channel multiplexer (2/4-wire) module	250	300 V	50 mA	Get a Quote >
DAQM903A	20-channel actuator / GP switch module	120	300 V	1 A	Get a Quote >
DAQM904A	4 x 8 two-wire matrix module	120	300 V	1 A	Get a Quote >
DAQM905A	2 GHz dual 1:4 RF mux, 50 Ω module	60	42 V	0.7 A	Get a Quote >
DAQM907A multifunction modules	Two 8-bit digital I/O ports		42 V	400 mA	Get a Quote >
	26-bit event counter		42 V		
	Two 16-bit analog outputs		±12 V	10 mA	
DAQM908A	40-channel single-ended multiplexer module	100	300 V	1 A	Get a Quote >
DAQM909A	4-channel simultaneous sampling module	800[1]	36 Vpk		Get a Quote >

[1] Kilo samples / sec

Keysight PathWave BenchVue data acquisition and control software supports DAQ970A, DAQ973A, 34980A, and modules. You can easily control Keysight data acquisition units to configure channels, execute scan lists, and log data. Clearly analyze or view measurement data using visualization tools and a broad choice of display options.

34980A Data Acquisition System and Modules

Achieve maximum versatility in a minimal footprint

Keysight's 34980A eight-slot mainframe includes a choice of 21 optional plug-in modules for custom configurations. As a one-instrument solution, it is ideal for medium- to high-density switch / measure applications in design verification, automated tests, and data acquisition applications.

34980A
Data Acquisition
System

The 34980A offers these features:

- optional built-in 6½-digit multimeter — with up to 3,000 readings / sec and scan rates up to 1,000 channels / sec

- high-performance switching –– up to 560 two-wire multiplexer channels or 4,092 matrix cross-points in one mainframe

- intuitive display with self-guiding menu

- PathWave BenchVue software supported

Table 3. 34980A mainframe

Technical overview	34980A
Module slots available	8
Measurement resolution	22-bits
Types of measurements	• temperature: thermocouples, RTDs, and thermistors • DC / AC volts • 2- and 4-wire resistance • frequency and period • DC / AC current
Connectivity	USB, LAN, and GPIB

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Modules for 34980A DAQ systems

A variety of plug-in modules gives you a choice between switch types and topologies, with frequency ranges from DC to 26.5 GHz. The 34980A offers high-density multiplexers for scanning multiple channels, matrices for connecting multiple points at one time, and general-purpose switches for simple control and high-power needs. The 34980A also offers flexible choices for system control. You can select modules to control external devices such as microwave switches, attenuators, solenoids, and power relays. Or you can use the digital inputs to sense limit-switch and digital-bus status.

Table 4. 34980A Multiplexer, Matrix and General-purpose modules

Module	Description	Max volts	Switch / carry current	BW (MHz)	Scan ch / sec	
Multiplexer modules						
34921A	40-channel armature multiplexer with low thermal offset	± 300 V	1 A / 2 A	45 MHz	100	Get a Quote >
34922A	70-channel armature multiplexer	±300 V	1 A / 2 A	25 MHz	100	Get a Quote >
34923A	40/80-channel reed multiplexer	±150 V	0.5 A / 1.5 A	45 MHz	500	Get a Quote >
34924A	70-channel reed multiplexer	±150 V	0.5 A / 1.5 A	25 MHz	500	Get a Quote >
34925A	40/80-channel optically isolated FET multiplexer	±80 V	0.02A	1 MHz	1,000	Get a Quote >
Matrix modules						
34931A	Dual 4x8 armature matrix	±300 V	1 A / 2 A	30 MHz	100	Get a Quote >
34932A	Dual 4x16 armature matrix	±300 V	1 A / 2 A	30 MHz	100	Get a Quote >
34933A	Dual / quad 4x8 reed matrix	±150 V	0.5 A / 1.5 A	30 MHz	500	Get a Quote >
34934A	Quad 4x32 reed matrix	±100 V	0.5 A / 0.5 A	20MHz	500	Get a Quote >
General-purpose modules						
34937A	28-channel form C and 4-channel form A	±300 V ±250 VAC	1 A / 2 A 5 A	10 MHz	NA	Get a Quote >
34938A	20-channel 5-amp form A	±250 VAC	5 A / 8 A	1 MHz	NA	Get a Quote >
34939A	64-channel form A	±100 V	1 A / 2 A	10 MHz	NA	Get a Quote >

Table 5. 34980A RF and Microwave modules

Module	Description	Insertion loss	Isolation	Freq range	VSWR	Input impedance	
RF and microwave modules							
34941A	Quad 1x4 50 Ω 3 GHz RF multiplexer	0.6 dB	> 58 dB	3 GHz	< 1.25	50 Ω	Get a Quote >
34942A	Quad 1x4 75 Ω 1.5 GHz RF multiplexer	0.6 dB	> 60 dB	1.5 GHz	< 1.35	75 Ω	Get a Quote >
34945A / 34945EXT	Microwave switch / attenuator driver	Can drive up to 64 external switch coils, 32 SPDT switches, 8 multiport switches, 8 attenuators, or your own combination. Expand with additional 34945EXTs.					Get a Quote >
34946A	Dual 1x2 SPDT terminated microwave switch	< 0.42 dB < 0.69 dB < 0.8 dB	> 85 dB > 67 dB > 60 dB	4 GHz or 20 GHz 26.5 GHz	< 1.15 < 1.30 < 1.6	50 Ω	Get a Quote >
34947A	Triple 1x2 SPDT unterminated microwave switch	< 0.42 dB < 0.69 dB < 0.8 dB	> 85 dB < 0.69 dB < 0.8 dB	4 GHz or 20 GHz 26.5 GHz	< 1.15 < 1.30 < 1.6	50 Ω	Get a Quote >

Table 6. 34980A System control modules

Module	Description	Insertion loss	
System control modules			
34950A	64-bit digital I/O with memory and counter	Eight 8-bit digital I/O channels with programmable polarity, thresholds up to 5 V, with handshaking protocols and pattern memory. Two 10-MHz frequency counters and programmable clock output to 20 MHz.	Get a Quote >
34951A	4-channel isolated D/A converter with waveform memory	Output DC voltage up to ±16 V or current up to ±20 mA. Output waveforms with a 200 kHz update rate and 16 bits of resolution. Use onboard memory to create point-to-point waveforms with more than 500,000 points.	Get a Quote >
34952A	Multifunction module with 32-bit DIO, 2-ch D/A, and totalizer	Four 8-bit digital I/O channels, two ±12 V analog outputs, and a 100-kHz gated totalizer.	Get a Quote >
34959A	Breadboard module	Create custom designs with access to the +12 V and +5 V supplies, 16 GPIO ports, and 28 relay drivelines	Get a Quote >

USB Data Acquisition Mainframe and Modules

Flexibility as a modular or standalone test instrument

The Keysight USB DAQ family gives you the choice and flexibility to create standalone or modular solutions that expand and evolve according to your test requirement needs. Whatever your configuration, setup is easy with high-speed USB 2.0 connectivity: just plug the device into your PC and launch the bundled software.

The USB DAQ Series includes multifunction measurement modules, simultaneous-sampling measurement modules, and digital input / output (DIO) modules. The thermocouple signal conditioner option is available for temperature measurements with the multifunction measurement modules.

USB mainframe

The U2781A mainframe has six module slots (requires an external controller or PC). The modules in the mainframe are hot-swappable, and the auto-detectable characteristic minimizes startup time and effort. The mainframe comes with an internal 10-MHz reference clock for each module slot for simultaneous synchronization between modules.

U2781A USB Mainframe

Choice of U2300 Series USB multifunction DAQ modules

This high-performance series consists of four basic models and three high-density models. The basic models feature 16 single-ended / eight differential inputs with 16-bit resolution and ±10 V maximum range. The high-density models offer 64 single-ended / 32 differential inputs with 16-bit resolution in the lower-speed models and 12-bit resolution in the high-speed U2331A.

Table 7. U2300 Series

Module	Module multifunction features	A/D sampling rate	Analog input channels	Analog output channels	Digital I/O channels	
U2331A	12-bit D/A converter 12-bit A/D converter Programmable digital I/O Dual counter / totalizer	Up to 3 MSa/s for single-channel and 1 MSa/s for multiple channels	64 single-ended / 32 differential	2	24-bit	Get a Quote >
U2351A	16-bit D/A converter 16-bit A/D converter Programmable digital I/O Dual counter / totalizer	Up to 250 kSa/s	16 single-ended / 8 differential	2	24-bit	Get a Quote >
U2352A	16-bit A/D converter Programmable digital I/O Dual counter / totalizer	Up to 250 kSa/s	16 single-ended / 8 differential	None	24-bit	Get a Quote >
U2353A	16-bit D/A converter 16-bit A/D converter Programmable digital I/O Dual counter / totalizer	Up to 500 kSa/s	16 single-ended / 8 differential	2	24-bit	Get a Quote >
U2354A	16-bit A/D converter Programmable digital I/O Dual counter / totalizer	Up to 500 kSa/s	16 single-ended / 8 differential	None	24-bit	Get a Quote >
U2355A	12-bit D/A converter 16-bit A/D converter Programmable digital I/O Dual counter / totalizer	Up to 250 kSa/s	64 single-ended / 32 differential	2	24-bit	Get a Quote >
U2356A	12-bit D/A converter 16-bit A/D converter Programmable digital I/O Dual counter / totalizer	Up to 500 kSa/s	64 single-ended / 32 differential	2	24-bit	Get a Quote >

Choice of U2600 Series USB isolated DIGITAL I/O DAQ modules

The Keysight U2600 Series USB Digital I/O is a cost-effective device offering 64 opto-isolated digital lines. It comes bundled with the Keysight PathWave BenchVue USB modular DAQ units software for quick setup and data logging.

Giving users more flexibility, the U2600 series Digital I/O is compatible with a variety of application development environments such as Keysight VEE, MATLAB R2007a, NI LabVIEW, and Microsoft Visual Studio.

Table 9. U2600 Series

Module	Number of digital inputs	Digital input logic levels	Number of digital outputs	Digital output type	Power consumption	
U2651A	32	High: 10–24 V; low: 0–2 V	32	Open-drain power MOSFET driver	+12 V at 235 mA (typical)	Get a Quote >
U2652A	64	High: 10–24 V; low: 0–2 V	NA	NA	+12 V at 115 mA (typical)	Get a Quote >
U2653A	NA	NA	64	Open-drain power MOSFET driver	+12 V at 260 mA (typical)	Get a Quote >

U2651A DAQ Module

U2653A DAQ Module

U2751A USB modular switch matrix module

Keysight's U2751A is a 4x8 two-wire switch matrix module, the size of a typical novel. It operates flexibly as a standalone unit or as a modular unit in the U2781A USB modular product chassis. It offers a flexible connection path between the device under test and the test equipment, thus allowing different instruments to connect to multiple points on the device under test at the same time. This instrument supports measurements at a high bandwidth of up to 45 MHz.

U2802A 31-channel thermocouple input signal conditioner

The Keysight U2802A is a 31-channel thermocouple signal conditioning module with a built-in thermistor for cold junction compensation. The U2802A converts low-input-voltage signals (less than ±100 mV) from a thermocouple into an output voltage range suitable for data acquisition devices (±10 V). Use the U2802A device in conjunction with the Keysight U2355A or U2356A model DAQ device to enable temperature measurements using thermocouples.

U2751A
switch matrix module

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