

KEYSIGHT TECHNOLOGIES (AGILENT HP)

DAQ970A

The Keysight DAQ970A is a high-performance Data Acquisition System and Data Logger. Equipped with a built-in 6.5-digit digital multimeter (DMM) and a 3-slot mainframe, it is designed for highly accurate and versatile multiplexing, switching, and scanning applications.

SPECIFICATIONS

General

Interfaces	USB 2.0 Host (front panel), USB 2.0 Device (rear panel), LAN (10/100 Base-T, LXI-C compliant)
Display	4.3-inch color TFT graphical display, 480 x 272 resolution with built-in trend charting and histograms

Physical

Power Supply	100 V to 240 V AC $\pm 10\%$, 50/60 Hz $\pm 10\%$, 400 Hz $\pm 10\%$, 150 VA maximum power consumption
Operating Temperature	0 °C to 55 °C °C
Dimensions (W×H×D)	261.2 mm x 104.0 mm x 374.0 mm (with bumpers and feet) mm
Weight	4.2 kg kg

System Performance

Internal DMM Resolution	6.5 digits (22-bit)
Maximum Scan Rate	450 channels/second
Maximum Reading Speed to Memory	50,000 readings/second
Internal Reading Memory Capacity	1,000,000 readings with timestamps
Number of Module Card Slots	3
Maximum Channels per Mainframe	120 channels (using 3x DAQM908A 40-channel multiplexers)
A/D Converter Integration Times	0.02 PLC, 0.2 PLC, 1 PLC, 10 PLC, 100 PLC

DC Voltage Measurements

DC Voltage Ranges	100 mV, 1 V, 10 V, 100 V, 300 V
DC Voltage Maximum Resolution	100 nV
DCV 1-Year Basic Accuracy	0.0035% of reading + 0.0005% of range (10 V range)
DCV Input Impedance (100mV to 10V ranges)	> 10 G Ω (selectable) or 10 M Ω $\pm$ 1%
DCV Input Impedance (100V and 300V ranges)	10 M Ω $\pm$ 1%
Maximum Input Voltage	300 V on any input terminal

AC Voltage Measurements

AC Voltage Measurement Type	True RMS AC-coupled
AC Voltage Ranges	100 mV, 1 V, 10 V, 100 V, 300 V
AC Voltage Frequency Range	3 Hz to 300 kHz
ACV 1-Year Basic Accuracy	0.06% of reading + 0.03% of range (10 Hz to 20 kHz, 10 V range)
ACV Crest Factor	3:1 at full scale

Resistance Measurements

Resistance Measurement Configurations	2-wire and 4-wire
Resistance Ranges	100 Ω , 1 k Ω , 10 k Ω , 100 k Ω , 1 M Ω , 10 M Ω , 100 M Ω , 1 G Ω
Resistance Maximum Resolution	100 $\mu\Omega$
Resistance 1-Year Basic Accuracy	0.01% of reading + 0.001% of range (10 k Ω range)

DC Current Measurements

DC Current Ranges	1 μ A, 10 μ A, 100 μ A, 1 mA, 10 mA, 100 mA, 1 A
DC Current Maximum Resolution	1 pA
DCI 1-Year Basic Accuracy	0.05% of reading + 0.005% of range (10 mA range)

AC Current Measurements

AC Current Ranges	100 μ A, 1 mA, 10 mA, 100 mA, 1 A
AC Current Measurement Type	True RMS AC-coupled
AC Current Frequency Range	3 Hz to 10 kHz
ACI 1-Year Basic Accuracy	0.1% of reading + 0.04% of range (10 mA range, 10 Hz to 5 kHz)

Frequency and Period Measurements

Frequency Measurement Range	3 Hz to 300 kHz
Period Measurement Range	3.3 μ s to 333 ms
Frequency 1-Year Basic Accuracy	0.01% of reading

Capacitance Measurements

Capacitance Measurement Ranges	1 nF, 10 nF, 100 nF, 1 μ F, 10 μ F, 100 μ F
Capacitance 1-Year Basic Accuracy	1% of reading + 0.1% of range

Temperature Measurements

Thermocouple Types Supported	B, E, J, K, N, R, S, T
RTD Types Supported	PT100, PT1000 (2-wire and 4-wire)
Thermistor Types Supported	2.2 k Ω , 5 k Ω , 10 k Ω
Internal CJC Accuracy	± 1.0 $^{\circ}$ C (typical)

Triggering and Alarms

Scan Trigger Sources	Internal Timer, External, Software, Front Panel (Manual), Bus
Alarm Limits per Channel	2 limits (High, Low)
Alarm Outputs	4 hardware alarm outputs (TTL)
External Trigger Input	TTL compatible, selectable edge
Trigger Output Pulse	TTL compatible, selectable polarity
Built-in Math Functions	Scaling (mX+B), dB, dBm, Limit Testing, Min/Max/Average

Supported Modules

Supported Multiplexer Modules	DAQM900A, DAQM901A, DAQM902A, DAQM908A
Supported General Purpose & Matrix Modules	DAQM903A, DAQM904A
Supported RF Modules	DAQM905A
Supported Multifunction Modules	DAQM907A
Supported Digitizer Modules	DAQM909A (4-channel simultaneous digitizer)

Connectivity and Control

Programming Language Support	SCPI, Agilent 34970A/34972A compatibility modes
Built-in Web Server Features	Configuration, monitoring, data logging control, SCPI console
Companion Desktop Software	Keysight PathWave BenchVue DAQ App
Instrument Drivers Supported	IVI-C, IVI-COM, LabVIEW

Physical and General

Form Factor	Benchtop or 2U half-rack
Kensington Lock Slot	Available on rear panel
Line Frequency	45 Hz to 66 Hz, and 360 Hz to 440 Hz
Power-On Configuration Options	Last State, Factory Default, or User Preset
Storage Temperature Range	-40 °C to 70 °C
Operating Humidity Range	Up to 80% RH at 40 °C (non-condensing)
Maximum Operating Altitude	3,000 meters (9,842 feet)
Warm-up Time	60 minutes
Calibration Interval	1 year or 2 years

Compliance and Certifications

Safety Standards	IEC 61010-1, EN 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1
EMC Standards	IEC 61326-1, EN 61326-1, ICES-001, AS/NZS CISPR 11
Environmental Compliance	RoHS, WEEE

Power Requirements

Maximum Power Consumption	75 VA
AC Power Input Voltage Range	100 V to 240 V ($\pm 10\%$)
AC Power Input Frequency Range	50 Hz to 60 Hz ($\pm 10\%$), 400 Hz ($\pm 10\%$ at 100 V to 120 V)

System Characteristics

Non-volatile State Storage Capacity	5 instrument states
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Connectivity

USB Host Port Location	Front panel
USB Host Port Compatibility	USB 2.0 (supports FAT32 format USB flash drives)
USB Device Port Location	Rear panel
USB Device Port Protocol	USBTMC (USB 2.0)
LAN Interface Speed and Standard	10BASE-T/100BASE-TX, LXI Core 2011 Device Specification Version 1.4

Environmental Compliance

Vibration and Shock Compliance	MIL-PRF-28800F, Class 3
Pollution Degree Rating	Pollution Degree 2

Measurement Parameters

Continuity Test Current Source	1 mA
Diode Test Current Source	1 mA

Measurement Performance

DC Common Mode Rejection (CMRR)	140 dB (with 1 k Ω unbalance in LO)
AC Common Mode Rejection (CMRR)	70 dB (at 50/60 Hz, 1 k Ω unbalance in LO)
Normal Mode Rejection (NMRR)	60 dB (at 50/60 Hz $\pm 0.1\%$, for integration times ≥ 1 PLC)
DC Input Bias Current	< 30 pA at 25 °C
A/D Converter Linearity	0.0002% of reading + 0.0001% of range
Overrange Capability	120% of range (except max voltage and current ranges)
Internal DMM Current Fuse Protection	3.15 A, 250 V fast-acting fuse
Frequency/Period Gate Times	1 ms, 10 ms, 100 ms, 1 s
Continuity Threshold	Fixed at 10 Ω

Interfaces and Software

LXI Compliance	LXI Device Specification 2011, Class C / Core
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TECHNOLOGY

Data Acquisition System (DAQ) / Data Logger

APPLICATIONS

Automated testing, temperature logging, environmental monitoring, and multi-channel sensor characterization

