Keysight Basic Instruments

May 2020 - July 2020

DAQ970A/DAQ973A Data Acquisition System

Sample More Signals, Faster and Dynamically
SPOTLIGHT
A New Era of Data Acquisition

As feature sets expand, electromechanical devices become more complex in terms of design, integration, and characterization. When you need to test the physical and electrical parameters of your product, you need high precision, complete communication interface flexibility, and the simplest way to automate test sequences. Combine the precision of Keysight’s DAQ970A / DAQ973A multichannel data acquisition (DAQ) system with the PathWave BenchVue DAQ software capability to get the following:

- Fastest reading measurements — up to 50,000 readings / sec — and scan rates up to 450 channels / sec
- Dynamic data acquisition with new four-channel simultaneous sampling digitizer — up to 800 kSa/s sampling rate per channel (viewing graphs in time and frequency domain)
- Ability to measure voltages up to 300 V
- Ability to measure wide temperature ranges (from -200 °C to 1,800 °C) for many high-performance applications

A complete selection of plug-in modules gives you a choice of high-quality measurement, switching, and control capabilities. Modules include a few flavors of general-purpose switch multiplexers, a radio-frequency multiplexer, a matrix switch, a digitizer module, and a multifunction module with digital input / output, analog output, and totalizer capabilities. Mix and match modules to get just 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.

So, whether you are an R&D engineer characterizing your latest design or a manufacturing engineer building a test system or troubleshooting a process, the Keysight DAQ system offers the best value and measurement performance.

PLUS, FOR A LIMITED TIME…
YOU CAN EXPAND YOUR DATA ACQUISITION CAPABILITIES!

Get a free industry-leading DAQ multiplexer module with qualifying purchase.

What could be better than the industry’s best general-purpose DAQM901A multiplexer module? A 20-channel multiplexer module with two extra dedicated channels for current measurements — for free. For a limited time, you can buy a combination DAQ mainframe (DAQ970A or DAQ973A) with the latest digitizer module (DAQM909A) and claim a DAQM901A multiplexer module at no extra cost.

Find more information at
www.keysight.com/find/ExpandYourDAQCapabilities

Find out more about Keysight’s DAQ offerings at
www.keysight.com/find/DAQ
Signal Generators  |  www.keysight.com/find/sg

X-Series signal generators*

To know your device’s behavior, you’ll take many paths. That’s the idea behind the Keysight Technologies X-Series signal generators. They produce the signals you need—from simple to complex, from clean to dirty—to test your design within and beyond its limits.

To simplify the creation of standards-based or customized signals, equip yourself with PathWave Signal Generation software. It’s the fast, flexible way to realize application-specific signals with your X-Series vector signal generator. In simulation, development and production test, PathWave Signal Generation accelerates waveform creation and lets you focus on your device.

The X-Series is crafted to create signals capable of testing your very best devices. From the pure and precise MXG to the cost-effective EXG and general-purpose CXG, the X-Series helps you generate true performance.

* From selected distributors only

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Signal Analyzers  |  www.keysight.com/find/sa

N9000B CXA signal analyzer*

Whether you are rapidly updating a next-generation product or revising an existing design, the CXA signal analyzer helps you perform signal characterization, circuit design verification, and troubleshooting. The CXA’s built-in capabilities enable you to perform essential frequency, power, spurious and distortion measurements without overspending your budget.

* From selected distributors only

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<table>
<thead>
<tr>
<th>Model number</th>
<th>MXG-ANALOG</th>
<th>EXG-ANALOG</th>
<th>CXG-VECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>9 kHz to 6 GHz</td>
<td>9 kHz to 6 GHz</td>
<td>9 kHz to 6 GHz</td>
</tr>
<tr>
<td>Max. output power</td>
<td>+24 dBm</td>
<td>+21 dBm</td>
<td>+18 dBm</td>
</tr>
<tr>
<td>Frequency switching (list mode)</td>
<td>800 µs</td>
<td>800 µs</td>
<td>5 ms</td>
</tr>
<tr>
<td>Level accuracy</td>
<td>± 0.6 dB</td>
<td>± 0.6 dB</td>
<td>± 0.6 dB</td>
</tr>
<tr>
<td>SSB phase noise (1 GHz, 20 kHz offset)</td>
<td>-146 dBc/Hz</td>
<td>-122 dBc/Hz</td>
<td>-119 dBc/Hz</td>
</tr>
<tr>
<td>Harmonics (at 1 GHz)</td>
<td>–35 dBc</td>
<td>–35 dBc</td>
<td>–35 dBc</td>
</tr>
<tr>
<td>Analog modulation</td>
<td>AM, FM, PM, and pulse modulation</td>
<td>AM, FM, PM, and pulse modulation</td>
<td>AM, FM, PM, and pulse modulation</td>
</tr>
<tr>
<td>Digital Modulation</td>
<td>N/A</td>
<td>N/A</td>
<td>120 MHz bandwidth</td>
</tr>
</tbody>
</table>

Characterize signals and devices with general-purpose spectrum analysis and one-button PowerSuite measurements
- Frequency: 9 kHz to 26.5 GHz
- Frequency options: 3, 7.5, 13.6, 26.5 GHz
- -163 dBm DANL at 1 GHz (preamp on)
- -110 dBc/Hz Phase Noise at 1 GHz (10 kHz offset)
- Built-in tracking generator
- USB 2.0, LAN, GPIB and LXI Class C compliance
Oscilloscopes | www.keysight.com/find/oscilloscopes

**InfiniiVision oscilloscopes**

- Up to 1,000,000 waveforms/sec update rate
- MegaZoom IV responsive, uncompromised smart memory
- Multiple instrument functionality
- Upgradable: bandwidth, MSO, serial analysis, built-in WaveGen function generator

PathWave BenchVue software included with instrument

www.keysight.com/find/infiniivision

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**Supercharge Your Bandwidth**

For a limited time, get more bandwidth for the same price on select 4-channel mixed signal oscilloscopes.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
<th>BANDWIDTH</th>
<th>CHANNELS</th>
<th>SAMPLE RATE</th>
<th>MEMORY DEPTH</th>
<th>STANDARD WARRANTY</th>
<th>CALIBRATION PERIOD</th>
<th>BUILT-IN INSTRUMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEW 1000 X-Series</td>
<td>Basic R&amp;D bench</td>
<td>50 MHz to 200 MHz</td>
<td>2, 4</td>
<td>Up to 2 GSa/s</td>
<td>Up to 2 Mpts and segmented memory standard</td>
<td>3 years</td>
<td>5 years</td>
<td>DVM, frequency counter, frequency response analyzer, 20 MHz FG</td>
</tr>
<tr>
<td>NEW 2000 X-Series</td>
<td>Basic R&amp;D bench</td>
<td>70 MHz to 200 MHz</td>
<td>2, 2+8, 4, 4+8</td>
<td>Up to 2 GSa/s</td>
<td>Up to 1 Mpts and segmented memory standard</td>
<td>5 years</td>
<td>2 years</td>
<td>20 MHz FG, 5-digit counter*</td>
</tr>
<tr>
<td>3000T X-Series</td>
<td>Everything the 2000X has plus</td>
<td>100 MHz to 1 GHz</td>
<td></td>
<td>Up to 5 GSa/s</td>
<td></td>
<td>3 years</td>
<td></td>
<td>20 MHz AWG, 8-digit counter</td>
</tr>
<tr>
<td>4000 X-Series</td>
<td>Everything the 3000T has plus</td>
<td>200 MHz to 1.5 GHz</td>
<td>2, 2+16, 4, 4+16</td>
<td></td>
<td>4 Mpts and segmented memory standard</td>
<td>3 years</td>
<td></td>
<td>Dual 20 MHz AWG, 5-digit counter and frequency response analyzer*</td>
</tr>
<tr>
<td>6000 X-Series</td>
<td>Everything the 4000X has plus</td>
<td>1 GHz to 6 GHz</td>
<td></td>
<td>Up to 20 GSa/s</td>
<td></td>
<td>2 years</td>
<td></td>
<td>Dual 20 MHz AWG, 10-digit counter</td>
</tr>
<tr>
<td>NEW Infinium S-Series</td>
<td>R&amp;D Analysis Bench</td>
<td>500 MHz to 8 GHz</td>
<td>4, 4+16</td>
<td>Up to 20 GSa/s</td>
<td>Up to 800 Mpts</td>
<td>3 years</td>
<td>1 year</td>
<td>Digital channels, Digital Signal Analysis (DSA)</td>
</tr>
</tbody>
</table>

*All X-Series models have built-in protocol analyzer and 3-digit DVM.

NEW: Added value software packages - now get more functionality.

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For a limited time, get more bandwidth for the same price on select 4-channel mixed signal oscilloscopes.

**DOWNLOAD YOUR NEXT Insight**

Keysight software is downloadable expertise.

www.keysight.com/find/software
Data Acquisition / Switch Units  |  www.keysight.com/find/DAQ

DAQ970A and DAQ973A data acquisition system

Get the next-generation data acquisition (DAQ) system with a 3-slot mainframe and your choice of 9 plug-in modules. Interface with the DAQ using Keysight BenchVue DAQ software, the intuitive graphical front panel with task oriented, self-guiding menus, or a web browser.

PATHWAVE BenchVue software included with instrument
www.keysight.com/find/DAQ970A
www.keysight.com/find/DAQ973A
DAQ970A/DAQ973A Data Sheet

PathWave BenchVue software included with instrument
www.keysight.com/find/DAQ970A
www.keysight.com/find/DAQ973A

DESCRIPTION | DAQ970A/73A MODULES | KEY SPECIFICATIONS
--- | --- | ---
20-channel solid-state multiplexer | DAQM900A | Up to 450 ch/s
20-channel multiplexer + 2 current channels | DAQM901A | Armature 2/4 wire, 80 ch/s with DAQ970A/DAQ973A, up to 300 V, 1 A
16-channel multiplexer | DAQM902A | Reed 2/4 wire, 250 ch/s, up to 300 V, 50 mA
20-channel actuator/GP switch | DAQM903A | SPDT/Form C, 120 ch/s, up to 300 V, 1 A
4 x8 matrix | DAQM904A | Armature 2-wire, 120 ch/s, up to 300 V, 1 A
2 GHz, dual 4-channel, RF mux, 50Ω | DAQM905A | Common low (not terminated), 60 ch/s up to 42 V, 0.7 A
Multifunction module | DAQM907A | Two 8-bit digital I/O ports, up to 42 V, 400 mA
| | | 26-bit 100 kHz event counter, up to 42 V
| | | Two 16-bit analog outputs, up to ±12 V, 10 mA
40-channel single-ended multiplexer | DAQM908A | Common low (no 4-wire meas.) 60 ch/s, up to 300 V, 1 A
4 channel simultaneous sampling digitizer | DAQM909A | Differential inputs, up to 800 kSa/s sampling rate, 24-bit resolution

– Advanced 6½ digit internal DMM with improved accuracy and faster measurement speed (50,000 readings/sec)
– Ability to measure very low current ranges (1 μA DC and 100 μA AC) and higher resistance range (1000 MΩ)
– New auto-calibration that compensates for internal drifts caused by time and temperature changes
– 3497XA compatible, program and configuration
– LAN and USB for easy connectivity to your PC (DAQ973A comes with additional GPIB)

PLUS
– All modules have been updated to have improved switching speeds and accuracies
– DAQM900A solid state multiplexer with scan rate speed of up to 450 channels/sec
– New DAQM909A 4 channel simultaneous sampling digitizer module with a sampling rate of up to 800 kSa/sec
N6700 Modular power system

**N6700**: Ideal DC power supply solution for automated test systems
- Small 1U mainframe (400, 600, 1200 W); holds up to four output modules per mainframe
- Over 30 programmable DC modules - Each offers unique capabilities, performance, voltage, and current combinations
- New DC Electronic load modules, 100 & 200 W, allow current to be sourced and sinks in the same mainframe

**N6705C**: Deep insight into DUT power consumption—without assembling a complex test system
- Integrated benchtop unit holds up to four N6700 Series modules (600 W total)
- DMM, scope, arb, and data logger features
- Characterize and improve battery run time with a source/measure unit and BV9200B analysis software

PathWave BenchVue software included with instrument

N6705C Data Sheet
N6700C, N6701C, and N6702C Data Sheet

www.keysight.com/find/n6700

E36300 Series triple output DC power supplies

- Large display shows voltages and currents for all three outputs
- Programming/readback accuracy as low as 0.03%
- Low output ripple and noise less than 2 mVpp/350 uVrms
- Data logging plus output sequencing and coupling
- Front and rear output terminals
- Color-coded outputs and individual knobs for voltage and current
- LAN (LXI Core), USB, and GPIB (optional)

PathWave BenchVue software included with instrument

E36300 Series Data Sheet

www.keysight.com/find/e36300

<table>
<thead>
<tr>
<th>MODEL</th>
<th>E36311A Economy model</th>
<th>E36312A Most popular</th>
<th>E36313A Twice the current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>80 W</td>
<td>80 W</td>
<td>160 W</td>
</tr>
<tr>
<td>Channels</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>DC output</td>
<td>0 to 6 V</td>
<td>0 to 6 V</td>
<td>0 to 6 V</td>
</tr>
<tr>
<td>Rating (0 to 40 °C)</td>
<td>0 to +25 V</td>
<td>0 to 25 V</td>
<td>0 to 10 A</td>
</tr>
<tr>
<td></td>
<td>0 to -25 V</td>
<td>0 to 25 V</td>
<td>0 to 2 A</td>
</tr>
</tbody>
</table>

Need More Power? See the E36200 Series 200 and 400 W autoranging power supplies.
Waveform Generators | www.keysight.com/find/functiongenerators

33500B and 33600A Series waveform generators

- Generate Trueform arbitrary waveforms with high fidelity and less jitter and harmonic distortion
- Ease of use features, such as modulation, sweep, burst, dual-channel coupling and IQ baseband signal player

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
<th>CHANNELS</th>
<th>FREQUENCY RANGE</th>
<th>PULSE</th>
<th>STD/OPT ARB</th>
<th># BITS</th>
<th>SAMPLE RATE</th>
<th>MEMORY/CHANNEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>33509B</td>
<td></td>
<td>1 2</td>
<td>20 MHz</td>
<td>20 MHz</td>
<td>Optional</td>
<td>16</td>
<td>160 MSa/s</td>
<td>1 M Standard, 16 M Optional</td>
</tr>
<tr>
<td>33510B</td>
<td></td>
<td>1 2</td>
<td>20 MHz</td>
<td>20 MHz</td>
<td>Standard</td>
<td>16</td>
<td>160 MSa/s</td>
<td>1 M Standard, 16 M Optional</td>
</tr>
<tr>
<td>33511B</td>
<td>Exclusive Trueform waveform technology with &lt; 40 ps jitter and &lt; 0.04% THD.</td>
<td>1 2</td>
<td>30 MHz</td>
<td>30 MHz</td>
<td>Optional</td>
<td>14</td>
<td>660 MSa/s</td>
<td>4 M Standard, 64 M Optional</td>
</tr>
<tr>
<td>33512B</td>
<td></td>
<td>1 2</td>
<td>30 MHz</td>
<td>30 MHz</td>
<td>Standard</td>
<td>14</td>
<td>660 MSa/s</td>
<td>4 M Standard, 64 M Optional</td>
</tr>
<tr>
<td>33519B</td>
<td></td>
<td>1 2</td>
<td>80 MHz</td>
<td>80 MHz</td>
<td>Standard</td>
<td>14</td>
<td>660 MSa/s</td>
<td>4 M Standard, 64 M Optional</td>
</tr>
<tr>
<td>33520B</td>
<td></td>
<td>1 2</td>
<td>120 MHz</td>
<td>100 MHz</td>
<td>Standard</td>
<td>14</td>
<td>660 MSa/s</td>
<td>4 M Standard, 64 M Optional</td>
</tr>
</tbody>
</table>

Digital Multimeters | www.keysight.com/find/dmm

Truevolt digital multimeters

PathWave BenchVue software included with instrument

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
<th>DIGITS OF RESOLUTION</th>
<th>MAX READING RATE AT 4½ DIGITS (RDGS/S)</th>
<th>BUILT-IN PC INTERFACES</th>
</tr>
</thead>
<tbody>
<tr>
<td>34460A</td>
<td>New industry standard. Display DMM results in ways you never have before and measure with unquestioned Truevolt confidence.</td>
<td>6½</td>
<td>300</td>
<td>USB; optional GPIB, LAN</td>
</tr>
<tr>
<td>34461A</td>
<td></td>
<td>7½</td>
<td>50,000</td>
<td>USB, LAN; optional GPIB</td>
</tr>
<tr>
<td>34465A</td>
<td>More measurements, higher speed, better accuracy, and more memory than the 34461A. Comes with digitizer and advanced triggering capability.</td>
<td>6½</td>
<td>300</td>
<td>USB; optional GPIB, LAN</td>
</tr>
<tr>
<td>34470A</td>
<td></td>
<td>7½</td>
<td>50,000</td>
<td>USB, LAN; optional GPIB</td>
</tr>
</tbody>
</table>

Find a Keysight distributor today at www.keysight.com/find/distributor
Vector Network Analysis  |  www.keysight.com/find/E5063A

E5063A ENA vector network analyzer*

- Various frequency options to suit your test needs and budget, upgradable at any time
- PCB manufacturing test capability with Option 011
- Support for six languages via softkey and the embedded help manual in English/Simplified Chinese
- Supports all Keysight calibration kits including the N755xA economy ECal module

<table>
<thead>
<tr>
<th>ENA SERIES E5063A HIGHLIGHTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Test port</td>
</tr>
<tr>
<td>Dynamic range</td>
</tr>
<tr>
<td>Trace noise</td>
</tr>
<tr>
<td>Source power</td>
</tr>
<tr>
<td>Key software capability</td>
</tr>
<tr>
<td>Interface</td>
</tr>
</tbody>
</table>

1. Optional capability.
2. External software (Keysight N1500A Material Measurement Suite) required.

Keysight Streamline Series  |  USB Instruments

Vector network analyzers and oscilloscopes

- Multiple new compact, faceless, USB instruments
- Common technology and measurement capabilities as benchtop and modular instruments
- Perfect for component and subassembly test, R&D labs, and light manufacturing
- Small footprint in size, weight, and power
- Perfect for a rack at 1U high

<table>
<thead>
<tr>
<th>VECTOR NETWORK ANALYZER (VNA)*</th>
<th>OSCilloscope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Models:</td>
<td></td>
</tr>
<tr>
<td>Bandwidth:</td>
<td></td>
</tr>
<tr>
<td>300 kHz to 26.5 GHz</td>
<td>200 MHz, 500 MHz, and 1 GHz</td>
</tr>
<tr>
<td>Capabilities:</td>
<td></td>
</tr>
<tr>
<td>Full 2-port</td>
<td>2 analog channels</td>
</tr>
<tr>
<td>Ability to extend the number of ports</td>
<td>5 GSa/s</td>
</tr>
<tr>
<td>Same calibration and metrology as all trusted Keysight VNAs</td>
<td>1,000,000 wfms/s</td>
</tr>
<tr>
<td>Zone triggering</td>
<td></td>
</tr>
<tr>
<td>6-in-1 instrument: Arbitrary Waveform Generator, Frequency Response Analyzer, Digital Voltmeter, Counter, Protocol Analyzer</td>
<td></td>
</tr>
</tbody>
</table>

* From selected distributors only
Boost your Benchtop
For a limited time, get a free handheld DMM with your purchase of an eligible digital multimeter, function/waveform generator, or power supply mainframe.

Ends August 31, 2020

Expand your Data Acquisition Capabilities
Buy either a DAQ mainframe (DAQ970A or DAQ973A) with the latest digitizer module (DAQM909A), and you get the DAQM901A multiplexer module at no extra cost.

Power Up
Experience the convenience of a power supply and electronic load in the same mainframe. With your next purchase of a qualifying N6700 Mainframe and a new N6790A Series Electronic Load Module, claim a free Keysight N6745B DC Power Module.

See our complete list of current promotions:
www.keysight.com/find/promotions

PathWave BenchVue Lab Management and Control Solution  |  www.keysight.com/find/LMS

Control. Automate. Simplify.
PathWave BenchVue Lab management and control solution BV9111B allows centralized control of instruments, and provides control and automation of the instruments.

– Configure the most commonly used controls and measurements from instruments.
– Easily log and export data and screen images in just a few clicks for faster analysis.
– Create automated test sequences fast with minimal instrument knowledge.

BenchVue is now PathWave BenchVue, part of Keysight’s PathWave Software Platform

Download a free 30-day trial
BenchVue Data Sheet