Keysight & Our Distributor Network
RIGHT *Instrument.* RIGHT *Expertise.*
Delivered RIGHT *Now.*

Keysight
Basic Instruments

August 2020 - October 2020

N6790 Electronic Loads

Experience the Capabilities
of Modular Power

KEYSIGHT TECHNOLOGIES

SPOTLIGHT

Improving Power Storage and Conversion

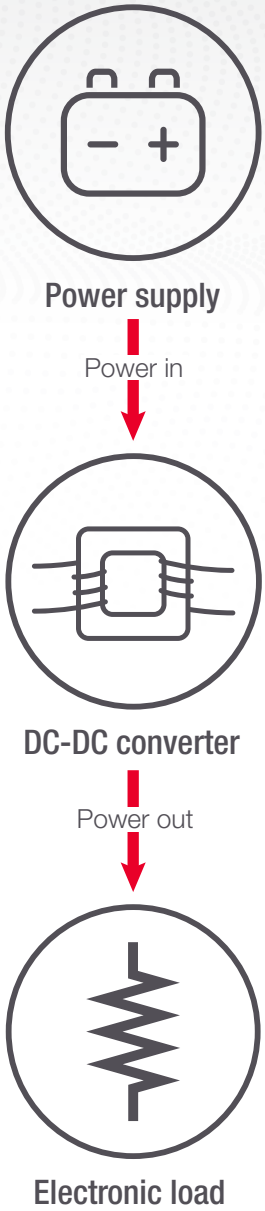
Every electronic device you use shares two processes: power storage and power conversion. Power originating at your local power plant traverses the grid and arrives at your home's wall outlets. Your wall chargers transform the AC power into DC energy. DC electricity powers circuits and screens, and batteries store it. Energy conversion has become incredibly efficient.

Efficient energy conversion has several advantages: it reduces size and minimizes heat and cost. Electronic devices take advantage of these properties and use a variety of DC voltages internally. Manufacturers benefit from further cost reductions by using existing parts, regardless of their supply voltages. Also, faster charging times are possible with adaptive chargers that use multiple voltages. The rise in low-cost, efficient converters is evolving the electronics we use daily.

Testing and improving highly efficient electronics creates a challenge. It's no secret that using lower currents and taking advantage of sleep and idle states increase a device's efficiency. However, these small dynamic currents can be hard to measure. Here are three common measurement challenges:

- Researching and finding similar hardware to power and load electronics can be time-consuming. Ideally, the power supply and load would share a mainframe and use the same configuration.
- Calculating efficiency requires correlating source and load measurements. Using a source and a load with the same measurement system would provide synchronized measurements.
- Sequencing tests that provide statistical insights and allow repeated testing at lower voltages to simulate the effects of battery discharge can be time-consuming.

The sight of travelers in an airport terminal crowding charging stations and wall outlets indicates that today's devices lack a robust battery life. For additional information, check out our latest application note: Keysight Solution for Power Storage and Conversion Testing.



EXPERIENCE THE CONVENIENCE OF A POWER SUPPLY AND ELECTRONIC LOAD IN THE SAME MAINFRAME

For a limited time, claim a Keysight N6745B power module with your next purchase of a qualifying N6700 Series mainframe and a new N6790 Series electronic load module. If you are testing a device that converts or stores energy, you will appreciate the convenience of having a power supply and load in the same mainframe. Choose from the 100 W single-wide or the 200 W double-wide electronic load module. For additional details see the: Power Up promotion

Find more information at
www.keysight.com/us/en/cmp/promotions/power-up.html

Find out more about Keysight's Power Offerings at
www.keysight.com/find/power

Signal Generators | www.keysight.com/find/sg

X-Series signal generators

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.

	MXG-ANALOG	EXG-ANALOG	CXG-VECTOR
Model number	**N5181B**	**N5171B**	**N5166B**
Frequency range	9 kHz to 6 GHz	9 kHz to 6 GHz	9 kHz to 6 GHz
Max. output power	+24 dBm	+21 dBm	+18 dBm
Frequency switching (list mode)	800 µs	800 µs	5 ms
Level accuracy	± 0.6 dB	± 0.6 dB	± 0.6 dB
SSB phase noise (1 GHz, 20 kHz offset)	-146 dBc/Hz	-122 dBc/Hz	-119 dBc/Hz
Harmonics (at 1 GHz)	–35 dBc	–35 dBc	–35 dBc
Analog modulation	AM, FM, PM, and pulse modulation	AM, FM, PM, and pulse modulation	AM, FM, PM, and pulse modulation
Digital Modulation	N/A	N/A	120 MHz bandwidth

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.

PathWave signal generation software available for CXG N5166B		
	Model	**Communications standard**
Cellular communications	N7631C	5G new radio (NR)
	N7626C	V2X
	N7625C	LTE/LTE-A TDD
	N7624C	LTE/LTE-A FDD
	N7612C	TD-SCDMA/HSPA
	N7602C	GSM/EDGE/Evo
	N7601C	cdma2000®/1xEV-DO
	N7600C	W-CDMA/HSPA+
Wireless connectivity	N7617C	WLAN 802.11 a/b/g/j/p/n/ac/ah/af/ax
	N7610C	IoT (WiSUN, ZigBee, Z-Wave, LoRa, and UWB)
	N7607C	DFS Radar Profiles
	N7606C	Bluetooth®(BR, EDR, 4.0/4.2, BT5)
	N7609C	Global Navigation Satellite Systems (GNSS)
General purpose	N7608C	Custom modulation
	N7622C	IQ toolkit

X-Series RF Signal Generators Technical Overview

X-Series Signal Generators Website

PathWave Signal Generation Software Website

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.

PathWave BenchVue software supported

CXA Data Sheet

www.keysight.com/find/cxa

- 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

* From selected distributors only

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

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

MODEL	DESCRIPTION	BANDWIDTH	CHANNELS	SAMPLE RATE	MEMORY DEPTH	STANDARD WARRANTY	CALIBRATION PERIOD	BUILT-IN INSTRUMENTS
NEW **1000 X-Series** 1000X Data Sheet Videos	Basic R&D bench – 200,000 wfms/s update rate – 7-inch display – Protocol analysis	50 MHz to 200 MHz	2, 4	Up to 2 GSa/s	Up to 2 Mpts and segmented memory standard	3 years	5 years	DVM, frequency counter, frequency response analyzer, 20 MHz FG
2000 X-Series 2000X Data Sheet Videos	Basic R&D bench – 200,000 wfms/s update rate – 8.5-inch display – Serial bus options	70 MHz to 200 MHz	2, 2+8, 4, 4+8	Up to 2 GSa/s	Up to 1 Mpts and segmented memory standard	5 years	2 years	20 MHz FG, 5-digit counter*
3000T X-Series 3000X Data Sheet Videos	Everything the 2000X has plus – 1,000,000 wfms/s update rate – Advanced math and power analysis – Capacitive touch screen	100 MHz to 1 GHz	2, 2+16, 4, 4+16	Up to 5 GSa/s	4 Mpts and segmented memory standard	3 years	3 years	20 MHz AWG, 8-digit counter
4000 X-Series 4000X Data Sheet Videos	Everything the 3000T has plus – 12.1-inch capacitive touch screen – FFT, USB 2.0 pre-compliance – Up to four active probes	200 MHz to 1.5 GHz					2 years	Dual 20 MHz AWG, 5-digit counter and frequency response analyzer*
6000 X-Series 6000X Data Sheet Videos	Everything the 4000X has plus – 450,000 wfms/s update rate – Multi-touch display – Voice control – Jitter and real-time eye diagram analysis	1 GHz to 6 GHz		Up to 20 GSa/s				Dual 20 MHz AWG, 10-digit counter
NEW **Infiniium S-Series** Data Sheet Videos	R&D Analysis Bench – 10-bit ADC for highest signal integrity – Deep analysis toolkit for power, serial data, jitter – Support for >100 probes – Up to 40 analogue channels with MultiScope app	500 MHz to 8 GHz	4, 4+16	Up to 20 GSa/s	Up to 800 Mpts	3 years	1 year	Digital channels, Digital Signal Analysis (DSA)

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

NEW Added value software packages - now get more functionality.

	AUTOMOBILE	AEROSPACE & DEFENSE	EMBEDDED	POWER	USB	NFC	ULTIMATE BUNDLE
1000X	Standard (DSOX)	NA	Standard	NA	NA	NA	NA
2000X	D2000AUTA	NA	D2000GENA	NA	NA	NA	D2000BDLA
3000X/T	D3000AUTA	D3000AERA	D3000GENA	D3000PWRA	NA	D3000NFCA	D3000BDLA
4000X	D4000AUTA	D4000AERA	D4000GENA	D4000PWRA	D4000USBA	D4000NFCA	D4000BDLA
6000X	D6000AUTA	D6000AERA	D6000GENA	D6000PWRA	D6000USBA	NA	D6000BDLA
P9240A	P9240AUTB	P9240AERB	P9240GENB	NA	NA	P9240NFCB	P9240BDLB
M9240A	M9240AUTB	M9240AERB	M9240GENB	M9240PWRB	NA	M9240NFCB	M9240BDLB

DOWNLOAD YOUR NEXT INSIGHT

Keysight software is downloadable expertise.
www.keysight.com/find/software

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

- 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

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

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
- DC Electronic load modules, 100 & 200 W, allow current to be sourced and sinked 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

MODEL	E36311A			E36312A			E36313A		
	Economy model			Most popular			Twice the current		
Power	80 W			80 W			160 W		
Channels	1	2	3	1	2	3	1	2	3
DC output Rating (0 to 40 °C)	0 to 6 V	0 to +25 V	0 to –25 V	0 to 6 V	0 to 25 V	0 to 25 V	0 to 6 V	0 to 25 V	0 to 25 V
	0 to 5 A	0 to 1 A	0 to 1 A	0 to 5 A	0 to 1 A	0 to 1 A	0 to 10 A	0 to 2 A	0 to 2 A

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

PathWave BenchVue software included with instrument

www.keysight.com/find/function-generators

33500B and 33600A Data Sheet

MODEL	DESCRIPTION	CHANNELS	FREQUENCY RANGE	PULSE	ARBITRARY WAVEFORMS			
					STD/OPT ARB	# BITS	SAMPLE RATE	MEMORY/CHANNEL
33509B 33510B	Exclusive True*form* waveform technology with < 40 ps jitter and < 0.04% THD.	1 2	20 MHz	20 MHz	Optional	16	160 MSa/s	1 M Standard, 16 M Optional
33511B 33512B		1 2			Standard			
33519B 35520B		1 2	30 MHz	30 MHz	Optional		250 MSa/s	
33521B 33522B		1 2			Standard			
33611A 33612A	Exclusive True*form* waveform technology at higher frequency ranges with < 1 ps jitter < 0.03% THD.	1 2	80 MHz	80 MHz	Standard	14	660 MSa/s	4 M Standard, 64 M Optional
33621A 33622A		1 2	120 MHz	100 MHz			1 GSa/s	

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

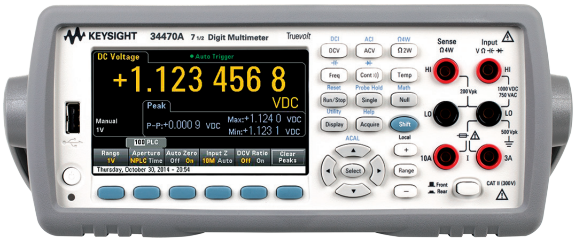
True*volt* digital multimeters

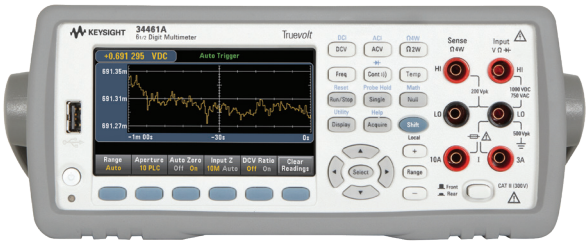
PathWave BenchVue software included with instrument

34460A, 34461A, 34465A, 34470A Data Sheet

www.keysight.com/find/true*volt*

- 6½ and 7½ digit performance
- Graphical capabilities such as trend and histogram charts
- Measure very low current, 1 µA range with pA resolution, allowing measurements on very low power devices
- Auto calibration to compensate for temperature drift
- Basic measurements: DCV, ACV, DCI, ACI, 2- and 4-wire resistance, frequency, period, continuity, diode, temperature, capacitance





MODEL	DESCRIPTION	DIGITS OF RESOLUTION	MAX READING RATE AT 4½ DIGITS (RDGS/S)	BUILT-IN PC INTERFACES
34460A	New industry standard. Display DMM results in ways you never have before and measure with unquestioned True*volt* confidence.	6½	300	USB; optional GPIB, LAN
34461A			1,000	USB, LAN; optional GPIB
34465A	More measurements, higher speed, better accuracy, and more memory than the 34461A. Comes with digitizer and advanced triggering capability.	6½	50,000	USB, LAN; optional GPIB
34470A		7½		

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

ENA SERIES E5063A HIGHLIGHTS	
Frequency	50 kHz to 500 M, 1.5, 3, 4.5, 6.5, 8.5, 14 or 18 GHz
Test port	2-port 50 Ω S-parameter test set
Dynamic range	117 dB (spec.), 122 dB (typ.)
Trace noise	0.005 dBrms (spec.), 0.002 dBrms (typ.)
Source power	–20 to 0 dBm
Key software capability	Fixture simulator, Time domain analysis/Test Wizard option [1], Wireless power transfer analysis [1], and Materials measurement [2]
Interface	LAN, USB (front 2, rear 4), USBTMC, GPIB [2], Handler I/O [2]

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

PathWave BenchVue software supported

www.keysight.com/find/e5063a

Keysight electronic calibration kits

* From selected distributors only

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

www.keysight.com/find/usb-vna

www.keysight.com/find/usb-scope

Compact form. Zero compromise.

	VECTOR NETWORK ANALYZER (VNA)*	OSCILLOSCOPE
Models:	P9370A, P9371A, P9372A, P9373A, P9374A, P9375A	P9241A, P9242A, P9243A
Bandwidth:	300 kHz to 26.5 GHz	200 MHz, 500 MHz, and 1 GHz
Capabilities:	Full 2-port Ability to extend the number of ports Same calibration and metrology as all trusted Keysight VNAs	2 analog channels 5 GSa/s 1,000,000 wfms/s Zone triggering 6-in-1 instrument: Arbitrary Waveform Generator, frequency Response Analyzer, Digital Voltmeter, Counter, Protocol Analyzer

* From selected distributors only

KEYSIGHT TECHNOLOGIES

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.

PATHWAVE

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

Download a free 30-day trial

BenchVue Data Sheet

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