Keysight
Basic Instruments

February–April 2017

BenchVue Software

Faster instrument configurations using your PC.

KEYSIGHT
TECHNOLOGIES

SPOTLIGHT

Use your PC to configure data acquisition instruments for temperature measurement

You can use a PC for many tasks—and with Keysight's BenchVue software, you can even use it to configure your data acquisition (DAQ) instruments. BenchVue supports many different Keysight instruments with different apps for each instrument type. For this example, we'll use the BenchVue DAQ app with the Keysight 34972 DAQ.

Set up in minutes

Start by configuring your channels. For example, you might have nine different channels configured to measure temperature.

You'll want to label each channel, then configure the type of temperature sensor you're using, such as a thermocouple type T sensor (*Figure 1*). You can also configure different types of ranges or units on your measurement.

If you want to scale or adjust the readings to make them absolute zero or absolute temperature, you can use the scaling mechanism to adjust the readings to your expected value.
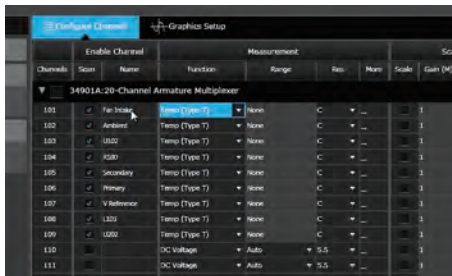

Figure 1. With BenchVue, you can configure temperature-measurement channels, type of temperature sensor, and ranges or units for your measurements.

You may also want to configure your data logging settings. You can change the scan interval to whatever is appropriate—say once every 30 seconds. And perhaps you want to stop data logging after one hour, so you can configure that as well (*Figure 2*). After you press Start, the data logger will scan through all of the channels and make a measurement on each channel once every 30 seconds. After an hour, it will stop.
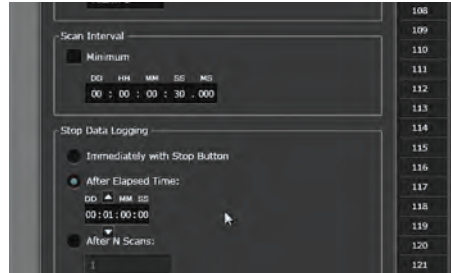

Figure 2. BenchVue lets you set your scan interval and elapsed time or number of scans to suit your application.

Graph your logged results

Once the logging is complete, you'll want to see your data on-screen. To do that, first set up a strip chart and configure it to display a few channels. You can autoscale charts by pressing the Target Button.

To adequately temperature-characterize your unit, you should actually test under load conditions, in various environments. You want to test at maximum and minimum operating environments, to ensure your unit will not break under those conditions as well. With BenchVue, you can see the different values and make sure there are no anomalies to worry about.

Figure 3. To view your logged data, set up a strip chart to display the temperature measurements on each channel.

Export data to Excel

You can also export your logged data if you want to use other tools for analysis. You can choose a format such as Microsoft Excel. BenchVue will export the data and let you open it up right away for quick analysis (*Figure 4*).

You can even see the timestamps for each of the readings. The data log resulted in 142 readings over the course of an hour.
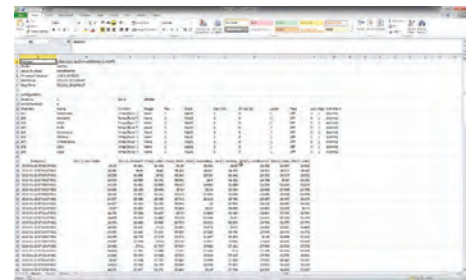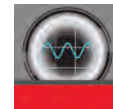

Figure 4. An export of logged data to an Excel spreadsheet lets you use a familiar program for analysis.

And that's it. With minimal setup time using BenchVue you can easily setup data logging and quickly analyze your data without programming.

To see BenchVue in action, spend a few minutes with the YouTube video "Measuring Temperature with Data Acquisition using BenchVue " at www.keysight.com/find/daqvideo

---

Keysight & Our Distributor Network

RIGHT *Instrument.* **RIGHT** *Expertise.* **Delivered** **RIGHT** *Now.*

Keysight and our network of Keysight Authorized Distributors have teamed up to provide fast, easy access to the world's largest selection of off-the-shelf T&M instruments. It's the best of both worlds: Keysight's measurement expertise and product breadth combined with speed, convenience and same-day shipping from our distribution partners. It's never been easier to get the right instrument in the right hands, right away.

34980A multi-function switch/measure unit

– High-performance, 8-slot mainframe with 6½ digit DMM and built-in signal conditioning
– Choose from 21 plug-in modules, up to 1024 1-wire (560 2-wire) channels or 4096 cross points

☰ 34980A Data Sheet

34980A modules

Model	Key specifications
34921A–34925A multiplexer switch modules	Up to 300 V, 40, 70 or 80 channels
34937A–34939A general-purpose switch modules	Up to 64 channels, and up to 300 V
34931A–34934A matrix switch modules	4x8, 4x16, up to Quad 4x32 matrix
34941A–34947A RF and µWave switch modules	Up to 26.5 GHz
34950A–34952A system control modules	DIO, DAC, totalizer
34959A breadboard module	For custom designs with +12 V and + 5 V supplies

34970A / 34972A data acquisition switch units

– Low-cost, 3-slot unit with 6½ digit DMM and built-in signal conditioning
– Choose from 8 plug-in modules, up to 120 1-wire (60 2-wire) channels or 96 cross points
– 34972A has built-in Web interface

 BenchVue software enabled

☰ 34970A / 34972A Data Sheet

34970A/72A modules

Model	Key specifications
34901A/02A/08A multiplexers	Up to 300 V, 16, 20, or 40 channels
34903A general-purpose switch	300 V, 20 actuator channels
34904A matrix	4x8 matrix
34905A/06A RF switches	2 GHz dual, 50 and 75 Ω
34907A multi-function	DIO, DAC, totalizer

KEYSIGHT
TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

☰ Data Sheet   Brochure   Learn More   YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

Professional performance and compact size for general-purpose testing needs

N9310A RF signal generator

- 9 kHz to 3 GHz CW output, 20 Hz to 80 kHz low frequency (LF) output
- -127 to +13 dBm output level range (max +20 dBm settable)
- - 95 dBc/Hz SSB phase noise
- Extensive analog modulation: AM, FM, phase, and pulse modulation

  N9310A Data Sheet

Streamlined for straightforward, efficient operation

Basic spectrum analyzers (BSAs)

- Increase productivity on a budget with reliable performance up to 7 GHz
- Tracking generator up to 7 GHz for stimulus/response measurements
- ASK/FSK demodulation analysis capability

  BenchVue software enabled

  Learn more about basic spectrum analyzers

Model	Key specifications
N9320B	9 kHz to 3 GHz frequency, -145 dBm DANL @ 1 GHz
N9322C	9 kHz to 7 GHz frequency, -152 dBm DANL @ 1 GHz

BenchVue Software

BenchVue software for the PC makes it simple to connect, record and achieve results with your instruments without programming

Look for this icon throughout this flyer to identify BenchVue enabled instruments (450+ Keysight instruments).

- Visualize multiple measurements simultaneously
- Easily capture data, screen shots and system state
- Rapidly prototype custom test sequences
- Measurement data export to Excel, Word and MATLAB in only three clicks
- Monitor and control your bench from mobile devices

  BenchVue Software Data Sheet

  Play BenchVue examples and learn how to increase your productivity and make the most of your bench

  Download today

Unlock measurement insights. Click on the icons and product images for more information

| Data Sheet | Brochure | Learn More | YouTube Video |

KEYSIGHT
TECHNOLOGIES

Find a Keysight distributor today at www.keysight.com/find/distributor

More resolution and speed with graphical display offers more insights

53200A Series RF and universal frequency counters

– Frequency, frequency ratio, time interval, rise/fall time, phase, and much more
– Histograms, trend charts, data logging, and built-in math and statistical functions
– Optional 6 or 15 GHz RF channel

BenchVue software enabled

53200A Series Data Sheet

Model	Key specifications
53210A	350 MHz RF frequency counter, 10 digits/s
53220A	350 MHz universal frequency counter/timer, 12 digits/s, 100 ps
53230A	350 MHz universal frequency counter/timer, 12 digits/s, 20 ps

Digital Multimeters

Truevolt digital multimeters (DMMs)

– 6½ digit 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

BenchVue software enabled

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

Learn more about Truevolt

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 Truevolt 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 34461A.	6½	5,000; optional 50,000	USB, LAN; optional GPIB
34470A		7½		

KEYSIGHT TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

Data Sheet   Brochure   Learn More   YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

DMMs (continued)

Keysight offers exceptional performance and reliability at a great price. Highlights from our complete portfolio include

U3400 Series 4½ and 5½ digit multimeters

– Elegantly simple and affordable DMMs with basic capabilities, including dual display.

   ≡ U3400 Series Data Sheet

U3606B multimeter | DC power supply

– Two instruments in one; 5½ digit DMM with built-in 30 W power supply. Cuts required rack space in half.

   ≡ U3606B Data Sheet
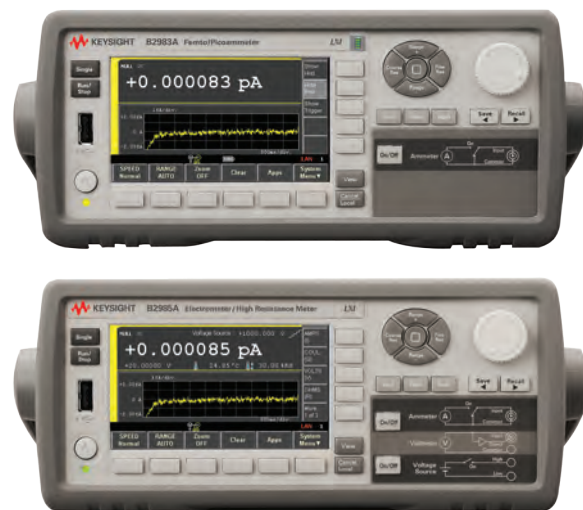
34450A bench digital multimeter

– Turbo charge your measurements with one of the fastest tools in its class. 5½ digit bench digital multimeter with OLED dual display.

   ⬤ BenchVue software enabled

   ≡ 34450A Data Sheet

▶ Learn more about Benchtop DMMs

B2980A Series femto/picoammeter and electrometer/high resistance meters

– The world's only graphical picoammeter / electrometer that can confidently measure down to 0.01 fA and up to 10 PΩ
– Four models available:
    B2981A / B2983A* femto / picoammeter
    B2985A / B2986A* electrometer / high resistance meter
– 0.01 fA (10^{-17} A) minimum measurement resolution and 2 pA to 20 mA current measurement ranges with 6.5 digits resolution
– < 20 µV burden voltage in its lowest current range
– High-speed reading rate up to 20,000 rdg/s
   Battery operated models for line noise-free measurements.

   ≡ B2980 Series Data Sheet

KEYSIGHT
TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

≡ Data Sheet   📈 Brochure   ▶ Learn More   ▶ YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

N6700 modular power system family

N6700: Ideal DC power supply solution for automated test systems

– Small 1U mainframe (400, 600, 1200 W); up to four modules per mainframe

– More than 30 programmable DC power modules: basic, high performance, precision and SMU; available in 20 to 500 W

BenchVue software enabled

N6700 Series Data Sheet

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

– Source/measure units and application-specific modules

BenchVue software enabled

N6705C Data Sheet

B2900 Series precision source/measure units

– Display I-V curves on the front panel

– 6.5-digit sourcing/measurement resolution

– Wide application coverage from 100 nV / 10 fA to 210 V / 3 A DC and 10.5 A pulsed

– Multiple free software control options to fit your particular application

BenchVue software enabled

B2900 Series Data Sheet

B2960 Series low noise power sources

– Precision current and voltage source with ultra-low noise 10 µVrms

– 6.5 digit resolution (100 nV / 10 fA)

– Innovative and precision ARB capability; six built-in waveforms with speeds up to 10 kHz

BenchVue software enabled

B2960 Series Data Sheet

Measurement Hint

Challenged by maximizing the life of small, on-board batteries of IoT devices?

Easily measure the deep sleep mode, wake up mode, active mode, pulse transmission, and the return to sleep mode in the same measurement sweep with Keysight N6705C DC power analyzer and the N6781A/N6785A source measure unit.

www.keysight.com/find/batteries4iot

KEYSIGHT
TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

Data Sheet   Brochure   Learn More   YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

HIGH-VALUE BASIC DC POWER: Solid performance and robust features help you achieve more on lower budgets

E36100 Series DC power supplies

– 30 to 40 W outputs
– Compact, 2U ¼-rack form factor
– High-contrast OLED display viewable from any angle
– Intuitive on-screen menus
  - BenchVue software enabled

  - E36100 Series Data Sheet

  - Take a look at the inside of Keysight's new E36100 DC power supply

E3600 Series DC power supplies

– Output noise as low as 1mVp-p/0.2mVrms
– Fast load transient response time (<50 μs)
– 30 to 200 W outputs
  - BenchVue software enabled

  - E3620A & E3630A Data Sheet
  - E3631A – E3634A Data Sheet
  - E3640A – E3649A Data Sheet

N5700 and N8700 Series system DC power supplies

– 45 models in compact 1U (750 and 1500 W) and 2U (3.3 and 5 kW) packages
– Up to 600 V or up to 400 A
– Programmability and built-in V & I measurements simplify test set ups
  - BenchVue software enabled

  - N5700 Series Data Sheet
  - N8700 Series Data Sheet

N8900 Series autoranging high-power system supplies

– 5 and 10 kW basic, single-output, autoranging programmable DC power for ATE applications
– 18 models that offer up to 1000 V or 340 A
– Easily parallel units to create "one" power supply with up to 100 kW of power
  - BenchVue software enabled

  - N8900 Series Data Sheet

KEYSIGHT TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

- Data Sheet
- Brochure
- Learn More
- YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

STABLE, RELIABLE AC POWER: Make sure your designs can handle unpredictable real-world power

AC6800 Series basic AC sources

– Four models, 500 to 4000 VA (dual range 135 / 270 Vrms, up to 120 A)
– Intuitive user interface
– Access and control the source remotely using a standard Web browser

≔ AC6800 Series Data Sheet

▶ See an AC6800 Series AC Power Source Product Overview
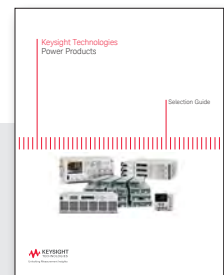
6800B Series performance AC sources/analyzers

– Complete AC power test solution
– Three models, up to 1750 VA (300 Vrms, up to 80 A)
– Extensive power measurement capabilities (rms, peak, DC, AC+DC, THD, and more)
– Built-in arbitrary waveform generator to simulate many types of power waveforms

≔ 6800B Series Data Sheet

Keysight offers more than 300 power products to meet your specific needs.

The Keysight Power Products Selection Guide helps you choose your instrument by the number of outputs, output power characteristics, packaging, special features and application specific solutions.

✎ Power Products Brochure

Keysight Technologies
Power Products

Selection Guide

KEYSIGHT
TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

≔ Data Sheet   ✎ Brochure   ▶ Learn More   ▶ YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

Retool your expectations

From digital multimeters (DMMs) and basic capacitance meters, to oscilloscopes, spectrum/signal and network analyzers, our handheld and portable test tools will address the test and measurement capabilities you need to complete your tasks on the bench or in the field. Whatever your industry and application – electronics, electrical, installation and maintenance, wireless communications, aerospace and defense, or industrial process testing – Keysight handheld instruments provide clear readouts from high-contrast OLED displays, ontinuity checks with audible and flashing alerts, and low-light troubleshooting with a built-in flashlight

⊡ Handheld Test Tools Brochure

U5850 Series True*IR* thermal imagers

– 4X more in-camera fine resolution to identify abnormalities faster
– Image logging and temperature trending to monitor temperature changes
– High-temperature range (up to 1200 °C)
– Long standard product warranty – 3 years

  ▤ U5850 Series Data Sheet

Insulation resistance testers

– Wireless insulation resistance testing via PC and smart phone / tablet applications
– Automatic test report generation
– 50 V/100 V/250 V/500 V/1000 V test voltages
– Keysight Remote Link solution, with an optional U1117A Infrared (IR)-to-*Bluetooth*® adapter

  ▤ U1450A/60A Series Data Sheet

Digital multimeters

– Data logging capability
– Long battery life
– CAT III 600 V overvoltage protection or higher
– Keysight Remote Link solution, with an optional U1117A Infrared (IR)-to-*Bluetooth* adapter

  ▤ U1240 Series Data Sheet

  ▤ U1250 Series Data Sheet

  ▤ U1270 Series Data Sheet

  ▤ U1280 Series Data Sheet

KEYSIGHT
TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

▤ Data Sheet   ⊡ Brochure   ▶ Learn More   ▶ YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

Quickly and accurately characterize your electronics design.

Using a thermal imaging camera, coupled with a data acquisition box, you can perform a thorough thermal analysis of your device under test.

▶ Electronics Thermal Characterization: Quick and Accurate Method

---

Clamp meters

- Full-featured digital multimeter capabilities
- CAT III 600 V overvoltage protection or higher
- Keysight wireless remote connectivity solution on some models

  ≣ U1190 Series Data Sheet
  ≣ U1210 Series Data Sheet

Oscilloscopes

- 20 to 200 MHz bandwidth
- Large color display
- High sampling rate and recording length

  ≣ U1600 Series Data Sheet

Capacitance/LCR meters

- 20,000 counts resolution, 0.2% basic accuracy
- Wide LCR ranges with 3 to 5 selectable test frequencies (Up to 100 kHz for U1733C)
- Battery life of 16 hours/AC-powered
- IR-to-USB connectivity for data logging to PC

  ≣ U1701B Data Sheet
  ≣ U1730C Series Data Sheet

KEYSIGHT
TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

≣ Data Sheet   ⬚ Brochure   ▶ Learn More   ▶ YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

33500B and 33600A Series Waveform Generators

– Generate True*form* arbitrary waveforms with less jitter,
  more fidelity and greater resolution
– Modulation: AM/FM, FSK, PWM

BenchVue software enabled

▶ Learn more about benchtop waveform generators

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	Opt	16	160 MSa/s	1 M Standard, 16 M Optional
33511B 33512B		1 2	20 MHz	20 MHz	Std	16	160 MSa/s	1 M Standard, 16 M Optional
33519B 35520B		1 2	30 MHz	30 MHz	Opt	16	250 MSa/s	1 M Standard, 16 M Optional
33521B 33522B		1 2	30 MHz	30 MHz	Std	16	250 MSa/s	1 M Standard, 16 M Optional
≣ 33500 Series Data Sheet ▶ 33500 Series Videos								
33611A 33612A	Exclusive True*form* waveform technology at higher frequency ranges with <1 ps jitter <0.03% THD.	1 2	80 MHz	80 MHz	Std	14	660 MSa/s	4 M Standard, 64 M Optional
33621A 33622A		1 2	120 MHz	100 MHz	Std	14	1 GSa/s	4 M Standard, 64 M Optional
≣ 33600 Series Data Sheet ▶ 33600 Series Videos								

33210A 10 MHz function/arbitrary waveform generator

Uncompromising performance at a lower price for basic functions and waveforms.
It is the most frequency stable and lowest distortion function generator in its class.

BenchVue software enabled

▶ Learn more about the 33210A

≣ 33210A Data Sheet

Measurement Hint

If you'd like to design a signal, like one you might use for synchronization with a True*form* generator (see main article), consider building it with Keysight's 33503A BenchLink Waveform Builder Pro software. This is the first full-featured waveform creation software for pulse/function/ arbitrary waveform generators. Take full advantage of the signal generation capabilities and make custom waveform creation fast and simple.

www.keysight.com/find/33503

KEYSIGHT
TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

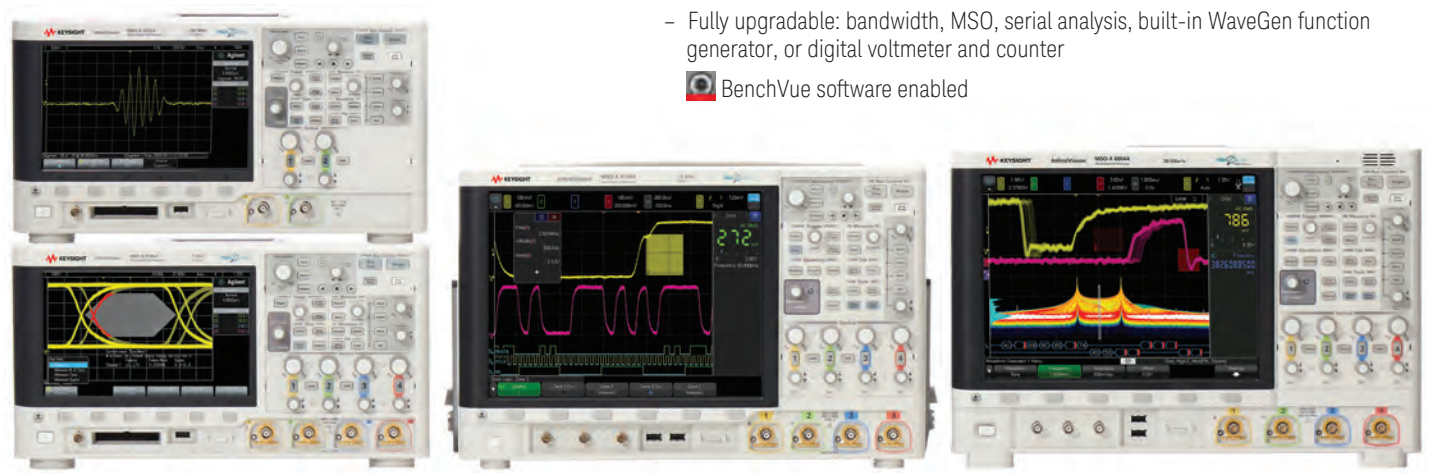≣ Data Sheet   ⌁ Brochure   ▶ Learn More   ▶ YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

InfiniiVision X-Series oscilloscopes

▶ Learn more about InfiniiVision X-Series oscilloscopes

– Up to 1,000,000 waveforms/sec update rate

– MegaZoom IV responsive, uncompromised smart memory

– 5 or 6 instruments in 1 oscilloscope

– Fully upgradable: bandwidth, MSO, serial analysis, built-in WaveGen function generator, or digital voltmeter and counter

🔘 BenchVue software enabled

▶ Oscilloscope how-to video series, new videos every Tuesday! The basics for beginners and some helpful tips for more advanced users.

Model	Description	Bandwidth	Channels	Sample rate	Memory depth	Standard warranty	Calibration period	Special triggers	Built-in instruments
2000 X-Series ☰ 2000 Data Sheet	Basic R&D bench – 50,000 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	5 years	2 years	Serial protocol	8 digital channels, 20 MHz FG, 5-digit counter, 3-digit DVM
3000T X-Series ☰ 3000T 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	Near Field Communication (NFC) Trigger, Serial protocol, Zone touch	16 digital channels, 20 MHz AWG, 8-digit counter and totalizer, 3-digit DVM
4000 X-Series ☰ 4000 Data Sheet	Everything the 3000T has plus – 12.1-inch capacitive touch screen – FFT, USB 2.0 pre-compliance and FPGA applications – Up to four active probes	200 MHz to 1.5 GHz					2 years		16 digital channels, Dual 20 MHz AWG, 5-digit counter, 3-digit DVM
6000 X-Series ☰ 6000 Data Sheet	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				Serial protocol Zone touch	16 digital channels, Dual 20 MHz AWG, 10-digit counter and totalizer, 3-digit DVM

InfiniiVision Software Applications

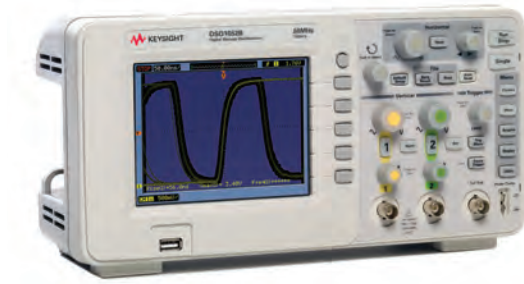| Serial protocols and triggering	Features
I^2C, SPI, RS232, UART, USB 2.0, CAN, CXPI, LIN, FlexRay, Audio, MIL-STD 1553, ARINC 429	Dual-channel WaveGen, jitter, real-time eye diagram, integrated voltmeter, 10-digit counter, mask limits, USB signal quality, video/TV, FPGA dynamic probe, power analysis, frequency response analysis via Bode plot, and near field communication testing

▶ Learn more about oscilloscope software applications

DOWNLOAD YOUR NEXT ⬇ INSIGHT
Keysight software is downloadable expertise. www.keysight.com/find/software

Big scope performance with a small scope price

1000 Series oscilloscopes

– 50 to 200 MHz, 2- and 4-channel DSO models with up to 20 kpts memory
– 5.7-inch color display offers powerful signal capture and display
– Up to 2 GSa/s sample rate
– Accelerate your productivity with 23 automatic measurements, an 11-language user interface, USB connectivity, and a standard educator's kit

BenchVue software enabled March 2016

1000 Series Data Sheet

Extreme temperature tools:
N7007A passive probe and N7014A adapter

– Temperature range: -40 to +85 °C
– Low-cost, high-impedance probe with rugged tip perfect for general-purpose applications
– 2-meter cable length ideal for hard-to-reach automotive test points
– Banana-to-socketed tip adapter compatible with differential active probes

Extreme Temperature Tools Data Sheet

Learn more and see the complete list of available probes

Measurement Hint

If you need to verify product performance over a wide temperature range or find the cause of failure at high or low temperatures, you know most probes are limited to 0 to 50 °C. Operate them outside that range and you risk damage. No need to take the risk, Keysight offers extreme-temperature probing solutions that operate at -40 to +85 °C and beyond. Measure with the probe head and accessories inside the temperature chamber and the probe pod and scope outside. ▶ Learn More

KEYSIGHT
TECHNOLOGIES

Unlock measurement insights. Click on the icons and product images for more information

Data Sheet   Brochure   Learn More   YouTube Video

Find a Keysight distributor today at www.keysight.com/find/distributor

KEYSIGHT
TECHNOLOGIES

P.O. Box 4026, Englewood, CO 80155-4026
www.keysight.com/find/contactus

What is BenchVue software?

BenchVue software simplifies your bench testing. Easily control your instruments and quickly build automated tests without instrument programming. Control, automate, simplify with BenchVue.

Learn more at www.keysight.com/find/BenchVue

Promotions

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

STANDARD
3 YR
WARRANTY

Get Greater Reliability— Standard

You've come to expect the highest quality from Keysight. We stand behind our products with a three-year warranty that's standard on all instruments, worldwide.

www.keysight.com/find/ThreeYearWarranty