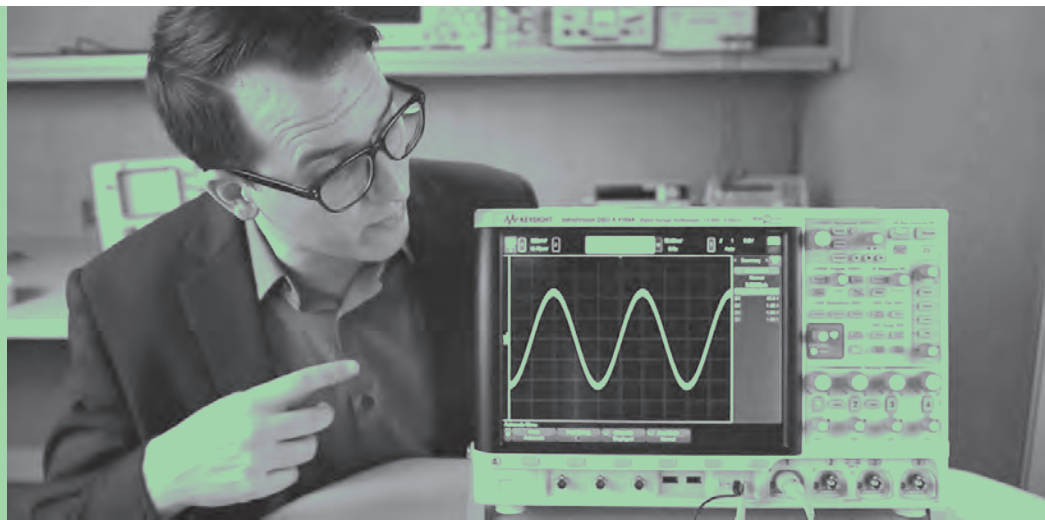


Keysight Basic Instruments

February-April 2018



Tips, tricks, and giveaways
available at *WAVE 2018*



SPOTLIGHT

Join *WAVE 2018* for tips, tricks and giveaways to make you an engineering legend!

Enter now for free giveaways worth up to \$44,000 (USD)!

Keysight is launching *WAVE 2018*, a first-of-its kind event created to connect you with our experts! Join us March 1-16 to learn helpful tips, discuss latest ideas, and explore new advances in the industry via daily videos, exclusive content, and live question and answer session. Plus you can register for daily bench and RF giveaways worth up to \$44,000 (USD)! You won't want to miss a minute of this event – or your chance to win. You can register now for a free early entry, and mark your calendar for March 1 when we'll kick off *WAVE 2018* with a live stream. Get ready to discover an entire Keysight community focused on helping you become an engineering legend!



Don't leave it to chance!

Enter Keysight's *Test to Impress* contest during *WAVE 2018* for even more ways to win. Simply submit a short video on why you need test and measurement equipment and our panel of judges will be awarding one grand prize winner, who will get a bench or RF bundle prize of their choice. Four runner-up winners will be awarded a **DSOX1102G InfiniiVision 1000 X-Series oscilloscope**. Want to see example entries? [Check out the 2017 Test to Impress entries playlist.](#)

What happened to *Scope Month*?

WAVE 2018 is the next evolution of Keysight's *Scope Month*, a 2016/2017 month-long oscilloscope-focused event that also featured measurement tips and giveaways. During *WAVE 2018* you'll have access to helpful content beyond just oscilloscopes. Learn tips and tricks that will help you master all of the test and measurement tools on your bench. *Scope Month* had drawings for single oscilloscopes, but during *WAVE 2018* you could win giveaway bundles that include oscilloscopes, waveform generators, power supplies, digital multimeters, microwave analyzers, and more!

While you wait for *WAVE 2018* to begin, we have other useful resources to help you with your measurement challenges:

Keysight's Digital/Bench Facebook Page

Don't miss out on information about *WAVE 2018* and other events by following us on social.

Keysight's RF/Microwave Facebook Page

Keep up to date with the latest RF/microwave news and content.

Keysight Labs YouTube Channel

Get a steady stream of how-to videos by subscribing to our YouTube channel.

"EEs Talk Tech" Electrical Engineering Podcast

Join Mike and Daniel as they cover a broad range of topics from the basics of electrical engineering to the tough engineering problems of tomorrow's technologies.

Keysight Oscilloscopes Blog

Discover the latest industry news and advice from Keysight oscilloscope experts.

Keysight General Electronics Measurement Blog

Follow for more information about Keysight solutions, new applications, measurement tips, and industry trends.

Keysight RF Test Blog

Learn how to improve your RF/microwave test measurements.

**The specifics around this event are subject to change. View the latest information at www.keysight.com/find/JoinWave2018.*



Only Keysight delivers the industry’s largest selection of bench instruments and groundbreaking Keysight BenchVue software – the intuitive way to view, capture, and export the data you collect from your bench with no need for programming.



Waveform Generators | www.keysight.com/find/functiongenerators

33500B and 33600A Series waveform generators

- Generate Trueform arbitrary waveforms with less jitter, more fidelity and greater resolution
- Modulation, sweep, burst, dual-channel coupling

 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 Trueform waveform technology with <40 ps jitter and <0.04% THD. | 1 | 20 MHz | 20 MHz | Opt | 16 | 160 MSa/s | 1 M Standard, 16 M Optional | | | |
| 33511B 33512B | | 2 | | | Std | | | | | | |
| 33519B 35520B | | 1 | 30 MHz | 30 MHz | Opt | | | | 250 MSa/s | | |
| 33521B 33522B | | 2 | | | Std | | | | | | |
| 33611A 33612A | | Exclusive Trueform waveform technology at higher frequency ranges with <1 ps jitter <0.03% THD. | 1 | 80 MHz | 80 MHz | | Std | | 14 | 660 MSa/s | 4 M Standard, 64 M Optional |
| 33621A 33622A | | | 2 | | | | | | | | |
| | 1 | | 120 MHz | 100 MHz | 1 GSa/s | | | | | | |
| | 2 | | | | | | | | | | |

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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, or digital voltmeter and counter

BenchVue software enabled

[Learn more about InfiniiVision oscilloscopes](#)

Oscilloscope how-to video series. 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* |
|--|--|--------------------|------------------|---------------|--------------------------------------|-------------------|--------------------|---|--|
| 1000 X-Series 1000X Data Sheet Videos | Basic R&D bench - 50,000 wfms/s update rate - 7-inch display - Serial bus options | 50 MHz to 100 MHz | 2 | Up to 2 GSa/s | Up to 1 Mpts | 3 years | 5 years | Serial protocol | Frequency response analyzer, 20 MHz FG, 5-digit counter |
| 2000 X-Series 2000X Data Sheet Videos | 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 | 20 MHz FG, 5-digit counter |
| 3000T X-Series 3000TX 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, | 20 MHz AWG, 8-digit counter, totalizer and frequency response analyzer |
| 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 | | | | | | Serial protocol, Zone touch | 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 | Serial protocol, Zone touch | Dual 20 MHz AWG, 10-digit counter, totalizer and frequency response analyzer |

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



InfiniiVision software applications

Serial protocols and triggering

I²C, SPI, RS232, UART, USB 2.0, CAN, CXPI, LIN, FlexRay, Audio, MIL-STD 1553, ARINC 429, and more

Features

Dual-channel WaveGen, jitter, real-time eye diagram, integrated voltmeter, 10-digit counter, mask limits, USB signal quality, video/TV, power analysis, frequency response analysis via Bode plot, near field communication testing, and more.

[Learn more about oscilloscope software applications](#)

DOWNLOAD YOUR NEXT INSIGHT

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

Truevolt digital multimeters (DMMs)

 BenchVue software enabled

 [34460A, 34461A, 34465A, 34470A Data Sheet](#)

 [Learn more about Truevolt](#)

- 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 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 the 34461A. | 6½ | 5,000; optional 50,000 | USB, LAN; optional GPIB |
| 34470A | | 7½ | | |

DC Power Supplies | www.keysight.com/find/power

E36300 Series triple output DC power supplies

 BenchVue software enabled

 [E36300 Series Data Sheet](#)

 [Learn more about the E36300 Series](#)

- 4.3" color display that shows voltage and current on all three channels simultaneously
- Programming/readback accuracy as low as 0.03%
- Output ripple and noise: < 2 mVpp/350 µVrms
- Data logging plus output sequencing and coupling
- Front and rear output terminals
- Color-coded channels and individual knobs for voltage and current
- Modern I/O (USB, LAN and GPIB)



| Model | E36311A | | | E36312A | | | E36313A | | |
|-------------------------------|----------------------|------------------------|------------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Performance specifications | 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 5 A | 0 to +25 V 0 to 1 A | 0 to -25 V 0 to 1 A | 0 to 6 V 0 to 5 A | 0 to 25 V 0 to 1 A | 0 to 25 V 0 to 1 A | 0 to 6 V 0 to 10 A | 0 to 25 V 0 to 2 A | 0 to 25 V 0 to 2 A |

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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](#)

 [Learn more about the 3497xA Series](#)

34970A/72A modules

| Model | Key specifications |
|-------------------------------|--|
| 34901A/02A/08A multiplexers | Up to 300 V, 16, 20, or 40 channels respectively |
| 34903A general-purpose switch | 300 V, 20 actuator channels |
| 34904A matrix | 2-wire 4x8 matrix switch |
| 34905A/06A RF switches | 2 GHz bandwidth, dual 4-channel multiplexers, 50 and 75 Ω respectively |
| 34907A multi-function | 2 8-bit digital I/O, 2 16-bit DAC, 100 kHz totalizer |


BenchVue Software | www.keysight.com/find/benchvue

BenchVue control, automation and analysis software

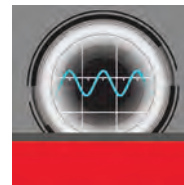
BenchVue software for the PC makes it simple to connect, record and achieve results across multiple instruments with no programming.

- Configure the most commonly used controls and measurements from instruments
- Visualize multiple measurements simultaneously
- 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 Software Data Sheet](#)

 [Play BenchVue examples and learn how to increase your productivity and make the most of your bench](#)

 [Download a free 30-day trial today](#)




Look for this icon throughout this flyer to identify BenchVue enabled instruments (500 Keysight instruments, and counting).



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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

BenchVue software enabled

[Learn more about the E5063A ENA Series network analyzer](#)

[Learn more about Keysight calibration kits](#)

| ENA Series E5063A highlights | |
|------------------------------|--|
| Frequency ¹ | 100 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 ² , Wireless power transfer analysis ³ , and Materials measurement ⁴ |
| Interface | LAN, USB (front 2, rear 4), USBTMC, GPIB ⁴ , Handler I/O ⁴ |

1. The E5063A starting frequency can be set down to 50 kHz.
2. Optional capability. Consists of conventional time domain analysis capabilities and GUI for PCB test.
3. Optional capability.
4. External software (Keysight N1500A Material Measurement Suite) required.

FieldFox Handheld Analyzers | www.keysight.com/find/fieldfox



- Maximum frequency from 4 to 50 GHz across family of 22 models
- Measurement results agree with those obtained with benchtop analyzers
- Compact form factor measures 29 x 19 x 7 cm (11.5 x 7.4 x 2.8 in)
- Light weight (3.2 kg /7.1 lbs), dust-free, and weather-resistant
- MIL-PRF-28800F Class 2 compliant
- MIL-STD-810G, Method 511.5 Procedure I requirements for operation in explosive environments (type tested)

BenchVue software enabled

[Learn more about FieldFox](#)

| | Combination analyzers | | | Vector network analyzers | | Spectrum analyzers | |
|-----------------------------|-----------------------|-----------------------------|----------------|--------------------------|---------------------|----------------------|----------------|
| Model number | N9912A | N9913/4/5/6/7/8A | N9950/1/2A | N9923A | N9925/6/7/8A | N9935/6/7/8A | N9960/1/2A |
| Maximum frequency range | 4, 6 GHz | 4, 6.5, 9, 14, 18, 26.5 GHz | 32, 44, 50 GHz | 4, 6 GHz | 9, 14, 18, 26.5 GHz | 9, 14, 18, 26.5 GHz | 32, 44, 50 GHz |
| Cable and antenna analyzer | Standard | | | Optional | | Optional (VSWR & RL) | |
| Vector network analyzer | Optional (1 port) | Optional | | Standard | | — | |
| QuickCal | Optional | | — | Optional | | — | |
| Full 2-port S-parameters | — | Optional | | Optional | | — | |
| VNA time domain | Optional | | | Optional | | — | |
| Spectrum analyzer | Optional | | | — | | Standard | |
| Real-time spectrum analyzer | — | Optional | | — | | Optional | |
| Interference analyzer | Optional | | | — | | Optional | |
| Tracking generator | Optional | | | — | | Optional | |

Join [WAVE 2018](#) for measurement tips, exclusive content, and daily giveaways of Keysight test gear. For details visit www.keysight.com/find/JoinWave2018.

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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.

