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cleverscope

World Class Isolated Oscilloscope



CEO's Corner

Dear Colleague,

Power-electronics engineers face increasingly complex measurement challenges, from analyzing high-side gate-drive signals and switching losses to evaluating parasitic stress, EMC performance, and control-loop stability. The four-channel CleverScope CS548 simplifies these demanding tasks with individually isolated inputs, 2 kV DC CAT III isolation, 100 dB CMRR at 50 MHz, frequency-response analysis, high-resolution spectrum analysis, power-loss and switching-energy calculations, and extensive mixed-signal capture capabilities.

Also featured is the new CleverScope CS328AE-FRA, a versatile Ethernet-connected, PC-hosted oscilloscope, spectrum analyzer, and frequency-response analyzer. It offers two simultaneously sampled 14-bit analog channels at 100 MSa/s, eight digital inputs, 8 million samples of storage per channel, advanced triggering, and long-duration streaming to a PC. Its factory-installed CS701 isolated 0–65 MHz signal generator enables power-supply frequency-response analysis without requiring a separate isolation injection transformer. Both the CS548 and CS328AE-FRA are available from Saelig Company, Inc., a certified CleverScope distributor.

Read on for more!

Alan Lowne
CEO, Saelig Company Inc.

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The CS548 isolated channel oscilloscope is made for measurements in power electronics systems, including on the high side. 2kV DC isolated

Cleverscope CS548 200MHz 500 MSa 14-bit Isolated 4-Channel Oscilloscope

The CS548 Can:

- Make measurements of all high side nodes
- Do EMC measurements
- Check out start up behavior
- Calculate power loss and switching energy



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The Cleverscope CS548

- 14-bit resolution with noise free measurements of 1 part in 1300.
- Four isolated input channels for signals with a common mode voltage change of 100V/ns at up to 2kV.
- 64-bit Windows software and DLL driver to control between 1 and 4 oscilloscopes simultaneously.

- Four remote channel sockets for use with the CS1200 voltage, and CS1201 current remote digitizers. Fiber 1-30m linked.
- An isolated signal generator, 0-65MHz, (also 100V/ns common mode) for Frequency Response Analysis (FRA).
- Two pod high speed interfaces for I/O expansion.
- Two CS1301 Isolated digital input pods for logic signals with high common mode voltages (1130V DC) having 4 digital inputs each for a total of 8 digital inputs.

The CS548 package includes:

- CS548 Oscilloscope.
- Two CS1301 Isolated digital input pods for measuring logic signals with high common mode voltages (1130V DC).
- Four 1x/10x probes and four 100x probes

Optional pods:

- CS1200 Isolated Voltage digitizer with 1 - 30 m fiber cable
- CS1201 Isolated Current digitizer with 1 - 30 m fiber cable. 63A and 630A ranges with CS1501 1 mOhm current shunt.
- CS1302 Isolated digital I/O pods for up to 4 outputs for double pulse, half/full bridge PWM control or arbitrary pulse.
- CS1133 Vsat probe pod for measuring mV saturation levels while switching up to 3kV for power loss measurement.
- CS1070 50 MHz power amplifier with 36Vpp 1A output for wide bandwidth higher power FRA.

These pods are in development:

- CS1303 Isolated Current Measurement pod with 4 isolated 16-bit analog channels for measuring current shunts.
- CS1304 Isolated Voltage Measurement pod with 4 isolated 16-bit analog channels. With CS1303 forms a real-time power analyzer.



The CS548 can be used to make measurements of all high side nodes, do EMC measurements, check out start up behavior, calculate power loss and switching energy, and examine message contents. Use it for stability analysis and gain/phase on working power electronics modules, impedance measurement of power planes, inputs and outputs, and measurement of inductors and capacitors over frequency. Application examples include gate drives to measure voltage and charge, the power switch to measure loss and parasitic stress, the output to measure power and spectrum for EMC compliance, and the control system for Gain/Phase and stability. It can be used to make measurements of all high side nodes, do EMC measurements, check out start up behavior, calculate power loss and switching energy, and examine message contents.

Compact in size (11.8" x 7.5" x 2.8") and weight (5.9lb) the CS548 is made in New Zealand by Cleverscope, an innovative test equipment manufacturer, and is available now from:



[Cleverscope Model CS328AE-FRA](#) is an ideal mixed-signal oscilloscope for Frequency Response Analysis (FRA). It is a 14-bit USB- or Ethernet-connected, 100 MSPS, 100 MHz analog bandwidth PC-hosted oscilloscope and spectrum analyzer with PC-based application software. The CS701 Isolated Signal Generator is factory fitted for FRA use. You can use the CS328AE-FRA for Power Supply FRA without needing an isolation injection transformer. Complete with the CS300 application software, 2 x CS1001

1x/10x probes and CS1004/5 4 digital input pod sets, power supply and Ethernet cable. The front panel ground is continuous via the power supply ground to the PC. It's easy to use Windows program integrates with standard office

applications. Graphs and data can be copied and pasted to other applications, saved or loaded from disk, and printed. The CS320A version is the same as the CS328A, but without digital inputs.

<https://www.saelig.com/category/MFR00018.htm>

To view a video
showing how to get started
with a Cleverscope CS548
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