

DSO-8000 USB Oscilloscope USB Spectrum Analyzer

The PC Oscilloscope operates at up to 500 MSa/s (single shot) and 20 GSa/s (repetitive) with a 1Mpt buffer. The windows software features dual channel FFT Spectrum Analysis, a powerful suite of measurements, XY plot and advanced triggering are also included.



Overview

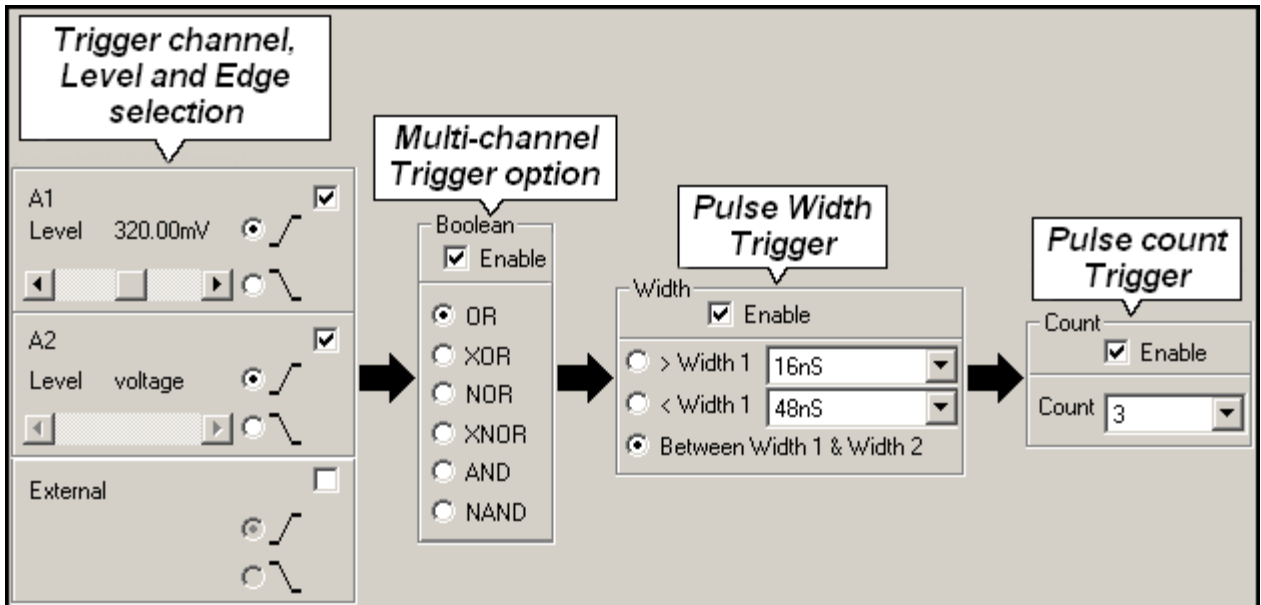
- **High speed sampling**
Single shot: Up to 500MSa/S
Repetitive mode: 20GSa/S
Bandwidth: 100MHz+ bandwidth
- **Large capture buffer**
Up to 1Million samples per channel
- **USB 2.0 Hi-Speed**
- **Advanced Triggering**
Level
Filter
Pulse width
Pulse count
Multi-channel
TV
- **250 MHz Spectrum Analyzer/FFT**
Dual channel FFT with Averaging, Memory and spectral subtraction.
- **History plots** (variable persistence with color)
Review and compare current and previous captures.
- **XY Plot**
- **Auto-setup**
- **Fast, Accurate Measurements**
- **Automatic Storage**
With save and export capabilities
- **Battery Power**
- **Easy Installation**
- **Simple Operation**
- **FrontPanel™ Oscilloscope software supports Windows**
- **DLL Libraries (optional)**
DLL and LabView

Advanced Triggering DSO

- Level
- Multi-channel
- Pulse width
- Pulse count
- Filter
- TV

The high-speed circuit allows you to sample at full speed(up to 500MSa) while triggering on various TV sync signals including individual scan line.

- Adjustable position



Deep Acquisition Memory

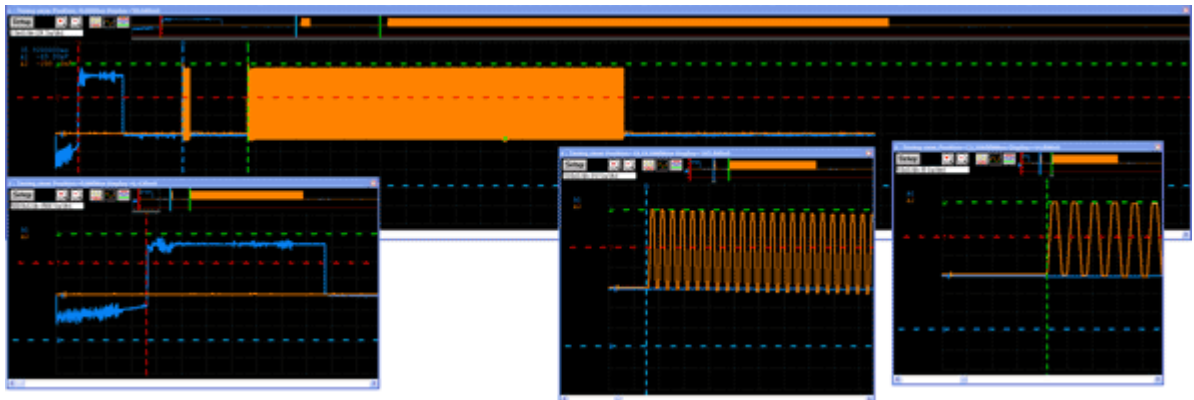
DSO-8502 1 Million point buffer on 1 channel at a sample rate of 500MSa/S.
512K point buffer on 2 channels at sample rates of 250MSa/S and below.

DSO-8202 128K point buffer on 2 channels at sample rates of 200MSa/S and below.

The long buffer lets you sample at high speed while capturing long traces. Other instruments with short memory buffers force you to degrade your sample rate and thus lower your bandwidth. For example if you needed to capture a 100us event using a 1 GSa/s scope with a 2.5k buffer, you would reduce your sample rate to 40 MSa/s, or at best a bandwidth of 10 MHz!". The DSO-8502 would let you view that 100us event at 5GSa/s.

"The big buffer really saved me. With my last oscilloscope I always had to balance recording time and time per division. With Link's scope I can record at the fast sampling rate and still see the entire event." Bob Mitchell, consultant. (beta tester)"

A vast amount of data can be captured in the large acquisition buffer. Often there are many points of interests that are scattered throughout the buffer. QuadVue provides 4 independent timing windows that allow you to focus and analyze the analog and digital data on just the point of interest, instead of constantly panning and zooming after each capture. Each window can even have a different timebase. Since each timing display window can display its own set of waveforms, one can superimpose mathematically operated data and history memory data on top of the most recent data for quick analysis and comparison.



In this example 4 timing windows are being displayed. Window 1 is showing the entire buffer. Window 2 is showing a zoomed in section around the trigger (Red cursor) event. Windows 3 and 4 are each showing a different part of the waveform and are zoomed differently.

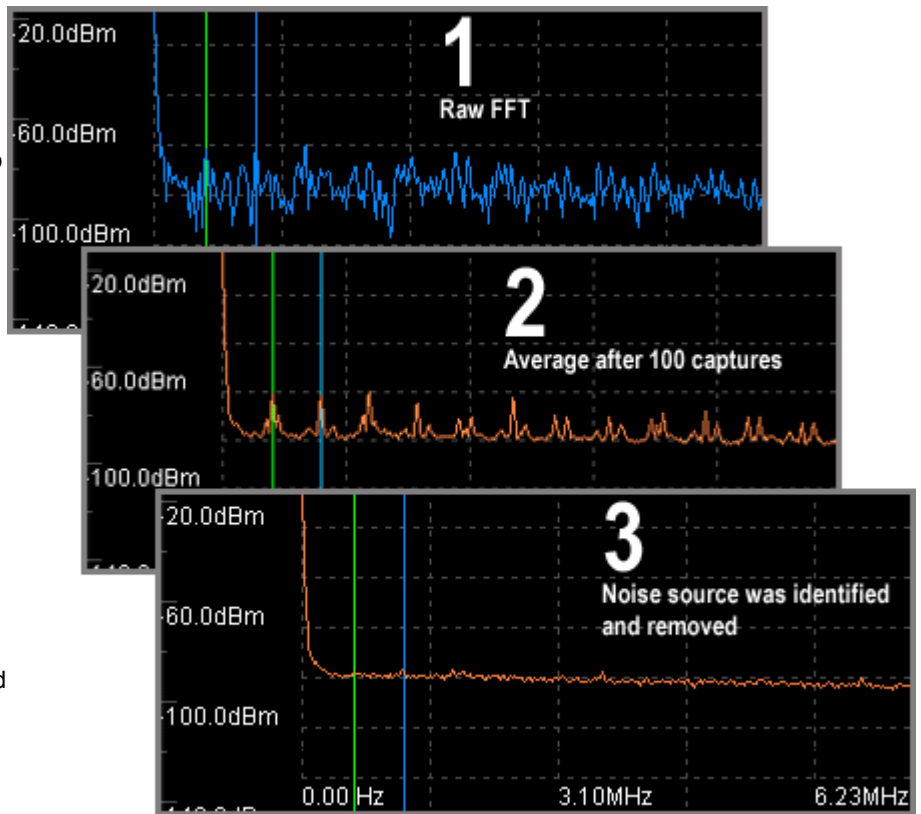
Spectrum Analyzer/FFT

This example shows use of FFT averaging to identify and reduce noise.

Image 1: Spectral plot of noisy output of an Op Amp circuit.

Image 2: Average after 100 captures of the same circuit. Notice how clear the fundamental and harmonic frequencies are displayed and the random noise is suppressed.

Image 3: The noise source was identified and removed.

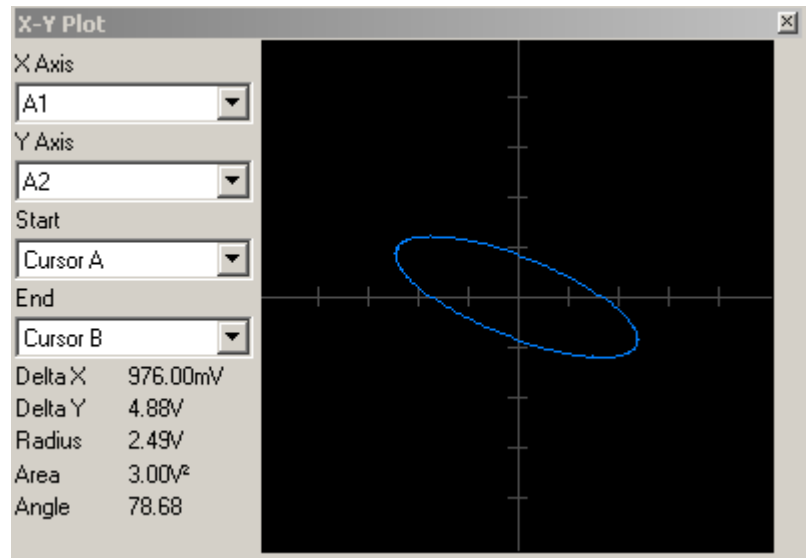


Auto-Setup

With one mouse click the DSO will analyze incoming signals and setup the oscilloscope using advanced analysis routines.

XY Oscilloscope plot

- XY Area (Lissajous curve)
- Angle
- Radius
- Delta X
- Delta Y



Oscilloscope Probes

Two 1x/10x switchable probes are included with the oscilloscope.

We also sell the following types of probes:

- 1x/10x (2 meter cable)
- 100x
- [Differential Probes](#)

Waveform Measurements

A powerful suite of over 40 measurements are available. The measurements can be performed on incoming waveform, stored waveform or a mathematically processed waveform. The data cursors can be used to define a subset of data to be measured.

Pass/fail testing based on user specified criteria is also supported. Data can be saved to disk based on the test results.

Measurements [screen]			
Test	Source	Value	Pass/Fail
1 Frequency	(CH A)	102.56410KHz	Fail
2 Peak to peak	(CH A)	488.00mV	Pass
3 Cycles	(CH A)	4	Fail
4 Duty cycle rising	(CH B)	25.00%	Fail
5 Falltime (10% .. 90%)	(CH B)	38.000US	Fail
6 Period	(CH A)	9.000US	Fail
7 Pulse width (neg)	(CH A)	7.000US	Pass
8 Standard Deviation	(CH A)	66.63mV	Fail
9			
10			

Easy Installation

The PC Based oscilloscope connects to the USB port of your computer. To install the oscilloscope all you need to do is plug it into your PC, plug in the power supply and install the software.

The DSO is about the size of a video tape (7" x 3.75" x 1.5"). If you need portability what could be easier than connecting the DSO to your laptop?

Simple Operation

- Installation is a snap.
 - Make measurements in your first half hour.
 - Simple controls make operation intuitive.
 - Perform sophisticated operations that you couldn't even dream of doing with a knob based DSO.
 - Save default setups to disk for easy recall at a future date. You don't need to keep a notepad with settings scribbled in it. Just save them to the file name of your choice.
 - Data and settings are easily saved to disk.
 - Screen shots can be pasted into documents and annotated in your favorite image editing program.
-

Battery power or wall power

Wall power

Most people will power their DSO with the included wall adapter.

Battery power

The case has a battery holder for 4 AA batteries (NiMH recommended). Using AA batteries allows you to use the DSO away from a power source without draining your laptop's battery.

Automatic Storage

To save time, you can automatically datalog your waveforms to your PC. The data logger can also store only waveforms meeting specific parameter criteria, such as rise times between 20 and 30ns and pulse widths greater than 100ms, etc....

The Windows Oscilloscope software takes advantage of your computer's large color screen.

You can display any combination of Digital Oscilloscope and Spectrum Analyzer traces simultaneously.

Color can be a real time saver. Each display element can be a unique color. This includes each of the Traces, Memories, Cursors, Text, Background, Grid and more.

Stand-alone oscilloscope display screens represent a compromise at best. Few people would choose a 7" or 9" monitor as the screen for their PC. So why use a small monitor for an oscilloscope? Link PC Based instruments let you choose the display monitor size and type for viewing your traces. Plus, you can utilize powerful PC-industry display peripherals such as projectors, remote monitors, and heads-up displays. Many people are now using dual monitor PC's - our software will work there also - Imagine having a 30" wide trace window.

You can take electronic snapshots of the screen and put them into your documents as well as print to your standard windows printer.

The speed of your PC does not significantly affect the performance of our instruments

All of the high speed acquisition is done with the oscilloscope hardware, the speed of your PC is not a factor. The PC is used for display and for the user interface. If your PC is fast enough and has enough memory to run windows well, it will run our products well also.

The Instrument has high speed samplers and buffers. It can acquire at up to 500MSa/s^{*1} and stores the data in it's own 1 MegaSample^{*1} data buffer. When these buffers are full everything is transferred to the PC.

Software Libraries (optional)

The optional [DLL library](#) allows users to write custom software to control the instrument. The library works with visual studio, labview and matlab.

	DSO-8502	DSO-8202																								
Input																										
Max Sample Rate	500MSa/s on 1 ch. 250MSa/s on 2 ch.	200MSa/s on 2 ch.																								
Bandwidth	100MHz	100MHz																								
Inputs	2 + External	2 + External																								
Gain Range (per division) <i>full scale = 10 divisions</i>	<table border="1"> <thead> <tr> <th>Probe</th> <th>Voltage per division</th> <th>Full scale voltage</th> </tr> </thead> <tbody> <tr> <td>1x</td> <td>5mV to 5V per division</td> <td>50mV to 50V</td> </tr> <tr> <td>10x</td> <td>50mV to 50V per division</td> <td>500mV to 500V</td> </tr> <tr> <td>100x</td> <td>500mV to 500V per division</td> <td>5V to 5000V</td> </tr> </tbody> </table>	Probe	Voltage per division	Full scale voltage	1x	5mV to 5V per division	50mV to 50V	10x	50mV to 50V per division	500mV to 500V	100x	500mV to 500V per division	5V to 5000V	<table border="1"> <thead> <tr> <th>Probe</th> <th>Voltage per division</th> <th>Full scale voltage</th> </tr> </thead> <tbody> <tr> <td>1x</td> <td>10mV to 5V per division</td> <td>100mV to 50V</td> </tr> <tr> <td>10x</td> <td>100mV to 50V per division</td> <td>1V to 500V</td> </tr> <tr> <td>100x</td> <td>1V to 500V per division</td> <td>10V to 5000V</td> </tr> </tbody> </table>	Probe	Voltage per division	Full scale voltage	1x	10mV to 5V per division	100mV to 50V	10x	100mV to 50V per division	1V to 500V	100x	1V to 500V per division	10V to 5000V
Probe	Voltage per division	Full scale voltage																								
1x	5mV to 5V per division	50mV to 50V																								
10x	50mV to 50V per division	500mV to 500V																								
100x	500mV to 500V per division	5V to 5000V																								
Probe	Voltage per division	Full scale voltage																								
1x	10mV to 5V per division	100mV to 50V																								
10x	100mV to 50V per division	1V to 500V																								
100x	1V to 500V per division	10V to 5000V																								
Max Input Voltage (at BNC connector)	<p><i>max input voltage at probe tip depends on probe type (1x, 10x, 100x, etc.)</i></p> <table border="1"> <thead> <tr> <th>Probe</th> <th>Continuous</th> <th>Transient (DC + AC <10KHz)</th> </tr> </thead> <tbody> <tr> <td>BNC</td> <td>± 50V DC</td> <td>± 150V DC</td> </tr> <tr> <td>1X probe:</td> <td>± 50V DC</td> <td>± 150V DC</td> </tr> <tr> <td>10X probe:</td> <td>± 500V DC</td> <td>± 1,500V DC</td> </tr> <tr> <td>100X probe:</td> <td>± 5,000V DC</td> <td>± 15,000V DC</td> </tr> </tbody> </table>		Probe	Continuous	Transient (DC + AC <10KHz)	BNC	± 50V DC	± 150V DC	1X probe:	± 50V DC	± 150V DC	10X probe:	± 500V DC	± 1,500V DC	100X probe:	± 5,000V DC	± 15,000V DC									
Probe	Continuous	Transient (DC + AC <10KHz)																								
BNC	± 50V DC	± 150V DC																								
1X probe:	± 50V DC	± 150V DC																								
10X probe:	± 500V DC	± 1,500V DC																								
100X probe:	± 5,000V DC	± 15,000V DC																								

	1000X probe: ± 50,000V DC	± 150,000V DC
Vertical Resolution	8 bits/ch.	
Vertical Range	10 divisions	
External Trigger	TTL level (1.4V) Max voltage: 5V	
Offset Range	± 5 divisions	
Coupling	AC, DC, and Ground	
Offset Resolution	0.04 division increments	
Impedance	1MΩ // 15pF	
DC Accuracy	± 2%	
A/D	Dual 8 bit	
Probes	1x/10x switchable with standard BNC connector. Two probes are included. 100x probes are available as an option	
Timebase		
Rate (single shot)	500MSa/s... 5Sa/s 2ns/sample to 5s/sample 2ns/division to 20secons/division	200MSa/s... 5Sa/s 5ns/sample to 5s/sample 5ns/division to 20secons/division
Rate (Repetitive)	20GMSa/s...1GSa/s	N/A

Accuracy	+/- 0.01%	
Resolution	2ns	5ns
Skew	< 1ns	
Memory		
Buffer Size	1 Million points/ch.(1 ch. mode) 512K points/ch.(2 ch. mode)	128K points/ch. (2 ch.mode)
Calibration		
Oscilloscope	Self calibrating	
Probe	Calibration signal provided	
Trigger		
Type	Rising Edge (Adjustable level), Falling Edge (Adjustable level), TV-H, TV-V, Pulse Width, Pulse Count, Pulse Width & Pulse Count	
External In	Yes	
External Out	Yes	
Rising Edge	Yes	
Falling Edge	Yes	

Pulse Count	Yes
Pulse Width	Yes
Pulse Width & Count	Yes
TV Horizontal	Yes
TV Vertical	Yes
Out	Yes
Mode	Auto, Normal, and Single
Autosetup	Yes
Slope	Rising or Falling
Level	Adjustable
Range (vertical)	10 divisions
Resolution	0.04 division increments
Software	
Windows XP/2K/Vista	Yes
FFT	Yes
XY Plot	Yes

Math	Yes
Advanced Math	Yes
Pass/Fail Testing	Yes
Data Logging (based on pass/fail test) (on every capture)	Yes Yes
Physical	
Interface	USB 2.0
Probes	Two 1x/10x switchable probes are included.
BNC Connectors	4 total: 2 input, Trig-in and trig-out
Calibration point	Yes
Power Requirement	5V at 750mA (Typical) Wall power or battery power (NiMH recommended)
Dimensions	7" x 3.75" x 1.5"

	DSO-8502	DSO-8202
DSO Kit: Oscilloscope, two 1x/10x probes, USB cable, US power supply, software	<u>\$950</u> DSO-8502 Non U.S. customers add \$38 for universal power supply (90-240V 50-60Hz)	<u>\$799</u> DSO-8202 Non U.S. customers add \$38 for universal power supply (90-240V 50-60Hz)

Description	Price	Part Number
Universal Power Supply	<u>\$38</u>	DSO-8000-UNIV-PWR
Battery charger and batteries	<u>\$35</u>	P-Bat-charger-4 <i>(includes: 4 AA NiMH batteries and charger)</i>
<u>DLL Library</u>	<u>\$300</u>	DSO-8000-DLL-2K, WinXP/2000
<u>10x/100x Differential Probe</u>	<u>\$395</u>	DSO-probe-dif-kit <i>(includes: probe, power supply, assorted clips, carrying case)</i>
100x Probes <i>(100MHz, 2 meters)</i>	<u>\$72</u>	DSO-probe-x100
1x/10x Probes <i>(100MHz, 2 meters)</i>	<u>\$60</u>	DSO-probe-2M
1x/10x Probes <i>(150MHz, 1.2 meter)</i>	<u>\$45</u>	P-PROBE-P150