



# Digitizers

Particle Accelerators and Light Sources



Product	Resolution	Maximum Sample Rate	Maximum Analog Bandwidth	Platform	Channels			Maximum Record Length
					PCI PXI	VXI	LXI	
<b>ZT4420-DP Series</b>	12 bit (488 $\mu$ V)	500 MS/s	300 MHz	PCI, PXI, VXI, LXI	2	2 or 4	2 or 4	128 MS
<b>ZT4430-DP Series</b>	13 bit (244 $\mu$ V)	250 MS/s	300 MHz	PCI, PXI, VXI, LXI	2	2 or 4	2 or 4	128 MS
<b>ZT4440-DP Series</b>	14 bit (122 $\mu$ V)	400 MS/s	300 MHz	PCI, PXI, VXI, LXI	2	2 or 4	2 or 4	128 MS

## Instrument Overview

The “direct path” (DP) option provides an alternative analog signal conditioning analog front end to ZTEC’s popular ZT4400 series of 12-bit, 13-bit and 14-bit digitizers and digital oscilloscopes (specifically including the ZT4421, ZT4422, ZT4431, ZT4432, ZT4441, and the ZT4442). The DP option is optimized for low noise, low distortion and a flat passband response which is required for extremely high signal fidelity applications. Key specifications include:

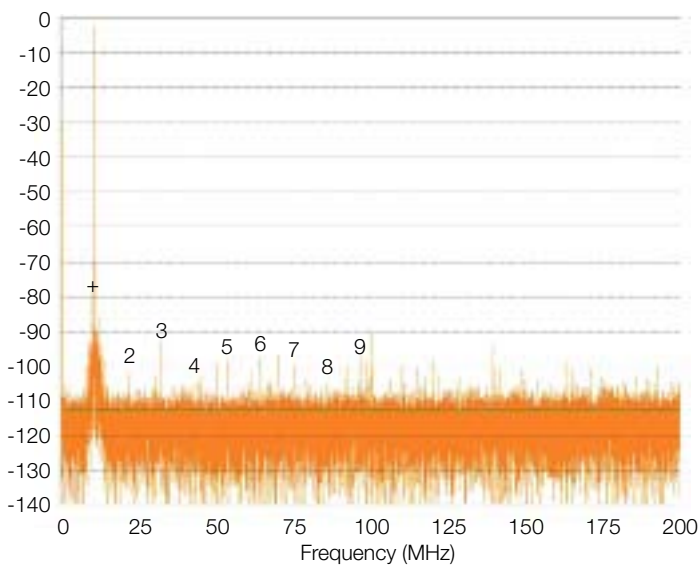
- 12-bit, 13-bit and 14 bit ADCs
- Up to 500 MS/s sample rate
- Up to 128 MS deep memory
- 300 MHz analog bandwidth
- 81.5 dB SFDR
- Multi-channel alignment and synchronization to less than 50 ps
- Available in 2 or 4 channels in PXI, PCI, VXI and LXI

While improving input signal dynamic range and adding the fiducial time marker, the DP option also retains the advanced functionality and features built into all of ZTEC’s digital oscilloscopes. The DP option includes the waveform math, measurements, acquisition modes, comprehensive driver support, and the popular ZScope® GUI.

## Low Noise & Distortion

Whereas ZTEC's general-purpose oscilloscopes offer very flexible input signal conditioning, the DP option is designed with a fixed 50 Ohm, DC-coupled, 2Vpp input configuration with 300 MHz of analog bandwidth. This "direct path" configuration optimizes the input signal path for up to 81.5 dB Spurious Free Dynamic Range (SFDR). The very low noise and distortion of this DP front end is ideal for applications ranging from transient event capture in particle and nuclear physics to video and IF/RF test applications.

Product	SNR	THD	SINAD	SFDR
<b>ZT4420-DP Series</b>	62.6 dBc	-86.7 dBc	62.5 dBc	81.5 dBc
<b>ZT4430-DP Series</b>	64.1 dBc	-86.7 dBc	64.0 dBc	81.5 dBc
<b>ZT4440-DP Series</b>	65.1 dBc	-86.7 dBc	65.0 dBc	81.5 dBc

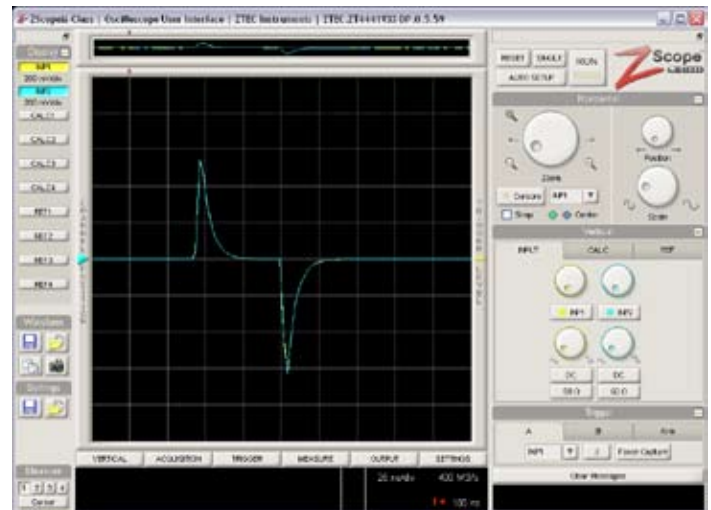


## Full-feature oscilloscope functionality

While improving input signal dynamic range, the DP option retains the advanced functionality and features built into all of ZTEC's digital oscilloscopes. The DP option includes the waveform math (add, subtract, FFT, parameter trending, etc.), measurements (over 40 time, voltage and frequency waveform parameters), acquisition modes (average, envelope, equivalent-time sampling, etc.), comprehensive driver support (LabVIEW™, IVI, C/C++, etc.), and the popular ZScope® GUI.

## Multi-channel alignment and synchronization to less than 50 ps

In addition, the DP option enables precise synchronization to an external event or across many digitizer channels. A "fiducial" time marker or transient signature (as shown in the following figure) can be encoded onto each analog waveform. With an included calibration routine, all channels within a system can be aligned to better than 50 ps time resolution. The fiducial time marker may be exposed on the waveforms or hidden in post acquisition memory to make synchronization transparent to the user. This timing synchronization is invaluable for applications requiring precise time-of-flight measurements such as mass spectrometry, nuclear physics, laser distance measurement, and medical imaging.



## Ordering Information

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