ZT450PXI-00 Datasheet

2GS/s 8-Bit Digital Storage Oscilloscope

Overview

Features

- 2 channels
- 8-bit resolution
- 1 GS/s dual-channel simultaneous or 2 GS/s single-channel interleaved
- 500 MHz analog bandwidth
- Up to 32 MS, 2 MS Standard
- Low power
- Programmable signal conditioning
- Real-time signal processing
- Envelope, average, and equivalent-time acquisition modes
- Powerful triggering including edge, pattern, pulse width, and video
- Limit and mask testing
- Multi-module synchronization with optional ZT1000PXI



The ZT450PXI-00 is a high speed, low power modular digital storage oscilloscopes (DSO) for Compact PCI/PXI. Built on state of the art data conversion technology with deep waveform memory, the ZT450PXI-00 delivers the best DSO performance in a modular instrumentation form factor. Setting the ZT450PXI-00 apart are its extensive bench top DSO capabilities, such as flexible signal conditioning, advanced triggering, average and envelope acquisition modes, and onboard signal processing. The ZT450PXI-00 is the only modular DSO product with “bench top instrument in a module” features for CompactPCI/PXI.

The instrument comes with Plug and Play style drivers that can be used with National Instruments LabVIEW™ and LabWindows™. Instrument control can also be achieved through the command interface or register-level access.

Waveform Acquisition

The ZT450PXI-00 is ideal for both single and multi-channel DSO applications. With 2 channels, the ZT450PXI-00 provides simultaneous sampling at 1 GS/s or interleaved sampling at 2 GS/s. Using its repetitive-time sampling, the DSO can sample up to 50 GS/s. The 8-bit DSO has a 500 MHz bandwidth with up to 32 MB waveform memory.

Universal Instrument Platform

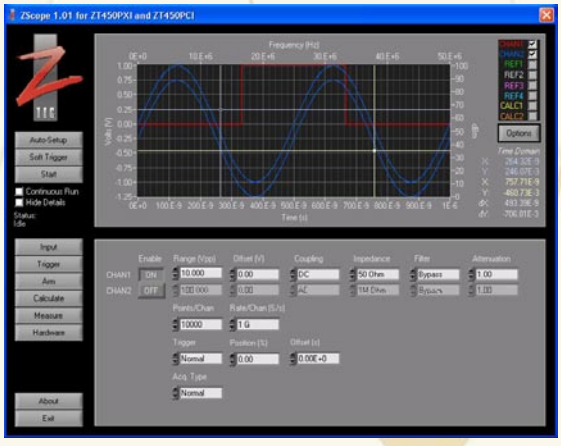
The ZT450PXI-00 is built on the ZTEC Universal Instrument Platform (UIP). This innovative and proprietary building block technology allows ZTEC to deploy common instrument hardware across multiple modular bus architectures. As UIP instruments utilize the same hardware core, ZTEC is able to deliver a higher quality, higher performance, and lower cost modular instrument solution to our customers.

Software Integration

To get you up and running quickly, ZTEC’s ZScope soft front panel software is provided. ZScope provides full control capability allowing the user to save and recall instrument configurations and to export waveform data files to an Excel compatible format.

For programmatic instrument control, the instruments are delivered with plug-and-play drivers that can be used in most application programming environments, such as LabVIEW, LabWindows/CVI, Visual Basic, and C/C++. An extensive example program library is provided to show various implementations of the driver.

Instrument control can also be achieved using an intuitive command interface that is based on the SCPI industry standard. The same command interface is used for both the PCI/PXI and VXI versions of the product, providing additional interchangeability between the platforms.

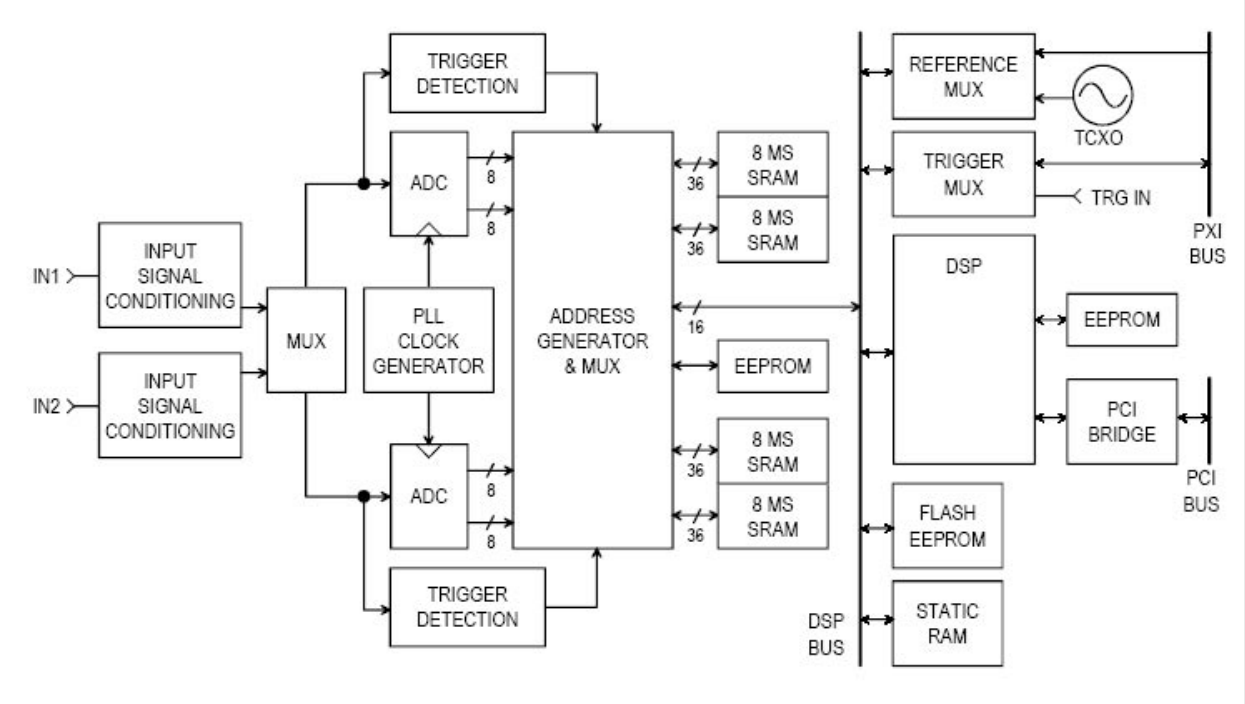


ZScope Soft Front Panell

ZT450PXI-00 Datasheet

2GS/s 8-Bit Digital Storage Oscilloscope

ZT450PXI-00 Block Diagram



Expect More from your Modular Instrument

Specifications such as frequency and resolution are obvious considerations when selecting a modular instrument. However, you must look beyond the obvious to ensure the overall success of your test and measurement project. You must consider functionality and expect not to make any sacrifices when moving to a modular form factor. You should expect your modular instruments to be built using the latest technology. You should expect a modular instrument to include the tools you need to integrate their products into your system, regardless of your application environment. You should also expect to receive the assistance you need, when you need it. In summary, you should expect more from your modular instrumentation company.



At ZTEC, we are committed to meeting your specification needs and providing the feature, integration, technology, and service you expect from a modular instrumentation company. Our unique products provide more functionality by including traditional bench-top instrument capabilities in modular instrument form factors. Using the latest commercially available digitization technology, we are able to rapidly deliver new and exciting products to the market. Our instrument software and communication interface allows for simplified integration into your system. And when you have a problem or question, our on-line and phone support is available to provide complete assistance.

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Technical Specifications

ZT450PXI-00 Performance Characteristics

ANALOG INPUT

Channels	Quantity 2
Bandwidth (50Ω)	500 MHz typical, 400 MHz minimum
Bandwidth (1MΩ)	300 MHz typical, 250 MHz minimum
Maximum Input	±250 VDC (1 MΩ) ±5 VDC (50 Ω), input load protection @ ±6 VDC
Full Scale Input Range	50 mVpp to 10 Vpp in 8 steps (50Ω) 500 mVpp to 100 Vpp in 8 steps (1 MΩ)
DC Gain Accuracy	±1.5% of full scale
Impedance	1 MΩ || 12 pF or 50Ω
Impedance Accuracy	± 1%
Input VSWR (50Ω)	≤ 1.4:1, DC to 500 MHz
Input Bias (50Ω)	≤ ±40 µA
Coupling	DC or AC
AC Coupling	200 kHz high pass (50Ω) 10 Hz high pass (1 MΩ)
Probe Attenuation	0.9 to 1000:1
Offset Adjust	

Impedance	Range	Offset
1 MΩ	10 Vpp to 100 Vpp	±100V
	0.5 Vpp to 5 Vpp	±5V
50Ω	1 Vpp to 10 Vpp	±10V
	0.05 Vpp to 0.5 Vpp	±0.5V

Offset Accuracy	± (1% offset + 2% full scale)
Analog Filters	20 MHz or Bypass Filter Stopband Rejection: >3dB @ 20 MHz
RMS Noise (50Ω)	≤ (350 µV + 0.5% range) 0.5 Vpp to 0.05 Vpp ≤ (3.5 mV + 0.5% range) 10 Vpp to 1 Vpp
RMS Noise (1MΩ)	≤ (2 mV + 0.5% range) 5 Vpp to 0.5 Vpp ≤ (20 mV + 0.5% range) 100 Vpp to 10 Vpp
RMS Noise (20 MHz Filter)	≤ (0.25% range)
Connectors	BNC

ANALOG-TO-DIGITAL CONVERTER

Resolution	8 bit
Sample Rate	2.5 kS/s to 1 GS/s in 1, 2.5, 5 steps 2 GS/s (1 channel interleaved)
Acquisition Time Range	50 ns to 6,710 seconds (32 MSample Memory) 50 ns to 419 seconds (2 MSample Memory)
Channel Skew	≤ 50 ps difference between channels (Channels at same input settings)

WAVEFORM MEMORY

Total Memory	Up to 16M samples/channel Up to 32M samples/channel (1 channel interleaved)
Memory Options	2M and 32M samples total

ACQUISITION MODES

Types	Normal, Average, Envelope, and Equivalent-Time
Channels	Quantity 2, both inputs simultaneous
Waveform Size	32k samples maximum
Waveform Count	2 to 2048 waveforms
Averaging	16-bit waveform averaging resolution
Envelope	Minimum and Maximum Envelope
Equivalent-Time	High sample rate waveform reconstruction
Equivalent-Time Points	2 to 100 equivalent-time points per real-time point 2 to 100 times equivalent-time sample rate

TRIGGER

Trigger Source	Channels 1 to 2, External Trigger, PXI Star Trigger, PXI Trigger0–7, Pattern, Software
Trigger Slope/Polarity	Positive or Negative
Trigger Position	0% to 100% of waveform time + trigger delay ±1 sample interval position accuracy
Trigger Delay	Programmable delay after trigger event before acquisition of waveform
Post-Trigger Delay	0 to 655 seconds
Pre-Trigger Delay	0 to waveform time
Trigger Hold Off	Programmable delay after trigger before recognizing next trigger event
Hold Off Range	0 to 655 seconds
Trigger B	Second edge trigger event qualifier
Pattern Trigger	Pattern match true or false
Pattern Sources	Channels 1 to 2, External Trigger, PXI Star Trigger
Event Trigger	Event Counter: 1 to 65535 trigger events
Trigger Modes	Edge, Pulse Width, Video
Edge Trigger Mode	Rising or Falling Edge
Pulse Width Trigger Mode	Triggers on pulse width greater than, less than, or between limits
Pulse Width Type	< limit1, > limit1, < limit1 & > limit2
Pulse Width Range	20 ns to 655 seconds
Pulse Width Resolution	10 ns
Video Trigger Mode	PAL (50 Hz), NTSC (60 Hz), SECAM (50 Hz) Standard, Field, Line selectable
Ch 1–2 Trigger Level	–full scale to +full scale
Ch 1–2 Trigger Sensitivity	5% of full scale (DC to 100 MHz) 10% of full scale (> 100 MHz)
Ch 1–2 Trigger Bandwidth	≥ 400 MHz
Ch 1–2 Trigger Hysteresis	5% (overdrive required)
Ch 1–2 Level Resolution	0.025% of full scale
Ch 1–2 Level Accuracy	±(2% setting + 2% FS + offset accuracy)
Trigger Timestamp	100 ns resolution, 1 second rollover

TRIGGER OUTPUTS

Functionality	Event Output Signals
Outputs	External Trigger, PXI Trigger0–7
Source	Trigger Event, Arm Event, OPC, Constant

EXTERNAL TRIGGER

Functionality	Trigger Input or Output
Maximum Input	0V to 5V, no damage
Trigger Input	TTL Compatible, 10 kΩ Input Impedance
Trigger Output	TTL Compatible into 50Ω
Connector	SMB

ARM

Functionality	Arm to qualify trigger event
Source	External Trigger, PXI Star Trigger, PXI Trigger0–7, Software
Polarity	Positive or Negative

EXTERNAL ARM INPUT

Maximum Input	0V to 5V, no damage
Nominal Level	TTL Compatible
Input Impedance	10 kΩ ±2%
Connector	SMB (Shared with Trigger I/O)

EXTERNAL SAMPLING CLOCK

Function	External Sampling Clock bypasses Phase Locked Loop
Synchronization	Both channels synchronized to ext. clock
Clock Rates	1 MHz to 2 GHz
Maximum Input	±5V, no damage
Input Signal Level	500 mVpp to 1 Vpp, sine or square wave
Input Impedance	AC coupled, 50Ω ±2%
Connector	SMB

10 MHZ TIME BASE REFERENCE

Clock Source	Internal TCXO, PXI Backplane
Internal TCXO	± 2.5 ppm accuracy

DATA PROCESSING

Auto Scale	Automatic adjust to input signals: Input Range, Offset, Impedance, Sample Rate
Self-Calibration	Auto. internal calibration: Input DC Offset

MEASUREMENTS

Measurements	Min, Max, Low, High, Mid, Average, Amplitude, Peak-to-Peak, DC RMS, AC RMS, +Width, –Width, Period, Frequency, +Duty, –Duty, Phase, Rise Time, Rise Overshoot, Rise Preshoot, Rise Crossing Time, Fall Time, Fall Overshoot, Fall Preshoot, Fall Crossing Time, Time of Maximum, Time of Minimum, Cycle Average, Cycle RMS, Cycle Frequency, Cycle Period
Measurement Methods	Entire Waveform, Gated by Time, Gated by Points
Measurement Levels	Low, Mid, High reference levels for edge measurements set in absolute voltages or relative percentages

REFERENCE WAVEFORMS

Reference Channels	Quantity 4
Reference Storage	Non-volatile memory storage
Reference Size	32k max waveform size

CALCULATIONS

Calculate Channels	Quantity 2
Calculate Size	32k maximum waveform size
Calculate Functions	Add, Subtract, Multiply, Copy, Invert, Integral, Derivative, Absolute Value, Limit Test, Mask Test, Frequency Transform, Time Transform
Limit Test	Measurement Limit Range Testing or Waveform Mask Testing
Limit Test Reports	Measurement maximum, minimum, average, current value, and pass/fail counts
Frequency Transform	FFT Magnitude
FFT Windowing	Rectangular, Hamming, Hanning, Blackman
Time Transform	Infinite Impulse Response (IIR) filtering
IIR Filter Count	2 to 40 data points

INSTRUMENT SETUP STORAGE

Reset	Non-volatile storage of default instrument setup configuration
Save & Recall	Non-volatile storage of 20 instrument setup configurations

DATA INTERFACE

PCI Bus	33 MHz, 32 bit address, 16 bit data
PCI Voltage	Universal, +3.3V or +5V
PCI Compatibility	Version 2.2

PHYSICAL AND ENVIRONMENTAL

Physical size	CompactPCI/PXI
Weight	1 lb.
Cooling	13.8 W typical cooling required 21.5 W maximum cooling required
Power Consumption	13.8 W typical power required 21.5 W maximum total power required
Operating Temperature	0 °C to +40 °C Ambient
Storage Temperature	-40 °C to +75 °C
Over-Temp Protection	Auto shutdown if internal temperature is greater than +60 °C.
Temp. Calibration Range	+20 °C to +30 °C Ambient, after a 20 minute warm-up period, to meet all calibration specification accuracies.
Operating or Storage Humidity	0 to 95%, non-condensing, up to +40 °C
Operating Altitude	Up to 15,000 feet
Storage Altitude	Up to 50,000 feet

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2GS/s 8-Bit Digital Storage Oscilloscope

Ordering Information

Model Numbers

Standard Configuration

2 MSample Memory	ZT450PXI-00

Options

32 MSample Memory	ZT450PXI-01

Services

Extended warranty	ZTEXTPXI-00
Calibration	ZTCALPXI-00

Accessories



ZTPXIKIT-00
SMB to BNC cable kit
for PCI instruments



ZT500PRB-00
500 MHz probe for BNC

Improve the Accuracy of your PXI Instruments with the ZT1000PXI

The ZT1000PXI provides an improved frequency standard and control of the PXI star trigger (Slot 2) and the PXI triggers. The improved trigger capabilities allow PXI instruments to be synchronized together and for additional synchronized chassis to be added to the test system. When fitted with the GPS option, the frequency reference can synchronized to the GPS network. Trigger events can be tagged with information identifying to within 25 ns of when they occurred in universal time. The ZTX1000PXI is an ideal way of improving the accuracy of your PXI instruments, instrument synchronization and unambiguous event recording.

For more information please contact us or visit www.ztec-inc.com.



ZT1000PXI Model Numbers

Standard Configuration

PXI	ZT1000PXI-00

Options

GPS	ZT1000PXI-01

Accessories

SMB to BNC cable kit	ZTPXIKIT-00
GPS Patch Antenna	ZT2000ANT-00
GPS Rooftop Bullet Antenna	ZT2001ANT-00

Services

Extended warranty	ZTEXTPXI-00
Calibration	ZTCALPXI-00

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