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# ZT500PXI Datasheet

## 300 MS/s, 14-Bit Arbitrary Waveform Generator

## Overview

### Features

- 1 channel, 14-bit resolution
- 300 MS/s, 200 MHz analog bandwidth
- 2 MS record length
- Programmable range (between 0.2 Vpp and 7 Vpp), TTL synchronization outputs, and analog reconstruction filtering
- Powerful sequencing and segmentation
- Standard LabVIEW™ waveform library
- Multi-module synchronization with optional ZT1000PXI




The ZT500PXI provides a high-performance arbitrary waveform generator in a 3U PXI/CompactPCI instrument. The module's excellent analog signal dynamic range and very low noise enable the creation of high-quality video, IF, RF and fast digital signals.

The ZT500PXI delivers precise waveforms with 14 bits of vertical resolution. Two digital TTL outputs provide additional time markers and sync outputs. Extensive segmenting, sequencing, and triggering options, along with a standard waveform library, provide a flexible and powerful method to generate a wide variety of user-definable waveforms.

The ZT500PXI 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.

### High-Quality Signal Generation

The ZT500PXI is the first 300 MSample/s 14-Bit Arbitrary Waveform Generator for PXI. The combination of high speed and large dynamic range make the ZT500PXI a very high-quality signal generator with the added flexibility of an arbitrary waveform generator. Four selectable analog reconstruction filters allow the user to optimize signal quality and bandwidth.

### Flexible Segmentation and Sequencing

The deep memory on the ZT500PXI can be segmented into multiple smaller waveforms that can be pieced together and repeated in a user-defined sequence. Multiple waveforms can be loaded once into the instrument and recalled as needed.

### External/Multiple Module Synchronization

Powerful triggering and gating functions allow the ZT500PXI to be synchronized to external events and generate waveforms in predefined time intervals. Multiple modules can be easily synchronized using the PXI backplane clock and trigger lines.

### TTL Synchronization Outputs

Two digital TTL outputs provide additional outputs for time markers and sync signals for synchronizing external equipment. These signals may be used independently as programmable pulse generator signals for logic stimulus.

### Powerful Triggering and Sequencing Modes

The ZT500PXI provides numerous triggering and sequencing modes that enable advanced signal generation capabilities.

Waveform generation can be started upon a trigger event or delayed for specified time from the trigger event. A trigger input can be used to gate the output waveform generation sequence. Waveforms can be generated once or looped continuously.

Waveform segment sequencing can be synchronized to a trigger event or allowed to advance automatically. Waveform segments can be played back seamlessly in any order, and may be repeated up to 65536 times before advancing to the next segment.

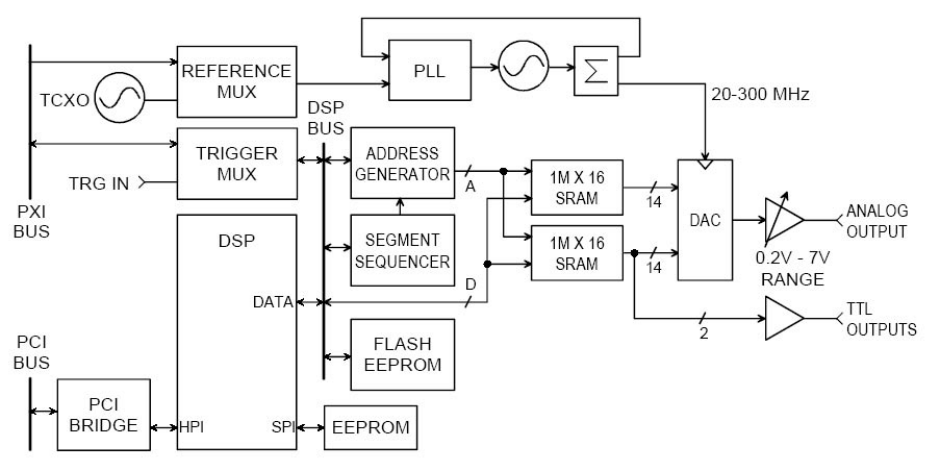


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# ZT500PXI Datasheet

## 300 MS/s, 14-Bit Arbitrary Waveform Generator

### ZT500PXI Block Diagram




Many other combinations of triggering and sequencing allow the user to generate very sophisticated waveforms and waveform sequences.

### Programmable Full-Scale Range

Two digital TTL outputs provide additional outputs for time markers and sync signals for synchronizing external equipment. These signals may be used independently as programmable pulse generator signals for logic stimulus.

### Software Integration

The ZT500PXI is 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 library is provided to show various implementations of the driver using both LabVIEW and C.

Instrument control can also be achieved using an intuitive command interface. In addition, register-level access is also supported to provide high speed data transfers and flexible integration into non-standard operating environments.

## 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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# ZT500PXI Datasheet

## 300 MS/s, 14-Bit Arbitrary Waveform Generator

# Technical Specifications

## ZT500 Performance Characteristics

### Analog Output

| | |
|---|---|
| Channel | 1 |
| Bandwidth | DC to 200 MHz |
| Lowpass Filters | Bypass, 100 MHz, 50 MHz, 25 MHz |
| Maximum Range | 7.0 VPP into High-Impedance<br>3.5 VPP into 50Ω |
| Range Adjust | 3400 Ranges, 0.2 VPP to 7.0 VPP<br>Adjustable in 2 mV increments |
| Range Accuracy | ±0.1% of Full Scale ±1mV |
| Output Impedance | 50Ω |
| Connector | SMB |

### Digital-to-Analog Converter

| | |
|---|---|
| Sample Rate | 20, 40, 80, 100, 160, 200, 300 MSamples/s |
| Resolution | 14 Bits |
| Record Length | 2 MSamples<br>4 MSamples (Option 1) |
| Max Record Time | 0.105 seconds<br>0.21 seconds (Option 1) |

### Digital Outputs

| | |
|---|---|
| Channels | 2 |
| Time Resolution | 6.667 to 100 nanoseconds |
| Functions | Waveform Markers, Synch, Programmable Pulse Generator |
| Signal Range | TTL Compatible |
| Output Loading | ±12 mA Drive Capability |
| Connector | SMB |

### Trigger

| | |
|---|---|
| Trigger Source | Front Panel, PXI Backplane, Software |
| Trigger Edge | Rising or Falling |
| External Trigger | Trigger Input or Output |
| Trigger Input | TTL Compatible, 10 kΩ Input Impedance, SMB Connector |
| Trigger Output | TTL Compatible into 50Ω, SMB Connector |
| Trigger Delay | 10 DAC clock periods + 50 ns |

### Waveform Sequencing Modes

| | |
|---|---|
| Loop | Loop in Sequence Continuously |
| Single | Sequence Once |

### Waveform Sequencing Advance

| | |
|---|---|
| Normal | Advance to Next Segment upon Segment Completion |
| N-Cycle | Advance to Next Segment upon N-Cycle Completion, N programmable from 1 to 65536. |
| Triggered | Advance to Next Segment upon Trigger Event |

### Acquisition Modes

| | |
|---|---|
| Non-Triggered | Arm initiates output |
| Triggered | Trigger initiates output |
| Trigger Gated | Trigger gates output |
| Delay Triggered | Trigger initiates timed delay of output |

### Reference Input

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

### Waveform Synthesis

| | |
|---|---|
| DSP Processing | Waveform Library, Custom, Algorithm-Based Processing |
| Segmentation | 1 to 65536 Segments<br>(32 Samples to 4 MSamples) |
| Sequencing | Continuous Waveform Switching<br>(per Sequence Table) |
| Sequence Table | Sequence of 1 to 65536 Segment Numbers<br>(with looping) |
| Looping | Infinite, Continuous Switching Sequence |

### Waveform Capabilities

| | | |
|---|---|---|
| Sine | | |
| | Frequency | 10 Hz to 150 MHz |
| | Initial Phase | 0 to 360° |
| | SFDR | 80 dBc @ fOUT = 1 MHz<br>67 dBc @ fOUT = 50 MHz |
| | THD | -73 dBc @ fOUT = 1 MHz |
| | Modulation | FM, QAM, Chirp, Multiple Tone |
| Triangle | | |
| | Frequency | 10 Hz to 30 MHz |
| | Initial Phase | 0 to 360° |
| Square | | |
| | Frequency | 10 Hz to 150 MHz |
| | Duty Cycle | 0.1% to 99.9% |
| | Rise/Fall Time | <4 nanoseconds |
| Pulse | | |
| | Frequency | 10 Hz to 150 MHz |
| | High/Low Time | 0.1% to 99.9% |
| | Rise/Fall Time | 0.1% to 99.9% |
| | Data Patterns | Programmable Binary Sequence |
| Noise | | |
| | Bandwidth | 150 MHz |
| | Noise Types | Gaussian White, Uniform White, Pink |
| DC | | |
| | Amplitude | ±100% of Maximum Range |
| Arbitrary Waveforms | | |
| | Custom | Sample-by-Sample Synthesis |

### PXI Interface

| | |
|---|---|
| PCI Interface | 33 MHz, 32-bit Address, 16-bit Data |
| PCI Voltage | Universal, +3.3V or +5V |
| PCI Compatibility | Version 2.2 |
| PXI Compatibility | PXI_TRIGn input/output selectable<br>PXI_STAR input selectable<br>10 MHz reference input selectable<br>Left and right side buses not used |

### Physical and Environmental

| | |
|---|---|
| Physical size | Single-Wide 3U CompactPCI/PXI Instrument |
| DC Power | +3.3V @ 200mA, +5V @ 1.75A |



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# ZT500PXI Datasheet

## 300 MS/s, 14-Bit Arbitrary Waveform Generator

## Ordering Information

### Model Numbers

**Standard Configuration**

| | |
|---|---|
| 2 MSample Memory | ZT500PXI-00 |

**Options**

| | |
|---|---|
| 4 MSample Memory | ZT500PXI-01 |

**Services**

| | |
|---|---|
| Extended warranty | ZTEXTPXI-00 |
| Calibration | ZTCALPXI-00 |

**Accessories**

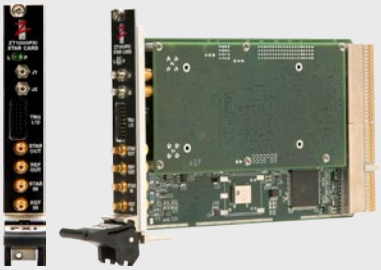


ZTPXIKIT-00
SMB to BNC cable kit
for PCI instruments

### 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 |

### Contact Information

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