

M-Class Oscilloscope Specifications

PCI, PXI, VXI, & LAN

ZT4610 Series: 8-bit, 4 GS/s, 1 GHz, 2 or 4 Ch

ZT4210 Series: 8-bit, 1 GS/s, 300 MHz, 2 or 4 Ch



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Acquisition

Sampling Modes Sample rates are available in steps on 1,2 and 5.

ZT4610:
 50 kS/s to 2 GS/s, non-interleaved real-time
 4 GS/s, interleaved real-time
 4 GS/s to 200 GS/s, interpolated or equivalent-time

ZT4210:
 10 kS/s to 500 MS/s, non-interleaved real-time
 1 GS/s, interleaved real-time
 1 GS/s to 100 GS/s, interpolated or equivalent-time

Non-Interleaved Acquisition 2-channel @ up to 2 GS/s real-time (ZT4611)
 4-channels @ up to 2 GS/s real-time (ZT4612)
 2-channels @ up to 500 MS/s real-time (ZT4211)
 4-channels @ up to 500 MS/s real-time (ZT4212)

Interleaved Acquisition 1-channel @ 4 GS/s real-time (ZT4611)
 2-channels @ 4 GS/s real-time (ZT4612)
 1-channel @ 1 GS/s real-time (ZT4211)
 2-channels @ 1 GS/s real-time (ZT4212)

Sampling Modes Normal: single-shot acquisition
 Average: multiple-capture averaging
 Envelope: multiple-capture minimum & maximum detection
 Equivalent time: multiple-capture high-rate reconstruction
 Peak detect: single-shot 10X over-sampling envelope detection
 High resolution: single-shot 10X over-sampling averaging
 Fast: multiple acquisition

Multiple-Capture Count 2 to 65536 waveforms in powers of 2

Acquisition Re-Arm Time ≤ 10 µs (ZT4610)
 ≤ 5 µs (ZT4210)

Maximum Record Length
 (Non-Interleaved/Interleaved)

Product	Standard Memory		Extended Memory	
	Non-Interleaved	Interleaved	Non-Interleaved	Interleaved
ZT4611/ZT4612	8M samples	16M samples	32M samples	64M samples
ZT4211/ZT4212	128M samples	256M samples	N/A	N/A

Min/Max Record Length
(By Acquisition Mode)

Acquisition Mode	Minimum Record Length	Maximum Record Length
Normal	10 samples	See table above
All other modes	10 samples	512k samples

Total Instrument Memory

Product	Standard Memory	Extended Memory
ZT4611 (2 input channels)	16M samples	64M samples
ZT4612 (4 input channels)	32M samples	128M samples
ZT4211 (2 input channels)	256M samples	N/A
ZT4212 (4 input channels)	512M samples	N/A

Segmented Memory

View & compare history of previous waveforms in memory
View component waveforms in memory when averaging
≤ 10 μs acquisition re-arm time between segments (ZT4610)
≤ 5 μs acquisition re-arm time between segments (ZT4210)

Memory Option	Maximum Segments
ZT4611 Standard Memory	8k waveforms @ ≤1k samples
ZT4612 Extended Memory	32k waveforms @ ≤1k samples
ZT4211/ZT4212	32k waveforms @ ≤4k samples

Vertical

Number of Channels

ZT4x11: Quantity 1 (interleaved acquisition)
ZT4x11: Quantity 2 (non-interleaved acquisition)
ZT4x12: Quantity 2 (interleaved acquisition)
ZT4x12: Quantity 4 (non-interleaved acquisition)

Connectors

BNC

Maximum Input (50 Ω)

±5 V (DC + peak AC), CAT I (ZT4610)
±5 V (DC + peak AC), CAT II (ZT4210)
Input load protection @ ±6 VDC

Maximum Input (1 MΩ)

±210 V [DC + peak AC (<100 kHz)], CAT I (ZT4610)
±300 V [DC + peak AC (<100 kHz)], CAT II (ZT4210)
Peak AC, de-rated 20 dB/decade above 100 kHz

ZT4610 Full Scale Input Range & Offset Adjust¹²

Impedance	Range	Full Scale	Offset
1 M Ω	10 V/div	100 Vpp	$\pm 50V$
	4 V/div	40 Vpp	$\pm 50V$
	2 V/div	20 Vpp	$\pm 50V$
	1 V/div	10 Vpp	$\pm 50V$
	500 mV/div	5 Vpp	$\pm 50V$
	200 mV/div	2 Vpp	$\pm 4V$
	100 mV/div	1 Vpp	$\pm 4V$
	50 mV/div	500 mVpp	$\pm 4V$
	25 mV/div	250 mVpp	$\pm 4V$
	10 mV/div	100 mVpp	$\pm 4V$
	5 mV/div	50 mVpp	$\pm 4V$
	2.5 mV/div	25 mVpp	$\pm 4V$
	1.25 mV/div	12.5 mVpp	$\pm 4V$
50 Ω	1 V/div	10 Vpp	0V
	500 mV/div	5 Vpp	$\pm 2.5V$
	200 mV/div	2 Vpp	$\pm 4V$
	100 mV/div	1 Vpp	$\pm 2V$
	50 mV/div	500 mVpp	$\pm 1V$
	25 mV/div	250 mVpp	$\pm 0.5V$
	10 mV/div	100 mVpp	$\pm 0.2V$
	5 mV/div	50 mVpp	$\pm 0.1V$
	2.5 mV/div	25 mVpp	$\pm 0.1V$
	1.25 mV/div	12.5 mVpp	$\pm 0.1V$

ZT4210 Full Scale Input Range & Offset Adjust¹²

Impedance	Range	Full Scale	Offset	Maximum Range + Offset
1 M Ω	40 V/div	400 Vpp	0V	$\pm 200V$
	20 V/div	200 Vpp	$\pm 100V$	$\pm 200V$
	8 V/div	80 Vpp	$\pm 100V$	$\pm 140V$
	4 V/div	40 Vpp	$\pm 100V$	$\pm 120V$
	2 V/div	20 Vpp	$\pm 100V$	$\pm 110V$
	1 V/div	10 Vpp	$\pm 100V$	$\pm 105V$
	500 mV/div	5 Vpp	$\pm 2.5V$	$\pm 5V$
	200 mV/div	2 Vpp	$\pm 2.5V$	$\pm 3.5V$
	100 mV/div	1 Vpp	$\pm 2.5V$	$\pm 3.0V$
	50 mV/div	500 mVpp	$\pm 2.5V$	$\pm 2.75V$
	25 mV/div	250 mVpp	$\pm 2.5V$	$\pm 2.625V$
	10 mV/div	100 mVpp	$\pm 2.5V$	$\pm 2.55V$
	5 mV/div	50 mVpp	$\pm 2.5V$	$\pm 2.525V$
	2.5 mV/div	25 mVpp	$\pm 2.5V$	$\pm 2.5125V$
	1.25 mV/div	12.5 mVpp	$\pm 2.5V$	$\pm 2.50625V$
50 Ω	1 V/div	10 Vpp	0V	$\pm 5V$
	500 mV/div	5 Vpp	$\pm 2.5V$	$\pm 5V$
	200 mV/div	2 Vpp	$\pm 2.5V$	$\pm 3.5V$
	100 mV/div	1 Vpp	$\pm 2.5V$	$\pm 3.0V$
	50 mV/div	500 mVpp	$\pm 2.5V$	$\pm 2.75V$
	25 mV/div	250 mVpp	$\pm 2.5V$	$\pm 2.625V$
	10 mV/div	100 mVpp	$\pm 2.5V$	$\pm 2.55V$
	5 mV/div	50 mVpp	$\pm 2.5V$	$\pm 2.525V$
	2.5 mV/div	25 mVpp	$\pm 2.5V$	$\pm 2.5125V$
	1.25 mV/div	12.5 mVpp	$\pm 2.5V$	$\pm 2.50625V$

1 Full-scale range assumes 10 divisions for vertical axis

2 Magnification is used below 5 mV/div range. Full-scale range for accuracy specifications is defined as 50 mV

Analog Bandwidth	ZT4610, 50 Ω: DC to 1000 MHz typical, 900 MHz minimum (-3dB) * *50mVpp and 100mVpp ranges 500 MHz (-3dB) 900 MHz (-6dB) ZT4610, 1M Ω: DC to 400 MHz typical, 300 MHz minimum Due to an impedance mismatch between the signal generator and the oscilloscope, passing this test with a 300 MHz signal verifies 400 MHz performance on the 1 MΩ path. ZT4210: DC to 300 MHz typical, 250 MHz minimum Due to an impedance mismatch between the signal generator and the oscilloscope, passing this test with a 200 MHz signal verifies 250 MHz performance on the 1 MΩ path.	
Analog Bandwidth, Probe ZT6103 Passive X10 ³	DC to 450 MHz typical, 400 MHz minimum (ZT4610) DC to 300 MHz typical, 250 MHz minimum (ZT4210)	
Risetime ⁴	350 ps (ZT4610, 50 Ω) 700 ps (ZT4610, 1 M Ω) 1.15 ns (ZT4210)	
Slew Rate	10,000 V/ μ s (ZT4610, 50 Ω) 1,000 V/ μ s (ZT4610, 1 M Ω) 2,000 V/ μ s (ZT4210)	
DC Gain Accuracy	< $\pm$ 1% full scale range	
DC Offset Accuracy (+25 $^{\circ}$ C)	< $\pm$ (1% full scale range + 1% offset + 1 mV) (50 Ω) < $\pm$ (1% full scale range + 1% offset + 5 mV) (ZT4610, 1 M Ω) < $\pm$ (1% full scale range + 1% offset + 1 mV) (ZT4210, 1M Ω , $\leq$ 5Vpp) < $\pm$ (1% full scale range + 1% offset + 50 mV) (ZT4210, 1M Ω , $\geq$ 10Vpp)	
DC Offset Drift (per $^{\circ}$ C)	< $\pm$ 0.1% full scale range/ $^{\circ}$ C (ZT4610) < $\pm$ (0.05% full scale range + 150 μ V) (ZT4210, 50 Ω) < $\pm$ (0.05% full scale range + 200 μ V) (ZT4210, 1M Ω , $\leq$ 5Vpp range) < $\pm$ (0.05% full scale range + 10 mV) (ZT4210, 1M Ω , $\geq$ 10Vpp range)	
Impedance	1 M Ω 12 pF or 50 Ω	
Impedance Accuracy	$\pm$ 1%	
Input VSWR (50 Ω)	$\leq$ 1.4:1, DC to 1000 MHz (ZT4610) $\leq$ 1.4:1, DC to 250 MHz (ZT4210)	

3 See ZTEC catalog for detailed specifications on all probes.

4 Rise time is calculated from $t_r = 0.35 / \text{bandwidth}$.

Input Bias	$\leq \pm 10 \mu\text{A}$ (50 Ω) $\leq \pm 1 \text{ nA}$ (1 M Ω)
Coupling	DC or AC
AC Coupling	200 kHz high pass (50 Ω) 10 Hz high pass (1 M Ω)
Analog Filter	20 MHz or Bypass Filter Stopband Rejection: approximately 3dB @ 20 MHz
Probe Attenuation	0.9 to 1000:1
RMS Noise	$\leq (0.5\% \text{ of full scale range} + 350 \mu\text{V})$ (50 Ω Full Bandwidth) $\leq (0.5\% \text{ of full scale range})$ (50 Ω + 20 MHz Filter) $\leq (0.5\% \text{ of full scale range} + 700 \mu\text{V})$ (1M Ω Full Bandwidth) $\leq (0.5\% \text{ of full scale range} + 350 \mu\text{V})$ (1M Ω + 20 MHz Filter)
Power Supply Noise Rejection	25dB (ZT4210 PCI/PXI only)
Channel-to-Channel Isolation	DC to 100 MHz: $\geq 50 \text{ dB}$ 100 MHz to 1 GHz: $\geq 40 \text{ dB}$ (ZT4610) 100 MHz to 250 MHz: $\geq 40 \text{ dB}$ (ZT4210)
Digitizer Resolution	8 bits (0.4% of full scale) Up to 32 bits with averaging

Dynamic Range

ZT4610 (2GS/s, 50 Ω):

Input Range & Signal Frequency	Signal-to Noise Ratio (SNR)	Total Harmonic Distortion (THD)	Signal-to-Noise + Distortion (SINAD)
10 Vpp, 10.7 MHz	46.6 dBc	-53.0 dBc	45.7 dBc
1 Vpp, 10.7 MHz	47.9 dBc	-56.8dBc	47.4 dBc
0.1 Vpp, 10.7 MHz	34.0 dBc	-56.8dBc	34.0 dBc
10 Vpp, 101 MHz	39.5 dBc	-45.0 dBc	38.4 dBc
1 Vpp, 101 MHz	41.3 dBc	-46.9 dBc	40.2 dBc
0.1 Vpp, 101 MHz	34.0 dBc	-48.0 dBc	33.8 dBc

ZT4210 (500MS/s, 50Ω):

Input Range & Signal Frequency	Signal-to-Noise Ratio (SNR)	Total Harmonic Distortion (THD)	Signal-to-Noise + Distortion (SINAD)
10 Vpp, 10.7 MHz	41.21 dBc	-53.15 dBc	40.94 dBc
1 Vpp, 10.7 MHz	41.93 dBc	-59.53 dBc	41.86 dBc
0.1 Vpp, 10.7 MHz	33.48 dBc	-57.59 dBc	33.47 dBc
10 Vpp, 60.1 MHz	41.24 dBc	-48.68 dBc	40.51 dBc
1 Vpp, 60.1 MHz	41.36 dBc	-49.93 dBc	40.79 dBc
0.1 Vpp, 60.1 MHz	33.16 dBc	-48.12 dBc	33.02 dBc

Horizontal

Sweep Time Range ⁵	Minimum: 250 ps/div (2.5 ns total) (ZT4610) 1 ns/div (10 ns total) (ZT4210) Maximum: 10 s/div (100 seconds total)
Horizontal Position	Pre-Trigger: 0 to 100% of acquisition window Post-Trigger: 0 to 100 seconds ±1 sample interval position accuracy
Channel-to-Channel Skew	Channels at same input settings Channels 1-to-2: < 100 ps Channels 3-to-4: < 100 ps (ZT4x12) Channels 1-to-3, 1-to-4, 2-to-3, 2-to-4: < 200 ps (ZT4x12)
Skew Adjust	ZT4610: n/a ZT4210: ±10 μs channel-to-channel skew adjustment 1 sample interval resolution ±1 sample interval accuracy
Timebase Reference	10 MHz
Timebase Reference Source	Internal TCXO, External Input, Backplane (PXI, VXI), Timing Expansion Connector (PCI)
Internal TCXO Timebase	± 2.5 ppm accuracy
Timebase Output	External Output, Timing Expansion Connector Reference I/O (PCI)

⁵ Horizontal time range assumes 10 divisions for horizontal axis

Trigger

Sweep Modes	Auto or normal triggered
Trigger Source	Channels 1 to 2, Channels 3 to 4 (ZT4x12), External Input, Pattern, Software, TTL Trigger 0-7, Star Trigger (PXI), ECL Trigger 0-1 (VXI)
Trigger Slope/Polarity	Positive or Negative
Trigger B	Qualify trigger on second source for edge trigger event
Trigger A Holdoff	Programmable delay after trigger A before recognizing next trigger A event
Trigger B Holdoff	Programmable delay after trigger A before recognizing trigger B event
Trigger A or B Holdoff Range	0 to 100 seconds
Trigger A or B Event Counter	Qualify trigger on N th trigger event, N = 1 to 65536
Trigger A Modes	Edge, Pattern, State, Pulse Width, Video
Trigger B Modes	Edge, Pattern
Edge Trigger Mode	Rising or falling edge
Pattern Trigger Mode	Pattern match true or false
Pattern Sources	Channels 1 to 2, Channels 3 to 4 (ZT4x12), External Input, Pattern, Software, TTL Trigger 0-7, Star Trigger (PXI), ECL Trigger 0-1 (VXI)
State Trigger Mode	Edge event when pattern match true or false Pattern source used as Arm qualifier
Pulse Width Trigger Mode	Triggers on pulse width greater than, less than, within limits, or outside limits
Pulse Width Type	< limit1, > limit1, < limit1 & > limit2, > limit1 & < limit2
Pulse Width Limits	10 ns to 500 ms, 5ns resolution, ± 5 ns accuracy
Pulse Width Minimum	2 ns pulse width captured for < limit1
Video Trigger Mode	PAL (50 Hz), NTSC (60 Hz), SECAM (50 Hz) Standard, Field, Line selectable
Trigger Timestamp	100 ns resolution, 1 second rollover

Trigger, Analog Input

Analog Input Triggers	Channels 1 & 2, Channels 3 & 4 (ZT4x12)	
Trigger Level	(offset – full scale range/2) to (offset + full scale range/2)	
Trigger Sensitivity	5% of full scale range (ZT4610, DC to 500 MHz), (ZT4210, DC to 100 MHz) 10% of full scale range (ZT4610, > 500 MHz), (ZT4210, > 100 MHz)	
Trigger Bandwidth	DC to 500 MHz minimum (ZT4610) DC to 300 MHz typical, 250 MHz minimum (ZT4210)	
Glitch Detection	≥ 250 ps glitch captured in edge trigger mode (ZT4610) ≥ 500 ps glitch captured in edge trigger mode (ZT4210)	
Trigger Hysteresis	2.5% (overdrive required)	
Trigger Level Resolution	0.025% of full scale range	
Trigger Level Accuracy	$\pm(2\% \text{ full scale range} + 5\text{mV} + \text{offset accuracy})$	

External Input

Functionality	External Trigger, External 10 MHz Timebase Reference, or External Arm	
Maximum Input	± 5 V (DC + peak AC), CAT I	
Threshold Adjustment	± 2 V	
Threshold Accuracy	± 20 mV	
Threshold Resolution	0.5 mV	
Input Impedance	$1 \text{ M}\Omega \parallel 30 \text{ pF}$ or 50Ω	
Impedance Accuracy	$\pm 2\%$	
Input Bandwidth	300 MHz typical 250 MHz minimum	
Input Hysteresis	20 mV (overdrive required)	
Connector	BNC (VXI, LAN) SMB (PCI, PXI)	

External Output

Functionality	Trigger Output, 10 MHz Timebase Reference Output, Event Output, Programmable Clock Output, Programmable Pulse Output, Limit Test Successful (ZT4210)
Output Level	TTL Compatible into High Impedance ($\geq 200 \Omega$) ± 24 mA Output Drive Capability
Output Enable	Tri-State Output Capability
Output Source	Arm Event, Trigger A Event, Trigger B Event, Trigger Complete, Capture Complete, Operation Complete, Constant Level, Reference Clock, Programmable Clock, Programmable Pulse, Limit Test Successful (ZT4210)
Programmable Clock	Clock Period: 26.667 ns to 100 seconds 50% Duty Cycle
Programmable Pulse	Pulse Repetition Interval: 50 ns to 100 seconds Pulse Width: 26.667 ns
Limit Test Successful (ZT4210)	1 μ s pulse after each capture upon limit or mask test success
Connector	BNC (VXI, LAN) SMB (PCI, PXI)

Event Outputs

Functionality	Event Output Signals
Outputs	TTL Trigger 0-7, ECL Trigger 0-1 (VXI) Timing Expansion Connector (PCI)
Source	Arm Event, Trigger A Event, Trigger B Event, Trigger Complete, Capture Complete, Operation Complete, Constant Level

Arm

Functionality	Arm to qualify trigger event
Source	External Input, TTL Trigger 0-7, Star Trigger (PXI), ECL Trigger 0-1 (VXI), Software
Polarity	Positive or Negative

Measurements

Measurements	AC RMS, Amplitude, Average, Cycle Average, Cycle Frequency, Cycle Period, Cycle RMS, DC RMS, Duty Cycle High, Duty Cycle Low, ENOB, Number of Falling Edges, Fall Crossing Time, Fall Overshoot, Fall Preshoot, Fall Time, Frequency, High, Low, Maximum, Mid, Minimum, Peak-to-Peak, Period, Phase, Pulse Width Positive, Pulse Width Negative, Number of Rising Edges, Rise Crossing Time, Rise Overshoot, Rise Preshoot, Rise Time, SFDR, SINAD, SNR, Standard Deviation, THD, Time of Maximum, Time of Minimum	
Edge Measurements	N th edge selectable, N = 1 to 65535	
Maximum Measurements	N th maximum selectable, N = 1 to 100, Applies to Maximum and Time of Maximum measurements	
Measurement Methods	Entire Waveform, Gated by Time, Gated by Points, Gated by Frequency, Gated by Cursors	
Measurement Levels	Low, Mid, High reference levels for edge measurements set in absolute voltages or relative percentages	
Cursors	Quantity 2 Horizontal & Vertical Axis Location Markers X, Y, DX & DY Measurements	
Measurement Lists	Quantity 4 Lists Up to eight measurements that are performed upon acquisition Stored for rapid measurement setup	
Measurement Statistics	History buffer of past measurement data stored in Calculate channel (See Calculate section.)	
Measurement Accuracy	Delta DC Voltage	± (DC gain accuracy)
	Absolute DC Voltage	± [(DC gain accuracy)+(offset accuracy)]
	Time	± (time resolution)
	Frequency	± [1/(time resolution)]
	Note: time resolution = one sample interval, one equivalent-time sample interval, or one interpolated-time sample interval (depending upon acquisition mode)	

Reference Waveforms

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

Calculations

Calculate Channels	Quantity 4
Calculate Size	512k sample maximum waveform size
Calculate Data	32-bit resolution
Calculate Functions	Add, Subtract, Multiply, Copy, Invert, Integral, Derivative, Absolute Value, Limit Test, Mask Test, Frequency Transform, Time Transform, Histogram, Measurement History
Limit Test	Measurement Limit Range Testing or Waveform Mask Testing
Limit Test Reporting	Measurement maximum, minimum, average, current value, pass/fail counts
Frequency Transform	FFT Magnitude
FFT Windowing	Rectangular, Hamming, Hanning, Blackman, Flattop
FFT Data Format	Linear Magnitude, Logarithmic Magnitude, Phase, Real, Imaginary
Time Transform	Digital Infinite Impulse Response (IIR) filter
IIR Filter Type	Auto-generate: Lowpass, 2 to 40 data point smoothing
Histogram	65536 bins for up to 16-bit histogram horizontal resolution
Measurement History	History waveform of past measurement data Provides trend data of 1 measurement point per capture

Data Processing & Download

Auto Scale	Automatic adjust to input signals: Input Range, Offset, Sample Rate, Trigger Source, and Trigger Level	
Self-Calibration	Automatic internal calibration: Input DC Offset Zero, Input DC Offset Adjust Scale Factor, ADC balance (ZT4610), ADC timing (ZT4610)	
Waveform Data Formats	8-bit, 16-bit, 32-bit, 32-bit floating point, 64-bit floating point, Intel or Motorola Byte Order	
Waveform Download Mode	Normal:	every real-time data point
	Decimated:	every N th real-time point (N = 2 to 100,000)
	Interpolated:	N points for every real-time point (N = 2 to 100), points interpolated by sin(x)/x reconstruction

Instrument Setup Storage

Reset	Non-volatile storage of default instrument setup configuration
Save & Recall	Non-volatile storage of 31 instrument setup configurations

PCI/PXI Data Interface

PCI Bus	33 MHz, 32 bit
PCI Data Transfer Rate	132 Mbyte/s burst up to 120 Mbyte/s sustained ⁶
PCI Voltage	Universal, +3.3V or +5V
PCI Compatibility	Version 2.2
PXI Compatibility	PXI Standard Slot and PXI Express Hybrid Slot Compatible
PXI Signals (XJ4 connector)	PXI_TRIG0-7 input/output selectable PXI_STAR input 10 MHz reference input Left and right side buses not used
Primary ID	3712 (0E80 ₁₆)
Secondary ID	ZT4611: 4611 (1203 ₁₆) ZT4611: 4611 (1204 ₁₆) ZT4211: 4211 (1073 ₁₆) ZT4212: 4212 (1074 ₁₆)

VXI Data Interface

Command Interface	A16 message-based servant, SCPI compatible
Interrupt Operation	Programmable interrupter, Level 1–7
Data Interface	32k Byte A32 register-based (ZT4610) A16 register-based DMA (ZT4210)
Manufacturer ID	3712 (0E8016)
Secondary ID	ZT4610: 461 (1CD16) ZT4210: 421 (1A516)

⁶ Sustained transfer rates are dependent upon host system configuration.

LAN Data Interface

Command Interface	LAN 10/100, USB 2.0 Full-Speed 12 MB/s, SCPI compatible
Manufacturer ID	3712 (0E80 ₁₆)
Secondary ID	ZT4610: 461 (1CD ₁₆) ZT4210: 421 (1A5 ₁₆)

PXI XJ4 Trigger & Clock Pin Usage

Pin A5	PXI Trigger 3	(TTL level bi-directional)
Pin A6	PXI Trigger 2	(TTL level bi-directional)
Pin A7	PXI Trigger 1	(TTL level bi-directional)
Pin B5	PXI Trigger 4	(TTL level bi-directional)
Pin B7	PXI Trigger 0	(TTL level bi-directional)
Pin C5	PXI Trigger 5	(TTL level bi-directional)
Pin D6	PXI Star Trigger	(TTL level input)
Pin E5	PXI Trigger 6	(TTL level bi-directional)
Pin E6	PXI CLK10	(TTL level input)
Pin E7	PXI Trigger 7	(TTL level bi-directional)

PCI Timing Expansion Connector Pin Usage

Pin 1	Reference	(TTL level bi-directional)
Pin 3	Star Trigger	(TTL level bi-directional)
Pin 5	Trigger 7	(TTL level bi-directional)
Pin 7	Trigger 6	(TTL level bi-directional)
Pin 9	Trigger 5	(TTL level bi-directional)

Pin 11	Trigger 4	(TTL level bi-directional)
Pin 13	Trigger 3	(TTL level bi-directional)
Pin 15	Trigger 2	(TTL level bi-directional)
Pin 17	Trigger 1	(TTL level bi-directional)
Pin 19	Trigger 0	(TTL level bi-directional)

VXIbus P2 Trigger & Clock Pin Usage

Pin A1	ECLTRG0	(ECL level bi-directional)
Pin A3	ECLTRG1	(ECL level bi-directional)
Pin A23	TTLTRG0*	(TTL level bi-directional)
Pin A24	TTLTRG2*	(TTL level bi-directional)
Pin A26	TTLTRG4*	(TTL level bi-directional)
Pin A27	TTLTRG6*	(TTL level bi-directional)
Pin C1	CLK10+	(ECL level input)
Pin C2	CLK10–	(ECL level input)
Pin C23	TTLTRG1*	(TTL level bi-directional)
Pin C24	TTLTRG3*	(TTL level bi-directional)
Pin C26	TTLTRG5*	(TTL level bi-directional)
Pin C27	TTLTRG7*	(TTL level bi-directional)

LED Indicators

Ready(RDY)	OFF: Hardware failure ON: Unit has passed power-up self-diagnostics TOGGLE: unit has an error pending in error queue
Host(HST/LAN)	OFF: Interface fault ON: Normal interface operation TOGGLE: device identify command received

Trigger(TRG)	OFF: trigger event not detected ON/PULSE: trigger complete event detected
Active(ACT)	OFF: Instrument Idle ON/PULSE: Data acquisition initiated
1588 Clock Status (LAN only)	OFF: IEEE 1588 clock not synchronized or fault ON: clock locked as IEEE 1588 slave TOGGLE @ 1s: clock synchronized as IEEE 1588 master TOGGLE @ 2s: clock synchronized as IEEE 1588 grand master
Power (PWR, LAN only)	ON: Instrument is powered on OFF: Instrument is powered off

Status Reporting

IEEE-488.2 Device Status	Reporting Structure including Status Byte, Standard Event Registers, Questionable Registers, Operation Registers
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Power

Power Supplies

Product Option	Platform	Memory	Voltage	Typical Current	Maximum Current
ZT4611	PCI or PXI	Standard	+3.3 VDC	4.4 A	6.4 A
			+5 VDC	1.1 A	2.1 A
			+12 VDC	0.0 A	0.0 A
			-12 VDC	0.0 A	0.0 A
	Extended		+3.3 VDC	4.9 A	7.2 A
			+5 VDC	1.1 A	2.1 A
			+12 VDC	0.0 A	0.0 A
			-12 VDC	0.0 A	0.0 A
	VXI	Standard	+5 VDC	4.0 A	6.1 A
			+12 VDC	0.0 A	0.0 A
			+24 VDC	0.0 A	0.0 A
			-2 VDC	0.02 A	0.05 A
		Extended	-5.2 VDC	0.5 A	0.7 A
			-12 VDC	0.0 A	0.0 A
			-24 VDC	0.0 A	0.0 A
	LAN	Standard	115 VAC	0.22 A	0.33 A
		Extended	115 VAC	0.23 A	0.36 A
ZT4612	VXI	Standard	+5 VDC	7.1 A	10.9 A
			+12 VDC	0.0 A	0.0 A
			+24 VDC	0.0 A	0.0 A
			-2 VDC	0.02 A	0.05 A
		Extended	-5.2 VDC	0.8 A	1.2 A
			-12 VDC	0.0 A	0.0 A
			-24 VDC	0.0 A	0.0 A
	LAN	Standard	+5 VDC	7.8 A	12.0 A
			+12 VDC	0.0 A	0.0 A
		Extended	+24 VDC	0.0 A	0.0 A
			-2 VDC	0.02 A	0.05 A
			-5.2 VDC	0.8 A	1.2 A
			-12 VDC	0.0 A	0.0 A
			-24 VDC	0.0 A	0.0 A
	LAN	Standard	115 VAC	0.38 A	0.58 A
		Extended	115 VAC	0.42 A	0.64 A

ZT4211	PCI or PXI	N/A	+3.3 VDC	3.99 A	5.55 A
			+5 VDC	0.76 A	1.08 A
			+12 VDC	0.00 A	0.00 A
			–12 VDC	0.00 A	0.00 A
	VXI	N/A	+5 VDC	3.85 A	5.41 A
			+12 VDC	0.00 A	0.00 A
			+24 VDC	0.00 A	0.00 A
			–2 VDC	0.07 A	0.08 A
			–5.2 VDC	0.42 A	0.53 A
			–12 VDC	0.00 A	0.00 A
			–24 VDC	0.00 A	0.00 A
	LAN	N/A	115 VAC	0.27 A	0.28 A
ZT4212	VXI	N/A	+5 VDC	6.26 A	8.67 A
			+12 VDC	0.00 A	0.00 A
			+24 VDC	0.00 A	0.00 A
			–2 VDC	0.07 A	0.08 A
			–5.2 VDC	0.69 A	0.90 A
			–12 VDC	0.00 A	0.00 A
			–24 VDC	0.00 A	0.00 A
	LAN	N/A	115 VAC	0.37 A	0.42 A

Total Cooling & Power Consumption

Product Option	Platform	Memory	Typical Cooling & Power	Maximum Cooling & Power
ZT4611	PCI or PXI	Standard	20.3 W	31.5 W
		Extended	21.9 W	34.2 W
	VXI	Standard	22.5 W	34.2 W
		Extended	24.3 W	37.2 W
	LAN	Standard	25.0 W	38.0 W
		Extended	27.0 W	41.3 W
ZT4612	VXI	Standard	39.4 W	60.5 W
		Extended	43.0 W	66.5 W
	LAN	Standard	43.8 W	67.2 W
		Extended	47.8 W	73.9 W
ZT4211	PCI or PXI	N/A	17.0 W	24.0 W
	VXI	N/A	22.0 W	30.0 W
	LAN	N/A	31.0 W	34.0 W
ZT4212	VXI	N/A	35.0 W	48.0 W
	LAN	N/A	42.0 W	50.0 W

AC Power (LAN)

Line Voltage 90-264 VAC, 47-63 Hz, automatic selection

Input Protection AC line fuse, 250 VAC, 2.0A, fast-acting

Harmonic Distortion Meets EN61000-3-2

Surge Withstand Meets EN61000-4

Physical

PCI Physical size	Single-Slot Short PCI Card
PXI Physical size	Single-Wide 3U CompactPCI/PXI Instrument
VXI Physical size	Single-Wide C-size VXIbus Instrument
LAN Physical size	Half-Width 1U LAN Instrument
PCI Weight	1 lb. or 0.45 kg
PXI Weight	1 lb. or 0.45 kg
VXI Weight	3 lbs. or 1.4 kg
LAN Weight	4 lbs. or 1.8 kg

Temperature Range

Operating	0 °C to +40 °C Ambient
Storage	-40 °C to +75 °C
Over-Temperature	Automatic shutdown if internal temperature exceeds: +65 °C (ZT4610) +70 °C (ZT4210)
Calibration Range	+20 °C to +30 °C Ambient, after a 20 minute warm-up period, to meet all calibration specification accuracies.

Relative Humidity

Operating or Storage	10 to 90%, non-condensing, up to +40 °C
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Altitude

Operating	Up to 2,000 m (ZT4610)
	Up to 3,000 m (ZT4210)
	Up to 5,000 m with Maximum Input (1 M Ω) of ± 150 V (ZT4210)
Storage	Up to 15,000 m

Safety

This product is designed to meet the requirements of the following standard of safety for electrical equipment for measurement, control and laboratory use:

EN 61010-1

Electromagnetic Compatibility

CE Marking EN 61326-1:1997 with A1:1998 and A2:2001 Compliant

FCC Part 15 (Class A) Compliant

Emissions

EN 55011	Radiated Emissions, ISM Group 1, Class A, distance 10 m, emissions < 1 GHz
EN 55011	Conducted Emissions, Class A, emissions < 30 MHz Immunity
EN 61000-4-2	Electrostatic Discharge (ESD), 4 kV by Contact, 8 kV by Air
EN 61000-4-3	RF Radiated Susceptibility, 10 V/m
EN 61000-4-4	Electrical Fast Transient Burst (EFTB), 2 kV AC Power Lines
EN 61000-4-5	Surge
EN 61000-4-6	Conducted Immunity
EN 61000-4-8	Power Frequency Magnetic Field, 30 A/m
EN 61000-4-11	Voltage Dips and Interrupts

CE Compliance

This product meets the necessary requirements of applicable European Directives for CE Marking as follows:

73/23/EEC	Low Voltage Directive (Safety)
89/336/EEC	Electromagnetic Compatibility Directive (EMC)

See Declaration of Conformity for this product for additional regulatory compliance information.