

ZT621VXI Specifications

Digital Storage Oscilloscope

8-bit, 1 GS/s, 250 MHz, 2 Channels



Contents

Input Channel Specifications.....	2
Analog-to-Digital Converter Specifications.....	3
Trigger Specifications.....	3
Trigger, Channels 1-2.....	4
Trigger, External Input.....	4
Fiducial Input.....	4
Arm Input.....	5
Reference Output.....	5
Signal Processing Specifications	5
LED Status Indicators	6
VXI Interface	6
Power	7

Input Channel Specifications

Channels	2
Connectors	BNC Female
Bandwidth	DC to 250 MHz
Bandwidth Limiting	Bypass, 20 MHz, or 250 MHz (180 MHz equivalent)
Full Scale Input Range	10 mV to 100 V Fine resolution range settings (1400 steps)

DC Gain Accuracy

Full-Scale Range	Maximum DC Gain Error
≥ 20 mV	$\pm 1.5\%$ of full-scale range
< 20 mV	$\pm 2\%$ of full-scale range

Impedance $1\text{ M}\Omega \parallel 12\text{ pF}$ or $50\ \Omega$

Input VSWR (50 Ohm)
 $< 1.3:1$ DC to 500 MHz
 $< 1.5:1$ 500 MHz to 1 GHz

Maximum Input
 ± 400 VDC ($1\text{ M}\Omega$)
 5 V_{rms} ($50\ \Omega$)

Input Protection Thermal (RMS) overload protection for $50\ \Omega$ load

Coupling DC or AC

AC Coupling Cutoff

Input Impedance	AC Highpass Frequency
$1\text{ M}\Omega$	200 kHz
$50\ \Omega$	10 Hz

Offset Adjust

Full-Scale Range	Offset Adjust Range
10 mV to 1 V	± 1 V
1.01 V to 10 V	± 10 V
10.1 V to 100 V	± 100 V

DC Offset Accuracy $\pm (1\% \text{ offset adjust setting} + 2\% \text{ full scale range})$

Analog-to-Digital Converter Specifications

ADC Resolution 8 bit resolution

Sample Rate 5 S/s to 1 GS/s sample rate (1, 2.5, 5 steps)

Acquisition Time 10 ns to 50 s

RMS Digitization Noise

Input Bandwidth	Maximum RMS Noise
250 MHz (filter bypass)	350 μ V + 0.5% range
180 MHz (250 MHz filter)	<48.6mV: 315 μ V + 0.5% range
	\geq 48.6mV: 165 μ V + 0.5% range
20 MHz (20 MHz filter)	<48.6mV: 175 μ V + 0.5% range
	\geq 48.6mV: 75 μ V + 0.5% range

Record Size 256 samples to 30k samples

Timebase Software selectable 10 MHz timebase, internal 2.5 ppm TCXO or VXI CLK10

Channel Skew < 200 ps delay skew between channels
(channels at the same range & coupling settings)

Trigger Specifications

Trigger Sources External Trigger Input, Channels 1 and 2,
TTLTRG*(0-7), ECLTRG(1-0)

Trigger Detect Modes Edge, Pulse Width, Glitch

Edge Trigger Rising or Falling Edge

Pulse Width Trigger Width Inside Window or Width Outside Window

Glitch Trigger Less Than Limit or Greater Than Limit

Glitch / Pulse Width Minimum: larger of 1 sample interval or 4 ns
Maximum: 1 s

Trigger Position Pre-Trigger and Post-Trigger Acquisition

Trigger Delay 16 ns to 250 s

Detection Delay < 20 ns

Trigger Holdoff	250 ns to 12 s
Auto-Trigger Mode	Normal or Auto
Event Counter	Qualify on N th Trigger Event, N = 1 to 65535 Events
Trigger B Auto-Advance Mode	Qualify on Second Edge Source 1 to 1024 records, depending on record size re-arm time < 10 ms
Trigger Time Stamp	100 ns resolution, 1 s rollover

Trigger, Channels 1-2

Trigger Level	(offset – range/2) to (offset + range/2)
Trigger Level Accuracy	± (2% trigger level setting + 3% full scale range + 1% offset adjust setting)
Coupling	DC, AC (60 Hz), LF reject (> 80 kHz), HF reject (< 30 kHz), noise reject
Trigger Bandwidth	> 200 MHz

Trigger, External Input

Maximum Input	±5 V
Trigger Level	-1V to +1V
Trigger Level Accuracy	±(2% trigger level setting + 75 mV)
Coupling	DC
Impedance	50 Ω
Trigger Bandwidth	> 100 MHz
Connector	BNC Female

Fiducial Input

Maximum Input	2 Vrms
Level	±1 V

Gain	-6 ± 25%
Coupling	AC
Impedance	0.01 μF in series with 50 Ω
Rise Time	< 3 ns
Insertion	Fiducial added before digitizer, after input scaling
Connector	BNC Female

Arm Input

Arm Sources	External Arm Input, Immediate (bypass), Software, TTLTRG*(0-7), ECLTRG(1-0)
Level	TTL compatible, 0 to 5 V maximum
Termination	1 kΩ pullup to +5 V
Logic	Logic 1 = hold off trigger detection, Logic 0 = enable trigger detection
Connector	BNC Female

Reference Output

Modes	Reference Voltage or Reference Clock
Reference Voltage	+8 V ± 1% into 10 kΩ load
Reference Clock	>1 Vpp into 50 Ω load, 10 MHz timebase source: Internal 2.5 ppm TCXO or VXI CLK10
Connector	BNC Female

Signal Processing Specifications

Acquisition Modes	Normal, Envelope, Average, Auto-Advance
Reference Waveforms	10 waveforms, (up to 15000 samples), saved in non-volatile memory

Configuration Save	10 instrument configurations, saved in non-volatile memory
Math Channels	4
Math Functions	Add, Subtract, Multiply, Divide, Greater than, Less than
Measurements	Min, Max, High, Low, Mid, Mean, Cycle Mean, Amplitude, Peak-to-Peak, Area, Cycle Area, Positive Area, Cycle Positive Area, Cycle RMS, Standard Deviation, Positive Width, Negative Width, Center of Pulse, Period, Frequency, Positive Duty, Negative Duty, Risetime, Faltime, Preshoot, Overshoot, Nth Positive Crossing Time, Nth Negative Crossing Time, Time at Crossing, Gain, Phase, Delay
Measurement Accuracy	Delta DC Voltage \pm (DC gain accuracy) Absolute DC Voltage \pm [(DC gain accuracy)+(offset accuracy)] Time \pm (one sample interval) Frequency \pm [1/(one sample interval)]

LED Status Indicators

Ready	Green LED indicating that unit has passed power-up self-diagnostics and is ready for use, indicator flashes when error status is pending
Accessed	Yellow LED indicating that a VXI access has occurred or that the VXIbus MODID line was asserted
Arm'd	Green LED indicating that the unit is armed and awaiting a trigger
Trig'd	Green LED indicating that a trigger event occurred

VXI Interface

Backplane Connection	Standard P1 and P2 interface
Command Interface	A16 message based, SCPI compatible
Interrupt Operation	Programmable interrupter, level 1 to 7
Data Interface	64 Mbytes of VXI accessible DRAM in A32 register-based address space

Power

Power Supplies

Voltage	DC Current	Dynamic Current
+24V	0.0A	0.0A
+12V	0.1A	0.1A
+5V	10.7A	0.7A
-24V	0.0A	0.0A
-12V	0.1A	0.1A
-5.2V	0.15A	0.1A
-2V	0.05A	0.1A

Power Consumption

54.5 W typical total power & cooling