User's Manual Addendum

ZT1428VXI-RT

User's Manual: 0004-000058
Revision 1A

March 14, 2007

Contact

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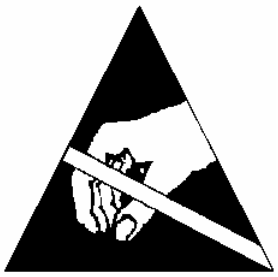

Handling Precautions for Electronic Devices Subject to Damage by Static Electricity

This instrument is susceptible to Electronic Static Discharge (ESD) damage. When transporting, place the instrument or module in conductive (anti-static) envelopes or carriers. Open only at an ESD-approved work surface. An ESD safe work surface is defined as follows:

- The work surface must be conductive and reliably connected to an earth ground with a safety resistance of approximately 250 kilo Ohms.

- The surface must NOT be metal. A resistance of 30–300 kilo Ohms per square inch is suggested.

Ground the frame of any line-powered equipment, chassis, test instruments, lamps, soldering irons, etc., directly to the earth ground. To avoid shorting out the safety resistance, ensure that the grounded equipment has rubber feet or other means of insulation from the work surface.

Avoid placing tools or electrical parts on insulators. Do NOT use any hand tool that can generate a static charge, such as a non-conductive plunger-type solder sucker. Use a conductive strap or cable with a wrist cuff to reliably ground to the work surface. The cuff must make electrical contact directly with the skin; do NOT wear it over clothing.

Note: Resistance between the skin and the work surface is typically 250 kilo Ohms to 1 mega Ohm using a commercially-available personnel grounding device.

Avoid circumstances that are likely to produce static charges, such as wearing clothes of synthetic material, sitting on a plastic-covered stool (especially when wearing woolen material), combing the hair, or making extensive pencil erasures. These circumstances are most significant when the air is dry.

When testing static sensitive devices, ensure DC power is ON before, during, and after application of test signals. Ensure all pertinent voltages are switched OFF while circuit boards or components are removed or inserted.

Revision History

Rev	Date	Section	Description
1	12/15/2006	All	Initial Release
1A	3/4/2007	Specifications	Updated Input Trigger sensitivity specifications

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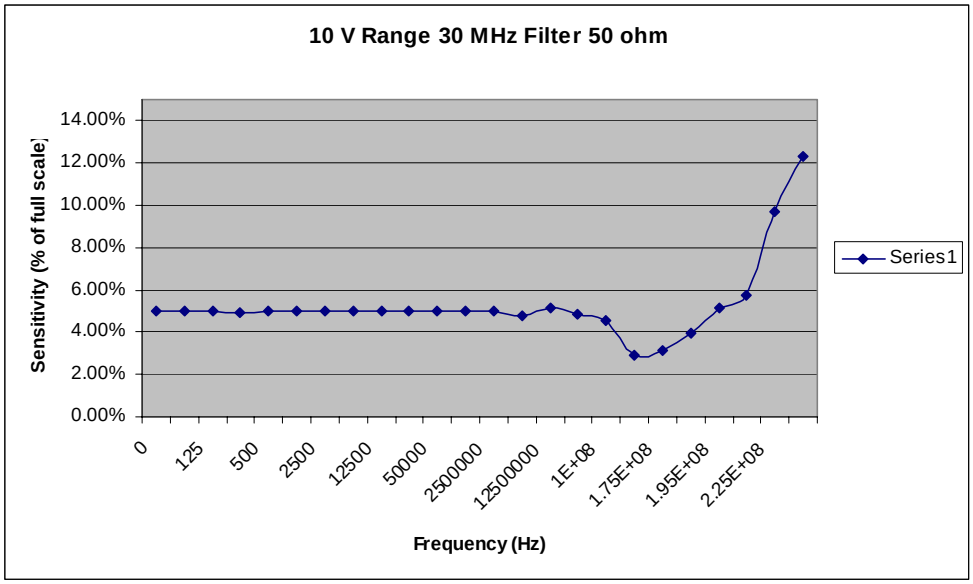

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Introduction

Description

The ZT1428VXI-RT has additional features and capabilities. This manual is a supplement to the ZT1428VXI manual. It documents the additional functionality, commands and specifications.

Product Options and Part Numbers.

Affected Part Numbers				
ZT1428VXI-RT				

Table 1: Affected Part Numbers

Functionality

Sweep Controls

Sweep Reference Scenarios

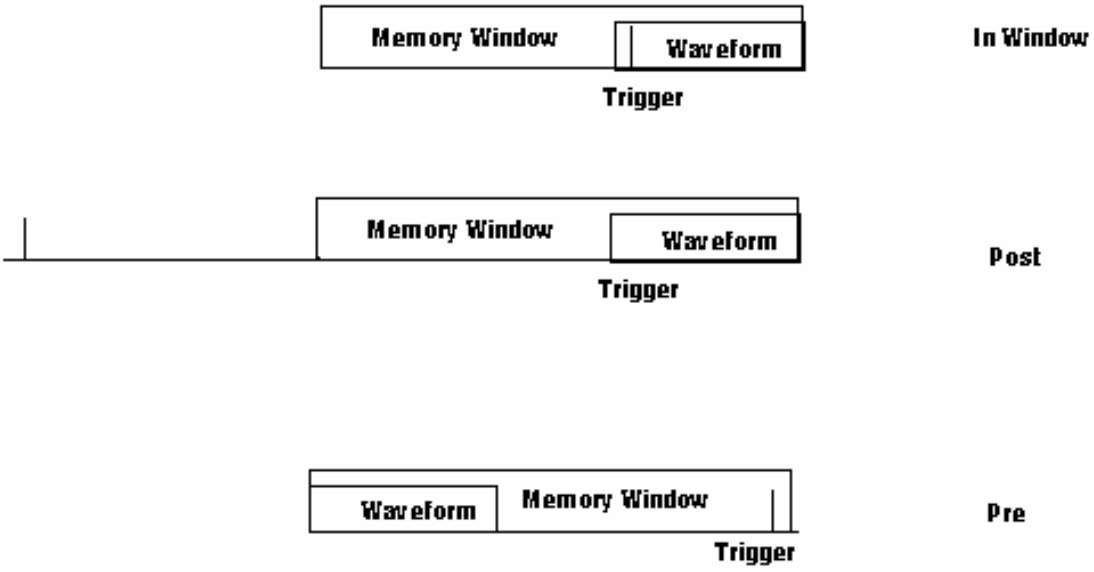


Figure 1: Sweep Reference of Various Trigger Positions

In Window Trigger

In Window acquisition corresponds to the normal acquisition mode where the trigger event falls within the desired waveform window view as shown in figure 1. The waveform size is limited by the maximum sample points at the selected sample rate.

Post-Trigger Waveform

Post-trigger acquisition corresponds to an acquisition where the desired waveform window view is after the trigger event as shown in figure 1. Post-trigger acquisition is limited to a maximum delay of 655 seconds, but the trigger jitter will be improved when the trigger event falls within the memory window. The memory window is limited by the maximum sample points at the selected sample rate.

Pre-Trigger Waveform

Pre-trigger acquisition corresponds to an acquisition where the desired waveform window view is before the trigger event as shown in figure 1. Pre-trigger acquisition is limited by the maximum sample points at the selected sample rate.

Trigger and Arm Controls

Trigger A and B

Figure 2 depicts the trigger block diagram for the ZT1428VXI-RT. The holdoff by time and event counting functionalities are complete and independent for both trigger A and B.

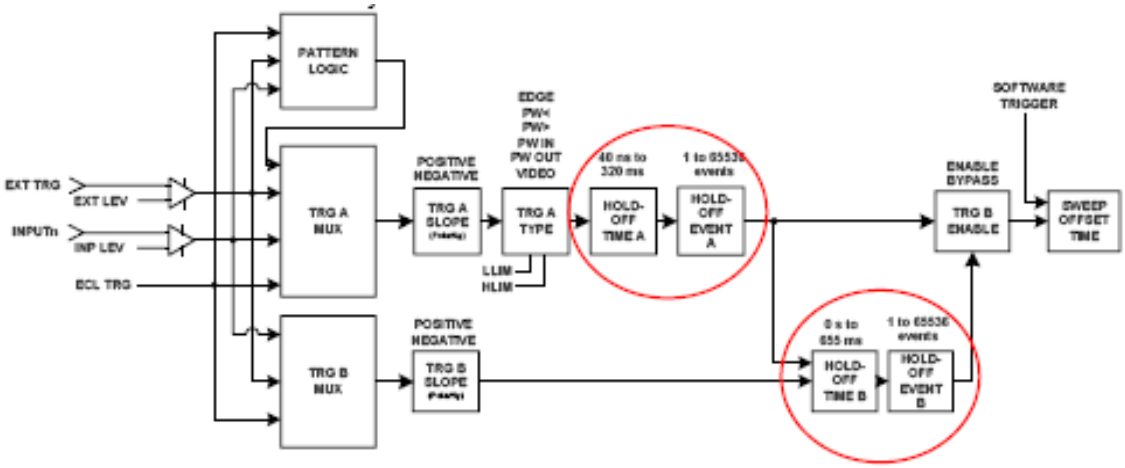


Figure 2: Trigger Block Diagram

Analog Trigger Emulation

The ZT1428VXI uses a synchronous latch to qualify trigger events. Enhancements to the ZT1428VXI-RT enable a faster clock rate for the trigger latch circuitry. The fast trigger clock rate improves the trigger detection for short or intermittent pulsed waveforms. The trigger clock rates are listed in the specifications for each of the requested sample rates.

Function Controls

Time Domain Transform

This enables a low-pass filter or Time Domain Transform on a waveform. The digital filter algorithm uses a second-order Infinite Impulse Response (IIR) filter. The number of filter length data points (range of 3 to 40) used to calculate the Time Domain Transform can be adjusted. A higher filter length point number causes a lower cutoff frequency for the filter.

Measurement Controls

Invalid Measurement Reporting

Instead of returning an invalid measurement value of 9.9999E+37 in the event of any clipped or over-voltage waveform, the ZT1428VXI-RT will return the actual measurement results, and set status bits in a status register to indicate the invalid or questionable measurement. The cases that cannot perform the measurement will continue to return 9.9999E+37. All measurements will have the following reporting 16 bit status register. An additional query(MEASure:VALid?) will be added to support the read back of the status valid of the last measurement queried.

Measurement Valid Bit Status Definition:

Description: Measure Valid Bit Error bit mask definition
Value:

Bit 0: Waveform not yet captured
Bit 1: Waveform Overvoltage High
Bit 2: Waveform Overvoltage Low
Bit 3: selected Edge(s) not found
Bit 4-15: Unused

Command Interface

Introduction

IEEE 488.2 commands that are different or unique to the ZT1428VXI-RT are presented in an alphabetic list below. See the ZT1428VXI Manual for all other commands.

IEEE 488.2 Common Commands

Name	Description
Identification Query ***IDN?**	The identification query returns the instruments identification information. The response contains four fields separated by commas in the form: *"ZTEC, ZT1428VXI-RT, serial number, firmware revision level"* **Command Syntax** None **Query Syntax** *IDN? **Parameters** <id string> Descriptions: Identification String Value: See above

COMP Commands and Queries

COMP language commands that are different or unique to the ZT1428VXI-RT are presented in an alphabetic list below. See the ZT1428VXI Manual for all other commands. Each command parameter table includes parameter name, parameter type, and range of values.

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Acquisition Points Command

Acquisition Points Query</td><td>The acquisition points command selects the number of samples for each acquisition record. The maximum number of sample points varies with the selected sample rates.
Note:
The Acquisition Points, Timebase interval Timebase Range and Timebase Delay are all interrelated. Any time one of these settings is entered the Acquisition Points will be coerced to the maximum points available at the setting desired. An error will be generated in the case the points are coerced. The Timebase Delay may also be coerced but it will not generate an error. The desired setting order should be as follows Timebase Interval or Timebase range followed by Acquisition Points and the Timebase Delay.

Command Syntax
ACQuire:POINts <points>

Query Syntax
ACQuire:POINts? <points>

Parameters:

<table><tr><td>Name</td><td>Type</td><td>Range</td></tr><tr><td><points></td><td>U32</td><td>100 to Maximum Samples

See Specifications for Maximum Samples per channel.</td></tr></table></td></tr>
<tr><td>Acquisition Type Command

Acquisition Type Query</td><td>The Acquire Type command selects the type of waveform that will be acquired. In real-time sampling mode, the instrument must use NORMal acquisition. In repetitive sampling mode, all three acquisition types are available. In repetitive timebase sampling mode, the number of acquisitions used to create the waveform is defined with the ACQuire:COUNt command. See the Timebase Sample command for more details on selecting real-time or repetitive sampling.

o NORMal: In real-time sampling mode, normal acquisition enables the capture of an entire waveform with each acquisition. In repetitive sampling mode, normal acquisition enables a high sample rate reconstruction over multiple acquisitions, also referred to as equivalent-time sampling. In equivalent time sampling, each point in the waveform reflects a data point (hit) in a time bucket between the sampling clock interval.</td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td></td><td>

AVERage: Used when reduction of signal noise and improved resolution are desired in repetitive timebase sampling mode. The waveform reflects multiple acquisitions averaged to form a combined waveform of averaged values for each sample point.
ENVelope: Used when measuring voltage or time jitter in repetitive timebase sampling mode. The waveform reflects the minimum and maximum values for each sample point.

The Acquire Type query returns the currently selected acquisition type.

Command Syntax
ACQuire:TYPE <mode>

Query Syntax
ACQuire:TYPE?
Parameters:

<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><mode></td><td>Discrete</td><td>NORMal | AVERage | ENVelope</td></tr>
</table>
</td></tr>
<tr><td>Function Transform Time Command</td><td>
Sets the instrument to perform a time transform on a waveform using a waveform math function channel. The time transform performs a second order IIR low pass filter operation on the data.

Command Syntax
FUNCtion<n>:TRANsform:TIME <source>

Query Syntax
None

Parameters:

<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><n></td><td>U16</td><td>1 Function Channel 1
2 Function Channel 2</td></tr>
<tr><td><source></td><td>Discrete</td><td>CHANnel<n>
Input channels, where <n> may be 1 or 2. Example: CHAN1.

WMEMory<n>
Waveform memory channels, where <n> may be 1, 2, 3, or 4. Example: WMEM1.

FUNCtion<n>
Function channels, where <n> may be 1 or 2. Example: FUNC1</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Function Transform Time Points Command

Function Transform Time Points Query</td><td>Sets or queries the number of filter length points used to calculate the Time Transform within a waveform math function channel. A higher filter length point number causes a lower cutoff frequency for the filter.

Command Syntax
FUNCtion<n>:TRANsform:TIME:POINts <points>

Query Syntax
FUNCtion<n>:TRANsform:TIME:POINts? → <points>

Parameters:

<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><n></td><td>U16</td><td>1 Function Channel 1
2 Function Channel 2</td></tr>
<tr><td><points></td><td>U16</td><td>3 to 40 points
MINimum 3
MAXimum 40</td></tr>
</table>
</td></tr>
<tr><td>Measure Valid Query</td><td>Queries the measurement valid register. The measurement valid register consists of 5 bits each indicating a possible issue with the last measurement requested. After a Measurement is requested the user can query the measurement valid status to identify if any of the following conditions could affect the measurement. Only the conditions that could affect a particular measurement will be reported in the query.

Query Syntax
MEASure:VALid? → <valid>

Parameters:

<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><valid></td><td>U16</td><td>Bit 0: Invalid Waveform
Bit 1: Wave Clipped High
Bit 2: Wave Clipped Low
Bit 3: Edge not found
Bit 4-15: Unused</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>System Advanced Mode Command

System Advanced Mode Query</td><td>System advanced mode is permanently enabled for the ZT1428VXI-RT configuration. The ZT1428VXI-RT will accept the command but it will have no effect.

The advanced mode query will always return 1.

Command Syntax
SYSTem:ADVanced <mode>

Query Syntax
SYSTem:ADVanced? → <mode>

Parameters:

<table><tr><td>Name</td><td>Type</td><td>Range</td></tr><tr><td><Mode></td><td>U16</td><td>1 ON</td></tr></table></td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Timebase Delay Command

Timebase Delay Query</td><td>The time base delay command is used to set the time interval between the trigger event and the active point. The delay reference point is set to waveform delay reference the left, center, or right of the active waveform using the TIMebase:REFerence command.

• Entering Time: When 0 is entered, the trigger event occurs at the delay reference point. Positive values set the trigger event to occur before the delay reference point (to capture post-trigger events). Negative values set the trigger event to occur after the delay reference point (to capture pre-trigger events). The range of acceptable DELay values is dependent on the current TIMebase:RANGe setting. If DELay is set to a value outside the allowable range, it will automatically be set to the nearest acceptable value without generating an error.

Note:
The Acquisition Points, Timebase interval Timebase Range and Timebase Delay are all interrelated. Any time one of these settings is entered the Acquisition Points will be coerced to the maximum points available at the setting desired. An error will be generated in the case the points are coerced. The Timebase Delay may also be coerced but it will not generate an error. The desired setting order should be as follows Timebase Interval or Timebase range followed by Acquisition Points and the Timebase Delay.

Command Syntax
TIMebase:DELay <time>

Query Syntax
TIMebase:DELay? → <time>

Parameters:

<table><tr><td>Name</td><td>Type</td><td>Range</td></tr><tr><td><time></td><td>Float</td><td>Dependant on TIMbase:RANGe</td></tr></table></td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Timebase Interval Command

Timebase Interval Query</td><td>The time base interval command selects the sampling interval for the instrument in seconds. The sample rate in samples per second can be calculated as the reciprocal of this sampling interval.

Note:
The Acquisition Points, Timebase interval Timebase Range and Timebase Delay are all interrelated. Any time one of these settings is entered the Acquisition Points will be coerced to the maximum points available at the setting desired. An error will be generated in the case the points are coerced. The Timebase Delay may also be coerced but it will not generate an error. The desired setting order should be as follows Timebase Interval or Timebase range followed by Acquisition Points and the Timebase Delay.

Command Syntax
TIMebase:INTerval <interval>

Query Syntax
TIMebase:INTerval? → <interval>

Parameters:
<table><tr><td>Name</td><td>Type</td><td>Range</td></tr><tr><td><interval></td><td>Float</td><td>20 ps to 1s with
1, 2, 4 sequence
(non-exact values are rounded down)

Additional interval of 500ps available

MINimum 20ps
MAXimum 1s</td></tr></table></td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Timebase Range Command

Timebase Range Query</td><td>
The time base range command is used to define the full scale horizontal axis, or "X-axis" of the main sweep. This time base range is specified for a 500-point waveform, even if the waveform size is not set to 500 points.

• Entering Range: Range values are entered in a 1, 2, 5 sequence. If a value is entered that is not in a 1, 2, 5 sequence, it is automatically rounded to the closest allowable value without generating an error.

• Effects on other timebase selections: A change in the range parameter may affect the current settings specified for TIMebase:DELay.

The timebase range query returns a numeric value representing the current range setting for the horizontal axis. The value (in seconds) corresponds to the time for a 500-point waveform, even if the waveform size is not set to 500 points.

Note:
The Acquisition Points, Timebase interval Timebase Range and Timebase Delay are all interrelated. Any time one of these settings is entered the Acquisition Points will be coerced to the maximum points available at the setting desired. An error will be generated in the case the points are coerced. The Timebase Delay may also be coerced but it will not generate an error. The desired setting order should be as follows Timebase Interval or Timebase range followed by Acquisition Points and the Timebase Delay.

Command Syntax
TIMebase:RANGe <range>

Query Syntax
TIMebase:RANGe? → <range>

Parameters:

<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><range></td><td>Float</td><td>10 ns to 500 s with
1, 2, 5 sequence (non-exact values are rounded down)

Additional range of 250 ns available

MINimum 10 ns
MAXimum 500 s</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Timebase Reference Command

Timebase Reference Query</td><td>The time base reference command sets the delay reference to the left, right, or to the center of the active waveform.

• Selecting Position: Position entered is used with the TIMebase:DELay command to set the time interval between the trigger event and the delay reference point. For example, if DELay is 0 seconds, and REFerence is CENTer, pre-trigger data is on the left and post-trigger data is on the right of the active waveform.

The time base reference? query returns the currently selected delay reference point. The data is sent to the output buffer. Returns LEFT, CENTer, or RIGHt depending on the current position selected.

Command Syntax
TIMebase:REFerence <position>

Query Syntax
TIMebase:REFerence? → <position>

Parameters:

<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><position></td><td>String</td><td>LEFT | CENTer | RIGHt</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Timebase Sample Command

Timebase Sample Query</td><td>The timebase sample command is used to select the sampling mode of the oscilloscope. REALtime sampling mode causes a complete data record to be collected (or captured) on one trigger event. REPetitive sample mode accumulates a complete data record over one or more trigger events.

• When in the repetitive mode, the acquisition points value must be 500. When in the real-time mode, acceptable acquisition points values are adjustable between 100 points and the maximum number of samples for the selected sample rate. See the Acquisition Points command for more details.

• The timebase sample mode is related to the acquisition type: When in the real-time mode, the acquisition type must be NORMal. When in repetitive mode, the acquisition type may be NORMal, AVERage or ENVelope. NORMal repetitive mode allows high sample rate reconstruction using many acquisitions, and is also referred to as equivalent-time sampling. The number of acquisitions used to reconstruct the waveform is defined with the ACQuire:COUNt command. See the Acquisition Type command for more details.

Command Syntax
TIMebase:SAMPle <mode>

Query Syntax
TIMebase:SAMPle? → <mode>

Parameters:

<table><tr><td>Name</td><td>Type</td><td>Range</td></tr><tr><td><mode></td><td>Discrete</td><td>Realtime | REPetative</td></tr></table></td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Trigger A Event Count Command

Trigger A Event Count Query</td><td>The TRIG:A:EVEN command is used to set the trigger A hold-off value in number of events. Event counting allows the trigger circuit to qualify a waveform capture based upon a specified number of trigger events. The number of events can range from 1 to 65535. Trigger A hold-off can be used with EDGE, PATTern, STATe, or TV trigger modes.

Command Syntax
TRIGger:A:EVENt <event>

Query Syntax
TRIGger:A:EVENt? → <event>

Parameters:

<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><event></td><td>U16</td><td>1 to 65535
MINimum 1
MAXimum 65535</td></tr>
</table>
</td></tr>
<tr><td>Trigger A Hold Off Command

Trigger A Hold Off Query</td><td>Sets or queries the duration (in seconds) to hold off or ignore all other triggers before recognizing the next trigger A event.

Command Syntax
TRIGger:A:HOLDoff <seconds>

Query Syntax
TRIGger:A:HOLDoff? → <seconds>

Parameters:
Trigger A Parameters
<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><seconds></td><td>Float</td><td>40 ns to 320 ms

MINimum 40 ns
MAXimum 320 ms

Resolution: see table below</td></tr>
</table>
Resolution:
<table>
<tr><td>Resolution</td><td>Time in Seconds</td></tr>
<tr><td>10 ns</td><td>40 ns to 655.36 µs</td></tr>
<tr><td>100 ns</td><td>655.36 µs to 6.5536 ms</td></tr>
<tr><td>1 µs</td><td>6.5536 ms to 65.536 ms</td></tr>
<tr><td>10 µs</td><td>65.536 ms to 320 ms</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Trigger B Event Count Command

Trigger B Event Count Query</td><td>The TRIG:B:EVEN command is used to set the trigger B hold-off value in number of events. Event counting allows the trigger circuit to qualify a waveform capture based upon a specified number of trigger events. The number of events can range from 1 to 65535. Trigger B events occur after a qualified trigger A event. Trigger B hold-off can be used with EDGE trigger mode.

Command Syntax
TRIGger:B:EVENt <event>

Query Syntax
TRIGger:B:EVENt? → <event>

Parameters:

<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><event></td><td>U16</td><td>1 to 65535
MINimum 1
MAXimum 65535</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Name</th><th>Description</th></tr>
<tr><td>Trigger B Hold Off Command

Trigger B Hold Off Query</td><td>Sets or queries the time duration (in seconds) after a qualified trigger A event to hold off before recognizing a valid trigger B event.

Command Syntax
TRIGger:B:HOLDoff <seconds>

Query Syntax
TRIGger:B:HOLDoff? → <seconds>

Parameters:
<table>
<tr><td>Name</td><td>Type</td><td>Range</td></tr>
<tr><td><seconds></td><td>Float</td><td>0 to 655mseconds

MINimum 0 s
MAXimum 655 s

Resolution: see table below</td></tr>
</table>
Resolution:
<table>
<tr><td>Resolution</td><td>Time in Seconds</td></tr>
<tr><td>10 ns</td><td>0 to 655.36 µs</td></tr>
<tr><td>100 ns</td><td>655.36 µs to 6.5536 ms</td></tr>
<tr><td>1 µs</td><td>6.5536 ms to 65.536 ms</td></tr>
<tr><td>10 µs</td><td>65.536 ms to 655.36 ms</td></tr>
<tr><td>100 µs</td><td>655.36 ms to 6.5536s</td></tr>
<tr><td>1 ms</td><td>6.5536s to 65.536s</td></tr>
<tr><td>10 ms</td><td>65.536s to 655 s</td></tr>
</table>
</td></tr>
</table>

Specifications

Analog-to-Digital Converter

Real-Time Sample Rate	1 S/s to 1 GS/s (1, 2.5, 5 steps)
Interpolated Sample Rate	2.5 GS/s to 50 GS/s (1, 2.5, 5 steps) and 2.0 GS/s
Equivalent time Sample Rate	2.5 GS/s to 50 GS/s (1, 2.5, 5 steps) and 2.0 GS/s

Waveform Memory

Maximum Samples per Channel

Sample Rate (S/s)	Memory (Samples)
1.0E+0	12.5E+3
2.5E+0	3.2E+3
5.0E+0	6.3E+3
10.0E+0	12.5E+3
25.0E+0	3.2E+3
50.0E+0	6.3E+3
100.0E+0	12.5E+3
250.0E+0	3.2E+3
500.0E+0	6.3E+3
1.0E+3	12.5E+3
2.5E+3	31.2E+3
5.0E+3	62.5E+3
10.0E+3	125.0E+3
25.0E+3	31.3E+3
50.0E+3	62.5E+3
100.0E+3	125.0E+3
250.0E+3	31.2E+3
500.0E+3	62.5E+3
1.0E+6	125.0E+3
2.5E+6	31.3E+3
5.0E+6	62.5E+3
10.0E+6	125.0E+3
25.0E+6	25.0E+3

50.0E+6	55.0E+3
100.0E+6	100.0E+3
250.0E+6	250.0E+3
500.0E+6	500.0E+3
> 1.0E+9	1.0E+6

Trigger

Trigger Rate

Sample Rate (S/s)	Trigger Rate (S/s)
1.0E+0	1.0E+6
2.5E+0 to 100E+0	10.0E+6
>= 250.0E+0	1.0E+9

Trigger A Holdoff 40 ns to 320 ms

Trigger B Holdoff 0 to 655 s

Trigger A Events 1 to 65535 events

Trigger B Events 1 to 65535 events

Pre-Trigger Delay

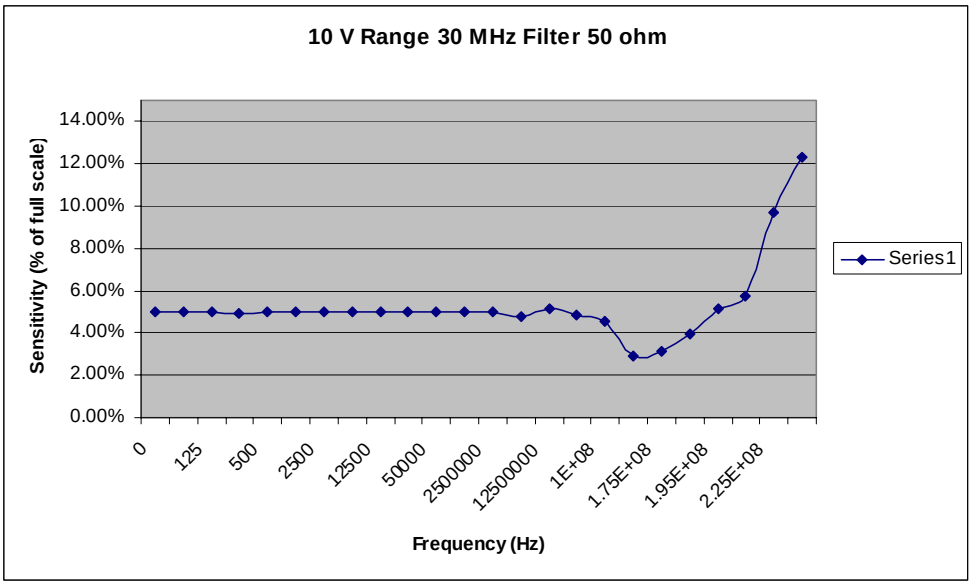
Sample Rate (S/s)	Pre-Trigger Delay (s)
1.0E+0	1.3E+04
2.5E+0 to 100.0E+0	1.3E+03
250.0E+0 to 10.0E+3	1.3E+01
25.0E+3 to 100.0E+3	1.3E+00
250.0E+3 to 1.0E+6	1.3E-01
>= 2.5E+6	1.0E-03

Ch 1-2 Level Accuracy
- Normal ±(2% setting +5% full-scale)
- Low Sensitivity, HF Reject ±(14% setting +10% full-scale)

Trigger Sensitivity

Positive Normal
4.75%--6.25% of full scale (DC to 100 MHz)
2.50%--5.50% of full scale (100 MHz to 200 MHz)
5.00%--16.00% of full scale (>200 MHz)

Negative Normal
3.00%--4.50% of full scale (DC to 100 MHz)
2.00%--3.50% of full scale (100 MHz to 200 MHz)
3.25%--12.00% of full scale (>200 MHz)


10 V Range 30 MHz Filter 50 ohm
Sensitivity (% of full scale)
14.00%
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
0
125
500
2500
12500
50000
2500000
12500000
1E+08
1.75E+08
1.95E+08
2.25E+08
Frequency (Hz)
Series1

Default Reset Conditions

Parameter	Default
Trigger B	Disable
Trigger B Events	1
Trigger B Holdoff	40E-9 seconds
Function Transform Points	40
Acquisition Points	500
Acquisition Type	Normal
System Advanced Mode	1 (now a constant)
Timebase Delay	0
Timebase Interval	2E-6 seconds
Timebase Range	1E-3 seconds
Timebase Reference	Center
Timebase Sample	Real-time

Error Codes

The following table lists the error codes. No error codes have been added or removed to support the ZT1428VXI-RT.

Code	Error Summary	Description

Commands Index

The following is an alphabetic list of the additional or modified commands and queries.

IEEE-488 Common Commands

Name	Command Syntax
Identification Query	*IDN?

Instrument Specific Commands

Name	Command Syntax
Acquisition Points Command/Query	ACQuire:POINts <points>
Acquisition Type Command/Query	ACQuire:TYPE <mode>
Function Transform Time Command	FUNC<n>:TRAN:TIME <source>
Function Transform Time Points Command/Query	FUNC<n>:TRAN:TIME:POIN <points>
Measure Valid Query	MEASure:VALid? → <valid>
System Advanced Mode Command /Query	SYSTem:ADVanced <mode>
Timebase Delay Command/Query	TIMebase:DELay <time>
Timebase Interval Command/Query	TIMebase:INTerval <interval>
Timebase Range Command/Query	TIMebase:RANGe <range>
Timebase Reference Command/Query	TIMebase:REFerence <points>
Timebase Sample Command/Query	TIMebase:SAMPle <value>
Trigger A Event Count Command/Query	TRIGger:A:EVENt <event>
Trigger A Hold Off Command/Query	TRIGger:A:HOLDoff <seconds>
Trigger B Event Count Command/Query	TRIGger:B:EVENt <event>
Trigger B Hold Off Command/Query	TRIGger:B:HOLDoff <seconds>

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