ZT432VXI Digital Oscilloscope

Introduction:

This instrument driver provides programming support for ZT432VXI Digital Oscilloscope.
It contains functions for opening, configuring, taking measurements from, and
closing the instrument.

Assumptions:

To successfully use this module, the following conditions must be met:

For GPIB instrument drivers:
- the instrument is connected to the GPIB.
- the GPIB address supplied to the initialize function must match the GPIB address of the instrument.

For VXI instrument drivers:
- the instrument is installed in the VXI mainframe and you are using one of the following controller options:
  - Embedded controller
  - MXI
  - MXI2
  - GPIB-VXI
- the logical address supplied to the initialize function must match the logical address of the instrument.

For RS-232 instrument drivers:
- the instrument is connected to the RS-232 interface.
- the COM port, baud rate, parity, and timeout supplied to the initialize function must match the settings of the instrument.

Error and Status Information:

Each function in this instrument driver returns a status code that
either indicates success or describes an error or warning condition.
Your program should examine the status code from each call to an
instrument driver function to determine if an error occurred.
The general meaning of the status code is as follows:

Value	Meaning
0	Success
Positive Values	Warnings
Negative Values	Errors

The description of each instrument driver function lists possible error
codes and their meanings

How To Use This Document:

Use this document as a programming reference manual.
It describes each function in the

ZT432VXI Digital Oscilloscope

instrument. The functions appear in alphabetical order, with a description
of the function and its C syntax, a description of each parameter, and a list
of possible error codes.

Function Tree Layout:

Class/Panel Name:	Function Name:
Initialize	zt432_initialize

Configure	
Channel Enable	zt432_channel_enable
Horizontal	zt432_horizontal
Vertical	zt432_vertical
Acquisition	zt432_acquisition
Clock	zt432_clock
Arm	zt432_arm
Trigger	zt432_trigger
Advanced Trigger	
Trigger Hold Off	zt432_trigger_hold_off
Trigger Pulse Width	zt432_trigger_pulse_width
Trigger Pattern	zt432_trigger_pattern
Trigger B	zt432_trigger_b
Outputs	
Output Reference	zt432_output_reference
Output Trigger	zt432_output_trigger
Calculate	
Calculate Immediate	zt432_calculate_immediate
Calculate Channel Enable	zt432_calculation_channel_enable
Calculate Function	zt432_calculate_function
Measurement	
Measure Immediate	zt432_measure_immediate
Measure Reference	zt432_measure_reference
Waveform	
Read Waveform	zt432_read_waveform
Read Waveform Preamble	zt432_read_waveform_preamble
Load Reference Waveform	zt432_load_reference_waveform
Store Reference Waveform	zt432_store_reference_waveform
Operate	
Abort	zt432_abort
Arm State Query	zt432_arm_state_query
Capture Complete Query	zt432_capture_complete_query
Capture Waveform	zt432_capture_waveform
Initiate	zt432_initiate
Soft Trigger	zt432_soft_trigger
Trigger Wait Query	zt432_trigger_wait_query
Trigger Timestamp Query	zt432_trigger_timestamp_query
Readback	
Channel Enable Query	zt432_channel_enable_query
Horizontal Query	zt432_horizontal_query
Vertical Query	zt432_vertical_query
Acquisition Query	zt432_acquisition_query
Clock Query	zt432_clock_query
Arm Query	zt432_arm_query
Trigger Query	zt432_trigger_query
Trigger Hold Off Query	zt432_trigger_hold_off_query
Trigger Pulse Width Query	zt432_trigger_pulse_width_query
Trigger Pattern Query	zt432_trigger_pattern_query
Trigger B Query	zt432_trigger_b_query
Output Reference Query	zt432_output_reference_query
Output Trigger Query	zt432_output_trigger_query
Calculate Channel Enable Query	zt432_calc_channel_query
Calculate Function Query	zt432_calculate_function_query
Measurement Query	zt432_measurement_query
Utilities	
Device Clear	zt432_device_clear
Error Query	zt432_error_query
Operation Complete	zt432_operation_complete
Reset	zt432_reset
Save/Recall State	zt432_save_recall_state
Self Test	zt432_self_test
Status	zt432_status
Versions	zt432_versions
Close	zt432_close

The following functions are in alphabetical order.

---

zt432_abort

ViStatus zt432_abort (ViSession instrumentSession);

Purpose

Commands the instrument to autoscale.
Peak-to-peak range is independently adjusted for each channel to force the peak signal levels to approximately 2/3 of full scale.
The sweep time is adjusted capture approximately 2 cycles of the signal on INPut1.
The trigger is set to edge mode and channel 1 source.
The input impedance, input coupling, and sweep points are not changed

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_acquisition

```
ViStatus zt432_acquisition (ViSession instrumentSession,
                            char acquireType[],
                            unsigned short acquireCount,
                            char triggerMode[]);
```

Purpose

Configures the acquisition settings of the oscilloscope.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

acquireType

Variable Type char []

The type of acquisition. In Normal mode, a single waveform is captured. In Average mode, multiple captured waveforms are averaged. In Envelope mode, the minimum and maximum values of multiple captured waveforms are used to create an envelope.

No Averaging - ZT432_ACQ_NO_AVG
Normal Average - ZT432_ACQ_NORM
Envelope - ZT432_ACQ_ENV

acquireCount

Variable Type unsigned short

Specifies the acquisition count for repetitive aquisition modes. In Normal mode, this parameter is ignored. In Average mode, this specifies the number of waveforms to be averaged before the acquisition is complete. In Envelope mode, this specifies the number of waveforms for which to capture minimum and maximum values before the acquisition is complete.

Valid Range:

1 to 2048

triggerMode

Variable Type char []

Selects the trigger mode to enable automatic triggering.

Auto - ZT432_TRIG_MODE_AUTO
Normal - ZT432_TRIG_MODE_NORM

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_acquisition_query

```
ViStatus zt432_acquisition_query (ViSession instrumentSession,
                                  char acquireType[],
                                  unsigned short *acquireCount,
                                  char triggerMode[]);
```

Purpose

Queries the acquisition settings of the oscilloscope.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

acquireType

Variable Type char []

The type of acquisition. In Normal mode, a single waveform is captured. In Average mode, multiple captured waveforms are averaged. In Envelope mode, the minimum and maximum values of multiple captured waveforms are used to create an envelope.

No Averaging - ZT432_ACQ_NO_AVG
Normal Average - ZT432_ACQ_NORM
Envelope - ZT432_ACQ_ENV

acquireCount

Variable Type unsigned short (passed by reference)

Queries the acquisition count for repetitive aquisition modes. In Normal mode, this parameter is ignored. In Average mode, this specifies the number of waveforms to be averaged before the acquisition is complete. In Envelope mode, this specifies the number of waveforms for which to capture minimum and maximum values before the acquisition is complete.

Valid Range:
1 to 2048

triggerMode

Variable Type char []

Queries the trigger mode.

Auto - ZT432_TRIG_MODE_AUTO
Normal - ZT432_TRIG_MODE_NORM

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_arm

ViStatus zt432_arm (ViSession instrumentSession, char source[],
char polarity[]);

Purpose

This functions configures the arm settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Sets or queries the arm signal source. The following considerations apply when setting the arm source:

· When a waveform acquisition has been initiated, the arm signal allows the unit to begin trigger detection.

· The front panel ARM IN signal can be selected using the ARM source setting.

Note: The ARM IN signal is inverted before input to the source selector.

External Arm - ZT432_SOURCE_ARM
ECLT0 - ZT432_SOURCE_ECLT0
ECLT1 - ZT432_SOURCE_ECLT1
Immediate - ZT432_SOURCE_IMM
TTLT0 - ZT432_SOURCE_TTLT0
TTLT1 - ZT432_SOURCE_TTLT1
TTLT2 - ZT432_SOURCE_TTLT2
TTLT3 - ZT432_SOURCE_TTLT3
TTLT4 - ZT432_SOURCE_TTLT4
TTLT5 - ZT432_SOURCE_TTLT5
TTLT6 - ZT432_SOURCE_TTLT6
TTLT7 - ZT432_SOURCE_TTLT7

polarity

Variable Type char []

Sets or queries the arm signal active state. The following considerations apply when setting the arm slope:

· The active arm slope is detected after the arm source is selected from the available sources.

· The front panel ARM IN signal is inverted before the source selector.

· POSITIVE slope defines the active state as the selected source in or transitioning to its high state.

· NEGATIVE slope defines the active state as the selected source in or transitioning to its low state.

Positive - ZT432_POLARITY_POS
Negative - ZT432_POLARITY_NEG

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_arm_query

```
ViStatus zt432_arm_query (ViSession instrumentSession, char source[],
                          char polarity[]);
```

Purpose

Queries the arm settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Queries the arm signal source. The following considerations apply when setting the arm source:

· When a waveform acquisition has been initiated, the arm signal allows the unit to begin trigger detection.

· The front panel ARM IN signal can be selected using the ARM source setting.

Note: The ARM IN signal is inverted before input to the source selector.

External Arm - ZT432_SOURCE_ARM
ECLT0 - ZT432_SOURCE_ECLT0
ECLT1 - ZT432_SOURCE_ECLT1
Immediate - ZT432_SOURCE_IMM
TTLT0 - ZT432_SOURCE_TTLT0
TTLT1 - ZT432_SOURCE_TTLT1
TTLT2 - ZT432_SOURCE_TTLT2
TTLT3 - ZT432_SOURCE_TTLT3
TTLT4 - ZT432_SOURCE_TTLT4
TTLT5 - ZT432_SOURCE_TTLT5
TTLT6 - ZT432_SOURCE_TTLT6
TTLT7 - ZT432_SOURCE_TTLT7

polarity

Variable Type char []

Sets or queries the arm signal active state. The following considerations apply when setting the arm slope:

· The active arm slope is detected after the arm source is selected from the available sources.

· The front panel ARM IN signal is inverted before the source selector.

· POSITIVE slope defines the active state as the selected source in or transitioning to its high state.

· NEGATIVE slope defines the active state as the selected source in or transitioning to its low state.

Positive - ZT432_POLARITY_POS
Negative - ZT432_POLARITY_NEG

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_arm_state_query

```
ViStatus zt432_arm_state_query (ViSession instrumentSession,
                                unsigned short *state);
```

Purpose

Sets the channel mode.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

state

Variable Type unsigned short (passed by reference)

Returns the value of the waiting for arm bit of the operation register.

0 - Not Waiting for Arm
1 - Waiting for Arm

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_calc_channel_query

```
ViStatus zt432_calc_channel_query (ViSession instrumentSession,
                                   char calcChannel[],
                                   unsigned short *state);
```

Purpose

Queries the state of a calculation channel.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

calcChannel

Variable Type char []

Sets the calculation channel to use.

Calc1 - ZT432_CALC_CH1
Calc2 - ZT432_CALC_CH2

state

Variable Type unsigned short (passed by reference)

Queries the state of the selected calculation channel.

Enable - ZT432_CALC_ON
Disable - ZT432_CALC_OFF

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_calculate_function

```
ViStatus zt432_calculate_function (ViSession instrumentSession,
                                   char calculationChannel[],
                                   char operation[], char source1[],
                                     char source2[],
                                 unsigned short range_andOffsetMode,
                                     float range_Volts,
                                      float offset_Volts);
```

Purpose

Configures a calculation channel for a specific function.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

calculationChannel

Variable Type char []

Select which calculation channel to setup.

Calc Channel 1 - ZT432_CALC_CH1
Calc Channel 2 - ZT432_CALC_CH2

operation

Variable Type char []

Sets the calculation operation to use.

Add - ZT432_CALC_ADD
Copy - ZT432_CALC_COPY
Derivative - ZT432_CALC_DER
Integral - ZT432_CALC_INT
Invert - ZT432_CALC_INV
Multiply - ZT432_CALC_MULT
Subtract - ZT432_CALC_SUBT

source1

Variable Type char []

Sets the calculation source 1.

INP1 - ZT432_SOURCE_INP1
INP2 - ZT432_SOURCE_INP2
INP3 - ZT432_SOURCE_INP3
INP4 - ZT432_SOURCE_INP4
CALC1 - ZT432_SOURCE_CALC1
CALC2 - ZT432_SOURCE_CALC2
REF1 - ZT432_SOURCE_REF1
REF2 - ZT432_SOURCE_REF2
REF3 - ZT432_SOURCE_REF3
REF4 - ZT432_SOURCE_REF4
REF5 - ZT432_SOURCE_REF5
REF6 - ZT432_SOURCE_REF6

source2

Variable Type char []

Sets the calculation source 2.

INP1 - ZT432_SOURCE_INP1
INP2 - ZT432_SOURCE_INP2
INP3 - ZT432_SOURCE_INP3
INP4 - ZT432_SOURCE_INP4
CALC1 - ZT432_SOURCE_CALC1
CALC2 - ZT432_SOURCE_CALC2
REF1 - ZT432_SOURCE_REF1
REF2 - ZT432_SOURCE_REF2
REF3 - ZT432_SOURCE_REF3
REF4 - ZT432_SOURCE_REF4
REF5 - ZT432_SOURCE_REF5
REF6 - ZT432_SOURCE_REF6

range_andOffsetMode

Variable Type unsigned short

range_Volts

Variable Type float

Sets the peak to peak range for the selected calculation channel.

offset_Volts

Variable Type float

Sets the offset for the selected calculation channel.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure

-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_calculate_function_query

```
ViStatus zt432_calculate_function_query (ViSession instrumentSession,
                                         char calculationChannel[],
                                           char operation[],
                                         char source1[], char source2[],
                                           float *range, float *offset);
```

Purpose

Queries a calculation channel.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

calculationChannel

Variable Type char []

Select which calculation channel to query.

Calc Channel 1 - ZT432_CALC_CH1
Calc Channel 2 - ZT432_CALC_CH2

operation

Variable Type char []

Returns the operation being completed.

Add - ZT432_CALC_ADD
Copy - ZT432_CALC_COPY
Derivative - ZT432_CALC_DER
Integrate - ZT432_CALC_INT
Invert - ZT432_CALC_INV
Multiply - ZT432_CALC_MULT
Subtract - ZT432_CALC_SUBT

source1

Variable Type char []

Returns the first source used for the operation.

Input Channel 1 - ZT432_INPUT_CH1
Input Channel 2 - ZT432_INPUT_CH2
Input Channel 3 - ZT432_INPUT_CH3
Input Channel 4 - ZT432_INPUT_CH4
Reference Channel 1 - ZT432_REF_CH1
Reference Channel 2 - ZT432_REF_CH2
Reference Channel 3 - ZT432_REF_CH3
Reference Channel 4 - ZT432_REF_CH4
Reference Channel 5 - ZT432_REF_CH5
Reference Channel 6 - ZT432_REF_CH6
Calculation Channel 1 - ZT432_CALC_CH1
Calculation Channel 2 - ZT432_CALC_CH2

source2

Variable Type char []

Returns the second source used for the operation. Ignore this for operations that only require one source.

Input Channel 1 - ZT432_INPUT_CH1
Input Channel 2 - ZT432_INPUT_CH2
Input Channel 3 - ZT432_INPUT_CH3
Input Channel 4 - ZT432_INPUT_CH4
Reference Channel 1 - ZT432_REF_CH1
Reference Channel 2 - ZT432_REF_CH2
Reference Channel 3 - ZT432_REF_CH3
Reference Channel 4 - ZT432_REF_CH4
Reference Channel 5 - ZT432_REF_CH5
Reference Channel 6 - ZT432_REF_CH6
Calculation Channel 1 - ZT432_CALC_CH1
Calculation Channel 2 - ZT432_CALC_CH2

range

Variable Type float (passed by reference)

Returns the range for the calculation.

offset

Variable Type float (passed by reference)

Returns the DC offset voltage that is represented at vertical center for the selected channel.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_calculate_immediate

ViStatus zt432_calculate_immediate (ViSession instrumentSession,
char calcChannel[]);

Purpose

The instrument performs a preconfigured calculation now. Use zt432_calculate_function() to configure the calculation channel.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

calcChannel

Variable Type char []

Sets the calculation channel to use for a Calculate Immediate command.

Calc1 - ZT432_CALC_CH1
Calc2 - ZT432_CALC_CH2

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure

-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_calculation_channel_enable

ViStatus zt432_calculation_channel_enable (ViSession instrumentSession,
char calcChannel[],
unsigned short state);

Purpose

Turns one calculation channel on or off.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

calcChannel

Variable Type char []

Sets the calculation channel to use for a Calculate Immediate command.

Calc1 - ZT432_CALC_CH1
Calc2 - ZT432_CALC_CH2

state

Variable Type unsigned short

Sets the state of the selected calculation channel.

Enable - ZT432_CALC_ON
Disable - ZT432_CALC_OFF

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_capture_complete_query

ViStatus zt432_capture_complete_query (ViSession instrumentSession,
unsigned short *state);

Purpose

Configures the horizontal and timebase settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

state

Variable Type unsigned short (passed by reference)

Returns whether a capture is complete. Used in Asynchronous capture mode.

0 - Not Complete
1 - Complete

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_capture_waveform

```
ViStatus zt432_capture_waveform (ViSession instrumentSession,
                                 unsigned short mode);
```

Purpose

Configures the vertical settings for the selected channel.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

mode

Variable Type unsigned short

Sets the capture mode to normal or asynchronous. Normal waits until the waveform is captured before returning. Asynchronous requires the use of the capture complete query to verify completion.

Normal - ZT432_CAPTURE_MODE_NORMAL
Asynchronous - ZT432_CAPTURE_MODE_ASYNCH

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_channel_enable

```
ViStatus zt432_channel_enable (ViSession instrumentSession,
                               char channelConfiguration[]);
```

Purpose

Sets the channel mode.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

channelConfiguration

Variable Type char []

Selects the channel configuration. The available samples rates are affected by which channel configuration is selected.

All channels on - ZT432_CHAN_ALL
Channels 1 and 2 on - ZT432_CHAN_12
Channels 3 and 4 on - ZT432_CHAN_34

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_channel_enable_query

ViStatus zt432_channel_enable_query (ViSession instrumentSession,
char channelConfiguration[]);

Purpose

Queries the channel mode.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

channelConfiguration

Variable Type char []

Returns the channel configuration. The available samples rates are affected by which channel configuration is selected.

All channels on - ZT432_CHAN_ALL
Channels 1 and 2 on - ZT432_CHAN_12
Channels 3 and 4 on - ZT432_CHAN_34

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_clock

ViStatus zt432_clock (ViSession instrumentSession,
unsigned short externalClockEnable,
char referenceSource[],

float externalClockPeriod);

Purpose

Configures the clock settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

externalClockEnable

Variable Type unsigned short

Used to select internal or external sample clock source.

Internal - ZT432_CLK_INT
External - ZT432_CLK_EXT

referenceSource

Variable Type char []

Sets the source for the 10 MHz reference clock that provides the instrument timebase. Options are Local reference or VXI backplane reference.

Local - ZT432_REF_CLK_LOCAL
VXI Backplane - ZT432_REF_CLK_VXI

externalClockPeriod

Variable Type float

Sets the external sample clock period. This parameter is ignored when using the internal sample clock.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_clock_query

ViStatus zt432_clock_query (ViSession instrumentSession,
unsigned short *externalClockEnable,
char referenceSource[],
float *externalSampleClockPeriod);

Purpose

Configures the clock settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

externalClockEnable

Variable Type unsigned short (passed by reference)

Used to select internal or external sample clock source.

Internal - ZT432_CLK_INT
External - ZT432_CLK_EXT

referenceSource

Variable Type char []

Queries the source for the 10 MHz reference clock that provides the instrument timebase. Options are Local reference or VXI backplane reference.

Local - ZT432_REF_CLK_LOCAL
VXI Backplane - ZT432_REF_CLK_VXI

externalSampleClockPeriod

Variable Type float (passed by reference)

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_close

ViStatus zt432_close (ViSession instrumentSession);

Purpose

Closes the VISA communication session opened by Initialize.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_device_clear

ViStatus zt432_device_clear (ViSession instrumentSession);

Purpose

Resets the command interface to the instrument.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_error_query

```
ViStatus zt432_error_query (ViSession instrumentSession,
                            unsigned short *number_ofErrors,
                                short errors[]);
```

Purpose

Returns the number of errors and an array containing the error numbers.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

number_ofErrors

Variable Type unsigned short (passed by reference)

Returns number of errors in queue.

Range: 0 to 32

errors

Variable Type short []

Returns all entries in the error log and clears the error log. Multiple errors are stored sequentially in the error log with the oldest error first.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_horizontal

```
ViStatus zt432_horizontal (ViSession instrumentSession,
                           unsigned int samplePoints, float sampleRate,
                            float offsetReference, float offsetTime);
```

Purpose

Configures the horizontal and timebase settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

samplePoints

Variable Type unsigned int

The number of samples in a waveform record.

Range:
256 to memory size

sampleRate

Variable Type float

Specifies the sample rate in hertz.

Range:
2CH mode: 50KS/s -> 200MS/s in 12 steps
4CH mode: 25KS/s -> 100MS/s in 12 steps

offsetReference

Variable Type float

Specifies the position within a record to measure the offset time from. Check the user manual figure 3.2 for examples of how to use the offset reference and offset time.

Range:
0 - 100%

offsetTime

Variable Type float

Specifies the time between the trigger and the offset reference in seconds.

Range:

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_horizontal_query

```
ViStatus zt432_horizontal_query (ViSession instrumentSession,
                                 unsigned int *samplePoints,
                                   float *sampleRate,
                                   float *offsetReference,
                                    float *offsetTime);
```

Purpose

Queries the instrument for the horizontal and timebase settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

samplePoints

Variable Type unsigned int (passed by reference)

The number of samples in a waveform record.

Range:
256 to max memory

sampleRate

Variable Type float (passed by reference)

The sample rate in hertz.

Range:

offsetReference

Variable Type float (passed by reference)

The position within a record to measure the offset time from.

Range:
0 - 100%

offsetTime

Variable Type float (passed by reference)

The time between the trigger and the offset reference in seconds.

Range:

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_initialize

ViStatus zt432_initialize (ViRsrc resourceName, unsigned short IDQuery,
unsigned short resetDevice,
ViPSession instrumentHandle);

Purpose

Sets up the visa session and establishes communications with the instrument. An instrument reset may also be selected with this function call.

Parameter List

resourceName

Variable Type ViRsrc

This control specifies the interface and address of the device that is to be initialized (Instrument

Descriptor). The exact grammar to be used in this control is:

PXI[board]::logical address::INSTR

IDQuery

Variable Type unsigned short

Controls whether an instrument ID Query is performed upon initialization. This prevents access to the wrong instrument.

off - 0
on - 1

resetDevice

Variable Type unsigned short

Controls whether an instrument reset is performed upon initialization. A reset will return all registers to their default condition.

off - 0
on - 1

instrumentHandle

Variable Type ViSession (passed by reference)

This control returns an Instrument Handle that is used in all subsequent function calls to differentiate between different sessions of this instrument driver. Each time this function is invoked a Unique Session is opened. It is possible to have more than one session open for the same resource.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_initiate

ViStatus zt432_initiate (ViSession instrumentSession);

Purpose

Configures the acquisition settings of the oscilloscope.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid

-905: ID check failed

---

zt432_load_reference_waveform

```
ViStatus zt432_load_reference_waveform (ViSession instrumentSession,
                                        char referenceChannel[],
                                         float waveform[],
                                        unsigned long points,
                                         float timeInterval,
                                         float timeOffset,
                                        float voltageInterval,
                                        float voltageOffset);
```

Purpose

Load a reference waveform onto the instrument.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

referenceChannel

Variable Type char []

Selects the channel to write the reference waveform.

Reference Channel 1 - ZT432_REF_CH1
Reference Channel 2 - ZT432_REF_CH2
Reference Channel 3 - ZT432_REF_CH3
Reference Channel 4 - ZT432_REF_CH4
Reference Channel 5 - ZT432_REF_CH5
Reference Channel 6 - ZT432_REF_CH6

waveform

Variable Type float []

The array of voltages to load into the reference channel. It should be floating point numbers in volts.

points

Variable Type unsigned long

The number of points in the waveform.

timeInterval

Variable Type float

The time interval between points (i.e. sample period).

timeOffset

Variable Type float

The time in seconds of the first data point.

voltageInterval

Variable Type float

The voltage resolution.

voltageOffset

Variable Type float

The zero-voltage reference or DC offset voltage for the specified waveform.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_measure_immediate

```
ViStatus zt432_measure_immediate (ViSession instrumentSession,
                                  char source[], char measurement[],
                                      float *result);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Selects the source to perform the measurement on.

INP1 - ZT432_SOURCE_INP1
INP2 - ZT432_SOURCE_INP2
INP3 - ZT432_SOURCE_INP3
INP4 - ZT432_SOURCE_INP4
CALC1 - ZT432_SOURCE_CALC1
CALC2 - ZT432_SOURCE_CALC2
REF1 - ZT432_SOURCE_REF1
REF2 - ZT432_SOURCE_REF2
REF3 - ZT432_SOURCE_REF3
REF4 - ZT432_SOURCE_REF4

measurement

Variable Type char []

Selects the type of measurement to compute.

AC RMS - ZT432_MEAS_ACRMS
Amplitude - ZT432_MEAS_AMPLITUDE
Average - ZT432_MEAS_AVERAGE
DC RMS - ZT432_MEAS_DCRMS
Delay - ZT432_MEAS_DELAY
Frequency - ZT432_MEAS_FREQUENCY
Fall Time - ZT432_MEAS_FALL_TIME
High - ZT432_MEAS_HIGH
Low - ZT432_MEAS_LOW
Maximum - ZT432_MEAS_MAX
Minimum - ZT432_MEAS_MIN
Negative Duty - ZT432_MEAS_NEG_DUTY
Neagtive Width - ZT432_MEAS_NEG_WIDTH
Overshoot - ZT432_MEAS_OVERSHOOT
Positive Duty - ZT432_MEAS_POS_DUTY
Period - ZT432_MEAS_PERIOD
Preshoot - ZT432_MEAS_PRESHOOT
Peak to Peak - ZT432_MEAS_PTP
Positive Width - ZT432_MEAS_POS_WIDTH
Rise time - ZT432_MEAS_RISE_TIME
Cross Time - ZT432_MEAS_TIME_CROSS

Time of Max - ZT432_MEAS_TIME_MAX
Time of Min - ZT432_MEAS_TIME_MIN

result

Variable Type float (passed by reference)

The result of the measurement.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_measure_reference

```
ViStatus zt432_measure_reference (ViSession instrumentSession,
                                  float lowReference,
                                  float midReference,
                                  float highReference,
                                  unsigned short edge1,
                                  unsigned short edge2);
```

Purpose

Set the measurement reference levels and edges.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

lowReference

Variable Type float

Set the low reference level in percent.

midReference

Variable Type float

Set the mid reference level in percent.

highReference

Variable Type float

Set the high reference level in percent.

edge1

Variable Type unsigned short

Set the first edge to use for a measurement.

edge2

Variable Type unsigned short

Set the second edge to use for a measurement.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_measurement_query

```
ViStatus zt432_measurement_query (ViSession instrumentSession,
                                  float *lowReference,
                                  float *midReference,
                                  float *highReference,
                                  unsigned short *edge1,
                                  unsigned short *edge2);
```

Purpose

Queries the measurement settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

lowReference

Variable Type float (passed by reference)

Returns the low reference level in percent.

midReference

Variable Type float (passed by reference)

Returns the mid reference level in percent.

highReference

Variable Type float (passed by reference)

Returns the high reference level in percent.

edge1

Variable Type unsigned short (passed by reference)

Get the first edge used for a measurement.

edge2

Variable Type unsigned short (passed by reference)

Get the second edge used for a measurement.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_operation_complete

ViStatus zt432_operation_complete (ViSession instrumentSession,
unsigned short *queryResult);

Purpose

Sends an operation complete query to the instrument.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

queryResult

Variable Type unsigned short (passed by reference)

The result of the Operation Complete Query.

0 - Operation not complete
1 - Operation Complete

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_output_reference

ViStatus zt432_output_reference (ViSession instrumentSession,
unsigned short state, char source[]);

Purpose

Configures the output reference settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

state

Variable Type unsigned short

Output Reference State sets the front panel REF OUT driver enable. The signal driven onto the REF OUT connector is selectable among several sources.

Enabled - ZT432_OUTPUT_REF_ON
Disabled - ZT432_OUTPUT_REF_OFF

source

Variable Type char []

Output Reference Source sets the function output on the unit front panel REF OUT connector when the output is enabled. The following considerations apply when using the reference source

command:

· The REF OUT connector is only driven when enabled.
· The TRGA and TRGB sources are active high
· The VOLTage source is only capable of sourcing 1 mA while remaining within tolerance, all other sources are capable of driving a 2 Vpp signal into a 50-ohm load.

Compensation - ZT432_OUTPUT_REF_COMP - 500Hz Square Wave
Pulse - ZT432_OUTPUT_REF_PULSE - 1Khz Repetition, 10ns pulse
Reference - ZT432_OUTPUT_REF_REF - 10MHz reference source
Trigger A - ZT432_OUTPUT_REF_TRGA - primary trigger detected
Trigger B - ZT432_OUTPUT_REF_TRGB - secondary trigger detected
Voltage - ZT432_OUTPUT_REF_VOLT - 8V reference voltage

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_output_reference_query

```
ViStatus zt432_output_reference_query (ViSession instrumentSession,
                                       unsigned short *state,
                                         char source[]);
```

Purpose

Queries the output reference settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

state

Variable Type unsigned short (passed by reference)

Output Reference State sets the front panel REF OUT driver enable. The signal driven onto the REF OUT connector is selectable among several sources.

Enabled - ZT432_OUTPUT_REF_ON
Disabled - ZT432_OUTPUT_REF_OFF

source

Variable Type char []

Output Reference Source gets the function output on the unit front panel REF OUT connector when the output is enabled. The following considerations apply when using the reference source command:

· The REF OUT connector is only driven when enabled.
· The TRGA and TRGB sources are active high
· The VOLTage source is only capable of sourcing 1 mA while remaining within tolerance, all other sources are capable of driving a 2 Vpp signal into a 50-ohm load.

Compensation - ZT432_OUTPUT_REF_COMP - 500Hz Square Wave

Pulse - ZT432_OUTPUT_REF_PULSE - 1Khz Repetition, 10ns pulse
Reference - ZT432_OUTPUT_REF_REF - 10MHz reference source
Trigger A - ZT432_OUTPUT_REF_TRGA - primary trigger detected
Trigger B - ZT432_OUTPUT_REF_TRGB - secondary trigger detected
Voltage - ZT432_OUTPUT_REF_VOLT - 8V reference voltage

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_output_trigger

```
ViStatus zt432_output_trigger (ViSession instrumentSession,
                               char channel[], unsigned short state,
                                 char source[], char polarity[]);
```

Purpose

Configures an output trigger channel.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

channel

Variable Type char []

Select which output trigger channel to configure.

TTL0 - ZT432_SOURCE_TTL0
TTL1 - ZT432_SOURCE_TTL1
TTL2 - ZT432_SOURCE_TTL2
TTL3 - ZT432_SOURCE_TTL3
TTL4 - ZT432_SOURCE_TTL4
TTL5 - ZT432_SOURCE_TTL5
TTL6 - ZT432_SOURCE_TTL6
TTL7 - ZT432_SOURCE_TTL7
ECL0 - ZT432_SOURCE_ECL0
ECL1 - ZT432_SOURCE_ECL1

state

Variable Type unsigned short

Enables or Disables the selected output trigger.

Enabled - ZT432_OUTPUT_TRG_ON
Disabled - ZT432_OUTPUT_TRG_OFF

source

Variable Type char []

Selects the output trigger source.

Arm - ZT432_OUTPUT_TRG_ARM
Trigger A - ZT432_OUTPUT_TRG_TRGA
Trigger B - ZT432_OUTPUT_TRG_TRGB
Operation Complete - ZT432_OUTPUT_TRG_OPC

polarity

Variable Type char []

Selects the polarity of the output trigger channel.

Positive - ZT432_POLARITY_POS
Negative - ZT432_POLARITY_NEG

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_output_trigger_query

```
ViStatus zt432_output_trigger_query (ViSession instrumentSession,
                                     char channel[],
                                     unsigned short *state,
                                     char source[], char polarity[]);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

channel

Variable Type char []

Select which output trigger channel to query.

TTL0 - ZT432_SOURCE_TTL0
TTL1 - ZT432_SOURCE_TTL1
TTL2 - ZT432_SOURCE_TTL2
TTL3 - ZT432_SOURCE_TTL3
TTL4 - ZT432_SOURCE_TTL4
TTL5 - ZT432_SOURCE_TTL5
TTL6 - ZT432_SOURCE_TTL6
TTL7 - ZT432_SOURCE_TTL7
ECL0 - ZT432_SOURCE_ECL0
ECL1 - ZT432_SOURCE_ECL1

state

Variable Type unsigned short (passed by reference)

Queries the state of the selected output channel.

Enabled - ZT432_OUTPUT_TRG_ON
Disabled - ZT432_OUTPUT_TRG_OFF

source

Variable Type char []

Queries the output trigger source.

Arm - ZT432_OUTPUT_TRG_ARM
Trigger A - ZT432_OUTPUT_TRG_TRGA
Trigger B - ZT432_OUTPUT_TRG_TRGB

Operation Complete - ZT432_OUTPUT_TRG_OPC

polarity

Variable Type char []

Queries the polarity of the output trigger channel.

Positive - ZT432_POLARITY_POS
Negative - ZT432_POLARITY_NEG

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_read_waveform

```
ViStatus zt432_read_waveform (ViSession instrumentSession,
                              char source[], float waveform[],
                                 float time[],
                              unsigned short transferType);
```

Purpose

Reads the waveform in the source channel. Use "Read Waveform Preamble" to get the appropriate time bases.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Selects the source to read the waveform from.

Input Channel 1 - ZT432_INPUT_CH1
Input Channel 2 - ZT432_INPUT_CH2
Input Channel 3 - ZT432_INPUT_CH3
Input Channel 4 - ZT432_INPUT_CH4
Reference Channel 1 - ZT432_REF_CH1
Reference Channel 2 - ZT432_REF_CH2
Reference Channel 3 - ZT432_REF_CH3
Reference Channel 4 - ZT432_REF_CH4
Reference Channel 5 - ZT432_REF_CH5
Reference Channel 6 - ZT432_REF_CH6
Calculation Channel 1 - ZT432_CALC_CH1
Calculation Channel 2 - ZT432_CALC_CH2

waveform

Variable Type float []

Array of samples in volts.

time

Variable Type float []

Array of time values correlating to the waveform points.

Note: Passing a null pointer disables this output.

transferType

Variable Type unsigned short

Selects the data transfer type to use. A32 is significantly faster than word serial but is not supported by all VXI controllers.

A32 - ZT432_TRANSFER_A32
Word Serial - ZT432_TRANSFER_WS

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_read_waveform_preamble

```
ViStatus zt432_read_waveform_preamble (ViSession instrumentSession,
                                       char source[],
                                       unsigned short *type,
                                       unsigned long *points,
                                       unsigned short *acquisitionCount,
                                       float *timeInterval,
                                       float *timeOffset,
                                       float *voltageInterval,
                                       float *voltageOffset);
```

Purpose

Gets all the information necessary to retrieve and interpret a waveform readback.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Selects the source to read the waveform preamble from.

Input Channel 1 - ZT432_INPUT_CH1
Input Channel 2 - ZT432_INPUT_CH2
Input Channel 3 - ZT432_INPUT_CH3
Input Channel 4 - ZT432_INPUT_CH4
Reference Channel 1 - ZT432_REF_CH1
Reference Channel 2 - ZT432_REF_CH2
Reference Channel 3 - ZT432_REF_CH3
Reference Channel 4 - ZT432_REF_CH4
Reference Channel 5 - ZT432_REF_CH5
Reference Channel 6 - ZT432_REF_CH6
Calculation Channel 1 - ZT432_CALC_CH1
Calculation Channel 2 - ZT432_CALC_CH2

type

Variable Type unsigned short (passed by reference)

Returns the type of waveform.

Invalid - ZT432_WAVE_TYPE_INVALID
Normal - ZT432_WAVE_TYPE_NORM
Average - ZT432_WAVE_TYPE_AVER
Envelope - ZT432_WAVE_TYPE_ENV

points

Variable Type unsigned long (passed by reference)

Returns the number of points in a waveform.

acquisitionCount

Variable Type unsigned short (passed by reference)

Returns the acquired waveform count used to create the selected average or envelope waveform. In Normal acquisition the Acquisition Count is always 1.

timeInterval

Variable Type float (passed by reference)

Returns the time interval between points (i.e. sample period).

timeOffset

Variable Type float (passed by reference)

Returns the time in seconds of the first data point relative to the trigger.

voltageInterval

Variable Type float (passed by reference)

Returns the voltage resolution.

voltageOffset

Variable Type float (passed by reference)

Returns the zero-voltage reference or DC offset voltage for the specified waveform.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_reset

ViStatus zt432_reset (ViSession instrumentSession);

Purpose

Performs a hardware reset function that returns the instrument to the initial default condition.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_save_recall_state

```
ViStatus zt432_save_recall_state (ViSession instrumentSession,
                                  unsigned short state,
                                  unsigned short stateNumber);
```

Purpose

Stores the current state of the instrument to the selected storage index in non-volatile memory or returns the state of the instrument from a stored condition.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

state

Variable Type unsigned short

Controls if a state should be stored or recalled.

Save - ZT432_SAVE_STATUS
Recall - ZT432_RECALL_STATUS

stateNumber

Variable Type unsigned short

Instrument storage index (location) control.

Range: 1 to 50

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_self_test

```
ViStatus zt432_self_test (ViSession instrumentSession,
                          unsigned short *selfTestStatus);
```

Purpose

Initiates an instrument self test and returns the test status register.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

selfTestStatus

Variable Type unsigned short (passed by reference)

Returns the test status register.

Bit 0 - Baseboard Test Failed Bit
Bit 1 - SRAM Test Failed Bit
Bit 2 - ROM Test Failed Bit
Bit 3 - Unused
Bit 4 - Reference Oscillator Test Failed Bit
Bit 5 - DRAM Test Failed Bit
Bit 6 - Flash Memory Test Failed Bit
Bit 7 - Unused Bit
Bit 8 - Input1-2 Register Test Failed Bit
Bit 9 - Input 1 RAM Test Failed Bit
Bit 10 - Input 2 RAM Test Failed Bit
Bit 11 - PLL Test Failed Bit
Bit 12-15 - Unused Bits

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_soft_trigger

ViStatus zt432_soft_trigger (ViSession instrumentSession);

Purpose

This functions configures the arm settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_status

ViStatus zt432_status (ViSession instrumentSession,
unsigned short *statusRegister,
unsigned short *standardRegister,

```
                    unsigned short *operationRegister,
                    unsigned short *questionableRegister);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

statusRegister

Variable Type unsigned short (passed by reference)

Returns the present condition of the status register.

Bit 0 - Unused Bit
Bit 1 - Unused Bit
Bit 2 - Error Log Not Empty Bit
Bit 3 - Questionable Summary Bit
Bit 4 - Message Available Bit
Bit 5 - Standard Event Summary Bit
Bit 6 - Master Summary Bit
Bit 7 - Operation Summary Bit

standardRegister

Variable Type unsigned short (passed by reference)

Returns the present condition of the standard status register.

Bit 0 - Operation Complete Bit
Bit 1 - Request Control Bit
Bit 2 - Query Error Bit
Bit 3 - Device Dependent Error Bit
Bit 4 - Execution Error Bit
Bit 5 - Command Error Bit
Bit 6 - User Request Bit
Bit 7 - Power On Bit

operationRegister

Variable Type unsigned short (passed by reference)

Returns the present condition of the operation status register.

Bit 0 - Calibrating Bit
Bit 1 - Settling Bit
Bit 2 - Ranging Bit
Bit 3 - Sweeping Bit
Bit 4 - Measuring Bit
Bit 5 - Waiting for Trigger Bit
Bit 6 - Waiting for Arm Bit
Bit 7 - Unused Bit
Bit 8 - Trigger Event Bit
Bit 9 - Limit Test Event Bit
Bit 10-15 - Unused Bits

questionableRegister

Variable Type unsigned short (passed by reference)

Returns the present condition of the questionable status register.

Bit 0 - Voltage Register Bit
Bit 1-4 - Unused Bits
Bit 5 - Frequency Register Bit
Bit 6-7 - Unused Bits
Bit 8 - Calibration Register Bit
Bit 9 - Test Register Bit

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_store_reference_waveform

```
ViStatus zt432_store_reference_waveform (ViSession instrumentSession,
                                         char referenceChannel[],
                                         char source[]);
```

Purpose

Stores a waveform from one of the sources in a reference waveform channel.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

referenceChannel

Variable Type char []

Selects the reference channel to store the waveform in.

Reference Channel 1 - ZT432_REF_CH1
Reference Channel 2 - ZT432_REF_CH2
Reference Channel 3 - ZT432_REF_CH3
Reference Channel 4 - ZT432_REF_CH4
Reference Channel 5 - ZT432_REF_CH5
Reference Channel 6 - ZT432_REF_CH6

source

Variable Type char []

Selects the source to store in the reference channel.

Input Channel 1 - ZT432_INPUT_CH1
Input Channel 2 - ZT432_INPUT_CH2
Input Channel 3 - ZT432_INPUT_CH3
Input Channel 4 - ZT432_INPUT_CH4
Reference Channel 1 - ZT432_REF_CH1
Reference Channel 2 - ZT432_REF_CH2
Reference Channel 3 - ZT432_REF_CH3
Reference Channel 4 - ZT432_REF_CH4
Reference Channel 5 - ZT432_REF_CH5
Reference Channel 6 - ZT432_REF_CH6
Calculation Channel 1 - ZT432_CALC_CH1
Calculation Channel 2 - ZT432_CALC_CH2

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger

```
ViStatus zt432_trigger (ViSession instrumentSession, char source[],
                        float level, char polarity[]);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Sets the trigger source.

External Trigger - ZT432_SOURCE_EXT
ECLT0 - ZT432_SOURCE_ECLT0
ECLT1 - ZT432_SOURCE_ECLT1
INP1 - ZT432_SOURCE_INP1
INP2 - ZT432_SOURCE_INP2
INP3 - ZT432_SOURCE_INP3
INP4 - ZT432_SOURCE_INP4
PATT - ZT432_SOURCE_PATT
TTLT0 - ZT432_SOURCE_TTLT0
TTLT1 - ZT432_SOURCE_TTLT1
TTLT2 - ZT432_SOURCE_TTLT2
TTLT3 - ZT432_SOURCE_TTLT3
TTLT4 - ZT432_SOURCE_TTLT4
TTLT5 - ZT432_SOURCE_TTLT5
TTLT6 - ZT432_SOURCE_TTLT6
TTLT7 - ZT432_SOURCE_TTLT7

level

Variable Type float

Sets the input level value in volts. This parameter only affects TRG IN, INP1-4.

-1.0 to 1.0 volts

polarity

Variable Type char []

Sets the trigger signal active state.

Positive - ZT432_TRIGGER_POS
Negative - ZT432_TRIGGER_NEG

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_b

```
ViStatus zt432_trigger_b (ViSession instrumentSession, char source[],
                          unsigned short state, float level,
                            char polarity[]);
```

Purpose

Sets the instruments Trigger B settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Sets the trigger source.

External Trigger - ZT432_SOURCE_EXT
ECLT0 - ZT432_SOURCE_ECLT0
ECLT1 - ZT432_SOURCE_ECLT1
INP1 - ZT432_SOURCE_INP1
INP2 - ZT432_SOURCE_INP2
INP3 - ZT432_SOURCE_INP3
INP4 - ZT432_SOURCE_INP4
PATT - ZT432_SOURCE_PATT
TTLT0 - ZT432_SOURCE_TTLT0
TTLT1 - ZT432_SOURCE_TTLT1
TTLT2 - ZT432_SOURCE_TTLT2
TTLT3 - ZT432_SOURCE_TTLT3
TTLT4 - ZT432_SOURCE_TTLT4
TTLT5 - ZT432_SOURCE_TTLT5
TTLT6 - ZT432_SOURCE_TTLT6
TTLT7 - ZT432_SOURCE_TTLT7

state

Variable Type unsigned short

Sets the state of Trigger B.

Enabled - ZT432_TRIG_B_ENABLE
Disabled - ZT432_TRIG_B_DISABLE

level

Variable Type float

Sets the input level value in volts.
-1.0 to 1.0 volts

polarity

Variable Type char []

Sets the trigger signal active state.

Positive - ZT432_POLARITY_POS
Negative - ZT432_POLARITY_NEG

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_b_query

```
ViStatus zt432_trigger_b_query (ViSession instrumentSession,
                                char source[], unsigned short *state,
                                  float *level, char polarity[]);
```

Purpose

Queries the instrument for Trigger B settings.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Queries the trigger source.

External Trigger - ZT432_SOURCE_EXT
ECLT0 - ZT432_SOURCE_ECLT0
ECLT1 - ZT432_SOURCE_ECLT1
INP1 - ZT432_SOURCE_INP1
INP2 - ZT432_SOURCE_INP2
INP3 - ZT432_SOURCE_INP3
INP4 - ZT432_SOURCE_INP4
PATT - ZT432_SOURCE_PATT
TTLT0 - ZT432_SOURCE_TTLT0
TTLT1 - ZT432_SOURCE_TTLT1
TTLT2 - ZT432_SOURCE_TTLT2
TTLT3 - ZT432_SOURCE_TTLT3
TTLT4 - ZT432_SOURCE_TTLT4
TTLT5 - ZT432_SOURCE_TTLT5
TTLT6 - ZT432_SOURCE_TTLT6
TTLT7 - ZT432_SOURCE_TTLT7

state

Variable Type unsigned short (passed by reference)

Gets the state of Trigger B.

Enabled - ZT432_TRIG_B_ENABLE
Disabled - ZT432_TRIG_B_DISABLE

level

Variable Type float (passed by reference)

Gets the input level value in volts.
-1.0 to 1.0 volts

polarity

Variable Type char []

Gets the trigger signal active state.

Positive - ZT432_POLARITY_POS
Negative - ZT432_POLARITY_NEG

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_hold_off

```
ViStatus zt432_trigger_hold_off (ViSession instrumentSession,
                                 float holdoff,
                                 unsigned short eventCount);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

holdoff

Variable Type float

This sets the time to ignore triggers after receiving a trigger.

Range: 0 to 64s

eventCount

Variable Type unsigned short

The number of events that have to happen before a trigger occurs.

Range:
1 - 65535

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_hold_off_query

```
ViStatus zt432_trigger_hold_off_query (ViSession instrumentSession,
                                       float *holdoff,
                                       unsigned short *eventCount);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

holdoff

Variable Type float (passed by reference)

Returns the time to ignore triggers after receiving a trigger.

Range: 0 to 655 s
Resolution: 10 ns for 0 to 655.36 us
100 ns for 655.36 us to 6.5536 ms
1 us for 6.5536 ms to 65.536 ms
10 us for 65.536 ms to 655 ms
100 us for 655.36 ms to 6.5536 s

1 ms for 6.5536 s to 65.536 s
10 ms for 65.536 s to 655 s

eventCount

Variable Type unsigned short (passed by reference)

The number of events that have to happen before a trigger occurs.

Range:
1 - 65535

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_pattern

```
ViStatus zt432_trigger_pattern (ViSession instrumentSession,
                                unsigned short patternMask,
                                unsigned short patternTruth,
                                  float channel1Level,
                                  float channel2Level,
                                  float channel3Level,
                                  float channel4Level,
                                  float externalLevel, char polarity[]);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

patternMask

Variable Type unsigned short

Configures which sources to use in the pattern.

Values:
0 = Don't Care
1 = Use in pattern trigger

Source Order (LSB - MSB):
CH1 OR CH3
CH2 OR CH4
External Trigger
ECL 0
ECL 1

patternTruth

Variable Type unsigned short

Configures the state of each source for pattern trigger to occur.

Values:
0 = Off
1 = On

Source Order (LSB - MSB):
CH1 OR CH3
CH2 OR CH4

External Trigger
ECL 0
ECL 1

channel1Level

Variable Type float

Sets the analog level in volts that is considered high.

Range: +-1V

channel2Level

Variable Type float

Sets the analog level in volts that is considered high.

Range: +-1V

channel3Level

Variable Type float

Sets the analog level in volts that is considered high.

Range: +-1V

channel4Level

Variable Type float

Sets the analog level in volts that is considered high.

Range: +-1V

externalLevel

Variable Type float

Sets the analog level in volts that is considered high.

Range: +-1V

polarity

Variable Type char []

Sets the active edge of the selected trigger for the instrument to rising edge or falling edge. Rising indicates when the pattern occurs while falling waits for the pattern to stop.

Rising - ZT432_POLARITY_POS
Falling - ZT432_POLARITY_NEG

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_pattern_query

ViStatus zt432_trigger_pattern_query (ViSession instrumentSession,
unsigned short *patternMask,
unsigned short *patternTruth,
float *channel1Level,
float *channel2Level,
float *channel3Level,

```
                                        float *channel4Level,
                                         float *external, char slope[]);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

patternMask

Variable Type unsigned short (passed by reference)

Returns which sources are being used for pattern triggering.

Values:
0 = Don't Care
1 = Uses in pattern trigger

Source Order (LSB - MSB):
CH1 OR CH3
CH2 OR CH4
External Trigger
ECL 0
ECL 1

patternTruth

Variable Type unsigned short (passed by reference)

Returns the state each source should be in pattern trigger to occur.

Values:
0 = Off
1 = On

Source Order (LSB - MSB):
CH1 OR CH3
CH2 OR CH4
External Trigger
ECL 0
ECL 1

channel1Level

Variable Type float (passed by reference)

Returns the analog level in volts that is considered high.

Range: +-1V

channel2Level

Variable Type float (passed by reference)

Returns the analog level in volts that is considered high.

Range: +-1V

channel3Level

Variable Type float (passed by reference)

Returns the analog level in volts that is considered high.

Range: +-1V

channel4Level

Variable Type float (passed by reference)

Returns the analog level in volts that is considered high.

Range: +-1V

external

Variable Type float (passed by reference)

Returns the analog level in volts that is considered high.

Range: +-1V

slope

Variable Type char []

Returns the activating edge for the trigger to occur

Rising - ZT432_POLARITY_POS
Falling - ZT432_POLARITY_NEG

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_pulse_width

```
ViStatus zt432_trigger_pulse_width (ViSession instrumentSession,
                                    char source[], float level,
                                    char mode[], float lowerLimit,
                                    float upperLimit);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Sets the trigger source.

INP1 - ZT432_SOURCE_INP1
INP2 - ZT432_SOURCE_INP2
INP3 - ZT432_SOURCE_INP3
INP4 - ZT432_SOURCE_INP4

level

Variable Type float

Sets the analog level in volts that is considered high.

Range: +-1V

mode

Variable Type char []

Sets the pulse width mode.

Less than checks that the pulse width is less than the lower limit.
Greater than checks that the pulse width is greater than the upper limit.
Inside limits checks that the pulse width is within the two limits.
Outside limits checks that the pulse width is outside of the two limits.

lowerLimit

Variable Type float

Sets the lower pulse width limit in seconds.

Range:
10ns <= limit < 262us

upperLimit

Variable Type float

Sets the upper pulse width limit in seconds.

Range:
15ns <= limit < 327us

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_pulse_width_query

```
ViStatus zt432_trigger_pulse_width_query (ViSession instrumentSession,
                                          char source[], float *level,
                                           char mode[],
                                           float *lowerLimit,
                                           float *upperLimit);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Returns the source that will be used to trigger the unit.

INP1 - ZT432_SOURCE_INP1
INP2 - ZT432_SOURCE_INP2
INP3 - ZT432_SOURCE_INP3
INP4 - ZT432_SOURCE_INP4

level

Variable Type float (passed by reference)

Returns the analog level in volts that is considered high.

Range: +-1V

mode

Variable Type char []

Returns the trigger mode.

Edge Triggering - ZT432_TRIG_EDGE
Pulse Width Inside Limits - ZT432_TRIG_PULS_IN
Pulse Width Outside Limits - ZT432_TRIG_PULS_OUT
Pulse Width Less Than - ZT432_TRIG_PULS_LT
Pulse Width Greater Than - ZT432_TRIG_PULS_GT

lowerLimit

Variable Type float (passed by reference)

Returns the lower pulse width limit in seconds.

Range:
10ns <= limit < 262us

upperLimit

Variable Type float (passed by reference)

Returns the upper pulse width limit in seconds.

Range:
15ns <= limit < 327us

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_query

```
ViStatus zt432_trigger_query (ViSession instrumentSession,
                              char source[], f32 *level,
                                char polarity[]);
```

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

source

Variable Type char []

Returns the trigger source.

External Trigger - ZT432_SOURCE_EXT
ECLT0 - ZT432_SOURCE_ECLT0
ECLT1 - ZT432_SOURCE_ECLT1
INP1 - ZT432_SOURCE_INP1
INP2 - ZT432_SOURCE_INP2
INP3 - ZT432_SOURCE_INP3
INP4 - ZT432_SOURCE_INP4
PATT - ZT432_SOURCE_PATT
TTLT0 - ZT432_SOURCE_TTLT0
TTLT1 - ZT432_SOURCE_TTLT1
TTLT2 - ZT432_SOURCE_TTLT2
TTLT3 - ZT432_SOURCE_TTLT3

TTLT4 - ZT432_SOURCE_TTLT4
TTLT5 - ZT432_SOURCE_TTLT5
TTLT6 - ZT432_SOURCE_TTLT6
TTLT7 - ZT432_SOURCE_TTLT7

level

Variable Type f32 (passed by reference)

Returns the trigger level.

polarity

Variable Type char []

Returns the trigger polarity.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_timestamp_query

ViStatus zt432_trigger_timestamp_query (ViSession instrumentSession,
float *time);

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

time

Variable Type float (passed by reference)

Returns the timestamp from the last trigger in seconds.

Range:
0 - 1 Seconds

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_trigger_wait_query

ViStatus zt432_trigger_wait_query (ViSession instrumentSession,
unsigned short *state);

Purpose

Queries the instrument for its current trigger state.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

state

Variable Type unsigned short (passed by reference)

Returns the value of the trigger event bit of the operation register.

0 - Not Waiting for Trigger Event
1 - Waiting for Trigger Event

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_versions

```
ViStatus zt432_versions (ViSession instrumentSession, char id[],
                         char driver_rev[],
                        unsigned short configuration[]);
```

Purpose

Returns the ID string, driver revision and configuration versions.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

id

Variable Type char []

Returns the instrument identification including manufacturer, model number, serial number and firmware version as a block of ASCII string data up to 44 characters in length. The string will be of this form: "ZTEC,ZT432VXI,S/N nnn,Version n.nn"

driver_rev

Variable Type char []

Returns the version of the C (CVI) driver string in the form Rev x.xx, dd/mm/yy, CVI n.n

configuration

Variable Type unsigned short []

Returns the instrument identification as an array where the first three elements are DSP firmware version, baseboard FPGA version and module FPGA version.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_vertical

ViStatus zt432_vertical (ViSession instrumentSession, char channel[],
float range, char coupling[], float impedance,
unsigned short smoothingState,
unsigned short smoothingPoints,
float attenuation);

Purpose

Configures the vertical settings for the selected channel.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

channel

Variable Type char []

Selects the input channel.

Channel 1 - ZT432_INPUT_CH1
Channel 2 - ZT432_INPUT_CH2
Channel 3 - ZT432_INPUT_CH3
Channel 4 - ZT432_INPUT_CH4

range

Variable Type float

Specifies the full scale acquisition range in volts for the specified input channel.

Valid Range:

coupling

Variable Type char []

Sets the input coupling for the selected channel.

AC - ZT432_COUP_AC
DC - ZT432_COUP_DC

impedance

Variable Type float

Sets the input impedance for the selected channel.

50 Ohm - ZT432_IMPEDANCE_50
1M Ohm - ZT432_IMPEDANCE_1M

smoothingState

Variable Type unsigned short

Turns digital FIR filtering on or off for the selected channel.

smoothingPoints

Variable Type unsigned short

Selects how many points to use for smoothing.

Range: 10-50 points

attenuation

Variable Type float

Sets the probe attenuation for the selected channel.

Range: 0.9 to 1000:1

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed

---

zt432_vertical_query

```
ViStatus zt432_vertical_query (ViSession instrumentSession,
                               char channel[], float *range,
                              char coupling[], float *impedance,
                              unsigned short *smoothing,
                             unsigned short *smoothingPoints,
                                float *attenuation);
```

Purpose

Queries the vertical settings for the selected channel.

Parameter List

instrumentSession

Variable Type ViSession

This Instrument Session handle is used to differentiate between different sessions of this instrument driver.

channel

Variable Type char []

Selects the input channel.

Channel 1 - ZT432_INPUT_CH1
Channel 2 - ZT432_INPUT_CH2
Channel 3 - ZT432_INPUT_CH3
Channel 4 - ZT432_INPUT_CH4

range

Variable Type float (passed by reference)

Queries the full scale acquisition range in volts for the specified input channel.

coupling

Variable Type char []

Returns the input coupling for the selected channel.

impedance

Variable Type float (passed by reference)

Returns the input impedance for the selected channel.

smoothing

Variable Type unsigned short (passed by reference)

Returns the state of the digital FIR filter for the selected channel.

smoothingPoints

Variable Type unsigned short (passed by reference)

Returns how many points are being used for smoothing.

attenuation

Variable Type float (passed by reference)

Returns the probe attenuation for the selected channel.

Return Value

This control contains the status code returned by the function call.

ZTECH Driver Error Codes:
-901: sprintf() failure
-902: scanf() failure
-903: malloc() failure
-904: formatting string invalid
-905: ID check failed