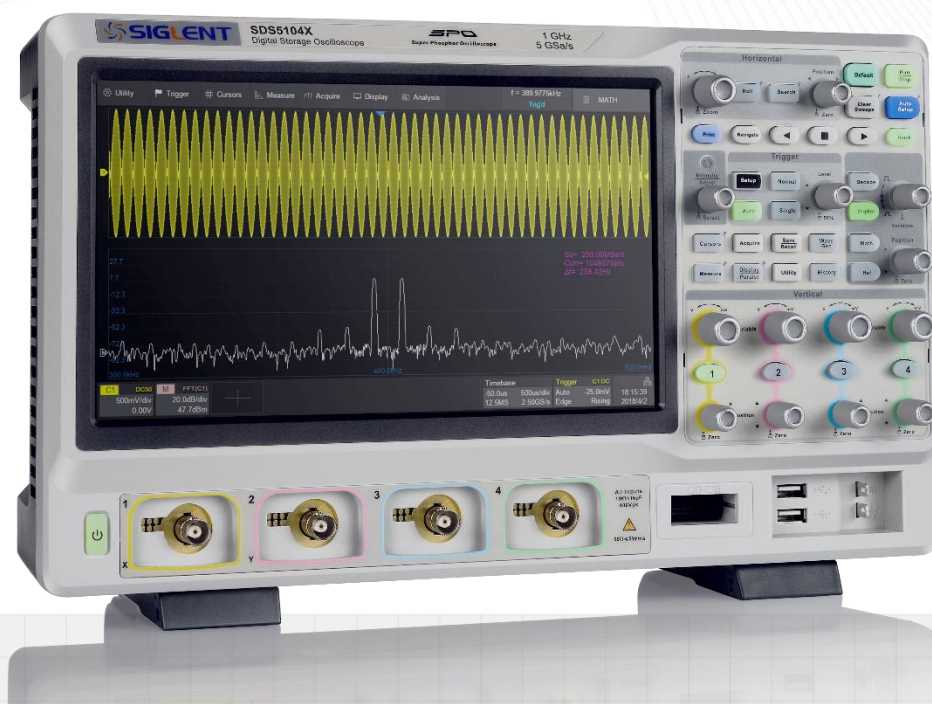


Digital Oscilloscopes

IVI-C Programming Guide

E01B
July, 2021



SIGLENT TECHNOLOGIES CO.,LTD

Revision History

This chapter declares the modifications of IVI driver in the most recent release of the programming guide version.

Version E01A at Introduction

This version, as the first version, will be compared with later versions. When the next version is released, the differences between the two versions will be marked.

Version E01B at Introduction

The following are the main revisions:

- ◆ New support models: SDS5000X , SDS6000A and SDS6000 Pro series.
- ◆ Added attribute of measurement subsystem:

SDS_ATTR_MEASURE_ADVANCED_SOURCEA,

SDS_ATTR_MEASURE_ADVANCED_SOURCEB,

SDS_ATTR_MEASURE_ADVANCED_TYPE,

SDS_ATTR_MEASURE_ADVANCED_VALUE

Models Supported

The series of SIGLENT digital oscilloscopes supporting this IVI-C driver is shown below.

Series	Release Version Supporting IVI-C Driver
SDS5000X	0.9.3R2 and higher
SDS2000X Plus	1.3.5R3 and higher
SDS6000A	1.3.4.0 and higher
SDS6000 Pro	1.3.4.0 and higher

Software Requirement

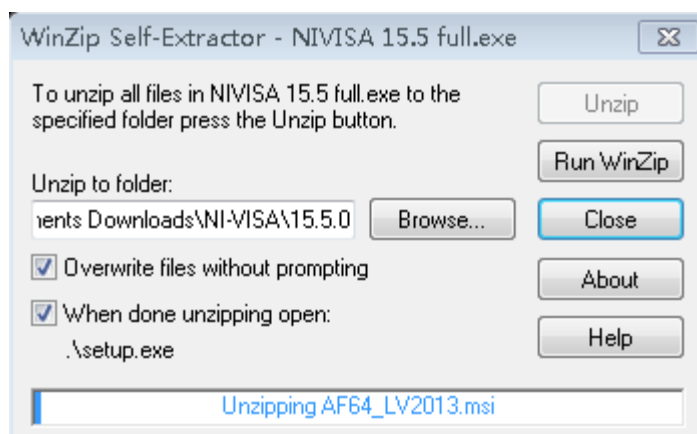
This chapter describes how to configure the IVI driver to control the instrument. If you want to use the IVI Driver, you must install NI-VISA, the IVI Compliance Package, and a C language development system that supports the IVI driver library.

Install NI-MAX

Currently, NI-VISA is packaged in two versions: Full version and Run-Time Engine version. The full version includes the NI device drivers and a tool named NI-MAX which is a user interface to control and test remotely connected devices. You need to install the full version of NI-VISA.

You can get the NI-VISA 15.5 full version or higher version from <https://www.ni.com/en-us/support/downloads/drivers/download.ni-visa.html#306031>.

- a. Double click the NIVISA 15.5 full.exe, a dialog will be shown as below:

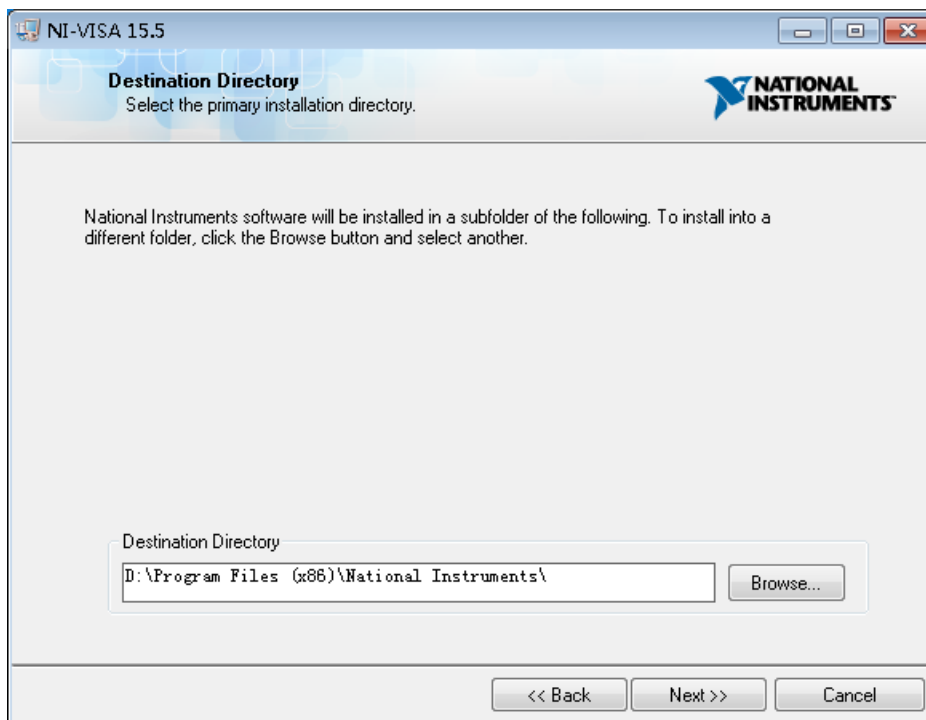


- b. Click Unzip, the installation process will automatically launch after unzipping files. If your computer needs to install .NET Framework 4, it may auto start.

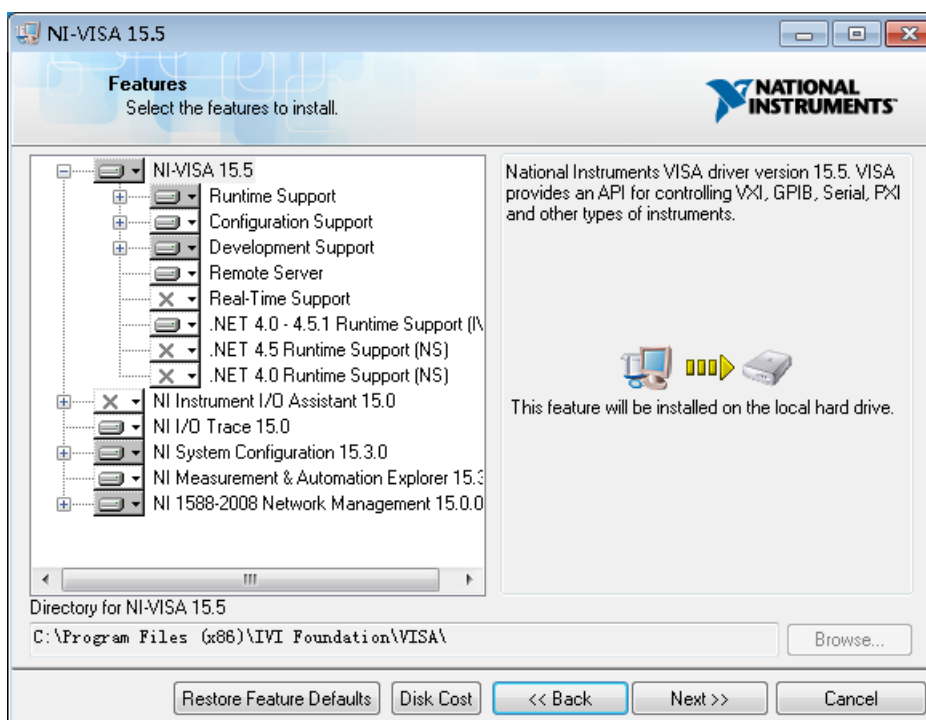


- c. The NI-VISA installing dialog is shown above. Click Next to start the installation

process.

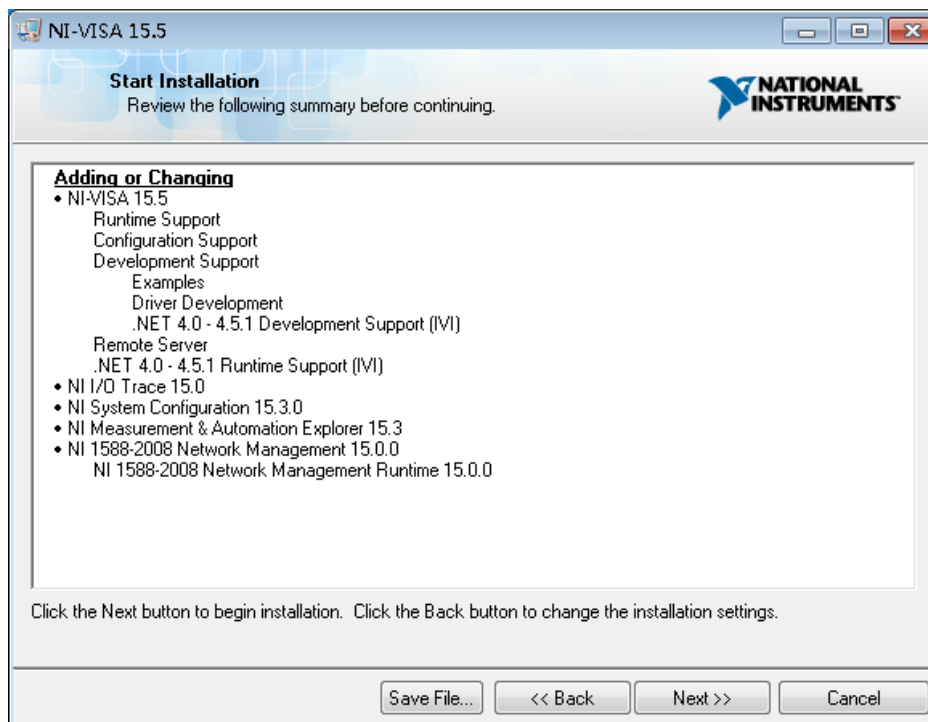


- d. Set the install path. The default path is “C:\Program Files\National Instruments\”. You can change it. Click Next.

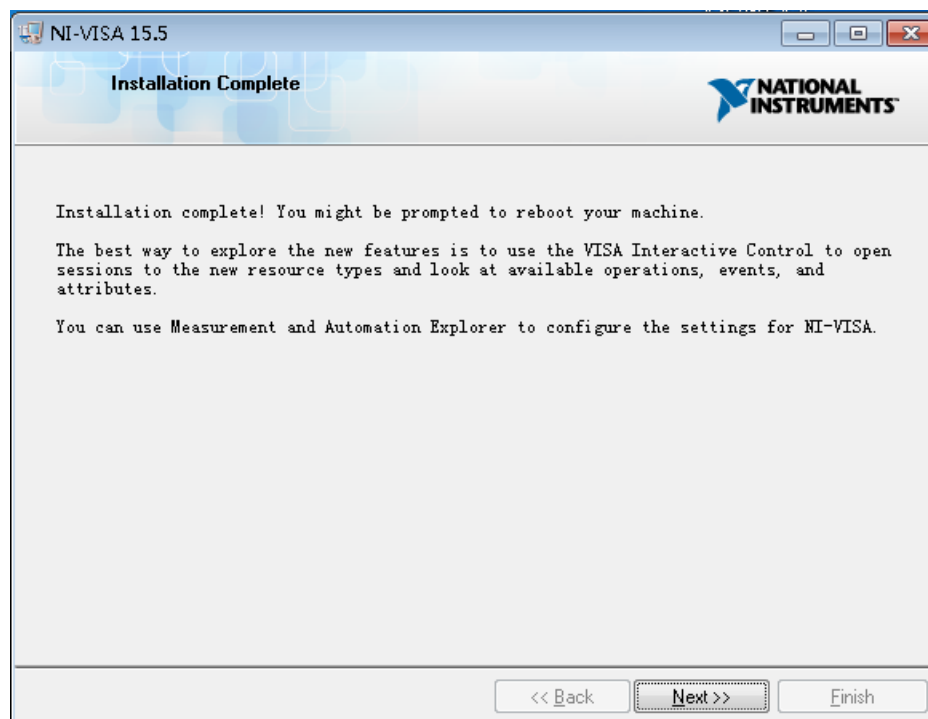


- e. Click Next twice, in the License Agreement dialog, select “I accept the above 2

License Agreement(s).” ,and click Next.



f. Click Next to begin the installation.



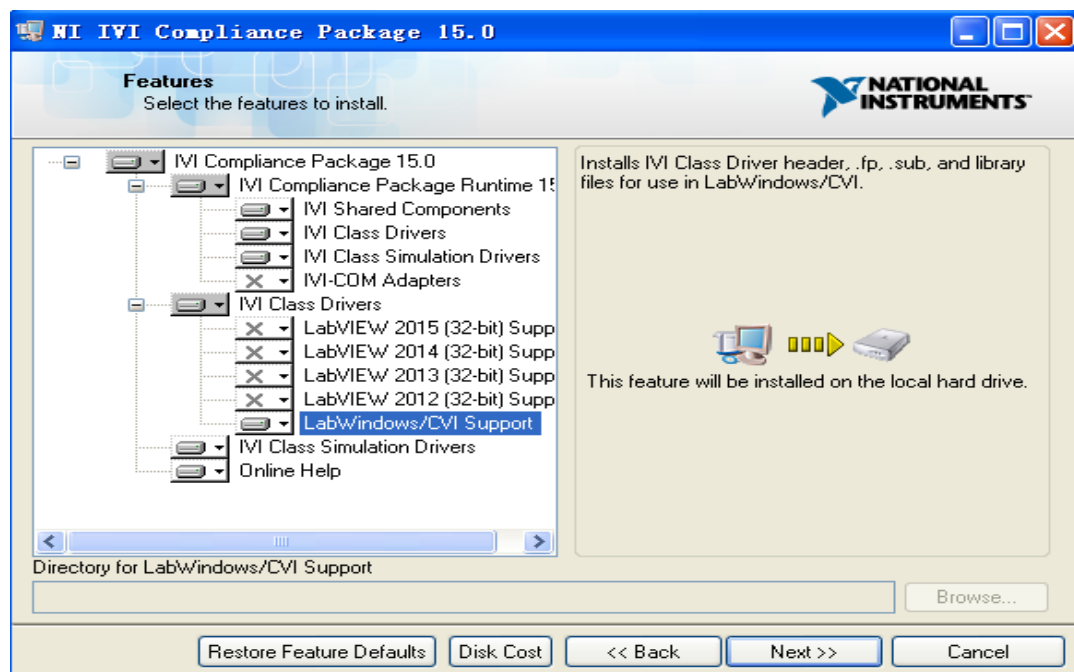
g. Wait until the installation is completed, and then reboot your PC.

Install the IVI Compliance Package

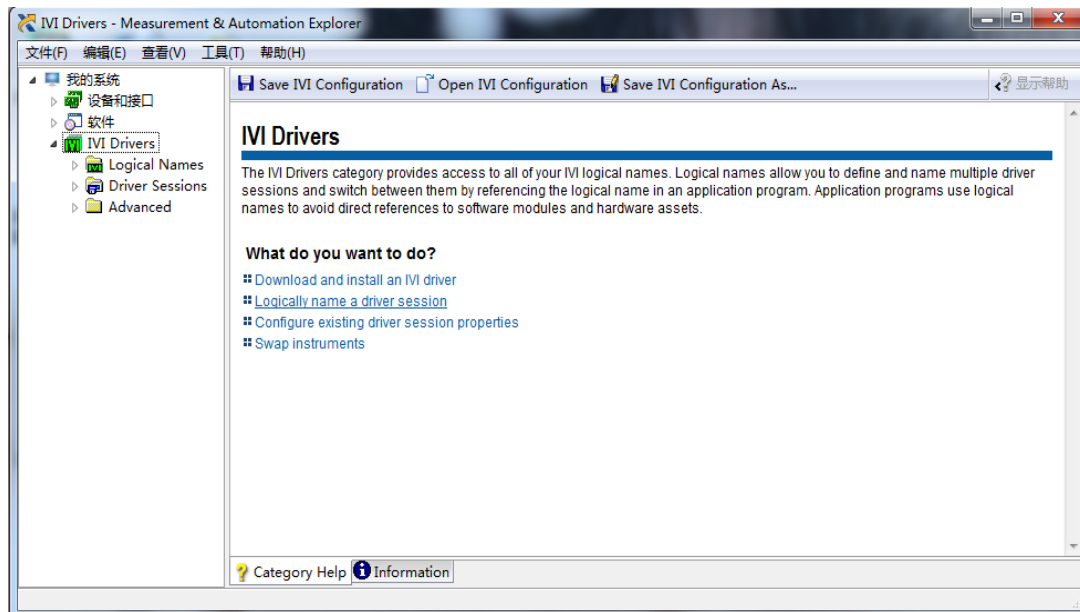
The IVI Compliance Package contains the IVI class drivers and supported libraries for developing and leveraging IVI-based applications.

You can get the IVI Compliance Package from <https://www.ni.com/zh-cn/support/downloads/drivers/download.ivi-compliance-package.html#329444>

- a. If the IVI Compliance Package is not installed, there is no IVI Drivers option in "My System".
- b. Install the IVI Compliance Package (ICP).



- c. Restart your computer after the installation. After the reboot, the IVI Drivers option appears.



SDS IVI-C Driver Package List

The SDS IVI-C driver package provides three kinds of files: sds.dll file, sds.h file and sds.lib file.

File	Description
sds.dll/sds_64.dll	A dynamic link library file, including variables, functions, and data interfaces for various attributes.
sds.lib/sds_64.lib	An import library file, including the symbolic name and optional identification number of each exported function in the sds.dll file.
sds.h	A header file, including declarations of variables, functions, and data interfaces.

You include the sds.h when programming the Siglent oscilloscope with the IVI driver, and load the sds.dll dynamic file or sds.lib import library file into your own project.

You will find an example that show you how to use these files at the end of this document.

Introduction to IVI

IVI (Interchangeable Virtual Instruments) is a new generation of instrument driver technology specifications introduced by the IVI Foundation. IVI can realize the interchangeability with the instrument, the instrument simulation, and the instrument state tracking and buffer function. All references to IVI drivers in this document refer to IVI-C drivers that are created using NI tools and that rely on the IVI Engine.

IVI Data Type

There are six data types for the attributes of the IVI Engine: ViInt32, ViReal64, ViString, ViBoolean, ViSession and ViAddr.

Table 1 Data Type

Data Type	Description
ViInt32	32-bit signed integer
ViReal64	64-bit floating-point number
ViString	String type
ViBoolean	Boolean value
ViSession	A VISA session handle
ViAddr	Logical address type

Access IVI Attribute

User-callable functions are typically implemented by manipulating attributes. You can call `sds_SetAttribute` or `sds_GetAttribute` functions.

SetAttribute Function Group

- `sds_SetAttributeViInt32` (ViSession vi, ViConstString channelName, ViAttr attributId, ViInt32 value)

Example: When you want to set the channel coupling, you can call the SetAttribute function to change the channel coupling.

```
sds_SetAttributeViInt32(session,"CHAN1",SDS_ATTR_VERTICAL_COUPLING,0);
```

where,

session: The instrument handle.

“CHAN1”: A constant string that represents the analog channel 1 and shows that this

SDS_ATTR_VERTICAL_COUPLING attribute is corresponding to that specific channel.

0: Set the coupling mode to AC.

- `sds_SetAttributeViReal64` (ViSession vi, ViConstString channelName, ViAttr attributId, ViReal64 value)

Example: When you want to set the probe attenuation, you can call SetAttribute or GetAttribute function to change or obtain the probe attenuation value.

```
sds_SetAttributeViReal64(session,"CHAN1",SDS_ATTR_PROBE_ATTENUATION,10);
```

where,

session: Instrument Handle.

“CHAN1”: A constant string that represents the analog channel 1 and shows that this

SDS_ATTR_PROBE_ATTENUATION attribute is corresponding to this specific channel.

10: Set the probe attenuation to x10.

- `sds_SetAttributeViString` (ViSession vi, ViConstString channelName, ViAttr attributeld, ViConstString value)

Example: When you want to set the channel label text, you can call `SetAttribute` or `GetAttribute` function to change or obtain the channel label text.

```
sds_SetAttributeViString(session,"CHAN1",SDS_ATTR_CHANNEL_LABEL_TEXT,"Channel1");
```

where,

session: The instrument handle.

"CHAN1": A constant string that represents the analog channel 1 and shows that this

SDS_ATTR_CHANNEL_LABEL_TEXT attribute is corresponding to this specific channel.

"Channel1": Set the label text of Channel 1 to "Channel1".

- `sds_SetAttributeViBoolean` (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)

Example: When you want to set a channel on or off, you can call `SetAttribute` or `GetAttribute` function to change or obtain the state of the channel.

```
sds_SetAttributeViBoolean(session,"CHAN1",SDS_ATTR_CHANNEL_ENABLED,VI_FALSE);
```

where,

session: The instrument handle.

“CHAN1”: A constant string that represents the analog channel 1 and shows that this

SDS_ATTR_CHANNEL_ENABLED attribute is corresponding to this channel.

VI_FALSE: This means turning channel 1 off.

GetAttribute Function Group

- `sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributId, ViReal64 *value)`

Example: When you want to set the probe attenuation, you can call SetAttribute or GetAttribute function to change or obtain the probe attenuation value.

sds_GetAttributeViReal64(session,"CHAN1",SDS_ATTR_PROBE_ATTENUATION,&value64);

where,

session: The instrument handle.

“CHAN1”: A constant string that represents the analog channel 1 and shows that this

SDS_ATTR_PROBE_ATTENUATION attribute is corresponding to this channel.

value64: A ViReal64 type variable which is used to store the returned value of the probe attenuation query.

- `sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributId, ViInt32 *value)`

Example: When you want to set the channel coupling, you can call SetAttribute or GetAttribute function to change or obtain the channel coupling.

```
sds_GetAttributeViInt32(session,"CHAN1",SDS_ATTR_VERTICAL_COUPLING,  
&value32);
```

where,

session: The instrument handle.

“CHAN1”: A constant string that represents the analog channel 1 and shows that this **SDS_ATTR_VERTICAL_COUPLING** attribute is corresponding to this specific channel.

value32: A ViInt32 type variable which is used to store the returned value of the coupling query.

- **sds_GetAttributeViBoolean** (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)

Example: When you want to set a channel on or off, you can call SetAttribute or GetAttribute function to change or obtain the state of channel.

```
sds_GetAttributeViBoolean(session,"CHAN1",SDS_ATTR_CHANNEL_ENABLED,  
&boolean);
```

where,

session: The instrument handle.

“CHAN1”: A constant string that represents the analog channel 1 and shows that this **SDS_ATTR_CHANNEL_ENABLED** attribute is corresponding to this specific channel.

boolean: A ViBoolean type variable which is used to store the returned value.

- `sds_GetAttributeViString` (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 bufSize, ViChar value[])

Example: When you want to set the channel label text, you can call `SetAttribute` or `GetAttribute` function to change or obtain the channel label text.

`sds_GetAttributeViString(session,"CHAN1",SDS_ATTR_CHANNEL_LABEL_TEXT, buffersize,str);`

where,

session: The instrument handle.

"CHAN1": A constant string that represents the analog channel 1 and shows that this **SDS_ATTR_CHANNEL_LABEL_TEXT** attribute is corresponding to this specific channel.

buffersize: A ViInt32 type variable.

str: A ViString type variable which is used to store the returned value.

Attribute

This chapter describes the attributes of the SIGLENT IVI driver. The following table lists the supported IVI base class attributes and SIGLENT custom attributes.

System	Attribute
Channel Subsystem	SDS_ATTR_MAX_INPUT_FREQUENCY
	SDS_ATTR_INPUT_IMPEDANCE
	SDS_ATTR_VERTICAL_COUPLING
	SDS_ATTR_PROBE_ATTENUATION
	SDS_ATTR_VERTICAL_OFFSET
	SDS_ATTR_VERTICAL_RANGE
	SDS_ATTR_CHANNEL_ENABLED
	SDS_ATTR_CHANNEL_LABEL_TEXT
	SDS_ATTR_CHANNEL_COUNT
Acquisition Subsystem	SDS_ATTR_ACQUISITION_TYPE
	SDS_ATTR_HORZ_RECORD_LENGTH
	SDS_ATTR_HORZ_SAMPLE_RATE
	SDS_ATTR_HORZ_TIME_PER_RECORD
	SDS_ATTR_ACQUISITION_START_TIME
	SDS_ATTR_INTERPOLATION
	SDS_ATTR_HORZ_MIN_NUM_PTS
Trigger Subsystem	SDS_ATTR_TRIGGER_TYPE
	SDS_ATTR_TRIGGER_HOLDOFF
	SDS_ATTR_TRIGGER_SOURCE
	SDS_ATTR_TRIGGER_LEVEL
	SDS_ATTR_TRIGGER_MODIFIER
	SDS_ATTR_TRIGGER_COUPLING
	SDS_ATTR_TRIGGER_SLOPE
	SDS_ATTR_TV_TRIGGER_LINE_NUMBER
	SDS_ATTR_TV_TRIGGER_SIGNAL_FORMAT
	SDS_ATTR_RUNT_HIGH_THRESHOLD
	SDS_ATTR_RUNT_LOW_THRESHOLD
	SDS_ATTR_RUNT_POLARITY
	SDS_ATTR_GLITCH_CONDITION
	SDS_ATTR_GLITCH_POLARITY
Measurement Subsystem	SDS_ATTR_MEASURE_ENABLED
	SDS_ATTR_MEASURE_MODE
	SDS_ATTR_MEASURE_GATE
	SDS_ATTR_MEASURE_GATE_GA
	SDS_ATTR_MEASURE_GATE_GB
	SDS_ATTR_MEASURE_SIMPLE_SOURCE
	SDS_ATTR_MEASURE_ADVANCED_SOURCEA

	SDS_ATTR_MEASURE_ADVANCED_SOURCEB
	SDS_ATTR_MEASURE_ADVANCED_TYPE
	SDS_ATTR_MEASURE_ADVANCED_VALUE
	SDS_ATTR_MEASURE_ADVANCED_STYLE
	SDS_ATTR_MEASURE_ADVANCED_LINENUMBER
	SDS_ATTR_MEASURE_ADVANCED_STATISTICS
	SDS_ATTR_MEASURE_ADVANCED_STATISTICS_HISTOGRAM
	SDS_ATTR_MEASURE_ADVANCED_STATISTICS_MAXCOUNT
	SDS_ATTR_MEASURE_ADVANCED_STATISTICS_RESET

Channel Subsystem

The channel group properties are used to set or read channel-related parameters. The channel group has the following attributes:

- ◆ **SDS_ATTR_MAX_INPUT_FREQUENCY**
- ◆ **SDS_ATTR_INPUT_IMPEDANCE**
- ◆ **SDS_ATTR_VERTICAL_COUPLING**
- ◆ **SDS_ATTR_PROBE_ATTENUATION**
- ◆ **SDS_ATTR_VERTICAL_OFFSET**
- ◆ **SDS_ATTR_VERTICAL_RANGE**
- ◆ **SDS_ATTR_CHANNEL_ENABLED**
- ◆ **SDS_ATTR_CHANNEL_LABEL_TEXT**
- ◆ **SDS_ATTR_CHANNEL_COUNT**

SDS_ATTR_MAX_INPUT_FREQUENCY

Description	This attribute specifies the channel bandwidth limit.
Data type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is one of the following analog inputs: CHAN1, CHAN2, CHAN3 or CHAN4. attributeld is SDS_ATTR_MAX_INPUT_FREQUENCY macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>(0,2e+7) means the bandwidth is limited to 20M.</p> <p>(2e+7,2e+8) means bandwidth is limited to 200M.</p> <p>(2e+8,1e+38) means bandwidth is Full.</p>
Related Attribute	SDS_ATTR_INPUT_IMPEDANCE
High Level Functions	sds_ConfigureChanCharacteristics

SDS_ATTR_INPUT_IMPEDANCE

Description	This attribute specifies the channel impedance.
Data type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is one of the following analog inputs: CHAN1, CHAN2, CHAN3 or CHAN4. attributeld is SDS_ATTR_INPUT_IMPEDANCE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>50 means the impedance is 50 Ω .</p> <p>1 e+6 means the impedance is 1M Ω .</p>
Related Attribute	SDS_ATTR_MAX_INPUT_FREQUENCY
High Level Functions	sds_ConfigureChanCharacteristics

SDS_ATTR_VERTICAL_COUPLING

Description

This attribute specifies channel coupling.

Data Type

ViInt32

Access

R/W

Common Control Functions

sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Note:

vi is the instrument handle.

channelName is one of the following analog inputs: CHAN1, CHAN2, CHAN3 or CHAN4.

attributeld is SDS_ATTR_VERTICAL_COUPLING macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Type	Discrete Value	Value
AC	SDS_VAL_AC	0
DC	SDS_VAL_DC	1
GND	SDS_VAL_GND	2

Related Attribute

SDS_ATTR_VERTICAL_OFFSET
SDS_ATTR_VERTICAL_RANGE
SDS_ATTR_CHANNEL_ENABLED
SDS_ATTR_PROBE_ATTENUATION

High Level Functions

sds_ConfigureChannel

SDS_ATTR_PROBE_ATTENUATION

Description	This attribute specifies channel probe attenuation.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is one of the following analog inputs: CHAN1, CHAN2, CHAN3 or CHAN4. attributeld is SDS_ATTR_PROBE_ATTENUATION macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The range of value is [1E-6, 1E6].
Related Attribute	SDS_ATTR_VERTICAL_OFFSET SDS_ATTR_VERTICAL_RANGE SDS_ATTR_CHANNEL_ENABLED SDS_ATTR_VERTICAL_COUPLING
High Level Functions	sds_ConfigureChannel

SDS_ATTR_VERTICAL_OFFSET

Description	This attribute specifies channel vertical offset.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributId, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributId, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is one of the following analog inputs: CHAN1, CHAN2, CHAN3 or CHAN4. attributId is SDS_ATTR_VERTICAL_OFFSET macro. value is used to store or set the value of function represented by attributId.</p>
Value Range	<p>● Range of value for SDS6000A/SDS6000 Pro: When the channel scale is between $[5e-4*probe, 5e-3*probe]$, the range of value is $[-1.6*probe, 1.6*probe]$.</p> <p>When the channel scale is between $(5e-3*probe, 1e-2*probe]$, the range of value is $[-4*probe, 4*probe]$.</p> <p>When the channel scale is between $(1e-2*probe, 2e-2*probe]$, the range of value is $[-8*probe, 8*probe]$.</p> <p>When the channel scale is between $[2e-2*probe, 1e-1*probe]$, the range of value is $[-16*probe, 16*probe]$.</p> <p>When the channel scale is between $(1e-1*probe, 2e-1*probe]$, the range of value is $[-80*probe, 80*probe]$.</p> <p>When the channel scale is between $(2e-1*probe, 1*probe]$, the range of value is $[-160*probe, 160*probe]$.</p> <p>When the channel scale is between $(1*probe, 1e+1*probe]$, the range of value is $[-400*probe, 400*probe]$.</p>

- **Range of value for SDS5000X/SDS2000X Plus:**

When the channel scale is between $[5e-4 \times \text{probe}, 1e-1 \times \text{probe}]$, the range of value is $[-2 \times \text{probe}, 2 \times \text{probe}]$.

When the channel scale is between $(1e-1 \times \text{probe}, 1 \times \text{probe}]$, the range of value is $[-20 \times \text{probe}, 20 \times \text{probe}]$.

When the channel scale is between $(1 \times \text{probe}, 10 \times \text{probe}]$, the range of value is $[-200 \times \text{probe}, 200 \times \text{probe}]$.

Note:

Probe is the value of channel attenuation.

Related Attribute

SDS_ATTR_VERTICAL_OFFSET
 SDS_ATTR_VERTICAL_RANGE
 SDS_ATTR_CHANNEL_ENABLED
 SDS_ATTR_VERTICAL_COUPLING
 SDS_ATTR_PROBE_ATTENUATION

High Level Functions

sds_ConfigureChannel

SDS_ATTR_VERTICAL_RANGE

Description	This attribute specifies channel vertical range.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is one of the following analog inputs: CHAN1, CHAN2, CHAN3 or CHAN4. attributeld is SDS_ATTR_VERTICAL_RANGE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>When the channel impedance is set to 50Ω, the value range is [5e-4*probe,1e+0*probe].</p> <p>When the channel impedance is set to 1MΩ, the value range is [5e-4*probe,1e+1*probe].</p> <p>Note: Probe is the value of channel attenuation.</p>
Related Attribute	SDS_ATTR_CHANNEL_ENABLED SDS_ATTR_VERTICAL_OFFSET SDS_ATTR_VERTICAL_COUPLING SDS_ATTR_PROBE_ATTENUATION SDS_ATTR_PROBE_ATTENUATION
High Level Functions	sds_ConfigureChannel

SDS_ATTR_CHANNEL_ENABLED

Description	This attribute specifies the status of channel.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sds_SetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sds_GetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Note: vi is the instrument handle. ChannelName is one of the following analog inputs: CHAN1, CHAN2, CHAN3 or CHAN4. attributeld is SDS_ATTR_CHANNEL_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>VI_TRUE means to turn on the channel.</p> <p>VI_FALSE means to turn off the channel.</p>
Related Attribute	<p>SDS_ATTR_VERTICAL_OFFSET</p> <p>SDS_ATTR_VERTICAL_RANGE</p> <p>SDS_ATTR_CHANNEL_ENABLED</p> <p>SDS_ATTR_VERTICAL_COUPLING</p> <p>SDS_ATTR_PROBE_ATTENUATION</p> <p>SDS_ATTR_PROBE_ATTENUATION</p>
High Level Functions	sds_ConfigureChannel

SDS_ATTR_CHANNEL_LABEL_TEXT

Description	This attribute specifies the label text of the source
Data Type	ViString
Access	R/W
Common Control Functions	<p>sds_SetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViConstString value)</p> <p>sds_GetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 bufSize, ViChar value[])</p> <p>Note: vi is the instrument handle. channelName is one of the following analog inputs: CHAN1, CHAN2, CHAN3 or CHAN4. attributeld is SDS_ATTR_CHANNEL_LABEL_TEXT macro. bufSize is the number of bytes you specified for the Attribute Value parameter in the ViChar array. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The limit of the label text is 20 bytes.
Related Attribute	None
High Level Functions	None

SDS_ATTR_CHANNEL_COUNT

Description	This attribute gets the channel counts.
Data Type	ViInt32
Access	RO
Common Control Functions	<p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_CHANNEL_COUNT macro. value is used to store the value of function returned by attributeld.</p>
Value Range	None
Related Attribute	None
High Level Functions	None

Acquisition Subsystem

The acquisition group properties are used to set or read acquisition related parameters.

The acquisition group has the following attributes:

- ◆ **SDS_ATTR_ACQUISITION_TYPE**
- ◆ **SDS_ATTR_HORZ_RECORD_LENGTH**
- ◆ **SDS_ATTR_HORZ_SAMPLE_RATE**
- ◆ **SDS_ATTR_HORZ_TIME_PER_RECORD**
- ◆ **SDS_ATTR_ACQUISITION_START_TIME**
- ◆ **SDS_ATTR_INTERPOLATION**
- ◆ **SDS_ATTR_HORZ_MIN_NUM_PTS**

SDS_ATTR_ACQUISITION_TYPE

Description	This attribute specifies the acquisition mode.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_ACQUISITION_TYPE macro. value is used to store or set the value of function represented by attributeld.</p>

Value Range

Type	Discrete Value	Value
Normal	SDS_VAL_NORMAL	0
Peak	SDS_VAL_PEAK_DETECT	1
ERES	SDS_VAL_HI_ERES	2
Average	SDS_VAL_AVERAGE	4

Notes:
SDS2000X Plus only supports Normal and Peak.

Related Attribute	None
High Level Functions	sds_ConfigureAcquisitionType

SDS_ATTR_HORZ_RECORD_LENGTH

Description	This attribute gets the length of the waveform record.
Data Type	ViInt32
Access	RO
Common Control Functions	<p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_HORZ_RECORD_LENGTH macro. value is used to store the value of function returned by attributeld.</p>
Value Range	None
Related Attribute	<p>SDS_ATTR_HORZ_MIN_NUM_PTS</p> <p>SDS_ATTR_HORZ_TIME_PER_RECORD</p>
High Level Functions	None

SDS_ATTR_HORZ_SAMPLE_RATE

Description	This attribute gets the sampling rate.
Data Type	ViReal64
Access	RO
Common Control Functions	<p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_HORZ_SAMPLE_RATE macro. value is used to store the value of function returned by attributeld.</p>
Value Range	None
Related Attribute	SDS_ATTR_HORZ_TIME_PER_RECORD
High Level Functions	None

SDS_ATTR_HORZ_TIME_PER_RECORD

Description	This attribute specifies the horizontal scale of the main window.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_HORZ_TIME_PER_RECORD macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>In the IVI-4.1 specification, values are default coerced up. And the following range make effect on the time base of the main window. So that,</p> <p>(2e-10,5e-10) means 500ps/div (5e-10,1e-9) means 1ns/div (1e-9,2e-9) means 2ns/div (2e-9,5e-9) means 5ns/div (5e-9,1e-8) means 10ns/div (1e-8,2e-8) means 20ns/div (2e-8,5e-8) means 50ns/div (5e-8,1e-7) means 100ns/div (1e-7,2e-7) means 200ns/div (2e-7,5e-7) means 500ns/div (5e-7,1e-6) means 1us/div (1e-6,2e-6) means 2us/div (2e-6,5e-6) means 5us/div (5e-6,1e-5) means 10us/div (1e-5,2e-5) means 20us/div (2e-5,5e-5) means 50us/div (5e-5,1e-4) means 100us/div (1e-4,2e-4) means 200us/div (2e-4,5e-4) means 500us/div</p>

(5e-4,1e-3) means 1ms/div
 (1e-3,2e-3) means 2ms/div
 (2e-3,5e-3) means 5ms/div
 (5e-3,1e-2) means 10ms/div
 (1e-2,2e-2) means 20ms/div
 (2e-2,5e-2) means 50ms/div
 (5e-2,1e-1) means 100ms/div
 (1e-1,2e-1) means 200ms/div
 (2e-1,5e-1) means 500ms/div
 (5e-1,1e+0) means 1s/div
 (1e+0,2e+0) means 2s/div
 (2e+0,5e+0) means 5s/div
 (5e+0,1e+1) means 10s/div
 (1e+1,2e+1) means 20s/div
 (2e+1,5e+1) means 50s/div
 (5e+1,1e+2) means 100s/div
 (1e+2,2e+2) means 200s/div
 (2e+2,5e+2) means 500s/div
 (5e+2,1e+3) means 1ks/div

Related Attribute

SDS_ATTR_ACQUISITION_START_TIME

High Level Functions

sds_ConfigureAcquisitionRecord

SDS_ATTR_ACQUISITION_START_TIME

Description	This attribute specifies the horizontal delay (trigger delay).
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sds_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value);</p> <p>sds_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value);</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_ACQUISITION_START_TIME macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [-10*timebase, (10000-5)*timebase].
Related Attribute	SDS_ATTR_HORZ_TIME_PER_RECORD
High Level Functions	sds_ConfigureAcquisitionRecord

SDS_ATTR_INTERPOLATION

Description	This attribute specifies the way of interpolation.									
Data Type	ViInt32									
Access	R/W									
Common Control Functions	<p>sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_INTERPOLATION macro. value is used to store or set the value of function represented by attributeld.</p>									
Value Range	<table><tr><th>Type</th><th>Discrete Value</th><th>Value</th></tr><tr><td>Sinc</td><td>SDS_VAL_SINE_X</td><td>2</td></tr><tr><td>x</td><td>SDS_VAL_LINEAR</td><td>3</td></tr></table>	Type	Discrete Value	Value	Sinc	SDS_VAL_SINE_X	2	x	SDS_VAL_LINEAR	3
Type	Discrete Value	Value								
Sinc	SDS_VAL_SINE_X	2								
x	SDS_VAL_LINEAR	3								
Related Attribute	None SDS_ATTR_HORZ_TIME_PER_RECORD									
High Level Functions	sds_ConfigureInterpolation									

SDS_ATTR_HORZ_MIN_NUM_PTS

Description This attribute specifies the maximum memory depth.

Data Type ViInt32

Access R/W

Common Control Functions sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is SDS_ATTR_HORZ_MIN_NUM_PTS macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Model	Type	Discrete Value	Value
SDS6000A/Pro	1.25k	SDS_VAL_1_25K	1.25e+3
SDS6000A/Pro	2.5k	SDS_VAL_2_5K	2.5e+3
SDS6000A/Pro	5k	SDS_VAL_5K	5e+3
SDS6000A/Pro	12.5k	SDS_VAL_12_5K	12.5e+3
SDS6000A/Pro	25k	SDS_VAL_25K	25e+3
SDS6000A/Pro	50k	SDS_VAL_50K	50e+3
SDS6000A/Pro	125k	SDS_VAL_125K	125e+3
SDS6000A/Pro	250k	SDS_VAL_250K	250e+3
SDS6000A/Pro	500k	SDS_VAL_500K	500e+3
SDS6000A/Pro	1.25M	SDS_VAL_1_25M	1.25e+6
SDS6000A/Pro	2.5M	SDS_VAL_2_5M	2.5e+6
SDS6000A/Pro	5M	SDS_VAL_5M	5e+6
SDS6000A/Pro	12.5M	SDS_VAL_12_5M	12.5e+6
SDS6000A/Pro	25M	SDS_VAL_25M	25e+6
SDS6000A/Pro	50M	SDS_VAL_50M	50e+6
SDS6000A/Pro	62.5M	SDS_VAL_62_5M	62.5e+6
SDS6000A/Pro	125M	SDS_VAL_125M	125e+6
SDS6000A/Pro	250M	SDS_VAL_250M	250e+6
SDS6000A/Pro	500M	SDS_VAL_500M	500e+6
SDS5000X	5k	SDS_VAL_5K	5e+3
SDS5000X	10k	SDS_VAL_10K	10e+3

SDS5000X	25k	SDS_VAL_25K	25e+3
SDS5000X	50k	SDS_VAL_50K	50e+3
SDS5000X	125k	SDS_VAL_125K	125e+3
SDS5000X	250k	SDS_VAL_250K	250e+3
SDS5000X	625k	SDS_VAL_625K	625e+3
SDS5000X	1.25M	SDS_VAL_1_25M	1.25e+6
SDS5000X	2.5M	SDS_VAL_2_5M	2.5e+6
SDS5000X	6.25M	SDS_VAL_6_25M	6.25e+6
SDS5000X	12.5M	SDS_VAL_12_5M	12.5e+6
SDS5000X	25M	SDS_VAL_25M	25e+6
SDS5000X	62.5M	SDS_VAL_62_5M	62.5e+6
SDS5000X	125M	SDS_VAL_125M	125e+6
SDS5000X	250M	SDS_VAL_250M	250e+6
SDS2000X Plus	10k	SDS_VAL_10K	10e+3
SDS2000X Plus	20k	SDS_VAL_20K	20e+3
SDS2000X Plus	100k	SDS_VAL_100K	100e+3
SDS2000X Plus	200k	SDS_VAL_200K	200e+3
SDS2000X Plus	1M	SDS_VAL_1M	1e+6
SDS2000X Plus	2M	SDS_VAL_2M	2e+6
SDS2000X Plus	10M	SDS_VAL_10M	10e+6
SDS2000X Plus	20M	SDS_VAL_20M	20e+6
SDS2000X Plus	50M	SDS_VAL_50M	50e+6
SDS2000X Plus	100M	SDS_VAL_100M	100e+6
SDS2000X Plus	200M	SDS_VAL_200M	200e+6

Related Attribute

SDS_ATTR_HORZ_TIME_PER_RECORD

High Level Functions

sds_ConfigureInterpolation

Trigger Subsystem

The triggering group properties are used to set or read trigger related parameters. The triggering group has the following attributes:

- ♦ **SDS_ATTR_TRIGGER_TYPE**
- ♦ **SDS_ATTR_TRIGGER_HOLDOFF**
- ♦ **SDS_ATTR_TRIGGER_SOURCE**
- ♦ **SDS_ATTR_TRIGGER_LEVEL**
- ♦ **SDS_ATTR_TRIGGER_MODIFIER**
- ♦ **SDS_ATTR_TRIGGER_COUPLING**
- ♦ **SDS_ATTR_TRIGGER_SLOPE**
- ♦ **SDS_ATTR_TV_TRIGGER_LINE_NUMBER**
- ♦ **SDS_ATTR_TV_TRIGGER_SIGNAL_FORMAT**
- ♦ **SDS_ATTR_RUNT_HIGH_THRESHOLD**
- ♦ **SDS_ATTR_RUNT_LOW_THRESHOLD**
- ♦ **SDS_ATTR_RUNT_POLARITY**
- ♦ **SDS_ATTR_GLITCH_CONDITION**
- ♦ **SDS_ATTR_GLITCH_POLARITY**

SDS_ATTR_TRIGGER_TYPE

Description	This attribute specifies the trigger type.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is SDS_ATTR_TRIGGER_TYPE macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Type	Discrete Value	Value
Edge	SDS_VAL_EDGE_TRIGGER	1
Runt	SDS_VAL_RUNT_TRIGGER	3
Pluse	SDS_VAL_GLITCH_TRIGGER	4
Video	SDS_VAL_TV_TRIGGER	5
Slope	SDS_VAL_SLOPE_TRIGGER	8
Pattern	SDS_VAL_PATTERN_TRIGGER	9
Qualified	SDS_VAL_QUALIFIED_TRIGGER	10
Window	SDS_VAL_WINDOW_TRIGGER	11
Interval	SDS_VAL_INTERVAL_TRIGGER	12
Dropout	SDS_VAL_DROPOUT_TRIGGER	13

Related Attribute

SDS_ATTR_TRIGGER_HOLDOFF
SDS_ATTR_TRIGGER_LEVEL
SDS_ATTR_TRIGGER_SOURCE

High Level Functions

sds_ConfigureTrigger
sds_ConfigureWidthTriggerSource
sds_ConfigureGlitchTriggerSource
sds_ConfigureEdgeTriggerSource

SDS_ATTR_TRIGGER_HOLDOFF

Description	This attribute specifies the trigger holdoff time.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_TRIGGER_HOLDOFF macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>[8.00e-09, 3.00e+01]</p> <p>Note: Only when the SDS_ATTR_TRIGGER_TYPE is Edge, Slope, Pulse, Window, Interval, Dropout, Runt, Pattern SDS_ATTR_TRIGGER_HOLDOFF can be set.</p>
Related Attribute	SDS_ATTR_TRIGGER_TYPE
High Level Functions	sds_ConfigureTrigger

SDS_ATTR_TRIGGER_SOURCE

Description	This attribute specifies the trigger source.
Data Type	ViString
Access	R/W
Common Control Functions	<p>sds_SetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViConstString value)</p> <p>sds_GetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 bufSize, ViChar value[])</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_TRIGGER_SOURCE macro. bufSize is the number of bytes you specified for the Attribute Value parameter in the ViChar array. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The source can be set to:{Cn Dm EX EX5 LINE} n can be set from 1 to 4. m can be set from 0 to 15.</p> <p>Example: If you want to set the source to C1, enter "C1". If you want to set the source to D0, enter "D0".</p> <p>Note: when the SDS_ATTR_TRIGGER_TYPE is Edge trigger, the SDS_ATTR_TRIGGER_SOURCE can be set as {Cn Dm EX EX5 LINE}.</p> <p>when the SDS_ATTR_TRIGGER_TYPE is Window, Runt, Slope, or TV trigger, the SDS_ATTR_TRIGGER_SOURCE can be set as {Cn}.</p> <p>when the SDS_ATTR_TRIGGER_TYPE is Dropout, Interval, Pulse trigger, the SDS_ATTR_TRIGGER_SOURCE can be set as {Cn Dm}.</p>

Related Attribute

SDS_ATTR_TRIGGER_LEVEL
SDS_ATTR_TRIGGER_TYPE

High Level Functions

sds_ConfigureEdgeTriggerSource
sds_ConfigureRuntTriggerSource
sds_ConfigureGlitchTriggerSource
sds_ConfigureWidthTriggerSource
sds_ConfigureTVTriggerSource

SDS_ATTR_TRIGGER_LEVEL

Description	This attribute specifies the trigger level.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_TRIGGER_LEVEL macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>Range of values for SDS6000A/SDS6000 Pro: [-4.5*vertical_scale-vertical_offset,4.5*vertical_scale-vertical_offset].</p> <p>Range of values for SDS5000X/SDS2000X Plus: [-4.1*vertical_scale-vertical_offset,4.1*vertical_scale-vertical_offset].</p> <p>Note: Only when the SDS_ATTR_TRIGGER_TYPE is Edge, Pulse, Interval, Dropout TV trigger type, the SDS_ATTR_TRIGGER_LEVEL can be set.</p>
Related Attribute	SDS_ATTR_TRIGGER_SOURCE SDS_ATTR_TRIGGER_TYPE SDS_ATTR_TRIGGER_LEVEL
High Level Functions	sds_ConfigureTrigger sds_ConfigureWidthTriggerSource sds_ConfigureGlitchTriggerSource sds_ConfigureEdgeTriggerSource

SDS_ATTR_TRIGGER_MODIFIER

Description	This attribute specifies the trigger mode.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is SDS_ATTR_TRIGGER_MODIFIER macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Type	Discrete Value	Value
Normal	SDS_VAL_NO_TRIGGER_MOD	1
Auto	SDS_VAL_AUTO	2
Single	SDS_VAL_SINGLE	4

Related Attribute	None
High Level Functions	sds_ConfigureTriggerModifier

SDS_ATTR_TRIGGER_COUPLING

Description This attribute specifies the coupling mode of the edge trigger.

Data Type ViInt32

Access R/W

Common Control Functions sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is SDS_ATTR_TRIGGER_COUPLING macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Type	Discrete Value	Value
AC	SDS_VAL_AC_TRIGGER	0
DC	SDS_VAL_DC_TRIGGER	1
HF Reject	SDS_VAL_HF_REJECT	3
LF Reject	SDS_VAL_LF_REJECT	4

Related Attribute None

High Level Functions sds_ConfigureTriggerCoupling

SDS_ATTR_TRIGGER_SLOPE

Description This attribute specifies the slope of the edge trigger.

Data Type ViInt32

Access R/W

Common Control Functions sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is SDS_ATTR_TRIGGER_SLOPE macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Type	Discrete Value	Value
Falling	SDS_VAL_NEGATIVE	0
Rising	SDS_VAL_POSITIVE	1
Alternating	SDS_VAL_ALTERNATE	2

Related Attribute SDS_ATTR_TRIGGER_SOURCE
SDS_ATTR_TRIGGER_LEVEL

High Level Functions sds_ConfigureEdgeTriggerSource

SDS_ATTR_TV_TRIGGER_LINE_NUMBER

Descriptor This attribute specifies the line number of the video trigger.

Data ViInt32

type

Access R/W

Common control function sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

s sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is SDS_ATTR_TV_TRIGGER_LINE_NUMBER macro.

value is used to store or set the value of function represented by **attributeld**.

Value [1,1125]

Range

Related SDS_ATTR_TV_TRIGGER_SIGNAL_FORMAT

Attribute

High sds_ConfigureTVTriggerLineNumber

Level sds_ConfigureTVTriggerLineNumber

Function

s

SDS_ATTR_TV_TRIGGER_SIGNAL_FORMAT

Description This attribute specifies the video standard of the video trigger.

Data type ViInt32

Access R/W

Common control functions sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is

SDS_ATTR_TV_TRIGGER_SIGNAL_FORMAT macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Type	Discrete Value	Value
NTSC	SDS_VAL_NTSC	1
PAL	SDS_VAL_PAL	2
720p/50	SDS_VAL_720P50	4
720p/60	SDS_VAL_720P60	5
1080p/50	SDS_VAL_1080P50	6
1080p/60	SDS_VAL_1080P60	7
1080i/50	SDS_VAL_1080I50	8
1080i/60	SDS_VAL_1080I60	9
Custom	SDS_VAL_CUSTOM	10

Related Attribute SDS_ATTR_TV_TRIGGER_LINE_NUMBER

High Level Functions sds_ConfigureTVTriggerSource

SDS_ATTR_RUNT_HIGH_THRESHOLD

Description	This attribute specifies the upper trigger level of the runt trigger.
Data type	ViReal64
Access	R/W
Common control functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_RUNT_HIGH_THRESHOLD macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>$[-4.5 * \text{vertical_scale} - \text{vertical_offset}, 4.5 * \text{vertical_scale} - \text{vertical_offset}]$</p> <p>Note: The value cannot be less than the value of the SDS_ATTR_RUNT_LOW_THRESHOLD attribute.</p>
Related Attribute	SDS_ATTR_RUNT_LOW_THRESHOLD SDS_ATTR_GLITCH_POLARITY
High Level Functions	sds_ConfigureRuntTriggerSource

SDS_ATTR_RUNT_LOW_THRESHOLD

Description	This attribute specifies the lower trigger level of the runt trigger.
Data type	ViReal64
Access	R/W
Common control functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_RUNT_LOW_THRESHOLD macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>$[-4.5 * \text{vertical_scale} - \text{vertical_offset}, 4.5 * \text{vertical_scale} - \text{vertical_offset}]$</p> <p>Note: The value cannot exceed the value of the SDS_ATTR_RUNT_HIGH_THRESHOLD attribute.</p>
Related Attribute	SDS_ATTR_RUNT_HIGH_THRESHOLD SDS_ATTR_GLITCH_POLARITY
High Level Functions	sds_ConfigureRuntTriggerSource

SDS_ATTR_RUNT_POLARITY

Description This attribute specifies the polarity of the runt trigger.

Data type ViInt32

Access R/W

Common control functions sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is SDS_ATTR_RUNT_POLARITY macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Type	Discrete Value	Value
Positive	SDS_VAL_RUNT_POSITIVE	1
Negative	SDS_VAL_RUNT_NEGATIVE	2

Related Attribute SDS_ATTR_RUNT_HIGH_THRESHOLD
SDS_ATTR_RUNT_LOW_THRESHOLD
SDS_ATTR_RUNT_POLARITY

High Level Functions sds_ConfigureRuntTriggerSource

SDS_ATTR_GLITCH_CONDITION

Description This attribute specifies the limit range type of the pulse trigger.

Data type ViInt32

Access R/W

Common control functions sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is SDS_ATTR_GLITCH_CONDITION macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Type	Discrete Value	Value
Less than	SDS_VAL_GLITCH_LESS_THAN	1
Greater than	SDS_VAL_GLITCH_GREATER_THAN	2
Inner	SDS_VAL_GLITCH_INNER_THAN	3
Outer	SDS_VAL_GLITCH_OUTER_THAN	4

Related to Channel SDS_ATTR_GLITCH_POLARITY

High Level Functions sds_ConfigureGlitchTriggerSource

SDS_ATTR_GLITCH_POLARITY

Description This attribute specifies the polarity of the pulse trigger.

Data type ViInt32

Access R/W

Common control functions sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Note:

vi is the instrument handle.

channelName is NULL.

attributeld is SDS_ATTR_GLITCH_POLARITY macro.

value is used to store or set the value of function represented by **attributeld**.

Value Range

Type	Discrete Value	Value
Positive	SDS_VAL_GLITCH_POSITIVE	1
Negative	SDS_VAL_GLITCH_NEGATIVE	2

Related to Channel SDS_ATTR_GLITCH_CONDITION

High Level Functions sds_ConfigureGlitchTriggerSource

Measurement Subsystem

The waveform measurement group properties are used to set or read Measurement related parameters. The waveform measurement group has the following attributes:

- ♦ **SDS_ATTR_MEASURE_ENABLED**
- ♦ **SDS_ATTR_MEASURE_MODE**
- ♦ **SDS_ATTR_MEASURE_GATE**
- ♦ **SDS_ATTR_MEASURE_GATE_GA**
- ♦ **SDS_ATTR_MEASURE_GATE_GB**
- ♦ **SDS_ATTR_MEASURE_SIMPLE_SOURCE**
- ♦ **SDS_ATTR_MEASURE_ADVANCED_SOURCEA**
- ♦ **SDS_ATTR_MEASURE_ADVANCED_SOURCEB**
- ♦ **SDS_ATTR_MEASURE_ADVANCED_TYPE**
- ♦ **SDS_ATTR_MEASURE_ADVANCED_VALUE**
- ♦ **SDS_ATTR_MEASURE_ADVANCED_STYLE**
- ♦ **SDS_ATTR_MEASURE_ADVANCED_LINENUMBER**
- ♦ **SDS_ATTR_MEASURE_ADVANCED_STATISTICS**
- ♦ **SDS_ATTR_MEASURE_ADVANCED_STATISTICS_HISTOGRAM**
- ♦ **SDS_ATTR_MEASURE_ADVANCED_STATISTICS_RESET**

SDS_ATTR_MEASURE_ENABLED

Description	This attribute turns on or off measurements.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sds_SetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sds_GetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value range	VI_TRUE means measurement is on VI_FALSE means measurement is off
Related Attribute	None
High Level Functions	None

SDS_ATTR_MEASURE_MODE

Description	This attribute specifies the mode of measurement.									
Data Type	ViInt32									
Access	R/W									
Common Control Functions	<p>sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_MODE macro. value is used to store or set the value of function represented by attributeld.</p>									
Value Range	<table><tr><th>Type</th><th>Discrete Value</th><th>Value</th></tr><tr><td>Simple</td><td>SDS_VAL_MEAS_MODE_SIMPLE</td><td>0</td></tr><tr><td>Advanced</td><td>SDS_VAL_MEAS_MODE_ADVANCED</td><td>1</td></tr></table>	Type	Discrete Value	Value	Simple	SDS_VAL_MEAS_MODE_SIMPLE	0	Advanced	SDS_VAL_MEAS_MODE_ADVANCED	1
Type	Discrete Value	Value								
Simple	SDS_VAL_MEAS_MODE_SIMPLE	0								
Advanced	SDS_VAL_MEAS_MODE_ADVANCED	1								
Related Attribute	SDS_ATTR_MEASURE_ENABLED									
High Level Functions	None									

SDS_ATTR_MEASURE_GATE

Description	This attribute turns on or off the measurement gate.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sds_SetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sds_GetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_GATE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>VI_TRUE means enable the measurement gate</p> <p>VI_FALSE means to disable the measurement gate</p>
Related Attribute	<p>SDS_ATTR_MEASURE_GATE_GA</p> <p>SDS_ATTR_MEASURE_GATE_GB</p>
High Level Functions	None

SDS_ATTR_MEASURE_GATE_GA

Description	This attribute specifies the position of gate A.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_GATE_GA macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>[-5*timebase, 5*timebase].</p> <p>Notes: The value cannot exceed SDS_ATTR_MEASURE_GATE_GB.</p>
Related Attribute	SDS_ATTR_MEASURE_GATE SDS_ATTR_MEASURE_GATE_GB
High Level Functions	None

SDS_ATTR_MEASURE_GATE_GB

Description	This attribute specifies the position of gate B
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sds_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_GATE_GB macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>[-5*timebase, 5*timebase].</p> <p>Notes: The value cannot be less than the value of the SDS_ATTR_MEASURE_GATE_GA</p>
Related Attribute	SDS_ATTR_MEASURE_GATE SDS_ATTR_MEASURE_GATE_GA
High Level Functions	None

SDS_ATTR_MEASURE_SIMPLE_SOURCE

Description	This attribute specifies the source of the simple measurement.
Data Type	ViString
Access	R/W
Common Control Functions	<p>sds_SetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViConstString value)</p> <p>sds_GetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 bufSize, ViChar value[])</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_SIMPLE_SOURCE macro. bufSize is passed the number of bytes you specified for the Attribute Value parameter in the ViChar array. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The source can be set to: {Cx Zx Fx Dn ZDn REFA REFB REFC REFD}.</p> <p>x can be set from 1 to 4 n can be set from 0 to 15</p> <p>Example: If you want to set the source to C1, enter "C1". If you want to set the source to D0, enter "D0". If you want to set the source to C1 in the Zoom window, enter "Z1". If you want to set the source to D0 in the Zoom window, enter "ZD0".</p>
Related Attribute	None
High Level Functions	None

SDS_ATTR_MEASURE_ADVANCED_SOURCEA

Description	This attribute sets the source A of the specified advance measurement.
Data Type	ViString
Access	R/W
Common Control Functions	<p>sds_SetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViConstString value)</p> <p>sds_GetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 bufSize, ViChar value[])</p> <p>Note: vi is the instrument handle. channelName is the position of advance measurement item. attributeld is SDS_ATTR_MEASURE_ADVANCED_SOURCEA macro. bufSize is passed the number of bytes you specified for the Attribute Value parameter in the ViChar array. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The position can be set to: {Pn}. n can be set from 1 to 12 The source can be set to: {Cx Zx Fx Dn ZDn REFA REFB REFC REFD}. x can be set from 1 to 4 n can be set from 0 to 15</p> <p>Example: If you want to set the source of the first measurement item to C1, channelName enter P1, value enter "C1". If you want to set the source of the second measurement item to D0, channelName enter P2, value enter "D0".</p>
Related Attribute	SDS_ATTR_MEASURE_ADVANCED_SOURCEB
High Level Functions	None

SDS_ATTR_MEASURE_ADVANCED_SOURCEB

Description	This attribute sets the source B of the specified advance measurement. Only the delay measurement item needs to set source B, and only supports setting as analog channel.
Data Type	ViString
Access	R/W
Common Control Functions	<p>sds_SetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViConstString value)</p> <p>sds_GetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 bufSize, ViChar value[])</p> <p>Note: vi is the instrument handle. channelName is the position of advance measurement item. attributeld is SDS_ATTR_MEASURE_ADVANCED_SOURCEB macro. bufSize is passed the number of bytes you specified for the Attribute Value parameter in the ViChar array. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The position can be set to: {Pn}. n can be set from 1 to 12 The source can be set to: {Cx}. x can be set from 1 to 4</p> <p>Example: If you want to set the source of the first measurement item to C1, channelName enter P1, value enter "C1".</p>
Related Attribute	SDS_ATTR_MEASURE_ADVANCED_SOURCEA
High Level Functions	None

SDS_ATTR_MEASURE_ADVANCED_TYPE

Description	This attribute sets the type of the specified advance measurement item.
Data Type	ViString
Access	R/W
Common Control Functions	<p>sds_SetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViConstString value)</p> <p>sds_GetAttributeViString (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 bufSize, ViChar value[])</p> <p>Note: vi is the instrument handle. channelName is the position of advance measurement item. attributeld is SDS_ATTR_MEASURE_ADVANCED_TYPE macro. bufSize A is passed the number of bytes you specified for the Attribute Value parameter in the ViChar array. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The position can be set to: {Pn}. n can be set from 1 to 12 The type can be set to: {PKPK MAX MIN AMPL TOP BASE LEVELX CMEAN M EAN STDEV VSTD RMS CRMS MEDIAN CMEDIAN OV SN FPRE OVSP RPRE PER FREQ TMAX TMIN PWID NWID DUTY NDUTY WID NBWID DELAY TIMEL RISE FALL CCJ PAREA NAREA AREA ABSAREA PACA NA CA ACA ABSACA CYCLES REDGES FEDGES EDGES PPULSES NPULSES PHA SKEW FRR FRF FFR FFF L RR LRF LFR LFF}</p>
Related Attribute	SDS_ATTR_MEASURE_ADVANCED_VALUE
High Level Functions	None

SDS_ATTR_MEASURE_ADVANCED_VALUE

Description	This attribute returns the value of the specified advance measurement item. If the measured value is invalid, it returns -9999.99.
Data Type	ViReal64
Access	R/O
Common Control Functions	<p>sds_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Note: vi is the instrument handle. channelName is the position of advanced measurement item. attributeld is SDS_ATTR_MEASURE_ADVANCED_VALUE macro. value is used to store the value of function represented by attributeld.</p>
Value Range	<p>The position can be set to: {Pn}.</p> <p>n can be set from 1 to 12</p>
Related Attribute	SDS_ATTR_MEASURE_ADVANCED_TYPE
High Level Functions	None

SDS_ATTR_MEASURE_ADVANCED_STYLE

Description	This attribute specifies the display mode of the advanced measurement.									
Data Type	ViInt32									
Access	R/W									
High Level Functions	None									
Common Control Functions	<p>sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_ADVANCED_STYLE macro. value is used to store or set the value of function represented by attributeld.</p>									
Value Range	<table><tr><th>Type</th><th>Discrete Value</th><th>Value</th></tr><tr><td>M1</td><td>SDS_VAL_MEAS_ADV_STYLE_M1</td><td>0</td></tr><tr><td>M2</td><td>SDS_VAL_MEAS_ADV_STYLE_M2</td><td>1</td></tr></table>	Type	Discrete Value	Value	M1	SDS_VAL_MEAS_ADV_STYLE_M1	0	M2	SDS_VAL_MEAS_ADV_STYLE_M2	1
Type	Discrete Value	Value								
M1	SDS_VAL_MEAS_ADV_STYLE_M1	0								
M2	SDS_VAL_MEAS_ADV_STYLE_M2	1								
Related Attribute	SDS_ATTR_MEASURE_MODE									
High Level Functions	None									

SDS_ATTR_MEASURE_ADVANCED_LINENUMBER

Description	This attribute specifies the total number of advanced measurement items displayed.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_ADVANCED_LINENUMBER macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	[1,12]
Related Attribute	SDS_ATTR_MEASURE_ADVANCED_STYLE
High Level Functions	None

SDS_ATTR_MEASURE_ADVANCED_STATISTICS

Description	This attribute turns on or off the measurement statistics.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sds_SetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sds_GetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_ADVANCED_STATISTICS macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means to enable measurement statistics VI_FALSE means to disable measurement statistics
Related Attribute	SDS_ATTR_MEASURE_MODE
High Level Functions	None

SDS_ATTR_MEASURE_ADVANCED_STATISTICS_HISTOGRAM

Description	This attribute turns on or off the measurement histogram.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sds_SetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sds_GetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_ADVANCED_STATISTICS_HISTOGRAM macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means to enable measurement histogram VI_FALSE means to disable measurement histogram
Related Attribute	SDS_ATTR_MEASURE_ADVANCED_STATISTICS
High Level Functions	None

SDS_ATTR_MEASURE_ADVANCED_STATISTICA_MAXCOUNT

Description	This attribute specifies the maximum value of the statistics count.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sds_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sds_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_ADVANCED_STATISTICA_MAXCOUNT macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	[0,1024]
Related Attribute	SDS_ATTR_MEASURE_ADVANCED_STATISTICS
High Level Functions	None

SDS_ATTR_MEASURE_ADVANCED_STATISTICS_RESET

Description	This attribute resets the measurement statistics.
Data Type	ViBoolean
Access	WO
Common Control Functions	<p>sds_SetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>Note: vi is the instrument handle. channelName is NULL. attributeld is SDS_ATTR_MEASURE_ADVANCED_STATISTICS_RESET macro. value is used to set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means to restart measurement statistics
Related Attribute	SDS_ATTR_MEASURE_ADVANCED_STATISTICS
High Level Functions	None

High Level Functions

Some high level functions are available to set multiple attributes.

- **sds_InitWithOptions(ViRsrc resourceName, ViBoolean IDQuery, ViBoolean resetDevice, ViConstString optionString, ViSession *newVi)**

This function creates a new IVI session.

Parameter	Description
resourceName	This parameter specifies the resource name of the instrument
IDQuery	To perform ID query or not
resetDevice	To reset the device or not
optionString	This parameter is the option string sets to the InitWithOptions function of the instrument driver. It includes settings for Simulate, RangeCheck, QueryInstrStatus and Cache
*newVi	Instrument handle
Example: <pre>sds_InitWithOptions("USB0::0xF4EC::0x1013::0123456789::INSTR", VI_TRUE, VI_FALSE, "Simulate=0,RangeCheck=1,QueryInstrStatus=0,Cache=0", &session);</pre>	

Notes: Siglent's driver 1.0 does not support simulation, cache, range check and querying instrument status. Therefore, it is only useful when connecting to an actual instrument. You should initiate the instrument by calling sds_InitWithOptions() before using it, and input the parameters we suggested except argument resourceName.

➤ **sds_Abort (ViSession vi)**

This function aborts a previously initiated acquisition.

Parameter	Description
vi	Instrument handle
Example: sds_Abort(session);	

➤ **sds_FetchWaveform(ViSession vi, ViConstString channel, ViInt32 waveformSize, ViReal64 waveform[], ViInt32 *actualPoints, ViReal64 *initialX, ViReal64 *xIncrement)**

This function fetches a waveform from a specified channel from a previously initiated acquisition.

Parameter	Description
vi	Instrument handle
channel	Name of the channel from which to fetch a waveform.
waveformSize	Specifies the number of elements in the waveform array.
waveform[]	A user-allocated buffer into which the acquired waveform is stored.
*actualPoints	Number of points actually placed in the waveform array.
*initialX	The time in relation to the Trigger Event of the first point in the waveform in seconds.
*xIncrement:	The effective time between points in the acquired waveform in seconds.
Example: sds_FetchWaveform(session,"CHAN1",256,waveform,&actualPoints,&initialX,&xIncrement);	

- **sds_ReadWaveform** (ViSession vi, ViConstString channel, Vilnt32 waveformSize, Vilnt32 maxTime, ViReal64 waveform[], Vilnt32 *actualPoints, ViReal64 *initialX, ViReal64 *xIncrement)

This function initiates a new waveform acquisition and returns a waveform from a specific channel.

Parameter	Description
vi	Instrument handle
channel	Name of the channel from which to read a waveform
waveformSize	Specifies the number of elements in the waveform array.
maxTime	Specifies the maximum time the end-user allows for this function to complete in milliseconds.
waveform[]	A user-allocated buffer into which the acquired waveform is stored.
*actualPoints	Contains the number of points the driver actually places in the waveform array.
*initialX	Contains the time of the first point in the waveform.
*xIncrement:	Contains the effective time between points in the waveform. The units are seconds.
Example: sds_ReadWaveform(session,"CHAN1",200,256,waveform, &actualPoints, &initialX, &xIncrement);	

- **sds_ActualRecordLength** (ViSession vi, Vilnt32 *actualRecordLength)

This function returns the actual waveform record length the oscilloscope acquires.

Parameter	Description
vi	Instrument handle

*actualRecordLength	Record length
Example: sds_ActualRecordLength(session,&value32);	

➤ **sds_InitiateAcquisition (ViSession vi)**

This function initiates waveform acquisition.

Parameter	Description
vi	Instrument handle
Example: sds_InitiateAcquisition(session);	

➤ **sds_SampleRate (ViSession vi, ViReal64 *sampleRate)**

This function returns the effective sample rate of the oscilloscope.

Parameter	Description
vi	Instrument handle
*sampleRate	Effective sample rate
Example: sds_SampleRate(session,&value64);	

➤ **sds_IsInvalidWfmElement (ViSession vi, ViReal64 elementValue, ViBoolean *isInvalid)**

This function takes one of the Waveform Array's element value that you obtain from the ReadWaveform or FetchWaveform function and determines if the value is a valid measurement value or a value indicating that the oscilloscope could not sample a voltage.

Parameter	Description
vi	Instrument handle
elementValue	Specify the value for which you want to determine the type
*isInvalid	The result of judgment
Example: sds_IsInvalidWfmElement(session,1,&isinvalid);	

- **sds_GetChannelName (ViSession vi, ViInt32 index, ViInt32 bufferSize, ViChar name[])**

This function returns the highest-level channel name that corresponds to the specific driver channel string that is in the channel table at an index you specify.

Parameter	Description
vi	Instrument handle
index	Specified index
bufferSize	The length of the channel name
name[]	Channel name storage location
Example: sds_GetChannelName(session,1,256,str);	

- **sds_ConfigureAcquisitionType (ViSession vi, ViInt32 acquisitionType)**

This function sets the acquisition mode.

Parameter	Description
vi	Instrument handle
acquisitionType	Acquisition mode

Example:

```
sds_ConfigureAcquisitionType (session,0);
```

- **sds_ConfigureAcquisitionRecord (ViSession vi, ViReal64 timePerRecord, ViInt32 minimumRecordLength, ViReal64 acqStartTime)**

This function configures the most common attributes of the horizontal subsystem

Parameter	Description
vi	Instrument handle
timePerRecord	Time base
minimumRecordLength	Memory depth
acqStartTime	Time delay
Example : sds_ConfigureAcquisitionRecord (session,1e-3, 5, 2e-3);	

- **sds_ConfigureInterpolation (ViSession vi, ViInt32 interpolation)**

This function sets the interpolation method.

Parameter	Description
vi	Instrument handle
interpolation	The way of interpolation
Example: sds_ConfigureInterpolation (session, 2);	

- **sds_ConfigureChannel (ViSession vi, ViConstString channel, ViReal64 range, ViReal64 offset, ViInt32 coupling, ViReal64 probeAttenuation, ViBoolean enabled)**

This function configures the vertical subsystem.

Parameter	Description
vi	Instrument handle
channel	Channel name
range	Vertical scale
offset	Vertical offset
coupling	Coupling mode
probeAttenuation	Probe attenuation
enabled	The state of the selected channel
Example: sds_ConfigureChannel(session,"CHAN1",1e+1,2e+1,0,1e+1,VI_TRUE);	

- **sds_ConfigureChanCharacteristics (ViSession vi, ViConstString channel, ViReal64 inputImpedance, ViReal64 maxInputFrequency)**

This function configures the less common attributes of the vertical subsystem.

Parameter	Description
vi	Instrument handle
channel	Channel name
inputImpedance	Impedence
maxInputFrequency	Bandwidth limit
Example: sds_ConfigureChanCharacteristics (session,"CHAN1", 5e+1, 2e+7);	

- **sds_ConfigureTrigger (ViSession vi, ViInt32 triggerType, ViReal64 holdoff)**

This function configures the common triggering attributes.

Description	Description
vi	Instrument handle

triggerType	Trigger type
holdoff	Holdoff time
Example: sds_ConfigureTrigger (session, 1, 8e-6);	

➤ **sds_ConfigureTriggerCoupling (ViSession vi, VInt32 coupling)**

This function configures the trigger coupling.

Description	Description
vi	Instrument handle
coupling	Coupling mode
Example: sds_ConfigureTriggerCoupling (session, 0);	

➤ **sds_ConfigureTriggerModifier (ViSession vi, VInt32 modifier)**

This function configures the trigger modifier.

Description	Description
vi	Instrument handle
modifier	Trigger mode
Example: sds_ConfigureTriggerModifier (session, 1);	

➤ **sds_ConfigureEdgeTriggerSource (ViSession vi, VInt32 source, ViReal64 level, VInt32 slope)**

This function configures the edge triggering.

Description	Description
vi	Instrument handle

source	Trigger source
level	Trigger level
slope	Trigger slope
Example: sds_ConfigureEdgeTriggerSource (session, "C1", 1e+0, 1);	

- **sds_ConfigureTVTriggerSource (ViSession vi, ViConstString source, ViInt32 TVSignalFormat, ViInt32 TVEvent, ViInt32 TVPolarity)**

This function configures the TV triggering.

Description	Description
vi	Instrument handle
source	Trigger source
TVSignalFormat	The video standard
TVEvent	Not supported. Can be set to any value
TVPolarity	Not supported. Can be set to any value
Example: sds_ConfigureTVTriggerSource (session, "C1", 1, 0, 0);	

- **sds_ConfigureTVTriggerLineNumber (ViSession vi, ViInt32 lineNumber)**

This function configures the line number of TV triggering.

Description	Description
vi	Instrument handle
lineNumber	The line number
Example: sds_ConfigureTVTriggerLineNumber (session, 200);	

- **sds_ConfigureRuntTriggerSource (ViSession vi, ViConstString source, ViReal64 runtLowThreshold, ViReal64 runtHighThreshold, ViInt32 runtPolarity)**

This function configures the runt triggering.

Description	Description
vi	Instrument handle
source	Trigger source
runtLowThreshold	The lower trigger level
runtHighThreshold	The upper trigger level
runtPolarity	Trigger polarity
Example: sds_ConfigureRuntTriggerSource (session, "C1", -1e+0, 1e+0, 1);	

- **sds_ConfigureGlitchTriggerSource (ViSession vi, ViConstString source, ViReal64 level, ViReal64 glitchWidth, ViInt32 glitchPolarity, ViInt32 glitchCondition)**

This function configures the glitch triggering.

Description	Description
vi	Instrument handle
source	Trigger source
level	Trigger level
glitchWidth	Not supported. Can be set to any value
glitchPolarity	Trigger polarity
glitchCondition	The limit range type
Example: sds_ConfigureGlitchTriggerSource(session, "C1", 1e+0, 15e-1, 1, 1);	

➤ **sds_AutoSetup(ViSession vi)**

This function performs an autosetup on the instrument.

Description	Description
vi	Instrument handle
Example: sds_AutoSetup(session);	

IVI-C Driver Programming Example

The example is running in an environment where NI VISA 5.4, LabWindow/CVI 2017, and IVI Compliance Package 15.0 are installed.

Using dynamic link library

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <Windows.h>
#include "sds.h"

#define SDS_EXAMPLE_INSTR_RES_ADDR
"TCPIP0::10.12.255.134::inst0::INSTR"
#define SDS_EXAMPLE_INIT_OPTION
"Simulate=0,RangeCheck=0,QueryInstrStatus=0,Cache=1"
#define BUFFER_SIZE 512L

ViSession session;
ViStatus status;

void main()
{
    ViChar    str[BUFFER_SIZE];
    //Connect the instrument
    status = sds_InitWithOptions(SDS_EXAMPLE_INSTR_RES_ADDR, VI_TRUE,
VI_FALSE, SDS_EXAMPLE_INIT_OPTION, &session);
    //Configure settings for channel 1
    sds_ConfigureChannel(session,"CHAN1",1e+1,2e+1,0,1e+1,VI_TRUE);
    //Open measurement
    sds_SetAttributeViBoolean(session,VI_NULL,SDS_ATTR_MEASURE_ENABLED,VI
_TRUE);
    //Query simple measurement source
    sds_GetAttributeViString(session,VI_NULL,SDS_ATTR_MEASURE_SIMPLE_SOUR
CE,BUFFER_SIZE,str);
```

```
printf("SDS_ATTR_MEASURE_SIMPLE_SOURCE = %s\n",str);

system("cmd /C pause");
}
```

SDS Series

Digital Oscilloscope

About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

Headquarters:

SIGLENT Technologies Co., Ltd
Add: Bldg No.4 & No.5, Antongda Industrial
Zone, 3rd Liuxian Road, Bao'an District,
Shenzhen, 518101, China
Tel: + 86 755 3688 7876
Fax: + 86 755 3359 1582
Email: sales@siglent.com
Website: int.siglent.com

USA:

SIGLENT Technologies America, Inc
6557 Cochran Rd Solon, Ohio 44139
Tel: 440-398-5800
Toll Free: 877-515-5551
Fax: 440-399-1211
Email: info@siglent.com
Website: www.siglentna.com

Europe:

SIGLENT Technologies Germany GmbH
Add: Staetzlinger Str. 70
86165 Augsburg, Germany
Tel: +49(0)-821-666 0 111 0
Fax: +49(0)-821-666 0 111 22
Email: info-eu@siglent.com
Website: www.siglenteu.com

Follow us on
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