

Function Generator

IVI-C Programming Guide

EN02A

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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 E02A at Introduction

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

Models Supported

The series of SIGLENT Function Generator supporting this IVI-C driver is shown below.

Series	Release Version Supporting IVI-C Driver
SDG1000X	1.01.01.33R1B5 and higher
SDG1000XPLUS	V1P.1.1.1.41R2 and higher
SDG2000X	2.01.01.23R5 and higher
SDG3000X	1.1.1.7 and higher
SDG6000X	6.01.01.33R2 and higher
SDG7000A	1.1.1.26 and higher
SDG8000A	1.1.1.7 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.

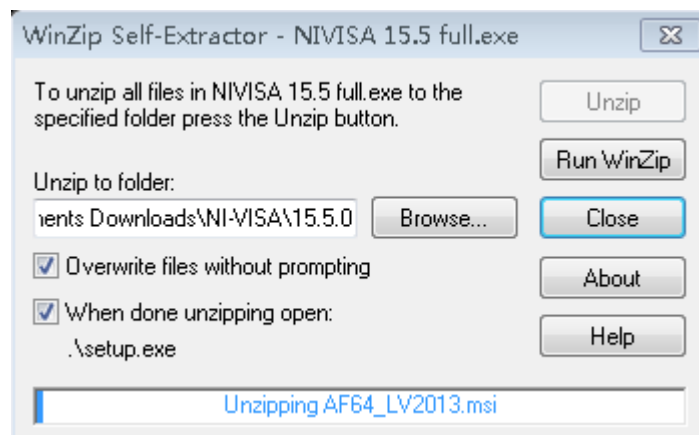
Install NI-MAX

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>.

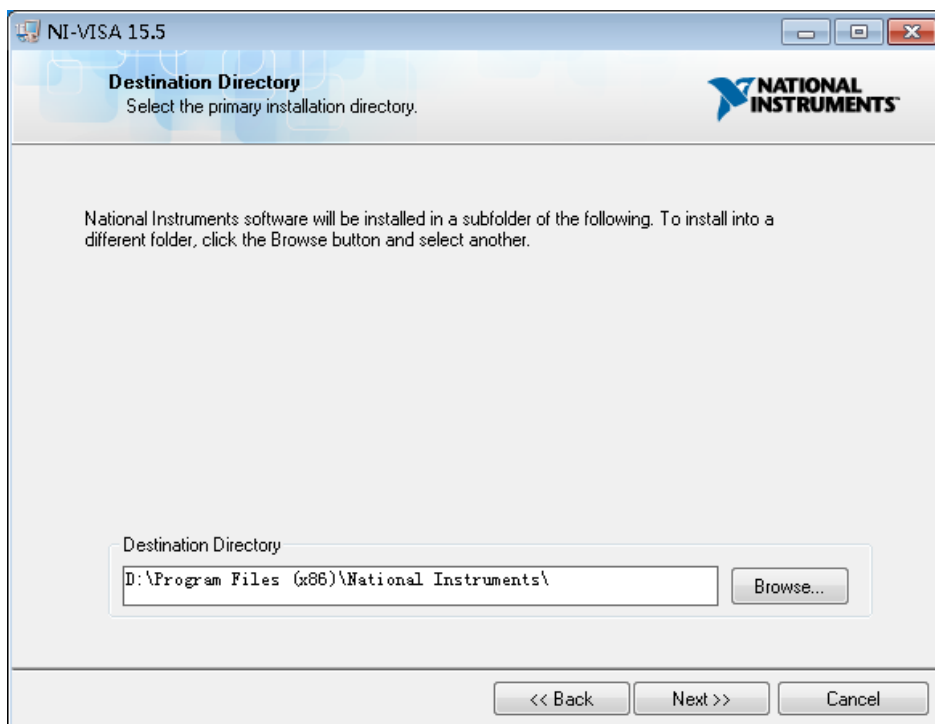
- a. Double click the NIVISA 15.5 full.exe, a dialog will be shown as below:



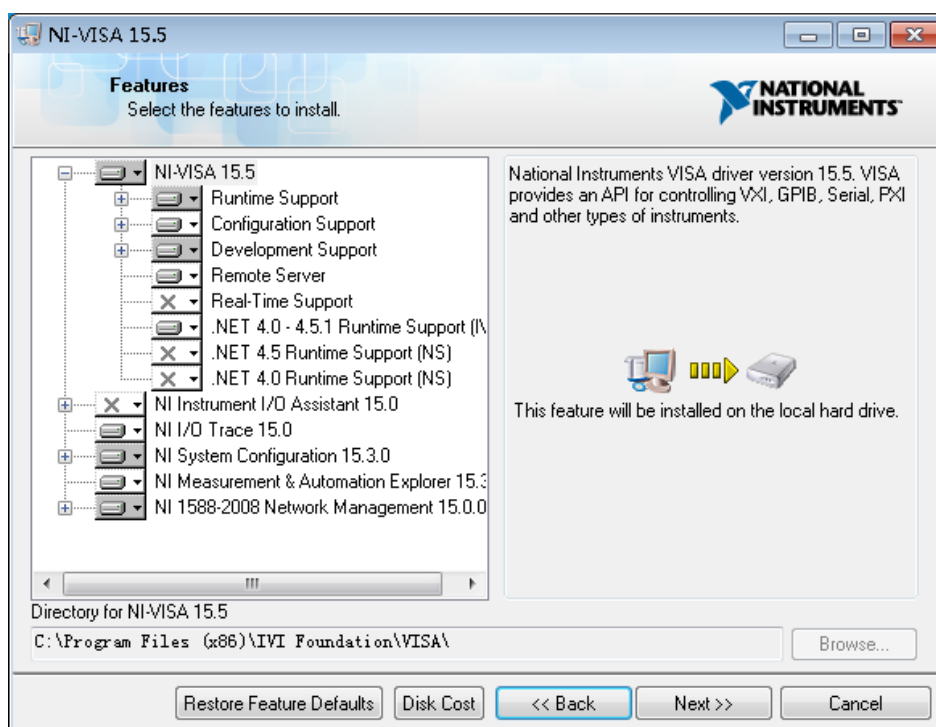
- b. Click Unzip, the installation process will automatically launch after unzipping files. If your computer needs to install .NET Framework 4, it may auto start.



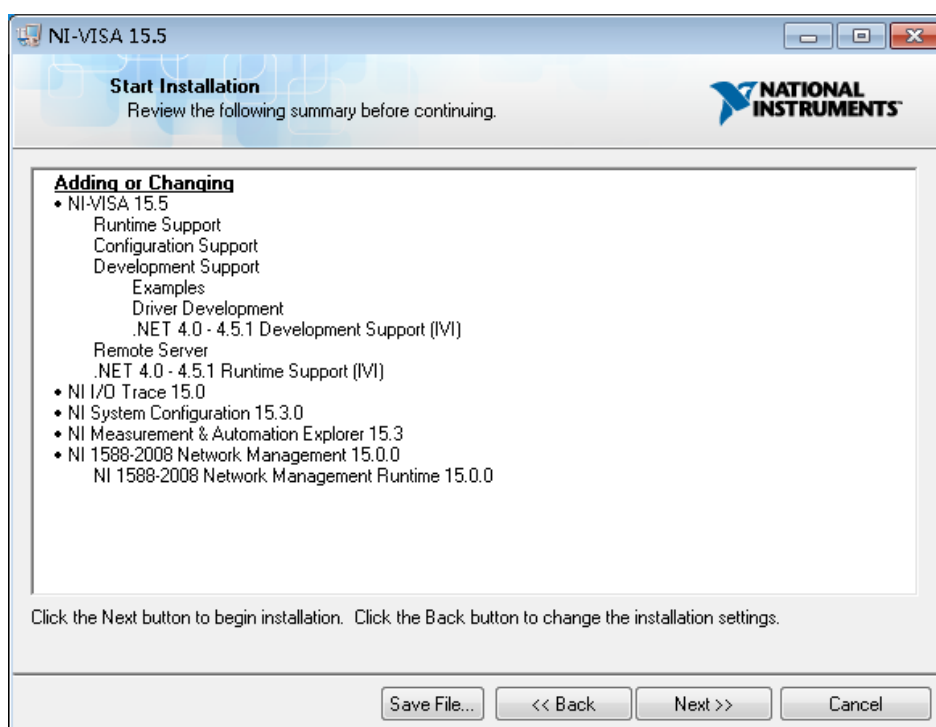
- c. The NI-VISA installing dialog is shown above. Click Next to start the installation process.



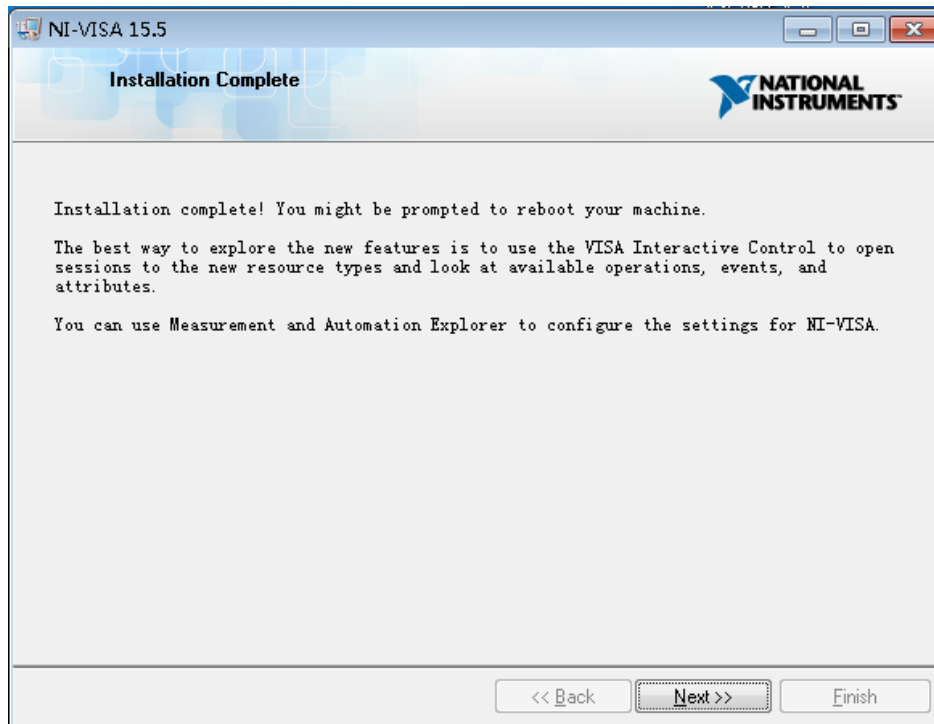
- d. Set the install path. The default path is "C:\Program Files\National Instruments\". You can change it. Click Next.



- 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.

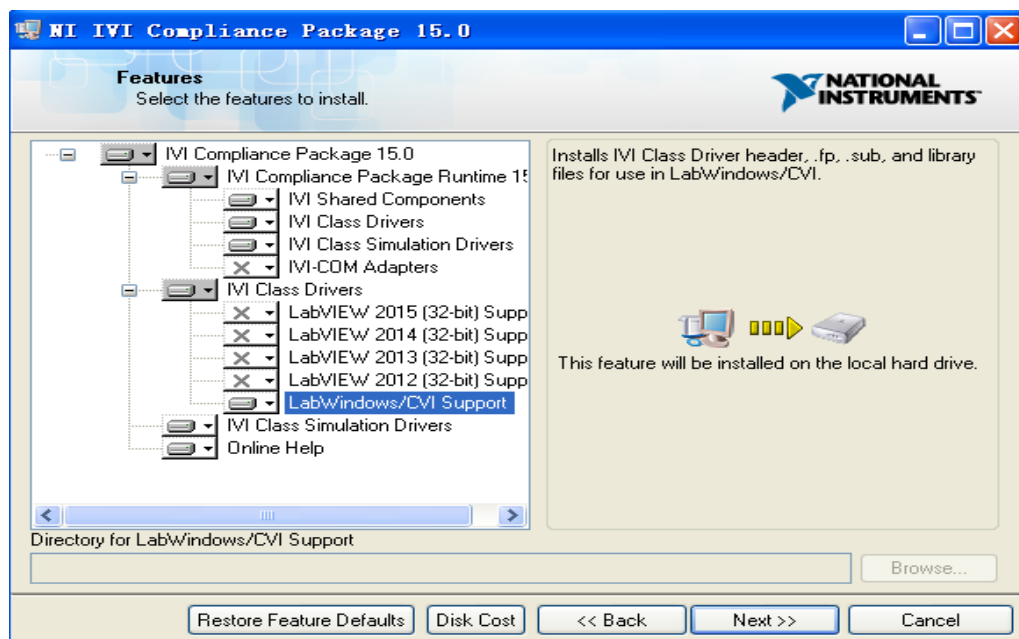
Install the IVI Compliance Package

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

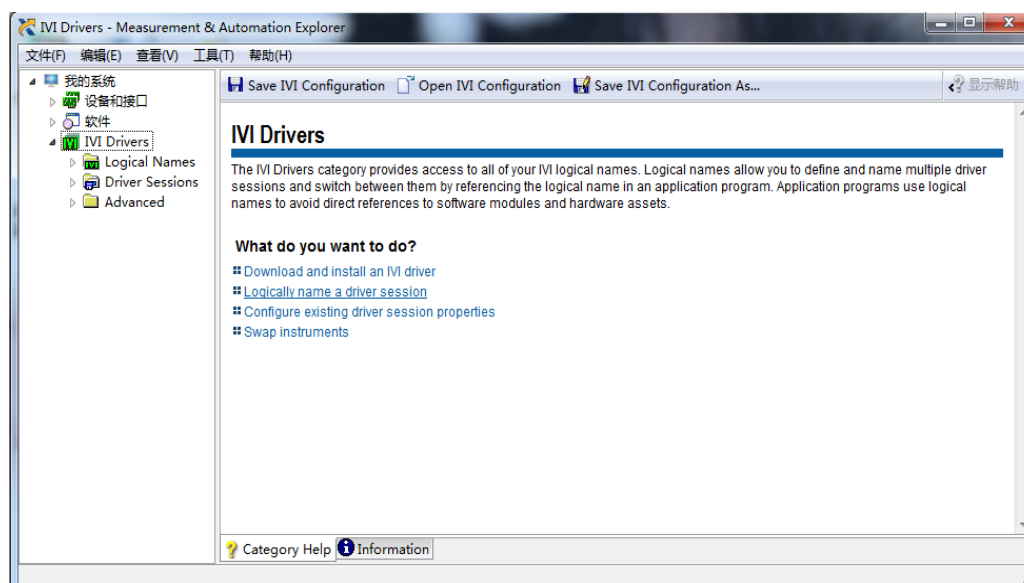
You can get the IVI Compliance Package from

<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.



SDG IVI-C Driver Package List

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

File	Description
sdg.dll/sdg_64.dll	A dynamic link library file, including variables, functions, and data interfaces for various attributes.
sdg.lib/sdg_64.lib	An import library file, including the symbolic name and optional identification number of each exported function in the sdg.dll file.
sdg.h	A header file, including declarations of variables, functions, and data interfaces.

You include the sdg.h when programming the Siglent Function Generator with the IVI driver, and load the sdg.dll dynamic file or sdg.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 `sdg_SetAttribute` or `sdg_GetAttribute` functions.

SetAttribute Function Group

- `sdg_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)`

Example: When you want to set the burst count, you can call the `SetAttribute` function to change the burst count.

`sdg_SetAttributeViInt32 (vi, channelName, SDG_ATTR_OPERATION_MODE, SDG_VAL_OPERATE_BURST);`

where,

vi: The instrument handle.

channelName: A constant string that represents the channelName and shows that this **SDG_ATTR_OPERATION_MODE** attribute is corresponding to that specific mode.

SDG_VAL_OPERATE_BURST: Set the value to mode.

- `sdg_SetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)`

Example: When you want to set the signal amplitude of the function generator, you can call the `SetAttribute` or `GetAttribute` function to change or get the amplitude.

`sdg_SetAttributeViReal64(vi, channelName, SDG_ATTR_FUNC_AMPLITUDE, value);`

where,

vi: Instrument Handle.

channelName: A constant string that represents the channelName and shows that this **SDG_ATTR_FUNC_AMPLITUDE** attribute is corresponding to that specific mode.

value: Set the value to value.

- `sdg_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.

```
sdg_SetAttributeViBoolean(session,"CHAN1", SDG_ATTR_OUTPUT_ENABLED,
VI_FALSE);
```

where,

session: The instrument handle.

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

VI_FALSE: This means turning channel 1 off.

GetAttribute Function Group

- `sdg_GetAttributeViReal64 (ViSession vi, ViConstString channelName, ViAttr attributId, ViReal64 *value)`

Example: When you want to set the signal amplitude of the function generator, you can call the SetAttribute or GetAttribute function to change or get the amplitude.

```
sdg_GetAttributeViReal64(session,"CHAN1", SDG_ATTR_FUNC_AMPLITUDE, &value64);
```

where,

session: The instrument handle.

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

value64: A variable of type ViReal64, which is used to store the return value of signal amplitude query.

- `sdg_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributId, ViInt32 *value)`

Example: When you want to get the burst count, you can call the GetAttribute function to change the burst count.

```
sdg_GetAttributeViInt32(session,"CHAN1",SDG_ATTR_OPERATION_MODE, &value32);
```

where,

session: The instrument handle.

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

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

- `sdg_GetAttributeViBoolean (ViSession vi, ViConstString channelName, ViAttr attributId,`

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.

```
sdg_GetAttributeViBoolean(session,"CHAN1", SDG_ATTR_OUTPUT_ENABLED,  
&boolean);
```

where,

session: The instrument handle.

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

SDG_ATTR_OUTPUT_ENABLED attribute is corresponding to this specific channel.

boolean: A ViBoolean 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
Basic Operation	SDG_ATTR_MACHINE_MODEL
	SDG_ATTR_OPERATION_MODE
	SDG_ATTR_OUTPUT_COUNT
	SDG_ATTR_REF_CLOCK_SOURCE
	SDG_ATTR_OUTPUT_ENABLED
	SDG_ATTR_OUTPUT_IMPEDANCE
Standard Function Output	SDG_ATTR_FUNC_WAVEFORM
	SDG_ATTR_FUNC_AMPLITUDE
	SDG_ATTR_FUNC_DC_OFFSET
	SDG_ATTR_FUNC_FREQUENCY
	SDG_ATTR_FUNC_START_PHASE
	SDG_ATTR_FUNC_DUTY_CYCLE_HIGH
	SDG_ATTR_FUNC_RAMP_SYMMETRY
Arbitrary Waveform Output	SDG_ATTR_ARB_GAIN
	SDG_ATTR_ARB_OFFSET
	SDG_ATTR_ARB_SAMPLE_RATE
	SDG_ATTR_ARB_WAVEFORM_HANDLE
	SDG_ATTR_MAX_NUM_WAVEFORMS
	SDG_ATTR_MAX_WAVEFORM_SIZE
	SDG_ATTR_MIN_WAVEFORM_SIZE
	SDG_ATTR_WAVEFORM_QUANTUM
	SDG_ATTR_ARB_FREQUENCY
Harmonic	SDG_ATTR_HARMONIC_ENABLED
	SDG_ATTR_HARMONIC_ORDER
	SDG_ATTR_HARMONIC_SN
	SDG_ATTR_HARMONIC_AMPL
	SDG_ATTR_HARMONIC_PHASE
	SDG_ATTR_HARMONIC_TYPE
Counter	SDG_ATTR_COUNTER_STATISTICS_STATE
	SDG_ATTR_COUNTER_STATE

	SDG_ATTR_COUNTER_HF
	SDG_ATTR_COUNTER_COUPING
	SDG_ATTR_COUNTER_IMPEDANCE
	SDG_ATTR_COUNTER_LEVE
Bursting	SDG_ATTR_BURST_NCYCLES_ENABLED
	SDG_ATTR_BURST_GATED_ENABLED
	SDG_ATTR_BURST_INFINITY_ENABLED
	SDG_ATTR_BURST_GATE_POLARITY
	SDG_ATTR_BURST_INTERNAL_PERIOD
	SDG_ATTR_BURST_PHASE
	SDG_ATTR_BURST_TDELAY
	SDG_ATTR_BURST_TRIGGER_SLOPE
	SDG_ATTR_BURST_TRIGGER_SOURCE
	SDG_ATTR_BURST_TRIGGER_TRIGOUT
	SDG_ATTR_BURST_COUNT
Sweep	SDG_ATTR_SWEEP_STATE
	SDG_ATTR_SWEEP_TIME
	SDG_ATTR_SWEEP_TRIGGER_SLOPE
	SDG_ATTR_SWEEP_TRIGGER_SOURCE
	SDG_ATTR_SWEEP_TRIGGER_TRIGOUT
	SDG_ATTR_SWEEP_TYPE
	SDG_ATTR_SWEEP_DIRECTION
	SDG_ATTR_SWEEP_FREQUENCY_CENTER
	SDG_ATTR_SWEEP_FREQUENCY_SPAN
	SDG_ATTR_SWEEP_FREQUENCY_START
	SDG_ATTR_SWEEP_FREQUENCY_STOP
	SDG_ATTR_SWEEP_FREQUENCY_START_RECORD
	SDG_ATTR_SWEEP_FREQUENCY_STOP_RECORD
IQ	SDG_ATTR_IQ_FREQUENCY_CENTER
	SDG_ATTR_IQ_SAMPLE_RATE
	SDG_ATTR_IQ_SYMBOL_RATE
	SDG_ATTR_IQ_AMPLITUDE
	SDG_ATTR_IQ_TRIGGER_SOURCE
	SDG_ATTR_IQ_ADJ_GAIN

	SDG_ATTR_IQ_ADJ_I_OFFSET
	SDG_ATTR_IQ_ADJ_Q_OFFSET
	SDG_ATTR_IQ_ADJ_Q_SKEW
	SDG_ATTR_IQ_WAVE_BUILT_IN
	SDG_ATTR_IQ_WAVE_USER
PRBS	SDG_ATTR_PRBS_BITRATE
	SDG_ATTR_PRBS_AMPLITUDE
	SDG_ATTR_PRBS_OFFSET
	SDG_ATTR_PRBS_LENGTH
	SDG_ATTR_PRBS_EDGE
	SDG_ATTR_PRBS_DIFFSTATE
	SDG_ATTR_PRBS_LOGIC_STATE
Modulation	SDG_ATTR_MOD_TYPE
	SDG_ATTR_MOD_STATE
	SDG_ATTR_AM_ENABLED
	SDG_ATTR_AM_SOURCE
	SDG_ATTR_AM_INTERNAL_DEPTH
	SDG_ATTR_AM_INTERNAL_WAVEFORM
	SDG_ATTR_AM_INTERNAL_FREQUENCY
	SDG_ATTR_FM_ENABLED
	SDG_ATTR_FM_SOURCE
	SDG_ATTR_FM_INTERNAL_DEVIATION
	SDG_ATTR_FM_INTERNAL_WAVEFORM
	SDG_ATTR_FM_INTERNAL_FREQUENCY
	SDG_ATTR_PM_ENABLED
	SDG_ATTR_PM_SOURCE
	SDG_ATTR_PM_DEVIATION
	SDG_ATTR_PM_INTERNAL_WAVEFORM
	SDG_ATTR_PM_INTERNAL_FREQUENCY
	SDG_ATTR_ASK_ENABLED
	SDG_ATTR_ASK_SOURCE
	SDG_ATTR_ASK_INTERNAL_RATE
	SDG_ATTR_ASK_AMPLITUDE
	SDG_ATTR_FSK_ENABLED

	SDG_ATTR_FSK_SOURCE
	SDG_ATTR_FSK_FREQUENCY
	SDG_ATTR_FSK_INTERNAL_RATE
	SDG_ATTR_PSK_ENABLED
	SDG_ATTR_PSK_SOURCE
	SDG_ATTR_PSK_POLARITY
	SDG_ATTR_PSK_PHASE
	SDG_ATTR_PSK_INTERNAL_RATE
	SDG_ATTR_PWM_ENABLED
	SDG_ATTR_PWM_SOURCE
	SDG_ATTR_PWM_DEVIATION_WIDTH
	SDG_ATTR_PWM_INTERNAL_WAVEFORM
	SDG_ATTR_PWM_INTERNAL_FREQUENCY
	SDG_ATTR_PULSE_WIDTH
	SDG_ATTR_PULSE_DELAY

Basic Operation

Attributes that control the basic features of the function generator. The basic group has the following attributes:

- ◆ **SDG_ATTR_MACHINE_MODEL**
- ◆ **SDG_ATTR_OPERATION_MODE**
- ◆ **SDG_ATTR_OUTPUT_COUNT**
- ◆ **SDG_ATTR_REF_CLOCK_SOURCE**
- ◆ **SDG_ATTR_OUTPUT_ENABLED**
- ◆ **SDG_ATTR_OUTPUT_IMPEDANCE**

SDG_ATTR_MACHINE_MODEL

Description This attribute is used to store the specific machine model.

Data type Vilnt32

Access R/W

Common Control Functions `sdg_SetAttributeViReal64` (ViSession vi, ViConstString channelName, ViAttr attributeld, Vilnt32 value)

`sdg_GetAttributeViReal64` (ViSession vi, ViConstString channelName, ViAttr attributeld, Vilnt32 *value)

Notes:

vi is the instrument handle.

channelName is one of the following analog inputs:

CHAN1, CHAN2, CHAN3, CHAN4.

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_MACHINE_MODEL macro.

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

Value Range

Type	Discrete Value	Value
SDG1012X	SDG_VAL_MACHINE_MODEL_SDG1012X	0
SDG1032X	SDG_VAL_MACHINE_MODEL_SDG1032X	1
SDG1062X	SDG_VAL_MACHINE_MODEL_SDG1062X	2
SDG2042X	SDG_VAL_MACHINE_MODEL_SDG2042X	3
SDG2082X	SDG_VAL_MACHINE_MODEL_SDG2082X	4
SDG2122X	SDG_VAL_MACHINE_MODEL_SDG2122X	5
SDG6022X	SDG_VAL_MACHINE_MODEL_SDG6022X	6
SDG6032X	SDG_VAL_MACHINE_MODEL_SDG6032X	7
SDG6052X	SDG_VAL_MACHINE_MODEL_SDG6052X	8
SDG7102A	SDG_VAL_MACHINE_MODEL_SDG7102A	9
SDG7052A	SDG_VAL_MACHINE_MODEL_SDG7052A	10
SDG7032A	SDG_VAL_MACHINE_MODEL_SDG7032A	11
SDG1022XP	SDG_VAL_MACHINE_MODEL_SDG1022XP	12
SDG1032XP	SDG_VAL_MACHINE_MODEL_SDG1032XP	13
SDG1062XP	SDG_VAL_MACHINE_MODEL_SDG1062XP	14
SDG3082X	SDG_VAL_MACHINE_MODEL_SDG3082X	15
SDG3162X	SDG_VAL_MACHINE_MODEL_SDG3162X	16
SDG3202X	SDG_VAL_MACHINE_MODEL_SDG3202X	17
SDG8002A	SDG_VAL_MACHINE_MODEL_SDG8002A	18
SDG8004A	SDG_VAL_MACHINE_MODEL_SDG8004A	19

Related Attribute NULL

High Level Functions NULL

SDG_ATTR_OPERATION_MODE

Description This channel-based attribute determines how the function generator produces waveforms.

Data type ViInt32

Access R/W

Common Control Functions `sdg_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)`

`sdg_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)`

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_OPERATION_MODE macro.

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

Value Range

Type	Discrete Value	Value
CONT	SDG_VAL_OPERATE_CONTINUOUS	0
BURST	SDG_VAL_OPERATE_BURST	1

Related Attribute SDG_ATTR_OUTPUT_IMPEDANCE
SDG_ATTR_OUTPUT_ENABLED
SDG_ATTR_REF_CLOCK_SOURCE
SDG_ATTR_OUTPUT_COUNT

High Level Functions `sdg_ConfigureOperationMode`
`sdg_ConfigureBurstCount`
`sdg_ConfigureBurstStartPhase`

SDG_ATTR_OUTPUT_COUNT

Description	Returns the number of available output channels.
Data type	ViInt32
Access	R
Common Control Functions	<p>sdg_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4. Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_OUTPUT_COUNT macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	NULL.
Related Attribute	SDG_ATTR_OUTPUT_IMPEDANCE SDG_ATTR_OUTPUT_ENABLED SDG_ATTR_REF_CLOCK_SOURCET SDG_ATTR_OPERATION_MODE
High Level Functions	NULL

SDG_ATTR_REF_CLOCK_SOURCE

Description Specifies the reference clock source. The function generator derives frequencies and sample rates that it uses to generate waveforms from the source you specify.

Data Type ViInt32

Access R/W

Common Control Functions `sdg_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)`

`sdg_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)`

Notes:

vi is the instrument handle.

channelName is NULL.

attributeld is SDG_ATTR_REF_CLOCK_SOURCE macro.

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

Value Range

Type	Discrete Value	Value
INT	SDG_VAL_REF_CLOCK_INTERNAL	0
EXT	SDG_VAL_REF_CLOCK_EXTERNAL	1
10MOUT,ON	SDG_VAL_REF_CLOCK_INTERNAL	2
10MOUT,OFF	SDG_VAL_REF_CLOCK_INTERNAL	3

Notes:

When the SDG_ATTR_MACHINE_MODEL is SDG8000A , SDG7000A , SDG6000X&SDG3000X, all types are satisfied, otherwise only "INT" and "EXT" are included

Related Attribute SDG_ATTR_OUTPUT_IMPEDANCE
SDG_ATTR_OPERATION_MODE
SDG_ATTR_OUTPUT_ENABLED
SDG_ATTR_OUTPUT_COUNT

High Level Functions `sdg_ConfigureChannel`

SDG_ATTR_OUTPUT_ENABLED

Description	This channel-based attribute specifies whether the signal the function generator produces appears at the output connector.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_OUTPUT_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means Output is on VI_FALSE means Output is off
Related Attribute	SDG_ATTR_OUTPUT_IMPEDANCE SDG_ATTR_OPERATION_MODE SDG_ATTR_REF_CLOCK_SOURCET SDG_ATTR_OUTPUT_COUNT
High Level Functions	sdg_ConfigureOutputEnabled

SDG_ATTR_OUTPUT_IMPEDANCE

Description	This channel-based attribute specifies the function generator's output impedance at the output connector.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_OUTPUT_IMPEDANCE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	Its value must be between 50 and 1000000. 1000000 indicates that the function generator is connected to a high impedance load.
Related Attribute	SDG_ATTR_OUTPUT_ENABLED SDG_ATTR_OPERATION_MODE SDG_ATTR_REF_CLOCK_SOURCET SDG_ATTR_OUTPUT_COUNT
High Level Functions	sdg_ConfigureOutputImpedance

Standard Function Output

Attributes for generating standard function waveform output. You use this group of attributes when you set the `SDG_ATTR_OUTPUT_MODE` attribute to `SDG_VAL_OUTPUT_FUNC`. You can use the `sdg_ConfigureStandardWaveform` function to set all these attributes except `SDG_ATTR_FUNC_DUTY_CYCLE_HIGH`.

The Standard Function group has the following attributes:

- ◆ **SDG_ATTR_FUNC_WAVEFORM**
- ◆ **SDG_ATTR_FUNC_AMPLITUDE**
- ◆ **SDG_ATTR_FUNC_DC_OFFSET**
- ◆ **SDG_ATTR_FUNC_FREQUENCY**
- ◆ **SDG_ATTR_FUNC_START_PHASE**
- ◆ **SDG_ATTR_FUNC_DUTY_CYCLE_HIGH**
- ◆ **SDG_ATTR_FUNC_RAMP_SYMMETRY**

SDG_ATTR_FUNC_WAVEFORM

Description	This channel-based attribute specifies which standard waveform the function generator produces.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_FUNC_WAVEFORM macro.

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

Value Range

Type	Discrete Value	Value
SINE	SDG_VAL_WFM_SINE	1
SQUARE	SDG_VAL_WFM_SQUARE	2
RAMP	SDG_VAL_WFM_RAMP	3
RAMP	SDG_VAL_WFM_RAMP_UP	4
RAMP	SDG_VAL_WFM_RAMP_DOWN	5
PULSE	SDG_VAL_WFM_PULSE	1001
NOISE	SDG_VAL_WFM_NOISE	1002
ARB	SDG_VAL_WFM_ARB	1003
DC	SDG_VAL_WFM_DC	6
PRBS	SDG_VAL_WFM_PRBS	7

Related Attribute	<p>SDG_ATTR_FUNC_AMPLITUDE</p> <p>SDG_ATTR_FUNC_FREQUENCY</p> <p>SDG_ATTR_FUNC_START_PHSAE</p>
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High Level Functions	<p>sdg_ConfigureSquareWaveformSpec</p> <p>sdg_ConfigureRampWaveformSpec</p>
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SDG_ATTR_FUNC_AMPLITUDE

Description	<p>This channel-based attribute specifies the amplitude of the standard waveform the function generator produces.</p> <p>This value is the amplitude at the output terminal.</p>
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FUNC_AMPLITUDE macro. value is used to store the value of function returned by attributeld.</p>
Value Range	<p>The value range is [2mV,24V]</p> <p>Notes: Only SDS7000A maximum amplitude is 24 V, other models are 20 V.</p>
Related Attribute	SDG_ATTR_FUNC_FREQUENCY SDG_ATTR_FUNC_WAVEFORM SDG_ATTR_FUNC_START_PHSAE
High Level Functions	sdg_ConfigureStandardWaveform

SDG_ATTR_FUNC_DC_OFFSET

Description	<p>This channel-based attribute specifies the DC offset of the standard waveform the function generator produces.</p> <p>This value is the offset at the output terminal.</p> <p>The units are volts (V).</p>
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FUNC_AMPLITUDE macro. value is used to store the value of function returned by attributeld.</p>
Value Range	<p>The value range is [-12V,12V]</p> <p>Notes: Only SDS7000A maximum offset is ± 12 V, other models are ± 10 V.</p>
Related Attribute	SDG_ATTR_FUNC_WAVEFORM
High Level Functions	sdg_ConfigureStandardWaveform

SDG_ATTR_FUNC_FREQUENCY

Description	This channel-based attribute specifies the frequency of the standard waveform the function generator produces. The units are hertz (Hz).
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FUNC_FREQUENCY macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1uHz,1GHz]</p> <p>Notes: SDG1000X range is [1uHz,60M] SDG1000XPlus range is [1uHz,60M] SDG2000X range is [1uHz,120M] SDG3000X range is [1uHz,200M] SDG6000X range is [1uHz,500M] SDG7000A range is [1uHz,1G] SDG8000A range is [1uHz,2G]</p>
Related Attribute	SDG_ATTR_FUNC_AMPLITUDE SDG_ATTR_FUNC_WAVEFORM SDG_ATTR_FUNC_START_PHSAE
High Level Functions	sdg_ConfigureAcquisitionRecord

SDG_ATTR_FUNC_START_PHASE

Description	This channel-based attribute specifies the horizontal offset of the standard waveform the function generator produces. You specify this attribute in degrees of one waveform cycle.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FUNC_START_PHASE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [-360°, 360°].
Related Attribute	SDG_ATTR_FUNC_AMPLITUDE SDG_ATTR_FUNC_FREQUENCY SDG_ATTR_FUNC_WAVEFORM
High Level Functions	sdg_ConfigureStandardWaveform

SDG_ATTR_FUNC_DUTY_CYCLE_HIGH

Description	This channel-based attribute specifies the length of time the output voltage level remains high in a square waveform. You specify this attribute as a percentage of one waveform cycle.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FUNC_DUTY_CYCLE_HIGH macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [0.01%, 99.9%].
Related Attribute	SDG_ATTR_FUNC_WAVEFORM
High Level Functions	sdg_ConfigureSquareWaveformSpec

SDG_ATTR_FUNC_RAMP_SYMMETRY

Description	This channel-based property specifies the symmetry of the output triangle wave. It can be set only when WVTP is a triangle wave, the unit is "%".
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FUNC_RAMP_SYMMETRY macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [0%,100%]
Related Attribute	SDG_ATTR_FUNC_WAVEFORM
High Level Functions	sdg_ConfigureRampWaveformSpec

Arbitrary Waveform Output

Attributes for generating arbitrary waveform output. You use this group of attributes when you set the SDG_ATTR_OUTPUT_MODE attribute to SDG_VAL_OUTPUT_ARB.

The Arbitrary Waveform group has the following attributes:

- ◆ SDG_ATTR_ARB_GAIN
- ◆ SDG_ATTR_ARB_OFFSET
- ◆ SDG_ATTR_ARB_SAMPLE_RATE
- ◆ SDG_ATTR_ARB_WAVEFORM_HANDLE
- ◆ SDG_ATTR_MAX_NUM_WAVEFORMS
- ◆ SDG_ATTR_MAX_WAVEFORM_SIZE
- ◆ SDG_ATTR_MIN_WAVEFORM_SIZE
- ◆ SDG_ATTR_WAVEFORM_QUANTUM
- ◆ SDG_ATTR_ARB_FREQUENCY

SDG_ATTR_ARB_GAIN

Description	This channel-based attribute specifies the factor by which the function generator scales the arbitrary waveform data.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_ARB_GAIN macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1mV,24V]</p> <p>Notes: SDG1000X range is [2mV,20V] SDG1000XPlus range is [2mV,20V] SDG2000X range is [2mV,20V] SDG3000X range is [2mV,20V] SDG6000X range is [2mV,20V] SDG7000A range is [1mV,24V] SDG8000A has different range in different channel mode.</p>
Related Attribute	SDG_ATTR_ARB_WAVEFORM_HANDLE SDG_ATTR_ARB_OFFSET
High Level Functions	sdg_ConfigureArbWaveform

SDG_ATTR_ARB_OFFSET

Description	This channel-based attribute specifies the value the function generator adds to the arbitrary waveform data.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_ARB_OFFSET macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [-12V,12V]</p> <p>Notes: SDG1000X range is [-9.999V,9.999V] SDG1000XPlus range is [-9.999V,9.999V] SDG2000X range is [-9.999V,9.999V] SDG3000X range is [-9.999V,9.999V] SDG6000X range is [-9.999V,9.999V] SDG7000A range is [-12V,12V] SDG8000A has different range in different channel mode.</p>
Related Attribute	SDG_ATTR_ARB_GAIN SDG_ATTR_ARB_WAVEFORM_HANDLE
High Level Functions	sdg_ConfigureArbWaveform

SDG_ATTR_ARB_SAMPLE_RATE

Description	Specifies the rate at which the function generator outputs the points in arbitrary waveforms. The units are samples per second.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_ARB_SAMPLE_RATE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1uSa/s,2.5GSa/s]</p> <p>Notes: SDG1000X range is [1uSa/s,30MSa/s] SDG1000XPlus range is [1uSa/s,250MSa/s] SDG2000X range is [1uSa/s,75MSa/s] SDG3000X range is [10mSa/s,600MSa/s] SDG6000X range is [1uSa/s,300MSa/s] SDG7000A range is [10mSa/s, 2.5GSa/s] SDG8000A range is [10mSa/s,5GSa/s]</p>
Related Attribute	None
High Level Functions	sdg_ConfigureSampleRate

SDG_ATTR_ARB_WAVEFORM_HANDLE

Description	This channel-based attribute identifies which arbitrary waveform the function generator produces.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_ARB_WAVEFORM_HANDLE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [10000, 10255].
Related Attribute	SDG_ATTR_ARB_GAIN SDG_ATTR_ARB_OFFSET
High Level Functions	sdg_ConfigureArbWaveform

SDG_ATTR_MAX_NUM_WAVEFORMS

Description	Returns the maximum number of arbitrary waveforms that the function generator allows. Typically, this value is constant for the function generator.
Data Type	ViInt32
Access	R
Common Control Functions	<p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_MAX_NUM_WAVEFORMS macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	None
Related Attribute	SDG_ATTR_WAVEFORM_QUANTUM SDG_ATTR_MAX_WAVEFORM_SIZE SDG_ATTR_MIN_WAVEFORM_SIZE SDG_ATTR_WFM_STRUCTURE
High Level Functions	sdg_VerifyWfmCreatable sdg_QueryArbWfmCapabilities sdg_CreateArbRecords sdg_GetNumDefinedWaveforms sdg_WfmExists sdg_GetWfmHandleFromNameUtil sdg_ClearDriverWfmRecord

SDG_ATTR_MAX_WAVEFORM_SIZE

Description	Returns the maximum number of points the function generator allows in an arbitrary waveform. Typically, this value is constant for the function generator.
Data Type	ViInt32
Access	R
Common Control Functions	<p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_MAX_WAVEFORM_SIZE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	None
Related Attribute	SDG_ATTR_WAVEFORM_QUANTUM SDG_ATTR_MIN_WAVEFORM_SIZE
High Level Functions	sdg_VerifyWfmCreatable sdg_QueryArbWfmCapabilities

SDG_ATTR_MIN_WAVEFORM_SIZE

Description	Returns the minimum number of points the function generator allows in an arbitrary waveform. Typically, this value is constant for the function generator.
Data Type	ViInt32
Access	R
Common Control Functions	<p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_MIN_WAVEFORM_SIZE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	None
Related Attribute	SDG_ATTR_WAVEFORM_QUANTUM SDG_ATTR_MAX_WAVEFORM_SIZE
High Level Functions	sdg_VerifyWfmCreatable sdg_QueryArbWfmCapabilities

SDG_ATTR_WAVEFORM_QUANTUM

Description	<p>The size of each arbitrary waveform must be a multiple of a quantum value.</p> <p>This attribute returns the quantum value the function generator allows.</p>
Data Type	ViInt32
Access	R
Common Control Functions	<p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_WAVEFORM_QUANTUM macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	None
Related Attribute	SDG_ATTR_MAX_WAVEFORM_SIZE SDG_ATTR_MIN_WAVEFORM_SIZE
High Level Functions	sdg_VerifyWfmCreatable sdg_QueryArbWfmCapabilities

SDG_ATTR_ARB_FREQUENCY

Description	This channel-based attribute specifies the rate at which the function generator produces an entire arbitrary waveform. The units are waveforms per second.
Data type	ViReal64
Access	R/W
Common control functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_ARB_FREQUENCY macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1uHz,100MHz]</p> <p>Notes: SDG1000X range is [1uHz,6MHz] SDG1000XPlus range is [1uHz,20MHz] SDG2000X range is [1uHz,20MHz] SDG3000X range is [1uHz,50MHz] SDG6000X range is [1uHz,50MHz] SDG7000A range is [1uHz,100MHz] SDG8000A range is [1uHz,100MHz]</p>
Related Attribute	None
High Level Functions	sdg_ConfigureArbFrequency

Harmonic

Attributes for configuring the harmonic mode. The harmonic mode group has the following attributes:

- ◆ **SDG_ATTR_HARMONIC_ENABLED**
- ◆ **SDG_ATTR_HARMONIC_ORDER**
- ◆ **SDG_ATTR_HARMONIC_SN**
- ◆ **SDG_ATTR_HARMONIC_AMPL**
- ◆ **SDG_ATTR_HARMONIC_PHASE**
- ◆ **SDG_ATTR_HARMONIC_TYPE**

SDG_ATTR_HARMONIC_ENABLED

Description	This channel-based attribute enable or disable the harmonic mode.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_HARMONIC_ENABLEDmacro. value is used to store or set the value of function represented by attributeld.</p>
Value range	VI_TRUE means harmonic is on VI_FALSE means harmonic is off
Related Attribute	None
High Level Functions	None

SDG_ATTR_HARMONIC_ORDER

Description	This channel-based attribute specifies the harmonic source.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_HARMONIC_ORDER macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The Value range is [2,16]</p> <p>Notes: SDG1000X range is [2,16] SDG1000XPlus range is [2,16] SDG2000X range is [2,16] SDG3000X range is [2,20] SDG6000X range is [2,16] SDG7000A range is [2,16] SDG8000A range is [2,16]</p>
Related Attribute	SDG_ATTR_HARMONIC_TYPE SDG_ATTR_HARMONIC_PHASE SDG_ATTR_HARMONIC_AMPL SDG_ATTR_HARMONIC_SN
High Level Functions	sdg_InitAttributes

SDG_ATTR_HARMONIC_SN

Description	This attribute is just a assistant for the attribute SDG_ATTR_HARMONIC_PHASE. You can use this attribute to specify which order of harmonic you will specify its phase.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_HARMONIC_SN macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	None
Related Attribute	SDG_ATTR_HARMONIC_TYPE SDG_ATTR_HARMONIC_PHASE SDG_ATTR_HARMONIC_AMPL SDG_ATTR_HARMONIC_ORDER
High Level Functions	sdg_InitAttributes

SDG_ATTR_HARMONIC_AMPL

Description	This channel-based attribute specifies the amplitude of the specified order of harmonic.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_HARMONIC_AMPL macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [2mV, 24V].</p> <p>Notes: SDG8000A has different range in different channel mode. Only SDS7000A maximum amplitude is 24V, other models are 20V.</p>
Related Attribute	SDG_ATTR_HARMONIC_TYPE SDG_ATTR_HARMONIC_PHASE SDG_ATTR_HARMONIC_ORDER SDG_ATTR_HARMONIC_SN
High Level Functions	sdg_InitAttributes

SDG_ATTR_HARMONIC_PHASE

Description	This channel-based attribute specifies the phase of the specified order of harmonic.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_HARMONIC_PHASE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [0°, 360°].
Related Attribute	SDG_ATTR_HARMONIC_TYPE SDG_ATTR_HARMONIC_AMPL SDG_ATTR_HARMONIC_ORDER SDG_ATTR_HARMONIC_SN
High Level Functions	sdg_InitAttributes

SDG_ATTR_HARMONIC_TYPE

Description	This channel-based attribute specifies the harmonic type to EVEN, ODD, ALL or USER.
Data Type	ViInt32
Access	R/W
Common Control Functions	sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value) sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_HARMONIC_TYPE macro.

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

Value Range

Type	Discrete Value	Value
EVEN	SDG_VAL_HARMONIC_TYPE_EVEN	0
ODD	SDG_VAL_HARMONIC_TYPE_ODD	1
ALL	SDG_VAL_HARMONIC_TYPE_ALL	2

Related Attribute	SDG_ATTR_HARMONIC_PHASE SDG_ATTR_HARMONIC_AMPL SDG_ATTR_HARMONIC_ORDER SDG_ATTR_HARMONIC_SN
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High Level Functions	sdg_InitAttributes
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Counter

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

- ◆ **SDG_ATTR_COUNTER_STATISTICS_STATE**
- ◆ **SDG_ATTR_COUNTER_STATE**
- ◆ **SDG_ATTR_COUNTER_HF**
- ◆ **SDG_ATTR_COUNTER_COUPING**
- ◆ **SDG_ATTR_COUNTER_IMPEDANCE**
- ◆ **SDG_ATTR_COUNTER_LEVE**

SDG_ATTR_COUNTER_STATISTICS_STATE

Description	This attribute enable or disable the measurement results statistic function of the counter.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

channelName is channelName(one of the following analog inputs: CHAN1, CHAN2).

attributeld is SDG_ATTR_COUNTER_STATISTICS_STATE macro.

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

Value Range

Type	Discrete Value	Value
ON	SDG_VAL_COUNTER_STATISTICS_ON	0
OFF	SDG_VAL_COUNTER_STATISTICS_OFF	1

Related Attribute None

High Level Functions sdg_InitAttributes

SDG_ATTR_COUNTER_STATE

Description	This attribute enable or disable the counter function.									
Data Type	ViInt32									
Access	R/W									
Common Control Functions	<div>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</div> <div>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</div> <div>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2). attributeld is SDG_ATTR_COUNTER_STATE macro. value is used to store or set the value of function represented by attributeld.</div>									
Value Range	<table><tr><th>Type</th><th>Discrete Value</th><th>Value</th></tr><tr><td>ON</td><td>SDG_VAL_COUNTER_STATE_ON</td><td>0</td></tr><tr><td>OFF</td><td>SDG_VAL_COUNTER_STATE_OFF</td><td>1</td></tr></table>	Type	Discrete Value	Value	ON	SDG_VAL_COUNTER_STATE_ON	0	OFF	SDG_VAL_COUNTER_STATE_OFF	1
Type	Discrete Value	Value								
ON	SDG_VAL_COUNTER_STATE_ON	0								
OFF	SDG_VAL_COUNTER_STATE_OFF	1								
Related Attribute	None									
High Level Functions	sdg_InitAttributes									

SDG_ATTR_COUNTER_HF

Description	This attribute enable or disable the high-frequency reject of the counter.									
Data Type	ViInt32									
Access	R/W									
Common Control Functions	<div>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</div> <div>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</div> <div>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2). attributeld is SDG_ATTR_COUNTER_HF macro. value is used to store or set the value of function represented by attributeld.</div>									
Value Range	<table><tr><th>Type</th><th>Discrete Value</th><th>Value</th></tr><tr><td>OFF</td><td>SDG_VAL_COUNTER_HF_OFF</td><td>0</td></tr><tr><td>ON</td><td>SDG_VAL_COUNTER_HF_ON</td><td>1</td></tr></table>	Type	Discrete Value	Value	OFF	SDG_VAL_COUNTER_HF_OFF	0	ON	SDG_VAL_COUNTER_HF_ON	1
Type	Discrete Value	Value								
OFF	SDG_VAL_COUNTER_HF_OFF	0								
ON	SDG_VAL_COUNTER_HF_ON	1								
Related Attribute	None									
High Level Functions	sdg_InitAttributes									

SDG_ATTR_COUNTER_COUPING

Description This attribute specifies the coupling mode of the counter to AC or DC.

Data Type ViInt32

Access R/W

Common Control Functions `sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)`

`sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)`

Notes:

vi is the instrument handle.

channelName is channelName(one of the following analog inputs: CHAN1, CHAN2).

attributeld is SDG_ATTR_COUNTER_COUPING macro

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

Value Range

Type	Discrete Value	Value
AC	SDG_VAL_COUNTER_COUPING_AC	0
DC	SDG_VAL_COUNTER_COUPING_D	1

Related Attribute None

High Level Functions `sdg_InitAttributes`

SDG_ATTR_COUNTER_IMPEDANCE

Description	This attribute specifies the input impedance of the counter to 50 Ω or 1 MΩ.									
Data Type	ViInt32									
Access	R/W									
Common Control Functions	<div>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</div> <div>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</div> <div>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2). attributeld is SDG_ATTR_COUNTER_IMPEDANCE macro value is used to store or set the value of function represented by attributeld.</div>									
Value Range	<table><tr><th>Type</th><th>Discrete Value</th><th>Value</th></tr><tr><td>50</td><td>SDG_VAL_COUNTER_IMPEDANCE_50</td><td>0</td></tr><tr><td>1M</td><td>SDG_VAL_COUNTER_IMPEDANCE_1M</td><td>1</td></tr></table>	Type	Discrete Value	Value	50	SDG_VAL_COUNTER_IMPEDANCE_50	0	1M	SDG_VAL_COUNTER_IMPEDANCE_1M	1
Type	Discrete Value	Value								
50	SDG_VAL_COUNTER_IMPEDANCE_50	0								
1M	SDG_VAL_COUNTER_IMPEDANCE_1M	1								
Related Attribute	None									
High Level Functions	sdg_InitAttributes									

SDG_ATTR_COUNTER_LEVE

Description	This attribute specifies the trigger level of the counter.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2). attributeld is SDG_ATTR_COUNTER_LEVE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is[-3V, 2.5V]
Related Attribute	None
High Level Functions	sdg_InitAttributes

Bursting

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

- ◆ **SDG_ATTR_BURST_NCYCLES_ENABLED**
- ◆ **SDG_ATTR_BURST_GATED_ENABLED**
- ◆ **SDG_ATTR_BURST_INFINITY_ENABLED**
- ◆ **SDG_ATTR_BURST_GATE_POLARITY**
- ◆ **SDG_ATTR_BURST_INTERNAL_PERIOD**
- ◆ **SDG_ATTR_BURST_PHASE**
- ◆ **SDG_ATTR_BURST_TDELAY**
- ◆ **SDG_ATTR_BURST_TRIGGER_SLOPE**
- ◆ **SDG_ATTR_BURST_TRIGGER_SOURCE**
- ◆ **SDG_ATTR_BURST_TRIGGER_TRIGOUT**
- ◆ **SDG_ATTR_BURST_COUNT**

SDG_ATTR_BURST_NCYCLES_ENABLED

Description	This channel-based attribute specifies whether the function generator is configured to N cycles burst mode.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_BURST_NCYCLES_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means Ncycles is on VI_FALSE means Ncycles is off
Related Attribute	NULL
High Level Functions	sdg_ConfigureBurstNcycEnabled sdg_InitAttributes

SDG_ATTR_BURST_GATED_ENABLED

Description	This channel-based attribute specifies whether the function generator is configured to gated burst mode.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_BURST_GATED_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>VI_TRUE means Gated is on</p> <p>VI_FALSE means Gated is off</p>
Related Attribute	None
High Level Functions	<p>sdg_ConfigureBurstGateEnabled</p> <p>sdg_InitAttributes</p>

SDG_ATTR_BURST_INFINITY_ENABLED

Description	This channel-based attribute specifies whether the function generator is configured to infinite burst mode.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_BURST_INFINITY_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means Infinity is on VI_FALSE means Infinity is off
Related Attribute	None
High Level Functions	sdg_InitAttributes

SDG_ATTR_BURST_GATE_POLARITY

Description Specify it's high level or low level from the rear panel [Mod/FSK/Trig] that triggers the function generator to produce pulse train. This attribute is effective only when the burst mode is gated.

Data Type ViInt32

Access R/W

Common Control Functions `sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)`

`sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)`

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_BURST_GATE_POLARITY macro

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

Value Range

Type	Discrete Value	Value
POS	SDG_VAL_BURST_GATE_POLARITY_POSITIVE	0
NEG	SDG_VAL_BURST_GATE_POLARITY_NEGATIVE	1

Related Attribute None

High Level Functions `sdg_InitAttributes`

SDG_ATTR_BURST_INTERNAL_PERIOD

Description	Specify the period of the burst pulse train which means the time interval between two adjacent N-cycles pulse train.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_BURST_INTERNAL_PERIOD macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	NULL
Related Attribute	None
High Level Functions	sdg_InitAttributes

SDG_ATTR_BURST_PHASE

Description	Specify the start phase of the pulse train, whose unit is degree.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_BURST_PHASE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [0°,360°]
Related Attribute	SDG_ATTR_BURST_TDELAY SDG_ATTR_BURST_COUNT
High Level Functions	sdg_ConfigureBurstStartPhase sdg_InitAttributes

SDG_ATTR_BURST_TDELAY

Description	Specify the time interval between the function generator just received a triggering and it starts to produce pulse train.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_BURST_TDELAY macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [0s,100s]
Related Attribute	SDG_ATTR_BURST_PHASE SDG_ATTR_BURST_COUNT
High Level Functions	sdg_InitAttributes

SDG_ATTR_BURST_TRIGGER_SLOPE

Description	Specify it's rising edge or failling edge that make the function generator produce pulse train.									
Data Type	ViInt32									
Access	R/W									
Common Control Functions	<div>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</div> <div>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</div> <div>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_BURST_TRIGGER_SLOPE macro value is used to store or set the value of function represented by attributeld.</div>									
Value Range	<table><tr><th>Type</th><th>Discrete Value</th><th>Value</th></tr><tr><td>NORM</td><td>SDG_VAL_BURST_TRIGGER_SLOPE_NORMAL</td><td>0</td></tr><tr><td>INV</td><td>SDG_VAL_BURST_TRIGGER_SLOPE_INVERTED</td><td>1</td></tr></table>	Type	Discrete Value	Value	NORM	SDG_VAL_BURST_TRIGGER_SLOPE_NORMAL	0	INV	SDG_VAL_BURST_TRIGGER_SLOPE_INVERTED	1
Type	Discrete Value	Value								
NORM	SDG_VAL_BURST_TRIGGER_SLOPE_NORMAL	0								
INV	SDG_VAL_BURST_TRIGGER_SLOPE_INVERTED	1								
Related Attribute	SDG_ATTR_BURST_TRIGGER_TRIGOUT SDG_ATTR_BURST_TRIGGER_SOURCE									
High Level Functions	sdg_InitAttributes									

SDG_ATTR_BURST_TRIGGER_SOURCE

Description	Specify the trigger source of the function generator, whose value can be internal, external or manual (software).
Data Type	ViInt32
Access	R/W
Common Control Functions	<pre>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</pre>

```
sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)
```

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

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

Value Range

Type	Discrete Value	Value
INT	SDG_VAL_BURST_TRIGGER_SOURCE_INTERNAL	0
EXT	SDG_VAL_BURST_TRIGGER_SOURCE_EXTERNAL	1
MAN	SDG_VAL_BURST_TRIGGER_SOURCE_MANUAL	2
EXT_A	SDG_VAL_BURST_TRIGGER_SOURCE_EXTERNAL_A	3
EXT_B	SDG_VAL_BURST_TRIGGER_SOURCE_EXTERNAL_B	4
MAN_A	SDG_VAL_BURST_TRIGGER_SOURCE_MANUAL_A	5
MAN_B	SDG_VAL_BURST_TRIGGER_SOURCE_MANUAL_B	6

Notes:

SDG8000A support "INT" , "EXTA" , "EXTB" , "MANA" and "MANB".
Other models support "INT" ,"EXT" and "MAN".

Related Attribute	SDG_ATTR_BURST_TRIGGER_TRIGOUT SDG_ATTR_BURST_TRIGGER_SLOPE
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High Level Functions	sdg_InitAttributes
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SDG_ATTR_BURST_TRIGGER_TRIGOUT

Description	Specify the edge type of the Trigger output signal.												
Data Type	ViInt32												
Access	R/W												
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_BURST_TRIGGER_TRIGOUT 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>OFF</td><td>SDG_VAL_BURST_TRIGGER_TRIGOUT_OFF</td><td>0</td></tr><tr><td>RISE</td><td>SDG_VAL_BURST_TRIGGER_TRIGOUT_POSITIVE</td><td>1</td></tr><tr><td>FALL</td><td>SDG_VAL_BURST_TRIGGER_TRIGOUT_NEGATIVE</td><td>2</td></tr></table>	Type	Discrete Value	Value	OFF	SDG_VAL_BURST_TRIGGER_TRIGOUT_OFF	0	RISE	SDG_VAL_BURST_TRIGGER_TRIGOUT_POSITIVE	1	FALL	SDG_VAL_BURST_TRIGGER_TRIGOUT_NEGATIVE	2
Type	Discrete Value	Value											
OFF	SDG_VAL_BURST_TRIGGER_TRIGOUT_OFF	0											
RISE	SDG_VAL_BURST_TRIGGER_TRIGOUT_POSITIVE	1											
FALL	SDG_VAL_BURST_TRIGGER_TRIGOUT_NEGATIVE	2											
Related Attribute	SDG_ATTR_BURST_TRIGGER_SOURCE SDG_ATTR_BURST_TRIGGER_SLOPE												
High Level Functions	sdg_ConfigureBurstTrigOut sdg_InitAttributes												

SDG_ATTR_BURST_COUNT

Description	This channel-based attribute specifies the number of cycles that the function generator produces when it is in the burst operation mode and receives a trigger.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_BURST_COUNT macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [1,1M]
Related Attribute	SDG_ATTR_BURST_PHASE SDG_ATTR_BURST_TDELAY
High Level Functions	sdg_ConfigureBurstCount sdg_InitAttributes

Sweep

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

- ◆ SDG_ATTR_SWEEP_STATE
- ◆ SDG_ATTR_SWEEP_TIME
- ◆ SDG_ATTR_SWEEP_TRIGGER_SLOPE
- ◆ SDG_ATTR_SWEEP_TRIGGER_SOURCE
- ◆ SDG_ATTR_SWEEP_TRIGGER_TRIGOUT
- ◆ SDG_ATTR_SWEEP_TYPE
- ◆ SDG_ATTR_SWEEP_DIRECTION
- ◆ SDG_ATTR_SWEEP_FREQUENCY_CENTER
- ◆ SDG_ATTR_SWEEP_FREQUENCY_SPAN
- ◆ SDG_ATTR_SWEEP_FREQUENCY_START
- ◆ SDG_ATTR_SWEEP_FREQUENCY_STOP
- ◆ SDG_ATTR_SWEEP_FREQUENCY_START_RECORD
- ◆ SDG_ATTR_SWEEP_FREQUENCY_STOP_RECORD

SDG_ATTR_SWEEP_STATE

Description	Enable or disable the sweep function.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_STATE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means Sweep is on VI_FALSE means Sweep is off
Related Attribute	SDG_ATTR_SWEEP_TIME SDG_ATTR_SWEEP_TYPE SDG_ATTR_SWEEP_DIRECTION
High Level Functions	None

SDG_ATTR_SWEEP_TIME

Description	Set the sweep time and the default unit is "s".
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_TIME macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1ms,1000s]</p> <p>Notes: Only SDS7000A maximum time is 1000s, other models are 500s</p>
Related Attribute	SDG_ATTR_SWEEP_TYPE SDG_ATTR_SWEEP_STATE SDG_ATTR_SWEEP_DIRECTION
High Level Functions	None

SDG_ATTR_SWEEP_TRIGGER_SLOPE

Description	Set the generator to enable the sweep output on the rising (POSitive) or falling (NEGative) edge of the external trigger signal.									
Data Type	ViInt32									
Access	R/W									
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_TRIGGER_SLOPE 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>POS</td><td>SDG_VAL_SWEEP_TRIGGER_SLOPE_POSITIVE</td><td>0</td></tr><tr><td>NEG</td><td>SDG_VAL_SWEEP_TRIGGER_SLOPE_NEGATIVE</td><td>1</td></tr></table>	Type	Discrete Value	Value	POS	SDG_VAL_SWEEP_TRIGGER_SLOPE_POSITIVE	0	NEG	SDG_VAL_SWEEP_TRIGGER_SLOPE_NEGATIVE	1
Type	Discrete Value	Value								
POS	SDG_VAL_SWEEP_TRIGGER_SLOPE_POSITIVE	0								
NEG	SDG_VAL_SWEEP_TRIGGER_SLOPE_NEGATIVE	1								
Related Attribute	SDG_ATTR_SWEEP_TRIGGER_SLOPE SDG_ATTR_SWEEP_TRIGGER_SOURCE SDG_ATTR_SWEEP_TRIGGER_TRIGOUT									
High Level Functions	None									

SDG_ATTR_SWEEP_TRIGGER_SOURCE

Description	Set the trigger source of the sweep to INTERNAL,EXTERNAL or MANUAL.Query the trigger source.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

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

Value Range

Type	Discrete Value	Value
INT	SDG_VAL_SWEEP_TRIGGER_SOURCE_INTERNAL	0
EXT	SDG_VAL_SWEEP_TRIGGER_SOURCE_EXTERNAL	1
MAN	SDG_VAL_SWEEP_TRIGGER_SOURCE_MANUAL	2
EXT_A	SDG_VAL_SWEEP_TRIGGER_SOURCE_EXTERNAL_A	3
EXT_B	SDG_VAL_SWEEP_TRIGGER_SOURCE_EXTERNAL_B	4
MAN_A	SDG_VAL_SWEEP_TRIGGER_SOURCE_MANUAL_A	5
MAN_B	SDG_VAL_SWEEP_TRIGGER_SOURCE_MANUAL_B	6

Notes:

SDG8000A support "INT" , "EXTA" , "EXTB" , "MANA" and "MANB".
Other models support "INT" , "EXT" and "MAN".

Related Attribute	None
High Level Functions	sdg_ConfigureSweepTriggerSource

SDG_ATTR_SWEEP_TRIGGER_TRIGOUT

Description	Set the edge type of the sweep trigger output to rising (POSitive) or falling (NEGative) edge or disable the trigger output signal (OFF).
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32 (ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_TRIGGER_TRIGOUT macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	NULL
Related Attribute	None
High Level Functions	sdg_ConfigureSweepTriggerOut

SDG_ATTR_SWEEP_TYPE

Description	Set the type of the sweep to Log or Linear.									
Data Type	ViInt32									
Access	R/W									
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_TYPE 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>LINE</td><td>SDG_VAL_SWEEP_TYPE_LINER</td><td>0</td></tr><tr><td>LOG</td><td>SDG_VAL_SWEEP_TYPE_LOG</td><td>1</td></tr></table>	Type	Discrete Value	Value	LINE	SDG_VAL_SWEEP_TYPE_LINER	0	LOG	SDG_VAL_SWEEP_TYPE_LOG	1
Type	Discrete Value	Value								
LINE	SDG_VAL_SWEEP_TYPE_LINER	0								
LOG	SDG_VAL_SWEEP_TYPE_LOG	1								
Related Attribute	SDG_ATTR_SWEEP_TIME SDG_ATTR_SWEEP_STATE SDG_ATTR_SWEEP_DIRECTION									
High Level Functions	None									

SDG_ATTR_SWEEP_DIRECTION

Description	Set the direction of the sweep to Up,Down or Up_and_Down.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_SWEEP_DIRECTION macro

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

Value Range

Type	Discrete Value	Value
UP	SDG_VAL_SWEEP_DIRECTION_UP	0
DOWN	SDG_VAL_SWEEP_DIRECTION_DOWN	1
UP_DOWN	SDG_VAL_SWEEP_DIRECTION_UP_DOWN	2

Notes:

SDG6000X&SDG7000A can set SDG_VAL_SWEEP_DIRECTION_UP_DOWN in linear mode

Related Attribute	<p>SDG_ATTR_SWEEP_TIME</p> <p>SDG_ATTR_SWEEP_TYPE</p> <p>SDG_ATTR_SWEEP_STATE</p>
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High Level Functions	sdg_ConfigureSweepDirection
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SDG_ATTR_SWEEP_FREQUENCY_CENTER

Description	Set the center frequency of the sweep and the default unit is "Hz".
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_FREQUENCY_CENTER macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is[1uHz,1GHz]</p> <p>Notes: SDG1000X range is [1uHz, 60MHz] SDG1000XPlus range is [1uHz, 60MHz] SDG2000X range is [1uHz,120MHz] SDG3000X range is [1uHz, 600MHz] SDG6000X range is [1uHz, 500MHz] SDG7000A range is [1uHz,1GHz] SDG8000A range is [1uHz,2GHz]</p>
Related Attribute	SDG_ATTR_SWEEP_FREQUENCY_SPAN SDG_ATTR_SWEEP_FREQUENCY_START SDG_ATTR_SWEEP_FREQUENCY_STOP
High Level Functions	sdg_InitAttributes

SDG_ATTR_SWEEP_FREQUENCY_SPAN

Description	Set the frequency span of the sweep and the default unit is "Hz".
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_FREQUENCY_SPAN macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is[0Hz,1GHz]</p> <p>Notes: SDG1000X range is [0Hz, 60MHz] SDG1000XPlus range is [0Hz, 60MHz] SDG2000X range is [0Hz,120MHz] SDG3000X range is [0Hz, 600MHz] SDG6000X range is [0Hz, 500MHz] SDG7000A range is [0Hz,1GHz] SDG8000A range is [0Hz,2GHz]</p>
Related Attribute	SDG_ATTR_SWEEP_FREQUENCY_START SDG_ATTR_SWEEP_FREQUENCY_STOP SDG_ATTR_SWEEP_FREQUENCY_CENTER
High Level Functions	sdg_InitAttributes

SDG_ATTR_SWEEP_FREQUENCY_START

Description	Set the start frequency of the sweep and the default unit is "Hz".
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_FREQUENCY_START macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1uHz,1GHz]</p> <p>Notes: SDG1000X range is [1uHz, 60MHz] SDG1000XPlus range is [1uHz, 60MHz] SDG2000X range is [1uHz,120MHz] SDG3000X range is [1uHz, 600MHz] SDG6000X range is [1uHz, 500MHz] SDG7000A range is [1uHz,1GHz] SDG8000A range is [1uHz,2GHz]</p>
Related Attribute	SDG_ATTR_SWEEP_FREQUENCY_SPAN SDG_ATTR_SWEEP_FREQUENCY_STOP SDG_ATTR_SWEEP_FREQUENCY_CENTER
High Level Functions	sdg_ConfigureSweepFrequencyStart sdg_InitAttributes

SDG_ATTR_SWEEP_FREQUENCY_STOP

Description	Set the end frequency of the sweep and the default unit is "Hz".
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_FREQUENCY_STOP macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1uHz,1GHz]</p> <p>Notes: SDG1000X range is [1uHz, 60MHz] SDG1000XPlus range is [1uHz, 60MHz] SDG2000X range is [1uHz,120MHz] SDG3000X range is [1uHz, 600MHz] SDG6000X range is [1uHz, 500MHz] SDG7000A range is [1uHz,1GHz] SDG8000A range is [1uHz,2GHz]</p>
Related Attribute	SDG_ATTR_SWEEP_FREQUENCY_SPAN SDG_ATTR_SWEEP_FREQUENCY_START SDG_ATTR_SWEEP_FREQUENCY_CENTER
High Level Functions	sdg_ConfigureSweepFrequencyStop sdg_InitAttributes

SDG_ATTR_SWEEP_FREQUENCY_START_RECORD

Description	Auxiliary attributes of SDG_ATTR_SWEEP_FREQUENCY_START.
Data Type	ViReal64
Access	NULL
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>Notes: vi is the instrument handle channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_FREQUENCY_START_RECORD macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	NULL
Related Attribute	SDG_ATTR_SWEEP_FREQUENCY_STOP_RECORD
High Level Functions	None

SDG_ATTR_SWEEP_FREQUENCY_STOP_RECORD

Description	Auxiliary attributes of SDG_ATTR_SWEEP_FREQUENCY_STOP.
Data Type	ViReal64
Access	NULL
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>Notes: vi is the instrument handle channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_SWEEP_FREQUENCY_START_RECORD macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	NULL
Related Attribute	SDG_ATTR_SWEEP_FREQUENCY_START_RECORD
High Level Functions	None

IQ

The I/Q vector signal group properties are used to set or read I/Q vector signal related parameters.

The I/Q vector signal group has the following attributes:

- ◆ **SDG_ATTR_IQ_FREQUENCY_CENTER**
- ◆ **SDG_ATTR_IQ_SAMPLE_RATE**
- ◆ **SDG_ATTR_IQ_SYMBOL_RATE**
- ◆ **SDG_ATTR_IQ_AMPLITUDE**
- ◆ **SDG_ATTR_IQ_TRIGGER_SOURCE**
- ◆ **SDG_ATTR_IQ_ADJ_GAIN**
- ◆ **SDG_ATTR_IQ_ADJ_I_OFFSET**
- ◆ **SDG_ATTR_IQ_ADJ_Q_OFFSET**
- ◆ **SDG_ATTR_IQ_ADJ_Q_SKEW**
- ◆ **SDG_ATTR_IQ_WAVE_BUILT_IN**
- ◆ **SDG_ATTR_IQ_WAVE_USER**

SDG_ATTR_IQ_FREQUENCY_CENTER

Description	Set the center frequency of the IQ and the default unit is "Hz".
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_IQ_FREQUENCY_CENTER macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1Hz,1GHz]</p> <p>Notes: SDG3000X range is [1Hz,600MHz] SDG6000X range is [1Hz,500MHz] SDG7000A range is [1Hz,1GHz] SDG8000A range is [1Hz,4GHz] Other models are not involved</p>
Related Attribute	None
High Level Functions	sdg_ConfigureIqFrequencyCenter

SDG_ATTR_IQ_SAMPLE_RATE

Description	Specifies the rate at which the function generator outputs the points in IQ waveforms.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_IQ_SAMPLE_RATE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1KHz,1.25GHz]</p> <p>Notes: SDG3000X range is [1KHz,600MHz] SDG6000X range is [1KHz,300MHz] SDG7000A range is [1KHz,1.25GHz] SDG8000A range is [1KHz,10GHz]</p>
Related Attribute	SDG_ATTR_IQ_SYMBOL_RATE
High Level Functions	sdg_ConfigureIqSampleRate

SDG_ATTR_IQ_SYMBOL_RATE

Description	Specifies the rate at which the function generator outputs oversampled points in the IQ waveform. This parameter is limited by the oversampling factor
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_IQ_SYMBOL_RATE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [250Sa/s,312.5MSa/s]</p> <p>Notes: SDG3000X range is [250Sa/s,100MSa/s] SDG6000X range is [250Sa/s,75MSa/s] SDG7000A range is [250Sa/s,312.5MSa/s] SDG8000A range is [500Sa/s,2GSa/s]</p>
Related Attribute	SDG_ATTR_IQ_SAMPLE_RATE
High Level Functions	sdg_ConfigureIqSymbolRate

SDG_ATTR_IQ_AMPLITUDE

Description	This attribute specifies the amplitude of the IQ.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_IQ_AMPLITUDE macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [0mVrms,939mVrms]</p> <p>Notes: SDG8000A has different range in different channel mode. SDG3000X range is [0mVrms, 939mVrms] SDG6000X range is [0mVrms,225.8mVrms] SDG7000A range is [0mVrms, 939mVrms]</p>
Related Attribute	None
High Level Functions	Nhoe

SDG_ATTR_IQ_TRIGGER_SOURCE

Description	This attribute specifies the trigger source.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.
channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4).
Only SDG8004A supports CH3 and CH4.
attributeld is SDG_ATTR_IQ_TRIGGER_SOURCE macro
value is used to store or set the value of function represented by attributeld.

Value Range

Type	Discrete Value	Value
INT	SDG_VAL_IQ_TRIGGER_SOURCE_INTERNAL	0
EXT	SDG_VAL_IQ_TRIGGER_SOURCE_EXTERNAL	1
MAN	SDG_VAL_IQ_TRIGGER_SOURCE_MANUAL	2
TIMER	SDG_VAL_IQ_TRIGGER_SOURCE_TIMER	3
EXTA	SDG_VAL_IQ_TRIGGER_SOURCE_EXTERNAL_A	4
EXTB	SDG_VAL_IQ_TRIGGER_SOURCE_EXTERNAL_B	5
MANA	SDG_VAL_IQ_TRIGGER_SOURCE_MANUAL_A	6
MANB	SDG_VAL_IQ_TRIGGER_SOURCE_MANUAL_B	7

Notes:

SDG8000A support "INT" , "TIMER" , "EXTA" , "EXTB" , "MANA" and "MANB".
SDG3000X support "INT" , "EXT" , "MAN" and "TIMER".
Other models support "INT" , "EXT" and "MAN".

Related Attribute	None
High Level Functions	sdg_ConfigureIqTriggerSource

SDG_ATTR_IQ_ADJ_GAIN

Description	This attribute is used for amplitude gain balance, which adjusts the amplitude difference between the two I/Q channels.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_IQ_ADJ_GAIN macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [-4dB,4 dB]
Related Attribute	None
High Level Functions	sdg_ConfigureIqAdjGain

SDG_ATTR_IQ_ADJ_I_OFFSET

Description	This attribute is used to adjust the offset of the I channel. Combined with the Q-channel DC bias adjustment to compensate for the bias imbalance of the I/Q channels
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_IQ_ADJ_J_OFFSET macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [-0.25V,0.25V]
Related Attribute	SDG_ATTR_IQ_ADJ_Q_OFFSET SDG_ATTR_IQ_ADJ_Q_SKEW
High Level Functions	sdg_ConfigureIqAdjIOffset

SDG_ATTR_IQ_ADJ_Q_OFFSET

Description	This attribute is used to adjust the offset of the I channel. Combined with the I-channel DC bias adjustment to compensate for the bias imbalance of the I/Q channels
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_IQ_ADJ_Q_OFFSET macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [-0.25V,0.25V]
Related Attribute	SDG_ATTR_IQ_ADJ_I_OFFSET SDG_ATTR_IQ_ADJ_Q_SKEW
High Level Functions	sdg_ConfigureIqAdjQOffset

SDG_ATTR_IQ_ADJ_Q_SKEW

Description	This attribute is used for the phase angle adjustment of the Q channel to compensate for the phase imbalance between the I/Q channels
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_IQ_ADJ_Q_SKEW macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [-10°,10°]
Related Attribute	SDG_ATTR_IQ_ADJ_I_OFFSET SDG_ATTR_IQ_ADJ_Q_OFFSET
High Level Functions	sdg_ConfigureIqAdjSkew

SDG_ATTR_IQ_WAVE_BUILT_IN

Description	This attribute is used to select the I/Q waveform from the built-in waveform list.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_IQ_WAVE_BUILT_IN macro

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

Value Range

Type	Discrete Value	Value
2ASK	SDG_VAL_IQ_WAVE_BUILT_IN_2ASK	0
4ASK	SDG_VAL_IQ_WAVE_BUILT_IN_4ASK	1
8ASK	SDG_VAL_IQ_WAVE_BUILT_IN_8ASK	2
BPSK	SDG_VAL_IQ_WAVE_BUILT_IN_BPSK	3
QPSK	SDG_VAL_IQ_WAVE_BUILT_IN_QPSK	4
8PSK	SDG_VAL_IQ_WAVE_BUILT_IN_8PSK	5
DBPSK	SDG_VAL_IQ_WAVE_BUILT_IN_DBPSK	6
DQPSK	SDG_VAL_IQ_WAVE_BUILT_IN_DQPSK	7
D8PSK	SDG_VAL_IQ_WAVE_BUILT_IN_D8PSK	8
8QAM	SDG_VAL_IQ_WAVE_BUILT_IN_8QAM	9
16QAM	SDG_VAL_IQ_WAVE_BUILT_IN_16QAM	10
32QAM	SDG_VAL_IQ_WAVE_BUILT_IN_32QAM	11
64QAM	SDG_VAL_IQ_WAVE_BUILT_IN_64QAM	12
128QAM	SDG_VAL_IQ_WAVE_BUILT_IN_128QAM	13
256QAM	SDG_VAL_IQ_WAVE_BUILT_IN_256QAM	14

Related Attribute SDG_ATTR_IQ_WAVE_USER

High Level Functions sdg_ConfigureIqWaveBuiltIn

SDG_ATTR_IQ_WAVE_USER

Description	This attribute is used to select the I/Q waveform among the user-stored waveforms.
Data Type	ViString
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViString(ViSession vi, ViConstString channelName, ViAttr attributeld, ViConstString value)</p> <p>sdg_GetAttributeViString(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 bufSize, ViChar value[])</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_IQ_WAVE_USER macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	NULL
Related Attribute	SDG_ATTR_IQ_WAVE_BUILT_IN
High Level Functions	sdg_ConfigureIqWaveUser

PRBS

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

- ◆ **SDG_ATTR_PRBS_BITRATE**
- ◆ **SDG_ATTR_PRBS_AMPLITUDE**
- ◆ **SDG_ATTR_PRBS_OFFSET**
- ◆ **SDG_ATTR_PRBS_LENGTH**
- ◆ **SDG_ATTR_PRBS_EDGE**
- ◆ **SDG_ATTR_PRBS_DIFFSTATE**
- ◆ **SDG_ATTR_PRBS_LOGIC_STATE**

SDG_ATTR_PRBS_BITRATE

Description	This attribute is used to set the bit rate/symbol period of PRBS.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PRBS_BITRATE macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1ubps,312.5Mbps]</p> <p>Notes: SDG1000XPlus range is [1ubps, 40Mbps] SDG3000X range is [2ubps,120Mbps] SDG6000X range is [1ubps, 300Mbps] SDG7000A range is [1ubps,312.5Mbps] SDG8000A range is [1ubps,1.25Gbps] Other models are not involved.</p>
Related Attribute	SDG_ATTR_PRBS_AMPLITUDE SDG_ATTR_PRBS_OFFSET
High Level Functions	sdg_ConfigurePrbsBitRate

SDG_ATTR_PRBS_AMPLITUDE

Description	This attribute specifies the amplitude of the PRBS.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PRBS_AMPLITUDE macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [2mV,24V]</p> <p>Notes: SDG8000A has different range in different channel mode. SDG1000XPlus range is [2mV,20V] SDG3000X range is [2mV,20V] SDG6000X range is [2mV,20V] SDG7000A range is [2mV,24V]</p>
Related Attribute	SDG_ATTR_PRBS_OFFSET SDG_ATTR_PRBS_BITRATE
High Level Functions	sdg_ConfigurePrbsAmplitude

SDG_ATTR_PRBS_OFFSET

Description	This attribute specifies the offset of the PRBS
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PRBS_OFFSET macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [-12V,12V]</p> <p>Notes: SDG8000A has different range in different channel mode. SDG1000XPlus range is [-9.99V,9.99V] SDG3000X range is [-9.99V,9.99V] SDG6000X range is [-9.99V,9.99V] SDG7000A range is [-12V,12V]</p>
Related Attribute	None
High Level Functions	sdg_ConfigurePrbsOffset

SDG_ATTR_PRBS_LENGTH

Description	This attribute specifies the length of the PRBS. The settable range is PRBS-3 ~ 32. Its length = $2^{length} - 1$
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PRBS_LENGTH macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [3,32]
Related Attribute	None
High Level Functions	sdg_ConfigurePrbsLength

SDG_ATTR_PRBS_EDGE

Description	This attribute specifies the edge rise/fall time of PRBS.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PRBS_EDGE macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [0.5ns,1us]</p> <p>Notes: SDG1000XPlus range is [10ns,1us] SDG6000X range is [2.5ns,1us] SDG6000X range is [1ns,1us] SDG7000A range is [500ps,1us] SDG8000A range is [100ps,1us]</p>
Related Attribute	None
High Level Functions	sdg_ConfigurePrbsEdge

SDG_ATTR_PRBS_DIFFSTATE

Description	This attribute specifies the differential output switch mode of the PRBS.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PRBS_DIFFSTATE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	None
Related Attribute	None
High Level Functions	sdg_ConfigurePrbsDifferentialState

SDG_ATTR_PRBS_LOGIC_STATE

Description	This attribute is used to set the logic level of PRBS.
Data Type	ViInt32
Access	W
Common Control Functions	sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_PRBS_LOGIC_STATE macro.

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

Value Range

Type	Discrete Value	Value
TTL / CMOS	SDG_VAL_PRBS_TTL_CMOS	0
LVTTTL / LVCMOS	SDG_VAL_PRBS_LVTTTL_LVCMOS	1
ECL	SDG_VAL_PRBS_ECL	2
LVPECL	SDG_VAL_PRBS_LVPECL	3
LVDS	SDG_VAL_PRBS_LVDS	4
CUSTOM	SDG_VAL_PRBS_CUSTOM	5

Related Attribute	None
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High Level Functions	sdg_ConfigurePrbsLogicLevel
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MOD

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

- ◆ SDG_ATTR_MOD_TYPE
- ◆ SDG_ATTR_MOD_STATE
- ◆ SDG_ATTR_AM_ENABLED
- ◆ SDG_ATTR_AM_SOURCE
- ◆ SDG_ATTR_AM_INTERNAL_DEPTH
- ◆ SDG_ATTR_AM_INTERNAL_WAVEFORM
- ◆ SDG_ATTR_AM_INTERNAL_FREQUENCY
- ◆ SDG_ATTR_FM_ENABLED
- ◆ SDG_ATTR_FM_SOURCE
- ◆ SDG_ATTR_FM_INTERNAL_DEVIATION
- ◆ SDG_ATTR_FM_INTERNAL_WAVEFORM
- ◆ SDG_ATTR_FM_INTERNAL_FREQUENCY
- ◆ SDG_ATTR_PM_ENABLED
- ◆ SDG_ATTR_PM_SOURCE
- ◆ SDG_ATTR_PM_DEVIATION
- ◆ SDG_ATTR_PM_INTERNAL_WAVEFORM
- ◆ SDG_ATTR_PM_INTERNAL_FREQUENCY
- ◆ SDG_ATTR_ASK_ENABLED
- ◆ SDG_ATTR_ASK_SOURCE
- ◆ SDG_ATTR_ASK_INTERNAL_RATE
- ◆ SDG_ATTR_ASK_AMPLITUDE
- ◆ SDG_ATTR_FSK_ENABLED
- ◆ SDG_ATTR_FSK_SOURCE
- ◆ SDG_ATTR_FSK_INTERNAL_RATE
- ◆ SDG_ATTR_PSK_ENABLED
- ◆ SDG_ATTR_PSK_SOURCE
- ◆ SDG_ATTR_PSK_POLARITY
- ◆ SDG_ATTR_PSK_PHASE
- ◆ SDG_ATTR_PSK_INTERNAL_RATE
- ◆ SDG_ATTR_PWM_ENABLED
- ◆ SDG_ATTR_PWM_SOURCE
- ◆ SDG_ATTR_PWM_DEVIATION_WIDTH
- ◆ SDG_ATTR_PWM_INTERNAL_WAVEFORM
- ◆ SDG_ATTR_PWM_INTERNAL_FREQUENCY
- ◆ SDG_ATTR_PULSE_WIDTH
- ◆ SDG_ATTR_PULSE_DELAY

SDG_ATTR_MOD_TYPE

Description	Select the modulation mode.
Data Type	ViInt32
Access	R/W
Common Control Functions	sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value) sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_MOD_TYPE macro

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

Value Range

Type	Discrete Value	Value
AM	SDG_VAL_MOD_TYPE_AM	0
FM	SDG_VAL_MOD_TYPE_FM	1
PM	SDG_VAL_MOD_TYPE_PM	2
ASK	SDG_VAL_MOD_TYPE_ASK	3
FSK	SDG_VAL_MOD_TYPE_FSK	4
PSK	SDG_VAL_MOD_TYPE_PSK	5
PWM	SDG_VAL_MOD_TYPE_PWM	6
BPSK	SDG_VAL_MOD_TYPE_BPSK	7
QPSK	SDG_VAL_MOD_TYPE_QPSK	8
3PSK	SDG_VAL_MOD_TYPE_3FSK	9
4PSK	SDG_VAL_MOD_TYPE_4FSK	10
OSK	SDG_VAL_MOD_TYPE_OSK	11
DSB-SC	SDG_VAL_MOD_TYPE_DSBSC	7

Notes:

Different models support different modulation types

Related Attribute	None
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High Level Functions	None
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SDG_ATTR_MOD_STATE

Description	Enable or disable the modulation function.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_MOD_STATE macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means MOD is on VI_FALSE means MOD is off
Related Attribute	SDG_ATTR_MOD_TYPE
High Level Functions	None

SDG_ATTR_AM_ENABLED

Description	This channel-based attribute specifies whether the function generator applies amplitude modulation to the output signal.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_AM_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means AM is on VI_FALSE means AM is off
Related Attribute	None
High Level Functions	sdg_ConfigureAMEnabled

SDG_ATTR_AM_SOURCE

Description	This channel-based attribute specifies the signal that the function generator uses to modulate the output signal.
Data Type	ViInt32
Access	R/W
Common Control Functions	sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value) sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_AM_SOURCE macro

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

Value Range

Type	Discrete Value	Value
INT	SDG_VAL_AM_INTERNAL	0
EXT	SDG_VAL_AM_EXTERNAL	1
CH1	SDG_VAL_AM_CH1	2
CH2	SDG_VAL_AM_CH2	3
CH3	SDG_VAL_AM_CH3	4
CH4	SDG_VAL_AM_CH4	5

Notes:

"CH3" and "CH4" only supported by SDG8004A.

Related Attribute	None
High Level Functions	sdg_ConfigureAMSource

SDG_ATTR_AM_INTERNAL_DEPTH

Description	Specifies the extent of modulation the function generator applies to the carrier signal.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_AM_INTERNAL_DEPTH macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [0%,120%]
Related Attribute	SDG_ATTR_AM_INTERNAL_FREQUENCY SDG_ATTR_AM_INTERNAL_WAVEFORM
High Level Functions	sdg_ConfigureAMInternal

SDG_ATTR_AM_INTERNAL_WAVEFORM

Description	This attribute turns on or off the measurement gate.
Data Type	ViInt32
Access	R/W
Common Control Functions	<pre>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</pre> <pre>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</pre>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_AM_INTERNAL_WAVEFORM macro

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

Value Range

Type	Discrete Value	Value
SINE	SDG_VAL_AM_INTERNAL_SINE	0
SQUARE	SDG_VAL_AM_INTERNAL_SQUARE	1
TRIANGLE	SDG_VAL_AM_INTERNAL_TRIANGLE	2
UPRAMP	SDG_VAL_AM_INTERNAL_RAMP_UP	3
DNRAMP	SDG_VAL_AM_INTERNAL_RAMP_DOWN	4
NOISE	SDG_VAL_AM_INTERNAL_NOISE	5
ARB	SDG_VAL_AM_INTERNAL_ARB	6

Related Attribute	SDG_ATTR_AM_INTERNAL_DEPTH SDG_ATTR_AM_INTERNAL_FREQUENCY
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High Level Functions	sdg_ConfigureAMInternal
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SDG_ATTR_AM_INTERNAL_FREQUENCY

Description	Specifies the frequency of the standard waveform that the function generator uses to modulate the output signal.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_AM_INTERNAL_FREQUENCY macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1mHz,2MHz]</p> <p>Notes: SDG1000X range is [1mHz,20KHz] SDG1000XPlus range is [1mHz,1MHz] SDG2000X range is [1mHz,1MHz] SDG3000X range is [1mHz,1MHz] SDG6000X range is [1mHz,1MHz] SDG7000A range is [1mHz, 2MHz] SDG8000A range is [1mHz, 5MHz]</p>
Related Attribute	SDG_ATTR_AM_INTERNAL_DEPTH SDG_ATTR_AM_INTERNAL_WAVEFORM
High Level Functions	sdg_ConfigureAMInternal

SDG_ATTR_FM_ENABLED

Description	Specifies whether the function generator applies frequency modulation to the output signal.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FM_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means FM is on VI_FALSE means FM is off
Related Attribute	None
High Level Functions	sdg_ConfigureFMEnabled

SDG_ATTR_FM_SOURCE

Description	Specifies the signal the function generator uses to modulate the output signal.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_FM_SOURCE macro

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

Value Range

Type	Discrete Value	Value
INT	SDG_VAL_FM_INTERNAL	0
EXT	SDG_VAL_FM_EXTERNAL	1
CH1	SDG_VAL_FM_CH1	2
CH2	SDG_VAL_FM_CH2	3
CH3	SDG_VAL_FM_CH3	4
CH4	SDG_VAL_FM_CH4	5

Notes:

"CH3" and "CH4" only supported by SDG8004A.

Related Attribute	None
High Level Functions	sdg_ConfigureFMSource

SDG_ATTR_FM_INTERNAL_DEVIATION

Description	Specifies the maximum frequency deviation the modulating waveform applies to the carrier waveform.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FM_INTERNAL_DEVIATION macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1uHz,500MHz]</p> <p>Notes: The max deciation is 0.5*BW(BW stands for maximum output frequency)</p>
Related Attribute	SDG_ATTR_FM_INTERNAL_WAVEFORM SDG_ATTR_FM_INTERNAL_FREQUENCY
High Level Functions	sdg_ConfigureFMInternal

SDG_ATTR_FM_INTERNAL_WAVEFORM

Description	Specifies the standard waveform type that the function generator uses to modulate the output signal.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

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

Value Range

Type	Discrete Value	Value
SINE	SDG_VAL_FM_INTERNAL_SINE	0
SQUARE	SDG_VAL_FM_INTERNAL_SQUARE	1
TRIANGLE	SDG_VAL_FM_INTERNAL_TRIANGLE	2
UPRAMP	SDG_VAL_FM_INTERNAL_RAMP_UP	3
DNRAMP	SDG_VAL_FM_INTERNAL_RAMP_DOWN	4
NOISE	SDG_VAL_FM_INTERNAL_NOISE	5
ARB	SDG_VAL_FM_INTERNAL_ARB	6

Notes:

Only SDG7000A can modulate noise

Related Attribute	<p>SDG_ATTR_FM_INTERNAL_DEVIATION</p> <p>SDG_ATTR_FM_INTERNAL_FREQUENCY</p>
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High Level Functions	sdg_ConfigureFMInterna
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SDG_ATTR_FM_INTERNAL_FREQUENCY

Description	Specifies the frequency of the standard waveform that the function generator uses to modulate the output signal.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FM_INTERNAL_FREQUENCY macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1mHz,2MHz]</p> <p>Notes: SDG1000X range is [1mHz,20KHz] SDG1000XPlus range is [1mHz,1MHz] SDG2000X range is [1mHz,1MHz] SDG3000X range is [1mHz,1MHz] SDG6000X range is [1mHz,1MHz] SDG7000A range is [1mHz, 2MHz] SDG8000A range is [1mHz, 5MHz]</p>
Related Attribute	SDG_ATTR_FM_INTERNAL_DEVIATION SDG_ATTR_FM_INTERNAL_WAVEFORM
High Level Functions	sdg_ConfigureFMInternal

SDG_ATTR_PM_ENABLED

Description	Specifies whether the function generator applies phase modulation to the output signal.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PM_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means PM is on VI_FALSE means PM is off
Related Attribute	None
High Level Functions	None

SDG_ATTR_PM_SOURCE

Description	Specifies the signal the function generator uses to modulate the output signal.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_PM_SOURCE macro

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

Value Range

Type	Discrete Value	Value
INT	SDG_VAL_PM_INTERNAL	0
EXT	SDG_VAL_PM_EXTERNAL	1
CH1	SDG_VAL_PM_CH1	2
CH2	SDG_VAL_PM_CH2	3
CH3	SDG_VAL_PM_CH3	4
CH4	SDG_VAL_PM_CH4	5

Notes:

"CH3" and "CH4" only supported by SDG8004A.

Related Attribute None

High Level Functions None

SDG_ATTR_PM_DEVIATION

Description	Specifies the maximum frequency deviation the modulating waveform applies to the carrier waveform.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PM_DEVIATION macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [0°,360°]
Related Attribute	None
High Level Functions	None

SDG_ATTR_PM_INTERNAL_WAVEFORM

Description	Specifies the standard waveform type that the function generator uses to modulate the output signal.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

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

Value Range

Type	Discrete Value	Value
SIN	SDG_VAL_PM_INTERNAL_SINE	0
SQU	SDG_VAL_PM_INTERNAL_SQUARE	1
TRI	SDG_VAL_PM_INTERNAL_TRIANGLE	2
RAMP	SDG_VAL_PM_INTERNAL_RAMP	3
DRAM	SDG_VAL_PM_INTERNAL_NRAMP	4
NOISE	SDG_VAL_PM_INTERNAL_NOISE	5
USER	SDG_VAL_PM_INTERNAL_USER	6

Related Attribute	None
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High Level Functions	None
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SDG_ATTR_PM_INTERNAL_FREQUENCY

Description	Specifies the frequency of the standard waveform that the function generator uses to modulate the output signal
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PM_INTERNAL_FREQUENCY macro</p> <p>value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1mHz,2MHz]</p> <p>Notes: SDG1000X range is [1mHz,20KHz] SDG2000X range is [1mHz,1MHz] SDG3000X range is [1mHz,1MHz] SDG6000X range is [1mHz,1MHz] SDG7000A range is [1mHz, 2MHz] SDG8000A range is [1mHz, 5MHz]</p>
Related Attribute	None
High Level Functions	None

SDG_ATTR_ASK_ENABLED

Description	Specifies whether the function generator applies amplitude shift keying modulation to the output signal.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_ASK_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means ASK is on VI_FALSE means ASK is off
Related Attribute	None
High Level Functions	None

SDG_ATTR_ASK_SOURCE

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SDG_ATTR_ASK_INTERNAL_RATE

Description	Set the ASK(amplitude shift keying) rate.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_ASK_INTERNAL_RATE macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1mHz,2MHz]</p> <p>Notes: SDG1000X range is [1mHz,50KHz] SDG2000X range is [1mHz,1MHz] SDG3000X range is [1mHz,1MHz] SDG6000X range is [1mHz,1MHz] SDG7000A range is [1mHz, 2MHz] SDG8000A range is [1mHz, 5MHz]</p>
Related Attribute	SDG_ATTR_ASK_AMPLITUDE SDG_ATTR_ASK_SOURCE
High Level Functions	None

SDG_ATTR_ASK_AMPLITUDE

Description	Set the amplitude of the ASK(amplitude shift keying) modulating waveform.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_ASK_AMPLITUDE macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [0V,10V]
Related Attribute	SDG_ATTR_ASK_INTERNAL_RATE SDG_ATTR_ASK_SOURCE
High Level Functions	None

SDG_ATTR_FSK_ENABLED

Description	This channel-based attribute specifies whether the function generator applies frequency shift keying modulation to the output signal.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FSK_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means FSK is on VI_FALSE means FSK is off
Related Attribute	None
High Level Functions	None

SDG_ATTR_FSK_SOURCE

Description	This channel-based attribute specifies whether the function generator applies frequency shift keying modulation to the output signal.
Data Type	ViInt32
Access	R/W
Common Control Functions	sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value) sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_FSK_SOURCE macro

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

Value Range

Type	Discrete Value	Value
INT	SDG_VAL_FSK_INTERNAL	0
EXT	SDG_VAL_FSK_EXTERNAL	1

Related Attribute	SDG_ATTR_FSK_FREQUENCY SDG_ATTR_FSK_INTERNAL_RATE
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High Level Functions	None
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SDG_ATTR_FSK_FREQUENCY

Description	Set the FSK(Frequency Shift Keying) hop frequency.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FSK_FREQUENCY macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1uHz,1GHz]</p> <p>Notes: The max deciation is BW(BW stands for maximum output frequency)</p>
Related Attribute	SDG_ATTR_FSK_SOURCE SDG_ATTR_FSK_INTERNAL_RATE
High Level Functions	None

SDG_ATTR_FSK_INTERNAL_RATE

Description	Set the FSK(Frequency Shift Keying) rate.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_FSK_INTERNAL_RATE macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1mHz,2MHz]</p> <p>Notes: SDG1000X range is [1mHz,50KHz] SDG2000X range is [1mHz,1MHz] SDG3000X range is [1mHz,1MHz] SDG6000X range is [1mHz,1MHz] SDG7000A range is [1mHz, 2MHz] SDG8000A range is [1mHz, 5MHz]</p>
Related Attribute	SDG_ATTR_FSK_FREQUENCY SDG_ATTR_FSK_SOURCE
High Level Functions	None

SDG_ATTR_PSK_ENABLED

Description	This channel-based attribute specifies whether the function generator applies phase shift keying modulation to the output signal.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PSK_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means PSK is on VI_FALSE means PSK is off
Related Attribute	None
High Level Functions	None

SDG_ATTR_PSK_SOURCE

Description	This channel-based attribute set the PSK modulation source to INTERNAL or EXTERNAL.									
Data Type	ViInt32									
Access	R/W									
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PSK_SOURCE 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>INT</td><td>SDG_VAL_PSK_INTERNAL</td><td>0</td></tr><tr><td>EXT</td><td>SDG_VAL_PSK_EXTERNAL</td><td>1</td></tr></table>	Type	Discrete Value	Value	INT	SDG_VAL_PSK_INTERNAL	0	EXT	SDG_VAL_PSK_EXTERNAL	1
Type	Discrete Value	Value								
INT	SDG_VAL_PSK_INTERNAL	0								
EXT	SDG_VAL_PSK_EXTERNAL	1								
Related Attribute	SDG_ATTR_PSK_INTERNAL_RATE SDG_ATTR_PSK_PHASE SDG_ATTR_PSK_POLARITY									
High Level Functions	None									

SDG_ATTR_PSK_POLARITY

Description	Select the positive or negative polarity of the modulating waveform to control the phase output.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_PSK_POLARITY macro

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

Value Range

Type	Discrete Value	Value
POS	SDG_VAL_PSK_POLARITY_POSITIVE	0
NEG	SDG_VAL_PSK_POLARITY_NEGATIVE	1

Related Attribute	SDG_ATTR_PSK_INTERNAL_RATE SDG_ATTR_PSK_PHASE SDG_ATTR_PSK_SOURCE
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High Level Functions	None
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SDG_ATTR_PSK_PHASE

Description	Set the phase of the PSK modulating waveform.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PSK_PHASE macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	The value range is [-360°,360°]
Related Attribute	SDG_ATTR_PSK_INTERNAL_RATE SDG_ATTR_PSK_POLARITY SDG_ATTR_PSK_SOURCE
High Level Functions	None

SDG_ATTR_PSK_INTERNAL_RATE

Description	Set the PSK(Phase Shift Keying) rate.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PSK_INTERNAL_RATE macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1mHz,2MHz]</p> <p>Notes: SDG1000X range is [1mHz,20KHz] SDG2000X range is [1mHz,1MHz] SDG3000X range is [1mHz,1MHz] SDG6000X range is [1mHz,1MHz] SDG7000A range is [1mHz, 2MHz] SDG8000A range is [1mHz, 5MHz]</p>
Related Attribute	SDG_ATTR_PSK_PHASE SDG_ATTR_PSK_POLARITY SDG_ATTR_PSK_SOURCE
High Level Functions	None

SDG_ATTR_PWM_ENABLED

Description	This channel-based attribute specifies whether the function generator applies pulse width modulation to the output signal.
Data Type	ViBoolean
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean value)</p> <p>sdg_GetAttributeViBoolean(ViSession vi, ViConstString channelName, ViAttr attributeld, ViBoolean *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PWM_ENABLED macro. value is used to store or set the value of function represented by attributeld.</p>
Value Range	VI_TRUE means PWM is on VI_FALSE means PWM is off
Related Attribute	None
High Level Functions	None

SDG_ATTR_PWM_SOURCE

Description	This channel-based attribute set the PWM modulation source to internal or external.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p>

sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

attributeld is SDG_ATTR_PWM_SOURCE macro

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

Value Range

Type	Discrete Value	Value
INT	SDG_VAL_PWM_INTERNAL	0
EXT	SDG_VAL_PWM_EXTERNAL	1
CH1	SDG_VAL_PWM_CH1	2
CH2	SDG_VAL_PWM_CH2	3
CH3	SDG_VAL_PWM_CH3	4
CH4	SDG_VAL_PWM_CH4	5

Notes:

"CH3" and "CH4" only supported by SDG8004A.

Related Attribute None

High Level Functions None

SDG_ATTR_PWM_DEVIATION_WIDTH

Description	Set the pulse width deviation of PWM.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PWM_DEVIATION_WIDTH macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [0s,500s]</p> <p>Notes: SDG1000X range is [0s,17.6ns] SDG2000X range is [0s,500s] SDG6000X range is [0s,500s] SDG7000A range is [0s,500s]</p>
Related Attribute	None
High Level Functions	None

SDG_ATTR_PWM_INTERNAL_WAVEFORM

Description	Select the PWM modulating waveform.
Data Type	ViInt32
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 value)</p> <p>sdg_GetAttributeViInt32(ViSession vi, ViConstString channelName, ViAttr attributeld, ViInt32 *value)</p>

Notes:

vi is the instrument handle.

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

Only SDG8004A supports CH3 and CH4.

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

Value Range

Type	Discrete Value	Value
SIN	SDG_VAL_PWM_INTERNAL_SINE	0
SQU	SDG_VAL_PWM_INTERNAL_SQUARE	1
TRI	SDG_VAL_PWM_INTERNAL_TRIANGLE	2
RAMP	SDG_VAL_PWM_INTERNAL_RAMP	3
DRAM	SDG_VAL_PWM_INTERNAL_NRAMP	4
NOIS	SDG_VAL_PWM_INTERNAL_NOISE	5
USER	SDG_VAL_PWM_INTERNAL_USER	6

Related Attribute	SDG_ATTR_PWM_INTERNAL_FREQUENCY
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High Level Functions	None
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SDG_ATTR_PWM_INTERNAL_FREQUENCY

Description	Set the frequency of the PWM modulating waveform.
Data Type	ViReal64
Access	R/W
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PWM_INTERNAL_FREQUENCY macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1mHz,2MHz]</p> <p>Notes: SDG1000X range is [1mHz,20kHz] SDG2000X range is [1mHz,1MHz] SDG3000X range is [1mHz,1MHz] SDG6000X range is [1mHz,1MHz] SDG7000A range is [1mHz, 2MHz] SDG8000A range is [1mHz, 5MHz]</p>
Related Attribute	SDG_ATTR_PWM_INTERNAL_WAVEFORM
High Level Functions	None

SDG_ATTR_PULSE_WIDTH

Description	This attribute is used to set the width of the pulse wave.
Data Type	ViReal64
Access	R
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PULSE_WIDTH macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [1ns,1Ms]</p> <p>Notes: SDG1000X range is [32.6ns,47.4ns] SDG2000X range is [16.3ns,1Ms] SDG3000X range is [8ns,1Ms] SDG6000X range is [3.3ns,1Ms] SDG7000A range is [1ns,1Ms] SDG8000A range is [500ps,1Ms]</p> <p>The maximum pulse width is limited by the frequency setting, and the minimum pulse width has nothing to do with the frequency</p>
Related Attribute	SDG_ATTR_PULSE_DELAY
High Level Functions	None

SDG_ATTR_PULSE_DELAY

Description	This attribute is used to set the delay of the pulse wave.
Data Type	ViReal64
Access	R
Common Control Functions	<p>sdg_SetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 value)</p> <p>sdg_GetAttributeViReal64(ViSession vi, ViConstString channelName, ViAttr attributeld, ViReal64 *value)</p> <p>Notes: vi is the instrument handle. channelName is channelName(one of the following analog inputs: CHAN1, CHAN2, CHAN3, CHAN4). Only SDG8004A supports CH3 and CH4. attributeld is SDG_ATTR_PULSE_DELAY macro value is used to store or set the value of function represented by attributeld.</p>
Value Range	<p>The value range is [-1Ms,1Ms]</p> <p>Notes: SDG3000X and SDG8000A is not support. SDG1000X range is [-80ns,80ns] SDG2000X range is [-999999.999s,999999.999s] SDG6000X range is [-999999.999s,999999.999s] SDG7000A range is [-1Ms,1Ms]</p>
Related Attribute	SDG_ATTR_PULSE_WIDTH
High Level Functions	None

High Level Functions

Some high level functions are available to set multiple attributes.

- **sdg_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: sdg_InitWithOptions("USB0::0xF4EC::0x1013::0123456789::INSTR", VI_TRUE, VI_FALSE, "Simulate=0,RangeCheck=1,QueryInstrStatus=0,Cache=0", &session);	

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 `sdg_InitWithOptions()` before using it, and input the parameters we suggested except argument `resourceName`.

- **sdg_close (ViSession vi)**

This function closes the instrument.

Parameter	Description
vi	Instrument handle
Example: sdg_close(vi);	

Notes: This function must unlock the session before calling `lvi_Dispose`.

- **sdg_ConfigureOperationMode (ViSession vi, ViConstString channelName, ViInt32 outputMode)**

This function configures the operation mode of the function generator. The operation mode determines how the function generator produces waveforms.

Parameter	Description
vi	Instrument handle

channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
outputMode	operation mode of the function generator
Example: ConfigureOperationMode(vi,"1",0)	

➤ **sdg_ConfigureOutputEnabled (ViSession vi, ViConstString channelName, ViBoolean enabled)**

This function configures whether the signal the function generator produces appears at the channel's output connector.

Parameter	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
enabled	Turn output function on / off
Example: sdg_ConfigureOutputEnabled(vi,"1",0)	

➤ **sdg_ConfigureOutputImpedance (ViSession vi, ViConstString channelName, ViReal64 impedance)**

This function configures the output impedance for the channel you specify.

Parameter	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
impedance	Output impedance
Example: sdg_ConfigureOutputImpedance (vi,"1",50);	

➤ **sdg_ConfigureOutputMode (ViSession vi, ViInt32 outputMode)**

This function configures the output mode of the function generator. The output mode determines the kind of waveform the function generator produces.

Parameter	Description
vi	Instrument handle
outputMode	output mode of the function generator
Example: sdg_ConfigureOutputMode (vi,0);	

➤ **sdg_ConfigureRefClockSource (ViSession vi, ViInt32 refClockSource)**

This function configures the function generator's reference clock source. The function generator uses the reference clock to derive frequencies and sample rates for signal generation.

Parameter	Description
vi	Instrument handle
refClockSource	Ref Clock Source
Example : sdg_ConfigureRefClockSource (vi, 2);	

➤ **sdg_ConfigureStandardWaveform (ViSession vi, ViConstString channelName, ViInt32 waveform, ViReal64 amplitude, ViReal64 dcOffset, ViReal64 frequency, ViReal64 startPhase)**

This function sets the Standard Waveform.

Parameter	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
waveform	Output waveform type
amplitude	Output waveform amplitude
dcOffset	Output waveform dcOffset
frequency	Output waveform frequency
startPhase	the horizontal offset of the standard waveform the function generator produces.
Example: sdg_ConfigureStandardWaveform(vi, "1", SDG_VAL_WFM_SINE, 20, 0, 1000, 0)	

➤ **sdg_ConfigureSquareWaveformSpec(ViSession vi, ViConstString channelName, ViReal64 dutyCycle)**

This function configures the Square Duty Cycle and Square Period of waveform. Period is paired with Frequency in ConfigureStandardWaveform and whichever one is executed last overrides the other.

Parameter	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
dutyCycle	The length of time the output voltage level remains high in a square waveform
Example: sdg_ConfigureSquareWaveformSpec (vi, "1", 50);	

- **sdg_ConfigureRampWaveformSpec(ViSession vi, ViConstString channelName, ViReal64 symmetry)**

This function configures the Ramp Symmetry of the function generator that affect ramp waveform generation.

Parameter	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
symmetry	the Ramp Symmetry
Example: sdg_ConfigureChanCharacteristics (vi,"1", 50);	

- **sdg_ConfigureArbWaveform (ViSession vi, ViConstString channelName, ViInt32 handle, ViReal64 gain, ViReal64 offset)**

This function configures the attributes of the functiongenerator that affect arbitrary waveform generation. These attributes are the arbitrary waveform handle, gain, and offset.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
handle	attribute identifies which arbitrary waveform the function generator produces
gain	similar to amplitude
offset	the value the function generator adds to the arbitrary waveform data
Example: sdg_ConfigureArbWaveform (vi, "2", 10100, 3, 4);	

- **sdg_CreateArbWaveform(ViSession vi, ViInt32 size, ViReal64 data[], ViInt32 *handle)**

This function creates an arbitrary waveform and returns a handle that identifies that waveform.

You use the handles this functionreturns to specify what waveform to generate with the sdg_ConfigureArbWaveform function. You also use the handles this function returns to specify a sequence of arbitrary waveforms with the sdg_CreateArbSequence function. Use sdg_ConfigChannel function to specify a target channel for 2-channel instrument.

Description	Description
vi	Instrument handle
size	Size of waveform
data[]	Data of waveform

*handle	a handle that identifies that waveform
Example: sdg_CreateArbWaveform(vi, 1e+3, 1e+3, SDG_VAL_WFM_SINE);	

- **sdg_QueryArbWfmCapabilities (ViSession vi, ViInt32 *MaxNumWfms, ViInt32 *WfmQuantum, ViInt32 *MinWfmSize, ViInt32 *MaxWfmSize)**

This function returns the attributes of the function generator that are related to creating arbitrary waveforms. These attributes are the maximum number of waveforms, waveform quantum, minimum waveform size, and maximum waveform size

Description	Description
vi	Instrument handle
*MaxNumWfms	maximum number of waveforms
*WfmQuantum	waveform quantum
*MinWfmSize	minimum waveform size
*MaxWfmSize)	maximum waveform size
Example: sdg_QueryArbWfmCapabilities (vi, 3, 4, 10010, 10015);	

- **sdg_ConfigureArbMode(ViSession vi, ViConstString channelName, ViInt32 arbMode)**

This function configures the arbitrary waveform output mode.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
arbMode	Arb mode
Example: sdg_ConfigureArbMode (vi, "1", 0);	

- **sdg_ConfigureArbFrequency (ViSession Vi, ViConstString ChannelName, ViReal64 Frequency)**

This function configures the arbitrary waveform frequency, which is the rate at which the function generator produces one cycle of an arbitrary waveform.

Description	Description
vi	Instrument handle
ChannelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
Frequency	set frequency value
Example: sdg_ConfigureArbFrequency (vi, "1", 1e+3)	

➤ **sdg_SendSoftwareTrigger (ViSession vi)**

This function can make the user send a software trigger to cause signal output to occur

Description	Description
vi	Instrument handle
Example: sdg_SendSoftwareTrigger (vi);	

➤ **sdg_ConfigureBurstState (ViSession vi, ViConstString channelName, ViBoolean enabled)**

This function configures the burst switch. The driver uses this value to set the AM Enabled attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
enabled	Turn on the Burst
Example: sdg_ConfigureBurstState(vi,"1",1)	

➤ **sdg_ConfigureBurstTrigSrc (ViSession vi, ViConstString channelName, ViInt32 src)**

This function configures the burst trigger source. The driver uses this value to set the Burst Trigger Source attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
src	The burst trigger source
Example: sdg_ConfigureBurstTrigSrc (vi,"1",3)	

➤ **sdg_ConfigureBurstCount (ViSession vi, ViConstString channelName, ViInt32 count)**

This function configures the burst count. The driver uses this value to set the Burst Count attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
count	the number of cycles
Example: sdg_ConfigureBurstCount(vi,"1",3)	

- **sdg_ConfigureBurstGateEnabled (ViSession vi, ViConstString channelName, ViBoolean enabled)**

This function configures the Burst-GATE switch. The driver uses this value to set the Burst-GATE Enabled attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
enabled	Turn on the Burst-GATE
Example: sdg_ConfigureBurstGateEnabled (vi,"1",0);	

- **sdg_ConfigureBurstNcycEnabled (ViSession vi, ViConstString channelName, ViBoolean enabled)**

This function configures the Burst-NCYC switch. The driver uses this value to set the Burst-NCYC Enabled attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
enabled	Turn on the Burst-NCYC
Example: sdg_ConfigureBurstNcycEnabled (vi,"1",0);	

- **sdg_ConfigureBurstStartPhase (ViSession vi, ViConstString channelName, ViReal64 phase)**

This function configures the burst start phase. The driver uses this value to set the Burst Start phase attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
phase	the burst start phase
Example: sdg_ConfigureBurstStartPhase (vi,"1",45);	

- **sdg_ConfigureBurstTrigOut (ViSession vi, ViConstString channelName, ViInt32 trigoutmod)**

This function configures mod of the burst trigger out. The driver uses this value to set the Burst Trigger Out attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
trigoutmod	Mod of the burst trigger out
Example: sdg_ConfigureBurstGateEnabled (vi,"1",1);	

➤ **sdg_ConfigureAMEnabled (ViSession vi, ViConstString channelName, ViBoolean enabled);**

This function configures the am switch.The driver uses this value to set the AM Enabled attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
enabled	Turn on the AM
Example: sdg_ConfigureAMEnabled (vi,"1",0);	

➤ **sdg_ConfigureAMInternal (ViSession vi, ViReal64 Depth, ViInt32 Waveform, ViReal64 Frequency)**

This function configures the am internal.The driver uses this value to configure the AM Internal attribute.

Description	Description
vi	Instrument handle
Depth	the extent of modulation
Waveform	standard waveform type
Frequency	frequency of the standard waveform
Example: sdg_ConfigureAMInternal(vi, 90, 2, 10)	

➤ **sdg_ConfigureAMSource (ViSession vi, ViConstString channelName, ViInt32 Source)**

This function configures trigger source of the Am .The driver uses this value to set the Am Trigger Source attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.

Source	trigger source
Example: sdg_ConfigureAMSource (vi,"1",0);	

➤ **sdg_ConfigureFMEnabled(ViSession vi,ViConstString channelName,ViBoolean enabled)**

This function configures the FM switch.The driver uses this value to set the FM Enabled attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
enabled	Turn on the FM
Example: sdg_ConfigureFMEnabled (vi,"1",0);	

➤ **sdg_ConfigureFMInternal (ViSession vi, ViReal64 Dev, VInt32 Waveform, ViReal64 Frequency)**

This function configures the fm internal.The driver uses this value to configure the FM Internal attribute

Description	Description
vi	Instrument handle
Dev	maximum frequency deviation the modulating waveform
Waveform	standard waveform type
Frequency	frequency of the standard waveform
Example: sdg_ConfigureFMInternal(vi, 10, 2, 10);	

➤ **sdg_ConfigureFMSource (ViSession vi, ViConstString channelName, VInt32 Source)**

This function configures the Burst-GATE switch.The driver uses this value to set the Burst-GATE Enabled attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
Source	Trigger source
Example: sdg_ConfigureFMSource(vi,"2",0);	

➤ **sdg_ConfigureSweepState (ViSession vi, ViConstString channelName, ViBoolean state)**

This function configures state of sweep. The driver uses this value to set the Sweep State attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
state	The state of Sweep
Example: sdg_ConfigureSweepState(vi,"1",1);	

➤ **sdg_ConfigureSweepTime (ViSession vi, ViConstString channelName, ViReal64 time)**

This function configures time of sweep. The driver uses this value to set the Sweep Time attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
time	time of sweep
Example: sdg_ConfigureSweepTime(vi,"1",3);	

➤ **sdg_ConfigureSweepFrequencyStart (ViSession vi, ViConstString channelName, ViReal64 freqstart)**

This function configures start frequency of sweep. The driver uses this value to set the Sweep Start Frequency attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
Freqstart	Sweep start frequency
Example: sdg_ConfigureSweepFrequencyStart(vi,"1",600);	

➤ **sdg_ConfigureSweepFrequencyStop (ViSession vi, ViConstString channelName, ViReal64 freqstop)**

This function configures stop frequency of sweep. The driver uses this value to set the Sweep Stop Frequency attribute

Description	Description
vi	Instrument handle

channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
Freqstop	Sweep stop frequency
Example: sdg_ConfigureSweepFrequencyStop(vi,"1",2000);	

➤ **sdg_ConfigureSweepTriggerSource (ViSession vi, ViConstString channelName, VInt32 trigsr)**

This function configures trigger source of sweep.The driver uses this value to set the Sweep Trigger Source attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
trigsr	Trigger Source
Example: sdg_ConfigureSweepTriggerSource(vi,"1",0);	

➤ **sdg_ConfigureSweepTriggerOut (ViSession vi, ViConstString channelName, ViBoolean state)**

This function configures trigger out of sweep.The driver uses this value to set the Sweep Trigger Out attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
state	edge type of the sweep trigger output
Example: sdg_ConfigureSweepTriggerOut(vi,"1",1);	

➤ **sdg_ConfigureSweepType (ViSession vi, ViConstString channelName, VInt32 type)**

This function configures the type of sweep.The driver uses this value to set the Sweep Type attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
type	type of the sweep

Example:

```
sdg_ConfigureSweepType(vi,"1",0);
```

➤ **sdg_ConfigureSweepDirection (ViSession vi, ViConstString channelName, Vilnt32 dir)**

This function configures the direction of sweep. The driver uses this value to set the Sweep Direction attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note: Only SDG8004A supports CH3 and CH4.
dir	the direction of the sweep
Example: <pre>sdg_ConfigureSweepDirection(vi,"1",2);</pre>	

➤ **sdg_ConfigureIqFrequencyCenter (ViSession vi, ViReal64 freqcenter)**

This function configures the center frequency of IQ. The driver uses this value to set the IQ Center Frequency attribute.

Description	Description
vi	Instrument handle
frequency	the center frequency of IQ
Example: <pre>sdg_ConfigureIqFrequencyCenter(vi,34000000);</pre>	

➤ **sdg_ConfigureIqSampleRate (ViSession vi, ViReal64 samplerate)**

This function configures the sample rate of IQ. The driver uses this value to set the IQ Sample Rate attribute.

Description	Description
vi	Instrument handle
samplerate	the sample rate of IQ
Example: <pre>sdg_ConfigureIqSampleRate(vi,600000);</pre>	

➤ **sdg_ConfigureIqSymbolRate (ViSession vi, ViReal64 symbolrate)**

This function configures the symbol rate of IQ. The driver uses this value to set the IQ Symbol Rate attribute.

Description	Description
vi	Instrument handle

symbolrate	the symbol rate of IQ
Example: sdg_ConfigureIqSymbolRate(vi,400000);	

➤ **sdg_ConfigureIqAmplitude (ViSession vi, ViReal64 amplitude)**

This function configures the amplitude of IQ. The driver uses this value to set the IQ Amplitude attribute

Description	Description
vi	Instrument handle
amplitude	the amplitude of IQ
Example: sdg_ConfigureIqAmplitude(vi,0.15)	

➤ **sdg_ConfigureIqTriggerSource (ViSession vi, ViInt32 trigsr)**

This function configures the trigger source of IQ. The driver uses this value to set the IQ Trigger Source attribute.

Description	Description
vi	Instrument handle
trigsr	trigger source
Example: sdg_ConfigureIqTriggerSource(vi,0);	

➤ **sdg_ConfigureIqAdjGain (ViSession vi, ViReal64 gain)**

This function configures the gain of adjustment of IQ. The driver uses this value to set the IQ Gain attribute

Description	Description
vi	Instrument handle
gain	the gain of adjustment of IQ
Example: sdg_ConfigureIqAdjGain(vi,1);	

➤ **sdg_ConfigureIqAdjIOffset (ViSession vi, ViReal64 offset)**

This function configures the I-offset of adjustment of IQ. The driver uses this value to set the IQ I-offset attribute.

Description	Description
vi	Instrument handle
offset	I-offset of adjustment

Example:

```
sdg_ConfigureIqAdjIOffset(vi,1);
```

➤ **sdg_ConfigureIqAdjQOffset (ViSession vi, ViReal64 offset)**

This function configures the Q-offset of adjustment of IQ. The driver uses this value to set the IQ Q-offset attribute.

Description	Description
vi	Instrument handle
offset	Q-offset of adjustment
Example: sdg_ConfigureIqAdjQOffset(vi,1);	

➤ **sdg_ConfigureIqAdjSkew (ViSession vi, ViReal64 angle)**

This function configures the skew of adjustment of IQ. The driver uses this value to set the IQ Skew attribute

Description	Description
vi	Instrument handle
angle	skew of adjustment
Example: sdg_ConfigureIqAdjSkew(vi,1);	

➤ **sdg_ConfigureIqWaveBUILTn (ViSession vi, ViInt32 wave)**

This function configures the wave in the system-stored of IQ. The driver uses this value to set the IQ Built-in Wave attribute.

Description	Description
vi	Instrument handle
wave	the wave in the system-stored of IQ
Example: sdg_ConfigureIqWaveBUILTn(vi,0)	

➤ **sdg_ConfigureIqWaveUser (ViSession vi, ViString wavename)**

This function configures the user's wave of IQ. The driver uses this value to set the IQ User's Wave attribute

Description	Description
vi	Instrument handle
wavename	The name of waveform file
Example: sdg_ConfigureIqWaveUser(vi,xxx); //xxx is file name	

➤ **sdg_ConfigurePrbsBitRate (ViSession vi, ViConstString channelName , ViReal64 bitrate)**

This function configures the bit rate of PRBS.The driver uses this value to set the PRBS Bit Rate attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
bitrate	the bit rate attribute of PRBS
Example: sdg_ConfigurePrbsBitRate(vi,"1",1000);	

➤ **sdg_ConfigurePrbsAmplitude (ViSession vi, ViConstString channelName , ViReal64 amp)**

This function configures the amplitude of PRBS.The driver uses this value to set the PRBS Amplitude attribute

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
amp	the amplitude attribute of PRBS
Example: sdg_ConfigurePrbsAmplitude(vi,"1",5);	

➤ **sdg_ConfigurePrbsOffest (ViSession vi, ViConstString channelName , ViReal64 offest)**

This function configures the offest of PRBS.The driver uses this value to set the PRBS Offest attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
offset	the offset attribute of PRBS
Example: sdg_ConfigurePrbsOffest(vi,"1",1);	

➤ **sdg_ConfigurePrbsLength (ViSession vi, ViConstString channelName , Vilnt32 length)**

This function configures the length of PRBS.The driver uses this value to set the PRBS Length attribute.

Description	Description
vi	Instrument handle

channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
length	the length attribute of PRBS
Example: sdg_ConfigurePrbsLength(vi,"1",3);	

➤ **sdg_ConfigurePrbsEdge (ViSession vi, ViConstString channelName , ViReal64 edge)**

This function configures the edge of PRBS.The driver uses this value to set the PRBS Edge attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
edge	Edge attribute
Example: sdg_ConfigurePrbsEdge(vi,"1",0.000000001);	

➤ **sdg_ConfigurePrbsDifferentialState (ViSession vi, ViConstString channelName , ViBoolean state)**

This function configures the differential state of PRBS.The driver uses this value to set the PRBS Differential State attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
state	differential state
Example: sdg_ConfigurePrbsDifferentialState(vi,"1",0);	

➤ **sdg_ConfigurePrbsLogicLevel (ViSession vi, ViConstString channelName , ViInt32 level)**

This function configures the logic level of PRBS. The driver uses this value to set the PRBS Logic Level attribute.

Description	Description
vi	Instrument handle
channelName	ChannelName: 1 or 2 or 3 or 4 Note:Only SDG8004A supports CH3 and CH4.
level	the logic level of PRBS
Example: sdg_ConfigurePrbsLogicLevel (vi,"1",0);	

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 <Windows.h>
#include <stdio.h>
#include <userint.h>
#include <utility.h>
#include "sdg.h"

#define SDG_EXAMPLE_INSTR_RES_ADDR    "USB0::0xF4EC::0x1101::0123456789::INSTR"
#define SDG_EXAMPLE_INIT_OPTION
"Simulate=0,RangeCheck=0,QueryInstrStatus=0,Cache=1"

ViSession SDG_vi;

#define BSWV_TYPE_NUM 7
static ViInt16 waveType[] = {SDG_VAL_WFM_SINE,
                             SDG_VAL_WFM_SQUARE,
                             SDG_VAL_WFM_RAMP_UP,
                             SDG_VAL_WFM_RAMP_DOWN,
                             SDG_VAL_WFM_PULSE,
                             SDG_VAL_WFM_NOISE,
                             SDG_VAL_WFM_DC,
                             };

typedef ViStatus _VI_FUNC (*setAttr)(ViSession vi,
                                     ViConstString channelName,
                                     ViAttr attribute, ViReal64 value);
typedef ViStatus _VI_FUNC (*getAttr)(ViSession vi,
                                     ViConstString channelName,
                                     ViAttr attribute, ViReal64 *value);
typedef ViStatus _VI_FUNC (*sdsInit)(ViRsrc resourceName,
                                     ViBoolean IDQuery, ViBoolean resetDevice,
                                     ViConstString optionString, ViSession *newVi);

int main (int argc, char *argv[])
{
    HINSTANCE hDLL = LoadLibrary("sdg.dll");

    if (hDLL != NULL)
    {
        sdgInit sdg_InitWithOptions = (sdgInit)GetProcAddress(hDLL, "sdg_InitWithOptions");
        setAttr sdg_SetAttributeViReal64 = (setAttr)GetProcAddress(hDLL, "sdg_SetAttributeViReal64");
        getAttr sdg_GetAttributeViReal64 = (getAttr)GetProcAddress(hDLL, "sdg_GetAttributeViReal64");
        ViStatus error = VI_SUCCESS;
        ViInt32 i = 0;
        ViString strMsg = "The function generator is outputting an standard waveform."
    }
}
```

```

        "\n\nPress <Enter> to continue";

    if (InitCVIRTE (0, argv, 0) == 0)
        return -1;
    sgd_InitWithOptions (SDG_EXAMPLE_INSTR_RES_ADDR, VI_TRUE, VI_FALSE,
SDG_EXAMPLE_INIT_OPTION, &SDG_vi);
    for(i = 0; i < BSWV_TYPE_NUM; i++)
    {
        sgd_ConfigureStandardWaveform(SDG_vi, "1", waveType[i], 20, 0, 1000, 0);
        sgd_ConfigureOutputEnabled (SDG_vi, "1", VI_TRUE);
        Delay(1);
    }
    sgd_ConfigureOutputEnabled (SDG_vi, "1", VI_FALSE);
    for(i = 0; i < BSWV_TYPE_NUM; i++)
    {
        sgd_ConfigureStandardWaveform(SDG_vi, "2", waveType[i], 20, 0, 1000, 0);
        sgd_ConfigureOutputEnabled (SDG_vi, "2", VI_TRUE);
        Delay(1);
    }
    sgd_ConfigureOutputEnabled (SDG_vi, "2", VI_FALSE);
    /* Display a message as the finish */
    MessagePopup ("Message", strMsg);
Error:
    if(VI_SUCCESS != error)
    {
        ViChar szErrMsg[2048];
        /* Retrieve the error and display it */
        sgd_GetError(SDG_vi, &error, 2048, szErrMsg);
        MessagePopup("Error!", szErrMsg);
    }
    if(SDG_vi)
        sgd_close(SDG_vi);
    return 0;
    //FreeLibrary(hDLL)
}
}

```



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.

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