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SCXI-1129

QUICK REFERENCE

NI-SWITCH Instrument Driver

Initialize with Topology and Close

ICON	VI NAME †	TYPE	PARAMETER
	niSwitch Initialize With Topology (niSwitch_InitWithTopology) Returns a session handle used to identify the switch module in all subsequent instrument driver calls and sets the topology of the switch. Refer to *Resource Name Syntax* at the end of this guide.	ViConstString	resource name
		ViConstString	topology name
		ViBoolean	simulate
		ViBoolean	reset
		ViSession (out)	vi
	niSwitch Close (niSwitch_close) Terminates the NI-SWITCH session and all of its attributes and deallocates any memory resources the driver uses.	ViSession	vi

Immediate Operations

ICON	VI NAME †	TYPE	PARAMETER
	niSwitch Connect Channels (niSwitch_Connect) Creates the shortest available path between **channel 1** and **channel 2**. If a path is unavailable, an error is returned.	ViSession	vi
		ViConstString	channel 1
		ViConstString	channel 2
	niSwitch Disconnect Channels (niSwitch_Disconnect) Disconnects an existing path between **channel 1** and **channel 2**. Paths are created using `niSwitch Connect Channels` or `niSwitch Set Path`.	ViSession	vi
		ViConstString	channel 1
		ViConstString	channel 2
	niSwitch Disconnect All Channels (niSwitch_DisconnectAll) Disconnects all existing paths.	ViSession	vi
	niSwitch Get Path (niSwitch_GetPath) Returns a string that uniquely identifies the path you created with `niSwitch Connect Channels`. Pass this string to `niSwitch Set Path` to establish the exact same path in the future.	ViSession	vi
		ViConstString	channel 1
		ViConstString	channel 2
		ViInt32	buffer size
		ViChar (out)	path list [ ]

† Function names for C, C++, LabWindows™/CVI™, and Visual Basic are in parentheses.

ICON	VI NAME	TYPE	PARAMETER
	Immediate Operations (continued)		
	niSwitch Set Path (niSwitch_SetPath) Connects two channels by establishing an explicit path with the **path list** parameter. Use for applications where repeatability of the path is important, such as in calibrated signal paths. If repeatability is not necessary, use niSwitch Connect Channels. To obtain the exact path for a given connection, use niSwitch Get Path.	ViSession ViConstString	vi path list
	niSwitch Wait For Debounce (niSwitch_WaitForDebounce) Returns after all the paths that you created have settled.	ViSession ViInt32	vi maximum time
	niSwitch Switch Is Debounced? (niSwitch_IsDebounced) Returns the state of the switch module and indicates if all the created paths have settled.	ViSession ViBoolean (out)	vi is debounced
	niSwitch Can Connect Channels? (niSwitch_CanConnect) Verifies that the switch module can create a path between the two channels specified in the **channel 1** and **channel 2** parameters. If the switch module can create a path, this function indicates whether the path is currently available given the existing connections.	ViSession ViConstString ViConstString ViInt32 (out)	vi channel 1 channel 2 path capability reference
	Scanning		
	niSwitch Initiate Scan (niSwitch_InitiateScan) Downloads the configured scan list and trigger settings to hardware, initiates the scan, and returns. Once the scan initiates, you cannot perform any other operation other than niSwitch Abort Scan or niSwitch Send Software Trigger, nor can you perform the retrieval of attributes.	ViSession	vi
	niSwitch Commit (niSwitch_Commit) Downloads the configured scan list and trigger settings to hardware. niSwitch Commit is useful for arming triggers in a given order or control when expensive hardware operations are performed.	ViSession	vi
	niSwitch Abort Scan (niSwitch_AbortScan) Aborts a scan in progress. Initiate a scan with niSwitch Initiate Scan.	ViSession	vi

Scanning (continued)

ICON	VI NAME	TYPE	PARAMETER
	niSwitch Configure Scan List (niSwitch_ConfigureScanList) Configures the scan list and scan mode used for scanning. The scan list is comprised of a list of channel connections separated by semicolons. For example, the following scan list scans the first three channels of a multiplexer: `com0->ch0; com0->ch1; com0->ch2;` To see the status of a scan, call `niSwitch Is Scanning` or `niSwitch Wait For Scan Complete`. Use `niSwitch Configure Scan Trigger` and `niSwitch Initiate` to configure the scan trigger and start the scan respectively.	ViSession	vi
		ViConstString	scan list
		ViInt32	scan mode
	niSwitch Set Continuous Scan (niSwitch_SetContinuousScan) Tells the driver whether to continuously loop the scan list (True) or to stop scanning after one pass through the scan list (False). Call `niSwitch Abort Scan` to halt a continuous scan.	ViSession	vi
		ViConstString	scan list
		ViInt32	scan mode
	niSwitch Configure Scan Trigger (niSwitch_ConfigureScanTrigger) Configures the scan triggers for the scan last established with `niSwitch Configure Scan List`.	ViSession	vi
		ViReal64	scan delay
		ViInt32	trigger input
		ViInt32	scan advanced output
	niSwitch Route Trigger Input (niSwitch_RouteTriggerInput) Routes the input trigger from the front or rear connector to a trigger bus line (TTL*x*).	ViSession	vi
		ViInt32	input connector
		ViInt32	trigger bus line
		ViBoolean	invert
	niSwitch Route Scan Advanced Output (niSwitch_RouteScanAdvancedOutput) Routes the scan advanced output trigger from the front or rear connector to a trigger bus line (TTL*x*).	ViSession	vi
		ViInt32	input connector
		ViInt32	trigger bus line
		ViBoolean	invert
	niSwitch Send Software Trigger (niSwitch_SendSoftwareTrigger) Sends a software trigger to the switch module specified by the NI-SWITCH session.	ViSession	vi
	niSwitch Wait For Scan To Complete (niSwitch_WaitForScanComplete) Pauses until the switch module stops scanning or **maximum time** has elapsed.	ViSession	vi
		ViInt32	maximum time

Scanning (continued)

ICON	VI NAME	TYPE	PARAMETER
	niSwitch Switch Is Scanning? (niSwitch_IsScanning) Indicates the status of the scan.	ViSession	vi
		ViBoolean (out)	is scanning

Relay Control

ICON	VI NAME	TYPE	PARAMETER
	niSwitch Relay Control (niSwitch_RelayControl) Controls individual relays of the switch module. When controlling individual relays, the protection offered by setting the usage of source channels and configuration channels is void.	ViSession	vi
		ViConstString	switch name
		ViInt16	switch action
	niSwitch Get Relay Position (niSwitch_GetRelayPosition) Returns the relay position for the relay specified in the **relay name** parameter.	ViSession	vi
		ViConstString	relay name
		ViInt16 (out)	position

Utility

ICON	VI NAME	TYPE	PARAMETER
	niSwitch Initialize (niSwitch_init) Returns a session handle used to identify the switch module in all subsequent driver calls. Refer to *Resource Name Syntax* at the end of this guide.	ViRsrc	resource name
		ViBoolean	id query
		ViBoolean	reset device
		ViSession (out)	vi
	niSwitch Initialize With Options (niSwitch_InitWithOptions) Returns a session handle used to identify the switch module in all subsequent driver calls. Also can optionally set attributes of the switch module. Refer to *Resource Name Syntax* at the end of this guide.	ViRsrc	resource name
		ViBoolean	id query
		ViBoolean	reset device
		ViString	option string
		ViSession (out)	vi
	niSwitch Reset (niSwitch_reset) Resets the switch module to a known state.	ViSession	vi
	niSwitch Reset with Defaults (niSwitch_ResetWithDefaults) Resets the switch module and applies the initial user-specified setting from the logical name used to initialize the session.	ViSession	vi

Utility (continued)

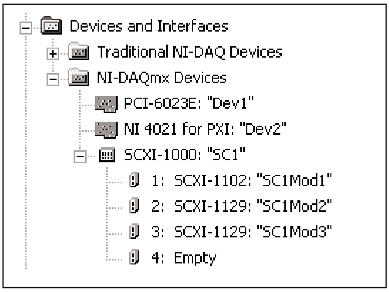
ICON	VI NAME	TYPE	PARAMETER
	niSwitch Get Channel Name (niSwitch_GetChannelName) Returns the channel string that is in the channel table at the specified index. Use this function/VI in a For Loop to get a complete list of valid channel names for the switch module. Use the Channel Count attribute to determine the number of channels.	ViSession	vi
		ViInt32	index
		ViString (out)	channel string
	niSwitch Get Relay Name (niSwitch_GetRelayName) Returns the relay name string that is in the relay list at the specified index. Use this function/VI in a For Loop to get a complete list of valid relay names for the switch module. Use the Number of Relays attribute to determine the number of relays.	ViSession	vi
		ViInt32	index
		ViString (out)	relay string
	niSwitch Self Test (niSwitch_self_test) Verifies the driver can communicate with the switch module.	ViSession	vi
		ViInt16 (out)	self test result
		ViChar (out)	self test message [ ]
	niSwitch Revision Query (niSwitch_revision_query) Returns the revision numbers of the driver.	ViSession	vi
		ViChar (out)	instrument driver revision [ ]
		ViChar (out)	firmware revision [ ]
	niSwitch Disable (niSwitch_Disable) Places the switch in a quiescent state where it has minimal or no impact on the system to which it is connected.	ViSession	vi
	niSwitch Error Message (niSwitch_error_message) Converts a status code returned by the driver into a user-readable string.	ViSession	vi
		ViStatus	error code
		ViChar (out)	error message [256]

Interchangeability

ICON	VI NAME	TYPE	PARAMETER
	niSwitch Clear Interchange Warnings (niSwitch_ClearInterchangeWarnings) Clears the list of current interchange warnings.	ViSession	vi
	niSwitch Reset Interchange Check (niSwitch_ResetInterchangeCheck) Resets the interchangeability checking algorithms in the specific driver, thus ignoring all previous configuration operations.	ViSession	vi
	niSwitch Get Next Interchange Check (niSwitch_GetNextInterchangeCheck) Returns the interchangeability warning associated with the IVI session.	ViSession ViConstString (out)	vi interchange warning

Resource Name Syntax

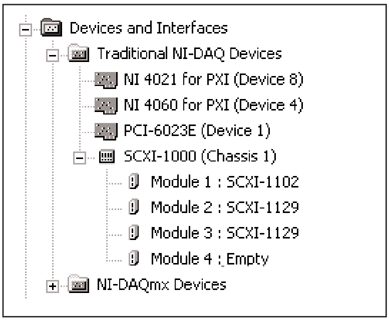
To establish a session with the correct switch module, you must pass a resource name to `niSwitch Initialize with Topology`. The syntax of the resource name depends on where in Measurement & Automation Explorer (MAX) you configured your switch module—under NI-DAQmx Devices, Traditional NI-DAQ (Legacy) Devices, or PXI System.



```
Devices and Interfaces
    Traditional NI-DAQ Devices
    NI-DAQmx Devices
        PCI-6023E: "Dev1"
        NI 4021 for PXI: "Dev2"
        SCXI-1000: "SC1"
            1: SCXI-1102: "SC1Mod1"
            2: SCXI-1129: "SC1Mod2"
            3: SCXI-1129: "SC1Mod3"
            4: Empty
```

NI-DAQmx Devices

If you configured the PXI or SCXI switch module under NI-DAQmx Devices in MAX, the resource name is the string in quotes. For example, the resource name of the first SCXI-1129 in the following figure would be `SC1Mod2`. Pass this string to `niSwitch Initialize With Topology`. You can rename the resource name for switch modules configured as DAQmx devices simply by clicking on the device in MAX and entering a new name.



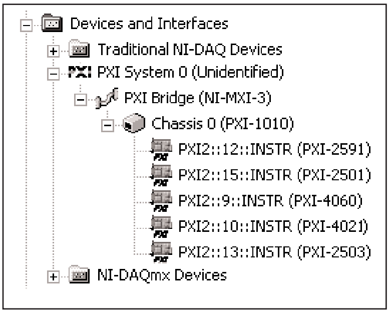
```
Devices and Interfaces
    Traditional NI-DAQ Devices
        NI 4021 for PXI (Device 8)
        NI 4060 for PXI (Device 4)
        PCI-6023E (Device 1)
        SCXI-1000 (Chassis 1)
            Module 1 : SCXI-1102
            Module 2 : SCXI-1129
            Module 3 : SCXI-1129
            Module 4 : Empty
    NI-DAQmx Devices
```

Traditional NI-DAQ (Legacy) Devices

If you configured the switch module in MAX under Traditional NI-DAQ (Legacy) Devices, the resource name syntax is:

`SCXI[chassis ID]::slot number`

For example, the resource name of the first SCXI-1129 for the following configuration would be `SCXI1::2`. Pass this string to `niSwitch Initialize With Topology`.



```
Devices and Interfaces
    Traditional NI-DAQ Devices
    PXI System 0 (Unidentified)
        PXI Bridge (NI-MXI-3)
            Chassis 0 (PXI-1010)
                PXI2::12::INSTR (PXI-2591)
                PXI2::15::INSTR (PXI-2501)
                PXI2::9::INSTR (PXI-4060)
                PXI2::10::INSTR (PXI-4021)
                PXI2::13::INSTR (PXI-2503)
    NI-DAQmx Devices
```

PXI System

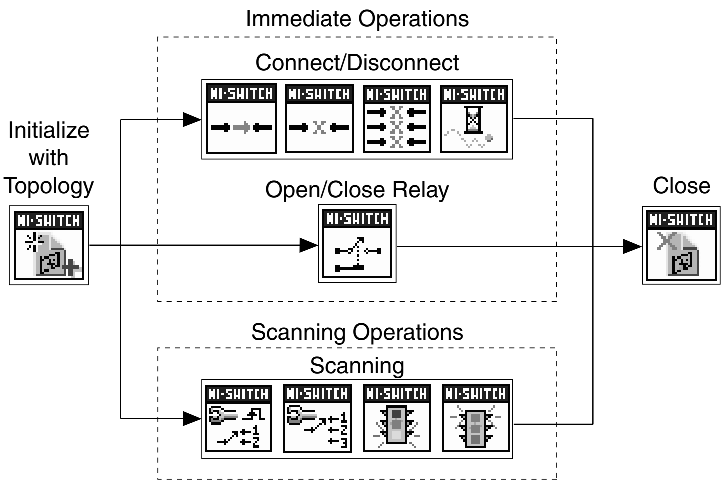
If you configured the switch module in MAX under PXI System, the resource name syntax is:

`PXI[bus number]::device number`

For example, the resource name of the PXI-2591 for the configuration to the left would be `PXI2::12`. Pass this string to `niSwitch Initialize With Topology`.

Note If the module also appears under NI-DAQmx Devices, configure your PXI module under NI-DAQmx Devices instead of PXI System.

Programming Flow



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