National Instruments™ Switch Executive Quick Reference Guide

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This document contains quick reference information about examples, functions, route specification strings, and error codes.

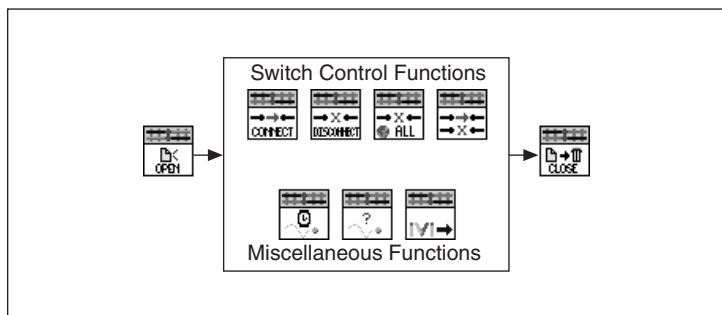**Note** Function names for C, C++, LabWindows/CVI, and Visual Basic are in parentheses.

ICON	FUNCTION NAME	DESCRIPTION
Examples		
Getting Started	Getting Started	Opens a session and makes a route connection
Inter-Active	Interactive Control	Uses many of the API functions through an interactive tool
Route Syntax	Route Specification Syntax Example	Demonstrates the many different aspects of route specifications, including usage of routes, route groups, fully-specified routes, and combinations of route types
Cnct & Discnct	Sequenced Connect And Disconnect	Uses Connect and Disconnect to sequence through different switching system states
Find Route	Using Find Route to Connect Two Channels	Uses Find Route to determine a path between two channels and then connects the path

Programming Flow

The following diagram shows a typical programming flow for Switch Executive.

ICON	FUNCTION NAME	TYPE	PARAMETER	VALUE TO SET, COMMENTS
Functions				
	niSE Close Session (niSE_CloseSession)	NISESession	sessionHandle	Reference to virtual device session
	niSE Connect (niSE_Connect)	NISESession	sessionHandle	Reference to virtual device session
		NISEConstString	connectSpec	String describing the connections to be made
		NISEInt32	multiconnectMode	NO_MULTICONNECT MULTICONNECT_ROUTES
		NISEBoolean	waitForDebounce	NISE_TRUE NISE_FALSE
	niSE Connect And Disconnect (niSE_ConnectAndDisconnect)	NISESession	sessionHandle	Reference to virtual device session
		NISEConstString	connectSpec	String describing the connections to be made
		NISEConstString	disconnectSpec	String describing the disconnections to be made
		NISEInt32	multiconnectMode	NO_MULTICONNECT MULTICONNECT_ROUTES
		NISEInt32	operationOrder	BREAK_BEFORE_MAKE BREAK_AFTER_MAKE
		NISEBoolean	waitForDebounce	NISE_TRUE NISE_FALSE
	niSE Disconnect (niSE_Disconnect)	NISESession	sessionHandle	Reference to virtual device session
		NISEConstString	disconnectSpec	String describing the disconnections to be made
	niSE Disconnect All (niSE_DisconnectAll)	NISESession	sessionHandle	Reference to virtual device session

ICON	FUNCTION NAME	TYPE	PARAMETER	VALUE TO SET, COMMENTS
Functions (Continued)				
FIND	**niSE Find Route** (niSE_FindRoute)	NISESession	sessionHandle	Reference to virtual device session
		NISEConstString	channel1	Channel name of one of the endpoints of the route to find
		NISEConstString	channel2	Channel name of one of the endpoints of the route to find
		NISEBuffer* [out]	routeSpec	Returns the path between the channels if PATH_EXISTS or PATH_AVAILABLE
		NISEInt32* [in/out]	routeSpecSize	Input = size of the route string buffer being passed Return = the size required to hold the entire route string
		NISEInt32* [out]	routeCapability	PATH_AVAILABLE (1); PATH_EXISTS (2); PATH_UNSUPPORTED (3); RSRC_IN_USE (4); SOURCE_CONFLICT (5); CHANNEL_NOT_AVAILABLE (6); CHANNELS_HARDWIRED (7)
	niSE Get Ivi Device Session (niSE_GetIviDeviceSession)	NISESession	sessionHandle	Reference to virtual device session
		NISEConstString	iviLogicalname	IVI device to retrieve an IVI device session for
		ViSession* [out]	iviSessionHandle	Returns the ViSession instrument handle of the specified IVI device
	niSE Is Debounced (niSE_IsDebounced)	NISESession	sessionHandle	Reference to virtual device session
		NISEBoolean* [out]	isDebounced	NISE_TRUE NISE_FALSE
OPEN	**niSE Open Session** (niSE_OpenSession)	NISEConstString	virtualDeviceName	Name of the Switch Executive virtual device to open a session to
		NISEConstString	options	Used to pass information to each of the IVI devices on startup
		NISESession* [out]	sessionHandle	Reference to virtual device session
	niSE Wait For Debounce (niSE_WaitForDebounce)	NISESession	sessionHandle	Reference to virtual device session
		NISEInt32	maxTime	Amount of time to wait (in ms) for the debounce to complete before timing out

Additional C/C++/Visual Basic Functions

C, C++, and Visual Basic users have two additional functions available that are not needed in LabVIEW

FUNCTION NAME	TYPE	PARAMETER	VALUE TO SET, COMMENTS
Additional C/C++/Visual Basic Functions			
`niSE_ClearError`	NISESession	sessionHandle	Reference to virtual device session
`niSE_GetError`	NISESession	sessionHandle	Reference to virtual device session
	NISEStatus* [out]	errorNumber	Returns the error number of the first error that occurred in the session since the error was last cleared
	NISEBuffer* [out]	errorDescription	Returns a string describing the error
	NISEInt32* [out]	errorDescriptionSize	Input = size of the error description buffer being passed Return = size required to hold entire string

Route Specification Strings

Route specification strings are the paths connecting two channels and are composed of one or more routes delimited by ampersands (&). For example, in the following line of syntax, there are three defined routes or route groups.

```
routeOrGroup & routeOrGroup & routeOrGroup
```

where `routeOrGroup` can be:

- Route name
- Route group name
- Fully specified path

where fully specified path is enclosed in square brackets and consists of one or more channels delimited by `->`.

```
[channel -> channel -> channel]
```

where `channel` can be:

- A channel alias name
- A unique name created by combining the IVI device logical name and IVI channel name separated by a forward slash (/) delimiter. For example, (*device/iviChan).

Note The channel on either end of the bracketed list must *not* be:
- Marked as a source channel (one or the other is valid)
- A configuration channel configured through an IVI con figuration and not by Switch Executive

> **Note** Any channel within a route specification string that is not an endpoint must be a configuration channel.

WARNING CODE	VALUE (HEX)	VALUE (DECIMAL)	DESCRIPTION
Error Codes			
INTERNAL	FFFF8EB8	–29000	An internal error has occurred. Please contact National Instruments technical support.
IVI_DRIVER_NO_SIMULATION	FFFF8EB7	–29001	The IVI specific driver does not support simulation mode.
INVALID_VIRUTUAL_DEVICE_NAME	FFFF8EB6	–29002	The specified Switch Executive virtual device is invalid or does not exist.
INVALID_SESSION	FFFF8EB5	–29003	This session is not a valid Switch Executive virtual device session.
INSUFFICIENT_SYSTEM_RESOURCES	FFFF8EB4	–29004	Switch Executive requires system resources that are currently unavailable. Close other applications and try again.
AMBIGUOUS_NAME	FFFF8EB3	–29005	The specified name is ambiguous. Specify a unique name.
INVALID_IVI_LOGICAL_NAME	FFFF8EB2	–29006	The IVI logical name is invalid or the device does not exist.
INVALID_ROUTE_SPECIFICATION	FFFF8EB1	–29007	The route specification string contains invalid characters or could not be understood.
EVAL_TIMED_OUT	FFFF8EAF	–29008	Switch Executive is running in evaluation mode and the time limit for this session has expired. Restart your application to continue evaluating.
INVALID_NAME	FFFF8EAE	–29009	The name contains invalid characters.
RUNTIME_IMPORTING_EVAL	FFFF8EAD	–29010	This configuration was created with an evaluation version. Switch Executive in run-time mode can only import configurations created with a development system version. Import the configuration into a development system and re-export the file from there to resolve the problem.
EVAL_EXPIRED_IMPORTING	FFFF8EAC	–29011	Switch Executive cannot import configurations once the evaluation period has expired.
RUNTIME_EXPORTING	FFFF8EAB	–29012	Switch Executive deployment mode cannot export configurations. The operation requested requires a development license.
IMPORTING_FILE_ACCESS	FFFF8EAA	–29013	There was an error when accessing (open or read) the Switch Executive configuration file.
IMPORTING_FILE_FORMAT	FFFF8EA9	–29014	The file is not a valid NI Switch Executive configuration file.
INVALID_END_POINTS	FFFF8EA8	–29015	The endpoints of the path do not match the existing endpoints.
INVALID_PATH	FFFF8EA7	–29016	Cannot connect this path on the device.
INVALID_CHANNEL_SPECIFICATION	FFFF8EA6	–29017	The channel specification string contains invalid characters or could not be understood.
DLL_NOT_FOUND	FFFF8EA5	–29018	A needed DLL was not found. Check to ensure that the NI Switch Executive is properly installed and that all needed DLLs are in the search path.

WARNING CODE	VALUE (HEX)	VALUE (DECIMAL)	DESCRIPTION
Error Codes (Continued)			
FUNCTION_NOT_FOUND	FFFF8EA4	–29019	A needed function in a DLL could not be found. Although the DLL exists, it may be an incorrect version and may not contain the needed function.
MAX_TIME_EXCEEDED	FFFF8EA3	–29020	One or more switching devices have not debounced within the specified maximum time.
ROUTE_ALREADY_EXISTS	FFFF8EA2	–29021	The route you are trying to connect or a route with the same endpoints is already connected.
ROUTE_EXISTS_AS_ UNSHAREABLE	FFFF8EA1	–29022	The route you are trying to connect already exists as an unshareable route. It must be disconnected before you can make a reference counted route.
ROUTE_EXISTS_BY_DIFFERENT_ PATH	FFFF8EA0	–29023	The route you are trying to connect already exists but is connected via a different path than the one specified.
ROUTE_DOES_NOT_EXIST	FFFF8E9F	–29024	The specified route does not exist. You cannot disconnect a route that does not exist.
PARTIAL_DISCONNECT	FFFF8E9E	–29025	Device specific errors occurred during the disconnect operation.