TSC-Material-Theme

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Chapter 1. Project description

No description found (add content in project description)

Chapter 2. Libraries

This section describes the libraries contained in the project.

2.1. TSC Material Theme.lvlib

Responsibility: Implement the Google Material Theme coloring to LabVIEW

https://m3.material.io/

Version: 1.0.0.0

Table 1. Nested libraries

Name	Type
Material Theme.lvclass	LVClass
Material-Palette.lvclass	LVClass
Material-Scheme.lvclass	LVClass

2.1.1. Functions

This library has no functions set to non private scope.

2.1.2. Library Constant VIs

NOTE	No Constant VIs Found

Chapter 3. Classes

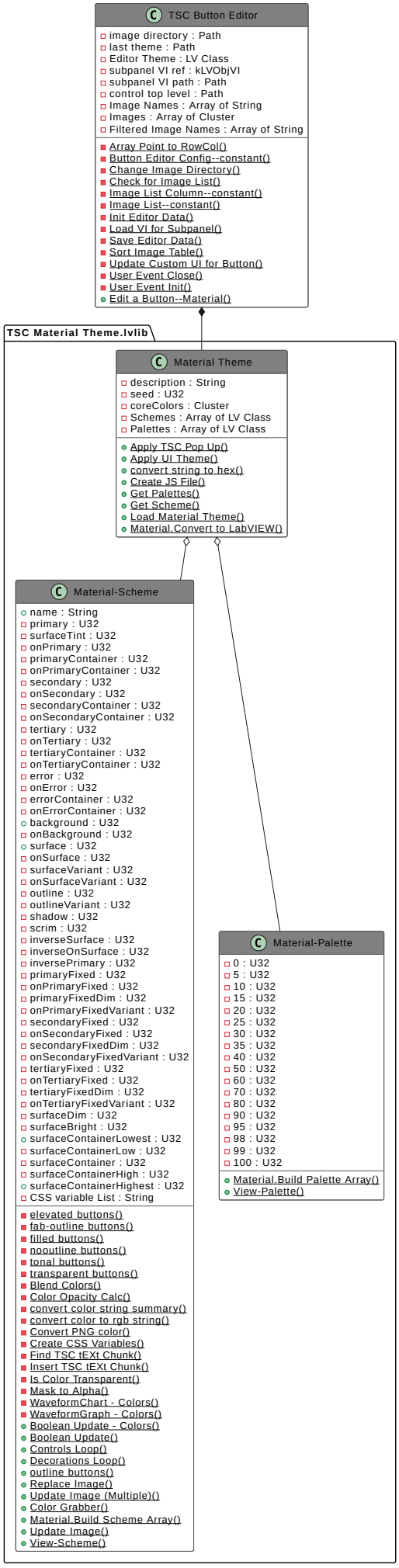
This section describes the classes contained in the project.

3.1. Classes overview

This project contains 4 classes and 0 interface.

Table 2. Classes list

Classes	Interfaces
TSC Button Editor.lvclass	
Material Theme.lvclass	
Material-Palette.lvclass	
Material-Scheme.lvclass	

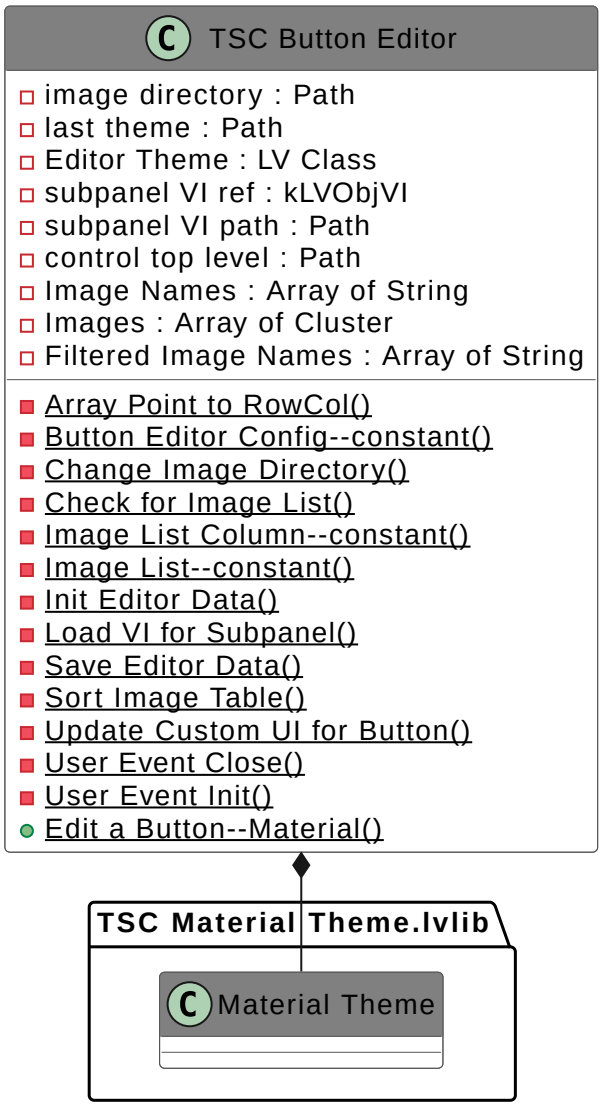

TSC Button Editor
image directory : Path
last theme : Path
Editor Theme : LV Class
subpanel VI ref : kLVObjVI
subpanel VI path : Path
control top level : Path
Image Names : Array of String
Images : Array of Cluster
Filtered Image Names : Array of String
Array Point to RowCol()
Button Editor Config--constant()
Change Image Directory()
Check for Image List()
Image List Column--constant()
Image List--constant()
Init Editor Data()
Load VI for Subpanel()
Save Editor Data()
Sort Image Table()
Update Custom UI for Button()
User Event Close()
User Event Init()
Edit a Button--Material()
TSC Material Theme.lvlib
Material Theme
description : String
seed : U32
coreColors : Cluster
Schemes : Array of LV Class
Palettes : Array of LV Class
Apply TSC Pop Up()
Apply UI Theme()
convert string to hex()
Create JS File()
Get Palettes()
Get Scheme()
Load Material Theme()
Material.Convert to LabVIEW()
Material-Scheme
name : String
primary : U32
surfaceTint : U32
onPrimary : U32
primaryContainer : U32
onPrimaryContainer : U32
secondary : U32
onSecondary : U32
secondaryContainer : U32
onSecondaryContainer : U32
tertiary : U32
onTertiary : U32
tertiaryContainer : U32
onTertiaryContainer : U32
error : U32
onError : U32
errorContainer : U32
onErrorContainer : U32
background : U32
onBackground : U32
surface : U32
onSurface : U32
surfaceVariant : U32
onSurfaceVariant : U32
outline : U32
outlineVariant : U32
shadow : U32
scrim : U32
inverseSurface : U32
inverseOnSurface : U32
inversePrimary : U32
primaryFixed : U32
onPrimaryFixed : U32
primaryFixedDim : U32
onPrimaryFixedVariant : U32
secondaryFixed : U32
onSecondaryFixed : U32
secondaryFixedDim : U32
onSecondaryFixedVariant : U32
tertiaryFixed : U32
onTertiaryFixed : U32
tertiaryFixedDim : U32
onTertiaryFixedVariant : U32
surfaceDim : U32
surfaceBright : U32
surfaceContainerLowest : U32
surfaceContainerLow : U32
surfaceContainer : U32
surfaceContainerHigh : U32
surfaceContainerHighest : U32
CSS variable List : String
elevated buttons()
fab-outline buttons()
filled buttons()
nooutline buttons()
tonal buttons()
transparent buttons()
Blend Colors()
Color Opacity Calc()
convert color string summary()
convert color to rgb string()
Convert PNG color()
Create CSS Variables()
Find TSC tEXt Chunk()
Insert TSC tEXt Chunk()
Is Color Transparent()
Mask to Alpha()
WaveformChart - Colors()
WaveformGraph - Colors()
Boolean Update - Colors()
Boolean Update()
Controls Loop()
Decorations Loop()
outline buttons()
Replace Image()
Update Image (Multiple)()
Color Grabber()
Material.Build Scheme Array()
Update Image()
View-Scheme()
Material-Palette
0 : U32
5 : U32
10 : U32
15 : U32
20 : U32
25 : U32
30 : U32
35 : U32
40 : U32
50 : U32
60 : U32
70 : U32
80 : U32
90 : U32
95 : U32
98 : U32
99 : U32
100 : U32
Material.Build Palette Array()
View-Palette()

3.2. TSC Button Editor.lvclass

Responsibility: The button editor class to keep track of helper functions and shared data

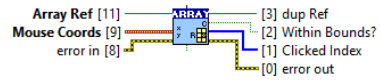
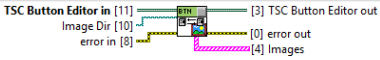
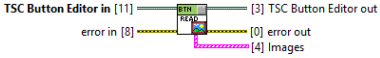
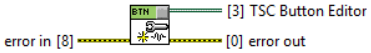
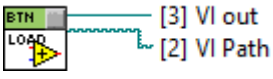
Version: 1.0.0.10

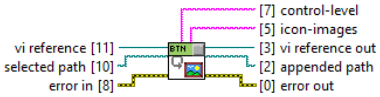
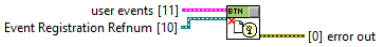
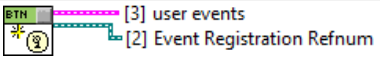
3.2.1. Diagram



3.2.2. Methods

Table 3. Functions

Name	Connector pane	Description	S.	R.	I.
Array Point to RowCol		Converts a pixel coordinate to an index into the array. Returns an array of indices with a length equal to the number of dimensions in the array. This method also returns whether the point is inside the bounds of the content rectangle. Downloaded from forum post to adapt to this application. Written by J. David Saunders https://forums.ni.com/t5/LabVIEW/get-index-of-an-element-from-an-array-on-mouse-click/td-p/1310143/page/2			
Change Image Directory		This VI will change the image directory and load the images from that location. **Code Developed By:** Technology Service Corporation			
Check for Image List		This VI will look to see if an image directory binary file exists. **Code Developed By:** Technology Service Corporation			
Init Editor Data		This VI will load the initial information from the configuration for the button editor if it exists to initialize the class. **Code Developed By:** Technology Service Corporation			
Load VI for Subpanel		This VI loads in the subpanel VI at program start which contains a sample Boolean control. **Code Developed By:** Technology Service Corporation			
Save Editor Data		This VI is called when the button editor finishes to write the object-data to an XML file for loading on next launch. **Code Developed By:** Technology Service Corporation			

Name	Connector pane	Description	S.	R.	I.
Sort Image Table		This VI reshapes the array of images into the display for the button editor UI. **Code Developed By:** Technology Service Corporation			
Update Custom UI for Button		Remove the existing control and replace with the selected custom button. **Code Developed By:** Technology Service Corporation			
User Event Close		close all user events **Code Developed By:** Technology Service Corporation			
User Event Init		create user events for the button editor. **Code Developed By:** Technology Service Corporation			
Edit a Button—Material		Edit/create buttons based on a few built-in templates. **Code Developed By:** Technology Service Corporation			

Scope: → Protected | → Community | → Private

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

3.2.3. Class Constant VIs

Table 4. Constant VIs Found

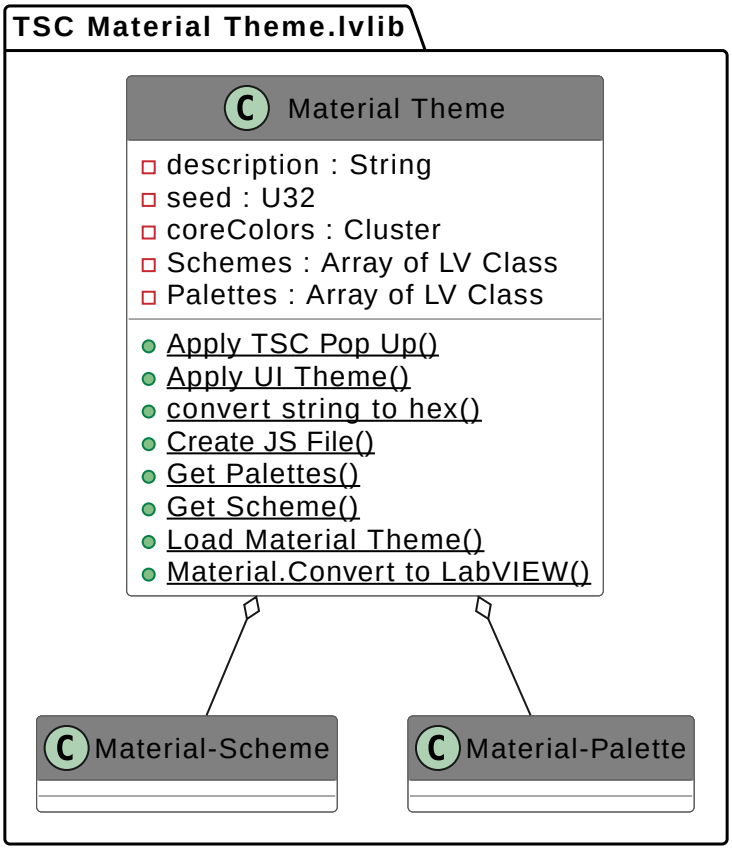
VI Name	Data Type	Value
Button Editor Config—constant.vi	Path	tsc\button-editor.xml
Image List Column—constant.vi	I32	8
Image List—constant.vi	Path	tsc\image-list.bin

3.3. Material Theme.lvclass

Responsibility: No description found (add content in lvclass description)

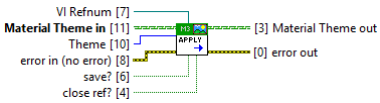
Version: 1.0.0.3

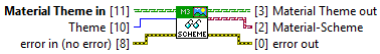
3.3.1. Diagram



3.3.2. Methods

Table 5. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Apply TSC Pop Up		Apply a loaded theme to the TSC Pop Up Library **Code Developed By:** Technology Service Corporation			
Apply UI Theme		Apply a loaded theme to a VI - will update the panel and the controls/indicators **Code Developed By:** Technology Service Corporation			
convert string to hex		convert an ARGB text string to the equivalent hex value **Code Developed By:** Technology Service Corporation			

Name	Connector pane	Description	S.	R.	I.
Create JS File		I have no recollection of why I made this or what it's purpose is. I am just going to leave it in case it is important…….. **Code Developed By:** Technology Service Corporation			
Get Palettes		Get the defined scheme from the loaded theme **Code Developed By:** Technology Service Corporation			
Get Scheme		Get the defined scheme from the loaded theme **Code Developed By:** Technology Service Corporation			
Load Material Theme		load a material theme from disk **Code Developed By:** Technology Service Corporation			
Material.Convert to LabVIEW		populate the material theme from the original Material JSON that was exported **Code Developed By:** Technology Service Corporation			

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

3.3.3. Class Constant VIs

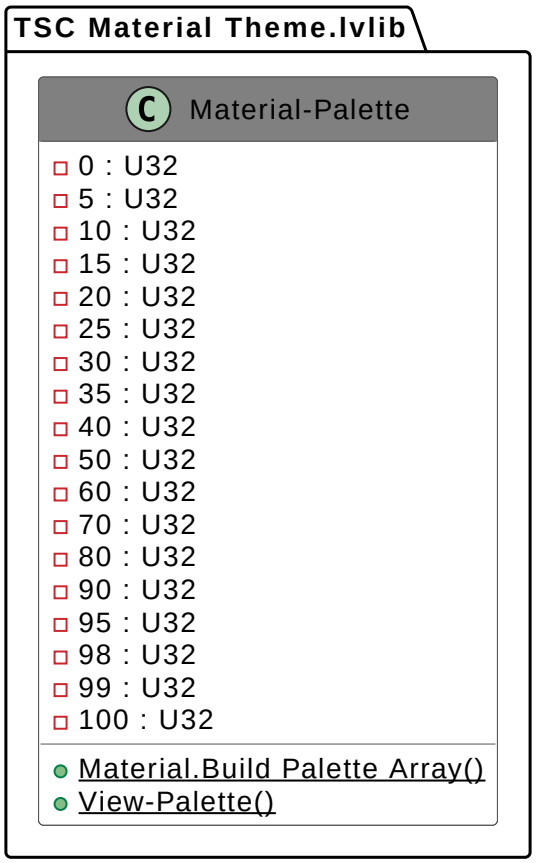
NOTE No Constant VIs Found

3.4. Material-Palette.lvclass

Responsibility: The Material-Palette class defines the gradients of colors

Version: 1.0.0.0

3.4.1. Diagram



3.4.2. Methods

Table 6. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Material.Build Palette Array	palettes [11] PALETTE [2] Palettes	Convert the json represenation of the palette colors into array of class palettes. **Code Developed By:** Technology Service Corporation			
View-Palette	Array [11] PALETTE	read material palette data **Code Developed By:** Technology Service Corporation			

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

3.4.3. Class Constant VIs

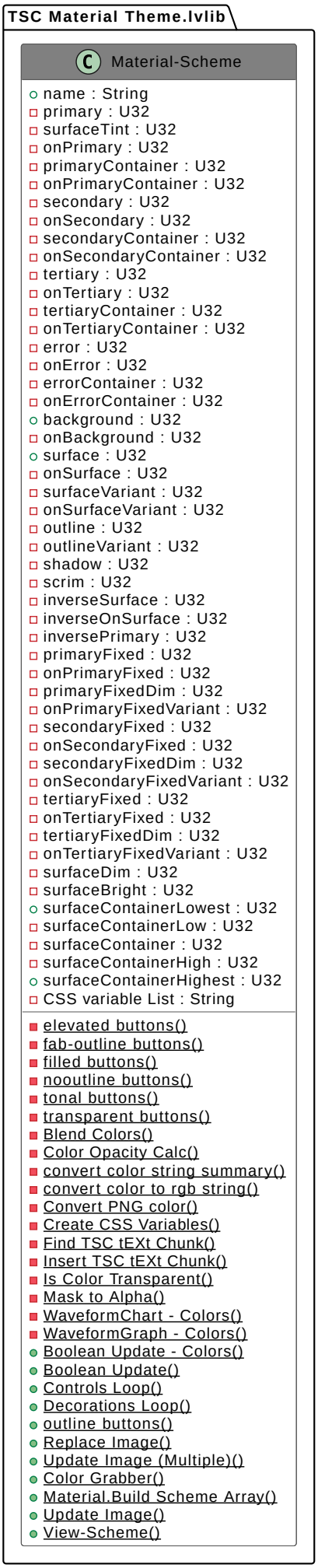
NOTE No Constant VIs Found

3.5. Material-Scheme.lvclass

Responsibility: The Material-Scheme class defines the coloring categories for a given theme

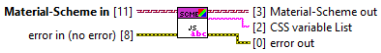
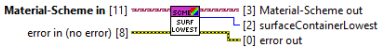
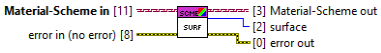
Version: 1.0.0.3

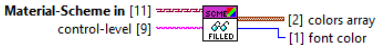
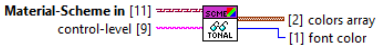
3.5.1. Diagram

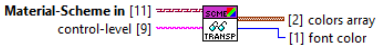
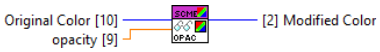
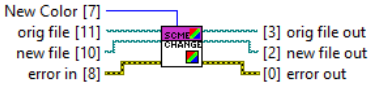
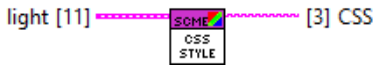

TSC Material Theme.lvlib
Material-Scheme
name : String
primary : U32
surfaceTint : U32
onPrimary : U32
primaryContainer : U32
onPrimaryContainer : U32
secondary : U32
onSecondary : U32
secondaryContainer : U32
onSecondaryContainer : U32
tertiary : U32
onTertiary : U32
tertiaryContainer : U32
onTertiaryContainer : U32
error : U32
onError : U32
errorContainer : U32
onErrorContainer : U32
background : U32
onBackground : U32
surface : U32
onSurface : U32
surfaceVariant : U32
onSurfaceVariant : U32
outline : U32
outlineVariant : U32
shadow : U32
scrim : U32
inverseSurface : U32
inverseOnSurface : U32
inversePrimary : U32
primaryFixed : U32
onPrimaryFixed : U32
primaryFixedDim : U32
onPrimaryFixedVariant : U32
secondaryFixed : U32
onSecondaryFixed : U32
secondaryFixedDim : U32
onSecondaryFixedVariant : U32
tertiaryFixed : U32
onTertiaryFixed : U32
tertiaryFixedDim : U32
onTertiaryFixedVariant : U32
surfaceDim : U32
surfaceBright : U32
surfaceContainerLowest : U32
surfaceContainerLow : U32
surfaceContainer : U32
surfaceContainerHigh : U32
surfaceContainerHighest : U32
CSS variable List : String
elevated buttons()
fab-outline buttons()
filled buttons()
nooutline buttons()
tonal buttons()
transparent buttons()
Blend Colors()
Color Opacity Calc()
convert color string summary()
convert color to rgb string()
Convert PNG color()
Create CSS Variables()
Find TSC tEXt Chunk()
Insert TSC tEXt Chunk()
Is Color Transparent()
Mask to Alpha()
WaveformChart - Colors()
WaveformGraph - Colors()
Boolean Update - Colors()
Boolean Update()
Controls Loop()
Decorations Loop()
outline buttons()
Replace Image()
Update Image (Multiple)()
Color Grabber()
Material.Build Scheme Array()
Update Image()
View-Scheme()

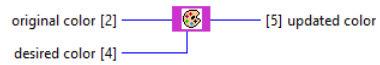
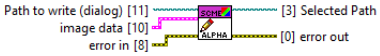
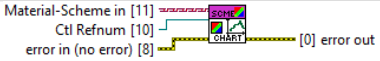
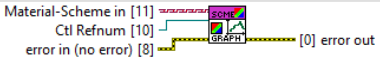
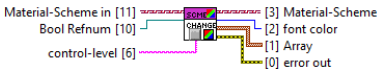
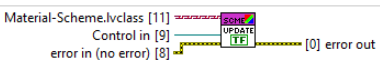
3.5.2. Methods

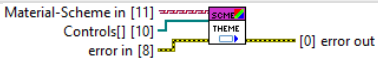
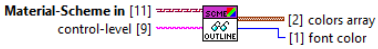
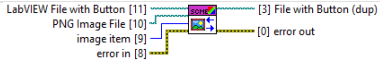
Table 7. Functions

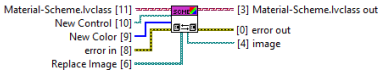
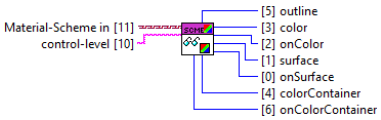
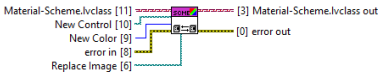
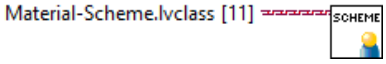
Name	Connector pane	Description	S.	R.	I.
Read background		Data member access method that provides the background color from the Scheme. **Code Developed By:** Technology Service Corporation			
Read CSS Variables		Data member access method to read the CSS Variables from the scheme. **Code Developed By:** Technology Service Corporation			
Read name		Data member access method to read the name for the Scheme. **Code Developed By:** Technology Service Corporation			
Read surfaceContainerHighest		Data member access method to read the surfaceContainerHighest color from the scheme. **Code Developed By:** Technology Service Corporation			
Read surfaceContainerLowest		Data member access method to read the surfaceContainerLowest color from the scheme. **Code Developed By:** Technology Service Corporation			
Read surface		Data member access method to read the surface color from the scheme. **Code Developed By:** Technology Service Corporation			

Name	Connector pane	Description	S.	R.	I.
elevated buttons		application of the floating action button transparent buttons (text buttons) rules https://m3.material.io/components/buttons/specs#9c12a1a1-9a74-499c-8139-5cff551afe4f **Code Developed By:** Technology Service Corporation			
fab-outline buttons		application of the floating action button (FAB) buttons coloring rules https://m3.material.io/components/floating-action-button/specs **Code Developed By:** Technology Service Corporation			
filled buttons		application of the FILLED buttons coloring rules https://m3.material.io/components/buttons/specs#7b9ba06e-d393-491b-830e-ae3fe0816d4b **Code Developed By:** Technology Service Corporation			
nooutline buttons		application of the NO OUTLINE buttons coloring rules https://m3.material.io/components/buttons/specs#9c12a1a1-9a74-499c-8139-5cff551afe4f **Code Developed By:** Technology Service Corporation			
tonal buttons		application of the TONAL buttons coloring rules https://m3.material.io/components/buttons/specs#31a04913-d070-49c5-9c36-41d551f20096 **Code Developed By:** Technology Service Corporation			

Name	Connector pane	Description	S.	R.	I.
transparent buttons		application of the floating action button transparent buttons (text buttons) rules https://m3.material.io/components/buttons/specs#9c12a1a1-9a74-499c-8139-5cff551afe4f **Code Developed By:** Technology Service Corporation			
Blend Colors		blend the colors together with a blend ratio **Code Developed By:** Technology Service Corporation			
Color Opacity Calc		apply an opacity percentage to a color **Note**: opacity input expected to be decimal of the percentage **Code Developed By:** Technology Service Corporation			
convert color string summary		Define the tip strip info for the Scheme → adds the hex and RGB info to the string **Code Developed By:** Technology Service Corporation			
convert color to rgb string		get the RGB string from the color box **Code Developed By:** Technology Service Corporation			
Convert PNG color		Change the colors of the png file using .net functions **Note**: Assumes a single color PNG file - replace old primary with new primary **Code Developed By:** Technology Service Corporation			
Create CSS Variables		for when new browser plugins get implemented, apply variables for CSS from the color scheme **Code Developed By:** Technology Service Corporation			

Name	Connector pane	Description	S.	R.	I.
Find TSC tEXt Chunk		Look to see if the TSC author tag has been embedded into the PNG **Code Developed By:** Technology Service Corporation			
Insert TSC tEXt Chunk		embed the png author text chunk into the image **Code Developed By:** Technology Service Corporation			
Is Color Transparent		check if original was transparent, if so, don't change it, if it isn't though, pass out the new color **Code Developed By:** Technology Service Corporation			
Mask to Alpha		convert mask data to alpha layer **Code Developed By:** Technology Service Corporation			
PNG Write with Alpha		Write png file with alpha layer **Code Developed By:** Technology Service Corporation			
WaveformChart - Colors		Sets the colors of the waveform chart. **Code Developed By:** Technology Service Corporation			
WaveformGraph - Colors		Set the colors for a waveform graph type. **Code Developed By:** Technology Service Corporation			
Boolean Update - Colors		update boolean control colors **Code Developed By:** Technology Service Corporation			
Boolean Update		Set the boolean scheme - will be the most involved of the control types **Code Developed By:** Technology Service Corporation			

Name	Connector pane	Description	S.	R.	I.
Controls Loop		loop through all the controls on a panel in order to change the appearance -this is a re-entrant VI because it is called recursively when there is a tab control **Code Developed By:** Technology Service Corporation			
Decorations Loop		Change the coloring on decorations → If it is a text decoration, change the background color only when it wasn't trasnparent before AND change the text color; otherwise, normal decoration just change background/foreground **Code Developed By:** Technology Service Corporation			
outline buttons		application of the OUTLINE buttons coloring rules -→this VI is *public* because it is used in the Button Editor UI https://m3.material.io/components/buttons/specs#6757c97e-0ae6-4802-a2d5-9e3b134a7231 **Code Developed By:** Technology Service Corporation			
Replace Image		This example VI was obtained from this post: https://forums.ni.com/t5/LabVIEW-APIs-Discussions/Set-TRUE-FALSE-Image-of-a-boolean-control-automatically-using/m-p/3419083/highlight/true#M868 **WARNING** This VI uses a dll call to the resource file for a LabVIEW VI/CTL - it is searching the binary data for the PNG images that the VI or CTL contains **Code Developed By:** Technology Service Corporation			

Name	Connector pane	Description	S.	R.	I.
Update Image (Multiple)		Update the image of the buttons **Code Developed By:** Technology Service Corporation			
Color Grabber		get the colorset for the application and the color-level **Code Developed By:** Technology Service Corporation			
Material.Build Scheme Array		build the array of scheme objects from the original data **Code Developed By:** Technology Service Corporation			
Update Image		Update the image of the buttons **Code Developed By:** Technology Service Corporation			
View-Scheme		scheme view UI set up like the material theme display **Code Developed By:** Technology Service Corporation			

Scope: → Protected | → Community | → Private

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

3.5.3. Class Constant VIs

NOTE	No Constant VIs Found

Chapter 4. Legal Information

4.1. Document creation

This document has been generated using the following tools.

4.1.1. Antidoc

Project website: Antidoc

Maintainer website: Wovalab

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4.1.2. Asciidoc for LabVIEW™

Project website: Asciidoc toolkit

Maintainer website: Wovalab

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4.1.3. classy Diagram Viewer

Project website: classy Diagram Viewer

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