

HAMPEL SOFTWARE ENGINEERING

hse-libraries

HAMPEL SOFTWARE ENGINEERING

Version 3.3.0 (2021-09-29)

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Documentation generated automatically and programmatically from LabVIEW!

This document was created fully automatically from the actual LabVIEW Source Code of this project using the [Release Automation Tools](#) of [Hampel Software Engineering](#).

1. STATE MACHINES

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2. CALLING DEPENDENCY DIAGRAMS

2.1. OVERVIEW

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2.2. CALLERS

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2.3. LISTENERS

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APPENDIX A: DQMH

DQMH modules documentation

A.1. GENNET-CLIENT.LVLIB

Type: Cloneable

Responsibility: No description found (add content in DQMH module lvlib description)

A.1.1. MODULE START/STOP CALLS

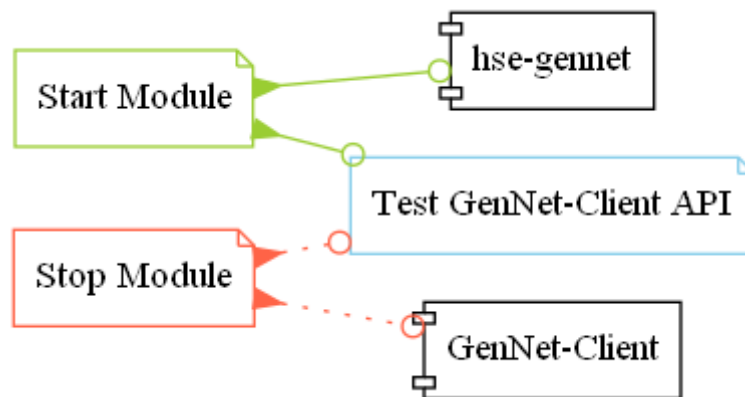


Table 1. Start and Stop module callers

Function	Callers
GenNet-Client.lvlib:Start Module.vi	Test GenNet-Client API.vi hse-gennet.lvlib:GenNet Init Client.vi
GenNet-Client.lvlib:Stop Module.vi	GenNet-Client.lvlib:Handle Exit.vi Test GenNet-Client API.vi

A.1.2. MODULE RELATIONSHIP



Table 2. Requests callers

Request Name	Callers
GenNet-Client.lvlib:Show Panel.vi	Test GenNet-Client API.vi
GenNet-Client.lvlib:Hide Panel.vi	GenNet-Client.lvlib:Main.vi Test GenNet-Client API.vi
GenNet-Client.lvlib:Show Diagram.vi	Test GenNet-Client API.vi
GenNet-Client.lvlib:Send via Network.vi	Test GenNet-Client API.vi

Request Name	Callers
GenNet-Client.lvlib:Listen for Network Broadcasts.vi	Test GenNet-Client API.vi
GenNet-Client.lvlib:Connect.vi	Test GenNet-Client API.vi hse-gennet.lvlib:GenNet Init Client.vi

Table 3. Broadcasts Listeners

Broadcast Name	Listeners
GenNet-Client.lvlib:Module Did Init.vi	Test GenNet-Client API.vi
GenNet-Client.lvlib:Status Updated.vi	Test GenNet-Client API.vi
GenNet-Client.lvlib:Error Reported.vi	Test GenNet-Client API.vi
GenNet-Client.lvlib:Module Did Stop.vi	Test GenNet-Client API.vi
GenNet-Client.lvlib:Update Module Execution Status.vi	Test GenNet-Client API.vi

Table 4. Used requests

Module	Requests
☒—☒	☒—☒

Table 5. Registered broadcast

Module	Broadcasts
☒—☒	☒—☒

A.1.3. MODULE CUSTOM ERRORS



Custom errors are added to the module via vi named `*--error.vi`.


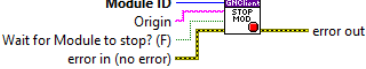
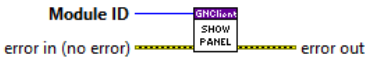
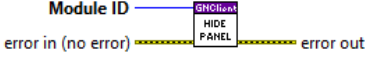
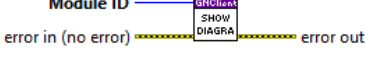


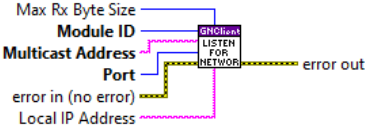
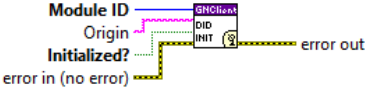
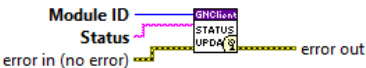
Module GenNet-Client.lvlib use the following custom errors:


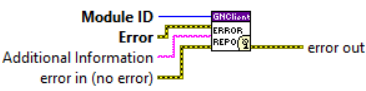

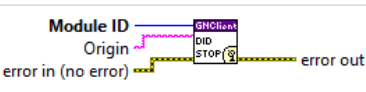

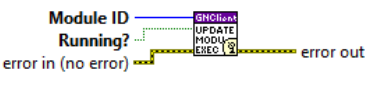
Table 6. Custom errors


Name	Code	Description
Module Running as Singleton	403680	The "%s" module is currently running as singleton, but the Start Module VI was called with 'Run as Singleton' specified as FALSE.
Module Not Stopped	403682	%s Module did not finish clean up on exit.
Module Not Synced	403683	%s Module was unable to synchronize events.
Module Not Running	403684	Not a single instance of "%s" Module running.
Module Running as Cloneable	403685	The "%s" module is currently running as cloneable, but the Start Module VI was called with 'Run as Singleton' specified as TRUE.
Request Timed Out	403686	The reply for the request "%s" of the "%s" Module timed out.
Request and Wait for Reply Timeout	403686	%s
Master Reference Not Closed	403687	The "%s" module cannot be run as singleton because the Master Reference is still open from a prior run as cloneable. If you plan on running this module as both singleton and cloneable, consider changing your Main VI to wire a value of TRUE to the 'Close Master Reference' input of Init Module.vi.

A.1.4. EVENT LIST

Table 7. Events

Name	Type	Connector pane	Description	S.	R.	I.
Start Module			Launches the Module Main.vi.			
Stop Module			<p>Send the Stop request to the Module's Main.vi. If Wait for Module to stop? is TRUE, then this VI will not complete execution until the Module Main VI has stopped running.</p> <p>Note: If the cloneable module is running as singleton, then the 'Wait for Module to stop?' input is ignored... this VI will always wait until a cloneable Main VI running as singleton has stopped running.</p> <p>Note: This VI was modified by the Validate DQMH Module tool to upgrade it to the DQMH 5.1 approach to poll the execution state of a cloneable module running as singleton to know when the module has gone idle.</p>			
Show Panel	→		Send the Show Panel request to the Module's Main.vi.			
Hide Panel	→		Send the Hide Panel request to the Module's Main.vi.			
Show Diagram	→		This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			
Send via Network	→		Forwards the message of a DQMH module via Network			
Connect	→		Open the TCP/IP connection to the listening module			
Listen for Network Broadcasts	→		Opens a port to listen for broadcasts sent by other modules via UDP			
Module Did Init	→		Send the Module Did Init event to any VI registered to listen to this module's broadcast events.			
Status Updated	→		Send the Status Updated event to any VI registered to listen to events from the owning module.			

Name	Type	Connector pane	Description	S.	R.	I.
Error Reported			Send the Error Reported event to any VI registered to listen to events from the owning module.			
Module Did Stop			Send the Module Did Stop event to any VI registered to listen to this module's broadcast events.			
Update Module Execution Status			Fire the Get Module Execution Status request.			

Type:  → Request |  → Request and Wait for Reply |  → Broadcast

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined

A.2. GENNET-SERVER.LVLIB

Type: Cloneable

Responsibility: No description found (add content in DQMH module lvlib description)

A.2.1. MODULE START/STOP CALLS

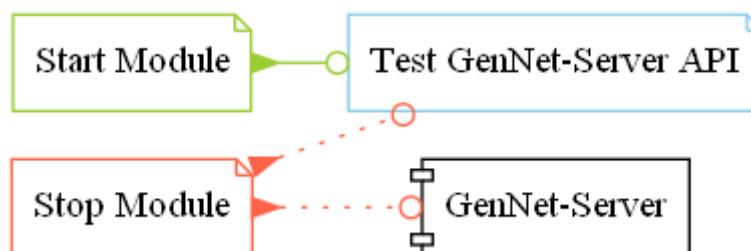


Table 8. Start and Stop module callers

Function	Callers
GenNet-Server.lvlib:Start Module.vi	Test GenNet-Server API.vi
GenNet-Server.lvlib:Stop Module.vi	GenNet-Server.lvlib:Main.vi GenNet-Server.lvlib:Handle Exit.vi Test GenNet-Server API.vi

A.2.2. MODULE RELATIONSHIP

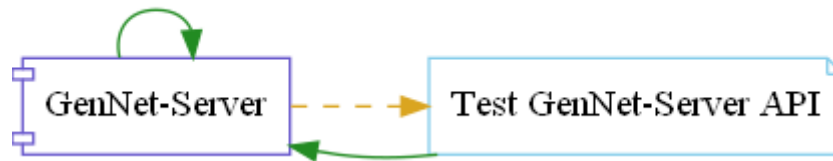


Table 9. Requests callers

Request Name	Callers
GenNet-Server.lvlib:Show Panel.vi	Test GenNet-Server API.vi
GenNet-Server.lvlib:Hide Panel.vi	Test GenNet-Server API.vi
GenNet-Server.lvlib:Show Diagram.vi	Test GenNet-Server API.vi
GenNet-Server.lvlib:Forward Generic Broadcasts to Network.vi	Test GenNet-Server API.vi

Table 10. Broadcasts Listeners

Broadcast Name	Listeners
GenNet-Server.lvlib:Module Did Init.vi	Test GenNet-Server API.vi
GenNet-Server.lvlib>Status Updated.vi	Test GenNet-Server API.vi
GenNet-Server.lvlib>Error Reported.vi	Test GenNet-Server API.vi
GenNet-Server.lvlib:Module Did Stop.vi	Test GenNet-Server API.vi
GenNet-Server.lvlib:Update Module Execution Status.vi	Test GenNet-Server API.vi

Table 11. Used requests

Module	Requests
☒—☒	☒—☒

Table 12. Registered broadcast

Module	Broadcasts
☒—☒	☒—☒

A.2.3. MODULE CUSTOM ERRORS



Custom errors are added to the module via vi named `*--error.vi`.

Module GenNet-Server.lvlib use the following custom errors:

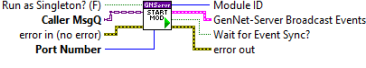
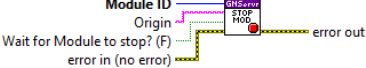
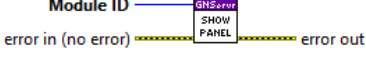


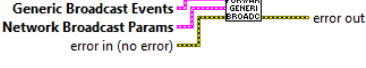
Table 13. Custom errors


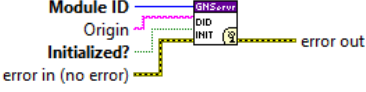



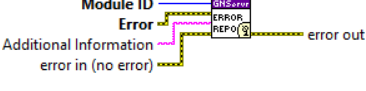



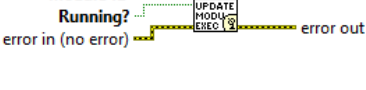
Name	Code	Description
Module Running as Singleton	403680	The "%s" module is currently running as singleton, but the Start Module VI was called with 'Run as Singleton' specified as FALSE.
Module Not Stopped	403682	%s Module did not finish clean up on exit.
Module Not Synced	403683	%s Module was unable to synchronize events.
Module Not Running	403684	Not a single instance of "%s" Module running.


Name	Code	Description
Module Running as Cloneable	403685	The "%s" module is currently running as cloneable, but the Start Module VI was called with 'Run as Singleton' specified as TRUE.
Request and Wait for Reply Timeout	403686	%s
Master Reference Not Closed	403687	The "%s" module cannot be run as singleton because the Master Reference is still open from a prior run as cloneable. If you plan on running this module as both singleton and cloneable, consider changing your Main VI to wire a value of TRUE to the 'Close Master Reference' input of Init Module.vi.

A.2.4. EVENT LIST


Table 14. Events

Name	Type	Connector pane	Description	S.	R.	I.
Start Module		 <p>Run as Singleton? (F) Caller MsgQ error in (no error) Port Number</p> <p>Module ID GenNet-Server Broadcast Events Wait for Event Sync? error out</p>	Launches the Module Main.vi.			
Stop Module		 <p>Module ID Origin Wait for Module to stop? (F) error in (no error)</p> <p>error out</p>	<p>Send the Stop request to the Module's Main.vi. If Wait for Module to stop? is TRUE, then this VI will not complete execution until the Module Main VI has stopped running.</p> <p>Note: If the cloneable module is running as singleton, then the 'Wait for Module to stop?' input is ignored... this VI will always wait until a cloneable Main VI running as singleton has stopped running.</p> <p>Note: This VI was modified by the Validate DQMH Module tool to upgrade it to the DQMH 5.1 approach to poll the execution state of a cloneable module running as singleton to know when the module has gone idle.</p>			
Show Panel	➡	 <p>Module ID</p> <p>error in (no error)</p> <p>error out</p>	Send the Show Panel request to the Module's Main.vi.			
Hide Panel	➡	 <p>Module ID</p> <p>error in (no error)</p> <p>error out</p>	Send the Hide Panel request to the Module's Main.vi.			
Show Diagram	➡	 <p>Module ID</p> <p>error in (no error)</p> <p>error out</p>	This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			
Forward Generic Broadcasts to Network	➡	 <p>Module ID Generic Broadcast Events Network Broadcast Params error in (no error)</p> <p>error out</p>	Enables forwarding of the callers Generic Broadcast Events to the network via UDP as set in the Network Broadcast Params.			

Name	Type	Connector pane	Description	S.	R.	I.
Module Did Init		 <p>Module ID Origin Initialized? error in (no error)</p>	Send the Module Did Init event to any VI registered to listen to this module's broadcast events.			
Status Updated		 <p>Module ID Status error in (no error)</p>	Send the Status Updated event to any VI registered to listen to events from the owning module.			
Error Reported		 <p>Module ID Error Additional Information error in (no error)</p>	Send the Error Reported event to any VI registered to listen to events from the owning module.			
Module Did Stop		 <p>Module ID Origin error in (no error)</p>	Send the Module Did Stop event to any VI registered to listen to this module's broadcast events.			
Update Module Execution Status		 <p>Module ID Running? error in (no error)</p>	Fire the Get Module Execution Status request.			

Type:  → Request |  → Request and Wait for Reply |  → Broadcast

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined

APPENDIX B: LIBRARIES

Misc. reuse libraries

B.1. HSE-CONFIG.LVLIB

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

Version: 1.0.0.0

Table 15. Nested libraries

Name	Type
[config-base.lvclass]	LVClass
[config-ini.lvclass]	LVClass

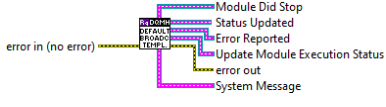
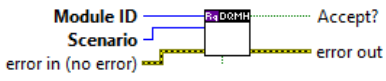
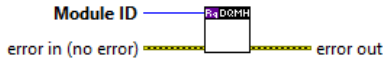
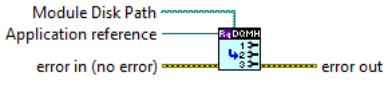
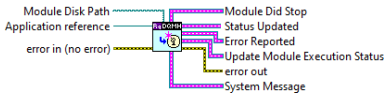
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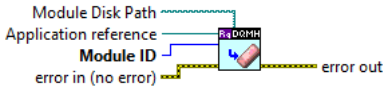
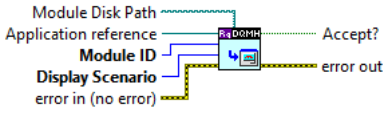
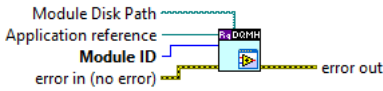
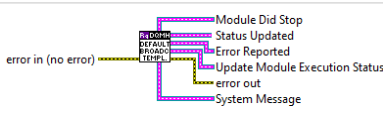
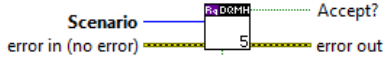

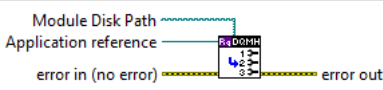
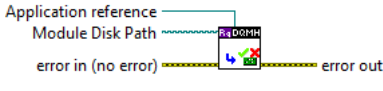
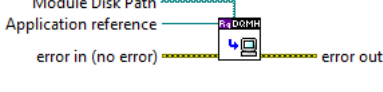
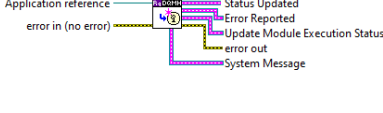
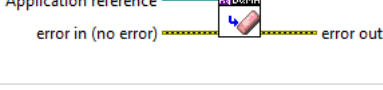
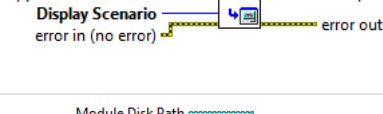
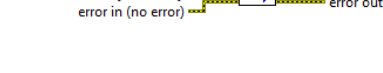
B.2. HSE-DQMH-DYNAMICREQUESTERS.LVLIB

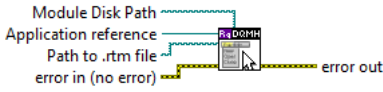
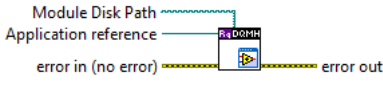
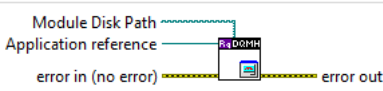
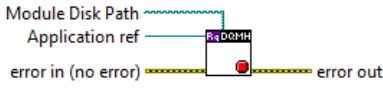
Responsibility: No description found (add content in lvlib description)

Version: 1.0.0.0



Table 16. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Default Broadcast (Cloneable)--template					
Request UI Display (Cloneable)--template		No description found (add content in vi description)			
Show Diagram (Cloneable)--template		No description found (add content in vi description)			
DQMH Configure (Cloneable)		Calls the "Configure" request VI of the module in path			
DQMH Obtain Default Broadcast Events (Cloneable)		Calls the "Obtain Default Broadcast Events" request VI of the module in path			

Name	Connector pane	Description	S.	R.	I.
DQMH Prepare (Cloneable)		Calls the "Prepare" request VI of the module in path			
DQMH Request UI Display (Cloneable)		Calls the "Request UI Display" request VI of the module in Path to module directory . Hands over the Module ID and the Display Scenario .			
DQMH Show Diagram (Cloneable)		Calls the "Request UI Display" request VI of the module in Path to module directory . Hands over the Module ID and the Display Scenario .			
Default Broadcast—template					
Request UI Display—template		No description found (add content in vi description)			
Set Modules—template		No description found (add content in vi description)			
DQMH Configure		Calls the "Configure" request VI of the module in path			
DQMH Load API Tester		Calls the "Load Module" request VI of the module in path			
DQMH Load Module		Calls the "Load Module" request VI of the module in path			
DQMH Obtain Default Broadcast Events		Calls the "Obtain Default Broadcast Events" request VI of the module in path			
DQMH Prepare		Calls the "Prepare" request VI of the module in path			
DQMH Request UI Display		Calls the "Request UI Display" request VI of the module in Path to module directory . Hands over the Module Name and the Display Scenario .			
DQMH Set Modules		Calls the "Set Modules" request VI of the module in Path to module directory . Hands over paths to all dynamically loaded modules in modules to load dynamically .			

Name	Connector pane	Description	S.	R.	I.
DQMH Set Runtime Menu		Calls the "Set Runtime Menu" request VI of the module in Path to module directory. Hands over the Path to .rtm file.			
DQMH Show Diagram		Calls the "Request UI Display" request VI of the module in Path to module directory. Hands over the Module Name and the Display Scenario.			
DQMH Show Panel		Calls the "Show Panel" request VI of the module in Path to module directory			
DQMH Stop Module		Calls the "Stop Module" request VI of the module in Path to module directory			

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

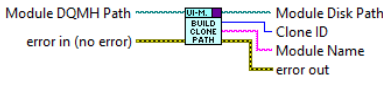
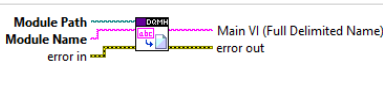

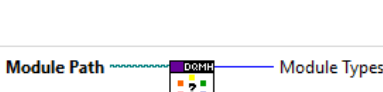

Inlining:  → Inlined

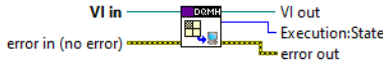

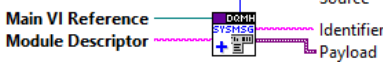

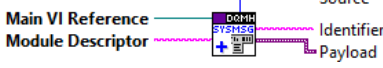

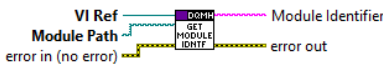

B.3. HSE-DQMH.LVLIB


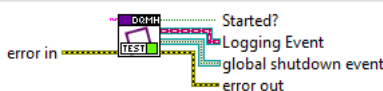
Responsibility: No description found (add content in lplib description)

Version: 1.0.0.0

Table 17. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
DQMH Build Module Disk Path From DQMH Path		Parses the Instance Name for the Clone ID and returns the full path to the module's directory, the Clone ID and the module's name			
DQMH Get Fully Delimited Instance Name from Module Name		Parses the fully delimited VI name from the module path and the module name. For cloneables, the clone ID is appended to the VI name.			
DQMH Get Module Type		Returns the type (singleton or cloneable) of the module in Module Path			

Name	Connector pane	Description	S.	R.	I.
DQMH Load Main VI Reference	 <p>VI in error in (no error) VI out Execution:State error out</p>	<p>Loads the VI reference to a Singleton DQMH module's main.vi. On Linux RT in Runtime Environment, the main.vi is loaded reentrant in order to circumvent a bug in LabVIEW.</p> <p>Details: On Linux RT with Embedded UI enabled running a startup.exe, a VI server invoke method (Control Value.set) doesn't work. This is possibly related to / covered by CAR 514879 (see https://forums.ni.com/t5/Delacor-Toolkits-Discussions/Deploy-and-run-at-Startup-for-RT-systems/m-p/3620339/highlight/true#M256).</p> <p>In order for this VI to work, you need to: 1. set the DQMH module's main.vi execution setting to "preallocated clone reentrant execution" 2. set the DQMH module's main.vi scope to "community" 3. add the hse-dqmh.lvlib as a friend in the DQMH module's .lvlib Friends properties</p>			
DQMH Request Reply Timed Out—error	 <p>Request Name Module Name timed out? error out</p>	No description found (add content in vi description)			
DQMH System Message - Add to Run-Time Menu	 <p>Main VI Reference Module Descriptor Source Identifier Payload</p>	Sends the modul's Path and Module Descriptor via the "Add to Run-Time Menu" System Message broadcast. The UI Manager inserts the module into the relevant locations in the run-time menu.			
DQMH System Message - Get Module Identifier	 <p>VI Ref Module Path error in (no error) Module Identifier error out</p>	No description found (add content in vi description)			
DQMH System Message - Ready for Display	 <p>Main VI Reference Source Identifier Payload</p>	No description found (add content in vi description)			
DQMH System Message - Remove from Run-Time Menu	 <p>Main VI Reference Source Identifier Payload</p>	No description found (add content in vi description)			
DQMH System Message - Removed from Subpanel	 <p>Removed Module Source Identifier Payload</p>	No description found (add content in vi description)			
DQMH Tester Cleanup hse-appl	 <p>Stop? error in error out</p>	If the hse-application object was instantiated and the hse-logger was initialized when starting the Tester, this VI cleans up both objects.			

Name	Connector pane	Description	S.	R.	I.
DQMH Tester Prepare hse- appl - Get Name and Path		<p>Returns APP-NAME as Project Name and /APP-NAME_Source as Project Path</p> <p>HSE projects follow this folder structure: /APP-NAME_Config Configuration Files /APP-NAME_Data Measured and Other Data /APP-NAME_Source LabVIEW Sources /APP-NAME Compiled Application</p> <p>REAL-TIME: As the configuration directory on real-time systems always needs to reside at "C:\<Project Name>_Config\", and as it tedious (embedded UI) or impossible (no embedded UI) to enter the path, it can be supplied via the optional Real-Time App Name string input.</p>			
DQMH Tester Prepare hse- appl		<p>If the hse-application class is not running, queries the user for the path of the containing application and instantiates the hse-appl class. Returns if it did load the class.</p> <p>HSE projects follow this folder structure: /APP-NAME_Config Configuration Files /APP-NAME_Data Measured and Other Data /APP-NAME_Source LabVIEW Sources /APP-NAME Compiled Application</p> <p>The hse-application:ApplicationInit.VI expects the "APP-NAME_Source" folder and the "application name", and processes these to automatically find the "_Config" and "_Data" directories.</p> <p>REAL-TIME: As the configuration directory on real-time systems always needs to reside at "C:\<Project Name>_Config\", and as it tedious (embedded UI) or impossible (no embedded UI) to enter the path, it can be supplied via the optional Real-Time App Name string input.</p>			

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined

B.4. HSE-GENNET.LVLIB

Responsibility: The DQMH-GenNet library contains all support files necessary to use the HSE Generic Networking Singleton Module provided by HAMEL SOFTWARE ENGINEERING.

The Delacor Queued Message Handler (DQMH) reference design is provided by Delacor, an NI Alliance Partner. The DQMH is available for download from the LabVIEW Tools Network. You can find more information on the Delacor Queued Message Handler (DQMH) at <http://delacor.com/products/dqmh/>.

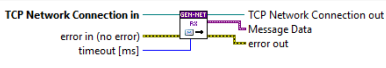


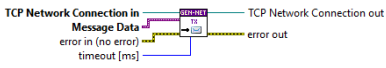





Version: 1.0.0.0


Table 18. Nested libraries



Name	Type
[DQMH-GenNet Message Queue.lvclass]	LVClass

Table 19. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
GenNet Close UDP Connection		Closes a TCP/IP connection.			
GenNet Send UDP Message		Sends a message via TCP/IP to a GenNet-Server module. The message is flattened to a string, and the length of the string is prepended before sending it over the network.			
GenNet Receive UDP Message		Receives a message sent by a GenNet-Client module. The first 4 bytes of the message contain the length of the actual data sent. The received message is converted to a variant.			
GenNet Get Broadcast Name From Variant		No description found (add content in vi description)			
GenNet Add Broadcast Name To Variant		No description found (add content in vi description)			
DQMH-GenNet Add Notifier To Variant		HSE: If a notifier reference is given, stores it as an attribute inside the Message Data variant. The notification data type is variant.			
DQMH-GenNet Get Notifier From Variant		HSE: Gets the Wait Notifier Refnum (datatype variant) from the Message Data variant			
GenNet Check Connection		Checks for a valid TCP/IP connection. Reestablishes the connection if no valid connection found. Creates a new connection if none was given.			
GenNet Close Connection		Closes a TCP/IP connection.			
GenNet Format System Message for MsgQ		Formats the contents of a System Message			
GenNet Init Client		Initializes a GenNet Client if ClientID == -1 and automatically connects to it. See usage example inside for how to use this VI.			

Name	Connector pane	Description	S.	R.	I.
GenNet Receive Message		Receives a message sent by a GenNet-Client module. The first 4 bytes of the message contain the lenght of the actual data sent. The received message is converted to a variant.			
GenNet Send Message		Sends a message via TCP/IP to a GenNet-Server module. The message is flattened to a string, and the length of the string is prepended before sending it over the network.			
GenNet Version-Safe Unflatten Variant		Unflattens a variant from a string. Automatically prepends the correct header if the variant was flattened in another LabVIEW version.			

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

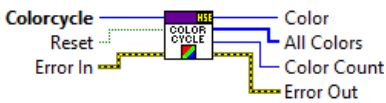






Inlining:  → Inlined





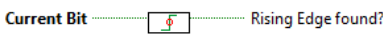


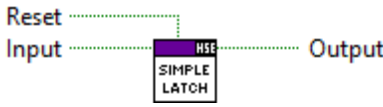


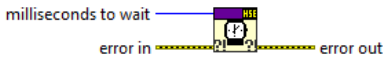

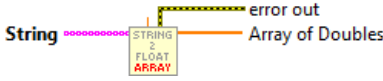

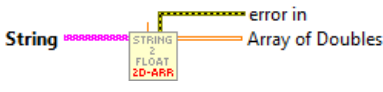

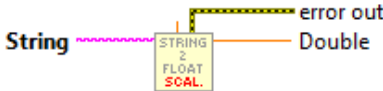

B.5. HSE-MISC.LVLIB

Responsibility: source code password: bowman-tyro-kickback-besides



Version: 1.0.0.0

Table 20. Functions (non private scope only)


Name	Connector pane	Description	S.	R.	I.
ColorCycle		With every call, this VI returns a color from a color pallet. If the last color from a pallet is reached, the VI continues with the first color. This Vi is useful to give plots and graphs better looking colors. The color sets are inspired by a subset of the colormaps from the Python plotting library Matplotlib.			
Get Enum Details from Type String		No description found (add content in vi description)			
Get Multiple Attributes from Variant		No description found (add content in vi description)			
Graph Scale Axis		Calculates usefull values for the Graph scaling (Minimum, Maximum) that go 10% over the min/max-values and include zero.			


Name	Connector pane	Description	S.	R.	I.
Set Multiple Attributes to Variant		Set multiple attributes (key-values-pairs) to a variant.			
Simple Edge Detection (Falling)		Returns True if a falling edge (True -> False) occurs. (This VI is inlined.)			
Simple Edge Detection (Rising)		Returns True if a rising edge (False -> True) occurs. (This VI is inlined.)			
Simple Latch		A simple boolean latch with reset functionality.			
Wait_ErrorCluster		Simple wrapper for the Wait function that allows for data flow.			
ConvertStringToFloat_Array-1D		converts array of string values to floating point values			
ConvertStringToFloat_Array-2D		converts array of string values to floating point values			
ConvertStringToFloat_Scalar		converts single string value to floating point value			


Name	Connector pane	Description	S.	R.	I.
Filename Sanitizer		+++Removes all characters that are not supported in filenames (/ \ : * ? " < >))		
:imgpath: empty.png [empty.png]	Find Data Type	:imgpath: hse_misc.lvlib_Find_Data_Type.vi___.png [hse- misc.lvlib:Find Data Type.vi]	N		


Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Represent Boolean	:imgpath: hse_misc.lvlib_Represent_Boolean.vi____.png [hse-misc.lvlib:Represent Boolean.vi]	N o d e s c r i p t i o n f o u n d (a d d c o n t e n t i n v i d e s c r i p t i o n)		
:imgpath: inlined.png [inlined.png]	Text to UTF-8 Wrapper	:imgpath: hse_misc.lvlib_Text_to_UTF_8_Wrapper.vi____.png [hse-misc.lvlib:Text to UTF-8 Wrapper.vi]	C o n v e r t s L a b V I E W t e x t t o U T F - 8.		

Name	Connector pane	Description	S.	R.	I.
:imgpath: inlined.png [inlined.png]	UTF-8 to Text Wrapper	:imgpath: hse_misc.lvlib_UTF_8_to_Text_Wrapper.vi____.png [hse-misc.lvlib:UTF-8 to Text Wrapper.vi]	Converts UTF-8 text to text encoded in the specified system.		
:imgpath: inlined.png [inlined.png]	U8-Array to U64	:imgpath: hse_misc.lvlib_U8_Array_to_U64.vi____.png [hse-misc.lvlib:U8-Array to U64.vi]	Convert an array of Bytes (U8) to an array of U64.		


Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	U64-Array to U8	:imgpath: hse_misc.lvlib_U64_Array_to_U8.vi____.png [hse- misc.lvlib:U64-Array to U8.vi]	Co nv er t an ar ra y of U6 4 to an ar ra y of By te s (U 8).		

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Variant_BuildClusterFromElementArray	:imgpath: hse_misc.lvlib_Variant_BuildClusterFromElementArray.vi___.png [hse- misc.lvlib:Variant_BuildClusterFromElementArray.vi]	From the LabVIEW Open Source project Data Manipulation library v1.4.0 by Franco Nordin (https://github.com/LabVIEW-OpenSource)		

Name	Connector pane	Description	S.	R.	I.
:imgpath: inlined.png [inlined.png]	Variant_EmptyCluster	:imgpath: hse_misc.lvlib_Variant_EmptyCluster.vi____.png [hse-misc.lvlib:Variant_EmptyCluster.vi]	Fr o m th e La bV IE W O pe n So ur ce pr oj ec t Da ta M an ip ul ati on lib ra ry v1 .4. 0 by Fr an co is N or m an di n (ht tp s:/ /gi th ub .c o m/ La bV IE W- O pe n- So		



Name	Connector pane	Description	S.	R.	I.
:imgpath: inlined.png [inlined.png]	LV Timestamp to Unix Epoch	:imgpath: hse_misc.lvlib_LV_Timestamp_to_Unix_Epoch.vi _.png [hse-misc.lvlib:LV Timestamp to Unix Epoch.vi]	Co nv ert a La bV ie w Ti m es ta m p (U TC Ti m ez on e) to a U ni x Ep oc h Ti m es ta m p (C ti m e_ t).		

Name	Connector pane	Description	S.	R.	I.
:imgpath: inlined.png [inlined.png]	Seconds to Time	:imgpath: hse_misc.lvlib_Seconds_to_Time.vi____.png [hse- misc.lvlib:Seconds to Time.vi]	Co nv er t a t i m e r a n g e (in se co nd s) to a t i m e str in g in th e for m at "h h: m m: ss ". E. g. 36 80 s -> "0 1: 01 :2 0".		

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Unix Epoch to LV Timestamp	:imgpath: hse_misc.lvlib_Unix_Epoch_to_LV_Timestamp.vi _.png [hse-misc.lvlib:Unix Epoch to LV Timestamp.vi]	Co nv ert a U ni x Ep oc h Ti m es ta m p (C ti m e_ t) to a La bV ie w Ti m es ta m p (U TC Ti m ez on e).		

Name	Connector pane	Description	S.	R.	I.
:imgpath: inlined.png [inlined.png]	Error_AddAdditionalInformation	:imgpath: hse_misc.lvlib_Error_AddAdditionalInformation. vi__.png [hse- misc.lvlib>Error_AddAdditionalInformation.vi]	Ad ds A dd iti on al Inf o< /b > to th e so ur ce of E rr or In </ b>		

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Error_AppendErrorsToSource	:imgpath: hse_misc.lvlib_Error_AppendErrorsToSource.vi_ _.png [hse- misc.lvlib>Error_AppendErrorsToSource.vi]	Take the first element of >error s in </ b> and concat enate all other element s' code and source into the source of the first error		

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Error_Clear	:imgpath: hse_misc.lvlib_Error_Clear.vi___.png [hse-misc.lvlib>Error_Clear.vi]	Clears the error in error in		
:imgpath: empty.png [empty.png]	Error_Helper_BuildCluster	:imgpath: hse_misc.lvlib_Error_Helper_BuildCluster.vi___.png [hse-misc.lvlib>Error_Helper_BuildCluster.vi]	Builds an error cluster from Code and Additional Info		

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Error_Helper_OverwriteCluster	:imgpath: hse_misc.lvlib_Error_Helper_OverwriteCluster.vi ___.png [hse- misc.lvlib>Error_Helper_OverwriteCluster.vi]	If Error Information with Code > and Additional Info< >.		





Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Error_Helper_RaiseError	:imgpath: hse_misc.lvlib_Error_Helper_RaiseError.vi____.png [hse-misc.lvlib>Error_Helper_RaiseError.vi]	If RaiseError? is true, , puts the error in ErrorToRaise on the error output and adds Additional Info > to the source of the er		


Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Error_Helper_RaiseErrorFromLabel	:imgpath: hse_misc.lvlib_Error_Helper_RaiseErrorFromLabel.vi___.png [hse- misc.lvlib>Error_Helper_RaiseErrorFromLabel.vi]	If R ais e? </ b> is tr ue , se ts an er ro r wi th co de se t by E rr or La be ls< /b > an d so ur ce by A dd iti on al Inf o< /b >		


Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Error_LogToFile	:imgpath: hse_misc.lvlib_Error_LogToFile.vi___.png [hse- misc.lvlib>Error_LogToFile.vi]	If >e rr or in </ b> is tr ue , wr ite s th e er ro r to th e fil e id en tifi ed by >p at h< /b > an d cl ea rs th e er ro r.		

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Event_CloseRegistrationRef	:imgpath: hse_misc.lvlib_Event_CloseRegistrationRef.vi__. png [hse- misc.lvlib:Event_CloseRegistrationRef.vi]	U n r e g i s t e r s t h e g i v e n e v e n t r e g i s t r a t i o n f r o m t h e H S E- E v e n t		


Name	Connector pane	Description	S.	R.	I.
:imgpath: inlined.png [inlined.png]	Event_Generate	:imgpath: hse_misc.lvlib_Event_Generate.vi____.png [hse- misc.lvlib:Event_Generate.vi]	Ge ne ra te s an HS E- Ev en t an d se nd s N a m e< /b >, P ar a m et er </ b> an d D at a< /b > as ev en t da ta.		

Name	Connector pane	Description	S.	R.	I.
:imgpath: inlined.png [inlined.png]	Event_GetRefAndReg	:imgpath: hse_misc.lvlib_Event_GetRefAndReg.vi__.png [hse-misc.lvlib:Event_GetRefAndReg.vi]	Ge ts th e HS E- Ev en t ref nu m and a ne w ev en t re gis tr ati on ref nu m for it.		
:imgpath: inlined.png [inlined.png]	Event_LoadOrCreateRefs	:imgpath: hse_misc.lvlib_Event_LoadOrCreateRefs.vi__.pn g [hse-misc.lvlib:Event_LoadOrCreateRefs.vi]	Re tu rn s th e ref nu m of th e HS E- Ev en t		
:imgpath: inlined.png [inlined.png]	Hash Core	:imgpath: hse_misc.lvlib_Hash_Core.vi__.png [hse-misc.lvlib:Hash Core.vi]			
:imgpath: empty.png [empty.png]	Hash	:imgpath: hse_misc.lvlib_Hash.vi__.png [hse- misc.lvlib:Hash.vi]			

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Delete Duplicates From 1D- Array (String)	:imgpath: hse_misc.lvlib_Delete_Duplicates_From_1D_Arr ay_(String).vi___.png [hse-misc.lvlib>Delete Duplicates From 1D-Array (String).vi]	(v 0. 2. 1b ; 20 17 -0 8- 14 16 :4 4)		

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Sort 2D-Array	:imgpath: hse_misc.lvlib_Sort_2D_Array.vi____.png [hse-misc.lvlib:Sort 2D-Array.vi]	Sorts a 2D string array by the column declared in Search parameters and by Sort Order .		

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	String_PadWithCharacters	:imgpath: hse_misc.lvlib_String_PadWithCharacters.vi__p ng [hse-misc.lvlib:String_PadWithCharacters.vi]	Ad ds c ha r (A SC II) </ b> ch ar ac ter s to s tr in </ b> un til it is l en gt h< /b > ch ar ac ter s lo ng . Co m m on AS CII ch ar ac ter s: 0x 09 ... ta b 0x 20		


Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	String_StripNullValues	:imgpath: hse_misc.lvlib_String_StripNullValues.vi___.png [hse-misc.lvlib:String_StripNullValues.vi]	Re m ov es all N U L L va lu es fro m a str in g		


Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	Generate Clone Name	:imgpath: hse_misc.lvlib_Generate_Clone_Name.vi____.png [hse-misc.lvlib:Generate Clone Name.vi]	Give n th e ful ly qu ali fie d na me of a VI (m ea ni ng th e na me in cl ud es an y lib ra ry na me es pa ce pr efi xe s), thi s VI ret ur ns th e na me of a cl on e of		


Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	ShowRunningVIs	:imgpath: hse_misc.lvlib_ShowRunningVIs.vi___.png [hse- misc.lvlib:ShowRunningVIs.vi]	Re tu rn s a li st of VI s in me m or y		

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Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	StringLogger	:imgpath: hse_misc.lvlib_StringLogger.vi____.png [hse-misc.lvlib:StringLogger.vi]	Simple helper VI for writing data to a log file.		
			Path Data		
			Label		
			for the folder structure, and		
			Function		
			is part of the		

Name	Connector pane	Description	S.	R.	I.
:imgpath: empty.png [empty.png]	TypeDescriptor_GetName	:imgpath: hse_misc.lvlib_TypeDescriptor_GetName.vi_.png [hse-misc.lvlib:TypeDescriptor_GetName.vi]	Fr o m th e La bV IE W O pe n So ur ce pr oj ec t Da ta M an ip ul ati on lib ra ry v1 .4. 0 by Fr an co is N or m an di n (ht tp s:/ /gi th ub .c o m/ La bV IE W- O pe n		

Name	Connector pane	Description	S.	R.	I.
:imgpath: inlined.png [inlined.png]	TypeDescriptor_GetPString	:imgpath: hse_misc.lvlib_TypeDescriptor_GetPString.vi__. png [hse- misc.lvlib:TypeDescriptor_GetPString.vi]	Fr o m th e La bV IE W O pe n So ur ce pr oj ec t Da ta M an ip ul ati on lib ra ry v1 .4. 0 by Fr an co is N or m an di n (ht tp s:/ /gi th ub .c o m/ La bV IE W- O pe n- So		

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined

B.6. HSE-NETWORK.LVLIB

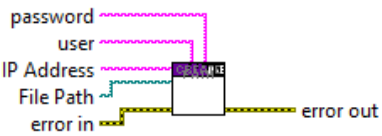
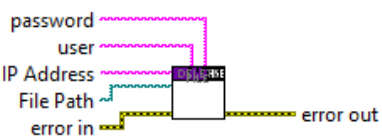
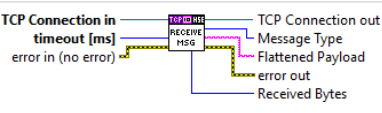
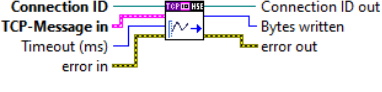

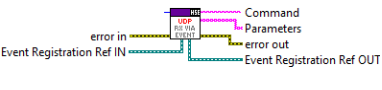
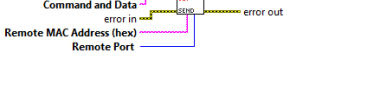
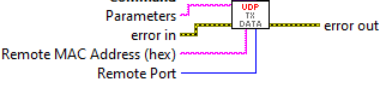
Responsibility: No description found (add content in lvlib description)

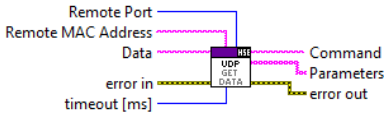
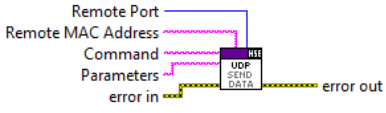


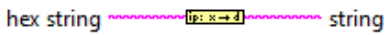
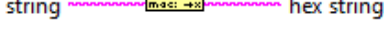
Version: 1.0.0.0

Table 21. Nested libraries

Name	Type
[NetStream.lvclass]	LVClass

Table 22. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
FTP_CreateRemotePath					
FTP_RemoveRemoteFile					
TCP Receive Message					
TCP Send Message		Send a message (measurement data, command, ...) via TCP. The message must be flattened to a string and the message typ is determined by the "Message Type Enum".			
UDP__ReceiveDataViaSystemEvent					
UDP__Send					
UDP__TransmitData					

Name	Connector pane	Description	S.	R.	I.
UDP_GetDataFromDevice					
UDP_SendData					
COM_ParseCommand		(v0.2.1b; 2017-08-14 16:44)			
GetNetworkInfo		(v0.2.1b; 2017-08-14 16:44)			
IP_CheckIfValid		Check if the string input is a valid IP address			
IP_ToDecimalString		(v0.2.1b; 2017-08-14 16:44)			
IP_ToHexString		(v0.2.1b; 2017-08-14 16:44)			
MAC_ColonToHex		(v0.2.1b; 2017-08-14 16:44)			
MAC_HexToColon		(v0.2.1b; 2017-08-14 16:44)			
MAC_ToHexString		(v0.2.1b; 2017-08-14 16:44)			
SystemConfigSession		(v0.2.1b; 2017-08-14 16:44)			

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy


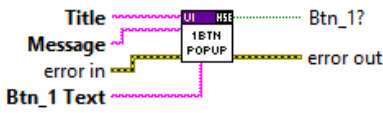

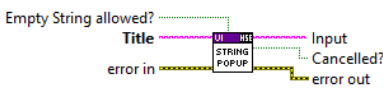
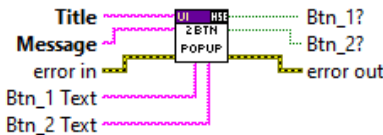
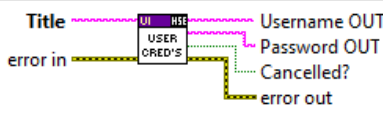
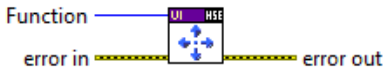
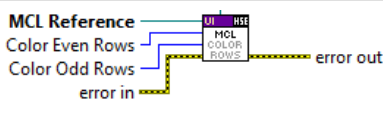
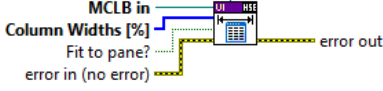
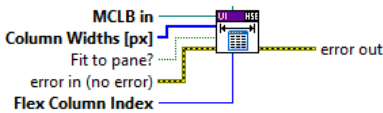
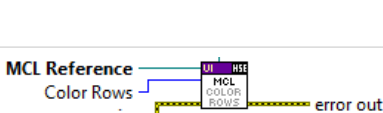

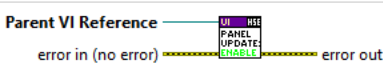
Inlining:  → Inlined

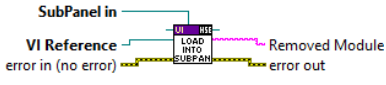
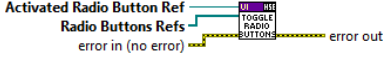
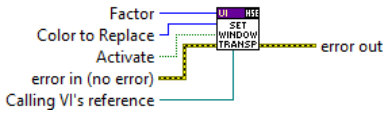

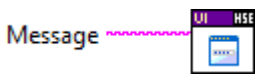
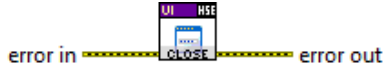


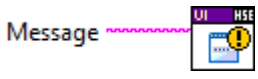

B.7. HSE-UI.LVLIB

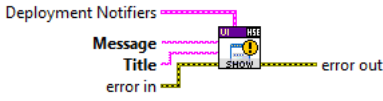

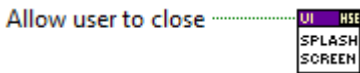


Responsibility: No description found (add content in lvlib description)

Version: 1.0.0.0



Table 23. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Dialogue_Error		Shows a dialog window for displaying an error message.			
Dialogue_OneButton		Shows a dialog window with a message and an OK button			
Dialogue_Password		Shows a dialog window for entering a password.			
Dialogue_String		Shows a dialog window for entering a string value.			
Dialogue_TwoButton		Shows a dialog window with a message and two buttons (default: "Ok" and "Cancel")			
Dialogue_UserCredentials		Shows a dialog window for entering user credentials (username and password).			
FPControl					
MultiColumnListBox_ColorRows		Colors the rows of a MCLB in alternate colors. If Parent VI Reference is supplied, panel updates are deferred.			
MultiColumnListBox_Resize		Resizes the columns of a MCLB according to the widths given in Column Widths [%] . If Parent VI Reference is supplied, panel updates are deferred.			
MultiColumnListBox_Resize_Absolute		Resizes the columns of a MCLB according to the widths given in Column Widths [px] . The column with the index in Flex Column Index uses the remaining space. If Parent VI Reference is supplied, panel updates are deferred.			
MultiColumnListBox_UnColorRows		Colors the rows of a MCLB in alternate colors. If Parent VI Reference is supplied, panel updates are deferred.			
PanelUpdates_Defer					
PanelUpdates_Enable					

Name	Connector pane	Description	S.	R.	I.
Subpanel - Load VI		<p>Opens the VI reference to Full Delimited Name and inserts it into SubPanel in. The reference of the inserted VI is returned in Subpanel VI Ref OUT.</p> <p>If Subpanel VI Ref IN is a valid reference, the front panel of the referenced VI is opened hidden before removing it from the subpanel in order to avoid losing the VI from memory.</p>			
Toggle Radio Buttons		No description found (add content in vi description)			
Window Color to Transparent					
Window Handle		This VI will use the FindWindow API function to retrieve a window refnum for the window identified by window name. 'window name' is the text appearing in the title bar of a window. If the window cannot be found, the window refnum out will be 'Not a Window Refnum', and an error will occur.			
ProgressPopup					
ProgressPopup_Close		Closes the modal progress window.			
ProgressPopup_Show		<p>Shows a modal window with an animated progress bar, indicating that some (background) process is running.</p> <p>The Title of the window and the Message being displayed can be specified.</p>			
ProgressPopup_Update		Closes the modal progress window.			
ProgressPopup_WithStatus					
ProgressPopup_WithStatus_Close		Closes the modal progress window.			

Name	Connector pane	Description	S.	R.	I.
ProgressPopup WithStatus_Sh ow		<p>Shows a modal window with an animated progress bar, indicating that some (background) process is running.</p> <p>The Title of the window and the Message being displayed can be specified.</p>			
HSE_AboutScr een					
PROJECT_Spla shScreen_Tem plate		No description found (add content in vi description)			
Screen_ShowH seAbout					
Screen_ShowP rojectAbout					

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined