

# **HAMPEL SOFTWARE ENGINEERING**

**hse-libraries**

**HAMPEL SOFTWARE ENGINEERING**

**Version 3.4.0 (2022-03-31)**

# TABLE OF CONTENTS

1. State Machines .....	2
2. Calling Dependency Diagrams .....	3
2.1. Overview .....	3
2.2. Callers .....	3
2.3. Listeners .....	3
Appendix A: DQMH .....	4
A.1. GenNet-Client.lvlib .....	4
A.2. GenNet-Server.lvlib .....	7
Appendix B: Libraries .....	11
B.1. hse-config.lvlib .....	11
B.2. hse-dqmh-dynamicrequesters.lvlib .....	11
B.3. hse-dqmh.lvlib .....	13
B.4. hse-gennet.lvlib .....	15
B.5. hse-misc.lvlib .....	17
B.6. hse-network.lvlib .....	21
B.7. hse-ui.lvlib .....	23

***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

—no elements found—

## 2. CALLING DEPENDENCY DIAGRAMS

### 2.1. OVERVIEW

—no elements found—

### 2.2. CALLERS

—no elements found—

### 2.3. LISTENERS

—no elements found—

# 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

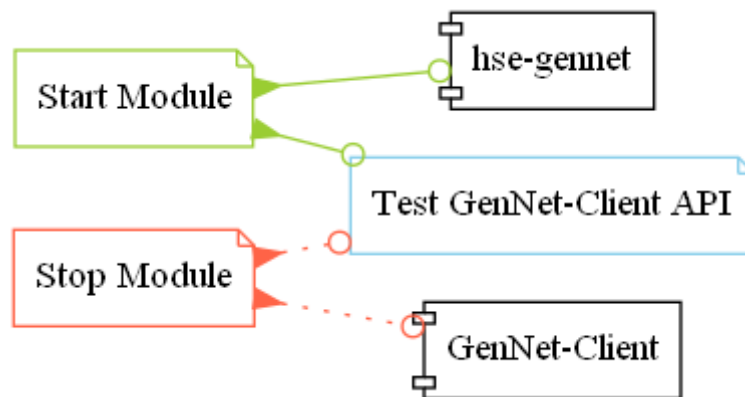


Table 1. Start and Stop module callers

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

### A.1.2. MODULE RELATIONSHIP

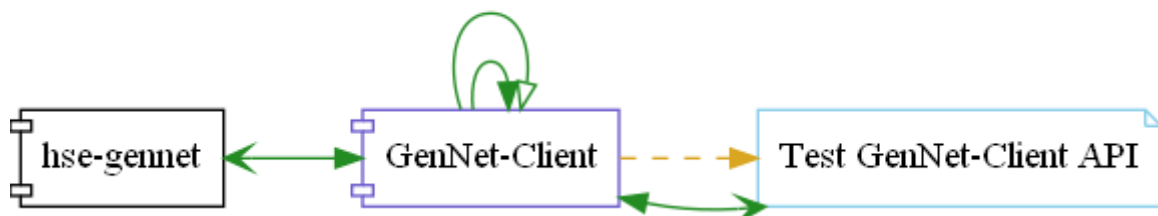


Table 2. Requests callers

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

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

Table 3. Broadcasts Listeners

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

Table 4. Used requests

Module	Requests
GenNet-Client.lvlib	Hide Panel.vi Stop Module.vi

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:

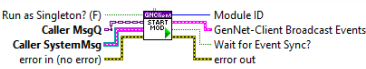
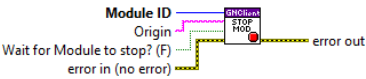
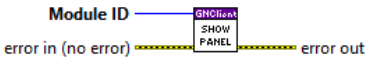
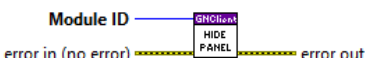
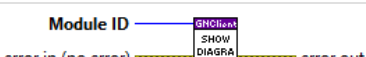


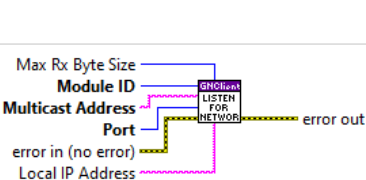
Table 6. Custom errors

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


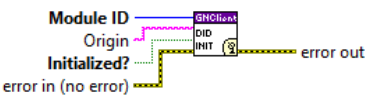

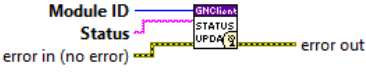

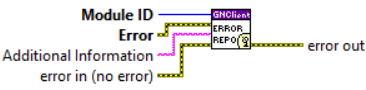

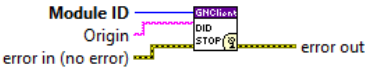

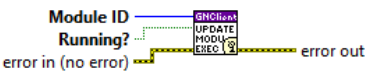
Name	Code	Description
Master Reference Not Closed	403687	The "%s" module cannot be run as singleton because the Master Reference is still open from a prior run as cloneable. If you plan on running this module as both singleton and cloneable, consider changing your Main VI to wire a value of TRUE to the '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		 <p>Run as Singleton? (F) Caller MsgQ Caller SystemMsg error in (no error)</p> <p>Module ID GenNet-Client 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 <b>&lt;b&gt;Wait for Module to stop?&lt;/b&gt;</b> is TRUE, then this VI will not complete execution until the Module Main VI has stopped running.</p> <p><b>&lt;b&gt;Note:&lt;/b&gt;</b> If the cloneable module is running as singleton, then the 'Wait for Module to stop?' input is ignored... this VI will <b>&lt;b&gt;always&lt;/b&gt;</b> wait until a cloneable Main VI running as singleton has stopped running.</p> <p><b>&lt;b&gt;Note:&lt;/b&gt;</b> This VI was modified by the <b>&lt;b&gt;Validate DQMH Module&lt;/b&gt;</b> 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 error in (no error)</p> <p>SHOW PANEL error out</p>	Send the Show Panel request to the Module's Main.vi.			
Hide Panel	→	 <p>Module ID error in (no error)</p> <p>HIDE PANEL error out</p>	Send the Hide Panel request to the Module's Main.vi.			
Show Diagram	→	 <p>Module ID error in (no error)</p> <p>SHOW DIAGRA error out</p>	This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			
Send via Network	→	 <p>Module ID Message Data error in (no error)</p> <p>SEND VIA NETWORK error out</p>	Forwards the message of a DQMH module via Network			
Connect	→	 <p>Module ID error in (no error)</p> <p>CONNEC timed out? error out</p>	Open the TCP/IP connection to the listening module			
Listen for Network Broadcasts	→	 <p>Max Rx Byte Size Module ID Multicast Address Port error in (no error) Local IP Address</p> <p>LISTEN FOR NETWORK error out</p>	Opens a port to listen for broadcasts sent by other modules via UDP			



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

## 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
Start Module	Test GenNet-Server API.vi

Function	Callers
Stop Module	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
Forward Generic Broadcasts to Network	Test GenNet-Server API.vi
Hide Panel	Test GenNet-Server API.vi
Show Diagram	Test GenNet-Server API.vi
Show Panel	Test GenNet-Server API.vi

Table 10. Broadcasts Listeners

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

Table 11. Used requests

Module	Requests
GenNet-Server.lvlib	Stop Module.vi (3)

Table 12. Registered broadcast

Module	Broadcasts
☒—☒	☒—☒

## A.2.3. MODULE CUSTOM ERRORS



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

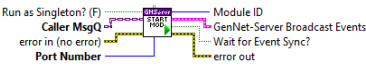
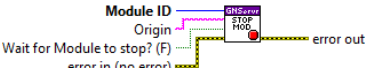
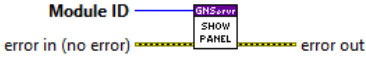
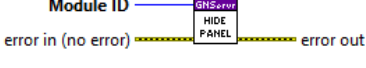
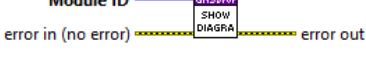
Module GenNet-Server.lvlib use the following custom errors:


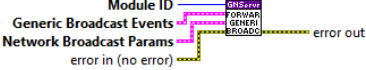

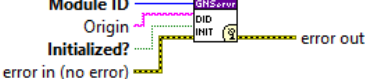



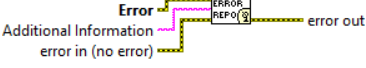






Table 13. Custom errors

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.
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 — error out</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 — error out</p> <p>Wait for Module to stop? (F) — error in (no error) — error out</p>	<p>Send the Stop request to the Module's Main.vi.</p> <p>If <b>Wait for Module to stop?</b> is TRUE, then this VI will not complete execution until the Module Main VI has stopped running.</p> <p><b>Note:</b> If the cloneable module is running as singleton, then the 'Wait for Module to stop?' input is ignored... this VI will <b>always</b> wait until a cloneable Main VI running as singleton has stopped running.</p> <p><b>Note:</b> This VI was modified by the <b>Validate DQMH Module</b> 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 — error in (no error) — error out</p> <p>SHOW PANEL</p>	Send the Show Panel request to the Module's Main.vi.			
Hide Panel	➡	 <p>Module ID — error in (no error) — error out</p> <p>HIDE PANEL</p>	Send the Hide Panel request to the Module's Main.vi.			
Show Diagram	➡	 <p>Module ID — error in (no error) — error out</p> <p>SHOW DIAGRAM</p>	This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			

Name	Type	Connector pane	Description	S.	R.	I.
Forward Generic Broadcasts to Network		 <p>Module ID Generic Broadcast Events Network Broadcast Params error in (no error)</p>	Enables forwarding of the callers <b>Generic Broadcast Events</b> to the network via UDP as set in the <b>Network Broadcast Params</b> .			
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.			
GenNet Message Received		 <p>Module ID Message error in</p>	Broadcasts a received <b>message</b> as variant datatype. The actual datatype (and decoding) of the variant depends on the GenNet Protocol being used.			

**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

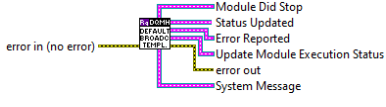
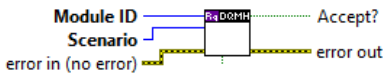
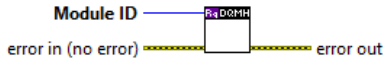
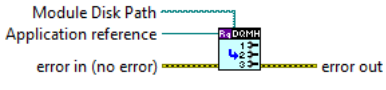
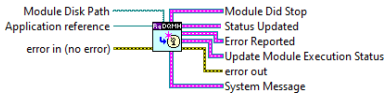
This library has no functions set to non private scope.

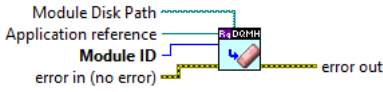
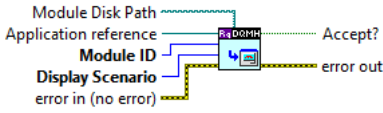
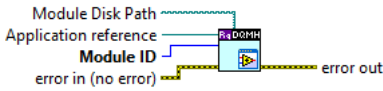
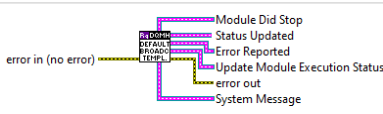
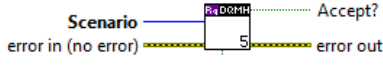

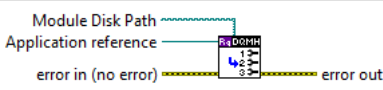
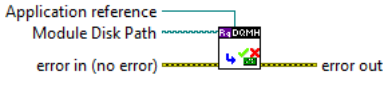
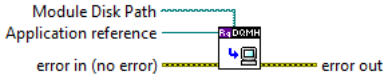
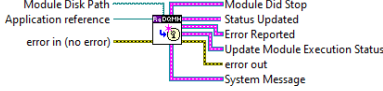
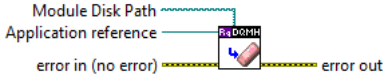
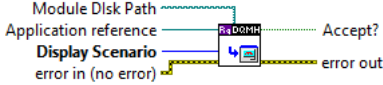
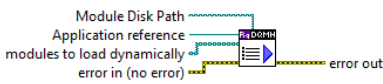
## B.2. HSE-DQMH-DYNAMICREQUESTERS.LVLIB

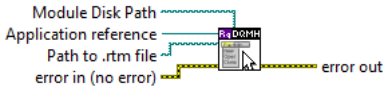
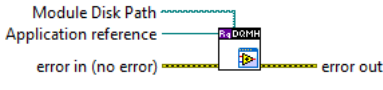
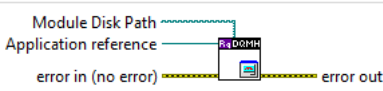
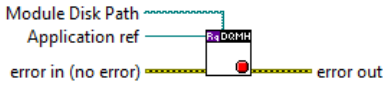
**Responsibility:** No description found (add content in lvlib description)

**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 <b>path</b>			
DQMH Obtain Default Broadcast Events (Cloneable)		Calls the "Obtain Default Broadcast Events" request VI of the module in <b>path</b>			

Name	Connector pane	Description	S.	R.	I.
DQMH Prepare (Cloneable)		Calls the "Prepare" request VI of the module in <b>&lt;b&gt;path&lt;/b&gt;</b>			
DQMH Request UI Display (Cloneable)		Calls the "Request UI Display" request VI of the module in <b>&lt;b&gt;Path to module directory&lt;/b&gt;</b> . Hands over the <b>&lt;b&gt;Module ID&lt;/b&gt;</b> and the <b>&lt;b&gt;Display Scenario&lt;/b&gt;</b> .			
DQMH Show Diagram (Cloneable)		Calls the "Request UI Display" request VI of the module in <b>&lt;b&gt;Path to module directory&lt;/b&gt;</b> . Hands over the <b>&lt;b&gt;Module ID&lt;/b&gt;</b> and the <b>&lt;b&gt;Display Scenario&lt;/b&gt;</b> .			
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 <b>&lt;b&gt;path&lt;/b&gt;</b>			
DQMH Load API Tester		Calls the "Load Module" request VI of the module in <b>&lt;b&gt;path&lt;/b&gt;</b>			
DQMH Load Module		Calls the "Load Module" request VI of the module in <b>&lt;b&gt;path&lt;/b&gt;</b>			
DQMH Obtain Default Broadcast Events		Calls the "Obtain Default Broadcast Events" request VI of the module in <b>&lt;b&gt;path&lt;/b&gt;</b>			
DQMH Prepare		Calls the "Prepare" request VI of the module in <b>&lt;b&gt;path&lt;/b&gt;</b>			
DQMH Request UI Display		Calls the "Request UI Display" request VI of the module in <b>&lt;b&gt;Path to module directory&lt;/b&gt;</b> . Hands over the <b>&lt;b&gt;Module Name&lt;/b&gt;</b> and the <b>&lt;b&gt;Display Scenario&lt;/b&gt;</b> .			
DQMH Set Modules		Calls the "Set Modules" request VI of the module in <b>&lt;b&gt;Path to module directory&lt;/b&gt;</b> . Hands over paths to all dynamically loaded modules in <b>&lt;b&gt;modules to load dynamically&lt;/b&gt;</b> .			

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

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

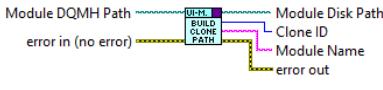
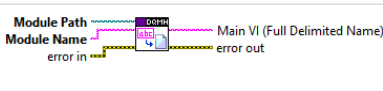

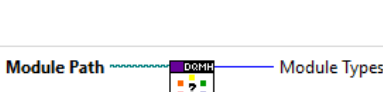

Inlining:  → Inlined

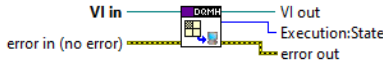

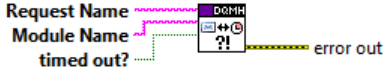

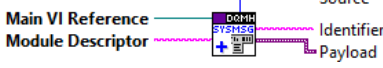

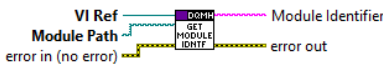

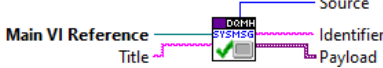

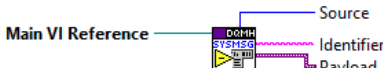




## B.3. HSE-DQMH.LVLIB

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


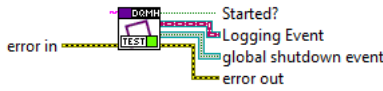
**Version:** 1.0.0.0

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 <b>Module Path</b>			

Name	Connector pane	Description	S.	R.	I.
DQMH Load Main VI Reference		<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 <a href="https://forums.ni.com/t5/Delacor-Toolkits-Discussions/Deploy-and-run-at-Startup-for-RT-systems/m-p/3620339/highlight/true#M256">https://forums.ni.com/t5/Delacor-Toolkits-Discussions/Deploy-and-run-at-Startup-for-RT-systems/m-p/3620339/highlight/true#M256</a>).</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		No description found (add content in vi description)			
DQMH System Message - Add to Run-Time Menu		Sends the modul's <b>Path</b> and <b>Module Descriptor</b> 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		No description found (add content in vi description)			
DQMH System Message - Ready for Display		No description found (add content in vi description)			
DQMH System Message - Remove from Run-Time Menu		No description found (add content in vi description)			
DQMH System Message - Removed from Subpanel		No description found (add content in vi description)			
DQMH Tester Cleanup hse-appl		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:\&lt;Project Name&gt;_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:\&lt;Project Name&gt;_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.

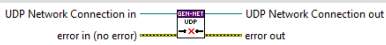


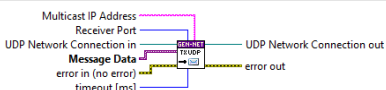


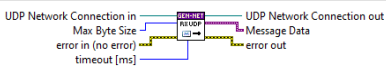














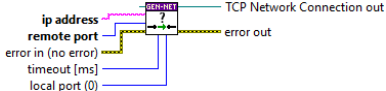


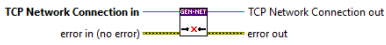




The Delacor Queued Message Handler (DQMH) reference design is provided by Delacor, an NI Alliance Partner. The DQMH is available for download from the LabVIEW Tools Network. You can find more information on the Delacor Queued Message Handler (DQMH) at <http://delacor.com/products/dqmh/>.

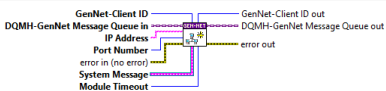

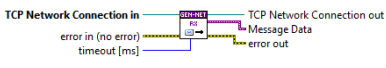


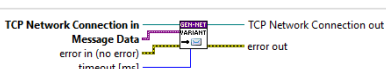





**Version: 1.0.0.0**

Table 18. Nested libraries

Name	Type
[GenNet Protocol.lvclass]	LVClass
[GenNet Variant Protocol.lvclass]	LVClass
[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			

Name	Connector pane	Description	S.	R.	I.
GenNet Init Client		Initializes a GenNet Client if <B>ClientID == -1</B> and automatically connects to it. See usage example inside for how to use this VI.			
GenNet Receive Variant 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 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

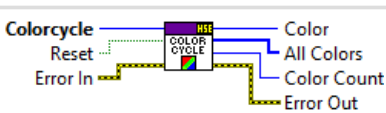



**Responsibility:** source code password: bowman-tyro-kickback-besides




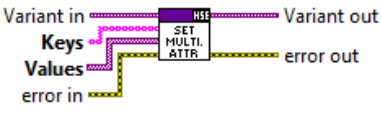






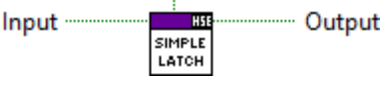






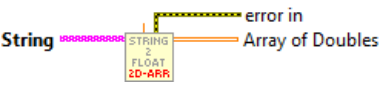

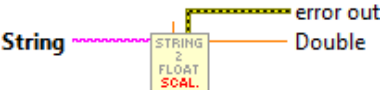



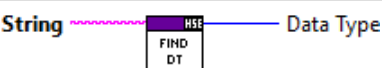
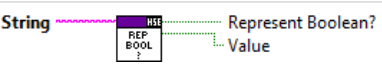


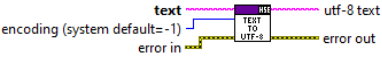


**Version:** 1.0.0.0

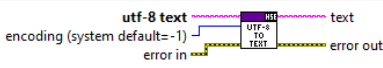












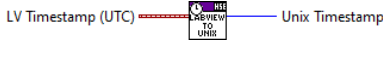



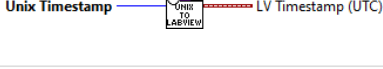








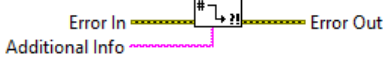



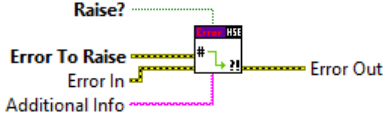

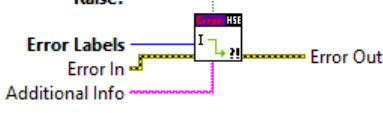

Table 20. Nested libraries


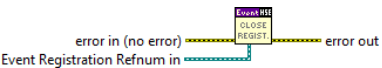


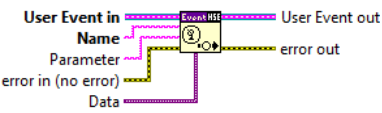


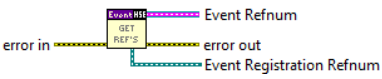





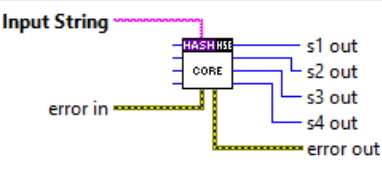







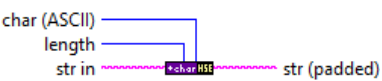



Name	Type
[Loop Timer.lvclass]	LVClass

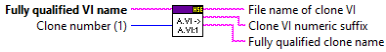


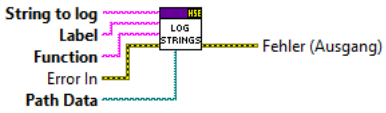

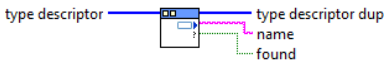


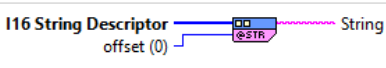


Table 21. Functions (non private scope only)


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)			

Name	Connector pane	Description	S.	R.	I.
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.			
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) occures.  (This VI is inlined.)			
Simple Edge Detection (Rising)		Returns True if a rising edge (False -> True) occures.  (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			
Filename Sanitizer		Removes all characters that are not supported in filenames (/ \ : * ? " < >   ) and replaces it with "Replace String" (default is "_").			
Find Data Type		No description found (add content in vi description)			
Represent Boolean		No description found (add content in vi description)			
Text to UTF-8 Wrapper		Converts LabVIEW text to UTF-8.			

Name	Connector pane	Description	S.	R.	I.
UTF-8 to Text Wrapper		Converts UTF-8 text to text encoded in the specified system.			
U8-Array to U64		Convert an array of Bytes (U8) to an array of U64.			
U64-Array to U8		Convert an array of U64 to an array of Bytes (U8).			
Variant_BuildClusterFromElementArray		From the LabVIEW Open Source project DataManipulation library v1.4.0 by Francois Normandin ( <a href="https://github.com/LabVIEW-Open-Source/DataManipulation">https://github.com/LabVIEW-Open-Source/DataManipulation</a> ).			
Variant_EmptyCluster		From the LabVIEW Open Source project DataManipulation library v1.4.0 by Francois Normandin ( <a href="https://github.com/LabVIEW-Open-Source/DataManipulation">https://github.com/LabVIEW-Open-Source/DataManipulation</a> ).			
LV Timestamp to Unix Epoch		Convert a LabVIEW Timestamp (UTC Timezone) to a Unix Epoch Timestamp (C time_t).			
Seconds to Time		Convert a time range (in seconds) to a time string in the format "hh:mm:ss". E.g. 3680s -> "01:01:20".			
Unix Epoch to LV Timestamp		Convert a Unix Epoch Timestamp (C time_t) to a LabVIEW Timestamp (UTC Timezone).			
Error_AddAdditionalInformation		Adds <b>Additional Info</b> to the source of <b>Error In</b>			
Error_AppendErrorsToSource		Takes the first element of <b>errors in</b> and concatenates all other elements' code and source into the source of the first error.			
Error_Clear		Clears the error in <b>error in</b>			
Error_Helper_BuildCluster		Builds an error cluster from <b>Code</b> and <b>Additional Info</b>			
Error_Helper_OverwriteCluster		If <b>Error In</b> is true, overwrites the error cluster information with <b>Code</b> and <b>Additional Info</b>.			
Error_Helper_RaiseError		If <b>Raise?</b> is true, puts the error in <b>Error To Raise</b> on the error output and adds <b>Additional Info</b> to the source of the error.			
Error_Helper_RaiseErrorFromLabel		If <b>Raise?</b> is true, sets an error with code set by <b>Error Labels</b> and source by <b>Additional Info</b>			

Name	Connector pane	Description	S.	R.	I.
Error_LogToFile		If <b>error in</b> is true, writes the error to the file identified by <b>path</b> and clears the error.			
Event_CloseRegistrationRef		Unregisters the given event registration from the HSE-Event			
Event_Generate		Generates an HSE-Event and sends <b>Name</b>, <b>Parameter</b> and <b>Data</b> as event data.			
Event_GetRefAndReg		Gets the HSE-Event refnum and a new event registration refnum for it.			
Event_LoadOrCreateRefs		Returns the refnum of the HSE-Event			
Hash Core					
Hash					
Delete Duplicates From 1D-Array (String)		(v0.2.1b; 2017-08-14 16:44)			
Sort 2D-Array		Sorts a 2D string array by the column declared in <b>Search parameters</b> and by <b>Sort Order</b>.			
String_PadWithCharacters		Adds <b>char (ASCII)</b> characters to <b>str in</b> until it is <b>length</b> characters long.  Common ASCII characters: 0x09 ... tab 0x20 ... space 0x2E ... dot (.)			
String_StripNullValues		Removes all NULL values from a string			

Name	Connector pane	Description	S.	R.	I.
Generate Clone Name	 <p>Fully qualified VI name Clone number (1)</p> <p>File name of clone VI Clone VI numeric suffix Fully qualified clone name</p>	<p>Given the fully qualified name of a VI (meaning the name includes any library namespace prefixes), this VI returns the name of a clone of the VI. By default, it returns the name of the first clone that gets created, but you can request the Nth clone by supplying the "Clone number" input.</p> <p>USE WITH CAUTION. The name returned by this VI can be used with the "Open VI Reference" function to open a VI reference to a clone VI. This is an unsupported feature of LabVIEW (i.e. opening an additional reference to a clone VI was never intended to work but someone forgot to disable it when clones were added to LabVIEW). Opening extra references beyond the one used to create the clone (i.e. the clone's "this VI" reference) is known to cause instabilities, including crashes, in some situations. However, such refnums are critical for writing certain debugging tools. Be careful.</p>			
ShowRunningVIs		Returns a list of VIs in memory			
StringLogger	 <p>String to log Label Function Error In Path Data</p> <p>LOG STRINGS Fehler (Ausgang)</p>	Simple helper VI for writing data to a log file. <b>&lt;b&gt;Path Data&lt;/b&gt;</b> and <b>&lt;b&gt;Label&lt;/b&gt;</b> form the folder structure, and <b>&lt;b&gt;Function&lt;/b&gt;</b> is part of the file name.			
TypeDescriptor_GetName	 <p>type descriptor</p> <p>type descriptor dup name found</p>	From the LabVIEW Open Source project DataManipulation library v1.4.0 by Francois Normandin ( <a href="https://github.com/LabVIEW-Open-Source/DataManipulation">https://github.com/LabVIEW-Open-Source/DataManipulation</a> ).			 
TypeDescriptor_GetPString	 <p>116 String Descriptor offset (0)</p> <p>String</p>	From the LabVIEW Open Source project DataManipulation library v1.4.0 by Francois Normandin ( <a href="https://github.com/LabVIEW-Open-Source/DataManipulation">https://github.com/LabVIEW-Open-Source/DataManipulation</a> ).			 

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

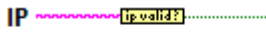

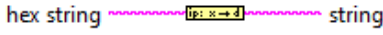
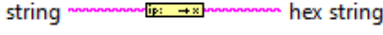


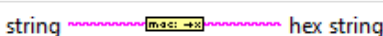

Table 22. Nested libraries

Name	Type
[NetStream.lvclass]	LVClass

Table 23. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
FTP_CreateRemotePath	 <p>password user IP Address File Path error in error out</p>				
FTP_RemoveRemoteFile	 <p>password user IP Address File Path error in error out</p>				
TCP Receive Message	 <p>TCP Connection in timeout [ms] error in (no error) TCP Connection out Message Type Flattened Payload error out Received Bytes</p>				
TCP Send Message	 <p>Connection ID TCP-Message in Timeout (ms) error in Connection ID out Bytes written error out</p>	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	 <p>error in Event Registration Ref IN Command Parameters error out Event Registration Ref OUT</p>				
UDP__Send	 <p>UDP Network Connection in Command and Data error in Remote MAC Address (hex) Remote Port UDP Network Connection out error out</p>				
UDP__TransmitData	 <p>Local Port Command Parameters error in Remote MAC Address (hex) Remote Port error out</p>				
UDP_GetDataFromDevice	 <p>Remote Port Remote MAC Address Data error in timeout [ms] Command Parameters error out</p>				
UDP_SendData	 <p>Remote Port Remote MAC Address Command Parameters error in error out</p>				
COM_ParseCommand	 <p>Message in error in Command Parameters error out</p>	(v0.2.1b; 2017-08-14 16:44)			
GetNetworkInfo	 <p>error in IP Address MAC Address error out</p>	(v0.2.1b; 2017-08-14 16:44)			



Name	Connector pane	Description	S.	R.	I.
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


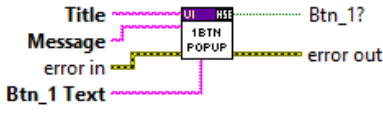
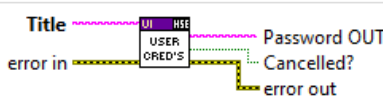
Inlining:  → Inlined

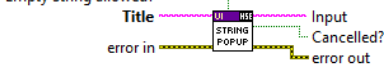
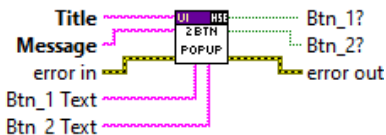
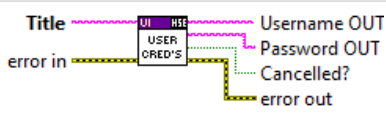
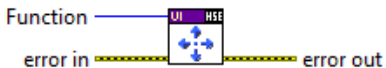
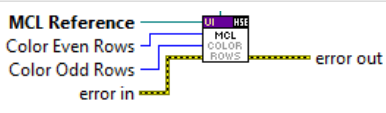
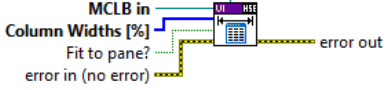
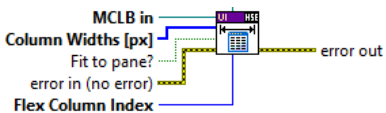
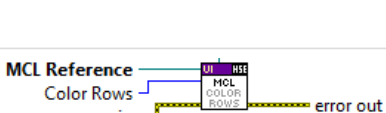
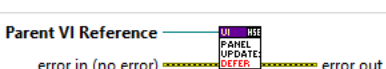
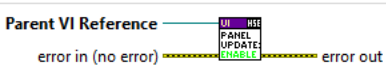
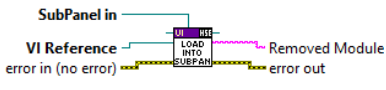

## B.7. HSE-UI.LVLIB

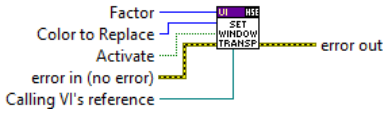

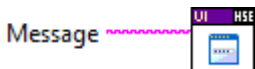



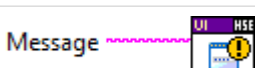

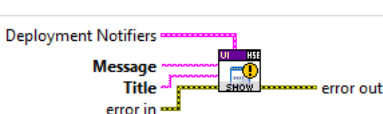

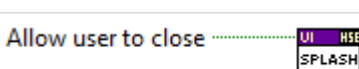

**Responsibility:** No description found (add content in lplib description)

**Version:** 1.0.0.0

Table 24. 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.			



Name	Connector pane	Description	S.	R.	I.
Dialogue_String		Shows a dialog window for entering a string value.			
Dialogue_Two Button		Shows a dialog window with a message and two buttons (default: "Ok" and "Cancel")			
Dialogue_User Credentials		Shows a dialog window for entering user credentials (username and password).			
FPControl					
MultiColumnListBox_ColorRows		Colors the rows of a MCLB in alternate colors. If <b>&lt;b&gt;Parent VI Reference&lt;/b&gt;</b> is supplied, panel updates are deferred.			
MultiColumnListBox_Resize		Resizes the columns of a MCLB according to the widths given in <b>&lt;b&gt;Column Widths [%]&lt;/b&gt;</b> . If <b>&lt;b&gt;Parent VI Reference&lt;/b&gt;</b> is supplied, panel updates are deferred.			
MultiColumnListBox_Resize_Absolute		Resizes the columns of a MCLB according to the widths given in <b>&lt;b&gt;Column Widths [px]&lt;/b&gt;</b> . The column with the index in <b>&lt;b&gt;Flex Column Index&lt;/b&gt;</b> uses the remaining space. If <b>&lt;b&gt;Parent VI Reference&lt;/b&gt;</b> is supplied, panel updates are deferred.			
MultiColumnListBox_UnColorRows		Colors the rows of a MCLB in alternate colors. If <b>&lt;b&gt;Parent VI Reference&lt;/b&gt;</b> is supplied, panel updates are deferred.			
PanelUpdates_Defer					
PanelUpdates_Enable					
Subpanel - Load VI		<p>Opens the VI reference to <b>&lt;b&gt;Full Delimited Name&lt;/b&gt;</b> and inserts it into <b>&lt;b&gt;SubPanel in&lt;/b&gt;</b>. 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)			

Name	Connector pane	Description	S.	R.	I.
Window Color to Transparent					
Window Handle		<p>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.</p>			
ProgressPopup					
ProgressPopup_Close		<p>Closes the modal progress window.</p>			
ProgressPopup_Show		<p>Shows a modal window with an animated progress bar, indicating that some (background) process is running.</p> <p>The <b>Title</b> of the window and the <b>Message</b> being displayed can be specified.</p>			
ProgressPopup_Update		<p>Closes the modal progress window.</p>			
ProgressPopup_WithStatus					
ProgressPopup_WithStatus_Close		<p>Closes the modal progress window.</p>			
ProgressPopup_WithStatus_Show		<p>Shows a modal window with an animated progress bar, indicating that some (background) process is running.</p> <p>The <b>Title</b> of the window and the <b>Message</b> being displayed can be specified.</p>			
HSE_AboutScreen					
PROJECT_SplashScreen_Template		<p>No description found (add content in vi description)</p>			
Screen_ShowHseAbout					

## hse-libraries

Name	Connector pane	Description	S.	R.	I.
Screen_ShowProjectAbout	 <p>The diagram shows a central component icon with 'UI' and 'HSE' labels. Below it is a box with an information icon and 'PROJ'. To the left is 'error in' and to the right is 'error out', both connected to the central component by dashed yellow lines.</p>				

**Scope:**  → Protected |  → Community

**Reentrancy:**  → Preallocated reentrancy |  → Shared reentrancy

**Inlining:**  → Inlined