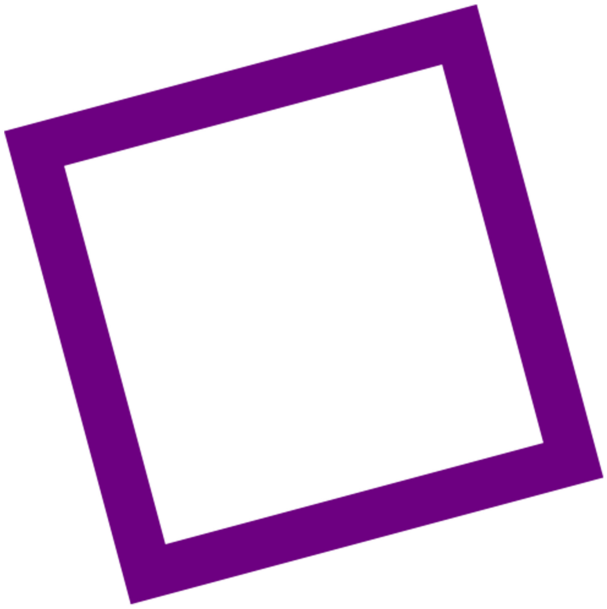


HAMPEL SOFTWARE ENGINEERING

generic-networking-export

HAMPEL SOFTWARE ENGINEERING

Version 3.0.4 (2024-08-20)

TABLE OF CONTENTS

Document generated automatically!

This document was created fully automated from the actual LabVIEW Source Code of this project using the Release Automation Tools of Hampel Software Engineering.

The Release Automation Tools (RAT) help automate the validating, testing, documenting, building, packaging and publishing of your projects. Built-in support for Git lets you trigger our tools from your repository, via GitLab CI/CD or Azure DevOps amongst others.

For a more detailed overview of what these tools do, see https://rat.hampel-soft.com/, where you can find information on the available tools, how we automate them using GitLab CI, when the next scheduled webinars are on, and how you can run those tools on your own servers using a commercial license for RAT.

CHAPTER 1. PROJECT DESCRIPTION

The motivation behind the Generic Networking (or GenNet) implementation is to use the API of a DQMH module even if the module itself is running on a different, distributed system. Both the caller and the callee should be absolutely oblivious of whether they are running on the same or on different systems.

In other words, the original idea is to use the exact same module (i.e. the same source code) in two different applications, and configure one application to act as a server - i.e. receiving API calls via a network connection and processing those calls locally - and the other application as client - i.e. forwarding API calls via network instead of processing them locally.

Later, we discovered that it is quite handy to use the Generic Networking basic functions to communicate between two different modules. This involves a bit more manual work but allows for greater flexibility.

1.1. DOCUMENTATION

Detailed documentation on how the actual implementation works and how to use the Generic Networking modules is hosted at [our Dokuwiki](https://dokuwiki.hampel-soft.com/code/dqmh/generic-networking).

Specifically, look at these pages:

- [Use Cases](https://dokuwiki.hampel-soft.com/code/dqmh/generic-networking/use-cases)
- [Protocols](https://dokuwiki.hampel-soft.com/code/dqmh/generic-networking/protocols)
- [Implementation](https://dokuwiki.hampel-soft.com/code/dqmh/generic-networking/implementation)
- [Example Code](https://dokuwiki.hampel-soft.com/code/dqmh/generic-networking/example-code)

There’s also [a post on the Delacor Blog](https://delacor.com/dqmh-generic-networking-module/) available.

CHAPTER 2. STATE MACHINES

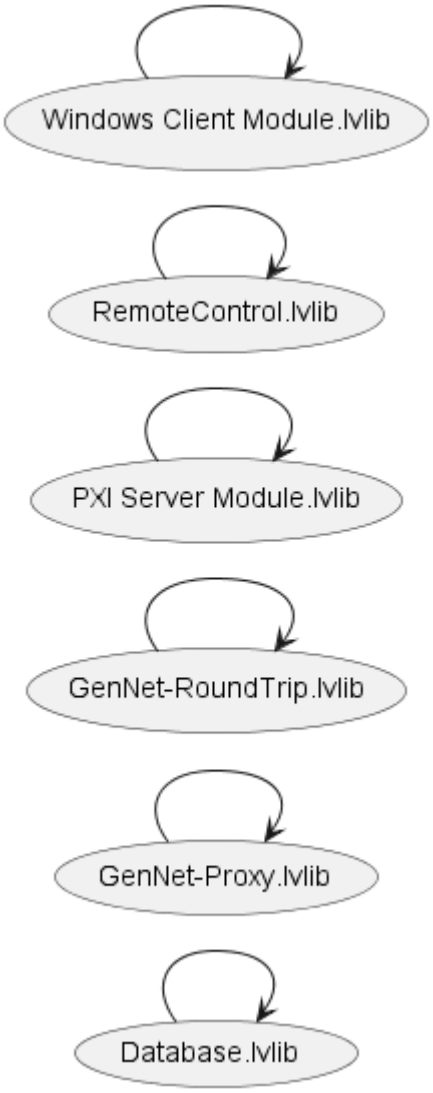
No state machines found.

HSE offers a robust, parsable, free open-source State Machine Template! You can find out more about it at https://dokuwiki.hampel-soft.com/code/dqmh/hse-module-templates/state-machine.

CHAPTER 3. CALLING DEPENDENCY DIAGRAMS

3.1. OVERVIEW

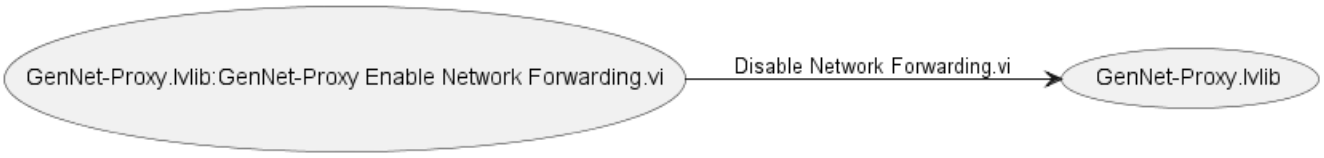
3.1.1. PROJECT



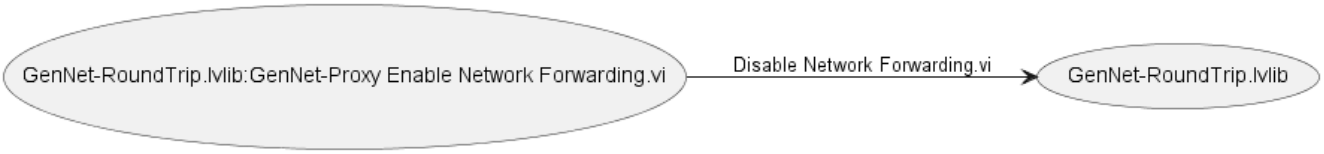
3.2. CALLERS

3.2.1. DATABASE.LVLIB

3.2.2. GENNET-PROXY.LVLIB



3.2.3. GENNET-ROUNDTRIP.LVLIB



3.3. LISTENERS

No elements found.

APPENDIX A: DQMH

DQMH modules documentation

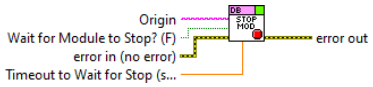
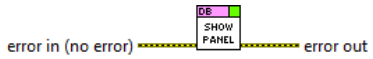
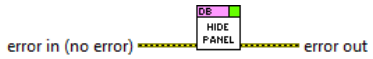
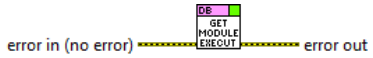
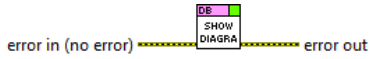
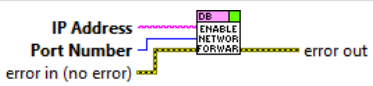
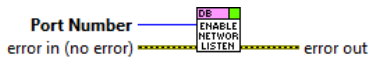
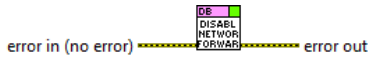
A.1. DATABASE.LVLIB

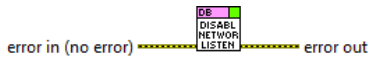
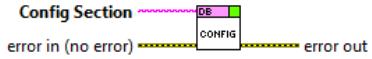
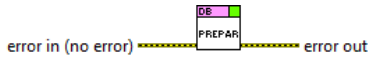
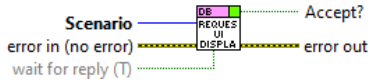
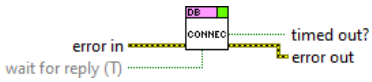
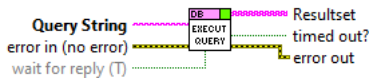
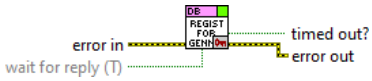
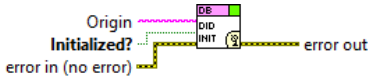
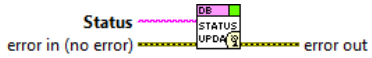
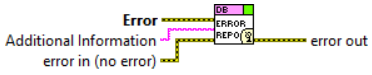
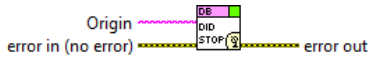
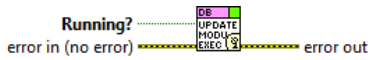
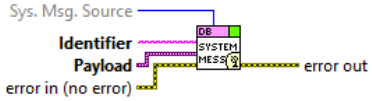
Type: Singleton

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

A.1.1. EVENT LIST

Table 1. Events

Name	Type	Connector pane	Description	S.	R.	I.
Start Module			Launches the Module Main.vi.			
Stop Module			Send the Stop request to the Module's Main.vi. If Wait for Module to Stop? is TRUE, this VI will wait until the module main VI stops, and will timeout at the Timeout to Wait for Stop value. This value defaults to "-1", which means the VI will not timeout, and will always wait until the module main VI stops before completing execution. Note: The Timeout to Wait for Stop value is ignored if 'Wait for Module to Stop?' is set to FALSE.			
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.			
Get Module Execution Status			Fire the Get Module Execution Status request.			
Show Diagram			This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			
Enable Network Forwarding			This loads a NET-TX module and enables forwarding of messages to another application with the given network address			
Enable Network Listening			Loads a NET-TR module and enables listening for incoming messages at given TCP port			
Disable Network Forwarding			Stops and unloads the GenNet-Client module.			

Name	Type	Connector pane	Description	S.	R.	I.
Disable Network Listening			Stops the NET-RX module, thus closing the TCP port			
Configure			Triggers the module's self-sufficient configuration function			
Prepare			Prepares the module's front panel for display.			
Request UI Display			Requests the module to display its UI as specified in Scenario: "managed" => in the UI Manager's subpanel "stand-alone" => as a separate window			
Connect			Loads the configured DB Engine object and connects to the database			
Execute Query			Note: This VI was renamed by the DQMH Rename Event utility. Make sure the VI Description is updated to reflect the new event name, then delete this comment. This event serves as an example for the DQMH Generic Networking functionality. The module "does something" and "sends an answer" back. The actual implementation takes the number in Some Value, multiplies it by "Factor", and sends back the result.			
Register for GenNet Broadcasts			Registers for the broadcasts of the GenNet child modules (client and/or server)			
Module Did Init			No description found (add content in vi description)			
Status Updated			No description found (add content in vi description)			
Error Reported			Note: This VI was modified by the Validate DQMH Module tool to parse additional information tags out of the incoming error source string.			
Module Did Stop			No description found (add content in vi description)			
Update Module Execution Status			No description found (add content in vi description)			
System Message			No description found (add content in vi description)			

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

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

A.1.2. MODULE RELATIONSHIP

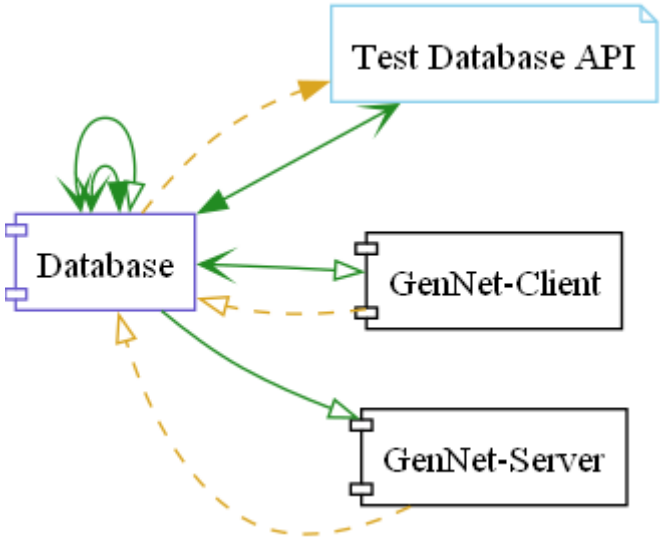


Table 2. Requests callers

Request Name	Callers
Configure	Test Database API.vi
Connect	Test Database API.vi
Disable Network Forwarding	Database.lvlib:MHL Enable Network Forwarding.vi Test Database API.vi
Disable Network Listening	Test Database API.vi
Enable Network Forwarding	Test Database API.vi
Enable Network Listening	Test Database API.vi
Execute Query	Test Database API.vi
Get Module Execution Status	Database.lvlib:Obtain Broadcast Events for Registration.vi Database.lvlib:Start Module.vi
Hide Panel	Test Database API.vi
Prepare	
Register for GenNet Broadcasts	Database.lvlib:MHL Enable Network Forwarding.vi Database.lvlib:MHL Enable Network Listening.vi
Request UI Display	Test Database API.vi
Show Diagram	Test Database API.vi
Show Panel	Test Database API.vi

Table 3. Broadcasts Listeners

Broadcast Name	Listeners
Error Reported	Test Database API.vi

Broadcast Name	Listeners
Module Did Init	Test Database API.vi
Module Did Stop	Test Database API.vi
Status Updated	Test Database API.vi
System Message	Test Database API.vi
Update Module Execution Status	Test Database API.vi

Table 4. Used requests

Module	Requests
Database.lvlib	Disable Network Forwarding.vi Get Module Execution Status.vi Register for GenNet Broadcasts.vi (2) Stop Module.vi
GenNet-Client.lvlib	Connect.vi Listen for Network Broadcasts.vi Send via Network.vi Stop Module.vi (2)
GenNet-Server.lvlib	Forward Generic Broadcasts to Network.vi Stop Module.vi (2)

Table 5. Registered broadcast

Module	Broadcasts
GenNet-Client.lvlib	Error Reported.vi Status Updated.vi
GenNet-Server.lvlib	Error Reported.vi Status Updated.vi

A.1.3. MODULE START/STOP CALLS

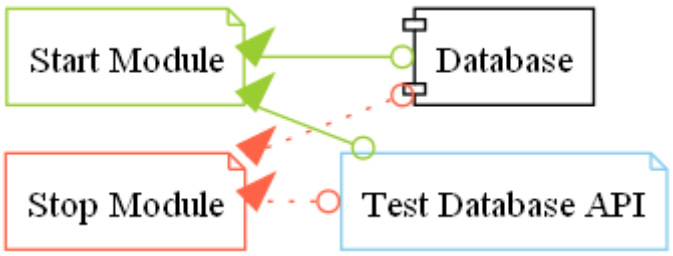


Table 6. Start and Stop module callers

Function	Callers
Start Module	Database.lvlib:Load Module.vi Test Database API.vi
Stop Module	Database.lvlib:Handle Exit.vi Test Database API.vi

A.1.4. MODULE CUSTOM ERRORS

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

Module Database.lvlib use the following custom errors:

Table 7. Custom errors

Name	Code	Description
Module Not Running	403681	%s Module is not running.
Module Not Stopped	403682	The Stop Module VI for the %s module timed out while waiting for the module main VI to stop. The module main VI may still be running.
Module Not Synced	403683	%s Module was unable to synchronize events.
Request and Wait for Reply Timeout	403686	%s

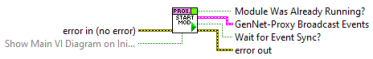
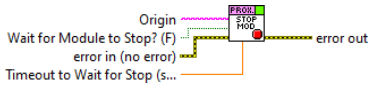
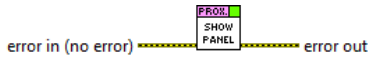
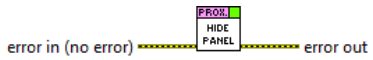
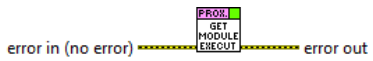
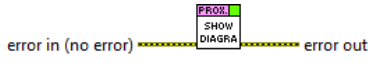
A.2. GENNET-PROXY.LVLIB

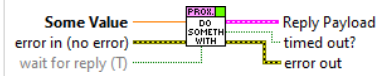
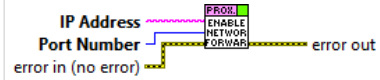
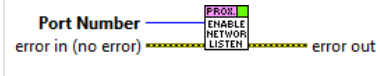
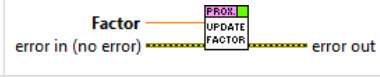
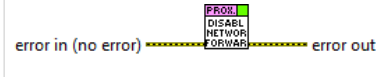
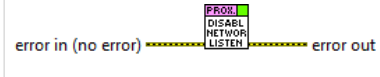
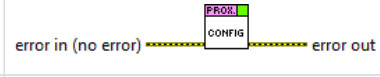
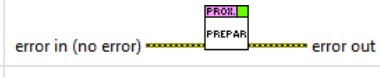
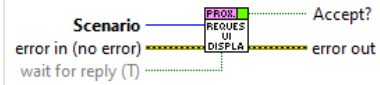
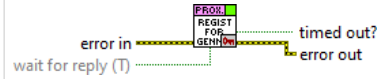
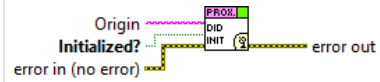
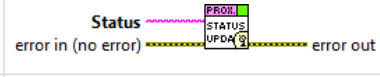
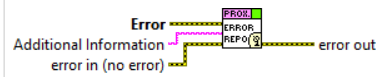
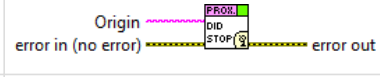
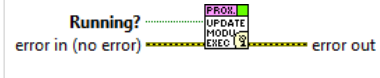
Type: Singleton

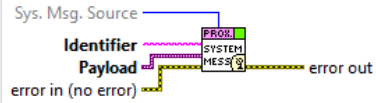
Responsibility: No description found (add content in DQMH module lvlib description)

A.2.1. EVENT LIST

Table 8. Events

Name	Type	Connector pane	Description	S.	R.	I.
Start Module			Launches the Module Main.vi.			
Stop Module			Send the Stop request to the Module's Main.vi. If Wait for Module to Stop? is TRUE, this VI will wait until the module main VI stops, and will timeout at the Timeout to Wait for Stop value. This value defaults to "-1", which means the VI will not timeout, and will always wait until the module main VI stops before completing execution. Note: The Timeout to Wait for Stop value is ignored if 'Wait for Module to Stop?' is set to FALSE.			
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.			
Get Module Execution Status			Fire the Get Module Execution Status request.			
Show Diagram			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.
Do something with answer			This event serves as an example for the DQMH Generic Networking functionality. The module "does something" and "sends an answer" back. The actual implementation takes the number in Some Value, multiplies it by "Factor", and sends back the result.			
Enable Network Forwarding			This loads a NET-TX module and enables forwarding of messages to another application with the given network address			
Enable Network Listening			Loads a NET-TR module and enables listening for incoming messages at given TCP port			
Update Factor			Updates the factor used in "Do something with reply"			
Disable Network Forwarding			Stops and unloads the GenNet-Client module.			
Disable Network Listening			Stops the NET-RX module, thus closing the TCP port			
Configure			Triggers the module's self-sufficient configuration function			
Prepare			Prepares the module's front panel for display.			
Request UI Display			Requests the module to display its UI as specified in Scenario: "managed" => in the UI Manager's subpanel "stand-alone" => as a separate window			
Register for GenNet Broadcasts			Registers for the broadcasts of the GenNet child modules (client and/or server)			
Module Did Init			No description found (add content in vi description)			
Status Updated			No description found (add content in vi description)			
Error Reported			Note: This VI was modified by the Validate DQMH Module tool to parse additional information tags out of the incoming error source string.			
Module Did Stop			No description found (add content in vi description)			
Update Module Execution Status			No description found (add content in vi description)			

Name	Type	Connector pane	Description	S.	R.	I.
System Message			No description found (add content in vi description)			

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

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

A.2.2. MODULE RELATIONSHIP

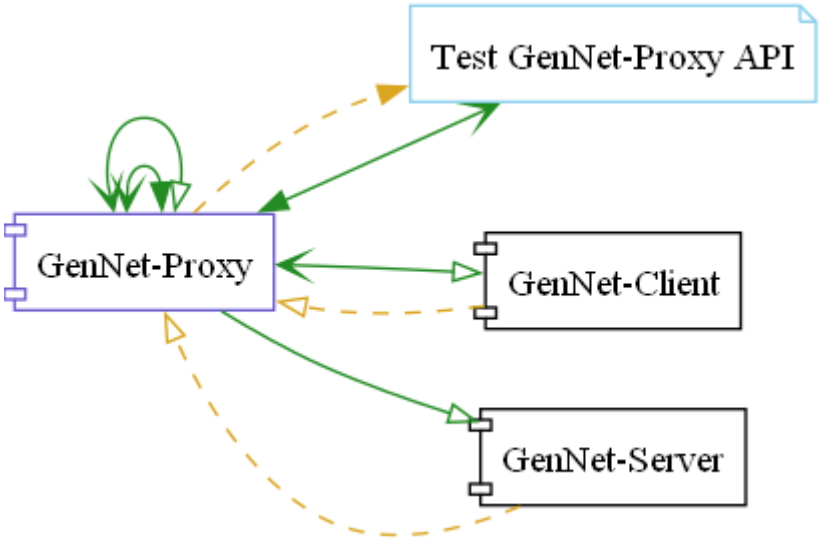


Table 9. Requests callers

Request Name	Callers
Configure	Test GenNet-Proxy API.vi
Disable Network Forwarding	GenNet-Proxy.lvlib:GenNet-Proxy Enable Network Forwarding.vi Test GenNet-Proxy API.vi
Disable Network Listening	Test GenNet-Proxy API.vi
Do something with answer	Test GenNet-Proxy API.vi
Enable Network Forwarding	Test GenNet-Proxy API.vi
Enable Network Listening	Test GenNet-Proxy API.vi
Get Module Execution Status	GenNet-Proxy.lvlib:Obtain Broadcast Events for Registration.vi GenNet-Proxy.lvlib:Start Module.vi
Hide Panel	Test GenNet-Proxy API.vi
Prepare	Test GenNet-Proxy API.vi

Request Name	Callers
Register for GenNet Broadcasts	GenNet-Proxy.lvlib:GenNet-Proxy Enable Network Forwarding.vi GenNet-Proxy.lvlib:GenNet-Proxy Enable Network Listening.vi
Request UI Display	Test GenNet-Proxy API.vi
Show Diagram	Test GenNet-Proxy API.vi
Show Panel	Test GenNet-Proxy API.vi
Update Factor	Test GenNet-Proxy API.vi

Table 10. Broadcasts Listeners

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

Table 11. Used requests

Module	Requests
GenNet-Client.lvlib	Connect.vi Listen for Network Broadcasts.vi Send via Network.vi Stop Module.vi (2)
GenNet-Proxy.lvlib	Disable Network Forwarding.vi Get Module Execution Status.vi Register for GenNet Broadcasts.vi (2) Stop Module.vi
GenNet-Server.lvlib	Forward Generic Broadcasts to Network.vi Stop Module.vi (2)

Table 12. Registered broadcast

Module	Broadcasts
GenNet-Client.lvlib	Error Reported.vi Status Updated.vi
GenNet-Server.lvlib	Error Reported.vi Status Updated.vi

A.2.3. MODULE START/STOP CALLS

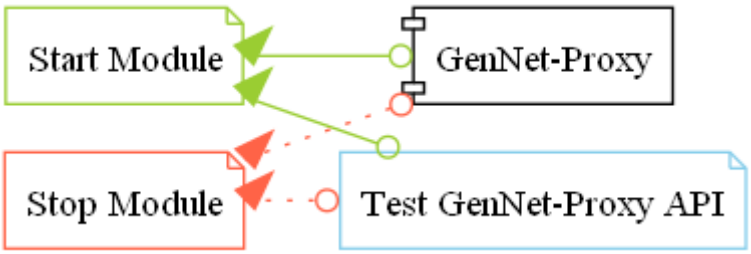


Table 13. Start and Stop module callers

Function	Callers
Start Module	GenNet-Proxy.lvlib:Load Module.vi Test GenNet-Proxy API.vi
Stop Module	GenNet-Proxy.lvlib:Handle Exit.vi Test GenNet-Proxy API.vi

A.2.4. MODULE CUSTOM ERRORS

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

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

Table 14. Custom errors

Name	Code	Description
Module Not Running	403681	%s Module is not running.
Module Not Stopped	403682	The Stop Module VI for the %s module timed out while waiting for the module main VI to stop. The module main VI may still be running.
Module Not Synced	403683	%s Module was unable to synchronize events.
Request and Wait for Reply Timeout	403686	%s

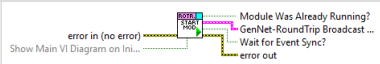
A.3. GENNET-ROUNDTRIP.LVLIB

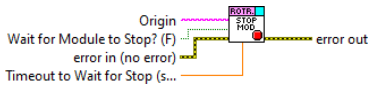
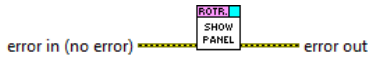
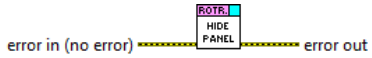
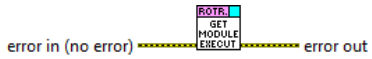
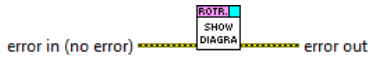
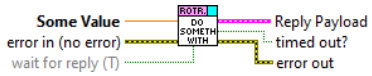
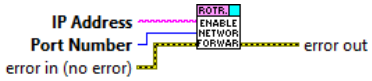
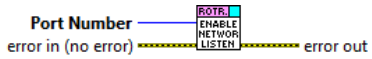
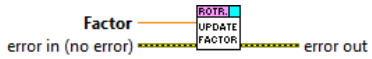
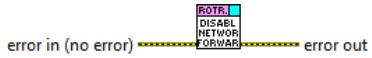
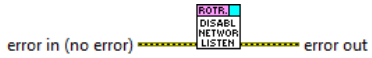
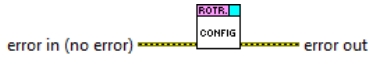
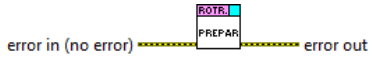
Type: Singleton

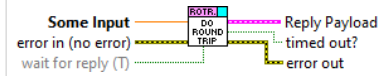
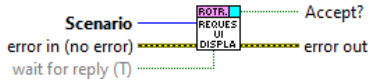
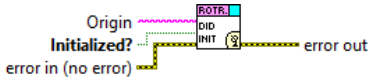
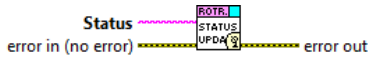
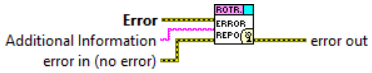
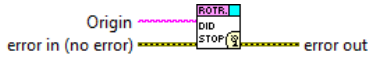
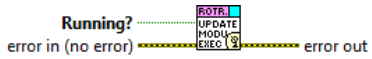
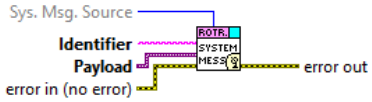
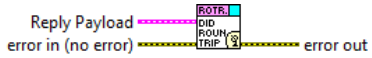
Responsibility: No description found (add content in DQMH module lvlib description)

A.3.1. EVENT LIST

Table 15. Events

Name	Type	Connector pane	Description	S.	R.	I.
Start Module			Launches the Module Main.vi.			

Name	Type	Connector pane	Description	S.	R.	I.
Stop Module			Send the Stop request to the Module's Main.vi. If Wait for Module to Stop? is TRUE, this VI will wait until the module main VI stops, and will timeout at the Timeout to Wait for Stop value. This value defaults to "-1", which means the VI will not timeout, and will always wait until the module main VI stops before completing execution. Note: The Timeout to Wait for Stop value is ignored if 'Wait for Module to Stop?' is set to FALSE.			
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.			
Get Module Execution Status			Fire the Get Module Execution Status request.			
Show Diagram			This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			
Do something with answer			This event serves as an example for the DQMH Generic Networking functionality. The module "does something" and "sends an answer" back. The actual implementation takes the number in Some Value, multiplies it by "Factor", and sends back the result.			
Enable Network Forwarding			This loads a NET-TX module and enables forwarding of messages to another application with the given network address			
Enable Network Listening			Loads a NET-TR module and enables listening for incoming messages at given TCP port			
Update Factor			Updates the factor used in "Do something with reply"			
Disable Network Forwarding			Stops and unloads the GenNet-Client module.			
Disable Network Listening			Stops the NET-RX module, thus closing the TCP port			
Configure			Triggers the module's self-sufficient configuration function			
Prepare			Prepares the module's front panel for display.			

Name	Type	Connector pane	Description	S.	R.	I.
Do Round Trip			Performs a complete round trip event over network			
Request UI Display			Requests the module to display its UI as specified in Scenario: "managed" => in the UI Manager's subpanel "stand-alone" => as a separate window			
Module Did Init			No description found (add content in vi description)			
Status Updated			No description found (add content in vi description)			
Error Reported			Note: This VI was modified by the Validate DQMH Module tool to parse additional information tags out of the incoming error source string.			
Module Did Stop			No description found (add content in vi description)			
Update Module Execution Status			No description found (add content in vi description)			
System Message			No description found (add content in vi description)			
Did Round Trip			Performs a complete round trip event over network			

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

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

A.3.2. MODULE RELATIONSHIP

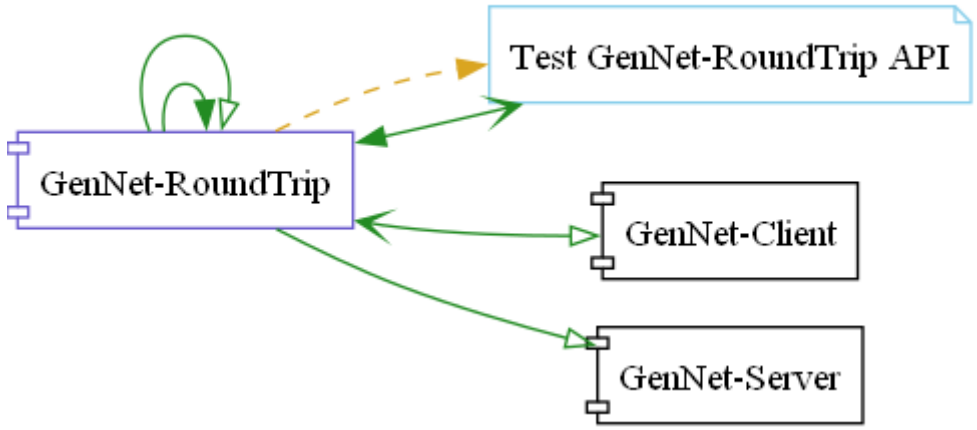


Table 16. Requests callers

Request Name	Callers
Configure	Test GenNet-RoundTrip API.vi
Disable Network Forwarding	GenNet-RoundTrip.lvlib:GenNet-Proxy Enable Network Forwarding.vi Test GenNet-RoundTrip API.vi
Disable Network Listening	Test GenNet-RoundTrip API.vi
Do Round Trip	Test GenNet-RoundTrip API.vi
Do something with answer	Test GenNet-RoundTrip API.vi
Enable Network Forwarding	Test GenNet-RoundTrip API.vi
Enable Network Listening	Test GenNet-RoundTrip API.vi
Get Module Execution Status	GenNet-RoundTrip.lvlib:Obtain Broadcast Events for Registration.vi GenNet-RoundTrip.lvlib:Start Module.vi
Hide Panel	Test GenNet-RoundTrip API.vi
Prepare	Test GenNet-RoundTrip API.vi
Request UI Display	Test GenNet-RoundTrip API.vi
Show Diagram	Test GenNet-RoundTrip API.vi
Show Panel	Test GenNet-RoundTrip API.vi
Update Factor	Test GenNet-RoundTrip API.vi

Table 17. Broadcasts Listeners

Broadcast Name	Listeners
Did Round Trip	Test GenNet-RoundTrip API.vi
Error Reported	Test GenNet-RoundTrip API.vi
Module Did Init	Test GenNet-RoundTrip API.vi
Module Did Stop	Test GenNet-RoundTrip API.vi
Status Updated	Test GenNet-RoundTrip API.vi
System Message	Test GenNet-RoundTrip API.vi
Update Module Execution Status	Test GenNet-RoundTrip API.vi

Table 18. Used requests

Module	Requests
GenNet-Client.lvlib	Connect.vi Listen for Network Broadcasts.vi Send via Network.vi Stop Module.vi (2)
GenNet-RoundTrip.lvlib	Disable Network Forwarding.vi Get Module Execution Status.vi Stop Module.vi
GenNet-Server.lvlib	Forward Generic Broadcasts to Network.vi Stop Module.vi (2)

Table 19. Registered broadcast

Module	Broadcasts
—	—

A.3.3. MODULE START/STOP CALLS

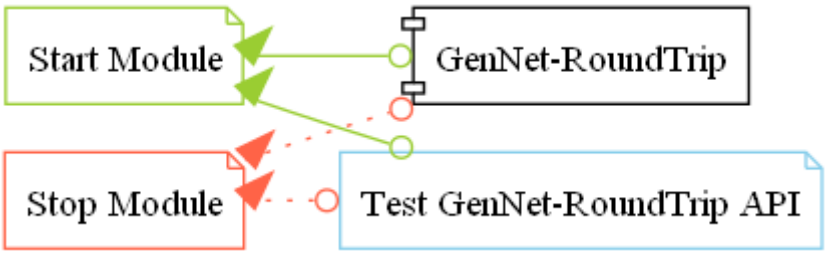


Table 20. Start and Stop module callers

Function	Callers
Start Module	GenNet-RoundTrip.lvlib:Load Module.vi Test GenNet-RoundTrip API.vi
Stop Module	GenNet-RoundTrip.lvlib:Handle Exit.vi Test GenNet-RoundTrip API.vi

A.3.4. MODULE CUSTOM ERRORS

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

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

Table 21. Custom errors

Name	Code	Description
Module Not Running	403681	%s Module is not running.
Module Not Stopped	403682	The Stop Module VI for the %s module timed out while waiting for the module main VI to stop. The module main VI may still be running.
Module Not Synced	403683	%s Module was unable to synchronize events.
Request and Wait for Reply Timeout	403686	%s

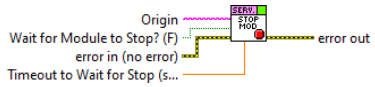
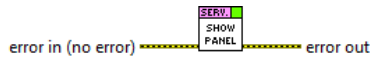
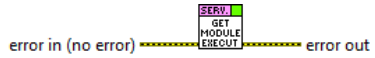
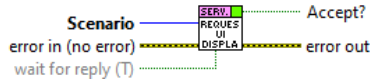
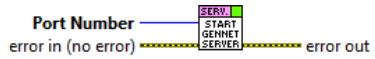
A.4. PXI SERVER MODULE.LVLIB

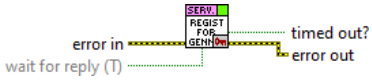
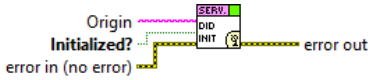
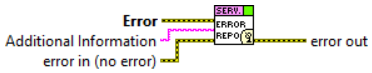
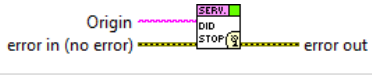
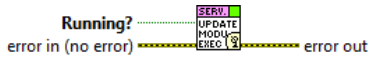
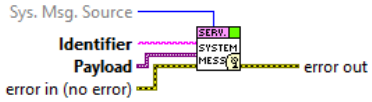
Type: Singleton

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

A.4.1. EVENT LIST

Table 22. Events

Name	Type	Connector pane	Description	S.	R.	I.
Start Module			Launches the Module Main.vi.			
Stop Module			Send the Stop request to the Module's Main.vi. If Wait for Module to Stop? is TRUE, this VI will wait until the module main VI stops, and will timeout at the Timeout to Wait for Stop value. This value defaults to "-1", which means the VI will not timeout, and will always wait until the module main VI stops before completing execution. Note: The Timeout to Wait for Stop value is ignored if 'Wait for Module to Stop?' is set to FALSE.			
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.			
Get Module Execution Status			Fire the Get Module Execution Status request.			
Show Diagram			This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			
Configure			Triggers the module's self-sufficient configuration function			
Prepare			Prepares the module's front panel for display.			
Request UI Display			Requests the module to display its UI as specified in Scenario: "managed" => in the UI Manager's subpanel "stand-alone" => as a separate window			
Start GenNet Server			Note: This VI was renamed by the DQMH Rename Event utility. Make sure the VI Description is updated to reflect the new event name, then delete this comment. Loads a NET-TR module and enables listening for incoming messages at given TCP port			

Name	Type	Connector pane	Description	S.	R.	I.
Stop GenNet Server			Note: This VI was renamed by the DQMH Rename Event utility. Make sure the VI Description is updated to reflect the new event name, then delete this comment. Stops the NET-RX module, thus closing the TCP port			
Register for GenNet Broadcasts			Registers for the GenNet Module's broadcasts			
Module Did Init			No description found (add content in vi description)			
Status Updated			No description found (add content in vi description)			
Error Reported			Note: This VI was modified by the Validate DQMH Module tool to parse additional information tags out of the incoming error source string.			
Module Did Stop			No description found (add content in vi description)			
Update Module Execution Status			No description found (add content in vi description)			
System Message			No description found (add content in vi description)			

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

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

A.4.2. MODULE RELATIONSHIP

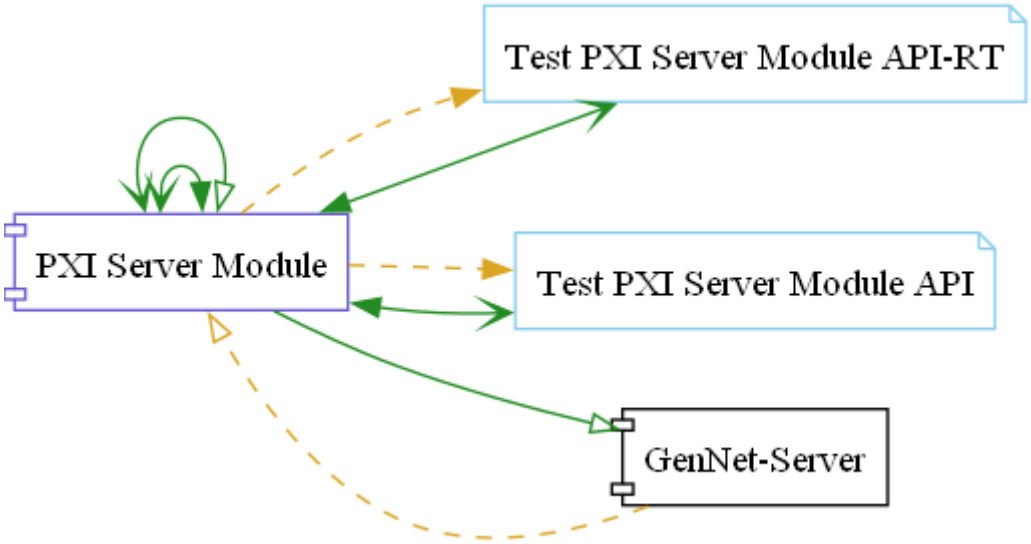


Table 23. Requests callers

Request Name	Callers
Configure	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi
Get Module Execution Status	PXI Server Module.lvlib:Obtain Broadcast Events for Registration.vi PXI Server Module.lvlib:Start Module.vi Test PXI Server Module API-RT.vi
Hide Panel	Test PXI Server Module API.vi
Prepare	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi
Register for GenNet Broadcasts	PXI Server Module.lvlib:Start GenNet Server using PlainString Protocol.vi
Request UI Display	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi
Show Diagram	Test PXI Server Module API.vi
Show Panel	Test PXI Server Module API.vi
Start GenNet Server	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi
Stop GenNet Server	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi

Table 24. Broadcasts Listeners

Broadcast Name	Listeners
Error Reported	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi
Module Did Init	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi
Module Did Stop	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi
Status Updated	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi

Broadcast Name	Listeners
System Message	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi
Update Module Execution Status	Test PXI Server Module API-RT.vi Test PXI Server Module API.vi

Table 25. Used requests

Module	Requests
GenNet-Server.lvlib	Forward Generic Broadcasts to Network.vi Stop Module.vi (2)
PXI Server Module.lvlib	Get Module Execution Status.vi Register for GenNet Broadcasts.vi Stop Module.vi

Table 26. Registered broadcast

Module	Broadcasts
GenNet-Server.lvlib	Error Reported.vi Status Updated.vi

A.4.3. MODULE START/STOP CALLS

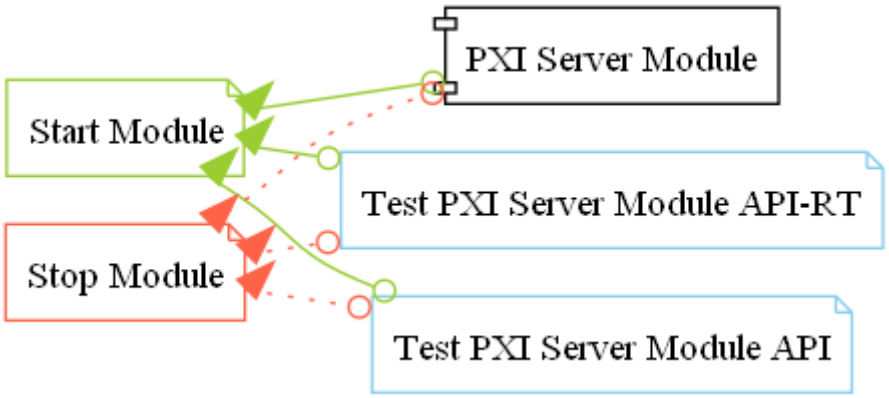


Table 27. Start and Stop module callers

Function	Callers
Start Module	PXI Server Module.lvlib:Load Module.vi Test PXI Server Module API-RT.vi Test PXI Server Module API.vi
Stop Module	PXI Server Module.lvlib:Handle Exit.vi Test PXI Server Module API-RT.vi Test PXI Server Module API.vi

A.4.4. MODULE CUSTOM ERRORS

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

Module PXI Server Module.lvlib use the following custom errors:

Table 28. Custom errors

Name	Code	Description
Module Not Running	403681	%s Module is not running.
Module Not Stopped	403682	The Stop Module VI for the %s module timed out while waiting for the module main VI to stop. The module main VI may still be running.
Module Not Synced	403683	%s Module was unable to synchronize events.
Request and Wait for Reply Timeout	403686	%s

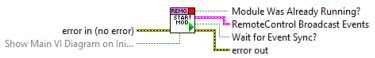
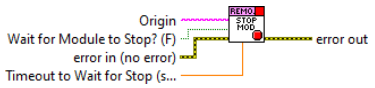
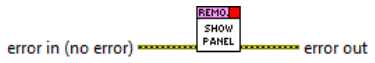
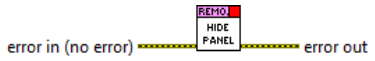
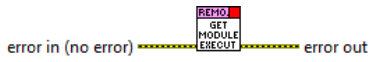
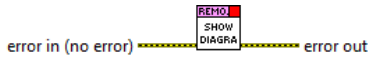
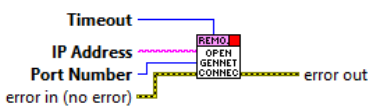
A.5. REMOTECONTROL.LVLIB

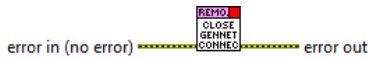
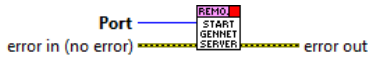
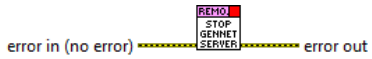
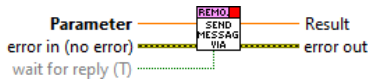
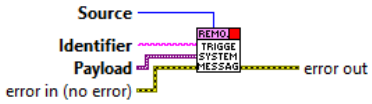
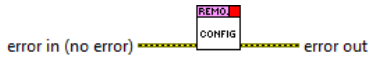
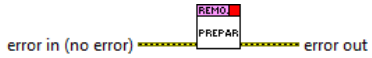
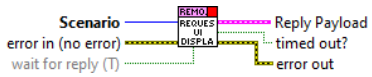
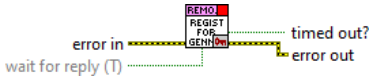
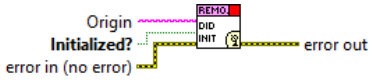
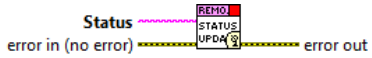
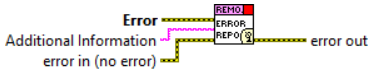
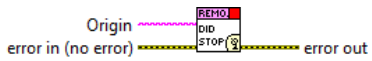
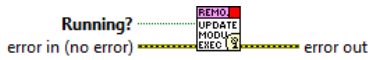
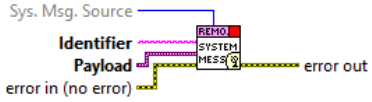
Type: Singleton

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

A.5.1. EVENT LIST

Table 29. Events

Name	Type	Connector pane	Description	S.	R.	I.
Start Module			Launches the Module Main.vi.			
Stop Module			Send the Stop request to the Module's Main.vi. If Wait for Module to Stop? is TRUE, this VI will wait until the module main VI stops, and will timeout at the Timeout to Wait for Stop value. This value defaults to "-1", which means the VI will not timeout, and will always wait until the module main VI stops before completing execution. Note: The Timeout to Wait for Stop value is ignored if 'Wait for Module to Stop?' is set to FALSE.			
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.			
Get Module Execution Status			Fire the Get Module Execution Status request.			
Show Diagram			This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			
Open GenNet Connection			Spawns a GenNet-Client module and initiates the network connection to a GenNet-Server specified by IP Address, Port Number and Timeout			

Name	Type	Connector pane	Description	S.	R.	I.
Close GenNet Connection			Closes the GenNet connection and stops the GenNet-Client module.			
Start GenNet Server			Spawns a GenNet-Server module clone and starts listening for incoming TCP connections on the given port.			
Stop GenNet Server			Aborts the TCP listener and stops the GenNet-Server module clone.			
Send Message via Gennet			Sends a message through the GenNet-Client to a remote target. This request serves as an example of manually sending a request with one argument (a numeric Parameter) to a GenNet-enabled module. See the block diagram and the #HSE comments for more information.			
Trigger System Message event			Sends a request to the module to trigger the "System Message" broadcast event. Source tells the receiving module where the broadcast event came frome.			
Configure			Triggers the module's self-sufficient configuration function			
Prepare			Prepares the module's front panel for display			
Request UI Display			Requests the module to display its UI as specified in Scenario: "managed" => in the UI Manager's subpanel "stand-alone" => as a separate window			
Register for GenNet Broadcasts			Registers the module for the broadcasts of the GenNet Client module			
Module Did Init			No description found (add content in vi description)			
Status Updated			No description found (add content in vi description)			
Error Reported			Note: This VI was modified by the Validate DQMH Module tool to parse additional information tags out of the incoming error source string.			
Module Did Stop			No description found (add content in vi description)			
Update Module Execution Status			No description found (add content in vi description)			
System Message			No description found (add content in vi description)			

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

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

A.5.2. MODULE RELATIONSHIP

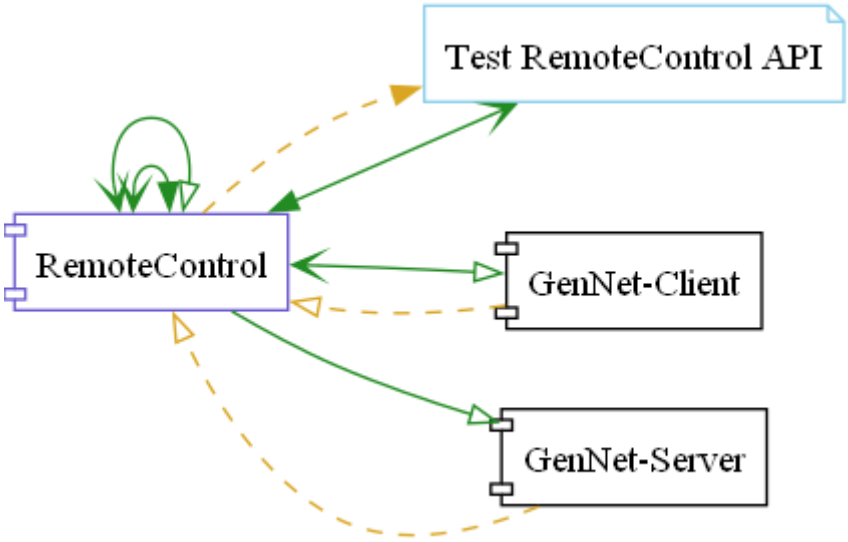


Table 30. Requests callers

Request Name	Callers
Close GenNet Connection	Test RemoteControl API.vi
Configure	Test RemoteControl API.vi
Get Module Execution Status	RemoteControl.lvlib:Obtain Broadcast Events for Registration.vi RemoteControl.lvlib:Start Module.vi
Hide Panel	Test RemoteControl API.vi
Open GenNet Connection	Test RemoteControl API.vi
Prepare	Test RemoteControl API.vi
Register for GenNet Broadcasts	RemoteControl.lvlib:Main.vi RemoteControl.lvlib:Open GenNet Connection—wrapper.vi
Request UI Display	Test RemoteControl API.vi
Send Message via Gennet	Test RemoteControl API.vi
Show Diagram	Test RemoteControl API.vi
Show Panel	Test RemoteControl API.vi
Start GenNet Server	Test RemoteControl API.vi
Stop GenNet Server	Test RemoteControl API.vi
Trigger System Message event	Test RemoteControl API.vi

Table 31. Broadcasts Listeners

Broadcast Name	Listeners
Error Reported	Test RemoteControl API.vi
Module Did Init	Test RemoteControl API.vi
Module Did Stop	Test RemoteControl API.vi
Status Updated	Test RemoteControl API.vi
System Message	Test RemoteControl API.vi
Update Module Execution Status	Test RemoteControl API.vi

Table 32. Used requests

Module	Requests
GenNet-Client.lvlib	Connect.vi Listen for Network Broadcasts.vi Send via Network.vi Stop Module.vi (2)
GenNet-Server.lvlib	Forward Generic Broadcasts to Network.vi Stop Module.vi
RemoteControl.lvlib	Get Module Execution Status.vi Register for GenNet Broadcasts.vi (2) Stop Module.vi

Table 33. Registered broadcast

Module	Broadcasts
GenNet-Client.lvlib	Error Reported.vi Status Updated.vi
GenNet-Server.lvlib	Error Reported.vi Status Updated.vi

A.5.3. MODULE START/STOP CALLS

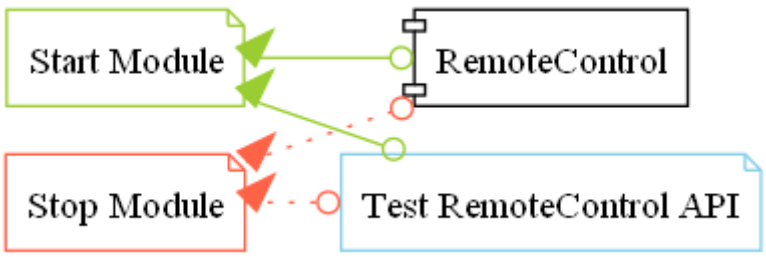


Table 34. Start and Stop module callers

Function	Callers
Start Module	RemoteControl.lvlib:Load Module.vi Test RemoteControl API.vi
Stop Module	RemoteControl.lvlib:Handle Exit.vi Test RemoteControl API.vi

A.5.4. MODULE CUSTOM ERRORS

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

Module RemoteControl.lvlib use the following custom errors:

Table 35. Custom errors

Name	Code	Description
Module Not Running	403681	%s Module is not running.
Module Not Stopped	403682	The Stop Module VI for the %s module timed out while waiting for the module main VI to stop. The module main VI may still be running.
Module Not Synced	403683	%s Module was unable to synchronize events.
Request and Wait for Reply Timeout	403686	%s

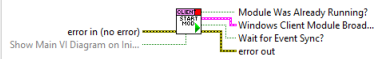
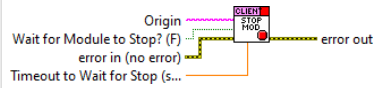
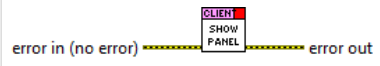
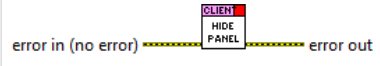
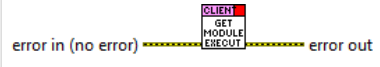
A.6. WINDOWS CLIENT MODULE.LVLIB

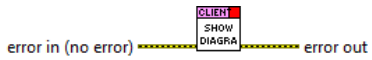
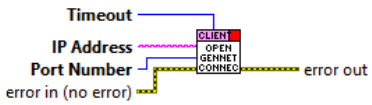
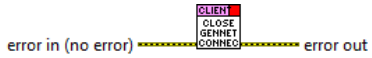
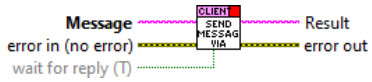
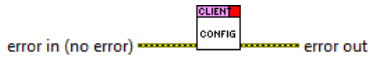
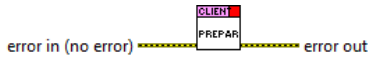
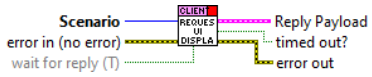
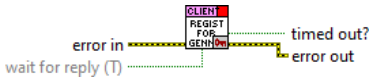
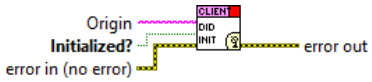
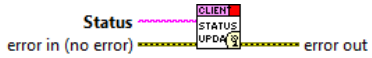
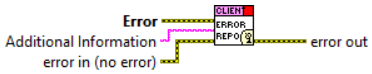
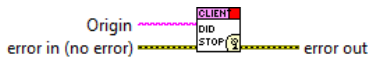
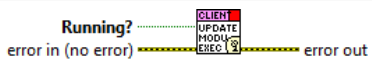
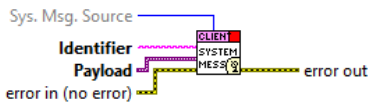
Type: Singleton

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

A.6.1. EVENT LIST

Table 36. Events

Name	Type	Connector pane	Description	S.	R.	I.
Start Module			Launches the Module Main.vi.			
Stop Module			Send the Stop request to the Module's Main.vi. If Wait for Module to Stop? is TRUE, this VI will wait until the module main VI stops, and will timeout at the Timeout to Wait for Stop value. This value defaults to "-1", which means the VI will not timeout, and will always wait until the module main VI stops before completing execution. Note: The Timeout to Wait for Stop value is ignored if 'Wait for Module to Stop?' is set to FALSE.			
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.			
Get Module Execution Status			Fire the Get Module Execution Status request.			

Name	Type	Connector pane	Description	S.	R.	I.
Show Diagram			This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			
Open GenNet Connection			Spawns a GenNet-Client module and initiates the network connection to a GenNet-Server specified by IP Address, Port Number and Timeout			
Close GenNet Connection			Closes the GenNet connection and stops the GenNet-Client module.			
Send Message via Gennet			Sends a message through the GenNet-Client to a remote target. This request serves as an example of manually sending a request with one argument (a numeric Parameter) to a GenNet-enabled module. See the block diagram and the #HSE comments for more information.			
Configure			Triggers the module's self-sufficient configuration function			
Prepare			Prepares the module's front panel for display			
Request UI Display			Requests the module to display its UI as specified in Scenario: "managed" => in the UI Manager's subpanel "stand-alone" => as a separate window			
Register for GenNet Broadcasts			Registers for the broadcasts of the GenNet module			
Module Did Init			No description found (add content in vi description)			
Status Updated			No description found (add content in vi description)			
Error Reported			Note: This VI was modified by the Validate DQMH Module tool to parse additional information tags out of the incoming error source string.			
Module Did Stop			No description found (add content in vi description)			
Update Module Execution Status			No description found (add content in vi description)			
System Message			No description found (add content in vi description)			

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

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

A.6.2. MODULE RELATIONSHIP

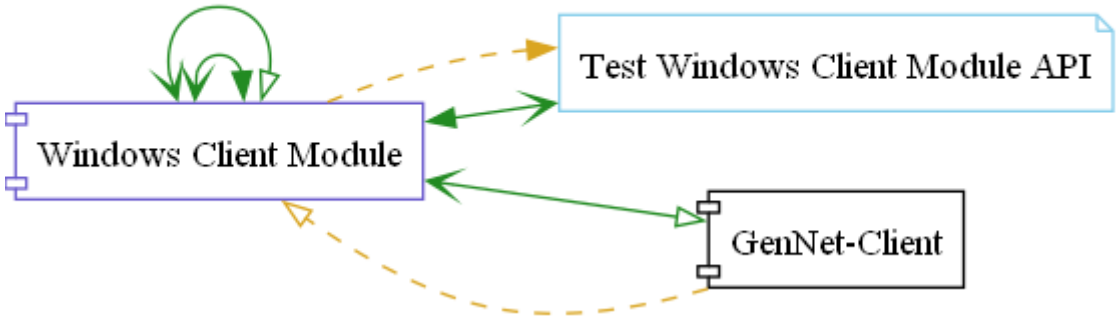


Table 37. Requests callers

Request Name	Callers
Close GenNet Connection	Test Windows Client Module API.vi
Configure	Test Windows Client Module API.vi
Get Module Execution Status	Windows Client Module.lvlib:Obtain Broadcast Events for Registration.vi Windows Client Module.lvlib:Start Module.vi
Hide Panel	Test Windows Client Module API.vi
Open GenNet Connection	Test Windows Client Module API.vi
Prepare	Test Windows Client Module API.vi
Register for GenNet Broadcasts	Windows Client Module.lvlib:Open PlainString Connection—wrapper.vi
Request UI Display	Test Windows Client Module API.vi
Send Message via Gennet	Test Windows Client Module API.vi
Show Diagram	Test Windows Client Module API.vi
Show Panel	Test Windows Client Module API.vi

Table 38. Broadcasts Listeners

Broadcast Name	Listeners
Error Reported	Test Windows Client Module API.vi
Module Did Init	Test Windows Client Module API.vi
Module Did Stop	Test Windows Client Module API.vi
Status Updated	Test Windows Client Module API.vi
System Message	Test Windows Client Module API.vi
Update Module Execution Status	Test Windows Client Module API.vi

Table 39. Used requests

Module	Requests
GenNet-Client.lvlib	Connect.vi Listen for Network Broadcasts.vi Send via Network.vi Stop Module.vi (3)
Windows Client Module.lvlib	Register for GenNet Broadcasts.vi Stop Module.vi

Table 40. Registered broadcast

Module	Broadcasts
GenNet-Client.lvlib	Error Reported.vi Status Updated.vi

A.6.3. MODULE START/STOP CALLS

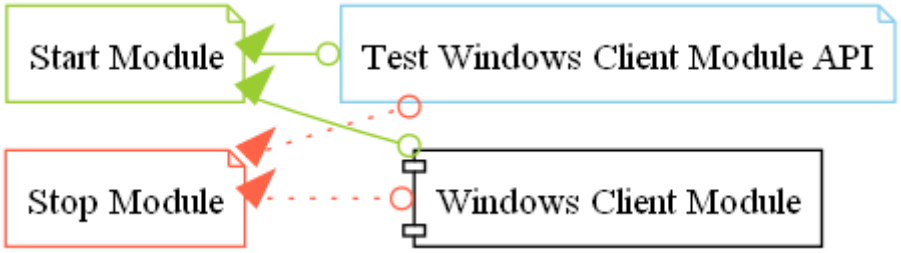


Table 41. Start and Stop module callers

Function	Callers
Start Module	Test Windows Client Module API.vi Windows Client Module.lvlib:Load Module.vi
Stop Module	Test Windows Client Module API.vi Windows Client Module.lvlib:Handle Exit.vi

A.6.4. MODULE CUSTOM ERRORS

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

Module Windows Client Module.lvlib use the following custom errors:

Table 42. Custom errors

Name	Code	Description
Module Not Running	403681	%s Module is not running.
Module Not Stopped	403682	The Stop Module VI for the %s module timed out while waiting for the module main VI to stop. The module main VI may still be running.
Module Not Synced	403683	%s Module was unable to synchronize events.
Request and Wait for Reply Timeout	403686	%s

APPENDIX B: LIBRARIES

Misc. reuse libraries

APPENDIX C: CLASSES

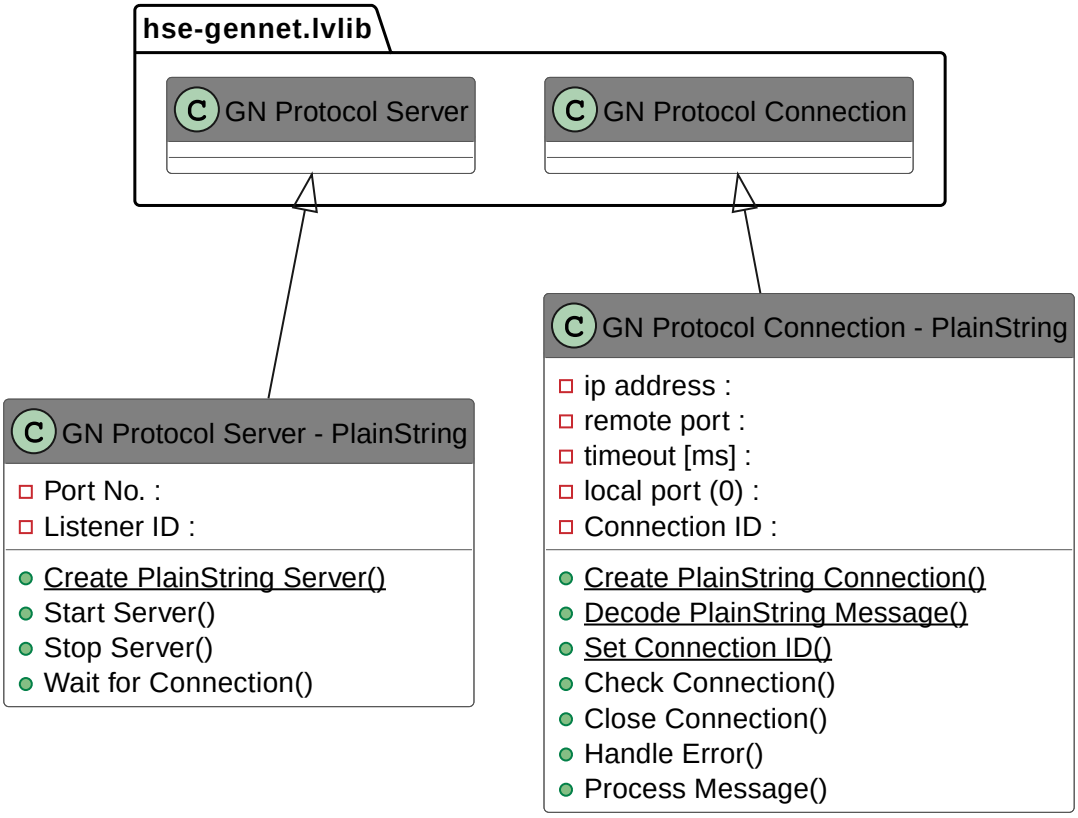
LabVIEW Classes

C.1. CLASSES OVERVIEW

This project contains 2 classes and 0 interface.

Table 43. Classes list

Classes	Interfaces
GN Protocol Server - PlainString.lvclass	
GN Protocol Connection - PlainString.lvclass	



C.2. GN PROTOCOL SERVER - PLAINSTRING.LVCLASS

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

Version: 1.0.0.0

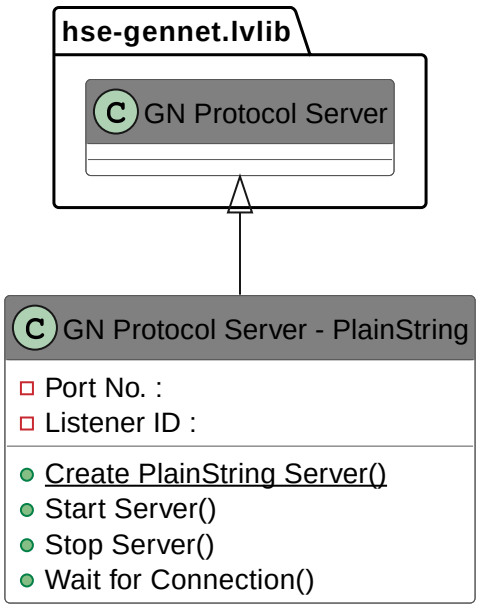


Table 44. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Create PlainString Server	Port No. / error in (no error) → PlainString out / error out	No description found (add content in vi description)			
Start Server	GN Server in / error in → GN Server out / error out / Log Info	No description found (add content in vi description)			
Stop Server	GN Server in / error in → GN Server out / error out	No description found (add content in vi description)			
Wait for Connection	GN Server in / error in → GN Server out / GN Service out / error out / Log Info	No description found (add content in vi description)			

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

C.3. GN PROTOCOL CONNECTION - PLAINSTRING.LVCLASS

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

Version: 1.0.0.1

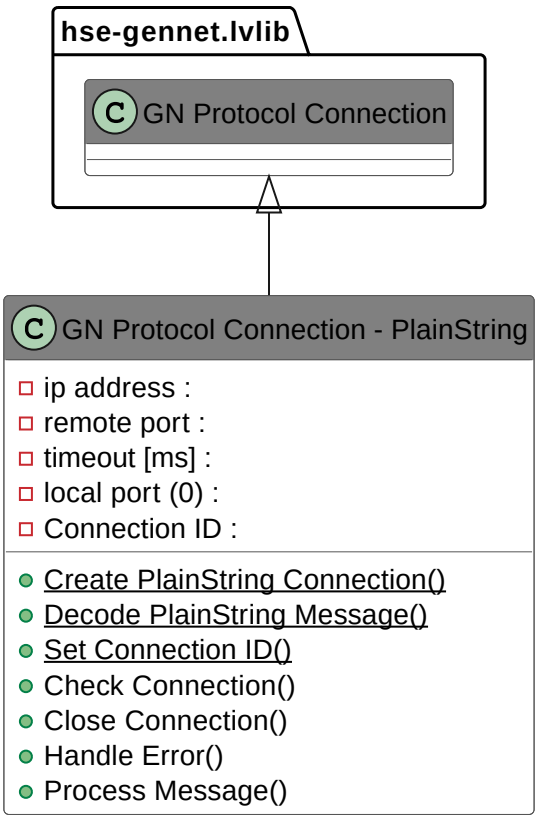
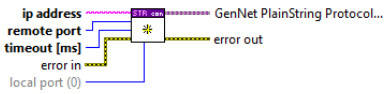
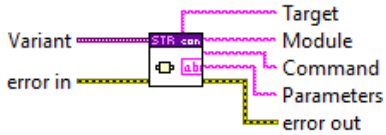
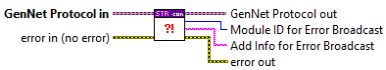
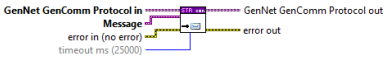


Table 45. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Check Connection		No description found (add content in vi description)			
Close Connection		No description found (add content in vi description)			
Create PlainString Connection		No description found (add content in vi description)			
Decode PlainString Message		No description found (add content in vi description)			
Handle Error		No description found (add content in vi description)			
Process Message		No description found (add content in vi description)			
Read Message		No description found (add content in vi description)			
Set Connection ID		No description found (add content in vi description)			
Write Message		No description found (add content in vi description)			

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

APPENDIX D: CUSTOM ERRORS

List of Custom Error VIs

D.1. CUSTOM ERRORS

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

Table 46. Custom errors

Name	Code	Description	Owned by
Module Not Running	403681	%s Module is not running.	Database.lvlib GenNet-Proxy.lvlib GenNet-RoundTrip.lvlib PXI Server Module.lvlib RemoteControl.lvlib Windows Client Module.lvlib
Module Not Stopped	403682	The Stop Module VI for the %s module timed out while waiting for the module main VI to stop. The module main VI may still be running.	Database.lvlib GenNet-Proxy.lvlib GenNet-RoundTrip.lvlib PXI Server Module.lvlib RemoteControl.lvlib Windows Client Module.lvlib
Module Not Synced	403683	%s Module was unable to synchronize events.	Database.lvlib GenNet-Proxy.lvlib GenNet-RoundTrip.lvlib PXI Server Module.lvlib RemoteControl.lvlib Windows Client Module.lvlib
Request and Wait for Reply Timeout	403686	%s	Database.lvlib GenNet-Proxy.lvlib GenNet-RoundTrip.lvlib PXI Server Module.lvlib RemoteControl.lvlib Windows Client Module.lvlib

GLOSSARY

The rat-documentr tool facilitates the following LabVIEW-related tools and libraries:

- Antidoc by Wovalab
- Asciidoc Toolkit by Wovalab
- Graph Builder by C. Gambini
- Classy by T. Boy
- DQMH® by Delacor

Furthermore, it relies on the following tools and libraries:

- Ruby
- Asciidoctor
- Java
- GraphViz