

HAMPEL SOFTWARE ENGINEERING

hse-db

HAMPEL SOFTWARE ENGINEERING

Version 2.0.3 (2024-07-09)

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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. STATE MACHINES



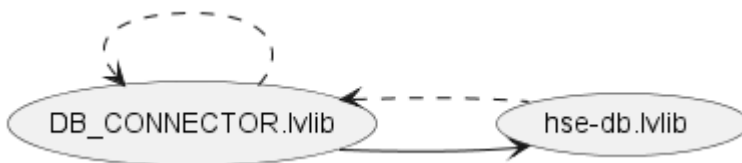
No state machines found.

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 2. CALLING DEPENDENCY DIAGRAMS

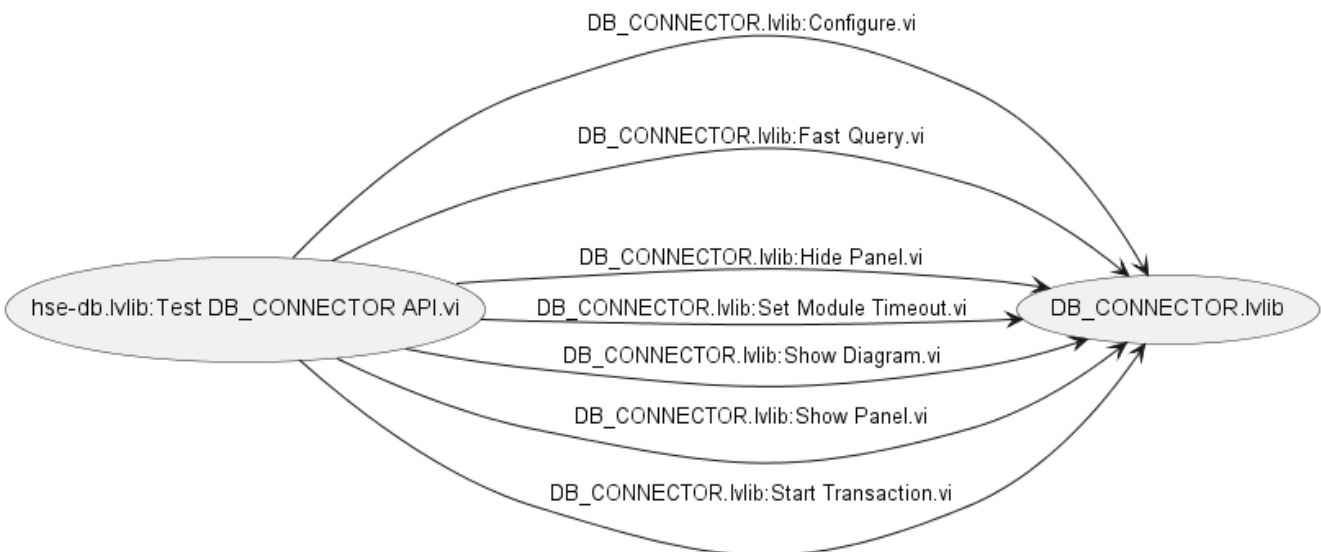
2.1. OVERVIEW

2.1.1. PROJECT



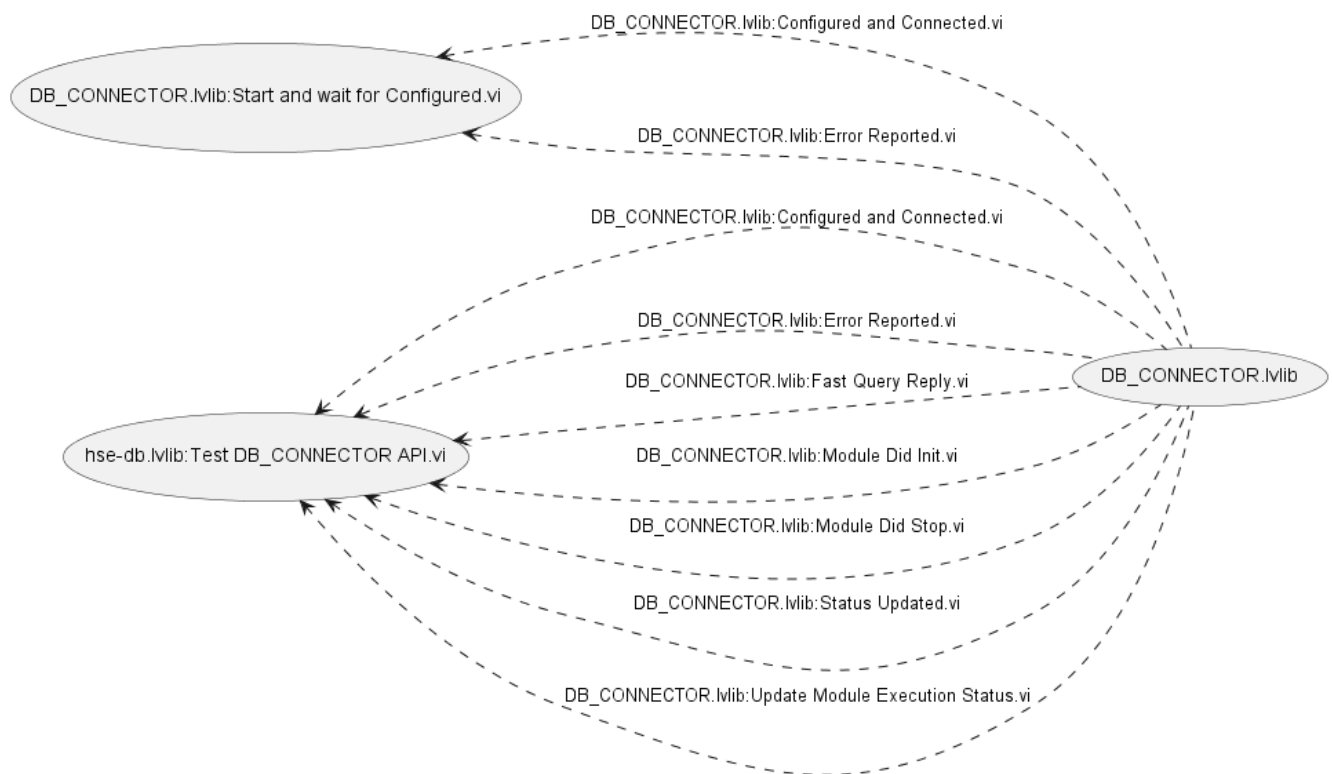
2.2. CALLERS

2.2.1. DB_CONNECTOR.LVLIB



2.3. LISTENERS

2.3.1. DB_CONNECTOR.LVLIB



APPENDIX A: DQMH

DQMH modules documentation

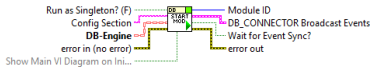
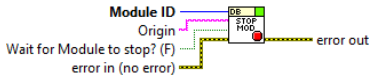
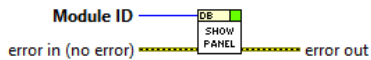
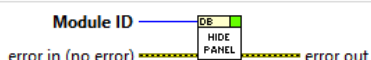
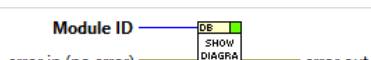
A.1. DB_CONNECTOR.LVLIB

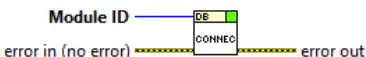
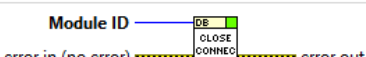
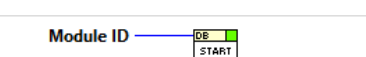
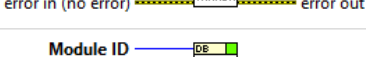

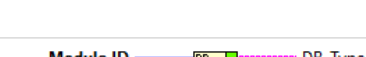

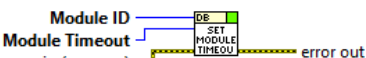
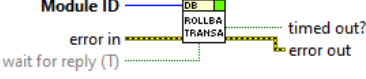
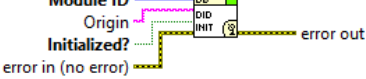
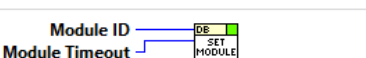

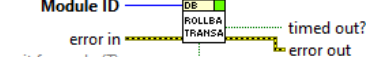
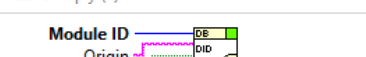

Type: Cloneable





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			<p>Send the Stop request to the Module's Main.vi. If Wait for Module to stop? is TRUE, then this VI will not complete execution until the Module Main VI has stopped running.</p> <p>Note: If the cloneable module is running as singleton, then the 'Wait for Module to stop?' input is ignored... this VI will always wait until a cloneable Main VI running as singleton has stopped running.</p> <p>Note: This VI was modified by the Validate DQMH Module tool to upgrade it to the DQMH 5.1 approach to poll the execution state of a cloneable module running as singleton to know when the module has gone idle.</p> <p>Note: This VI was modified by the Validate DQMH Module tool to upgrade it to the DQMH 5.0 approach to destroying cloneable module event references.</p> <p>Note: This VI was modified by the Validate DQMH Module tool to remove the Status Updated.vi subVI call.</p>			
Show Panel	→		Send the Show Panel request to the Module's Main.vi.			
Hide Panel	→		Send the Hide Panel request to the Module's Main.vi.			
Show Diagram	→		This VI tells the Module to show its block diagram to facilitate troubleshooting (add probes, breakpoints, highlight execution, etc).			

Name	Type	Connector pane	Description	S.	R.	I.
Configure	➡		Triggers the auto-configuration of the module			
Connect	➡		Connect to database.			
Close Connection	➡		Close connection to the database.			
Start Transaction	➡		Start a transaction to get sure all following SQL commands get executed or none.			
Fast Query	➡		An asynchronous query to the DB. This request does not block and has no reply. To receive the db response register to the corresponding broadcast.			
Get DB-Type	↺		Returns the type of the database in DB-Type			
Query	↺		Send a SQL-Query to the database.			
Commit Transaction	↺		Commit a transaction. Either all SQL-commands get committed or, in case of an error, all get rejected.			
Set Module Timeout	➡		Overrides the DQMH internal Module Timeout with the specified value (must be greater than 0)			
Rollback Transaction	↺		Rollback the active transaction.			
Module Did Init	↺		Send the Module Did Init event to any VI registered to listen to this module's broadcast events.			
Status Updated	↺		Send the Status Updated event to any VI registered to listen to events from the owning module.			
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	↺		Send the Module Did Stop event to any VI registered to listen to this module's broadcast events.			
Update Module Execution Status	↺		Fire the Get Module Execution Status request.			
Fast Query Reply	↺		The database reply from a (asynchronous) "Fast Query".			

Name	Type	Connector pane	Description	S.	R.	I.
Configured and Connected		 <p>Module ID  error in  error out</p>	broadcast to inform that the module has been configured and connected			

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

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined

A.1.2. MODULE RELATIONSHIP

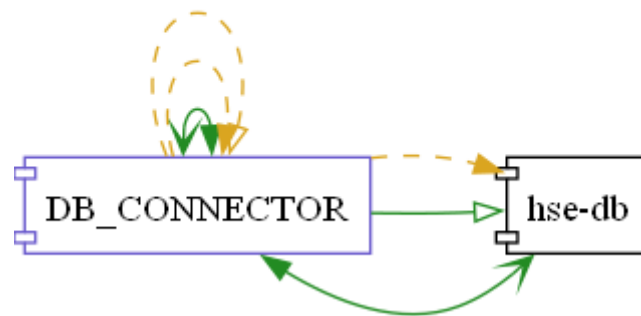


Table 2. Requests callers

Request Name	Callers
DB_CONNECTOR.lvlib:Close Connection	
DB_CONNECTOR.lvlib:Commit Transaction	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Configure	DB_CONNECTOR.lvlib:Start and wait for Configured.vi hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Connect	
DB_CONNECTOR.lvlib:Fast Query	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Get DB-Type	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Hide Panel	hse-db.lvlib:Test DB_CONNECTOR API.vi

Request Name	Callers
DB_CONNECTOR.lvlib:Query	DB_CONNECTOR.lvlib:Query - DBL - 1D - Col.vi DB_CONNECTOR.lvlib:Query - DBL - 1D.vi DB_CONNECTOR.lvlib:Query - DBL - 2D.vi DB_CONNECTOR.lvlib:Query - DBL - Scalar.vi DB_CONNECTOR.lvlib:Query - Int64 - 1D - Col.vi DB_CONNECTOR.lvlib:Query - Int64 - 1D.vi DB_CONNECTOR.lvlib:Query - Int64 - 2D.vi DB_CONNECTOR.lvlib:Query - Int64 - Scalar.vi DB_CONNECTOR.lvlib:Query - String - 1D - Col.vi DB_CONNECTOR.lvlib:Query - String - 1D.vi DB_CONNECTOR.lvlib:Query - String - 2D.vi DB_CONNECTOR.lvlib:Query - String - Scalar.vi
DB_CONNECTOR.lvlib:Rollback Transaction	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Set Module Timeout	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Show Diagram	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Show Panel	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Start Transaction	hse-db.lvlib:Test DB_CONNECTOR API.vi

Table 3. Broadcasts Listeners

Broadcast Name	Listeners
DB_CONNECTOR.lvlib:Configured and Connected	DB_CONNECTOR.lvlib:Start and wait for Configured.vi hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib>Error Reported	DB_CONNECTOR.lvlib:Start and wait for Configured.vi hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Fast Query Reply	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Module Did Init	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Module Did Stop	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib>Status Updated	hse-db.lvlib:Test DB_CONNECTOR API.vi
DB_CONNECTOR.lvlib:Update Module Execution Status	hse-db.lvlib:Test DB_CONNECTOR API.vi

Table 4. Used requests

Module	Requests
hse-db.lvlib	DB_CONNECTOR.lvlib:Stop Module.vi

Table 5. Registered broadcast

Module	Broadcasts
DB_CONNECTOR.lvlib	Configured and Connected.vi Error Reported.vi

A.1.3. MODULE START/STOP CALLS

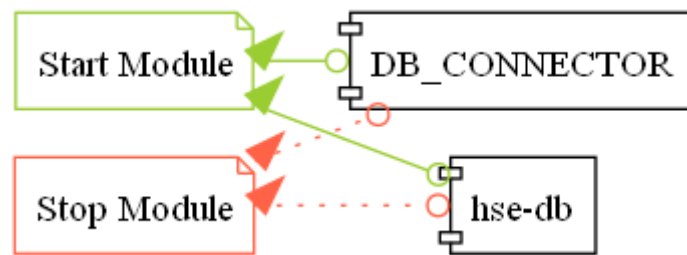


Table 6. Start and Stop module callers

Function	Callers
Start Module	DB_CONNECTOR.lvlib:Load Module.vi DB_CONNECTOR.lvlib:Start and wait for Configured.vi hse-db.lvlib:Test DB_CONNECTOR API.vi
Stop Module	DB_CONNECTOR.lvlib:Handle Exit.vi hse-db.lvlib:Test DB_CONNECTOR API.vi

A.1.4. MODULE CUSTOM ERRORS



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

Module DB_CONNECTOR.lvlib use the following custom errors:

Table 7. Custom errors

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

APPENDIX B: LIBRARIES

Misc. reuse libraries

B.1. HSE-DB-ADO.LVLIB

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

Version: 1.0.0.0

Table 8. Nested libraries

Name	Type
DB-ADO.lvclass	LVClass
ADO-DB-Driver.lvlib	Library

This library has no functions set to non private scope.


B.2. ADO-DB-DRIVER.LVLIB

Responsibility: ADO-DB driver.

Version: 1.0.0.0

Table 9. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
convert " to NULL	String In length → 'to' → Formatted String	Convert an empty string (two quotes) to NULL			
Convert from date-first Timestamp	dtm string → dtm → Timestamp	Convert "MM/DD/YYYY HH:MM:SS" to timestamp			
Convert to date-first Timestamp	DTTM (Now) → dtm → insertion string	Convert timestamp to "MM/DD/YYYY HH:MM:SS"			
format floats for database	Number → %e → Insertion String	Format float for database (either engineering format or NULL)			
format floats[] for database	Numbers → %e → Insertion Strings for database.vi]	Format array of float for database (either engineering format or NULL)			
Close Recordset+	Recordset → Close → error in → error out	Close the recordset			
Create New Record in Recordset	Field Values → Recordset → New → Recordset Out error in (no error) → error out Field Names	Create new recordset			
Open Recordset+	Connection → Source → Recordset Parameters → Open → Recordset error in (no error) → error out	Open a recordset			

Name	Connector pane	Description	S.	R.	I.
parse field names from SELECT statement	Select String → Parse Fields → variant(field names)	Parse a select statement into an array of variant fields			
Read Recordset (DBVIEW)	Recordset In, No. of rows, error in → Read? DBVIEW → Recordset Out, tabular data, graphical data, error out, Rows Returned	Read a recordset and return an array of DBVIEW			
Read Recordset (DOUBLE)	Recordset In, Max Rows to Fetch (-1 = all), error in (no error) → Read? → Recordset Out, Data out, Rows Returned, error out, Field Names	Read a recordset and return an array of double			
Read Recordset (STRING)	Recordset In, Max Rows to Fetch (-1 = all), error in (no error) → Read? → Recordset Out, Data out, Rows Returned, error out, Field Names	Read a recordset and return an array of string			
Read Recordset (VARIANT)	Recordset In, Max Rows to Fetch (-1 = all), error in (no error) → Read? → Recordset Out, data out, Rows Returned, error out, Field Names	Read a recordset and return an array of variants			
SQLSTATE Lookup	SQLSTATE Value → sqlstate → SQLSTATE Description	Look up a SQL State code			
_Database Driver Catalog		This VI contains a list of available API functions			
Close Connection+	Connection → Close → error in, error out	Close the connection			
Create and Read Recordset	Connection In, Source, Recordset Parameters, error in (no error), Max Rows to Fetch (-1 = all) → Read? → Connection Out, Selection Data, Rows Returned, error out, Field Names Fetched	Create and read a recordset			
Execute SQL Command (no data returned)	Connection In, SQL Command, error in → Execute → Connection Out, records effected, error out	Execute a SQL command without returning any data			
Get Database Errors	Connection In, My Errors, ADO Open Errors → Get Errors → Connection Out, error out	Get database errors			
Get Table Info	Connection in, error in → tables? → Connection out, Info out, error out	Get table info			
Insert BLOB data	Data In (Variants), Connection In, BLOB Recordset definition S..., Recordset Parameters, error in → Insert → Connection Out, error out	Insert BLOB data			
Open Connection+	Connection String, UserID, Password, error in (no error), Options → Open → Connection ADO Version, error out	Open a connection to the database			
Rollback Transaction on Error	Connection In, error in → Rollback → Connection Out, error out	Rollback the transaction			
Set Command Timeout	Connection In, CommandTimeout, error in → Set Command Timeout → Connection Out, error out	Set the command timeout			
Start Transaction	Connection In, error in → Go { → Connection Out, error out	Start a transaction			

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined

B.3. HSE-DB-MYSQL.LVLIB

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

Version: 1.0.0.0

Table 10. Nested libraries

Name	Type
DB-MySQL.lvclass	LVClass

This library has no functions set to non private scope.

B.4. HSE-DB-SQLITE.LVLIB

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

Version: 1.0.0.0

Table 11. Nested libraries

Name	Type
DB-SQLite.lvclass	LVClass

This library has no functions set to non private scope.

B.5. HSE-DB.LVLIB

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

Version: 1.0.0.0



Table 12. Nested libraries

Name	Type
DB-Interface.lvclass	LVClass
DB_CONNECTOR.lvlib	Library
[VI Reference Management.lvlib]	Library
[Clone Registration.lvlib]	Library

Table 13. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Test DB_CONNECTOR API		DB_CONNECTOR API Tester.			

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined

APPENDIX C: CLASSES

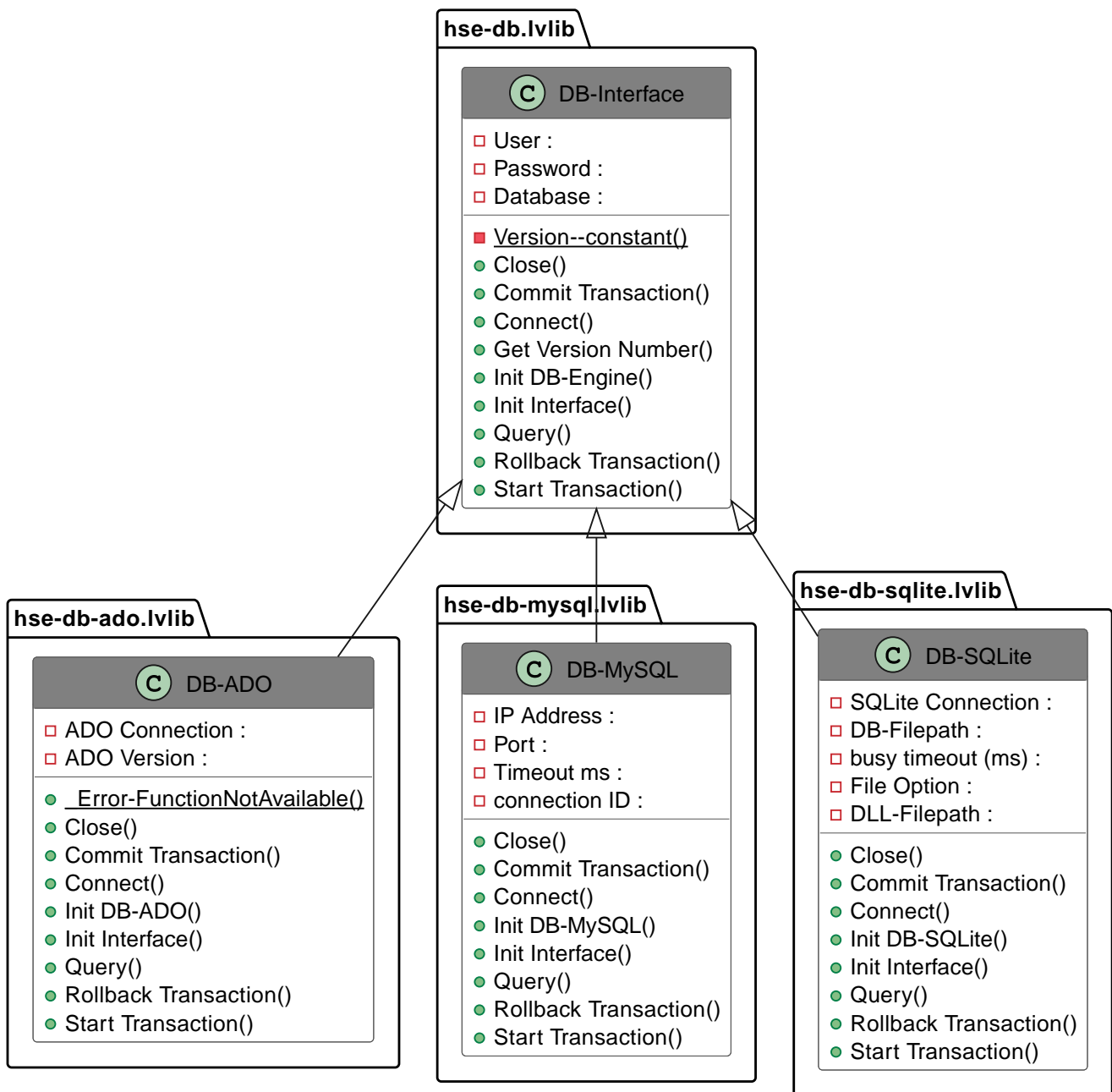
LabVIEW Classes

C.1. CLASSES OVERVIEW

This project contains 4 classes and 0 interface.

Table 14. Classes list

Classes	Interfaces
DB-ADO.lvclass	
DB-MySQL.lvclass	
DB-SQLite.lvclass	
DB-Interface.lvclass	



C.2. DB-ADO.LVCLASS

Responsibility: ADO-Driver subclass.

Version: 1.0.0.2

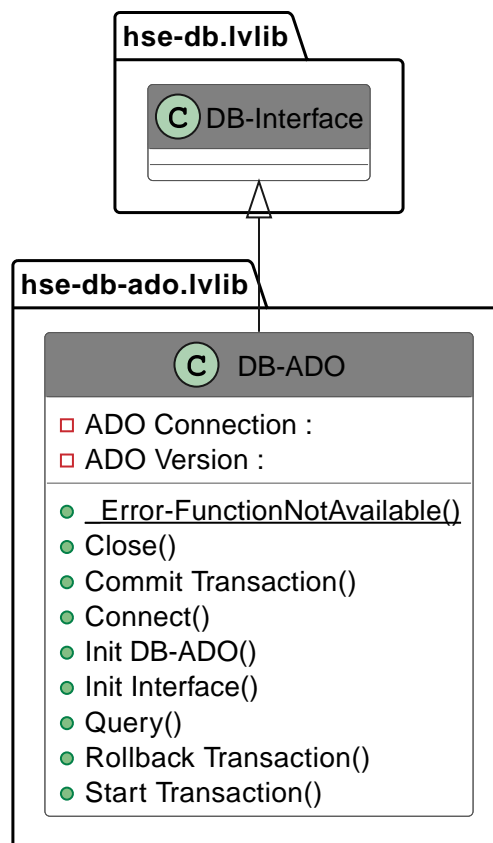

































Table 15. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
_Error-FunctionNotAvailable	 error out	returns an error because the requested function is not available			
Close	DB-ADO in  DB-ADO out error in  error out	Close the ADO connection.			
Commit Transaction	DB-ADO in  DB-ADO out error in  error out	Commit a transaction. Either all SQL-commands get committed or, in case of an error, all get rejected.			
Connect	DB-ADO in  DB-ADO out error in  error out	Connect to a ADO database.			
Init DB-ADO	DB-ADO in  DB-ADO out Authentication  error in  error out	Init a new ADO DB object.			
Init Interface	DB-ADO  DB-ADO hse-config  error in  error out	init the interface			
Query	DB-ADO in  DB-ADO out Query  Return Data error in  Packed Metadata error out  Field Names	Send a SQL-query and return the answer. Return data is a 2D-array of strings wrapped in variants.			
Rollback Transaction	DB-ADO in  DB-ADO out error in  error out	Rollback the active transaction.			
Start Transaction	DB-ADO in  DB-ADO out error in  error out	Start a transaction to get sure all following SQL commands get executed or none.			

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined

C.3. DB-MYSQL.LVCLASS

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

Version: 1.0.0.0

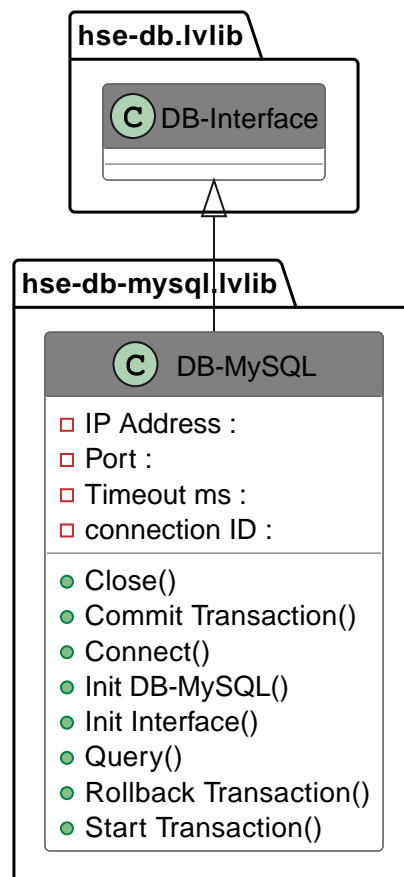








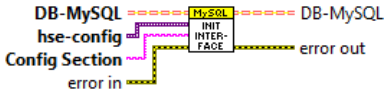

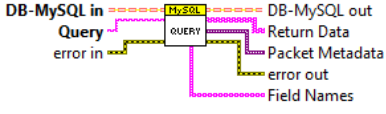









Table 16. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Close		closes the connection			
Commit Transaction		Commit a transaction. Either all SQL-commands get committed or, in case of an error, all get rejected.			
Connect		connects to the database			
Init DB-MySQL		init the class			

Name	Connector pane	Description	S.	R.	I.
Init Interface		init the interface			
Query		query the database			
Rollback Transaction		Rollback the active transaction.			
Start Transaction		Start a transaction to get sure all following SQL commands get executed or none.			

Scope:  → Protected |  → Community

Reentrancy:  → Preallocated reentrancy |  → Shared reentrancy

Inlining:  → Inlined

C.4. DB-SQLITE.LVCLASS

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

Version: 1.0.0.1

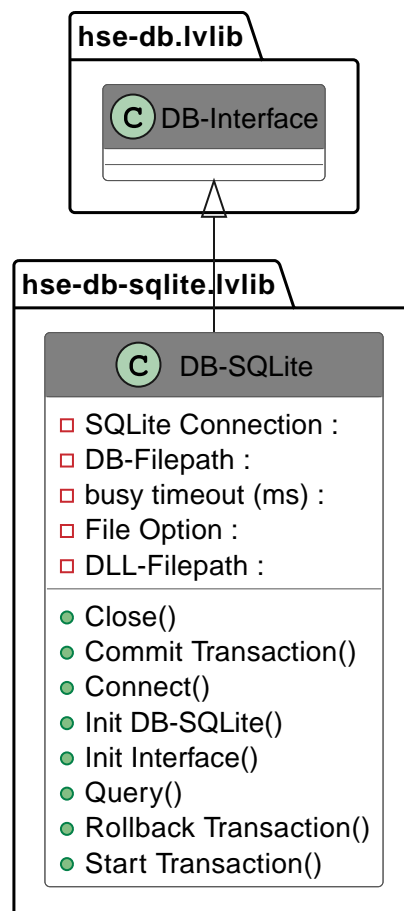


Table 17. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Close		closes the connection			
Commit Transaction		commits the current transaction			
Connect		connects to the database			
Init DB-SQLite		init the class			
Init Interface		init the interface			
Query		query the database			
Rollback Transaction		Rollback the active transaction.			
Start Transaction		starts a new transaction			

Scope: → Protected | → Community

Reentrancy: → Preallocated reentrancy | → Shared reentrancy

Inlining: → Inlined

C.5. DB-INTERFACE.LVCLASS

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

Version: 1.0.0.0

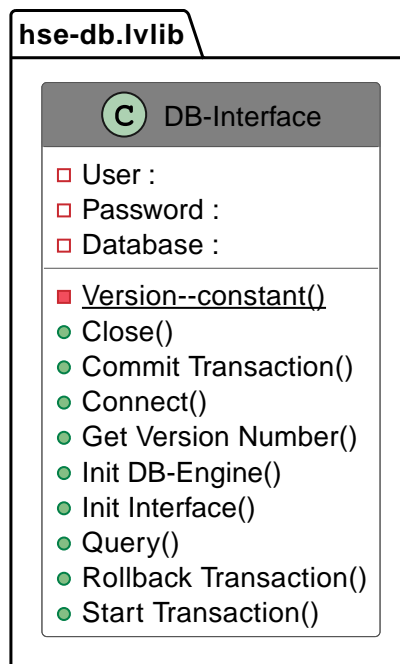


Table 18. Functions (non private scope only)

Name	Connector pane	Description	S.	R.	I.
Close		close the connection. -- This Method is just a prototype --			
Commit Transaction		commits a transaction. Either all SQL-commands get committed or, in case of an error, all get rejected.			
Connect		connects to the database -- This method is just a prototype --			
Get Version Number		returns the version number			
Init DB-Engine		Initialize the class.			
Init Interface		Initialize the interface.			
Query		query the database			
Read Authentication		Returns the authentication data.			
Rollback Transaction		rolls a transaction back			
Start Transaction		starts a transaction			

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 19. Custom errors

Name	Code	Description	Owned by
DB_CONNECTOR.lvlib: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.	[hse-db.lvlib]
DB_CONNECTOR.lvlib:Module Not Stopped	403682	%s Module did not finish clean up on exit.	[hse-db.lvlib]
DB_CONNECTOR.lvlib:Module Not Synced	403683	%s Module was unable to synchronize events.	[hse-db.lvlib]
DB_CONNECTOR.lvlib:Module Not Running	403684	Not a single instance of "%s" Module running.	[hse-db.lvlib]
DB_CONNECTOR.lvlib: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.	[hse-db.lvlib]
DB_CONNECTOR.lvlib:Request Timed Out	403686	The reply for the request "%s" of the "%s" Module timed out.	[hse-db.lvlib]
DB_CONNECTOR.lvlib:Request and Wait for Reply Timeout	403686	%s	[hse-db.lvlib]
DB_CONNECTOR.lvlib: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.	[hse-db.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. Boylston
- DQMH[®] by Delacor

Furthermore, it relies on the following tools and libraries:

- Ruby
- AsciiDoctor
- Java
- GraphViz