

SIMO Release Notes

SIMO 4.16.1 (2019-08-12)

Bugfix release with RIFLEX and SIMO corrections.

SIMO 4.16.1 Corrected errors

Multibody simulations with QTFs

Simulations where multiple bodies had quadratic transfer functions (QTFs) would previously yield incorrect results. This has now been resolved.

Longstanding error.

SIMO 4.16.0 (2019-05-06)

Initial release of SIMO 4.16.

SIMO 4.16.0 Known issues

No known issues in the 4.16.0 version.

SIMO 4.16.0 Input changes

Input files used in version 4.14 can be used unchanged.

SIMO 4.16.0 Corrected errors

Kinematic viscosity in air is changed

The default value for viscosity in air is set to 1.516E-5, air temperature 20 degree centigrades.

SIMO 4.16.0 Removed functionality

No previously available functionality have been removed in this version.

SIMO 4.16.0 Deprecated functionality

No functionality is deprecated in this version.

SIMO licensing

SIMO is license-managed using the FLEXlm / FLEXnet software license management system. If you want SIMO to be used from any networked computer on your site, you must run a license manager on a server in your network. Alternatively, SIMO may be run on a single computer using a standalone license file.

Please note that version 4.2 and higher requires a licence file with a feature version that is equal or larger than the link date.

In order to issue a server license or a standalone license file, SINTEF Ocean or DNV GL needs the following info on your server:

- License type (server or standalone)
- Operating system and version (Windows 7, Windows XP, HP-UX and Linux currently supported)
- MAC address / FLEXlm hosted of the computer.

Your IT-staff is probably already familiar with this procedure as FLEXlm is used by a large number of other applications (e.g. Matlab).

SIMO version numbers

The version number consists of three numbers separated by periods, e.g. 4.16.0. The two first are the version. The third is updated for each subsequent (bug fix) release.

Even numbered versions, e.g. 4.14, 4.16, are reserved for official versions.

Odd numbered versions, e.g. 4.15, 4.17, are reserved for development versions. The next official release will therefore be 4.18.

SIMO 4.14.0 (2018-11-01)

SIMO 4.14.0 New / improved functionality

Constant tension tugger wire

A constant tension control mode has been added to the Simple Wire Coupling. It is intended to simulate tugger wires with constant tension winches and can limit the winch run velocity.

Vertical axis wind turbine internal controller

The internal control system for vertical axis wind turbines was updated: the low-pass filter was removed, and a 2np filter was added (in addition to improving the existing np filter).

SIMO 4.14.0 Corrected errors

Incorrect handling of winch limitations

Previously the winch in SIMO could get stuck if all of the wire initially on the drum was payed out. The algorithm has now been improved so that this does not happen anymore.

SIMO 4.12.4

SIMO 4.12.4 Corrected errors

Articulated structure

A bug in the initialization of rotation angle for articulated structure was fixed.

SIMO 4.12.3 (2018-07-03)

SIMO 4.12.3 Improved functionality

Vertical axis wind turbine internal controller

The internal control system for vertical axis wind turbines was updated: the low-pass filter was removed, and a 2np filter was added (in addition to improving the existing np filter).

SIMO 4.12.3 Corrected errors

Vertical axis wind turbine forces

The aerodynamic loads on vertical axis wind turbines during iteration steps are now maintained from the previous step when the aerodynamic code was run.

SIMO 4.12.0

SIMO 4.12.0 New / improved functionality

Gust wind normal to main wind direction with state space wind model

The state space wind model now supports using the Simiu wind spectrum for simulating wind with gusts normal to the main wind direction.

New stationary uniform wind with shear

Wind type 14, stationary uniform wind with shear, has been added. A power or logarithmic shear profile may be specified.

This wind type differs from wind type 10, stationary uniform wind with shear, values interpolated at grid points, in that the shear profile is used directly.

A new simple turret model based on articulated structures

A new turret model is implemented in SIMO. The functionality enables modeling of a turret as an articulated structure with free-rotation around vertical axis (Z). The vessel is considered as the master and turret as the slave. The model also provides simple locking and sliding through “maximum lock angle” and “slip angle” options. See **Articulated Structures** section in user manual for more details."

SIMO 4.12.0 Corrected errors

Incorrect calculation of wind speed for some wind types

A bug has been fixed where the wind speed used to calculate force from quadratic wind coefficients was incorrect. This applies when the following wind types was used in combination with quadratic wind coefficients:

- Stationary uniform wind with shear

- Fluctuating uniform 2-component wind
- Fluctuating 3-component wind read from files (IECWind format)
- Fluctuating 3-component wind read from files (TurbSim format)

Previously the body z-position was used to determine the wind speed used in the force calculation while the reference height for the wind coefficient should have been used.

Corrected in SIMO 4.10.1.

Correction of notch-filter in PID controller when heading passes ± 180 deg

A bug has been fixed where the notch filter gave incorrect large differences between estimated and real heading when the real heading passed ± 180 deg.

Incorrect input for fixed direction thrusters

When giving input to fixed direction thrusters the NDIR parameter would have to be given, even though the manual states that this parameter is intended for rotatable thrusters. This has now been fixed. As a result, old input files using fixed direction thrusters need to be updated by removing this parameter.

Wind turbine equipped with one foil blade

An error correction has been done to SIMO wind turbine to prevent program termination if the turbine is only equipped with one blade.

Corrected in SIMO 4.10.4.

Correct possible error in array size for time series

Avoid possible overflow during calculation of the optimal division of time series into sequences. The error was observed for very large systems with long time series and could cause incorrect array dimensions and error termination before the dynamic simulation in SIMO or in RIFLEX for coupled analysis.

Corrected in SIMO 4.10.2.

SIMO 4.12.0 Known issues

Incorrect calculation of wind speeds for bodies with wind coefficients

SIMO will in some situations calculate wind speed based on an incorrect wind spectrum for bodies with wind coefficients. This depends on the choice of wind

spectrum type, the wind spectrum reference height and the wind coefficients reference height.

If default values are used for both wind coefficients and spectrum reference heights (both default values are 10 m) the calculated wind speed will always be correct.

If non-default values are used some spectra will give incorrect wind speeds:

Case / Wind Type:	Gust wind	Davenport	Harris	Wills
Wind coefficients reference height = 10 m	Ok*	Ok	Ok	Ok
Wind coefficients reference height != 10 m	Incorrect**	Ok	Ok	Ok

Case / Wind Type:	Sletringen	ISO 19901-1 (NPD)	API
Wind coefficients reference height = 10 m	Ok*	Ok	Ok
Wind coefficients reference height != 10 m	Incorrect**	Incorrect	Ok

*) ONLY if wind spectrum reference height is 10 m (default)

**) unless wind spectrum reference height is set to the same value as the wind coefficients reference height

Incorrect calculation of wind speeds for bodies with slender elements

SIMO will in some situations calculate wind speed based on an incorrect wind spectrum for bodies that has slender elements with wind drag coefficients. This depends on the choice of wind spectrum type, the wind spectrum reference height and the vertical position of the slender elements:

Case / Wind Type:	Gust wind	Davenport	Harris	Wills
Slender element global z-position = 10 m	Ok*	Ok	Ok	Ok
Slender element global z-position != 10 m	Incorrect**	Ok	Ok	Ok

Case / Wind Type:	Sletringen	ISO 19901-1 (NPD)	API
Slender element global z-position = 10 m	Ok*	Ok	Ok
Slender element global z-position != 10 m	Incorrect**	Incorrect spectrum	Ok

*) ONLY if wind spectrum reference height is 10 m (default)

**) unless wind spectrum reference height is set to the same z-value

SIMO 4.12.0 Input changes

The following changes must be made to input files used in version 4.10: - The NDIR parameter must be removed for fixed direction thrusters.

SIMO 4.12.0 Removed functionality

No previously available functionality have been removed in version 4.12.0.

SIMO 4.12.0 Deprecated functionality

The old thruster specification (THRUST) and the old DP model (DYNAMIC POSITIONING SYSTEM) are deprecated and will be removed in a future version of SIMO.

SIMO 4.10

SIMO 4.10.0 Input changes

The following changes must be made to input files used in version 4.8: - Bodies of body type 1 must now specify a method for separating wave frequency and low frequency motions during the simulation - Macro files for STAMOD must be updated due to the new equilibrium solver and new options regarding global elimination of degrees of freedom - Macro files for DYNMOD, S2XMOD and OUTMOD must be updated due to changes in the structure of position results - The parameters IMAXTH and THRMAX should be removed from system description files with dynamic positioning systems

SIMO 4.10.0 Corrected errors

Distributed aero-dynamic element forces

An error in load moments caused by wind forces acting on slender elements and fixed bodies has been corrected. The error has been present since 4.2.0. In addition, the wind drag force has been calculated from the wind velocity only. The relative velocity is now used in the wind drag calculation.

INPMOD import of QTFs

A bug has been fixed where the program would crash during reading of large QTF data sets from WAMIT.

Calculation of zero wind

The calculation of wind velocity could fail if all resulting wind components at a point and time were exactly zero. Scaling of the components resulted in a division by zero and an illegal number (NaN) was returned. This has been corrected.

SIMO 4.10.0 New / improved functionality

Separation of wave frequency motions when using wave force transfer functions

A method for estimating wave frequency and low frequency motions when using body type 1 (wave force transfer functions) has been added. This is in particular important to consider when using cosine series waves and when simulating a current moored ships.

The method utilises a 2nd order Butterworth low pass filter in order to estimate the low frequency motion from the total motion during simulation. For more details see Separation of wave frequency and low frequency motions for body type 1 in the user guide.

Change in structure of position time series

The following change break compatibility with macro files used by older versions of DYNMOD, S2XMOD and OUTMOD. Macro files need to be updated in order to be used with new versions of SIMO.

Time series of total and low frequent position are now always stored for bodies of body type 1 (wave force transfer functions) and body type 2 (wave motion transfer functions). This means that DYNMOD macro files that specify storage of results must be updated before they can be run in newer versions.

Users of S2XMOD and/or OUTMOD should note that the content of responses 29 and 33 has changed and macro files need to be updated to accomodate this change. Starting with version 4.10.0 the content of these responses are the same for all bodies regardless of type. The table below summarises the content of the relevant responses before and after this change.

Response Number	Body Type	Before 4.10.0	4.10.0 and later
29	1	Total position	Total position
	2	LF position	Total position
	3 and 4	Total position	Total position
33	1	N/A	LF position
	2	Total position	LF position
	3 and 4	N/A	N/A

New static equilibrium calculation algorithm (Newton-Raphson)

It is now possible to compute the static equilibrium of a **SIMO** system by using a Newton-Raphson algorithm. The method used in the previous **SIMO** versions is now referred to as “Transient”.

Some remarks when using the Newton-Raphson method: - the Newton-Raphson method is generally faster when considering a system with only one body - the “transient” method still remains the most robust method, especially in case of systems with several bodies, and/or with strong non-linearities (like fenders, DP systems, ...).

It is recommended to use the “transient” method as the default method.

Restraining global degrees of freedom

When using the Newton-Raphson method, the user can choose to restrain the “global” degrees of freedom of one or several bodies during the static equilibrium calculation. By “global” degrees of freedom, we refer here to the translations and rotations about the axes of the XGB coordinate system.

Multiple equilibrium calculations

When using the Newton-Raphson method, it is possible to use the “multiple equilibrium calculation” option on one specified body. This allows the user to define a grid of roll and pitch values. For each point of the grid, the equilibrium position will be computed, restraining the roll and pitch rotations. This means that the equilibrium is solved for the other degrees of freedom.

Note that in the present version, the results are stored in the prs.lis file but are not available directly in **SIMA**. This will be updated in a future version of **SIMO/SIMA**.

New option in quadratic current force coefficients

It is now possible to model the quadratic current coefficients as a function of: - relative current direction - body vertical position - body roll angle - body pitch angle

New option in wind force coefficients

It is now possible to model the wind coefficients as a function of: - relative wind direction - body vertical position - body roll angle - body pitch angle

New option in hydrostatic stiffness model

It is now possible to model the non-linear buoyancy force by means of volume integration, by using the new Hydrostatic Stiffness option **Non-linear hydrostatic stiffness**. The geometry of the hull is given as a STL file (mesh of triangular panels) allowing the definition of complex geometries.

New option in TDM model

It is now possible to model a ballast system made of an unlimited number of ballast tanks by using the TDM new option **BALLAST SYSTEM**. The geometry of each tank is described by a STL file (mesh of triangular panels) allowing the definition of complex geometries.

Change in environment during simulation

Functionality is added for changing the wave, wind, and current over the course of a simulation. The program fades from one environment to the next defined environment at the prescribed time over the specified fade-in period.

RIFLEX line tension measurements in DP system

A new option has been added that allows the **SIMO** DP system to receive line tension measurements from **RIFLEX** lines in a coupled simulation. Previously this has only been possible for **SIMO** catenary lines. See the the section on Dynamic positioning in the userguide for more details.

SIMO 4.10.0 Removed functionality

No previously available functionality have been removed in version 4.10.

SIMO 4.10.0 Deprecated functionality

The following functionality is deprecated and will be removed in a future version of SIMO: - The simplified line dynamics model for catenary lines (LINPTY = 3 in LINE CHARACTERISTICS DATA) - The strip model for quadratic current coefficients (QUADRATIC CURRENT COEFFICIENTS) - The old thruster specification (THRUST) and the old DP model (DYNAMIC POSITIONING SYSTEM)

SIMO 4.8

SIMO 4.8 Input changes

Input files used in version 4.6 can be used unchanged in version 4.8 with the following exceptions: - Input files for models with an external DP system (MTDP) must be updated.

SIMO 4.8 Corrected errors

Positioning element force components

Time series of force components for positioning elements are now available as results in SIMA.

Corrected in SIMO 4.8.8.

Debug output

Unnecessary debug output have been removed.

Corrected in SIMO 4.8.7.

Memory size in S2XMOD

S2XMOD now uses the SIMO_MEM environment variable to determine the amount of memory that is allocated.

Corrected in SIMO 4.8.6.

Sporadic crashes when using visualization waves

An error which caused SIMO to crash sporadically when using visualization waves has been fixed. The error did not influence simulation results in any way.

Corrected in **SIMO 4.8.5**.

There have been made no changes to **SIMO** in this release.

Corrected in **SIMO 4.8.4**.

Linux binary files

The record length of the binary files was set to four times the correct value. The .ffi, .sam, .raf, .bin and .tda files were therefore four time their necessary size. The .bin and .tda files were not comparable with their documentation and pre-existing tools for reading them.

Error since 4.8.0. Corrected in **SIMO 4.8.3**.

SIMO crash when using articulated structure

A bug has been fixed where **SIMO** sometimes would crash when using the articulated structure functionality.

Corrected in **SIMO 4.8.1**.

Unexpected simulation failure when when simulating thruster black-out

In certain cases when using the new thruster model and specifying thruster blackout the simulation would fail unexpectedly. This has now been fixed.

Corrected in **SIMO 4.8.0**.

SIMO crash when using time dependent mass

Some models using the time dependent mass functionality will cause **SIMO** to crash. This has now been fixed.

Corrected in **SIMO 4.8.0**.

Unexpected simulation failure for models with slender elements

In certain models including slender elements with and without aerodynamic drag coefficients simulations would fail with NaN (not a number) results. This has now been fixed.

Corrected in SIMO 4.8.0.

SIMO 4.8 New / improved functionality

Improved eigenmode calculations

The underlying linear algebra routine in eigenmode calculations has been replaced. The new routine gives improved accuracy, especially for longer eigenperiods. Note that this means slightly modified results.

MTDP system changes

The MTDP functionality for external DP systems have been changed so that SIMO is now the server in the TCP/IP communication. As a result any external DP systems using the MTDP protocol must be changed from being a TCP/IP server to a TCP/IP client. The input of MTDP hostname have been removed from the SIMO sys-file as it is no longer needed.

Controlling thrusters using the new thruster model is now supported through the MTDP interface.

New Linux release

The new Linux release of SIMO, RIFLEX and VIVANA is 64-bit and solves several issues. Unfortunately, this means that 32-bit Linux operating systems are no longer supported.

- Supports more than the 32-bit imposed limit of 2 GB of RAM
- No need to install 32-bit support libraries separately
- No special considerations are needed for writing output files larger than 2 GB
- The necessary runtime libraries are included in the installation package and no special consideration is needed for installation; the package is now fully relocatable

The package has been tested on the following Linux distributions:

- CentOS 7
- Ubuntu 14.04 LTS
- Linux Mint 17

SIMO 4.8 Removed functionality

No previously available functionality have been removed in the 4.8 release.

SIMO 4.8 Deprecated functionality

The old thruster specification (**THRUST**) and the old DP model (**DYNAMIC POSITIONING SYSTEM**) are deprecated and will be removed in a future version of SIMO.

SIMO 4.6

SIMO 4.6 Input changes

4.4 input files may be used unchanged.

SIMO 4.6 Corrected errors

Coordinate system for stiffness forces

Stiffness forces are now presented in body related coordinate system. In previous SIMO versions they were presented in body fixed system.

Corrected in SIMO 4.6.2.

Error when thruster formulation 4.1

In previous SIMO versions the thruster dynamic was not calculated correctly when using formulation 4.1, which could lead to numerical problems. This error has now been fixed. Simulations using thrusters and DP controller with formulation 4.1 should be rerun.

Corrected in SIMO 4.6.1.

Error when using swell waves with summation of harmonic components (cosine series) in the time domain

In previous SIMO versions, an error prevented time series generation using the summation of harmonic components (cosine series) in the time domain for environments with swell waves. This error has now been fixed.

Error when visualizing broken catenary lines

In previous SIMO versions, a certain combination of visualization and catenary lines with the line failure option enabled would cause the program to crash. This error has now been fixed.

SIMO 4.6 New / improved functionality

Change in applied reference system for large volume wave loads in case load heading correction is disregarded

The wave forces are now applied in body-related reference system instead of the fixed initial reference system. This ensures that the wave forces and corresponding reaction forces now act in the same system for non-zero yaw angles, which in turn leads to a more numerically robust solution of the system of equations. This correction is expected to give insignificant changes to results for normal analysis with small yaw motions. However, the changes in results will become larger with larger yaw motions.

SIMO 4.6 Removed functionality

The option for wave force modification under **Nonlinear modification of buoyancy and wave forces** is temporarily removed.

SIMO 4.6 Deprecated functionality

The following functionality was also deprecated in SIMO 4.2 and 4.4.

The old thruster specification (**THRUST**) and the old DP model (**DYNAMIC POSITIONING SYSTEM**) are deprecated and will be removed in a future version of SIMO.

SIMO 4.4

SIMO 4.4 Corrected errors

Error when using Nonlinear Buoyancy Correction for bodies with wave drift force coefficients

In previous SIMO versions the nonlinear buoyancy correction was not calculated correctly when used for bodies which also had wave drift force coefficients. This

error has now been fixed. Simulations using the Nonlinear Buoyancy Correction feature along with wave drift force coefficients should be rerun.

Corrected in SIMO 4.4.2.

Wind termination error message

A potential infinite loop in error reporting of wind termination is eliminated.

Corrected in SIMO 4.4.1.

Failure when running interactive HLA simulations

A bug has been fixed where SIMO failed to initialize an interactive simulations using HLA.

Corrected in SIMO 4.4.1.

SIMO 4.4 New / improved functionality

TurbSim 3D wind files

TurbSim 3D wind files may now be read by SIMO.

Time dependent mass

Possible problem with numerical precision when using TIME DEPENDENT MASS. This has been counteracted by increasing the numerical precision during accumulation of the time dependent mass.

Improved bumper formulation

The bumper formulation has been improved when contact occurs at the end of a bumper. The mathematical model can be regarded as if there are half-spheres at the end of all bumper elements. For more details see ‘Bumpers’ in ‘Station-keeping forces’ in ‘Force models’ in the SIMO Theory Manual.

Improved in SIMO 4.4.1.

Vertical axis wind turbines

Vertical axis wind turbine functionality is added. The aerodynamic loads are computed using the double-multiple streamtube method.

Added in 4.4.1.

External controller for horizontal axis wind turbines

The use of an external control system (Java) for horizontal axis wind turbines in SIMO is now possible.

Added in 4.4.1.

SIMO 4.4 Removed functionality

The option for wave force modification under **Nonlinear modification of buoyancy and wave forces** is temporarily removed.

SIMO 4.4 Deprecated functionality

The following functionality was also deprecated in SIMO 4.2.

The old thruster specification (**THRUST**) and the old DP model (**DYNAMIC POSITIONING SYSTEM**) are deprecated and will be removed in a future version of SIMO.

SIMO 4.4 Miscellaneous

Run time environment

Windows versions 4.4 and higher are 64 bit executables and therefore require different Fortran and Java DLLs than earlier version. The necessary DLLs are included in the download package. The preformance is improved.

SIMO 4.2

SIMO 4.2 Input changes

4.0 input files may be used unchanged.

Input for new functionality is described in the User Manual.

SIMO 4.2 Corrected errors

The following errors have been corrected in SIMO 4.2 versions.

Hydrodynamic drag forces on slender elements

If depth dependent current was applied and wind also was specified in the environmental condition, the computed current drag forces on slender elements were in error. This was due to an incorrect z-position being used to interpolate the shear profile. The error has been present since version 4.2.0. The consequence is incorrect drag forces on the slender elements. **Analysis done with this combination by version 4.2.0 should be re-run!** The error has been corrected.

Corrected in SIMO 4.2.1.

Nonlinear modification of buoyancy and wave forces

The formulation is corrected so that no modification to drift forces is made if no waves are active. Normally of no consequence to results.

Corrected in SIMO 4.2.1.

Error correction: Thruster forces

To be in accordance with the old deprecated thruster force model the thrust forces from the “new thruster” model (THRUSTER SYSTEM DATA) are updated at each main time step and kept constant during substepping. This will give insignificant consequence to the results.

Corrected in SIMO 4.2.1.

SIMO 4.2 Improvements

The following errors have been corrected in SIMO 4.2 versions.

Nonlinear modification of buoyancy and wave forces

The applied models for wave- and hydrostatic stiffness loading acting on a “large volume” body are based on a hydrodynamic input description pre-calculated for a certain draught assuming constant geometry of the intersection between the hull and the mean water level. This means that the body fixed coordinate system has to coincide with the system used for computation of the hydrodynamic potential flow solution and that the load model for nonlinear modification of buoyancy and wave forces has to be initialized at the appropriate draught.

Originally the load model was initialized at the initial position of the body. This created unwanted requirements to the initial position which had to coincide with the origin of the system used for hydrodynamic calculations.

In the improved version the load model is initialized at the reference position for hydrostatic stiffness forces. As a consequence the reference position has to coincide with the origin of the system used for hydrodynamic calculations. This implies that the reference position can not be used to introduce specified force in global Z-direction, nor moments for roll or pitch.

Improved in SIMO 4.2.1.

SIMO 4.2 New functionality

New thruster model (THRUSTER SYSTEM DATA)

The “old” thruster model (THRUSTER DATA) can still be used in the current version of SIMO, but is marked as “deprecated”, meaning that it will be removed in the next release version. The new thruster model has two main additional features compared to the “old” one:

- Dynamics of the thruster has been improved, including a simple servo-motor model
- An option for thrust loss due to surface proximity is included

Note 1: for a given body, all thrusters have to be modelled with the same model (all with the “old” one or all with the “new” one).

Note 2: the new thruster model cannot be used with the “old” DP model (DYNAMIC POSITIONING SYSTEM)

New DP model (DYNAMIC POSITIONING CONTROL)

The “old” DP model (DYNAMIC POSITIONING SYSTEM) can still be used in the current version of SIMO, but cannot be used with the new thruster model (see section above). It is marked as “deprecated”, meaning that it will be removed in the next release version. The new DP model has one main additional feature compared to the “old” one: the thruster data used by the DP system has to be given separately from the physical thruster data. The DP model does no longer “know” everything about the physical thruster, and can now be provided with wrong or inaccurate information if one wants to do error analysis or check robustness. Further, the DP system does not have to use all thrusters, but only those assigned to it.

Note: the new DP model can only be used with the “new” thruster model (THRUSTER SYSTEM DATA)

Wind forces on slender elements

In data group `DISTRIBUTED ELEMENT FORCE` it is now possible to include wind drag forces on slender elements. Quadratic wind drag coefficients in x-, y- and z-direction are then given in data group `AERODYNAMIC DESCRIPTION`.

Nonlinear modification of buoyancy and wave forces

In the new version it is possible to account for non-linear buoyancy due to the variation in vessel geometry above and below the still-water plane.

The basic first order wave forces and wave-drift forces are computed as before using transfer functions and wave-drift coefficients. Then the non-linear correction is obtained by integrating pressure forces on the instantaneously additional wet/dry surface. New input is a file in so-called (`.gdf`) format, containing the hull geometry in the splash zone.

Winch control using Generic External Control System

A new feature Generic External Control System has been added to enable `SIMO` simulations with user developed control systems. External control systems are developed using a Java interface defined in `HLALib.jar`. Currently the system supports controlling `SIMO` winches.

SIMO 4.2 Removed functionality

No `SIMO 4.0` functionality has been removed in `SIMO 4.2`.

SIMO 4.2 Miscellaneous

Java and HLALIB.jar

The included Java folder and the `HLALIB.jar` file have been updated in the Windows installation `.zip` file.