

# GitHub issues resolved for v4.1.0

As part of this release 424 [issues](#) (including 319 pull requests (PR)) were closed.

## --MSL-general--

### Enhancements

- [#4094](#) (PR) First figure

### Documentation

- [#3552](#) (PR) Add division tag around image tags
- [#3673](#) (PR) Update DLR contact address
- [#3745](#) (PR) Update DLR contact link
- [#4136](#) (PR) Unify spelling of controllers
- [#4196](#) (PR) Fix and add ITEA links
- [#4208](#) (PR) Bump used Modelica language version to 3.6

### Miscellaneous

- [#3639](#) (PR) Fix missing include in Common.c (CI)
- [#3642](#) (PR) Include provided header files (CI)
- [#3643](#) (PR) Fix and extend table tests (CI)
- [#3681](#) (PR) Handle redirect errors in URL checker (CI)
- [#3709](#) (PR) Utilize GitHub Actions for CI
- [#3723](#) (PR) Check Modelica files for UTF-8 BOM (CI)
- [#3805](#) (PR) Update CI to check for deprecated Text.lineColor annotation
- [#3809](#) (PR) Fix exception where tag HTML was not in lower case (CI)
- [#3814](#) Unify spelling of controllers
- [#3851](#) (PR) Update tidy-html5 (CI)
- [#3886](#) (PR) Generate MSL Release Notes by GitHub Actions (CI)
- [#3899](#) (PR) Run spelling check via GitHub Actions (CI)
- [#3952](#) (PR) Update icons almost automatically updated to have correct gradient
- [#3972](#) (PR) Add problem matchers for GitHub Actions (CI)
- [#4072](#) Near-zero coordinates in graphical annotations
- [#4140](#) (PR) Clean-up of near-zero coordinates in graphical annotations
- [#4165](#) (PR) Fix codespell exceptions (CI)
- [#4175](#) Which Modelica Language version for MSL 4.1.0?
- [#4181](#) (PR) Update text annotations to not use deprecated features
- [#4183](#) (PR) Fix regex to optionally ignore quoted strings when checking for deprecated Text.lineColor annotation (CI)
- [#4203](#) (PR) Fix codespell exceptions (CI)
- [#4247](#) (PR) Update version, uses annotation and copyright year

# Blocks

## Bugs

- [#3627](#) (PR) Blocks.Routing.Extractor: add assert for input range
- [#3878](#) Unit-checking using Gain and LimIntegrator-blocks
- [#4045](#) (PR) Fix startTime of (SignalPWM) -> ZeroOrderHold
- [#4189](#) (PR) Avoid having both start-value and initial equation
- [#4345](#) (PR) Consider shiftTime for verbose extrapolation in CombiTimeTable

## Enhancements

- [#3548](#) Avoid unnecessary discontinuities in sources (Cosine, Sinc)?
- [#3691](#) (PR) Add reading of CSV files from ModelicaTableAdditions to ModelicaStandardTables
- [#3692](#) (PR) Add tableOnFile parameter to icon of CombiTable blocks
- [#3762](#) (PR) Add a block (based on time events) to calculate the extrema of a signal
- [#3806](#) (PR) Missing initialization of Blocks.Math.Mean and derived blocks
- [#3831](#) (PR) Implement ImpulseSources
- [#3864](#) Undesired minimum gain of LimPID
- [#3985](#) (PR) Added assert condition block
- [#4006](#) (PR) Added new power block for raising an input to a user parameterized exponent
- [#4015](#) (PR) Implement continuous version of SignalExtrema
- [#4065](#) Unnecessary potential state events in Modelica.Blocks.Sources.Pulse
- [#4066](#) (PR) Replaced state events by time events
- [#4291](#) (PR) Add the very first figure annotation

## Examples

- [#3727](#) Value of motor.uniformNoise.localSeed in ActuatorWithNoise

## Documentation

- [#3595](#) (PR) Precising the description of u1 and u2 in Division block
- [#3683](#) (PR) Document matrix name syntax for table text files
- [#3975](#) (PR) Update wrapAngle.mo

## Miscellaneous

- [#3720](#) (PR) Remove superfluous zeros from coordinates of CombiTable block icons
- [#3881](#) (PR) Revert major part of [#227](#), and remove unit from gain parameter of Modelica.Blocks.Continuous.\* blocks and Modelica.Blocks.Math.Gain
- [#3893](#) (PR) Consider the derivatives at boundaries in the 2D-table
- [#3906](#) Issues with Modelica.Blocks.Math.ContinuousMean
- [#3986](#) (PR) Do not preserveAspectRatio for terminate-block
- [#4027](#) (PR) Remove discrete input
- [#4035](#) startTime of (SignalPWM) -> ZeroOrderHold
- [#4055](#) (PR) Propose better unit-handling in equation for LogSweep
- [#4118](#) (PR) Remove min attribute of gain in Blocks.Continuous.LimPID
- [#4122](#) (PR) Remove plural 's' in 'height of ramps'

- [#4150](#) (PR) Avoid discontinuities
- [#4151](#) (PR) Simpler mean
- [#4180](#) Remove deprecated Text.color attribute from graphical annotations
- [#4188](#) (PR) Fix unit errors in ExternalCombiTimeTable constructor
- [#4220](#) (PR) Remove real relation in non-discrete-time controlled if-statement

## C-Sources

### Bugs

- [#3556](#) MinGW possibly neglected in safe-math.h
- [#3562](#) Error message for out of bounds column in tables is broken
- [#3563](#) (PR) Fix invalid memory access in isValidCombiTimeTable and isValidCombiTable1D
- [#3568](#) (PR) Do not include intsafe.h on MinGW
- [#3660](#) Modelica.Utilities.Files.createDirectory fails if the directory does not exist
- [#3663](#) (PR) Add getcwd fallback in ModelicaInternal\_fullPathName
- [#3669](#) (PR) Fix reading file with EOL=LF on Windows
- [#3894](#) Derivative signal of combiTable2Ds is set to zero outside of table with HoldLastPoint
- [#3896](#) (PR) Fix derivatives in 2D-table for one-sided extrapolation by constant continuation
- [#3983](#) (PR) Fix index-out-of-bounds exception for splines

### Enhancements

- [#3603](#) Memory allocation error in CombiTimeTable when given UTF16 LE file
- [#3604](#) (PR) ModelicaIO.c: Improve error message if reading text file containing zero bytes
- [#3686](#) (PR) Add ModelicaDuplicateString and ModelicaDuplicateStringWithErrorReturn (introduced in Modelica 3.5)
- [#3691](#) (PR) Add reading of CSV files from ModelicaTableAdditions to ModelicaStandardTables
- [#3700](#) (PR) Make array inputs of external C functions const (introduced in Modelica 3.5)
- [#3839](#) External ModelicaStandardTables lack const qualifiers for array inputs (Modelica Language Specification version 3.5)
- [#4222](#) (PR) Update matio library to 1.5.24

### Miscellaneous

- [#3246](#) (PR) Remove call of localtime
- [#3564](#) Unguarded clang pragmas in ModelicaStrings.c
- [#3565](#) (PR) Add pragma guards in ModelicaStrings.c
- [#3647](#) Linker warning mktemp is dangerous
- [#3696](#) (PR) Fix some compiler warnings
- [#3728](#) (PR) Fix Modelica.Utilities.Strings.hashString to always use provided HASH\_AP and update 3rd-party header uthash to v2.3.0
- [#3783](#) (PR) Remove unused static function get\_token
- [#3784](#) (PR) Fix LCC build
- [#3787](#) (PR) Fix C89 compliance

- [#3861](#) (PR) Fixed -Wundef warning by first checking if macro is defined
- [#3867](#) Is ModelicaUtilities.h tool-specific?
- [#3871](#) (PR) Remove ModelicaUtilities.h from MSL distribution
- [#3893](#) (PR) Consider the derivatives at boundaries in the 2D-table
- [#3903](#) Modelica.Blocks.Tables: Wrong format specifier is ignored
- [#3905](#) (PR) ModelicaIO.c: Fix error handling for invalid format specifier in text file
- [#4281](#) (PR) Upgrade zlib to v1.3.1

## Clocked

### Documentation

- [#4299](#) (PR) Clarify the Clocks chapter of Modelica.Clocked User Guide

### Miscellaneous

- [#3801](#) (PR) Remove duplicate "and" in doc string
- [#3971](#) Clocked noise example modifying something not in constraining class
- [#4070](#) Unused parameters in Modelica.Clocked.ClockSignals.Clocks.Logical
- [#4071](#) (PR) Propagate useSolver to these variants as well
- [#4074](#) (PR) Fix for [#3971](#)

## Complex\*

### Bugs

- [#1260](#) Complex.scalarProduct not a scalar product
- [#3651](#) Complex transfer function block uses wrong order of coefficients
- [#3733](#) (PR) Fix interpretation of coefficients of complex transfer function
- [#3742](#) (PR) Fix implementation of scalarProduct
- [#4239](#) (PR) Simplify ComplexRampPhasor

### Enhancements

- [#3584](#) (PR) Smooth complex

### Documentation

- [#3659](#) (PR) Mark ComplexBlocks and FundamentalWave with DocumentationClass

### Miscellaneous

- [#3638](#) (PR) Use one character instead of line drawings
- [#3677](#) (PR) Do not fail for  $w \leq 0$  in Complex TransferFunction
- [#3768](#) Conversion from ModelicaServices and Complex version 3.2.3 to 4.0.0?
- [#3770](#) (PR) Add missing conversions for Complex and Services 3.2.3
- [#4264](#) (PR) Set unit instead of having it in description

# Constants

## Bugs

- [#2056](#) Proper definition of Modelica.Constants.{eps,small}
- [#4042](#) (PR) Give a proper definition of machine constants.

## Miscellaneous

- [#3295](#) Unit of permeability
- [#3811](#) (PR) Change unit of permeability to V.s/(A.m)
- [#4155](#) (PR) Add units to mathematical constants

# Electrical.Analog

## Bugs

- [#3827](#) (PR) Fix M\_Oline.segment as discussed in [#3826](#)
- [#3828](#) (PR) Fix initialization of Lines as discussed in [#3826](#)

## Enhancements

- [#3748](#) Inconsistent M\_OLine
- [#3830](#) (PR) Unify Lines models
- [#3831](#) (PR) Implement ImpulseSources
- [#3833](#) (PR) Improvements to line models
- [#3904](#) DC PowerSupply missing
- [#3926](#) (PR) Implemented and tested PowerSupply

## Examples

- [#3590](#) (PR) Changed homotopy parameter to be consistent
- [#3625](#) (PR) Wrong StopTime for DifferenceAmplifier
- [#3819](#) (PR) Lines examples
- [#4020](#) This looks like a typo in the description?
- [#4025](#) (PR) [#4020](#) This looks like a typo in the description?
- [#4206](#) (PR) Remove redundant diagram text from Analog examples (second attempt)
- [#4245](#) Connect(p, p) in Modelica.Electrical.Analog.Examples.Utilities.SwitchedCapacitor?
- [#4261](#) (PR) Remove self-connect

## Documentation

- [#3815](#) (PR) Fix inconsistent M\_OLine model
- [#3960](#) Documentation image M\_OLine error

## Miscellaneous

- [#3961](#) (PR) Remove outdated unused image files

- [#3987](#) (PR) Set Evaluate = true for IdealTransformer.considerMagnetization
- [#4119](#) (PR) Fix unit error in Thyristor
- [#4147](#) (PR) Fix annotations

## Electrical.Batteries

### Bugs

- [#3878](#) Unit-checking using Gain and LimIntegrator-blocks
- [#3901](#) Possible bug in Modelica.Electrical.Batteries.Utilities.PulseSeries
- [#3902](#) (PR) Electrical.Batteries.Utilities.PulseSeries

### Examples

- [#4098](#) Unit error in Modelica.Electrical.Batteries.Examples.BatteryDischargeCharge
- [#4112](#) (PR) Fix unit error in CCCVcharging

### Documentation

- [#3804](#) (PR) Fix/remove dead links

## Electrical.Digital

### Examples

- [#4174](#) Unused parameters in Modelica.Electrical.Digital.Examples.Utilities.DFF
- [#4176](#) (PR) Fix (and rename) parameters of Modelica.Electrical.Digital.Examples.Utilities.DFF

## Electrical.Machines

### Bugs

- [#4158](#) (PR) Remove unit-casting

### Enhancements

- [#3786](#) (PR) Rotational coupling
- [#3920](#) (PR) Liberate machine parameter m
- [#4052](#) (PR) Fix SI units by introducing reference phase impedance ZsRef

### Examples

- [#3816](#) Remove Modelica.Electrical.Machines.Examples.ControlledDCDrives.Utilities.Battery
- [#4011](#) (PR) Remove battery model from examples

## Documentation

- [#3937](#) Dead Modelica URI link in documentation
- [#3939](#) (PR) Removes commented Modelica URI link in documentation with list

## Miscellaneous

- [#3472](#) Remove reference signals of zero sequence currents of electric machine examples
- [#3622](#) Unused parameter in function
- [#3623](#) (PR) Remove unused code ([#3622](#))
- [#3951](#) Missing gradient colors in some Icons
- [#4030](#) Bug in a component: Modelica.Electrical.Machines.Sensors.HallSensor
- [#4031](#) (PR) Fix HallSensor

## Electrical.Polyphase

### Bugs

- [#3963](#) Parameter T not considered in Polyphase Resistors and Conductors
- [#3964](#) (PR) Propagate parameter T in Polyphase Resistors and Conductors

## Electrical.PowerConverters

### Bugs

- [#3626](#) (PR) Correct a bug in Modelica.Electrical.PowerConverters.DCAC.Control.SVPWM
- [#3897](#) (PR) PowerConverters.DCDC.HBridge
- [#3910](#) (PR) Fix parameter propagation of IntersectivePWM

### Enhancements

- [#3679](#) (PR) Implement choice between sawtooth and triangle reference signal in PowerConverters/DCDC/Control/SignalPWM
- [#3774](#) (PR) Add ChopperBuckBoost to PowerConverters
- [#3895](#) Fire signals of H-Bridge

### Examples

- [#3523](#) Jumps in signal at very tiny time intervals in PolyphaseTwoLevel\_RL reference results

## Documentation

- [#3682](#) (PR) Update link in documentation to no longer rely on Freescience.info
- [#3842](#) (PR) Fix permanent link redirect

## Miscellaneous

- [#3887](#) Inadequate handling of geometric corner case in PowerConverters.DCAC.Control.SVPWM
- [#3888](#) (PR) Update block descriptions of control blocks
- [#3892](#) (PR) Avoid values out of bound, and simplify logic in PowerConverters.DCAC.Control.SVPWM
- [#4035](#) startTime of (SignalPWM) -> ZeroOrderHold
- [#4054](#) Model issues detected by unit checking ThreePhaseTwoLevel\_PWM
- [#4152](#) (PR) Correct start-value for t0 in ThreePhaseTwoLevel

## Electrical.QuasiStatic

### Bugs

- [#4022](#) (PR) Removed duplicate definition of m

### Enhancements

- [#3697](#) (PR) Quasi-static Transformer
- [#3705](#) (PR) Add the connection indicator to the terminal box icon
- [#3865](#) Why are there no single phase quasistatic RMS voltage and current sensors?
- [#3876](#) (PR) Add QuasiRMS voltage and current single-phase sensors

### Documentation

- [#3873](#) Documentation mentions Quasi-static AC machine models not being available
- [#3874](#) (PR) Update documentation of quasi-static AC machines
- [#3938](#) (PR) Strip leading newline in img.alt attributes

## Miscellaneous

- [#4021](#) Duplicate non-identical component in Modelica.Electrical.QuasiStatic.Polyphase.Sources.FrequencySweepVoltageSource
- [#4264](#) (PR) Set unit instead of having it in description

## Electrical.Spice3

### Documentation

- [#3676](#) (PR) Remove repeated advice on package Internal (previously called Repository)

## Miscellaneous

- [#3576](#) Rewrite if Boolean == true then
- [#3812](#) (PR) Simplify "if Boolean == true" to "if Boolean"
- [#4135](#) (PR) Delete redundant points of polygon annotation of connectors



# Fluid

## Bugs

- [#3758](#) Jump in Modelica.Fluid.Pipes.BaseClasses.WallFriction.LaminarAndQuadraticTurbulent.massFlowRate
- [#3924](#) (PR) Fix the bad Evaluate annotation
- [#3944](#) Bug in the SharpEdgedOrifice for Loss factors
- [#3953](#) Wrong enthalpies calculated by DynamicPipe
- [#3959](#) (PR) Fixed Wb\_flows discretization terms for DynamicPipe
- [#4144](#) Dimension mismatch in function linearPower
- [#4258](#) (PR) Bug in SharpEdgedOrifice for Loss factors resolved
- [#4259](#) (PR) Fix dimension error of Modelica.Fluid.Machines.BaseClasses.PumpCharacteristics.linearPower

## Examples

- [#3654](#) (PR) Remove unused/undocumented block setReal from example
- [#3656](#) The reference solution of Modelica.Fluid.Examples.Explanatory.MomentumBalanceFittings is wrong
- [#3657](#) (PR) Add start value to ensure convergence to the right flow in suddenExpansion1
- [#3779](#) (PR) choicesAllMatching=true is the correct annotation!
- [#3782](#) What is the quality of the TankWithEmptyingPipe1 reference result?
- [#3813](#) (PR) Decrease solver tolerance of Modelica.Fluid.Examples.AST\_BatchPlant.Test.TankWithEmptyingPipe1
- [#4032](#) (PR) The dT is a temperature difference
- [#4033](#) (PR) Reduce guess for initial temperature difference across wall.

## Documentation

- [#3629](#) (PR) Fix outdated contact
- [#3715](#) (PR) Remove superfluous blank line in documentation of Modelica.Fluid.UsersGuide.ComponentDefinition.WallFriction
- [#3863](#) (PR) Add missing parenthesis in fluid user guide page

## Miscellaneous

- [#3649](#) (PR) Just use "redeclare" instead of "redeclare final"
- [#3760](#) (PR) Fix assert message of Modelica.Fluid.Pipes.BaseClasses.WallFriction.NoFriction.massFlowRate\_dp\_staticHead
- [#3802](#) (PR) State temperatures in PartialHeatTransfer declared as Medium-specific type
- [#3951](#) Missing gradient colors in some Icons
- [#4104](#) (PR) Remove modification of 'quantity' for FixedBoundary.X
- [#4157](#) (PR) If the limits don't make sense use linear interpolation in Modelica.Fluid.Utilities.regfun3

# Fluid.Dissipation

## Enhancements

- [#1429](#) Conditionally uninitialized output variable Re in Modelica.Fluid.Dissipation.HeatTransfer.HeatExchanger.kc\_flatTube used

## Miscellaneous

- [#3743](#) (PR) Resort variable declarations of Modelica.Fluid.Dissipation.HeatTransfer.HeatExchanger.{kc\_flatTube, kc\_flatTube\_KC, kc\_roundTube\_KC} such that they are declared before used
- [#3744](#) (PR) Add assertion in else branches of Modelica.Fluid.Dissipation.HeatTransfer.HeatExchanger.{kc\_flatTube, kc\_flatTube\_KC, kc\_roundTube, kc\_roundTube\_KC}
- [#4147](#) (PR) Fix annotations

## Icons

### Miscellaneous

- [#3632](#) (PR) Render borders
- [#4135](#) (PR) Delete redundant points of polygon annotation of connectors

# Magnetic.FluxTubes

## Bugs

- [#4158](#) (PR) Remove unit-casting

## Enhancements

- [#3993](#) (PR) FluxTubes: some improvements in shapes and material

## Examples

- [#4077](#) Unit error in Modelica.Magnetic.FluxTubes.Examples.MovingCoilActuator.ArmatureStroke
- [#4109](#) (PR) Fix unit errors in ArmatureStroke

## Documentation

- [#3847](#) (PR) Fix link
- [#4211](#) (PR) Fix broken link in Modelica.Magnetic.FluxTubes

## Miscellaneous

- [#3295](#) Unit of permeability
- [#3951](#) Missing gradient colors in some Icons

- [#4007](#) Redundant connect equation in ConstantActuator
- [#4008](#) (PR) Remove redundant connect equation in ConstantActuator

## Magnetic.FundamentalWave

### Bugs

- [#4158](#) (PR) Remove unit-casting
- [#4172](#) (PR) Protect internal ports of base class machines

### Enhancements

- [#3817](#) (PR) Implemented split of stray inductance in common and individual part

### Examples

- [#3822](#) (PR) Add documentation of SinglePhaseInductance

### Documentation

- [#3736](#) (PR) More clearly specify damper cage in synchronous machine models

### Miscellaneous

- [#3472](#) Remove reference signals of zero sequence currents of electric machine examples
- [#4187](#) (PR) Remove newlines at end of Text primitive

## Magnetic.QuasiStatic

### Bugs

- [#3997](#) (PR) Propagate the angle alpha also in the calculation of A in HollowCylinderRadialFlux
- [#4158](#) (PR) Remove unit-casting
- [#4172](#) (PR) Protect internal ports of base class machines

### Enhancements

- [#3993](#) (PR) FluxTubes: some improvements in shapes and material

### Examples

- [#3592](#) (PR) Fix name of plot variable in documentation
- [#3803](#) (PR) Added an example to demonstrate ideal field weakening
- [#3845](#) (PR) QuasiStatic example induction machine with inverter

### Documentation

- [#3593](#) Check documentation of induction machines' examples

- [#3659](#) (PR) Mark ComplexBlocks and FundamentalWave with DocumentationClass
- [#3736](#) (PR) More clearly specify damper cage in synchronous machine models
- [#3823](#) (PR) Remove obsolete "(quasi-static)" from documentation

## Miscellaneous

- [#3472](#) Remove reference signals of zero sequence currents of electric machine examples
- [#3620](#) (PR) Refs [#3593](#): Fix documentation of quasi-static machine examples

## Math

### Bugs

- [#3836](#) Incorrect results from isPowerOf2 for large inputs
- [#3850](#) (PR) Avoid max({}) in Modelica.Math.Matrices.nullSpace

### Enhancements

- [#3919](#) (PR) Use boolean array reductions

## Miscellaneous

- [#3578](#) Order Modelica.Math.Matrices.LAPACK
- [#3602](#) (PR) Reorder Lapack functions in alphabetic order
- [#3703](#) (PR) Avoid deprecated "builtin" external language for common mathematical functions
- [#3843](#) (PR) Fully integer based version of isPowerOf2
- [#3849](#) Invalid function Modelica.Math.Matrices.nullSpace calculating max({})
- [#4036](#) Illegal value of 'lwork' in LAPACK.dtrsens
- [#4039](#) (PR) Most LAPACK routines don't want lwork=0 and/or work with size zero
- [#4314](#) (PR) Compatibility fix for Dymola 2024x; not needed in coming release.

## Mechanics.MultiBody

### Bugs

- [#3588](#) Quaternions.from\_T returns error for valid matrix
- [#3710](#) Singular Jacobian of the initial equations for the rotational constraint in Modelica.Mechanics.MultiBody.Joints.Constraints.Prismatic
- [#3718](#) (PR) Correct Constraints.Prismatic
- [#3989](#) ForceAndTorque model does not set color of force arrow
- [#3990](#) (PR) Pass forceColor to arrow visualizer
- [#4145](#) Error with frame\_resolve math in BasicAbsoluteAngularVelocity sensor
- [#4148](#) (PR) Fix false calculation of w (omega) when resolveInFrame == frame\_resolve

### Enhancements

- [#3724](#) (PR) Stable calculation of quaternion from transformation matrix

- [#3859](#) (PR) Fix missing or ambiguous SI-units in MultiBody.Sensors
- [#3908](#) Late inlining of  
Modelica.Mechanics.MultiBody.Frames.Internal.maxWithoutEvent
- [#4133](#) (PR) Replace 'Inline=false' with late inlining

## Examples

- [#3706](#) Wrongly fixed initial conditions in example  
Modelica.Mechanics.MultiBody.Examples.Constraints.PrismaticConstraint
- [#3712](#) (PR) Initialize motion in x direction (r\_rel\_a\_1) instead of in z (r\_rel\_a\_3)
- [#3776](#) Link rot
- [#3866](#) startBackward and startForward should not be reference results
- [#3870](#) (PR) Remove startBackward and startForward from reference results
- [#4080](#) Unit error in  
Modelica.Mechanics.MultiBody.Examples.Loops.Utilities.GasForce2
- [#4081](#) (PR) Delete variables dens and R\_air from  
Modelica.Mechanics.MultiBody.Examples.Loops.Utilities.GasForce2
- [#4108](#) (PR) Fix unit error in RobotR3.OneAxis

## Documentation

- [#3610](#) shapeType documentation example for file:// is inconsistent with standard file URIs
- [#3613](#) (PR) Add missing URI separator in file URIs
- [#3804](#) (PR) Fix/remove dead links
- [#3933](#) (PR) Update documentation of  
Modelica.Mechanics.MultiBody.Visualizers.Advanced
- [#4184](#) (PR) Restore documentation of  
Modelica.Mechanics.MultiBody.Visualizers.Internal.Lines
- [#4217](#) (PR) Documentation: clarify mind-set of planar rotation

## Miscellaneous

- [#2474](#) Spherical, etc. render poorly on non-white backgrounds
- [#3445](#) Wrong rotation direction in planarRotation functions
- [#3634](#) (PR) Utilize ellipses' closure
- [#3716](#) (PR) Improve icons of joint assemblies RRR and RRP
- [#3725](#) (PR) Simplify selection of constraint equations to be used
- [#3729](#) (PR) Fix position of component's and parameter's name according to icon conventions
- [#3730](#) (PR) Use ellipses instead of arcs by lines in Mechanics.MultiBody.Forces
- [#3835](#) (PR) Remove Evaluate=true for fixed=false parameter 'n\_b'
- [#3932](#) (PR) Remove superfluous import statements for  
Modelica.Units.Conversions.to\_unit1
- [#4147](#) (PR) Fix annotations
- [#4171](#) (PR) Initialize output array C even when multiColoredSurface=false
- [#4192](#) Unit errors when calling Modelica.Mechanics.MultiBody.Frames.from\_nxy
- [#4194](#) (PR) Correct units for normalizing vectors.
- [#4246](#) Unused ndim in MBS World
- [#4248](#) (PR) Use vector for visualization of physical quantities
- [#4266](#) (PR) Delete unused protected parameters ndim, ndim2 and  
ndim\_pointGravity

# Mechanics.Rotational

## Enhancements

- [#3661](#) Improve table design of Modelica.Mechanics.Rotational.Components.Clutch to use static tables instead of dynamic
- [#3662](#) (PR) Enhance frictional models based on ExternalCombiTable1D
- [#3702](#) (PR) Rotational and translational inverse speed dependent torque/force
- [#3786](#) (PR) Rotational coupling
- [#3976](#) (PR) Eddy current sources

## Examples

- [#3866](#) startBackward and startForward should not be reference results
- [#3870](#) (PR) Remove startBackward and startForward from reference results
- [#4010](#) (PR) Minor fixes of the documentation of Mechanics.Rotational.Examples

## Documentation

- [#1493](#) Mechanics.Rotational.Interfaces.PartialFriction.w\_small
- [#3594](#) (PR) Fix wrong or missing documentation
- [#3633](#) (PR) Describe the effect of w\_small in friction elements
- [#3862](#) (PR) Improve documentation of both rotational and translational sensors

## Miscellaneous

- [#3735](#) (PR) Use ellipses instead of arcs by lines
- [#4204](#) (PR) Use mustBeConnected annotation (introduced in Modelica 3.6)
- [#4256](#) (PR) Fix position prescribed friction

# Mechanics.Translational

## Enhancements

- [#3664](#) Improve design of frictional translational components to use static tables instead of dynamic
- [#3690](#) (PR) Enhance frictional translational models based on ExternalCombiTable1D
- [#3702](#) (PR) Rotational and translational inverse speed dependent torque/force
- [#3976](#) (PR) Eddy current sources

## Examples

- [#3866](#) startBackward and startForward should not be reference results
- [#3870](#) (PR) Remove startBackward and startForward from reference results

## Documentation

- [#3594](#) (PR) Fix wrong or missing documentation
- [#3862](#) (PR) Improve documentation of both rotational and translational sensors

- [#3942](#) (PR) Fix copy/paste error in description of Translational.Sources.Force2

## Miscellaneous

- [#4197](#) Unit issue in Modelica.Mechanics.Translational.Components.ElastoGap
- [#4200](#) (PR) Improve ElastoGap
- [#4204](#) (PR) Use mustBeConnected annotation (introduced in Modelica 3.6)
- [#4256](#) (PR) Fix position prescribed friction

## Media

### Bugs

- [#3666](#) ReferenceMoistAir, substances mass conservation issue
- [#3695](#) Trajectory of 'k' in R134a\_setState\_pTX doesn't look suitable for comparison
- [#3704](#) (PR) Changed Modelica.Media.R134a.R134a\_ph.dofpT issue [#3695](#)
- [#3834](#) (PR) Correct error in function  
Modelica.Media.Air.ReferenceMoistAir.Utilities.pd\_pTX\_der

### Examples

- [#4099](#) Unit error in Modelica.Media.Examples.SimpleLiquidWater
- [#4115](#) (PR) Fix unit errors in Examples.MoistAir

## Documentation

- [#3629](#) (PR) Fix outdated contact
- [#4084](#) (PR) Documentation: improve indentation of HTML code

## Miscellaneous

- [#3576](#) Rewrite if Boolean == true then
- [#3650](#) Modelica Media Interface is information incomplete w.r.t. independent mass fractions
- [#3652](#) (PR) Fix descriptions and improve documentation style
- [#3763](#) (PR) Make constants in functions protected
- [#3766](#) (PR) Update FluidData.mo
- [#3812](#) (PR) Simplify "if Boolean == true" to "if Boolean"
- [#3885](#) (PR) Refactor spliceFunction\_der
- [#4038](#) (PR) spliceFunction\_der check limits
- [#4096](#) (PR) Fix unit error in SimpleAir
- [#4100](#) (PR) Use plain SI.Mass instead of medium-based 'quantity' for MixtureGases.m1 and MixtureGases.m2
- [#4103](#) (PR) Fix unit error in SimpleLiquidWater model
- [#4116](#) (PR) Fix unit errors in ReferenceAir.MoistAir
- [#4117](#) (PR) Fix unit error in IdealGasH2O
- [#4233](#) Old value for universal gas constant used for calculation of specific gas constant
- [#4238](#) (PR) R\_s for each ideal gas record now calculated with R\_NASA
- [#4243](#) (PR) Add massFraction function to Media library
- [#4262](#) (PR) Utilize PressureSlope unit in Media consistently

# ModelicaReference

## Documentation

- [#3773](#) getInstanceName and spatialDistribution not listed in ModelicaReference
- [#3808](#) (PR) getInstanceName and spatialDistribution not listed in ModelicaReference
- [#3980](#) (PR) Fix variable name
- [#4023](#) Obsolete form of noDerivative in ModelicaReference
- [#4024](#) (PR) Update obsolete form of noDerivative in ModelicaReference
- [#4127](#) (PR) Type cast result of malloc
- [#4298](#) (PR) Fix syntax errors in ModelicaReference documentation snippets

## Miscellaneous

- [#3923](#) (PR) Fix misspelled file name

# ModelicaServices

## Miscellaneous

- [#3768](#) Conversion from ModelicaServices and Complex version 3.2.3 to 4.0.0?
- [#3770](#) (PR) Add missing conversions for Complex and Services 3.2.3

# ModelicaTest

## Bugs

- [#3695](#) Trajectory of 'k' in R134a\_setState\_pTX doesn't look suitable for comparison

## Enhancements

- [#3689](#) (PR) Add 2 more test examples to ModelicaTest.Electrical.Machines

## Examples

- [#3866](#) startBackward and startForward should not be reference results
- [#3870](#) (PR) Remove startBackward and startForward from reference results

## Miscellaneous

- [#3778](#) Reference result degradation for TestValvesCompressibleReverse (fixed by Dymola 2022)
- [#3852](#) Invalid models ModelicaTest.Media.TestsWithFluids.MediaTestModels.\*
- [#3881](#) (PR) Revert major part of [#227](#), and remove unit from gain parameter of Modelica.Blocks.Continuous.\* blocks and Modelica.Blocks.Math.Gain
- [#3918](#) (PR) Update ModelicaTest/Media.mo: Reduce dp\_nominal in TestsWithFluid.Components.PartialTestModel by a factor of 1000
- [#4114](#) (PR) Fix unit error in TestOnly.MoistAir, R134a\_setState\_pTX and



WaterIF97\_dewEnthalpy

- [#4195](#) (PR) Add all defined outputs of the test example to reference signals
- [#4229](#) (PR) Add ZeroThresholds test in Blocks
- [#4273](#) (PR) Utilize PressureSlope unit in ModelicaTest consistently

## Resources

### Bugs

- [#3614](#) (PR) Update Run.mos for MultiBody examples
- [#3767](#) (PR) Add more explicit conversion rules for inherited gasConstant function

### Documentation

- [#4251](#) (PR) Create Modelica.UsersGuide.ReleaseNotes.Version\_4\_1\_0

### Miscellaneous

- [#3580](#) (PR) Save the CFLAGS already passed to the script
- [#3591](#) (PR) Remove zero inductor currents in comparison signals
- [#3618](#) (PR) Fix result file name in Run.mos script
- [#3753](#) (PR) Add semicolon after conversion commands of ConvertModelica\_from\_3.2.3\_to\_4.0.0.mos
- [#3794](#) (PR) Turn compiler warning of implicit function declaration to error
- [#3800](#) (PR) Fix (all but one) conversion issues reported by Dymola
- [#3867](#) Is ModelicaUtilities.h tool-specific?
- [#3871](#) (PR) Remove ModelicaUtilities.h from MSL distribution
- [#3961](#) (PR) Remove outdated unused image files
- [#4167](#) (PR) Remove voltageSensor.v from the comparison list
- [#4179](#) (PR) Remove duplicates in SignalNames of 10 examples of ModelicaTest
- [#4268](#) (PR) Make third-party licenses explicit
- [#4316](#) MSL v4.1.0-beta.1 feedback: broken Dymola plot scripts
- [#4322](#) (PR) Fix plot scripts

## StateGraph

### Examples

- [#4076](#) Modelica.StateGraph.Examples.Utilities.Tank could set units for its variables.

### Documentation

- [#4202](#) (PR) Fix broken links in Modelica.StateGraph

### Miscellaneous

- [#4264](#) (PR) Set unit instead of having it in description

# Thermal.FluidHeatFlow

## Enhancements

- [#3956](#) (PR) Add animated level on the icon layer of the OpenTank

## Examples

- [#4141](#) (PR) Documentation and description for FluidHeatFlow library improved

## Documentation

- [#3474](#) Improve doc strings and documentation of FluidHeatFlow

# Thermal.HeatTransfer

## Documentation

- [#3954](#) Broken link to academia.edu
- [#4199](#) (PR) Fix link to Holman2010

# Units

## Enhancements

- [#3872](#) (PR) Add electrical quantities per unit length

## Miscellaneous

- [#3295](#) Unit of permeability
- [#3811](#) (PR) Change unit of permeability to V.s/(A.m)
- [#4103](#) (PR) Fix unit error in SimpleLiquidWater model
- [#4105](#) (PR) Add StoichiometricCoefficient next to StoichiometricNumber
- [#4264](#) (PR) Set unit instead of having it in description

# UsersGuide

## Documentation

- [#3804](#) (PR) Fix/remove dead links
- [#3844](#) Conflicting guidelines for HTML documentation conventions for tables
- [#3848](#) (PR) Remove `align=bottom` from guidelines and code
- [#3854](#) (PR) Remove obsoleted BMBF link
- [#4216](#) (PR) Add recommendation for styling of 'tab' and 'group' annotations
- [#4221](#) (PR) Add recommendation for code formatting (and apply it)
- [#4251](#) (PR) Create Modelica.UsersGuide.ReleaseNotes.Version\_4\_1\_0

# Utilities

## Bugs

- [#3615](#) ModelicaServices classes extends from classes in a partial package
- [#3617](#) (PR) Models should be partial, not the package

## Enhancements

- [#3503](#) (PR) Improve fault-tolerance of Modelica.Utilities.Strings.substring w.r.t. index arguments and remove undocumented case with endIndex=-999

## Examples

- [#3608](#) Incorrect dimension parameter used when defining A in Modelica.Utilities.Examples.ReadRealMatrixFromFile
- [#3609](#) (PR) Use correct dimensions
- [#3921](#) Enhancement of Modelica.Utilities.Examples.readRealParameter
- [#3922](#) (PR) Adds optional default return value parameter

## Documentation

- [#4059](#) (PR) Document unicode for String functions
- [#4073](#) (PR) Fix documentation of Modelica.Utilities.System.getTime()

## Miscellaneous

- [#3728](#) (PR) Fix Modelica.Utilities.Strings.hashString to always use provided HASH\_AP and update 3rd-party header uthash to v2.3.0