

VECTO 3.x

28.06.2016



Release Notes

Vecto 3.0.4.544

- Main Updates
 - New gear shift strategy according to White Book 2016
 - New coasting strategy according to White Book 2016
 - New input parameters (engineering mode) for coasting and gear shift behavior
 - Use SI units in Advanced Auxiliaries Module and compile with strict compiler settings (no implicit casts, etc.)
 - Allow efficiency for transmission losses (in engineering mode)
- Bugfixes
 - Auxiliary TechList not read from JSON input data
 - Improvements in driver strategy
 - Bugfixes in MeasuredSpeed mode

Notes for using Vecto 3.x with AAUX (1)

- The AdvancedAuxiliaries module requires the number of activations for pneumatic consumers (brakes, doors, kneeling) and the (estimated) total cycle time. This can be configured in the .APAC-file (actuators file). For standard bus/coach cycles (i.e., the cycle file contains “bus” **and** “heavy_urban” or “suburban” or “interurban” or “urban”; **or** the cycle contains “coach” (*case insensitive*)) the actuators file already contains the number of activations and the cycle time. For other cycles the filename without extension is used to lookup the activations in the .APAC file (*case sensitive*)

Notes for using Vecto 3.x with AAUX (2)

- Vecto 3 uses an average auxiliaries load (determined by the AAUX module depending on the settings) for the simulation. The AAUX module computes the fuel consumption in parallel to VectoCore and accounts for smart consumers (e.g., alternator, pneumatics, ...).
- Output
 - The .vmod file contains both, the fuel consumption calculated by VectoCore (per simulation interval) and AAUX (accumulated and per simulation interval).
Columns in .vmod file:
 - AA_TotalCycleFC_Grams [g]: accumulated fuel consumption as computed by the AAUX model, considering smart consumers
 - FC-Map [g/h]: fuel consumption as computed by VectoCore interpolating in the FC-Map, using an average base load of auxiliaries
 - FC-AUXc [g/h]: fuel consumption corrected due to engine stop/start (currently not applicable)
 - FC-WHTCc [g/h]: WHTC-corrected fuel consumption (not applicable in engineering mode)
 - FC-AAUX [g/h]: fuel consumption per simulation interval, derived from AA_TotalCycleFC_Grams
 - FC-Final [g/h]: final fuel consumption value with all (applicable) corrections applied (stop/start, WHTC, smart auxiliaries)

Notes for using Vecto 3.x with AAUX (3)

- Output .vsum
 - Columns in .vsum file:
 - FC-Map: total fuel consumption as computed by VectoCore interpolating in the FC-Map, using an average base load of auxiliaries
 - FC-AUXc: total fuel consumption corrected due to engine stop/start (currently not applicable)
 - FC-WHTCc: WHTC-corrected fuel consumption (not applicable in engineering mode)
 - FC-AAUX: fuel consumption per simulation interval, derived from AA_TotalCycleFC_Grams
 - FC-Final: final fuel consumption value with all (applicable) corrections applied (stop/start, WHTC, smart auxiliaries)

Vecto 3.0.3.537

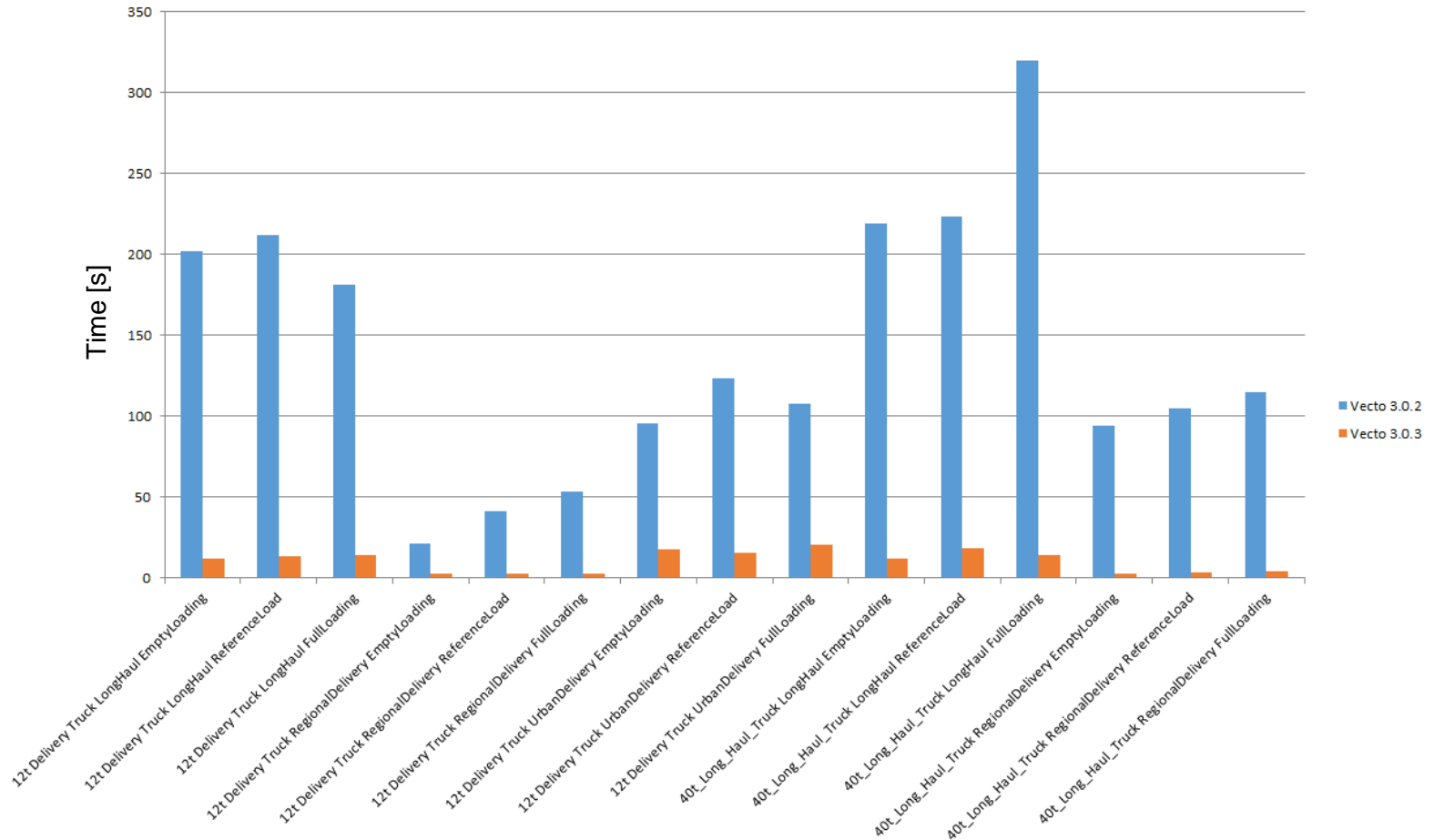
- Main Updates
 - Plot shift lines as computed according to WB 2016 declaration mode in GUI
- Bugfixes
 - GUI: Buttons to add/remove auxiliaries are visible again
 - Error in calculation of WHTC correction factor
 - Fix: consider gearbox inertia (engineering mode) for searching operating point
 - Wrong output of road gradient in measured speed mode (correct gradient for simulation)
 - Fuel consumption in .vsum file now accounts for AdvancedAuxiliaries model
 - GraphDrawer (Vecto): handle new .vmod format of Vecto 3
 - AdvancedAuxiliaries: language-settings independent input parsing
 - Paux was ignored when running Vecto 2.2
 - Error in massive multithreaded execution
 - Fix unhandled response during simulation
 - Fix output columns in .vmod

Vecto 3.0.3

- Main Updates
 - Support for Advanced Auxiliaries (Ricardo) in Vecto 3.0.3 and Vecto 2.2
 - Performance improvements
 - Gearshift polygons according to WB 2016
 - Revision of SUM-data file, changed order of columns, changed column headers
- Bugfixes
 - Delaunay Maps: additional check for duplicate input points
 - Creation of PDF Report when running multiple jobs at once
 - Sanity checks for gear shift lines
 - Improvements DriverStrategy: handling special cases

Performance Comparison

Execution Times (all 15 runs in parallel)



Total execution time (15 runs in parallel): Vecto 3.0.2: 6min 6s; **Vecto 3.0.3: 35s**

VECTO 3.0.2

Main updates

- New simulation modes:
 - Pwheel (SiCo),
 - Measured Speed (with/without gear)
 - v_{air} /beta cross-wind correction (vcdb)
- Adaptations of powertrain components architecture
 - Move wheels inertia from vehicle to wheels
 - Auxiliaries no longer connected via clutch to the engine but via a separate port
 - Engine checks overload of gearbox and engine overload
- Fixed some driving behavior related issues in VectoCore:
 - When the vehicle comes to a halt during gear shift, instead of aborting the cycle, it tries to drive away again with an appropriate gear.
- ModData Format changed for better information and clarity
- Added validation of input values (according to latest VectoInputParameters.xls)
- Various bugfixes

Pwheel (SiCo) Mode

- Function as already available in Vecto 2.2 also added in Vecto 3.0.2
 - Driving cycle specifies power at wheel, engine speed, gear, and auxiliary power
 - No driver model in the simulation.
 - The Vecto gear-shift model is overruled.
 - Function used for creating reference results for SiCo tests
 - For details see user manual: Simulation Models / Pwheel Input (SiCo)

Measured Speed Mode

- Functionality already available in Vecto 2.2 added in Vecto 3.0.2
 - Driving cycle not defined by target speed but by actual speed. No driver model in the simulation.
 - Gear and engine speed can be specified in the driving cycle. In this case the Vecto gear-shift model is overruled.
 - Function used for “proof of concept” purposes
 - For details see user manual: Calculation Modes / Engineering Mode / Measured Speed

.vmod File Update

- In Vecto 3.0.2 the structure of the modal data output has been revised and re-structured. Basically for every powertrain component the .vmod file contains the power at the input shaft and the individual power losses for every component. For the engine the power, torque and engine speed at the output shaft is given along with the internal power and torque used for computing the fuel consumption.
- For details see the user manual: Input and Output / Modal Results (.vmod)

Changelog 3.0.2

- - New simulation modes:
 - + Measured Speed
 - + Measured Speed with Gear
 - + Pwheel (SiCo)
- - Adaptations of powertrain components architecture
 - + Move wheels inertia from vehicle to wheels
 - + Auxiliaries no longer connected via clutch to the engine but via a separate port
 - + Engine checks overload of gearbox and engine overload
- - Fixed some driving behavior related issues in VectoCore:
 - + When the vehicle comes to a halt during gear shift, instead of aborting the cycle, it tries to drive away again with an appropriate gear.
- - [ModData Format](#modal-results-.vmod) changed for better information and clarity
- - Entries in the sum-file are sorted in the same way as in Vecto 2.2
- - In engineering mode the execution mode (distance-based, time-based measured speed, time-based measured speed with gear, engine only) are detected based on the cycle
- - Added validation of input values
- - Gravity constant set to 9.80665 (NIST standard acceleration for gravity)
- - Improved input data handling: sort input values of full-load curves (engine, gbx, retarder)
- - Better Integration of VectoCore into GUI (Notifications and Messages)
- - v_{air}/β cross-wind correction (vcdb) implemented
- - For all calculations the averaged values of the current simulation step are used for interpolations in loss-maps.
- - Allow extrapolation of loss maps in engineering mode (warnings)
- - Refactoring of input data handling: separate InputDataProvider interfaces for model data
- - Refactoring of result handling: separate result container and output writer
- - New Long-Haul driving cycle included
- - User Manual updated for VECTO V3.x
- - Fix: sparse representation of declaration cycles had some missing entries
- - Bugfix: error in computation of engine's preferred speed
- - Bugfix: wrong vehicle class lookup
- - Bugfix: duplicate entries in intersected full-load curves
- - Bugfix: retarder takes the retarder ratio into account for lossmap lookup
- - Bugfix: use unique identifier for jobs in job list
- - Bugfix: error in triangulation of fuel consumption map