

BikeSim 2022.0 New Features

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This document lists notable new features in BikeSim version 2022.0.

VS Math Models

GPS Calculations

GPS coordinates are calculated and provided as output variables for the first vehicle unit and for moving objects. The conversion from global X and Y coordinates in the simulation model coordinate system to GPS have been based on the starting location of the vehicle, with updates occurring when there is a significant change in GPS latitude. Several improvements were made to accommodate simulations involving multiple vehicles and moving objects that might be separated by significant distances.

1. The GPS conversion parameters `GPS_REF_LAT`, `GPS_REF_LONG`, `GPS_REF_X`, and `GPS_REF_Y` now retain their initial value, reflecting the value associated with the creation of the road or scene. Instead, when any reference point is reset for a vehicle or moving object, the run’s log file will contain a line indicating the vehicle or moving object ID and the latitude/longitude at the reset.
2. The GPS reference point is now checked at initialization, to improve GPS output accuracy in cases where the initial location of the vehicle or moving object is past `GPS_RANGE_Y`.
3. Moving object GPS output calculations now account for the reference point reset implied by the parameter `GPS_RANGE_Y`, rather than always using the reference point established by `GPS_REF_LAT`, `GPS_REF_LONG`, `GPS_REF_X`, and `GPS_REF_Y`.
4. Moving object GPS output calculations now function if the X-Y coordinates of the moving object are specified directly. Previously, moving object GPS outputs were only produced if the moving object was set to follow a path.

Miscellaneous

A new system parameter `OPT_ECHO_DEFAULT` is available to disable the identification with the indicator [D] in the Echo file for default values that were not set by reading an input file. This can be helpful in advanced applications, such as when a new run is made using an Echo file written at the end of a previous run. In this case, the [D] indicator never appears in the Echo files for the continuation run. The new parameter may be used to ensure the [D] indicator doesn't appear in other runs either, simplifying the use of text editors to compare files.

VS Browser: Graphic User Interface (GUI)

Tool: Find links to the current dataset from any library

A new command was added to the **Tools** menu for searching: **Find All References to this Dataset in "Run_all.par" Files by Library...**

The existing **Find All References to This Dataset** option finds datasets that are immediately referenced by others. The search can be repeated, to find datasets that reference datasets that reverence the current dataset, but this form of manual repeating is time consuming.

The new search option takes advantage of `Run_all.par` files that are made automatically whenever a run is made, or VS Visualizer is used to view results. This has significant advantages:

1. Searching these files is rapid compared to searching the entire database. Even with large databases, the search is much less than a minute.
2. The searching finds all references where the current dataset was used in an existing run.
3. Results are filtered to show only cases where the current dataset referenced (no matter how indirectly) by datasets in a specified library.

For example, perform a search from a **Tire** dataset to find all the **Run Control** datasets that may somehow make use of the current tire dataset. Or, search for all vehicle datasets that used the current tire dataset in a run.

Miscellaneous Changes

- Users can now specify the results output directory of an FMU with self-contained mode enabled.
- Many minor changes were made to fix bugs, correct typos, improved consistency, etc.

VS Visualizer

Added new option to scale plots non-symmetrically by pressing the "alt" key while dragging with the middle-mouse-button (or left+right mouse buttons). In this mode, moving the mouse up/down zooms vertically, moving left/right zooms horizontally. There is also an option on the plot window right-click context menu, "Asymmetric mouse zoom", to switch which mode is default (active w/o the Alt key).

VS Solver Wrapper (Command Line Interface)

Support of VS Solver Wrapper with a command-line interface has been improved to provide more options when using external software to provide automation.

- VS Solver Wrapper can now execute simulations using Simulink completely using the command line interface. Simulink will be automatically launched when the `SIMULINK_MODEL_FILE` keyword is detected in the “all.par” input file. For more information, see [VS SolverWrapper.pdf](#).
- VS Solver Wrapper can execute simulations of an FMU using the command line interface. An FMU must be FMI version 2.0 and self-contained that includes all input files and binary solvers: vehicle solver 32/64 bit for Windows and Linux 64 if running on Linux 64, `simfile.sim`, `Run_all.par`, `events parsfiles`, `vs_terrain file`, external tire files, see [VS SolverWrapper.pdf](#).
- VS Solver Wrapper can now load and run External Tire model datasets. Previously these were referenced through absolute path, due to third-party requirements. They are now referenced through relative path, with the absolute path being determined dynamically through the `PROGDIR simfile` parameter.

Documentation

The following document was added to the **Help** menu:

1. High Performance Computing (HPC) and VehicleSim

The following Reference Manuals have been updated:

2. VS Browser (GUI and Database)
3. VS COM Interface
4. VS Commands Reference Manual
5. VS Commands Summary
6. VS Math Models Reference Manual
7. VS Visualizer Reference Manual

The following Screen documents have been updated:

8. ADAS Sensors and Target Objects
9. Animator: Wheel Arrows and Other Indicators
10. External Models and RT Systems

The following Technical Memos have been updated:

11. High Performance Computing (HPC) and VehicleSim
12. HPC Licensing
13. VS Camera Sensor Simulink Block

14. VS Solver Wrapper

The following Real-Time and DS System documents have been updated:

15. dSPACE RT Guide

New Animator Resources

New Animator Shape Assemblies have been added for the three-Axle Sleeper Cab, Flatbed Trailer, Shipping Container Hauler, and 53-ft. Box Trailer.