

TruckSim 2024.0 New Features

VS Solver Architecture: Delayed Initialization.....	1
VS Math Models	1
Loader Arms	1
Other Improvements	1
VS Browser: Graphical User Interface (GUI)	2
CarMaker Converter	2
Other Improvements	2
Real-Time Platform: Vector CANoe.....	2
Documentation	2
Japanese Language	3
Database	3

This document lists notable new features in TruckSim 2024.0.

VS Solver Architecture: Delayed Initialization

A new option to delay initialization was added to allow imported variables from external software such as Simulink to be used to initialize the vehicle state before the simulation starts. This is needed when variables that are critical for determining the initial state of the model are provided by user VS Commands or imported from external software. A new system parameter `OPT_DELAY_INIT` is used to choose an alternate time to perform the initialization. Details are provided in a new Tech Memo, *Initialize a Vehicle with Imported Ground Z*, and new examples were added to the database.

VS Math Models

Loader Arms

A new model can be installed that allows for the simulation of mechanical loader arms typically seen on construction vehicles. The simulated arm has full kinematics and dynamics and can interact and influence the motion of the vehicle to which it is attached. For more information, see the new technical memo *Loader Arms*.

Other Improvements

1. Driving in reverse is now supported when using the built-in Speed Controller in acceleration control mode (`OPT_SC = 5`).
2. An idle speed controller can be installed on IC powertrains to regulate the input throttle and automatically prevent engine stall. For more information, see the *Engine Idle Speed Controller* section in the *Powertrain Systems* Help document.

3. Siemens MF-Tyre/MF-Swift tire model is now supported on Linux 64-bit system environment.

Simulink S-Function

Starting with version 2024.3, we support Simulink S-Function with bus I/O. Each bus signal is named by the short name of the solver. We added two new S-Function blocks:

1. Input is vector, output is bus
2. Both input and output are buses.

VS Browser: Graphical User Interface (GUI)

CarMaker Converter

The CarMaker Converter is available to read CarMaker datasets and convert them to CarSim properties, setting values in a CarSim database using COM automation with the Browser. In addition to general improvements to performance, the converter also now supports the conversion of 2-axle TruckMaker datasets to TruckSim models. If you'd like to use the converter, please contact Mechanical Simulation technical support.

Other Improvements

The menu option **File > Export to Simian** has been replaced with **File > Export ADP Package**. This action will automatically create a package of the current model that the Applied Intuition software platform (ADP) can import and use. The file extension is **.vsmp**.

Real-Time Platform: Vector CANoe

The VS Solvers now support the Vector CANoe Real-Time platform, which includes VN8900, VT6000, and RT Rack. These devices together form the Vector Tool Platform and are equipped with a Windows operating system. The CANoe platform is supported by the existing VS Browser (using the **Models: Transfer to Remote RT Target** library). Example runs were added to the database and the **Real-Time and DS Systems > Vector CANoe Guide** documentation was added.

Documentation

Built-in Help Documents

The following Technical Memos were added:

1. CarMaker Converter
2. Initialize a Vehicle with Imported Ground Z
3. Loader Arms

The following Reference Manuals have been updated:

4. System Parameters in VS Math Models
5. VS Browser Reference Manual
6. VS Commands Reference Manual
7. VS Math Model Manual

The following documents in the **Help** menu have been updated:

8. Powertrain Systems

The following RT and DS documents have been updated:

9. A&D Guide
10. Concurrent RT Guide
11. dSPACE RT Guide
12. ETAS RTPC Guide
13. NI RT Target Systems
14. RT-Lab Target Systems
15. Speedgoat Guide

Japanese Language

Japanese language documentation is now available from the user section of the Mechanical Simulation website. The documents available at the time of this writing are translated from versions 2023.1 and 2023.2, with 2024.0 equivalents available later.

Database

New examples were added in the following categories.

Compact Track Loader

New simulations model a compact track loader with VS Terramechanics: Rigid Wheel (TMRW), the soft soil tire model. This is based on the pre-existing, two-axle skid-steer loader vehicle, but with five axles to approximate the behavior of a tracked vehicle.

Engine Idle Controller

A new simulation shows a vehicle on a hill with the built-in engine idle controller that prevents stalling at low speed.

Imported Ground Elevation

New simulations are added to show several methods for handling user-defined road surfaces using Simulink or VS Commands. The examples make use of the new system parameter `OPT_DELAY_INIT` that allows imported variable to be used during the initialization of the vehicle model. Details are provided in a new Tech Memo, *Initialize a Vehicle with Imported Ground Z*.

Loader Arm Vehicle

New simulations show an articulated loader with loader arm operation. The articulation is controlled by a hydrostatic steering system, and the forces driving the loading arm are defined with VS Commands.

Reversing with Accel Control

A new simulation shows a vehicle with a trailer backing into a parking location using the acceleration control mode of the speed controller ($\text{OPT_SC} = 5$).