# VI-Driver 2020.20.1 Release Notes

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# 1 Release Notes

Welcome to the release notes of VI-Driver 20.1. The chapter contains information regarding new features, known issues and revision history.

Please send your comments or support requests to support@vi-grade.com.

## 1.1 What's New

This VI-Driver release has the following new or enhanced modeling and simulation capabilities

### New Adams Car Interface features

- Support for Adams 2020

Please refer to the revision history table for a summary of the addressed issues.

## 1.2 Licenses

VI-Driver 20.1 requires following set of license keys:

- VI_Driver_Basic_Core
- VI_Driver_EventBuilder

The Human Driver extension requires the key:
- VI_Driver_Human

The Matlab interface require the key:
- VI_Driver_Matlab

The FMI interfaces require the key:
- VI_Driver_FMI

Please make sure that you are running VI-grade Licensing version 20.0 or newer (based on LMX server version 4.9.20 or newer).

Please look at VI-Licensing.pdf document for a detailed description of VI-grade's licensing system and how to setup a license server.

This product is patly based on incorporated software libraries. Please refer to the acknowledgments.pdf document, included in the product documentation for a listing of the adopted components and the respective licenses.

## 1.3 Known Issues

The following limitations have been identified at release time:

- When the human driver is active with `MODEL='STANDARD'`, there could be some steering instability problems for high speed maneuvers. The problem can be reduced, or avoided, increasing the Preview Time value.

## 1.4 Changed Behaviour

Thanks to some correction applied to reference engine torque input in standstill conditions, VI-Driver will produce smoother throttle and brake signals when vehicle is idling.

## 1.5 Platform Support

VI-Driver 20.1 is available for the following:

| 3rd Party Tool | Platform | Installer Name |
|---|---|---|
| Adams 2020 | windows x64 | VI_Driver_2020_20_1_x64_Setup.exe |
| Adams 2019 | windows x64 | VI_Driver_2019_20_1_x64_Setup.exe |
| Adams 2018 | windows x64 | VI_Driver_2018_20_1_x64_Setup.exe |
| Matlab/Simulink | windows x64 | VI_Driver_matlab_20_1_x64_Setup.exe |
| dSPACE® DS1006 release 2018b | DS1006 | VI_Driver_matlab_DS1006_20_1_r14b_Setup.exe |
| FMI 1.0/2.0 | windows x64 | VI_Driver_fmi_20_1_x64_Setup.exe |

## 1.6 3rd Party Compatibility

This table shows the compatibility of the VI-grade suite products with the main 3rd party software.

| | VI-CarRealTime | VI-BikeRealTime | VI-DriveSim | VI-Driver/VI-Rider for Matlab | VI-Driver for FMI |
|---|---|---|---|---|---|
| Matlab® | from 2015b to 2019b | from 2015b to 2019b | from 2015b to 2019b* | from 2015b to 2019b | |
| SimWorkBench® | 2018.3<br>2020.1 | 2018.3<br>2020.1 | 2018.3<br>2020.1 | | |
| Veristand™ (***) | 2015sp1 | 2015sp1 | | | |
| dSPACE® RCP & HIL (**) | 2018b<br>2019a 2019b | 2018b | | 2018b | |
| ETAS LABCAR-OPERATOR IP® | 5.4.8 | | | | |
| SCANeR® | 1.8r33, 1.9r22 | | 1.8r33, 1.9r22 | | |
| Prescan® | 7.3 | | | | |
| Virtual Test Drive® | 1.4 | | | | |
| SolidThinking Activate | 2017.1 | | | | |
| Dymola® | 2015 | | | | 2015 |
| CarSim™ | 2017.1 | | | | |
| CarMaker™ | 9.0 | | | | |
| TameTire | 6.1 | | 6.1 | | |
| CDTire | 4.2.8 | | 4.2.8 | | |
| RIDESuite | 1.9/2.1 | | 1.9/2.1 | | |
| FTire | 2020.2 | | 2020.2 | | |

(*): please refer to SimulationWorkBench documentation for Matlab version compatible with MLToolkit module.
(**): the following combinations of dSPACE toolchain and SCALEXIO firmware are supported: 2018b with firmware 4.3.1, 2019a with firmware 4.4.1p3, 2019b with firmware 4.5.2.

3rd Party Software included in VI-grade products:

| | VI-CarRealTime | VI-BikeRealTime | VI-DriveSim | VI-Driver/VI-Rider for Matlab | VI-Driver for FMI |
|---|---|---|---|---|---|
| MF-Tyre/MF-Swift | 6.2.0.3<br>2020.1 | 6.2.0.3<br>2020.1 | 6.2.0.3<br>2020.1 | | |

The following table shows the 3rd party compatibility for Adams-based VI-grade product:

| | VI-Motorcycle | VI-Automotive | VI-Rail | VI-Aircraft | VI-CarRealTim Plug-In | VI-Driver |
|---|---|---|---|---|---|---|
| MSC Adams™ | 2020.0 | 2020.0 | 2019.2 | 2020.0 | 2018.0, 2019.0, 2020.0 | 2018.0, 2019.0, 2020.0 |
| Matlab® | * | * | * | * | | |

(*): please refer to Adams documentation for compatibility version.
(***) The NI-PXI integration requires Visual C++ 2010 / SDK 7.1 to complete the building procedure successfully. Please refer to the NI-VeriStand documentation for more detail.

The VI-Licensing LMX supported version is **4.9.20** both for Server and for Client.

# 1.7 Revision History

## 1.7.1 Release 20.0

### Added Capabilities:

| Change ID | Module | Description |
|---|---|---|
| 18481 | Driver | Enhance VI-Driver and VI-Road compatibility with MB-SHARC |

### Bugs Corrected:

| Change ID | Module | Description |
|---|---|---|
| 16029 | Driver | Combo box list not fully visible |

## 1.7.2 Release 19.1

### Added Capabilities:

| Change ID | Module | Description |
|---|---|---|
| 10699 | Driver | Support Adams 2019.0 |

### Bugs Corrected:

| Change ID | Module | Description |
|---|---|---|
| 13047 | Driver | Simulation not interrupted by end of path event |
| 11528 | Driver | Adams controls simulation with vidriver failure |
| 10398 | Driver | Adams crash submitting VDF |
| 3886 | Driver | File -> Import Event menu in VI-EventBuilder doesn't work |

## 1.7.3 Release 19.0

### Added Capabilities:

| Change ID | Module | Description |
|---|---|---|
| 5810 | Driver | Add Steering Angle Velocity END Condition in VDF |
| 3901 | Driver | Apply new dedicated license key to Matlab interface |
| 3900 | Driver | Apply new dedicated license key to FMI interface |
| 3444 | Driver | Wrong Target Engine Torque when vehicle stops |
| 756 | Driver | Path distance as end condition |

### Bugs Corrected:

| Change ID | Module | Description |
|---|---|---|
| 7399 | Driver | Update VDF option chooses wrong shift gear RPM for GSE-based powertrain |
| 5754 | Driver | Gear Mapped Module inhibit clutch idle control |
| 4787 | Driver | Filling '.testrig.vidriver_tires_array' not waterproof |
| 4786 | Driver | End condition NEXT_MANEUVER_NAME not saved from EventBuilder |
| 4232 | Driver | Smoothing Time neglected on maneuver transition |
| 3886 | Driver | File -> Import Event menu in VI-EventBuilder doesn't work |
| 3544 | Driver | End of path check fails with multimaneuver |

## 1.7.4 Release 18.0

| Version | Change ID | Module | Change |
|---|---|---|---|
| 18.0 | FDB-5235 | Adams | Simulation failure with CarAt + F77 solver + SI2 integrator |
| | FDB-5086 | | Memory leak from core classes |
| | FDB-5031 | | throttle control flag cannot be activated when throttle is open loop |
| | FDB-4514 | | Improve Human driver efficiency to fulfill realtime requirements |
| | FDB-4074 | | Add parameters to VI-Driver to control delay between consecutive gearshifting |

## 1.7.5 Release 17.0

| Version | Change ID | Module | Change |
|---|---|---|---|
| 17.0 | FDB-4900 | | No error msg produced with incorrect event |
| | FDB-4656 | | No maneuver information in error message reported by VI-Driver |
| | FDB-4619 | | SDF converter does not work when angles are expressed in degrees |
| | FDB-4615 | FMI | Installer does not properly configure license environment variable |
| | FDB-4603 | Adams | LONSLIP controller supports only 1 axle |
| | FDB-4543 | Matlab | Start script for matlab (start.m) wrongly hard-codes win32 platforms |
| | FDB-4540 | Matlab | Matlab crash specifing a non existing vdf file |

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|---|---|---|---|
| | FDB-4096 | Matlab | Input signal sample time should match VI-Driver sample time |
| | FDB-4078 | | Simulation failure swtiching from openloop steering to machine with CONNECT_PATH option |
| | FDB-4053 | | EDS module does not support target speed map function of time |
| | FDB-4434 | Adams | 'vidriver_vehicle_params_array' ignores a Flex Chassis |
| | FDB-4405 | | Wrong engine pwr map default in VI-EventBuilder |
| | FDB-4388 | | VI-EventBuilder: missing parameters in [VEHICLE_PARAMETER] |
| | FDB-4363 | | VI-EventBuilder does not support NEXT_MANEUVER name |
| | FDB-4332 | | SetStartup api does not update output |
| | FDB-4286 | | Signal auto_scale and auto_saturate attributes are wrongly managed |
| | FDB-4204 | | VI-EventBuilder numerical path block miss some columns |
| | FDB-4151 | | Support skidpad exit section |
| | FDB-4106 | | VI-EventBuilder doesn't start from matlab interface |
| | FDB-4105 | Matlab | Additional outputs from Matlab interface |
| | FDB-4103 | Matlab | Add generic channels for end conditions |
| | FDB-4101 | Matlab | Update vidriver_sample using end_condition channels and user channels |
| | FDB-4100 | Matlab | VI-EventBuilder startup file not removed from working directory |
| | FDB-4097 | | Add an option to stop simulation when a maneuver hits abort time |
| | FDB-4094 | | Missing standard end condition names in EventBuilder |
| | FDB-4055 | | Possible crash during EDS initialization |
| | FDB-4054 | | VI-EventBuidler Gear Mapped Data block supports only 5 gears |
| | FDB-4040 | | VI-EventBuilder: calc_mode=relative misread when opening vdf |
| | FDB-3974 | Matlab | External input for Maneuver ID |
| | FDB-3896 | Matlab | Define a proper set end condition |
| | FDB-3880 | Matlab | VI-Driver activity flag as output channel |
| | FDB-3846 | Matlab | Support for external controllers |
| | FDB-3835 | | VDF parameters mismatch during reading/saving procedure |
| | FDB-3816 | | VI-EventBuilder rider motion library component wrongly defined |
| | FDB-3813 | Adams | Support for Adams 2015 |
| | FDB-3797 | | VI-EventBuilder --> Save VDF file (direct button) doesn't work |
| | FDB-3793 | FMI | Support for FMI 2.0 |
| | FDB-3784 | | VI-EventBuilder crash when 'connect to' action is applied to an input port |
| | FDB-3070 | | Improve error management in VDF Converter |
| | FDB-2523 | | Spike on computation time for closed paths |
| | FDB-1709 | Matlab | Support user defined signal |
| | FDB-601 | | Minimum skidpad path length is hardcoded to 1000m |

## 1.7.6 Release 16.0

| Version | Change ID | Module | Change |
|---|---|---|---|
| 16.0 | FDB-3564 | Matlab | Integrate documentation of unsupported functionalities for matlab version of VI-Driver |
| | FDB-3204 | | VDF converter misunderstand SDF yaw controller activation state |
| | FDB-3200 | | VDF converter ignore the straight setup mode in Adams Car event files |

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|---|---|---|---|
| | FDB-3169 | Adams | Longidudinal slip controller is broken in v15 |
| | FDB-3151 | | Unexpected different clutch behavior for gear machine or openloop |
| | FDB-2992 | Adams | Support for Adams 2013.2 |
| | FDB-2979 | | Human driver model evolution to adopt an optimization process on cost function |
| | FDB-2972 | | Graphical interface for creating/editing event files (VI-EventBuilder) |
| | FDB-2889 | | Controller settings block should be maneuver specific |
| | FDB-2590 | Adams | Wrong ACF file is generated with SI2 and HHT integrators |
| | FDB-2453 | FMI | New package VI-Driver for FMI to enable usage of VI-Driver in FMI enabled environments |
| | FDB-2352 | Adams | Macro errors reported generating VDF for vehicle with many gears |
| | FDB-1205 | Adams | Event initial conditions are duplicated in VDF and auxiliary VDF file |

## 1.7.7 Release 15.0

| Version | Change ID | Module | Change |
|---|---|---|---|
| 15.0 | FDB-2868 | Matlab | Support for grt and rsim targets |
| | FDB-2713 | Matlab | Unify 32 and 64 bit installation packages |
| | FDB-2589 | Adams | Initial setup = 'STANDARD' incorrectly activate initial condition setup |
| | FDB-2553 | Adams | New tool to convert Adams Car XML and SDF event files to VDF |
| | FDB-2547 | Adams | Support for Adams 2013 |
| | FDB-2447 | | Gear shifting parameters defined as function of path_s |
| | FDB-2244 | Adams | Initial condition can be inaccurate using CXX solver with STRAIGHT setup mode |
| | FDB-2188 | Adams | Support for plain Adams/Solver vehicle models |
| | FDB-1896 | Adams | Unclear message is reported when startup speed differs from first point of DRD based speed map |
| | FDB-1889 | Adams | Velocity end condition may trigger incorrectly at time=0.0 |
| | FDB-1489 | | Support more human driver skill levels |
| | FDB-1482 | | Human driver computation mode |
| | FDB-1294 | Adams | Could not run simulation once VI-Driver completes the maneuvers set |
| | FDB-1044 | | Brake demand increases when a downshift occurs |

## 1.7.8 Release 14.0

| Version | Change ID | Module | Change |
|---|---|---|---|
| 14.0 | FDB-2081 | Matlab | Introduced specific license protection |
| | FDB-2052 | Adams | Missing warning about overwriting existing installations |
| | FDB-1989 | Adams | Engine speed initialized to 0 for models iincluding Adams/Driveline components |
| | FDB-1986 | Adams | Errors loading VI-driver module with some loaded assemblies |
| | FDB-1935 | Adams | The key INITIAL_SETUP='SETTLE' can produce wrong initial setting for throttle brake signals |
| | FDB-1895 | | Random crash on simulation termination |
| | FDB-1708 | | Add capability of starting vehicles with manual transmission from zero speed |
| | FDB-1067 | | Improve error messages from steering controller |

| | | | |
|---|---|---|---|
| | FDB-994 | | Support acceleration tracking mode for longitudinal controller |

## 1.7.9 Release 13.1

| Version | Change ID | Module | Change |
|---|---|---|---|
| 13.1 | FDB-1707 | Adams | VDF files generated with the path compensation procedure does not include all settings from the original VDF |
| | FDB-1703 | Adams | Separatte target plugin directory from other VI-grade modules |
| | FDB-1691 | Matlab | VI-Driver Mex integration time is not connected to the VDF file specification |
| | FDB-1688 | | Differentiate gearshifting parameters between upshift and downshift conditons |
| | FDB-1681 | | Support PATH_S as independent variable for DCD based signals |
| | FDB-1678 | Matlab | VI-Driver messages are not shown in the matlab console |
| | FDB-1648 | Adams | Inlcude the Tire Longitudinal slip controller in VDF creation |
| | FDB-1619 | Adams | Path compensation request should support multiple instances |
| | FDB-1607 | Adams | VI-Driver initial condition setup activation is disconneted from event file setting |
| | FDB-1599 | Adams | Adams/Solver output step affects VI-Driver calculation |
| | FDB-1571 | | Tire longitudinal slip controller formulation improvements to generate more continous throttle corrections |
| | FDB-1539 | | VI-Driver idle controller may fail on maneuver trigger |
| | FDB-1535 | Adams | VDF file created for VI-SpeeGen does not include all available data blocks. |
| | FDB-1477 | Adams | Several SmartDriver warnings are dumped in the message file running VI-Driver events |
| | FDB-1407 | Adams | Updating VDF file based on drd may lead to initial speed mismatches. |
| | FDB-1352 | Adams | Tire Longitudinal slip controller data block is lost during VDF update process |
| | FDB-1348 | Adams | Running VI-Driver events with ADAMS/Driveline model may lead to incorrect initial gear selection (3rd) |
| | FDB-154 | Matlab | Print product banner with version/revision number |
| | FDB-116 | Adams | One step delay in maneuver termination |

## 1.7.10 Release 13.0

| Version | Change ID | Module | Change |
|---|---|---|---|
| 13.0 | FDB-1381 | | driver setup may not converge for high initial speed |
| | FDB-1301 | | Detect error condition when string is not terminated in VDF file |
| | FDB-1231 | | Added missing URL info in version banner |
| | FDB-1216 | | Created package documentation |
| | FDB-1213 | | Fixed compatibility with Adams/Driverline events |
| | FDB-1204 | | Support for cubic map interpolation |
| | FDB-1203 | | Support for map scaling factor |
| | FDB-1195 | | Fixed VDF dump of longitudinal slip controller data |
| | FDB-1181 | | Support for Adams 2010 |
| | FDB-1142 | | Fixed crash enabling EDS with speed set to maintain |
| | FDB-1085 | | Prevent gearshifting when tires spin |

| | | | |
|---|---|---|---|
| | FDB-1043 | | Fixed controls compatibility from Adams Car |
| | FDB-1042 | | Generate matlab interface file for cosimulation mode |
| | FDB-1040 | | Support for variable steering ratio |
| | FDB-1039 | | Simulink does not stop integrating on license error |
| | FDB-993 | | Support absolute/relative s_coord in map interpolation |
| | FDB-991 | | Support transmission efficiency coefficient |
| | FDB-889 | | Prevent extreme resizing of Adams dialog boxes |
| | FDB-885 | | Support for gearshifting with no clutch/throttle actuation |
| | FDB-504 | | Support rate limiter for throttle, brake and steering demand |


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