VR-Vantage 3.0.2 Release Notes

This release note contains the following release-specific information for VR-Vantage 3.0.2.

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Systems Supported and System Requirements

For the most up-to-date information about systems supported, see the MAK ONE Product Specifications & Dependencies page on the MAK web site at: https://www.mak.com/mak-one/support/help/specs. For hardware requirements, see https://www.mak.com/mak-one/support/help/hardware-recommendations.

VR-Vantage 3.0.2 is available for the platforms listed in Table 1. For toolkit users, application code must be built with the indicated compilers in order to link to VR-Vantage libraries.

Table 1. Platforms supported

Operating System	Compiler
Windows 10	Microsoft Visual C++ 15.0 (64-bit)
Red Hat Enterprise Linux 8.0 (64-bit libraries)	default compiler
CentOS — versions that are equivalent to supported versions of Red Hat Linux.	default compiler

3D Video Cards Supported

VR-Vantage 3.0.2 supports NVIDIA graphics cards that support OpenGL 4.5 or above. While we support NVIDIA Quadro cards, we strongly recommend GeForce cards. If you use a Kepler Series Quadro card, read the instructions in "Using Kepler Series Quadro Cards" on the facing page. VR-Vantage does not support AMD (formerly ATI) graphics hardware.

VR-Vantage strives to provide the best 3D scene quality possible and cutting edge visualization effects. To provide this functionality, VR-Vantage takes advantage of OpenGL features that may not be supported on older video cards. When this is the case, you can disable these features, allowing VR-Vantage to run in 3D modes.

OpenGL 4.5 is the minimum requirement for rendering a 3D scene in VR-Vantage. For the best visual quality and highest performance, you should use the most recent NVIDIA GeForce card. The minimum recommended card is 2070 or better.

Some laptops have an NVIDIA graphics card and an Intel graphics card. You must configure your computer to use the NVIDIA card. To do so:

1. Open the NVIDIA Control Panel (in the System Tray).
2. Select Manage 3D Settings.
3. Select Global Settings.
4. Select Preferred Graphics Processor.
5. Select High-performance NVIDIA Processor.

You should always try to use the latest drivers available for your video card. For video streaming on Windows, you must use driver 397.44 or later. For video streaming on Linux, you must use driver 387.26 or later.

If you use an external monitor with your laptop and your laptop is not using the NVIDIA graphics card when running VR-Vantage, try setting the main display to be the laptop's built-in monitor instead of an external monitor.

Using Kepler Series Quadro Cards

There is a known issue with the Quadro drivers on Kepler series Quadro cards. NVIDIA says it's related to the fact that the default profile optimizes for a fixed eyepoint (for applications like CAD). To run on these cards, you must change the global profile for the driver, as follows:

1. Open the NVIDIA Control Panel.
2. Select the Manage 3D Settings page.
3. Select the Global Settings tab.
4. In the list of driver profiles, select Workstation App - Dynamic Streaming.

We are working with NVIDIA to have their drivers recognize our applications and apply this profile automatically. In the meantime, for Kepler series Quadro you must make this change manually.

Disk Space Requirements

A full installation of VR-Vantage requires approximately 6.3 GB of disk space and an additional 50.3 GB for the complete MAK data package.

Compiler Compatibility on Windows

MAK provides versions of product releases that have been compiled with different versions of Microsoft Visual C++ (for example, 12.0 and 15.0). When you run MAK products together on the same computer, for example, VR-Vantage, we strongly recommend that you run versions compiled with the same compiler. Mixing products compiled with different versions of the compiler can result in program instability. The exception to this is that products built with VC 14 and VC 15 are binary compatible.

Required Software for Toolkit Users

If you plan to build VR-Vantage applications using the VR-Vantage Toolkit, you must download and install VR-Link 5.8.

If you plan to build the VR-Vantage GUI, you must download and install Qt 5.15.2 (Windows VC 15 and Linux Red Hat 8). You can download it at: https://www.mak.com/mak-one/support/help/bonus-material.

Qt is also available as a free download under the LGPL version 2.1 license at https://www.qt.io. This version should be satisfactory for most VR-Vantage customers. If you need a Qt commercial license, you must purchase the license from Qt.

License Manager

VR-Vantage 3.0.2 uses FLEXlm 11.17.1. You must install the license management software to run VR-Vantage. If you are upgrading from a version of VR-Vantage that used an older version of FLEXlm, you must upgrade your license management files. You do not need a new license. Licenses are forward compatible.

The License Manager files are not part of the VR-Vantage installer. You can download them at:

- Windows: Windows License Manager Installer (64-bit)
- Linux: Linux License Manager Installer (64-bit)

Installation of the license manager is covered in the *MAK ONE Installation Guide*, available online at https://mak.com/mak-one-installation-guide. Support is also available at https://www.mak.com/mak-one/support/portal.

Third-Party Libraries Supported

VR-Vantage 3.0.2 uses the indicated versions of the following libraries:

- VR-Link 5.8
- Qt 5.15.2 (VC 15 and Red Hat 8)
- OpenSceneGraph 3.6.4
- Boost 1.63.0
- FreeGlut 2.4.0 (Windows), 2.6.0 (Linux)
- GL-Studio 7.0 (VC 15)
- DI-Guy 13.6 (development version)
- Triton 4.43
- Silverlining 6.20
- SpeedTree 6.3.2
- CDB API 2.2 (Windows), 2.1 (Linux)
- osgEarth 3.2
- CUDA 9.2 (Windows), 10.2 (Linux)
- CIGI - CCL 4.0.4

Using MAK Products on Virtual Machines

You can run MAK products on virtual machines. For more information, see the *Running MAK ONE Products on Virtual Machines or Docker Containers* guide on our website at https://www.mak.com/docs/support/MAK_ONE_Running_On_Virtual_Machines.pdf.

The makData Package

MAK applications can share the same data package. A complete installation of the makData 16 package requires about 50.3 GB of space, including the supplemental data package. For instructions on installing the data, see "Installing the makData Package" in the *VR-Vantage Users Guide*.

Network Compatibility

VR-Vantage 3.0.2 is compliant with RPR FOM 1.0 and RPR FOM 2.0 and includes FOM mappers for many draft versions of the RPR FOM. It is compliant with RTIs that support the HLA 1.3 specification, the SISO DLC HLA API 1516 version of the IEEE 1516 specification (SISO-STD-004.1-2004), or HLA Evolved. MAK recommends HLA Evolved.

To use an RTI with VR-Vantage, it must use the same operating system and be built with the same compiler.

VR-Vantage 3.0.2 supports DIS 4, 5, 6, and 7, and can therefore interoperate with DIS applications of any of these versions. MAK recommends DIS 7.

Backward Compatibility

VR-Vantage 3.0.2 applications and some files are not backward compatible. Specific incompatibilities are as follows:

- Applications from a given release cannot control display engines from a different release. (In other words, a VR-Vantage 3.0.2 application cannot control a VR-Vantage 2.4 display engine.)
- Plug-ins built against one version cannot be used with the other.
- Model files (MEDF and MEIF) built with one version do not work with the other.

Support for MAK Data Logger Recordings

While VR-Vantage 3.0.2 works with all recent versions of the MAK Data Logger, please know:

- Versions of the MAK Data older than 5.5.1 (released in May 2018) have known problems with the encoding of DIS 7 Attributes, which can cause crashes in MAK products.
- Most new versions of MAK products contain FOM updates. To successfully play logger tapes that were recorded with earlier FOM versions, the matching (earlier) FOM version must be properly configured in each federate. This mean, for example, that HLA Logger recordings in MAK Logger 5.9 require VR-Vantage 3.0.2 to use the FOM modules that were used to record these files, not the default FOM configuration in VR-Vantage 3.0.2. The MAK Data Logger is forward compatible, however, so older MAK Data Logger versions can be configured to record and work with VR-Forces 5.0 and VR-Vantage 3.0.2 FOM. You simply need to copy the FOM files to the older MAK Data Logger installation and configure them correctly. Refer to the *MAK Data Logger Users Guide* for details.

New Features and Updates

VR-Vantage 3.0.2 has the following updates.

- Added support to render all UI into only a single eye of the VR overlay.
- Buildings can enable externally referenced features. VR-Vantage now gets the name of the FeatureSource directly from the BuildingLayer, rather than trying to get it from the configuration. This improves the performance of loading OSM data.

API Changes

- Decoupled DtWorldMagneticModel from the DtCoordinate system. Moved it to vrvCore and made it instance-able on DtDe and DtBaseConnection. Created a DtWorldMagneticModel in DtDeSharedState and registered it with DtDe.
- Updated the OpenFlight API to 22.0, removing MSVC2005 distributable dependencies. Removed the NVTT (NVIDIA Texture Tools) libraries.

For information on the features included in 3.0 and 3.0.1, see the *VR-Vantage 3.0 Release Notes* and *VR-Vantage 3.0.1 Release Notes* (found in the *./doc* folder of the installation).

Table 2. Fixed Bugs

Key	Summary	Release Notes	Fix Version/s
VRV-4308	When a window is closed, other open windows will flicker.	VR-Vantage no longer deletes cube map data for all windows when only one window or channel is shut down. This prevents the flickering in the windows or channels that are not closed.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1b
VRV-4320	Runway lights on Rhone Valley float in air after reloading the terrain	Fixed the setup of the topo frame to ensure that the runway lights display correctly.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1c
VRV-4330	Focus View in VR/MR culls terrain	VR-Vantage now accounts for the extremities of both eyes when calculating the frustum angles of the actual OSG camera used for culling. This fix was made primarily to support Varjo headsets.	VRV-3.0.2
VRV-4336	CIGI HAT/HOT Responses are wrong in geocentric	Fixed the calculation to use the real down vector to ensure that it works in geocentric terrains. Previously, the calculation only worked on projected terrains.	VRV-3.1, VRV-IPB16, VRV-2.8g, VRV-3.0.2, VRV-3.0.1a
VRV-4340	Creating objects that use a coord system converter are inadvertently creating (and initializing) a Magnetic Model instance	Decoupled DtWorldMagneticModel from the DtCoordinate system. Moved it to vrvCore and made it instance-able on DtDe and DtBaseConnection. Created a DtWorldMagneticModel in DtDeSharedState and registered it with DtDe.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1b
VRV-4343	Procedural Building Roofs have lighting problems when indirect rendering is turned off.	Updated to use appropriate effect textures when indirect is not enabled.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1c
VRV-4348	PVD Entity Heading Indicator is wrong when zoomed in.	Fixed the heading indicator in the 2D view to work regardless of the observer's zoom level. The application now correctly computes the heading indicator in topographic coordinates.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1b

Table 2. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix Version/s
VRV-4376	Loading CDB terrain causes hang with 1 model in indirect rendering	Fixed a bug in the CDB loader that caused the application to hang if there is a feature in the top-level node/shape file.	VRV-3.1, VRV-IPB16, VRV-2.8g, VRV-3.0.2, VRV-3.0.1b
VRV-4385	Bind observers broken with offset	Fixed too ensure that bind observers view the desired offset.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4388	Reverse name map in DtElementAttributeManager breaks down with same display name	Application no longer uses the elementId to displayName map for general purpose use, because it is valid only if there are no duplicate display names. The VR-Forces GUI can use duplicate display names. We now use the ElementAttribute instead of depending on the reverse map.	VRV-3.1, VRV-2.8g, VRV-3.0.2, VRV-3.0.1c
VRV-4409	SilverLining MultiView shader causes slowdown in VR/MR	Modified a function in SilverLining to improve the time it takes to toggle VR.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4422	CDB Cache for elevation clamping is not created anymore	Fixed to ensure that directories are created in the cache, specifically files ending with .elev_cache.	VRV-3.1, VRV-3.0.2
VRV-4429	When view is magnified in VR some tiles will be incorrectly culled out.	Corrected the zoom values to prevent culling problems.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4441	Landcover splatting with CDB terrains can be misaligned.	Fixed a bug that caused some imagery to be misaligned on CDB databases.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d
VRV-4454	Editing bullseye in VRF removes bullseye from selection toolbar	There was an issue where moving a Bullseye would cause it to disappear from the list in the Bullseye Selection toolbar. This is fixed.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d
VRV-4455	Adding a Channel creates new SpeedTree shader set which causes slowdown	SpeedTree now checks whether it should add a new shader set to ensure it does not create more than it should.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d

Table 2. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix Version/s
VRV-4459	DDM formatting was broken.	Fixed a bug the prevented coordinates from displaying in DDM format.	VRV-3.0.2, VRV-3.0.1d
VRV-4469	The Compass should not be rendered when there is no terrain loaded.	The compass now only displays when a terrain is loaded.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4484	Allow Selection of Ghosted Objects (2D Only) does get applied for newly created aggregates	Fixed to ensure that newly created units recognize the setting of the Allow Selection of Ghosted Objects (2D Only) display setting.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d
VRV-4494	Increasing magnification and tilting your eyepoint causes some terrain tiles to display at a lower LOD	Restored the intended behavior: the application uses the current FOV to determine whether the distance to a tile should be reduced when using view magnification while constraining it to no less than a value specified by terrainMagnificationHighLodAngle.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4503	LOD Scaling not working for articulated models	The application now considers the magnification factor when culling. This ensures that when the observer is zoomed in, they will see models correctly.	VRV-3.1, VRV-IPB16, VRV-3.0.2, VRV-3.0.1d
VRV-4522	Need to remove CIGI mapping to M113APC model definition that no longer exists	Removed mapping for TrackM113ArmoredPersonnelCarrier (entity type #3302). There is no longer a model that can be configured for use with CIGI.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4524	Clean up spurious console messages.	Added code to suppress OSG notify during inset window creation.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4525	Remove incorrect console message about FBO Deletion	Suppressed message to debug level.	VRV-3.0.2
VRV-4526	Creating a PVD window generates a warning on the console about a nullptr	Fixed the code to better handle the initialization pattern.	VRV-3.1, VRV-IPB16, VRV-3.0.2
VRV-4527	Correctly read ../data/Environment/Ocean/ocean-mask-texture.tif	Fixed how the image is read to resolve the issue that was causing the warning in the console.	VRV-3.1, VRV-IPB16, VRV-3.0.2

Table 2. Fixed Bugs (continued)

Key	Summary	Release Notes	Fix Version/s
VRV-4552	Running the VR-Vantage examples requires cmake when it shouldn't	Fixed to allow users to build and run VR-Vantage examples without having cmake.	VRV-3.1, VRV-3.0.2
VRV-4598	DI-Guy returning from being invisible doesn't get initial update.	Fixed to ensure that the motion model performs the initial update when the fullUpdateNeeded flag is set.	VRV-IPB16, VRV-3.0.2

Known Problems

VR-Vantage has the following known problem:

- If you use the settings covered in "Installing the makData Package" in the *VR-Vantage Users Guide* for the shared data, SensorFX works correctly. If you launch VR-Vantage with SensorFX and see an error about data, however, you can resolve it by setting the JRM_DATA_DIR environment variable to indicate the location where you installed the data. Enter the path to the SensorFX directory in the format *mydatalocation*`/ModelData/sensorFX` where *mydatalocation* is the full path to the *./SharedData/16/latest* directory. An example of the full entry is: `E:/SharedData/16/latest/ModelData/sensorFX`.

For information on other issues that you might encounter while using VR-Vantage, see the *Troubleshooting* appendix in the *VR-Vantage Users Guide*.