



VR-Vantage 2.2

Release Notes

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Systems Supported and System Requirements

This section describes platform support and system requirements for VR-Vantage. To take full advantage of VR-Vantage's visualization capabilities and optimize performance, you must use a modern game computer with a high quality NVidia graphics card.

For the most up-to-date information about systems supported, see the Product Versions page on the MAK web site at: <http://www.mak.com/support/productversions.php>.

VR-Vantage is available for the following operating systems:

Table 1: Platforms supported

Operating System	Compiler
Windows 7, Windows 8, Windows 10	Microsoft Visual C++ 10.0 SP 1 (64 bit) Microsoft Visual C++ 12.0 (64 bit)
Red Hat Enterprise Linux 6.0. (64 bit libraries)	default compiler
CentOS - versions that are equivalent to supported versions of Red Hat Linux.	default compiler



YOU MUST INSTALL THE VR-VANTAGE DATA PACKAGE.

It is not optional. It contains data that is required by VR-Vantage applications.

Third Party Library Support

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

- ♦ VR-Link 5.3.1
- ♦ Qt 5.5.1
- ♦ OpenSceneGraph 3.4.0
- ♦ Boost 1.46.1
- ♦ FreeGlut 2.4.0
- ♦ GL-Studio 5.0.2
- ♦ DI-Guy 13.2
- ♦ Triton 3.73
- ♦ Silverlining 4.59
- ♦ SpeedTree 6.3.2
- ♦ Oculus 0.8

- ♦ osgEarth 2.8.13.

3D Video Cards Supported

VR-Vantage 2.2 supports NVIDIA graphics cards that support OpenGL 3.3 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 page 5. VR-Vantage does not support AMD graphics hardware.



The recommended NVIDIA drivers for VR-Vantage 2.2 are those as close to 376.53 as possible, but no later. Drivers after that date have a minor memory leak issue when running Triton ocean with moving boats. This was a problem with drivers as recent as 378.78. This problem may be fixed in future versions of NVIDIA drivers, but it is safest to use the drivers nearest to 376.53.



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 3.3 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.

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 board.

Using Kepler Series Quadro Cards

There is a known issue with the Quadro drivers on Kepler series Quadro cards. NVIDIA says its 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, Kepler series Quadro you must make this change manually.

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 5.3.1. You can download it from:

- <ftp://ftp.mak.com/out/products/vrlink5.1.3-win-vc10.exe>
- <ftp://ftp.mak.com/out/products/vrlink5.1.3-linux-rh6.tar.gz>

If you plan to build the VR-Vantage GUI, you must download and install QT 5.5.1. You can download it at: <http://www.mak.com/support/resources/bonus-material>.

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

Compiler Compatibility on Windows

MAK provides versions of product releases that have been compiled with different versions of Microsoft Visual C++. When you run MAK products together on the same computer, for example, the Logger and a VR-Vantage application, we strongly recommend that you run versions compiled with the same compiler. Mixing products compiled with different versions of the compiler on the same computer can result in program instability.

License Manager

VR-Vantage 2.2 uses FLEXlm 11.13.0.2.



You must update your License Manager software for this release. You can continue to use old licenses if maintenance is up to date.

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

- ♦ Windows: <ftp://ftp.mak.com/out/MAKLicenseManager-win64-setup.exe>
- ♦ Linux: <ftp://ftp.mak.com/out/MAKLicenseManager-linux64-setup.tar.gz>

A license manager FAQ is available at:

<http://www.mak.com/license-support.html>

Using MAK Products on Virtual Machines

In general, MAK products run on virtual machines without any problems. The exception to this statement is that applications that use 3D graphics, such as VR-Vantage and the VR-Forces front-end, require a graphics card. Standard graphics cards typically do not work with VMs. To use a 3D enabled environment in a VM, please contact your VM vendor for options. NVidia produces the NVidia GRID card, which is designed to solve this problem. Your VM vendor may have additional information. For more information on NVidia GRID, please see <http://www.nvidia.com/object/virtual-gpus.html>



We do not test with GRID cards. They are not supported by MAK. Please work with NVidia and your virtual machine provider to solve any technical issues with their use.

Network Compatibility

HLA only

VR-Vantage 2.2 is compliant with:

- RPR-FOM 0.5, 0.7, 0.8, 1.0, and 2.0 (draft 6, 14, 17, and 20)
- MAK RTI 2.x, 3.x, 4.x
- Pitch RTI 1.3 C++ interface.

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

DIS only

VR-Vantage 2.2 supports DIS 4, 5, 6, and 7 and can therefore interoperate with DIS applications of any of these versions.

FOM Support

VR-Vantage 2.2 has built-in support for versions 0.5, 0.7, 0.8, 1.0, and 2.0, drafts 6, 14, 17, and 20 of the RPR FOM. It also supports VR-Link's ability to support alternative FOMs through the FOM Mapper.

If you want to use VR-Vantage with VR-Forces 3.9 or later and RPR FOM version 2, draft 17, use the *VR-Link20017-1.fed* file.



Please see a known problem regarding MAK Logger recordings that use HLA Evolved ("[Known Problems](#)," on page 16).

New FED File Naming Convention

VR-Vantage 2.2 uses the FOM naming conventions introduced in VR-Link 5.2. This section describes these changes.

Historically, VR-Link has named FED files using the convention VR-Link<*RPR FOM version*>.fed or VR-Link<*RPR FOM version*>.xml. For example, the FED file for RPR FOM 2, draft 17 was *VR-Link20017-1.fed*. This naming scheme has two problems. First, it is confusing for end-users of applications that use VR-Link (but who are not themselves VR-Link customers) to be using a FOM named that way. Second, the file-name was not versioned, so any updates that we would make to the existing FOMs could cause compatibility problems. In fact for this latter reason, we had refrained from fixing a few minor bugs that we found over the years until now.

Effective with this release, VR-Link introduces a new naming convention: MAK-<*FOM name*><*FOM revision*><*FOM version*>.fed (or .xml, or *_evolved.xml*, as appropriate). For example, *VR-Link20017-1.fed* has been renamed *MAK-RPR20017-1-1.fed*.

Additionally, given the power of HLA Evolved FOM Modules, starting with RPR 2.0 we are now providing the RPR standard FOM for HLA Evolved, currently named RPR_FOM_v2.0_1516-2010. MAK's extensions, are in FOM Modules that our software will automatically add to an exercise. This means that if you have another RPR-based FOM, such as NETN or NASMP, you will have a much easier time using it without needing to modify the FOM.

VR-Link continues to include FED files and XML files using the old convention, so you do not have to change any existing scripts or code.

Table 1-1 lists legacy FED files and how they map to new FED files. Many of the FED files delivered in previous releases do not have updated versions, usually because they are rarely used.

Table 1-1: Old FED file to new FED file mappings

Old FOM	New FOM
HLA 1.3	
DI-Guy-13_0.fed	
DI-Guy.fed	
VR-Link.fed	MAK-RPR1-1-1.fed
VR-Link05.fed	
VR-Link07.fed	
VR-Link08.fed	
VR-Link10.fed	MAK-RPR1-1-1.fed
VR-Link16.fed	
VR-Link20006.fed	
VR-Link20014.fed	
VR-Link20017-1.fed	MAK-RPR20017-1-1.fed
VR-Link20017-6.fed	MAK-RPR20017-6-1.fed
VR-Link20017.fed	
VR-Link20020.fed	MAK-RPR2-1-1.fed
VR-LinkBOML16.fed	
VR-LinkDDM.fed	
VR-LinkMC02.fed	MAK-RPR1-MC02-1-1.fed
VR-LinkTM.fed	MAK-RPR1-TimeManagement-1-1.fed
VRL-20017-1-Link16.fed	
VRL-DIGuy20017.fed	
VRL-DIGuy20017DDM.fed	

Table 1-1: Old FED file to new FED file mappings

Old FOM	New FOM
1516-2000	
DI-Guy-13_0.xml	
DI-Guy.xml	
VR-Link.xml	MAK-RPR1-1-1.xml
VR-Link20014.xml	
VR-Link20017-1.xml	MAK-RPR20017-1-1.xml
VR-Link20017-6.xml	MAK-RPR20017-6-1.xml
VR-Link20020.xml	MAK-RPR2-1-1.xml
VR-LinkBOML16.xml	
VR-LinkDDM.xml	
VR-LinkTM.xml	MAK-RPR1-TimeManagement-1-1.xml
VRL-DIGuy20017.xml	
VRL-DIGuy20017DDM.xml	
HLA Evolved	
DIGuyModule_1300.xml	MAK-DIGuy-1_evolved.xml
DIGuyModule_1302.xml	
RPR_FOM_v2.0_draft20_1516-2010.xml	RPR_FOM_v2.0_1516-2010.xml
VR-Link20014_base_evolved.xml	
VR-Link20014_evolved.xml	
VR-Link20017-1_base_evolved.xml	MAK-RPR20017-Base-1-1_evolved.xml
VR-Link20017-1_base_evolved_with-UpdateRate.xml	
VR-Link20017-1_evolved.xml	MAK-RPR20017-1-1_evolved.xml
VR-Link20017-1_evolved_withUpdateRate.xml	
VR-Link20017-6_base_evolved.xml	MAK-RPR20017-Base-6-1_evolved.xml
VR-Link20017-6_evolved.xml	MAK-RPR20017-6-1_evolved.xml
VR-LinkDDM_base_evolved.xml	
VR-LinkDDM_evolved.xml	
VR-Link_LgrControl_evolved.xml	MAK-LgrControl-1_evolved.xml
VR-Link_ViewControl_evolved.xml	
VR-Link_VrlExt_evolved.xml	MAK-VRFExt-1_evolved.xml

Table 1-1: Old FED file to new FED file mappings

Old FOM	New FOM
VR-Link_base_evolved.xml	MAK-RPR1-Base-1-1_evolved.xml
VR-Link_evolved.xml	MAK-RPR1-1-1_evolved.xml
VRL-DIGuy20017DDM_evolved.xml	
VRL-DIGuy20017_evolved.xml	
updateRate.xml	MAK-updateRate-1_evolved.xml
VR-LinkBOML16_module.xml	MAK-BOML16-1_evolved.xml
	MAK-VRFAggregate-1_evolved.xml

Backwards Compatibility

VR-Vantage 2.2 applications and some files are not backwards 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 2.2 application cannot control a VR-Vantage 2.1 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

The recordings provided with MAK Data Logger 5.4 or later use the new FOM naming conventions. These should work seamlessly with the default HLA configurations in VR-Vantage 2.2. If you want to connect VR-Vantage 2.2 to recordings made with previous versions of the Logger, you must change the connection configuration to use the old FOM naming convention.

New Features and Product Updates

VR-Vantage 2.2 has the following new features:

Installation and Startup

- ♦ The installation process has changed slightly. Instead of providing a wizard-style installer for data, the data is in a compressed file. The application installer automatically tries to find the data file. It prompts you to confirm the data file and then uncompresses and installs the data.
- ♦ New command-line options:
 - `--mainScreenNum`. Specifies the number of the screen in which the main window should be displayed.
 - `--useReverseZBuffer`. Use reverse Z buffering to reduce z-fighting when observing the terrain from a distance. Oculus, simulation object labels, shadows, HUDs, and light points do not work with reverse Z buffering.
 - `--enableVSync`. The `--novsync` option has been removed. VSync is disabled by default.
 - `--autoReconnectPeriod`. Specifies the amount of time, in seconds, to wait before trying to attach to disconnected remote displays.
 - `--disableDynamicTerrain`. Disables the dynamic terrain engine.
 - `--entityDefsDir`. Merges in all *.hier* and *.leaf* files in the specified directory. The directory must be *.appData/definitions/Entity/ElementDefinitions*, *.appData/definitions/Aggregate/ElementDefinitions*, or *.appData/definitions/TacticalGraphics/ElementDefinitions* or be subordinate to one of them.
 - `--mergeHierarchyEntityDef`. Imports the specified *.hier* file.
 - `--mergeLeafEntityDef`. Merges in the specified *.leaf* file.
 - `--mergeHierarchyTacticalGraphicsDef`. Merges in the specified tactical graphics *.hier* file.
 - `--mergeLeafTacticalGraphicsDef`. Merges in the specified tactical graphics *.leaf* file.
 - `--mergeHierarchyUnitDef`. Merges in the specified unit *.hier* file.
 - `--mergeLeafUnitDef`. Merges in the specified unit *.leaf* file.
 - `--mergeModelDefs`. Merges in a model definitions file.
 - `--noAppDataModelDefs`. Do not load model definitions at startup.
 - `--noAppDataEntityDefs`, `--noAppDataUnitDefs`, or `--noAppDataTacticalGraphicsDefs`. Do not load element definitions at startup.

Performance

- ♦ Preemptive model loading. You can now specify a list of moving models to load into the scene on start to prevent stalls when the model is first created. For details, please see Section 5.3, “[Preloading Models](#),” in *VR-Vantage Users Guide*.
- ♦ CDB Terrains. Imagery and Elevation data for CDB terrains can be loaded in real time without preprocessing the terrain.
- ♦ Major performance improvements. This release made a number of improvements to reduce stalls as well as load and render-time. In general, you should experience faster, smoother scenes.
- ♦ DI-Guy instancing. VR-Vantage can render significantly more human characters while performing better than previously.

Visual Improvements

- ♦ HDR. VR-Vantage now supports High Dynamic Range lighting, so that the diversity of brightness in a real scene can be more accurately simulated in a rendered scene. For details, please see Section 13.9, “[Using High Dynamic Range Lighting](#),” in *VR-Vantage Users Guide*.
- ♦ Logarithmic Z-Buffering. Users who wish to look at things far in the distance while simultaneously looking at things close to the camera can do so without extensive Z-fighting. For example, a simulated UAV camera can now look at objects in the distance while still seeing parts of the UAV wing.
- ♦ Multiple Model Appearances. Models can be created that contain multiple skins. For example, an open flight model of a commercial airline can have multiple airline paint schemes for the same physical 3D model.
- ♦ Improved Effects. Several screen effects like Lens flare have been greatly improved.

Terrain

- ♦ Open Street Map data. Users of VR-Vantage can now use Open Street Map data stored on a VR-TheWorld server to generate roads, buildings, and point models for a world-wide terrain.
- ♦ Dynamic terrain. VR-Vantage allows changes to OpenFlight models through HLA, DIS, and API calls to support a correlated and robust dynamic terrain environment.
- ♦ Rooftop clutter. Building extrusions can have procedural rooftop clutter (AC units, hatches, and other mechanical items) procedurally added.
- ♦ Complex roofs and multi-floor textures. Building extrusions support multi-story texture diversity and complex rooftops.
- ♦ Point feature replacement. You can replace extruded buildings using specific OpenFlight models to produce more realistic scenes.
- ♦ Ability to quickly reload a terrain. For details, please see Section 3.3.2, “[Reloading a Terrain](#),” in *VR-Vantage Users Guide*.

- ♦ The ability to debug earth files by turning individual layers on and off. For details, please see Section 28.5, “[Debugging Earth Files](#),” in *VR-Vantage Users Guide*.
- ♦ The ability to cache elevation, image, and feature data through the GUI. For details, please see Section 28.1.2, “[Caching earth File Terrain Data](#),” in *VR-Vantage Users Guide*.
- ♦ Ability to determine when OSG data is paged in and out.

Art

- ♦ New terrain, “Brooklyn”, for modeling dense urban areas
- ♦ Many new moving models
- ♦ New weapon models including grenades, and smoke markers
- ♦ Improved emissive textures
- ♦ Destructible buildings in a dedicated test terrain and MAK Earth.
- ♦ A large streaming terrain of Southern California
- ♦ Support for DI-Guy variants (Fat/Skinny).

Infrastructure

- ♦ Visual model configuration. Model and element definitions (how 3D models are defined) can be broken into multiple configuration files, allowing for model configuration overlays on top of VR-Vantage installs. This means customers who configure their own models can create an overlay to apply to a VR-Vantage install without needed to manually edit default model configuration files.
- ♦ The model definition names for DI-Guy characters have changed.
- ♦ You can precache streaming terrains through the VR-Vantage User Interface.
- ♦ You can toggle on and off layers of streaming terrain though the User Interface.
- ♦ Upgrade to Qt 5.5.1.
- ♦ Upgrade to VR-Link 5.3.1.
- ♦ Added support for appearance bit control of tracks and trails. There are two new parameters for both of those visualizers:
 - `attributecontrolname`. A string that specifies which attribute bit to use to control the visualizer. “trailing_effects” would link the visualizer to the trailing effect appearance bit.
 - `attributecomparevalue`. An integer that specifies what value the attribute bit should trigger the visualizer to turn on. If it is not set then any value greater than 0 will turn on the visualizer.

If neither parameter is specified then the behavior defaults back to the old behavior of always being on.

Remote Display Engine

- Display Engine Restart. You can now restart a remote display engine without shutting down and bringing up the whole system.
- Edge blending. The Scalable Displays plugin has been integrated into VR-Vantage. You can load a Scalable Displays projector configuration file without installing additional software.

Documentation Updates

VR-Vantage documentation has been updated for this release.

In order for the H264VLC Out configuration for video streaming to work, the VR-Vantage window's width and height must be even numbers. To find out the dimensions of the window, look at the window's attributes in the Display Engine Configuration Editor (Figure 1).

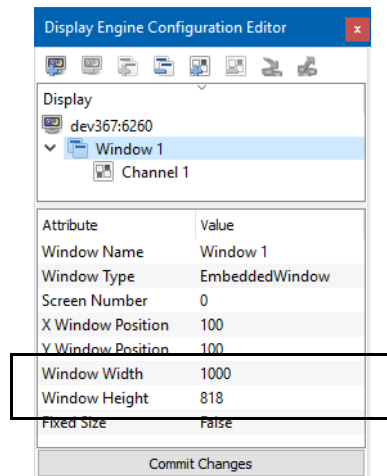


Figure 1. Display Engine Configuration Editor

Fixed Bugs

VR-Vantage 2.2 fixes the following problems that were present in previous releases:

- The API method setSolid was misused in some models. 54702
- The debug version of VR-Vantage Stealth did not work with SensorFX. 57539
- Some simulation object enumerations were not in compliance with the SISO Enumerations document. 55686
- AO multi-textures did not work with specular maps. 57186
- Effects textures with an uppercase extension were not found by the effects texture loaded. 57578

- ♦ After tethering to an entity in PVD mode, the attaching in stealth mode did not attach correctly. 57579
- ♦ Scribe boxes with alpha were handled inconsistently. 57607
- ♦ Added unimplemented functions to DtObserverObject. 57615
- ♦ DtTacticalGraphicModelUpdaterManager::computeHighestTerrainPoint didn't handle the case where the terrain patch is geocentric. 57632
- ♦ Visualizer Definition for trail effect on US flare was missing the **type** parameter. 57660
- ♦ For S57 data, the beacon height adjustment for lights was incorrectly added when 'heightAboveOrigin' was not specified for the model it was attached to. 57674
- ♦ Scalable Plugin did not correctly reinitialize on remote display engines when disconnected and then reconnected. 57716
- ♦ When the main window returned after exiting pseudoFullScreen mode, it had no Title Bar. 57726
- ♦ Crash in destructor of DtVrlinkEntityImageSymbolVisualizer. 57766
- ♦ Use of the mouse to control the flashlight effect had a logic problem. 57777
- ♦ CIGI connection did not set Status to 0 in SOF packet. 57914
- ♦ Post processor uniform names have been changed to have the prefix vrv_ before the old name. For example inputImage is now vrv_inputImage. 57926
- ♦ The example distributed object documentation does not have valid steps for running dcgen because the set output directory menu option was never hooked up. 57927
- ♦ The splash post process effects have a slight offset from the original image where there are not drops. 57944
- ♦ The --ignore_rest command line option did not work. 57980
- ♦ The -n command line option did not work. 58052
- ♦ HUD file paths were not able to use \$(DATA_DIR). 57984
- ♦ The first time a model is loaded in an execution that uses numbers for art part tags instead of strings defined in the model semantics mapper, the parts are not registered correctly. 58154
- ♦ 'Visiting' the DtDiguyOsgRootNode caused a crash. 58156
- ♦ Depth of field performance was poor. 58263
- ♦ Watercraft schema was missing the scale attribute. 58280
- ♦ Instanced models did not support shadows. 58376
- ♦ Terrapage terrains had dark tiles for low LODs. 58399

Known Problems

- ♦ Feature indexing for model layers in osgEarth terrains is not supported by VR-Vantage and must be disabled on all model layers to avoid performance issues and the possibility of crashes:

```
<model>
  <feature_indexing enabled="false"/> <!-- include this with every model
    section for VR-Vantage. If enabled, feature_indexing causes performance
    issues and crashes on Linux -->
  <!-- rest of model layer setup here-->
</model>
```

- ♦ VR-Vantage 2.2 will not display remote objects generated by applications using the vrvControlToolkit that were built with VR-Vantage 2.1. Customers will have to rebuild their application on top of VR-Vantage 2.2 to remotely draw objects to VR-Vantage 2.2 applications.
- ♦ One of the FOM modules delivered with MAK Logger 5.4.1 and earlier, *MAK-VRFAggregate-1_evolved.xml*, was changed by VR-Link 5.3.1, which VR-Vantage 2.2 uses. As a result, HLA Evolved Logger connections may cause crashes in VR-Vantage when used out of the box.

To use the MAK Logger and VR-Vantage together using HLA Evolved, copy the version of *MAK-VRFAggregate-1_evolved.xml* from the MAK Logger into VR-Vantage's *.bin64* directory. Make sure you back up the current version of this file first, as you will still need it to run with any application (including VR-Forces 4.5) that is built on using VR-Link 5.3.1 or later.