



VR-Vantage 2.0 Release Notes

This document provides the following release-specific information for VR-Vantage™ 2.0:

Systems Supported and System Requirements	2
Third Party Library Support	2
3D Video Cards Supported	3
Compiler Compatibility on Windows	3
FLEXIm Support	3
Running the 32-bit Version of VR-Vantage	4
Using MÄK Products on Virtual Machines	4
Network Compatibility	4
FOM Support	4
Backwards Compatibility	5
New Features and Product Updates	5
Documentation Updates	9
Fixed Bugs	10

Copyright © 2015 VT MÄK, 150 Cambridge Park Drive, 3rd Floor, Cambridge, MA 02140 All rights reserved. VR-Exchange™, VR-TheWorld™, VR-Vantage™, DI-Guy™, and DI-Guy Scenario™ are trademarks of VT MÄK. MÄK Technologies®, VR-Forces®, RTIsPy®, B-HAVE®, and VR-Link® are registered trademarks of VT MÄK.

Document ID: VRV-2.0-3-150317

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 MÄK 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 Vista, Windows 7, Windows 8	Microsoft Visual C++ 10.0 (32 and 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 5.1.2
- ♦ Qt 4.7.4
- ♦ OpenSceneGraph 3.1.4
- ♦ Boost 1.46.1
- ♦ FreeGlut 2.4.0
- ♦ GL-Studio 4.2.3
- ♦ DI-Guy 13.0.1
- ♦ Triton 3.10
- ♦ Silverlining 3.040
- ♦ SpeedTree 6.3.2
- ♦ osgEarth 2.6_rev151025.

MÄK will provide modified source code for OSG and osgEarth upon request, as per the OSGPL license. Please contact support@mak.com for download links.

3D Video Cards Supported

VR-Vantage 2.0 supports NVIDIA graphics cards that support OpenGL 3.3 or above. While we support NVidia Quadro cards, we strongly recommend GeForce cards. 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 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.

Compiler Compatibility on Windows

MÄK provides versions of product releases that have been compiled with Microsoft Visual C++ 7.1, 8.0, 9.0, 10.0, and 11.0 (most products are not available for all of these compilers). When you run MÄK products together, 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.

FLEXlm Support

VR-Vantage 2.0 uses FLEXlm 11.11.

Running the 32-bit Version of VR-Vantage

While VR-Vantage is supported on 32-bit operating systems and processors, it is not recommended. Modern applications like VR-Vantage take advantage of large pools of memory to load complicated and beautiful content. Using a 32-bit operating system or machine, will mean some content may not be available, and VR-Vantage may perform worse than with a 64-bit environment.

Using MÄK Products on Virtual Machines

In general, MÄK 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>

Network Compatibility

HLA only

VR-Vantage 2.0 is compliant with:

- ♦ RPR-FOM 0.5, 0.7, 0.8, 1.0, and a subset of 2.0 (draft 6, 14, 17, and 20)
- ♦ MÄK 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 2.0 supports DIS 4, 5, 6, and 7 and can therefore interoperate with DIS applications of any of these versions.

FOM Support

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

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.

Backwards Compatibility

VR-Vantage 2.0 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 2.0 application cannot control a VR-Vantage 1.6 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.

New Features and Product Updates

VR-Vantage 2.0 has the following new features:

- ♦ New command-line options:
 - `-O` | `--hasNTPSyncArg`. Synchronizes ocean and speedtrees between different applications, such as the VR-Forces front-end and VR-Vantage Stealth.
 - `-I` | `--unbatchedRendering`. Disables instancing for multiple instances of identical models.
 - `-S` | `--suppressHatIntersectOnAttach`. Suppress the periodic HAT intersection when attached. This option improves performance if you are attaching the observer to ground entities, but not air entities.
- ♦ SensorFX. SensorFX has been updated to work with VR-Vantage 2.0. For details, please see *SensorFX 2.0 Release Notes*.
- ♦ The Oculus Rift head mounted display is supported.
- ♦ Attempt to force NVidia card use on laptops. VR-Vantage now exports a global symbol used by Optimus (NVidia's laptop graphics management system) to always use the high-performance graphics card.
- ♦ You can now use environment variables for file names anywhere that `APP_DIR`, `DATA_DIR`, and `USER_DIR` are supported, provided the environment variable begins with “`VRVDIR_`”. Any path that matches that variable will have the variable substituted into whatever file is being written and will be resolved when the file is read.
- ♦ SpeedTrees are now synchronized across channels and remote displays. They are also synchronized across multiple independent applications when those applications run on systems with synchronized system clocks (the same way that Triton ocean may be synchronized).
- ♦ Upgraded to OSG 3.1.4.
- ♦ Upgraded to VR-Link 5.1.2, which includes support for DIS 7.
- ♦ VR-Vantage now uses DI-Guy 13.0.
- ♦ VR-Vantage now uses SpeedTree 6.3.2.

- The Boundary Tool has been updated. The executable has been renamed. For details, please see Section 4.5.1, “[Using the Boundary Generation Tool](#)”, in *VR-Vantage Configuration Guide*.
- New and updated terrains to demonstrate streaming features, such as S-57 data and point buildings. (The terrain *VR-TheWorld Online - Mak Earth - with point feature buildings.mtf* is considered to be an experimental terrain. Experimental terrains may cause degraded performance or may have visual problems.) *VR-TheWorld Online - MAK Earth - No Streaming SpeedTrees.mtf* and *MaklandNoSpeedtrees.mtf* have been removed.

Lighting, Shadows, and Other Shader Improvements

- Support for Forward+ lighting. This improvement removes the restriction on the number of lights in the scene.
- Cascaded, shadow map-based shadows. Shadowing is significantly improved. Entities, props, and terrain can all cast shadows and shadows can be cast on them as well. Shadow configuration is managed on the Display Settings dialog box, Shadow Settings page. This page will probably be simplified prior to final release and therefore is not fully documented. Generic descriptions of most parameters are available on the world wide web. For more information, please see Section 16.8, “[Displaying Shadows \(3D Only\)](#)”, in *VR-Vantage Users Guide*.
- Ambient Material Value and Diffuse Material Value. In conjunction with shadows, it is important that the ambient response of modeled materials is compatible. You can now allow VR-Vantage to set the ambient material value and diffuse material value to be used for all objects in a scene and to scale the current ambient value(s) in use, whether ours or the values on the modeled materials. For more information, please see Section 16.6, “[Configuring the Material Ambient and Diffuse Values](#)”, in *VR-Vantage Users Guide*.
- Emissive Maps for Day/Night. VR-Vantage now supports Emissive Maps that can be used to control the emissivity of whatever is applied to based on the current ambient light values. These maps use a naming scheme similar to the way our specular and normal maps work – texture names that end with `_EMM` are recognized as Emissive Maps. For more information, please see Section 3.6, “[Using Shader-based Effects Maps](#)”, in *VR-Vantage Configuration Guide*.
- Dynamic reloading of shaders. Developers who are updating shaders can reload them while VR-Vantage is running. For details, please see Section 3.6.1, “[Reloading Shaders](#)”, in *VR-Vantage Configuration Guide*.
- Anti-aliasing is supported when rendering to a texture buffer rather than the screen. This means it is now supported on post-processor effects such as rain splash and depth of field.
- Ability to set the regeneration threshold for the skybox cube map. For details, please see Section 16.7, “[Configuring the Skybox Cube Map](#)” in *VR-Vantage Users Guide*.
- Ability to change which shaders are visualized for a 3D model.

Marine

- ♦ Support for S-57 data, as follows:
 - Streaming buoys and beacons. VR-Vantage can display buoys, beacons, and navigation lights based on data in shape files or S-57 data. To view buoys, load *VRTW - Massachusetts S-57 buoys.mtf* and zoom into Boston harbor. Turning on model scaling may help you to see them more easily. For more information, please see Section 4.8, “[Streaming Buoys and Beacons](#)”, in *VR-Vantage Configuration Guide*.
 - Signal sequence generation. If S-57 data for beacons and buoys does not include signal sequence information, VR-Vantage tries to generate one. For details, please see Section 4.8.6, “[Generating Signal Sequences](#)”, in *VR-Vantage Configuration Guide*.
 - Multicolor (alternating) navigational aid lights are now supported.
 - Streaming daymarks for buoys are supported. For details, please see Section 4.8.5, “[Streaming Daymarks](#)”, in *VR-Vantage Configuration Guide*.
- ♦ The maximum ocean height that can be specified from the GUI has been increased to 5000 m.
- ♦ Tidal stream wakes. Tidal stream wakes are wake effects around buoys and beacons caused by movement of the tides around them. For more information, please see Section 7.6.1, “[Configuring Tidal Stream Wakes](#)”, in *VR-Vantage Configuration Guide*.
- ♦ Ability to set the ocean height map size, texture, and regeneration threshold. For details, please see Section 3.5.4, “[Configuring the Ocean Height Map](#)” in *VR-Vantage Configuration Guide*.
- ♦ Buoyancy model. You can now turn off the buoyancy model for watercraft entities. The parameter `autoBuoyancy` has been added to the watercraft model definition schema. The default (unspecified) is `true`. Add `autoBuoyancy false` to disable the buoyancy model from entities created using that model definition.

Modeling Features

- ♦ Depth of Field. When enabled, the Stealth view is focused only within the focal depth and range. For details, please see Section 10.11, “[Using the Depth of Field Effect](#)”, in *VR-Vantage Users Guide*.
- ♦ Display of laser designators. For more information, please see Section 10.14, “[Displaying Laser Designators](#)”, in *VR-Vantage Users Guide*.
- ♦ Particle systems are affected by wind.
- ♦ Support for animated flags and windsocks.
- ♦ New render settings for high quality rotor wash, and sea spray particle effects.

Performance

- ♦ Improved performance and visual quality. In addition to all the specific features listed in this section, VR-Vantage 2.0 has significantly improved performance through changes to underlying APIs and rendering approaches.
- ♦ Batched instance rendering (instancing). This can greatly reduce the GPU time to render multiple entities of the same type. Instancing is disabled using the `-I` or `--unbatchedRendering` command line argument. Default: enabled.
- ♦ Updated performance statistics display and new function profiler. For information about using the function profiler, please see Section 11 in *VR-Vantage Developers Guide*.

Improved CIGI Support

This release adds the following new CIGI features:

- ♦ DI-Guy characters are amphibious. DI-Guys received in CIGI now get a water clamping updater that will make these models buoyant when in dynamic ocean.
- ♦ Support for a waterline offset in CIGI. Our CIGI implementation now allows the host to specify a waterline offset for watercraft and character entities. This can be specified using either an entity component control or short component control message. Component ID 5 (entity component class) is used to specify the floating point waterline offset.
 - Add ability to change observer mode (for example, out the window vs. sensor) through CIGI. The CIGI View Definition packet's ViewType field can now be mapped to an observer mode. The mapping is done using the CIGI Observer Mode Mapping page in the CIGI Mappings dialog box.
 - Support for sinking ships. Sinking support is started by setting the Entity Control packet's Animation State to Play. Setting it to Stop will restore the ship to normal buoyancy. The way this works is that the host lowers the altitude of the ship to simulate sinking, while the buoyancy model attempts to adjust the buoyancy of the ship to approximate the altitude sent from the host. When the ship is below the waterline, the buoyancy model disengages, and the host altitude is used exclusively.

- ♦ A new package, `cigiExt`, contains the include file, export libraries and DLLs needed to send the new CIGI DI-Guy control packet. This is not an overlay to the normal VR-Vantage installation. Everything in this package is already in the VR-Vantage release (if you install the toolkit). The separate package is necessary for customers using CIGI to control VR-Vantage without a dev kit, but also means that you do not need to go find the necessary files in our dev tree that you will need to add the packet to your host; so think of it as a separate package, similar to the CIGI Class Library.

The packet's specification contains documentation. The DI-Guy's character model and appearance are part of the model definition used to create the DI-Guy, so these two are not included in the packet. Note that not all postures/animations/weapon states can be combined with DI-Guys. For example, you can't give the character a sitting posture and a jogging animation or a prone position and a stowed weapon, and so on. Keep that in mind as you are testing with the new packet.

- ♦ It is now possible to send CIGI packets (including custom packets) using:

```
DtCigiConnection::sendUserPacket( DtCigiBasePacket* packet );
```

For custom packets, you still need to register the packet for sending. The user needs to create the packet and pass a pointer to it to the connection. The connection will then include that packet in the next CIGI message it builds (and then deletes the packet).

- ♦ Support for user-defined CIGI packets. For details, please see *DtCigiDiGuyCtrl.h*.

API Changes

We have renamed header files in the `makTerrainToolkit` and `vrFVrlinkExtToolkit` libraries for clarity, so that they will better match class names and make things easier to find. This release includes tools to help make this part of the upgrade process easy:

- ♦ In the `./compatibility` folder, there is a command line tool you can run to upgrade the header file references in your code. Instructions for how to do this are in `./compatibility/readme.txt`.
- ♦ Alternatively, header files with the old names have been added to `./include/compatibility`. They point to the new files. You can add this directory to your project's include paths.

Documentation Updates

VR-Vantage Configuration Guide and *VR-Vantage Users Guide* have been updated to describe new features. Some video tutorials have not been updated. Although there have been some changes to the GUI and slight changes to the written procedures, the procedures they illustrate have not changed.

Step 4 in the procedure in Section 16.3.1, “[Configuring Ocean Planar Reflections](#),” in *VR-Vantage Users Guide* is not valid. The Ocean Planar Reflections Specific Far Clip check box and its associated slider were not part of the final version of VR-Vantage.

Fixed Bugs

VR-Vantage 2.0 fixes the following problems that were present in previous releases:

- ♦ If you load the MAK Earth terrain after you have loaded other terrains, it does not page in the highest LODs. 51151
- ♦ If you attach the observer to an entity that is displaying communications lines and you turn off communications lines, VR-Vantage crashes. 51120
- ♦ If precipitation is enabled and you open an inset window, it may stop. 50480
- ♦ Restoring CameraFX sensors to factory settings breaks the sensors. 51159
- ♦ Lights without sequences are not on all the time.
- ♦ The implementation of the CIGI Celestial Sphere message did not allow the Ephemeris model to be enabled/disabled unless a time and date were also specified. This has been corrected.
- ♦ CIGI entities now cast shadows.
- ♦ There was a bug in the CIGI code regarding embarked entities which prevented them from having velocities (which DI-Guy uses to choose its animations). This has been fixed.