



VR-Vantage IG

First Experience

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VR-Vantage IG First Experience

Thank you for deciding to try out VR-Vantage IG. VR-Vantage IG is a configurable desktop image generator that provides realistic 3D scenes of your virtual simulation environment. It lets you control multiple distributed display engine windows and channels from a centralized location.

This first experience with VR-Vantage IG will be a quick guided tour of some its most important features. To get the full experience you will need:

- ♦ VR-Vantage IG installed on two computers on the same network. (The second computer is required to try the remote display engine tutorial.)
- ♦ MAK Data Logger.

Before you begin, install and license the software. Please see [“Installation and Licensing,”](#) on page 23 for instructions.

When you are ready, this guide will help you:

- ♦ [Load and Explore a Terrain](#)
- ♦ [View a Simulation](#)
- ♦ [Explore Streaming Terrain](#)
- ♦ [Manipulate Objects in the Scene](#)
- ♦ [Attach to an Entity that has a Cockpit Display](#)
- ♦ [Save and Load Display Engine Configurations](#)
- ♦ [Continue to Explore VR-Vantage IG.](#)

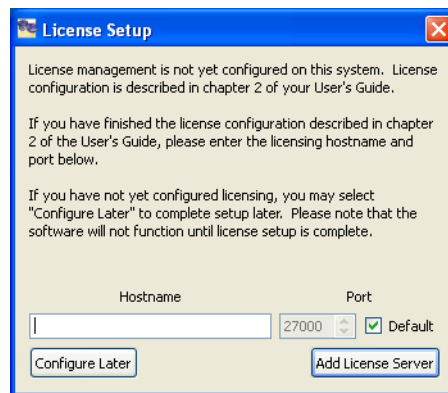
VR-Vantage IG is part of MAK’s VR-Vantage product line. VR-Vantage IG is built using the VR-Vantage Toolkit. Using the toolkit, developers can extend the capabilities of our applications and can create entirely new applications. For more information, please read *VR-Vantage Developers Guide*, which is in the `./doc` directory.

1. Start VR-Vantage IG

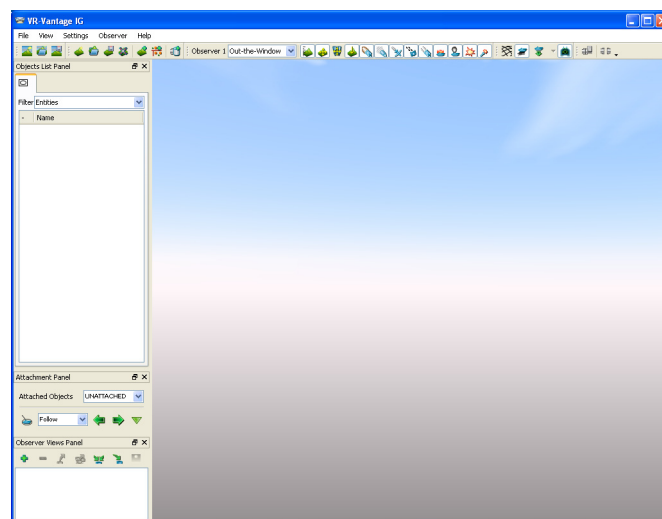
- On the Start menu, choose **Programs** → **MÄK Technologies** → **VR-Vantage 1.2** → **VR-Vantage IG**. VR-Vantage IG starts up. (The first time you run VR-Vantage IG, you will have to specify the license server.)

1.1. Specify the License Server

The first time you run a MÄK application on a computer, the License Setup dialog box opens. It prompts you to enter the hostname of the license server and optionally, a port number.



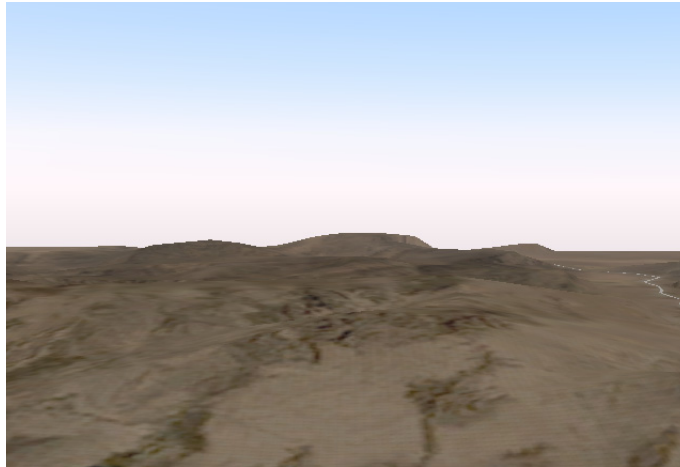
1. Type the hostname in the Hostname box. This is the name you gave your salesperson when you requested the license file. (For details, please see (Section B.1, ["Identify the Host ID and License Server Hostname"](#)).)
2. Click Add License Server. VR-Vantage IG starts.



2. Load and Explore a Terrain

To view a simulation, you must load a terrain database.

1. Choose **File** → **Open** → **Terrain**. The Open Terrain dialog box opens.
2. Select *VR-Village.mtf*.
3. Click Open. In a few seconds, the terrain is displayed.



2.1. Move the Observer (Navigate the Terrain)

The observer is your viewpoint into the terrain. You can navigate through the terrain using the keyboard and mouse. This section introduces the basic keyboard and mouse actions. For a complete list, please see online help or the Quick Reference Card in *VR-Vantage Users Guide*.

Use the Game-like Keyboard Navigation

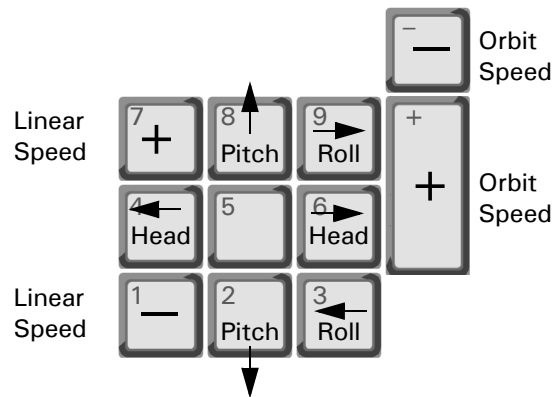
Press **w** and **s** to move forward and backward.
Press **e** and **q** to move up and down. Press **a** and **d** to move left and right.

Press multiple keys to combine movement modes. Notice that you cannot go through walls or through the ground — unless you want to. Press and hold **x** while moving the observer and you can go through walls and terrain.

Press the Spacebar to move the observer to the default starting point.



The keypad lets you control position and orientation.



Use the Mouse to Move the Observer

Drag the Terrain

Dragging the terrain moves the observer forward, backward, left, and right.

1. Click a point on the terrain and hold down the left mouse button.
2. Drag the mouse left, right, forward, and backward.

Drag the View

Dragging the view moves the observer up, down, left, and right.

- Hold down the middle mouse button (or wheel) and drag the mouse.

Change the Observer's Orientation

- Hold down the right mouse button and drag the mouse.

Teleport the Observer

- **Shift**+click someplace on the terrain to jump to the location.

2.2. Change the Environment

VR-Vantage lets you manipulate the environment. This just affects how the scene looks. It does not affect the simulation you are viewing.

Make it Rain and Snow

1. Choose **Settings** → **Scene**. The Scene Settings dialog box opens.
2. Select the Environment Settings page.
3. Select the Precipitation Enabled check box. It starts to rain.
4. On the Precipitation Type drop-down list, select Snow.



5. In the Precipitation Intensity box, change the intensity to .50.

Add a Cloud Layer

1. Choose **Settings** → **Scene**.
2. Select the Environment Settings page.
3. Click the Add icon (+) to the right of the list of cloud layers. The Add Cloud Layer dialog box opens.
4. In the Cloud Type drop-down list, select Cumulus Congestus.
5. Click OK. See how the cloud layers change in the scene.

Change the Time of Day

1. Choose **Settings** → **Scene**.
2. Select the Date and Time page.
3. In the Time group box set the value using the spinner controls. See how the lighting changes as you change the time.

2.3. Save the Scene

1. Choose **File** → **Save** → **Scene**. The Save Scene dialog box opens.
2. Type a name for the scene.
3. Click Save. (When you save any kind of data, VR-Vantage automatically appends the correct VR-Vantage extension.)

3. View a Simulation

To view a simulation, you must load an appropriate terrain and connect to the simulation network. In this guide we assume that you have the MÄK Data Logger and the recorded simulations that it includes. However, if you want to view your own simulation data, feel free to use it instead of the suggested files.

3.1. Connect to a Simulation Network

1. Choose **Settings** → **Connection**. The Simulation Connections dialog box opens.
2. Select the DIS Connections page.
3. Click Connect.

3.2. Load the Terrain

If you have not already loaded the VR-Village terrain, as explained in [“Load and Explore a Terrain,”](#) on page 3, load it now.

3.3. Start the Logger and Play a Simulation

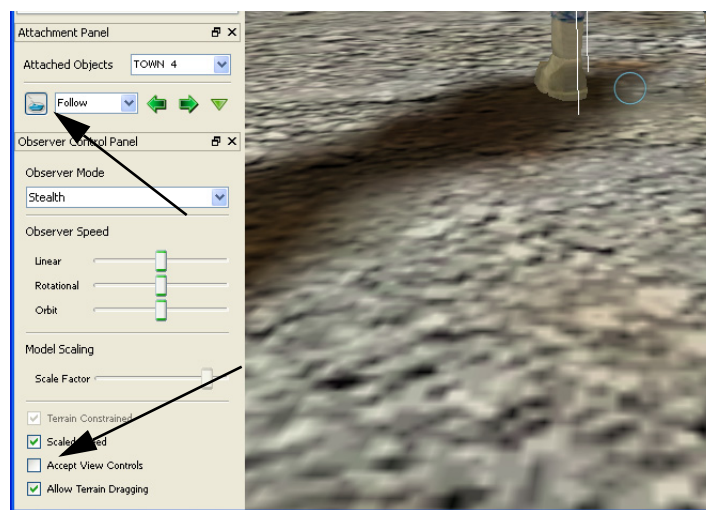
1. On the Start Menu, choose **Programs** → **MÄK Technologies** → **Logger X.X** → **Logger DIS**. The Logger starts.
2. Choose **File** → **Open**. The Open File dialog box opens.
3. Select *VR-Village-CarBombDemoDIS.lgr*.
4. Click Open.
5. Choose **Play** → **Toggle Loop at End**. This will cause the recording to continuously loop back to the beginning when it reaches the end.
6. Choose **Play** → **Play/Pause**, or click the Play button.

3.4. View the Simulation

VR-Vantage IG will take a few seconds to load model files. Then it will start to display the action in this simulation. The Logger file sends view control messages to VR-Vantage IG to control the observer. Watch the simulation for a while. When you are ready to explore the simulation on your own, disable view controls.

Disable View Controls

1. Choose **View** → **Observer Control Panel**. The Observer Control Panel gets added to the set of panels on the left side of the window.
2. On the Observer Control Panel, clear Accept View Controls. Now, VR-Vantage IG will not respond to newly received view controls.
3. On the Attachment Panel, click the Attach/Detach icon. The observer stops following the entity to which it was attached.



4. Choose **Settings** → **Connection**. The Simulation Connections dialog box opens.
5. Select the DIS Connections page.
6. Clear the Listen for View Controls check box.

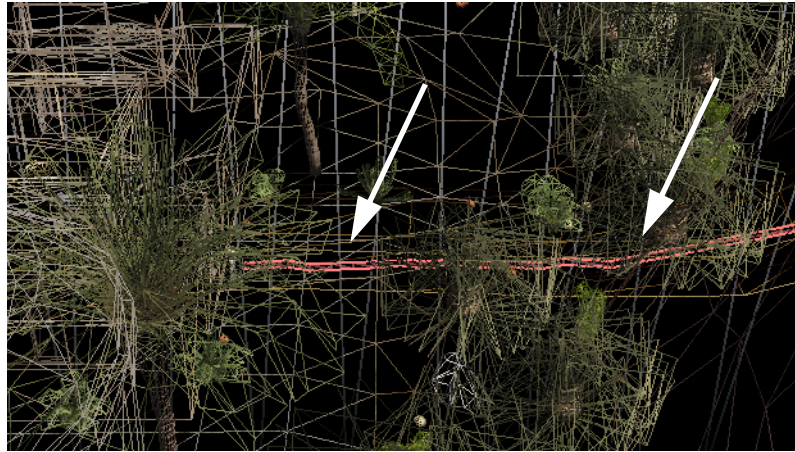
Use the navigation controls you learned earlier to navigate through the village and watch the simulation from the viewpoints that interest you.

View Track Histories

1. Press the **s** key to zoom out a bit from the village.
2. Choose **Observer** → **Track Histories**.
3. As entities move notice that they leave a track showing their path.



4. Choose **Settings** → **Wireframe Rendering**. The VR-Village terrain has underground passages. If entities are currently moving through the passages, you can see their track history.



5. Turn off Track Histories and Wireframe Rendering.

When you are done exploring VR-Vantage with this simulation, stop the Logger.

4. Explore Streaming Terrain

In addition to displaying terrain data stored on your computer or a local disk, VR-Vantage IG can display streaming data from a terrain service.

4.1. Connect to a Terrain Server

1. Choose **File** → **Add** → **Server Connection**. The Add Terrain Server dialog box opens.
2. Select VR-TheWorld.earth¹ from the Servers drop-down list.
3. Click Connect. The whole earth is displayed.



Navigate the Earth

Use the keyboard and mouse to navigate the display. Zoom in and out. As you zoom in, more detailed terrain is displayed.

1. VR-TheWorld is a terrain server hosted by VT MÄK. If you access a different server, please note its terms of service. Many commercial sites like Google, Yahoo, and ESRI have specific restrictions on commercial use. It is your responsibility to abide by these terms.

4.2. View a Combat Scenario

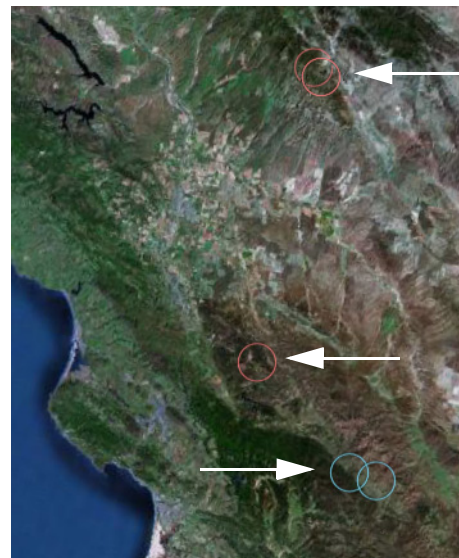
The scenario for this part of the evaluation was made with high fidelity air combat models plugged into VR-Forces, MÄK's computer generated forces product.

Run the Demonstration File

1. If the Logger is not still running from a previous exercise, start it.
2. Load *IISEC_VPMM_Demo_Final.lgr*.
3. Play the file.
4. If VR-Vantage is not connected to the DIS network, connect it as described in [“Connect to a Simulation Network,”](#) on page 6. (This recording is a DIS recording.)

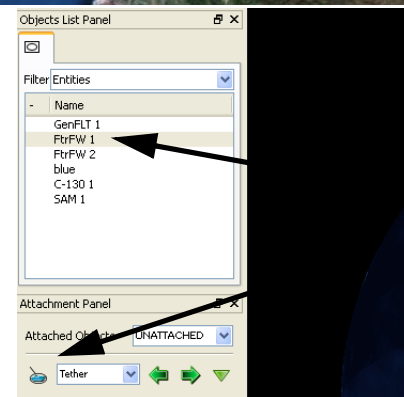
View the Scenario

In this scenario, a friendly fighter (GenFLT 1) is escorting a cargo plane (C-130 1). Two opposing force fighters (FtrFW 1 and FTRFW 2) threaten the convoy. The fighters engage and GenFLT 1 shoots down the opposing fighters. Several minutes later, GenFLT 1 launches flairs in response to an attack from a surface-to-air missile battery (SAM 1). In this figure, we have zoomed in from the entire earth, as in the previous figure, to an area above California, USA. Entity labels identify the entities.



Attach the Observer to an Entity

1. Select an entity in the Objects List Panel, for example, FtrFW1.
2. On the Attachment Panel, click the Attach icon. If the observer does not jump to the entity, press the Spacebar.



Change the View Mode

- With the observer still attached to a fighter, select the different attach modes on the Attachment Panel.

For a cockpit view, select Mimic mode. To maintain a specific offset from the entity, use Follow or Tether mode. To watch the entity from a fixed location, use Track mode.

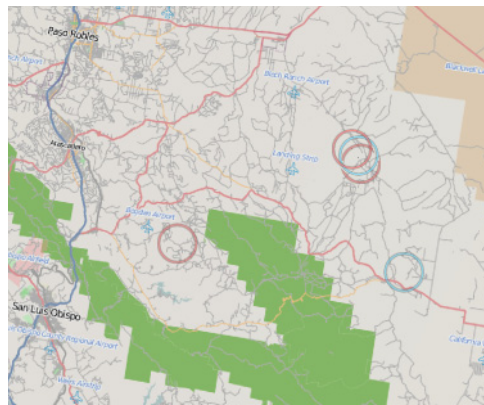
As you view the scenario, use the entity label feature to identify the entities. Enable track history to chart their movement.

4.3. Change the Data Stream

You can change the data stream you are using without disconnecting from the simulation.

1. Choose **Settings** → **Terrain**. The Terrain Settings dialog box opens.
2. Select the Terrain Contents page.
3. In the window, select VR-TheWorld.earth.
4. Click Remove.
5. Click Add Terrain Server.
6. Select OpenStreetMapExample.earth.
7. Click Connect.

The earth will now be covered in map data as it streams in, as shown in the following figure.

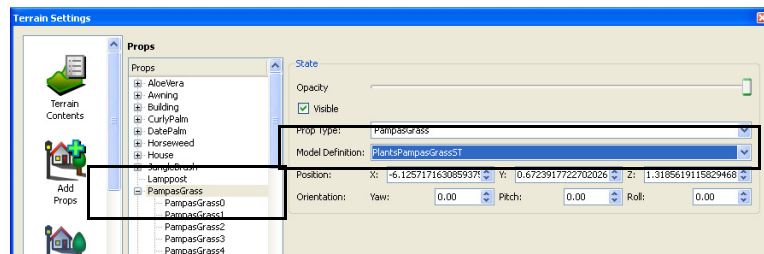


When you are finished exploring streaming terrain, stop the Logger.

5. Manipulate Objects in the Scene

VR-Vantage lets you add value to terrains, even if you did not originally create them. In this exercise you will replace low fidelity models with high fidelity models.

1. Choose **File** → **Open** → **Terrain**.
2. Select *VR-Village_NoSpeedTrees.mtf*.
3. Click Open.
4. After the terrain loads, press **e** until the observer stops at the ground. You will be looking at a portion of VR-Village.
5. Choose **Settings** → **Terrain**. The Terrain Settings dialog box opens. (You might need to pull it to the side to see the terrain.)
6. Select the Props page.



7. In the Props list, select PampasGrass. Bounding boxes are displayed around the grass objects. You might want to zoom out and up a little to see more of them.
8. In the Model Definition field of the State group box, select PlantsPampassGrassST. This replaces the low fidelity model with a SpeedTree model. See how much better the grass looks.



Before



After

5.1. See Through Walls

You can control the transparency of walls so that you can see inside buildings.

1. In the VR-Village terrain, click a building to select it.
2. Right-click. A menu is displayed.
3. Choose Make Transparent. The walls become approximately 80% transparent.
4. Choose **Settings** → **Terrain**. The Terrain Settings dialog box opens.
5. Select the Props page.
6. Note the setting for the Opacity slider.
7. Move the slider to increase or decrease the transparency of the building.

6. Attach to an Entity that has a Cockpit Display

VR-Vantage is based on OpenSceneGraph (OSG), so developers can integrate third-party modules that are built on OSG. GL Studio, from DiSTI, is an application for building cockpit displays (also called heads-up displays, or HUDs). VR-Vantage includes a set of these displays for each vehicle type.

1. Choose **File** → **Open** → **Terrain**.
2. Select *Makland.mtf*.
3. Click Open.
4. In the Logger, load *maklanddemoDIS.lgr*. Run the file.
5. In VR-Vantage, connect to the DIS network.
6. On the Observer Control Panel, clear Accept View Controls.
7. In the Objects List Panel, right-click USAtRW 1. A popup menu is displayed.
8. Choose **Attach Mimic**. The helicopter cockpit should be displayed.



9. To see other examples of cockpit displays, attach to FtrFW 4 and M1A2 2 in Mimic mode.

7. Save and Load Display Engine Configurations

This tutorial demonstrates how to:

- ♦ Connect VR-Vantage IG to a VR-Vantage Display Engine
- ♦ Change a display engine configuration
- ♦ Save display engine configurations
- ♦ Load display engine configurations in the Display Engine Configuration Editor
- ♦ Load multiple display engine configurations from the command line.

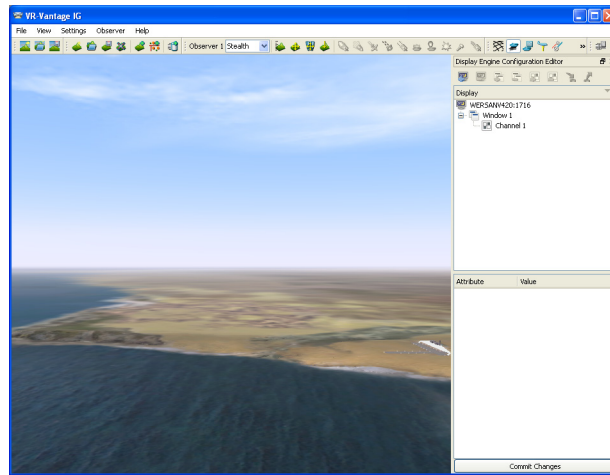
7.1. Connect to a VR-Vantage Display Engine



- ♦ To declutter the screen for the figures, we have closed all of the information panels.
 - ♦ This tutorial assumes that you have two computers, one for VR-Vantage IG, and one for the remote display engine.
-

To create the display engine configurations:

1. On computer 1, start VR-Vantage IG.
2. Load *makland.mtf*.
3. Choose **View** → **Display Engine Configuration Editor**. The Display Engine Configuration Editor opens. It shows one window and one channel for the VR-Vantage IG window on the local computer.



4. On computer 2, choose **Start** → **Programs** → **MAK Technologies** → **VR-Vantage** → **VR-Vantage Display Engine**.

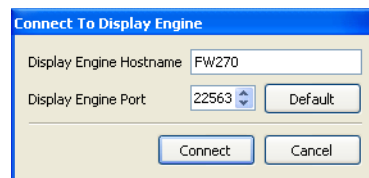
On Linux or the Windows command line, run:

```
./bin/displayEngine.extension
```

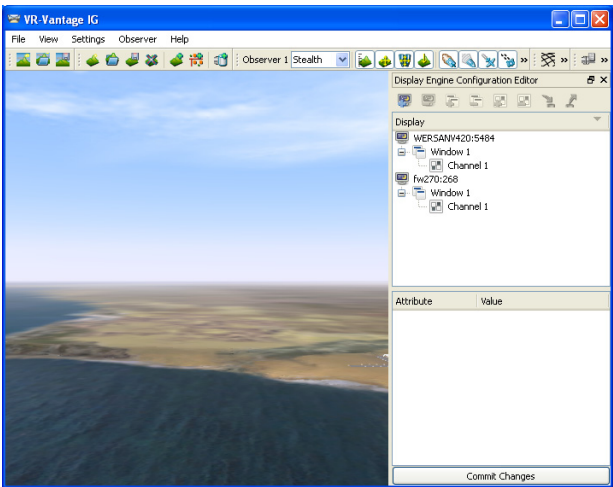
where *extension* is the appropriate script extension.

A VR-Vantage display engine opens. It does not show a default window.

5. On computer 1, in the Display Engine Configuration Editor, click the Connect a Display Engine icon. The Connect to Display Engine dialog box opens.
6. In the Display Engine Hostname box, replace “localhost” with the name of computer 2.



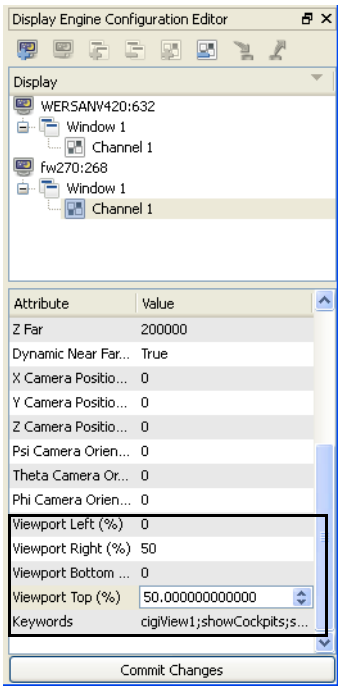
7. Click Connect. An entry for the display engine is added to the Display Engine Configuration Editor window. The remote display engine now displays the Makland terrain with the same view as VR-Vantage IG.



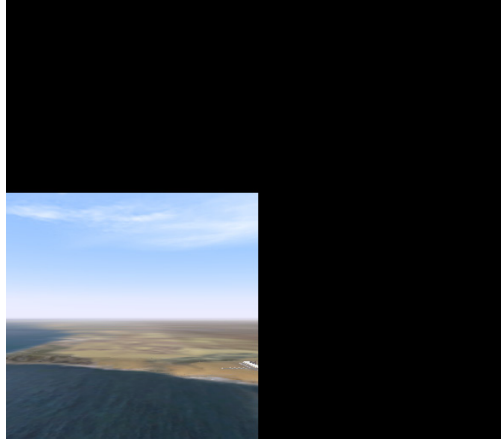
7.2. Create and Save Display Engine Configurations

By default, the views in the VR-Vantage IG window and the remote display engine window look exactly the same. So we will change the view in one of them so that when we load the display engine configurations later on, we can tell that each is different.

1. Select Channel 1 of the remote display engine. Its attributes are displayed.
2. Change the value for the Viewport Right and Viewport Top attributes to 50.



3. Click Commit Changes. The view of the terrain is now in the lower left quadrant of the display engine. (The full screen view of the terrain may also be visible until such time as the display engine refreshes.)



4. Select the display engine on VR-Vantage IG (in this example, WERSANV420).
5. Click the Save Display Engine Configuration icon (📁). A save dialog box opens.
6. Call this configuration *mainwindow*.
7. Click Save.
8. Select the display engine on the remote display engine (in this example, fw270).
9. Click the Save Display Configuration icon. A save dialog box opens.
10. Call this configuration *remotedisplay*.
11. Click Save.

7.3. Load Display Engine Configurations in the GUI

We now have two visually distinct display engine configurations. In this part of the tutorial, we simply load them into the two display engines to see that loading a display engine configuration changes the view in the window. This part of the tutorial also demonstrates that display engine configurations are not unique to a particular display engine and are not tied to one either. Any particular configuration can be loaded into any display engine.

1. Select the display engine on VR-Vantage IG.
2. Click the Load Display Engine Configuration icon (). The Load Display Configuration dialog box opens.
3. Select *remotedisplay.dcx*.
4. Click Open. The window on the VR-Vantage IG application now shows the terrain in the lower left quadrant. (You may need to press **Spacebar** to reset the observer.)
5. Reload the *mainwindow.dcx* configuration in the main window.
6. Try loading the two different configurations in the remote display engine.

7.4. Load Display Engine Configurations from the Command Line

As you have seen in the previous part of this tutorial, you can load display engine configurations for individual display engines through the GUI. However, you cannot load more than one at a time. If you have a complex set of display engines that you need to configure, loading them one at a time can be tedious. To load multiple display engine configurations, you must start VR-Vantage IG from the command line.

You load multiple display engine configurations from the command line with the `--dispSetting` command line argument and the `-W` or `--withDisplayEngine` command-line argument. The syntax is:

```
vrvApplication.exe --dispSetting masterdisplayConfigFile  
-W port@netAddress;remotedisplayConfigFile1 ....  
port@netAddress;remotedisplayConfigFileN
```

In this tutorial, we use the default port – 22563. The netaddress for the remote display engine is the computer name – FW270. The display engine configuration files are *mainwindow.dcx* and *remotedisplay.dcx*.

So the command line to load the two display engine configurations that we created would be:

```
vrvIG.exe --dispSetting ../appData/settings/vantageIG/mainwindow.dcx  
-W 22563@FW270;../appData/settings/vantageIG/remotedisplay.dcx
```

To load the tutorial configurations from the command line:

1. Open a command window.
2. Change directory to *./bin*.
3. Enter the command:

```
vrvIG.exe --dispSetting ../appData/settings/vantageIG/mainwindow.dcx  
-W 22563@FW270;../appData/settings/vantageIG/remotedisplay.dcx
```

VR-Vantage IG starts. The display engine configurations are visible in the main window and the remote display engine window.

4. Choose **View** → **Display Engine Configuration Editor**. In the Display Engine Configuration Editor, confirm that VR-Vantage IG is connected to the remote display engine.

8. View a Terrain Agility Tutorial

VR-Vantage IG lets you load terrains created in terrain creation applications, such as OpenFlight files. However, you can also create terrains from elevation, feature, and imagery data. To see how:

1. Choose **Programs** → **MÄK Technologies** → **VR-Vantage 1.2** → **Documentation** → **VR-Vantage Video Tutorials**. A page opens in your web browser.
2. Click the first link in the list and follow the chain of videos.

9. Continue to Explore VR-Vantage IG

Continue to explore VR-Vantage IG. Look at the various settings options on the Settings menu. For more information, please read *VR-Vantage Users Guide* or online help. They provide detailed descriptions of all VR-Vantage IG features.

- To open *VR-Vantage Users Guide*, choose **Programs** → **MÄK Technologies** → **VR-Vantage 1.2** → **Documentation** → **VR-Vantage Users Guide**
- To open online help, choose **Help** → **Help**.

Please contact sales@mak.com for additional assistance or to provide feedback.



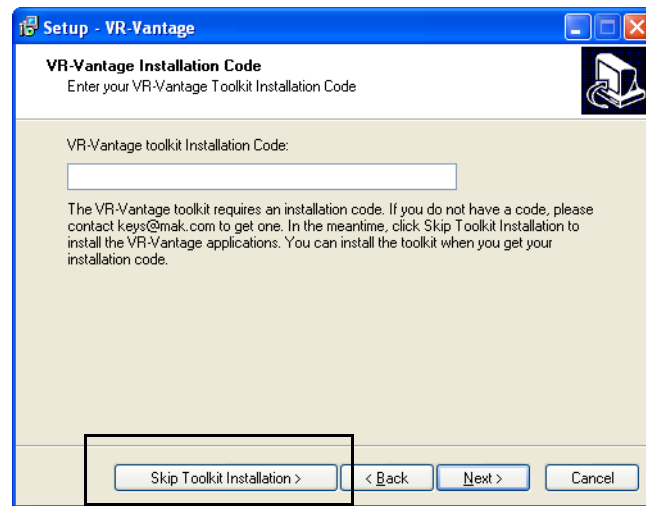
Installation and Licensing

Your MÄK salesperson has given you a link to the VR-Vantage IG installer as well as links to other MÄK applications and data to support your first user experience. Download the files. Before you install the applications, note the following possible issues:

- ♦ You must have administrator privileges to install VR-Vantage on Windows Vista.
- ♦ When you install VR-Vantage on Vista, there may be a delay of up to several minutes from the time you try to run the setup program to the time that an installation dialog box is displayed. If you experience this problem, turning off User Access Control can reduce or eliminate this delay.
- ♦ These instructions assume you are familiar with installing Windows applications that use a wizard-style installer. They also assume that you have an unzipping application and know how to use it.

A. Install VR-Vantage IG and Supporting Applications and Data

- To install VR-Vantage IG, run the installer. On the VR-Vantage Installation Code page, click Skip Toolkit Installation.



- Run the MÄK Data Logger installer. Accept all of the default settings.
- Extract *IISEC_VPMM_Demo_Final.lgr* from *IISEC_VPMM_Demo_Final.zip* to *C:/MAK/Loggerx.x/logger_tapes*.

B. Setting Up the License Manager

MÄK products use the FLEXlm license manager. When you install a MÄK product, the installation includes a directory called *./flexlm11.6*. Before you can use a MÄK product, you must obtain a valid license file and specify the license server.

The general procedure for configuring license management is as follows:

1. Identify the name and ID of the license server and request a license file.
2. Put the license file in the *flexlm* directory on the license server.
3. Run the license server.
4. Specify the license server location.

B.1. Identify the Host ID and License Server Name

For simplicity, use the computer on which you installed VR-Vantage IG as the license server. To find out the host ID and license server name:

1. On the Start menu, choose **Programs → MÄK Technologies → VR-Vantage 1.2 → Licensing → Run LMTOOLS**. The LMTOOLS application opens.
2. Select the System Settings tab. The host ID is the string in the Ethernet Address text box. The license server name is the name in the Computer/Hostname text box.

3. Send the host ID and hostname to your MÄK salesperson. MÄK will e-mail you a license file.

B.2. Put the License File in the *flexlm* Directory

When you receive your license file, put it in the *.flexlm 11.6* directory. If you are evaluating several MÄK applications, pick one of them. It does not matter which one you use.

B.3. Run the License Server

- To run the license server, on the Start menu, choose **Programs → MÄK Technologies → VR-Vantage 1.2 → Licensing → lmrn**.



If this option is not available on the menu, run *.flexlm11.6/lmrn*.

Shutting Down the License Server

- To force all applications to check in their licenses and shut down the license server daemon, run *.flexlm.x/lmdown*.



Do not just close the console window for the license server. You must shut it down properly.

B.4. Specify the License Server

The first time you run a MÄK application on a computer, the License Setup dialog box opens (Figure 1-1). It prompts you to enter the hostname of the license server and optionally, a port number.

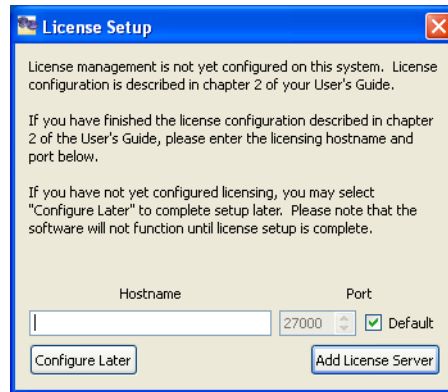


Figure 1. License Setup dialog box

1. Type the hostname in the Hostname box.
2. Click Add License Server. The application will start.