



Copyright © 2020 MAK Technologies
All rights Reserved. Printed in the United States.

Under copyright laws, no part of this document may be copied or reproduced in any form without prior written consent of MAK Technologies.

VR-Exchange™, VR-TheWorld™, VR-Vantage™, DI-Guy™, and DI-Guy Scenario™ are trademarks of MAK Technologies. MAK Technologies®, VR-Forces®, RTIsPy®, B-HAVE®, and VR-Link® are registered trademarks of MAK Technologies.

GL Studio® is a registered trademark of The DiSTI® Corporation.

Portions of this software utilize SpeedTree® technology (©2008 Interactive Data Visualization, Inc.). SpeedTree is a registered trademark of Interactive Data Visualization, Inc. All rights reserved.

SilverLining™ is a trademark of Sundog Software.

Terrain Profiles are based in part on the work of the Qwt project (<http://qwt.sourceforge.net>).

3ds Max® is a registered trademark of Autodesk, Inc.

All other trademarks are owned by their respective companies.

MAK Technologies
150 CambridgePark Drive, 3rd Floor
Cambridge, MA 02140 USA

Voice: 617-876-8085
Fax: 617-876-9208

info@mak.com
www.mak.com

Revision VRV-2.6-7-200619



1. VR-Vantage PVD First Experience

Thank you for deciding to try out VR-Vantage PVD (plan view display). VR-Vantage PVD provides a 2D big-picture view of the simulated world.

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

- ♦ VR-Vantage PVD
- ♦ MAK Data Logger

Before you begin, install and license the software. Please see [“Install VR-Vantage PVD and Supporting Applications and Data,”](#) on page 2-2 for instructions.

When you are ready, this guide will help you:

- ♦ [Explore the Terrain](#)
- ♦ [View a Simulation](#)
- ♦ [Attach the Observer to Entities](#)
- ♦ [Explore Paged and Streaming Terrain](#)
- ♦ [Continue to Explore VR-Vantage PVD](#)

VR-Vantage PVD is part of MAK’s VR-Vantage product line. VR-Vantage PVD 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 the developer documentation, which is in [./doc/classdoc/index.html](#).

1.1. Start VR-Vantage PVD

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

1.1.1. Specify the License Server

The first time you run a MAK 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.

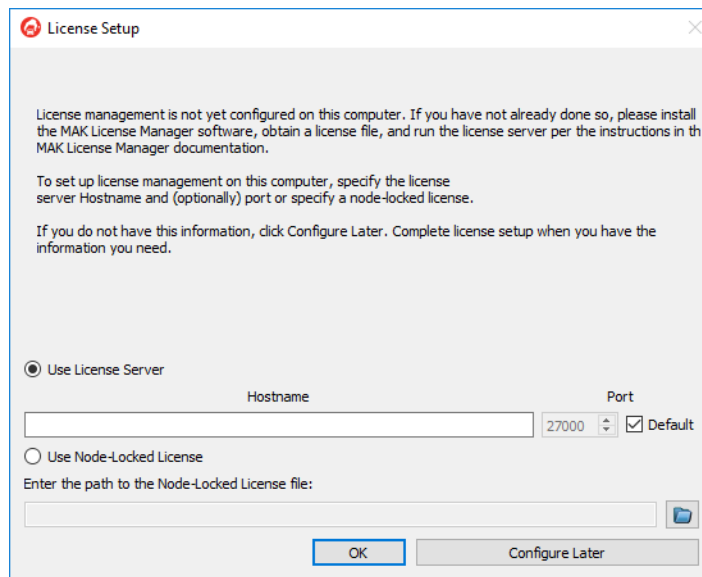


Figure 1-1. License Setup dialog box

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 2.2.1, “[Identify the Host ID and License Server Name](#)”).)
2. Click Add License Server. VR-Vantage PVD starts. The Load Terrain window opens on top of the main window ([Figure 1-2](#)). It lets you immediately load a terrain.

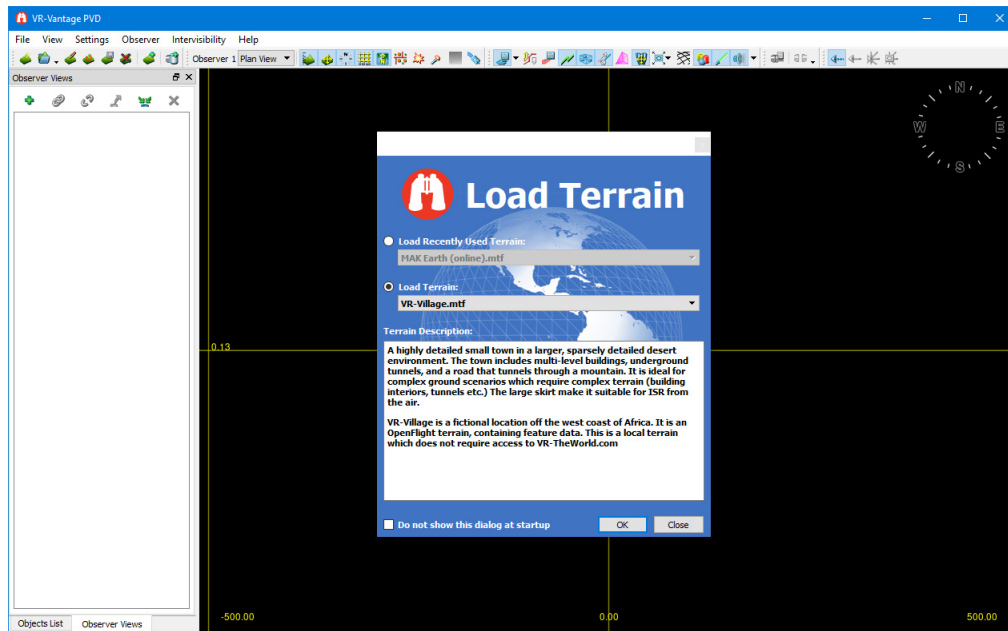


Figure 1-2. Load Terrain window



When you start VR-Vantage PVD, if you receive the following message, it means that you did not install the data package:

Data package not found in specified data directory: 'c:\MAK\vrvan-
tage2.6\data'.
Please make sure the data package is installed.

VR-Vantage PVD has an application installer and multiple data packages. You must install all of them.

3. Select Load Terrain.
4. In the list, select *VR-Village.mtf*.
5. Click OK. The VR-Village terrain loads.

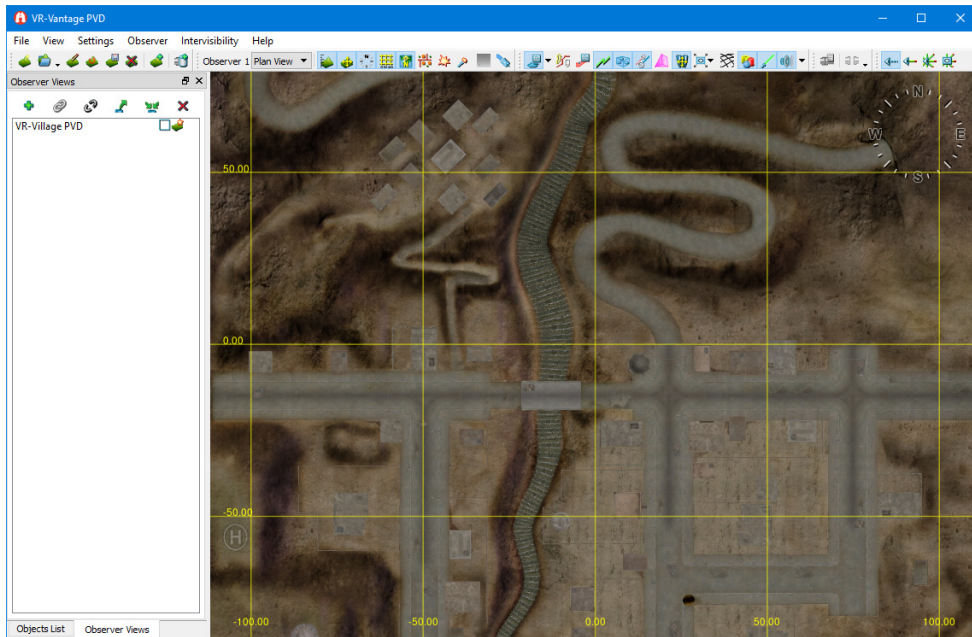


Figure 1-3. VR-Village terrain database

1.2. Explore 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*.

1. Tap **q** once or twice to zoom out.



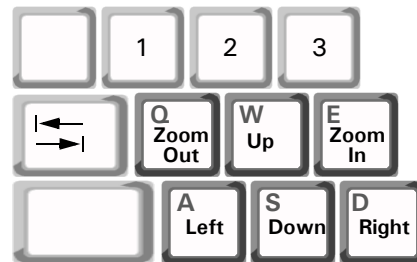
Figure 1-4. VR-Village zoomed in

2. Press and hold **e** to zoom in.
3. Continue to explore the terrain using the keyboard options described in the next few paragraphs.

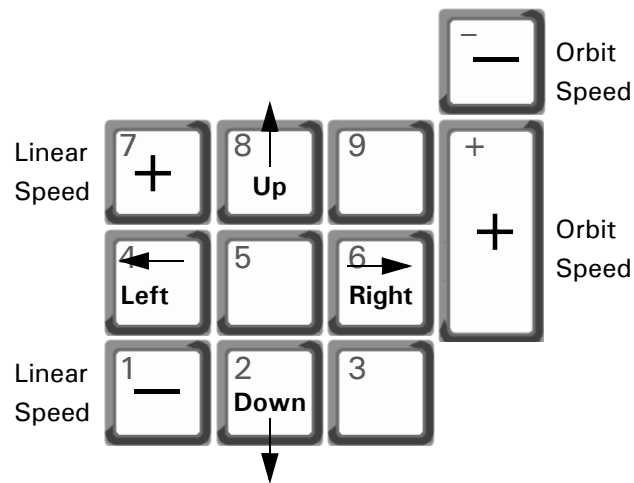
Press **w** and **s** to move up and down. Press **e** and **q** to zoom in and out. Press **a** and **d** to move left and right.

Press multiple keys to combine movement modes.

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



The keypad lets you control position. Arrow keys let you control orientation.



1.2.1. Moving the Observer Using the Mouse

You can change the observer's position and heading with the mouse. You can change the observer's position by dragging the terrain.

1. Hold down the left mouse button and move the mouse to drag the terrain.
2. Rotate the mouse wheel to zoom in and out.

You can change heading by orbiting.

To orbit the terrain with the mouse:

1. Choose **Observer** → **Orient North**. When Orient North is enabled, the orientation is forced to North, so to orbit, you have to disable it.
2. Hold down the right mouse button and drag the mouse.
3. Choose **Observer** → **Orient North**. The observer snaps back to be oriented North.

1.3. 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 MAK 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.

1.3.1. Start the Logger and Check the Connection Information

1. On the Start Menu, choose **MAK Technologies** → **Logger DIS**. The Logger starts.
2. Choose **File** → **Connection**. The Connection dialog box opens.
3. Make a note of the Port, Exercise ID, Site ID, Application Number, and Network Interface Address. You need this information when you connect VR-Vantage PVD to the simulation network.

1.3.2. Connect to a Simulation Network

1. In VR-Vantage PVD, choose **Settings** → **Connection**. The Simulation Connections dialog box opens.
2. Select the DIS Connections page.
3. In the Connections list, select DIS (7).
4. Enter the Port, Exercise ID, Site Number, Application Number, and Network Interface Address to match the settings in the Logger.
5. Click Connect.
6. Click Close.

1.3.3. Load a Terrain

1. Choose **File** → **Open Terrain**. The Open Terrain dialog box opens.
2. Select *MAK Earth (online).mtf*.
3. Click Open. In a few seconds, the terrain is displayed ([Figure 1-5](#)).

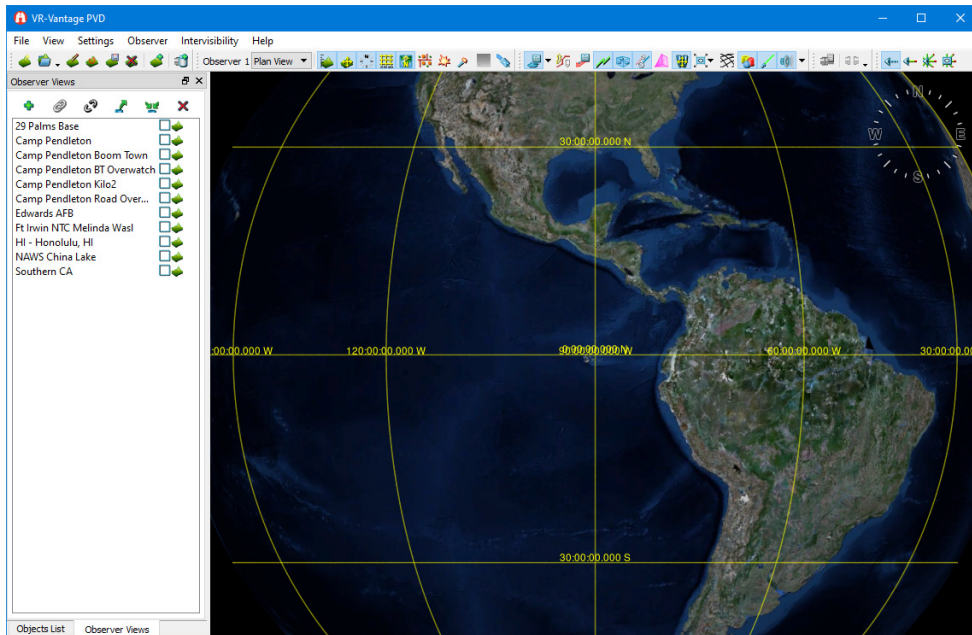


Figure 1-5. MAK Earth (online)

1.3.4. Start the Logger and Play a Simulation

1. In the Logger, choose **File** → **Open**. The Open File dialog box opens.
2. Select *Raid2013-viewControl-DIS.lgr*.
3. Click Open.
4. Choose **Play** → **Toggle Loop at End**. This will cause the recording to continuously loop back to the beginning when it reaches the end.
5. Choose **Play** → **Play/Pause**, or click the Play button.

1.3.5. View the Simulation

VR-Vantage PVD will take a few seconds to load model files. Then it will start to display the simulation. The Logger file sends view control messages to VR-Vantage PVD to control the observer. If the view starts to change every few seconds, disable view controls as described below.

Enable or Disable View Controls

- Choose **Settings** → **View Controls**.

1.3.6. Explore the Simulation

1. Zoom in to get a better view of the action (Figure 1-6). (Use the **e** key or the mouse wheel.) Watch the simulation for a while.



Figure 1-6. Simulation loaded

2. Drag the terrain (hold down the left mouse button and drag the mouse) to look at entities in different locations.

View Intervisibility Lines

When you view a simulation in 2D, it can be difficult to tell the effect of terrain on entity interaction. There is no obvious way to tell if entities can see portions of the terrain or other entities. To remedy this limitation, VR-Vantage PVD supports intervisibility lines.

VR-Vantage PVD supports the following types of intervisibility:

- Point-to-point (intervisibility line). Shows intervisibility between two points.
 - Intervisibility fan. Shows intervisibility around a point along multiple rays.
 - Entity intervisibility. Shows intervisibility between an entity and all other entities.
1. If *Raid2013-viewControl-DIS.lgr* is running, pause it. Click in the time line at about 2:25. The scene should look like [Figure 1-7](#).

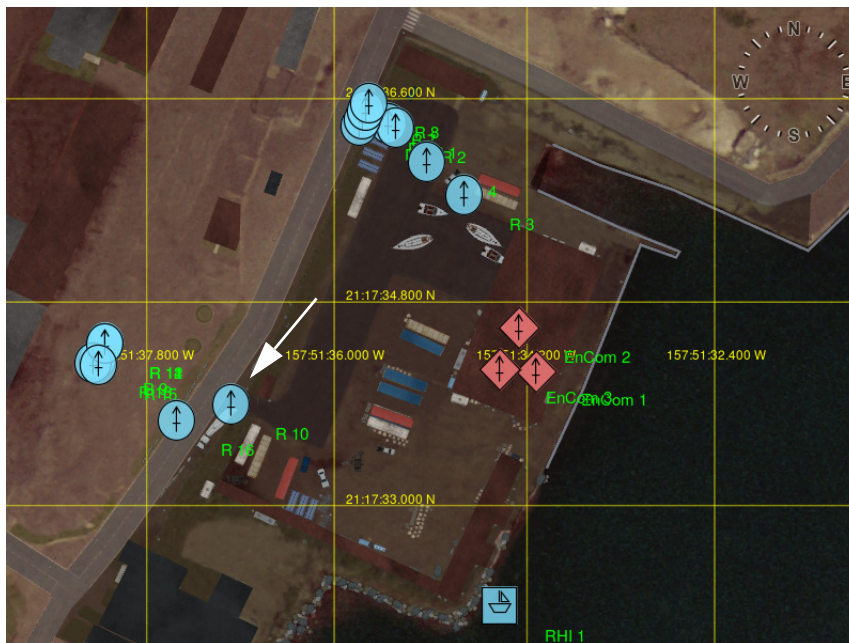


Figure 1-7. Ala Moana for intervisibility

2. Enable the display of intervisibility lines:
 - a. Choose **Settings** → **Display**. The Display Settings dialog box opens.
 - b. Select the Intervisibility Settings page.
 - c. If it is not already selected, select the Enable Intervisibility Objects check box.
 - d. Close the dialog box.
3. Choose **Intervisibility** → **Create Intervisibility Line**.
4. Click on one of the entities that the arrow points to in [Figure 1-7](#).

5. Move the cursor to extend a line and rotate it around the entity. Wherever the line is green, the entity has line-of-sight. Wherever it is red, the line-of-sight is obstructed (Figure 1-8).



Figure 1-8. Intervisibility line

6. Press **Esc** to exit intervisibility mode.
7. Choose **Intervisibility** → **Create Intervisibility Fan**.
8. Click an entity and move the cursor to extend the fan. The rays show line-of-sight all around the entity (Figure 1-9).

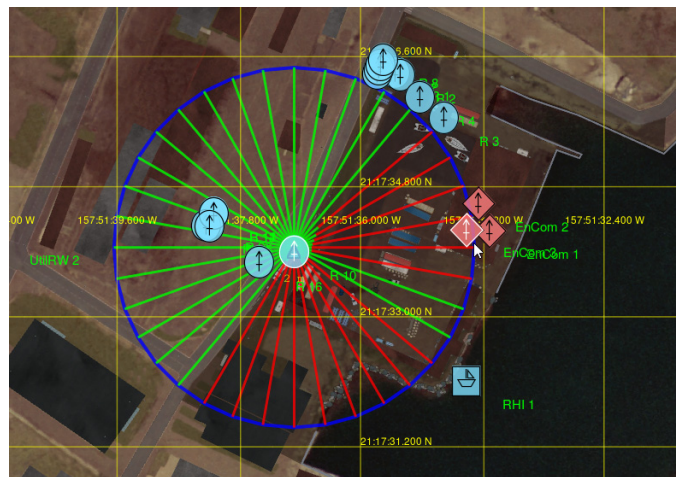


Figure 1-9. Intervisibility fan

9. Left-click to place the fan.

Manage Grid Lines

VR-Vantage PVD can display grid lines on the terrain. You can show and hide them. You can configure the coordinate system used and the spacing.

- Click the Display Grid Lines icon () on the Observer Settings toolbar. This toggles the grid lines off. Then, turn them back on again.
- 1. Choose **Settings** → **Display**. The Display Settings dialog box opens.
- 2. Select the Grid Lines Settings page ([Figure 1-10](#)).

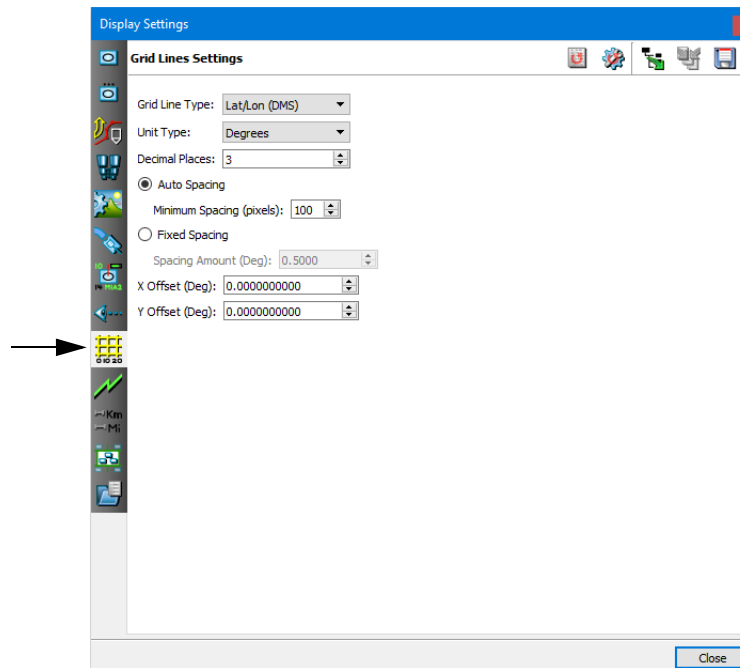


Figure 1-10. Grid Lines Settings page

- 3. In the Grid Line Type list, select a different grid line type. See how the text on the grid line display changes.
- 4. Zoom in and out and see how the grid lines recalculate and redisplay.

View Track Histories

1. Press the **q** key to zoom out a bit.
2. If the Logger is paused, start playing the recording again.
3. Choose **Observer** → **Track Histories**.
4. As entities move, notice that they leave a track showing their path (Figure 1-11).



Figure 1-11. Track histories

5. Turn off Track Histories.

1.3.7. Change the Size of the Icons

If an exercise has many simulation objects and they are all concentrated in a small area, the icons may overlap to the point that you cannot easily distinguish them, as in [Figure 1-12](#).



Figure 1-12. Entities in small area

You can make the disposition of simulation objects easier to see by changing the size of the icons.

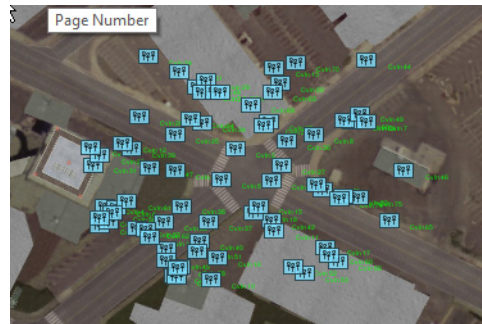


Figure 1-13. Icon size changed

To change the size of simulation object icons:

1. Choose **Settings** → **Display**. The Display Settings dialog box opens.
2. Select the Entity Display Settings page ([Figure 1-14](#)).

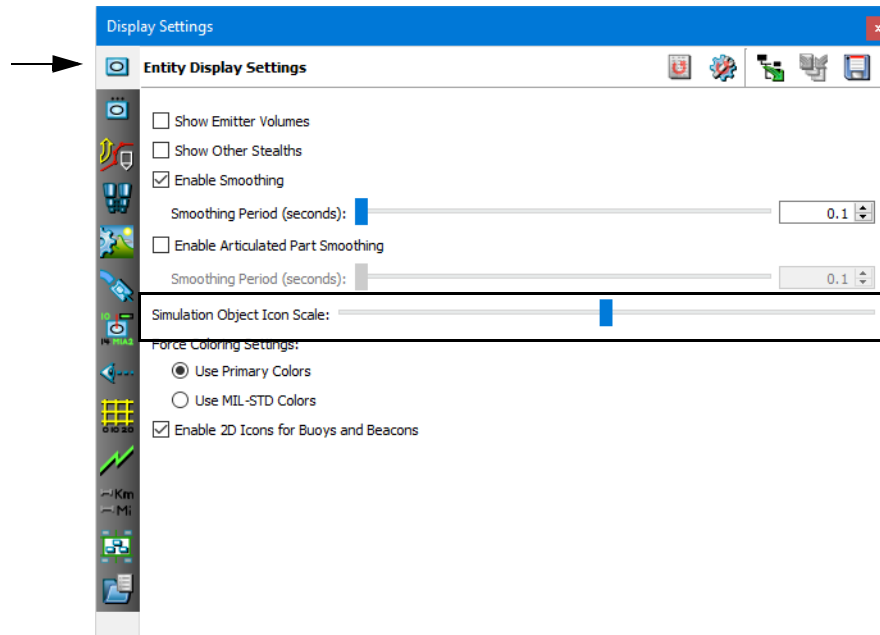


Figure 1-14. Entity Display Settings page

3. Adjust the Simulation Object Icon Scale slider.

1.4. Attach the Observer to Entities

So far, you have moved the observer through the scene to observe entities. You can also attach the observer to entities and have it move as they move.

1. In the Objects List Panel, right-click UtilRW 1. A popup menu is displayed.
2. Choose **Attach Follow**.
3. Press **Spacebar**. This puts the observer in the default position relative to the entity. It is now attached to the helicopter. As the helicopter moves, the observer will move with it. You can change the position and orientation of the observer with the keyboard and mouse controls you learned earlier, but it will maintain its relationship with the helicopter and move through the scene as the helicopter moves.
4. Press **.** (period). The attachment moves to the next object in the Objects List Panel. The Attachments Panel shows the name of the currently attached entity. (If an object is embarked, such as the soldiers on the helicopters, attaching to them will not change the observer.)
5. Continuing attaching to additional entities.
6. Press **z** to detach the observer.
7. When you are done, stop the Logger.

1.5. Explore Paged and Streaming Terrain

VR-Vantage PVD can display databases for which all of the data is loaded into memory, called static databases, and databases for which data is loaded as it is needed, called paged terrains. Paged terrain is used when the amount of data available is too great to load into memory. Paged databases can have their data stored locally on a computer or can be streamed over a network or the internet. In the previous section of this guide, you have used both kinds of terrains. The Ala Moana and VR-Village terrains are local static terrains. If you have an internet connection, you can use terrains that stream over the internet.

1.5.1. Connect to a Terrain Server

1. Choose **File** → **New Terrain**.
2. Choose **Settings** → **Terrain**. The Terrain Settings dialog box opens.
3. Select the Terrain Contents page ([Figure 1-15](#)).

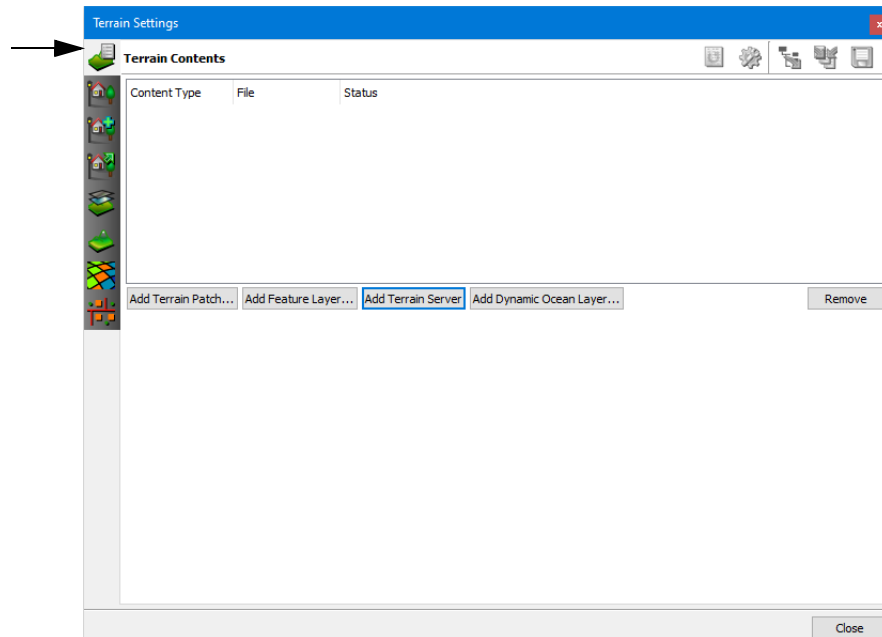


Figure 1-15. Terrain Contents

4. Click Add Terrain Server. The Add Terrain Server dialog box opens ([Figure 1-16](#)). The dialog box contains information about the selected terrain server. It is not editable.

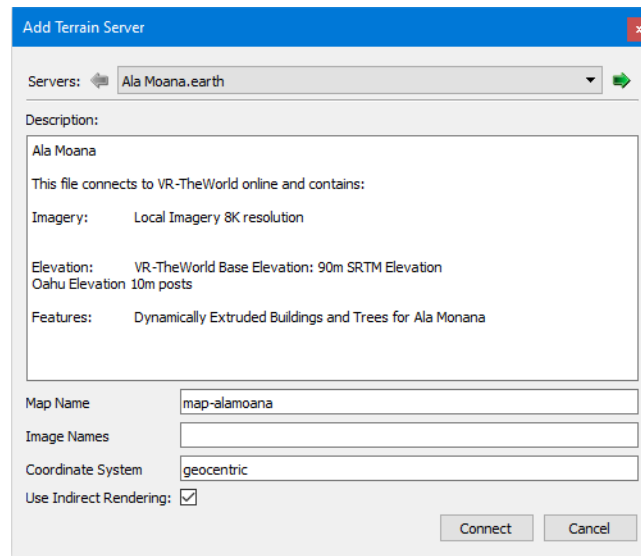


Figure 1-16. Add Terrain Server dialog box

5. Select *Ala Moana.earth*¹ from the Servers drop-down list. (Earth files use osgEarth, a geospatial SDK and terrain engine for OpenSceneGraph applications. This database has elevation and imagery data for the entire earth.)
6. Click Connect. VR-Vantage PVD connects to the terrain server and displays a default terrain view (Figure 1-17).

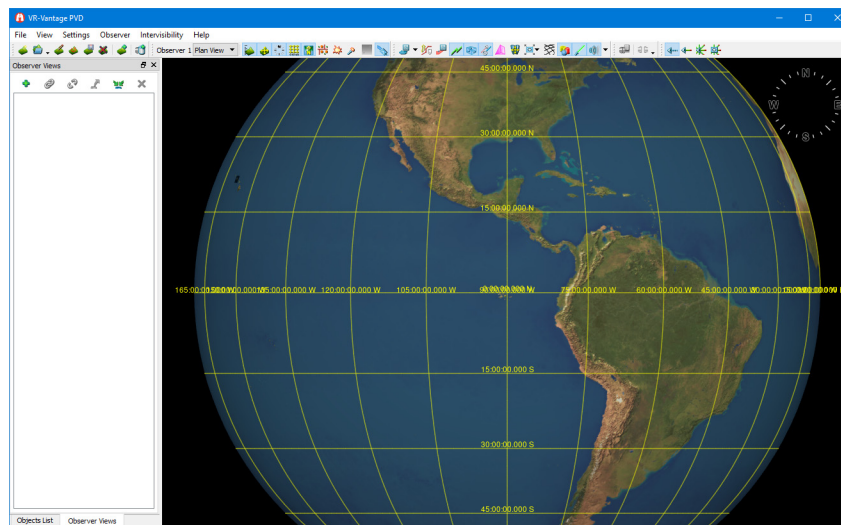


Figure 1-17. Ala Moana.earth

1. MAK Earth gets its data from VR-TheWorld Server, a terrain server hosted by MAK Technologies. 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.

Navigate the World

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

1.6. Continue to Explore VR-Vantage PVD

Continue to explore VR-Vantage PVD. 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 PVD features.

- To open *VR-Vantage Users Guide*, on the Start menu, choose **MAK Technologies** → **VR-Vantage Users Guide**. You can also access it from the **Help** menu in VR-Vantage PVD.
- To open online help, in the VR-Vantage window, choose **Help** → **Help**.

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



2. Installation and Licensing

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

- ♦ When you install VR-Vantage PVD on Windows, 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.

2.1. Install VR-Vantage PVD and Supporting Applications and Data

VR-Vantage has an applications installer and a data package, which consists of six compressed files.

To install VR-Vantage PVD:

1. If you downloaded the application installer and the data files, make sure they are in the same directory. If you received your software on a set of DVDs, copy the files to a directory on your hard drive.
2. Run the application installer. On the Select Components page (Figure 2-1), clear the VR-Vantage Developers Toolkit check box and leave No SensorFX SDK selected.

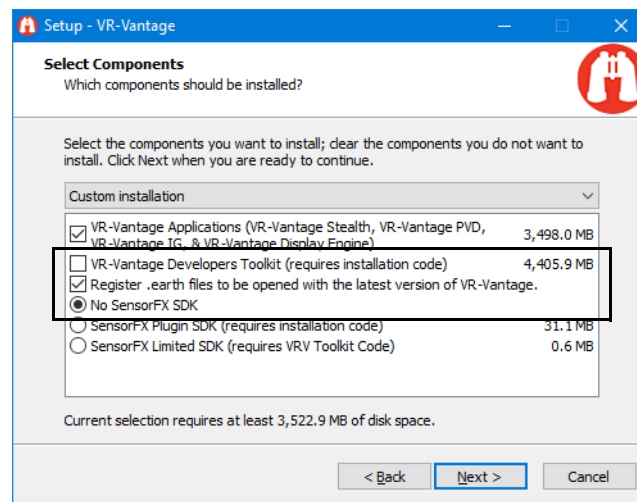


Figure 2-1. Installation wizard

3. When you are prompted to choose an option for installing the data package (Figure 2-2), select the default - “Install the recommended data package automatically”.

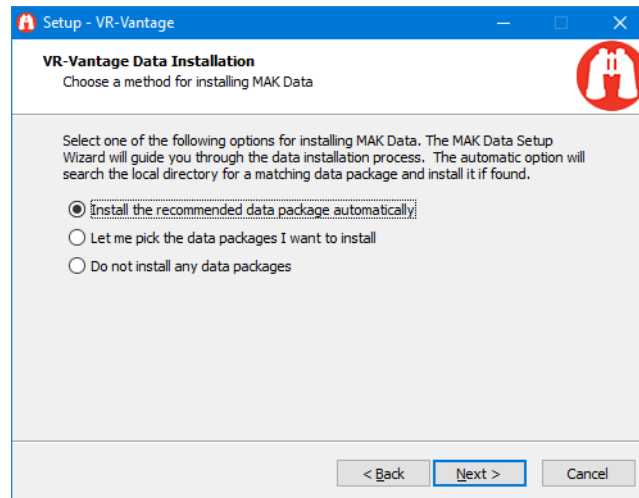


Figure 2-2. Data installer selection page

4. Continue with the installation wizard. When the application installer finishes, the MAK Data Setup Wizard (Figure 2-3) opens automatically and installs the data.

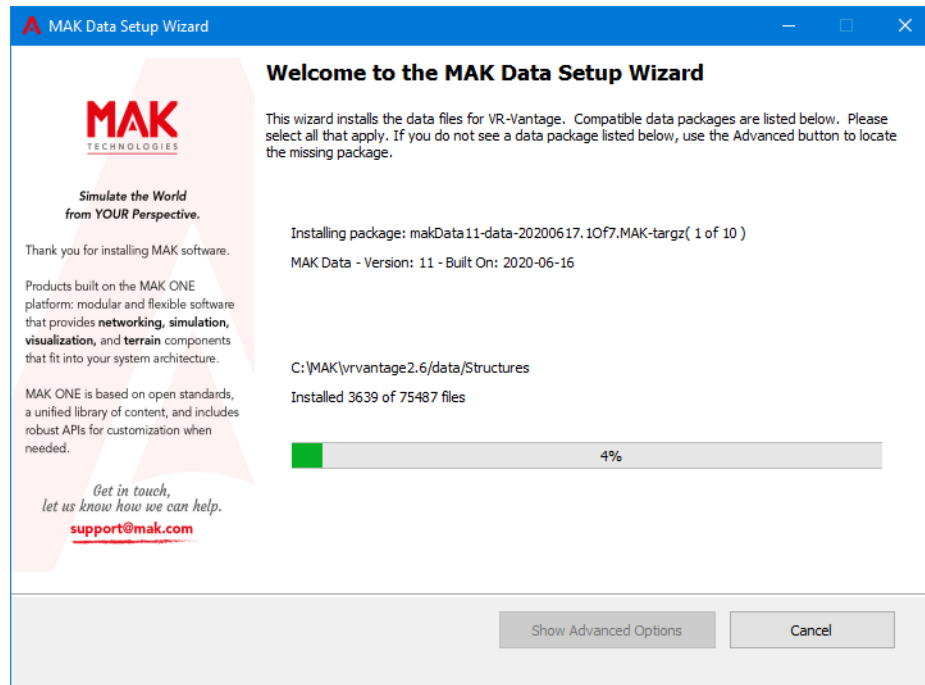


Figure 2-3. MAK Data Setup Wizard



You must install the data package. It is not optional. VR-Vantage PVD will not run properly without it.

If you do not already have the MAK Data Logger installed, install it as follows:

- Run the MAK Data Logger installer. Accept all of the default settings.

2.2. Setting Up the License Manager

To use a MAK product, you must install the MAK License Manager and get a license for your product. Before you can use a MAK product, you must obtain a valid license file and specify the license server.

- To install the MAK License Manager, run the installer.

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 *MAK/MAKLicenseManager* directory on the license server.
3. Run the license server.
4. Specify the license server location.

2.2.1. Identify the Host ID and License Server Name

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

1. On the Start menu, choose **MAK Technologies** → **MAK License Manager**. The MAK License Manager utility opens (Figure 2-4).

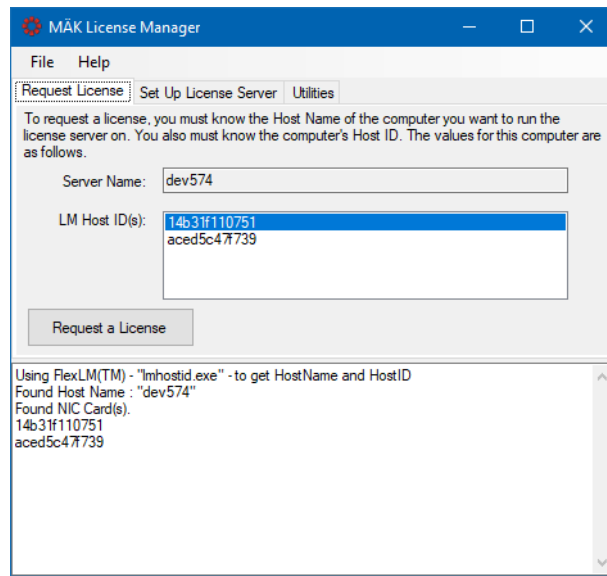


Figure 2-4. License Manager

2. Select the Request License tab. It displays the server name and the IDs for your network cards.
3. If you have more than one network card, select the one that you want to use as Host ID.
4. Send the host ID and hostname to your MAK salesperson. MAK will e-mail you a license file.

2.2.2. Put the License File in the *MAKLicenseManager* Directory

When you receive your license file, put it in the *MAKLicenseManager* directory on the license server. The file should have the extension *.lic*. If it does not, please contact keys@mak.com to clarify why it did not follow this convention.

2.2.3. Run the License Server

- To start the license server daemon, on the server machine only, execute `runLm` from the *MAKLicenseManager* directory.

Shutting Down the License Server

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

2.2.4. Specify the License Server

The first time you run a MAK application on a computer, the License Setup dialog box opens (Figure 2-5). It prompts you to enter the hostname of the license server and optionally, a port number.

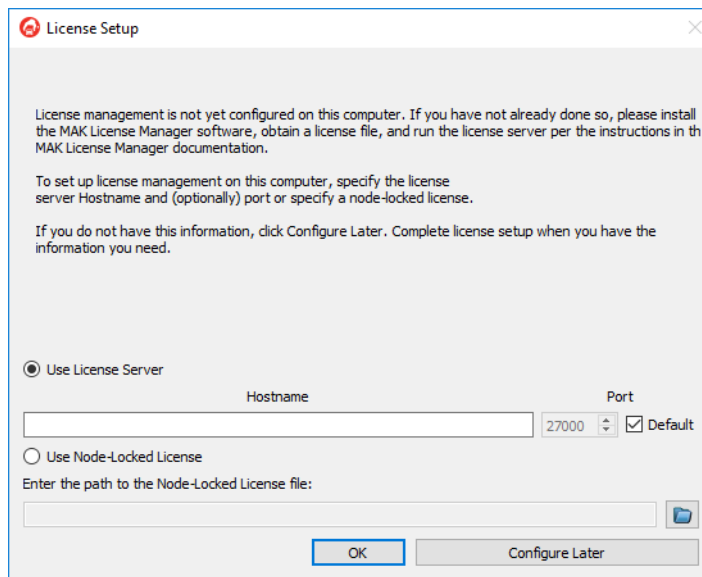


Figure 2-5. License Setup dialog box

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



VRV-2.6-7-200619