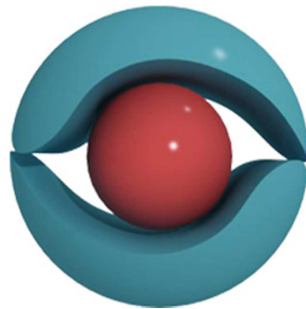


AR-media™ Plugin v2.2

for Nemetschek Vectorworks

QUICK START GUIDE

(January, 2012)



(Windows XP/Vista/7)

Copyright

Copyright © 2008/2012 Inglobe Technologies S.r.l. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual or otherwise, without the prior written permission of Inglobe Technologies S.r.l.

Contents

1. Introduction	1
2. Installing the ARplugin	1
3. Activating your License	1
4. Getting Started	2
5. General Settings	2
6. Creating your first Augmented Reality Scene	3
7. Interacting with your AR Scene	4
8. Adapting to Environmental Lighting conditions (Lighting Debug Mode)	6
9. Creating your own Markers	7
10. Adding a Custom Marker to your AR Scene	8
11. Exporting your AR Scene	8
10. Viewing your AR Scene	9
11. Moving the License to another computer	9

1. Introduction

This guide offers the quickest way to install and begin using the AR-media™ “Augmented Reality” Plugin for Nemetschek Vectorworks (ARplugin) to create compelling Augmented Reality scenes. Although this guide assumes users have a basic knowledge of Nemetschek Vectorworks, ARplugin can be used easily also by those who don’t have much experience with it. However, it is recommended that users consult other reference and tutorial resources eventually available. Please, feel free to move along the topic of interest without reading everything in this Guide.

2. Installing the ARplugin

The installation of the ARplugin can be done by downloading the latest standard distribution of ARplugin. This package is recommended for new ARplugin users and includes an installer that guides you through the installation process. This standard distribution comes as an executable .exe file, which automatically determines the correct system settings for ARplugin. To download and install the ARplugin please follow the steps described hereunder:

1. Login into your user account here (you have to register if you do not have an account yet):
http://www.inglobetechnologies.com/vectorworks_login.php
2. Once logged in, download the full version of the software

Note: If more than one version is available, you can only download the software version that you have a license available for.

3. Once the download has completed, start the ARplugin installation by double-clicking on the installer file: ARPluginSetupPRO.exe (for the Professional Edition). This will launch the installer. Simply follow the steps to complete the installation process.

Note: You must have administrator privileges to install and configure the software

3. Activating your License

To activate your license, you need an internet connection available and also need to use the License Manager that comes with software. The procedure will take few seconds. Please follow the steps described hereunder to avoid activation problems:

1. Make sure to have an Internet connection active
2. Locate the “**ARplugin License Manager**” in the “ARplugin 2.2 (PRO) Vectorworks” folder inside the Programs Menu

3. Launch the “**ARplugin License Manager**”. Once launched, a graphical interface will be prompted asking to generate a **Request ID** that you will need to use online to generate the **License ID** that you need to activate the software.

Note: Please, keep the “ARplugin License Manager” open during the whole activation process

4. Generate a **Request ID** and keep memory of it
5. Login into your user account here:

http://www.inglobetechnologies.com/vectorworks_login.php
6. Once logged in, locate and click the reference product slide bar
7. Locate the “Activation” button and click it;
8. Paste the **Request ID** that you have kept memory of earlier in the **Request ID** slot
9. Click “Continue” button. Once clicked the button, a new page with the “**License ID**” will be prompted
10. Copy the generated “License ID” and paste it in the License ID slot of your local License Manager

Note: Please, follow carefully the software instructions while activating the software

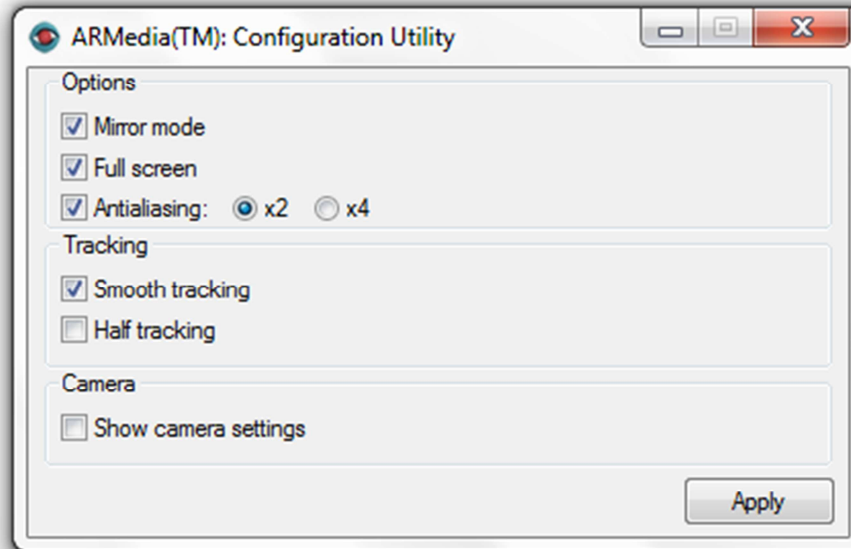
4. Getting Started

To create compelling Augmented Reality scenes using ARplugin for Nemetschek Vectorworks, you can rely on a set of powerful features that you will learn to use easily. With the ARplugin you can quickly create augmented reality scenes out of your Vectorworks 3D models in few steps. What does the ARplugin allow? The ARplugin allows to:

- Set-up some Global Preferences within the design and visualization sessions
- Create single marker scenes (by associating a single model to a single marker)
- Export for the AR-media™ Player
- Optimize tracking to the real lighting conditions

5. General Settings

By launching the **ARmedia Configuration Utility** in the ARmedia 2.2 folder in the Programs Menu, you can choose to set up some **global parameters** of your working environment that will affect your design session.



Enable the **“Mirror mode”** to flip the video stream horizontally (like in front of a mirror). This mode is suitable for cameras mounted in a fixed position and facing the user (like inbuilt cameras for example). If disabled the video stream will be not flipped. This other mode is suitable for head mounted displays as well as in those scenarios where the user can move the camera around.

Enable **“Full screen”** to run Augmented Reality in full screen rather than windowed mode.

Enable **“Antialiasing”** to smooth edges of your 3D models in the augmented reality views. The higher the multiplier the better your 3D models will appear but at the expense of frame rates. Video quality is not affected by this parameter.

Enable **“Smooth tracking”** to configure the tracker for using either a smooth or precise technique; if smooth tracking is enabled then objects will follow the marker in a soft manner and with a little delay, if smooth tracking is disabled then objects will be glued to the marker.

Enable **“Half tracking”** to configure the tracker for tracking a video with half the resolution of the video from the camera. This mode is useful especially when tracking high resolution images to improve the frame rate (but at the expense of a lower tracking quality).

Enable **“Show camera settings”** to adjust camera’s parameters before starting the Augmented Reality experience.

6. Creating your first Augmented Reality Scene

Creating an Augmented Reality scene with Vectorworks has never been so simple. Please, follow the following steps to create your first augmented reality visualization:

1. Create or load any 3D model in Vectorworks
2. Clean up the scene by deleting or hiding elements that you don’t want to visualize

Note: By default, the ARplugin will associate the 3D model in the work space to the standard ARmedia marker. You need to print the marker in order to visualize the AR scene. To print the marker

- open the “Markers” directory inside the “ARmedia 2.2 (PRO) Vectorworks” folder in the Programs Menu
- open and print the file “Marker .pdf”

3. Set-up your workspace to contain the ARplugin menu entries by using the Workspace Editor. In the editor, you will find the “AR-media™→ ARPlugin” menu entry that you can drag on any active menu you want
4. Click the “View in AR” menu item to launch an Augmented Reality view of the model

Note: You need to plug-in your webcam in order to view the Augmented Reality scene.

7. Interacting with your AR Scene

During the viewer execution, you can switch between different management modalities using the function keys: each one permits you to adjust different parameters and interact with the AR scene in real-time. You can bring up an on-screen help which contains all the supported commands for the current active mode by hitting the ‘h’ key at any time.

The following sections will offer a brief description of how to perform some of the available operations.

Flipping the Video Frame

This is especially useful when you want to adjust to different camera and monitor configurations like in-built webcams and projectors (which are sometimes set up to flip the image output vertically).

1. Press the **F1** key to enter the *Visualization Management Mode*
2. Use the arrow keys to flip the video horizontally or vertically

Toggling between full screen and windowed frame

1. Press the **F1** key to enter the *Visualization Management Mode*
2. Press the **F** key to enter windowed or full screen mode.
3. Press the **F** key again to go back to the previous mode.

Visualizing wireframes

1. Press the **F1** key to enter the *Visualization Management Mode*
2. Press the **W** key to show your 3D models in wireframe.
3. Press the **W** key again to restore the default visualization of your models.

Scaling the 3D model

You can emphasize the details of 3D objects or adjusting the overall size of the model by scaling it up or down.

1. Press the **F2** key to enter the *Objects/Scene Interactions Mode*
2. Use the **s/S** keys to respectively scale the model down and up.

Playing selected audio tracks

Once a custom soundtrack has been correctly configured by using ARPlugin, you can interact with it during the Augmented Reality visualization:

1. Press the **F4** key to enter the *Sounds Management Mode*
2. Press the **Return/Enter** key to start the audio playback (pressing the same key again will stop it)
3. Use the arrow keys to jump to the desired track: left/down and right/up will respectively jump to the previous and next track
4. If you want to restart the playback of the current track, press the **Backspace** key

Displaying a sequence of 3D objects

Once you used ARPlugin to correctly place your 3D objects in different layers, you can interact with it during the Augmented Reality visualization:

1. Press the **F5** key to enter the *Layers/Sequences Management Mode*
2. Press the **Return/Enter** key to enter the *Sequence Mode*: this mode displays each layer for five seconds, then it hides the current layer and displays the next one
3. If you want to temporarily pause the sequence, press the **Spacebar** key. Pressing it again will restore the sequence's playback.

Hiding/Showing a layer

1. Press the **F5** key to enter the *Layers/Sequences Management Mode*
2. Press the number key (0 through 9) corresponding to the layer number you want to hide/show
3. Press the same key again to show/hide it again

Hiding/Showing all layers

1. Press the **F5** key to enter the *Layers/Sequences Management Mode*
2. Press the **U** key to hide all layers
3. Press the **SHIFT+U** key to show all layers again

Sectioning 3D objects

1. Press the **F6** key to enter the *Clipping Management Mode*
2. Press the **Return/Enter** key to enable *Clipping mode*
3. Select one of the clipping plane by pressing the **CTRL+(1..6)** keys
4. Use the **down** and **up** keys to move the selected clipping plane respectively away and towards the marker
5. Use the **left** and **right** keys to rotate the selected clipping plane respectively clockwise and counter-clockwise with respect to the marker's center.
6. Press the **Return/Enter** key again to disable *Clipping mode*

Increase tracking performances

Two parameter must be taken into account when improving tracking performances: objects' stickiness and jittering: the higher the first factor is, the more all the objects will strictly follow the markers' movements (even the ones that are due to the camera adjustments to the lighting conditions). This may result in 3D objects which appear unstable, thus causing a jittering effect.

ARPlugin permits you to adjust what is called the *Smoothing effect*: the higher this value is, the more the jittering will be reduced (3D objects will tend to remain to their position despite marker movements).

1. Press the **F7** key to enter the *Tracking Management Mode*
2. Use the up/down arrow keys to respectively increase objects' stickiness to the marker and reduce objects' jittering

Adjusting light's position in the scene

When the 3D model contains a light source which can cast shadows on other objects, you can interact with it during the Augmented Reality visualization:

1. Press the **F8** key to enter the *Lighting Management Mode*
2. Ensure that the marker which has the light is visible in the camera
3. Press the **Spacebar** key to view the current light's position in the scene. A 3-axis figure representing the light source will show up
4. Use the arrow keys to move the light source backward, forward, left and right
5. Press the **CTRL+UP arrow** key to move the light source up
6. Press the **CTRL+DOWN arrow** key to move the light source down
7. Press the **Q/A** keys to rotate the light source around its local X axis
8. Press the **W/S** keys to rotate the light source around its local Y axis
9. Press the **E/D** keys to rotate the light source around its local Z axis
10. When you are satisfied with the new position of the light source, press the **Spacebar** key again to hide the 3-axis figure.

Displaying soft shadows

1. Press the **F8** key to enter the *Lighting Management Mode*
2. Press the **CTRL+2** keys to enable soft shadows visualization.
3. If you notice a performance's reduction, you may need to set the visual accuracy mode to "fastest" by pressing the **ALT+1** key.

If even in the "fastest" visualization accuracy mode performances are not reasonable, you may need to set back the "Simple" shadows visualization by pressing the **CTRL+1** keys.

8. Adapting to Environmental Lighting conditions (Lighting Debug Mode)

It may happen that default parameter settings are not suitable to real environmental lighting conditions thus impeding the correct visualization of the Augmented Reality scene. The **Lighting Debug Mode** allows you to adjust tracking responsivity as a function of real lighting conditions by modifying a **lighting threshold parameter**. Modifying the lighting threshold will allow you to recognize the marker even in bad lighting conditions (too dark or too lit environments) and it is useful if used in combination with the lighting debug mode. To adjust the lighting threshold, enter the "Tracking Management Mode" and use the "+" and "-" keys:

- Key **"d"** to toggle to Lighting Debug Mode
- Key **"+"** to increase the lighting threshold
- Key **"-"** to decrease the lighting threshold

9. Creating your own Markers

With ARplugin 2.2 Professional you can create augmented reality markers autonomously in the format `.arpattern`. You can do it by using the **ARmedia Marker Generator** utility that comes with the software. To create a marker and temporarily add it to the library you can go through the following steps:

1. Launch the **ARmedia Marker Generator**. You can do it from within Vectorworks by clicking the “Marker Creation...” menu item in the ARPlugin menu, or by locating the Marker Generation Utility in the ARplugin 2.2 Folder in the Programs Menu
2. Once launched, the Marker Generation Utility interface will pop-up, asking you to fill in the details of the marker you are going to create.
3. Insert the name of the Marker in the “**Marker Name**” slot
4. Insert the path of your marker image in the “**Input Image**” slot

Note: The marker’s input image must be perfectly square and must include a very small white contour. If the marker is square but doesn’t include a white contour it will be not suitable for publication (see image below). A couple of empty markers’ templates are available in the same folder where you can find the markers’ PDFs.

Note: Images can be provided in one among `jpg`, `jpeg`, `bmp`, `tga`, `png`, `tif`, `tiff` formats, with RGB color model.

Note: The marker images must be files up to 1024x1024 pixels (greater resolutions might not work properly).

5. Insert the path of the output marker in the “**Output**” slot
6. Click on the “Create” button to create the marker
7. Once created, a window with the marker inside will pop up. If the marker has a green square around it then the custom marker is suitable for AR. If the image is not suitable, then a “No markers found.” message will be prompted like in the image below



8. Click on the Marker image to generate the marker.

9. Once generated you can locate it in the path you had previously set-up. You can now add it to your augmented reality scene

Note: To make the marker generation utility work you need to have **Quicktime** installed.

10. Adding a Custom Marker to your AR Scene

To add a custom marker to your AR scene:

1. Click on the “**Options...**” menu item in the ARPlugin menu within Vectorworks.
2. Click on the “**Add...**” button under the “Available Markers” list in the Markers Library. A path selection will be prompted to select the marker
3. Once selected, a new marker with the specified name will be added to the “Available Markers” list
4. Select the newly added marker from the list if you want to use this marker during the Augmented Reality visualization

11. Exporting your AR Scene

With ARplugin Professional you can also create independent augmented reality files in the format `.armedia` that can be viewed independently with the free AR-media™ Player on any computer without Arplugin and Vectorworks installed. To export an augmented reality scene you just need to:

1. Create or load any 3D model in Vectorworks
2. Clean up the scene by deleting or hiding elements that you don't want to visualize
3. Click the “*Export for AR*” menu item to export the model

Exporting for iOS devices

If you want to create a `.armedia` file visible on the ARPlayer for iOS, be sure to have the “**Ask to export for iOS**” option checked in the main panel. After clicking on the “*Export for AR*” menu item you will be able to set all the custom properties of the model and then create the `.armedia` file.

Note: Please remember that when exporting for iOS devices, the resulting `.armedia` file will display only the first layer in the scene. Any other layer, along with any configuration you may have made will not be taken into account during the creation of the `.armedia` file. You will be able to display the content by using the default “AR-media” marker. Additionally, no soundtrack will be available.

12. Viewing your AR Scene

ARplugin provides users with different visualization options.

The first visualization option is accessible from the “**View in AR**” menu item. This action allows you to view all visible objects in Augmented Reality with just one click. Your camera will start and you will be able to view all the 3D objects in your scene on the printed “AR-media” marker (i.e. the default marker). To view your scene:

1. Click on the “**View in AR**” item in the “**AR-media**” menu

The second visualization option is given by the possibility to open a previously generated/exported .armedia files with the ARplayer. To open an .armedia file:

1. If you don't have already installed it, first download and install the latest version of the AR-media™ Player from the website here:
http://www.inglobetechnologies.com/armedia_player.php
2. Double click on the .armedia file you want to visualize
3. Once clicked, the ARplayer will automatically open the file and the Augmented Reality experience will start.

13. Moving the License to another computer

You can move your license from a computer to another one whenever you like. You can do it by following few steps:

1. Be sure to have the full version of the ARplugin installed on every computer where you want to run it
2. Launch the **ARplugin License Manager** of the active ARplugin. You can locate it in the ARplugin 2.2 Folder in the Programs Menu
3. Once launched, the ARplugin License Manager interface will pop up.
4. Click the “**Release**” button to generate the **Release ID**. Copy the **Release ID** and keep memory of it.
4. Login into your user account here:
http://www.inglobetechnologies.com/vectorworks_login.php
5. Click on the product you want to move the license for
6. Click on the “**Release**” button. A new page will be prompted asking you to paste the **Release ID** generated in local using the ARplugin License Manager
7. Paste the **Release ID** generate using the License Manager in local in the **Release ID** slot and click “**Continue**”. This will make your license available again for a new activation
8. Repeat the activation procedure described in Section 3 of this Guide to activate the license on the new computer