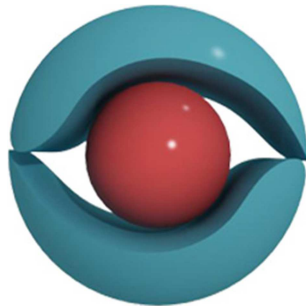


AR-media™ Plugin v2.2

for Nemetschek Scia Engineer

INSTALLATION & USER GUIDE

(November, 2011)



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Foreword

AR-media™ Plugin technology allows you to bring your models from your favourite 3D modelling tools straight into reality just in a click. Once installed and configured the plug-in allows you to visualize any model in Augmented Reality and experience a totally new way to interact with your digital content and show it to your customers.

The *AR-media™ Plugin* for Nemetschek Scia Engineer allows you to enhance the world famous analysis and design software from Nemetschek Scia with Augmented Reality capabilities, bringing the power of the AR-media™ platform on your desktop. The bundle comprises the AR-media™ Viewer and the AR-media™ Exporter: the former allows you to start your Augmented Reality experience inside the creative and design process, whereas the latter allows you to export your models and distribute them to your clients that will be able to experience your models in Augmented Reality even without Scia Engineer installed.

Requirements

Hardware

Minimum Hardware: 1 GHz Processor, 512 MB Ram, 100% Compliant OpenGL Video Card with 128 MB Ram, 50 MB of available Hard Disk space, USB 2.0 Webcam.

Recommended Hardware: 2 GHz Processor, 2 GB Ram, 100% Compliant OpenGL Video Card with 512 MB Ram, 50 MB of available Hard Disk space, USB 2.0 Webcam with 30FPS @ 640x480 resolution.

Software

Required Software: Microsoft Windows® XP/Vista/7, Latest Video Drivers, Nemetschek Scia Engineer 2011 or later.

Software Versions

Currently, just one software version is available to end users: the “Professional” version. Please refer to the licensing section to discover how to register your software.

Professional Edition

The professional edition has a 30 seconds time limit and shows the AR-media™ logo on screen unless a valid license is activated. You can freely view your 3D scenes with the standard “AR-media™” marker and customize some visualization options as well as the possibility to export models for viewing outside of Scia Engineer.

Introduction

Augmented Reality

Augmented Reality refers to the real-time view of the physical world whose elements are augmented by computer generated items. Thanks to Augmented Reality, users can interact with 3D content directly in the environment where they live and work, by means of a suitable computer interface. Augmented Reality helps users to put any virtual content in context thus assisting them in solving real world tasks in a completely new way.

AR-media™ Platform

AR-media™ is the Augmented Reality Platform behind the line of products by Inglobe Technologies that goes under the name “AR-media™ Plugin”. AR-media™ is a general purpose platform for the development of advanced Augmented Reality applications and solutions. It allows to create solutions ranging from stand alone, web and mobile as well as custom solutions targeted to meet complex requirements in a wide range of applications scenarios. It supports distinct tracking techniques and software technologies that are at the basis of any Augmented Reality solution designed and deployed by Inglobe Technologies.

AR-media™ Plugin for Nemetschek Scia Engineer

“AR-media™ Plugin” is the name of a line of software products derived from AR-media™ and especially targeted to enhance specific 3rd parties software with Augmented Reality functionalities. The plugin implements only some of the features of the AR-media™ platform. The AR-media™ Plugin for Nemetschek Scia Engineer allows you to enhance the world famous analysis and design software by Nemetschek Scia with Augmented Reality capabilities. Specifically, the AR-media™ Plugin for Scia Engineer allows users to create and manage Augmented Reality content out of 3D models visualized in Scia Engineer in a very simple and practical way. No programming capabilities are required. Using the AR-media™ Plugin for Scia Engineer you can create complex and high quality Augmented Reality scenes leveraging on the main features described below.

Product Features

Exporter

With AR-media™ Plugin you can create independent Augmented Reality files with extension .armedia and let other users enjoy them using the free AR-media™ Player. You are free to distribute this content at no charge for most uses in compliance with the License Agreement.

“Lighting Debug” Mode

Light is an important factor in Augmented Reality applications as it affects strongly the performance and stability of the AR visualization specifically for what concerns the tracking of the markers. With AR-media™ Plugin you have better control on the tracking algorithms, thus being able to adjust important parameters as a function of the real lighting conditions of your real world scene. Moreover you are able to adjust tracking parameters with useful visual feedback. This is what we call the “Lighting Debug” Mode.

Clipping/Sectioning

During the Augmented Reality visualization, you can enable the Clipping mode which permits you to view sections and clipping planes of the selected 3D objects.

Antialiasing

The Antialiasing function allows users to minimize some visual artifacts of the 3D content in the Augmented Reality view.

Real-time Rendering

During the Augmented Reality visualization AR-media™ Plugin performs real-time rendering in a way that is compatible with the standard Scia Engineer rendering engine.

HD Support

AR-media™ Plugin supports a wide range of HD webcams and cameras. A suitable frame grabber could be required.

Tracking Technology

Even though AR-media™ platform is not limited to a given tracking technology, AR-media™ Plugin is based on a marker tracking technique.

Head Mounted Displays

A variety of Head Mounted Displays is supported by AR-media™ Plugin. AR-media™ Plugin supports, but is not limited to, eMagin Z800 3D Visor, I-O Display Systems i-Glasses, VR ProAR.

Installation

Installation is performed during the installation process of Nemetschek Scia Engineer itself (please refer to Scia Engineer's documentation for details).

The installation procedure requires full administrative rights, so be sure to have the required privileges before trying to install the software. The installation process will install the following components:

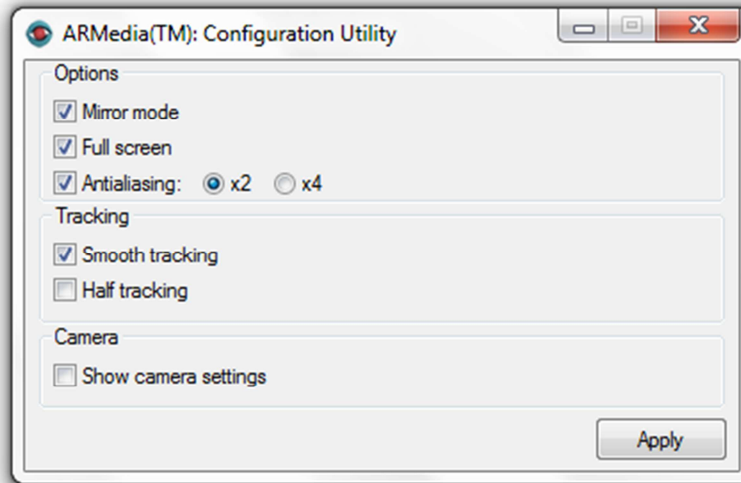
- AR-media™ Plugin for Nemetschek Scia Engineer
- AR-media™ Exporter for Nemetschek Scia Engineer
- AR-media™ Configuration Utility
- AR-media™ License Manager
- Help and Documentation files

When the installation process starts, just follow on screen instructions from the installation wizard.

Configuration

You can configure¹ the Plugin and Exporter using the *AR-media™ Configuration Utility* installed with the AR-media™ software. The Configuration Utility window is shown in the following figure:

¹ Please note that you must have full administrative rights to configure the plugin.



In the configuration window you can choose many options each of which is described in the following section.

Configuration Options

Mirror mode: if enabled, the video stream will be horizontally flipped like in front of a mirror (this mode is suitable for cameras mounted in a fixed position and facing the user); if disabled the video stream will be not flipped (this mode is suitable for head mounted displays and in those scenarios where the user can move the camera around).

Full screen: allows to choose to run Augmented Reality in full screen or windowed mode.

Antialiasing: allows to enable antialiasing and set the corresponding value. 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.

Smooth tracking: allows 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.

Half tracking: allows 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).

Show camera settings: allows to adjust camera's parameters before starting the Augmented Reality experience.

When you click the *Apply* button any change you've made will be applied.

Usage

Printing Markers

The very first step to experience Augmented Reality with AR-media™ tools is to print the provided marker and possibly fix each one of them on a rigid, flat surface. You can print the default marker from the Plugin program group by opening the “Markers” sub-group where the default PDF file is available for printing.

During execution point your webcam towards the printed marker to visualize your 3D content on it; be sure to have a well lit environment without reflections and highlights on the marker surface in order to have the best possible experience.

Using the Plugin

When *AR-media™ Plugin* is installed and configured, Nemetschek Scia Engineer interface will be enhanced with:

1. a sub-menu called “*ARMedia*” (under the default plug-ins menu) with:
 - a. a menu item called “*View in AR*”
 - b. a menu item called “*Export for AR*”
 - c. a menu item called “*Configure*”
 - d. a menu item called “*About*”

View in AR: allows you to view the current model/scene in Augmented Reality.

Export for AR: allows you to export the current model/scene for Augmented Reality (a stand alone .armedia file will be created – such kind of files can be played with the AR-media™ Player freely available on the Inglobe Technologies website).

About: will show an information window.

Viewer Interactions

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 each mode and then a summary table of all supported commands.

Visualization Management Mode

This mode permits you to adjust the visualization parameters regardless of AR content that will be displayed. All operations performed in this mode will affect the global scene and all the 3D objects.

This mode 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).

Note that this is the initial mode in which the Viewer will be every time is started.

Object/Scene Interaction Mode

This mode permits you to configure the global scene with respect to the markers. This mode is useful for demonstration reasons, to quickly change the global display of a model in real-time.

In fact, you can scale the whole model up or down to emphasize the details of 3D objects.

Animation Management Mode

Not available in this version.

Sound Management Mode

Not available in this version.

Layers/Sequences Management Mode

Not available in this version.

Clipping/Sectioning Management Mode

This mode permits you to show and interact with the clipping planes of the 3D objects in the scene to perform real-time sectioning. By sectioning your models you can look inside them and interactively move the section as you wish. Note that in order to start the sectioning command one and only one marker must be visible because clipping planes are bound to the currently visible marker (the default position of these planes are placed on the faces of a cube whose bottom face is over the marker and whose side is 80.0 units wide).

Note: in order to perform all the actions described below, clipping/sectioning must be 'enabled' by using the corresponding key (refer to the table below for details).

Tracking Management Mode

This mode permits you to adjust some parameters that will help you to improve tracking performances.

For instance, 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 (see below for details).

You can also modify the tracking smoothness factor: this parameter is what modifies the way 3D objects follow the marker movements on the screen.

A low factor will make 3D objects appear to have “inertia”: they will tend to remain to their position despite marker movements. This is useful when the marker is not moved much and in a slow way during the Augmented Reality visualization, so the objects will appear more stable and especially in those cases when you experience jittering because of bad lighting conditions.










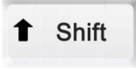









Instead, a high factor will make 3D objects strictly follow the marker movements. Remember that a very high factor will magnify all the little movements of the markers (even the ones that are due to the camera adjustments to the lighting conditions), so it may result in 3D objects which appear unstable.

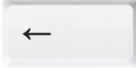
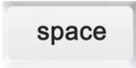


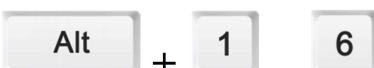



















Lighting Management Mode

Not available in this version.

Commands and Interactions' Summary

The following table summarizes all the keys' interactions available during the Augmented Reality visualization.

<i>Description</i>	<i>Key</i>
Visualization Management	
<i>flip the video horizontally</i>	 or 
<i>flip the video vertically</i>	 or 
<i>toggle fullscreen visualization ON and OFF</i>	
<i>toggle wireframe visualization ON and OFF</i>	
Object/Scene Interaction	
<i>scale up the model</i>	
<i>scale down the model</i>	 + 
Animation Management	
<i>Not available for this version</i>	
Sound Management	
<i>Not available for this version</i>	
Layers/Sequence Management	
<i>Not available for this version</i>	
Clipping/Sectioning Management	
<i>move clipping plane away from the marker</i>	
<i>rotate clipping plane clockwise with respect to the marker</i>	
<i>rotate clipping plane counter-clockwise with respect to the marker</i>	
<i>move clipping plane towards the marker</i>	

<i>disable Clipping mode</i>	
<i>show all clipping planes</i>	
<i>enable Clipping mode</i>	
<i>activate respective clipping plane</i>	
<i>show respective clipping plane</i>	
<i>select respective clipping plane</i>	
<i>activate all clipping planes</i>	
<i>deactivate all clipping planes</i>	
<i>select clipping plane of a 3D object</i>	
Tracking Management	
<i>increase lighting threshold</i>	 or 
<i>decrease lighting threshold</i>	 or 
<i>increase smoothing parameter (increase objects' stickiness to the marker)</i>	 or 
<i>decrease smoothing parameter (decrease objects' stickiness to the marker)</i>	 or 
<i>toggle lighting debug mode</i>	
<i>reset lighting threshold</i>	 or 
Lighting Management Mode	
<i>Not available for this version</i>	
On-screen help	
Terminate the execution and take you back to Scia Engineer	

Lighting Debug Mode

Lighting debug mode allows you to adjust parameters in order to track markers even in bad lighting condition. By entering the “Tracking Management Mode” and then hitting the ‘d’ key the video will turn into black & white showing you the way the software ‘sees’ reality and in particular how the printed marker is seen. In order to have a good tracking or even to just have your models appear on markers, they must be clearly detected, if they are not then you can use the ‘+’ or ‘-’ keys in order to improve detection.

Exporting Models

When you export your models the plugin will create a file with the name you provide and the .armedia extension. The .armedia file format is the format used within AR-media™ tools and technologies. In order to experience .armedia files in Augmented Reality users have to download and install the free AR-media™ Player available on the Inglobe Technologies website. Once the Player is installed, users simply have to double-click the .armedia file to start their experience. Although the Exporter refers to specific content creation software (such as Scia Engineer), exported files do not require any software but the free AR-media™ Player to be displayed.

Licensing

In order to use the full capabilities of the AR-media™ Plugin you need to:

- 1) register yourself
- 2) buy one or more licenses
- 3) download the registered version of the plug-in
- 4) follow the activation procedure

Each step will be now described in more detail.

Registering

You can register yourself by pointing your browser at the following URL:

http://www.inglobetechnologies.com/sciaengineer_plugins.php

After successful registration you'll be prompted to access the Scia Engineer Area in order to:

1. buy new licenses
2. activate a license
3. release a license
4. download the last registered version of the plug-in
5. request and download personal customizations

The *Online License Manager's* control panel also summarizes the number of purchased licenses as well as the number of currently active licenses. License activation and management will be described later.



Figure 1 - Online License Manager's control panel

You can always access the control panel by using the previous URL and your registration credentials.

Buying licenses

To buy a new license, you need to click on the “Buy” button from the *Online License Manager*’s control panel, this will bring you to the purchase’s page where you can click on the PayPal™ button to start a standard PayPal™ procedure. Please note that if you need more than one license, you can set the desired quantity during the PayPal™ checkout procedure. If you prefer to agree on other payment methods you can contact the licensing service (see below for contacts details).

Downloading registered versions

Buying licenses

To buy a new license, you need to click on the “Buy licenses” button from the *Online License Manager*’s control panel. After submitting your billing information, this will bring you to the purchase’s page where you can click on the PayPal™ button to start a standard PayPal™ procedure. Please note that if you need more than one license, you can set the desired quantity during the PayPal™ checkout procedure. If you prefer to agree on other payment methods you can contact the licensing service (see later for contacts details).

Downloading registered versions

After the registration or buying a license you’ll be able to download the registered versions of *AR-media™ Software*.

In order to download the *AR-media™ Plugin* you must click the link that will be displayed at the bottom of the relative version available in the *License Manager*’s control panel.

Before installing the latest available version, it is recommended to remove any previously installed version. You can always refer to the download section for the latest registered version available.

License Management²

Licensing for the AR-media™ Plugin is based on the following actions:

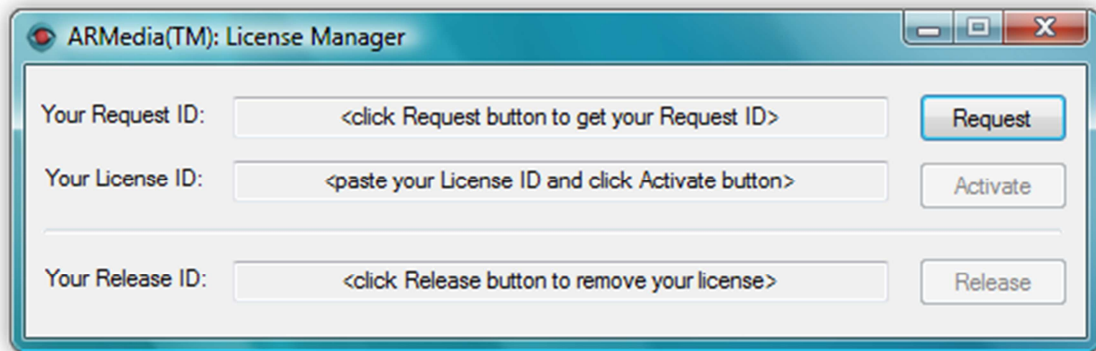
- 1) license activation
- 2) license release

License management actions require you to use both the *Online License Manager*’s control panel and the local *AR-media™ License Manager* that is installed with the plugin and that can be found in the Plugin program group. Please refer to the following section for instructions on how to activate and release a license.

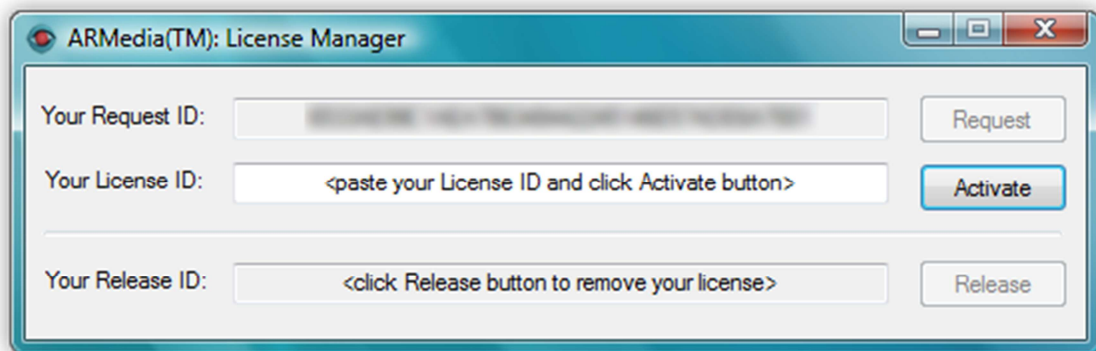
License Activation: allows you to unlock your registered version. Unless you activate your plugin, it will still run with the time limit. In order to activate your plugin, follow these steps:

- 1) On the machine you need a license for, run the local License Manager that was installed with the plugin:

² In order to buy, activate or release a license you must have an Internet connection available.



2) Click the **Request** button in order to get a *Request ID*, the interface will change as follow:



3) copy the *Request ID* somewhere

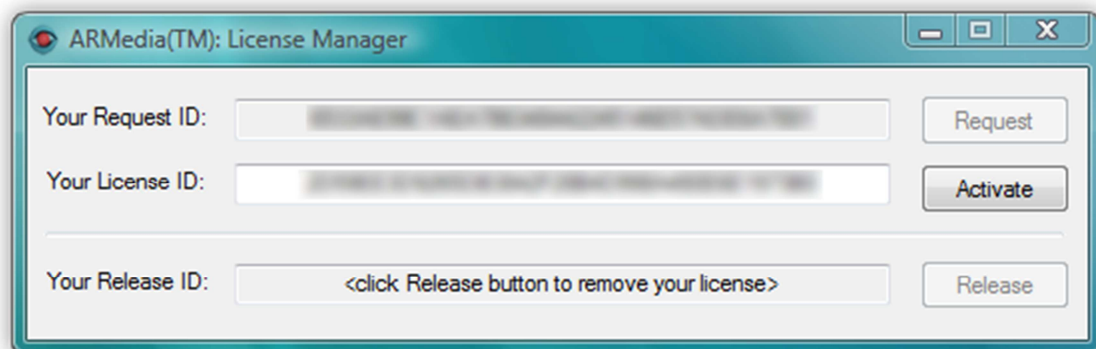
4) Login to the *Online License Manager* using the credentials provided upon registration

a. click the **Activate** button

b. paste the *Request ID* and click on **Continue** (the web application will generate your *License ID*)

c. copy the *License ID* somewhere

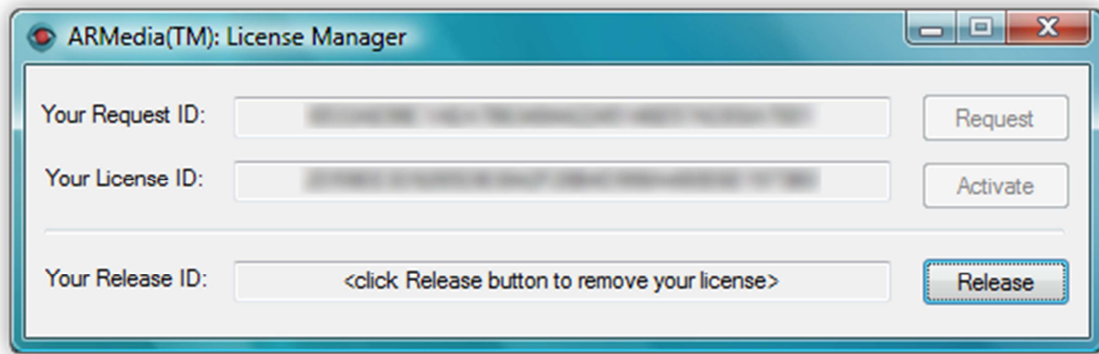
5) Go back to the local License Manager and paste the *License ID* in the corresponding area:



6) Click the **Activate** button

7) the utility will prompt you a confirmation message depending if you entered a valid license or not.

If the licensing procedure completes successfully, the local License Manager will look like the following figure:



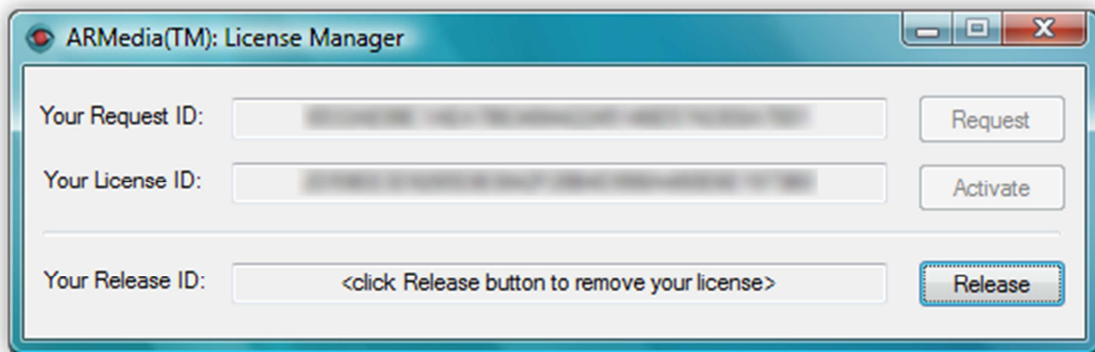
Please note that if you paste an invalid *Request ID* into the *Online License Manager*, and if the web application's engine is not able to understand that it is not valid, you could waste your license and get an invalid *License ID*.

License Release: allows you to remove your previously activated license so that you can re-use it. Only correctly activated licenses can be released. Typically you'll need to release your license in the following scenarios:

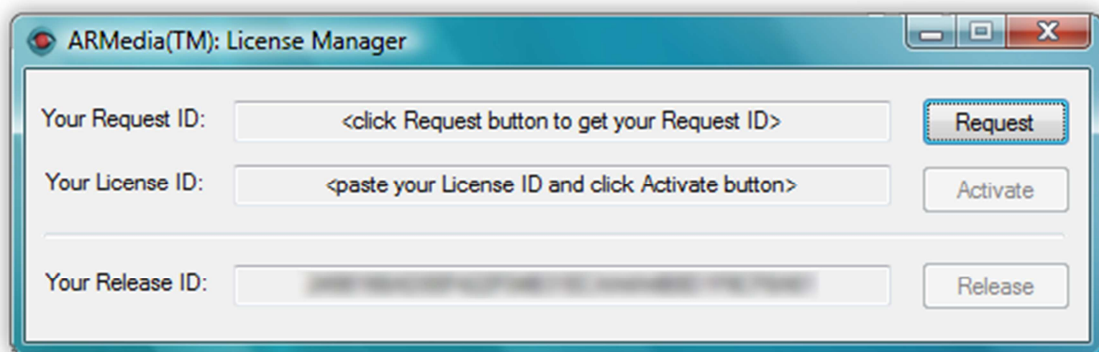
- a) when you need to uninstall or re-install the plugin or the operating system
- b) when you need to move your license from a computer to another

License release is achieved by following these steps:

- 1) execute the local License Manager:



- 2) click the **Release** button, a confirmation message will pop up
- 3) confirm that you want to release the currently active license by clicking on **Continue**³
- 4) the application will generate the *Release ID*, copy it somewhere:



- 5) login into the *Online License Manager* using the credentials provided upon registration

³ At this point your plugin will run in trial mode even though you won't follow the other steps.

- a. click the “*Release*” button
- b. paste the *Release ID* in the input box and click the “*Continue*” button
- c. if the key is correct the web application will make your license available again for another installation and will prompt you with a confirmation message

The *Online License Manager*’s control panel will be updated with the information regarding your current active licenses. Once your license has been released, the plugin will run in trial mode again, and you can use your license with another computer or for a new installation by repeating the License Activation procedure described earlier.

WARNING: *be sure to store your Release IDs for future uses.*

Request license deactivation: if you are unable to release a license anymore because you lost the Release ID, you can follow this recovery procedure:

- 1) Log into your user’s area
- 2) Click on the “*Release*” button of the product you lost your *Release ID*
- 3) Follow the link that appears just under the form
- 4) If you have a valid *License ID*, you can submit it, otherwise you can specify to release one among all your active licenses.

Submitting this request will inform our Licensing service that will provide a manual release of one of your license. Please note that this operation requires the analysis of your request by the licensing/support team, so it could take some time before one of your licenses will be actually released. At the end of the administrative process, you will receive an e-mail notification.

WARNING: this operation cannot be repeated if you already submitted a request. You will be able to issue a new request only after the licensing/support team has processed your previous one.

License Type

Each license is valid for one seat only: you may install and use the full version of the plugin only on a single machine. In order to use the plugin on other machines you must purchase another license or transfer the license from a machine to another. Please refer to previous sections in order to understand licenses management tasks.

Customizations

By accessing the “Customizations” panel found at the bottom of the online *License manager*, you can request software customizations and download them when they are available.

Once the customization process is over, you will receive an e-mail notification containing the credentials to download the file from our site. In order to obtain your personal customization you have to:

- 1) Log into your user’s area
- 2) Open the “Customizations” panel
- 3) Click on the link displayed
- 4) Provide the login credentials that you’ll receive by email.

Support

Licensing Service

The user can refer to the Inglobe Technologies licensing service through the email address: licensing@inglobetechnologies.com. Please feel free to write for any licensing related questions.

General Help

For any problem or question you can write to: help@inglobetechnologies.com.