



# Visualize 3D for INVENTOR to Creo View (INVENTOR Adapter)



## USER GUIDE

Product Release Version 24.2

Document Revision: 1.0

Issued: 29/10/2021



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## Overview of Visualize 3D

### About Theorem

Theorem Solutions is a world leader in the field of Engineering Data Services and Solutions. This leadership position stems from the quality of our technology and the people in the company. Quality comes not only from the skills and commitment of our staff, but also from the vigorous industrial use of our technology & services by world leading customers.



We are proud that the vast majority of the world's leading Automotive, Aerospace, Defence, Power Generation and Transportation companies and their Supply chains use our products and services daily. Working closely with our customers, to both fully understand their requirements and feed their input into our development processes has significantly contributed to our technology and industry knowledge.

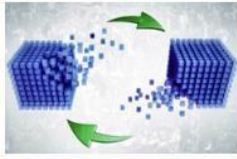
Theorem Solutions is an independent UK headquartered company incorporated in 1990, with sales and support offices in the UK and USA. Theorem has strong relationships with the major CAD and PLM vendors, including; Autodesk, Dassault Systemes, ICEM Technologies (a Dassault company), PTC, SolidWorks, Spatial Technology and Siemens PLM Software. These relationships enable us to deliver best in class services and solutions to engineering companies worldwide.

### What is Visualize 3D?

Visualize 3D is one of 6 core Theorem brands which consist of:

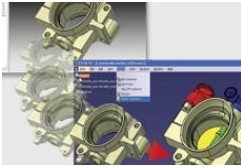
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### *CADverter*

Direct translation of 3D data to or from an alternate CAD, Visualization or Standards Based format



### *Multi-CAD*

Interactive integration of non-native 3D data formats into the native CAD system



### *Visualize 3D*

Direct translation of 3D data for the purpose of Visualization



### *Publish 3D*

The creation of documents enriched with 3D content



### *Process Automation*

Applications to automate any Data Exchange and collaboration processes



### *Digital Reality*

Visualization for [Augmented \(AR\)](#), [Mixed \(MR\)](#) and [Virtual \(VR\)](#) Reality applications

## The INVENTOR Creo View Adapter

Theorem's Visualize 3D product for INVENTOR to Creo View is also known as The INVENTOR Adapter for Creo View.

It is a direct data converter from INVENTOR to Creo View, PTC's visual collaboration product. The Adapter rapidly and accurately publishes 3D mechanical design geometry parts,

assemblies and 2D drawings, together with attribute information to the compact formats used by the Creo View application.

Designed to be compatible with other PTC Creo View Adapters, the Adapter can be integrated into Windchill, DIVISION Graphics Server or other PDM environments.

The AutoDesk Inventor Object Adapter allows the user to translate Inventor assemblies (.iam files) and part (.ipt files) from their original Inventor format into the PTC Creo View .pvs and .ol file formats. In addition to this it also supports the translation of Inventor drawings (.idw files) into DWF format. The adapter is developed using the AutoDesk Apprentice Application Programming Interface (API) and therefore must be installed onto a machine that also has the ability to run an Apprentice API application.

Output file characteristics are configured using the standard PTC Recipe File Editor.

The Adapter may be installed on a number of machines each accessing a central networkfloating license.

### Primary Product Features

- Converts part geometry including analytic data, solid models, and surfaces to the Creo View “.ol” file format
- Converts assembly structure and part orientations to the Creo View “.pvs” file format
- Converts attribute data such as meta-data, colour and layer information and INVENTOR properties
- Retains accuracy of data in Creo View allowing accurate measurements, sections etc.
- Configuration compatible with other PTC Creo View Adapters
- Optional integration with Windchill, DIVISION Graphics Server as a standard “Worker” application. Also able to be integrated with other PDM environments
- Operates in both command-line and batch modes
- Configurable to output earlier versions of Creo View data
- The Creo View data created using this Adapter can be imported into the Arbortext IsoDraw CADprocess

### Primary Product benefits?

- Direct conversion from INVENTOR to Creo View reduces processing time, simplifies integration and retains accuracy of the model

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- Improved communication and collaboration by visualizing INVENTOR data in Creo View across the enterprise
- Reduce costs and risks associated to accessing the wrong version of data by integrating the publishing process into all related business processes
- With over 20 years industrial use Theorem's product robustness and quality is well proven, reducing your business risk

## Getting Started

### Documentation

The latest copy of this documentation can be found on our web site at:

<http://www.theorem.com/Documentation>

Each product has a specific link that provides user documentation in the form of PDF and Tutorials videos.

### Installation Media

The latest copy of Theorem software can be found via our web site at:

<http://www.theorem.com/Product-Release-Notes>

Each product has a specific link to the Product Release Document, which contains a link to the download location of the installation CD.

Alternatively, you can request a copy of the software to be shipped on a physical CD.

## Installation



The installation is run from the CD or ZIP file download provided.

To install the translator, select the **Setup.exe** file and follow the installation process. For a full guide to the process, please see our 'Translator Installation Process' demonstration video located [here](#).



## License Configuration

In order for the translation to run successfully, the Theorem license file provided to you needs to be configured using FlexLM. For a full guide to this process, please see our 'FlexLM License Set Up and Configuration' demonstration video located [here](#).

## Running the Product

Once configured and licensed, the product is ready to be run.

Running the translator via the Command Line:-

- The Command Line Interface provides a direct method of invoking the translator. It can be used directly on the command line or called via a third party application as part of a wider process requirement. Full compatibility with PTC's Windchill Visualization Service (WVS) is supported and is detailed in PTC's *Windchill Installation and Configuration Guide Inventor\_Creo View*.

## Using the Product

### Translation Configuration

It is recommended that the INVENTOR to Creo View Adapter be run from a pre-created configuration. Theorem have adopted the standard PTC Configuration tools which will create a **batch** script for running the Adapter on the command line and also a **worker** script to allow the Adapter to be run with Windchill.

To take full advantage of the configuration tools and to configure the Adapter for use as a Windchill Worker please contact your PTC representative to provide the *Windchill Installation and Configuration Guide Inventor Creo View*.

### Default Translation

#### Default Translation – via the Command Line

Running a translation via the command line can be carried out without using a pre-created configuration. This will use the default translator settings. This is achieved by directly running the script file located in the **<installation\_directory>\bin** directory. The format of the command is as follows:

```
<Translator_installation_directory>\bin\ inventor_pv.cmd <input_files> -p <output_path>  
-o <output_file>
```

The example above will translate a sample file provided within the installation and produce the following screen output:





```
c:\TEMP>"C:\Program Files\Theorem\23.3_INU_CUV\bin\inventor_pv.cmd" "C
:\Program Files\Theorem\23.3_INU_CUV\samples\inventor\Oil Pan.ipt" -p
c:\temp -o test.JT
```

The file will be output to the target location. In this case:

**C:\temp\test.jt**

## Configuring the INVENTOR Creo View Adapter using the Recipe Editor

For completeness this section of the User Guide describes the available configuration options provided by the recipe editor.

A recipe is a set of user-defined rules that drive the individual CAD Adapter. The recipe concept provides a solution to the problem of efficiently converting CAD data into a form suitable for viewing on a wide range of computer platforms. Like its analogy in cooking, gaining a desired result requires cooking to a specific recipe. While most CAD parts will convert into an efficient form for large-scale visualization, some parts require modifications to the standard visualization recipe to be viewed effectively.

The INVENTOR Adapter is provided with a master or default recipe file. This file is preconfigured to allow the visualization of most objects. The master recipe file should not be edited. Instead, additional new recipes can be created from this default file using Save As function in the recipe editor (*rcpedit*) provided with the translator.

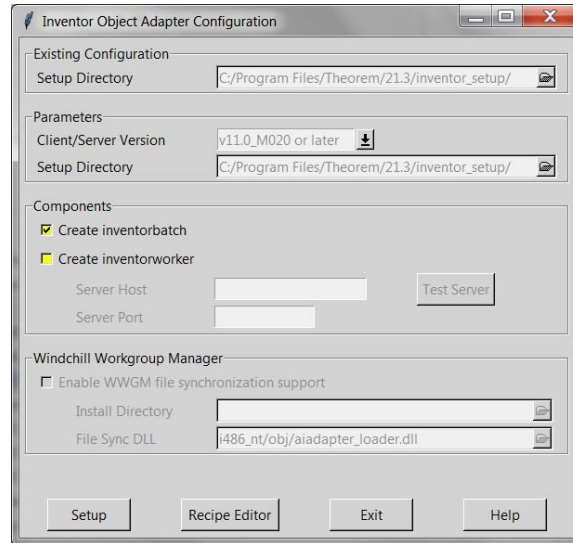
For full details concerning the Recipe Editor, please refer to the 'Creo View MCAD Adapters Installation and Configuration Guide' document, which can be obtained via the PTC Reference Documents Site at <https://www.ptc.com/appserver/cs/doc/refdoc.jsp>. Theorem's Creo View Adapters use the standard PTC mechanism to Configure translation options. The basic concepts and available options are covered here for convenience.

Theorem provide a configuration script to allow a recipe file to be created. Running the following script will launch the Recipe Editor Configuration Tool:

**<Translator\_installation\_directory>\bin\inventor\_pv\_config.cmd**

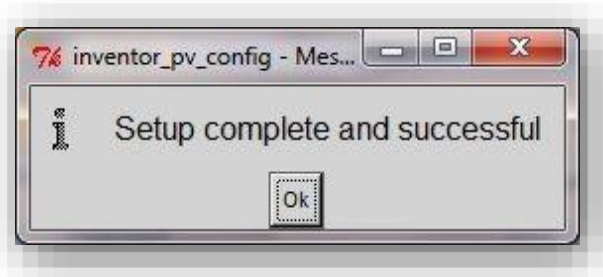
The panel below will be displayed:





The Configuration Tool allows the INVENTOR Creo View Adapter to be configured for use in batch (*via the command line*) and/or for use in a Windchill environment (*inventorworker*). Please contact your PTC representative to provide the Windchill Installation and Configuration Guide INVENTOR\_Creo View for full details on configuring in a Windchill environment. This guide will focus on running the translator from the command line, but all of the configuration options are available in both environments.

The '**Create inventorbatch**' selection will create a recipe file for batch and the '**Create inventorworker**' will create a recipe file for a Windchill invocation. Having selected either of these options (and provided a valid Windchill Host and Port) the '**Setup**' button will become active. Selection of the '**Setup**' button will launch the following panel:

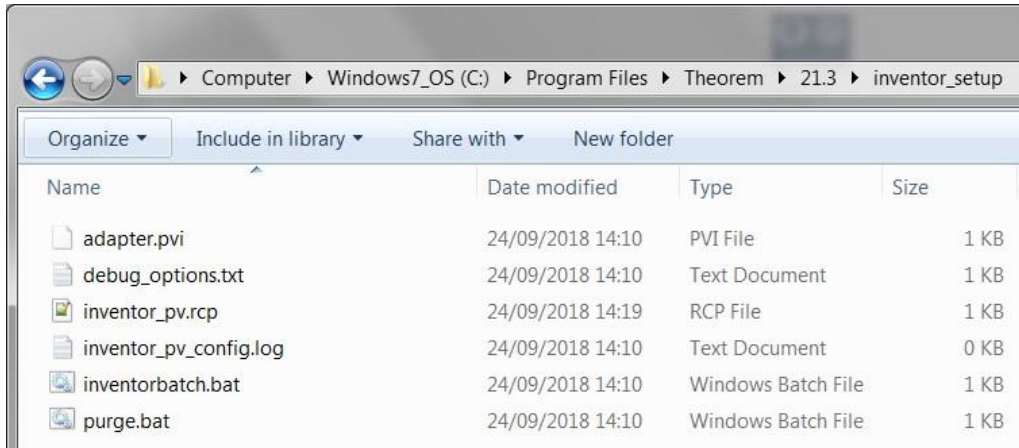


This can be accepted and the '**Recipe Editor**' button will become active.

The '**Setup**' action will create a new directory beneath the translator installation directory. So, the user that creates new configurations will need write access to the translator installation directory. The first configuration directory will be named **inventor\_setup**. Subsequent configurations will be named **inventor\_setup[n]** (where 'n' is a unique number). In this manner many different configurations can be created. The configuration directory will contain an invocation script that will deliver a default Configuration that uses default translation settings. Selection of the '**Recipe Editor**' button will allow the user to set specific translation settings.

The contents of a Configuration folder are:





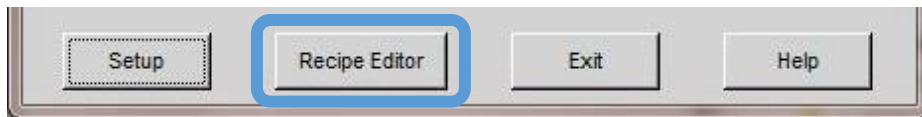
The *inventorbatch.bat* script will be used in preference to the Theorem provided script discussed in the [Default Translation – via the Command Line](#) section and will use configuration options specified in the *inventor\_pv.rcp* (recipe) file.

Running a translation using the *inventorbatch.bat* script can be achieved using the following command

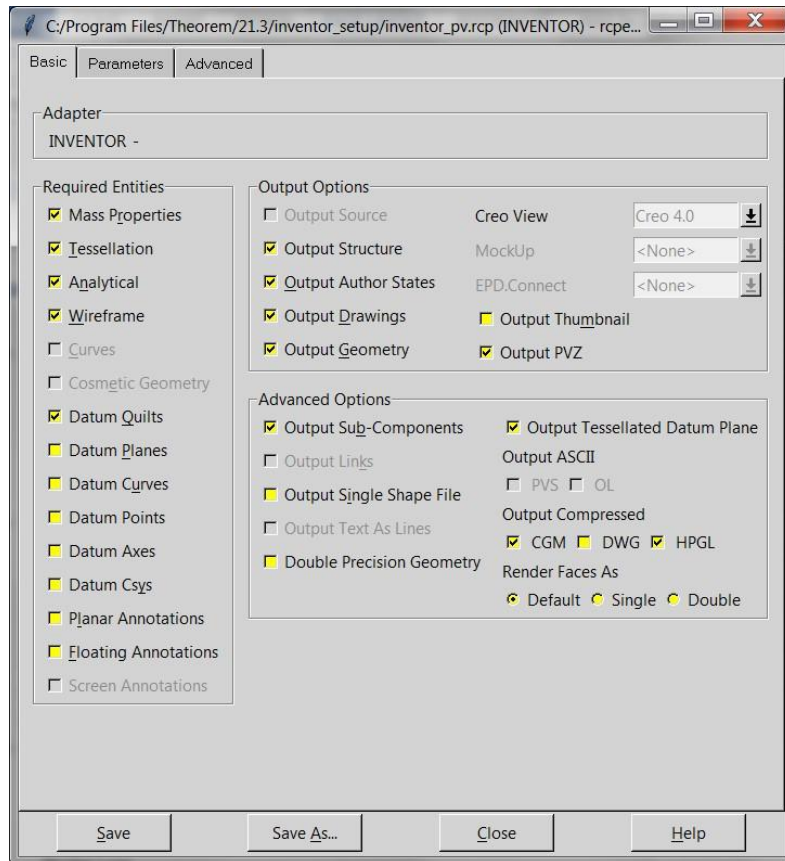
```
<Translator_installation_directory>\inventor_setup\inventorbatch.bat <input_files> -p
<output_path> -o <output_file>
```

The results and screen output will be the same as that noted for the Default Translation.

Changing the translation options in the configuration recipe file is achieved by selecting the **'Recipe Editor'** button.



This action will display a number of panels that are of interest to the Theorem INVENTOR Creo View Adapter.

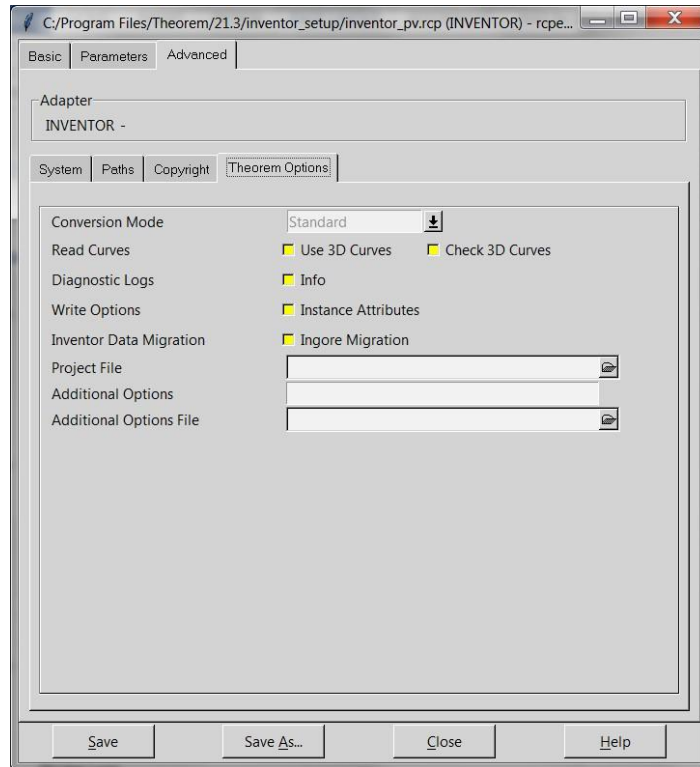


The main page provides standard PTC options that we will not discuss in this document, as these are well documented in PTC's 'Creo View MCAD Adapters Installation and Configuration Guide' document, which can be obtained via the PTC Reference Documents Site at <https://www.ptc.com/appserver/cs/doc/refdoc.jsp>.

Instead, we will focus on the Theorem specific settings that effect the output. These are accessible via the **Advanced Tab** and Theorem Options sub-tab:



Theorem Options – General translation settings



Each of these options is described below:

Option	Description
<p><b>Conversion Mode</b></p>	<p>The user has the option to process Assembly information in one of 2 modes:</p> <ul style="list-style-type: none"> <li>• Standard</li> <li>• Minimum Memory</li> </ul> <p><i>Standard:</i> The default method for assembly processing reads an INVENTOR assembly and its entire geometry contents into memory, before writing out all of the data to Creo View.</p> <p><i>Minimum Memory:</i> A more efficient way of processing the data has been provided via the Minimum Memory conversion mode selection. This mechanism reads in the assembly data then processes each “.ipt” file referenced by the assembly on a part by part basis.</p>
<p><b>Read Curves</b></p>	<p><b>Use 3D Curves</b></p> <p>This option allows Creo View API to generate its own 2D curves. This option is most likely only ever used as a work-around when poor data is encountered.</p>
	<p><b>Check 3D Curves</b></p> <p>This option allows the Adapter to test the data and if necessary automatically enable Use 3D Curves. A</p>
<p>12   Page</p>	<p>©Theorem Solutions 2020</p>



default tolerance of 0.01 (1%) face/surface overlap being used for these checks. This tolerance can be adjusted with ***validate\_3D\_curve\_tol <value>*** in the additional option field.

Diagnostic Logs	<b>Info</b>	Generate a more verbose log files
Write Options	<b>Instance Attributes</b>	This option enables the writing of any instance attributes.
Inventor Data Migration	<b>Ignore Migration</b>	This option allows the check for data migration to be omitted.
Project File	<b>File Name</b>	This allows the user to specify an Inventor project file (*.ipg) which details search paths for parts within an assembly amongst other Inventor settings.
Additional Options	<b>Options</b>	This allows the user to specify any advanced options that are not given here by default. Generally these are used for Support purposes.
Additional Options File	<b>File Name</b>	This allows the user to specify a text file that contains a number of advanced options listed line by line.

### Processing INVENTOR Assemblies (.iam files)

Assuming that the input to the Adapter was a single assembly named ***test\_assembly.iam*** related to many subordinate parts (.ipt) files then the output from the translator will be a single Creo View assembly file ***test\_assembly.pvs*** plus many geometry .ol files, one for each part file processed.



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Given that the example assembly file had additional assembly files subordinate to it then all of the accumulated assembly hierarchy information would be output into the top level Creo View .pvs file.

The INVENTOR Creo View Adapter takes advantage of the latest Creo View dAPI which writes .pvs files (Creo View binary assembly structure files) by default. If a user wishes to write out earlier .pvs versions or .ol files, this can be achieved via the appropriate setting the recipe editor.

### Processing INVENTOR Parts (.ipt files)

For each part (.ipt) file processed individually then the output from the translator will be a single Creo View assembly .pvs file and a single geometry .ol file. Therefore assuming that the file being processed was named **test\_component.ipt** then the output would be **test\_component.pvs** and **test\_component.ol**

### Processing INVENTOR Drawings (.idw files)

For each drawing (.idw) file processed individually the translator will output a (by default) DXF (.dxf) file per sheet found in the .idw file. The final output to the user is a Creo View assembly file and one or many .dxf format files.

Therefore, assuming that the file being processed was named **test.idw** then the output would be **test.pvs** and **test\_sheet1.dxf**, **test\_sheet2.dxf**, etc.

The user can alternatively elect to output drawing files in either CGM, HPGL, PDF or TIF formats. This can be selected via the recipe editor.

## Appendix A – PTC Adapter Support

### PTC Adapter Options

In order to support the PTC Windchill interface, Theorem have also adopted the PTC Adapter command line syntax, a full list of available options is shown below and can be displayed by issuing the following command:

```
<Translator_installation_directory>\bin\inventor_pv.exe -h
```

Setting	Result
<@File>	Read Options from the response file <file>
-?-h	For basic help page.
-d <depth>	Set the conversion file depth. When converting an assembly file determines to what depth the hierarchy should be traversed. The default is all.

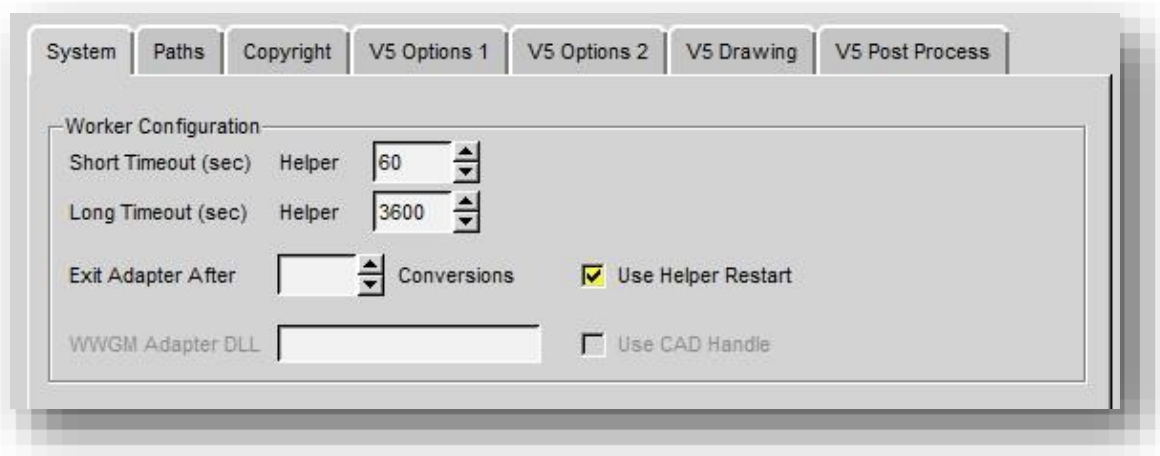


<b>-H</b>	For extended help options
<b>-o &lt;name&gt;</b>	Set output file base name (number of input files must be 1).
<b>-p &lt;path&gt;</b>	Set output base path.
<b>-r &lt;recipe file&gt;</b>	Set recipe to <name>
<b>-vc</b>	Disable all console print-out.
<b>-vc1</b>	Redirect all console print-out to stdout.
<b>-vc2</b>	Redirect all console print-out to stderr (default)
<b>-ve[n]</b>	Increment or set (if[n]is given) the error reporting level. –ve0 disables all error reporting, default 1.
<b>-vl &lt;file&gt;</b>	Direct all printed output to <file>
<b>-vL &lt;file&gt;</b>	Concatenates all printed output to <file>
<b>-vn &lt;file&gt;</b>	Direct all printed output to new log file <file>-.#.log.
<b>-vp &lt;n&gt;</b>	Set the process verbosity flag. List the modules by –l. Flags are listed in the source code.
<b>-vw [n]</b>	Increment or set the warning reporting level, see -vc
<b>-vt</b>	Give the current date/time stamp with all print outs.
<b>-j &lt;name&gt;</b>	Get job from <name> .paj file
<b>-epdconnect</b>	Enable EPD.Connect orientated conversion.
<b>-mockup</b>	Enable MockUp oriented conversion process

## Restart

When the Adapter is used in a Windchill context, in some circumstances the worker process may require a restart. This behaviour can be enabled by a recipe setting:





In addition to the recipe setting an environment variable setting is required to ensure that the end-user deliberately wants to switch on the restart functionality.

Variables can also be set to run a user defined script that can carry out specific actions at the time of restart, e.g. stopping other processes and cleaning temporary directories

Variable	Value	Description
TS_CREOVIEW_RESTART_CONFIG	1	Switch on Windchill Restart

### Worker Logs

If `-vm <level>` worker logs are enabled and not re-directed to a log file, then these messages will default to stderr and be written to the `ts_v5_pc_stderr.log`

### PVZ Output

PVZ Output can be enabled by selecting the 'Output PVZ' options from the 'Output Options' section of the Recipe Editor in the 'Basic' tab or adding the recipe editor setting as:

***adapter/outputPvz=1***

