

CAXperts

PlantReModeller

Manual



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1 Introduction

PlantReModeller imports following PDS data into the **SmartPlant 3D** plant:

- Piping line topology
- Piping components
- Structural linear members

 Note: **PlantReModeller** requires a SmartPlant 3D licence seat on a SmartPlant License Server.

1.1 General conventions


This document contains many visual cues to help you understand the meaning of certain words or phrases. The use of different fonts for different types of information allows you to scan the document for key concepts or commands. Symbols help abbreviate and identify commonly used words, phrases, or groups of related information



Typefaces

<i>Italic</i>	Indicates a system response, which is an explanation of what the software is doing. For example, <i>The text is placed in the viewing plane.</i>
Bold	Indicates a command name, parameter name, or dialog box title. Command paths are shown using an arrow between command names. For example, Choose File → Open to load a new file.
Sans serif	Indicates a system prompt or message, which requires an action be taken by the user. For example, Select first segment of alignment
Normal typewriter	Indicates an actual file or directory name. For example, The ASCII report is stored in the layout.rpt file.
Bold typewriter	Indicates what you literally type in. For example, Key in original.dat to load the ASCII file.

Symbols

This document uses the following symbols to identify special information:

 Note – important supplemental information.

-  Map or path – shows you how to get to a specific command or form.
-  More information – indicates there is additional or related information.

2 Installation

Requirements:

- Supported operating systems:
 - Microsoft Windows XP SP3
 - Microsoft Windows Server 2003
 - Microsoft Windows Vista
 - Microsoft Windows 7
- Intergraph SmartPlant 3D 2009.1 or later
- Microsoft Excel 2003 or later

Administrator rights are required on each computer to install CAXperts **PlantReModeller**. “Run as” is not supported.

Uninstall

To uninstall the software, select **Control panel** from the start menu. Then on

- Windows 7: in large or small icon view, click **Programs and features**. If you're using category view, under **Programs**, click **Uninstall a program**.
- Windows Vista: in classic view, double-click **Programs and features**. In control panel home view, under **Programs**, click **Uninstall a program**.
- Windows XP/2000: (Double) click the **Add or remove programs** icon.

Select the program you want to remove, and click Uninstall/Remove. Alternatively, right-click the program and select **Uninstall**.

Setup command line (for administrators)

The following command line options are supported by the installer:

/S:<<optional ini file>>

Allow an install to be run in silent mode. As a result, no screens or dialogs will be shown.

This command line option also has an optional INI file that can be passed containing session variable values. For example:

```
"C:\output\setup.exe" "/S:C:\setupvars.ini"
```

This will cause the session variables in the INI file to be used for the setup. The INI file should be in the format:

```
[SetupValues]
```

```
%AppFolder%=C:\Program Files\MyProduct
```

/U:<<XML config file>>

This command line option must be used when calling the uninstall program from the command line. This command also has an optional XML file that can be passed containing session variable values. For example:


```
"C:\Program Files\MyProduct\uninstall.exe" "/U:C:\Program Files\MyProduct\irunin.xml"
```

2.1 Licence

PlantReModeller works with signed PD Schema files (i.e. PD schema files that are locked to a certain SmartPlant 3D plant name and might be restricted to certain areas or models), please contact CAxperts Sales to get your PD Schema files signed.

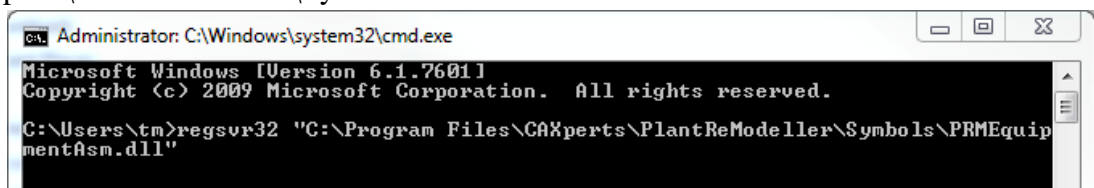
2.2 Prerequisites

PlantReModeller requires RIS dump files of the PD and MTO schemas from a PDS project. The RIS dump of a PD schema contains the information about the project structure (areas, models). The MTO schema dump includes the data about the graphics of the PDS model (coordinates, NPD, attributes, ...). To fill the MTO schema with the data use **Intergraph Material Data Publisher**.

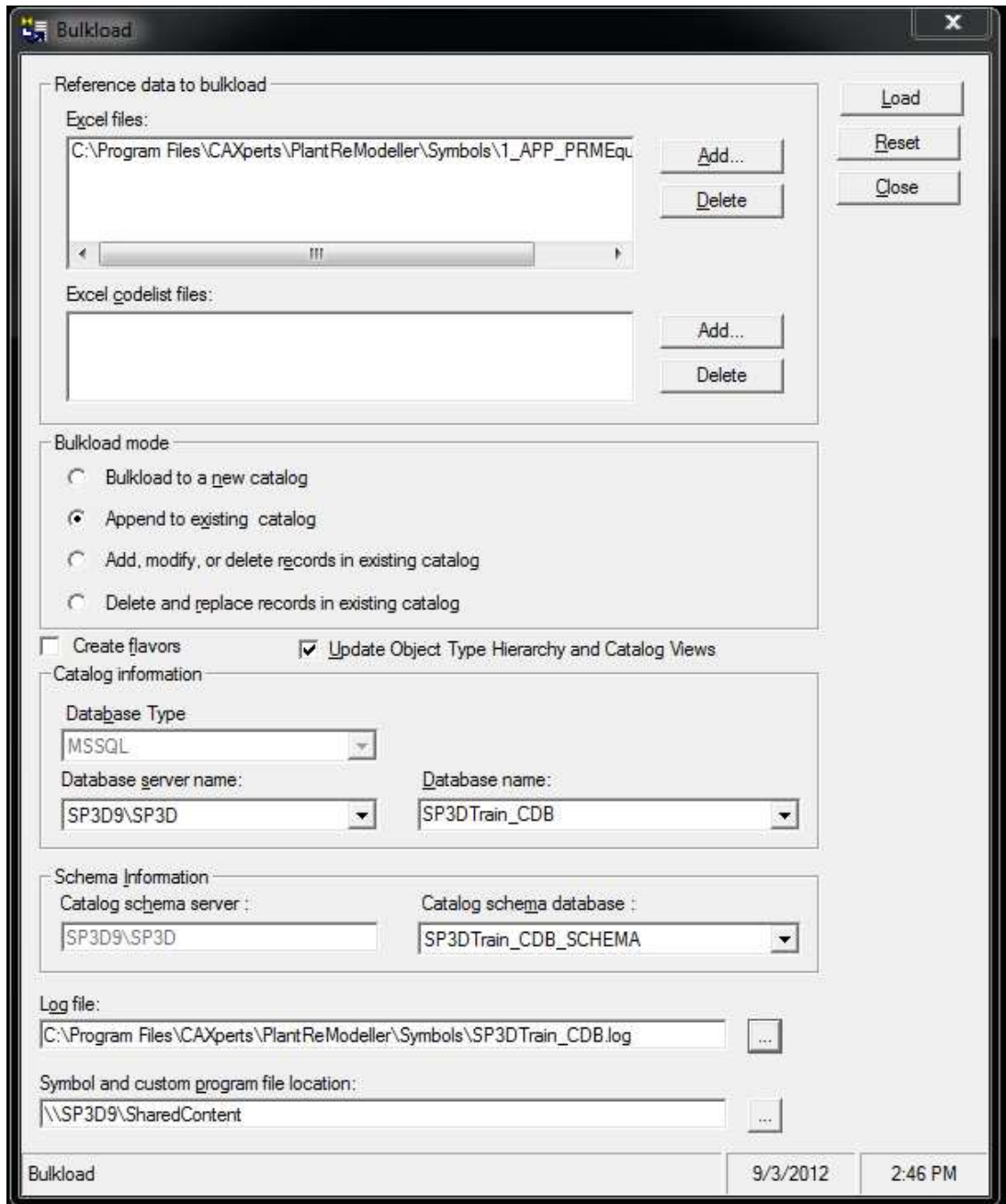
 Note: **PlantReModeller** supports RIS dump files in fixed and variable format. See the **Intergraph PDS** manual for details.

For the equipment task, a special **PlantReModeller** equipment symbol has to be installed according to the Smart 3D standard procedures for symbol registration and bulkload.

1. The file PRMEquipmentAsm.dll has to be registered (either using regsvr32 or the XML file procedure, depending on the way other symbols were registered). This file is located in the Symbols folder in the application folder. folder e.g. ... \CAxperts\PlantReModeller\Symbols.



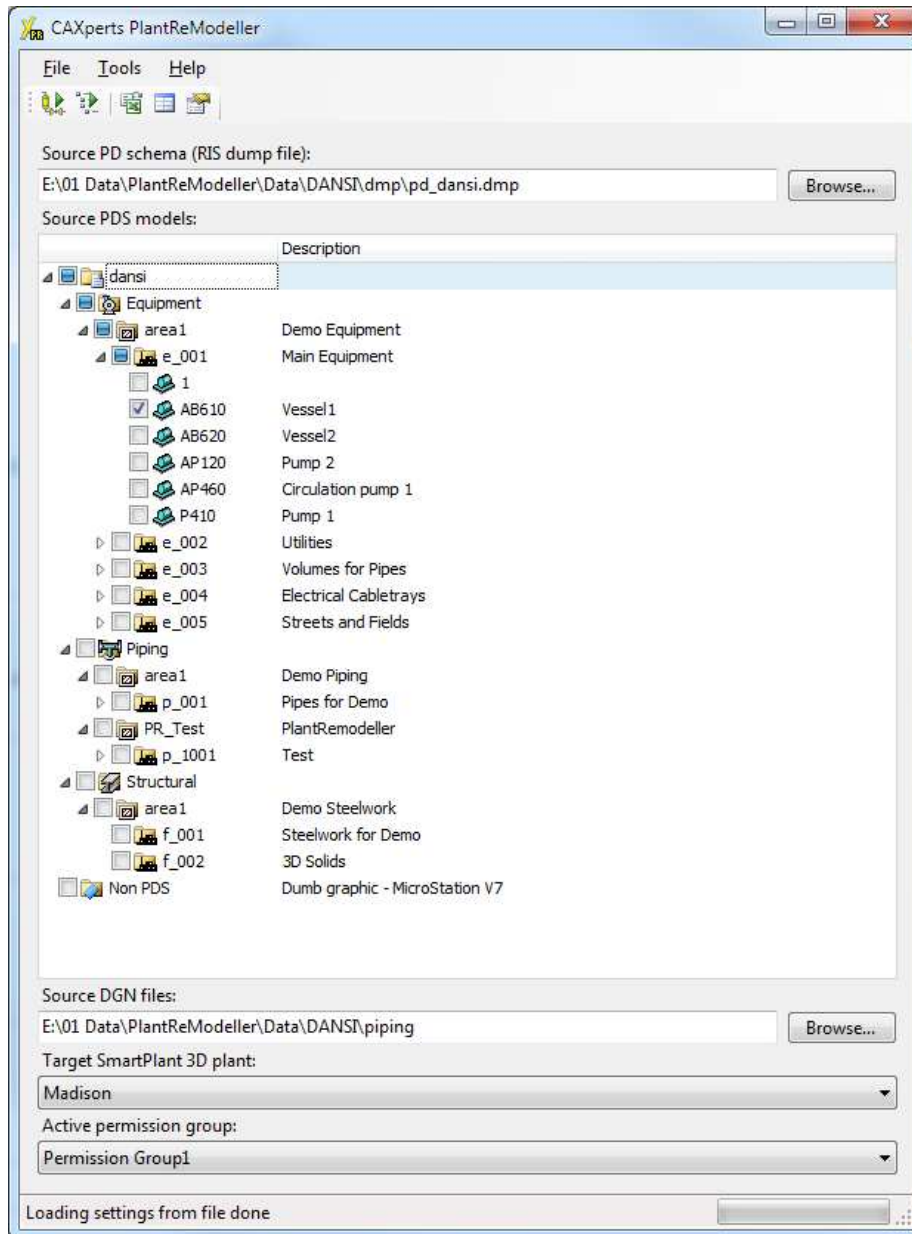
2. The file 1_APP_PRMEquipment.xls has to be bulkloaded using **Start** → **Intergraph SmartPlant 3D** → **Database Tools** → **Bulkload Reference Data**:




The file 1_APP_PRMEquipment.xls is located in the Symbols folder in the application folder e.g. ...\\CAXperts\PlantReModeller\Symbols.


3 PlantReModeller



Run the software and select a source PD schema RIS dump file. The PDS hierarchy (areas, models, lines) is read.



 Note: After selecting a PD dump file **PlantReModeller** looks for the RIS dump file of the MTO schema, which should be located in the same directory as the PD dump file and should be named `mto_PROJECTNAME.dmp`.

Select the pipelines and/or non-piping models to import. The output **SmartPlant 3D** plant will be chosen automatically (according to the information from the signed PD Schema). Finally, define an active permission group which is used to create the new **SmartPlant** objects.

 Note: **PlantReModeller** adds a new generic system *PlantReModeller* to the root of the workspace explorer. All imported PDS data is shown there.

To start the placement process, you can either use the **Run import** button () or the **Remodel step-by-step using topology** button (). These modes differ in the way they handle piping: Run import uses mapping to place lines and add components. If the PDS and SmartPlant 3D pipe specs and pipe spec mapping are not absolutely identical, this might cause errors in the remodelled plant. **Remodelling via topology** remapping works via topology and DGN file analysis, i.e. the piping DGN files have to be placed in the **Source DGN files folder**, the dummy symbols have to be registered and been bulkloaded to the catalogue. The components graphics will be very close to the PDS original, but everything is based on custom instruments and the graphics is fixed (non-parametric).

After completion **PlantReModeller** generates the Excel report.

3.1 Configuration file

All configuration settings are stored in an Excel file, located by default in Config\Default.xls in the application folder. The location of the **Excel configuration file** can be changed using the **Settings** menu.

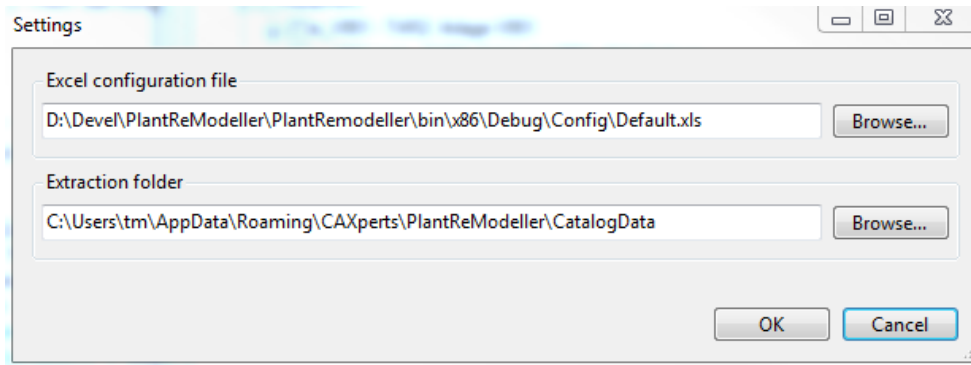
The Excel configuration file consists of the following sheets:

- *PipingSpecMapping*
Specification mapping between PDS and SmartPlant 3D piping specs
- *PipingPartMapping*
Mapping between PDS commodity names and SmartPlant 3D parts/instruments
- *PipingIgnoreComponents*
Contains PDS commodity names which are ignored upon import process
- *StructuralCrossSectionMapping*
Mapping between PDS and SmartPlant 3D structural cross sections
- *StructuralMaterialMapping*
Mapping between PDS and SmartPlant 3D structural material
- *PipingEquipPortMapping_2*
Mapping between PDS and SmartPlant 3D port attributes

Each Excel sheet contains the attribute names followed by the data. The attribute name must be located in the first row irrespective of the column.


3.2 Extraction folder


The extracted data of the piping specification is stored under the selected folder in the **Settings** menu under **Extraction folder**. The location of the extraction folder path can be changed using the **Settings** menu.



4 Import piping data

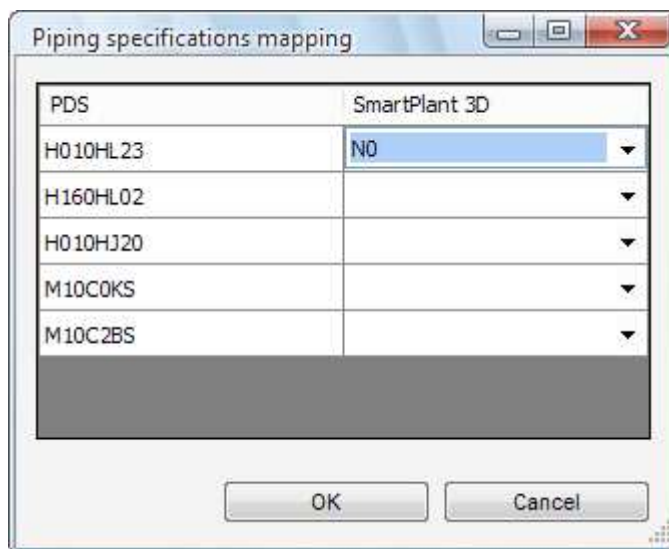
PlantReModeller allows importing piping data from PDS. Along with line topology and common segment attributes the software places parts for the corresponding PDS components as defined on *PipingPartMapping* sheet.


 Note: **PlantReModeller** overwrites previously imported piping data (SmartPlant 3D Pipelines).


 Note: All **SmartPlant 3D** piping specifications and parts required to import piping data must be properly loaded and tested before the user starts the import process.


Piping specification mapping

The menu item **Piping specification mapping...** opens a window where the user can define piping specification mappings for all lines within the selected RIS dump file.



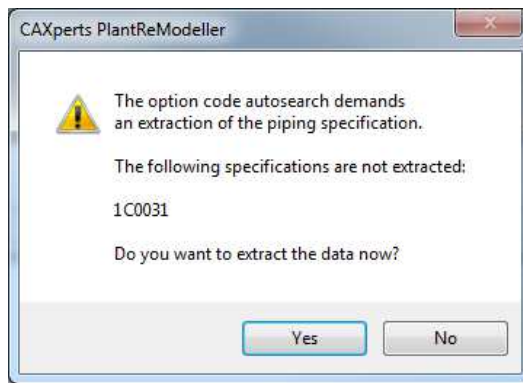
 Note: Only **SmartPlant 3D** piping specifications allowed for the *PlantReModeller* piping system or the whole plant will be shown.


 Note: The piping specifications mapping dialogue automatically shows the PDS specifications for all selected lines to confirm/change the mapping to the corresponding **SmartPlant 3D** specification.


 Note: To get proper results map ANSI PDS to ANSI SmartPlant 3D piping specifications only (the same is also applicable to piping specifications according to DIN).

Piping specification extraction

After the definition of the piping specification mappings, **PlantReModeller** asks for an extraction of the selected piping specifications. At the moment the extraction is necessary for the automatic search of the option code for piping parts.



 Note: The extracted data can be used as long as the data is up to date.

 Note: Without an extraction of the piping specification the automatic search of the option code is not possible → OptionCode set to 1.

4.1 Import line topology

Using route pipe functionality **PlantReModeller** imports first the line topology by placing pipes, reducers and branches. Here only the default **SmartPlant 3D** parts are used (with default option code).

The following PipeRun attributes are retaken automatically from PDS:

- DesignMaxTemp
- DesignMaxPressure
- OperatingMaxTemp
- OperatingMaxPressure
- InsulationPurpose
- InsulationThick

4.2 Import parts


There are two important groups of parts during the import process:

- **End-feature parts:** The parts placed at the end of the line. After placement the total length of the line is increased by the length of the new part.
- **Straight-feature parts:** The parts placed in the middle of the line (at any straight feature). After placement, the total length of the line is unchanged.

End-feature parts

PlantReModeller routes the pipe over all PDS components first. This causes the end-feature parts defined on the *PipingPartMapping* sheet to be inserted with a shift and not on the real position. This happens because of the pipe in place, created as a place holder during the "import line topology" step. In order to properly recognize end-feature parts and to place them correctly, additional rules have to be defined on the *PipingPartMapping* sheet.

Any rule which begins (or ends) with the \$ character defines an end-feature part rule. e.g. \$6Q2C01 defines the flange at the begin (or at the end) of any line. Once recognised, **PlantReModeller** won't place a pipe in place of this flange at the stage of pipe routing, so the end flange is inserted properly on the step of importing single parts.

 Note: The end-feature part rule may contain more than one PDS component, e.g. a ball valve with blind flange.

Piping part mapping

Part mapping allows mapping single or multiple **PDS** components to the **SmartPlant 3D** part. All mapped parts will be placed in **SmartPlant 3D** in place of corresponding PDS components.

The default configuration (*PipingPartMapping* sheets) includes some common cases and is delivered with the software.

PdsName	SmartPlant3DName	SmartPlant3DOptionCode	Comments
!End Component			
\$6Q2C08 6Q1C01 6Q2C01	Gate Valve	autosearch	gate valve with blind flange
6Q2C01 6Q1C06\$	Ball Valve	autosearch	end ball valve
6Q2C01 6Q1C11\$	Globe Valve	autosearch	end globe valve
6Q2C01 6Q2C08\$	Blind Flange	autosearch	blind flange
6Q2C01\$	FLANGE	autosearch	end flange
6Q2C01 IND\$	IND4	autosearch	end instrument
!Inline Component			
6Q2C01 6Q1C11 6Q2C01	Globe Valve	autosearch	
6Q2C01 6Q1C06 6Q2C01	Ball Valve	autosearch	
6Q2C01 6Q1C01 6Q2C01	Gate Valve	autosearch	
6Q1C11 6Q2C01	Globe Valve	autosearch	
6Q1C06 6Q2C01	Ball Valve	autosearch	
6Q1C01 6Q2C01	Gate Valve	autosearch	
6Q2C01 6Q2C01	FLANGE	autosearch	middle flange
6Q2C01 EJ1 6Q2C01	4BOX6	autosearch	
!Auto Routing Options			
6Q2C76		autosearch	Skip E90LR (placed by auto-routing)
6Q2C56		autosearch	Skip E45LR (placed by auto-routing)
6Q2C23		autosearch	Skip REDC (placed by auto-routing)
6Q3C22		autosearch	Skip T (placed by auto-routing)
!Default for all other components			
*	4BOX6	autosearch	Default rule for not mapped components

Some hints for mapping parts:

- The mapping rules are executed top to down
- The rule for end parts should be placed before any other rules, especially for straight-feature parts
- Wildcard "*" can be used to define a PDS commodity code
- For each rule **PlantReModeller** generates automatically the reverse rule (the order of PDS components: left → right, right → left)
- Any valid **SmartPlant 3D** short code or instrument number can be used
- Instead of autosearch for the **SmartPlant3DOptionCode** it is possible to use an fixed value

End-feature part mapping rules

e.g. pipeline ends with ball valve:

n:1	6Q2C01 6Q1C06\$	Ball Valve	End Ball Valve
-----	-----------------	------------	----------------

e.g. pipeline ends with flange and blind flange

n:1	6Q2C01 6Q2C08\$	Blind Flange	Blind Flange
-----	-----------------	--------------	--------------

Straight-feature part mapping rules

e.g. a flanged PDS globe valve

n:1	6Q2C01 6Q1C11 6Q2C01	Globe Valve	Flanged Inline Globe Valve
-----	----------------------	-------------	----------------------------

e.g. a flanged PDS instrument

n:1	6Q2C01 1D1 6Q2C01	I2WAY4	Flanged Inline Instrument
-----	-------------------	--------	---------------------------

Skip rules

To achieve placement of any unmapped items, e.g. as a default standard piping speciality (e.g. 4BOX6) in **SmartPlant 3D**, all parts which were placed by auto-routing must be skipped in order to avoid replacing them by standard piping speciality:

6Q2C76		Skip E90LR (placed by auto-routing)
6Q2C75		Skip 90 Degree elbow (placed by auto-routing)
6Q2C56		Skip E45LR (placed by auto-routing)
6Q2C55		Skip 45 Degree elbow (placed by auto-routing)
6Q2C23		Skip REDC (placed by auto-routing)
6Q3C22		Skip T (placed by auto-routing)
6Q3C73		Skip WELDOLET (placed by auto-routing)
*	4BOX6	Default rule for not mapped components

Piping port mapping

Port mapping allows mapping the **PDS** attributes EndPreparation, PressureRating, TableSuffix and ScheduleThickness to the SmartPlant 3D part and instrument ports. All mapped attributes will be placed in **SmartPlant 3D** in place of corresponding PDS attributes.

The mapping will also be used to determine the option code for **SmartPlant 3D** parts there for the corresponding piping specifications must be extracted.

ASME / DIN	PDSEndPreparation	PDSPressureRating	PDSTableSuffix	PDSScheduleThickness	SP3DEndPreparation	SP3DPressureRating	SP3DStandard	SP3DScheduleThickness
A	11	125	5		11	125	5	
A	11	150	5		11	150	5	
A	11	150	5	40	11	150	5	S-40
A	11	150	5	80	11	150	5	S-80
A	11	150	5	160	11	150	5	S-160
A	11	150	5	STD	11	150	5	S-STD
A	11	150	5	XS	11	150	5	S-XS
A	11	150	5	XXS	11	150	5	S-XXS
A	11	150	60		11	150	60	
A	11	150	61		11	150	61	
A	11	150	80		11	150	80	
A	11	150	81		11	150	81	
A	11	175	60		11	175	60	
A	11	175	61		11	175	61	
A	11	275	62		11	275	62	
A	11	300	5		11	300	5	
A	21	150	5		21	150	5	
A	21	150	5	40	21	150	5	S-40
A	21	150	5	80	21	150	5	S-80
A	21	150	5	160	21	150	5	S-160
A	21	150	5	STD	21	150	5	S-STD
A	21	150	5	XS	21	150	5	S-XS
A	21	150	5	XXS	21	150	5	S-XXS
A	21	150	79		21	150	79	
A	21	150	80		21	150	80	
A	21	150	81		21	150	81	
A	21	300	5		21	300	5	

4.3 Import supports

PlantReModeller imports all PDS logical and physical supports and places a **SmartPlant 3D** logical support automatically. The support number is taken from PDS.

5 Import structural data

PlantReModeller allows importing structural linear members from PDS. This requires proper cross sections and material mapping, which are defined on the *StructuralCrossSectionMapping* and *StructuralMaterialMapping* sheets in the Microsoft Excel configuration file.

- 📌 Note: **PlantReModeller** overwrites previously imported structural data (SmartPlant 3D unit system).
- 📌 Note: Load any required cross section bulkload file using the Intergraph Bulkload utility before starting the import.

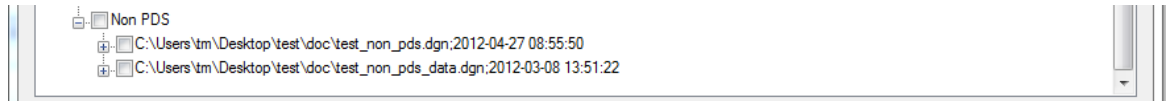
6 Import equipment from DGN files

PlantReModeller uses dump files and DGN files to remodel equipment in **SmartPlant 3D**. Be sure that you have registered and bulkloaded the symbols that come with **PlantReModeller** according to the *Prerequisites* chapter.

If **PlantReModeller** cannot import the geometry of an equipment completely, the left over geometry will be stored in a DGN file in the local TEMP directory (e.g. "C:\Temp\PlantReModeller\") and can be referenced manually in SmartPlant 3D.



7 Import DGN files not created by PDS

PlantReModeller can be used to import DGN files that were not created using PDS: drag & drop the DGN files or folder on the “Non PDS” node of the **PlantReModeller** tree.



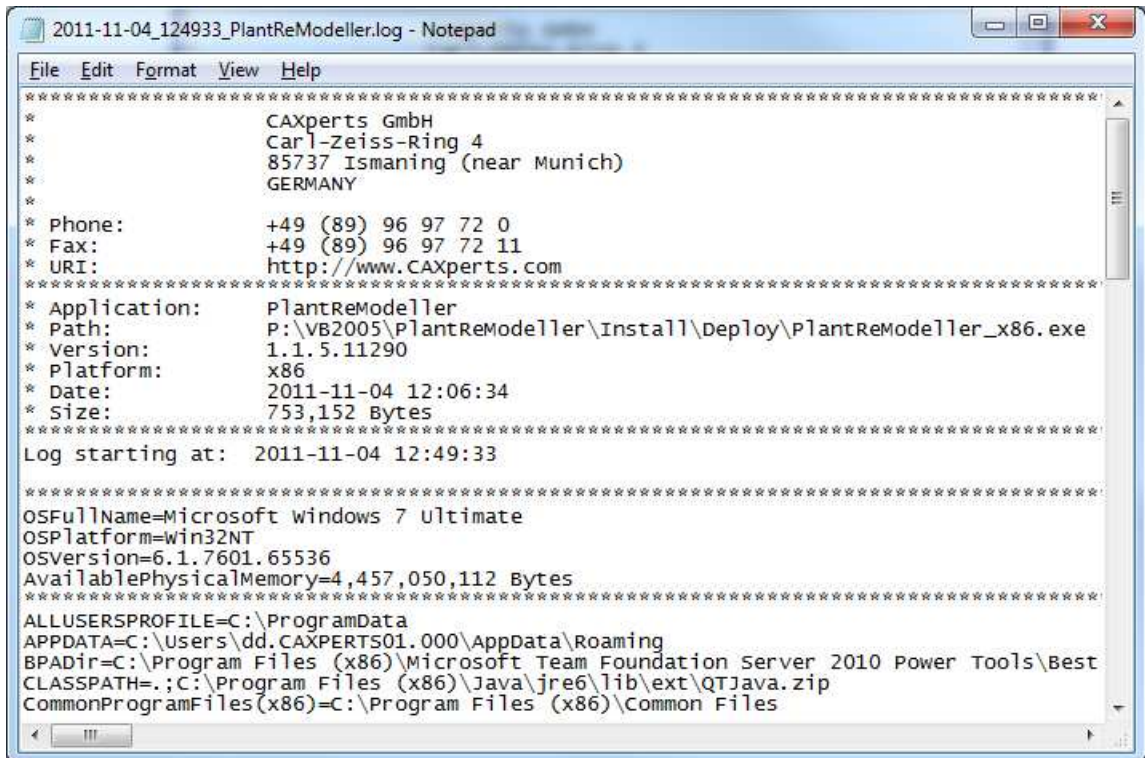
In **SmartPlant 3D** the non PDS data appears in the Workspace Explorer under PlantReModeller / Non-PDS items.

If **PlantReModeller** cannot import all the geometry the software creates a dgn file with the left over geometry in the local TEMP directory (e.g. “C:\Temp\PlantReModeller”).

-  Note: **PlantReModeller** adds a new generic system *Non-PDS items* to *PlantReModeller* of the workspace explorer. All imported non PDS data is shown there.
-  Note: **PlantReModeller** overwrites previously imported non PDS data.

8 Log files

The software creates log files in the local TEMP directory (e.g. “C:\Temp\PlantReModeller\”). The user can also open these files by double-clicking on the **PlantReModeller** status bar:



```
2011-11-04_124933_PlantReModeller.log - Notepad
File Edit Format View Help
*****
*                               CAXperts GmbH
*                               Carl-Zeiss-Ring 4
*                               85737 Ismaning (near Munich)
*                               GERMANY
*
* Phone:                        +49 (89) 96 97 72 0
* Fax:                          +49 (89) 96 97 72 11
* URI:                           http://www.CAXperts.com
*****
* Application:                   PlantReModeller
* Path:                          P:\VB2005\PlantReModeller\Install\Deploy\PlantReModeller_x86.exe
* Version:                       1.1.5.11290
* Platform:                      x86
* Date:                          2011-11-04 12:06:34
* Size:                          753,152 Bytes
*****
Log starting at: 2011-11-04 12:49:33
*****
OSFullName=Microsoft windows 7 ultimate
OSPlatform=win32NT
OSVersion=6.1.7601.65536
AvailablePhysicalMemory=4,457,050,112 Bytes
*****
ALLUSERSPROFILE=C:\ProgramData
APPDATA=C:\Users\dd.CAXPERTS01.000\AppData\Roaming
BPA Dir=C:\Program Files (x86)\Microsoft Team Foundation Server 2010 Power Tools\Best
CLASSPATH=.;C:\Program Files (x86)\Java\jre6\lib\ext\QTJava.zip
CommonProgramFiles(x86)=C:\Program Files (x86)\Common Files
```

9 Other features

9.1 Usage of a text file to check items in the treeview

Create a text file according to this example (one line per search string, wildcard character '*' is allowed):

```
pipe01  
pipe02  
pipe03  
equipment_*  
structural01
```

Drag & drop the text file on the **PlantReModeller** tree. PlantReModeller will then check all items within the piping, equipment and structural sub-tree that are listed in the text file.

10 Appendix (Graphical User Interface)

10.1 Menu

File

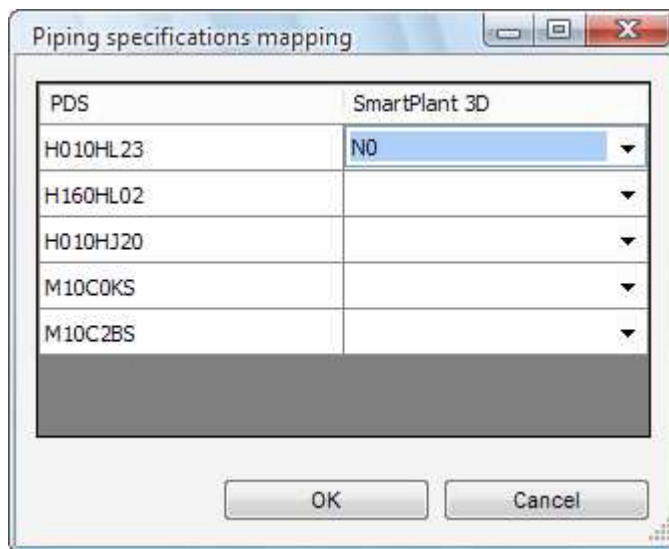
Exit

The menu item **Exit** closes the application.

Tools

Piping specification mappings...

The menu item **Piping specification mappings...** opens a window where the user can define piping specification mappings.



Help

Help

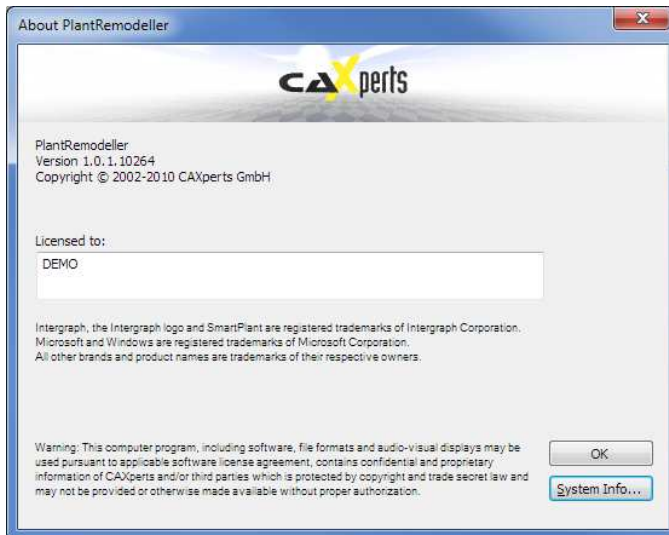
The menu item **Help** opens the **PlantReModeller** documentation (i.e. this PDF file).

Update licence

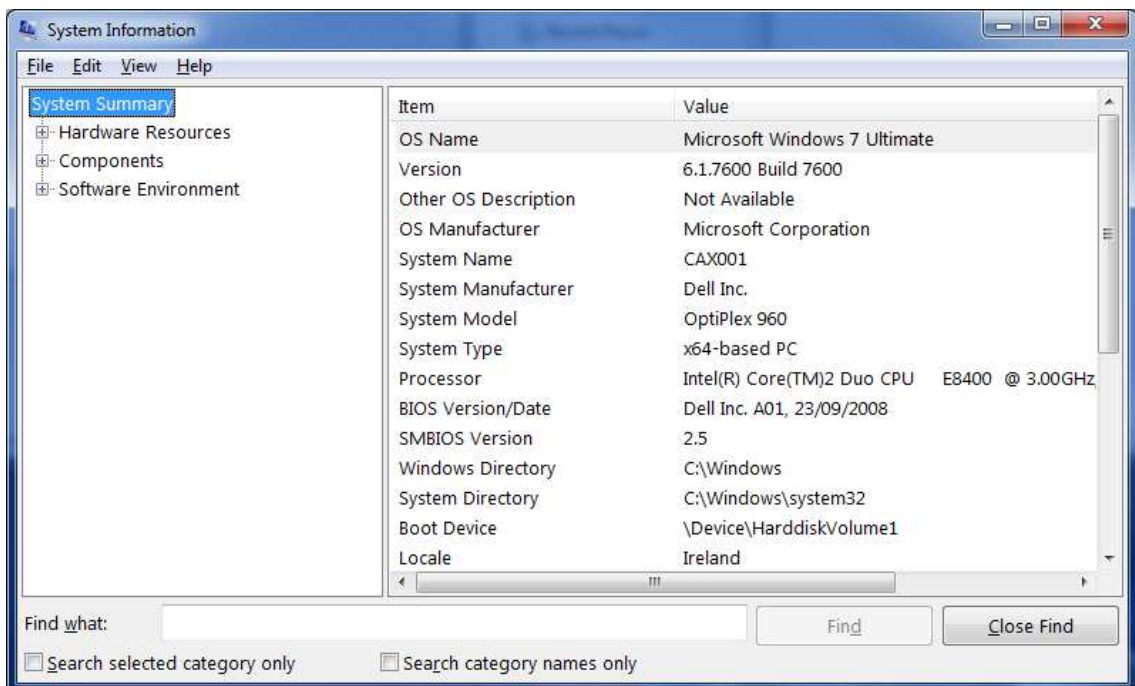
The menu item **Update licence...** brings up the licence update form. On how to install a licence key please refer to chapter 2.1 *Licence*.

About

The menu item **About** shows the About form, which contains information about this software product:



Click **OK** to close the form. The button **System info** brings up the Windows System Information:



10.2 Status bar

The status bar shows information about the current state of the software (e.g. progress bars). If you double click on it, the log file opens (see chapter 6)

11 Technical support

Need more help? Contact CAXperts support by email, online, or phone:

<mailto:support@caxperts.com>

http://www.caxperts.com/component/option,com_contact