digipara® liftdesigner

CAD Models & Automation

EL4

Recommendation

ONLINE TRAINING

Are you an attendee in a DigiPara Liftdesigner online training module?

We recommend to print these out in advance so that you have a handout for your own editing and for your notes during your training.

Information

ONLINE TRAINING

Since DigiPara can not provide software licenses for CAD programs like SolidWorks, Creo, Inventor or AutoCad on the remote training machines, attendees will follow the feature demonstration by the trainer. Attendees can also practice the training samples, but the related CAD software must be installed on the attendees machine.

Please contact DigiPara AG some days in front of the training, to obtain a free DigiPara Liftdesigner software license, to be installed on the trainees local workstation. Installing other CAD programs as mentioned above needs also to be done by the attendee upfront.

Agenda

EL4.1 Reuse 3D CAD Models

- Load CAD Models
- CAD Model Settings
- Positioning & Orientation
- Copy CAD Models
- Reload & Remove

EL4.2 CAD Performance

- Show Polygons or Bounding Boxes

Agenda

EL4.3 Occurrences Docking Window

- Enabled / Disabled Occurrences
- Filter Options

EL4.4 LOD Model Settings

- Occurrences Properties
- LOD Quickedit

EL4.5 Reuse 3D CAD Models (Repetition)

- Load CAD Models, Positioning and Orientation

Agenda

EL4.6 CAD Automation (SolidWorks required)

- Parameter Mapping Option 1: CAD Model Parameter
- Parameter Mapping Option 2: Excel File Automation
- Use of Rule Editor
- Loaded CAD Models Docking Window

EL4.7 Open Models in CAD Application

- Update original 3D CAD Models and related Drawings

Agenda

EL4.8 How to share modified CAD Models

- Save and reuse Node Files

EL4.9 Practice

- Simply loading process: Door fixings
- Automation option 1: Automation of own CAD Models
- Automation option 2: DigiPara training example: Car Frame

EL4.10 Summary

- Custom Q&A‘s

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EL4.1

Reuse 3D CAD Models

DigiPara Liftdesigner enables you to add your own 3D CAD Model from Autodesk® Inventor®, PTC® Creo® and SolidWorks®.

- The CAD Model will be displayed exactly as designed, it might need adaption to the concrete elevator project dimensions.

PTC Creo
asm, prt

Autodesk Inventor
iam, ipt

SolidWorks
sldasm, sldprt

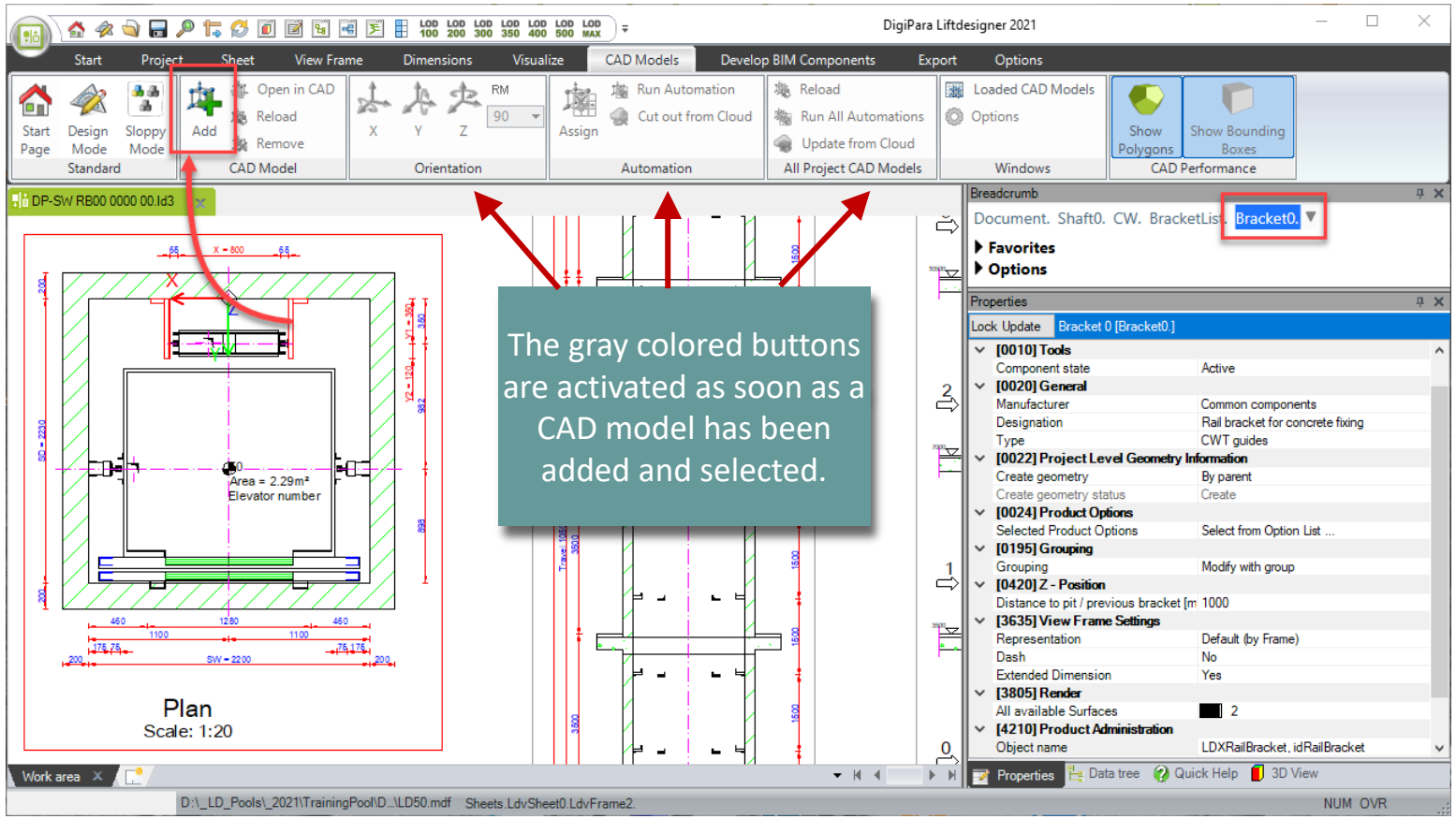
STEP Files
stp, step, stpz

Load CAD Models

Load CAD Models

EL4.1 REUSE 3D CAD MODELS

Choose the existing DigiPara Liftdesigner BIM component you want to replace and click on the **Add** button under the **CAD Models** tab.

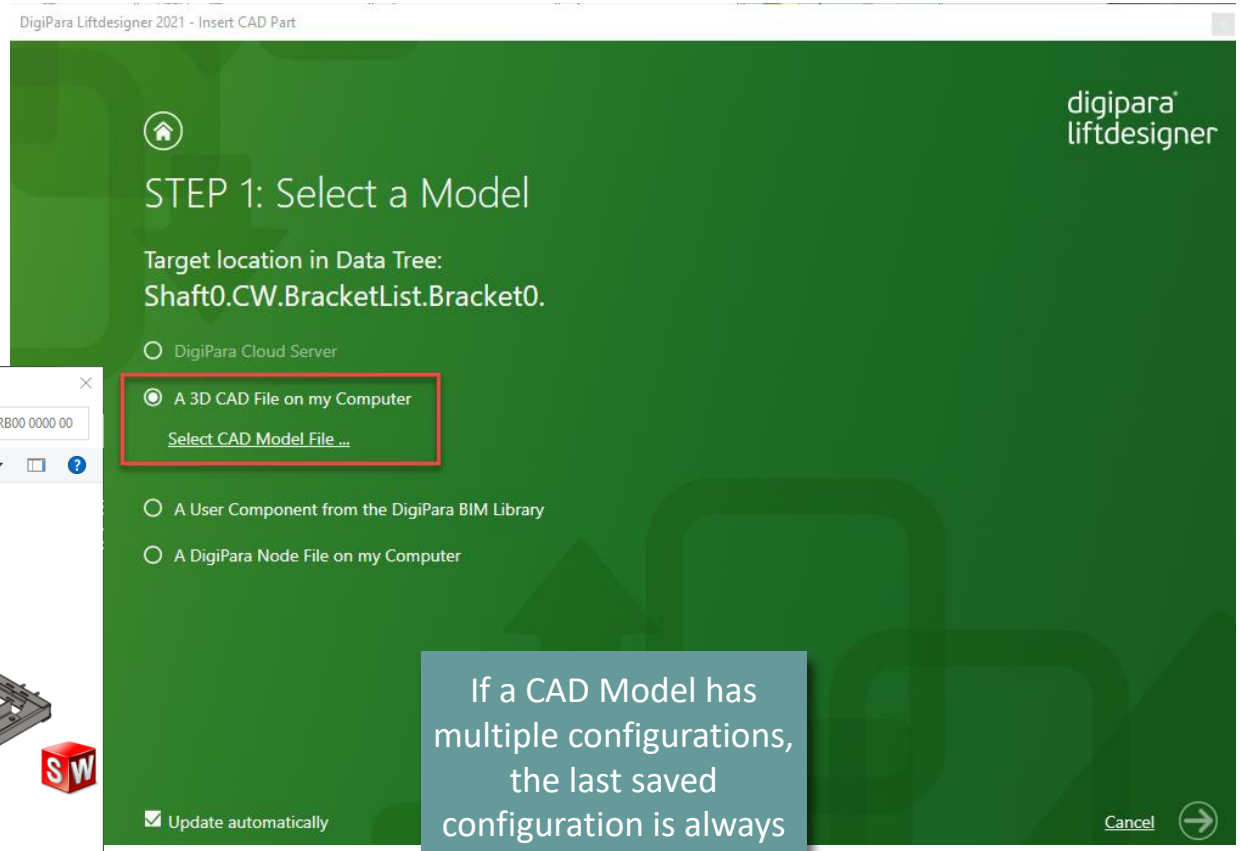


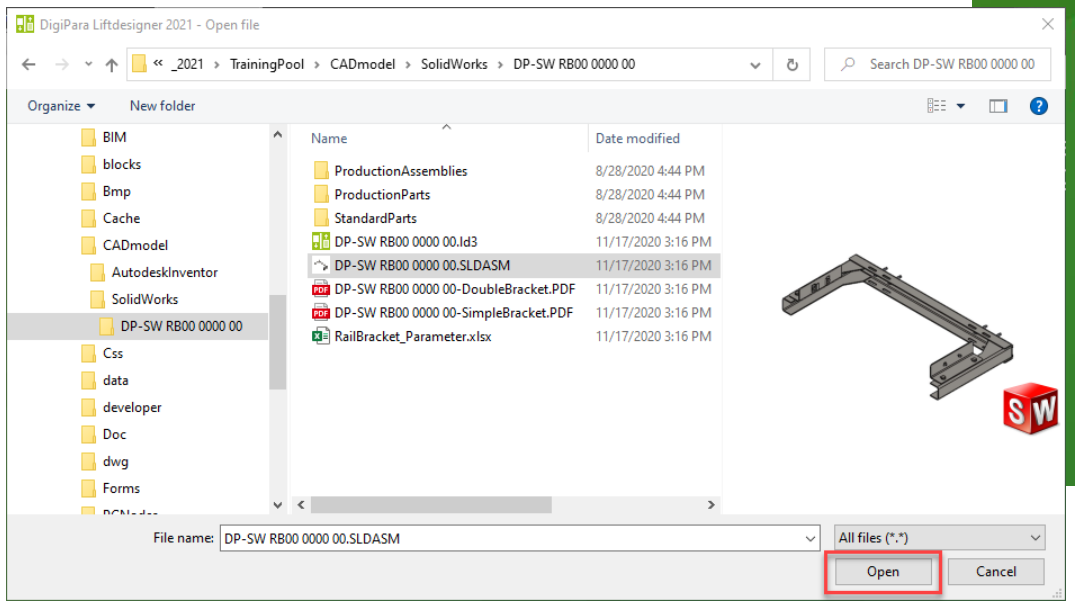
Load CAD Models

EL4.1 REUSE 3D CAD MODELS

STEP 1: Select a Model

- Select a 3D CAD Model File on your computer.





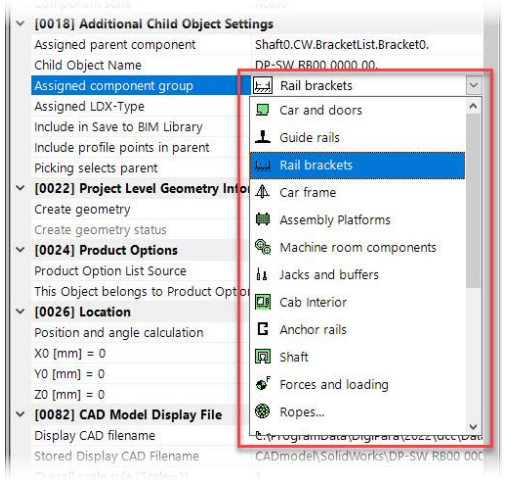
If a CAD Model has multiple configurations, the last saved configuration is always inserted.

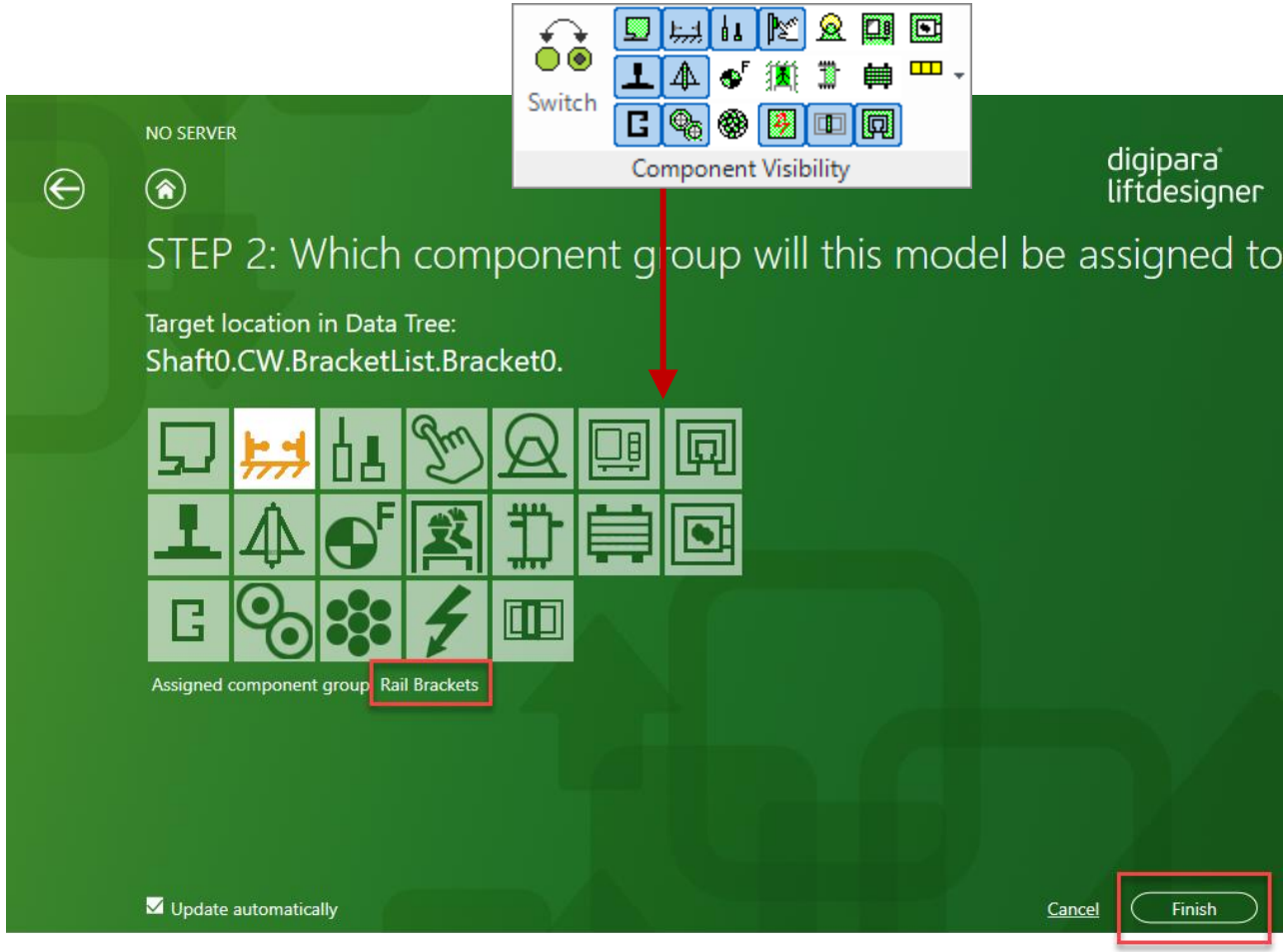
Load CAD Models

EL4.1 REUSE 3D CAD MODELS

STEP 2: Which component group will this model be assigned to?

- Assign the component group to control the visibility of the new CAD Model.
- Can be changed subsequently via the associated component properties, when required:





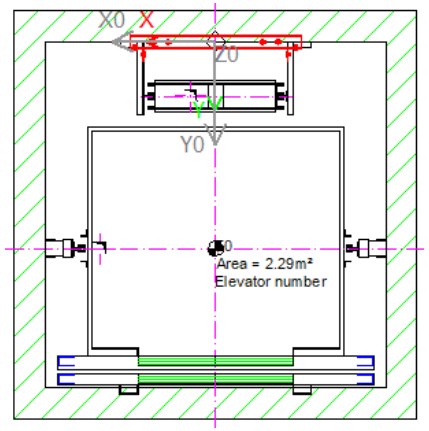
Load CAD Models

EL4.1 REUSE 3D CAD MODELS

DigiPara Liftdesigner automatically creates a report to show the update status regarding the imported 3D CAD Model.

The correct position and orientation will be determined in the following training steps.

Is synchronized to all list objects.



Report

Auto fit columns

R1:Sheets.Components.CAD Files Update Report.Components.Report.

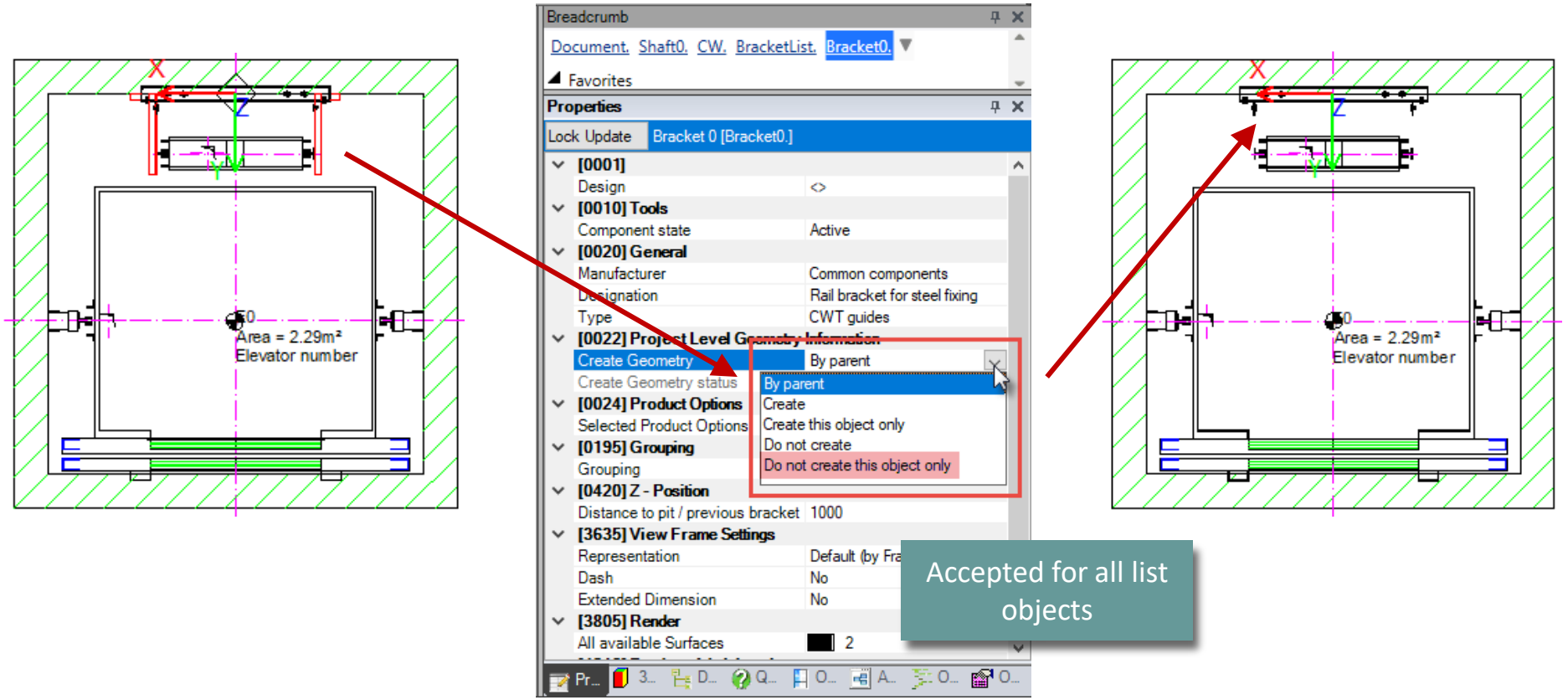
Number	Stat	Stat	Chapter	Topic	Message 0	Component name
0	**1**		**CAD File**	**Loading**	**DP-SW RB00 0000 00.SLDASM reloaded.**	**Shaft0.CW.BracketList.Bracket0.0001.**
1	0		CAD File	Reload Start	D:_LD_Pools_2021\TrainingPool\CADmodel\SolidWorks\DP-SW RB00 0000 00 \DP-SW RB00 0000 00.SLDASM	Shaft0.CW.BracketList.Bracket0.0001.Profile0.Inserte
2	0		CAD File	Reload End	D:_LD_Pools_2021\TrainingPool\CADmodel\SolidWorks\DP-SW RB00 0000 00 \DP-SW RB00 0000 00.SLDASM	Shaft0.CW.BracketList.Bracket0.0001.Profile0.Inserte
3	0		CAD File	Update Start		
4	1		CAD File	Loading	DP-SW RB00 0000 00.SLDASM reloaded.	Shaft0.CW.BracketList.Bracket0.DP-SW RB00 0000 00.
5	0		CAD File	Update End		

The file has been imported successfully.

Load CAD Models

EL4.1 REUSE 3D CAD MODELS

Adjust the **Project Level Geometry Information** of the existing DigiPara Liftdesigner BIM component that you doesn‘t need any longer.



CAD Model Settings

CAD Model Settings

EL4.1 REUSE 3D CAD MODELS

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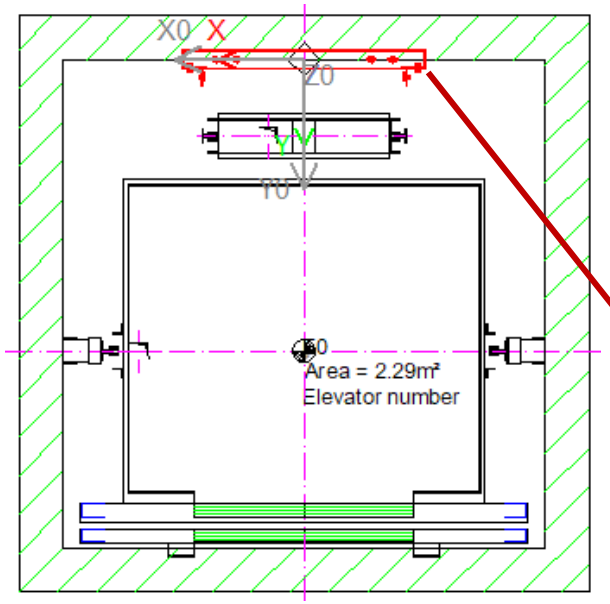
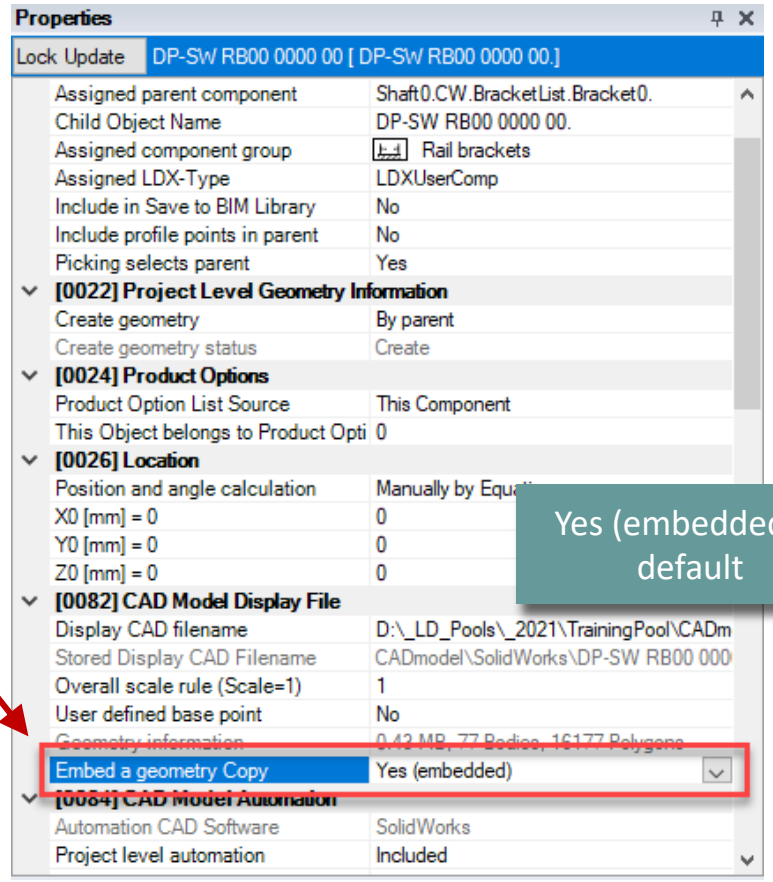
Embed a **Geometry Copy** in your project to show the 3D CAD Model in shared .ld3 DigiPara Liftdesigner files.





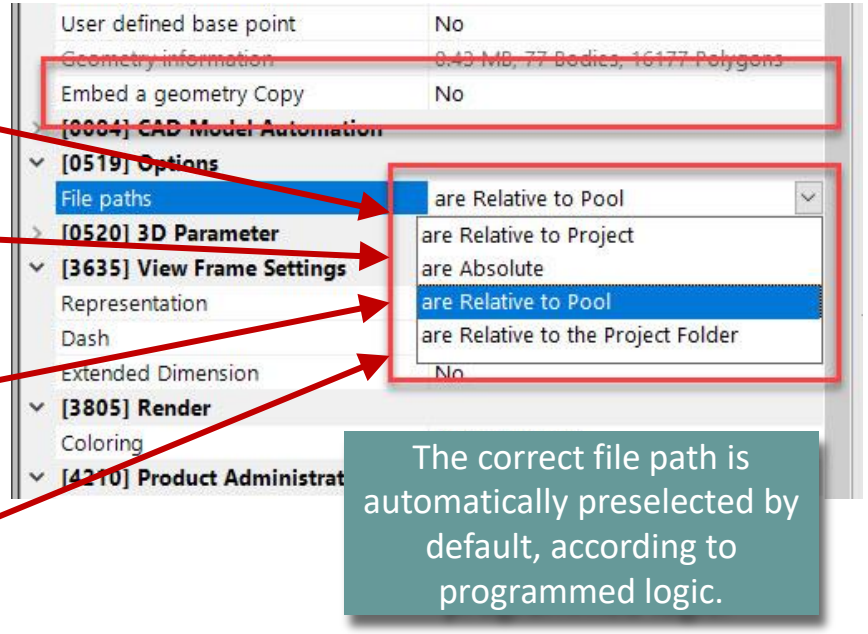
Yes (embedded) = default

CAD Model Settings

EL4.1 REUSE 3D CAD MODELS

When sharing .ld3 files with non-embedded geometry copy, the file path must be checked!

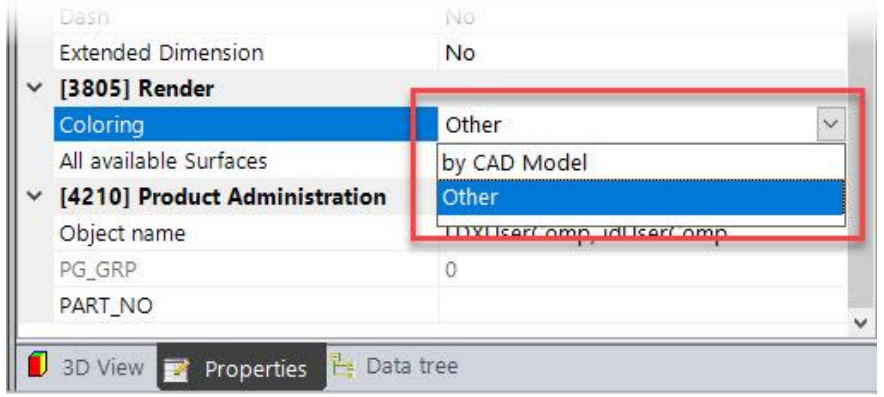
- CAD file is transferred with project file (.ld3).
- When using central file repositories.
- CAD file placed in data pool.
- (Working within the DigiPara Liftdesigner Cloud)



CAD Model Settings

EL4.1 REUSE 3D CAD MODELS

The coloring (render) of loaded CAD models can be set individually via the corresponding properties.

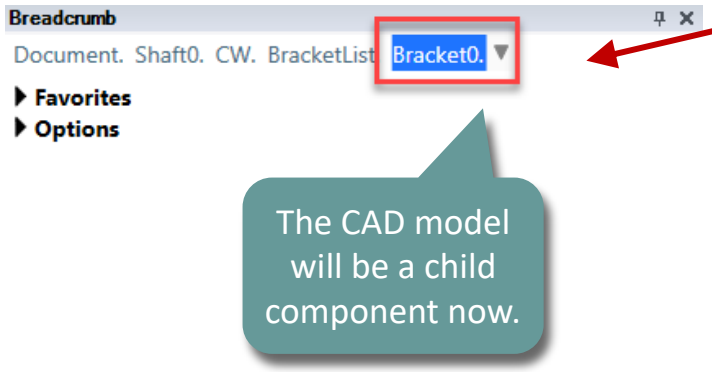


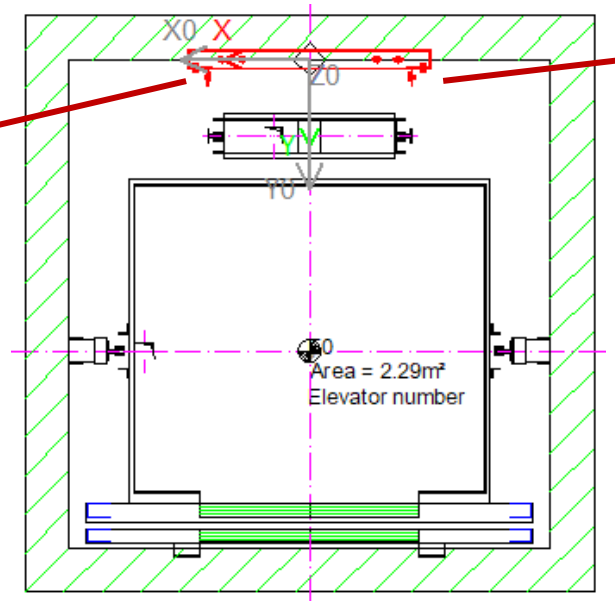
CAD Model Settings

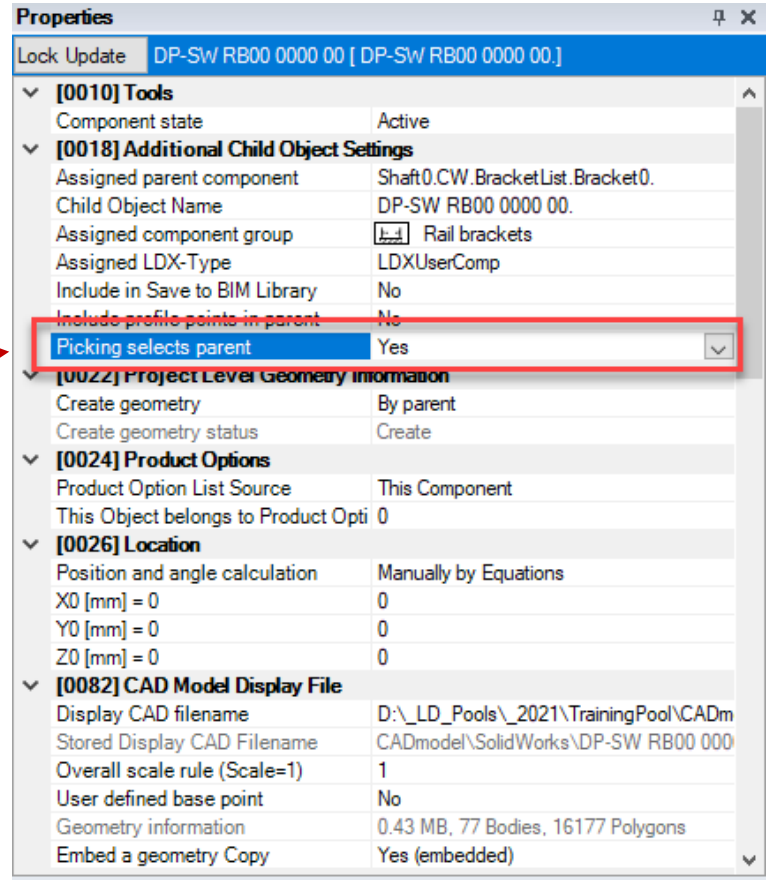
EL4.1 REUSE 3D CAD MODELS

CAD Model setting: Picking selects parent

- The original DigiPara Liftdesigner parent BIM Component will always be selected.
  - Especially recommended for components that consist of several CAD models.





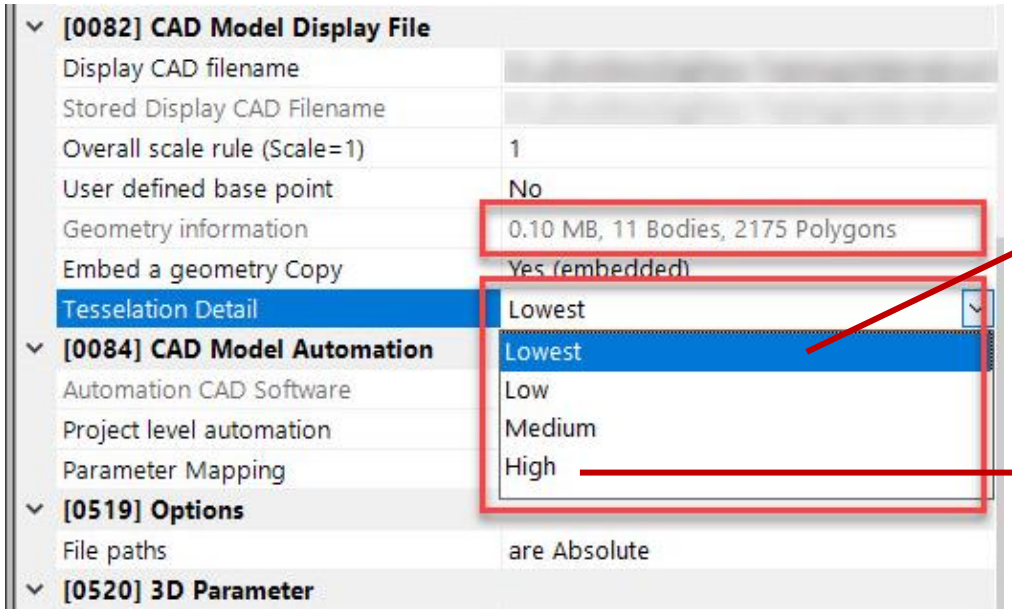


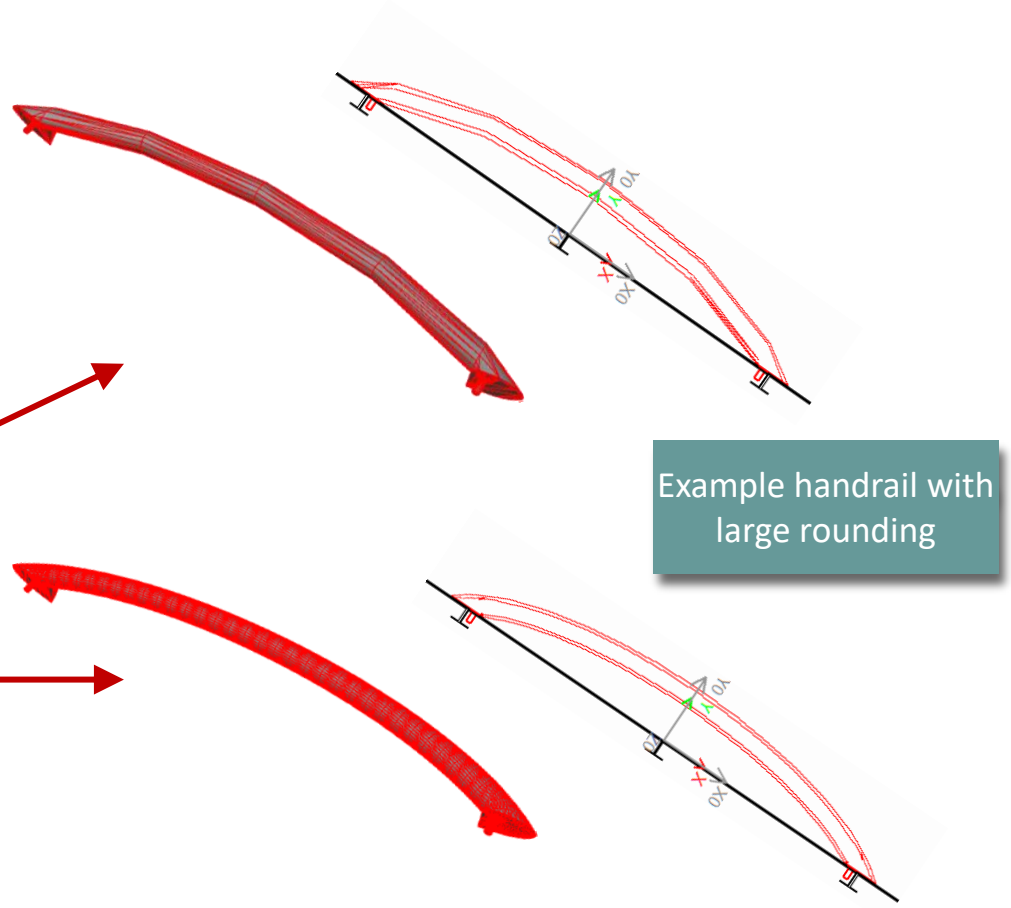
CAD Model Settings

EL4.1 REUSE 3D CAD MODELS

CAD-Modell-Einstellung: Tesselation-Detail

- Increase the number of polygons to fine-tune the CAD Models representation





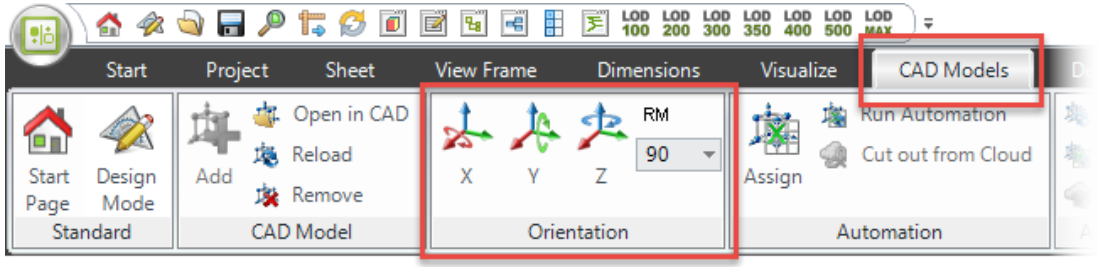
Example handrail with large rounding

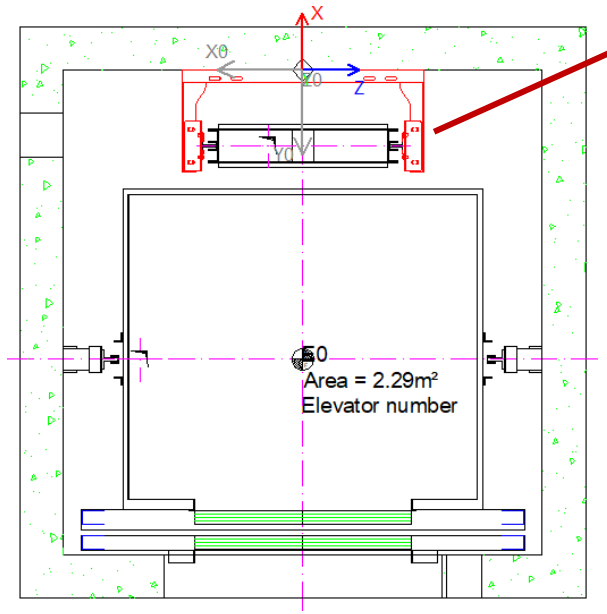
Positioning & Orientation

Positioning & Orientation

EL4.1 REUSE 3D CAD MODELS

Define the CAD Model **Orientation** using the X, Y and Z coordinates





Active, if a CAD model is selected.

Positioning & Orientation

EL4.1 REUSE 3D CAD MODELS

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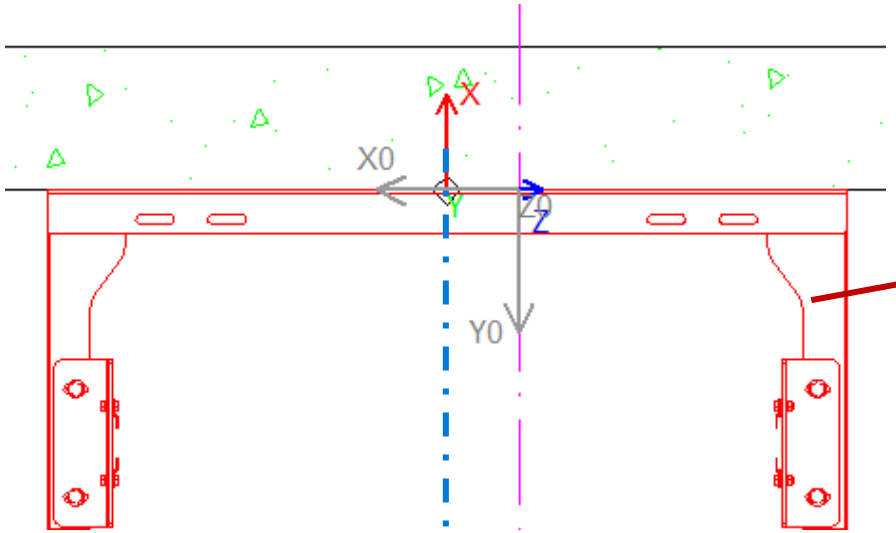
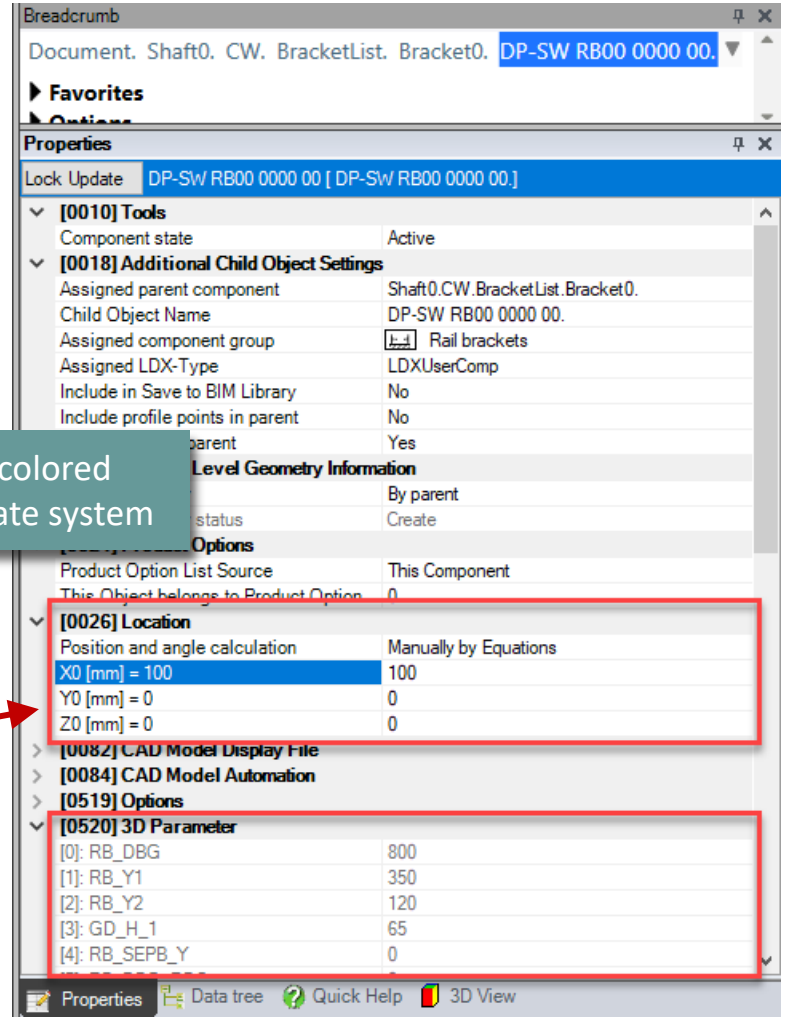
CAD Models can be moved via the associated properties via X0, Y0 and Z0 coordinates. It can be used:

- Fix values
- 3D Parameter (gray colored)
- Equations consisting of 3D parameters and fix values



Gray colored coordinate system

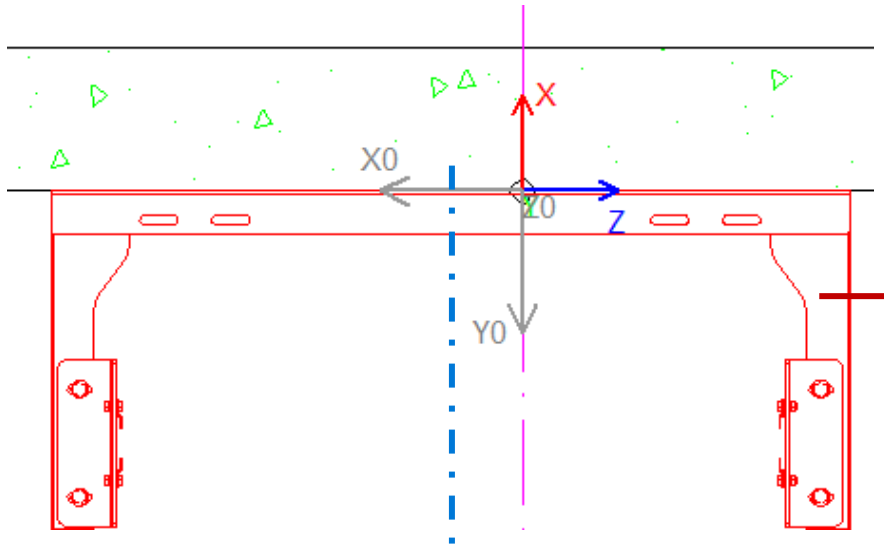


Positioning & Orientation

EL4.1 REUSE 3D CAD MODELS

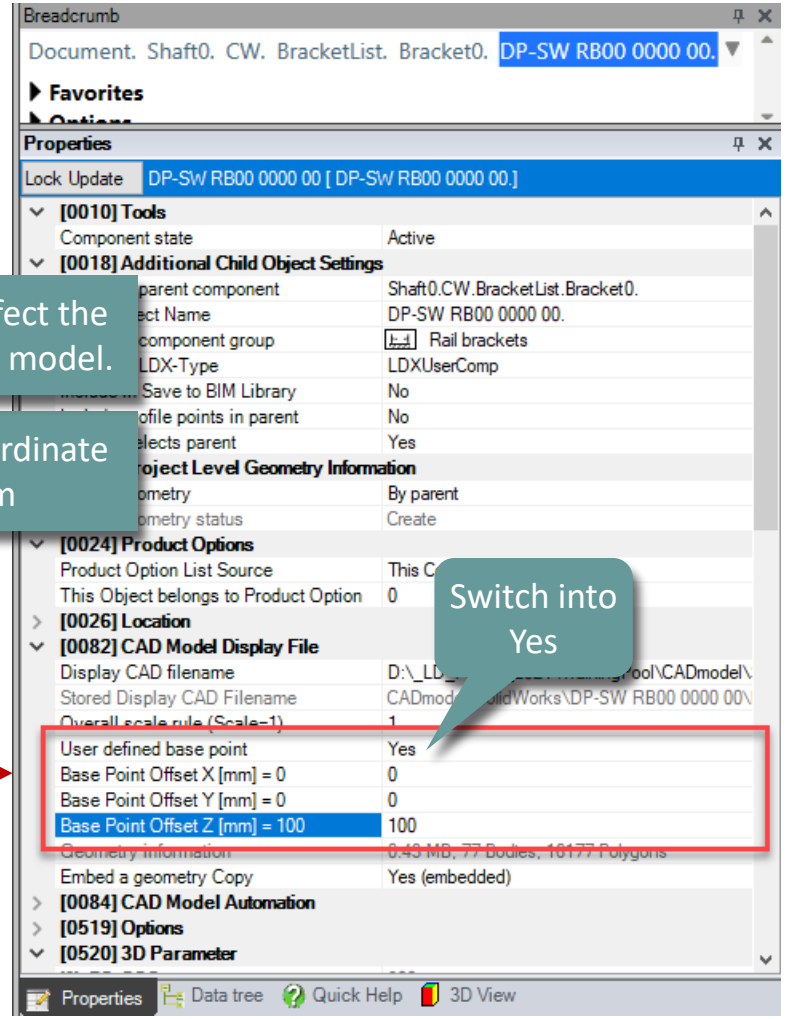
If necessary, the original CAD Model base point can be new defined via the **Base Point Offset** propeties. It can be used:

- Fix values



Does not affect the original CAD model.

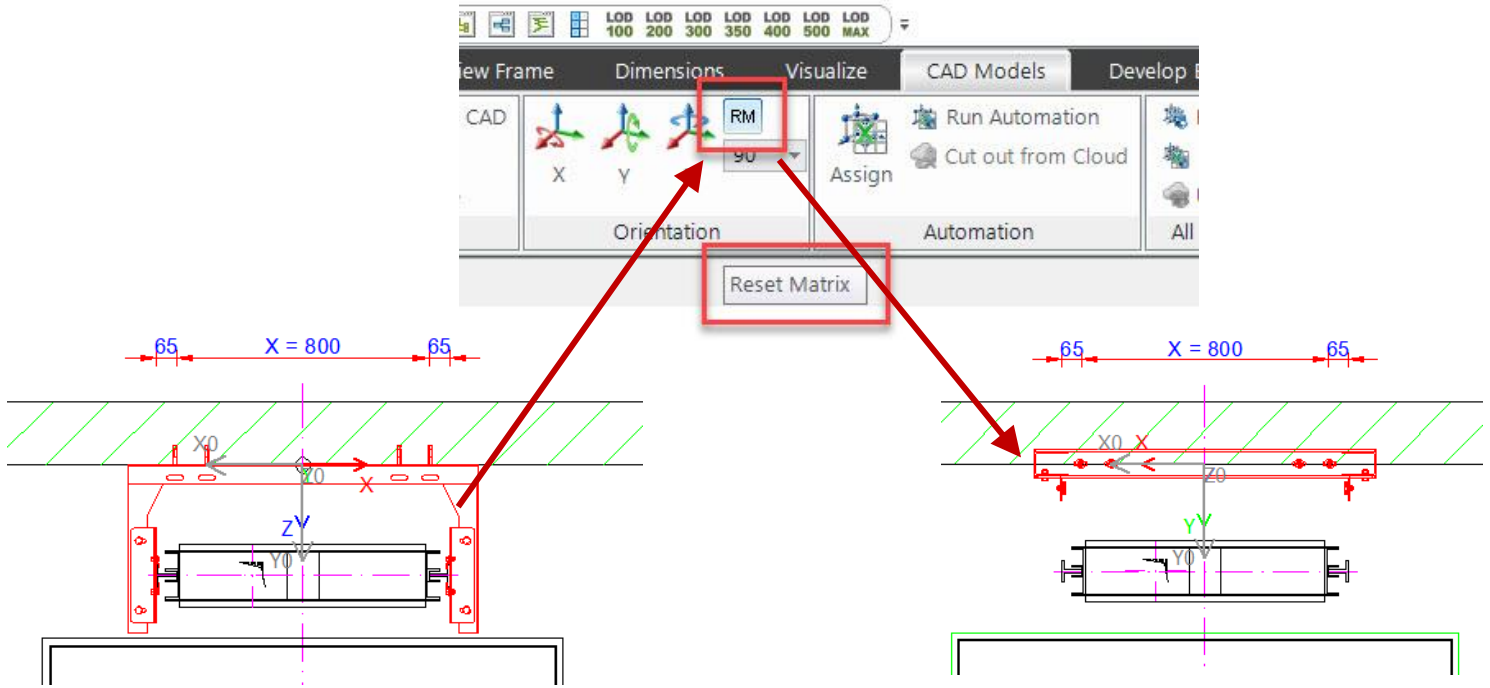
Colored coordinate system



Positioning & Orientation

EL4.1 REUSE 3D CAD MODELS

The original positioning can be restored.

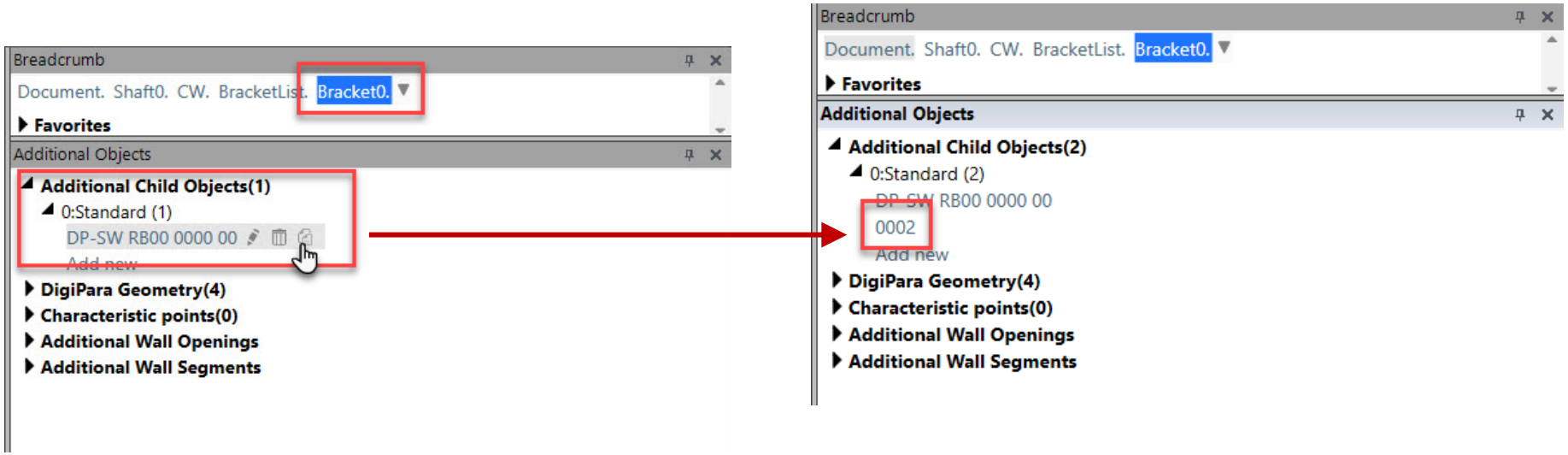


Positioning & Orientation

EL4.1 REUSE 3D CAD MODELS

Copying a loaded CAD Model with all it’s settings within the elevator project via the Additional Objects docking window any time.

- Additional Child Objects



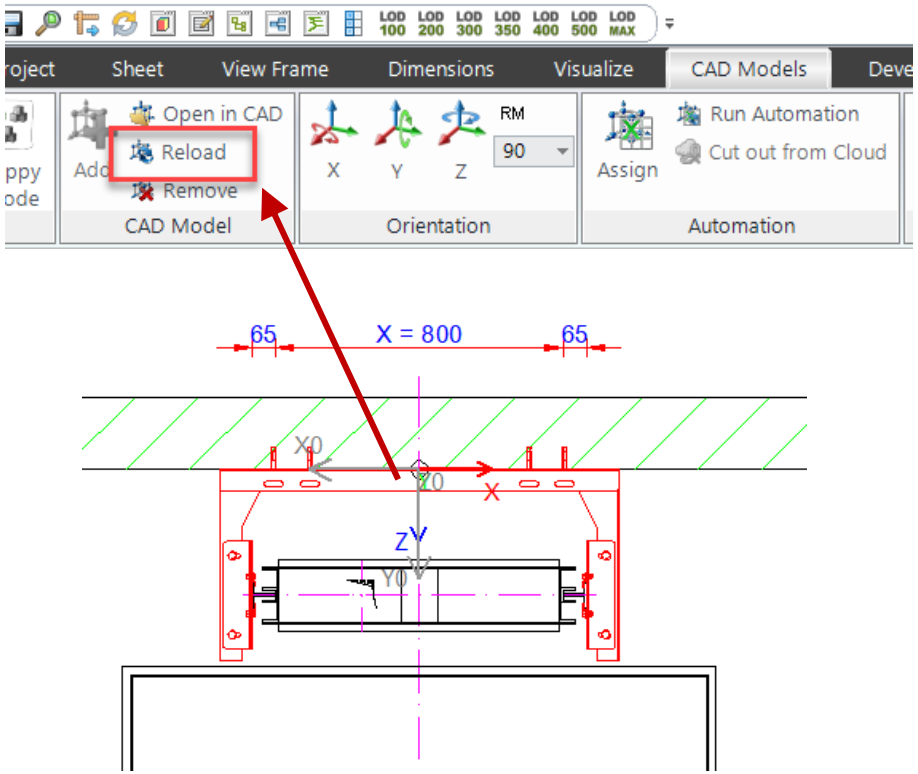
Reload & Remove

Reload & Remove

EL4.1 REUSE 3D CAD MODELS

The loaded CAD model can be updated at any time in the DigiPara Liftdesigner project using the **Reload** button.

- If this becomes necessary after changes have been made to the original model.

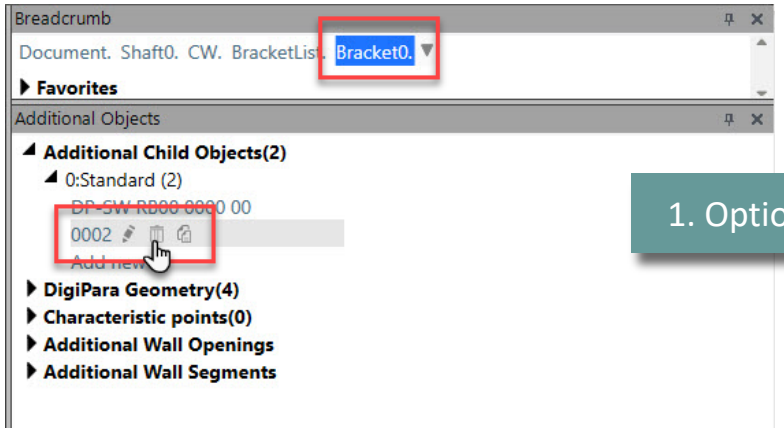


Reload & Remove

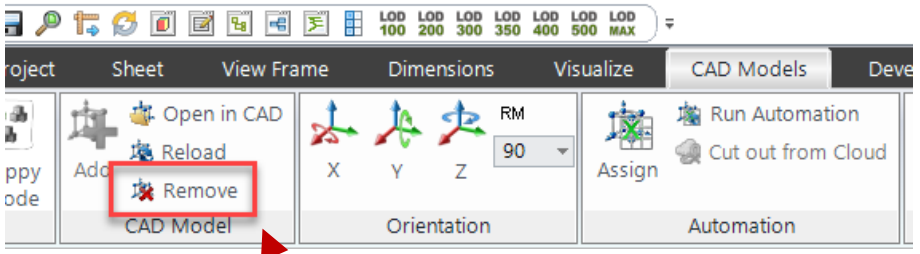
EL4.1 REUSE 3D CAD MODELS

The correct removal of loaded CAD models from the elevator model is done via the **Remove** buttons after selecting the corresponding CAD model or parent object.

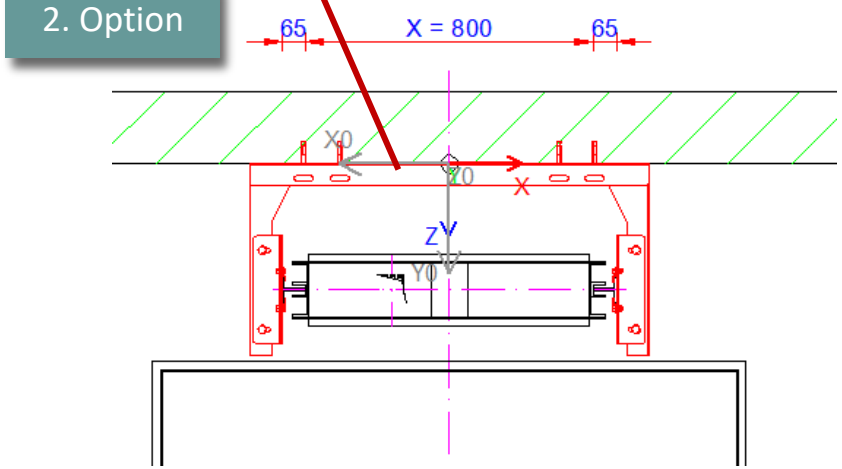
- List objects are automatically removed from each floor.



1. Option



2. Option



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EL4.2

CAD Performance

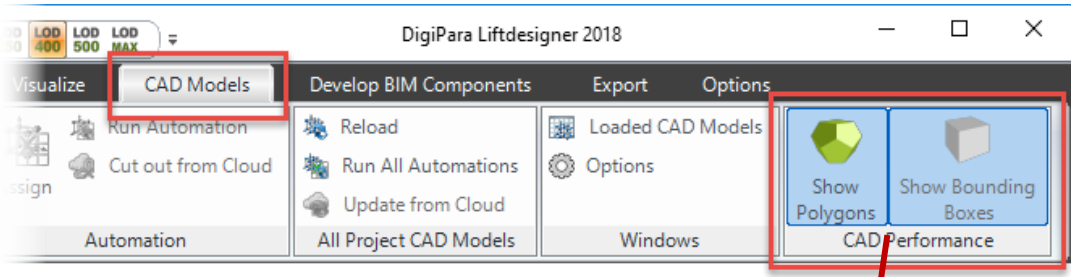
Show Polygons or Bounding Boxes

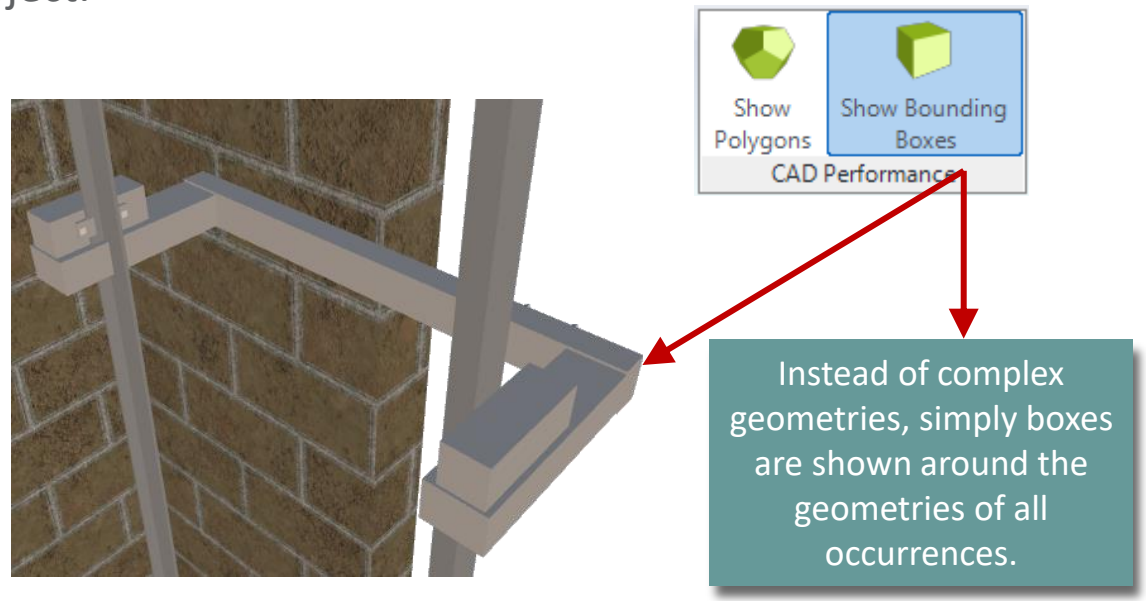
Show Polygons or Bounding Boxes

EL4.2 CAD PERFORMANCE

Show Polygons / Show Bounding Boxes

- By reducing the imported 3D CAD Models to simplified **Bounding Boxes** the performance will significant increase while the project processing.
- This affects all imported 3D CAD Models in the current project.





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EL4.3

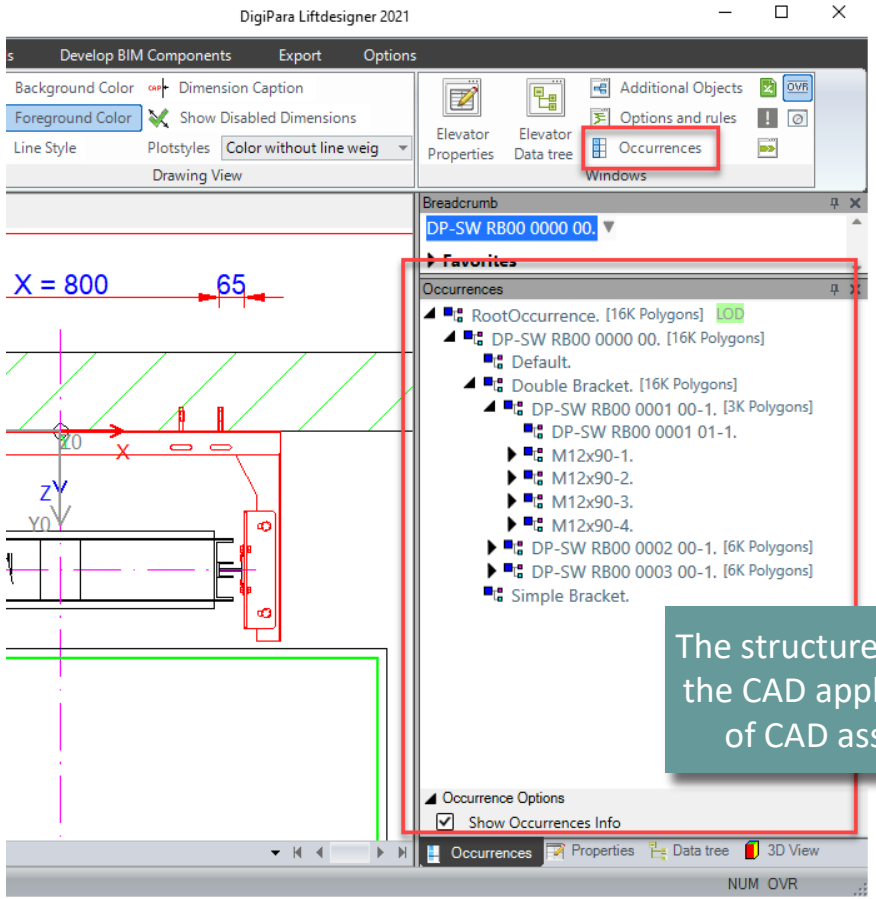
Occurrences Docking Window

General

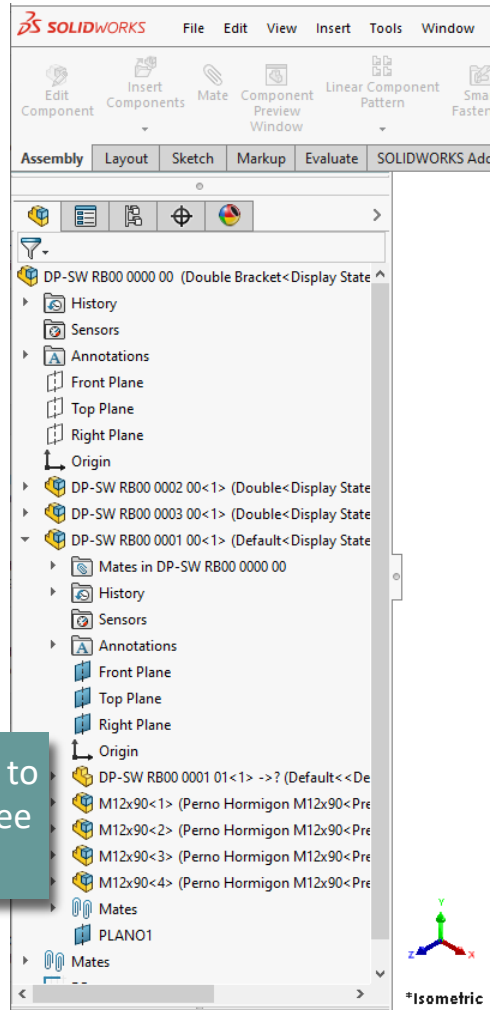
EL4.3 OCCURRENCES DOCKING WINDOW

The Occurrence Window allows the following main operations:

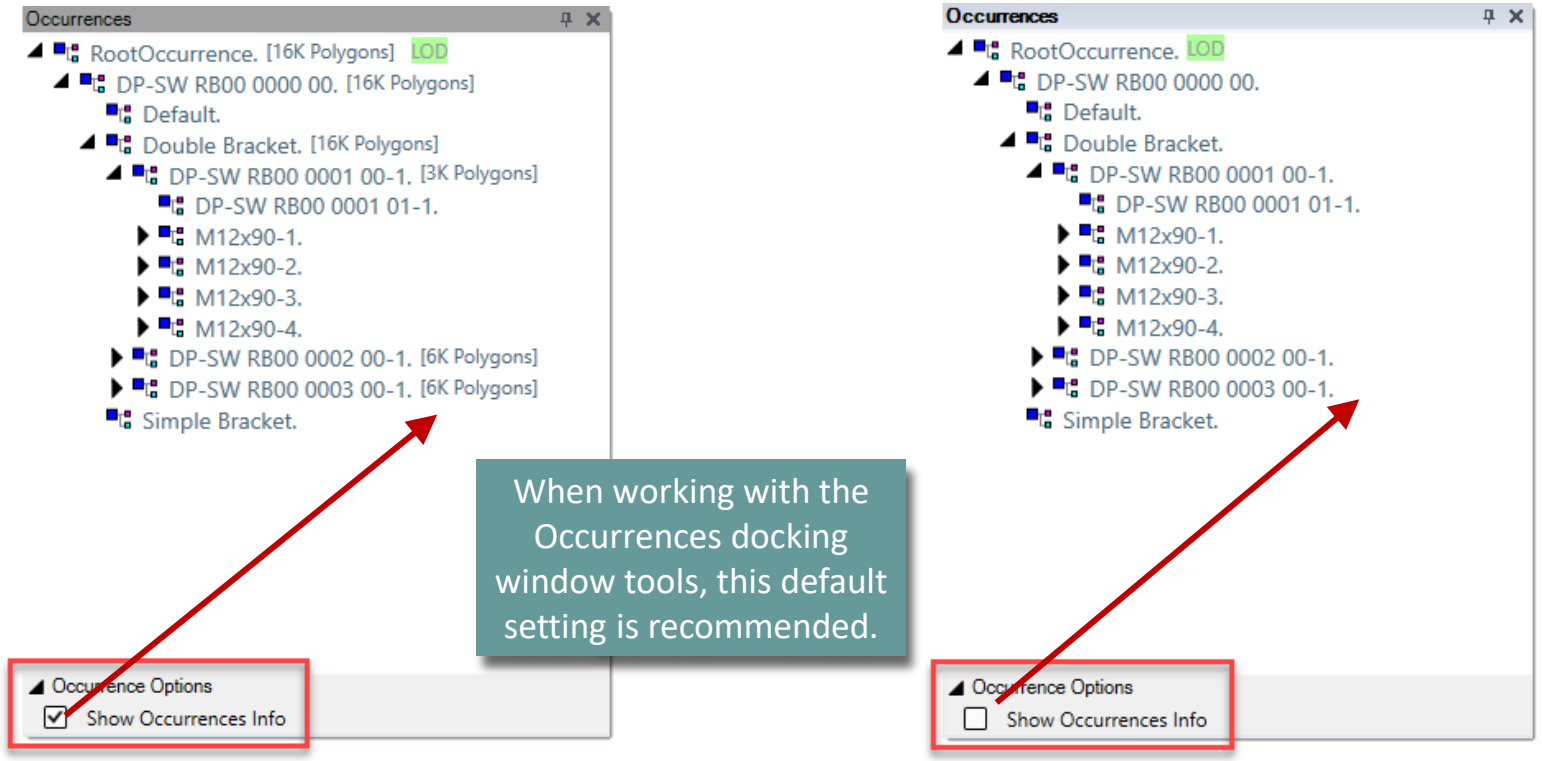
- Review the occurrence tree of the loaded CAD Model
- Selection of one or more occurrences



The structure is similar to the CAD application tree of CAD assemblies.



Switch on / off the Occurrences information about the model size → Number of Polygons



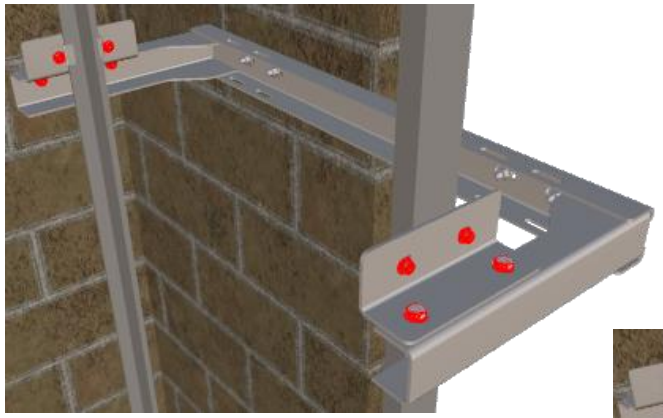
Enabled / Disabled Occurrences

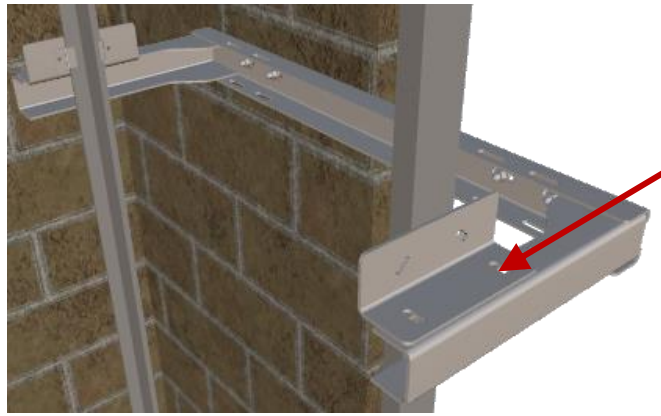
Enabled / Disabled Occurences

EL4.3 OCCURRENCES DOCKING WINDOW

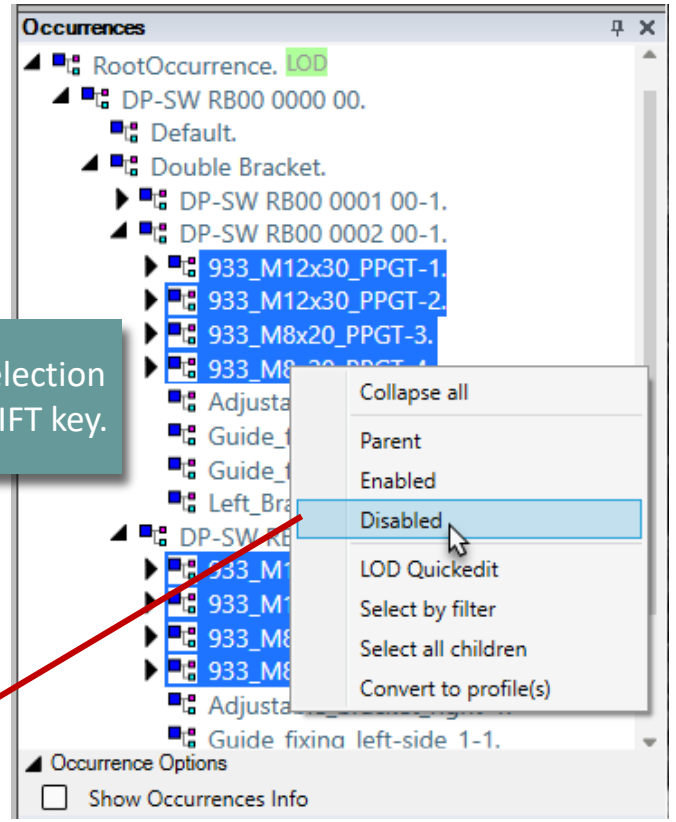
Disable unused occurrences like e.g. screw connection

- Tool selection → Right mouse button click





For multi selection hold the SHIFT key.



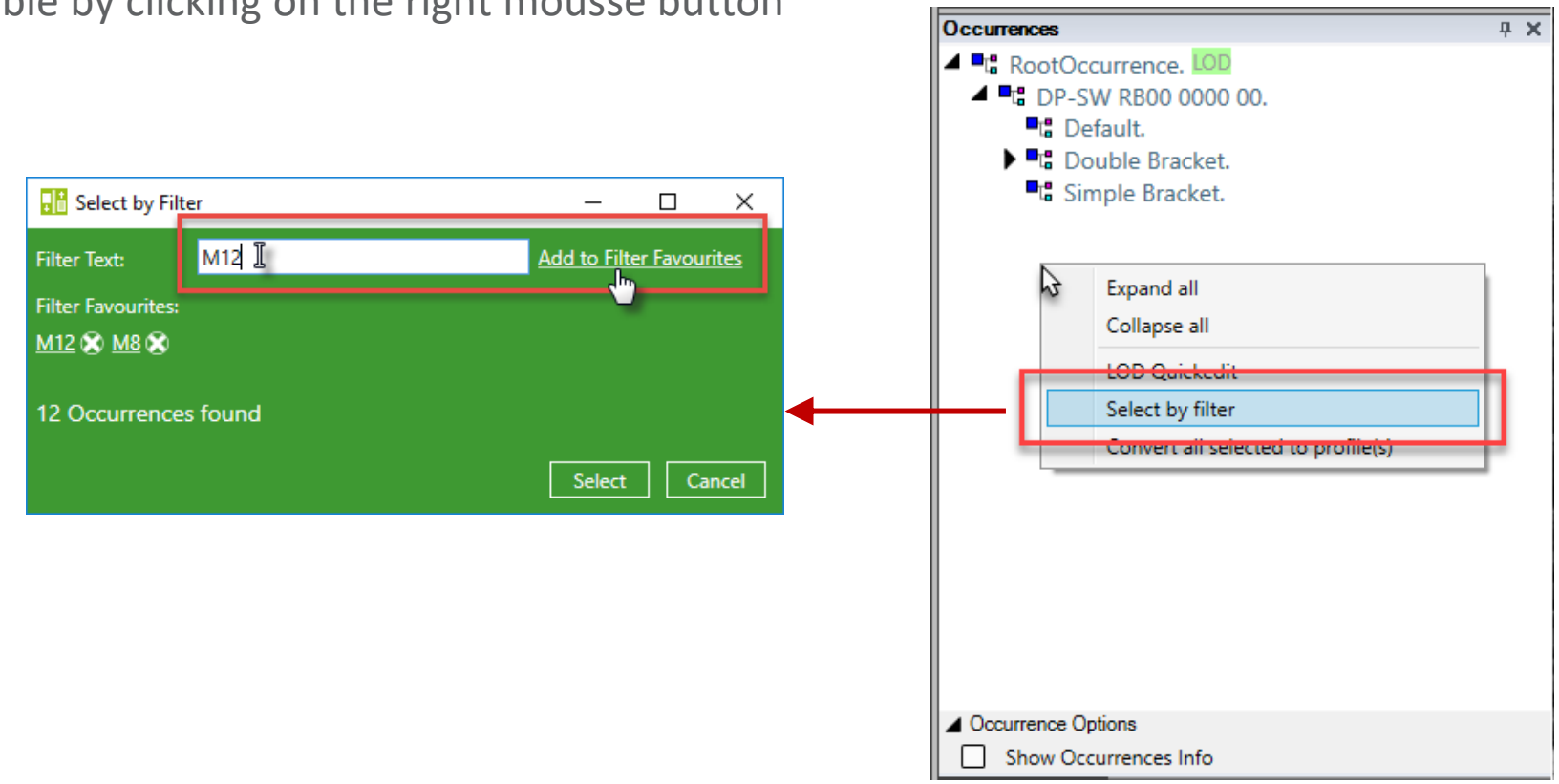
Filter Options

Filter Options

EL4.3 OCCURRENCES DOCKING WINDOW

Select Occurrences by filter and set favorites

- available by clicking on the right mousse button



Filter Options

EL4.3 OCCURRENCES DOCKING WINDOW

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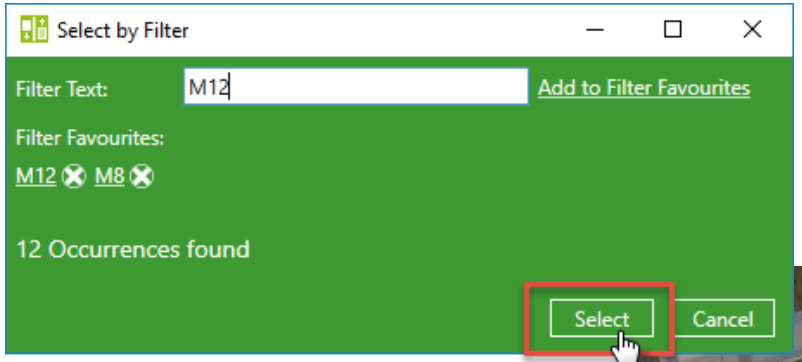
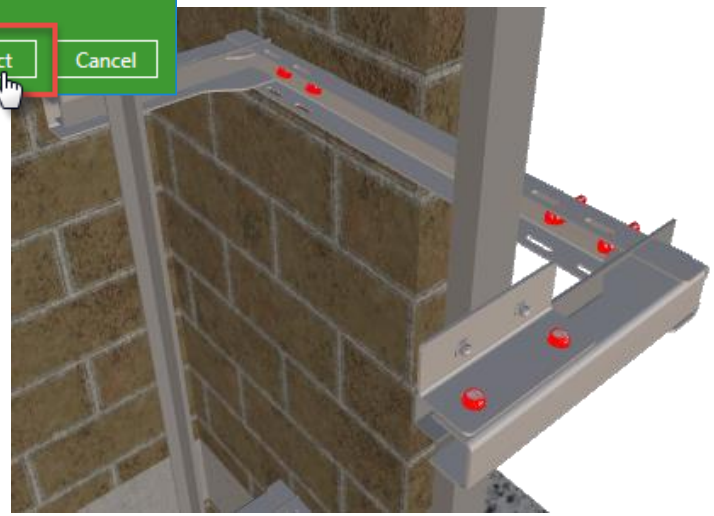
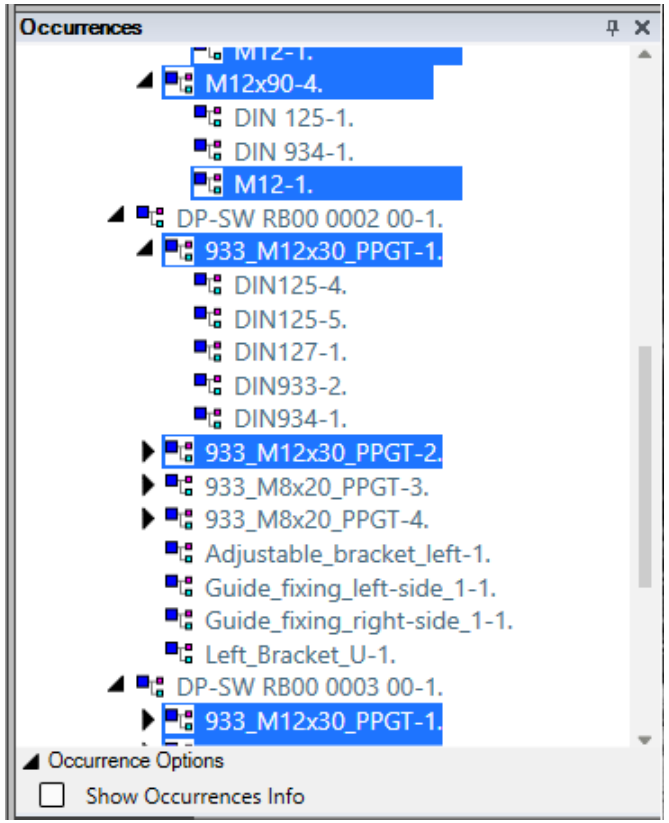
Choose occurrences with the same name in different levels by just one click.







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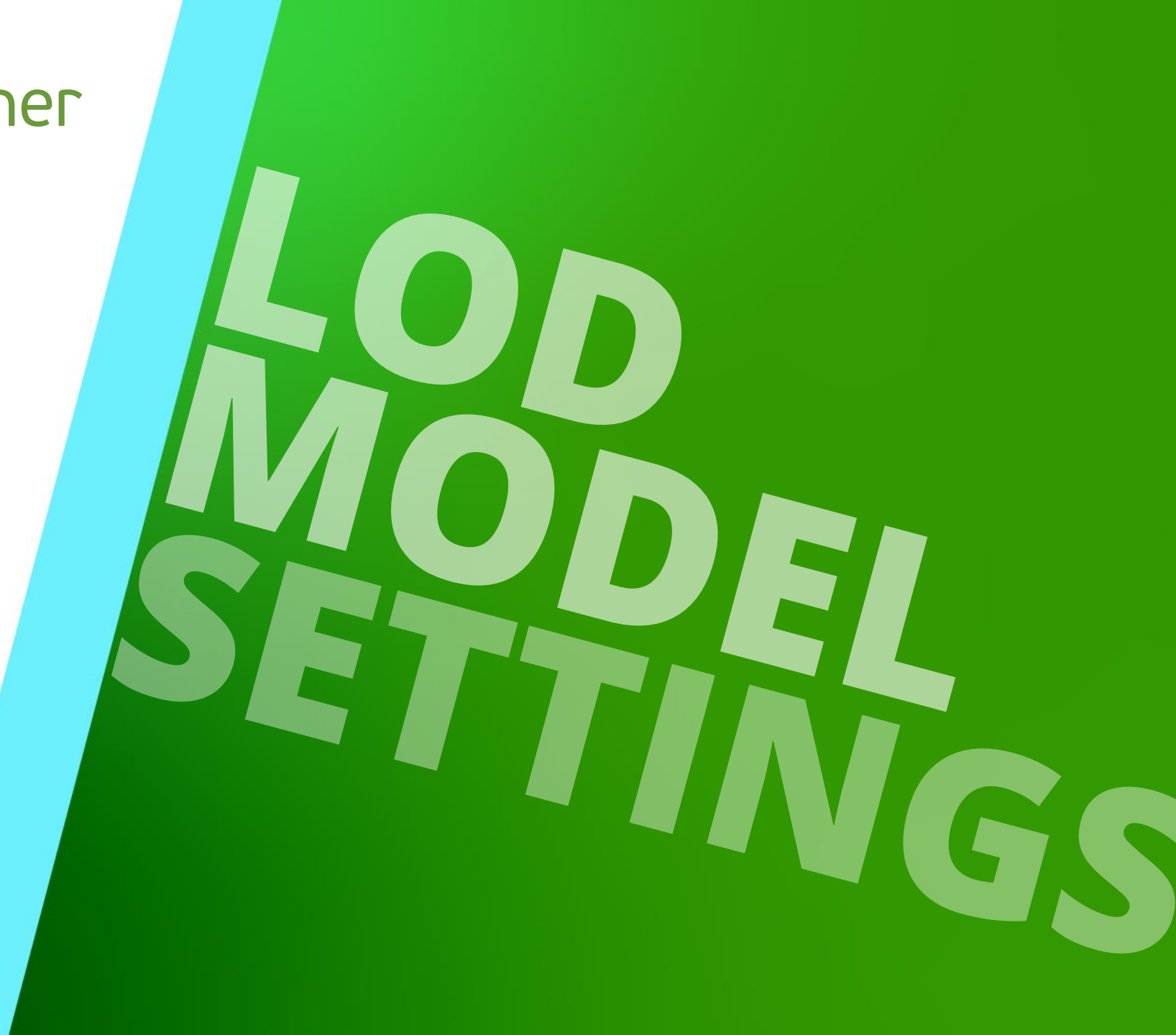
EL4.4

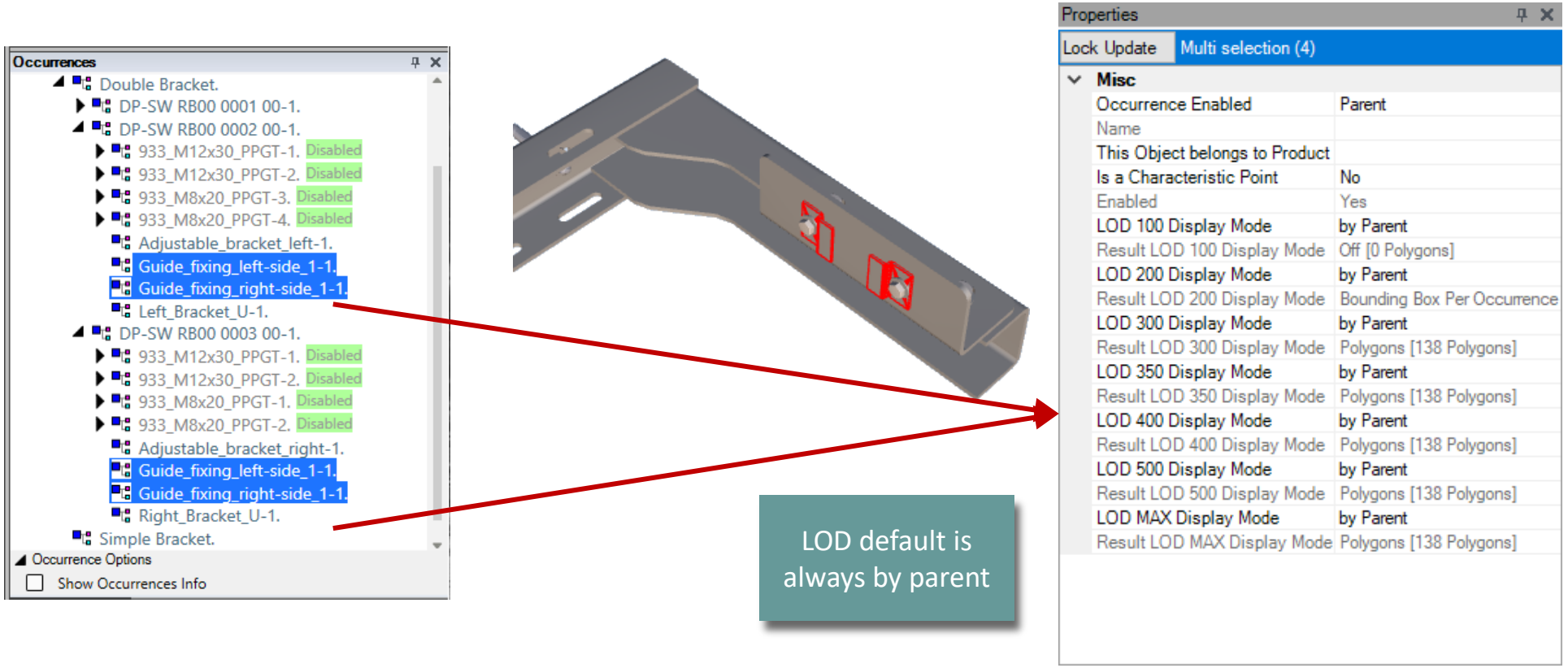
LOD Model Settings



Occurrences Properties

Occurrences Properties

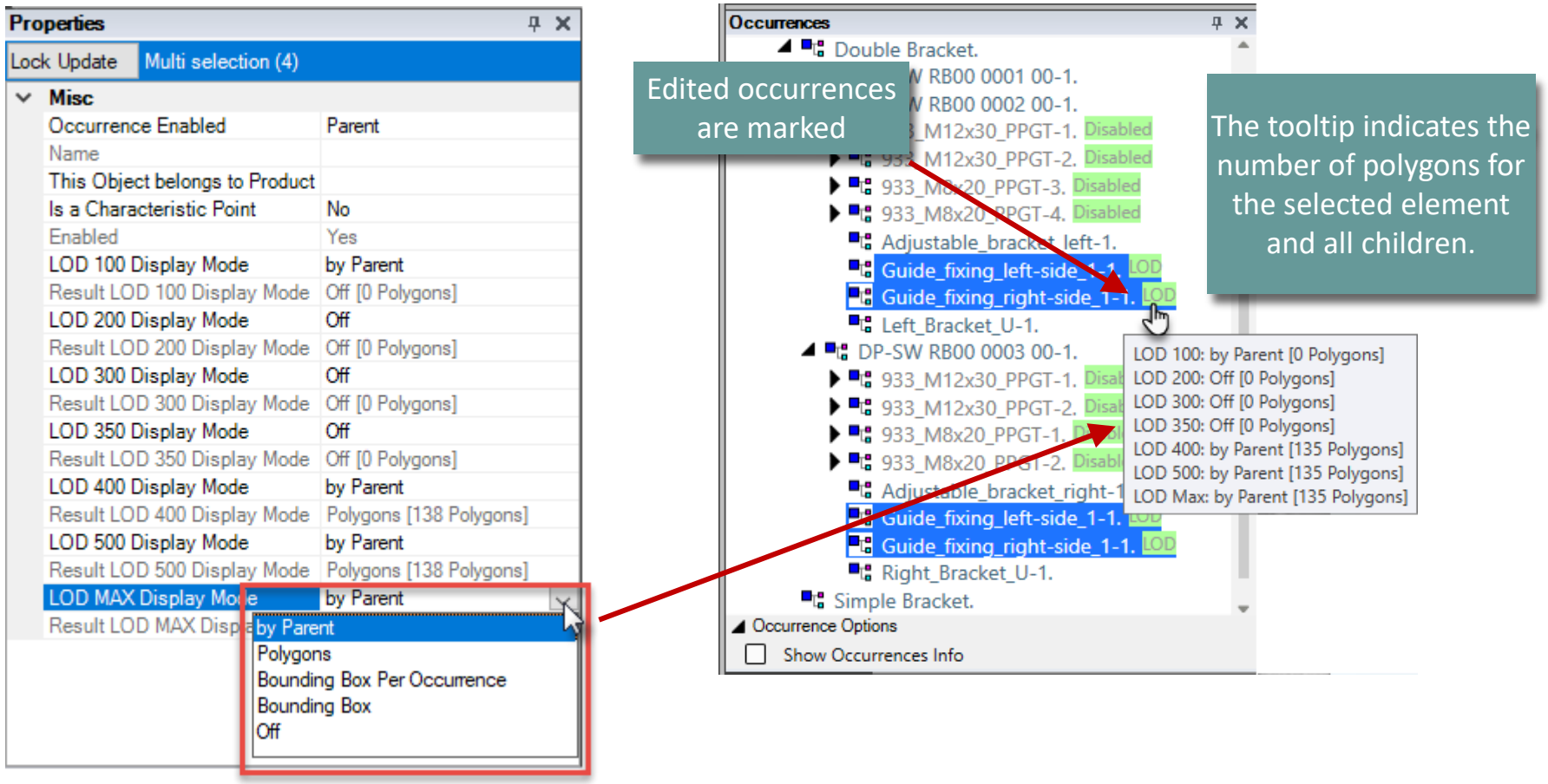
- When selecting more then one occurrence, common properties will be displayed



Occurrences Properties

EL4.4 LOD MODEL SETTINGS

Set the LOD for your selected occurrences via the properties window

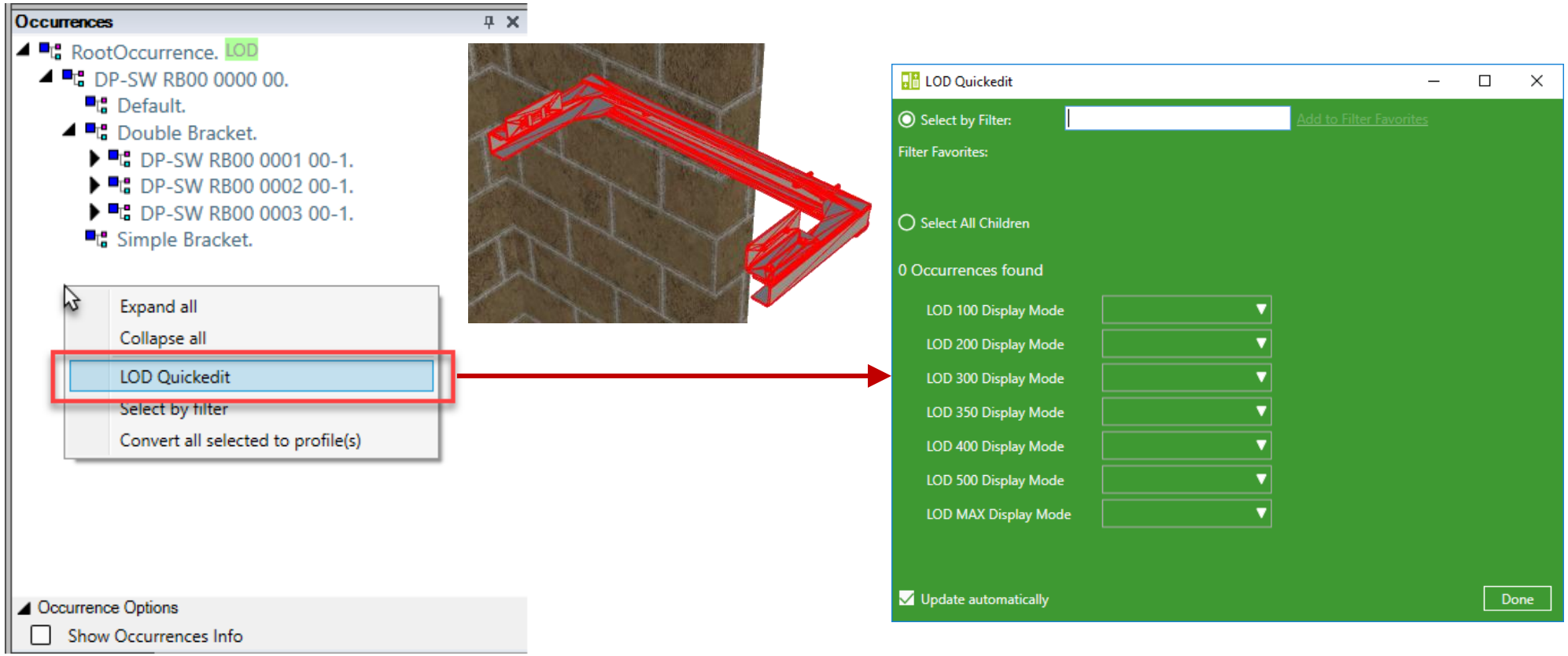


LOD Quickedit

LOD Quickedit

EL4.4 LOD MODEL SETTINGS

Set the occurrences LOD via the **LOD Quickedit** tool



LOD Quickedit

EL4.4 LOD MODEL SETTINGS

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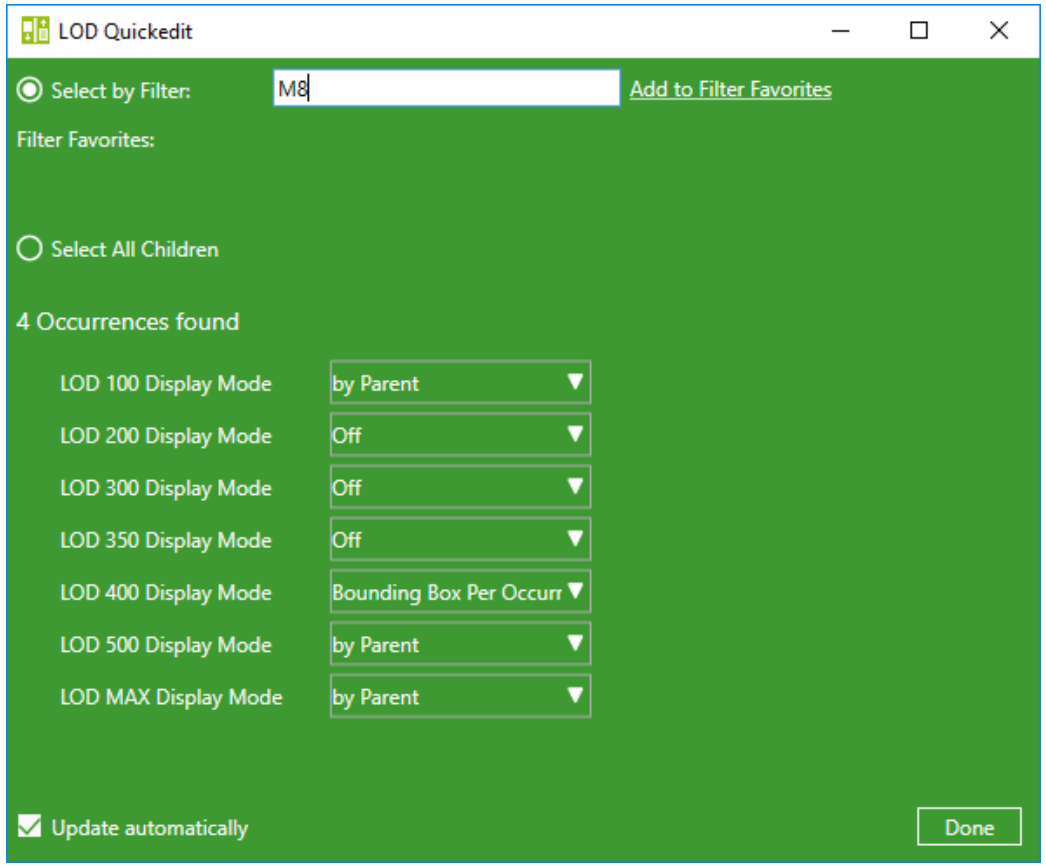
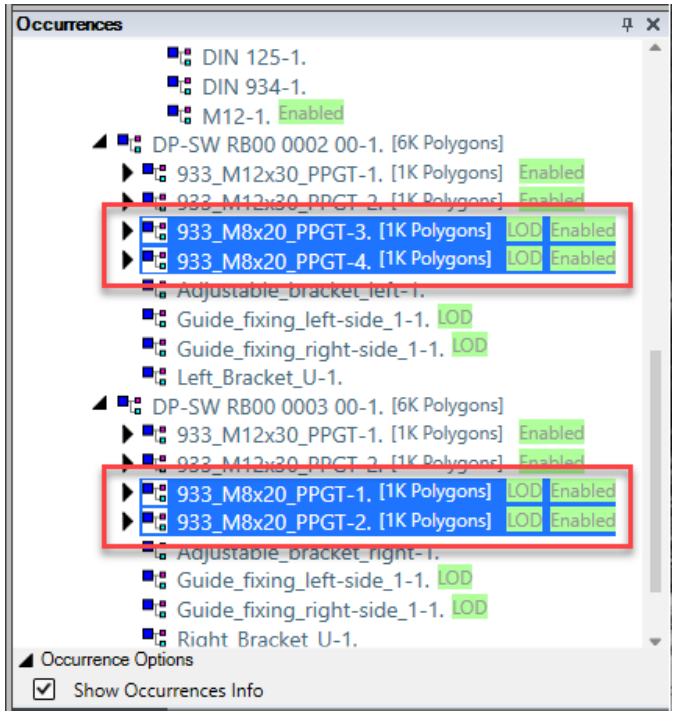
Choose appropriate occurrences by filter and set your own LOD



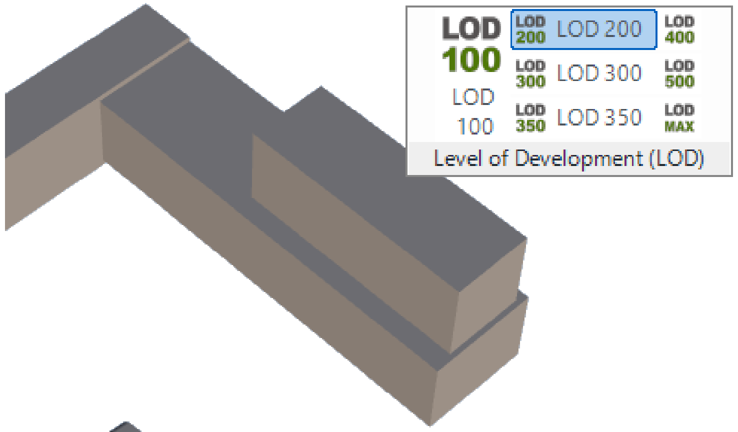


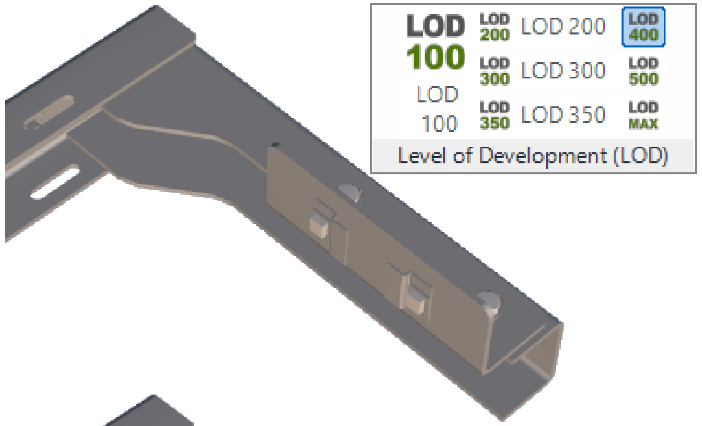
LOD Quickedit

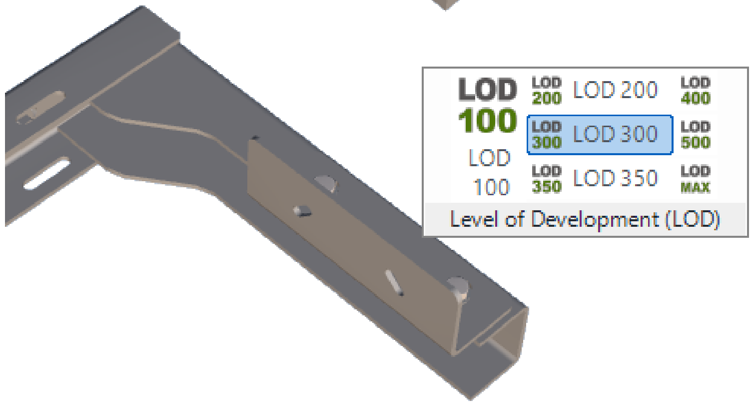
EL4.4 LOD MODEL SETTINGS

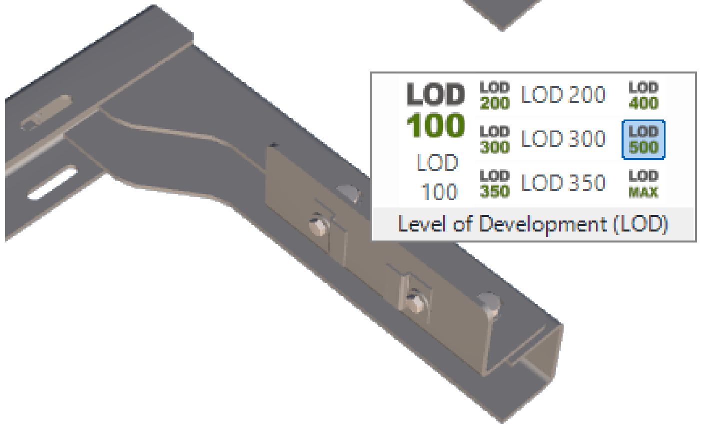
Different LOD settings for your 3D CAD Model in DigiPara Liftdesigner

- LOD Setting Recommendations for DigiPara Liftdesigner user









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Let‘s have a break!

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EL4.5

Reuse 3D CAD Models (Repetition)

Load, Positioning and Orientation

EL4.5 REUSE 3D CAD MODELS (REPETITION)

To demonstrate the CAD automation function, three differently constructed example models (rail brackets) have been prepared in SolidWorks.

A local SolidWorks installation is required to perform the automation using the exercise examples.

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EL4.6

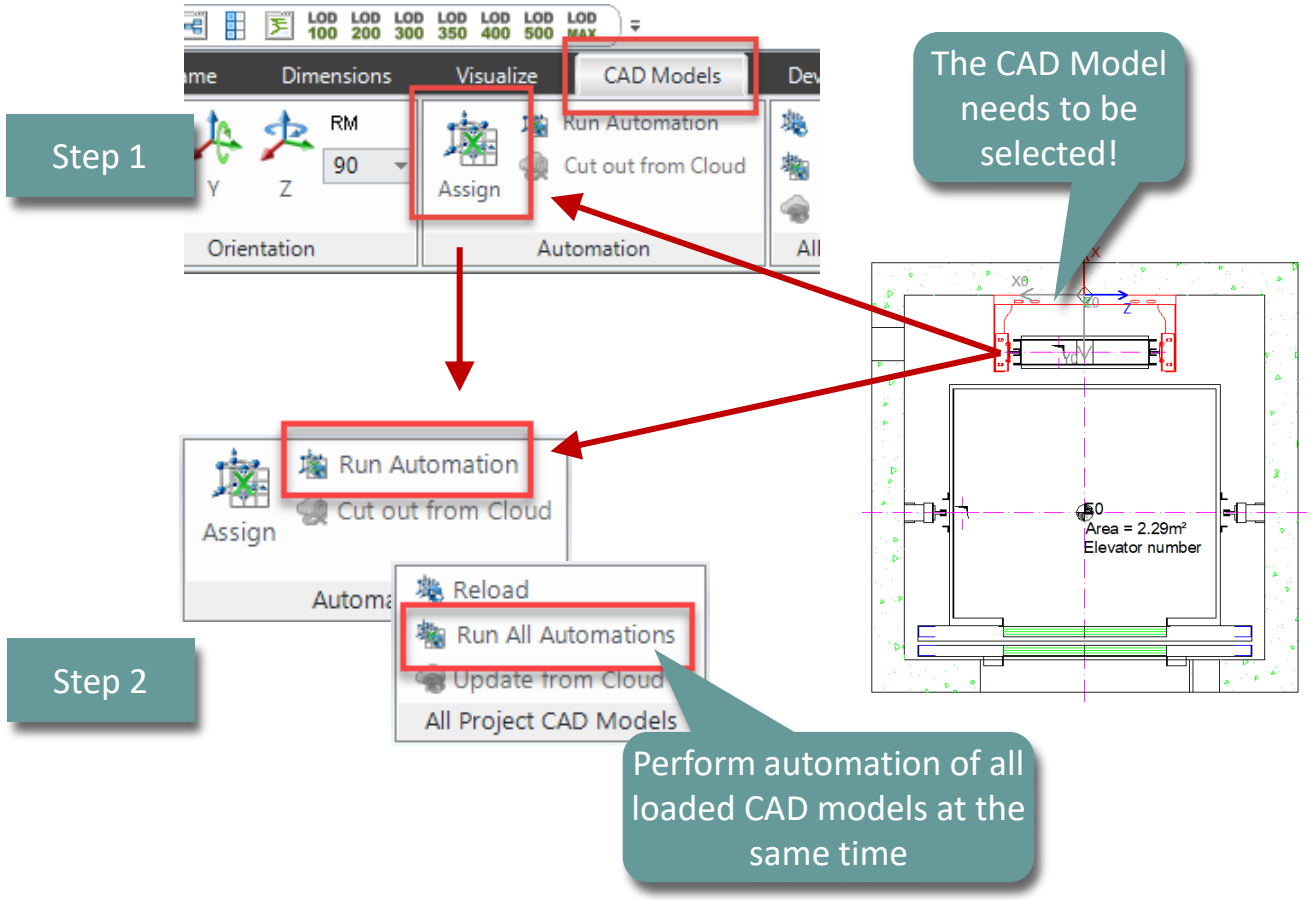
CAD Automation

SolidWorks is required to perform the exercises with the training files.

Link DigiPara Liftdesigner parameter with your 3D CAD Model parameter via the **Automation** Ribbon Group → **Assign**

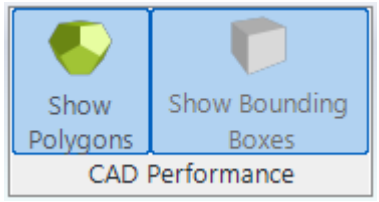
- With the following parameter mapping procedure you are able to drive your CAD Models within DigiPara Liftdesigner:
  - Step 1: Parameter mapping
  - Step 2: Run the automation

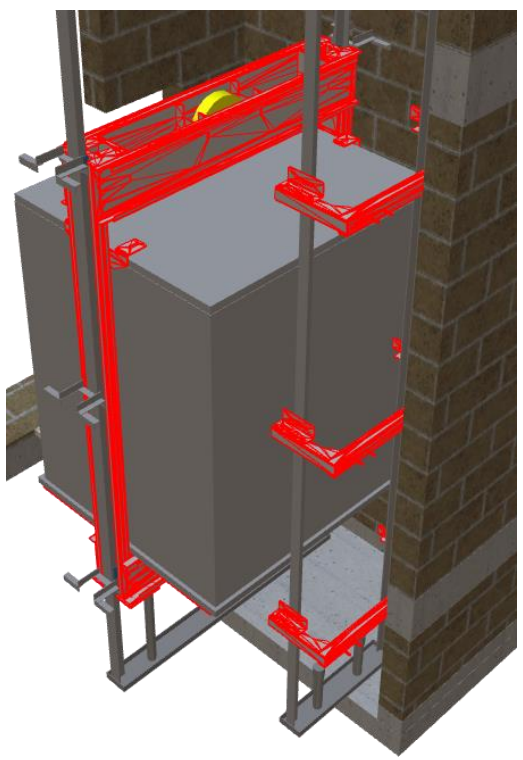
- **Write-protection** of the CAD files must be checked in advance and removed if necessary!

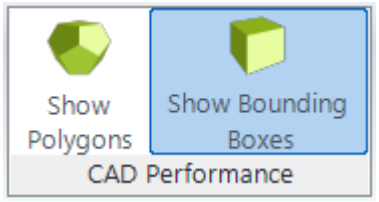


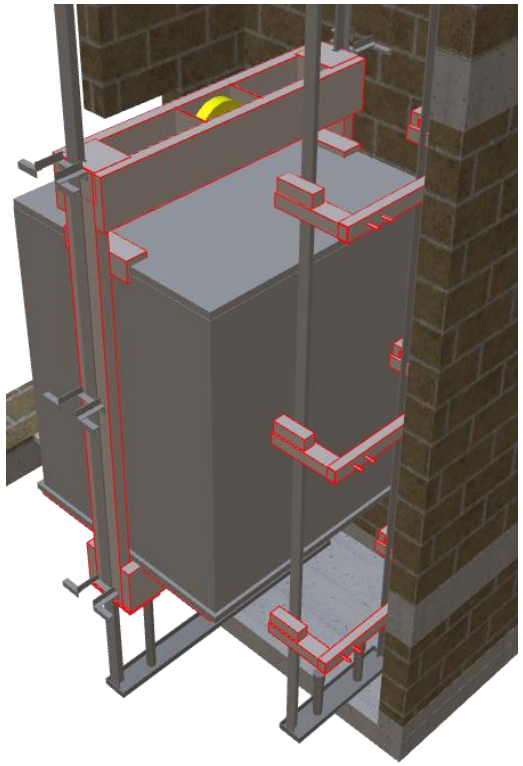
Recommendation before starting the automation process

- When using multiple and/or complex CAD models with many parameter mappings, simplifying the geometries can speed up the work process within the project.
  - Show Bounding Boxes



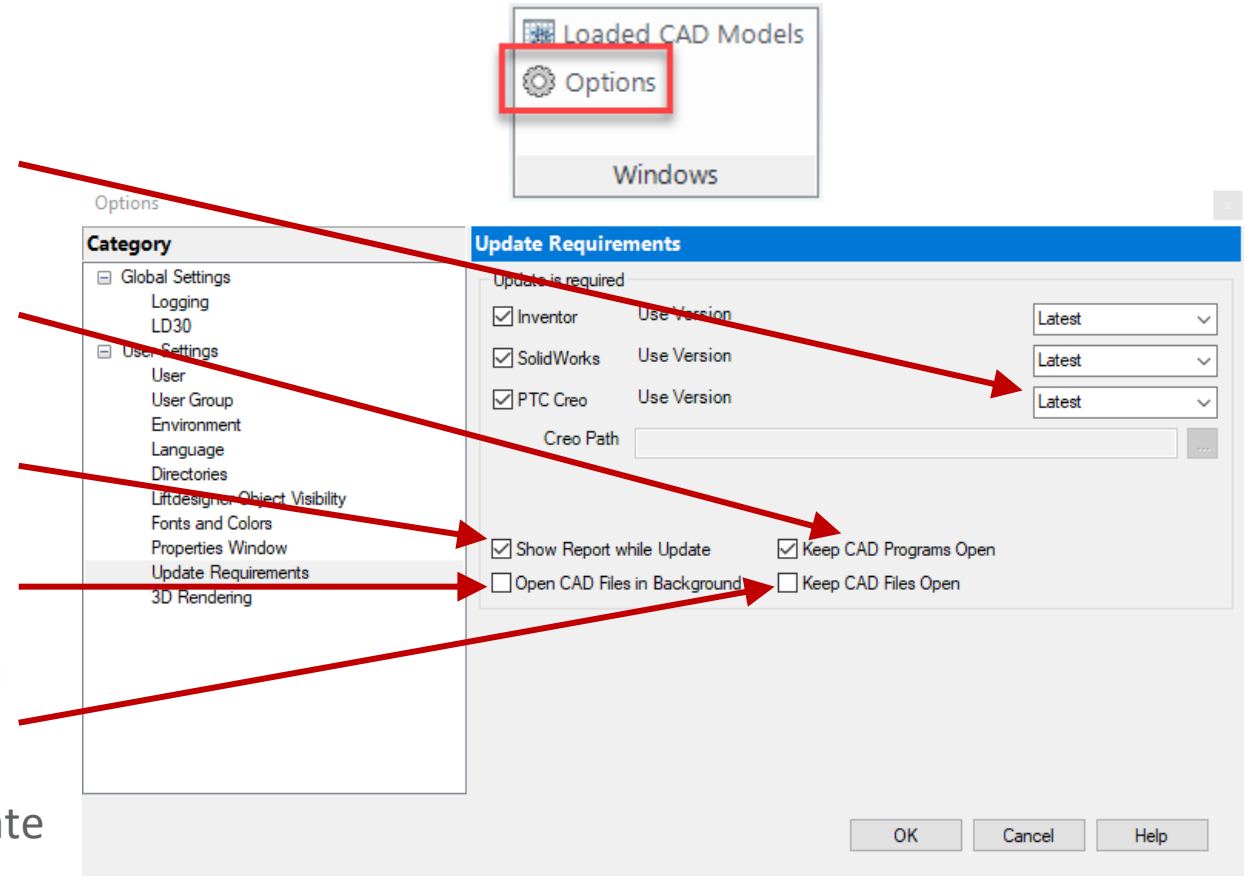






Update Requirements

- Last installed (current) CAD program version is used
- CAD programs are not closed after automation process
- Report is loaded automatically
- Update of the CAD model is displayed
- CAD models are closed after the update

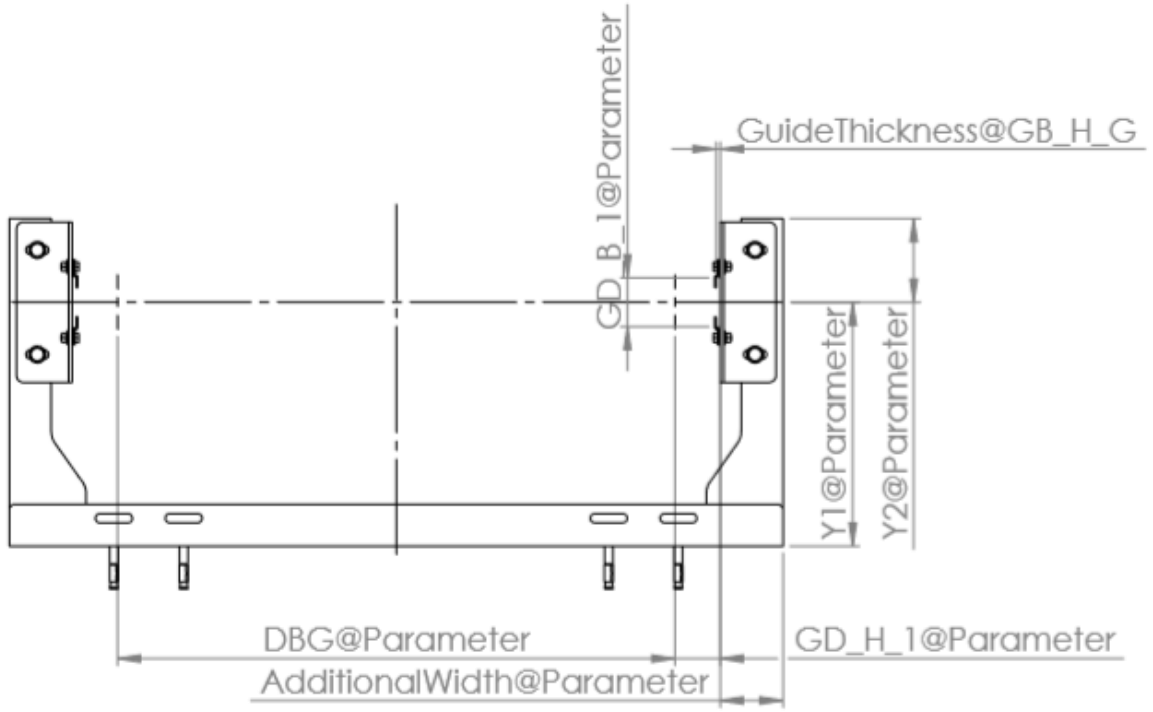


CAD Model Parameter

CAD Model Parameter

EL4.6 CAD AUTOMATION

The rail bracket size is controlled by a sketch inside the assembly.



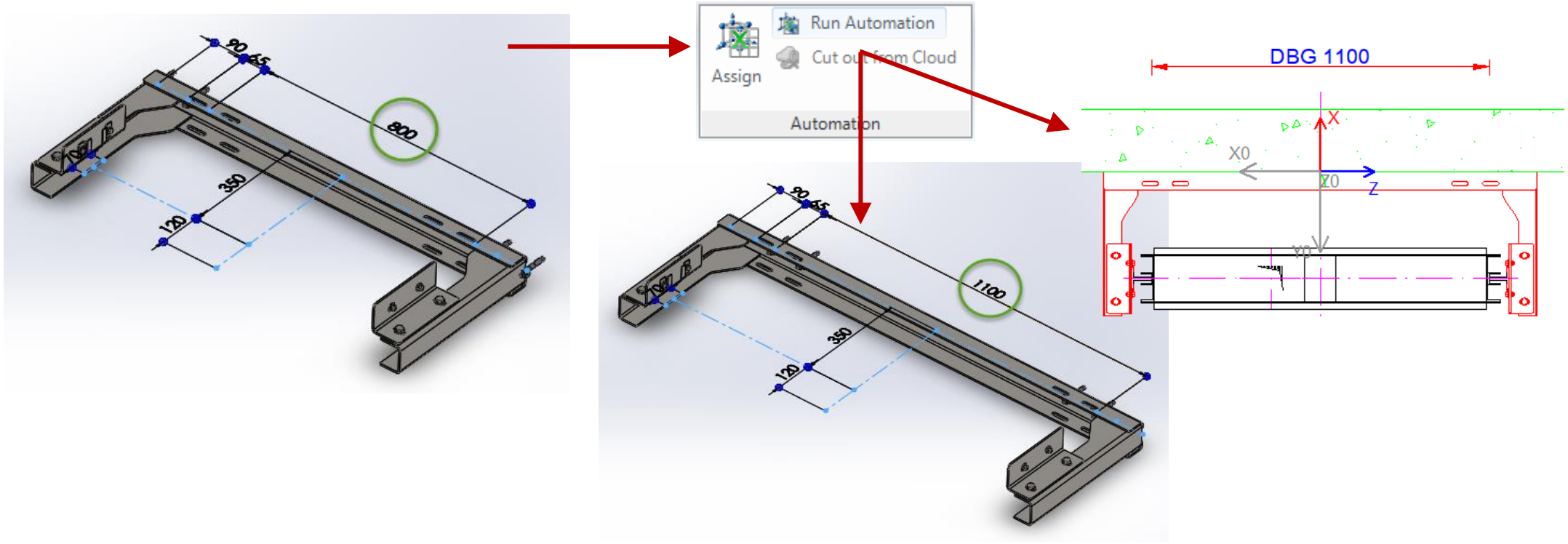
Y1@Parameter	350	Distance between the wall side of the bracket and the centerline of the rail in y-direction
Y2@Parameter	120	Distance between the centerline of the rail and the front edge of the bracket in y-direction
DBG@Parameter	800	Distance between the guides
GD_H_1@Parameter	65	Height of the guide
GD_B_1@Parameter	70	Width of the bottom of the rail
GuideThickness@GB_H_G	6	Thickness of the bottom at the end of the conicality
AdditionalWidth@Parameter	90	Additional width for completion

CAD Model Parameter

EL4.6 CAD AUTOMATION

Expected result

- Drive a CAD model parameter directly via the Liftdesigner **Run Automation** function to adapt the original model to the elevator project.



Parameter Mapping Option 1

CAD Model Parameter

CAD Model Parameter

EL4.6 PARAMETER MAPPING OPTION 1

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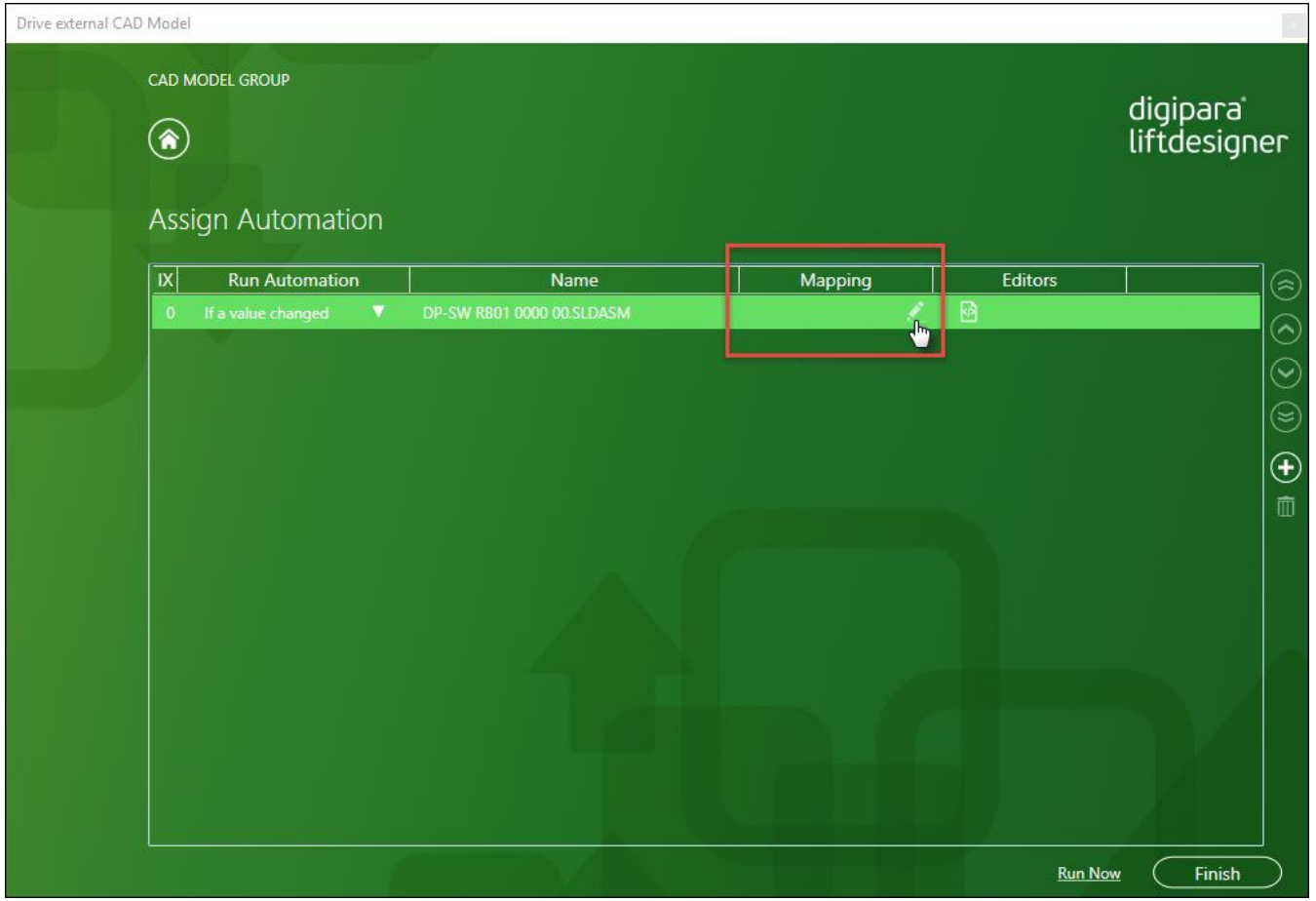
Assign mappings directly to your CAD Model parameter

- by selecting the associated Mapping column.

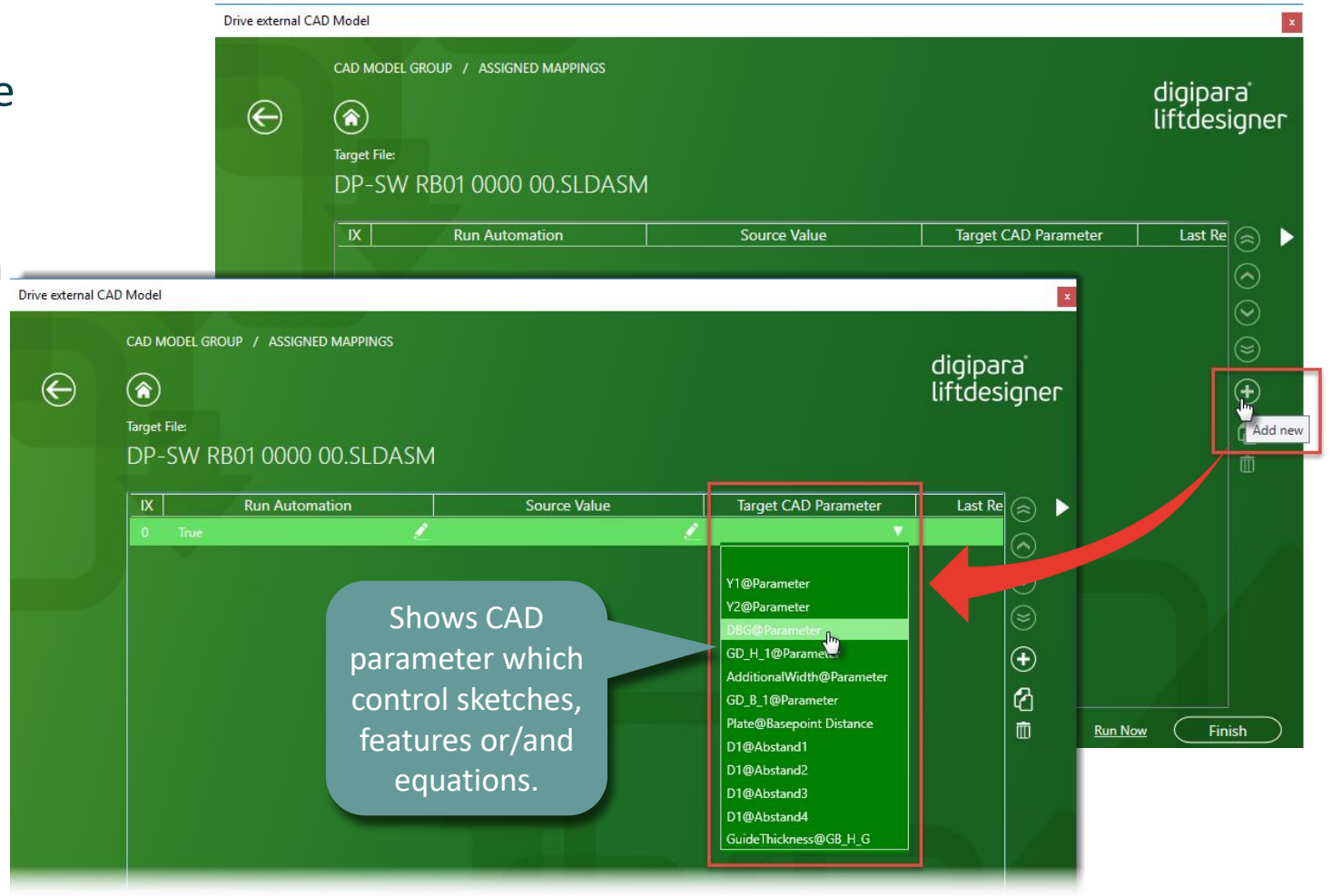


CAD Model Parameter

EL4.6 PARAMETER MAPPING OPTION 1

Add a new assignment record and choose the CAD parameter from the Target CAD Parameter list.

- After adding a new record the CAD model gets automatically opened in the corresponding application.



CAD Model Parameter

EL4.6 PARAMETER MAPPING OPTION 1

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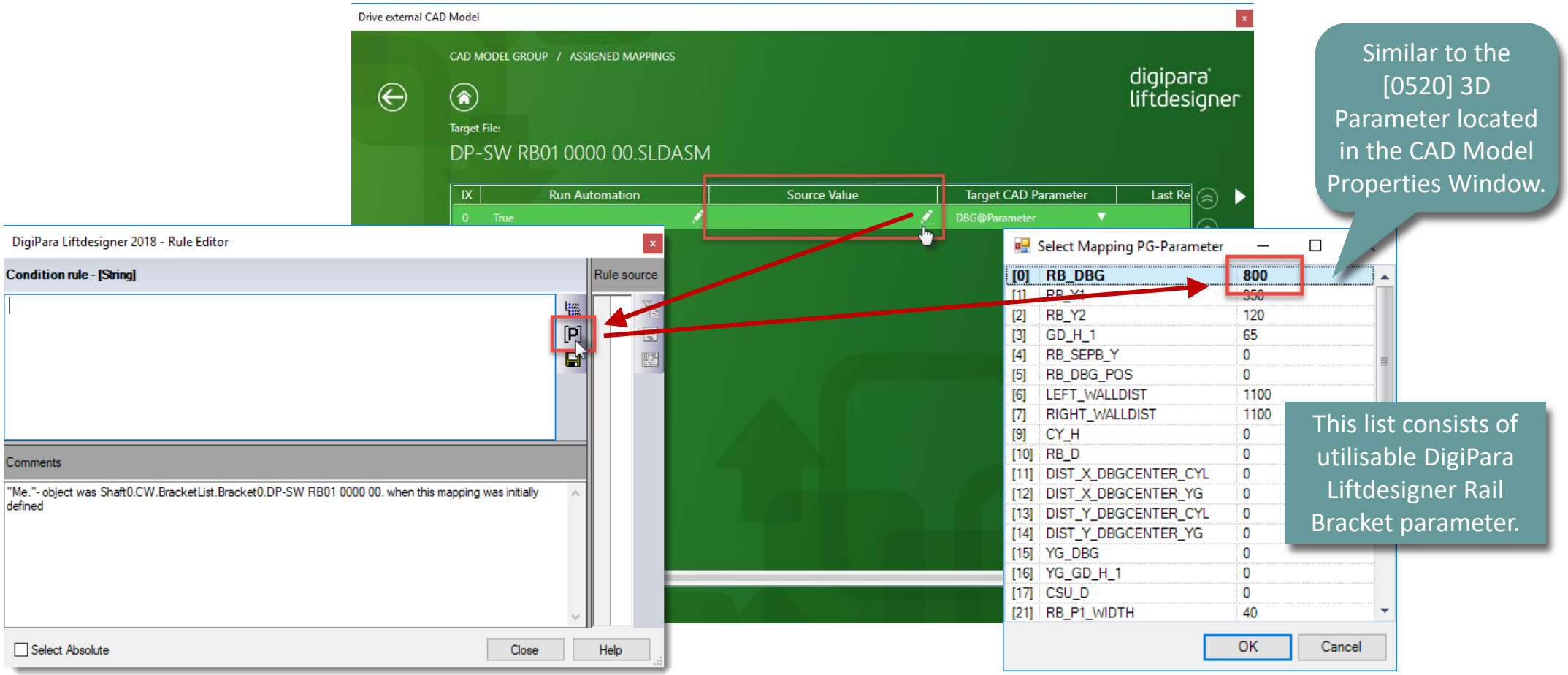
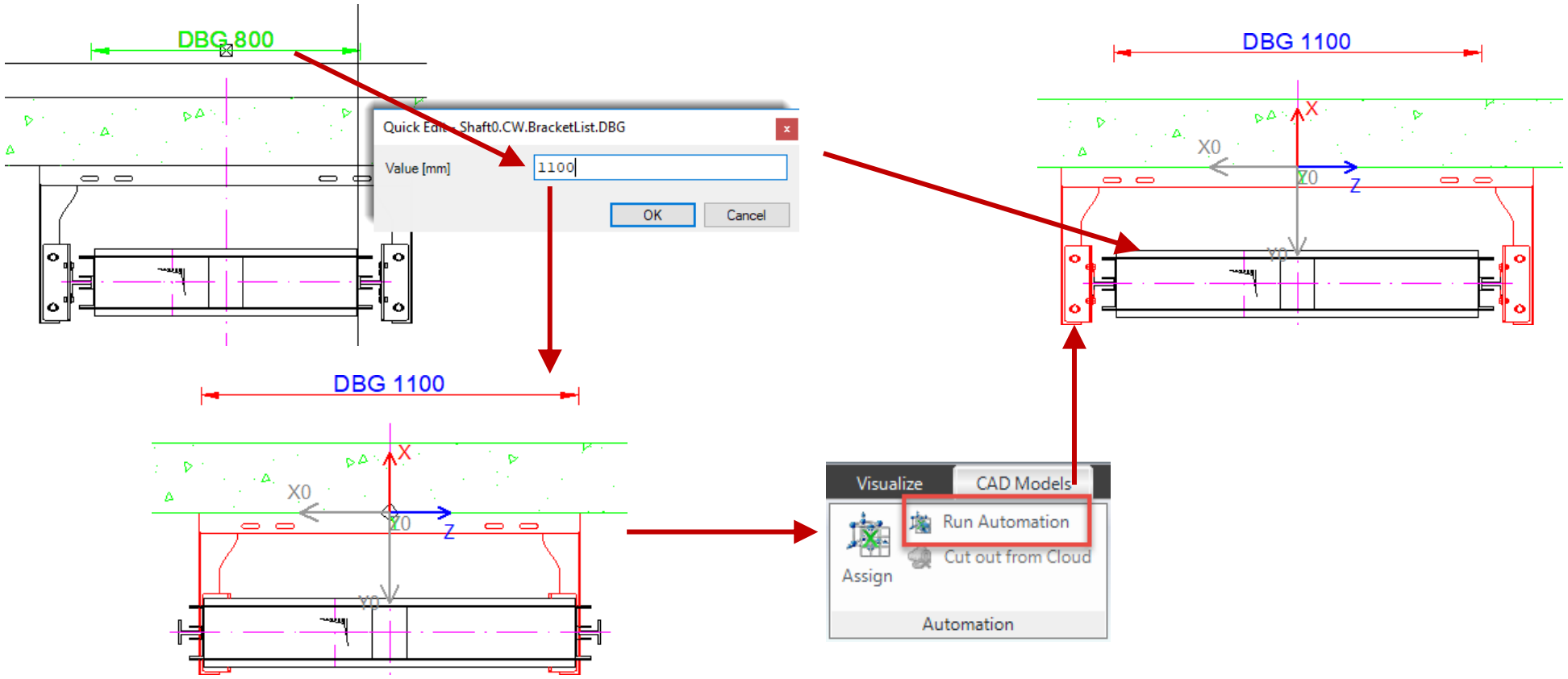
Choose the DigiPara Liftdesigner Source Value you want to link with via the PG-Parameter list.



CAD Model Parameter

EL4.6 PARAMETER MAPPING OPTION 1

Change the source value you have linked with in the current project and run the automation by selecting the CAD Model → Run Automation



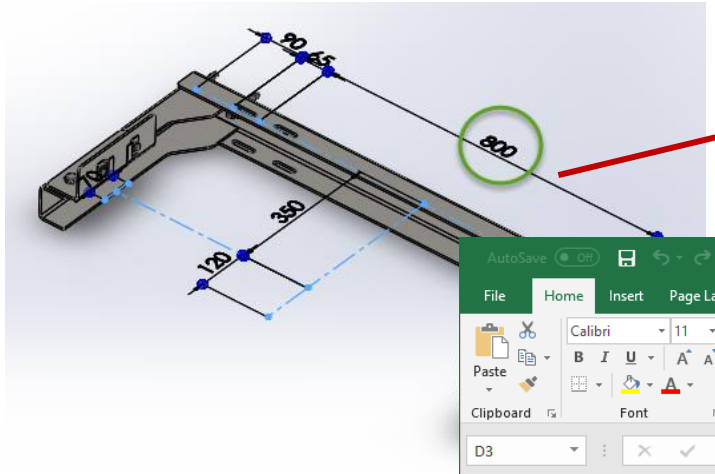
Excel File Automation

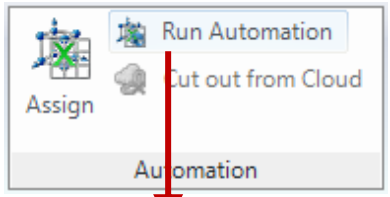
Excel File Automation

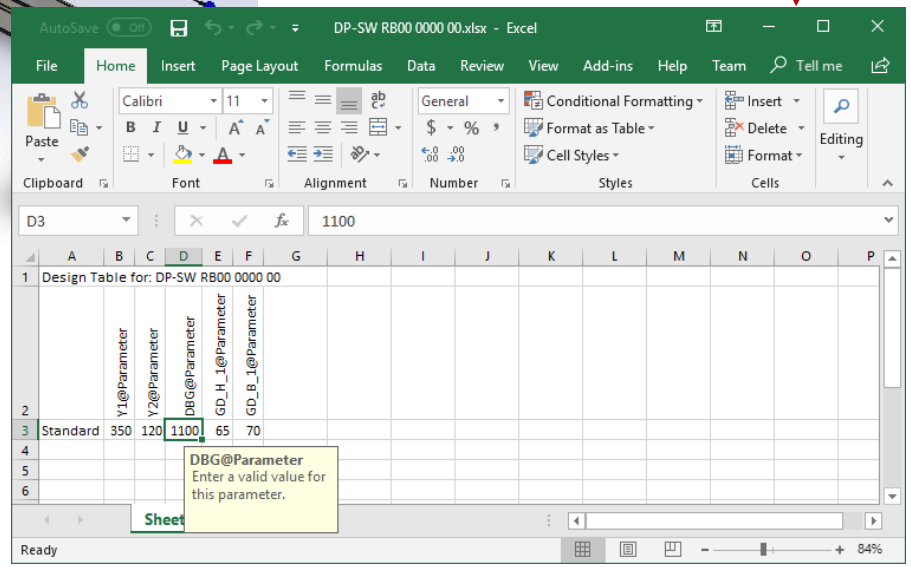
EL4.6 PARAMETER MAPPING OPTION 2

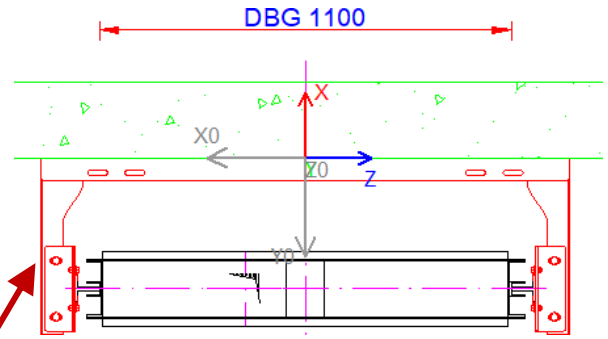
Expected result

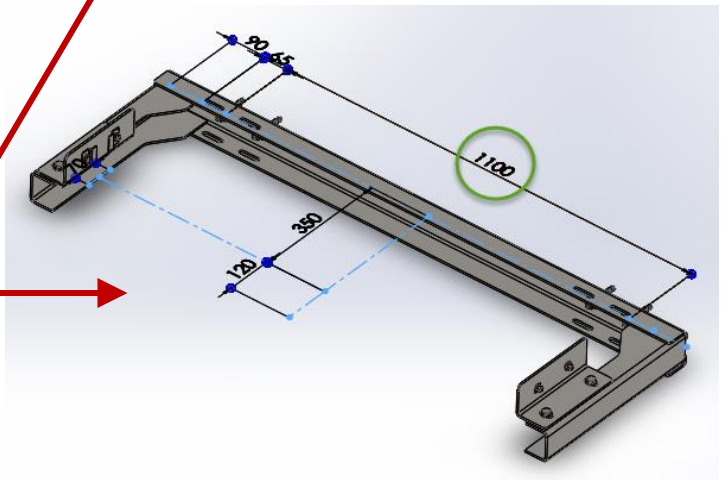
- Drive a CAD model parameter via an Excel file integrated into the Liftdesigner Run Automation function in order to adapt the original model to the elevator











Parameter Mapping Option 2

Excel File Automation

Excel File Automation

EL4.6 PARAMETER MAPPING OPTION 2

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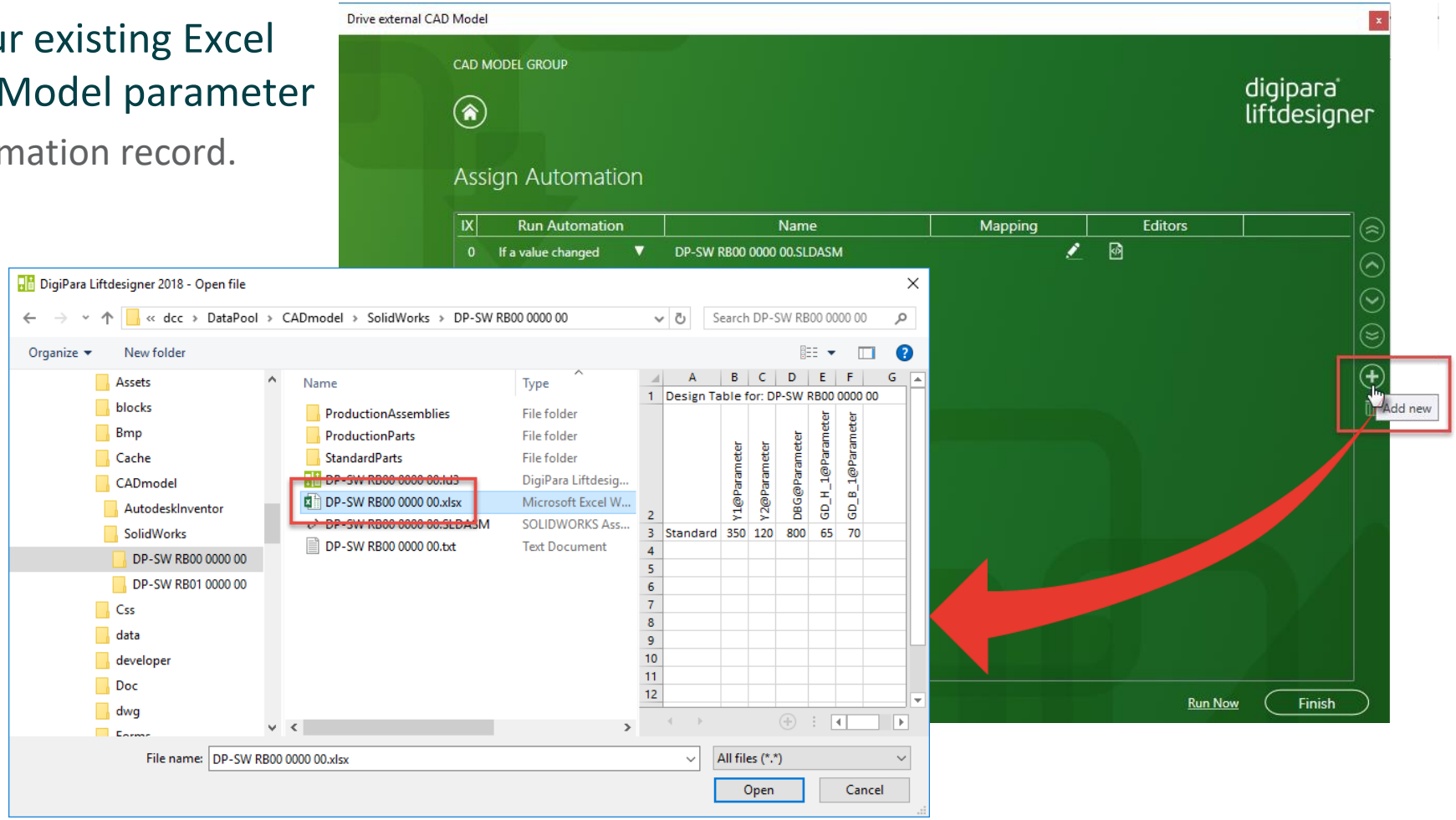
Assign mappings to your existing Excel file linked to your CAD Model parameter

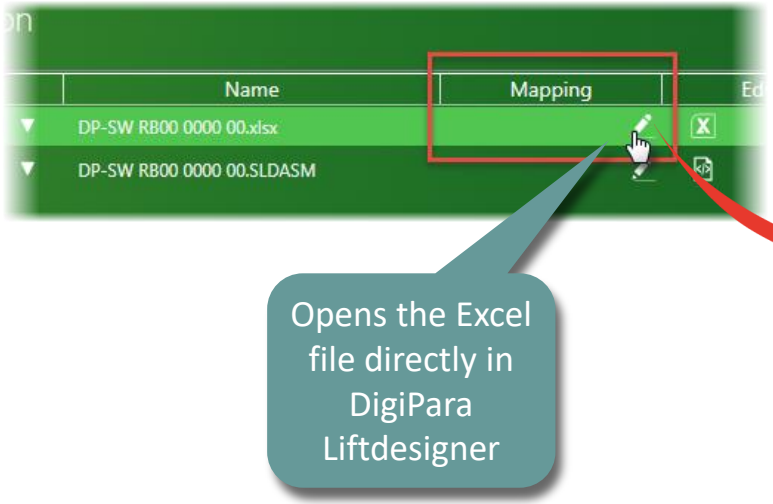
- by adding a new automation record.

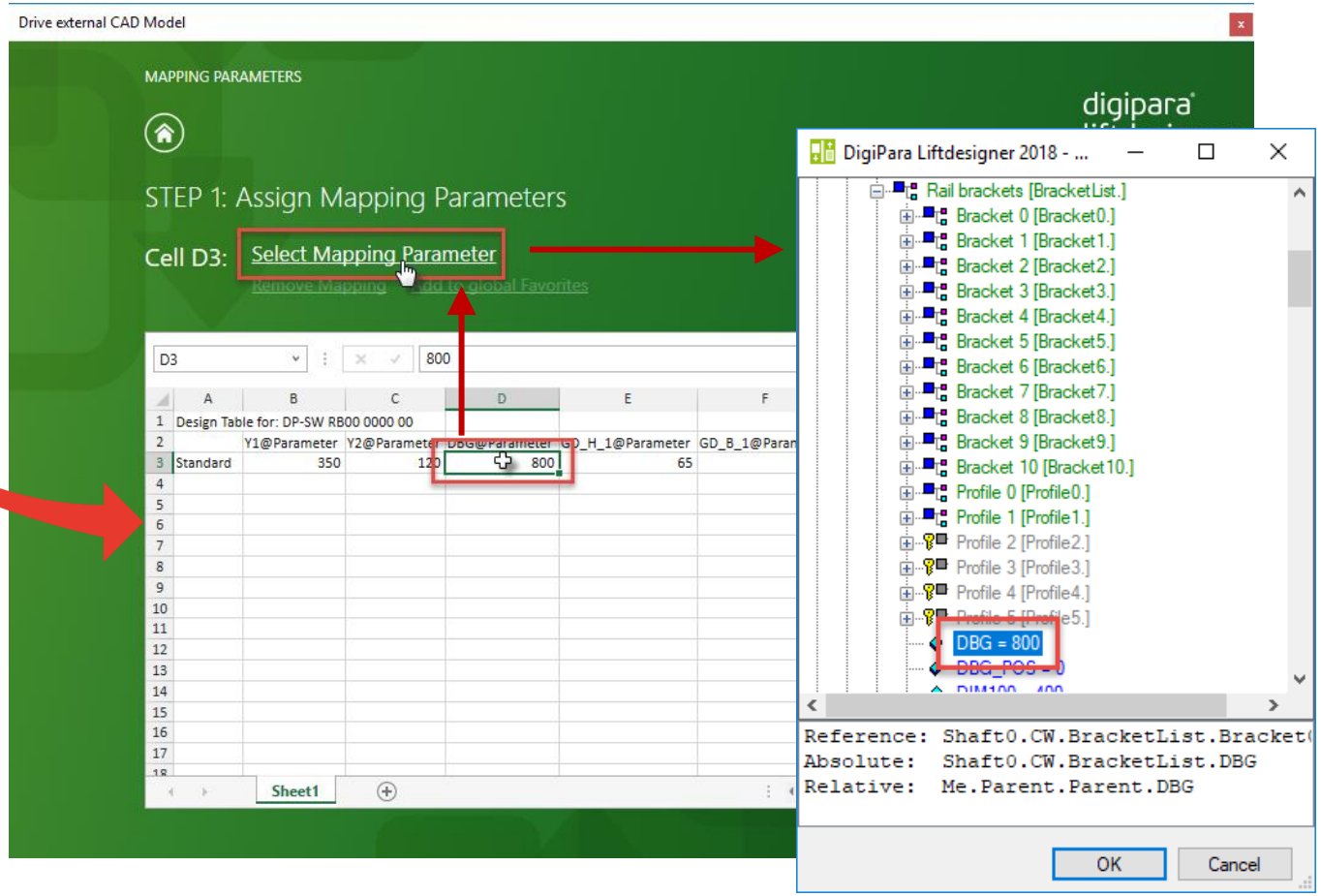


Excel File Automation

EL4.6 PARAMETER MAPPING OPTION 2

Choose the corresponding Excel cell you want to link with via the DigiPara Liftdesigner Project tree.





Excel File Automation

EL4.6 PARAMETER MAPPING OPTION 2

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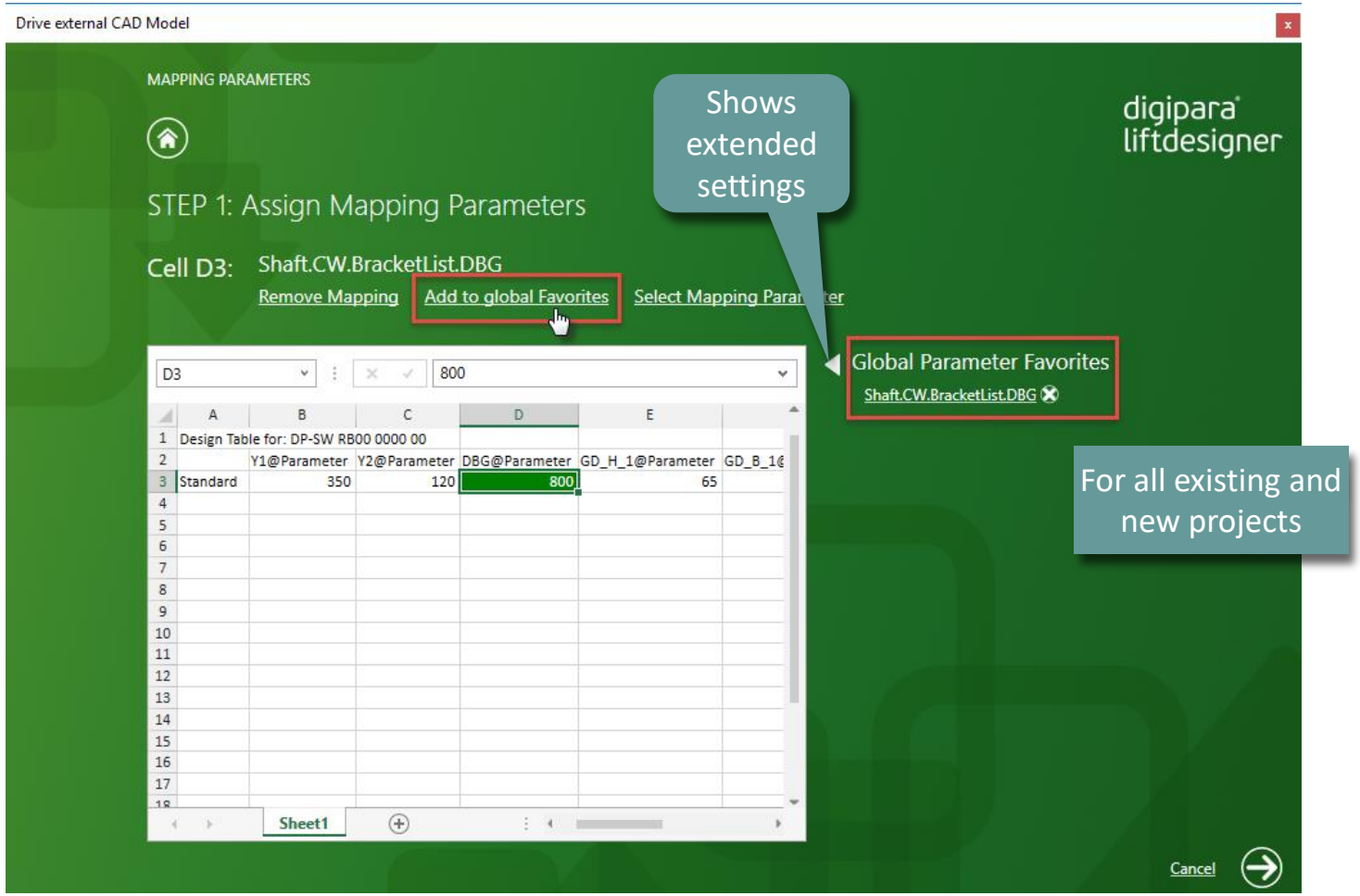
Add DigiPara Liftdesigner project tree parameter as global favorites.

- If the cell is correctly linked with the mapping parameter, it gets automatically green colored.

- The Excel file can be edited or extended directly in the DigiPara Liftdesigner dialog, e.g. by defining formulas

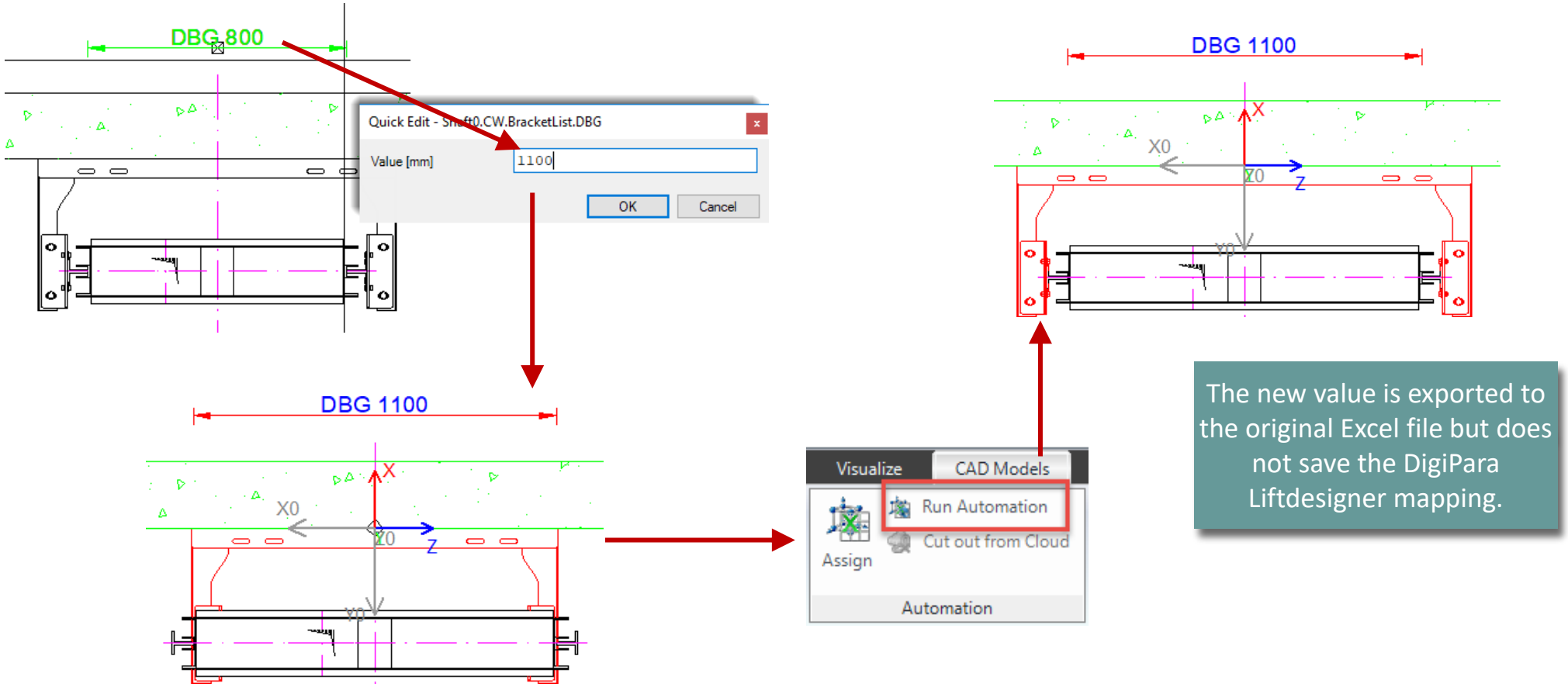


Excel File Automation

EL4.6 PARAMETER MAPPING OPTION 2

digipara® liftdesigner

Finish the mapping and run the automation with the associated changed value.



Use of Rule Editor

Use of Rule Editor

EL4.6 CAD AUTOMATION

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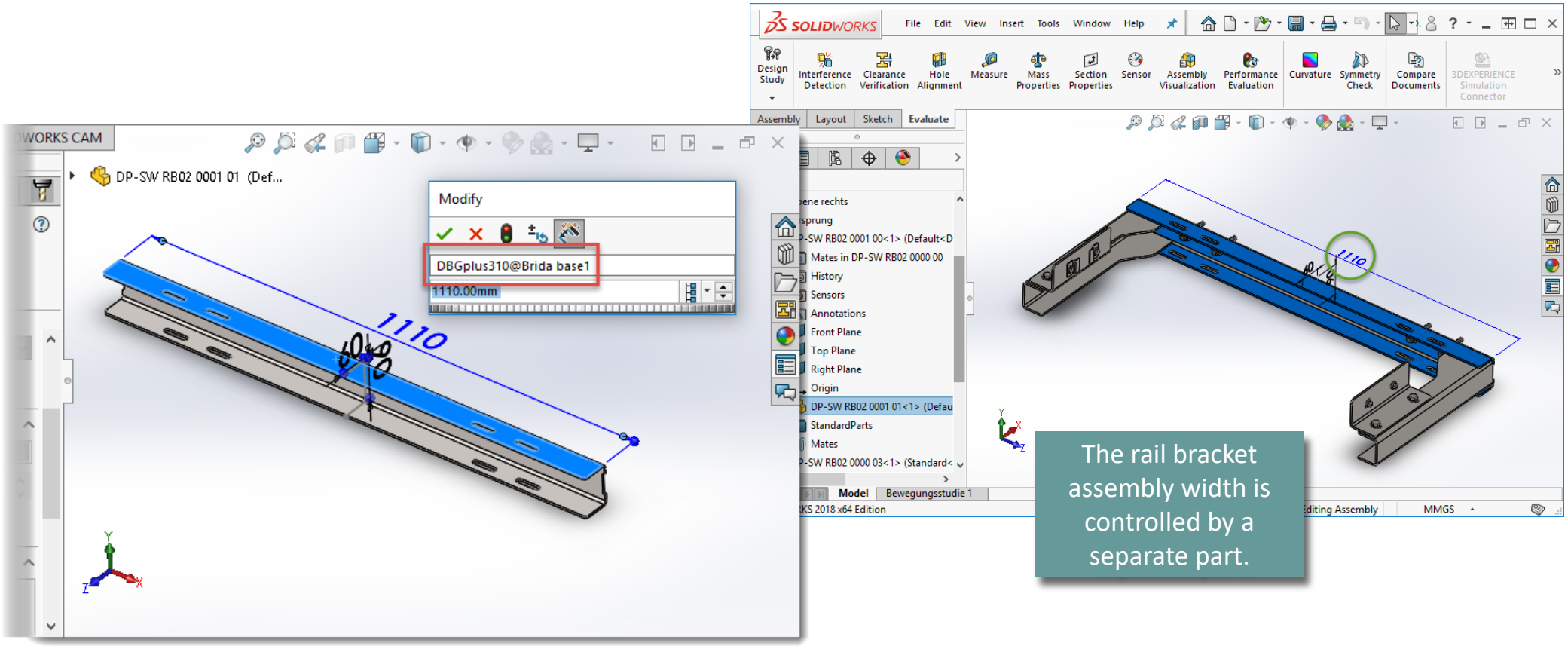
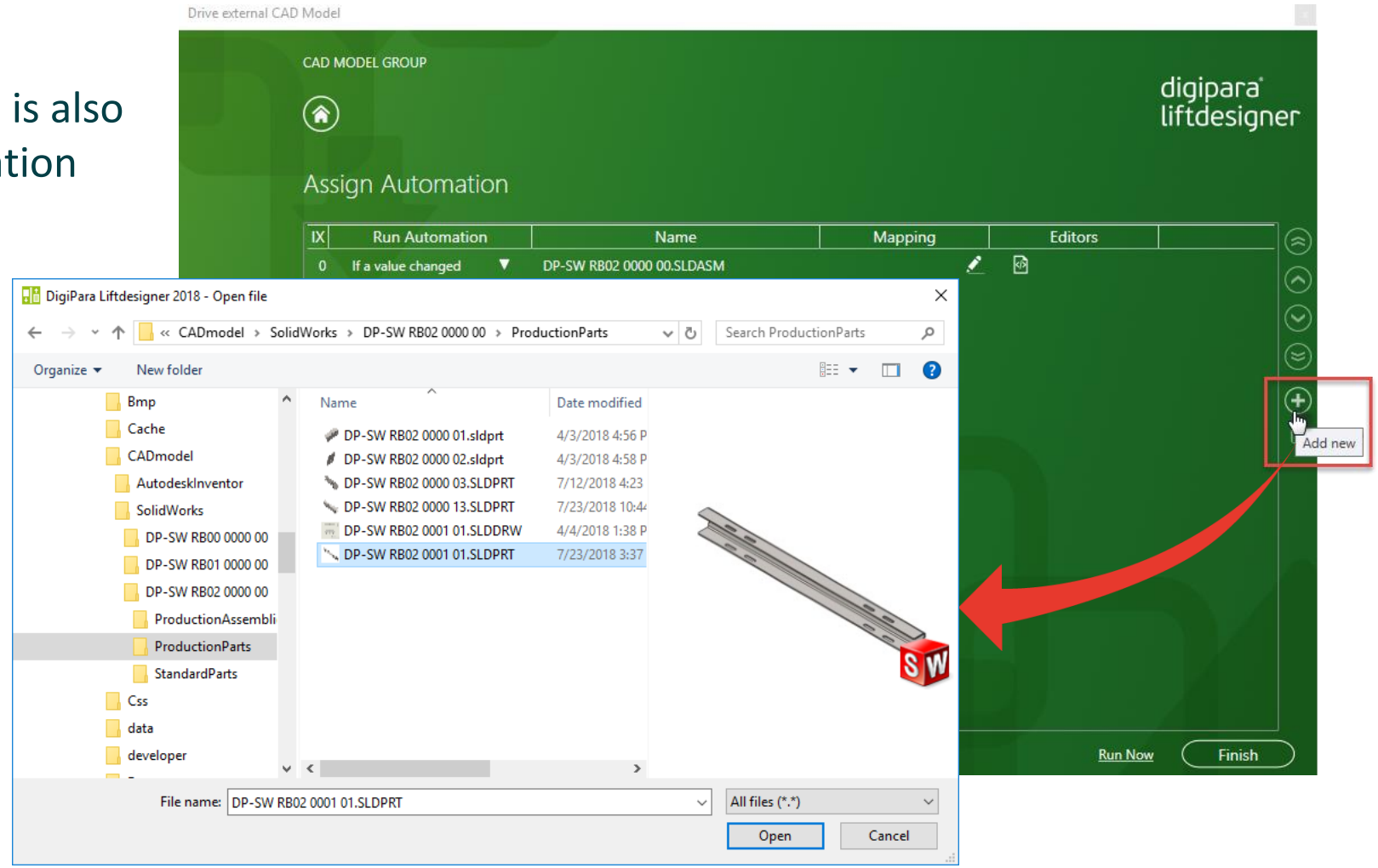
Use the CAD parameter of separate assembly parts for parameter mapping



Use of Rule Editor

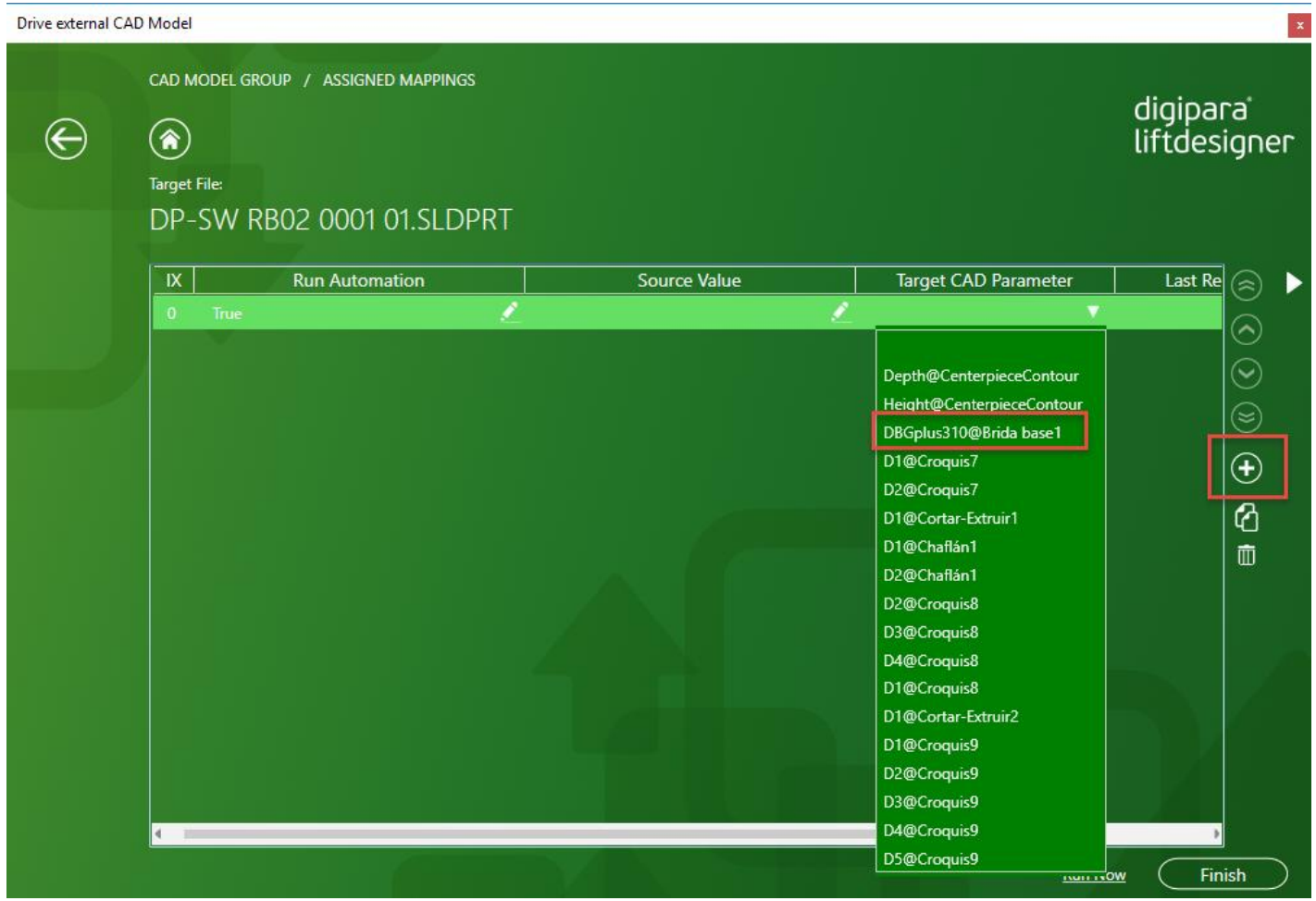
EL4.6 CAD AUTOMATION

In addition to the CAD model assembly the controlling part is also needed in the Assign Automation dialog.



EL4.6 CAD Automation

Add a new assignment record and choose the CAD part parameter from the Target CAD Parameter list.



Use of Rule Editor

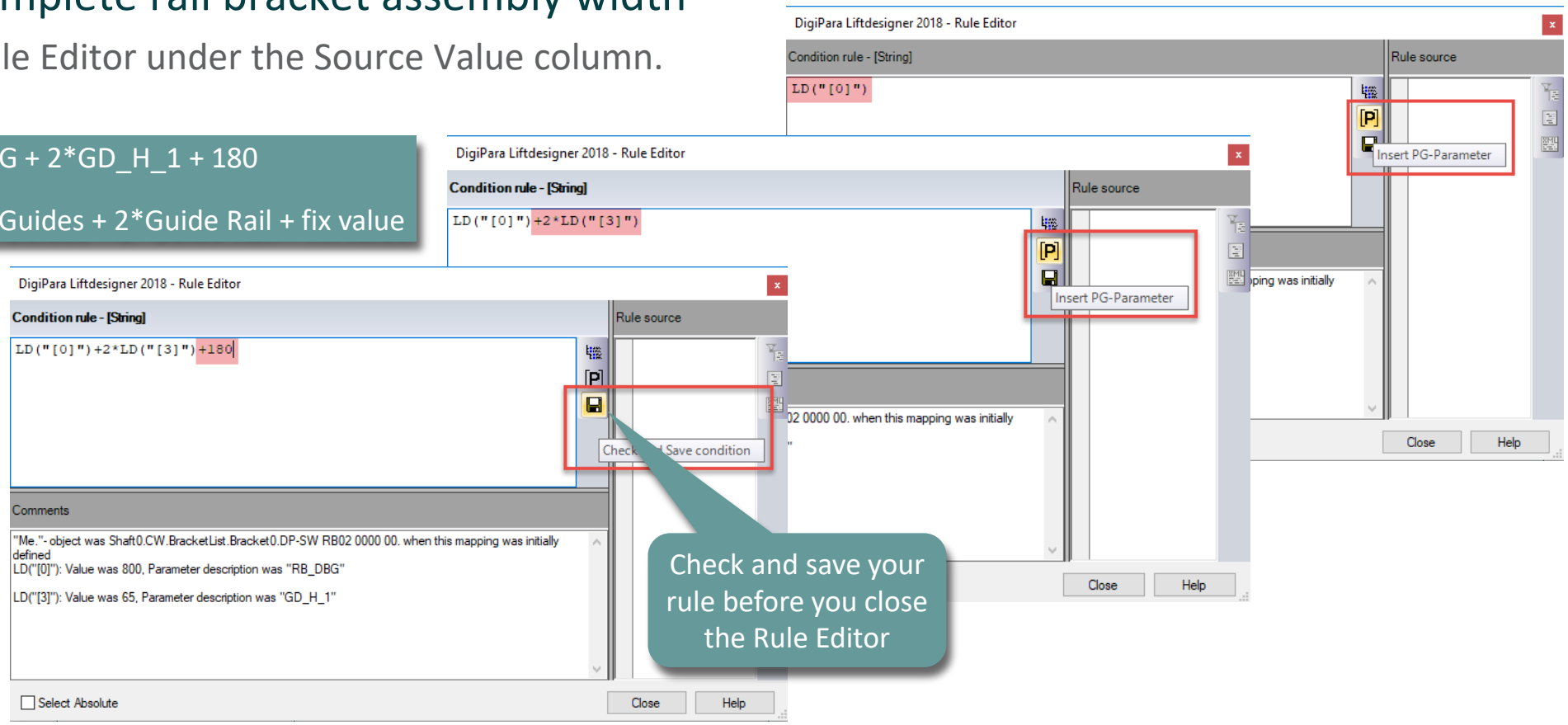
EL4.6 CAD AUTOMATION

Create an equation consists of DigiPara Liftdesigner PG-Parameter and fix values to define the complete rail bracket assembly width

- using the Rule Editor under the Source Value column.

RB_DBG + 2*GD_H_1 + 180

Distance between Guides + 2*Guide Rail + fix value

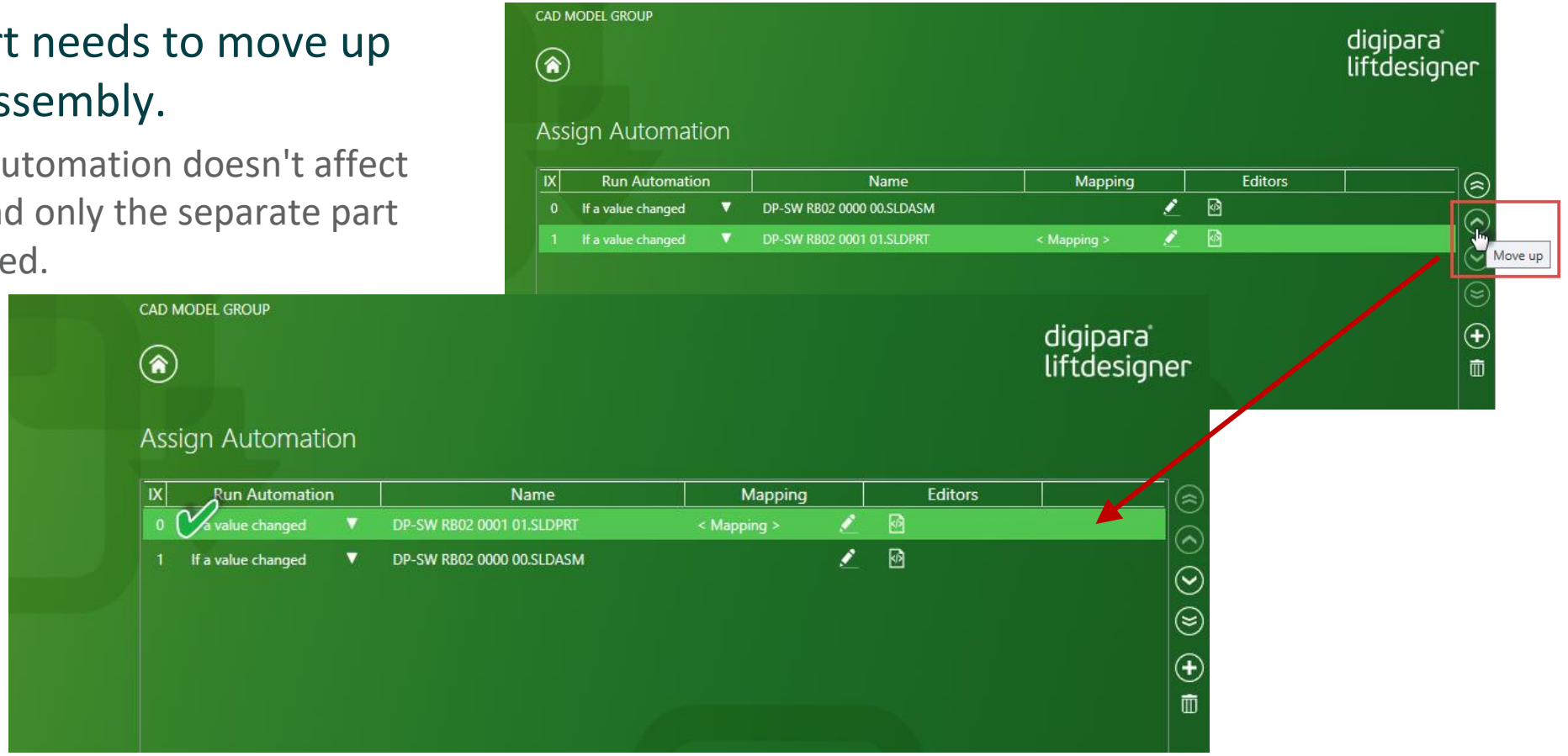


Use of Rule Editor

EL4.6 CAD AUTOMATION

The mapped part needs to move up (IX 0) over the assembly.

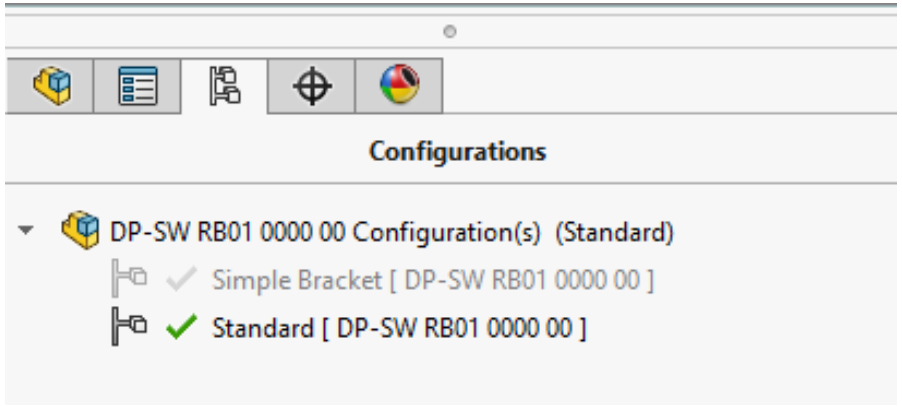
- Otherwise the automation doesn't affect the assembly and only the separate part would be changed.

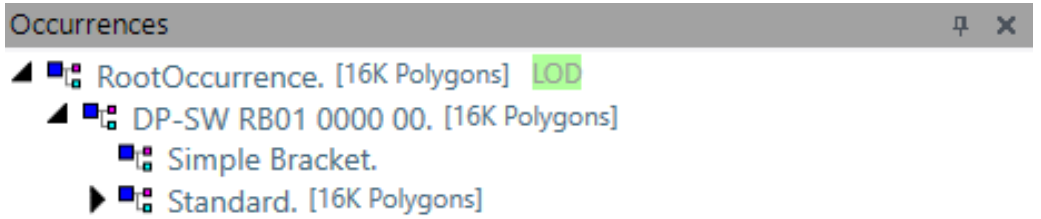


CAD Model Configurations

CAD Model Configurations

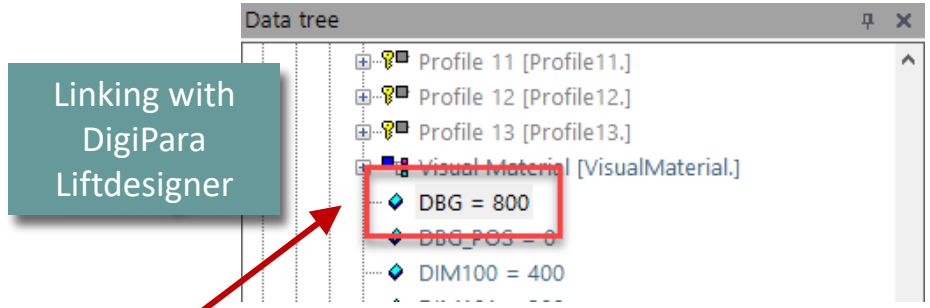
- The last saved configuration of the CAD model is always displayed in DigiPara Liftdesigner
  - The existing configuration names are displayed in DigiPara Liftdesigner but cannot be activated





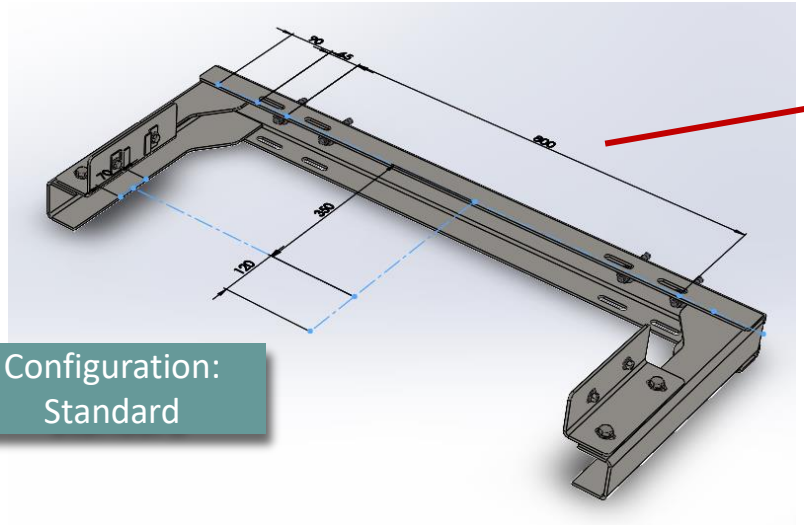
Show different CAD model configurations

- If the configurations are controlled via a parameter query in the CAD software, the various configurations can also be displayed in DigiPara Liftdesigner by linking the controlling CAD parameter with Datatree parameters.

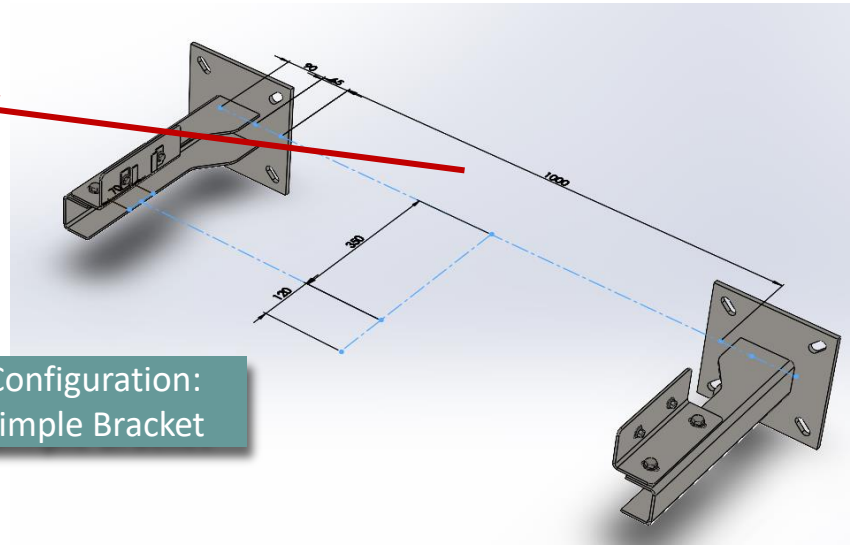


Linking with DigiPara Liftdesigner

Controlling CAD parameter switched the configurations



Configuration: Standard



Configuration: Simple Bracket

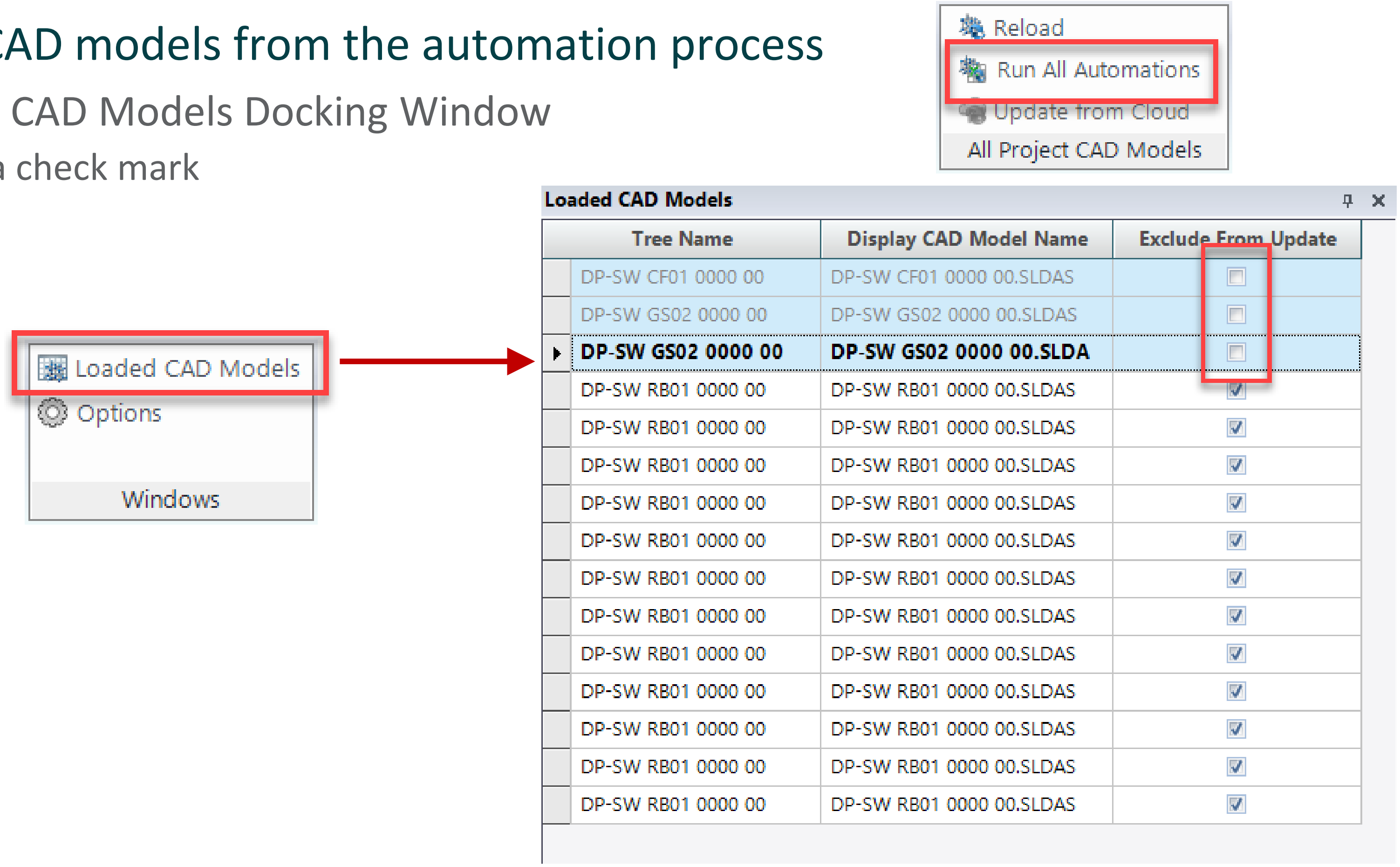
Loaded CAD Models Docking Window

Loaded CAD Models Docking Window

EL4.6 CAD AUTOMATION

Exclude certain CAD models from the automation process

- Via the Loaded CAD Models Docking Window
  - by removing a check mark



Tree Name	Display CAD Model Name	Exclude From Update
DP-SW CF01 0000 00	DP-SW CF01 0000 00.SLDAS	☐
DP-SW GS02 0000 00	DP-SW GS02 0000 00.SLDAS	☐
DP-SW GS02 0000 00	**DP-SW GS02 0000 00.SLDA**	☐
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑
DP-SW RB01 0000 00	DP-SW RB01 0000 00.SLDAS	☑

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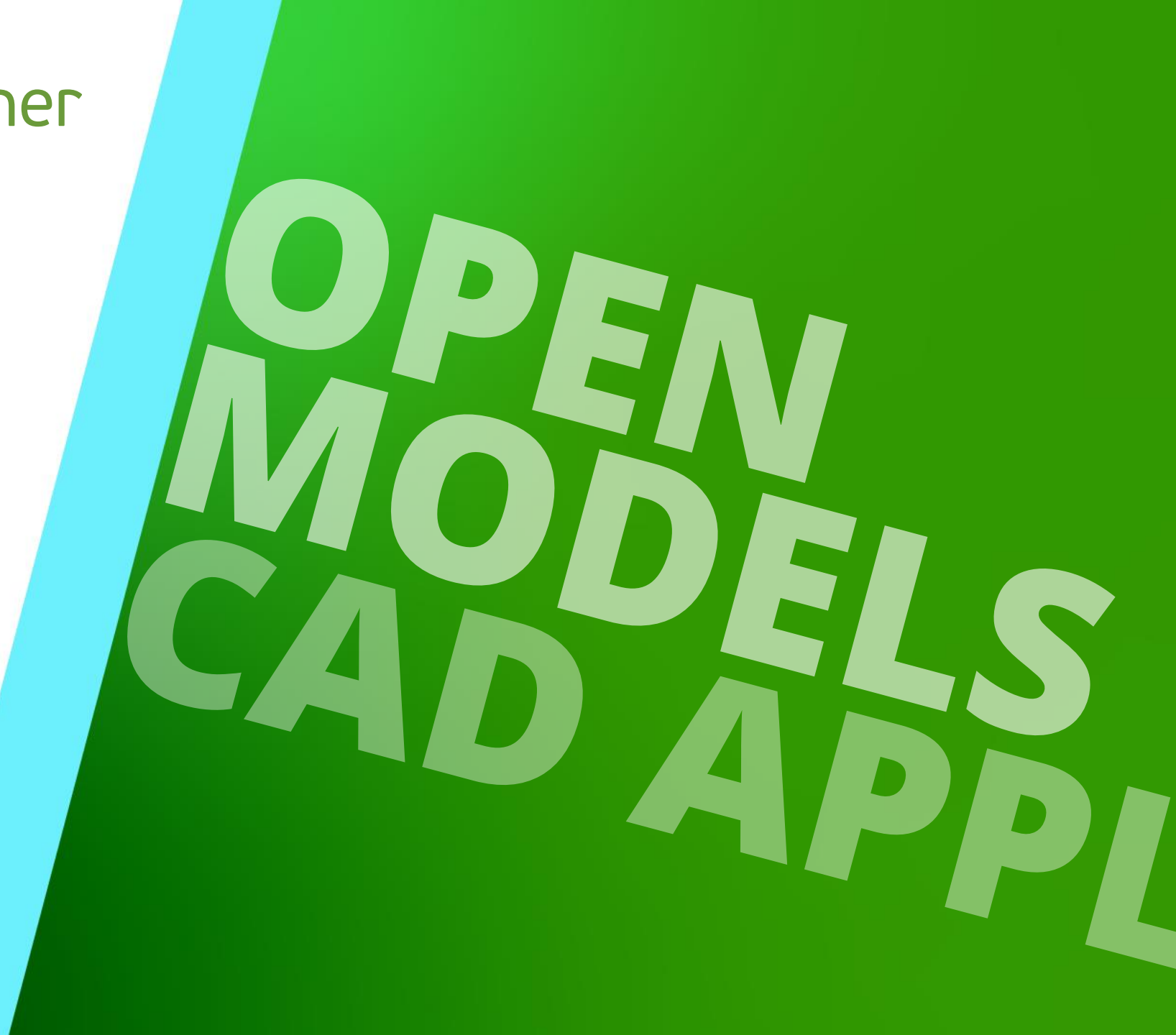
EL4.7

Open Models in CAD Application



Update original 3D CAD Models

EL4.7 OPEN MODELS IN CAD APPLICATION

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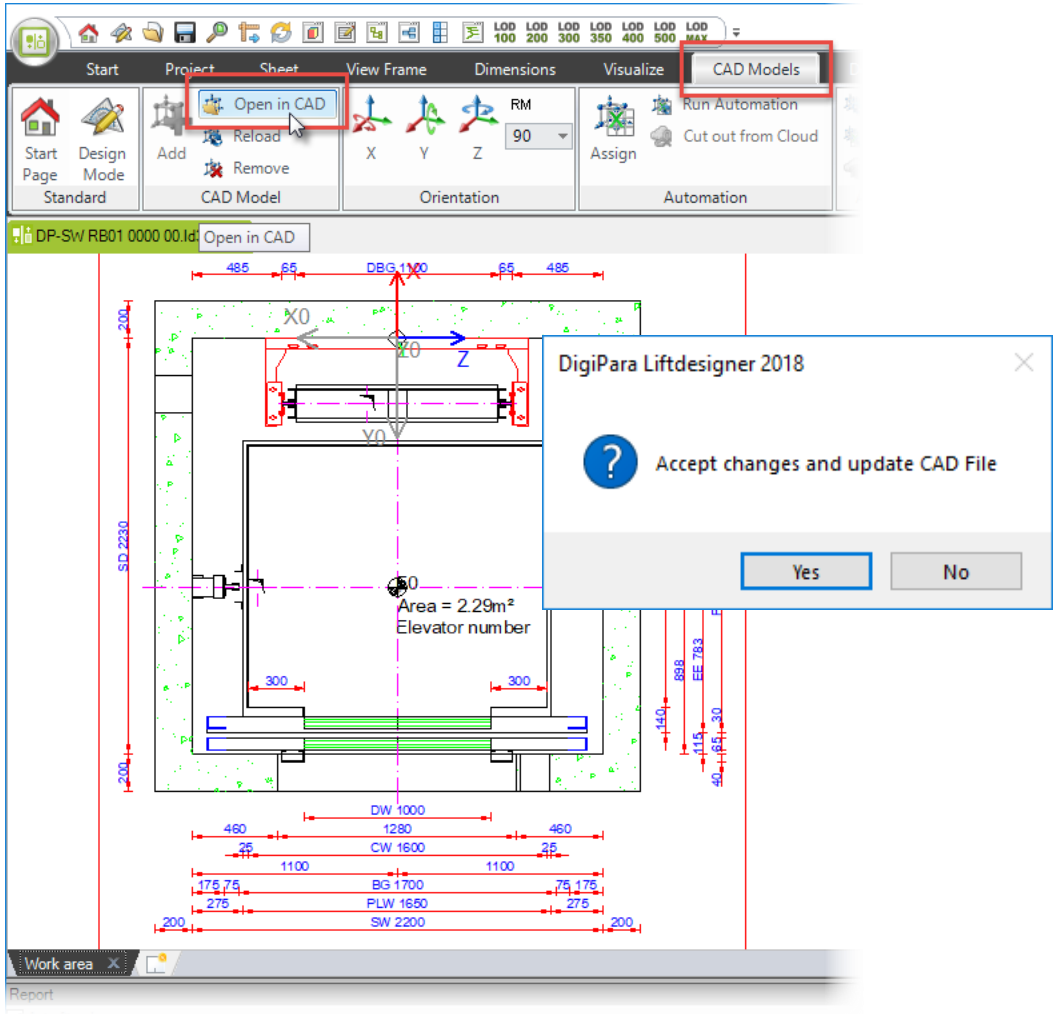
Determine by yourself when or if you want to update your CAD Files in Solid Works, Inventor or Creo

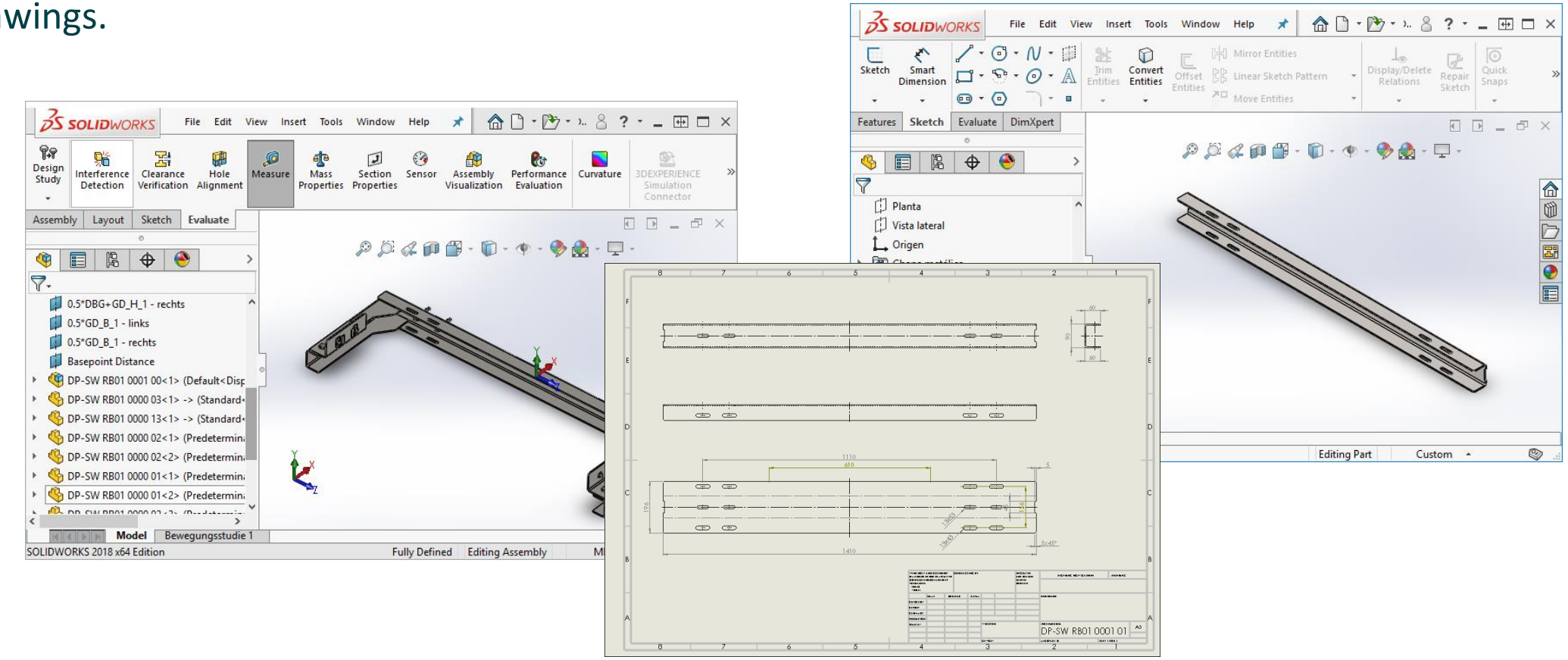
- by using the Open in CAD feature.



Update related Drawings

EL4.7 OPEN MODELS IN CAD APPLICATION

DigiPara Liftdesigner updates your complete 3D CAD Model as well as the associated production drawings.



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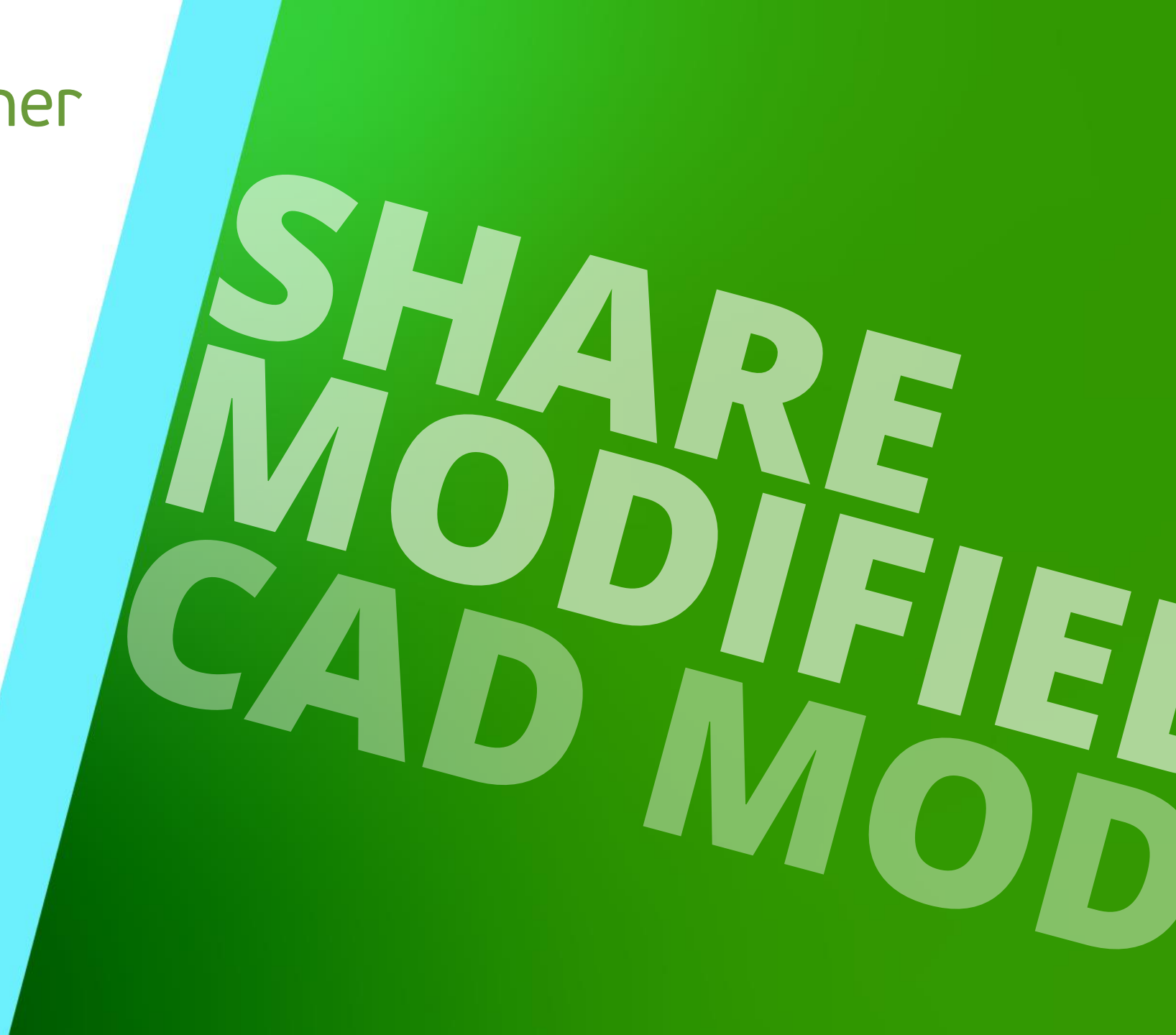
EL4.8

How to share modified CAD Models



General information

EL4.8 HOW TO SHARE MODIFIED CAD MODELS

The selected settings as well as the geometry of the CAD model, the path to the original file, and the parameter mapping can be saved in a node file, which other DigiPara Liftdesigner users can use instead of the CAD model.

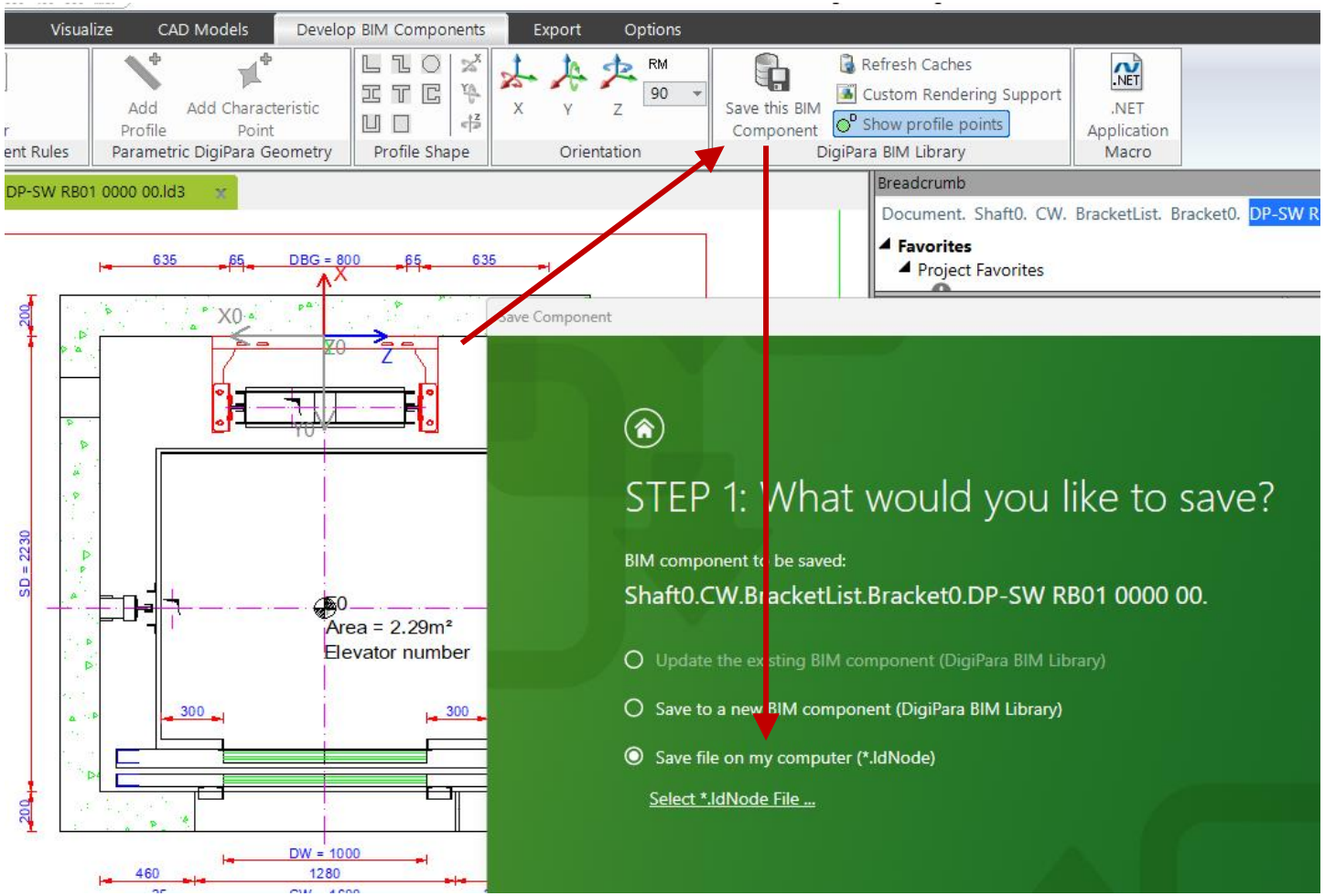
- The node file is embedded in the project file by default.
- Automation can only be performed if the path of the original file remains the same and all users have access to the source. (File paths: are Absolute)
  - Recommendation: If the files are stored on a network, several users should not work with the node file at the same time and perform automation.

Save and reuse Node Files

EL4.8 HOW TO SHARE MODIFIED CAD MODELS

Save as DigiPara Node File

- Save this BIM Component

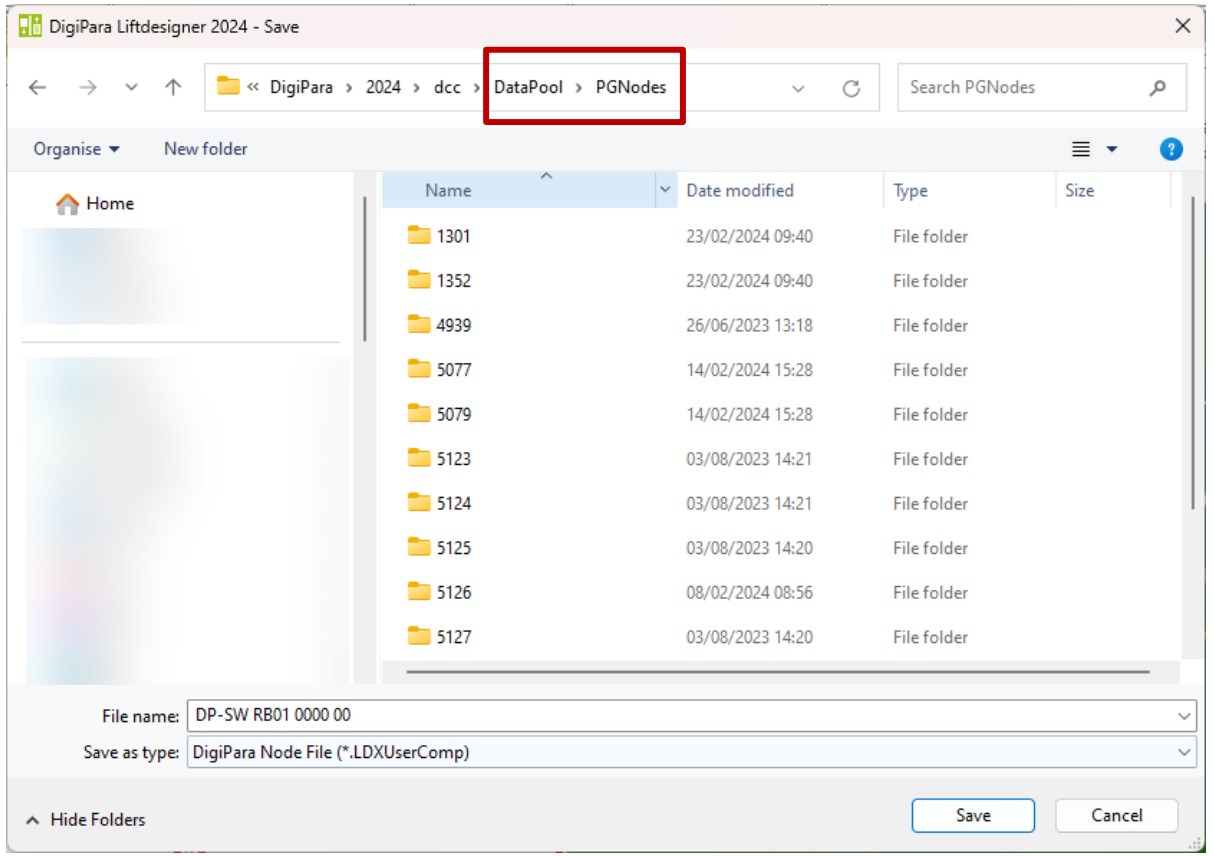


Save and reuse Node Files

EL4.8 HOW TO SHARE MODIFIED CAD MODELS

Save as DigiPara Node File (*.LDXUserComp)

- Default path:
  - C:\ProgramData\DigiPara*\dcc\DataPool\PGNodes
- The file path can be selected according to your own requirements.
- If node files are intended to be a regular part of the DigiPara Liftdesigner data pool, they should be registered as Module Files in the Datamanager. The corresponding .ldm12 file should then be exported and distributed.

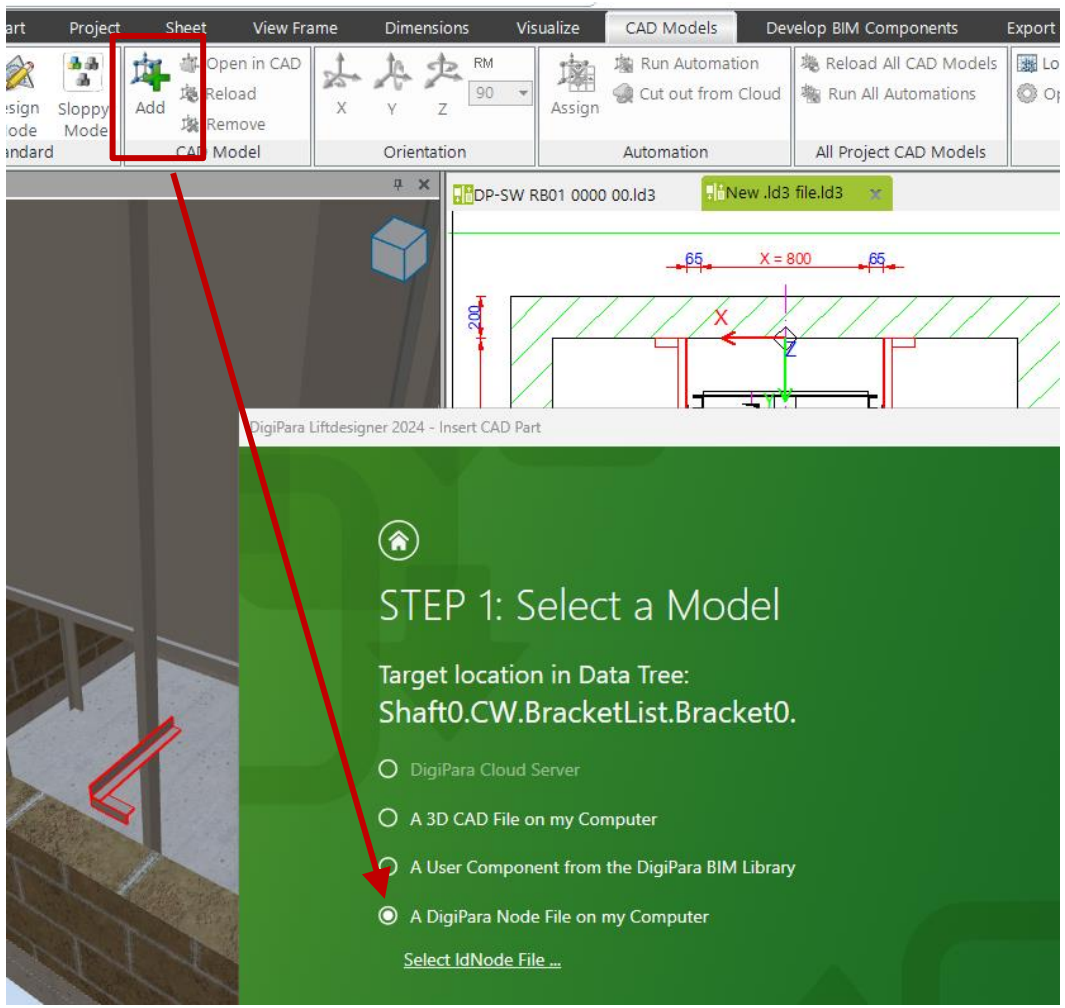


Save and reuse Node Files

EL4.8 HOW TO SHARE MODIFIED CAD MODELS

Load a DigiPara Node File

- with all previously made settings into other DigiPara Liftdesigner projects



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EL4.9

Practice

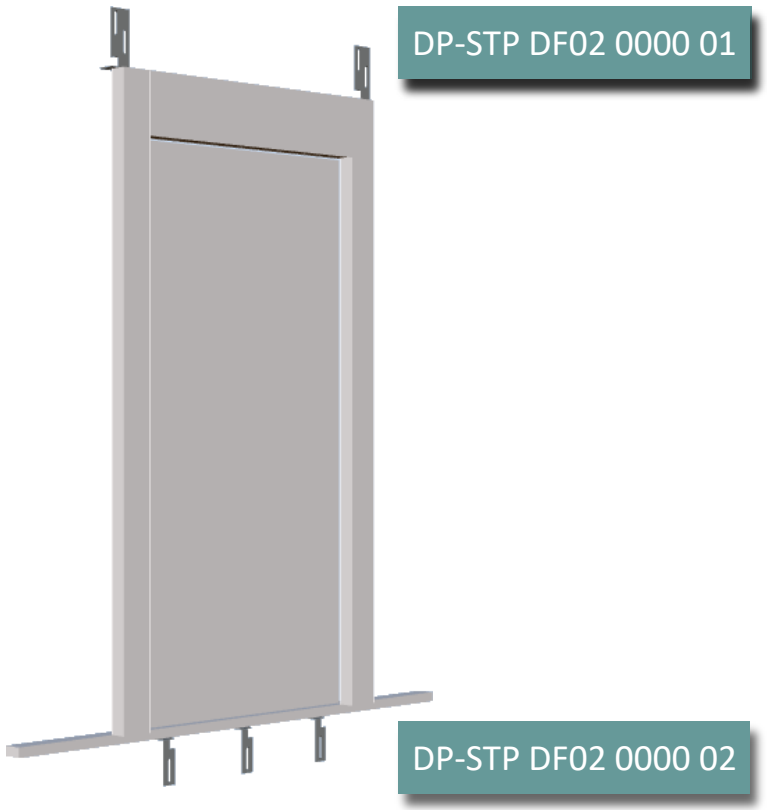
CAD Models: Door Fixings

EL4.8 PRACTICE

Load 3D CAD Models for top and bottom fixing elements to the landing doors.

- Use:
  - Your EL4 Training CAD Models

- Steps:
  - Load and align
  - Switch off original geometry
  - Set parent element to optimize the selection function



Automation Option 1

EL4.8 PRACTICE

Automation of own CAD Models

- This is a good opportunity testing automation processes using your own CAD models.
  - Automate the parameters of your own CAD models in the DigiPara Liftdesigner project.

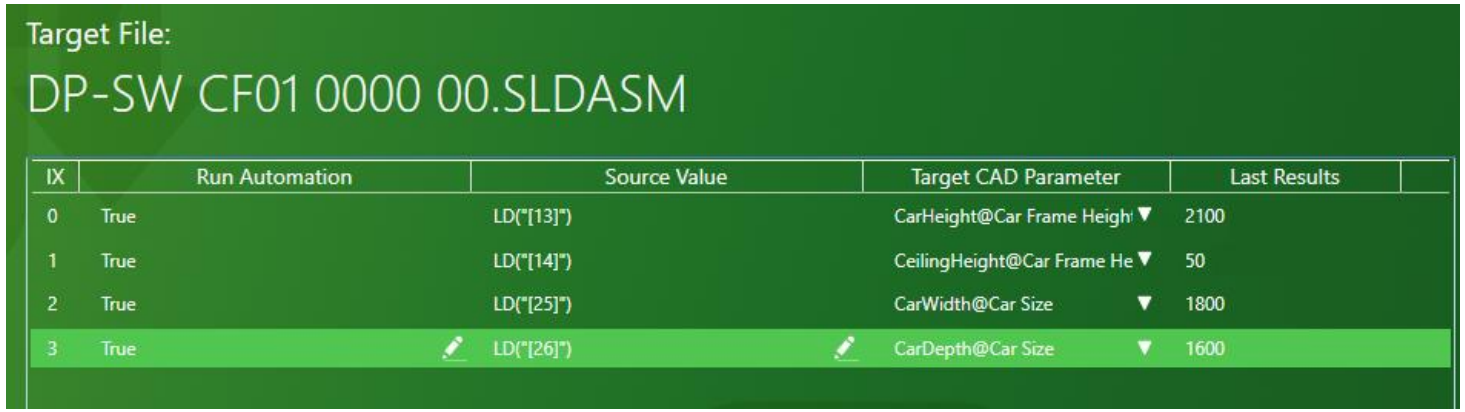
Automation Option 2

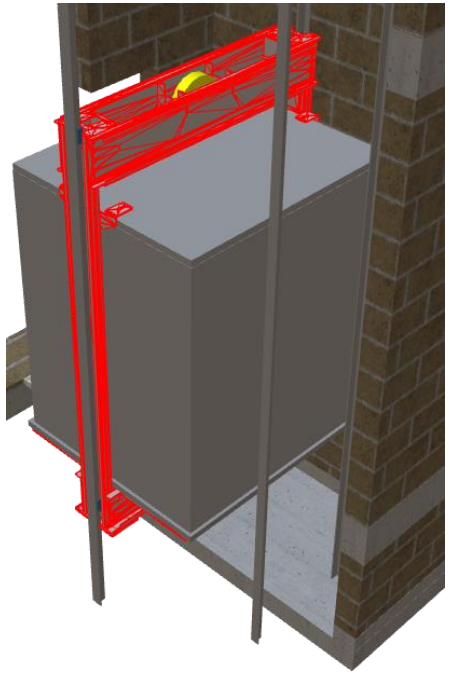
EL4.8 PRACTICE

DigiPara training example: Car Frame

- For practice purposes we provide another CAD model (SolidWorks) incl. prepared DigiPara Liftdesigner project (*.ld3), when no custom CAD model is available.

  - Open the prepared project
  - Load and align the CAD Model correctly
  - Define an automation of the following parameters:





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EL4.10

Summary & custom Q&A's

Congratulations

You reached the next level

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Your instructor will be available for individual questions after the module training.

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