

# FloTHERM v12.1 Release Highlights

Software Version 12.1

April 2018

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## Introduction

This document provides a high-level summary of this release. It includes a summary of the new features in this release, any authorization code changes required, any major installation changes, and any transitioning issues you should be aware of before installing.

This document is located on the CD and on Support Center. Changes may be added to this document after the release. Refer to the Release Highlights documents on Support Center for the most up-to-date release information

## New Features

The following new features are available in this release:

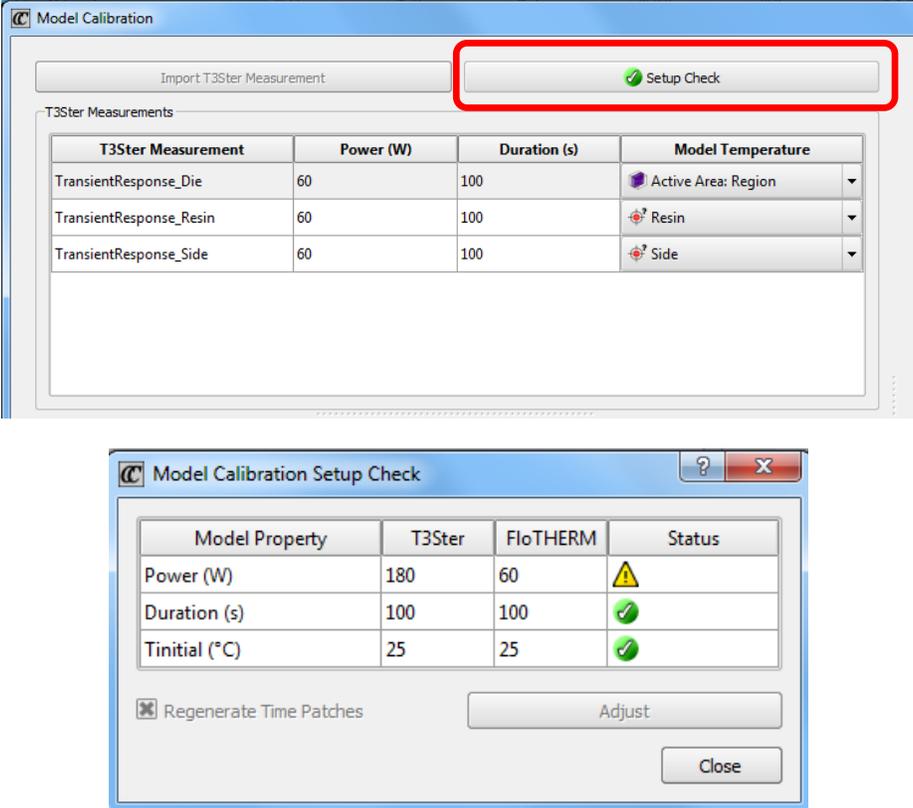
## Platform Support

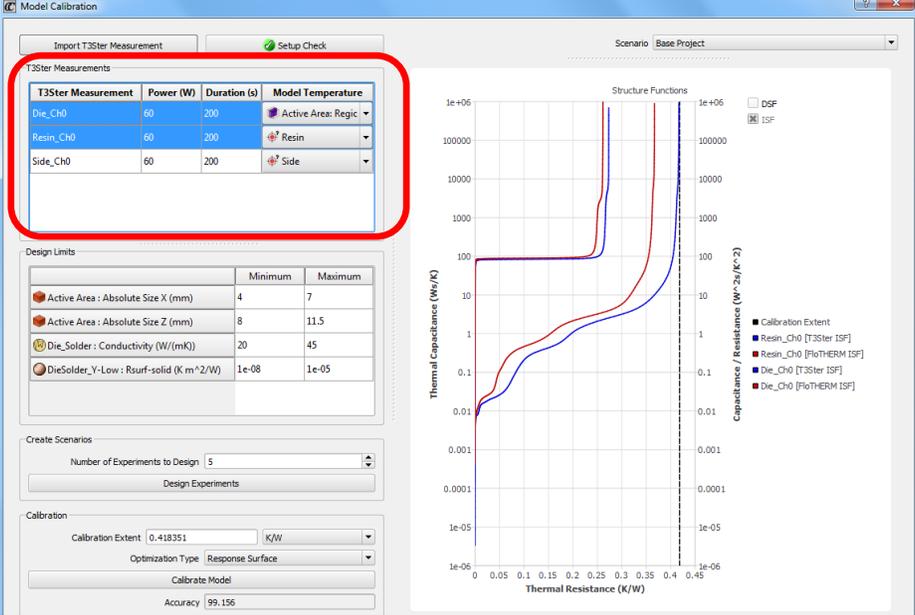
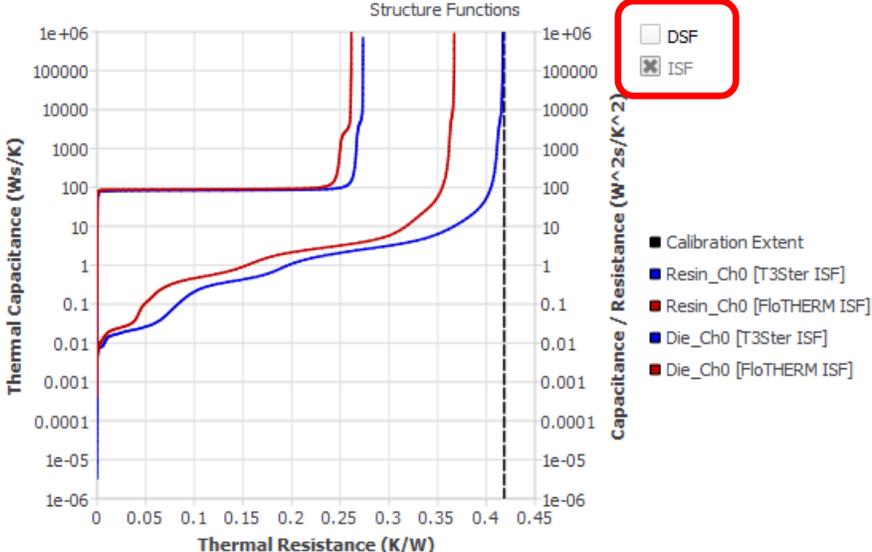
<b>Ref.</b>	<b>Title</b>	<b>Description</b>
1.1	No Changes	No changes to the supporting operating systems.

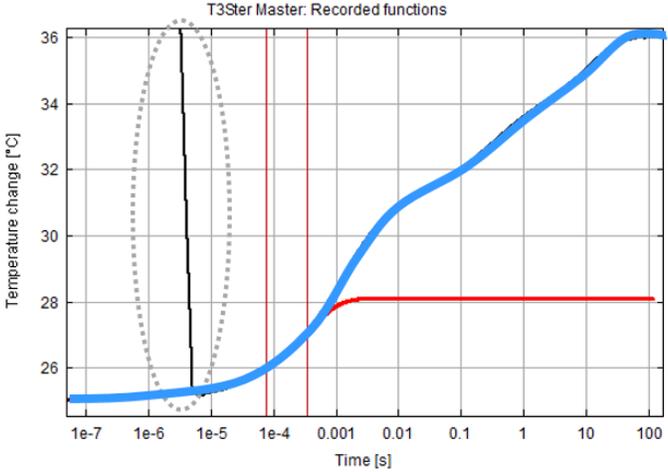
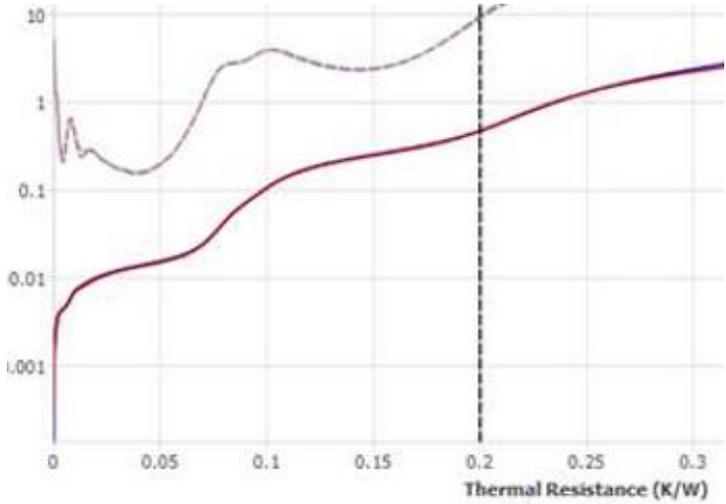
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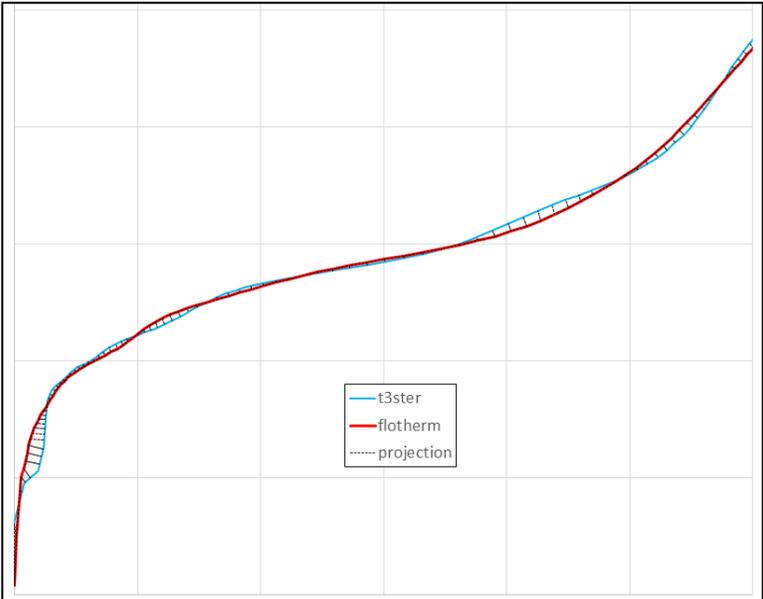
## Command Center – T3Ster Data Calibration

Ref.	Title	Description																
2.1	Multiple Curve Calibration	<p>Multiple .flocalibration files can be imported and used to calibrate a FloTHERM model.</p> <p>Each imported measurement file will appear in a table and the ‘Model Temperature’ to calibrate is set individually.</p> <p>The power and test duration for each measurement are displayed in the table as well.</p> <div data-bbox="548 688 1468 932"><p>T3Ster Measurements</p><table border="1"><thead><tr><th>T3Ster Measurement</th><th>Power (W)</th><th>Duration (s)</th><th>Model Temperature</th></tr></thead><tbody><tr><td>TransientResponse_Side</td><td>60</td><td>100</td><td>Side</td></tr><tr><td>TransientResponse_Resin</td><td>60</td><td>100</td><td>Resin</td></tr><tr><td>TransientResponse_Die</td><td>60</td><td>100</td><td>Active Area: Region</td></tr></tbody></table></div>	T3Ster Measurement	Power (W)	Duration (s)	Model Temperature	TransientResponse_Side	60	100	Side	TransientResponse_Resin	60	100	Resin	TransientResponse_Die	60	100	Active Area: Region
T3Ster Measurement	Power (W)	Duration (s)	Model Temperature															
TransientResponse_Side	60	100	Side															
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TransientResponse_Die	60	100	Active Area: Region															

Ref.	Title	Description																																
2.2	Calibration Setup Check	<p>The setup check data is now accessible via a ‘Setup Check’ button at the top of the calibration dialog.</p>  <p>The 'Model Calibration' dialog box features a 'Setup Check' button (highlighted in red) at the top right. Below it, the 'T3Ster Measurements' section contains a table with the following data:</p> <table border="1" data-bbox="602 499 1417 636"> <thead> <tr> <th>T3Ster Measurement</th> <th>Power (W)</th> <th>Duration (s)</th> <th>Model Temperature</th> </tr> </thead> <tbody> <tr> <td>TransientResponse_Die</td> <td>60</td> <td>100</td> <td>Active Area: Region</td> </tr> <tr> <td>TransientResponse_Resin</td> <td>60</td> <td>100</td> <td>Resin</td> </tr> <tr> <td>TransientResponse_Side</td> <td>60</td> <td>100</td> <td>Side</td> </tr> </tbody> </table> <p>The 'Model Calibration Setup Check' dialog box displays a table comparing T3Ster and FloTHERM values for various model properties:</p> <table border="1" data-bbox="686 877 1336 1035"> <thead> <tr> <th>Model Property</th> <th>T3Ster</th> <th>FloTHERM</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>Power (W)</td> <td>180</td> <td>60</td> <td>⚠</td> </tr> <tr> <td>Duration (s)</td> <td>100</td> <td>100</td> <td>✓</td> </tr> <tr> <td>Tinitial (°C)</td> <td>25</td> <td>25</td> <td>✓</td> </tr> </tbody> </table> <p>Additional options in the 'Model Calibration Setup Check' dialog include a checked 'Regenerate Time Patches' checkbox, an 'Adjust' button, and a 'Close' button.</p>	T3Ster Measurement	Power (W)	Duration (s)	Model Temperature	TransientResponse_Die	60	100	Active Area: Region	TransientResponse_Resin	60	100	Resin	TransientResponse_Side	60	100	Side	Model Property	T3Ster	FloTHERM	Status	Power (W)	180	60	⚠	Duration (s)	100	100	✓	Tinitial (°C)	25	25	✓
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2.3	Cost Function Weighting	<p>Each measurement can be assigned a weighting factor in the Output Variables tab to allow more control over the calibration process. The default is an equal weighting for all measurements.</p>																																

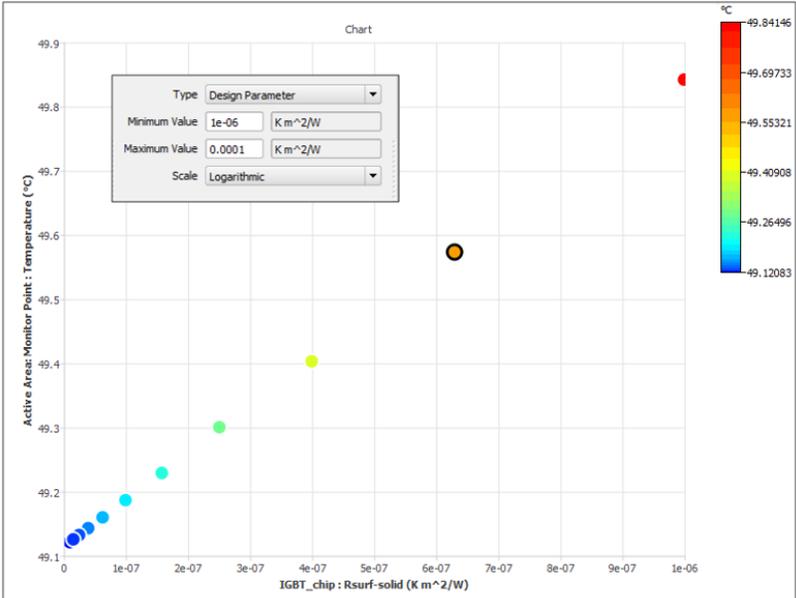
Ref.	Title	Description
2.4	Chart Controls	<p>Select a row in the T3Ster measurement table to display the Zth and Structure Function curves associated with that measurement. Multiple rows can be selected at once.</p> 
2.5	Structure Function display	<p>Integral and Differential Structure Functions can be turned on or off for all measurements with the checkboxes above the legend.</p> 

Ref.	Title	Description
2.6	Improved Curve Comparison	<p data-bbox="548 254 1433 470">For imported .flocalibration files generated with the ‘Square Root’ correction option in T3Ster Master, the electrical transient section is automatically replaced with FloTHERM simulation data for each scenario. This ensures the calibration result is independent of the T3Ster Master operator and that the curves are always compared in a consistent manner.</p> <div data-bbox="574 516 1458 1062" style="border: 1px solid black; padding: 10px;"> <p data-bbox="613 527 945 569" style="text-align: center;">Electrical Transient</p>  </div> <p data-bbox="548 1094 1401 1205">This has the effect of ensuring the early portion of the structure function must match, and guarantees the electrical transient <math>\Delta T</math> cannot impact the calibration result.</p> <div data-bbox="646 1262 1372 1766" style="border: 1px solid black; padding: 10px;">  </div>

Ref.	Title	Description												
2.7	Support for T3Ster Master v3.0	T3Ster Master v3.0 will provide a ‘simulation correction’ option. Flocalibration files produced with this option can be imported into FloTHERM and used for calibration. The data present is used without modification during the calibration process.												
2.8	Improved Cost Function calculation	<p>The Calibration Error computed now uses the sum of the shortest distances between curves. This enables all areas of the curve to have appropriate weighting. Note that the calibration error is computed for all imported measurements, and the weighted sum forms the calibration cost function. All calibration errors are reported as Output Variables in the Scenario Table.</p> <table border="1" data-bbox="678 674 1349 877"> <tbody> <tr> <td>Calibration : Die_Ch0 - Calibration Error</td> <td>12.74795</td> <td>8.9</td> </tr> <tr> <td>Calibration : Resin_Ch0 - Calibration Error</td> <td>5.248556</td> <td>0.8</td> </tr> <tr> <td>Calibration : Side_Ch0 - Calibration Error</td> <td>1.591411</td> <td>0.1</td> </tr> <tr> <td>Cost Function</td> <td>19.58791</td> <td>9.9</td> </tr> </tbody> </table> <p>The curve comparison is now computed from <math>0 \leq R \leq \text{Calibration Extent}</math>. In earlier versions the section of the Structure Function associated with the electrical transient was ignored.</p> <p>When loading legacy models, the first opening of the calibration dialog will inform the user that the calibration errors will be re-calculated with this method.</p> 	Calibration : Die_Ch0 - Calibration Error	12.74795	8.9	Calibration : Resin_Ch0 - Calibration Error	5.248556	0.8	Calibration : Side_Ch0 - Calibration Error	1.591411	0.1	Cost Function	19.58791	9.9
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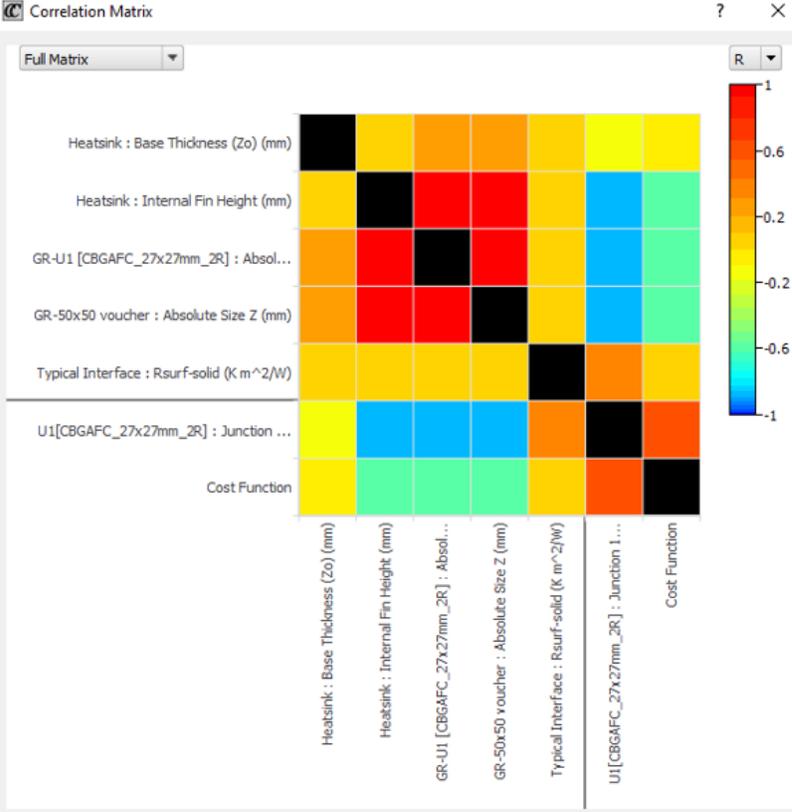
Ref.	Title	Description
2.9	Calibration Accuracy	$R^2$ is now only calculated for the optimal scenario and is reported in the calibration dialog once the calibration task completes. The calibration accuracy is $100 * R^2$
2.10	Export to T3Ster Master	Setting an environment variable named CALIBRATION_EXPORT_DATA will enable automatic export of the Temperature vs time data for all measurements and scenarios to disk. The files will be written to the location specified as the environment variable value. The export occurs when the calibration dialog is launched or the calibration cost function is evaluated.

## Command Center - General

Ref.	Title	Description
3.1	Logarithmic Design Parameters	<p>Design Parameters can be designated as ‘Logarithmic Scale’ parameters.</p> <p>In situations where a design parameter range spans several orders of magnitude this finds the optimum solution with fewer simulations.</p> 

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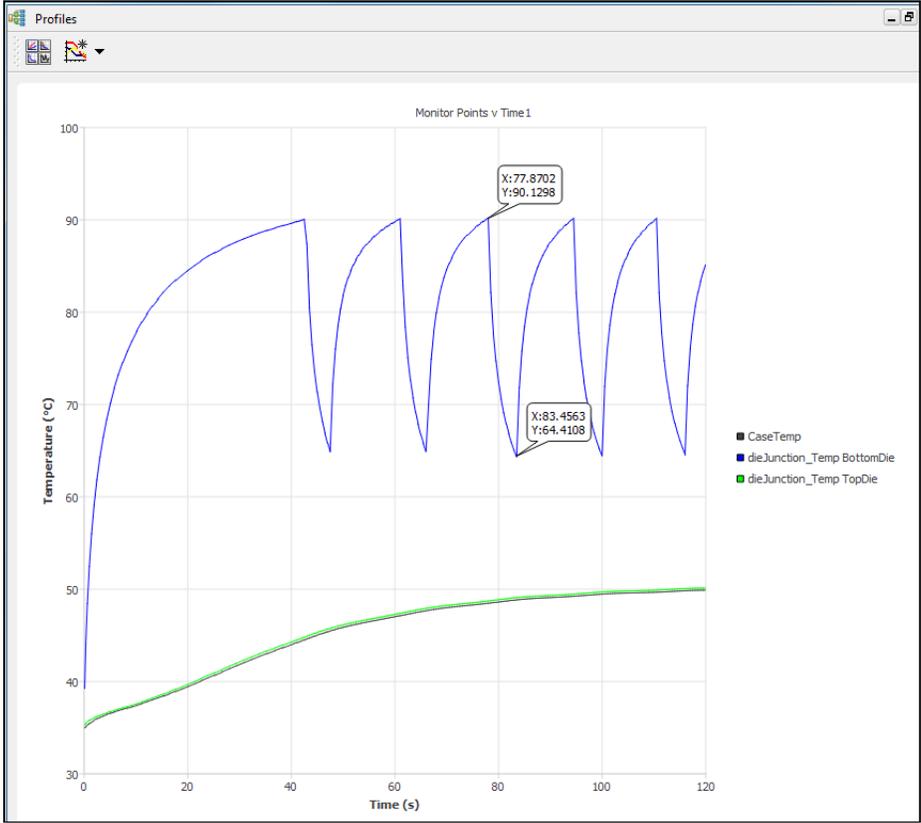
<b>Ref.</b>	<b>Title</b>	<b>Description</b>
3.2	Response Surface Axis Control	All response surface design parameter axes can be designated as linear or logarithmic scales.

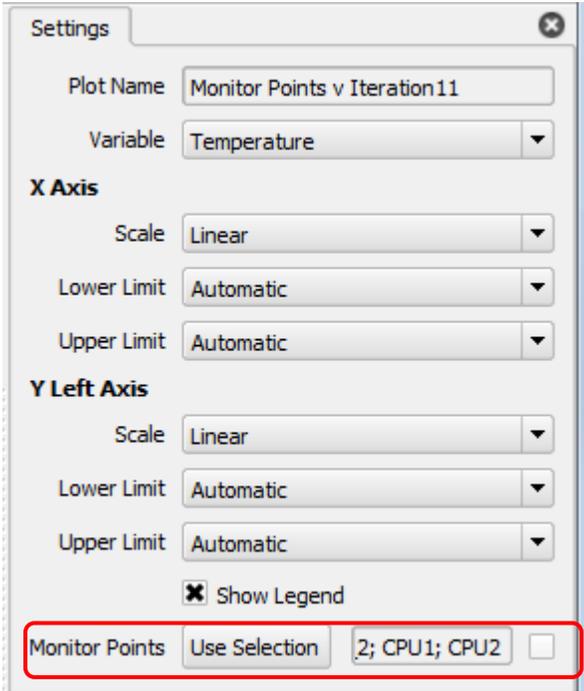
Ref.	Title	Description
3.3	Variable Correlation Chart	<p>Command Center will automatically compute R and R<sup>2</sup> for every combination of Input and Output Variables.</p> <p>A chart is provided to quickly identify what design parameters correlate well with output variables, including the cost function.</p>  <p>Configure what variables types are displayed:</p> <ul style="list-style-type: none"> <li>• Full Matrix</li> <li>• Inputs vs Outputs</li> <li>• Outputs vs Inputs</li> <li>• Outputs vs Outputs</li> <li>• Inputs vs Inputs</li> </ul> <p>Clicking a cell will display the R or R<sup>2</sup> value and plot the data.</p>

Ref.	Title	Description
3.4	Chart Legends	Any XY Chart defined with a 'Color by Variable' option will have a legend present to define the colors.
3.5	Create Scenario from Response Surface Viewer	When creating a new scenario from the Response Surface Viewer tool, the predicted values of all Output Variables will appear in the Scenario Table.

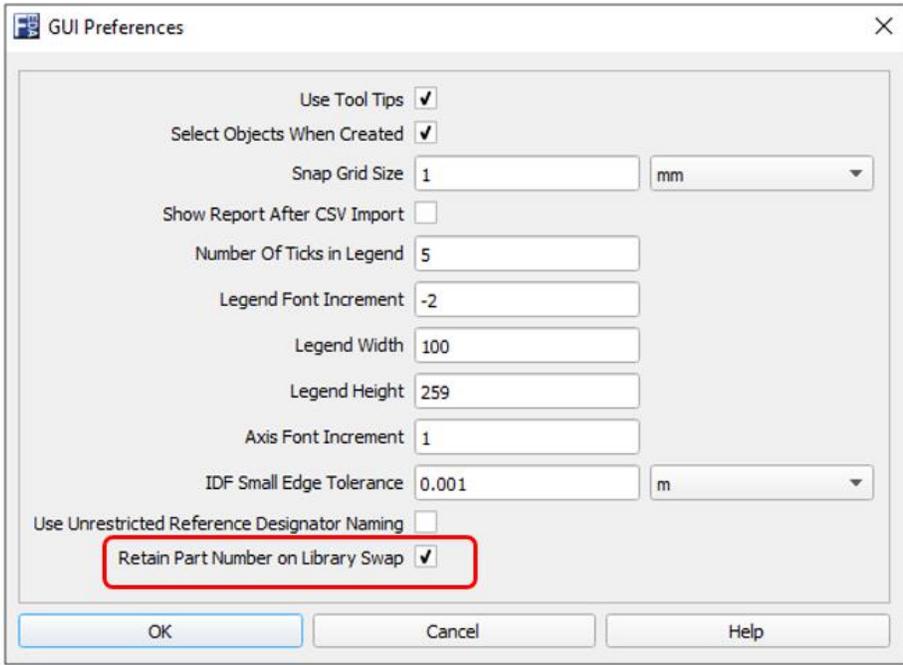
## Profiles Window

Ref.	Title	Description
4.1	Curve selection	Clicking a curve in a Monitor Point chart in the Profiles window will select the associated object in the node tree. To de-select, CTRL click the object, plot line, or legend entry.

Ref.	Title	Description
4.2	Curve Annotations	<p>Positioning the mouse cursor over a line will create a tooltip indicating the coordinates of that curve. Double-clicking will make the tooltip persist.</p> <p>To remove all tooltips, right-click and choose 'Clear Annotations'.</p> 
4.3	Tile Plots icon	<p>The Profiles toolbar now has a button to tile the plots more conveniently.</p> 

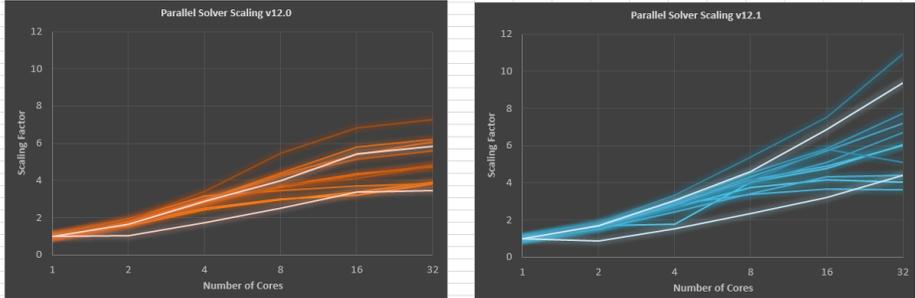
Ref.	Title	Description
4.4	Customize Monitor Point Plots	<p>The Monitor Points used in a Profiles chart are now set in the chart settings:</p>  <p>Select the desired monitor points (or Compact Components) in the model node tree, and click the ‘Use Selection’ button to display only those curves in the chart. The names of the selected objects are displayed to the right of the button.</p> <p>The checkbox to the right can be used to select all of the objects associated with the current plot in the node tree if they are not already selected.</p>

## FloEDA Bridge

Ref.	Title	Description
5.1	Percent coverage on import for ODB++ Import	<p>During import of ODB++ files or folders, the percentage copper coverage for all metallic and dielectric layers is computed.</p> <p>Any defined board cutouts are taken into account with this calculation.</p>
5.2	Copper Ounce Definition	To ensure consistency with Mentor tools, importing an ODB++ design with layer thicknesses defined in Copper Ounces will use 1 Cu Oz = 1.35 mil.
5.3	Library Swap Part Number Retention	<p>A new option to retain original part number during library swap is available in Preferences.</p>  <p>The screenshot shows the 'GUI Preferences' dialog box with the following settings: Use Tool Tips (checked), Select Objects When Created (checked), Snap Grid Size (1 mm), Show Report After CSV Import (unchecked), Number Of Ticks in Legend (5), Legend Font Increment (-2), Legend Width (100), Legend Height (259), Axis Font Increment (1), IDF Small Edge Tolerance (0.001 m), Use Unrestricted Reference Designator Naming (unchecked), and Retain Part Number on Library Swap (checked). The 'Retain Part Number on Library Swap' checkbox is highlighted with a red rectangle.</p>
5.4	Detailed Component Library Swap	Detailed components without a die can now be used with library swapping. Note that the power for such components cannot be modified or set within FloEDA Bridge.

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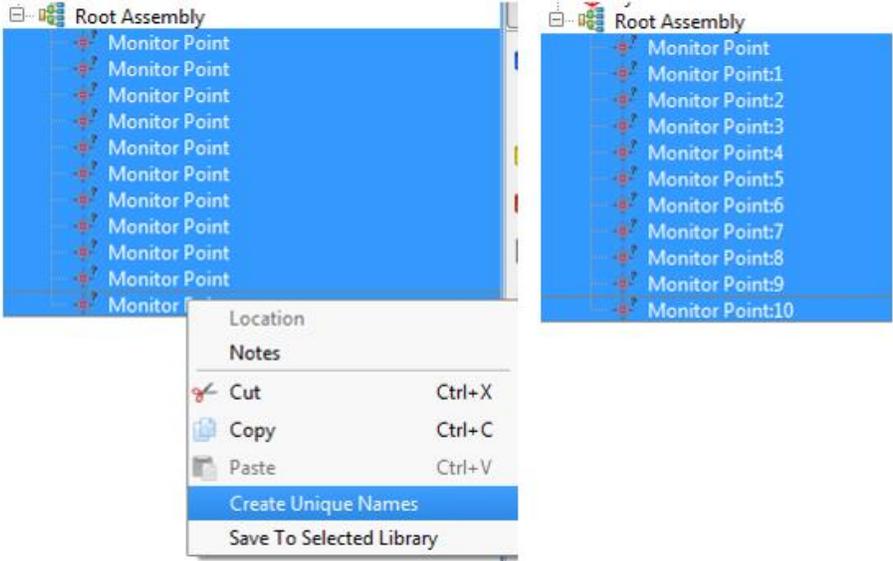
# Solver Enhancements

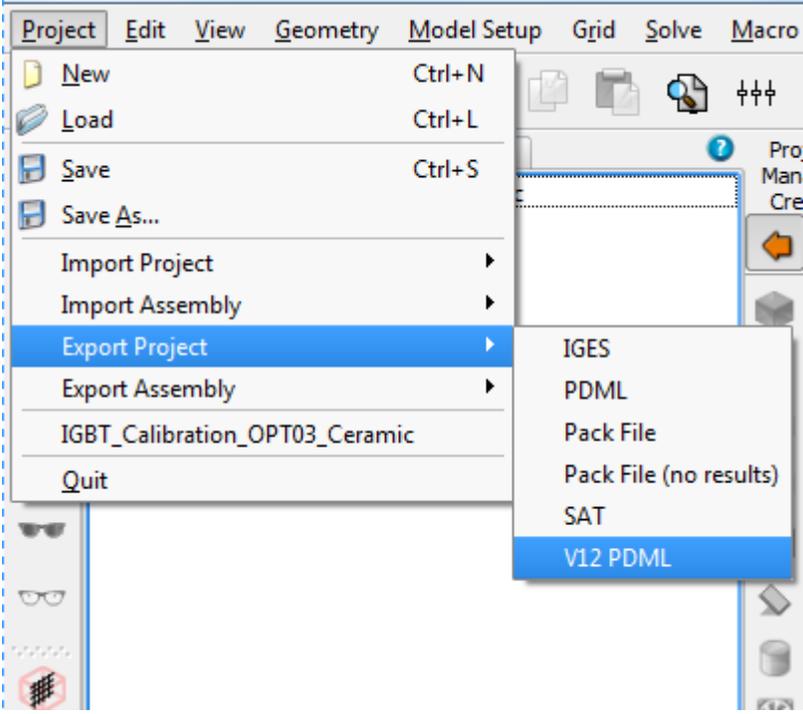
Ref.	Title	Description
6.1	Improved scalability	Parallel solver scalability and stability has improved at higher core counts. 

## Automation

Ref.	Title	Description
7.1	FloSCRIPT Event Handling	<p>FloSCRIPT now supports events that prompt the user to make a decision, such as:</p> <p>“Grid Changed, Save with new name?”</p> <p>“Overwrite existing model?”</p> <p>If the user response is not present in the FloSCRIPT, a default response will be used and playback will continue.</p>
7.2	FloSCRIPT playback in background	<p>Optionally playback FloSCRIPT without launching the user interface.</p> <p>Command syntax: Flotherm <code>-b -f floscript_file</code></p>

## General

Ref.	Title	Description
8.1	Create unique names	<p>Create unique names for multiple selections to facilitate post-processing.</p> 

Ref.	Title	Description
8.2	Export to previous version	Export models and assemblies as FloTHERM v12.0 PDML. 

## Authorization Codes

No changes to authorization codes are required for this release. You may request your existing authorization codes by opening a non-technical Service Request on Support Center.

<https://support.mentor.com>

For additional information on licensing, refer to the *Licensing Mentor Graphics Software* manual.

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## Licensing

This release of FloTHERM uses the Mentor Standard Licensing v2013\_1. This version requires a FLEXnet license server running at version 11.10 or higher. You should make sure this is the minimum version installed on your license server. Download the latest MGLS software from Support Center. Alternatively MGLS software is available as part of product download.

For additional information on licensing, refer to the Mentor Standard Licensing Manual.

## Installation Information

For additional information on installation, refer to the FloTHERM\_12\_1\_install.pdf and the help system within the installation software. You can view this manual in the release\_documents directory at the top level of the CD.

## Support Information

If you have questions about this software release, please log in to Support Center. You may search thousands of technical solutions, view documentation, or open a Service Request here:

<https://support.mentor.com/>

If your site is under a current support contract but you do not have a Support Center login, register today:

<https://support.mentor.com/register>

## Supported Configurations

### Appendix A: Windows 64 bit

#### Supported operating systems:

- Windows 10 Creators Update Version 1703 (Pro and Enterprise editions)
- Windows 8 and 8.1 (Core, Pro and Enterprise editions)
- Windows 7 (Business, Enterprise and Ultimate editions)
- Windows Server 2008 R2, Standard edition
- Windows Server 2012, Standard edition

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- Windows Server 2012 R2, Standard Edition

## Appendix B: Linux, 64 bit

### Supported operating systems:

- Red Hat Enterprise Linux 6