



Altair

HyperWorks[®]

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To contact an Altair support representative, reference the following table or the information available on the HyperWorks website:

<http://www.altairhyperworks.com/ClientCenterHWSupportProduct.aspx>

Location	Telephone	e-mail
Australia	64.9.413.7981	anzsupport@altair.com
Brazil	55.11.3884.0414	br_support@altair.com
Canada	416.447.6463	support@altairengineering.ca
China	86.400.619.6186	support@altair.com.cn
France	33.1.4133.0992	francesupport@altair.com
Germany	49.7031.6208.22	hwsupport@altair.de
India	91.80.6629.4500 1.800.425.0234 (toll free)	support@india.altair.com
Italy	39.800.905.595	support@altairengineering.it
Japan	81.3.5396.2881	support@altairjp.co.jp
Korea	82.70.4050.9200	support@altair.co.kr
Mexico	55.56.58.68.08	mx-support@altair.com

New Zealand	64.9.413.7981	anzsupport@altair.com
North America	248.614.2425	hwsupport@altair.com
Scandinavia	46.46.460.2828	support@altair.se
Spain	34.910.810.080	support-spain@altair.com
South Africa	27.21.8311500	support@altair.co.za
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For questions or comments about this help system, send an email to hwsupport@altair.com.

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Altair ElectroFlo 2018

A Platform for Innovation®

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Altair ElectroFlo 2018 Release Notes

What's new and changed in Altair ElectroFlo 2018

Altair ElectroFlo is designed exclusively for challenging electronics cooling and design applications. It is a CFD based package capable of solving problems involving conduction, natural and forced convection, radiation and conjugate heat transfer, yet it is easy enough to use for a non-CFD expert. The unique set of capabilities that Altair ElectroFlo offers are aimed at increasing accuracy while reducing modeling and simulation time.

Altair ElectroFlo User Interface

Utilizing an object-based modeling approach, Altair ElectroFlo GUI achieves unprecedented ease-of-use through extensive error-checking and automation.

Tools

A series of vital tools are provided to aid the design engineers during rapid prototyping exercises. These tools are aimed at reducing modeling time, error checking and standardization. These tools not only help novice users; but can potentially save advanced users hours and in some cases days of modeling time.

Model Manager (Listview)

Listview allows the user to have a glance at the entire model. Geometry and boundary conditions can be modified on multiple objects simultaneously and there are many useful tools for miscellaneous task. This tool is particularly useful to make sense of complex models; but it has many features that greatly enhance the modeling process.

- **Treeview:** Treeview, located on the left side of the Model Manager with checkboxes, is used to populate the Listview. It filters objects the user would like to be displayed in the right side of the window. Checking a parent box in the hierarchy will select/deselect all children nodes of that checkbox. Any combination of objects may be displayed at a time
- **Sort:** Information in the Listview is presented in columns. Most properties on the Listview can be modified directly by clicking on its properties twice (not double-clicking). Objects can be sorted by any property, such as type, material, power or temperature.
- **Hide/show:** The first column contains check boxes for hide/show. These toggle buttons will show or hide the object. (show = checked)
- **File:** "Point to File" functionality will export the items displayed in the main Model Manager view into a tab delimited text file that can be read into Excel. This can be useful for exporting solid temperature/power results or for getting other data for reports.
- **Model Tools:** provides various tools to make changes on multiple objects/BCs; these include changing reference coordinate system, renaming, moving/resizing changing material/assembly/color, include/uninclude in analysis and change installation priority.

- **Set Solid Critical Temperature:** This will bring up a pop up that lets the user set the critical and/or warning temperature for these selected solids. Having a critical and warning temperature for solids lets allows the user to easily post process which solids are failing or are close to failing. Solids can be colored by passing/warning/failing in the results view.
- **Show:** These are functions to change the visibility of solids.
- **Priority:** The priority determines which material properties will be used if there are solids that are overlapping. Top priority (lower number) takes highest precedence and will overwrite solids that have a higher priority number. The overwrite flag means that this solid will take precedence over any solid that does not have overwrite set.
- **Color:** The Color By options allows changing the coloring scheme for solids. Each material, assembly, part, and solid has an associated color, which the user can quickly change to be colored by material, assembly, part, or solid.

Member Display

View a graphical representation of the material composition of the solids. This allows the user to alter the way the model is color coded. It also let the user view the order that the materials are in a chosen plane. It is always a good idea to use this tool to make sure the correct element properties are passed to the solver and an important solid is not inadvertently overwritten by another object.

Electric Connection

This tool is only relevant if electrical co-simulation is being performed (electrical analysis is checked in model parameters). A fully-automated procedure is utilized to detect electrical regions using element resistivity and electrical links. The user can select from a list of regions and place all the members of selected circuits into a group. This is convenient way to view/modify entire regions.

Boundary Conditions

Boundary conditions are applied using full associativity between Objects, Loads and Functions. The user selects application region, enters a constant value or point to function(s)/table(s) for varying values. Modify/copy objects will automatically modify/create BCs accordingly.

Mesh

Meshing in Altair ElectroFlo is fully automated with user-controls for refinements.

- **Create Mesh:** This option will automatically generate the mesh, using the global mesh parameters specified or defaults if none have been specified. The automated routine starts with the rough mesh, consisting only of key-planes (formed by geometry and BCs) and packs elements inside "key-plane pairs" according to the global parameters.
 - **Local Mesh Edit:** To refine the mesh between specific key planes, the user selects the Local Parameters check box. From here the user selects the key plane pair between which the mesh is to be modified. This is accomplished by selecting the left (lower coordinate) key plane with the mouse. This will highlight the selected key plane as well as the adjacent (right) key plane. The user then specifies the mesh density between those planes via one of three methods.
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Method 1

The user specifies a mesh thickness for the left side (lower coordinate value) and another for the right side (higher coordinate value) along with corresponding mesh grade for both sides. This results in a two-way bias; however, the bias may be different proceeding from the left side toward the center than from the right side toward the center.

Method 2

The user provides the number of elements between the key planes as well as the size ratio between the first and last element. This is equivalent to specifying a one-way bias from one key plane to the next.

Method 3

This method is very similar to method 2 above. The user again specifies the number of elements between the key planes and then specifies the size ratio between the first and center element (in method 2, the user specifies the size ratio between the first and last element).

- **Model Clean-up Utilities:** Due to complexity and random placement of components, electronics thermal models often involve severe alignment issues resulting in elements with extremely high aspect ratios, which can lead to inaccurate solution and divergence of CFD calculations. Accordingly, one of the critical modeling steps involves "cleaning" the geometry by slight movement of objects and/or merging of "faces" within a prescribed tolerance. Altair ElectroFlo provides mesh clean-up tools that are one-click fully automated; or with user-control on selected objects.

Fully automated

The user provides a tolerance (minimum distance between faces). The tool detects all cases with associated solids to merge individually or globally by clicking "Yes for All"

Objects @Keyplane

This tool is used to identify solid objects that coincide with any key-plane. The user is presented with a summary report of all objects at a key-plane pair and can optionally merge the two key-planes and modify the objects.

Materials

Material definition is provided to all geometric entities by selecting the material from the box or entering the name of a new material that you will set the properties of later. Material properties are stored under a material name. The material properties are either user-defined or a material is selected from a materials library provided with Altair ElectroFlo.

Library material	To reference a material from the library, the user must select from the material in the list box.
User-defined	A user defined material is created by typing the material name (not contained in the library) in the material data box. This name is added to the materials name list for subsequent uses.
Geometry	Geometry can be created/modified/copied by the user; it can also be imported via various formats into the model. Altair ElectroFlo allows import of geometry objects from CAD (STEP) and ECAD (IGES, IDF and ODB++). Currently, the ECAD import using ODB++ is being enhanced to allow "intelligent import" of thermally relevant details, filtering-out the vast majority of PCB objects that have no significant impact in the thermal solution. During this enhancement period, the ECAD import functionality is disabled.
