What’s New in 6SigmaET Release 12

We’re continually evolving 6SigmaET to keep our users ahead in a fast-paced market. In Release 12, we’ve focused our improvements on four key areas:

1. Improved Modeling

   We’ve added bonded heat sink modeling objects and made improvements to the radial fan, blower and TEC objects in Release 12. You can now also model detailed layers on the substrate object.

   Are you modeling screens, lamps, laser scanners, or other equipment with transparent materials? R12 lets you simulate the heat radiation and solar radiation through these materials.

   Ever simulated a leaky liquid cooling system, then struggled to find the leak? We’ve added leak detection functionality to solve this.

2. Better Performance

   Independent research has found 6SigmaET to be the fastest electronics thermal simulation software on the market. However, we’re continually working to further improve performance.

   6SigmaET’s unique multi-level unstructured staggered grid system has been further enhanced in R12 with a new Boundary Cell Reconstruction Method, improving solid/fluid interface representation for greater performance and accuracy.

   Solve larger models with our reassembly improvements – it’s up to 10 times faster for unstructured grids. Optimize your solving performance with detailed breakdowns of the latest solver runtime.
3 Increased Usability

Modeling in 6SigmaET is now even easier: new sub-assemblies allow you to group items, while improved object positioning lets you change the origin of group obstructions and sub-assemblies.

Are you a 3D mouse user? R12 lets you use your 3D mouse with 6SigmaET, making model manipulation even faster.

The new Control View helps you visualize the controllers and sensors in your model, and the connections between them, while the updated Welcome Screen helps you find what you need quickly.

4 Supply Chain Collaboration

Thermal engineers need to centralize data from across their organization and suppliers to create an accurate thermal model. We’re working hard to make this as easy as possible in 6SigmaET.

We’ve integrated with ODB++ in R12, making PCB importing easier while preserving more object detail. Component manufacturers can now also create DELPHI compact models in 6SigmaET to share with their customers.

We’re continually working with suppliers to expand the 6SigmaET library, adding new fans from Papst and TIMs from Parker Chromerics in R12.
Release 12 of 6SigmaET contains a range of new and improved features, the most significant of which are listed below for your information.

**User Interface**

Release 12 of 6SigmaET brings the following changes to the user interface.

**Welcome Screen Improvements**

We’ve made a range of improvements to the Welcome Screen - shown when you first open the software - to help you find what you need quickly.

The new Welcome Screen layout (left) is split into three tabs: Work, Learn and License. Work lets you begin or open a model, Learn shows you how to use 6SigmaET, and License helps you to request and add software licenses.

**Add Background Colour and Transparency to Text Boxes**

You can now adjust the background colour and transparency of overlay text boxes.

**Toggle Flow Arrows On or Off**

You can now toggle flow arrows on or off globally, via the Flow Arrows option on the View ribbon. This is useful for producing high quality images for presentations.
Email Support and Run Diagnostics from License Error Window

We've added an Email Support button to the error window shown when the software can't find licenses. You can run diagnostics from here (provided you have administrative permissions), and email the reports directly to us. This will help us to resolve your issue faster.

Control View

We've added the Control View to the View ribbon. This displays a visual representation of the controllers and sensors in your model, and the connections between them.

Controllers are important for creating realistic models. The new control view (right) provides you with a clear and easy way to see the controllers in your model and to examine the inputs they take from sensors.

New Shortcut for Isometric View

You can now switch to an isometric view by pressing the I key.

The new isometric view (left) displays the 3D model in 2D perspective.
Model Creation & Manipulation

We’ve worked on the following features to provide you with enhanced or improved model creation and manipulation capabilities.

DELPHI Model Creation Wizard

We’ve added the Generate Compact Component wizard to help you build DELPHI compact component models. This wizard helps you to specify and solve the DELPHI scenarios, then generate a compact component model that matches the thermal performance of your detailed model.

The Generate Compact Component tool (left) helps you to specify and batch solve the DELPHI scenarios. You can import pre-specified scenarios from a CSV file to speed up this process.

3D Mouse Support

You can now connect a 3D mouse to control the orientation of models in the graphical view. We support 3D connexion mice using their official API, which allows for user-configured controls.

Surface Temperature on Overlapping Solids

We’ve updated the Surface Temperature plots to show the contact temperature where overlapping solids intersect.

(Right) The solid obstruction’s surface temperature plot now shows the contact temperature where it intersects with the transparent green solid.
Solution

We’ve improved the level of control you have over the solving process. Here’s what’s new:

Re-Assembly Speed Up

The re-assembly process is now up to 10 times faster for unstructured grids. This is useful when solving models with large numbers of grid cells, and transient models.

Runtime CPU Statistics

You can now view a detailed breakdown of the latest solver runtime from the Results tab of the Solution Control property sheet. This is useful for debugging and performance optimization.

Transparency to Heat Radiation

You can now specify that materials are transparent to heat radiation. This is useful when modeling glass obstructions and some types of enclosures.

Transparency to Solar Radiation

You can now specify that materials are transparent to solar radiation, and set the values of solar reflectance and absorptance.

Solve on Linux CFD Server from Windows

You can now install a CFD Server and Batch Server on a CentOS 7 or Red Hat 7 Linux system and submit batch jobs from a Windows device.

Allow Gridding of Objects Smaller than One Micron

We’ve extended the package level grid rules to allow you to resolve features down to 0.1 microns.
Results

The way in which your solved model appears, and the options that you have to display the results and create new views and reports, have all been enhanced in Release 12.

Use Flow Solution Regions to Find Leaks

You can now attach flow solution regions to pumped supplies and returns. This allows you to identify leaks in ducts or pipes by examining the propagation of the solution region.

Overheating Components Results Data

Components, resistors, capacitors and inductors now have an Overheat entry in the Results tab of their property sheet. This shows whether that component is exceeding its allowed maximum temperature, and allows you to find all overheating components quickly using the Find tool.

Add a Volumetric Flow Rate Sensor

You can now use sensors to measure the average volumetric flow rate through objects. We've also made it possible to add sensors to perforated obstructions and obstruction holes.

Mean Values on Result Plane

In addition to minimum and maximum values, you can now view the mean value of a result plane's displayed variable.
Model Integration

Future Facilities continues to make 6SigmaET even more inter-operable by introducing the following new integrations.

Explore Models in VR with Oculus Rift

We've integrated 6SigmaET with the Oculus Rift VR headset, allowing you to view and explore your models in virtual reality.

The new VR view (right) lets you walk around your models in virtual reality. Use it to showcase solutions to your clients by putting them inside your models, or to get up close with design issues.

Import ODB++ Files

You can now import ODB++ data into 6SigmaET. The import will read any net list information in the ODB++ file, and will replicate this structure in 6SigmaET by using net objects to group conductors. This functionality requires a PCB Investigator license.
New & Updated Model Objects

In response to customer feedback, we’ve added some new objects and updated some existing ones.

New Geometry Options for Perforated Obstructions

You can now create circular perforated obstructions, in addition to rectangular and polyline obstructions.

Subassembly Object

You can now create subassemblies, which are logical groupings that allow sets of objects to be moved and manipulated together. The geometry of a subassembly automatically adjusts to accommodate the objects added to it.

Dual Inlet Radial Fans

You can now model radial fans with a choice of one or two inlets. Use the Number of Inlets property in the Construction node of the property sheet to specify multiple inlets.

Create a Heat Sink as a Child of a Heat Sink

You can now create heat sinks as children of another heat sink. This makes it easier to build more complex heat sink designs.

New TEC Geometry Options

You can now model thermoelectric coolers as rectangular or circular, and use the thermoelectric cooler object to cut holes in them. This allows you to better represent TEC geometry in your models.
New Bonded Heat Sink

You can now create bonded heat sinks. You can specify the adhesive material and its properties.

New Options for Solder Ball Patterns

You can now use the package builder to restore solder balls in the center of a component when using the peripheral solder ball pattern.

New Layer Modeling Options for Substrates

When modeling substrates as Combined Layer Average, 3 Layer Average or Explicit Layers, you can now add more detail to each of the substrate’s conductor layers using the Modeling Level property. This property allows you to model the layer in three ways: with uniform conductivity; as a simplified representation of a detailed model or a Gerber import; or as a detailed model where you create traces, pads and conductors to define the conductor layer.

Dual Outlet Blowers

You can now model blowers with a choice of one or two outlets. Use the Number of Outlets property in the Construction node of the property sheet to specify multiple outlets, then configure each outlet’s case geometry in the Geometry node.

Contact Thermal Resistances

You can now add Thermal Interface Materials to more objects, including Solid Obstructions, STL objects, and Mobj shapes. An interface’s thermal properties can now be specified separately, at solid-solid and solid-fluid interfaces.
Add Heat Sink to Shielding Can

You can now add a heat sink as a child of a shielding can, giving you more flexibility when modeling in 6SigmaET.

Add Grid Control to Components

You can now add the grid control object to components. This allows you to create additional grid around components and capture more of their detail.

Add Radial Fan to PCB

You can now add radial fans to a PCB in 6SigmaET, allowing you to model a wider range of configurations.

Change Origin of Group Obstructions & Subassemblies

You can now change the origin of the group obstruction and subassembly objects with respect to their X, Y and Z Location. To do this, edit the object’s Origin X, Y and Z Location values in the Placement node of the property sheet. Alternatively, you can set the origin to Center, Low Center or Low Corner using the corresponding buttons on the context-sensitive Object ribbon. All child objects will then be placed and rotated in relation to this point.
About Future Facilities

We set Future Facilities up to deliver the power of engineering simulation into the hands of an emerging data center industry. We created a tool optimized for data centers, designed to be used by the DC professional, and made it powerful, intelligent, automated and connected.

Five years later, we tuned our technology to deliver the same benefits to the thermal management of electronics and provide an integrated toolset for these two converging industries. In 2015 we were awarded Product of the Year at the Engineering Simulation Show.

Our client base has grown to include not only design consultants, but also electronics and semiconductor manufacturers, investment banking, social media, automotive, aerospace, oil & gas, and government sectors.

Our contribution extends to helping define and improve industry standards by participating in activities organized by leading institutions, professional bodies and academia.

Learn More

For more information about 6SigmaET, contact your local Future Facilities representative or visit our site at www.6SigmaET.info.