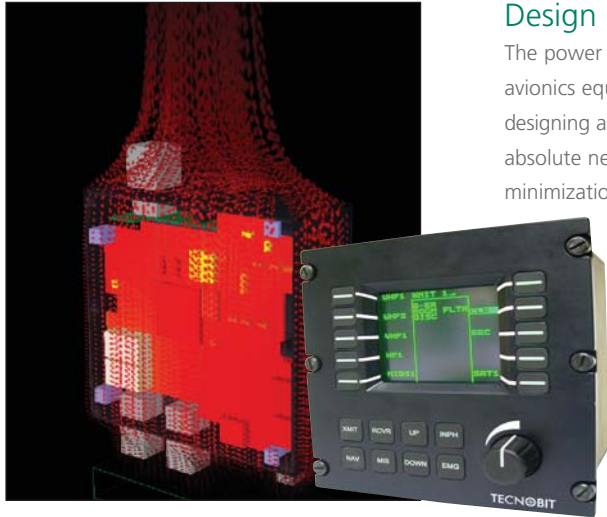


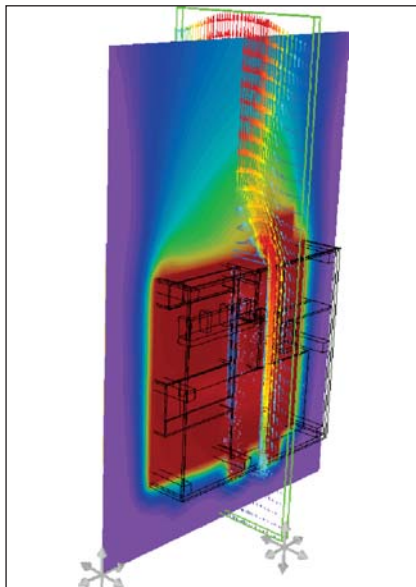
FLOTHERM Helps TecnoBit Ensure Reliability of Avionics Equipment



Design Challenge

The power and heat dissipation of modern avionics equipment is increasing rapidly, and designing appropriate cooling systems is now an absolute necessity to ensure reliability. Weight minimization and space optimization are key design goals for us, and thermal management is often the main design bottleneck. We avoid using cooling fans wherever possible in order to minimize possible causes of failure, so thermal management is a major challenge from the very first design phase.

the standard thermal design tool at TecnoBit, establishing itself successfully among the majority of thermal electronic engineers due to its power and ease of use. In the example shown here, TecnoBit designed a special chassis enabling the avionics to be housed in a reduced space (max dimension around 10cm). The system is totally sealed, so the task was to maximize heat transfer by conduction, radiation and natural convection from the outside surface. The preliminary design was clearly not thermally acceptable, and the internal chassis structure was modified in order to increase heat conduction from the components to the chassis walls. At the same time the outer surfaces of the chassis were modified using special fins, sand blasting treatment and electrostatic painting in order to enhance convection and radiation exchange with the external ambient. All the design options were evaluated without building prototypes, and the Flotherm simulations enabled us to optimize the thermal design rapidly and reduce component junction temperatures by 40°C compared with the initial design.



Solution and Benefits

TecnoBit engineers use Flotherm to perform steady state and transient thermo-fluid simulations and predict system thermal behaviour before building expensive prototypes. The key benefits are that a lot of time and money is saved, and no time is wasted building prototypes for unfeasible projects. Flotherm has become

Customer Testimonial

"Flotherm is of crucial importance to us in understanding and optimizing the different heat transfer paths and mechanisms between electronic components and the ambient surroundings in the harsh environmental conditions found in aircraft. We use FloMCAD to simplify our original mechanical CAD files and quickly create computational models for the simulations. The way Flotherm represents electronic components is a key advantage, enabling us either to use simple thermal data from component datasheets or switch to detailed 3D models for critical components when necessary."

Jorge Giménez Romo, Hardware Engineer, TecnoBit