

Going into Orbit

dSPACE pushes ahead with satellite test systems

The space industry makes extremely high demands on the development of electronic control systems. Business Development Manager Dr. Dirk Spenneberg explains how dSPACE's satellite technology solutions will help meet these demands.



Dr. Spenneberg, what does dSPACE aim to achieve in the field of space technology?

dSPACE systems are used in numerous space and aerospace applications. We're proud of this, and plan to extend our product range for these applications. Our main focus is on supporting acceptance tests for satellite subsystems such as attitude and orbit control or energy management, with the objective of strategic growth in these fields.

What makes these application fields so interesting?

The attitude and orbit control system, or AOCS for short, is one of the most complex components in any modern satellite. For realistic simulation, all the factors that affect the satellite – even very small ones like solar wind – have to be modeled very precisely. In addition, numerous sensors (star trackers, magnetometers, etc.) and actuators (reaction wheels, magnetic coils, etc.) have to be integrated into the simulation.

Does dSPACE have the necessary know-how?

dSPACE has a mature tool chain to reliably test such complex systems with simulation support. Our hardware-in-the-loop (HIL) simulators are the de facto standard in the automotive industry and every day prove their ability to meet stiff challenges. Their operational track record is without doubt unmatched anywhere in the world. This is the solid base on which we can build solutions for customers

in space technology. And to get additional expertise on board, we're proactively cooperating with institutions like the German Aerospace Center (DLR).

How are you going to convince your customers?

Whenever you enter a new field, the first steps are the ones that are the most difficult. Our systems are a good starting point, there is absolutely no doubt about that. In the USA, for example, we already gained customers such as NASA.

It is also clear that space technology has special requirements that we cannot fulfill yet. But we have an excellent track record on working side-by-side with customers, successfully tackling highly complex projects with numerous new requirements – and we also have a very proficient engineering department that quickly develops completely new solutions outside our regular product range. One example: the simulator for all the avionics in the Honda Business Jet.



“As one of the largest providers of HIL systems, we can offer our space technology customers future-proof development tools.”

Dr. Dirk Spenneberg, dSPACE GmbH

What kind of products are already under development?

In concrete terms, we are working on new simulation models for simulating a satellite on our HIL systems in real time, including AOCS-relevant sensor systems and all the environmental effects on the satellite. These models will comply with the ECSS standards and are also being validated by external experts. In parallel, we are extending our range of interface boards to provide optimum connections between space components and dSPACE systems. The MIL-STD-1553 Interface Board is a current example, and there will soon be a similar solution for the SpaceWire bus. For HIL tests, we will be able to supply turnkey systems with the usual high dSPACE quality.

Don't satellite manufacturers have their own models and simulators?

Simulation models are part of the core expertise of numerous companies. But they often need models

from an independent partner. A dSPACE simulator is an economically attractive alternative to the special solutions that are widely used in the space industry – after all, we produce hundreds of our HIL simulators every year. Moreover, we are constantly updating our product portfolio to ensure that our technology is state-of-the-art. So space technology customers profit from high quality and a comprehensive tool range that are only possible because we're engaged in such a wide range of industries. As one of the largest providers of HIL systems, we can offer our space technology customers excellent sustainability.

Where do you go from here?

We're currently consulting closely with our customers and with experts from the DLR and the ESA to continuously expand our range. We would like to involve more people in this dialog, and invite any interested party to contact us and bring their new ideas and input to the

table. We're not satisfied until our customers are satisfied.

Thank you for speaking with us, Dr. Spenneberg.



Profile

Dr. Dirk Spenneberg took over the management of Business Development for Satellite Test Systems at dSPACE GmbH in 2010. Before joining dSPACE, Dr. Spenneberg was responsible for the Space Robotics business field at the DFKI GmbH (German Research Center for Artificial Intelligence) in Bremen, Germany.