SIEMENS

Electronics and semiconductor

Brunner Elektronik

From CAD screen straight to the cockpit

Product

Solid Edge

Business challenges

Develop and produce products more efficiently

Transition to 3D CAD/CAM system

Simplify processes, from design to prototyping and production

Fulfill customer requirements

Keys to success

Simulation with digital prototypes

Design agility and flexibility

Data consistency and interfaces to CAM

Collaboration across various development departments

Results

Significant time savings

Simplified processes

Minimized risk

Cost reduction with good cost-benefit ratio

Faster time-to-market

Workload reduction

Photorealistic rendering created with Solid Edge. The motion platform for a flight simulator integrates control and mechanical systems for movements requiring high agility and freedom.

Solid Edge with synchronous technology accelerates Brunner Elektronik development work and facilitates high diversity in variants for turnkey solutions

Control and drive system specialist

Brunner Elektronik's day-to-day challenge is to perfectly combine mechanical and electrical components into comprehensive solutions. Its customers' high design standards challenge the processes used throughout product development, driving Brunner to achieve optimal results in visual design, functionality assessment and thermal simulation. Thanks to Solid Edge® software from product lifecycle management (PLM) specialist Siemens PLM Software, Brunner can develop products quickly and efficiently.

For 47 years, Brunner Elektronik has been producing custom control and drive systems, sophisticated assemblies and complex integrated solutions. Located at Hittnau, near Zürich, Switzerland, the company is renowned for its deep expertise in power electronics and mechatronic systems. Brunner primarily designs and manufactures to individual specifications, mainly for customers in the machinery, medical and simulation technology industries. To serve these customers, the company runs a complete mechanical production shop with state-of-the-art computer numerical control (CNC) milling and turning machines, as well as everything needed to design, engineer and manufacture mechanical parts.

Reviewers look at the motion platform for a flight simulator designed using Solid Edge. Visualizing important interdependencies and possible critical issues as early as the design phase helps increase production efficiency. (Image: M. Frutig.)

Using Solid Edge computer-aided design (CAD) software, Brunner engineers can optimize their designs in minute detail prior to production, and perform simulations using digital prototypes. Brunner Elektronik is currently using Solid Edge with the Insight™ design data management solution. "These capabilities enable us to improve product quality and fulfill our customers' requirements faster," says Robert Brunner, founder and owner, Brunner Elektronik. The company has been using Solid Edge with great success for 10 years.

Intuitive operation, superior productivity

Brunner is an electronics engineer with passion. He puts all his faith in Solid Edge, having acquainted himself with the software more than 10 years ago, and has used it for increasingly complex customer projects.

His son, Thomas Brunner, is head of the company's mechanical department. He and his colleagues work with Solid Edge to design housings and printed circuit boards

"We can implement virtually everything in-house. Customers benefit directly from this flexibility and consequential cost savings, which is another great benefit for Brunner Elektronik."

Thomas Brunner
Head of the Mechanical Department
Brunner Elektronik

(PCBs). "What I particularly like about Solid Edge is its intuitive usability," Thomas Brunner says. "I was able to use the software for production work after a very short time. Having worked with a well-known competing product for testing purposes, I must say that by comparison, Solid Edge has fully convinced me. It has a good, comprehensible structure and design, which is a great plus."

Accelerated development cycles and fast reaction to changes from customers require Brunner Elektronik to work with great efficiency to reduce costs. By optimizing the implementation of customer requirements within predefined, tight schedules, Brunner and his team can bring new products to market well ahead of competitors. The company can generally act with greater flexibility, which helps it compete in fiercely competitive international markets.

From complex mechatronic assemblies, all the way to documentation

At Brunner Elektronik, Solid Edge is used not only for mechanical design but also for electrical and electronic design tasks. Mechatronic designs require the integration of electronic components, and limited space frequently poses quite a challenge for the design engineers and in production. The software also includes useful tools for finding optimal, technically mature solutions in heat sink design. "We use Solid Edge for electronic components a lot," says Thomas Brunner. "There, multibody simulation capabilities of the software are important to us. Using simulation, we can trace movements to see immediately whether parts collide or get stuck. It takes the most current CAD technology to facilitate virtual design. Solid Edge is perfectly suited for this."

With the broad range of Solid Edge functions for part modeling, exploded views, photorealistic rendering and frame design, and with add-on capabilities for simulation, cable harness design, injection mold design and additional assembly applications, Brunner Elektronik can quickly produce product videos for customers. Particularly for smaller businesses, this capability opens doors not only across design, engineering and production operations, but also for marketing purposes.

"With Solid Edge, we have acquired a high-performance solution with a very favorable cost-benefit ratio that substantially relieves and supports us in our daily work."

Robert Brunner, Sr.
Founder and Owner
Brunner Elektronik AG

Solid Edge enables substantially enhanced productivity. (Image: M. Frutig.)

Evolution from first designs to the optimized control stick with full functionality and integrated electronics - designed using Solid Edge, with mockups produced on an in-house 3D printer. (Image: M. Frutig.)

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Head of the Mechanical Department
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For Thomas Brunner, these are distinct competitive advantages that he had the opportunity to test and fully exploit in completing another recent project: the core component of a flight simulator. He explains, "In the computer simulation, you can see all movements of the entire platform in detail. This is quite a thrill – also, of course, for our customers. We can also use Solid Edge in the creation of all the documentation. The renderings are so realistic we effectively do not need to have photos made anymore." Eliminating the need for photographs also means significant cost savings.

The Brunner Elektronik design office is frequently met with requests from domestic and international aerospace customers, for which the motion simulation, collision detection and structural strength calculations of Solid Edge are particularly useful.

For the design department, working with Solid Edge helps realize significant overall design time reduction. The software also serves an important role in fulfilling the rigid traceability requirements for product certifications. Furthermore, the automatic collision detection and comprehensive integration of interfaces to other processes are vitally important and extremely practical in prototyping. At the touch of a button, all component data is transferred to the central system, where all settings for the milling machine are generated automatically. "By comparison with when we created drawings manually, this alone saves a significant amount of time," Thomas Brunner says.

He adds, "What I like most about Solid Edge is its superior usability."

Design freedom and production reliability

Designing freeform geometries that optimally balance requirements for ergonomics, electronics, and injection molding processes can take small businesses to their limits. These challenges make service providers such as Brunner Elektronik, with its specialized expertise, an important partner.

A recent example project is an aircraft control stick, designed and engineered with Solid Edge, from start to finish, by Robert Brunner. Thomas Brunner had initially tried various other software products, concluding that there were other software packages that could easily do the modeling, but the resulting data could not be used by the plastics specialist. The company then adopted Solid Edge.

With comprehensive support from Robin Vornholt, senior consultant at bytics AG, a Siemens PLM Software channel partner and systems integrator based at nearby Volketswil, the entire Brunner Elektronik design team successfully entered the 3D world of Solid Edge. The individual training provided by bytics laid the foundation for

the company to become proficient with the operation of the system and its many modules and add-ons, and to exploit its high-value functionality.

Brunner Elektronik also worked with bytics to implement the Solid Edge with Insight document management system. “We are quite satisfied with it,” says Thomas Brunner. “It has been working flawlessly for years now. We have been talking to the same bytics people from the start. It is important to us that the support engineers are familiar with our system and that there is always someone there for us. We are absolutely happy with their support.”

The first series of the control stick and the associated control unit was produced and delivered, and a second batch is already in stock at Hittnau. For Robert Brunner, it is quite clear that training is crucial to success. “Training should, in no event, be omitted,” he says. “The software has a lot to offer, much of which would go undiscovered without training.”

Thanks to the sophisticated, yet easy-to-use, freeform design capabilities of Solid Edge, Brunner Elektronik now receives growing numbers of queries from the aerospace industry for extraordinarily complex assemblies such as joysticks. “Because we can implement individual customer requirements with great flexibility, we are in an even better starting position,” notes Thomas Brunner.

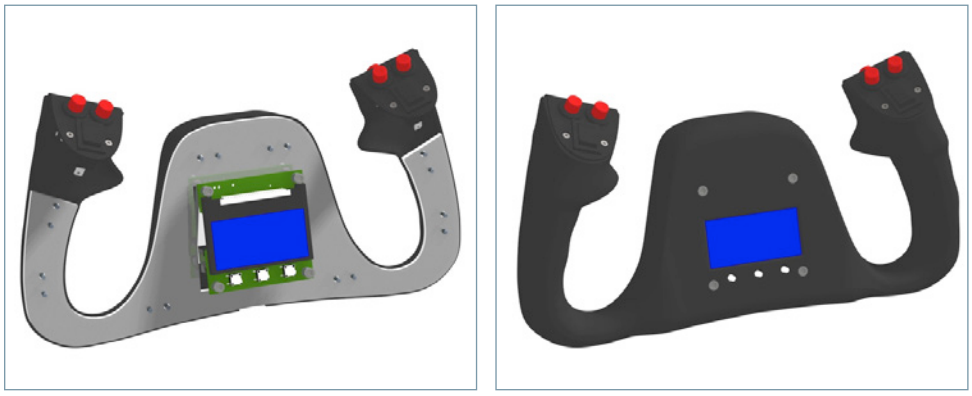
A notable edge: synchronous technology

Customer requirements have changed a great deal since Brunner Elektronik was founded. The solutions have evolved from single components and devices to comprehensive control solutions. “Today, customers want comprehensive turnkey solutions from a single source – without any interface issues,” Thomas Brunner explains. “This presents manufacturers like Brunner Elektronik with new challenges. We are constantly looking for new and optimal tools, and Solid Edge ideally supports this search. It gives us the ability to react to customer requirements fast and with great

Data consistency from the 3D model on the CAD screen to the CNC milling/turning machine facilitates comprehensive turnkey solutions from a single source. (Image: M. Frutig.)

"We have a large customer who is using another well-known CAD software product. Thanks to synchronous technology, modifications to their designs and building new models work absolutely flawlessly, as does data exchange with third-party software in general."

Robert Brunner, Sr.
Founder and Owner
Brunner Elektronik



3D view of the internal architecture of the yoke with the autopilot and radio LCD control panel.

flexibility. Time-to-market is a critical factor as well. Additional processes such as rapid prototyping and 3D modeling help us find and implement final solutions quickly." These capabilities enable the company to create products without costly and time-consuming prototyping and metalworking processes, and to begin effective production with the first piece.

Brunner Elektronik also values the direct modeling capabilities made possible by the synchronous technology capability of Solid Edge. "We have a large customer who is using another well-known CAD software product," says Robert Brunner. "Thanks to synchronous technology, modifications to their designs and building new models work absolutely flawlessly, and so does data exchange with third-party software in general."

Mastering challenges, crossing frontiers

Another challenge mastered by Thomas Brunner and his team is the interaction between internal computer-aided manufacturing (CAM) and CNC, Microsoft's Excel® spreadsheet software and Solid Edge with Insight. Intense cooperation within engineering fosters quality and eliminates errors. "Possible data errors are identified and possible interface problems can be resolved immediately, allowing us to cross frontiers," says Thomas Brunner. "In the future, distances will also lose their relevance, since work can be done using the same system with the same image, which facilitates much faster action." Brunner also emphasizes the importance of interfaces to downstream processes: "Interface functionalities to subsequent processes can be implemented error-free, and this also minimizes the risk for our company."

High-performance solution with a good cost-benefit ratio

"Interaction with customers and suppliers can be greatly improved, risks can be limited or eliminated at an early stage and our time-to-market is much shorter," says Thomas Brunner. "With Solid Edge, we have acquired a high-performance solution with a very favorable cost-benefit ratio that substantially relieves and supports us in our daily work."

Solutions/Services

Solid Edge
www.siemens.com/solidedge

Customer's primary business

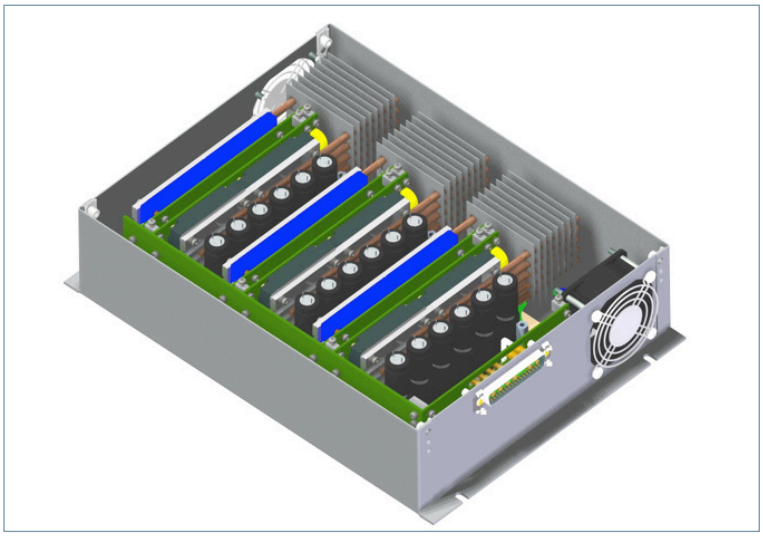
Brunner Elektronik AG specializes in the design and production of power electronics and mechatronic systems, as well as providing related support. The family-owned business, established in 1968, serves customers across industries, including machinery, medical equipment and simulation technology.
www.beh.ch

Customer location

Hittnau
Switzerland

Partner

Bytics
www.bytics.ch



Optimized housing, component and assembly design in a power supply for aerospace applications with space limitations. (Image: Brunner.)

Brunner Elektronik perceives other distinct benefits. Solid Edge makes it possible to use visualization to point out critical issues to customers in the virtual design stage, to pace the project with them, and to discuss issues. "For us, paperless documentation is of the essence," says Robert Brunner. "We have more or less everything screen-based. I am at a loss trying to imagine how I worked with 2D drawings not so long ago. This was and is a great achievement in more than one respect."

After using Solid Edge for 10 years, Thomas Brunner is also thoroughly convinced: "This software is stable and we are totally satisfied. "We can implement virtually everything in-house. Customers benefit directly from this flexibility, and the consequential cost savings represent represents another great benefit for Brunner Elektronik."

"What I like most about Solid Edge is its superior usability."

Thomas Brunner
Head of the Mechanical Department
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