



# “FIRST-TIME RIGHT” PCB DESIGN

## ALTAIR SOLUTIONS ACCELERATE TAILORED ELECTRONIC DESIGN AT PSICONTROL

### About the Customer

Psicontrol, part of Picanol Group (a business unit of Tessenderlo Group), is an innovative high-tech company focusing on the design, development, production, and support of custom-made control systems. Headquartered in Ypres, Belgium, the company develops custom-made solutions for control applications such as heating, ventilation, and air conditioning (HVAC), textile machinery, compressors, and vending machines. Specializing in advanced human interfaces, wireless communication technologies, and embedded systems, the Psicontrol team strives to meet customers' highest expectations. Focusing on customization, Psicontrol's R&D team leverages best-in-class hardware software solutions to create unique products for their demanding clients for whom reliability and time to market are key.

### Their Challenge

Psicontrol offers a wide range of services, from the design of printed circuit board assembly (PCBA) to full product assembly and manufacturing of human-machine interfaces (HMI). To meet the needs of their customers – who operate in an array of diverse industries – Psicontrol's engineers design complex electronic circuit boards as well as mechanical enclosures. To demonstrate their product development capabilities and accelerate time to market for their clients, Psicontrol developed a customization platform that showcases a multitude of functionalities combined within a single product. This customization platform, called the “4 inch concept,” is a combination of a graphical user interface, a PCB, and a multi-purpose control unit. The 4 inch concept allows individual control unit configurations for a wide range of machines and systems, such as construction machinery, vending machines, weaving machines, smart buildings, climate systems in a motor home, and more.

COMPREHENSIVE  
VIRTUAL PROTOTYPE  
ASSESSMENT

**4 WEEKS** ▼

REDUCTION IN  
DEVELOPMENT TIME

MORE CONFIDENCE  
EARLIER

DERISKING HARDWARE  
PROCUREMENT



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PCB development is a long and complex process. It entails the schematic capture; layout drawing, which includes traces and physically connecting them on the board; component ordering, production, and shipping from abroad; product assembly; and finally, prototype testing. As such, PCB development often takes up to 10 weeks. Developing a new PCB is also demanding because designers must consider many constraints early in the design process such as size, thermal issues, power efficiency, electromagnetic compatibility (EMC), and more. In addition to signal integrity and EMC, meeting manufacturing restrictions and customers' individual certification requirements presents additional hurdles.

To combine as much functionality as possible into the 4 inch concept customization platform, Psicontrol's engineers must consider all the variants of a product. To reduce development time, they needed a tool with which they could virtually test and validate numerous design variants before building prototypes. Delivering a "first-time right" design was the ultimate goal.

### Our Solution

In the development of their 4 inch concept, Psicontrol's engineers worked with Altair's electronic design solutions. They used [Altair® Feko®](#) to predict EMC radiation, simulate antenna performance and placement, evaluate signal quality, and ensure signal integrity early in the development process. Feko allowed the team to study various antenna types, such as Wi-Fi or Bluetooth connection. Using [Altair® Pollex™](#), a PCB-level electronic design automation (EDA) software suite covering analysis, verifications, and manufacturing assessment of physical, thermal, and electrical attributes, Psicontrol performed physics-based analysis of their 4 inch concept early in the design process. Leveraging Pollex's integration with ECAD tools, their engineers could understand potential design issues right away and use simulation to resolve possible problems. Further parametrized optimization within [Altair® HyperStudy®](#) allowed the team to fine-tune selected geometry for the specific stackup.

Altair's solutions enabled Psicontrol to perform a full-system analysis, which integrated mechanical, thermal, electromagnetic, and embedded code in one design flow. As a result, the entire PCB development process from first design to component assembly took Psicontrol just six weeks, rather than the typical 10.

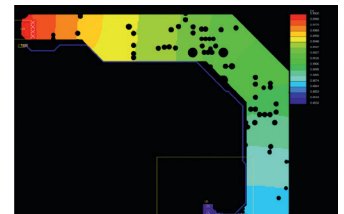
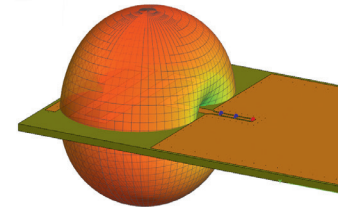
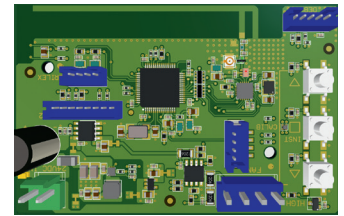
**"Speeding development and having confidence early in the design process is a key differentiator that helps our customers shorten time to market. We're proud to say that Pollex made our 4 inch concept a first-time right success story."**

Arne Pannecouque, specialist R&D engineer, Psicontrol

### Results

Using Altair's solutions, Psicontrol nearly halved the development time of a complex HMI product and achieved their goal of creating a first-time right design for their customers. Ensuring the flawless functionality of the control unit's processor and memory, Altair's tools helped the company test and validate the new system before any prototype was built. With Feko, Psicontrol can now test several antenna types and positions for a product early in the design cycle. This helps the company reduce costly, time-consuming prototype iterations by selecting the best design variant at the start of the project. And with Pollex, Psicontrol can confidently and accurately design high-speed interfaces.

"Thanks to Altair, we achieved our goal of producing a first-time right PCB prototype. Altair's solutions helped us cut development time almost in half and gave us the tools to verify any custom-made design upfront, early in the design process," said Arne Pannecouque, specialist R&D engineer, Psicontrol. "Plus, we can do all the required analyses in-house without needing to involve third parties, which is a major benefit to our customers."



**TOP:** Altair's solutions enabled Psicontrol to achieve their goal of producing a first-time right PCB prototype, helping them to cut development time almost in half. **MIDDLE:** Using Altair® Feko®, Psicontrol was able to predict EMC radiation, simulate antenna performance and placement, evaluate signal quality, and ensure signal integrity early in the development process. **BOTTOM:** Leveraging Pollex's integration with ECAD tools, the engineers could understand potential design issues right away and use simulation to resolve possible problems.