

Shaping the Future of Rail Through Complex, Precision Engineering

How SPII turned digital unity into a catalyst for human led, scalable innovation



SPII has been a specialist in human-machine interfaces for the rail industry for more than seven decades, evolving from a family run company in 1947 into one of Italy's foremost engineering innovators. Today, the company operates on a global scale with design, production and assembly activities spanning Italy, the United States and India to support leading rolling stock manufacturers and rail operators worldwide.

Renowned for its precision engineered driver desks, master controllers and safety critical control components, SPII blends industrial design, ergonomics and engineering rigor to deliver bespoke solutions tailored to each customer's operational needs. Now part of German industrial leader, Schaltbau Group, SPII (formerly known as Studio Professionale Ingegneria Industriale) continues to build on its heritage of innovation and engineering excellence.

Challenge: Managing Complexity Across Bespoke, Safety Critical Products

SPII delivers highly customized products, each tailored to the needs of a specific operator, fleet or cab layout. This level of detailed, bespoke engineering creates inherent complexity, especially when teams must collaborate across multiple sites, time zones and disciplines.

Before adopting a fully model based approach, SPII faced growing challenges as the complexity of its bespoke rail control products continued to increase. Although the company had moved away from 2D drafting in the mid 1990s and later introduced Windchill to manage product data, the increasing complexity of projects highlighted the need for a more integrated collaboration environment.

Engineers worked across multiple projects and product variants without a unified, end to end digital workflow to keep information aligned, making it more difficult to efficiently share, reuse and standardize designs. This created opportunities to further improve design reuse, process consistency and overall engineering efficiency.

As product variants multiplied, maintaining standardization became even more challenging, and disconnected processes made it harder to keep information flowing smoothly into manufacturing and assembly. For a company delivering safety critical systems, these increasingly sophisticated workflows reinforced the importance of greater integration and standardization, highlighting the need to evolve from independently managed digital tools to a fully integrated, model-based environment.

As SPII continued to grow internationally and manage increasingly sophisticated projects, the company recognized the need for a more connected and scalable digital framework. SPII needed an integrated way of working that could keep pace with its growing scale, strengthen collaboration and deliver consistent, validated information from design through to manufacturing and assembly.

"Our challenge was never creativity or capability, it was alignment," said Silvio Zuffetti, CEO of SPII. "We needed a digital foundation that could unify every idea, every variant and every team into one coherent way of working. Only then could we continue to innovate at the pace our customers expect."



Partner Spotlight

Horsa Softech (Horsa Group) supports manufacturers in accelerating digital transformation through CAD, PLM, and digital engineering solutions. As a strategic PTC partner, Horsa Softech helps organisations connect design, product data, and cross-functional workflows to optimize the full product lifecycle.

Leveraging deep industry expertise and integration capabilities across the Horsa Group, the team delivers tailored solutions that support complex product development, improving efficiency, collaboration, and engineering continuity across the industrial value chain.

Solution: A Unified Digital Foundation

SPII worked with its implementation partner, Softech Software and Technology SRL, to establish a digital thread within its engineering domain by unifying Creo and Windchill into a single, model based environment. This created a continuous flow of validated product data from design through to manufacturing and assembly, replacing the fragmented processes that had previously made collaboration difficult. The result is a single, integrated digital ecosystem of interconnected systems that minimizes misalignment, strengthens process consistency, and reduces support and training complexity.

"We weren't changing the tools we trusted, we were connecting them," added Zuffetti. "That's what allowed us to build a true digital thread across our engineering operations. Once our models and data flowed seamlessly through Creo and Windchill, we gained the consistency and alignment that had been missing."

Creo enables SPII to manage both mechanical assemblies and advanced surface design within one environment, while real time and high fidelity simulation tools allow engineers to validate performance and manufacturability early in the process.

Windchill serves as the central repository for all product information, ensuring that only approved and validated versions are visible across engineering, manufacturing, quality, and purchasing.

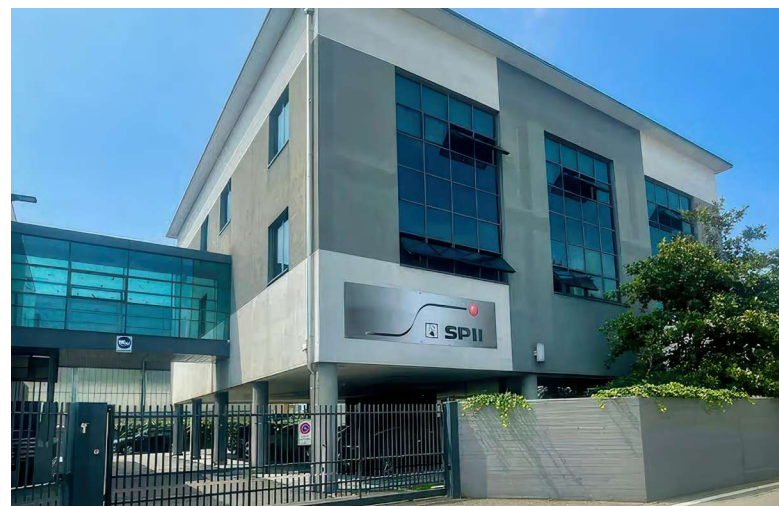


When every model, every part and every decision flows through a single digital thread, you unlock a different kind of organization."

Silvio Zuffetti, CEO, SPII S.p.A.

Results: Faster Decisions, Stronger Governance and Smarter Reuse

With Creo and Windchill working together, SPII has fundamentally transformed the way it designs, validates and delivers its products. A structured funnel process encourages the reuse of standard, validated components. Engineers now reuse existing parts through classification and PartsLink in Windchill, significantly reducing effort and lowering quality risks while driving stronger, faster collaboration across teams.



Fully annotated 3D models created in Creo have replaced traditional drawings for assembly, reducing engineering workload and giving operators a more intuitive, natural view of the product, improving comprehension and sharply reducing interpretation errors.

Windchill ensures that every department and supplier works from the same up to date information, strengthening traceability, version control and change visibility, supported by ERP integration that automatically shares approved documentation with the suppliers when purchase orders are issued.

The result is a measurable increase in efficiency, greater consistency in execution, smoother cross functional alignment, fewer downstream issues and a more reliable flow of information across the business.

The technology transformation was enabled by SPII's strong engineering culture and deep domain expertise, allowing teams to fully leverage the benefits of an integrated model-based approach.

"When every model, every part and every decision flows through a single digital thread, you unlock a different kind of organization," Zuffetti said. "One that learns faster, adapts faster and creates with far greater confidence. This is the future of enhanced engineering, and at SPII, we're already living it."

Looking Ahead: Scaling Modularity, Reuse and Innovation

SPII's strengthened digital foundation positions the company to manage even greater complexity as it expands its portfolio of bespoke rail control solutions. With a unified model based environment now in place, the next phase will focus on increasing modularity across product families and maximising component reuse. This will allow SPII to deliver customized configurations at greater speed while maintaining the precision, consistency and safety standards that define its engineering approach.

Looking ahead, SPII is also preparing for the next wave of AI driven capabilities that will further enhance design efficiency, variant exploration and decision making. By combining its model based processes with emerging intelligence tools, the company aims to accelerate innovation, strengthen predictive insight and create an engineering environment that can adapt dynamically as customer requirements evolve.



"We've built the digital backbone that will carry us into the next era of engineering," Zuffetti concluded. "Modularity, reuse and AI driven insight will allow us to deliver highly customized solutions efficiently, collaboratively and at speed and scale. As our digital thread strengthens, AI is our natural next step, not as an add on, but rather as a catalyst for how we explore ideas, make decisions and shape the bespoke systems of tomorrow.

"Our vision, defined in 2020, is 'to put the Human Being at the center of a fully automatized and robotized world of the future'. This is the principle that guides not only the solutions we deliver to our customers, but also the way we are shaping our own organization. Step by step, we are building an internal environment that reflects the same vision, where digital tools and technologies support people rather than replace them, enabling better decisions, greater efficiency, and a more human-centered way of working."

Benefits

- **Faster Engineering Cycles** - Significant reduction in design effort through structured reuse of validated components.
- **Higher Design Quality** - Standardized parts and model based workflows reduce errors and improve consistency across variants.
- **Stronger Cross Team Collaboration** - Unified data in Creo and Windchill enables faster, clearer communication across engineering and operations.
- **Intuitive, Error Free Assembly** - Fully annotated 3D models give operators a clearer view of the product, reducing interpretation mistakes.
- **Single Source of Truth** - Windchill ensures every team and supplier works from the same up to date, validated information.
- **Robust Traceability & Change Control** - Improved versioning, visibility and governance ensure every change is captured, understood and correctly executed across the lifecycle.
- **Seamless ERP Integration** - Approved documentation flows automatically to procurement and suppliers when purchase orders are issued.
- **Greater Standardisation & Reuse** - Classification and PartsLink drive systematic reuse, improving quality and accelerating configuration.
- **Smoother Cross Functional Alignment** - Connected processes reduce friction between design, manufacturing and assembly.
- **Scalable Digital Foundation** - A model based environment supports growing product complexity and future innovation, including AI driven capabilities.

Customer Overview | Climeworks

Industry	Rail Equipment Manufacturing
Headquarters	Lombardy, Italy
Employees	175
Revenue	33 million euro in 2025
Website	www.spii.eu
PTC Products	Creo, Windchill