

Bosch aims to break the billion-dollar barrier with sales revenue from factory software

Digital orchestration of manufacturing through software

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- ▶ Bosch Industrial Technology aims to achieve sales revenue of around \$1 billion from software and software-related services by the beginning of the next decade.
- ▶ Tanja Rueckert: “We know factories like the back of our hand. Our software solutions are made by users for users.”
- ▶ Bosch Rexroth’s ctrlX AUTOMATION offers a rapidly growing ecosystem for factory automation.
- ▶ Bosch customers, as well as some 150 Bosch plants, use software from Bosch Connected Industry’s NEXEED portfolio.
- ▶ Bosch Semantic Stack is the basis for digital twins of products and the key to unlocking the value of data.

Charlotte – Bosch is continuing its software offensive. The technology company’s Industrial Technology business sector is pursuing ambitious goals: by the beginning of the next decade, it wants its sales revenue from software and software-related services to have reached around \$1 billion. “Bosch is one of the world’s biggest manufacturing companies. We know factories like the back of our hand. This know-how flows into our software development. Our solutions are made by users for users, since we also use our software in our own plants,” says Dr. Tanja Rueckert, member of the board of management of Robert Bosch GmbH whose responsibilities include the Industrial Technology business sector. This business sector comprises Bosch Rexroth, Bosch Manufacturing Solutions, and Bosch Connected Industry. Bosch has the expertise and knowledge to make fully software-assisted manufacturing a reality. Its software solutions for the operations management level, such as Bosch Connected Industry’s NEXEED, and for the control level, such as Bosch Rexroth’s ctrlX AUTOMATION, dovetail seamlessly. Bosch Manufacturing Solutions also offers AI-based process optimization for existing manufacturing landscapes.

At the heart of factory automation – Bosch Rexroth’s ctrlX AUTOMATION

Bosch Rexroth’s ctrlX AUTOMATION is an open automation system for factory automation. Since its launch five years ago, it has attracted over 2,000 customers. The partner network ctrlX WORLD with over 100 partner companies, extends the range of solutions to include software and hardware. The ctrlX OS operating system is also growing and becoming increasingly important. Open interfaces and standards make it possible to integrate all types of automation technologies and partners. “As the pace of digitalization increases, what’s needed are new solutions that enable systems to be interconnected and open in all directions. Co-creation and open ecosystems let companies pool their strengths, develop innovations together, and react much faster to changes in the market,” says Thomas Fechner, Member of the Executive Board of Bosch Rexroth with responsibility for the factory automation business. The company now offers more than 80 apps in its ctrlX OS store. These range from communication and IoT solutions to innovative vision and engineering apps, all of which are validated in accordance with strict Bosch Rexroth guidelines. Around half the apps come from third-party providers. This underlines the co-creation approach that is becoming increasingly prevalent in this domain. ctrlX AUTOMATION can also be connected to NEXEED.

The brain of the smart factory – Bosch Connected Industry’s NEXEED

Bosch Connected Industry’s software for Industry 4.0 controls the manufacturing process and provides the transparency that is needed for raw materials and other supplies to be used efficiently. It can detect and eliminate the causes of rejects at an early stage, and it permits predictive maintenance, retrofitting, and optimization for machinery and equipment. The result is factories that are up to 25 percent more productive, up to 15 percent greater machine availability, and a reduction in maintenance costs by as much as 25 percent. With NEXEED, everyone responsible for manufacturing has exactly the information they need. It uses artificial intelligence to provide assembly-line workers with support directly at the machine. In the future, they will be able to use an app to voice-record any incidents at a workstation, ask about similar situations, and request suggestions for solutions. NEXEED’s international customers include Sick and Osram. It is also used in around 150 Bosch plants. Thanks to its open interfaces, the Bosch software can be integrated into common industrial platforms and existing infrastructure. The data it generates can also be used in other applications.

The key to unlocking data's full potential – Bosch Semantic Stack

One such application is the Bosch Semantic Stack. “Companies are sitting on a treasure trove of data, but very few of them know what to do with it. We have the key to unlocking the value of all that data,” says Norbert Jung, CEO of Bosch Connected Industry. The Bosch Semantic Stack software portfolio creates a semantic data layer that makes product data understandable for humans and machines throughout the lifecycle. When this data is assigned to a digital twin, the result is consistent, reliable insights for well-founded business decisions. Instead of simply storing data, the Bosch Semantic Stack explains what the data means, making repeated rounds of data preparation and integration unnecessary. Using the solution itself, Bosch has already created more than 400 million digital twins of its products throughout the company. These make it possible to use data more easily and securely, also across company boundaries. For example, effective 2027, the EU will require battery manufacturers to create a digital battery passport for any batteries with a capacity of 2 kilowatt-hours or more. This passport must be able to show a wide range of data on the battery's lifecycle, including data on CO₂ from its manufacturing, performance data, and, for recycling, information about its constituent materials. The Battery Passport, a module of the Bosch Semantic Stack, fulfills these legal requirements by using digital twins to automatically create the passports needed for end-to-end data transparency over the battery's entire lifecycle.

Bosch Rexroth model factory provides insights into the factory of the future

At the Bosch Rexroth model factory in Ulm, Germany, the company shows how Bosch software makes factories and their control systems simpler and more efficient. Bosch uses concrete manufacturing scenarios to present its portfolio of high-performance industrial technology, including intralogistics and distribution. The exemplary manufacturing process also illustrates how existing factory environments can be transformed safely and cost-effectively. The model factory brings solutions for the automotive, battery, consumer goods, and semiconductor industries to life. Users can flexibly adapt their manufacturing to fluctuating demand and economically produce different versions or even very small batches. With its open standards, the Bosch software manages communication both between the machines and systems and with higher-level systems, ensuring seamless exchanges of information and complete orchestration of manufacturing operations.

Since the model factory opened in 2021, around 8,400 visitors have learned about topics such as sustainability in factory automation, flexible materials flows, and the benefits of modular software architecture.

Press photos and infocharts are available on the Bosch Media Service at www.bosch-press.com.

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About Bosch

Having established a presence in North America in 1906, today the Bosch Group employs more than 41,000 associates in more than 100 locations in the North American region (as of Dec. 31, 2024). According to preliminary figures, Bosch generated consolidated sales of \$17.4 billion in the U.S., Mexico and Canada in 2024. For more information visit www.bosch.us, www.bosch.mx and www.bosch.ca.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 417,900 associates worldwide (as of December 31, 2024). According to preliminary figures, the company generated sales of 90.5 billion euros in 2024. Its operations are divided into four business sectors: Mobility, Industrial Technology, Consumer Goods, and Energy and Building Technology. With its business activities, the company aims to use technology to help shape universal trends such as automation, electrification, digitalization, connectivity, and an orientation to sustainability. In this context, Bosch's broad diversification across regions and industries strengthens its innovativeness and robustness. Bosch uses its proven expertise in sensor technology, software, and services to offer customers cross-domain solutions from a single source. It also applies its expertise in connectivity and artificial intelligence in order to develop and manufacture user-friendly, sustainable products. With technology that is "Invented for life," Bosch wants to help improve quality of life and conserve natural resources. The Bosch Group comprises Robert Bosch GmbH and its roughly 470 subsidiary and regional companies in over 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. Bosch's innovative strength is key to the company's further development. At 136 locations across the globe, Bosch employs some 86,900 associates in research and development, of which nearly 48,000 are software engineers.

The company was set up in Stuttgart in 1886 by Robert Bosch (1861–1942) as "Workshop for Precision Mechanics and Electrical Engineering." The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant upfront investments in the safeguarding of its future. Ninety-four percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The remaining shares are held by Robert Bosch GmbH and by a company owned by the Bosch family. The majority of voting rights are held by Robert Bosch Industrietreuhand KG. It is entrusted with the task of safeguarding the company's long-term existence and in particular its financial independence – in line with the mission handed down in the will of the company's founder, Robert Bosch.

Additional information is available online at www.bosch.com, www.iot.bosch.com, www.bosch-press.com.

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