Press release

Bosch sees factories' future in connectivity
Industry 4.0-related sales grow 25 percent

June 16, 2020
PI 11143 RB Cn/Bär

- Intelligent production: connected solutions ensure manufacturing transparency and flexibility as well as reliable operation.
- Measurable benefit: Industry 4.0 increases productivity at individual sites by up to 25 percent.
- Strong demand: Bosch increases its sales from Industry 4.0 solutions from some 600 million euros in 2018 to over 750 million euros in 2019.
- Rolf Najork: "Connectivity is essential for any company that wants to stay competitive. Industry 4.0 offers enormous potential."

Stuttgart, Germany – Crises reveal weaknesses. The coronavirus pandemic has highlighted the value of connected manufacturing and logistics. The internet of things (IoT) helps manufacturing companies react more flexibly than before to disruptions, since the utilization and condition of each individual machine can be tracked in real time, and there is transparency along the supply chain. "Especially in exceptional times such as the current crisis, connectivity makes companies less vulnerable and helps them keep an even keel," says Rolf Najork, the member of the Bosch board of management responsible for industrial technology. For example, where the risk of infection makes physical proximity a challenge, shift handovers can be handled digitally. Digitalization enables remote monitoring and maintenance of systems and machines, with no need for a technician on site. Intelligent software can track goods and deliveries, and ensure replenishment, from any location. All this is possible thanks to Industry 4.0. Connected solutions will help make manufacturing and logistics simpler, more efficient, more flexible – and also more robust. Bosch is an IoT pioneer. The company began adding connectivity to manufacturing and logistics in 2012 – both in its own plants and in those of its customers. And this is paying off: In 2019, Bosch generated sales of more than 750 million euros with connected solutions for manufacturing and logistics – an increase of 25 percent over the previous year.

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Industry 4.0 boosts factory productivity

In the factory of the future, the only things that are static and fixed are the floors, walls, and ceilings. The factory of the future constantly reinvents itself as needed. It is guided by a vision of a manufacturing set-up that can produce thousands of different products and variants, down to a batch size of one, without the need for expensive retrofitting. This is why Bosch is committed to connectivity. Projects in this area drive progress and deliver measurable benefit. With the help of Industry 4.0, it is possible to increase productivity at individual locations by up to 25 percent. “Connectivity is essential for any company that wants to stay competitive. Industry 4.0 is a historic opportunity, offering enormous potential,” Najork says. “We are not only improving factory productivity, but also enabling companies to respond quickly and appropriately to changes.” To take the example of Bosch, the transition of the automotive industry means pressure on costs for its powertrain division, as well as pressure to adapt. For precisely this reason, the division will be investing some 500 million euros in comprehensively digitalizing and adding connectivity to its manufacturing operations over the next few years. The expected saving will be twice as high: roughly 1 billion euros by 2025. And the use of artificial intelligence is expected to add even more of a boost. The focus here is on AI-based solutions for predictive maintenance of machinery, for quality assurance, and for improving production processes. For example, AI is used in highly complex wafer fabs – such as the Bosch plant in Reutlingen – for detailed production scheduling, saving time and costs as it guides the wafers through more than 500 processing steps. This alone means a 5 percent faster wafer throughput, with an investment payback time of just three months.

From individual projects to large-scale implementation

In Germany, six out of ten industrial companies with more than 100 employees already use Industry 4.0 applications, according to a recent study by the industry association Bitkom. In many cases, however, the applications are only piecemeal. The VDMA, the association of German machinery and equipment manufacturers, estimates that 80 percent of the country’s existing machinery has yet to be digitalized. “There’s still a lot more we can do in manufacturing, and many points we can tweak and adjust. Our task now is to make Industry 4.0 the norm in all parts of the manufacturing sector,” Najork says. For companies, the biggest obstacle to implementing Industry 4.0 is the large sums of capital this requires (Bitkom, 2020). In fact, machinery can also be retrofitted with communications technology and sensor systems. Doing so opens the door to the industrial internet of things. The Bosch Rexroth plant in Erbach, Germany, shows how even minor investments in large-scale machine lines can pay off: It spent a total of 25,000 euros on equipping these lines with sensors and light barriers, and now saves some 200,000 euros a year.

Balancing economic and ecological factors through connected solutions
As a leading IoT company, Bosch has all the core competencies required to shape Industry 4.0. Its portfolio includes software packages for maintenance, monitoring, and logistics, robotics systems for manufacturing and transport, retrofit solutions for existing machinery, and assistance systems for machine operators. Now Bosch is debuting a software-based, 5G-capable control technology that is open to third-party applications. ctrlX Automation marks an end to isolated solutions in factories. Featuring more than 30 data protocols, the new Bosch Rexroth automation platform will be the control center of the factory of the future. With its improved Nexeed Industrial Application System, Bosch Connected Industry offers more than simply an "app store" for manufacturing and logistics. The various software applications can be ordered, used, and combined with one another as needed. All machine data is available in a clear and standardized format, thus ensuring greater transparency and efficiency in the factory. A prime example of how to harmonize economic and ecological considerations is the Bosch Energy Platform. Once a machine has been connected to it, its power consumption can be tracked, analyzed, and controlled. The result is factories that are more economical, require less energy, and emit less CO_2. Connectivity will play a major role in making manufacturing climate neutral.

Press photos: #1360999, #2718989, #1360997, #1846409, #2826798, #1848394

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Additional information:
Manufacture #LikeABosch – IoT is expanding the bounds of possibility
Bosch is developing the factory of the future. In this endeavor, the company is relying on Industry 4.0. Once Bosch has tested and validated products in-house, it markets them to other companies. The portfolio ranges from software packages for manufacturing and logistics, to robots that make and deliver parts, to workplace assistance systems. In its development work, Bosch is guided by clear principles: The products and solutions have to be rapidly adaptable to any task. The are intuitive to use, open to and compatible with third-party applications, and work efficiently and economically. Manufacture #LikeABosch means: business

success, technological flexibility, ecological sustainability, and smart connectivity. The campaign puts an unconventional spin on how Bosch is making factories fit for Industry 4.0.

The Bosch Group is a leading global supplier of technology and services. It employs roughly 400,000 associates worldwide (as of December 31, 2019). The company generated sales of 77.7 billion euros in 2019. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to facilitate connected living with products and solutions that either contain artificial intelligence (AI) or have been developed or manufactured with its help. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiary and regional companies in 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. Bosch employs some 72,600 associates in research and development at 126 locations across the globe, as well as roughly 30,000 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-two percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The majority of voting rights are held by Robert Bosch Industrietreuhand KG, an industrial trust. The entrepreneurial ownership functions are carried out by the trust. The remaining shares are held by the Bosch family and by Robert Bosch GmbH.

Additional information is available online atwww.bosch.com, www.iot.bosch.com, www.bosch-press.com, www.twitter.com/BoschPresse.