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Case Study

CS00020

Bosch Rexroth Chooses Hirschmann to Support Wireless Connectivity for Industrial Tools



With wireless capability, the Nexo Nutrunner from Bosch Rexroth brings industrial customers one step closer to Industry 4.0. The widely-used tightening tool uses an advanced wireless access point to transmit data in real-time to back-office systems.

Project Overview

Bosch Rexroth, a leading provider of drive and control technologies, is committed to helping its customers improve their operational excellence through factory automation and motion tasks. The Industrial Internet of Things (IIoT) is a top priority for its customers around the world, and for Bosch Rexroth the ability to help them accelerate the move to the "smart" factory is a critical differentiator.

Recognizing even handheld devices for fine tuning tasks can benefit from Industry 4.0 innovation, Bosch Rexroth saw an immediate opportunity to deliver new value to customers within its line of tightening technology products. At the same time, the company saw productivity and safety enhancements that could be made by moving to wireless capability for some of its more relied upon tools.

When Bosch Rexroth decided to design and launch the Nexo Cordless Wi-Fi Nutrunner with wireless capability, the company looked no further than its trusted partner, Hirschmann, a Belden brand to help ensure fast and easy adoption worldwide.

The Nexo is the first "smart" handheld nutrunner with integrated control and barcode scanning capabilities, large display features and power electronics. Through the partnership with Belden, customers have the option of connecting to a Hirschmann OpenBAT access point. This wireless connectivity gives industrial manufacturers a flexible, safe, reliable and cost-effective way for the tool to communicate with higher-level systems for reporting and monitoring.

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Project Needs and Challenges

Bosch Rexroth's Nutrunner is designed to streamline and add value to the physical task of screw, nut and bolt tightening on industrial equipment.

When previously tethered via a cable to a separate control unit, the device represented a safety issue. It limited the user's mobility and they had to navigate the workspace with a long cable and plug and unplug it to move from task to task. Users were also at risk of health-related issues from repetitive activity and muscle strain or fatigue.

Wireless capability would not only eliminate these issues; it would give customers an unprecedented ability to collect quality and productivity data in real-time. Then, this information can be made available to upstream applications used in a variety of decision-making. The shift to wireless would also reduce network failures and make documentation easier.

With industrial customers in automotive, equipment, construction and many more markets, Bosch Rexroth needed a wireless connectivity solution that could:

- Meet approval for protocols that enable use of the device in key regions of the world
- Comply with industry standard IEEE 802.11n transmission for WLAN applications
 - Enable data rates up to 450 Mbit/s in 5 GHz and 2.4 GHz bands
 - Send and receive more than one data stream at the same time with multiple-input, multiple-output (MIMO)
 - Use two data channels simultaneously to double the data rate; the channel width of products meeting 802.11n has doubled from 20MHz to 40MHz
 - Operate on two frequency bands, 2.4GHz and 5GHz, for less interference
- Withstand the harsh conditions in industrial environments, such as vibration, dust, chemicals and more
- Seamlessly integrate into existing communications infrastructure and be installed in a DIN-rail cabinet
- Maintain high reliability and WLAN stability for optimized uptime in industrial environments



The Nexo Cordless Wi-Fi Nutrunner, with connectivity supported by Hirschmann OpenBAT access points, gives manufacturers an innovative way to perform routine tasks with high reliability, lower risk and optimal productivity.

- Satisfy robust security requirements and be delivered with customer pre-defined configurations

The Belden Solution

As a global company with customers worldwide, Belden has pursued compliance with the broadest set of industrial wireless protocols across its wireless portfolio. To support Bosch Rexroth's commitment to meet the wireless connectivity requirements of key regions in the world and ensure timely delivery of the new Nexo Cordless Wi-Fi Nutrunner to global customers, the Hirschmann team recommended its OpenBAT wireless access point.

In addition to meeting global wireless protocols, the Hirschmann OpenBAT device offers high reliability and the hardened features needed to operate in any harsh industrial setting. Large industrial operations often have dead spots or zones, where wireless signals are weak or do not reach. Even in these places, the Nexo Cordless Wi-Fi Nutrunner can store and transmit wirelessly to the receiver station when the device moves back into an area where connectivity is available.

"Our customers depend on us for the solutions they need to do their jobs today and ones that allow them to capitalize on the innovation that will transform their businesses tomorrow. The Bosch Rexroth Nexo Cordless Wi-Fi Nutrunner, with an integrated control system and wireless connectivity, captures and delivers all the potential of Industry 4.0 – where machines are connected, information is visualized and shared to improve production and outcomes – and it all happens seamlessly." Marcus Kiesslich, head of product management tightening and resistance welding DC-IA/SWT3 at Bosch Rexroth

The Nexo Cordless Wi-Fi Nutrunner, with connectivity to Hirschmann OpenBAT access points, gives manufacturers a futuristic way to perform routine tasks with high reliability, lower risk and optimal productivity.

The tool is also extraordinarily easy to use and requires little or no additional training. In some cases, it can arrive bundled with the Hirschmann OpenBAT access point and customer-defined configurations. The access point can easily be installed on a DIN-rail.



Now, an employee simply picks up the Nutrunner and scans the product to see what task needs to be done. Information, such as when the task was performed, when it was completed and any potential issues, is captured on the device itself and shared with back-end systems through the OpenBAT access point. The required documentation is now easily available and accessible on the wirelessly enabled tool and improves the accuracy and timeliness of maintenance, quality and product reliability reporting.

The wireless connectivity of the tool and the highly reliable Hirschmann OpenBAT access point combine to give manufacturers in machine building, automation products, automotive, industrial equipment and other key industries new ways to improve efficiency and quality.

Product Details

Hirschmann's OpenBAT family of access points provides optimal flexibility and permits tailor-made solutions, while maximizing cost effectiveness. Customers gain:

- Unparalleled flexibility with up to 8,000 possible configurations, for functions, protocols, WLAN and Ethernet ports, interfaces, power supply, installation concepts and certifications
- Unlimited reliability with ClearSpace technology, which reliably eliminates competing radio frequencies and guarantees stable WLAN connections at all times
- Industrially hardened devices able to operate in temperatures ranges from -40°C up to +70°C and withstand electro-static discharges up to 25 kV
- Comprehensive security functionality through Belden's unique and powerful HiLCOS operating system
- Electrostatic discharge (ESD) protection, which guarantees high reliable data transmission in industrial environments and longer product lifetime

Why Belden

With its best-in-class wireless connectivity products for industrial environments, Belden supports Bosch Rexroth's efforts to meet customer and worker needs for a wireless nutrunner. The availability of Hirschmann's industrially-hardened wireless access point gives Bosch Rexroth's customers a single-source solution for meeting various wireless protocols and collecting and transmitting reliable, real-time data. Now with a "smart" nutrunner, it's easy to document data and glean insights from seemingly simple tasks to help companies continuously improve their processes.



Bosch Rexroth's Nexo Cordless Wi-Fi Nutrunner, the first "smart" handheld nutrunner.



Connectivity is an integral part of all production equipment – from large-scale assembly lines and robots to handheld devices that perform fine-tuning tasks.



OpenBAT access point - innovative wireless technology that guarantees maximum WLAN availability.



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Belden Competence Center

As the complexity of communication and connectivity solutions has increased, so have the requirements for design, implementation and maintenance of these solutions. For users, acquiring and verifying the latest expert knowledge plays a decisive role in this. As a reliable partner for end-to-end solutions, Belden offers expert consulting, design, technical support, as well as technology and product training courses, from a single source: Belden Competence Center. In addition, we offer you the right qualification for every area of expertise through the world's first certification program for industrial networks. Up-to-date manufacturer's expertise, an international service network and access to external specialists guarantee you the best possible support for products. Irrespective of the technology you use, you can rely on our full support – from implementation to optimization of every aspect of daily operations.

Always Stay Ahead with Belden

In a highly competitive environment, it is crucial to have reliable partners who add value to your business. When it comes to signal transmissions, Belden is the No. 1 solutions provider. We know your business and want to understand your specific challenges and goals to show how effective signal transmission solutions can push you ahead of the competition. By combining the strengths of our five leading brands, Belden, GarrettCom, Hirschmann, Lumberg Automation and Tofino Security, we are able to offer the integrated solution you need. Today, it may be a single cable, switch or connector, to solve a specific issue; tomorrow, it can be a complex range of integrated applications, systems and solutions. With the rise in smart, connected devices brought on by the Industrial Internet of Things (IIoT), together, we can make sure your infrastructure is ready to handle and make sense of the influx of data. Transform your business now with instant access to information, and make your vision a reality. Visit info.belden.com/iiot to learn more.

About Belden

Belden Inc., a global leader in high quality, end-to-end signal transmission solutions, delivers a comprehensive product portfolio designed to meet the mission-critical network infrastructure needs of industrial, enterprise and broadcast markets. With innovative solutions targeted at reliable and secure transmission of rapidly growing amounts of data, audio and video needed for today's applications, Belden is at the center of the global transformation to a connected world. Founded in 1902, the company is headquartered in St. Louis, USA, and has manufacturing capabilities in North and South America, Europe and Asia.

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