M2M Research Series

Industrial Automation and Wireless IoT

Industrial Automation and Wireless IoT is the fourth strategy report from Berg Insight analysing the latest developments on the market for wireless IoT applications in industrial automation worldwide.

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- **In-depth analysis** of market trends and key developments.
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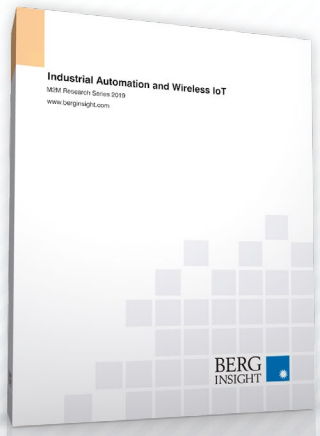

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BERG INSIGHT

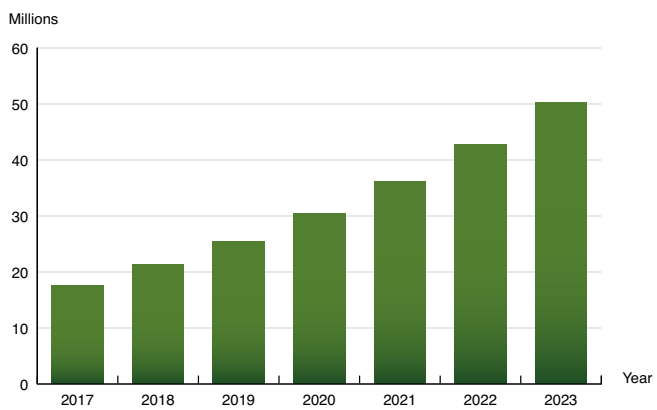
The installed base of wireless IoT devices in Industrial Automation to reach 50.3 million in 2023

Wireless technologies are integrated into a wide range of devices that can be used throughout an automation system, from the supervisor level all the way to the control and field levels. The devices can be broadly divided into two segments: automation equipment and network equipment. In the automation equipment segment, high-volume product categories featuring wireless communications capability include instrumentation such as industrial sensors, as well as wireless I/O and field devices that connect to sensors, actuators and machines. Important product categories within the network equipment segment are wireless access points, gateways, routers and switches.

The adoption of wireless solutions in industrial environments is often a gradual process and an initial deployment typically comprises clusters of wireless devices connected to an existing wired network. Although wired networking solutions are still predominantly used for industrial communications between sensors, controllers and systems, wireless solutions are widely used as wire replacement in hard to reach or hazardous areas, on moving machine parts and on portable equipment. Proprietary radio solutions have traditionally been used to support these use cases and is still used in many applications today. Standardised wireless technologies such as Wi-Fi, 802.15.4 and Bluetooth have advanced to become the leading wireless technologies for industrial applications. Cellular technologies based on 5G could expand the addressable market for wireless communications as it allows for deployments where requirements related to bandwidth, latency or capacity cannot be fulfilled today.

Berg Insight estimates that annual shipments of wireless devices for industrial automation applications including both network and automation equipment reached 4.6 million units worldwide in 2018, accounting for approximately 6 percent of all new connected nodes. Growing at a compound annual growth rate (CAGR) of 16.3 percent, annual shipments are expected to reach 9.9 million in 2023. The installed base of wireless devices in industrial automation applications is forecasted to grow from an estimated 21.3 million connections at the end of 2018 to 50.3 million connected devices by 2023.

Automation equipment such as wireless instrumentation is offered by many large automation vendors as part of complete systems for automation of industrial processes, but also by specialised providers.



Installed base of active wireless devices in industrial automation (World 2017–2023)

Emerson became the first company to market WirelessHART products in 2008 and is today the largest provider of wireless instrumentation devices. The company has an installed base of more than 42,000 wireless networks worldwide and serves many leading players across various process industries. Major wireless instrumentation vendors further include Yokogawa and Honeywell, which both provide field devices based on the wireless technology ISA100.11a. Pepperl+Fuchs significantly strengthened its position in the wireless field device market through the acquisition of MACTek in 2015, a provider of HART protocol devices. Other major industrial automation vendors that provide wireless field devices include ABB, Endress+Hauser, Schneider Electric and Siemens. Wireless I/O and field devices are also offered by a diverse range of players that are primarily active in the industrial communications and control markets.

Major providers of wired industrial network equipment also offer wireless solutions to enable customers to monitor and control devices wirelessly in parts of the plant that are normally not connected to the control room due to accessibility or wiring costs. These include Siemens, Cisco, Belden, Moxa and Phoenix Contact, which all offer comprehensive portfolios of industrial wireless devices such as routers, gateways and wireless access points. These companies typically partner with large automation vendors as a go-to-market strategy. Cisco has for example developed the Ethernet and IP-networking based architecture for industrial Ethernet applications – Converged Plantwide Ethernet (CPwE) – together with Rockwell Automation. Additional providers of industrial Wi-Fi devices are Acksys, Advantech, Antaira Technologies, Beijer Electronics Group, Data-Linc, Hilscher, HMS Networks, INSYS Microelectronics, MB Connect Line, MC Technologies, NetModule and Red Lion Controls.

Cellular and unlicensed ISM radio solutions are typically used for data acquisition and backhaul communications in distributed automation applications. The largest provider of cellular IoT gateways and routers in the industrial space include Sierra Wireless, followed by Cradlepoint, Cisco, Digi International, InHand Networks, HMS Networks, Maestro Wireless, GE's industrial communications group GE MDS, Robustel Technologies, Advantech, MultiTech Systems, NetModule and Eurotech. Major vendors of proprietary radio solutions are GE MDS, FreeWave Technologies and Banner Engineering.

This report answers the following questions:

- Which are the major applications for wireless IoT in industrial automation?
- Which are the leading wireless IoT solution providers for industrial automation applications?
- What offerings are available from device vendors, platform vendors and service providers?
- What are the key drivers behind the adoption of wireless IoT in industrial automation?
- What impact will technology advancements have on the market?
- How will the market evolve in North America, Asia-Pacific and Europe?
- Why is Big Data analytics and cloud solutions crucial for the future of wireless connectivity in industrial automation?
- How will connectivity strategies in industrial automation evolve in the future?

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Glossary

About the Author

Fredrik Stålbrand is an IoT Analyst with a Master's degree in Industrial Engineering and Management from Chalmers University of Technology. He joined Berg Insight in 2016 and his areas of expertise include IoT platforms and IoT/M2M applications in the industrial markets.

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