Summary

Executive summary

Wireless connectivity is instrumental in the Internet of Things era and the use of wireless solutions in industrial automation is increasing rapidly at all levels of automation systems. Industrial automation systems utilize wireless communication to connect remote and local facilities and equipment to increase operational efficiency. A wireless automation system contains a mix of network technologies, equipment and systems including enterprise and automation systems, network equipment, control devices and field devices. The most common wireless technologies in industrial automation include cellular, 802.11.x Wi-Fi, proprietary unlicensed ISM radio, Bluetooth, various LPWAN technologies and 802.15.4 based protocols such as WirelessHART, ISA100.11a and ZigBee.

Berg Insight estimates that shipments of wireless devices for industrial automation applications including both network and automation equipment reached 4.8 million units worldwide in 2015. Growing at a compound annual growth rate of 25.1 percent, shipments are expected to reach 18.3 million by 2021. The installed base of wireless devices in industrial applications is forecasted to grow at a compound annual growth rate of 27.7 percent from 14.3 million connections at the end of 2015 to 62.0 million devices by 2021. Wi-Fi is widely used for backbone communications as well as in monitoring and control applications within factory automation where Industrial Ethernet has got a strong foothold. Bluetooth is also popular – often as a point-to-point wire-replacement between for example a mobile HMI solution and a field device or control unit. 802.15.4 networks are often used to connect wireless sensors and instrumentation in process automation. Cellular connectivity is typically used for backhaul communication between plants, connecting remote devices in long haul SCADA applications and for third party access to machinery and robots. LPWAN technologies are increasingly used in certain low data, long range applications. Most of the major vendors of wireless IoT devices in industrial automation offer a wide range of devices with various wireless technologies in order to support many different applications.

Global automation solution providers such as Siemens, Emerson, GE, ABB, Honeywell, Schneider Electric, Yokogawa and Rockwell Automation are all major providers of wireless solutions to the automation industry. As wireless solutions have become increasingly popular, more and more major automation equipment and solution vendors are offering wireless technology as part of their solutions. Eaton is a major provider of Wi-Fi and cellular devices for industrial automation applications and Endress+Hauser and Pepperl+Fuchs are successful vendors of 802.15.4 devices. National Instruments offers a wide range of measurement and control equipment featuring embedded Bluetooth and Wi-Fi. Advantech, Murata and Kontron offer many of their automation products as well as their network infrastructure equipment with WPAN, WLAN and WWAN options.

Industrial communication specialists offer equipment and solutions for industrial automation networks and wireless is becoming a natural part of many major vendors' offerings. Phoenix Contact, Belden, Laird, Wago and Weidmüller are major vendors within industrial communications with thousands of employees which all have incorporated one or more wireless standards in their offerings. Red Lion, Softing, HMS Networks, Westermo, Moxa, FreeWave Technologies and B+B SmartWorx are industrial communication specialists renowned for their wireless offerings. Cisco is one of the largest vendors of communication infrastructure equipment and provides wireless WPAN, WLAN and WWAN devices to a wide range of industries, including industrial automation. Sierra Wireless, Telit, CalAmp and Digi International are major cellular M2M device vendors which provide products and solutions to the industrial automation industry.

Companies are now deepening the integration between industrial automation systems and enterprise applications and the promise of IoT is getting more tangible by the day. Large multinational corporations are beginning to systematically develop and adopt best practices to maximise the benefits of IoT technology in every part of their organisations. IT/OT convergence, smart factories, Industry 4.0 and the Industrial Internet of Things are concepts which are part of the ongoing evolution of industrial automation. Innovation in sensors, wireless connectivity, collaborative robots, big data and cloud solutions along with seamless exchange of information between devices, systems and people paves the way for improved performance, flexibility and responsiveness throughout the enterprise value chain.

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