Design and Implementation of ISA100 Wireless Field Devices for Automation and Manufacturing

Problem:

Wire connectivity and cabling is an issue in industrial systems. Traditionally, process automation vendors have been conservative and somewhat reluctant to adopt new technologies, such as ISA100 Wireless. However, with the growing portfolio of wireless devices and instruments that are now available with over a decade of service history, the benefits of offering wirelessly connected field instruments are very apparent.

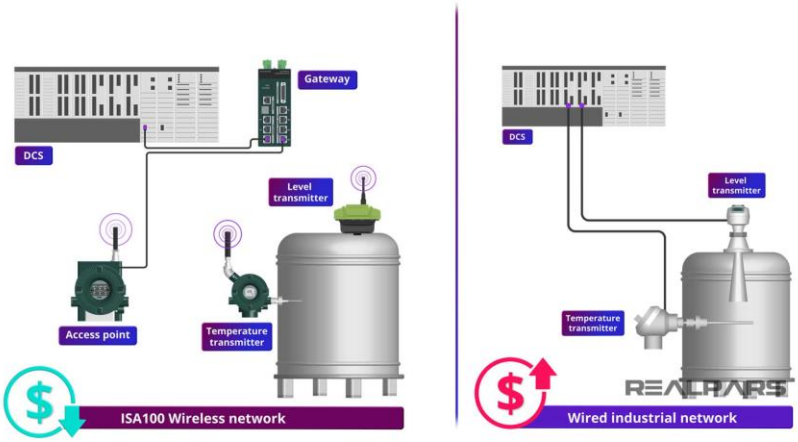

Figure: ISA100 Setting and Comparison with Tradition Wired Model (Picture from Realpars)

Solution:

ISA-100 can resolve some of the issues, such as reliability and high maintenance cost in wired field devices. The ISA-100 connected field devices offer several benefits, including:

a) Cost-efficiency: wireless instruments have significantly reduced installation costs as compared to wired devices.
b) Touch-free maintenance: ISA100 Wireless devices can be provisioned over the air, and configuration and upgrades do not require physical access to the instrument.
c) High reliability: ISA100 offer high level of reliability through mesh networking to relay the message to the controller.

Scope of the Project:

a) Design and implementation of a sensor/actuator board with built-in ISA-100 wireless connectivity
b) Mech networking capability of the sensor/actuator board to transmit messages to an ISA receiver.
c) The demo of the project consists of an environment monitoring sensor board that include multiple sensors such as pressure, temperature or humidity sensor, and an actuator that turns on a motor. These devices are connected to a central controller over ISA-100 wireless. The central controller process maybe a remote terminal unit (RTU) that receiving the data from the sensors and send control command to the actuators.

There are companies that are actively working ISA100 wireless field devices such as Yokogawa. Feel free to explore the companies such as this and their technologies for your reference.