PlantWeb University – Wireless 303

Near- Plant Wireless Applications
10 minutes

In this course:

1   **Overview**

2   **Automation challenges**

3   **A wireless solution**

4   **Benefits**

5   **Summary**

?   **Quiz**

Overview

Other courses in this series show how wireless technology can help you access information from **remote** operations many kilometers away, and from **in-plant** applications within a few hundred meters.

This course focuses on applications that are in between – often within sight but difficult to get to because of distance or physical barriers such as highways or rivers. These **near-plant** operations can include tank farms, loading and unloading stations, skids, water-treatment plants, and other isolated processes.

We'll examine the challenges of automating such applications and how wireless technology can overcome them – providing monitoring, control, and improved asset management capabilities where they were previously too difficult or expensive to implement.

At the end of the course you'll find a short quiz to help you confirm what you've learned – and earn valuable Reward Points.

| Hint |
| --- |
| As you go through the topics in this course, watch for answers to these questions:

■ How can you automate an operation without a DCS?

■ Which wireless technology is a good choice for linking near-plant applications with a central control room?

■ What FOUNDATION fieldbus capabilities are especially useful in near-plant applications? |

Automation challenges

Performance of near-plant applications can affect the efficiency and profitability of the total operation. Unfortunately, automating these applications with traditional wired connections can be both difficult and expensive.

Physical distance from the near-plant site to a central control room can make a wired connection expensive to install and maintain. Barriers such as rivers, highways, railroads, or other obstructions can increase the difficulty and cost. In many cases, the costs outweigh the potential benefits.

One option is to automate the near-plant area using local loops. This is not an ideal choice, however, because operators in the central control room won't have real-time information on process conditions.

A wireless solution

Controlling isolated near-plant applications – while still allowing operators to interact with the process from a central control room or elsewhere in the main plant – calls for a combination of technologies: **wireless** and **FOUNDATION fieldbus**.
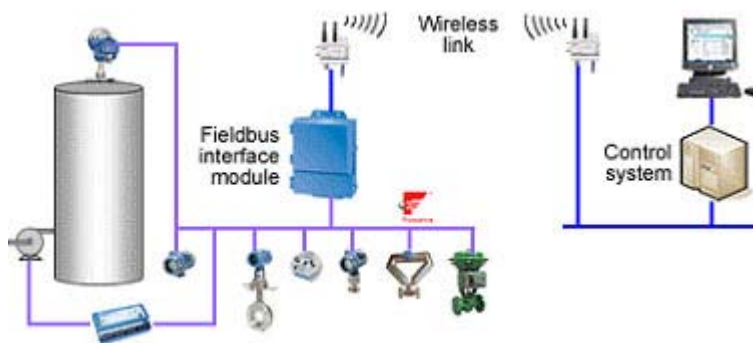
Combining FOUNDATION fieldbus and wireless technology provides a cost-effective way to automate near-plant applications.

Wireless alone may not provide an ideal solution because the fast update rates often required to execute real-time, closed-loop control can reduce the battery life of wireless devices.

That's where FOUNDATION fieldbus comes in. Besides measuring and communicating process variables, many FOUNDATION fieldbus devices also use built-in microprocessors and software to enable **control in the field** – control algorithms that execute within the devices, not in a central DCS. *(For more about this technology, see the series of PlantWeb University courses on* **FOUNDATION fieldbus**.*)*

This capability eliminates the need for high-speed communication between the near-plant area and the control room. With the appropriate function blocks, FOUNDATION fieldbus devices can even provide functions such as compensated flow, tank volume and temperature averages.

To enable operators to monitor and interact with the process, these FOUNDATION fieldbus loops are linked to the control room **wirelessly** using a radio-equipped fieldbus interface module.

Several wireless technologies are capable of providing this link. **Wi-Fi** – also known as IEEE 802.11 or wireless Ethernet – is often a good choice because of its high bandwidth and proven reliability.

The Emerson Advantage

Emerson's Rosemount 3420 Fieldbus Interface Module provides easy connectivity between control systems and FOUNDATION fieldbus segments by offering Ethernet, Modbus, and OPC integration into legacy hosts. Standard serial interfaces such as RS485 and Ethernet also simplify use with a wide selection of wireless technologies.

The 3420 is easy to use. It automatically detects any connected fieldbus devices and identifies them by tag name – so you don't have to know a device's address or even how it is physically connected. The 3420's embedded web server also lets you use it independently of a control system for configuration, trending and alarming.

Benefits

Combining fieldbus and wireless technologies provides a cost-effective way to automate near-plant applications.

The benefits of automating near-plant operations are similar to those for any other application. Tighter control can improve consistency, throughput, and energy efficiency, while automated monitoring provides information needed for better decision-making – without the cost, errors, and delays of manual data-collection.

Wireless technology offers a cost-effective way to overcome the distance and physical barriers that previously made it too difficult or expensive to gain these benefits. Now operators can have easy access to real-time information about what's happening in near-plant applications, and when necessary can interact with the process from the control room or – when equipped with portable PCs linked to a wireless control network – from wherever their work takes them in the plant.

Besides the control in the field capabilities described in the previous section, including FOUNDATION fieldbus in the solution brings additional benefits. For one thing, FOUNDATION fieldbus can be easier and less costly to install than traditional analog technology.

Perhaps more important, digital FOUNDATION fieldbus technology also enables the devices to provide information on their own status, including **diagnostics**. Diagnosing potential problems from the control room or maintenance shop reduces "equipment check" trips to the field – which often reveal that the device is operating properly – as well as time spent locating and fixing problems that do occur. The advantage is even greater for devices in remote or hazardous areas.

Diagnostics can even help you identify conditions that could lead to problems in the future – so you can take corrective action before operations are affected.

*For more about this technology, see PlantWeb University's series of courses on **FOUNDATION fieldbus**.*

The Emerson Advantage

Emerson's Rosemount 3420 Fieldbus Interface Module communicates all diagnostic information from FOUNDATION fieldbus devices to our AMS Suite: Intelligent Device Manager asset-management software. The software provides an efficient and simple interface to the many diagnostic and status conditions that are available in FOUNDATION fieldbus products, as well as configuration, audit trail, and calibration support.

Summary

In this course you learned that wireless technology can be part of a solution for overcoming barriers that previously made automation of "near-plant" applications too difficult or expensive.

This solution combines FOUNDATION fieldbus with wireless technology. Fieldbus devices provide control functions independently of a central control system, while the wireless link enables operators to remotely view and interact with the application.

With the right FOUNDATION fieldbus devices, interface module, and asset-management software, you'll also gain access to valuable equipment information and diagnostics – which can provide even greater value.