

Cellular Wireless: A New Communication Option for Industrial Automation

ProSoft Technology[®], October 2009
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Introduction

As wireless communication has proven itself as a valuable tool in the industrial automation arena, the number of options has grown to meet application-specific needs. With the introduction of industrial cellular wireless communication, manufacturers have another wireless alternative. As with any tool, the key to deriving maximum benefits from cellular wireless communication is to determine if its capabilities suit an application's needs and understand the steps required for effective implementation.

Geographic dispersity

For applications in which the devices requiring connection are geographically dispersed, cellular wireless communication eliminates the need to build a large infrastructure and install numerous repeater radios.

For example, an OEM manufacturing equipment builder installing equipment throughout North America or even globally may want to sell a service package with the equipment. Cellular wireless communication eliminates the need for an Internet connection and concern about getting an Internet drop within the factory or plant or connectivity issues like getting through an IT firewall. It also offers security since it is only plugged in when a connection is desired.

Consider a systems integrator who has just commissioned or is in the process of commissioning equipment and maybe an eight-hour drive or four-hour plane ride away from a customer. The integrator may get a phone call and learn that a 10-minute fix is required. Instead of investing the time and expense of driving or flying to the location, with cellular communication the integrator can ship a cell modem to the customer where it can be attached to the equipment and the problem can be solved remotely.

Costs

In selecting a wireless communication option, users need to evaluate capital versus operating costs. In situations where a tower site has to be erected to elevate an antenna high enough to make a link work, comparing that cost with the operating costs of cell modems and data plans often demonstrates that a cellular solution is the best choice.

With carriers like AT&T and Verizon now serving the Machine-to-Machine (M2M) market, the cost of data plans have become very reasonable and available to meet specific user needs.

Since cellular communication has built in security, users can put up Virtual Private Network (VPN) tunnels between their remote devices and the headquarters where they are bringing the data.

Another cost saving benefit for the user is that there is no need to buy and install numerous extension cables and place antennas. Cellular modems can be placed right next to the device making installation simple. For large outdoor applications, there is no need for a study of paths between sites to determine what obstacles might interfere with transmission.

Existing infrastructure

Since cellular communication is a well-established technology with a widely distributed secure infrastructure, it offers some distinct advantages such as eliminating concerns about interference.

Unlike Wi-Fi, cellular is a frequency that is licensed, managed by the carriers, and is more controlled, assuring users of the availability of bandwidth. With Wi-Fi, the proliferation of access points continues to expand creating concerns about sharing bandwidth.

Implementation

Once it has been determined that cellular communication is an optimal solution, it is essential to select an industrial cell modem that meets the application's requirements including operating temperature and hazardous location rating. In addition, selecting a product that has an enterprise management tool versus a device management tool allows users to manage a large network of devices from a single screen. Cell modems can be monitored globally and firmware or settings can be changed globally.

Technological advanced modems with embedded intelligence provide reliable, persistent network connectivity. The intelligence enables the modems to give real-time device status and health information including network connectivity, throughput and signal strength as well as enabling over-the-air device configuration and firmware updates. Although these connections are always on, they have been designed so that users only pay for the data that is transmitted over the connection.

Working with a cell modem supplier with extensive knowledge of implementation is critical. Suppliers' expertise enables users to select the appropriate data service carrier and features. For example, suppliers to the industrial marketplace should be able to aid users in determining whether or not static or dynamic, public or private Internet Protocol (IP) addresses are required for their particular application.

Additionally, working with a supplier with an understanding of the devices, industrial protocols and applications being connected is imperative to ensure successful configuration. Value-added support from a supplier can help users understand the impact of cellular communication's latency on the application as well as determine data rate requirements and advise how needs can be met cost effectively.

As a new option for industrial automation, cellular wireless offers manufacturers an innovative solution to specific communication challenges. While today's sophisticated industrial modem technology is a powerful tool, its effectiveness depends on in-depth understanding of its capabilities and implementation requirements.