



Wireless Communication in Monitoring and Control Systems

Industrial wireless communication opens up many new possibilities for highly flexible and efficient automation solutions. They are suitable for indoor and outdoor use. When used in the fields of remote control and remote maintenance, they bring outstanding benefits. The most tedious part of the industrial automation system is the laying of tens of thousands of feet of cabling; then having to check the cable labels before wiring them. If the wrong cables have been connected to the wrong modules then you will need to find right ones or replace them. The entire process can take days to do. In addition to wiring issues, there are also wiring costs, labor costs and cable costs. Besides these costs, there are other reasons that will make choosing a wireless communication system, the right choice. In this essay, I am going to give an example of benefit of the usage of wireless communication in monitoring and control systems and I provide you a solution.

Briefly, let's take a look at one of our customer's problem in 2014. They are a very good customer of ours and they were coming up on a project deadline. They had laid all of their cabling out and were connecting their controllers when they found that one of the communication cables had been routed to the wrong room. The problem was that all of the cabling structures were buried in the ground and were almost impossible to reach to correct. Re-cabling was the obvious solution but there was another problem; the type of cable used is a very specific type of cable and is hard to find in the market. The cable had to be reordered from the manufacturer and it took 10 days to be delivered. In total, it took almost 2 weeks to correct a single cabling mistake.

About six months ago, we came out with our new line of Wireless Zigbee Products and immediately thought about this customer. Upon sharing this information with him, he embraced our zigbee products as the way he was going to specify in large and small communication projects.

Here is the solution that would have saved our customer time and money.

Zigbee Wireless:

ZigBee is a specification based on the IEEE 802.15.4 standard for wireless personal area networks (WPANs). ZigBee operates in the ISM radio bands, and it defines a general-purpose, inexpensive, self-organizing, mesh network for industrial controls. It can also be used for embedded sensing, medical data collection, smoke and intruder warning, building automation and home automation.



The three topologies defined in the IEEE 802.15.4 are standard, Star, Cluster Tree and Mesh. There are three different types of ZigBee devices in a ZigBee network: coordinator, repeater and slave converter which includes our Zigbee IO modules which have built in IO to save even more wiring costs.

Coordinator (Master): Only one coordinator exists in each ZigBee network

ZT-2550 - RS-485/RS-232 to ZigBee Converter, communication up to 700 meters
http://www.icpdas-usa.com/zt_2550.html

ZT-2570 -Ethernet/RS-485/RS-232 to ZigBee Converter, communication distance up to 700 meters
http://www.icpdas-usa.com/zt_2570.html

ZT-USBC- USB to ZigBee Converter. Communicates up to 60 Meters (196 feet)
http://www.icpdas-usa.com/zt_usbc.html

Repeaters: To bridge the data gap from node to node where distance or signal strength need to be extended.

ZT-2510-ZigBee Repeater to extend communication distance up to 700 meters.
http://www.icpdas-usa.com/zt_2510.html

Slave Converters

ZT-2551 - RS-485/RS-232 to ZigBee Converter, communication up to 700 meters
http://www.icpdas-usa.com/zt_2551.html

ZT-2571- Ethernet/RS-485/RS-232 to ZigBee Converter, communication distance up to 700 meters.

http://www.icpdas-usa.com/zt_2571.html

In general, the ZigBee protocols minimize the time the radio is on, so as to reduce power use. In beaconing networks, nodes only need to be active while a beacon is being transmitted. In non-beacon-enabled networks, power consumption is decidedly asymmetrical: some devices are always active, while others spend most of their time in sleep state. Applications include wireless light switches, electrical meters with in-home-displays, traffic management systems, and other consumer and industrial equipment that requires short-range wireless transfer of data at relatively low rates can use ZigBee as a solution. The technology defined by the ZigBee specification is intended to be simpler and less expensive than other WPANs.

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