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Wireless Anywhere: Leading the way for wireless process solutions?

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Wireless Anywhere: leading the way for wireless process solutions

Following the announcement that Yokogawa's 'Wireless Anywhere' concept was given the Frost & Sullivan 2014 Global Enabling Technology Leadership Award, in its wireless solution category, *Suzanne Gill* found out why.

The implementation of field wireless systems enable field devices and host-level monitoring and control systems to communicate wirelessly. This allows for the placement of field instruments or analytical sensors in traditionally hard-to-wire locations, eliminating the need for cables reducing installation costs, and offering more valuable, but previously unavailable, process data.

Process industries today are becoming increasingly dependent on wireless solutions to enable better connectivity and productivity and this is also resulting in an increasing number of field devices, and the need for more robust systems and products.

Frost & Sullivan has noted an increased demand for both process control and remote monitoring of field assets to help improve operational performance and efficiency and it advises that 'a balanced approach to solution development and deployment is required for the connected wireless industry to ensure competitiveness and increased productivity.'

Yokogawa was presented with the award by Frost & Sullivan for its efforts in developing ISA100 Wireless solutions to enable high-reliability, openness, and interoperability. Frost & Sullivan evaluated a variety of wireless offerings, based on whether they enabled the creation of new products, enhanced current products, enabled new applications, had potential for market acceptance, and had a breadth of access to technology.

Yokogawa released the world's first ISA100.11a compliant wireless system devices and wireless pressure and temperature transmitters in 2010 and launched its Wireless Anywhere concept in April 2013 to promote the plant-wide use of field wireless systems through the development of ISA100 Wireless devices. In December 2013, the company launched a wireless communications module with a built-in antenna, designed to shorten the time required for developing wireless solutions.

About ISA 100.11 a

ISA100.11a is an International Society of Automation (ISA) communications standard for field wireless systems. ISA100 Wireless is a technology based on the ISA100.11a standard. It includes ISA100.11a-2011 communications, an application layer with process control industry standard objects, device descriptions and capabilities, a gateway interface, infrared provisioning, and a backbone router.

ISA100.11a is also compatible with wired communications standards such as FOUNDATION fieldbus, HART and PROFIBUS. ISA100.11a is said to have a number of key strengths – it is topology flexible so can be employed in any topology when used in non-critical applications. The devices can have different roles and can act as an I/O device, a routing device or an I/O and routing device. This can offer benefits to end-users as an I/O device will consume less power as it does not have to route. The system also uses high sensitivity, low power radio's and ultra-low power electronics which allow for a combination of low-power consumption and a standard distance of 600m line of sight.

To be suitable for use in control applications wireless networks must possess the necessary reliability and deterministic data transfer capabilities. ISA100.11a supports reliable radio technology and offers good coexistence with other wireless networks.

With bidirectional digital wireless networks based on ISA 100.11a, the measurement values, device diagnostics and parameter data transferred between a control system and field devices are security encrypted. However, Yokogawa does suggest the use of a redundant star topology to provide the level of reliability needed for critical monitoring and process control applications. To provide the best determinism, high communication speed, low latency and the multiple route communications needed for process control applications.

The next step in this programme is expected to be released later this year – a series of multi-protocol wireless adaptors to enable wired field instruments or analytical sensors to be used as ISA100 Wireless devices. The adaptors will be suited to use with any type of wired field instrument or analytical sensors commonly used in plants, and will be compatible with devices from a range of vendors.

Henk van der Bent, marketing manager field networks at Yokogawa Europe, explained more about the devices. "The first device coming to market will be a HART adapter. This can be connected to a powered HART device, but is also able to power a HART device

and communicate its process variables into the ISA 100 network, while the HART data can still be sent to the asset management system, where it is visualised using the device's HART DTM." The adaptor family will also be joined by a device aimed at RS485 Modbus standards and there are plans to introduce additional versions to cover other standards.

Adaptors

The adaptors consist of two components – an electronics box and a wireless communications module with built-in antenna – both certified for use in hazardous areas. The communications-antenna module is available as a separate unit, and this will be offered to other automation vendors who might want to develop ISA100 devices. Frost & Sullivan highlighted this development as an example of Yokogawa's best practice, stating that 'it will help to foster strong development of industry specific applications in a cost-effective manner.'

Today, most field wireless systems are still installed in relatively small areas with limited applications. However, the growing demand for monitoring and process control requires components with speed and scalability, as well as reliability. Frost & Sullivan believes that Yokogawa's customer centric approach has enabled it to implement a plant-wide field wireless system that will provide effective coverage across the entire plant, The Wireless Anywhere architecture incorporates reliability, high speed capabilities across long distances, creating an intricate wireless infrastructure that supports the inclusion of third-party field wireless devices and varied protocols and hosts to provide best in class solutions,' it said.

Concluding Frost & Sullivan said: 'Yokogawa is focused on fusing openness, interoperability and reliability not a total wireless solution. Through the adoption of ISA100 Wireless, the company has truly enabled a compatibility link between wireless and wired solutions, opening the path to the vision of the field digital evolution in the concept of an ideal plant."

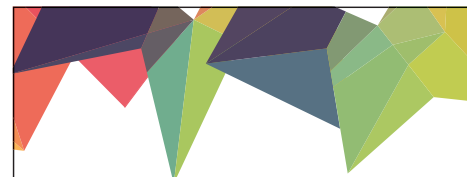## The Wireless Anywhere concept

With its Wireless Anywhere concept Yokogawa advocates the use of ISA100.11a full functional field wireless systems throughout plants. It is pursuing the following three initiatives:

1. Modularising wireless components to accelerate product development - Yokogawa will develop modularised wireless components that incorporate the various technologies in its field wireless devices. This will make it easier for vendors to implement the ISA100.11a technology in new sensor products, and accelerate time to market.

2. Promoting adoption of the ISA100.11a standard - Yokogawa will work with other members of the ISA100 Wireless Compliance Institute (ISA100WCI) to increase the number of ISA100WCI member companies and promote acceptance of the ISA100.11a standard, expanding the field wireless market. To make a wider range of ISA100.11a-compliant products available to the market, Yokogawa will supply modularised components to other vendors.

3. Facilitating host connectivity for both wired and wireless field networks - To encourage the use of field wireless systems in both monitoring and control applications, Yokogawa is seeking to improve the effectiveness of plant-wide field digital networks by making it possible for wired and wireless field devices and systems to connect with host monitoring and control systems. The company is developing technologies that ensure host systems and field devices can communicate with each other using a variety of protocols.