Manage wireless networks from a central location with IWLAN Controller

Innovative Industrial WLAN solution is the foundation for a giant technological leap for CP Kelco

The food company CP Kelco, one of the world’s leading producers of pectin, is in the process of rolling out a controller-based, wireless network in its Danish factory. Working with iPads and QR codes, this will deliver tremendous benefits – significant reduction in costs and time as well as unprecedented flexibility.

Imagine production without stationary operator stations and push buttons, a production in which each operator instead moves around freely with an iPad, monitoring and managing his or her machines quickly and efficiently – without the need for a stationary computer and IP addresses.

This is the vision that the Danish factory of the global food company CP Kelco in Lille Skensved, outside Køge, is striving toward. The key to transforming this vision into reality is a controller-based, wireless solution from Siemens, which makes it possible to connect production to several dozen wireless access points, thus minimizing administrative work.

Throughout 2013, project engineer Jesper Knage and his colleague Henrik Parbo tested a wireless solution with one SCALANCE WLC711 IWLAN-controller and a variety of access points on a limited section of their large production line. They were so successful that, by the end of the year, they were given the green light to implement the solution throughout the factory.

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“This factory is constantly changing. We may be one of the factories that undergoes the most changes in a year because we are constantly optimizing the controls of existing equipment and building new ones,” explains automation engineer Henrik Parbo.

**Avoiding a hopeless administrative task**

The automation division has used Industrial Wireless LAN (IWLAN) technology before, but only for programming. Operator interfaces, for example, were not connected to the wireless network.

The six access points were each configured individually and through their own website. Thus, if a new user needed to be added or the selected channels needed to be changed, these changes had to be made at each access point. For six access points, this was easy enough of course. But for a production of CP Kelco’s size, for which a fully developed network would need up to 100 access points, it would be a hopeless administrative task,” says Henrik Parbo.

"We had just six of these, and that was already more work than we could manage. We could see that we could not implement a full rollout in the factory using that technology. We needed a tool that would allow us to see everything at one control point and make changes at one place."

**Troubleshooting ten times faster**

This is where the controller-based solution of Siemens came in. The signal strength and channel selection of the individual access points is continuously optimized. The entire management and configuration – for instance the downloading of firmware and IP addresses – are carried out in one place. In other words, there is no need for individual configuration of each access point, no laborious plowing through hundreds of websites to perform troubleshooting. If one access point shuts down, the two nearest access points increase their signal strengths and cover the gap left by the failed access point. In addition, the diagnostic options have also been combined, providing a much better overview.

"Now we can open one website, look through it, and perhaps see that an access point is lighting up in red. This means that we can provide the individuals troubleshooting the fault a better indication of where it might lie,” says Jesper Knage, adding, “In a fully connected network, troubleshooting speed is ten times faster. That’s just fantastic.”

**Most advanced in Denmark**

The solution is now being rolled out, with the expectation that the factory will, over time, be equipped with up to 100 access points. Thus, with the Siemens controller-based Industrial Wireless LAN – the accurate term for this technology – CP Kelco is the most advanced company in this country.

"We thought that it was probably time to take a chance and try to make our production wireless so that our operators could move around with tablets and smartphones instead of being bound to expensive, fixed operator stations. The various technologies were available, so it was really just about taking a chance. And we've done that successfully," says Jesper Knage.

**A constantly changing factory**

CP Kelco primarily manufactures food ingredients, such as pectin and carrageenan, which are used as thickening agents and stabilizers in many products that we use on a daily basis – from jams and dairy products to sunscreens, lotions, and toothpaste.

Moving around in the factory, one notes smells alternating between a tea shop and the seaside, between citrus fruit and dried seaweed. Each year, several hundred thousand tons of citrus peel and dried seaweed is delivered to Lille Skensved. These are then processed into pectin and carrageenan. This means that large quantities pass through production in a very short time, with high demands on quality and flexibility as well as rapid changeover between the different types of items being produced. Up to 200 different products are shipped from Lille Skensved to the world’s markets.
One access point replaces four operator stations

The rollout of the wireless solution is currently far from complete. But a subsequent tour of the factory serves to highlight why Jesper Knage is already very excited about the new solution. For deliveries of dried citrus peel – or pomace in trade jargon – on large pallets, individual operator stations are still being used (more specifically, four of them) at a unit price of roughly €11,000.

Jesper Knage estimates that this will be done in the future with one, or at most two, access points and a tablet or smartphone – at a third of the cost.

A second, much larger hall houses a row of pressure filters in which the peels are cleaned of impurities. Previously, there were push buttons mounted on each machine, but they are now being replaced by two access points that afford wireless access to all machines.

Operation moved into production

One of the advantages of the wireless network is related to maintenance and service. Jesper Knage believes that there are also great potential rewards to be gained in daily operations. CP Kelco aims to equip each machine and all process instruments in production with a QR code, so that, by scanning a component’s code, production employees can monitor the device or access operational data and parameters. In other words, operation can be moved to the production line, rather than being done from a desktop PC located in the central control room.

If a particular valve needs to be opened, the operator can stand next to the machine with a tablet or smartphone in hand and open the valve. If a bag of a particular substance needs to be poured into a hopper, the employee does not need to search the order book and match the order number with the bag contents and hopper number. The operator only needs to scan the code, and the iPad will indicate what needs to be done.

Finally, the QR codes also allow the operator to create a maintenance order directly in SAP while standing next to the defective equipment. The relevant data is recorded automatically, which ensures that the correct component failure is reported. All of these productivity improvements are only possible because the controller-based solutions minimize setup and maintenance.

“As such, there were no alternatives. It had to be a centralized solution so that we would not be overburdened administratively. There are certainly other suppliers, but we needed the technology and reliability. So of course, the wisest choice was an industry supplier such as Siemens, rather than an office supplier,” says Jesper Knage.

“Everything works together”

One of the prerequisites for implementing this complex solution is robust industrial components that are not only extremely reliable but can also be used in aggressive and even potentially explosive environments. Another prerequisite is that the solution consists of technologies that have all achieved a certain stage of maturity. “All of the utilized technologies, such as iPads, operating system, Wireless LAN, etc., reached this maturity some time ago. But it is only now – at least for us – that we are finding that everything works together,” adds Jesper Knage.

According to him, the next step is to set up another controller so that the system has full redundancy. In addition to the ongoing rollout of the wireless network in production, consideration is also being given to connecting the administrative network to the controller solution, so that both production IT and administrative IT are controlled in one common network and multiple virtual networks.
Various services, security requirements, and access criteria can be managed reliably with the IWLAN controller. Additionally, the wireless upgrade of an existing Ethernet network is possible without any changes to the network infrastructure.

Can be used widely in the industry

The controller-based Industrial Wireless LAN solution can be used not only at processing companies such as CP Kelco, but in all types of manufacturing companies having more than 10 to 12 access points. Controller-based solutions offer tremendous flexibility and can achieve significant time and cost savings.

“This is a viable solution for many industrial companies and can be used in a variety of different areas,” says Jesper Knage.

Technical information:

CP Kelco currently has the following installed:
- 1 x IWC 711 (Industrial Wireless LAN Controller)
- 21 x SCALANCE W786C-2IA RJ45 (450Mbps, Industrial Wireless LAN access points)
- 9 x SCALANCE X308-2M PoE (Modular PoE, Industrial Ethernet switches)
- 1 x SINEMA Server V12 (diagnostics and monitoring software)

About CP Kelco

CP Kelco is one of the world’s leading manufacturers and suppliers of food ingredients. Since 2004, the company has been owned by the American company J.M. Huber Corporation. It has manufacturing plants in Europe, the USA, Asia, and Latin America.

End products include pectin, carrageenan, xanthan gum, and cellulose gum, which are used to improve texture, consistency, and stability. These products are used in a variety of foodstuffs, for example dairy products, ham, and jam, as well as in pharmaceuticals and toothpaste.

CP Kelco’s Danish factory produces pectin and carrageenan. 98 percent of the production is exported. The company has approximately 2,200 employees worldwide, including 360 in Denmark.