Leading Tools Manufacturer Transforms Operations with IoT

Stanley Black & Decker turns to Cisco and AeroScout for visibility and productivity gains in Latin America plant.

Executive summary

Customer name:
Stanley Black & Decker, Inc.

Industry:
Manufacturing

Location:
Reynosa, Mexico

Number of employees:
52,000 worldwide

Challenges

- Transparency of real-time production to schedule
- Actual labor costs exceeding standard costs
- Understanding effects of shift changes and resource shifts from line to line
- Visibility to real-time overall equipment effectiveness and line productivity and reducing production line change over time

Solution

- Implemented AeroScout Real-Time Location System (RTLS)
- Cisco® Wi-Fi infrastructure and plantwide Ethernet

Results

- Provided 24 percent increase of Overall Equipment Effectiveness (OEE) On the router production line
- Allowed faster decision making because of immediate notifications of any issues
- Reduced labeling DPMO by 16 percent
- Realized labor utilization improvements from 80 to 92 percent
- Provided better labor ergonomics (line layout redesign to reduce excess of motion and repetitive movements) and reduced labor training
- Increased throughput by around 10 percent
- Reduced inventory or material holding costs by 10 percent
- Empowered employees on the line to notify supervisors of product quality problems
- Provided visibility to the line managers to immediately react to line issues

The challenge:
Managing manufacturing complexity

Stanley Black & Decker Inc., an S&P 500 company headquartered in New Britain, Connecticut, is a leading global provider of hand tools, power tools and related accessories, mechanical access solutions, electronic security and monitoring systems, and products and services for industrial applications. The company operates one of its largest tool manufacturing plants in Reynosa, Mexico, which serves the North American market. Opened in 2005, the Reynosa plant primarily manufactures dozens of products, such as jigsaws, planers, cordless drills, floodlights, and screwdrivers for the DeWALT brand and lawnmowers for the Black & Decker brand. With 40 multiproduct manufacturing lines and thousands of employees, the plant produces millions of power tools each year.

Managing this scale of production and manufacturing complexity can be a challenge. Like many large enterprises, Stanley Black & Decker strives to bring together line-of-business decision makers with experts from Operational Technology (OT) and Information Technology (IT). In order to integrate technology solutions into business operations, the Stanley Black & Decker team relies on line-of-business, OT, and IT experts to determine which issues are the most pressing, how to approach these fixes and improvements,

and what approaches are best suited for root cause remediation. As part of its continuous improvement strategy, Stanley Black & Decker sought to give all the plant managers an equal seat at the table to drive priorities.

According to Nick DeSimone, Global Vice President of Manufacturing for the Professional Power Tools Division, "Our company has an international and diverse manufacturing footprint. Better enterprise visibility and access to real-time information are critical to drive faster decision making. The technology proven at Reynosa will serve as the catalyst to achieving similar operational benefits from product to product and from plant to plant in Reynosa."

After management decided on the appropriate solution investment approach, it had to test the new technology based on a highly networked factory floor. The team selected the Reynosa Mexico manufacturing facility and its router production line, which produces nearly three dozen models of router power tools. The line requires quick changeovers and demands that assets be managed efficiently. Questions on transparency of the schedule and production output, updates on quality, and effect of shift changes were all issues management wanted to improve on this complex line.

Management at the Reynosa plant understood the potential benefits that real-time production metrics provide to operations and looked to integrate technology with its people to realize aggressive cost savings goals.

"With the help of the Cisco and AeroScout Industrial solution, we are on our way toward realizing our vision of a virtual warehouse and fully connected factory, with complete visibility and traceability."

Gary Frederick
Chief Information Officer
Stanley Black & Decker Industrial Division

Built for IoT: Gaining production visibility and flexibility

As constant connections become more important, companies are relying on the network of physical objects accessed through the Internet to connect people, places, and things, referred to as the "Internet of Things" (IoT). Stanley Black & Decker's plant in Reynosa is a textbook example of IoT through its fully connected production lines with Real-Time Location System (RTLS), powered by Cisco's robust wireless network and AeroScout Industrial's leading enterprise visibility solutions. The RTLS includes small and easily deployed Wi-Fi RFID tags that attach to virtually any material and provide real-time location and status to assembly workers, shift supervisors, and plant managers.

For nearly a decade Stanley Black & Decker relied on a Cisco Unified Wireless Network infrastructure to provide a scalable and high-performance networking platform for its Reynosa plant. Having wireless enabled by Cisco throughout the plant meant Reynosa did not have to spend the resources laying the network, but could use those strong connections to better inform its employees and ultimately provide value to its end customers. During the RTLS implementation, management further took advantage of the networked facility by using Cisco access points to offer mobile access to production line information through plant floor managers' tablets and smartphones.

Along with AeroScout Industrial, the Reynosa plant deployed visual and executable dashboards to keep production floor managers up to the minute, making sure of a high-quality end product that is produced and delivered on time. For example, because the AeroScout Wi-Fi tag is integrated with the Programmable Logic Controller (PLC) of the quality scale at the end of the line, good and bad production results are immediately sent when the router box is weighed at final test.

The RTLS tags, which connect throughout five inventory lines, track production as it happens. This means that floor managers are constantly aware of each line's output, whether production needs to speed or slow to meet daily targets, and how quickly employees are completing their respective stages of production. With increased visibility across operations, managers looked to better understand how to remove obstacles preventing the plant from achieving greater efficiency.

The results: Measurable business outcomes

After the initial implementation was completed, direct cost benefits became immediately apparent. On the router production line, Overall Equipment Effectiveness (OEE) increased by 24 percent, and significant cost savings are already estimated just for one line because labor needs are more clearly defined. According to Mike Amaya, plant manager, Reynosa Operations, "The RTLS solution helps us maintain throughput in the line, which allows us to hit our production targets on time. Any bottlenecks in material flow immediately get identified and addressed."

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With more accurate work in process data than ever before, Stanley Black & Decker's Reynosa plant can keep its materials and components inventory as low as possible and consequently lower the costs associated with housing and managing that inventory. Detailed information and visibility around inventory also mean Stanley Black & Decker offers greater service to customers by providing accurate delivery schedules. Because the company can confidently identify the status and location of its inventory and products, customers also gain detailed insight into the status of their orders.

Greater visibility into labor hours has delivered a better understanding of how employees, the company's greatest asset, are being utilized. As a result, the plant has achieved an estimated 10 percent greater labor efficiency and better use of labor critical resources, improving utilization rates from 80 percent to 90 percent.

Amaya describes the benefits IoT has provided: "We now have products and machines talking to the Internet, and we are able to monitor and control production almost automatically." In addition, the solution has resulted in quality improvements (first-time pass defects per million opportunities, or DPMO, were reduced 16%) and in faster decision making and reaction time. Amaya continues, "Supervisors can now react more quickly because they get notifications of issues much earlier. The improved visibility means you can look at trends and material flow and fix any issues in the middle of the shift."

The Wi-Fi-enabled RTLS solution has truly increased information sharing, driven operational efficiency for Reynosa, and provided managers with the details needed to continue not just to cut costs, but also to maximize production and accelerate time to market.

Next steps: Plantwide rollout

The Reynosa team will deploy the Cisco and AeroScout Industrial solution to the rest of the production lines in the factory. In addition, the hope is to use additional tracking capabilities to realize the vision of a completely virtual warehouse where materials and components are tracked seamlessly and can be directly routed to deliver the right materials to any given production line. Gary Frederick, chief information officer, concludes, "With the help of the Cisco and AeroScout Industrial solution, we are on our way toward realizing our vision of a virtual warehouse and fully connected factory, with complete visibility and traceability."

For more information

To find out more about Cisco manufacturing solutions, go to www.cisco.com/go/manufacturing.

To find out more about Cisco wireless, go to www.cisco.com/go/wireless.

To find out more about the AeroScout and Cisco solution, go to www.cisco.com/web/strategy/docs/manufacturing/cisco-aeroscout-pov.pdf or www.aeroscoutindustrial.com

To learn more about the Cisco IoT solutions, visit: www.cisco.com/go/iot

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Nick DeSimone
Global Vice President, Manufacturing
Stanley Professional Tools Division

Product list

Routing and switching
- Cisco 2911 Integrated Services Router
- Cisco Catalyst® 3750 Series Switches

Wireless
- Cisco Unified Wireless
- Cisco Aironet® 1200 Series Access Points

Partner products
- AeroScout MobileView Software
- AeroScout Wi-Fi Active RFID Tags