AUTOMATION SENSORS TREND WATCH

ETHERNET SENSORS UNLOCK SIGNIFICANT ADVANCES IN AUTOMATION

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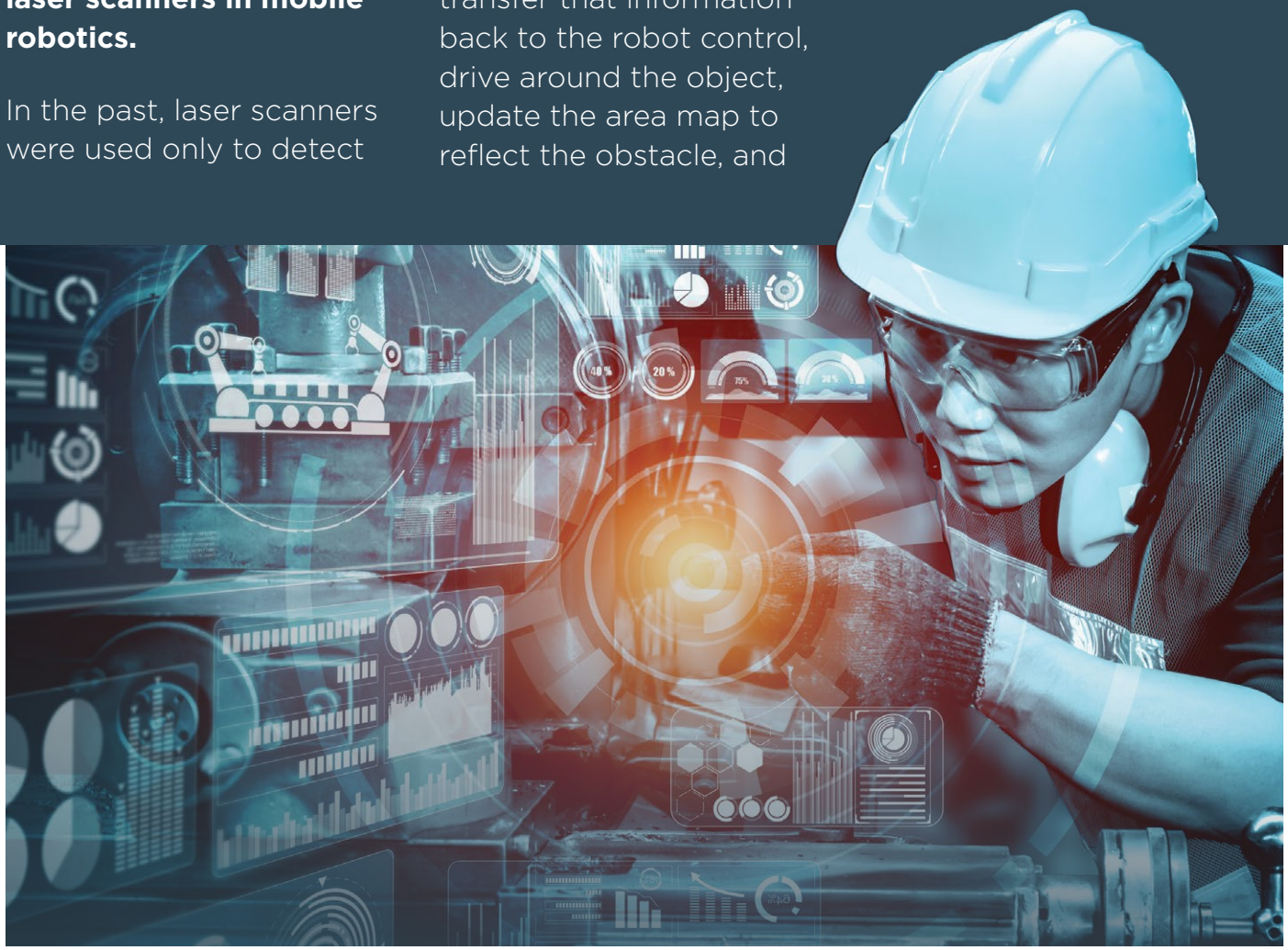
THE NEXT EVOLUTION IN INDUSTRIAL AUTOMATION IS HAPPENING NOW.

As manufacturers and distribution and fulfillment centers integrate sensors within industrial Ethernet networks, they are unlocking greater capabilities. These field-level insights are boosting the intelligence and the efficiency of their operation. Take for example, safety laser scanners in mobile robotics.

In the past, laser scanners were used only to detect whether an object was in the robot's travel path. If an obstacle was present, the safety scanner stopped the robot from moving forward. Over time, however, more data has become available across the industrial infrastructure. Now manufacturers can get a complete data set of the robot's surroundings, transfer that information back to the robot control, drive around the object, update the area map to reflect the obstacle, and reroute other mobile robots on a new optimal path.

Even for companies that are not in the mobile robotics business, the emerging trend of integrating sensors into the network shows great promise. Let's explore how the trend came about and where it could go next.



HOW HAVE ETHERNET SENSORS BECOME A TREND?

For decades, the majority of industrial sensors have provided what is basically a “trigger” function to machine builders: if something moves in front of the sensor, the sensor triggers an alert. It is essentially a message to the system saying, “Hey, there’s something here.”

The interface for these basic sensors is a simple on-off signal wired to an I/O module. When the sensor triggers an alert, the on-off signal gets sent to the control so it can respond. But those simple trigger sensors are not equipped to take in more data or to provide more functionality, which has become problematic as we evolve to Industry 4.0 and manufacturers want to take advantage of things like machine vision, artificial intelligence, and machine learning. Moving forward, we need sensors that are capable of more than a simple react/respond set of functions, and that is where we have seen an increase in integrating sensors within the system itself. In essence, the sensor becomes part of the control network.

WHAT DO ETHERNET SENSORS DO?

Industry 4.0 requires more elaborate control at the field level, which means gaining more functionality from industrial sensors. Integrating sensors within the control network unlocks additional functionality that manufacturers need.

How? By making sensors a node in the Ethernet network. This allows the sensor to communicate in the control language of the industrial Ethernet protocol used so it can more effectively and seamlessly perform high-level tasks. Code readers, machine vision, and position encoders are all good examples of where you see these Ethernet sensors in place today. They are truly part of the network so they can communicate almost seamlessly – making edge computing and cloud connectivity possible. The use of Ethernet sensors has grown dramatically.

Read more about what's next for automation sensors in our paper: Industrial Automation Sensors: *Trends, Challenges, and Optimization Strategies*.

WHAT IS NEXT FOR ETHERNET SENSORS?

For lower-end applications, where it does not make financial sense to integrate a direct Ethernet connection, we are seeing an uptick in the use of IO-Link in combination with remote I/Os acting as the gateway between the networks. This allows sensors to communicate additional data and enable greater functionality as well as provide decentralization. It is also an evolution of the integrated automation sensor trend, providing a path for manufacturers with legacy "trigger" sensors and other low-end sensor applications to access the increased functionality and seamless interconnectivity of Industry 4.0.

With increasing demand for decentralization and flexibility in industrial environments, we will continue to see a rise in demand for sealed remote I/Os. This solution provides a cost-efficient and space-saving way to integrate sensors into control networks without requiring an Ethernet port in each sensor. With a sealed remote I/O, clusters of sensors can be connected via one power and data cable to provide additional sensor functionality, such as on moving machinery parts.

WE ARE HERE TO HELP

Read more insights from TE Connectivity (TE)'s experts:

Industrial Automation Sensors: Trends, Challenges, and Optimization Strategies

TE's Solutions for Automation Sensors

Single Pair Ethernet – the infrastructure for IIoT

Connect With Us

No matter your answers to the questions above, the engineering team at TE is here to help. Our team brings deep expertise in sensor applications and can work with you to co-create a customized solution to fit your needs. At TE, we provide highly engineered connectivity solutions that support virtually uninterrupted operations for power, signal, and data, including high-speed connectivity of 1 Gbps and beyond for data-intensive applications like machine vision. We also build integrated components and solutions to help simplify your most complex manufacturing processes.

We are ready to help you take your industrial automation capabilities to the next level.

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