Success story

Omron integrates data control, motion control, machine vision and more in next-generation production line for automotive customer

The Mexican regional headquarters of a leading manufacturer of premium air brake actuators for global on-highway and specialty markets required a new automated production assembly line. One of the company's key performance indicators is to deliver a fully assembled product every 30 seconds, and it is with this end goal at the forefront that the team started the process of automating the production line.

The manufacturer was interested in implementing a system that would employ cutting-edge technology in a cost-effective way. In addition, the system needed to be up and running quickly in order to meet growing demand. The company chose Omron as its partner in automation design and installation thanks to Omron's reputation for offering advanced technology with excellent customer service throughout a project's span.

The new production line leveraged Omron's powerful Sysmac platform that brings the entire solution under the umbrella of a single software and a single brand. The fully integrated solution successfully overcame all technical challenges related to design, installation and testing, and the resulting automation technology was able to achieve the desired throughput while significantly reducing the number of operators required at any given time.

Business need

A leading manufacturer of premium air brake actuators needed to replace an original production line with a new one that would deliver a fully assembled product on a rapid timetable using cutting-edge automation equipment.

Unique solution

Omron developed a solution incorporating NX-I/O, NJ-SQL, NS HMI, axis motion control, MX drives and FH vision in combination with EtherNet infrastructure using W4S1 industrial switching hubs and GX-JC junction slaves for EtherNet/IP and EtherCAT.

Customer benefits

The customer achieved their goal of quickly and cost-effectively designing and building a new machine utilizing vanguard technology that manufactures and fully assembles a high-quality brake every 30 seconds.

The solution
Omron next-generation production line solution

The need

Due to high demand and new upcoming contracts, the manufacturer needed to quickly ramp up production capability. When a customer in Germany requested local supply chain and production support, the company moved its existing production line to Germany. It then became necessary to construct a replacement production line in Mexico.

The major challenge of the project was the need to implement cutting-edge technology in the most cost-efficient way possible. The customer wanted to develop a system to meet its goal of delivering a fully assembled product every 30 seconds using best-in-class automation equipment and advanced design.

The ability to collect and communicate manufacturing and process data was a must. The manufacturer needed to gather detailed information on each part, including lot code information on raw assemblies and material moving into the production cell. Date and critical process information needed to be saved in order to be later analyzed for quality and productivity trends by the company's team of data scientists.

The technology

Omron developed a solution for the next-generation production line that incorporates the Omron NJ-SQL, the NS HMI, axis motion control, MX drives and the FH vision system in combination with EtherNet infrastructure using W4S1 industrial switching hubs and GX-JC junction slaves for EtherNet/IP and EtherCAT.

The NJ series of controllers with SQL capability provides a simple method for data collection as well as the necessary motion control to allow fast integration and deployment of all machine motion control aspects. The new system uses Omron RFID to track the movement of the brake assembly system and error proof the delivery of raw materials to the production line.

The production line also makes use of the NX remote I/O system, a safety controller, and multiple safety components working in tandem with pick-and-place robots. Omron provided significant pre-sale support and product selection assistance in addition to live demonstrations to the system integrator and end user.

The outcome

The results of the project provided an excellent example of the power of Omron's Sysmac platform to pull together a complete solution with a single software and automation brand. The new production line has reduced the number of required operators as compared to the original system and achieves the production targets as well.

Major improvements relative to the original production line include the replacement of standalone drives with EtherCAT-based MX drives. Whereas the standalone drives required additional interfacing hardware and I/O, the EtherCAT-based MX drives offer direct control from the NJ controller.

Additionally, the new production line uses RFID for product tracking. Barcodes had been tried previously, but environmental limitations led to read errors. RFID read performance is unaffected by dust or oil.

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