



Omron's Shanghai factory addresses labor shortages and boosts throughput on high-mix, low-volume production lines with collaborative robots

Solving societal issues and respecting humanity are important to Omron's corporate philosophy. The future of manufacturing will require factories to adapt processes flexibly and intelligently to meet ever-changing customer demands, and new technologies will give manufacturers the opportunity to realize the collaboration between people and robots at a higher level. This so-called "Factory of the Future" will also help relieve workers from dull, repetitive tasks and allow them to focus on more creative ones.

Omron's factory in Shanghai is creating an environment in which humans and robots work together to meet today's manufacturing challenges, such as manpower shortages and overall equipment effectiveness. The goal is to employ collaborative robots (also called "cobots") to help humans and machines collaborate more closely and achieve true harmony. Cobots have many advantages from a safety point of view, since they can operate at a slower speed in collaborative mode and make a safe stop if contact becomes likely.

Collaborative robots significantly reduce the risk of human error in high-mix, low-volume production lines that can't be fully automated. By helping to eliminate the need for manual data input and management, cobots can significantly improve traceability and overall quality. In addition, they can be integrated with mobile robots like Omron's LD Series to freely and autonomously move between production lines to transport parts and material.

Business need

Rising labor costs and growing manpower shortages were making it increasingly difficult for Omron's Shanghai factory to hire operators for its high-mix, low-volume production lines that resist full automation.

Unique solution

The factory chose the Omron TM14 collaborative robot for its applications because its integrated vision and 3D positioning capabilities make it highly suitable for high-mix, low-volume production needs in which layout changes occur frequently.

Customer benefits

Production efficiency improved dramatically with an ROI of just 12-14 months, and the factory is now in a position to easily and gradually increase its number of cobot units as production expands in the future.

The solution

Flexible, intuitive collaborative robots



The need

In Shanghai, labor costs are increasing by 7% each year, and the growing shortages in manpower are making it increasingly difficult to hire operators. Although some factories might be able to completely automate their production lines, Omron's Shanghai factory is a typical high-mix, low-volume production facility with cells and lines that only operate for a few hours a day and require frequent process changes. A complete automation solution would be unlikely to offer the requisite return on investment or appropriate level of equipment effectiveness.

To further improve efficiency without fully automating the production lines using Omron's traditional industrial robots, the factory realized that it needed to come up with a way for people and machines to work together in harmony within the same environment. Given that human tasks are absolutely necessary in the production of Omron's products, the Shanghai team decided to introduce collaborative robots.



The technology

The factory chose the Omron TM14 collaborative robot thanks to its suitability for high-mix, low-volume production where layout changes are frequent. This is largely due to the cobot's integrated camera and 3D Landmark feature, which allows it to immediately recognize a specific work cell and know what tasks to complete at that station. Since there's no need to recalibrate or reattach a cobot whenever it's moved, the factory was able to share a single cobot between two laser marking machines.

Omron's collaborative robot effortlessly handles a wide variety of components because it can easily use different types of plug-and-play grippers. This allows the operator to quickly deploy it into production and ensures that the technology can be flexible when adapting to changes. Furthermore, the cobot's programming is highly intuitive, allowing even a person without any previous experience to start using it successfully.



The outcome

With the introduction of collaborative robots, the Shanghai factory dramatically improved its production efficiency and saw an ROI of just 12-14 months. Moreover, it's now in a position to gradually increase the number of cobot units in tandem with a future expansion of production, which is a major advantage. The team has stated that collaborative robots are a key development that will propel Omron towards the "Factory of the Future."

Operators are happy with the new cobots, as the technology reduces the work burden and makes jobs less repetitive. The Shanghai team feels safe working next to the Omron TM14 because it works at a similar pace and provides an intuitive system for setting up safety parameters. Nonetheless, it's always important to conduct a risk assessment with collaborative robots, and the Shanghai factory made sure to work together with Omron's professional risk assessment team to ensure proper safety analysis and risk mitigation.

