

Industrial automation strategies step up manufacturing and production lines



Sameer Gandhi, Managing Director, Omron Automation India, says that adopting industrial automation presents numerous benefits for organisations, including increased productivity and improved safety standards. From training and integration issues to cybersecurity concerns, proactive strategies are essential for overcoming the obstacles and maximising the potential of automated systems.

*Sameer Gandhi
Managing Director, Omron Automation, India.*

How do PLCs enhance industrial automation systems' efficiency, safety, and adaptability?

PLCs are a key component of industrial automation systems, providing the intelligence and control necessary to optimise production processes, improve efficiency, ensure consistency in product quality, and enhance overall safety in industrial settings. PLCs function by orchestrating control logic, enabling real-time operation, and ensuring adaptability through programmability. They are aptly called the backbone of all manufacturing.

PLCs serve various functions in industrial settings, starting with their role in implementing control logic for diverse processes. They manage machinery operations, monitor sensor inputs, and activate outputs to control actuators like motors and valves. Crucially, PLCs operate in real-time, processing inputs with precision to ensure quick response times and accurate timing, such as in manufacturing and production lines.

Their flexibility allows easy programming adjustments to adapt to different manufacturing processes without requiring physical rewiring. Additionally, PLCs facilitate communication with various industrial devices and systems, enabling centralised monitoring and control across the entire industrial setup. Designed for durability, some PLCs can withstand harsh environmental conditions and operate reliably over extended periods with minimal maintenance. Moreover, PLCs contribute to safety measures by implementing features such as emergency stop circuits and safety interlocks to protect equipment and operators from potential hazards.

How does sensor integration within industrial automation systems improve safety and operational efficiency?

Integrating sensors and actuators within industrial automation systems plays a key role in enhancing operational efficiency. It does this through real-time data acquisition, enabling process control, optimising maintenance schedules, enhancing energy efficiency, ensuring safety, and ultimately maximising productivity and quality in industrial settings.

Sensors primarily gather data from the industrial environment, encompassing parameters like temperature,

pressure, position, speed, and other pertinent variables. This real-time data furnishes the automation system with insights to make informed decisions and forecast maintenance needs, averting unexpected breakdowns, minimising downtime, and refining maintenance schedules to bolster efficiency. Their ability to deliver precise and accurate measurements is indispensable for upholding quality standards and attaining optimal performance in industrial processes.

Furthermore, sensors furnish feedback to the automation system regarding the ongoing status of industrial processes. They detect unsafe conditions such as overloads, overheating, or obstructions and instigate appropriate responses to safeguard equipment, products, and personnel. This feedback loop facilitates real-time monitoring and control of processes, enabling swift adjustments to optimise efficiency and productivity.

Sensors are also utilised to monitor energy consumption in industrial processes and identify opportunities for energy savings. By analysing this data from sensors, automation systems can optimise energy usage, reduce waste, and improve overall energy efficiency in the industrial setting.

Under the purview of the automation system, actuators enact precise adjustments based on sensor feedback to ensure consistent and accurate operation. They can also be deployed to institute safety mechanisms, such as emergency stops, to prevent accidents and ensure a safe working environment.

How do implementations of SCADA contribute to the monitoring and controlling of industrial processes?

SCADA (Supervisory Control and Data Acquisition) systems are crucial in overseeing and managing industrial processes through real-time data collection, monitoring, control functionalities, alarm handling, historical data examination, integration with diverse systems, and remote access features. These can typically connect to several PLCs over a network and provide a consolidated control and operations window for plant operations.

SCADA systems serve multiple purposes within industrial

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