Success story

Omron factory reduces materials handling by 70% and lead times by 80% with new mobile robot solution

Omron's Ayabe factory recently made a major upgrade to its FA components manufacturing system with a unique materials handling strategy. The solution employs Omron's popular LD series of mobile robots to efficiently transport works-in-progress throughout the factory. These robots transport payloads autonomously through unpredictable environments, including those with people and equipment moving around constantly.

Mobile robots get their configuration data from the Enterprise Manager appliance, which helps optimize traffic flow by sharing each robot's position and trajectory with others in its vicinity. This allows each robot to make path adjustments to avoid potential conflicts. Enterprise Manager also saves manufacturers significant amounts of time in uploading configuration data and ensures that updates are less prone to error.

Enterprise Manager enables operators to manage map and configuration updates from a central communication point so that they can be pushed out to each mobile robot in the fleet. The system also provides a queuing manager to receive job requests from call buttons and automation equipment, and dispatch jobs to the robots in the fleet. Robots can work within close range of one another without colliding thanks to the system's knowledge of the location and path of each vehicle.

Business need

Omron's Ayabe factory was seeking to upgrade its FA components manufacturing system with a fully automated solution for transporting works-in-progress.

Unique solution

The Ayabe factory engineering team chose Omron's unique LD mobile robots, which use self-guiding software to navigate their way through dynamic environments, for materials transport.

Factory benefits

Overall materials handling was reduced by 75% while lead times dropped by 80%, and the LD new solution can be easily implemented in other factories as well without incurring new design costs.

The solution
Automated materials transport with mobile robots

The need

Realizing that a fully automated work-in-progress (WIP) transport system could greatly improve efficiency, the Ayabe factory engineering team sought a way to replace manual transport without hampering flexibility. Conveyors were not the ideal option for this, since they can be cumbersome and difficult to rearrange when production requirements change.

Fortunately, Omron's own technology portfolio includes the powerful LD Series mobile robots that can provide a fully flexible solution to this issue. The Ayabe factory opted for this method and designed a solution that would be capable of carrying materials to two destinations in just one trip for maximum efficiency.

The technology

In the Ayabe factory solution, LD robots carry product containers from the assembly station to the final inspection station. After inspection, the robots take the containers to the shipment station. Since the LD system is connected with the manufacturing engineering system (MES), transportation orders through the MES are conducted according to the progress of work.

Each station in the Ayabe solution has a standardized temporary storage rack for material handling by the mobile robots. Operators can set the layout by simply moving the storage rack to a new location and modifying the map. (This can be easily done on tablets using the LD system's Mobile Planner.) In order to make transportation more efficient, each LD robot has two lifts – one on the front and one on the back – which makes it possible to carry materials to two destinations in a single trip.

The outcome

The Ayabe factory's use of the LD mobile robots reduced labor significantly, replacing 75% of WIP material handling operation. By changing the process from batch to synchronous transfer, lead time was reduced by 80% (from 45 min to 8 min). The overall solution also reduces the expense and effort required for future investments, as the standardized system can be easily implemented in other plants without an additional design cost.

Whenever the need arises, the factory layout can be easily changed thanks to the exceptional flexibility of the mobile robot solution. The need for automation has been addressed without opting for a cumbersome and rigid conveyor-based arrangement.