

Technology helps machine builders offer improved availability

Comment by Robert Brooks,
European Industry Marketing Manager – Food & Beverage

The ongoing pursuit of ever better OEE scores has become a real focus for end users in the food and beverage industry in recent years. OEE itself, however, is not a conversation end users routinely have with their machinery suppliers, with the focus instead tending to be on areas such as baseline speed, cycle times and overall performance.

However, if machine builders can bear OEE in mind during machine design, and subsequently demonstrate how their machine designs can contribute to improved OEE results, then they can give themselves a significant competitive advantage.

One area where machine builders can really impact on OEE for the end user is in machine availability. For example, inbuilt diagnostics and monitoring algorithms can highlight developing problems before they become critical, enabling users to take preventative action during scheduled maintenance periods. These are systems that machine builders can easily build in as part of the machine design – without incurring additional costs.

Consider, for example, the operation time of an actuator or cylinder. With a simple teach operation, the controller can learn the ideal move times in both directions, and limits can be expressed – creating rules perhaps for an early warning, and an alarm if the actuator’s operation time falls outside of these rules, predicting a potential impending problem.



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The same thinking could be applied to sensors on the production line. The control system can monitor the sensor’s performance, with limits set to trigger alarms as the output drifts towards tolerance limits. Then there is the monitoring of servo torque values – knowing what the ideal should be, and setting alarms to spot if those torque values drift out of tolerance. A simple teach routine is all that is required in the first instance; the controller takes care of everything else from that point on.

The machine controller can then flag up these warnings and alarms on an HMI local to the machine or inform engineers remotely, giving operators plenty of time to look at the operation of the devices in question and taking quick and appropriate actions before failures occur.

Decreasing product changeover time

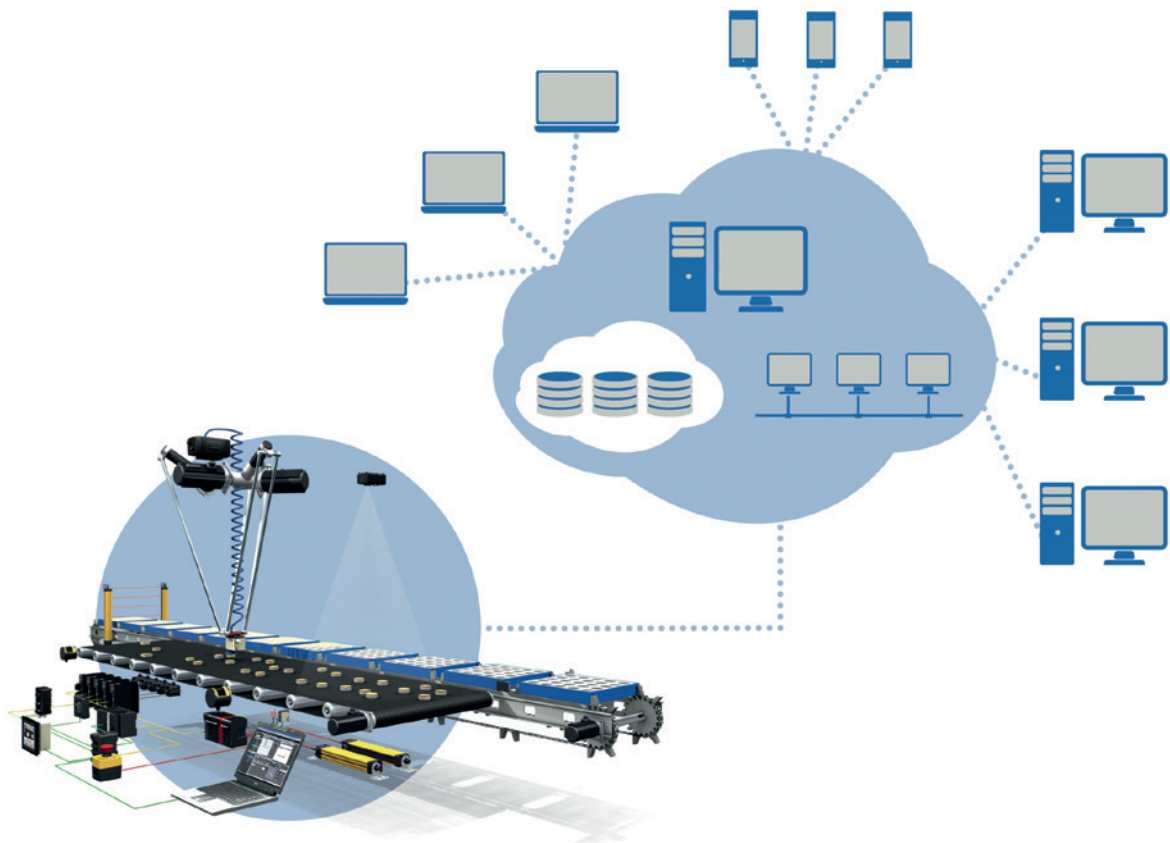
A further benefit to be derived from automation is being able to demonstrate to a customer how, for example, changeover times from one product size or packaging style to another could be significantly reduced.

'One push configuration' is now a standard feature in automation technologies such as Omron's Sysmac platform. Once the operator can configure the whole line from a single push button operation on an HMI, product changeover times are dramatically shortened,

getting the line back up and running much more quickly.

Another area to consider is unscheduled downtime, and the cost implications that this has for the end user. Today's automation equipment is inherently reliable, but even the most reliable of equipment can fail unexpectedly. If that faulty part is a complex piece of electrical equipment that may have incurred significant programming effort, then the end user could be facing substantial downtime.

Here machine builders can offer their end users the benefits of backup/restore functionality, perhaps with all the critical program settings and parameters stored on an SD card. All of this could help an end user to get a machine back up and running quickly. For the machine builder, that means an enhancement to your reputation for machines that are easy to maintain, but



it also means that there is less need to take your own engineers away from important design projects and instead onto non-profit generating maintenance or support roles.

Importantly, none of the features which can help to increase machine availability have to be a challenge for the machine builder to implement. For example, Omron has addressed the requirements for teach activation, monitoring, pre-alarm warnings and alarms with a suite of new Function Blocks within the Sysmac control platform.

In summary, machine builders can design-in as standard the ability to predict issues before they become real problems, to rectify faults quickly and efficiently, and to dramatically speed up product changeover times, enabling end users to boost availability and drive inherently good OEE results.

