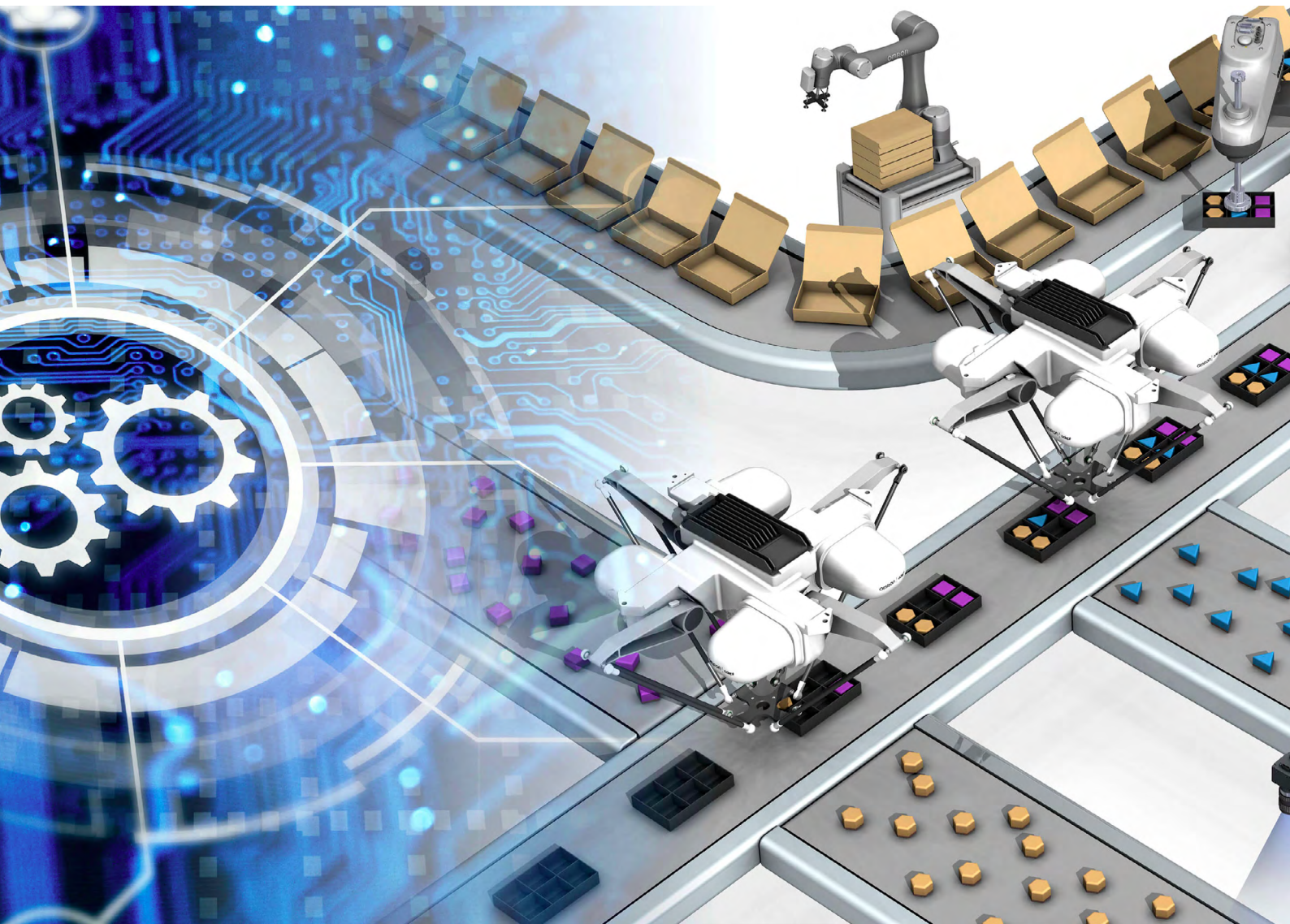# Smarter Control on the Factory Floor
5 Tips to Get Started with Smart Devices

The Food & Beverage industry is increasingly embracing the Industrial Internet of Things (IIoT) and Industry 4.0, driven by advancements in computing power, data availability, and IoT-enabled equipment. The integration of AI in production processes offers significant potential for improvements such as predictive maintenance and enhanced productivity. However, many manufacturers struggle with implementing these technologies. Learn here how to get started!

The discussion around implementing Industrial Internet of Things (IIoT) and Industry 4.0, from smart devices up to artificial intelligence in the factory has gradually been picking up speed in the Food & Beverage industry. This is especially a result of increased computing power and the availability of growing amounts of data, and further accelerated by the increased use of equipment with IoT features such as smart sensors and temperature regulators. The introduction of artificial intelligence on the factory floor of Food & Beverage producers also has an impact.

Machine controllers equipped with adaptive algorithms offer enormous potential for further developments such as predictive maintenance and networked, efficient production that are necessary within the framework of Industry 4.0. In this context, F&B producers are realizing that these developments give them the opportunity to increase overall equipment effectiveness (OEE), reduce costs and increase productivity.

When implementing smart devices for IIoT or Industry 4.0, many manufacturers face a situation where they are restricted by their existing infrastructure of legacy machinery and plant, lacking standardisation of system architecture. So, defining a process or starting point for implementation can be challenging. Here are 5 tips to help you get started.

1 Define the problem you need to solve

One of the biggest challenges that manufacturers face is that they don't know what problem they want to solve. But how can you define the problem without data? The solution is to start collecting and cleaning data first. You can then start obtaining information from the data, visualise it and see where the areas of improvement are.

2 Define how to access and make the best use of your data

The machines within a factory are a potential source of valuable data. But how can users access and analyse the data that a machine could provide? How can a manufacturing plant then make the most effective possible use of this data? Ask yourself, do I have enough data, and which data is the most relevant and how will it be used? And how much will the infrastructure cost?

3 Deploy a system that enables monitoring machinery or plant effectiveness

One of the first steps we recommend to manufacturers that are beginning their Industry 4.0 journey, is to deploy a system that enables them to monitor machinery or plant effectiveness. These types of solutions can be used to monitor productivity and downtime. Whilst being relatively simple and cost effective to deploy, systems like these provide valuable line level information, and permit more informed decisions about possible areas of additional investment.

4 Ensure real-time communication between devices

Getting the right data from the 'grass-root' level of the manufacturing process is essential when creating the factory of the future. Real-time communication to and from field level devices, for example, open vendor protocols like IO-Link, allows sensors and actuators to exchange data with the machine controller. Bidirectional communication is established so parameters can be transferred from the controller to the devices and the status can be read. Sensors and actuators can communicate more than simple on/off signals or analogue ranges. They can provide advanced status and diagnostics information communicating with the controller about how they are performing. Furthermore, the controller can also change the sensor's parameters, creating the ultimate in flexible manufacturing.

5 Make the most of your smart devices, and the possibilities of AI

Once you've established real-time communication between the devices, the field devices can be monitored and corrected before they malfunction and cause a line stoppage. Another level of predictive maintenance can be achieved with artificial intelligence at the Edge. AI at the Edge, for example using a machine controller with an AI library, allows companies to collect, process and react to data collected at line level, in real time. In this approach, the machine is collecting all the data. Although the scope of the data remains relatively large, organizations need less resources in terms of hardware, communication infrastructure or processing capabilities at enterprise levels.

Sensors play a vital role in Smart Manufacturing for the Food & Beverage industry

In the fast-evolving Food & Beverage industry, the adoption of Industrial Internet of Things (IIoT) and Industry 4.0 technologies is accelerating. This trend is propelled by advances in computing power, abundant data, and the rising use of IoT-enabled equipment, especially smart sensors. These sensors are vital in transforming traditional manufacturing into intelligent, data-driven operations.

Real-Time Communication and Data Collection

Smart manufacturing relies on real-time data collection and analysis. Sensors are key, capturing crucial information directly from the manufacturing process. Open vendor protocols like IO-Link enable seamless communication between sensors, actuators, and machine controllers. This bidirectional communication allows parameter transfer and status reading, ensuring comprehensive monitoring and optimization.

Advanced Diagnostics and Flexibility

Unlike traditional sensors, modern smart sensors offer advanced status and diagnostics information, providing deeper performance insights. Controllers can dynamically adjust sensor parameters, creating adaptive and efficient manufacturing processes that respond to real-time conditions.

Enhancing Overall Equipment Effectiveness (OEE)

Artificial intelligence, combined with sensor data, significantly impacts overall equipment effectiveness (OEE). By continuously analyzing sensor data, AI systems can predict maintenance needs, identify issues early, and optimize production. This proactive approach reduces costs, boosts productivity, and enhances product quality.

Overcoming Legacy Infrastructure Challenges

Despite the clear benefits, integrating smart sensors can be challenging due to legacy infrastructure and lack of system standardization. Defining a clear implementation process helps overcome these hurdles. Smart sensors can bridge the gap between legacy systems and modern IIoT solutions, easing the transition to Industry 4.0.

Why Temperature Regulators are key for Smart Maintenance

In the fast-paced and highly regulated Food & Beverage industry, maintaining precise temperature control is crucial for ensuring product quality, safety, and consistency. Smart temperature regulators, such as the OMRON NX-HTC, are essential for manufacturing companies looking to gain more control over their factory floor and integrate smart devices into their production facilities.

The OMRON NX-HTC temperature regulator is designed to achieve optimal and automatic temperature control without the need for human intervention. This advanced technology is particularly beneficial in the food and beverage industry, where even slight variations in temperature can significantly impact product quality and safety.

Early Detection of Equipment Anomalies and Data-Driven Maintenance

Smart temperature regulators offer the advantage of early detection of unusual equipment conditions. By automatically calculating temperature and MV waveform characteristics, they can identify fluctuations during production. This early detection helps prevent anomalies caused by issues like heater degradation, wrong sensor placement, or particle adhesion on sealing bar surfaces.

These controllers also support data-driven maintenance decision-making by monitoring equipment and environmental changes. They provide key process information trends, allowing users to plan smarter maintenance tasks. By detecting unusual conditions earlier, the controller reduces man-hours spent on analyzing and fixing anomalies, ultimately improving overall equipment effectiveness (OEE).

Benefits with smart temperature controllers in the Food & Beverage Industry

For manufacturing companies aiming to get started with smart devices in their production facilities, the NX-HTC offers several significant benefits:

Enhanced Traceability

The temperature regulator adds temperature waveform data to production records, enabling detailed analysis if a defect occurs. This allows manufacturers to identify the cause and target lot quickly, ensuring swift corrective actions and minimizing downtime.
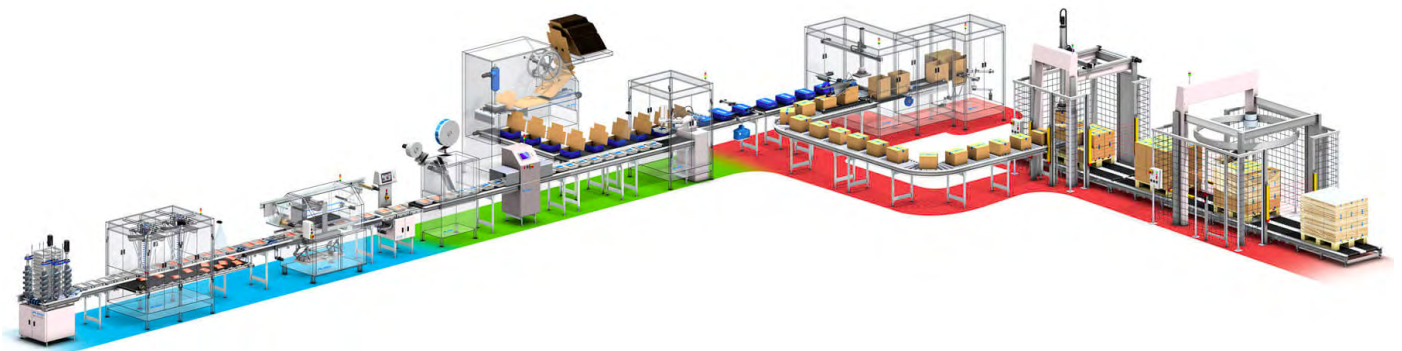
Abnormality Detection by Alarm

The controller's abnormality detection alarms that alert operators to unusual equipment conditions, such as particle adhesion or heater deterioration. This helps prevent potential issues from escalating, ensuring smoother and more efficient production processes.

Flexible and Advanced Temperature Control

The NX-HTC is designed for both flexible and advanced temperature control applications. Its versatility makes it suitable for a wide range of food and beverage production processes, from simple temperature regulation to complex, multi-stage heating and cooling cycles.

The Importance of Temperature Regulators in Smart Manufacturing

Advanced temperature regulators like the NX-HTC are vital for smart manufacturing. They optimize production processes, reduce waste, and improve efficiency by providing real-time data and early anomaly detection. This enables manufacturers to make informed decisions, plan maintenance effectively, and enhance product quality and safety.

In summary, the NX-HTC temperature controller is a powerful tool for the food and beverage industry. Its advanced features help manufacturers gain better control over production, improving efficiency, reducing costs, and ensuring high product quality and safety.
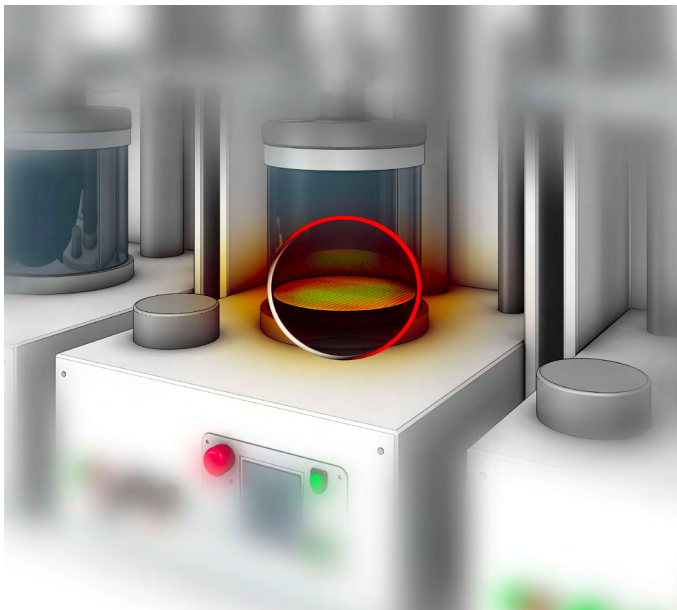
Conclusion

In conclusion, both smart temperature controllers and smart sensors play crucial roles in enhancing production processes in the food and beverage industry. By adopting these smart components, companies can improve efficiency, reduce costs, and ensure the highest standards of product quality and safety. Their ability to provide real-time data, advanced diagnostics, and flexible communication makes them indispensable in creating efficient, adaptive, and future-proof manufacturing processes.

As the industry continues to evolve, the role of both temperature controllers and sensors will become even more critical in driving innovation and competitiveness.