Time- Sensitive Networking is becoming the bread and butter for automation in the food industry

Producing traceable, high-quality products has always been a priority for manufacturers in the food and beverage sector. The implementation of Industry 4.0 applications and the associated efficient collection as well as transmission of data can enable companies to bring their production to the next level. To achieve this, businesses need to industrial communications that utilize advanced network technologies, such as Time-Sensitive Networking (TSN).

Thomas Burke, Global Strategic Advisor at CLPA, looks at how food and beverage manufacturers can set up advanced traceability and transparency across their enterprises.

With the need for increased quality control and assurance, regulatory compliance as well as auditing, it is essential for manufacturers in the food and beverage sector to adopt data-driven smart manufacturing strategies. These offer a unique way to set up full traceability and transparency across plants, enterprises and even entire supply chains.

By taking this approach, businesses can gain an in-depth understanding of their processes that leads to real-time actionable insight. This enables them to enhance monitoring activities, improving end product quality and consistency while reducing reworks and off-specs materials. In addition, the data generated and collected can be leveraged to streamline and facilitate auditing as well as regulatory compliance. Ultimately, these benefits lead to substantially increased productivity and product yield.

Even more, traceability can help food and beverage manufacturers to gain a competitive edge by sharing some of the generated product knowledge with customers. In effect, 81% of grocery shoppers indicate that transparency is 'important' or 'extremely important' when shopping online and in-store, according to a new report by The Food Marketing Institute (FMI) and Label Insight.[1] In addition, a 2018 study from the same organizations showcased that over 70% of the shoppers surveyed were more likely to switch to a brand that provides more in-depth product information beyond what is provided on the label.[2]

Traceability revolves around convergence and determinism

[1] FMI and Label Insight (2020) Transparency Trends: Omnichannel Grocery Shopping from the Consumer Perspective. Available at: https://www.fmi.org/forms/store/ProductFormPublic/transparency-trends-omnichannel-grocery-shopping-from-the-consumer-perspective

[2] FMI and Label Insight (2018) The Transparency Imperative: Product Labeling from the Consumer Perspective. Available at: https://www.fmi.org/forms/store/ProductFormPublic/the-transparency-imperative-product-labeling-from-the-consumer-perspective

In order to create successful data-driven factories that offer data transparency as well as traceability, it is necessary to create a highly interconnected production system, where knowledge and actionable insight are generated and communicated effectively. Therefore, it is necessary to have a network that can share vast amounts of data in a timely manner to support analytics, reporting and real-time control. Consequently, companies need to select an industrial communications technology that can support these functions and capabilities.

Current standard Ethernet has a limited ability to address these needs and manufacturers require innovative solutions to leverage the power of data. Technologies incorporating Time-Sensitive Networking (TSN) will be key to supporting highly effective industrial communications and helping the food and beverage sector advance. In effect, there has recently been a surge in the number of network devices compliant with TSN-based protocols, such as CC-Link IE TSN – the first open industrial Ethernet with 1 gigabit/second bandwidth and TSN functionalities.

By implementing a solution such as CC-Link IE TSN, food and beverage producers can set up an extensive network that is able to transmit multiple types of data traffic thanks to high transfer throughput capacity, supporting transparency and convergence. This is achieved while offering time synchronization and traffic prioritization. These features establish a suitable level of determinism to deliver time-critical messages without any delay or jitter that can affect automated operations.

Acting now is key

As a result, food and beverage manufacturers can monitor materials, machinery, processes and entire facilities from bulk ingredient input to end product delivery. This enables them to obtain detailed information that can be passed on downstream or to relevant parties, such as regulatory bodies, as well as being used to adjust activities on the fly, maximizing yield, efficiency and quality.

Ultimately, automation products that use the latest advances in network technology, such as CC-Link IE TSN compatible devices, are the gateway to setting up transparency-driven food manufacturing in the era of Industry 4.0. It is therefore clear that embracing these innovative solutions is not only highly advantageous, but also a must to address changing market needs. Even more, it also leaves companies perfectly positioned for the future of manufacturing.

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CLPAUS026 Food & Bev Industry Feature

Image Caption: Food and beverage manufacturers can monitor materials, machinery, processes and entire facilities from bulk ingredient input to end product delivery. [Source: istock: SHODOgraphy]

Keywords: CC-Link IE TSN, food and beverage, manufacturers, automation, Industry 4.0, Time-Sensitive Networking (TSN).

About The CC-Link Partner Association (CLPA)

The CLPA is an international organisation founded in 2000, now celebrating its 20th Anniversary. Over the last 20 years, the CLPA has been dedicated to the technical development and promotion of the CC-Link family of open automation networks. The CLPA's key technology is CC-Link IE TSN, the world's first open industrial Ethernet to combine gigabit bandwidth with Time Sensitive Networking (TSN), making it the leading solution for Industry 4.0 applications. Currently the CLPA has almost 3,800 member companies worldwide, and more than 2,000 compatible products available from over 340 manufacturers. Around 30 million devices using CLPA technology are in use worldwide.

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