

## 4 ways TSN can boost productivity in manufacturing

Time-Sensitive Networking (TSN) is considered by industry leaders as the future of industrial communications. In effect, it is poised to bring data transfer to the next-level, enabling Industry 4.0 applications. While the adoption of TSN is still in its early stages, with future-oriented businesses picking up the pace, this technology holds enormous potential for numerous manufacturing sectors.

*Thomas Burke, Global Strategic Advisor at the CC-Link Partner Organization (CLPA), looks at how different industrial sectors can reap a multitude of benefits by leveraging TSN for industrial communications*

### 1. Simplified machine design and higher performance for the converting sector

One of the key features of TSN that can bring great benefits to manufacturers is its ability to synchronize all network devices with high accuracy, especially when used with gigabit bandwidth. As a result, it is possible to ensure deterministic communications for time-critical high-speed applications, such as motion control.

For example, when this feature is adopted in networks used in the converting industry, plants can achieve accurate synchronization between multiple axes on a machine. By being able to control the motion of many different axes simultaneously over one network, facilities can optimize product quality and production processes as well as increasing the flexibility of their architectures and machines, while simplifying the mechanical set up. The end result is reduced time for retooling and maximized product yield.

### 2. Transparency and traceability for food & beverage

Accurate and precise time synchronization, as offered by TSN technology, is also extremely important when transparency and traceability are crucial.

The success of sensitive industries, such as food & beverage, relies heavily upon key process data, which need to be monitored to ensure product quality and compliance with relevant regulations or good manufacturing practices. These data require accurate timestamps that support visibility within the network and throughout the production process, eliminating any “blind spot” where issues can grow unnoticed.

By building a fully synchronized device network, TSN can support precise timestamping for timing analysis. In this way, food & beverage facilities can rely on a high degree of traceability throughout their networks and guarantee product quality and safety.

### 3. Better quality in automotive

TSN technology, particularly when combined with gigabit bandwidth, can also push manufacturing facilities to speed up their production processes, whilst ensuring determinism. This can be particularly useful for automotive assembly plants.

These facilities are responsible for the production of a wide variety of models, each characterized by different trim levels. Hence it is mandatory for these manufacturing systems to handle large amounts of data generated in real time during the assembly of various car parts. Only in this way, manufacturers can ensure that the different combinations of possible model variations do not slow down cycle times and the allocated parts are fitted correctly on the right models, at the right time, in a traceable manner. Automotive companies can use TSN to build production lines that ensure short cycle times, as the technology combines advanced synchronization with traffic prioritization capabilities. The latter allow the network to deliver time-critical traffic exactly when needed, while allowing less critical traffic to co-exist on the network. Consequently, total cost of ownership can be reduced, since multiple types of network can now be combined onto a single hierarchy. The end result is higher performance, lowered costs and simplified maintenance. This finally translates into better quality vehicles.

#### **4. Higher levels of integration for semiconductor manufacturing**

Synchronicity and traffic prioritization are also key to combining different types of process control on one network and effectively handling different recipes and activities across multiple machines and stations.

For example, TSN can support the semiconductor industry, which is characterized by numerous processing stages, all requiring process, discrete and motion control, along with integration of robots and IT systems. TSN-based networks for the sector allow businesses to mix time-critical data for high-performance, high-speed motion control with slower, less time-dependent traffic, e.g. for machine vision process monitoring. Furthermore, manufacturers are given the opportunity to integrate auxiliary systems into their process and associated networks.

Ultimately, semiconductor producers can enhance flexibility in their network architecture and in their processes.

#### **More than TSN**

While TSN offers a number of advantages to manufacturers *per se*, it provides a comprehensive solution when combined with an open network technology that offers high bandwidth. In this way, businesses are able to handle the large volume of data that modern Industry 4.0 applications will generate. As a result, they can further enhance network reliability, productivity and quality assurance strategies.

An example of an industrial network offering these paired capabilities is CLPA's CC-Link IE TSN. This is the first open Ethernet technology to merge gigabit bandwidth and key TSN functionalities, time synchronization and traffic prioritization. By relying on this cutting-edge network technology, manufacturers from any sector can find a key solution to boost their processes.

**- ENDS -**

## Image Captions:

**Image 1:** Time-Sensitive Networking (TSN) is poised to bring data sharing to the next-level, enabling Industry 4.0 applications. (Copyright: sompong\_tom)

**Image 2:** CLPA's CC-Link IE TSN is the first open Ethernet technology to merge gigabit bandwidth and key TSN functionalities, time synchronisation and traffic prioritisation.

**Keywords:** CC-Link Partner Association, CC-Link IE TSN, Time-Sensitive Networking, TSN, productivity in manufacturing, data sharing, converting, automotive, semiconductor, food & beverage

CLPAUS037 4 examples on how TSN can increase productivity in manufacturing

## About The CC-Link Partner Association (CLPA)

The CLPA is an international organization founded in 2000 dedicated to the technical development and promotion of the CC-Link open industrial network family. 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 over 3,800 corporate members worldwide, and more than 2,000 compatible products available from over 340 manufacturers. Over 30 million devices using CLPA technology are in use worldwide.

Anyone interested in joining the organization can apply here: <https://www.cc-link.org/en/clpa/members/index.html>

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