4 examples on how TSN can increase productivity in manufacturing

Described by industry leaders as the future of industrial communications, Time-Sensitive Networking (TSN) is poised to bring data sharing 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.

John Browett, General Manager of CLPA Europe, looks at how different industry verticals can reap maximum advantages 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 synchronise 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 synchronisation between multiple axes on a machine. By being able to control the motion of many different axes simultaneously over one network, facilities can optimise 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 maximised product yield.

2. Transparency and traceability for food & beverage

Accurate and precise time synchronisation, 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 synchronised 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 characterised by different trim levels. Hence it's 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 synchronisation with traffic prioritisation 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 prioritisation 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 characterised 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 synchronisation and traffic prioritisation. By relying on this cutting-edge network technology, manufacturers from any sector can find a key solution to boost their processes.

- ENDS -

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

About The CC-Link Partner Association (CLPA)

The CLPA is an international organisation founded in 2000 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 over 3,800 member companies worldwide, and more than 2,000 compatible products available from over 300 manufacturers. Over 26 million devices using CLPA technology are in use worldwide.

The image(s) distributed with this press release may only be used to accompany this copy, and are subject to copyright. Please contact DMA Europa if you wish to license the image for further use.

Editorial contact:

DMA Europa Ltd: Anne-Marie Howe

Tel: +44 (0)1562 751436 Fax: +44 (0)1562 748315

Web: www.dmaeuropa.com

Email: anne-marie@dmaeuropa.com

Company contact:

CLPA-Europe: John Browett

Tel: +44 (0) 7768 338708 Fax: +49 (0) 2102 532 9740

Web: eu.cc-link.org

Email: john.browett@eu.cc-link.org