

Converging with TSN

Creating connected industries to realise productivity opportunities

In data-driven smart factories, knowledge is power – and true business knowledge means having a holistic understanding of what is happening across the enterprise to enable more dynamic and agile operations. This can be achieved by merging information technology (IT) and operational technology (OT) using network infrastructures that support Time-Sensitive Networking (TSN). By applying this technology to realise network convergence, businesses can create the Connected Industries of the future and boost productivity.

John Browett, General Manager at the CC-Link Partner Association (CLPA), looks at the benefits of digitalisation strategies based on TSN-driven IT/OT convergence

To thrive and prosper in an environment where competition continues to become fiercer, forward-looking companies need to make their operations highly responsive and flexible. This can be achieved by leveraging TSN as an enabling technology for advanced communications. In this way, companies can increase collaboration across machines, facilities and enterprises to better address customer requests and fluctuating demand.

TSN-driven agile manufacturing strategies are a key part of Industry 4.0 applications, which rely on data-driven actionable insights. These insights come from better process visibility, enabled by converging multiple deterministic streams of manufacturing data into a single, cohesive network architecture.

Better, faster, stronger

Moreover, TSN promotes the integration of supervisory IT system data, with operational data used on the OT level. This OT data includes both information used to control physical devices and processes, as well as the results generated, which are the source of the insights mentioned earlier. This opens the door to a range of key benefits. Firstly, it supports process transparency and advanced management, as the convergence offered by TSN strengthens data transfer across the enterprise, providing end users with unprecedented access to data. As a result, they are given insights that can help to improve decision-making.

Secondly, by enabling the optimum management of machines, processes and plants, companies can drive up performance, productivity and efficiency. In particular, a single network that allows the handling of all types of data traffic removes the complexity caused by multiple data types across multiple systems. This typically hampers the ability of operators to identify potential issues. Hence, convergence streamlines troubleshooting, which in turn, reduces the downtime associated with maintenance or repair activities, maximising equipment and process availability.

Leaner designs

As only a single network is required to transfer all data, another substantial advantage is that less equipment is needed to create an interconnected architecture. In addition, any engineering work for the design, configuration and installation of network systems is minimised, shortening the time required to complete factory automation projects.

Even more, any subsequent installation of additional network devices or modifications to the existing setup is simplified. As a result, the flexibility and scalability of production lines and assets can be improved.

While TSN is a recent innovation, companies can already take advantage of this technology, with more and more industry players adopting it to fuel their digital transformation strategies. CC-Link IE TSN, the first open industrial Ethernet that combines gigabit bandwidth with TSN functions, and the broad range of compatible automation products available can help companies realise this journey to improved productivity.

Captions:

Image 1: By applying Time-Sensitive Networking (TSN) to realise network convergence, businesses can create the Connected Industries of the future and boost productivity.

Keywords: CLPA, CC-Link IE TSN, Time-Sensitive Networking (TSN), IT/OT convergence, network.

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.

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