

Time-Sensitive Networking – Time to look at development options

The Connected Industries of the future are taking shape and turning into a reality thanks to Time-Sensitive Networking (TSN). After being incorporated in forward-looking industrial Ethernet technologies, such as CC-Link IE TSN, this solution can now be applied to a variety of automation devices by leveraging a broad development ecosystem.

John Browett, General Manager of CLPA Europe, looks at the latest developments and trends in TSN-compatible industrial communications.

TSN is a key technology that enhances the capabilities of standard industrial Ethernet. It offers the opportunity to guarantee deterministic communications, even for ultra-high-speed applications, thus enabling network convergence both on the shop floor and between information technology (IT) and operational technology (OT). This can deliver a variety of benefits, such as simpler network architectures, increased process transparency and hence better productivity.

Comprehensive development ecosystem for TSN

Since the release of industrial Ethernet with TSN functions, such as CC-Link IE TSN, a broad range of development options has been created. Such a framework plays a key role in facilitating the transition towards this technology while supporting different applications.

For example, automation vendors interested in rapidly upgrading their existing products can leverage software development kits (SDKs) and their TSN software protocol stacks. In effect, these offer perhaps the fastest method to provide TSN capabilities to ‘brownfield’ devices. Examples of this are stacks from port industrial automation GmbH and SILA Embedded Solutions GmbH/Embedded Experts GmbH, which support CC-Link IE TSN compliance while reducing in-house development time and costs for component manufacturers.

For more demanding TSN-compatible applications, several hardware development methods can be adopted. While these may require more development effort, they can deliver highly competitive products and longer lifecycles. Key solutions include a variety of semiconductor devices, as well as embedded/built-in module solutions. These feature different capabilities and advantages, addressing the specific needs of a broad range of applications.

Specific CC-Link IE TSN solutions that are available include Mitsubishi Electric’s CP610 & 620 communication LSI, NXP Semiconductors’ Layerscape LS1028A applications processor and i.MX RT1170 crossover microcontroller as well as Renesas’ R-IN32M4-CL3 industrial Ethernet IC/IAR KickStart kit.

The time for product development is now

An increasing number of development solutions are being offered to help vendors

develop innovative solutions with this next-generation industrial Ethernet technology. Forward-looking automation suppliers should leverage the opportunities available now to futureproof their products. This means selecting the most suitable development method for their needs. By selecting CC-Link IE TSN and its broad development ecosystem, companies can succeed in this task and quickly deliver highly competitive automation components.

To help anyone interested in learning more about key development options for TSN-compatible automation devices, the CLPA will soon release a white paper on the topic. The document explores in detail the different solutions available and how they can suit different products and applications.

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CLPA375 CEEE - Comment on industrial communication

Caption: John Browett, General Manager, CLPA-Europe

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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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