It's easy to chase the next big thing with TSN

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Continuous development and breakthrough technologies are advancing industrial communications, enabling them to reach new heights and ultimately writing the next chapter of the digital era. One of the key innovations that is unlocking significant opportunities and cutting-edge applications is Time-Sensitive Networking (TSN).

John Browett, General Manager at the CC-Link Partner Association (CLPA), looks at how TSN is supporting the next big developments in industrial communications technologies.

Control engineers worldwide now have more tools than ever available to create seamlessly interconnected plants – and the best is yet to come, thanks to TSN. In effect, this technology complements standard industrial Ethernet to offer extremely accurate synchronisation, traffic prioritisation and scheduling. Thanks to these functions, TSN can handle multiple types of data and their different priorities over a single network infrastructure. As a result, it is possible to share information and generate more holistic business intelligence while reducing cabling requirements, which in turn can reduce network complexity, capital expenditure and operational expenses.

We can therefore confidently state that the adoption of TSN marks the first, crucial step in the creation of unified, comprehensive network architectures that serve all types of automation. Even more, the power of TSN to drive convergence enables engineers to implement many more future-oriented industrial communications

technologies, even beyond Ethernet. These provide a pathway to the realisation of the Connected Industries of the future as well as the creation of smart, flexible and proactive supply chains, where all players can share key insights with their partners and end users.

Cable multitasking

For example, the reduction in the number of cables required to create factory or enterprise-wide networks will continue and may even lead to the complete transition towards wireless technologies. These are evolving to support industrial applications, in addition to the information technology (IT) world, the consumer marketplace as well as home automation systems.

Expanding the use of wireless technologies in the operational technology (OT) domain, the latest 5G and 802.11 Wi-Fi standards are able to support ultra-reliable low-latency communications (URLLC) to meet the need of manufacturing facilities. The addition of TSN functions to these can therefore lead to communications with bounded low latency, low jitter and extremely low data loss. TSN-wireless hybrids may be the key to creating network architectures with unprecedented levels of flexibility while increasing data accessibility and availability to support a wide range of activities, such as enhanced remote monitoring.

What the future holds doesn't end here. While 5G adoption is still underway, work to develop the next generation of wireless solution, i.e. 6G, has already begun. These networks are expected to support even more heterogeneous applications, such as virtual and augmented reality, artificial intelligence (AI) infrastructures and the metaverse.

Driving change

All these communications technologies can help companies advance the digital transformation of their businesses and even their entire supply cycles. Given this will also be enabled by TSN, forward-looking businesses that want to keep up with the latest, most promising trends to drive their competitiveness should look at adopting new frameworks that are compatible with the technology.

CC-Link IE TSN, the earliest open industrial Ethernet to combine gigabit bandwidth with TSN functions, offers the ideal platform to support this transition. In addition to being the first of its kind, developed by an organisation that is committed to delivering innovative solutions to its users, CC-Link IE TSN provides a reliable system that leverages proven protocols and technologies. The open industrial network is already being used in readily available automation devices, empowering companies to set up futureproof machines and facilities now.

Image captions:

Image 1: TSN is supporting the next big developments in industrial communications technologies (Image source: iStock 1249307293)

About The CC-Link Partner Association (CLPA)

The CLPA is an international organization 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 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 4,100 corporate members worldwide, and more than 2,000 compatible products available from over 370 manufacturers. Around 38 million devices using CLPA technology are in use worldwide.

Further Information:

Website: eu.cc-link.org

LinkedIn: https://www.linkedin.com/company/cc-link-partner-association-europe/

Twitter: twitter.com/cc_linknews

YouTube: youtube.com/user/CLPAEurope

Press contact:
CC-Link Partner Association Europe
John Browett
General Manager
Tel.:   +44 (0) 7768 338708
john.browett@eu.cc-link.org

PR agency:
DMA Europa
Anne-Marie Howe
Progress House, Great Western Avenue, Worcester,
WR5 1AQ, UK
Tel.:   +44 (0) 1905 917477
anne-marie.howe@markettechgroup.com
news.dmaeuropa.com