Keeping up with the times

Time-sensitive, networked factories for consumer electronics production

Consumer electronics manufacturing is a fast-paced industry. To maintain and enhance their competitive edge, companies in this sector need to regularly adopt innovative technologies in their plants and their products to meet ever-evolving market demands. Currently, this means adopting smart, interconnected manufacturing approaches to create highly responsive and productive factories. To achieve such infrastructure, businesses should invest in the right industrial communications technology.

Thomas Burke, Global Strategic Advisor at CLPA, discusses what consumer electronics manufacturers need to look for when setting up industrial communication networks to create smart, interconnected factories.

The U.S. market for consumer electronics, which encompasses devices such as laptops, cell phones, TVs and audio systems is valued at nearly USD 119,000 million in 2020. It is estimated to grow at a compound annual growth rate (CAGR) of over 3% between 2020 and 2025, crossing USD 140,000 million by the end of the considered period.[1] To support this growth, the sector needs to invest in continuous innovations for the development of new products. These result in a wide variety of devices and models with different capabilities and in some case fully customizable products to address ever-growing customer demands.

More than speed

As fierce competition continues to characterize this sector, the fast pace of new releases and price-beating strategies have increased pressure on profit for manufacturers. In order to expand production volumes and revenue while minimizing time-to-market, companies need to implement key automation solutions. These are not only aimed at speeding up the manufacture of large volumes of various devices in a short time as well as supporting product customization. They can also be used to create an interconnected, smart production system that has the ability to improve responsiveness and flexibility while meeting high quality standards.

In effect, an interconnected production system enables different machines to communicate with each other for automated closed-loop feedback while allowing plant operators and managers to have a real-time overview on any process and activity on the factory floor. In addition to leveraging the power of operational technology (OT), companies can also converge this with higher-level information technology (IT) to gain holistic actionable insight over plant and enterprise activities. The foundation of such

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[1] Statista Consumer Market Outlook. (2020). Consumer Electronics Report 2020
Available at: https://www.statista.com/outlook/15000000/109/consumer-electronics/united-states

an industrial IoT (IIoT) system is the network technology utilized to connect all different parties.

This must be able to handle the large volume of data generated by machines and processes by offering sufficient bandwidth while prioritizing the most important information. For example, time-critical traffic that is shared on the factory floor to control key automated devices should be transferred without any delays to maintain optimum productivity on the manufacturing line. In addition, the network needs to be able to transfer data with high accuracy and precision to support high-speed motion. Finally, companies should favor a technology that can offer a transparent architecture to streamline maintenance activities or any network modification, e.g. to expand the facility.

IIoT is time-sensitive

Time-Sensitive Networking (TSN) technology, which is a recent extension of standard Ethernet, is well equipped to address most of these requirements. Its main features include the ability to synchronize devices on a network to a single clock with high accuracy as well as the capability to schedule traffic, prioritizing urgent messages. As a result, multiple types of data can be sent across a single network in a reliable manner, thus supporting IT/OT convergence.

These two key elements of TSN make it possible to create a transparent and simplified network infrastructure that can support advanced, data-driven IIoT applications. Even more, by coupling TSN with a high bandwidth network technology, companies can build sufficient transfer throughput capacity to support highly connected factories, where large volumes of data are generated, shared and analyzed by multiple devices.

The right technology

An existing solution that combines all of these elements is CC-Link IE TSN. This is the first open industrial Ethernet to incorporate gigabit bandwidth with TSN functionalities in order to provide next-generation industrial communications. The technology has been adopted by leading automation providers and compatible devices can substantially improve manufacturing operations.

By choosing CC-Link IE TSN compatible automation technologies, producers of consumer electronics can benefit from highly connected manufacturing facilities. As a result, they can increase productivity, responsiveness and flexibility, which can in turn lead to higher profits.

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CLPAUS029 Consumer electronics Industry Feature

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Image Caption: The U.S. market for consumer electronics, which encompasses devices such as laptops, cell phones, TVs and audio systems is valued at nearly USD 119,000 million in 2020. [Source: istock – metamorworks].

Keywords: consumer electronics, manufacturing, CC-Link, TSN, automation.

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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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
Address: Europa Building, Arthur Drive, Hoo Farm Industrial Estate, Kidderminster, Worcestershire, DY11 7RA, UK

Reader contact: CC-Link Partner Association : Thomas Burke
Tel: (847) 478-2100 Fax:
Web: am.cc-link.org/en/
Email: Tom.Burke@cclinkamerica.org
Address: 500 Corporate Woods Parkway, Vernon Hills, IL - 60061

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