Industrial networks open-up to the future

The Factory of the Future – taking into account Industry 4.0 - is loaded with sensors and devices that record real-time processes and statuses across the factory floor. A fast, efficient and reliable industrial network is key to successfully sharing and utilising the data being generated. The network architecture should be designed as an interconnected platform, able to link all the nodes together and provide both upstream and localised communication.

John Browett, General Manager at CLPA Europe, explains why open industrial networks are fundamental components of the Smart Factory.

The interconnected factory envisioned by Industry 4.0 has the potential to revolutionise manufacturing by demanding greater interconnectivity and control over the different factory processes. In this way, companies in any sector can boost productivity and efficiency whilst improving product quality and consistency.

The adoption of Industry 4.0 is much more than a simple plus for general operating efficiency, as it marks the transition to new manufacturing processes that are truly synchronous with customer demand. Now, during the fourth industrial revolution, the implementation of automation and network technologies is essential for businesses to remain competitive.

While Industry 4.0 is likely unavoidable, its adoption could be onerous for many companies. In real, practical terms, the development and implementation of a suitable digital strategy is a marathon, rather than a sprint. It is tempting to reengineer the whole enterprise at once, but this would be overwhelming, compromising the entire digitalisation process.

After having defined a suitable digital strategy, its implementation should take place in stages. It is generally helpful to proceed with small projects that have a clearly defined end-goal that are relatively easy to complete and manage. In this way, the success of each automation project can be measured, and their realisation helps to develop a controllable and scalable system that can adapt to future needs.

The rise of big data is inextricably linked to networking speed and data carrying capacity, hence any solution needs to have a high capacity. Of the current Ethernet variants, CC-Link IE stands out as the only open gigabit industrial Ethernet currently available. It is a good example of why choosing technologies that already offer an advantage, as well as a clear path toward to future developments, can be beneficial.

Digital strategies need to consider interconnectivity

This step-by-step approach results in the installation and upgrade at different times of factory equipment, whose vendors, technologies and protocols can vary. Therefore, it

is important to make sure that any new component is compatible and can communicate with the existing ones.

This may be trickier than expected. Many current products have closed, proprietary standards and protocols that let them exchange data only with solutions from the same vendor. Choosing a single hardware vendor is not always a feasible alternative, though, as users may need to "mix and match" different offerings to select the most suitable tools for their intended applications. In addition, businesses on their long journey to Industry 4.0 may face changes in the hardware market and its key players.

While this can cause frustration among manufacturers, not all is lost. Open Ethernet, which is not locked to a specific vendor system, can provide a framework that not only allows the connection of current automation products, but also features a built-in flexibility for future factory revamps, installations and upgrades. Therefore, open Ethernet actively supports innovation.

On the flip-side of proprietary solutions, where hardware and software are tightly coupled together, open Ethernet is based on the complete independence between hardware and software. This ensures a hardware application can run on any Ethernet software platform.

Organisations such as the CC-Link Partner Association (CLPA) are helping businesses to become highly connected by developing open networks, thus facilitating multi-vendor and multi-platform interoperability. The CC-Link family of network solutions developed by the CLPA features compatibility from over 300 manufacturers, making a huge catalogue of certified, interoperable products. This broad range of solutions allows end users and factories to select the component that best fits their needs.

Furthermore, the CC-Link family realises seamless transfer of data between communication layers within an enterprise, from shop floor to top floor. More precisely, CC-Link IE Field embraces all the requirements of general machine control, motion control and safety for the factory floor, while CC-Link IE Control is designed for higher level communication, such as directly between controllers in different production cells.

Action plan for a more open Ethernet

Providing an interoperable environment is a constant work-in-progress activity and the CLPA's continuous effort to provide open industrial networks is reflected by its collaborations. For example, the organisation has produced the specification for a coupler with PROFIBUS & PROFINET International (PI). This device allows CC-Link IE and PROFINET networks, and their respective machines to be freely interoperable. Similarly, the CLPA has also developed the CSP+ for Machine OPC UA Companion Specification with the OPC Foundation, allowing for unification of the interfaces between machines and IT systems.

In this way, the CLPA, OPC Foundation and PI are collaborating on the network of the future, which will ensure openness and interoperability from an intuitive and easy to use platform.

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CLPA288 Industry 4.0 and Open Industrial Networks

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, the world's first and only open gigabit Ethernet for automation and an ideal solution for Industry 4.0 applications due to its unmatched bandwidth. Currently the CLPA has over 3,400 member companies worldwide, with more than 1,800 certified products available from over 300 manufacturers. CC-Link is the leading open industrial automation network technology in Asia and is becoming increasingly popular in Europe and the Americas.

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