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FACTORY AUTOMATION

Customer Reference

CC-Link IE Field Powers Reliable 24/7 Production at Huhtamaki's Egg Carton Facility

How open industrial Ethernet technology transformed maintenance workflows and future-proofed automation at a high-volume packaging plant

Key points

- **Faster troubleshooting:** Integrated diagnostics pinpoint exact fault locations, dramatically reducing downtime
- **Improved reliability:** Star topology prevents single cable failures from stopping entire production lines
- **Reduced commissioning:** Easier configuration and fewer components accelerate installation

Huhtamaki's Franeker plant in the Netherlands produces over 11 million molded-fiber egg cartons weekly from recycled paper, operating continuously around the clock. To maintain this demanding production schedule, the facility required highly automated production lines that deliver speed, reliability, and long-term scalability. By upgrading from legacy serial networks to CC-Link IE Field open industrial Ethernet technology, the plant has significantly improved maintenance workflows, reduced troubleshooting time, and simplified system complexity whilst establishing a future-ready automation platform.

The Challenge: Operating 24/7 production lines meant that any downtime directly impacted output and efficiency. The plant's legacy serial network infrastructure presented several limitations that hindered operational effectiveness. Diagnostics capabilities were limited, making troubleshooting time-consuming and requiring additional tools and measurements to identify faults. The daisy-chain network topology meant a single cable failure could stop an entire production line. Additionally, Huhtamaki's in-house engineering team needed an automation platform that would remain reliable and supportable for at least ten years whilst accommodating both legacy equipment support and new machine development.

The Solution: Huhtamaki Franeker standardised on Mitsubishi Electric's iQ-R series PLCs combined with CC-Link IE Field network technology. The open industrial Ethernet platform delivers Gigabit performance, robust diagnostics, and long-term scalability. When machines are modernised, PLCs, inverters, and HMIs are upgraded together as integrated systems. CC-Link IE Field's Ethernet-based architecture enables star topology using standard switches, eliminating the vulnerability of daisy-chain configurations. Newer Mitsubishi Electric inverters include built-in CC-Link IE Field support, removing the need for additional expansion cards and reducing system complexity.

The Results: The network upgrade has delivered immediate and substantial benefits across multiple production lines. Diagnostic information is now instantly available and fully integrated into both PLCs and HMIs, with the system identifying exactly which node or cable is affected when communication errors occur. This has made troubleshooting significantly faster and more efficient, reducing downtime in the 24/7 operation. The star topology ensures single cable failures no longer stop entire lines, improving overall reliability. Use of standard Ethernet cables instead of specialised alternatives simplifies maintenance and procurement. The success of initial deployments has led Huhtamaki to adopt CC-Link IE Field as the site-wide networking standard for all future upgrades.

Technical Details: CC-Link IE Field is an open industrial Ethernet technology delivering Gigabit performance with deterministic communication suitable for demanding production environments. The network provides robust diagnostic capabilities fully integrated into Mitsubishi Electric's iQ-R series PLCs and HMI systems. Unlike legacy serial networks, the Ethernet-based architecture supports star topology using standard industrial switches, eliminating single points of failure inherent in daisy-chain configurations. Modern Mitsubishi Electric inverters feature built-in CC-Link IE Field connectivity, removing the need for additional interface cards and reducing hardware complexity.

Implementation Benefits: The transition to CC-Link IE Field has transformed Huhtamaki's maintenance workflows. Previously, limited diagnostic information required engineers to use additional measurement tools and conduct time-consuming investigations to locate faults. Now, when communication errors occur, the HMI displays precisely which node or cable is affected, enabling immediate targeted response. The use of standard Ethernet cabling eliminates dependency on specialised, hard-to-source cables that complicated maintenance of legacy systems. Fewer components mean less to install, configure, and maintain, streamlining both initial commissioning and ongoing support.

Operational Impact: For a facility producing over 11 million egg cartons weekly in continuous operation, the network upgrade directly impacts business performance. Faster fault localisation reduces downtime, maintaining stable throughput and production targets. The improved network reliability ensures consistent operation even when individual cable faults occur, as the star topology isolates problems rather than cascading failures across entire lines. The in-house engineering team benefits from simplified troubleshooting procedures, allowing them to focus on optimisation and development rather than reactive problem-solving. These improvements support Huhtamaki's commitment to reliable, efficient production.

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