

INDUSTRIAL NETWORKS: FIELDBUS PRINCIPLES AND ADVANTAGES.

Reliable and cost-effective solutions are the two major interests for industrial systems manufacturer. Machines are combinations of mechanical and electrical parts which work together to achieve the final product, and a reliable machine requires a reliable mechanical and electrical design and implementation. For the electrical side of a machine getting the signals right to and from the controller is the most important thing to do and the hardest one.

What makes it hard to transfer electrical signals is electrical noise and signals interference beside cables resistor (See Figure – 1). To reduce this problem we used to use shielded cables with larger cross-sections, but it was a very expensive solution when talking about systems with wide areas.

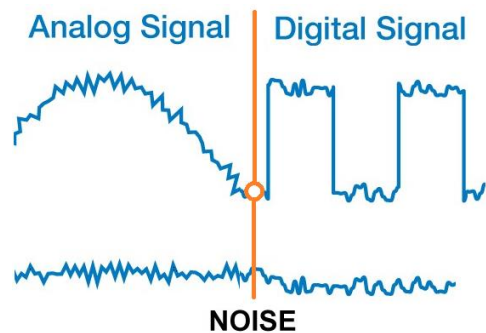


Figure 1 - Electrical noise

Fieldbus is the next technology to solve electrical signals transfer once and forever. It is a group of industrial, real-time networking protocols, which standardized in the IEC61158 (See Figure - 2), and characterized by:

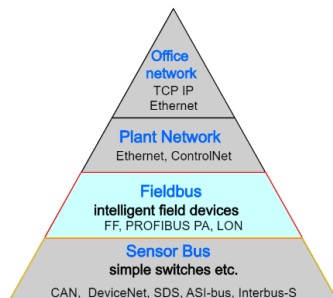


Figure 2 - Industrial Networks

- Bounded delay.
- Robust and easy to install.
- High integrity and availability.
- Large distance range.
- Continuous supervision and diagnostics.

Fieldbus introduce dozens of advantages compared to the classic electrical signals transfer, and those some of the most important ones:

- Less cabling.
- More availability.
- Easier installation and commissioning.
- Easier fault location and maintenance.
- Immune against harsh environments (EM-disturbance, temperature, vibrations, water, ...)

In AFAQ, we deploy many fieldbus protocols such as Profinet, Profibus and Ethercat to interconnect controllers with inverters, servo drives and monitoring devices (see Figure - 3). We are also working on using sensors/actuators buses like AS-I, and IO-Link to reduce cabling and increase efficiency and availability.

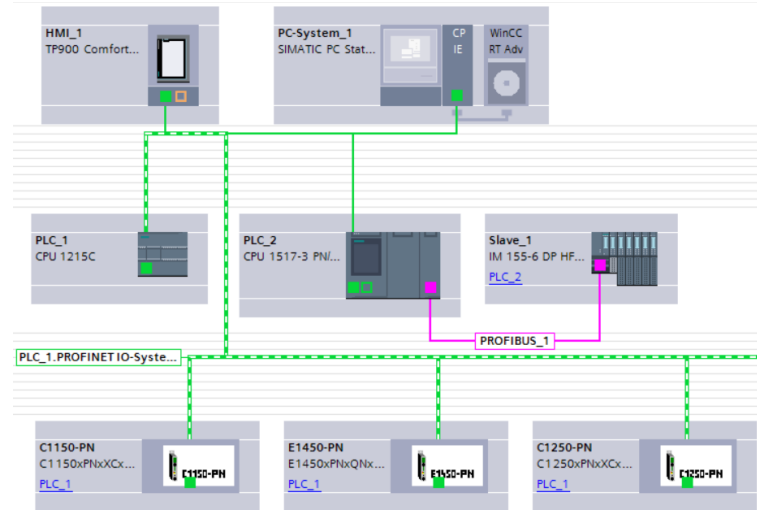


Figure 3 - Production Line Network Configuration



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