

CC-Link In Action

OPEN NETWORKS

Krones communicates with CC-Link

Krones A.G. one of the worlds largest suppliers of bottling and packaging machinery, has utilised the latest in high technology approaches for a multi million Euro health drink bottling line project they are supplying for a customer in Fukushima Japan (about 120 km north west of Tokyo).

The project undertaking was to take 72,000 empty glass bottles per hour, fill them with a liquid health drink (which are very popular in the far east) and pack them into boxes for transportation. The installation consisted of 6 process stages these being infeed, cleansing, filling, capping, labelling and finally packing.

To give their customer the best solution to the project, Krones looked for partners who could meet their and their customers exacting demands, and after careful consideration Mitsubishi Electric's automation products and CLPA's CC-Link were selected for use on the whole project.

Over 136 Variable Speed Drives (VSDs), were used on the project and all were connected to PLCs via CC-Link. The VSDs controlled all the conveyor lines and washing/Rinsing/fillining carousels on the project giving a swift seamless remote starting and stopping of the system with exact real-time speed control.


After the two Glideliners there follows the inspection of the bottles through the KRONES empty bottle inspector (EBI). This vision system checks that the bottle threads are intact, and searches for any unwanted particles on the bottles down to 10 microns.

Any bottles that fail this quality check are sent to a reject line under full production speed, keeping the throughput of the system high. The remaining bottles are then transported through the conveyer network and then onto a single-conveyor to the rinsing/filling block.

As the bottles filter through from the Marshalling conveyor, they are then entered onto a 3 stage cycle where they are cleaned, rinsed, filled (at about 80 degrees) and capped using three separate rotating carousel systems.

The production speed of the Rinser/Filler block is up to 72000 bottles per hour (1200 bottles per minute). Rotation of this machine is driven by a motor connected to a Mitsubishi Electric FR-A500 as are the machines fluid pumps. A Mitsubishi Q-PLC system controls the number of revolutions (rpm) of the carousel and pump output through a CC-Link network connection on the A500s.





Decentralisation of the PLC systems I/O used on the carousels is made even more cost effective and simple by connection to an ASI network. Via the AS-i bus, incoming signals are read by the different digital sensors and outgoing digital signals are sent to elements such as the pneumatic valves, with all other intelligent sensors being read over CC-Link, which can easily cope with the long lengths and multiple connected devices and works diversly with the AS-I networks.

The labelling machines communication is extremely flexible and constantly sends 16 bit 60 words data strings through an RS422 serial port to the PLC. This allows the status of the labelling machine to be constantly adjusted to accommodate the entire production process requirement.

Krones A.G., as well as constructing most of the hardware used, provided the installation for the whole project, including all the communications systems needed between theirs and other manufacturer's equipment used on the whole plant.

Communication was very important and the medium used to connect all these systems together was a the latest in Global open fieldbusses, CC-Link. This fast fieldbus which is excellent in bit or data transfer was very easy to programme and gave Krones no problems in linking all the third party automation and process products together. The network speed and distance (up to 10Mbps up to 4.3km) made it ideal for the high speed distributed communication used on the plant and removed from the whole project throughput reductions that can be caused by system communication delays.

The use of CC-Link on the plant allowed for dramatic reduction in hardwiring which would normally be used to connect different manufacturer's products together. Using only a four wire cable for connection, minimised installation errors, and gave the flexibility to extend the project without re-configuration during its construction, giving a customer friendly installation.

Krones Electrical Engineering Manager Emil Dirmeier stated "Our customer wanted a high speed distributed control philosphy. A major reason for Mitsubishi Electric being awarded this new contract was that they could supply connection to the latest in worldwide cutting edge fieldbus communication technology, CC-Link".



CC-Link Partner Association - Europe

Tel: +49 2102 486 1750 or +44 1707 278953

email: partners@clpa-europe.com | www.clpa-europe.com

www.clpa-europe.com