DeviceNet Packaging Machine Application

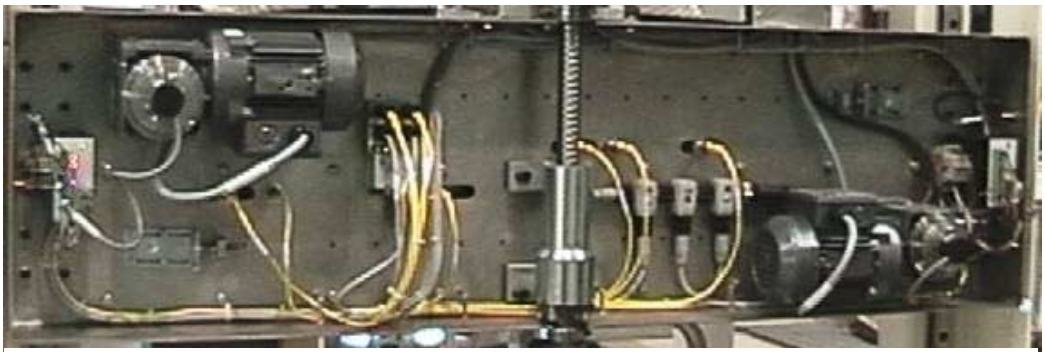
More and more OEM's are now looking to DeviceNet to find a more cost-effective solution to manufacturing.

A recent control upgrade on a simple bag gusset reformer, manufactured by Avalon Engineering Ltd in Hamilton New Zealand, provides you with a tangible comparison of a practical application.

The existing controls for the bag reformer consisted of a dual enclosure arrangement with the PLC on one end of the machine, and the motor VSD's, contactors and overloads on the other. The PLC structure required a 13-slot rack, 5 high-speed quadrature encoder modules, two analogue modules and 4 digital I/O modules. The control equipment was housed in two enclosures on either end of the machine and multi-core cables connecting them.

When Tait Control Systems Ltd were asked to review the current control system the obvious choice was replace it with DeviceNet architecture. The control enclosure was reduced to a single enclosure with a 4-slot rack, two discreet I/O modules and DeviceNet scanner module. The multicore cables became a single data cable, which linked all the encoder positional control, vision equipment, frequency drives and digital I/O.

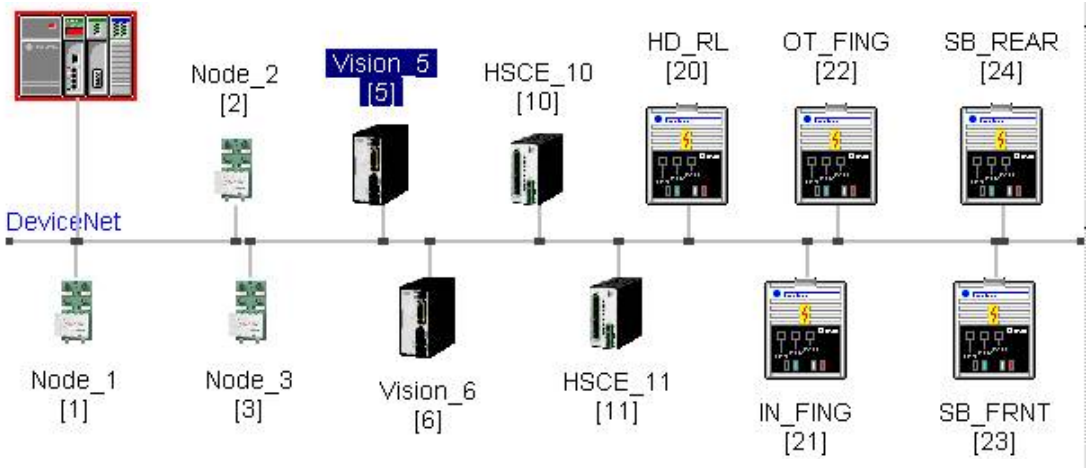
Apart from the reduction of the field cabling and manufacture time, distributing the control out in the field meant sensitive cables from pulse encoders no longer ran long distances with VSD cables and no longer suffered the possibility of induced EMF and RFI. The TCS encoder modules support up to 3 axis, with pulse rates up to 10,000,000 pulses per second. The vision inspection system that were originally an analogue 4 to 20 ma connection became digital with a complete diagnostic capability for both set-up and maintenance staff.



High speed Encoder Modules in close proximity to the encoders

Access to all the variable speed drive parameters meant that smart down loads via DeviceNet saved many hours of configuration time, whilst also providing diagnostic capabilities never seen before. Even the digital I/O for proximities, reed switches, limit switches and solenoids became distributed using TCS block I/O modules.

Whilst the cost comparison of the control hardware was similar. There was no comparison between both the field wiring and installation time. The use of moulded cables to connect field devices and the short runs to the distributed control points meant that the machine was up and running in days as oppose to weeks.



Network configuration

The ability to save parameter files electronically and then down load them into the next machine saved hours of setup time and data entry errors through conventional programming faceplates.

Avalon is now on to their third DeviceNet Gusset Reformer with camera upgrades pending for existing machines. So impressed with the ease of implementation and cost savings that the design stage is already underway to upgrade other machine control systems on to DeviceNet.

For further information on DeviceNet applied go to Tait Control Systems Ltd website
http://www.taitcontrols.com/