

# CC-Link In Action

OPEN NETWORKS

## CC-Link saves wiring time

**Pennine Healthcare has used a range of Mitsubishi equipment to automate the sterile bagging of its range of Yankauers, suction devices used by surgeons to remove excess fluid from areas of the body during surgical procedures.**

Pennine, based in Derby, makes an extensive range of single use medical devices, all manufacturing being undertaken in a medical quality clean room. With over 60 million individual products made a year, automation is vital as it helps avoid contamination through human intervention, maintains quality and consistency and contains costs.

A yankauer is essentially a rigid extruded PVC tube, with one end attached to a suction line. The free end is chamfered to avoid sharp edges, has a series of radial holes and is angled for ease of use. Further back along its length, the bore diameter is enlarged (through an air injection during extrusion) and a larger hole is provided to allow suction control during use. As well as surgeons, they are commonly used by dentists and vets.

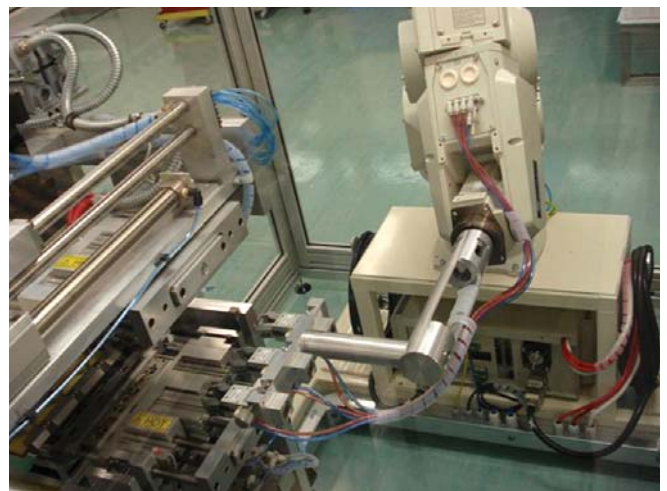
Manufacture of these has essentially always been partially automated, but until recently bagging them into poly sealed packaging was a manual process.

"We were aware that this was a production bottleneck, that the operatives had to maintain very strict hygiene routines and that inner packing was disproportionately expensive compared to the rest of the processes," says Plant & Systems Engineer Darryl Orridge. "So were keen to look at automation."

Many of Pennine's manufacturing processes are unusual, if not unique. Add to this the discipline for clean room operation and its engineering expertise has to be first class.

"For us, manufacturing technology is not a commodity that can simply be bought in as required. It's a core skill within the framework of the company and we have a highly skilled team dedicated to the development of our own high performance and sophisticated custom-built manufacturing systems."

Pennine has long favoured Mitsubishi for control technology and systems and it was the launch of the new Q series programmable automation controller (PAC) that encouraged Darryl to consider options for yankauer packing.



“The process can be broken down into distinct stages. We have to load the yankauer into the packaging machine, make the bags from a roll of flat tube polythene; insert the product into the bag then seal and label it. There is a 200W Mitsubishi J3 servo axes advancing the bag, the sealer/perforator, labeller, interlock, data handling and several other functions. In total there are 262 input/outputs, all handled by a Q01 PAC plus an E1032 HMI (human-machine interface) for local control and monitoring.”

The Q series is a flexible unit with dual central processors, which Pennine use in a mutual redundancy configuration, and a bespoke array of modules for each of the functions under control.

Because the machine is compact, loading requires the products to travel a route around several obstructions. This is done with a Mitsubishi RV3SB six-axis robot, controlled via the Q series.

The main conveyor within the cell is controlled by small induction motors with Mitsubishi 0.18kW FR500 inverters for speed matching.

“This is the first time we’ve used the new J3,” says Darryl. “Previously it’s been the J2. By comparison the J3 is smaller, faster, more powerful and easier to programme; it’s no harder to set up than a conventional AC motor.”

In another innovation Darryl has also made considerable use of fieldbus communications. CC-link is used for communications between the robot bagging machine and packaging machine, While ASiSafe is used for the safety interlock.

“Fieldbus has been a revelation for me. Its so easy compared to conventional wiring: just run the bus cable around the machine and link in the various devices locally. I reckon we saved several days of wiring up and troubleshooting in the build phase, and in use repairs and alternations are the work of moments.”

Another benefit is that because CC-Link is an open field network, it’s possible to add a wide range of other devices such as weigh scales, process controllers valves and the like very quickly and simply. Also, its hot swap capability means that if a networked device should fail it can be replace online without stopping the network, and without creating errors or affecting the cycle times.

“We have decided that CC-Link is going to be the company standard from now on,” Darryl enthuses

Pennine’s commitment to automation matches its commitment to hygiene and will continue to further automate its processes. Significantly this helps keep costs down so that exports are not hampered compared to product from low cost economies. Currently half of all production is exported, a proportion that has been growing steadily for many years.

