

CCS Technology develops advanced robotic solution using the off-the-shelf capabilities of ControlLogix PAC

Leading confectionery manufacturer tasks specialist control solutions company to address major production issue

Solutions

A Rockwell Automation solution was installed, which included:

- Allen-Bradley ControlLogix PAC
- Allen-Bradley Kinetix drives
- Allen-Bradley PanelView Plus HMI
- Low-voltage components

Results

- No dedicated robot controller needed due to in-built Kinematic model of the Delta 3 robot
- Easier maintenance by customer personnel
- Ethernet backbone communicates with third-party components and other elements of the factory
- End customer's standardisation on Rockwell Automation promotes easier integration with existing assets



Background

CCS Technology, a Recognised Rockwell Automation System Integrator, was established in 1988 to provide specialist control system design, software and manufacture for industrial machinery, based around PLC, CNC and Motion control systems.

Since its inception the company has seen steady, continual growth and has built a team of professional electrical and software engineers focused on control system engineering applications all across the globe.

Based in a 19th Century school house in the village of Wolston, UK, the company is ideally located within the heart of England to reach anywhere in England and Wales within four hours by road

In a recent application for a leading worldwide confectionery manufacturer, it was tasked with developing a robot-based machine, which could remedy production issues in the manufacture of a popular chocolate brand.

Thanks to its ability to offer off-the-shelf Kinematic robotic support, it opted for an Allen-Bradley ControlLogix programmable automation controller (PAC) from Rockwell Automation.

Recognised System Integrator



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Challenge

The end user requested a high speed, robot-based machine solution that could be used to identify and rectify errors in the production line used for the manufacture of chocolate-covered wafer bars – at a critical position in the manufacturing process.

Mark Fursland, Managing Director at CCS Technology explains: “Occasionally wafers would not be deposited correctly into the moulds or would be missing all together, resulting in solid sticks of chocolate being produced. Not only did this have an impact on quality, but it was also a relatively expensive error as chocolate is more expensive than the wafers. The solution needed to identify missing or incorrectly positioned wafers and then take the necessary remedial action.”

As well as issues relating to high-volume product throughput and short cycle times there was also an issue with floor space, which CCS Technology addressed by having the control panel mounted atop the robot cell. In order to address the high-speed interfacing requirements of vision systems and other third-party equipment, the control system needed a high-speed communications protocol, such as Ethernet platform. The solution also

pointed towards the use of a robot; therefore any control system deployed would also have to offer robotic control as well as communications with a host of other ancillary devices.

Solution

The machine CCS Technology designed was based around a Delta 3 Robot controlled by an Allen-Bradley ControlLogix PAC, coupled to an Allen-Bradley Kinetix 6000 servo solution.

Fursland elaborates: “The ControlLogix PAC is the only programmable controller solution available with a Kinematic model of the Delta 3 robot. The PAC architecture also makes it easier to integrate, communicate with and control other peripheral equipment.

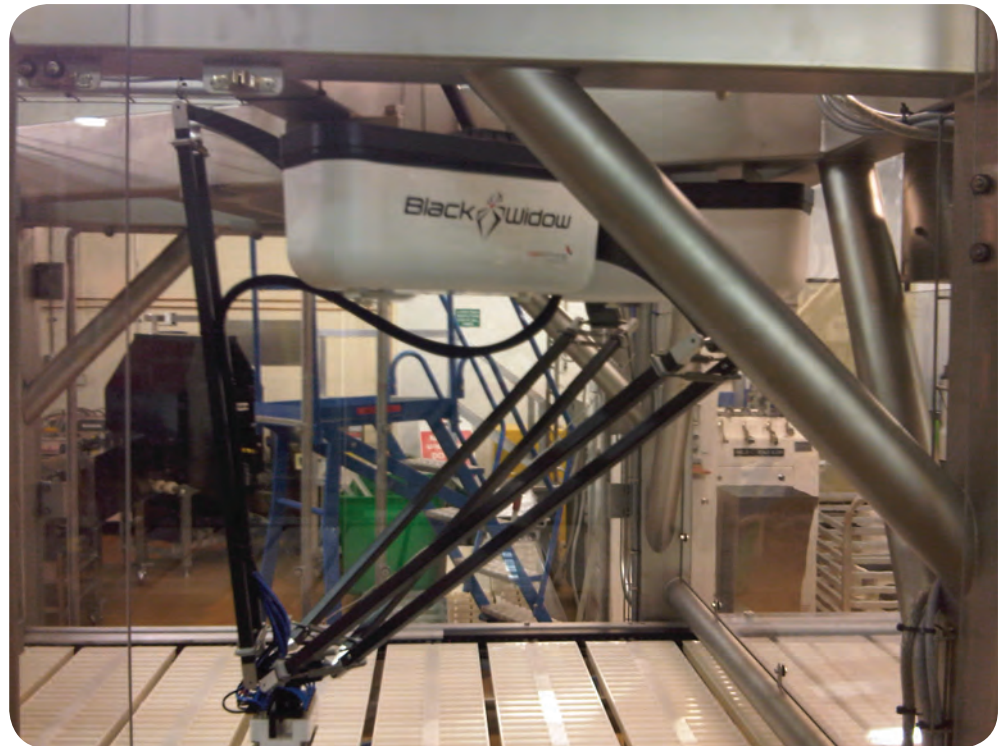
“Traditionally, Delta 3 robots are controlled by dedicated robot controllers that are effectively ‘black boxes’ and are very difficult to maintain by maintenance personnel in factories. More often than not, you have to call out specialist engineers from the company that developed the robot controller,” says Fursland.

“The robot system was fitted with a high-speed 3D



vision solution to identify the missing wafer pocket in the facility," he continues, "which was connected to the PAC via an Ethernet interface and used to guide the robot." The installation was completed with the addition of an Allen-Bradley PanelView Plus HMI and numerous low-voltage components.

The solution also needed to be expandable, to potentially control a second robot. "Based on the performance we have seen with this solution," Fursland explains, "the customer may not need a second robot, but if it does, it is very easy to add another SERCOS card and additional Kinetix drives as the Rockwell Automation solution is designed to cater for this type of expansion."



The flexibility and capabilities of the unit also means that it is more than capable of controlling other elements of the plant and then seamlessly interfacing with any number of factory systems, including those at enterprise level.

Results

"One major advantage of using the ControlLogix PAC is the fact that customer's maintenance personnel are already highly familiar with its architecture and are trained in the hardware and software elements of the system in order to provide first level support," Fursland continues. "The flexibility and capabilities of the unit also means that it is more than capable of controlling other elements of the plant and then seamlessly interfacing with any number of factory systems, including those at enterprise level."

"The actual machine is currently in the customer's research and development facility as it tests the solution prior to deploying it into the production environment," Fursland explains. "As the customer already standardises on Rockwell Automation equipment across the all of its

worldwide manufacturing plants, this eventual integration should be remarkable straightforward.

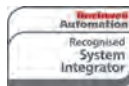
"There are no before/after comparisons," Fursland explains, "as this is a development machine, but I think I can safely say that it is unlikely that you will no longer find a solid finger of chocolate in the popular snack."

On being questioned about CCS Technology's relationship with Rockwell Automation, Fursland tells us: "The company is very supportive and offers great products. The genuine truth is that Rockwell Automation is our preferred choice of PAC and, as such, we have used Allen-Bradley technology across the globe, in applications including oil and gas installations, soft drink production facilities, tyre manufacturing, brewing and telecom. Indeed, we currently have a big project in Africa where we are developing a control solution for waterworks and water distribution to 12 villages, using ControlLogix, CompactLogix, soft starters, low voltage, HMI and SCADA."

Additional Information

www.rockwellautomation.com

The results mentioned above are specific to CCS Technology's use of Rockwell Automation products and services in conjunction with other products. Specific results may vary for other customers.



Rockwell Automation and PartnerNetwork companies collaborate to help you develop an ongoing approach to plant-wide optimization, improve your machine performance and achieve your sustainability objectives.

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CCS Technology was established in 1988 to provide specialist control system design, software and manufacture for industrial machinery. Since that time the company has continued steady growth, building a team of professional Electrical and Software Engineers focusing on control systems for industrial applications.

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