

XCS Systems Ltd. reduced programming time by 80% through integration of PowerFlex Drives and RSLogix 5000 Software from Rockwell Automation

Achieving seamless integration for over 160 drives

Solutions

Allen-Bradley PowerFlex® 40 Variable Frequency Drives

Powerful motor speed control in a compact, space-saving design.

Allen-Bradley PowerFlex® 70 Variable Frequency Drives

Full-featured, outstanding performance drive that connects seamlessly into integrated architecture with an extensive range of power ratings.

Rockwell Software RSLogix® 5000 Software, version 16

With RSLogix 5000 software, you need only one software package for sequential, process, drive, and motion control programming.

Allen-Bradley ControlLogix® Programmable Automation Controller (PAC)

Provides high-performance in an easy-to-use environment. Tight integration between programming software, controller and I/O reduces development and commissioning time.

Allen-Bradley PanelView™ Plus CE Displays

One of the most versatile operator interface options. The PanelView Plus CE provides seamless integration into Integrated Architecture and common development software.

Allen-Bradley EtherNet/IP Network

Open industrial networking standard that supports both real-time I/O messaging and message exchange.

Allen-Bradley POINT I/O™ module

Ideal for applications where flexibility and low-cost of ownership are key for a successful control system design and operation.

Results

Reduced Programming Time by 80%

Custom instruction feature and Ethernet network allows one edit to affect programming for all the drives.

Eliminated potential for programming errors

With integrated drives configuration, XCS Systems Ltd. could configure both the controller and drive at the same time with one tool.

Allowed for better energy efficiency

With signals from the conveyor, the software can automatically change the speed of a fan, depending on how full the line is running to conserve energy.

Background

UK system integrator, XCS Systems Ltd. of Droitwich Spa, Worcestershire, specializes in high-speed process control in the packaging industry, principally in the food and beverage sector. Its typical customer is a 'Blue Chip' company and often a market leader that expects the highest standards of engineering, documentation, safety, confidentiality and reliability. XCS Systems Ltd. aims to exceed its customers' expectations by providing total solutions for specific applications and turn-key projects. In 2007, XCS Systems Ltd. designed and commissioned a project for a canning plant to integrate over 160 motors and drives into a new can conveyor line.

Challenge

XCS Systems Ltd. challenges for this complicated installation were to reduce control system design and commissioning time, optimize drive speed control for improved process control and reduce energy use and reduce programming time for easier integration of the drives into controller programs.

Separately programming all 160 drives would be tedious and time consuming. XCS was looking for an integrated control system that links all the drives and speed control software, and could save programming time.

Improved process control would also improve production quality by minimizing damage to the cans on the conveyor.



XCS Systems Ltd. designed a project for a canning plant to easily integrate over 160 motors using PowerFlex drives and RSLogix 5000 Software version 16 into a new conveyor line.

Solution

Working with Rockwell Automation®, XCS Systems Ltd. saw the benefits of its trademarked solution strategies *Integrated Architecture and Intelligent Motor Control* using Allen-Bradley® control products. The solution combines leading-edge motor control and protection devices with advanced networking and diagnostic capabilities, and single-control infrastructure to simplify start-up, reduce install cost and provide easy access to plant and production data.

Rockwell Automation recommended Allen-Bradley PowerFlex® 40 AC Drives for the conveyor line motors and PowerFlex 70 AC Drives for the elevator and air-powered conveyors. The drives are all linked through an Ethernet/IP network to PanelView® Plus CE displays, ControlLogix Programmable Automation Controllers (PACs) and POINT I/O™, and RSLogix® 5000 Software version 16.

“Using variable-speed drives allows us to run the fans much slower when there are no cans on the air-powered conveyor. Running them only as fast as we need to,

Running them only as fast as we need to, at, say 20Hz, allows us to gain energy savings," says Paul Croad, XCS Systems Ltd. "Speed control is the most important factor, which is obviously why a network comes in handy. You can get the speed feedback from machines and their drives directly across the network, whereas in the past we would have had to hardwire analog signals back into the feedback loop."

To reduce design and commissioning time, the combination of the Ethernet/IP network and RSLogix 5000 Software offered a simple and technically superior solution. RSLogix 5000 software, with its plug-and-play capability and downloadable drive parameters, made software setup, hardware configuration and system commissioning easier than ever before for XCS Systems Ltd. The RSLogix 5000 Software version 16 uses Premier Integration with PowerFlex Drives, an integrated drive configuration feature that allows PowerFlex Drive users to consolidate drive system configurations, operation and maintenance into a single, integrated environment. This capability helps reduce programming, installation and overall ownership costs by minimizing the number of software tools required.

Results

With the solution from Rockwell Automation, XCS Systems Ltd. was able to achieve its goals for this project. The canning plant's production quality has improved using the drive-controlled air-powered conveyors that propel the cans on a cushion of air to minimize damage as the cans funnel from a wide conveyor to a single-file line.

By applying the variable speed control of PowerFlex drives XCS Systems reduced energy use and created less wear and tear

on motors and mechanical equipment. When the conveyor is near empty, the system can accelerate the cans quickly along an air cushion, with little friction. As the conveyor fills up and more air is needed to move the weight of cans, the drive will speed up the fans accordingly. XCS Systems Ltd. Peter John explains, "By using feedback from the pressure gauge we can automatically reduce the speed and therefore the energy required; using just enough energy at all times. Previously this would have taken several lines of code to implement, but using the custom instructions RSLogix 5000 Software featured made it easier to write a scaling subroutine with quicker and easier to navigate. It makes the program a lot more compact, and makes it easier for maintenance people to follow."

XCS Systems Ltd. has found an 80% savings in programming time. John says programming that used to take two months to write and implement can now be done in one week.

The custom instruction feature allows XCS Systems Ltd. to only have to edit the instruction once to affect all of the drives. "Furthermore, with Ethernet networking, if we need additional functions, we write a bit of software rather than pulling cables," John adds. Fiber-optic media also eliminates problems with electrical interference on copper cabling at distances greater than 100 meters.

The Ethernet/IP Network bandwidth provides a 50-70 millisecond system response-time for all the feedback signals to the drives and allows XCS Systems Ltd. to interlock all the machines and the various sections of the line together. Using RSLogix 5000 Software version 16 means

that there is now one single networking standard used throughout the line, for easier integration over the Ethernet/IP Network of the drives into controller programs. It makes design, configuration and commissioning of the line much more flexible.

Croad explains, "Now the global Ethernet/IP network does all the interlocking between machines and allows engineers to program any machine, or any part of the line control from anywhere in the line."

Drive parameters are now kept directly in the RSLogix 5000 Software, so that all the drive data is in one place and only one tool is used for networking and controller programming. This also helps XCS Systems Ltd. save panel space. "In the past, a controller chassis would consist of several racks filled with digital and analog I/O," says Croad. "Now, smaller control panels make it easier to fit new equipment into existing plant."

Immediately after initial start-up XCS Systems Ltd.'s canning plant customer was able to resume full 24-hour-production. "With everything new on such a large scale, there are always potential problems," says John, "but as soon as everything was installed on the new line, it all worked the first time. Normally a start-up would initially work on the day shift only, but we went immediately to 24-hour production and have stayed there ever since."

Intelligent Motor Control and Integrated Architecture from Rockwell Automation helped XCS Systems Ltd. meet its project goals to reduce design and commissioning time, reduce programming time and improve motor performance and process control while reducing energy use, which all translates to increased savings for their canning plant customer.

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www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

America: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation, Voorsman/Boulevard de Souverain 36, 1170 Bonasels, Belgium, Tel: (32) 2 663 0605, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core 5, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4785, Fax: (852) 2508 1846