

Series 6 To 90-70 PLC Upgrade

Background

The project consisted of upgrading three Finishing room wrapper G.E. Series 6+ PLC's into one 90-70 G.E. PLC due to the pending obsolescence of the Series 6+ technology. The intent of upgrading to one 90-70 PLC was to eliminate the complexity of the global transfer of data between the three Series 6+ PLC's and to segregate the control of roll storage equipment on a paper machine from the Finishing Room's wrapper PLC. Operation of the paper machine winder was interrupted when there was a PLC shutdown in the Finishing Room. Once awarded the contract to provide the detailed electrical and controls engineering for the project, KMH took part in a G.E. Fanuc training course for conversion of Series 6+ logic to 90-70 logic. Following the course G.E. certified KMH to use the (S6PIO) Series 6 I/O Controller module (purchased by KMH).

Design Approach

The 90-70 was a natural upgrade path from Series 6+ because of some obvious benefits;

- The ease of program conversion, due to the availability of a software conversion utility
- G.E. 90-70 Series PLC's were already in use in the Mill on Paper Machine Gauging Systems
- The compatibility of Genius I/O systems, allowing for all existing Genius I/O to be retained
- The flexibility that the G.E. S6PIO module offered, as well as the availability of G.E to provide KMH with the appropriate training and certification to purchase and use the module

To segregate the control of the roll storage equipment for the Paper Machine from the Finishing Room PLC's, it was determined that the most feasible solution would be to install a second standalone 90-70 PLC for that equipment. It was also determined that both new standalone 90-70 PLC's would be equipped with Ethernet communication cards to replace Genius Bus communication with the existing Wonder Ware MMI's and serial communications to the Product Tracking System (PTS). Another project task was the replacement of the S6+ ASCII Basic module, used to communicate to a Bar Code Scanner and Weigh Scale with the 90-70 PCM module as well as the conversion of the ASCII Basic program to MegaBasic.

Scope of Supply

- PLC, enclosure and misc. hardware specifications.
- PLC wiring diagrams.
- PLC cabinet and installation drawings.
- Cable Schedules.
- Termination Schedules.
- Construction Specifications.
- Program conversion from S6+ to 90-70.
- Segregation of the roll handling equipment's logic into a standalone 90-70.
- Programming a new 90-70 PCM module to communicate with the existing Bar Code Scanner and Weigh Scale.
- Programming of Ethernet communications to allow communications with existing Wonder Ware MMI's as well as the Mill PTS system.
- Wonder Ware database revisions resulting from address relocations from the merging of three S6+ PLC's into one 90-70 PLC.
- Completion of Factory Acceptance Testing of communications for the PTS system, MMI's as well as the Bar Code Scanner and Weigh Scales.

Summary

This fast track project of the S6+ to 90-70 PLC upgrade included meeting of the Mill's aggressive shut down schedules during switchovers from S6+ to 90-70 control. Multiple tests and dry runs of the new 90-70 PLC program as well as insuring all existing devices communicated to the new 90-70 PLC was done. Engineering began in May 2001. The S6+ conversion to 90-70 Series was started up under new controls for permanent use in Oct 2001, and the completion of the swapping of the I/O modules was completed by Jan 2002. All performance guarantees were met. The project was an overwhelming success.

References

- Dave Young, Electrical and Control Systems Specialist, Paper Machines, 807-475-2356
- Dave Daniels, Project Leader, 807-475-2492

