Modicon Quantum Controller Advanced
Programming & Troubleshooting
Module 104

Develop your understanding of the advanced functionality of the Modicon programmable controller as it applies to the maintenance technician and plant engineering personnel. Carefully selected lab projects are designed to develop and test your skills. This course offers insights into new and better ways to apply your Modicon control system as a troubleshooting and diagnostic tool. You will learn to trace the flow of control signals into the control system, through the user logic, and out to the output device. This knowledge will provide you the basis from which to comprehend complicated control circuits, use the system diagnostics more competently, diagnose and solve in-plant control problems more quickly. Course length is four (4) days. Prerequisite: Modicon Quantum/984 Intermediate II Programming & Troubleshooting or instructor approval.

Course Objectives

- Brief review of the major functional components of the Modicon programmable controller system.
- Review relays, timers, counters, and calculate function blocks.
- Explore and test the functionality of the calculate, move, matrix, PID, and read/write function blocks as they apply to your system.
- Apply function blocks to create and test your own programs in extensive hands-on lab sessions designed to stimulate a logical approach to problem solving.
- Examine methods and applications for the Enhanced Math, (E-Math) function blocks.
- Use E-MATH functions to convert from integer math to floating point math.
- Work with all of the number formats and explore the differences between each of the number formats, reviewing whole number math, sixteen (16) bit integer math, signed number and floating-point math.
- Apply your knowledge to sub-programs selected from your own control applications.
- Develop methods to test programs, develop traps, and to follow the flow of information through a series of function blocks.
- Provide labs to test your understanding of your plants control system.
- Process Control Functional Language, (PCFL) functions their application and content.
- Review the implications of thirty-two (32) bit math to help identify the registers that are used and hidden in the logic program.
- Is the problem hardware, software, or field device?
- Develop troubleshooting skills for gathering clues to help eliminate non-problem spots, and draw attention to possible problem spots.
- Network Equation Editor function and a look at what the future holds for programming that next application.