Control Equipment

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This ten-day course starts with an introduction and basic working knowledge of PLCs, progresses to advanced PLC programming, and ends with Variable Frequency Drive theory and troubleshooting using the SLC-5, PLC-5, and 1305/1336 VFDs for hands-on. This course is designed to prepare those personnel who are technically proficient, but have not previously been exposed to PLCs. It is also useful when presented in module format for a mixture of experience brought in different segments of the course. This works since this course is progressive in nature. The first module introduces PLCs, the second module presents advanced concepts, and the last module discusses VFD controls.

I. Basic Overview

- Purpose of Using PLCs in Industry
- Advantages/Disadvantages
- Plant Applications
- Safety Precautions

II. Basic SLC-500 Components

- Processor
- I/O
- Power Supply
- Programmer
- Chassis

III. Basic PLC-5 Components

- Processor
- I/O
- Power Supply
- Programmer
- Chassis

IV. Number/Addressing Systems Used in PLCs

- Binary
- Octal
- Hexadecimal
- BCD

V. Processors

- PLC 5
- Memory Capacity
- Scan Times
- Indicator Lights
- Power Requirements
- Mounting Instructions
- Adding CMOS Memory
- SLC 5/00 Series
- Memory Capacity
- B. Scan Times
- C. Indicator Lights
- Power Requirements
- Mounting Instructions
- Adding CMOS Memory

VI. Input/Output Modules

- Basic Operation
- Various Operating Voltages
- Power Requirements
- Mounting Instructions
- Wiring the Modules
- Identifying Faulty Modules

VII. Chassis

- PLC 5
- SLC 5/00 Series

VIII. Information Found in SLC-500/PLC5 Data Files

- Output File
- Input File
- Status File
- Bit File
- Timer File
- Counter File
- Control File
- Integer File

IX. Adding Memory to AB SLC-5/00 Series

- Extending Base Memory
- Adding CMOS

X. Adding Memory to AB PLC-5S

- Extending Base Memory
- Adding CMOS

XI. Programming and Editing Basics

- Clearing Memory
- Setting and Editing a Ladder File
- Using Various Ladder Logic Commands
- Exercises on all Commands

XII. Interfacing the SLC with the PLC-5

XIII. Configuring "Smart" Modules (Functional Overview)

- Analog Input Modules
- Analog Output Modules
- Thermocouple Modules

XIV. PLC Communications

- Communications on the Data Highway +
- Communication via the Ethernet Port
- Communication with PLCs in Adapter Mode

XV. Advanced Searching

- Searching Across Ladders
- Searching for "Strings"
- Searching for symbols

XVI. RSLogix5 Main View Screen

- Main Program Area
- Main Menu Bar
- Instruction Bar
- Icon Bar
- Status Bar
- File Area

XVII. Starting RSLogix5

- Main View Screen
- Off-line Operations
- Going Online

XVIII. Loading a Program

- Connecting the Laptop
- Loading Program from Hard Drives
- Loading Program from Floppy Disks
- Downloading to the Processor
- Comms Menu
- Program Mode

XIX. Saving Programs and Directories

- Saving a Program to a Disk
- Saving a Program to a Directory
- Downloading and Saving a Ladder File

XX. Editing

- Making Edits On-line
- Testing Edits
- Assembling the Edits
- Using Searches

XXI. Ladder File Operations

- Forcing Points
- Enabling/Disabling Forces

XXII. Printing Files

- Printing a Ladder File
- Printing I/O Tables

XXIII. Basic Ladder Logic Commands

- The Help Screen
- Contacts and Coils (XIC, XIO, OTE, OTL)
- Latching Coils (OTL, OTU)
- Timers (TON, TOF, RTO, RES)
- Counters (CTU, CTD)
- Move Commands
- Math Commands
- Master Control Relay
- Subroutines

XXIV. Troubleshooting Basics

- Basic 7 step principals
- Typical I/O faults
- Using Module Indicator Lights
- Exercises (Guided Discussion)

XXV. On-Line Troubleshooting

- Using Forces
- Using the AFI Command
- Diagnostic Tools

XXVI. AC Drive System

- Power Section
- Logic Section
- Variable Frequency Drive Parameters

XXVII. Variable Frequency Drive Overview

- Drive and Option Identification
- Drive Firmware Identification
- Drive Schematic Overview

XXVIII. Variable Frequency Drive Operation

- Programming and Display Panel
- Control Inputs
- Drive Functions

XXIX. Variable Frequency Troubleshooting

- Fault Information
- Fault Troubleshooting