



## Ron Beaufort Training, LLC

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## Hands-On Technical Workshops

by Ron Beaufort

Course Specifications: **C1540**

### Level 1 and 2 Skills for ControlLogix Using RSLogix5000 – Discrete & Analog Signals

This **five-day, hands-on** technical workshop for plant maintenance personnel is designed to:

- cover the basic hardware associated with the **ControlLogix-5000** family of Allen-Bradley programmable logic controllers
- cover the principle features of the **RSLogix5000** software used to program and monitor the operation of the CLX-5000
- cover the basic techniques required to work with both **discrete** and **analog** signals associated with CLX-5000 control systems

The following topics will be presented through hands-on exercises and demonstrations:

- Basic hardware of the CLX-5000 system
- Navigating the principal features of the RSLogix5000 software package
- Fundamentals of the CLX-5000 ladder logic instruction set
- Data types including DINT, INT, SINT, BOOL, REAL, STRING, User-Defined, etc.
- Accessing online help for RSLogix5000
- Online and offline editing skills
- Configuring and addressing I/O modules
- I/O wiring and basic troubleshooting
- Creating, editing, and monitoring tags
- Emergency Cut-Off systems; wiring for fail-safe operation
- Using I/O forces; techniques and safety issues
- Entry-level Ladder Logic programming skills; linear sequencing
- Basic introduction to Function Block Diagrams, Sequential Function Charts, Structured Text programs, and Equipment Phases
- Safety issues when using latches vs. "seal-around" programming techniques
- Tasks, Programs, Routines, etc. and their effects on the processor's scan
- Documenting the ControlLogix project with address and rung comments
- Accessing and resetting fault codes
- Downloading and uploading projects
- Installing and configuring analog I/O modules such as 1756-IF8 and 1756-OF4
- Wiring and processing analog inputs and outputs such as 4-20mA and other common instrumentation signals
- Using communications modules such as 1756-DHRIO, 1756-ENET, and 1756-CNB
- Troubleshooting techniques using Find, Cross Reference, Trend, Browse Logic, Bookmark, Watch List, Tag Data Monitor, and Compare Tool features
- Tracing logic which uses produced and consumed tags, and alias tag names
- Math functions required for scaling analog input and output signals
- Using subscripts in tag arrays for indirect addressing operations
- Using the Message instruction to communicate on Data Highway Plus, Ethernet, and Remote I/O networks
- Basics of Add-On Instructions
- Configuring RSLinx software drivers for various communication hardware

This course will be conducted as a laboratory workshop using the **Problem/Solution** method of instruction. There are absolutely no transparency projectors and no PowerPoint slide shows involved. Instead, all of the course material is presented through a series of hands-on exercises which each student performs on **real-world equipment**. By working through the same types of tasks which are commonly encountered in the field, students not only master the material more rapidly but also improve their **problem-solving** skills and develop the **confidence** required to apply their new abilities on the job. Most students, particularly those with a maintenance technician background, respond enthusiastically to the challenges of this dynamic style of instruction.

Students successfully completing this course will be awarded 4.0 Continuing Education units.

In order to provide each student with an **individual workstation** and with adequate instructor attention, the class size is normally limited to six students. **Please note** that this five-day workshop covers a large amount of material and that some students may consider the pace to be quite demanding.

It is **required** that each student have a good working knowledge of Microsoft Windows and also adequate mouse and keyboard skills to enable active participation in the lab exercises. Although the pace of this workshop will **not** accommodate students who lack these skills, we offer a separate one-day hands-on computer workshop to provide these prerequisites.

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