

Motorola SCADA RTU Installation, Maintenance and Programming Training Class (5 days)

Course Objectives

- Provide students with an understanding of the Motorola SCADA RTU equipment and its capabilities.
- Give the students the ability to Download RTU Firmware, Site Configurations, Application, Network Configuration, and RTU Flash Programs.
- Instruct the student on the use of Maintenance Features within the Motorola RTU Programming Software.
- Instruct students on various hardware tests and calibration for I/O modules.
- Provide instruction on the site configuration of individual SCADA RTU's.
- Provide instruction on the use of system network configurations.
- Instruct students on the uses of Process and Database monitoring within the application programmer.
- Give the students the ability to troubleshoot hardware down to the module level.
- This course provides instruction on ladder diagram programming for the Motorola SCADA RTU's.



Course Outline

1. *Typical Applications*

- A. Description and discussion on uses of the Motorola SCADA RTU's
- B. Application Guidelines

2. *Installation*

- A. Mounting – Frames, rack and housing
- B. Connecting power and ground
- C. Connecting the radio
- D. Power Supply and backup battery

3. *Communication Media*

- A. Radio – conventional and trunked, analog and digital
- B. IP
- C. Other Media

3. RTU Nomenclature and structure

- A. CPU to Power Sources

4. I/O Modules Details

- A. Digital input modules
- B. Digital output modules
- C. Analog Input/Output modules
- D. Specialty modules

5. Programming Software Operation

- A. Installation / Setup
- B. Site Configuration
- C. Application Programs
- D. Networking
- E. Hardware Diagnostics
- F. Software Diagnostics
- G. Backing up & restoring project files
- H. Upgrading projects to newer versions.

6. Introduction to Programming

- A. Data tables (Table types, Data types, Physical I/O data types)
- B. I/O Links (Assigning site configuration, Assigning digital I/O, Assigning analog I/O)
- C. Process Programming Overview (Process flow, Ladder rungs, Available I/O signals, Logic required for physical I/O data)
- D. Ladder Logic Programming. A program is created that uses local digital inputs to control local digital outputs. The example is improved upon until the original 6 ladder rungs are reduced to a single symbol.
- E. The programming example is expanded upon each day to provide many programming examples using the Programming Software.
- F. On-line monitor mode
- G. Programming considerations for radio communications is covered.
- H. Programming considerations for MODBUS protocol with a central computer.
- I. Enhanced PID (Proportional-Integral-Derivative) Controller. (ACE3600 Only)