

## Turbotronic 6 Control System Operations

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### Course Number

10220

### Course Duration

5 days

### Audience

Solar turbomachinery operators, maintenance personnel, and engineers

### Prerequisites

Participants must have completed a Solar Operation and Maintenance Principles or Package Operating Principles course to ensure they have a good understanding of the equipment being controlled. Equivalent experience is acceptable, if this course has not been completed.

### Description

This course is designed for package operators or maintenance technicians who are required to perform basic first line control system tasks with minimal guidance from Solar field service. The course will cover the Turbotronic 6 control system version.

The course will cover the knowledge and skills required to help maintain the package in a serviceable state under several scenarios, including the following:

- Using the control system program to determine the conditions for package alarms or shutdown
- Reloading the control system program following a component replacement or system malfunction
- Loading a revised control system program that may have been received from Solar
- Modifying Tunable Program Constants
- Monitoring the logic to aid in package maintenance and troubleshooting activities
- Using programming techniques, such as Forcing or the insertion of temporary logic, to aid in package maintenance and troubleshooting activities

Manipulation of the logic is not covered in this course.

A Pre-Test and Post-Test will be administered to measure progress as a result of the course.

## Methods

The course is a combination of presentations, interactive discussions, demonstrations, and simulated programming tasks. The programming tasks are completed using a three-stage “VUIT” activity (View / Under Instruction / Try). The steps are first demonstrated; the trainee completes the task with guidance, as necessary; and then has the opportunity to complete the task without guidance, as a verification of proficiency. Note that laptops are not provided for course participants. These activities are normally completed as a group activity using the Instructor’s laptop. All participants will be granted access to the activities via Solar’s LMS, and may therefore be able to complete the activities on a laptop or tablet that they bring to the class (this is contingent on internet access being available at the class location). In addition, all participants will have access to these activities via Solar’s LMS for a 12 month period following the class to allow for practice opportunities.

## Topics

1. Control System – Purpose and Function
2. Control System – Hardware and Communications
3. Control System – HMI Controls
4. Control System – Using the HMI
5. Control System – Software and Tools
6. Boolean Logic
7. Ladder Logic and the Basic Instruction Set
8. Project Architecture
9. Project Security
10. Logic – Tags and Databases
11. Logic – Hardware / Software Interface
12. Logic – Processing Discrete Signals
13. Logic – Processing Analog Signals
14. Logic – Using Timers and Counters
15. Logic – Using Program Constants
16. Logic – Processing Alarms and Shutdowns
17. Logic – HMI Interface
18. Logic – Function Block Logic
19. Logic – Logic Interpretation
20. Online Functions – Connecting to the Controller
21. Online Functions – Loading Software
22. Online Functions – Navigating the Logic
23. Online Functions – Forcing Discrete Values
24. Online Functions – Forcing Analog Values
25. Online Functions – Making Online Edits