

## PLC Maintenance with Logic Developer

### Course Description

The GE Intelligent Platforms PLC Maintenance course provides the student with the skills necessary to troubleshoot and repair faults in GE Intelligent Platforms programmable logic controllers (**90-30, 90-70, VersaMax, RX7i and RX3i**). The class is taught using Logic Developer PLC software, which is part of the Machine Edition family of products. The focus is on interpreting existing ladder logic programs for troubleshooting purposes. Students are also taught how to use the troubleshooting tools within the software to determine where faults have occurred and how to correct them.



### Who Should Attend?

This course is intended for anyone who will be troubleshooting GE Intelligent Platforms PLC control systems using Proficy Logic Developer PLC software. It is designed for electrical technicians, electricians, and/or engineers beginning to work with Logic Developer PLC, who will be tasked with modifying and maintaining PLC programs and hardware.

### Are There Any Prerequisites?

Participants should be comfortable operating in a Microsoft Windows environment. Participants should have a basic understanding of electrical/control fundamentals.

Upon completion of this course, the student will be able to:

- Define the function of each hardware component of GE Intelligent Platforms PLC systems
- Describe the Machine Edition software environment
- Configure and establish communication to the GE Intelligent Platforms PLC hardware
- Configure GE Intelligent Platforms PLC hardware using Logic Developer PLC software
- Define the instruction set(s) for GE Intelligent Platforms PLCs
- Modify existing ladder logic in GE Intelligent Platforms PLCs
- Interpret existing ladder logic for troubleshooting purposes
- Research hardware and software information in Infolink
- Access and interpret controller and I/O fault tables
- Use troubleshooting tools within Logic Developer PLC software

### Course Length

3 days

### Suggested Class Size

10 students

### Class Hours

8:00 am - 5:00 pm, daily



## Course Agenda

*(Schedule and timing may vary. The 3 day version of this course may condense and omit some topics.)*

### Day 1

#### Morning

##### **Control System Fundamentals**

Introduction to Controllers components and the roles Controllers play in automation.

Controller application components and Logic Structure.

Basic Controller Variables, Data Types, and Numbering Systems.

Understanding the Controller Scan.

##### **Controller Hardware Overview**

Basic controller system hardware components.

Find Controller Information using InfoLink and GE Intelligent Platforms web sites.

#### Afternoon

##### **Operating Proficiency Machine Edition**

Orientation to the Machine Edition programming environment and purpose of each of its tools.

Machine Edition "Best-Kept Secrets".

Define a Project and Target.

Navigate through the Project.

Backup, Delete, and Restore a Project.

Provide Project and Target Documentation.

##### **Configuring Controller and IO**

Configure the Controller, IO, and Option Modules.

Understand Hardware Configuration Status indicators.

Assign Reference Addresses to I/O Modules.

Use the Hardware Reference View.

Import and Export Hardware Configuration.

Run and Print Hardware Configuration Reports.

### Day 2

#### Morning

##### **Working with Controllers**

Establish communications to Controller over Serial and Ethernet connections.

Validate a Machine Edition Project.

Download to and Upload from a Controller.

Verify Information between a Project and a Controller.

Work with Fault Tables.

View Controller Status information.

##### **Working with Variables**

Understand basic Variable concepts, along with Universal, Local, Global, and Alias scoping of Variables.

Understand Variable Types, Variable access, and the various Variable attributes.

#### Afternoon

##### **Online Monitoring Tools**

Monitor programs using online Logic Monitoring, Data Watches, Reference View Tables, and the Data Monitor.

##### **Online Application Modification**

Make program changes to an application while the Controller is running.

Understand online change methods: Word-for-Word, Run Mode Store, and Test Edit

##### **Machine Edition Options**

Understand the key Machine Edition options and their impact on Machine Edition operation.

Reset Machine Edition options to their Default Values.



## Day 3

### Morning:

#### Introduction to LD Programming

Understand the basic operation of the Ladder Diagram Programming Language.

Become familiar with the LD Editor layout and operation.

Review the basic LD logic elements, such as contacts, coils, counters, timers, and relational operators.

Learn how to monitor the LD logic executing in the Controller.

#### Monitor Application Variables

Understand how to monitor application Variables using the Data Watch, Data Monitor Utility, and Reference View Tables.

Understand how to modify application Variables.

Understand how to use Variable References to find application Variable usage in the Project.

### Afternoon:

#### Monitor Controller Without Original Project

Understand how to monitor a Controller program without having the original Project.

#### Modify Existing Program

Understand how to modify an existing Project by working with Rungs, entering LD Logic, connecting LD Logic, and creating New Variables in the LD Editor.

Understand how to determine how Controller memory is being used by the application.

## Day 4

### Morning:

#### Controller Equality Status

Understand the Controller Equality Status indicators.

Understand how to determine what Controller components are Not Equal to the Project.

Understand how to gain Controller and Project Equality.

#### Manage Controller Forces

Understand how to detect and locate Controller Forces.

Understand how to Clear and Unforce Variables and Reference Memory Locations.

### Afternoon:

#### Application Troubleshooting

Understand how to troubleshoot Controller applications.

Understand how to use Search, Cross References, and References to diagnose logic behavior.

#### Controller and IO Faults

Understand how to use Controller and I/O Faults to diagnose system issues.

Understand the differences between Fatal and Non-fatal Faults.

Understand how to clear and print Faults.

Understand how to save Fault Tables to a file.

