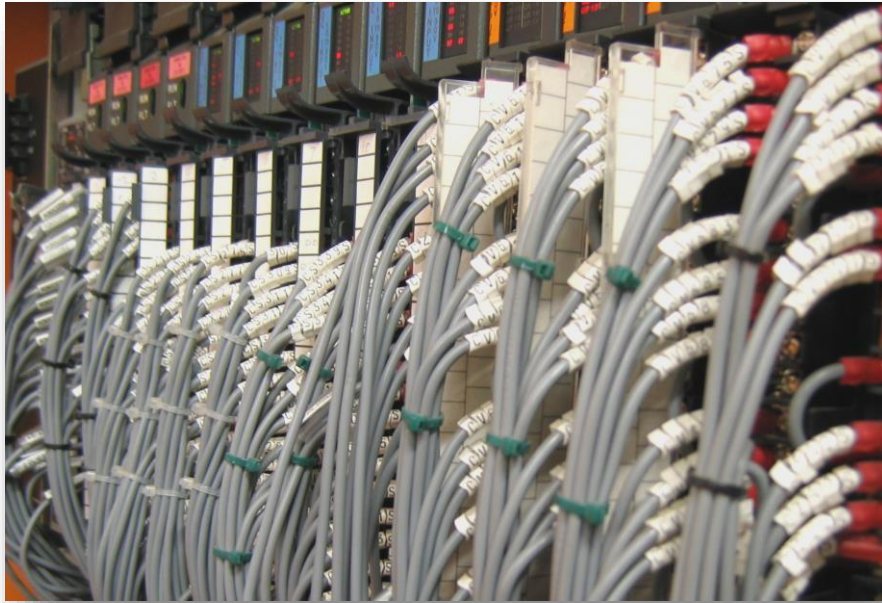




# ICE020

## PLC and SCADA System

# Course Introduction:

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This Course introduces you to Programmable Controllers, its general control Concept and the areas of applications in industry in which they are being applied. General operation, including its scanning method, is also covered in an introductory manner to immediately get you into the relationship of electromechanical relay control systems and programmable controller based systems. Input and output addressing of field devices is also covered as it relates to programmable controllers and its interaction with the real world.

## Course Objectives:

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**Upon successful completion of this course, the delegates will be able to:**

- ✓ To understand the major components which make up the Systems, operation of modules, performance critical protection, basic System configuration within the Winterpret software, Fault Reporting, I/O Circuits employed in the system, including redundancy and fault tolerance.
- ✓ To identify, isolate and repair faults of field interfaces as well as the
  - Controller equipment
- ✓ To understand and perform the steps necessary to initialize the system,
  - Including power-up sequences and program loading and execution
- ✓ To perform routine maintenance operations on the system
- ✓ To be familiar with the system drawings and documentation as required to Support maintenance and troubleshooting procedures
- ✓ Be able to interpret module information, carry out module replacement and plant maintenance

## Who Should Attend?

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This course is intended for all new engineers/technicians, senior engineers/technicians, process engineers/technicians, instrumentation engineers/technicians and electrical engineers/technicians.

## Course Outline:

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### Day 1:

#### **PRE TEST**

#### **Automation & Control**

- Automation Objectives
- Inputs

- outputs
- Processing Section
- Digital Systems
- Analog Systems
- Control Strategies
- Industrial Processes
- Sequential Control

### **Programmable logic control**

- PLC a Process Control Computer System
- Definition & Advantages
- Comparison with Other Control Systems
- Structure
- Power Supply
- Discrete Input & Discrete Output
- I/O Modules
- Communication - Point to Point
- Communication - Networking

### **Day 2:**

#### **Programming Languages**

- IEC 1131 & IEC 1131-3
- Instruction List (IL)
- Structured Text (ST)
- Ladder Diagram (LD)
- Function Block Diagram (FBD)
- Sequential Function Chart (SFC)
- LD Language - Graphic Elements

#### **Basic Programming**

- I/P Addressing
- Ladder Logic Vs Conventional Control
- Registers & timers
- Counters
- Arithmetic Functions
- PLC Sequencer

### **Day 3:**

#### **Advanced Programming**

- Analog Operation
- PID Principles
- Typical Process Control
- Advantages and Benefits
- New term OPC

#### **Networking and Data Communication**

- Network communication
- Network structure
- Point-to-point communication
- Broadcast "Multiple Drop" communication

### **Day 4:**

#### **Network standards**

- ISO OSI (Open System Interconnection) reference model
- Local Area Network (LAN)
- LAN characteristics & Topologies
- LAN's components

#### **Transmission Media**

- Twisted pair
- Coaxial cable
- Optical fiber cable

### **Day 5:**

#### **Data Communication**

- Communication systems
- Analog and Digital Data Transmission
- INTERFACES
- Standards and Protocols RS-232 Control or ( EIA-232C)
- RS-422

- RS-423
- RS-449
- RS-485

## **SCADA Systems and Features**

- SCADA Systems
- Monitoring
- Trends
- Alarms
- Historical Alarms
- Reporting
- Reliability

## **POST TEST**

## **Course Certificate:**

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**International Center for Training & Development (ICTD)** will award an internationally recognized certificate(s) for each delegate on completion of training.

## **Course Methodology:**

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**A variety of methodologies will be used during the course that includes:**

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

## Course Fees:

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**To be advised as per course location.** This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

## Course Timings:

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### Daily Course Timings:

|               |                            |
|---------------|----------------------------|
| 08:00 - 08:20 | Morning Coffee / Tea       |
| 08:20 - 10:00 | First Session              |
| 10:00 - 10:20 | Coffee / Tea / Snacks      |
| 10:20 - 12:20 | Second Session             |
| 12:20 - 13:30 | Lunch Break & Prayer Break |
| 13:30 - 15:00 | Last Session               |

