COURSE OVERVIEW IE0190-4D

PLC & SCADA for Automation & Process Control

Course Title
PLC & SCADA for Automation & Process Control

Course Date/Venue
February 09-12, 2026/TBA Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
IE0190-4D

Course Duration/Credits
Four days/2.4 CEUs/24 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using one of our state-of-the-art simulators.

This course is designed to benefit you with practical up-to-date information on the application of PLC's and SCADA to the automation and process control of plants and factories. It is suitable for people who have little or no exposure to PLC and SCADA but expect to become involved in some or all aspects of PLC and SCADA installation and Programming.

While the course is ideal for people who are new to PLC and SCADA, it will be of value to those who already have the basic skills, but need to refresh and update their basic knowledge. It aims to give practical advice from experts in the field, to assist you to correctly plan, program and install a PLC with a shorter learning curve and more confidence.

A selection of real world case studies is used to illustrate the key concepts with examples of real world working PLC and SCADA systems in process, utilities and manufacturing industries. The course will be an excellent opportunity to network with your peers as well as gain significant new information and techniques.

This course will cover most popular PLC's used in the industry, such as Quantum, Allen Bradley, Siemens, Bristol, Emersons, Omron and Telemechanique Shneider Modicon with extended case studies for Allen Bradley and Siemens.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply a comprehensive knowledge on Programmable Logic Controllers (PLC), telemetry and employ SCADA programming in process control
- Analyze the system parts and power supplies of a PLC hardware including the block diagram of a typical PLC, PLC processor module and memory organization
- Discover the underlying principles of a PLC software including the programming devices, number systems, memory components, data structures, operating modes and limitations
- Discuss the PLC systems design, installation and maintenance and review the documentation and troubleshooting techniques used in the system
- Practice PLC programming using Allen Bradley and Siemens Simulators
- Apply the concepts and common elements of IEC 1131-3 including its programming languages, instruction list, function block diagram and sequential function chart
- Employ the principles of data communications, object linking and embedding in Process Control (OPC) and be able to recognize their importance in PLC and SCADA systems
- Implement the concept of Operator Interfaces (OIU) and describe the operator interface programming such as its configuration, graphical languages, good and bad parts
- Determine the concept, terminology and components of SCADA system and increase in-depth knowledge on SCADA software
- Implement the complete procedures and requirements in SCADA programming and be able to practice how to create and configure a SCADA system using the various utilities, process control, commands and system components

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of PLC and SCADA for those who have little or no exposure to PLC and SCADA but expect to become involved in some or all aspects of PLC and SCADA. Further, the course will be of value to those who already have the basic skills but need to refresh and update their basic knowledge.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Haward's certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **2.4 CEUs** (Continuing Education Units) or **24 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Dr. Ahmed El-Sayed, PhD, MSc, BSc, is a **Senior Electrical & Instrumentation Engineer** with over **30 years** of extensive experience in the **Power**, **Petroleum**, **Petrochemical** and **Utilities**. He specializes in **HV/LV Equipment**, **High Voltage Electrical Safety**, **LV & HV Electrical System**, **HV Equipments Inspection & Maintenance**, **HV Switchgear Operation & Maintenance**, **LV Distribution Switchgear & Equipment**, **HV Switchgear Maintenance**, **HV/LV Electrical** Authorisation, **Hazardous Area Classification, Power Quality**, **Disturbance Analysis**, **Blackout**, **Power Network**, **Power Distribution**, **Power Systems Control**, **Power Systems Security**, Power **Electronics**, **ETAP**, Electrical **Substations**, Tariff Design & Structure Analysis, **Engineering Drawings, Codes & Standards**, **P&ID Reading, Interpretation & Developing**, **PLC**, **SCADA**, **DCS**, **Process Control**, **Instrumentation**, **Automation**, Power **Generation**, **Process Control Instrumentation**, **SIS**, **SIL**, **ESD**, **Alarm Management Systems**, **Fieldbus Systems** and **Fiber Optics** as well as the service pricing of these. He is currently the **Systems Control Manager** of **Siemens** where he is in-charge of Security & Control of Power **Transmission Distribution** & **High Voltage** Systems and he further takes part in the Load Records Evaluation & Transmission Services Pricing.

During his career life, Dr. Ahmed has been actively involved in different Power System Activities including Roles in Power System Planning, Analysis, Engineering, **HV Substation** Design, Electrical Service Pricing, Evaluations & Tariffs, Project Management and also in Teaching and Consulting. His vast industrial experience was honed greatly when he joined many International and National Companies such as **Siemens**, **Electricity Authority** and **ACETO** industries where he focused more on dealing with Technology Transfer, System Integration Process and Improving Localization. He was further greatly involved in manufacturing some of **Power System** and **Control & Instrumentation Components** such as Series of Digital Protection **Relays**, MV **VFD**, **PLC** and **SCADA** System with intelligent features.

Dr. Ahmed is well-versed in different electrical and instrumentation fields like Load Management Concepts, **PLC** Programming, Installation, Operation and Troubleshooting, **AC Drives** Theory, Application and Troubleshooting, Industrial Power Systems Analysis, AC & DC **Motors**, Electric Motor **Protection**, **DCS SCADA**, **Control** and Maintenance Techniques, Industrial Intelligent Control System, **Power Quality** Standards, Power Generators and Voltage Regulators, Circuit Breaker and Switchgear Application and Testing Techniques, **Transformer** and **Switchgear** Application, Grounding for Industrial and Commercial Assets, Power Quality and **Harmonics**, **Protective Relays** (O/C Protection, Line Differential, Bus Bar Protection and **Breaker Failure Relay**) and Project Management Basics (PMB).

Dr. Ahmed has **PhD**, **Master's** & **Bachelor's** degree in **Electrical** and **Instrumentation Engineering** from the **University of Wisconsin Madison**, **USA**. Further, he has numerous papers published internationally in the areas of Power Quality, Superconductive Magnetic Energy Storage, SMES role in Power Systems, Power System **Blackout** Analysis, and Intelligent Load Shedding Techniques for preventing Power System Blackouts, HV **Substation Automation** and Power System Stability.

Course Fee

US$ 4,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: ***Monday, 09th of February 2026***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0900	***Introduction*** *Goal and Plan of the Course • Introduction and Brief History of PLC • Industrial Control Systems and the PLC Part • Why is PLC so Widely Used • PLC Concerns and Alternatives*
0900 – 0930	***Fundamentals of PLC Hardware*** *Block Diagram of Typical PLC • PLC Processor Module, Memory Organization • Input and Output Modules, Types, Power Supply • Power Supplies*
0930 - 0945	*Break*
0945 – 1030	***Fundamentals of PLC Software*** *Programming Devices, On-Line and Off-Line Programming • Number Systems and the Computer World • PLC Numbers Handling • Memory Components, Data Structure and Addressing • Methods of Representing Logic, Boolean Algebra, Instruction Code, Graphical Presentation - Functional Logic Diagrams and Ladder Logic • Typical Ladder Logic Instruction Set • Comparison of Different Manufacturers, Memory and Data Representation and Instruction Code • System Software, System Scanning, Watch Dog Timer, Self Test • Internal Errors, Fault Table for PLC and I/O, Errors Handling • Operating Modes, Use and Limitations*

1030 – 1100	***PRACTICAL SESSION #1***
1100 – 1230	***PLC Systems Design, Installation & Maintenance*** *Process and Mechanical Control Diagrams • Process and Machine Control Descriptions • Selection of PLC and Modules • Control System Diagram • Wiring Diagrams • Control Panel Design, Equipment Layout, Good Installation Practice • Programming, Start-Up, Testing, Commissioning • Documentation, Maintenance, Troubleshooting, Techniques and Examples • Wrap up of the PLC Basics, Specific Terminology, Practical Queries*
1230 – 1245	*Break*
1245 – 1345	***PLC Programming*** *System Introduction • Basics Functions • DC Motor Run/Jog • Tools, Forcing and Toggling, On-line Changes*
1345 - 1420	***PRACTICAL SESSION #2***
1420 - 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2: ***Tuesday, 10th of February 2026***

0730 – 0830	***Lab Programming on Siemens SIMATIC & WinCC*** *Timers and Counters • Motor Forward/Reverse • Pipeline Pumping Station • Data Operations • Tracking Numbers in Storage • Motor Demand Start • Move Operations • Tracking Part Number with a Shift Register • Pulse Generator/Cookie Filling • 16 Bit Drum Sequencing • Bit Operations • Good Parts/Bad Parts • Motor Sequencing • Motor Sequencing 2 • Fault References and PLC Troubleshooting • Time of Day Display • Fault References*
0830 - 0930	***PRACTICAL SESSION #3***
0930 - 0945	*Break*
0945 – 1030	***Introduction to IEC 1131-3*** *Concepts • Common Elements • Top-Bottom and Bottom-Up Approaches • Programming Languages: Structured Text • Instruction List • Function Block Diagrams • Sequential Function Chart • Ladder Diagrams*
1030 – 1100	***PRACTICAL SESSION #4***
1100 - 1230	***Data Communications*** *Serial Interface Standards: RS-232C, RS-422 (RS-423) and RS-485 • Communication Links – Status, Errors, Timeout (Watchdog) • Protocols – Proprietary and Standard, Modbus, DH+ • Local Area Network, Topology, Ethernet, Control Networks • ISO/OSI Communications Standard*
1230 – 1245	*Break*
1245 – 1315	***Object Linking & Embedding in Process Control (OPC)*** *Introduction to OPC Standards • Confirmed and Developing Specifications • Practical Control System Benefits from OPC Compliance*

1315 – 1345	***Operator Interfaces (OIU)*** *Status and Alarm Messages • Operator Control Actions • Linking Displays to the PLC • PLC Manufacturer or Third Party – Depend on Connectivity*
1345 - 1420	***PRACTICAL SESSION #5***
1420 - 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3: ***Wednesday, 11th of February 2026***

0730 – 0900	***Operator Interface Programming*** *System Introduction • Configuration • Graphical Language • PLC Connection • Operator's Push Button • DC Motor Run/Jog • Operator's Indication • DC Motor Running • Good Parts/Bad Parts*
0900 – 0930	***PRACTICAL SESSION #6***
0930 – 0945	*Break*
0945 – 1030	***Fundamentals of SCADA*** *Concept, Terminology and Components • SCADA System Hardware • Communication Architecture • Radio and Wireless Basics • SCADA and Telemetry*
1030 – 1100	***PRACTICAL SESSION #7***
1100 – 1230	***SCADA Software*** *Configuration of SCADA Systems • Best Practice Configuration of Alarms • Rules for SCADA Design • SCADA and OPC • Security and Risk Management*
1230 – 1245	*Break*
1245 – 1345	***Introduction to GE Cimplicity HMI/SCADA Software*** *Modular Multitasking 32 Bit Design • Distributed Architecture • Microsoft Object Technology, ActiveX Controls • Device Connectivity, Open Data Base Connectivity • Feature Set, Options, Base*
1345 – 1420	***PRACTICAL SESSION #8***
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4: ***Thursday, 12th of February 2026***

0730 – 0900	***SCADA Programming Basics*** *Creating a Project, Master and Data • Configuration Data, ISAM Files, idx Files • Security, Users Roles (Privileges) and Resources (Areas) • Devices and Points Assigning to a Resource • System Configuration*
0900 – 0930	***PRACTICAL SESSION #9***
0930 – 0945	*Break*

0945 – 1100	***SCADA Programming*** *Creating a New Cimpliciy Project • Configuring Devices, Ports, Protocols, Users, Resources, Roles, Points, Alarm Classes, Alarm Strings and Alarms • Example with 4 Users, 3 PLCs, Robot and Masher • Access a Point Control Panel • Configuring a Point Control Panel • Modifying Points and their Alarms • Saving a Point Control Panel as a File • Creating and Configure a Graphic Screen • Configuring SmartObjects, Animation • Creating Events and Actions in Objects • Linking SmartObjects*
1100 – 1130	***PRACTICAL SESSION #10***
1130 - 1230	***SCADA Programming (cont'd)*** *Creating Automated Events and Actions • Displaying and Trigger Events and Actions in the BCEUI (Basic Control Engine User Interface) • Configuring a Simple Script Using Wizards • Configuring a New Button to Trigger an Event that Runs the Script • Creating New Tables in Database Logger • Configuring Logging and Maintenance Options in the Tables • Adding Points to the New Tables • Logging Alarms and Events • Executing a Quick Trend from your Project's Workbench • Creating an Embedded Trend Chart to display Historical Data • Applying ActiveX Trend Methods to a Trend Chart • Creating a Stand Alone Alarm Viewer • Creating and Configure an Embedded Alarm Viewer • Adding Alarm Sounds to Alarm Classes*
1230 – 1245	*Break*
1245 – 1330	***SCADA Programming (cont'd)*** *Using the Import/Export Command Utility • Using the IDTPOP Utility to View Tables in the Database • Using Process Control to Display Project Processes, Start/Stop Processes • Opening Project Status Logs to View Project and System Error Messages • Accessing the Windows NT Performance Monitor and Create a Graphic Display, View Running Applications and Processes • Accessing the Point Cross Reference Tool to View the Use and Locations of Pints in the Project • Configuring Project for Broadcast • Creating a Remote Project to Enable Enterprise Server • Configuring Text Objects for Point by Address • Configuring Command Line Switches on Screen Shortcuts*
1330 - 1345	***PRACTICAL SESSION #11***
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using one of our state-of-the-art simulators "Allen Bradley SLC 500", "AB Micrologix 1000 (Digital or Analog)", "AB SLC5/03", "AB WS5610 PLC", "Siemens S7-1200", Siemens S7-400" "Siemens SIMATIC S7-300", "Siemens S7-200" "GE Fanuc Series 90-30 PLC", "Schneider Electric Magelis HMISTU" and "Siemens SIMATIC Step 7 Professional Software".

Allen Bradley SLC 500 Simulator

Allen Bradley Micrologix 1000 Simulator (Digital)

Allen Bradley Micrologix 1000 Simulator (Analog)

Allen Bradley SLC 5/03

Allen Bradley WS5610 PLC Simulator PLC5

Siemens S7-1200 Simulator

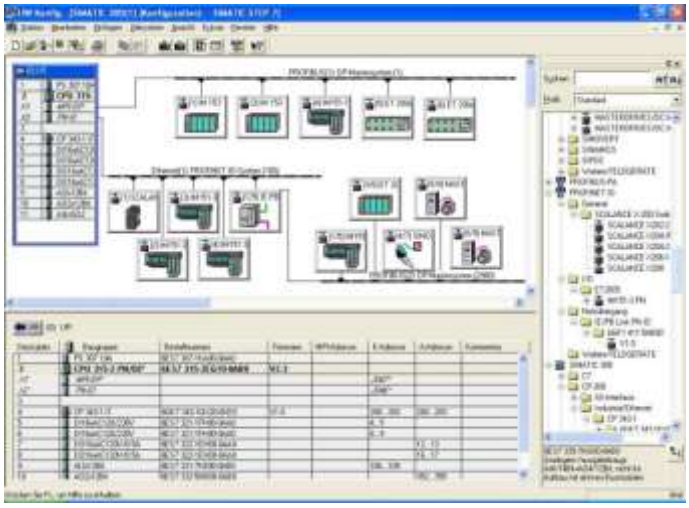
Siemens S7-400 Simulator

Siemens SIMATIC S7-300

Siemens S7-200 Simulator

GE Fanuc Series 90-30 PLC Simulator

Schneider Electric Magelis HMISTU



Siemens SIMATIC Step 7
Professional Software

Course Coordinator

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