COURSE OVERVIEW IE0090
PLC

Course Title
PLC

Course Date/Venue
June 22-26, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
IE0090

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical 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 PLCs to the automation and process control of plants and factories. It is suitable for people who have little or no exposure to PLCs, but expect to become involved in some or all aspects of PLC installation. 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.

While the course is ideal for electricians, technicians and engineers who are new to PLCs, much of the course and additional material in the extensive manual will be of value to those who already have some basic skills, but need a wider perspective for larger and more challenging tasks ahead. The accompanying manual includes contributions from a number of experts and will become a valuable reference document in your work.

The information contained in this course advances from the basics to challenge even the most experienced engineer in the industry today. You will undertake a series of practical hands-on sessions, ranging from elementary to advanced, based on the PLCs supplied. Full working solutions will be distributed to you after you have attempted the practicals.

Course Objectives

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

- Apply and gain a basic knowledge on PLC
- Identify PLC hardware and softwares and familiarize the input/output section related to module types and the different methods of representing logic
- Gain knowledge in PLC programming
- Apply concepts on ladder logic, FBS in line with looking ahead and how will programs be maintained based on practical exercises carried out during the course
- Recognize several techniques on good installation practice in accordance with location of hardware, good wiring practice, earthing and grounding
- Discuss the aspects of advanced control with PLC's by being aware of the uses of advanced programming functions and matrix logic
- Determine elements of batch processes and sequential control by remembering the programs state and creating a "stepper"
- Characterize the aspects of analog control through various PID control algorithm
- Avoid the consequences of hardware failure by enhancing the security and familiarizing the strategies to reduce the risks
- Evaluate functions of operator interfaces related to alarm handling, operator actions and linking displays to the PLC
- Identify the interface standards and protocols of data communications

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 Practical Programmable Logic Controllers (PLC's) for engineering managers, instrumentation and control engineers, process control and automation engineers, design engineers and consulting engineers, process control engineers, electrical engineers, management, engineering and supervision staff who are responsible on PLC, superintendents, supervisors, DCS, SCADA and PLC personnel, process control staff, trades staff working with or near PLC's and other technical staff.

Course Fee

US$ 5,500 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.

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.

Course Accreditations

Certificates are accredited by the following international accreditation organizations: -

- 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 **3.0 CEUs** (Continuing Education Units) or **30 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.

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. 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.

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:

Mr. Barry Pretorius is a **Senior Instrumentation Engineer** with almost **45** years of extensive experience within the **Oil**, **Gas**, **Petrochemical**, **Refinery** & **Power** industries. His expertise widely covers in the areas of **Cyber Security** Practitioner, **Cyber Security** of Industrial Control System, **IT Cyber Security** Best Practices, **Cybersecurity** Fundamentals, **Ethical Hacking & Penetration Testing**, **Cybersecurity** Risk Management, **Cybersecurity** Threat Intelligence, **OT Whitelisting** for Better Industrial Control System Defense, **NESA** Standard and Compliance Workshop, **OT**, **Cyber Attacks** Awareness - Malware/Ransom Ware / Virus /Trojan/ Philsing, **Information Security Manager**, **Security System** Installation and Maintenance, Security of Distributed Control System (**DCS**), Process Control, Instrumentation, Safeguarding & Security, Programmable Logic Controller (**PLC**), **Siemens PLC** Simatic S7-400/S7-300/S7-200, **PLC & SCADA** for Automation & Process Control, **Artificial Intelligence**, **Allen Bradley PLC** Programing and Hardware Trouble Shooting, Schneider **SCADA System**, **Wonder Ware**, **Emerson**, **Honeywell**, **Honeywell** Safety Manager PLC, **Yokogawa**, Advanced **DCS Yokogawa**, **Endress & Hauser**, Field Commissioning and Start up Testing Pre Operations, System Factory Acceptance Test (**FAT**), System Site Acceptance Test (**SAT**), **SCADA HMI & PLC** Control Logic, Implementation, Systems Testing, Commissioning and Startup, **Foxboro DCS & Triconics, SIS** Systems, **Drives**, Motion Control, **Hydraulics**, **Pneumatics and Control Systems** Engineering, **Electrical & Automation Control Systems**, **HV/MV Switchgear, LV & MV** Switchgears & Circuit Breakers, **High Voltage Electrical Safety**, **LV & HV Electrical System**, **HV Equipment** Inspection & Maintenance, **LV Distribution Switchgear & Equipment**, **Electrical Safety**, **Electrical** Maintenance, **Transformers**, **Medium & High Voltage Equipment**, **Circuit Breakers**, **Cable & Overhead Line** Troubleshooting & Maintenance, **Electrical Drawing & Schematics**, **Voltage Distribution**, **Power Distribution**, **Filters**, **Automation System**, **Electrical Variable Speed Drives**, **Power** Systems, **Power Generation**, **Diesel Generators**, **Power Stations**, Uninterruptible Power Systems (**UPS**), **Battery Chargers**, **AC & DC Transmission**, **CCTV** Installation, **Data & Fire Alarm** System, **Evacuation** Systems and **Electrical Motors & Variable Speed Drives**, & Control of Electrical and Electronic devices.

During Mr. Pretorius's career life, he has gained his practical experience through several significant positions and dedication as the **Senior Technical Analyst, Team Leader, Pre-operations Startup Engineer, Automation System's Software Manager, Automation System's Senior Project Engineer, PLC Specialist, Site Manager, Senior Project & Commissioning Engineer, Technical Director, Project Engineer, Radio Technician**, **A T E Technician** and **Senior Instructor/Trainer** from various companies like the ADNOC Sour Gas, Ras Al Khair Aluminum Smelter, Johnson Matthey Pty. Ltd, Craigcor Engineering, Unitronics South Africa Pty (Ltd), Bridgestone/Firestone South Africa Pty (Ltd) and South African Defense Force.

Mr. Pretorius's has a Higher Diploma in **Electrical Engineering Heavy Current**. Further, he is a **Certified Instructor/Trainer** and delivered numerous trainings, courses, workshops, seminars and conferences internationally.

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: Sunday, 22nd of June 2025

0730 - 0745	*Registration & Coffee*
0745 - 0800	*Welcome & Introduction*
0800 - 0815	***PRE-TEST***
0815 - 0930	***Introduction*** *Introduction to PLC'S ● A Brief History of PLC'S ● Alternative Control Systems – Where do PLC'S Fit In ● Why PLC'S have become so Widely Accepted ● Lingering Concerns about PLC'S.*
0930 - 0945	*Break*
0945 – 1115	***Fundamentals of PLC Hardware*** *Block Diagram of Typical PLC ● PLC Processor Module – Memory Organisation ● Input /Output Section – Module Types ● Power Supplies*
1115 – 1130	*Break*
1130 - 1300	***Fundamentals of PLC Software (cont'd)*** *Methods of Representing Logic ● Fundamental File Block ● Comparison of Different Manufacturers*
1300 - 1420	***PLC Programming***
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: Monday, 23rd of June 2025

0730 - 0930	***PLC Programming (cont'd)***
0930 - 0945	*Break*
0945 - 1100	***Practical Exercise on Ladder Logic, FBS*** *Keeping Track of Addresses and Data Used ● Looking Ahead – How will Programs be Maintained*
1100 - 1230	***Practical Exercise on Ladder Logic, FBS (cont'd)*** *Practical Methods to Improve Program Quality ● Keeping Track of Addresses and Data Used*
1230 - 1245	*Break*
1245 - 1420	***Practical Exercise on Ladder Logic, FBS (cont'd)*** *Looking Ahead – How will Programs be Maintained ● Practical Methods to Improve Program Quality*
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: Tuesday, 24th of June 2025

0730 – 0930	***PRACTICAL SESSION***
0930 – 0945	*Break*
09415 – 1100	***Good Installation Practice*** *Location of Hardware ● Good Wiring Practice ● Reducing Noise and Interference ● Screening and Shielding ● Earthing and Grounding*
1100 – 1230	***PRACTICAL SESSION***
1230- 1245	*Break*
1245 – 1420	***Advanced Control with PLC's*** *The Concept of Reusable Logic - Examples: Drive Logic, Alarm Handling ● Use of Advanced Programming Functions ● Matrix Logic ● Table Functions and Indirect Addressing*
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: Wednesday, 25th of June 2025

0730 – 0930	***Batch Processes & Sequential Control*** *Remembering the Program State ● Creating a "Stepper" ● Step Advance ● Fault Detection and Recovery ● Operator Intervention ● Multiple Recipes or Alternate Paths ● Sequential Function Charts*
0930 – 0945	*Break*
0945 – 1100	***Analog Control*** *Discontinuous Vs Continuous Control ● The PID Control Algorithm ● The Importance of Timing and Scan Time ● When PID is not always Appropriate*
1100 – 1230	***Enhanced Security*** *The Consequences of Hardware Failure ● Strategies to Reduce the Risks ● Hardware options*
1230 – 1245	*Break*
1245– 1420	***PRACTICAL SESSION***
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 Four*

Day 5: **Thursday, 26th of June 2025**

0730 – 0930	***Operator Interfaces*** *Alarm Handling ● Operator Actions ● Linking Displays to the PLC ● PLC Manufacturer or Third Party*
0930 – 0945	*Break*
0945 – 1100	***Data Communications*** *Interface Standards ● Protocols (Modbus / DH+) ● Local Area Network (Ethernet and Token Bus) ● Monitoring Communications Links (& simple watchdog timer)*
1100 – 1230	***PRACTICAL SESSION***
1230 – 1245	*Break*
1245– 1345	***System Checkout and Testing*** *Development and Verification of Code ● Factory Acceptance Testing ● Testing Procedures ● Emulating Missing Hardware ● Emulating Process Responses*
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", "Siemens SIMATIC Step 7 Professional Software", and "HMI SCADA".

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

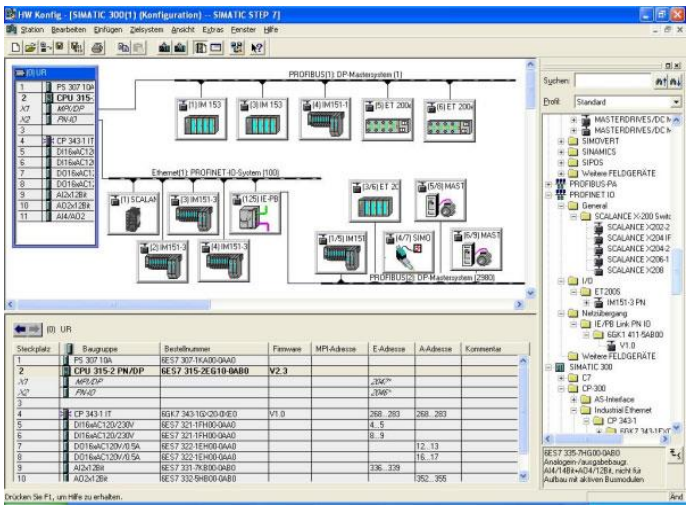
Siemens S7-1200 Simulator

Siemens S7-400 Simulator

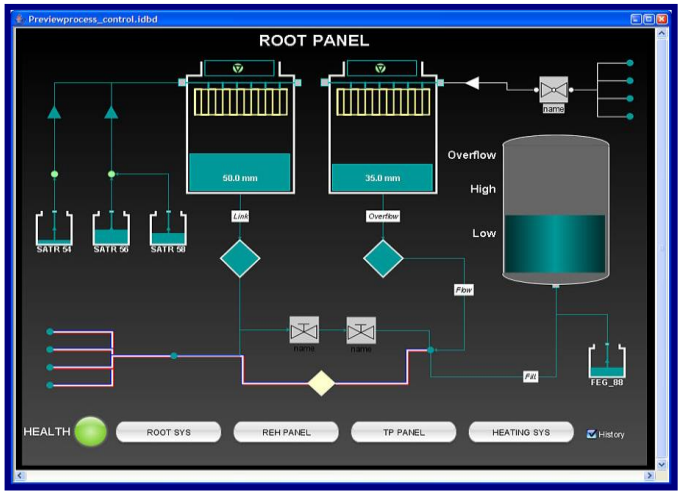
Siemens SIMATIC S7-300

Siemens S7-200 Simulator

GE Fanuc Series 90-30 PLC Simulator



Siemens SIMATIC Step 7
Professional Software



HMI SCADA

Course Coordinator

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