

COURSE OVERVIEW IE0139-4D
Advanced Process Control/Field Device Manager

Course Title

Advanced Process Control/Field Device Manager

Course Reference

IE0139-4D

Course Duration/Credits

Four days/2.4 CEUs/24 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	January 15-18, 2024	Al Aziziya Hall, The Proud Hotel Al Khobar, Al Khobar, KSA
2	March 04-07, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
3	June 03-06, 2024	Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	September 02-05, 2024	Boardroom, Warwick Hotel Doha, Doha, Qatar

Course Description



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



This APC/FDM course covers the practical application of Advanced Process Control (APC) or Field Device Manager (FDM) systems to a variety of continuous process plants. The course discuss automation and its importance, types of plants and controls, automation hierarchy, control system architecture, instrumentation and control, different types of computer-based control systems including PLCs and DCS. Basic requirements for good operator interface, industrial communication, information interchange, man-machine communication, enterprise level, engineering & commissioning, performance & dependability, dependable control systems, safety & hazard analysis, concepts & implementation of alarm & trip systems, device management protocols and Honeywell field device manager (FDM) will be illustrated during the course.



The course will provide hands-on training sessions in PLC and HMI (OIU and SCADA) programming techniques using one of our state-of-the art Allen Bradley SLC 500, Siemens S7-200, AB Micrologix 1000 (Digital or Analog), AB SLC5/03 and AB WS5610 PLC simulators. Please refer to the last page of this course overview for details of simulators.

Course Objectives

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

- Apply and gain a comprehensive knowledge on advanced process control (APC) or field device manager (FDM)
- Explain automation and its importance and identify the various types of plants and controls
- Describe automation hierarchy, control system architecture and control
- Enumerate the different types of computer-based control systems including PLCs and DCSs as well as the basic requirements for good operator interface
- Determine industrial communication, information interchange and man-machine communication
- Recognize enterprise level, engineering, commissioning, performance and dependability
- Carryout dependable control systems, safety and hazard analysis, concepts and implementation of alarm and trip systems
- Discuss device management protocols and Honeywell field device manager (FDM)

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 advanced process control or field device manager for those who are responsible for the selection and implementation of APC or field device manager systems and other process plant control systems. Personnel in technical positions who want to know more about APC or field device manager systems will also benefit from this course.

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 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:

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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.

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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.

Accommodation

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



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. Mike Tay, PhD, MSc, BSc, is a Senior Electrical, Instrumentation & Communications Engineer with over 40 years of extensive experience. His expertise widely covers Energy Industry, Global Warming, Hydroelectric & Geothermal Power, Biomass & Biogas, Four 'C's of the Energy Transition, Fifth Generation Heat, Protection Relay Maintenance, Application & Testing, System Analysis, Power System Faults, Protection Scheme Components, Current & Voltage Transformers, Power System Neutral Grounding, Feeder Overcurrent Protection, Electrical Protection Systems, Bus Protection, Motor Protection, Starting & Control, Transformer Protection, Generator Protection, Capacitor Protection, Numerical Relays, SCADA Security, ESD System Analysis & Control, Electrical & Instrumentation, Installation & Inspection, Custody Measurement, Loss Control for Petroleum Products, Process Control & Instrumentation, Fiber Optics Access Network Planning, Safety Instrumented System (SIS), Safety Integrity Level (SIL), PLC Design, Power System, Power Supply Design Management, Basic Electronics & Transformers, Diesel Generator, Electric Motors, Electrical Fundamentals, Basic Electricity and Electrical Codes. Further, he is also well-versed in Communications, Telecommunications, Mobile Protocols, 4G LTE, GSM/UMTS, CMDA2000, WIMAX Technology, HSPA+, Alarm Management System, Computer Architecture, Logic & Microprocessor Design, Embedded Systems Design plus Computer Networking with CISCO, Network Communication, Industrial Digital Communication, Designing Telecommunications Distribution System, Electrical Engineering, WIMAX Broadband Wireless System, TT Intranet & ADSL Network, TT Web & Voicemail, Off-site ATM Network, IT Maintenance, Say2000i, IP Phone, National Address & ID Automation, Electricity Distribution Network, Customs Network & Maintenance, LAN & WAN Network, UYAP Network, Network Routing Protocols, Multicast Protocols, Network Management Protocols, Mobile & Wireless Networks and Digital Signal Processing. Currently, he is the Technical Advisor of Izmir Altek.

During his career life, Dr. Tay worked with various companies such as the KOC Sistem, Meteksan Sistem, Altek BT, Yasar University, Dokuz Eylul University, METU and occupied significant positions like the **Aegean Region Manager, Group Leader, Technical Services Manager, Field Engineer, Research Assistant, Instructor, Technical Advisor** and the **Dr. Instructor**.

Dr. Tay has **PhD, Master** and **Bachelor** degrees in **Electrical & Electronic Engineering** from the **Dokuz Eylul University** and the **Middle East Technical University (METU)** respectively. Further, he is a **Certified Instructor/Trainer, Technical Trainer (Australia), Trainer for Data-Communication System (England & Canada), a Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM), a Certified CISCO (CCSP, CCDA, CCNP, CCNA, CCNP) Specialist, a Certified CISCO IP Telephony Design Specialist, CISCO Rich Media Communications Specialist, CISCO Security Solutions & Design Specialist** and **Information Systems Security (INFOSEC) Professional**. He has delivered and presented innumerable training courses and workshops worldwide.



Course Fee

Al Khobar	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.
Dubai	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.
Abu Dhabi	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.
Doha	US\$ 5,500 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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

0730 – 0800	<i>Registration & Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0900	Automation & Its Importance
0900 – 0930	Types of Plants & Controls <i>Continuous Processes • Discrete Processes • Mixed Processes</i>
0930 – 0945	<i>Break</i>
0945 – 1230	Automation Hierarchy
1230 – 1245	<i>Break</i>
1245 – 1420	Control System Architecture
1420 – 1430	Recap <i>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</i>
1430	<i>Lunch & End of Day One</i>

Day 2

0730 – 0930	Instrumentation <i>Binary & Analogue Instruments • Instrumentation Diagrams • Measurement Instrumentation for Flow, Level, Temp, Pressure • Instrument Calibration Concepts • Final Control Elements (Control Valves,- Actuators, Control Valve Instrumentation)</i>
0930 – 0945	<i>Break</i>
0945 – 1030	Control <i>Plant Modeling • Loop Dynamics • PID Controller • Various Forms of PID Algorithms • Optimal Tuning Theory and Calculations • Transforming Process Operating Information into Controller Tuning • Identifying Process Dynamics based on DCS Trends and Historical Data • Nested Controllers • Impact of Control Valves on Control Loop Performance</i>



1030 – 1130	Different Types of Computer-Based Control Systems including PLCs & DCSs as well as Basic Requirements for Good Operator Interface PLCs Functions & Construction • DCS Attributes & Features • Continuous & Discrete Control • IEC 61131 Languages
1130 – 1230	Industrial Communication Field Bus Principles • Field Bus Operation • Physical Layer (Media & Wiring) • Link Layer (Determinism & Redundancy) • Application Layer (Shared Memory & Messages Paradigm)
1230 – 1245	Break
1245 – 1420	Information Interchange Device Access Protocols: HART • OPC
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

0730 – 0930	Man-Machine Communication Hardware & Software Structure • Tools
0930 – 0945	Break
0945 – 1030	Enterprise Level Enterprise Resource Planning
1030 – 1130	Engineering & Commissioning Life Cycle • Project
1130 – 1230	Performance & Dependability Real-Time & Performance Evaluation
1230 – 1245	Break
1245 – 1420	Dependable Control Systems Dependability, Overview & Definitions • Dependability Evaluation
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

0730 – 0930	Safety & Hazard Analysis Fault Tolerance • Reliability & Safety • Fault Tolerance
0930 – 0945	Break
0945 – 1100	Concepts & Implementation of Alarm & Trip Systems
1100 – 1230	Device Management Protocols
1230 – 1245	Break
1245 – 1345	Honeywell Field Device Manager (FDM)
1345 – 1400	POST-TEST
1400 – 1415	Course Conclusion Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course
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”, “HMI SCADA”, “Gas Ultrasonic Meter Sizing Tool”, “Liquid Turbine Meter and Control Valve Sizing Tool”, “Liquid Ultrasonic Meter Sizing Tool” , “Orifice Flow Calculator” and “Automation Simulator”.



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



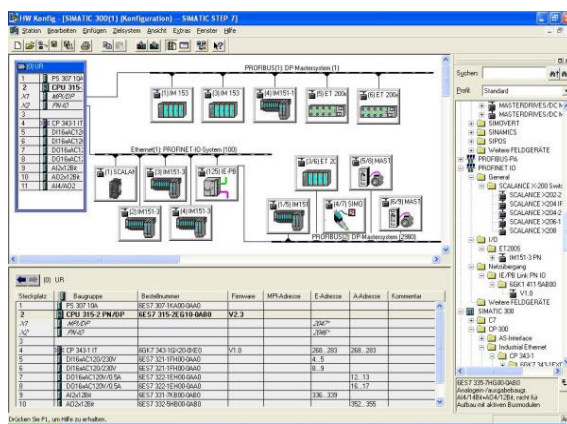
Siemens SIMATIC S7-300



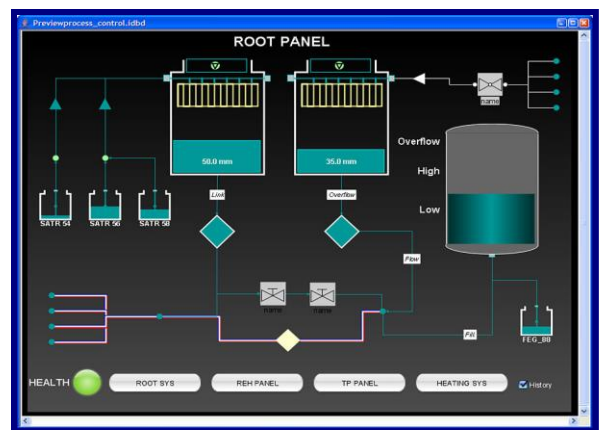
Siemens S7-200 Simulator



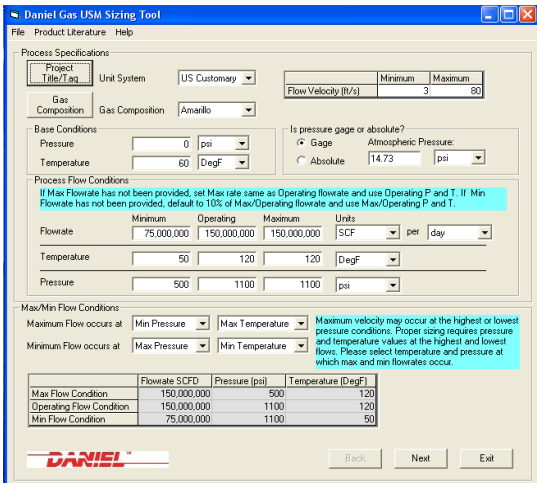
GE Fanuc Series 90-30 PLC Simulator



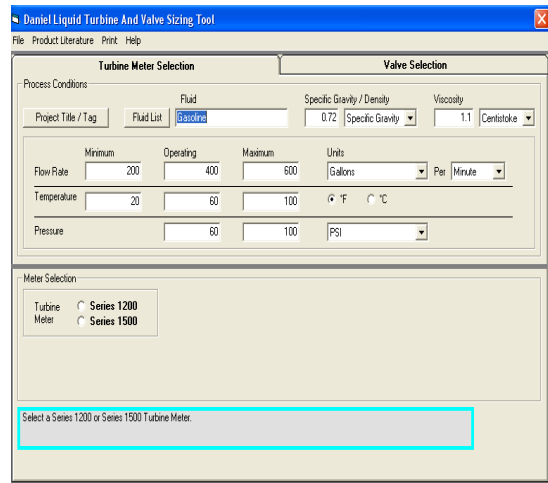
Siemens SIMATIC Step 7 Professional Software



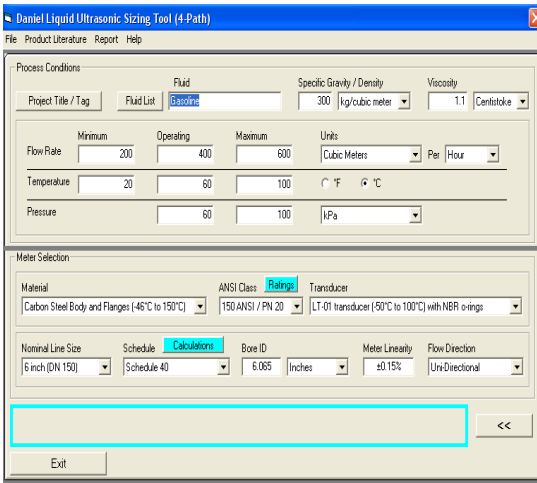
HMI SCADA



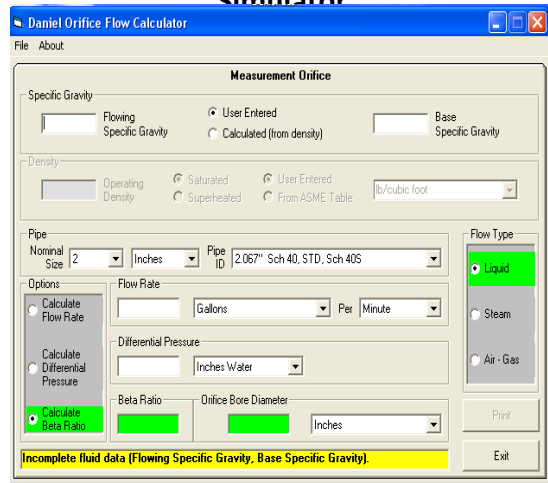
Gas Ultrasonic Meter (USM) Sizing Tool Simulator



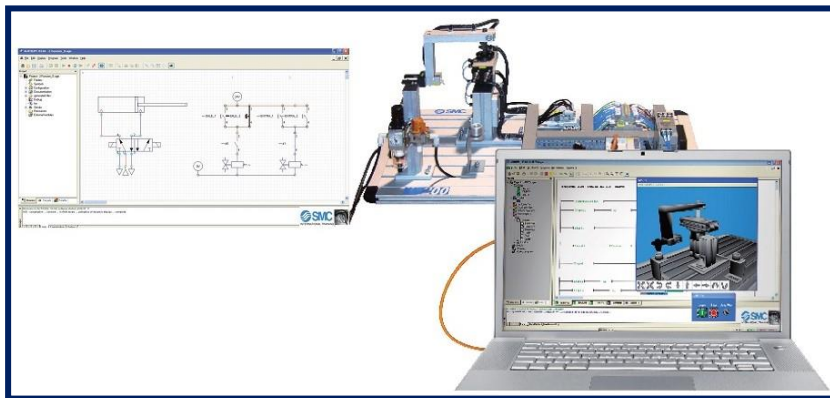
Liquid Turbine Meter and Control Valve Sizing Tool Simulator



Liquid Ultrasonic Meter Sizing Tool Simulator



Orifice Flow Calculator Simulator



AutoSIM – 200 Automation Simulator

Course Coordinator

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