



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

**Course Title**

Advanced Process Control/Field Device Manager

**Course Date/Venue**

December 22-25, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

**Course Reference**

IE0139-4D

**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 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, sample video clips of the instructor’s actual lectures & practical sessions during the course 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.

**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.





**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 Process Control & Instrumentation, Process Control Troubleshooting & Problem Solving, Process Control System, Loss Control System, Advanced Process Control (APC) Technology, Process Control & Loop Tuning, Flow Measurement, Multiphase Metering, Custody Measurement & Loss Control, Process Control & Automation, Control System Interface, Distributed Control Systems (DCS), Programmable Logic Controller (PLC), Supervisory Control and Data Acquisition (SCADA), SCADA Security, SCADA System Monitoring & Analysis, Pump Performance Analysis, Pump Control Strategies, Smart Control Strategies, Data Accuracy & System Function, Network Comprehensive, Systems Analysis, ESD System Function, Analysis & Control, Modern Power Systems Protective Relaying, Fiber Optics Access Network Planning, Process Analyzer & Analytical Instrumentation, HV/MV Substation Design & Maintenance, Combined Cycle Power Generation, PLC & SCADA Automation, Advanced Online Analyzer, Protection Relay Maintenance, Power System Faults, Current & Voltage Transformers, Power System Neutral Grounding, Feeder Overcurrent Protection, Electrical Protection Systems, Bus Protection, Motor Protection, Transformer Protection, Generator Protection, Numerical Relays, ESD System Analysis & Control, Custody Measurement, Safety Instrumented System (SIS), Safety Integrity Level (SIL), Interruptible Power Systems (UPS), Power System, Power Supply Design Management, Diesel Generator, Electric Motors and Basic Electricity & Electrical Codes. Further, he is also well-versed in Communications, Telecommunications, IT Service Management, IT Service Management Strategy, Information Technology Architectures, IT Maintenance, 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, 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.**

During his career life, Dr. Tay worked with various universities and institutions such as the KOC Sistem, Meteksan Sistem, Altek BT, Yasar University, Dokuz Eylul University and METU and occupied significant positions being the **Aegean Region Manager, Group Leader, Technical Services Manager, Field Engineer, Instrumentation & Control Engineer, Research Assistant, Instructor, Instrumentation & Control Instructor, Technical Advisor, Technical Consultant and Senior Instructor/Lecturer.**

Dr. Tay has **PhD, Master's and Bachelor's** degrees in **Electrical & Electronics Engineering** from the **Dokuz Eylul University** and the **Middle East Technical University (METU)** respectively. Further, he is a **Certified Instructor/Trainer, 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 further hold certification in **Fundamentals of Process Control and Understanding Process Control: An Overview** and delivered and presented innumerable trainings, courses, workshops, seminars and conferences worldwide.





**Accommodation**

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

**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, 22<sup>nd</sup> of December 2024**

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

**Day 2: Monday, 23<sup>rd</sup> of December 2024**

0730 – 0930	<b>Instrumentation</b> Binary & Analogue Instruments • Instrumentation Diagrams • Measurement Instrumentation for Flow, Level, Temp, Pressure • Instrument Calibration Concepts • Final Control Elements (Control Valves,- Actuators, Control Valve Instrumentation)
0930 – 0945	Break
0945 – 1030	<b>Control</b> 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
1030 – 1130	<b>Different Types of Computer-Based Control Systems including PLCs &amp; DCSs as well as Basic Requirements for Good Operator Interface</b> PLCs Functions & Construction • DCS Attributes & Features • Continuous & Discrete Control • IEC 61131 Languages
1130 - 1230	<b>Industrial Communication</b> 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	<b>Information Interchange</b> Device Access Protocols: HART • OPC
1420 - 1430	<b>Recap</b>
1430	Lunch & End of Day Two





**Day 3: Tuesday, 24<sup>th</sup> of December 2024**

0730 – 0930	<b>Man-machine Communication</b> Hardware & Software Structure • Tools
0930 – 0945	Break
0945 – 1030	<b>Enterprise Level</b> Enterprise Resource Planning
1030 – 1130	<b>Engineering &amp; Commissioning</b> Life Cycle • Project
1130 – 1230	<b>Performance &amp; Dependability</b> Real-Time & Performance Evaluation
1230 – 1245	Break
1245 – 1420	<b>Dependable Control Systems</b> Dependability, Overview & Definitions • Dependability Evaluation
1420 - 1430	<b>Recap</b>
1430	Lunch & End of Day Three

**Day 4: Wednesday, 25<sup>th</sup> of December 2024**

0730 – 0930	<b>Safety &amp; Hazard Analysis</b> Fault Tolerance • Reliability & Safety • Fault Tolerance
0930 – 0945	Break
0945 – 1100	<b>Concepts &amp; Implementation of Alarm &amp; Trip Systems</b>
1100 – 1230	<b>Device Management Protocols</b>
1230 – 1245	Break
1245 – 1345	<b>Honeywell Field Device Manager (FDM)</b>
1345 – 1400	<b>POST-TEST</b>
1400 - 1415	<b>Course Conclusion</b>
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

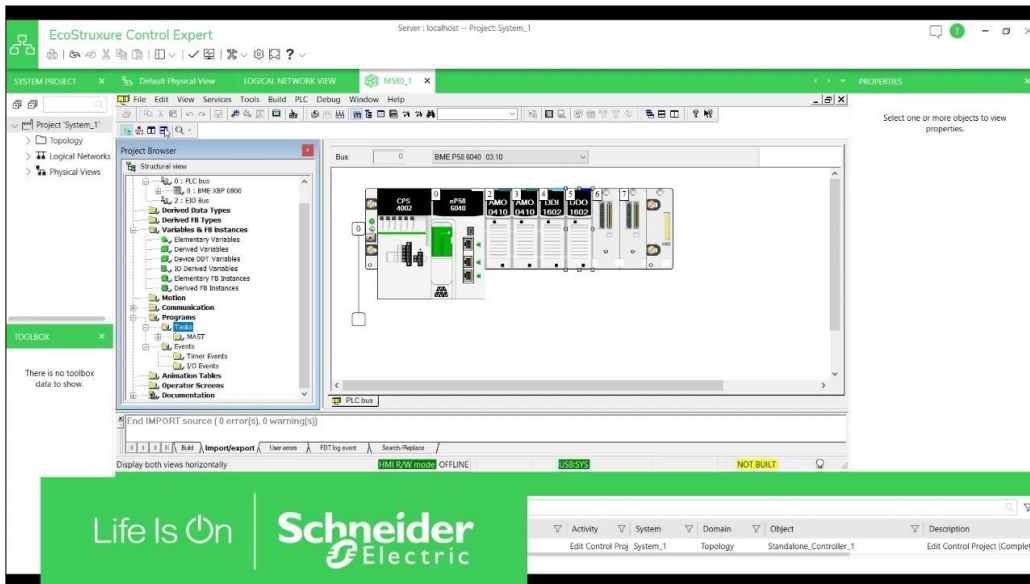


**Simulator (Hands-on Practical Sessions)**

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 “Modicon M340”, “EcoStruxure Expert Classic”, “Gas Ultrasonic Meter Sizing Tool”, “Liquid Turbine Meter and Control Valve Sizing Tool”, “Liquid Ultrasonic Meter Sizing Tool”, “Orifice Flow Calculator” and “Automation Simulator”.

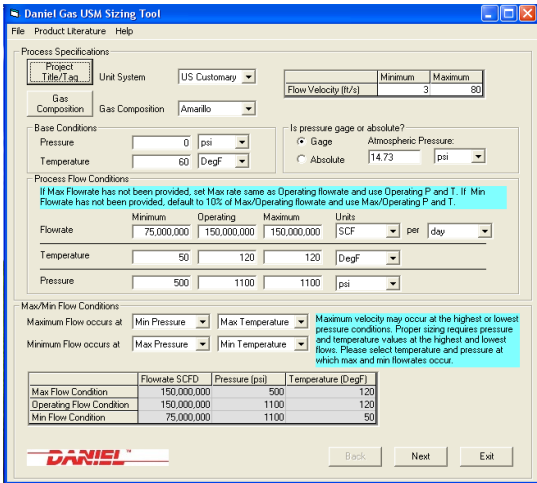


**Modicon M340**

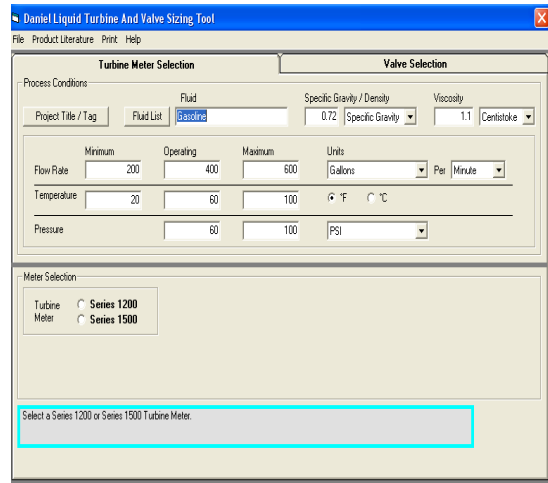


**EcoStruxure Expert Classic**

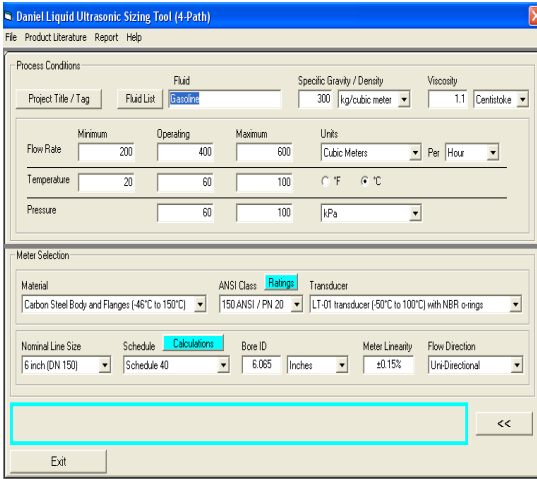




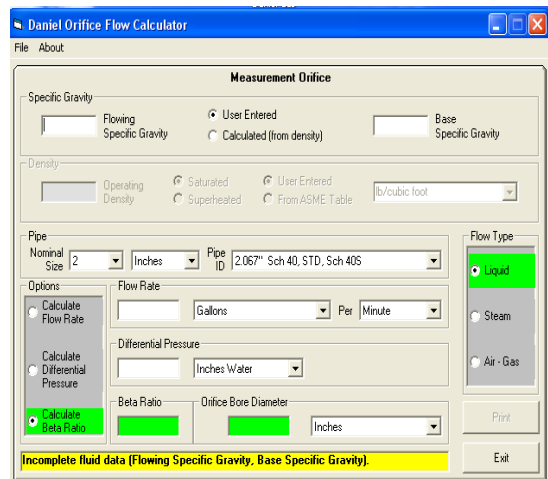
**Gas Ultrasonic Meter (USM) Sizing Tool Simulator**



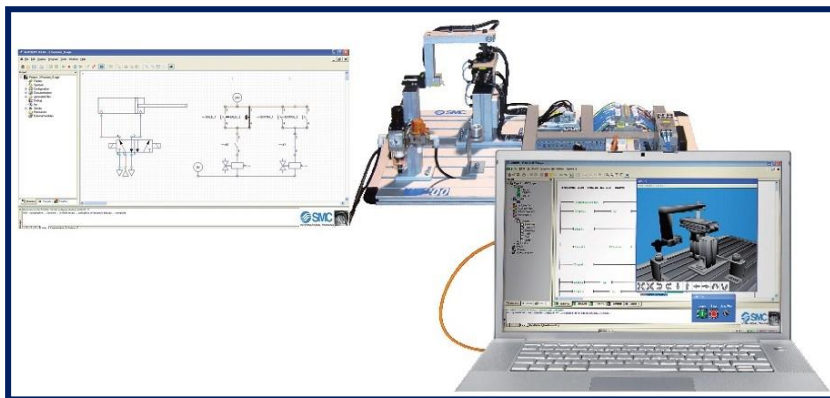
**Liquid Turbine Meter and Control Valve Sizing Tool Simulator**



**Liquid Ultrasonic Meter Sizing Tool Simulator**



**Orifice Flow Calculator Simulator**



**AutoSIM – 200 Automation Simulator**

**Course Coordinator**

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