COURSE OVERVIEW IE0139

Advanced Process Control & Field Device Manager

Course Title

Advanced Process Control and Field Device Manager

Course Date/Venue

Session 1: September 08-12, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Session 2: December 15-19, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

H-STK© INCLUDED

3.0 CEUs (30 PDHs) HAWARD

Course Reference

IE0139

Course Duration/Credits

Five days/3.0 CEUs/30 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:

- 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 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 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. Sydney Thoresson, PE, BSc, is a **Senior Electrical & Instrumentation Engineer** with over **40 years** of extensive experience within the **Petrochemical**, **Utilities**, **Oil**, **Gas** and **Power** industries. His specialization highly evolves in **Process Control Instrumentation**, **Process Instrumentation & Control**, **Process Control**, **Instrumentation**, Troubleshooting & Problem Solving, Instrumentation Engineering, Process Control (**PCI**) & Safeguarding, **Instrument Calibration & Maintenance**, **Instrumented Safety Systems**, High Integrity Protection Systems (**HIPS**), Process Controller, **Control Loop & Valve Tuning**, **Compressor Control & Protection**, **Control Systems**, Programmable Logic Controllers (**PLC**), **SCADA System**, **PLC & SCADA** - Automation & Process Control, **PLC & SCADA** Systems Application, Technical **DCS/SCADA**, **PLC-SIMATIC S7 300/400**: Configuration, Programming and Troubleshooting, **PLC, Telemetry and SCADA** Technologies, Cyber Security of Industrial Control System (**PLC, DCS, SCADA & IED**), Basics of **Instrumentation Control System, DCS**, **Distributed Control System** - Operations & Techniques, Distributed Control System (**DCS**) Principles, Applications, Selection & Troubleshooting, Distributed Control Systems (**DCS**) especially in **Honeywell DCS**, **H&B DCS**, **Modicon, Siemens**, **Telemecanique**, **Wonderware** and **Adrioit,** Safety Instrumented Systems (**SIS**), Safety Integrity Level (**SIL**), Emergency Shutdown (**ESD**), **Emergency Shutdown** System, Variable Frequency Drive (**VFD**), **Process Control & Safeguarding**, **Field Instrumentation**, **Instrumented Protective Devices** Maintenance & Testing, Instrumented Protective Function (**IPF**), **Refining & Rotating Equipment**, **Equipment Operations**, **Short Circuit Calculation**, **Voltage Drop Calculation**, **Lighting Calculation**, **Hazardous Area Classification**, **Intrinsic Safety**, **Liquid & Gas Flowmetering**, **Custody Measurement**, **Ultrasonic Flowmetering**, **Loss Control**, **Gas Measurement**, **Flowmetering & Custody Measurement**, **Multiphase Flowmetering**, **Measurement and Control**, **Mass Measuring System Batching** (**Philips**), Arc Furnace Automation-Ferro Alloys, Walking Beam Furnace, Blast Furnace, Billet Casting Station, Cement Kiln Automation, Factory Automation and Quality Assurance Accreditation (**ISO 9000** and **Standard BS 5750**). Further, he is also well-versed in **Electrical Safety**, **Electrical Hazards Assessment**, **Electrical Equipment**, **Personal Protective Equipment**, Log-Out & Tag-Out (**LOTO**), **ALARP & LOPA** Methods, Confined Workspaces, Power **Quality**, Power **Network**, Power **Distribution**, **Distribution Systems**, **Power Systems Control**, **Power Systems Security**, Power **Electronics**, Electrical **Substations**, **UPS** & **Battery System**, **Earthing & Grounding**, Power **Generation**, **Protective Systems**, **Electrical Generators**, **Power** & **Distribution Transformers**, **Electrical Motors**, **Switchgears**, **Transformers**, **AC** & **DC Drives**, **Variable Speed Drives** & **Generators** and **Generator Protection**. He is currently the **Projects Manager** wherein he manages projects in the field of electrical and automation engineering and in-charge of various process hazard analysis, fault task analysis, FMEA and HAZOP study.

During Mr. Thoresson's career life, he has gained his thorough and practical experience through various challenging positions and dedication as the **Contracts & Projects Manager**, **Managing Director**, **Technical Director**, **Divisional Manager**, **Plant Automation Engineer**, **Senior Consulting Engineer**, **Senior Systems Engineer**, **Consulting Engineer**, **Service Engineer** and **Section Leader** from several international companies such as **Philips**, **FEDMIS**, **AEG**, **DAVY International**, **BOSCH**, **Billiton** and **Endress/Hauser**.

Mr. Thoresson is a **Registered Professional Engineering Technologist** and has a **Bachelor's** degree in **Electrical & Electronics Engineering** and a **National Diploma** in **Radio Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and an active member of the International Society of Automation (**ISA**) and the Society for Automation, Instrumentation, Measurement and Control (**SAIMC**). He has further delivered numerous trainings, courses, seminars, conferences and workshops worldwide.

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

Day 2

0730 – 0930	***Instrumentation*** *Binary & Analogue Instruments ● Instrumentation Diagrams ● Measurement Instrumentation for Flow, Level, Temp, Pressure*
0930 – 0945	*Break*
0945 – 1100	***Instrumentation (cont'd)*** *Instrument Calibration Concepts ● Final Control Elements (Control Valves,-Actuators, Control Valve Instrumentation)*
1100 – 1230	***Control*** *Plant Modeling ● Loop Dynamics ● PID Controller ● Various Forms of PID Algorithms ● Optimal Tuning Theory and Calculations*
1230 – 1245	*Break*
1245 – 1420	***Control (cont'd)*** *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*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***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*
0930 – 0945	*Break*
0945 – 1100	***Industrial Communication*** *Field Bus Principles ● Field Bus Operation ● Physical Layer (Media & Wiring) ● Link Layer (Determinism & Redundancy) ● Application Layer (Shared Memory & Messages Paradigm)*
1100 – 1230	***Information Interchange*** *Device Access Protocols: HART ● OPC*
1230 – 1245	*Break*

1245 – 1420	***Man-machine Communication*** *Hardware & Software Structure ● Tools*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Enterprise Level*** *Enterprise Resource Planning*
0930 – 0945	*Break*
0945 – 1100	***Engineering & Commissioning*** *Life Cycle ● Project*
1100 – 1230	***Performance & Dependability*** *Real-Time & Performance Evaluation*
1230 – 1245	*Break*
1245 – 1420	***Dependable Control Systems*** *Dependability, Overview & Definitions ● Dependability Evaluation*
1420 - 1430	***Recap***
1430	*Lunch & End of Day Four*

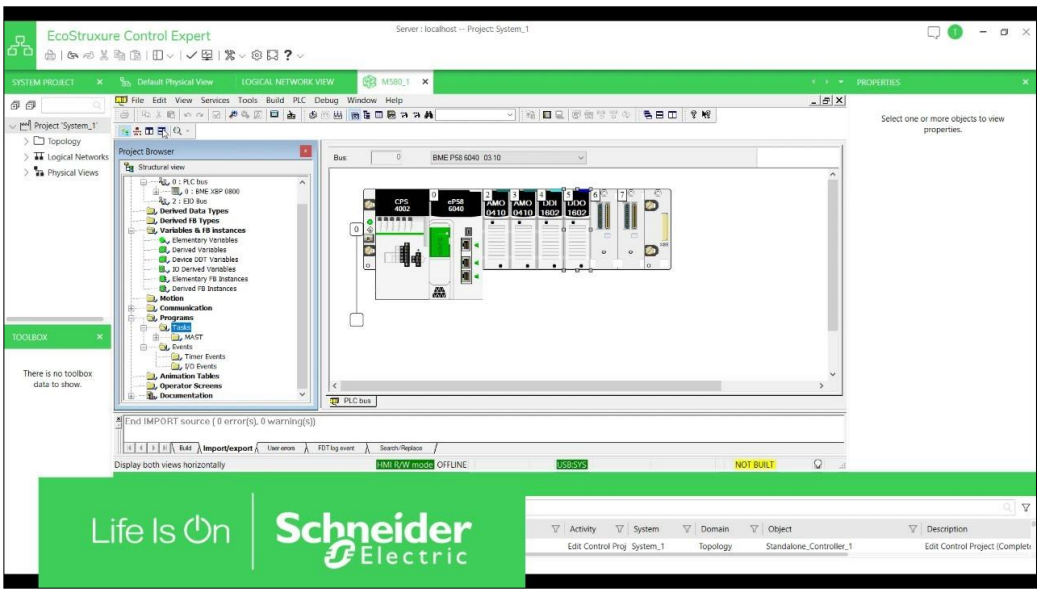
Day 5

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***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

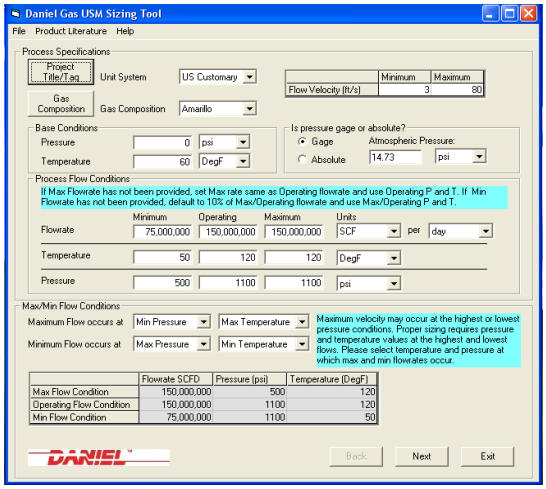
Simulator (Hands-on Practical Sessions)

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”.

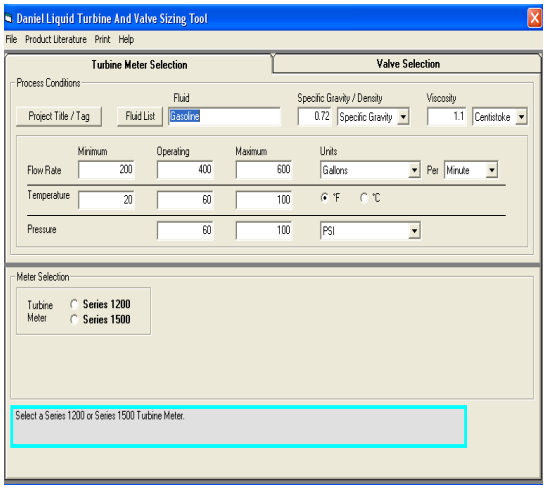
Modicon M340



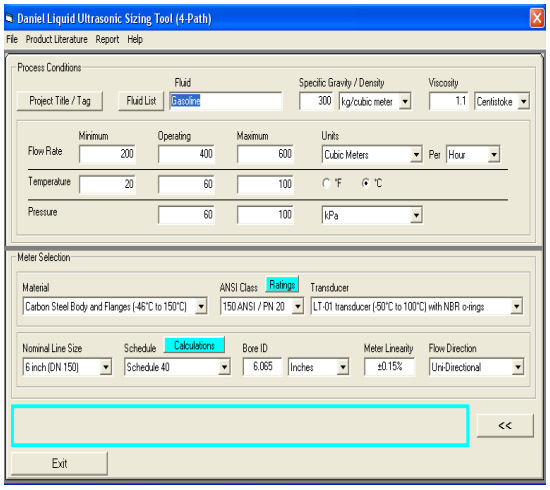
EcoStruxure Expert Classic



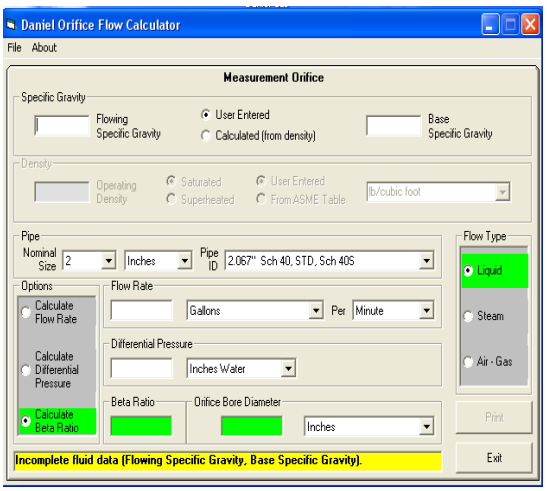
Gas Ultrasonic Meter (USM) Sizing Tool Simulator



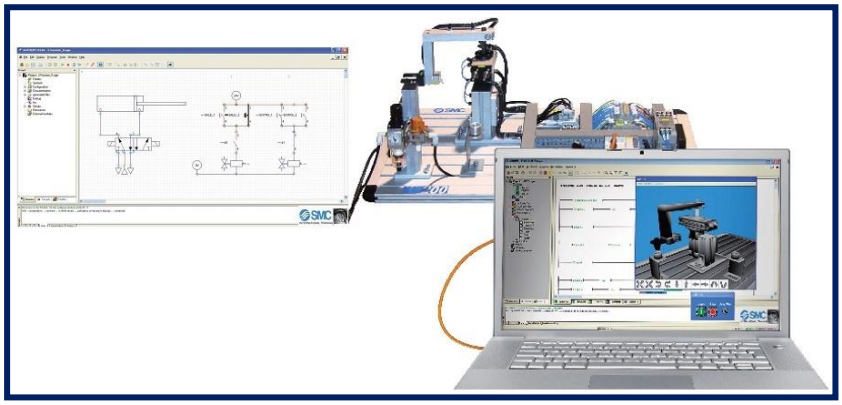
Liquid Turbine Meter and Control Valve Sizing Tool Simulator



Liquid Ultrasonic Meter Sizing Tool Simulator



Orifice Flow Calculator Simulator



AutoSIM – 200 Automation Simulator

Course Coordinator

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