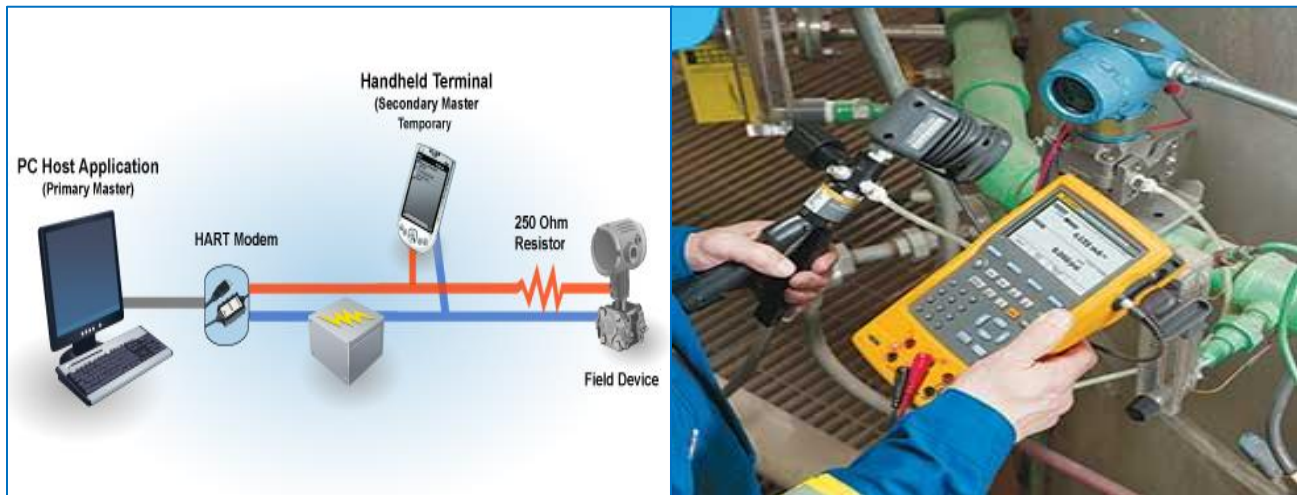




IE216: HART Signals and Communication Protocol

Training Description:

The HART Signals and communication protocol has become a widespread solution, allowing for convenient and efficient parameterization of smart (intelligent) measuring devices. Additionally, device specific diagnostic signals and data can be read which provides information about the device's physical health and allow for predictive maintenance. Monitoring various device parameters is also possibility with the HART signals and protocol.

This intensive training course introduces participant to the technology, circuitry, signaling, command set, and device description language (DDL) of HART protocol. participant also learn about HART-compatible field devices such as transmitters, process receivers, and field controllers.

Further, the course will also discuss the operation of process control loop; the HART signals and protocol; the HART device networks covering HART-highway addressable remote transducer, 4-20 mA analog signal, point-to-point and multidrop modes, packet structure and master/slave protocol; the HART field devices, HART networks, HART performance summary, wireless HART and HART signals security; and the HART architecture covering device identification, electronic device description language (EDDL), accessing data, wiring parameters and commanding devices.

During this interactive course, participants will learn the HART communication modes comprising of request and response, burst mode, events and event notification, block data transfer and features of block data transfer; the HART network topologies including point-to-point network, multidrop network wireless mesh; the wireless HART commands and HART communication stack consisting of HART communication layers and wired protocol; the HART-compatible field devices covering transmitters, valve positioners, field controllers, configuration, installation, checkout, monitoring, control and safety; and the HART devices, monitoring current loops and the proper application and future trends.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Apply and gain a comprehensive knowledge on HART signals and communication protocol
- ✓ Operate process control loop and discuss HART signals and protocol
- ✓ Describe HART device networks in detail covering HART-highway addressable remote transducer, 4-20 mA analog signal, point-to-point and multidrop modes, packet structure and master/slave protocol
- ✓ Identify HART field devices, HART networks, HART performance summary, wireless HART and HART signals security
- ✓ Illustrate HART architecture covering device identification, electronic device description language (EDDL), accessing data, wiring parameters and commanding devices
- ✓ Recognize HART communication modes comprising of request and response, burst mode, events and event notification, block data transfer and features of block data transfer
- ✓ Identify HART network topologies including point-to-point network, multidrop network wireless mesh
- ✓ Discuss wireless HART commands and HART communication stack consisting of HART communication layers and wired protocol

- ✓ Identify HART-compatible field devices covering transmitters, valve positioners, field controllers, configuration, installation, checkout, monitoring, control and safety
- ✓ Calibrate HART devices, monitor current loops and apply proper application and future trends

Training Designed for:

This course is intended for instrumentation, electrical, mechanical and chemical/process engineers, electronics and telecommunication engineers, project engineers, maintenance engineers, supervisors and those who are interested to acquire the knowledge in the field of HART signals and communication protocol.

Training Program:

DAY ONE:

- ❖ Pre-Test
- ❖ Introduction
- ❖ Operation of Process Control Loop
- ❖ HART Signals & Protocol Overview
 - Evolution of HART
 - Wired HART Simultaneous Analog & Digital Communication
- ❖ HART Signals & Protocol
 - HART Technology
 - HART Signaling
 - HART Command Set
 - HART Device Description Language (DDL)
- ❖ Recap

DAY TWO:

- ❖ Hart Device Networks in Detail
 - HART-Highway Addressable Remote Transducer
 - What is a 4-20 mA Analog Signal?
 - Why is the Current loop Used?
 - Point-To-Point and Multidrop Modes
 - Packet Structure of HART Signals
 - Master/Slave Protocol
 - HART Field Devices
 - HART Networks
 - HART Performance Summary
 - Wireless HART
 - HART Signals Security
- ❖ Recap

DAY THREE:

- ❖ HART Architecture
 - Device Identification
 - Electronic Device Description Language (EDDL)



- Architecture Accessing Data
- Wiring Parameters & Commanding Devices
- ❖ **Hart Communication Modes**
 - Request/Response
 - Burst Mode
 - Events & Event Notification
 - Block Data Transfer
 - Features of Block Data Transfer
- ❖ **Recap**

DAY FOUR:

- ❖ **HART Network Topologies**
 - Point-to-Point Network
 - Multidrop Network
 - Wireless Mesh
- ❖ **HART Commands**
 - Wireless HART Commands
- ❖ **HART Communication Stack**
 - HART Communication Layers
 - Wired Protocol
- ❖ **Recap**

DAY FIVE:

- ❖ **HART-Compatible Field Devices**
 - Transmitters
 - Valve Positioners
 - Field Controllers
 - Configuration, Installation & Checkout
 - Monitoring, Control & Safety
- ❖ **Calibrating HART Devices**
- ❖ **Monitoring Current Loops**
- ❖ **Application & Future Trends**
- ❖ **Course Conclusion**
- ❖ **Post-Test and Evaluation**

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request”.

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:

Aisha Relativo: aisha@cmc-me.com

Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615

Training & Career Development Department