



Process Control Training Courses 2012

About us...

Well established company - Started in 1997 by technocrat promoters with engineering background and industrial work experience. Prolific provides turnkey automation solutions and training services to over 200 manufacturing firms across the globe.

Objective – To provide state-of-the-art industrial automation solutions for the manufacturing industry and to provide advanced training to working professionals and fresh engineers / technicians

Executed over 500 in-plant training programs for well known companies including 50+ Fortune 1000 companies

One stop shop for Industrial Automation / Mechanical training – Widest range of product offering

Strategic investor – Al Tanmiya Holdings (Kuwait) – Strategic equity ownership in the company, Well funded to undertake large training projects.

Prolific assure you that our training programs will give your technicians / engineer's hands on exposure apart from being cost effective.

Please feel free to call us for further assistance.

With regards

Customized Training Department (CTD)

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Process Control Technologies

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| A01 | Programmable Logic Controllers (PLC) – General | 03 - 05 | 04 |
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Process Automation

Programmable Logic Controllers (PLC) - (Programming & Maintenance)

Duration of the course: 3 days

Topics Covered :

Hardware covered (any of the given)

Allen Bradley: Micrologix series, SLC 500

Schneider Electric: Modicon TSX Micro and Premium

Mitsubishi: Fx Series & Q Series

ABB: ACS 800 & Advance

Siemens: Series S7 200 and S7 300

GE Fanuc: Versa Max Series & 90:30

Messung Systems: Nextgen

Introduction to PLC

| Topic | Mode |
|---|--|
| <ul style="list-style-type: none"> ➤ Introduction to PLC hardware and role in automation ➤ Architectural Evolution of PLC ➤ Introduction to the field devices attached to PLC | Presentation and physical observations |
| <ul style="list-style-type: none"> ➤ PLC Fundamentals - (Block diagram of PLC's) ➤ Detail information about PLC components <ul style="list-style-type: none"> ○ Power supply, CPU, I/Os, Communication bus ➤ Various ranges available in PLC's | Practical demonstration on hardware |
| <ul style="list-style-type: none"> ➤ Types of Inputs & outputs / Source Sink Concepts ➤ Wiring of the I/O devices | Practical on PLC's |
| <ul style="list-style-type: none"> ➤ Concept of flags ➤ Scan cycle execution | Practical on PLC's |

Programming of PLC & Troubleshooting

| Topic | Mode |
|---|----------------------------------|
| <ul style="list-style-type: none"> ➤ Introduction to PLC programming software | Practical – Programming software |
| <ul style="list-style-type: none"> ➤ Addressing concepts | Practical – Programming software |
| <ul style="list-style-type: none"> ➤ Introduction to bit, byte & word concepts | Practical – Programming software |
| <ul style="list-style-type: none"> ➤ Programming instructions arithmetic and logical <ul style="list-style-type: none"> ▪ Load /and /or/out / and Read / Write ▪ Compare / Add / Sub /And /Or – Blocks ▪ Leading edge / trailing edge instructions ▪ MOVE block application ▪ Timer and Counter Blocks programming ▪ Advanced instructions ▪ File handling ▪ Comment functions ➤ Master control /set /reset function | Practical – Programming software |

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| ➤ Upload, download, Monitoring of programs | Practical – Programming software |
| ➤ Monitoring / Modifying data table values | Practical – Programming software |
| ➤ Standard procedure to be followed in wiring / writing ladder etc | Practical – Programming software |
| ➤ Communication protocol | Practical on PLC's & Software |
| ➤ Troubleshooting and fault diagnostics of PLC | Practical – Programming software |
| ➤ Documenting the project | Practical – Programming software |

Operation and Maintenance of PLC

| Topic | Mode |
|--|--------------------------------------|
| ➤ Setting up PLC's / Connecting CPU, I/O modules, Rack, Back plane and Communication bus | Practical – Assembling PLC |
| ➤ Connecting Field devices to PLC's I/Os | Practical -Physical wiring |
| ➤ Installing and to starting the programming terminals | Practical – Installation of software |
| ➤ Identifying the status of PLC and communication bus | Practical on PLC's |
| ➤ Fault detection and error handling | Practical on PLC's |
| ➤ Forcing of the I/O's | Practical on Software |
| ➤ Back up of the programs and reloading | Practical on PLC's |
| ➤ CPU, I/O module replacements | Practical on PLC's |

Programmable Logic Controllers (PLC) - Advance

Allen Bradley - ControlLogix Systems

Duration of the course: 3 days

Topics Covered :

| Topic | Mode |
|---|--|
| <ul style="list-style-type: none"> ➤ Introduction to PLC hardware and role in automation ➤ Architectural Evolution of PLC ➤ Introduction to the field devices attached to PLC | Presentation and physical observations |
| <ul style="list-style-type: none"> ➤ PLC Fundamentals - (Block diagram of PLC's) ➤ Detail information about PLC components <ul style="list-style-type: none"> ○ Power supply, CPU, I/Os, Communication bus ➤ Various ranges available in PLC's | Practical demonstration on hardware |
| <ul style="list-style-type: none"> ➤ Identifying Logix System hardware and software Components | Practical demonstration on hardware and software |
| <ul style="list-style-type: none"> ➤ Types of Inputs & outputs / Source Sink Concepts ➤ Wiring of the I/O devices | Practical on PLC's |
| <ul style="list-style-type: none"> ➤ Concept of flags ➤ Scan cycle execution | Practical on PLC's |

Programming / Project Development

| Topic | Mode |
|---|----------------------------------|
| <ul style="list-style-type: none"> ➤ Creating various Tasks ➤ Organizing Data ➤ Entering, Editing, & Verifying Ladder Logic ➤ Configuring Logix5000 Controllers to Share Data ➤ Configuring a Message ➤ Documenting & Searching for Project Components | Practical – Programming terminal |
| <p>Ladder Logic Programming/Interpretation</p> <ul style="list-style-type: none"> ➤ Identifying Programming Strategies & Techniques <ul style="list-style-type: none"> ▪ Documenting & Searching Ladder Logic ▪ Programming Basic Instructions ▪ Programming Timer & Counter Instructions ▪ Programming Program Control Instructions ▪ Programming Compare Instructions ▪ Programming Compute & Math Instructions ▪ Programming Move Instructions ▪ Programming with Advance Instruction Set | Practical – Programming terminal |
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|---|--------------------------------------|
| <ul style="list-style-type: none"> ➤ Function Block Programming <ul style="list-style-type: none"> ▪ Creating a Function Block Diagram ▪ Programming Logical Function Block Instructions ▪ Programming Timer & Counter Function Block Instructions ▪ Programming Analog Function Block Instructions ▪ Programming Timing Modes in a Function Block Instruction ▪ Programming & Monitoring an RMPS (Ramp/Soak) Function Block Instruction ▪ Controlling Program Flow Using Function Block Instructions | Practical – Programming terminal |
| <ul style="list-style-type: none"> ➤ Introduction to industrial networking ➤ Identifying Industrial Networks for Use in a Logix5000 System | Theory session |
| <ul style="list-style-type: none"> ➤ Introduction to DeviceNet, EtherNet & DHRIO <ul style="list-style-type: none"> ▪ DeviceNet configuration & use. ▪ EtherNet configuration & use ▪ DHRIO Configuration & use ▪ Messaging over networks | Practical – Demonstration on network |
| <p>ControlNet Configuration, Scheduling & Troubleshooting</p> <ul style="list-style-type: none"> ▪ Basics of networks ▪ Modules & Media ▪ Addressing of nodes ▪ Scheduling ▪ Downloading/ uploading schedule ▪ Troubleshooting | Practical – Demonstration on network |

Operation and Maintenance of PLC

| Topic | Mode |
|--|--------------------------------------|
| <ul style="list-style-type: none"> ➤ Setting up PLC's / Connecting CPU, I/O modules, Rack, Back plane and Communication bus | Practical – Assembling PLC |
| <ul style="list-style-type: none"> ➤ Connecting Field devices to PLC's I/Os ➤ Configuring Local 1756-I/O Modules | Practical -Physical wiring |
| <ul style="list-style-type: none"> ➤ Connecting a Computer to a Communications Network | |
| <ul style="list-style-type: none"> ➤ Installing and to starting the programming terminals ➤ Creating & Modifying an Rslogix new project ➤ Transferring a Project File to a Logix5000 Controller | Practical – Installation of software |
| <ul style="list-style-type: none"> ➤ Identifying the status of PLC and communication bus | Practical on PLC's |
| <ul style="list-style-type: none"> ➤ Creating Tags & Monitoring Data in an Rslogix 5000 Project ➤ Forcing of the I/O's | Practical on Software |
| <ul style="list-style-type: none"> ➤ Managing Rslogix 5000 Project Files ➤ Back up of the programs and reloading | Practical on PLC's |

Maintenance and Troubleshooting

| Topic | Mode |
|---|------------------|
| ControlLogix Troubleshooting <ul style="list-style-type: none">▪ Interpreting Project Organization & Execution▪ Monitoring Arrays & Tags of User-Defined Data Types▪ Editing Ladder Logic Online▪ Troubleshooting Controller Problems▪ Monitoring GSV/SSV Instructions▪ Forcing I/O & Toggling Bits▪ Troubleshooting I/O Module Problems▪ Troubleshooting Power Supply Problems▪ CPU, I/O module replacements▪ Fault detection and error handling | Practical on PLC |

RSView32 7.0 Application Development Programming & Troubleshooting

| Topic | Mode |
|--|-----------------------|
| RSView32 7.0 Application <ul style="list-style-type: none">▪ Installing & activating RSView32▪ Creating & working with project▪ Setting up communications▪ Creating display, trends & alarm summaries▪ Creating tags▪ Setting up logging & security▪ Using the RSView32 Object Module & VBA▪ Communication & Troubleshooting | Practical on Software |

Programmable Logic Controllers (PLC) - Advance

Siemens – Step 7 300 and 400 Series PLC's

Duration of the course: 4 days

Topics Covered :

| Topic | Mode |
|---|--|
| <ul style="list-style-type: none"> ➤ Introduction to PLC hardware and role in automation ➤ Architectural Evolution of PLC ➤ Introduction to the field devices attached to PLC | Presentation and physical observations |
| <ul style="list-style-type: none"> ➤ PLC Fundamentals - (Block diagram of PLC's) ➤ Detail information about PLC components <ul style="list-style-type: none"> ○ Power supply, CPU, I/Os, Communication bus ➤ Various ranges available in Siemens S7 200 / 300 /400 | Practical demonstration on hardware |
| <ul style="list-style-type: none"> ➤ Types of Inputs & outputs / Source Sink Concepts ➤ Wiring of the I/O devices | Practical on PLC's |
| <ul style="list-style-type: none"> ➤ Concept of flags ➤ Scan cycle execution | Practical on PLC's |

Programming / Project Development

| Topic | Mode |
|--|--------------------------------------|
| <ul style="list-style-type: none"> ➤ SIMATIC S7 PLC Functionalities ➤ Setting up Siemens PLC hardware | Practical on PLC's |
| <ul style="list-style-type: none"> ➤ Programming software <ul style="list-style-type: none"> ▪ PLC program structure in Siemens ▪ The instruction set of STEP 7 ▪ Parameters, functions and tools | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ CPU configuration, setting parameters and application of several I/O cards using the STEP 7 software | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Working online / offline ➤ Starting S7 400 system ➤ Cold, Warm, and Hot Restarts ➤ Starting Up a PROFIBUS-DP Subnet ➤ Connecting remote I/Os using Profibus communication | Practical – PLC programming software |

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| <ul style="list-style-type: none"> ➤ Addressing Concepts in Siemens PLC's ➤ Detail information about Organizational Blocks, Function Block, Functions, System Function Block, System Function, Data block | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Creating and Editing PLC programs ➤ Introduction to Bit Byte and Word Concept | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Programming instructions arithmetic and logical <ul style="list-style-type: none"> ▪ Load /and /or/out / and Read / Write ▪ Compare / Add / Sub /And /Or – Blocks ▪ Leading edge / trailing edge instructions ▪ MOVE block application | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Programming instructions arithmetic and logical <ul style="list-style-type: none"> ▪ Timer Blocks programming ▪ Counter Block programming ▪ Comment functions ▪ Comments in the PLC programs ▪ Handling Analog I/Ps ➤ Conversion shift and jump instructions | Practical – PLC programming software |
| <p>Advanced Programmers</p> <ul style="list-style-type: none"> ▪ Analyze /evaluate of status words ▪ Jump instructions ▪ Accumulator functions ▪ Extended mathematical functions ▪ Indirect Addressing ▪ Complex Data-Types ▪ Extended S7 Basic communication ▪ PID / Control functions | Practical – PLC programming software |
| <p>Siemens Networking</p> <ul style="list-style-type: none"> ▪ Industrial Data Networks ▪ Industrial Ethernet – General ▪ Siemens Profibus ▪ Communication via a Multi Point Interface (MPI) | Practical – on PLC's |

Programming / Project Development

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| <p>Troubleshooting and Maintenance procedure</p> <ul style="list-style-type: none"> ▪ Replacing Digital or Analog Modules ▪ Replacing CPUs ▪ Replacing the Backup Battery ▪ Replacing a Power Supply Module ▪ Back up and Restoring programs ▪ Fault diagnostics and error handling | Practical – on PLC's |
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Programmable Logic Controllers (PLC) - Advance

Schneider Quantum Series

Duration of the course: 3 days

Topics Covered :

Topics Covered

| Topic | Mode |
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| <ul style="list-style-type: none"> ➤ Introduction to PLC hardware and role in automation ➤ Architectural Evolution of PLC ➤ Introduction to the field devices attached to PLC | Presentation and physical observations |
| <ul style="list-style-type: none"> ➤ PLC Fundamentals - (Block diagram of PLC's) ➤ Detail information about PLC components <ul style="list-style-type: none"> ○ Power supply, CPU, I/Os, Communication bus | Practical demonstration on hardware |
| <ul style="list-style-type: none"> ➤ Types of Inputs & outputs / Source Sink Concepts ➤ Wiring of the I/O devices to the PLC's | Practical on PLC's |
| <ul style="list-style-type: none"> ➤ Concept of flags ➤ Scan cycle execution | Practical on PLC's |

Schneider PLC's

| Topic | Mode |
|---|--------------------------------------|
| <ul style="list-style-type: none"> ➤ Introduction to various ranges available in Schneider PLCs | Presentation |
| <ul style="list-style-type: none"> ➤ Setting up Schneider hardware system | Practical on PLCs |
| <ul style="list-style-type: none"> ➤ Configure and layout a Modicon system, including input/output modules and local and remote input/output systems ➤ Addressing concepts in Modicon | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Introduction to PL 7 PLC programming software ➤ Configuration, Program, Variables ➤ Hardware and Software Configuration | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Ladder Programming language and methodology ➤ Creating a new ladder logic program ➤ Handling Digital instructions (NO , NC, Rising Edge, Falling Edge, Coils, Set, Reset) | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Working with Timer and Counters ➤ Register, Drum ➤ Horizontal, Vertical and Operate Block | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Scaling and PID instructions ➤ Creating subroutine ➤ Jump instruction | Practical – PLC programming software |

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| <ul style="list-style-type: none"> ➤ Introduction to Grafset ➤ Creating an application using Grafset | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Task and event management ➤ Defined function blocks | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Safety considerations related to your PLC system | Practical – PLC programming software |
| <ul style="list-style-type: none"> ➤ Networking <ul style="list-style-type: none"> ▪ Industrial Data Networks supported by Schneider ▪ Industrial Ethernet – General ▪ Modicon Modbus and Modbus + networking protocols | Practical on PLCs |

Troubleshooting

| Topic | Mode |
|--|-------------------|
| <ul style="list-style-type: none"> ➤ PLC trouble shooting techniques <ul style="list-style-type: none"> ▪ Distinguish between hardware problems, software problems, and field problems ➤ Application debugging ➤ Replacing the faulty modules ➤ Fault diagnostics and error handling | Practical on PLCs |

Distributed Control Systems (DCS)- Advance

Emerson – Delta V DCS / Yokogawa CS 3000 / ABB freelance AC800F / ABB AC800xA (800M Controller) Honeywell Experion C2000

Duration of the course: 5 days

Topics Covered :

| Topic | Mode |
|--|--------------|
| <ul style="list-style-type: none"> ➤ Introduction to various control systems used ➤ Applications of DCS system | Presentation |
| <ul style="list-style-type: none"> ➤ Architectural evolution for DCS ➤ Hardware architecture of DCS <ul style="list-style-type: none"> ▪ Processor ▪ Power supply ▪ I/O modules ▪ Communication bus ▪ Operator and Engineering station ▪ Redundancy | Presentation |
| <ul style="list-style-type: none"> ➤ Comparison between the hardware PLC & DCS | Presentation |

Practical exposure on DCS System

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|---|------------------|
| <ul style="list-style-type: none"> ➤ Practical exposure on DCS system ➤ Overview of the system components and topologies ➤ Detailed information on <ul style="list-style-type: none"> ▪ Controllers ▪ I/O cards ▪ Carriers ▪ System power suppliers ▪ Control networks | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Designing DCS based automation solution for the application | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Setting up DCS system with PS, Controllers, I/Os with communication bus system ➤ Connecting field devices to DCS | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Configuring engineering and operator stations | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Application development in DCS system <ul style="list-style-type: none"> ▪ Graphical User Interface Development ▪ Control Modules ▪ Workspace | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Alarm and Process History ➤ Sequential Function Charts ➤ Display Scripting | Practical on DCS |

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| <ul style="list-style-type: none"> ➤ Users and Securities ➤ Custom Faceplates ➤ Custom Dynamos | Practical on DCS |
| ➤ Scripting and programming languages | Practical on DCS |
| ➤ Configuring nodes on networks | Practical on DCS |
| ➤ Networking technologies in DCS systems | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Redundancy systems available in DCS <ul style="list-style-type: none"> ▪ CPU redundancy ▪ Power supply redundancy ▪ Communication redundancy ▪ I/O redundancy | Practical on DCS |

Troubleshooting

| Topic | Mode |
|---|------------------|
| <ul style="list-style-type: none"> ➤ DCS trouble shooting techniques <ul style="list-style-type: none"> ▪ Distinguish between hardware problems, software problems, and field problems ➤ Reading the Error status bits ➤ Replacing the faulty modules <ul style="list-style-type: none"> ▪ CPU, I/O Modules / Power supply ➤ Fault diagnostics and error handling ➤ Backup & Restore Procedures and Techniques | Practical on DCS |

Distributed Control Systems (DCS)- Advance

Siemens – PCS 7

Duration of the course: 5 days

Topics Covered :

| Topic | Mode |
|--|--|
| <ul style="list-style-type: none"> ➤ Introduction to various control systems used ➤ Applications of DCS system | Presentation |
| <ul style="list-style-type: none"> ➤ Architectural evolution for DCS ➤ Hardware architecture of DCS <ul style="list-style-type: none"> ▪ Processor ▪ Power supply ▪ I/O modules ▪ Communication bus ▪ Operator and Engineering station ▪ Redundancy | Presentation |
| <ul style="list-style-type: none"> ➤ Comparison between the hardware PLC & DCS | Presentation and physical observations |

Practical exposure on Siemens PCS 7 System

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|---|------------------|
| <ul style="list-style-type: none"> ➤ Practical exposure on Siemens PCS 7 system ➤ Overview of the system components and topologies ➤ Detailed information on <ul style="list-style-type: none"> ▪ Controllers ▪ I/O cards ▪ Carriers ▪ System power suppliers ▪ Control networks | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Designing PCS 7 DCS based automation solution for the application | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Setting up PCS 7 system DCS system with PS, Controllers, I/Os with communication bus system ➤ Connecting field devices to PCS 7 System | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Configuring engineering and operator stations | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Operator Station – OS (WinCC HMI) <ul style="list-style-type: none"> ▪ WinCC Global scripts. Diagnostics, triggering and examples. ▪ Alarming ▪ Trending | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Application development in DCS system <ul style="list-style-type: none"> ▪ Graphical User Interface Development ▪ Control Modules ▪ Workspace | Practical on DCS |

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|---|------------------|
| <ul style="list-style-type: none"> ➤ Alarm and Process History ➤ Sequential Function Charts ➤ Display Scripting | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Users and Securities ➤ Custom Faceplates ➤ Custom Dynamos | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Scripting and programming languages <ul style="list-style-type: none"> ▪ Continuous Control – CFC ▪ Structured Control Language – SCL ▪ Sequential Control – SFC | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Configuring nodes on networks | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Networking technologies in PCS 7 systems <ul style="list-style-type: none"> ▪ Introduction to - Industrial Ethernet ▪ Introduction to Profibus technology | Practical on DCS |
| <ul style="list-style-type: none"> ➤ Redundancy systems available in DCS <ul style="list-style-type: none"> ▪ CPU redundancy ▪ Power supply redundancy ▪ Communication redundancy ▪ I/O redundancy ➤ Management of Redundancy <ul style="list-style-type: none"> ▪ External or Remote SP control | Practical on DCS |

Troubleshooting

| Topic | Mode |
|---|------------------|
| <ul style="list-style-type: none"> ➤ DCS trouble shooting techniques <ul style="list-style-type: none"> ▪ Distinguish between hardware problems, software problems, and field problems ➤ Reading the Error status bits ➤ Replacing the faulty modules <ul style="list-style-type: none"> ▪ CPU, I/O Modules / Power supply ➤ Fault diagnostics and error handling ➤ Backup & Restore Procedures and Techniques | Practical on DCS |

Supervisory Control and Data Acquisition Software (SCADA) - Advance

WonderWare InTouch / Siemens Win CC / Allen Bradley RS View / GE Fanuc Cimplicity / Citect

Duration of the course: 2 - 3 days

Topics Covered :

Objectives

Participants will learn selection, programming, installation, commissioning and troubleshooting of SCADA software

SCADA General

| Topic | Mode |
|---|-----------|
| <ul style="list-style-type: none"> ➤ Applications of SCADA software ➤ Different packages available with I/O structure ➤ Features of SCADA software | Practical |

Practical exposure on SCADA software

| Topic | Mode |
|---|----------------------|
| <ul style="list-style-type: none"> ➤ Creating a new SCADA application ➤ Creating Database of Tags | Practical – Software |
| <ul style="list-style-type: none"> ➤ Creating & Editing graphic display with animation <ul style="list-style-type: none"> ▪ Data Entry / Start Stop command ▪ Analog entry ▪ Sizing, Movement, Blinking, Visibility, Filling | Practical – Software |
| <ul style="list-style-type: none"> ➤ Trending <ul style="list-style-type: none"> ▪ Creating & Accessing Real-time and Historical Trends | Practical – Software |
| <ul style="list-style-type: none"> ➤ Creating Alarms & Events | Practical – Software |
| <ul style="list-style-type: none"> ➤ Writing logic through script | Practical – Software |
| <ul style="list-style-type: none"> ➤ Connectivity with the different hardware <ul style="list-style-type: none"> ▪ Communication protocols ▪ Communication with PLC ▪ Communication with Data Acquisition System | Practical – Software |
| <ul style="list-style-type: none"> ➤ Connectivity between software | Practical – Software |
| <ul style="list-style-type: none"> ➤ Concept of DDE, DLL, OPC drivers | Practical – Software |
| <ul style="list-style-type: none"> ➤ Commissioning the network nodes | Practical – Software |
| <ul style="list-style-type: none"> ➤ Troubleshooting the application <ul style="list-style-type: none"> ▪ Fault diagnostics and error handling ▪ Sorting communication problems | Practical – Software |

HMI -- SCADA

Siemens : WinCC Flexible | Protool

Allen Bradley : Factory Talk View | SE | ME | Studio with Panel view plus +
| Panel Builder

Schneider : XBT

More detail please feels to call us.

Duration of the course: 2 - 3 days

Industrial Communication & Networks Training

| | |
|--|-------|
| | 1 Day |
| Industrial Data Networks: | 1 Day |
| Industrial Ethernet – General: | 1 Day |
| Siemens Profibus: | 1 Day |
| Siemens Industrial Ethernet: | 2 Day |
| Rockwell DeviceNet ControlNet Ethernet IP: | 1 Day |
| Modicon Modbus: | |

Duration of the course: 1 - 2 days

Industrial Data Networks:

Duration of the course: 1 days

- Introduction to Industrial networking
- Basic network knowledge, supported by demonstrations and practical assignments;
- Data communication and networking used in plants
- Serial connections: RS232/RS422/RS485
- Sensor and Control-level Networks
- Introduction to network equipment, Routing, Switching
- Introduction to commonly used networking protocols

Industrial Ethernet – General

Duration of the course: 1 days

- Overview of common industrial communication networks.
 - OSI model
 - Available networks (Master/Slave, Client/Server and producer/Consumer)
 - Communication relations (Point to Point, Multicast and Broadcast)
 - Transmission media (Cables, Wireless)
 - Network Standards
- Common network topologies and media
 - The history of Ethernet
 - Standards (IEEE 802.3 and 802.11)
 - Transmission media and 10BASE-5, 10BASE-2, 1BASE-T, 10BASE-T, 10BASE-F, Fast Ethernet, Gigabit Ethernet and 10-Gigabit Ethernet
 - Ethernet and the OSI model
 - Cables, connectors and Ethernet devices: Repeaters, Hubs, Bridges, Routers, Switches, Gateways, etc.
 - Industrial Ethernet and OPC servers
 - Industrial Ethernet as a fieldbus and its requirements
 - IP, TCP and UDP ground rules
 - Industrial Ethernet protocols; Modbus/TCP, ProfiNet, Ethernet/IP, Foundation Fieldbus HSE, IDA
 - Organizations (IAONA, ODVA and IDA)

Siemens Profibus

Duration of the course: 1 days

- Profibus as open fieldbus system – relationship to the ISO/OSI model
- Transmission medium: RS485, fibre-glass and/or IEC 1158-2 technology
- Physical characteristics and installation details
- Profibus services: FDL, DP, FMS and PA
- Data link functions: SDA, SRD, SDN and CSRD
- Token passing principle: TTH, TTR, TRR parameters...
- Addressing: Profibus address (FDL) and Service Access Point (SAP)
- Active versus passive Profibus partners
- FMS service details:
 - Client server model
 - Virtual Field Device (VFD)
 - Object dictionary (OD)
 - Communication Relations List (CRL)
 - Standard and user defined data types
- DP service details:
 - Master slave model
 - Remote I/O system: distributed peripheral
 - Multi-DP sub-network on one cable

Siemens Industrial Ethernet

Duration of the course: 1 days

Contents

- Overview of common industrial communication networks.
- Common network topologies and -media.
- Access methods to the network media: token passing, collision detection etc.
- Master-Slave, Client-Server and Peer-to-Peer concepts.
- The 7 layer OSI model from the ISO.
- Historical aspects of the Siemens Industrial Ethernet.
- The OSI-stack-profile of the Siemens Industrial Ethernet.
- Transport layer ISO-8073 protocol.
- Comparison of ISO-8073 and TCP/IP.
- The Sinec-AP protocol.
- Application of “handling blocks” in the S7program.
- Practical demonstration on connecting remote I/Os on ethernet

Rockwell DeviceNet / ControlNet / Ethernet IP

Duration of the course: 1 days

Specific contents

- General overview of the various Rockwell networks

Part 1: ControlNet

- Familiarizing with ControlNet protocols
- Installing ControlNet networks (hardware)
- ControlNet network configuration with RSNetwork for ControlNet
- Planned and unplanned data-exchange with ControlNet
- Downloading and uploading projects
- Network diagnostics / trouble shooting
- Practical demonstration of connecting devices on control net networks

Part 2: DeviceNet

- Familiarizing with DeviceNet protocols
- Installing DeviceNet networks (hardware)
- DeviceNet network configuration with RSNetwork for DeviceNet
- Downloading and uploading projects
- Explicit-messaging
- Network diagnostics / trouble shooting
- Practical demonstration of connecting devices on Device net networks

Part 3: Ethernet IP

- Familiarising with Ethernet TCP/IP and EtherNet IP
- Installing EtherNet IP networks (hardware)
- Data-exchange over EtherNet IP
- Data-exchange over measurement and control devices
- Network diagnostics / trouble shooting
- Practical demonstration of connecting devices on Ethernet IP networks

Modbus

Duration of the course: 1 days

Contain

- INTRODUCTION
 - Overview of Modbus and development
 - How Modbus fits into the RS-232/ RS-485/Ethernet and TCP/IP Standards
 - List of typical problems
- OVERALL METHODOLOGY
 - Common symptoms, problems and solutions
 - How to quickly identify likely causes
 - Overall basic steps
 - Communications issues
 - Grounding/shielding/noise
- BASIC STANDARDS
 - **RS-232**
 - Fundamentals
 - Problems: cabling, male/female, DTE/DCE, 9-pin, handshaking, voltages, noise, isolation
 - RS-232 Practical Troubleshooting Session
 - **RS-485**
 - Fundamentals
 - Problems: cabling, common mode voltage, converters, isolation, idle state, terminations, control - Hardware/software
 - RS-485 Practical Troubleshooting Session
- MODBUS OVER ETHERNET
 - Modbus over TCP/IP
 - Modbus-IDA Packet structure
 - Typical troubleshooting issues
 - Practical session with Modbus over TCP/IP
- INDUSTRIAL AUTOMATION STANDARDS:
 - **Modbus over Serial Communications (such as RS-232/RS-485)**
 - Fundamentals
 - Problems: no response, exception reports, noise, radio interfaces, physical and application layers
 - Modbus troubleshooting session
 - **Modbus Plus**
 - Fundamentals
 - Problems: cabling, grounding, shielding, terminators, token passing

Fundamentals of Industrial Measurement -- Pressure | Flow | Temperature | Level Instrumentation Training for Engineers & Technician Duration of the course: 3 days

Objectives

- To gain knowledge on variety of instrumentation systems used in the plants
- To develop skills in installations, trouble shooting and maintenance
- To develop the ability to read and interpret P & I D circuit diagrams

| Topic | Mode |
|---|--------------|
| <ul style="list-style-type: none"> ➤ Basics of Field Instrumentation <ul style="list-style-type: none"> ▪ Transmitters and Signal types: Types of signals, Function of a transmitter, Block Diagram of a transmitter ▪ Commonly used field instruments and their applications ▪ Physical Parameters and their measurements: Temperature, Pressure, Flow | Presentation |
| <ul style="list-style-type: none"> ➤ Temperature measurement <ul style="list-style-type: none"> ▪ Basic principles ▪ Scales ▪ Thermocouples & RTD's ▪ Thermostats ▪ Radiation thermometry ▪ Temperature transmitters ▪ Selection, Installation and Commissioning | Presentation |
| <ul style="list-style-type: none"> ➤ Pressure and Flow measurement <ul style="list-style-type: none"> ▪ Basic principles ▪ Sensors and Transmitters ▪ Erection and Commissioning Guidelines ▪ Calibration practices ▪ Maintenance & Trouble shooting | Presentation |
| <ul style="list-style-type: none"> ➤ Technical advancement in instrumentation <ul style="list-style-type: none"> ▪ HART Communication ▪ Field bus technology | Presentation |

Instrumentation Induction Training for Fresh Engineers / Technician

Instrumentation Training for Non Instrumentation Professional

Duration of the course: 10 days

| Instrumentation Training for GETs | |
|-----------------------------------|--|
| LEVEL ONE | |
| Day 1- 2 | <p>Introduction and Pre Test</p> <ul style="list-style-type: none"> ➤ Purpose of instrumentation ➤ Basic measurement concepts ➤ Measurement Practices ➤ Sensors- Inductive / Capacitive, Proximity, Ultrasonic ➤ Introduction to instrumentation systems used in plants / process industry |
| Day 3 | <ul style="list-style-type: none"> ➤ Temperature measurement <ul style="list-style-type: none"> ▪ Basic principles ▪ Scales ▪ Thermocouples & RTDs ▪ Thermistors ▪ Radiation thermometry ▪ Temperature transmitters ▪ Selection, Installation and Commissioning guidelines |
| Day 4 | <p>Post test – Instrumentation & Temperature Measurement. Pre Test - Flow measurement</p> |
| Day 5 | <p>Post test – Flow control technique Pre Test - Data Acquisition & Control System</p> |
| Day 6 – 7 | <p>Data Acquisition & Control System</p> <ul style="list-style-type: none"> ➤ Data Acquisition Systems <ul style="list-style-type: none"> ▪ Introduction to Data Acquisition Systems ▪ Acquiring and Accessing Real-time and Historical trends ▪ Alarm Management ▪ Reporting |
| Day 8 | <p>Post test – Data Acquisition & Control System Pre Test - Control Systems</p> |
| Day 9 - 10 | <ul style="list-style-type: none"> ➤ Control Systems <ul style="list-style-type: none"> ▪ Introduction to process control technique ▪ Types of control systems used in the plant ▪ Introduction to PID Controllers, PLC and DCS control system (more time & details are required) ▪ Comparison between various control systems ▪ Selection of control system to suit the local requirement <p>Post test – Control Systems</p> |

Control System Automation

Advance Instrumentation Training for Engineers & Technician

Duration of the course: 10 days

IN HOUSE COURSE (INDIA, MUMBAI)

Instrumentation, Measurement and Control parameters as applicable in oil and gas industry such as

- Level, pressure, DP, Flow ,Temperature etc.(Rosemount transmitters)
- Analyzer Instruments like GC, oxygen, etc
- Control Valves
- ESD Valves,
- Fire and Gas System
- Hazardous Area instruments,
- Zener barriers and all the associated accessories
- All with associated accessories as applicable
- Etc as applicable for elements in a process control loop.

[Advanced Workshop on Operation & Maintenance of DCS](#)

[Workshop on Field Bus Transmitter](#)

[Workshop on Online Gas Analyzer & Oxygen System](#)

[Workshop on PLC, SCADA & DCS System](#)

Client List



Mineral Deposits Limited



OIL & GAS OPERATING COMPANY



Indorama Nigeria

قطر للبترول Qatar Petroleum



هيئة كهرباء و مياه دبي DURA ELECTRICITY & WATER AUTHORITY



GDF SVEZ