



ISI CONTROL SDN. BHD. (COMPANY NO: 221401V)

INDUSTRIAL SYSTEM INTEGRATOR

No. 9, Jalan USJ 9/5N, 47620 UEP Subang Jaya, Selangor D.E., Malaysia.

TEL: 603-8024 4948 FAX: 603-8024 4211

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Practical Training Course

INSTRUMENTATION & PROCESS CONTROL

Basic Level : 1 Day

Intermediate Level : 3 Days

Advance Level : 5 Days



“This training course emphasize on

- **giving participants an overview, understanding and hands-on.....”**
- **Build on the basic knowledge and provide hands on start up commissioning....”**
- **Design to teach skills for selecting, maintaining, calibrating and troubleshooting of instrumentation...”**

Contact us for a free proposal:

- Claims under **HRDF**
- **Customized** training
- Training delivered **when and where** customers need

You Will Learn :

- Latest technological advances in process monitoring, control and automation.
- Understanding of control systems in the plant
- Improve plant productivity

Specifically Design To Provide

- Understanding of automation control & process characteristics
- Determine application of various type of measurement devices & control equipments
- Determine relevant industry codes, standards, documents and guidelines to apply ie: palm oil, oleochemical industries
- Practical knowledge about instrumentation & control valves.
- How to install process equipment correctly
- How to troubleshoot instrumentation systems and control valves
- To correctly select and size control valves for industrial use.
- Correct maintenance procedures
- Establishing & documentating calibrating procedures
- Troubleshooting of equipment.

Who Should Attend :

- Managers, engineers
- Non Instrument related personnel
- Mechanical & process technicians
- Chemical & Process trainee engineers
- All personnel involved in the design, selection, operating, maintenance, troubleshooting, repair operations.
- All maintenance, engineering, operations personnel involved in improving reliability, conditioning monitoring and maintainability of process equipment and systems
- Participants should have basic foundation skills in instrumentation



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COURSE OUTLINE

1 Day

- 1. Introduction**
 - Basic concepts in Instrumentation & control
 - Definitions
 - Overview of Pressure, levels, temperatures and flows
 - Control Valves
- 2. Introduction to Instrumentation & Process Control**
 - Definition
 - Process Measurements
 - Evaluation & Control
 - Examples of Drawings
- 3. Introduction to Process Control & loops**
 - Definition
 - Block diagrams
 - Process controller
- 4. Process Characteristics**
 - Theoretical concepts of Physical systems
 - Electrical, liquid, thermal
- 5. Pressure Measurements**
 - Definitions
 - Gauge and absolutes
 - Manometer
 - Pneumatic or mechanical
 - Pressure sensor & transmitter
 - Pressure engineering units
- 6. Level Measurement**
 - Definition
 - Gauge glass level measurement
 - Electrical & electronic level sensor
 - Remote display level indicator
 - Level Engineering units
- 7. Temperature measurement**
 - Definitions
 - Temperature Gauges
 - Types of sensors
 - Temperature engineering units
- 8. Flow measurement**
 - Definitions
 - Types of flow techniques
 - Flow engineering units
- 9. Analytical Measurement**
 - Introduction
 - Conductivity, pH, Do and humidity measurement
 - Gas analysis
 - Measurement applications
- 10. Final Control Elements**
 - Control Valve
 - Pump Control
 - Louver Control
 - Heater Element
 - Inverter

3 Day

Day 1

- 1. Introduction to Instrumentation**
 - Process Measurement
 - Process Control
- 1. Understanding of PID**
 - Instrument symbols
- 2. Electrical, Electronic & Pneumatics**
 - Types of equipments
 - Engineering units
- 3. Engineering units**
 - Typical units for Flow , pressure, Temperature, levels and analytical
 - Conversion of units

Day 2

- 1. Pressure Measurement**
 - Manometer
 - Gauge pressure
 - Absolute pressure
- 2. Level measurement**
 - Differential Pressure DP
 - Buoyancy
 - Ultrasonic
 - Radar
 - Capacitance
 - Tank gauging
 - Bypass level gauge
- 3. Temperature measurement**
 - Gauges
 - Sensors

Day 3

- 1. Flow Measurement**

Principal of Flow Measurement

 - Variable area
 - Vortex
 - Magnetic
 - Turbine
 - Positive displacement/gear
 - Coriolis
 - Orifice/pitot tube / Anubar
 - Ultrasonic
 - Open Channel
 - Flow Measurement
- 2. Analytical Measurement**
 - pH
 - Conductivity
 - Dissolved Oxygen
 - Humidity
 - Gas analyzer

The specific details can be customer design to suit individual plants



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COURSE OUTLINE

5 Days

Day 1: Theory

- 1. Introduction to calibration**
 - Definitions
 - Purpose of calibration
 - Type of calibrators
- 2. Type of calibration**
 - Wet / Dry
 - On line / off line
 - Laboratory / on site
- 3. Terms**
 - Accuracy
 - Repeatability
 - Linearity
 - Uncertainty
 - Traceability
 - Records
 - ZERO adjustments
- 4. Calibration Procedures**

Day 2: Practical

- 1. Introduction to Control valves**
 - Definitions
 - Gauge and absolutes
 - Manometer
 - Pneumatic or mechanical
 - Pressure sensor & transmitter
 - Electrical pressure sensor & transmitter
 - Pressure engineering units
- 2. Calibration of Control valves**
 - Simulation of signals
 - Overhaul / Service
- 3. Sizing**

Day 3: Practical

- 1. Introduction to Level**
 - Definitions
- 2. Calibration of Level**
 - Simulation of signals
 - Gas analysis
 - Measurement applications

Day 4: Practical

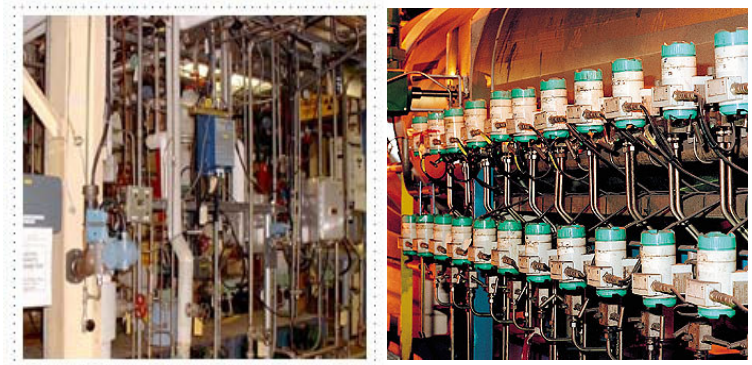
- 1. Introduction to Pressure Measurements**
 - Simulation of signals
- 2. Calibration of Pressure Instruments**
 - Simulation of signals

Day 5 : Practical

- 1. Introduction to Temperature & Analytical Measurements**
 - Simulation of signals
- 2. Calibration of Temperature & Analytical Instruments**
 - Simulation of signals

METHODOLOGY

- A combination of class lectures (30% of time), activities, reviews of Loop diagrams, specification sheets, calibration procedures and group discussion.
- Practical hand-on configuration of industrial instrumentation.
- The course will be intensive but practical and highly interactive.
- Participants are encouraged to participate actively and to ask questions especially pertaining to specific



CERTIFICATION

At the end of the course participants will be presented a Certificate of Accomplishment by ISI CONTROL SDN BHD as testimony to their commitment to professional development & further education.

TRAINING MANUAL

A compilation of slides, notes, valuable information, equipment drawings and reading material will be presented to all registered participants.