

Course Name: PCS7

Course Code: T.P 06

Course Duration: 32 Hours – 4 Days

Course Syllabus:

1. System Overview

- What Is Process Control?
- Seamless Integration of Today's Systems
- A New PLC Generation with Integrated
- Process Control Functionality
- SIMATIC PCS 7 - Automation Systems Configuring with Function Blocks
- Special Process Industry Requirements: Top-Down Design Methodology

2. Config Overview

- Example
- PCS Hardware
- Solution Principle (AS)
- Project Environment
- Our Plant (Factory 2)

3. Project Structure

- Project Environment
- Our Plant (Factory 2)
- Creating a Multiproject (MP)
- Creating Projects in the MP
- Setting the Language for Display Devices
- Assigning the Plant Hierarchy
- PH Settings
- Updating the Plant Hierarchy
- Plant View - Settings/Properties
- PH Assignment
- HID Generation
- OS Hierarchy (AS/OS)

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- OS Hierarchy (Picture Structure)
- Names in the Component View

4. System Configuration

- System Configuration for PCS 7 Components
- Configurable Components
- Using HW Config to Configure the AS
- Exercise: AS HW Config (Central AS)
- Task: AS HW Config (PROFIBUS DP CiR Compatibility)
- Exercise: AS HW Config (PROFIBUS DP Set Parameters for CiR Object)
- Exercise: AS HW Config (Set Parameters for PROFIBUS DP CiR Module)
- Exercise: AS HW Config (CPU Process Image Partition)
- Exercise: AS HW Config (Driver Concept/Symbolic Channel Names)
- Compiling and Downloading the AS HW-Config
- Setting the PG/PC Interface for the First AS Download
- Compiling the AS HW Config and Downloading in STOP Mode
- Exercise: Download the AS Hardware Configuration in RUN
- Exercise: Download the AS HW Config to the PLC Check CiR Compatibility-1)
- Configuring the PC Station (Overview)
- Set the PC Station (Modules)
- Set PC Station (Access Point)
- SCE (Station Configuration Editor Option)
- Exercise: SIMATIC PC Station/OS HW Config
- Calling Up NetPro
- Setting Up a Connection
- Downloading a Connection
- Cross-Project View
- S7 Connections (Stations in Unknown Projects)

5. Configuring Functions With CFC

- Integrating Libraries
- Block Libraries
- Integrating Blocks
- Organization Blocks
- CFC Basics

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- Exercise: The First Blocks
- Predecessor for Installation
- Insert Block
- Compiling and Downloading the Program
- Debugging a Program
- Exercise: Controlling a Value
- Exercise: Automate Reactor Plant A
- Reactor Simulation (Filling)
- Reactor Simulation (Heating)
- Reactor Simulation (Summary)
- Subexercise: REACTOR Block
- Block Diagram of a Valve Control System
- Subexercise: VALVE Block
- Block Diagram of a Motor Control System
- Subexercise: MOTOR Block
- CTRL_PID (with LINK)
- Subexercise: CTRL_PID Block
- Complete download with read back
- Driver Concept (from V5)

6. Configuring Sequence With SFC

- Overview
- Sequence Structures
- Action and Transition
- Preprocessing and Postprocessing for a Sequencer
- Operating State Logic of a Sequencer
- Exercise: Sequence Control - Temperature
- Open SFC (in Test Mode)
- Sequence Control – Reactor
- Parameter Control via the SFC
- SFC Operating Mode Logic
- Run Behavior of an SFC
- Restart Behavior of the SFC(1)
- Restart Behavior of the SFC(2)
- External View of SFC

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- Exercise: Adding Two Sequencers to the Sequential Control
- Holding Sequencer with Data Block for Values to be Saved
- Creating an SFC Type
- Creating an SFC Instance
- Miscellaneous Reference Data

7. Creating New Block With SCL

- Overview
- AFB - Structures
- Example: Arithmetic Block
- Insert Menu (Structures)
- Insert Menu
- AFB - Startup Characteristics
- Compiler and Debugger
- Appendix: Source Texts
- Creating a Library in the MP

8. Using The OS for Operator Control and Monitoring

- System Configurations
- WinCC Multi-Station Systems
- Configuration of Operator Control and Monitoring for SIMATIC PCS 7
- OS systems with multiple servers
- Central Engineering
- SIMATIC PCS 7 - Operator Station
- WinCC Editors (Standard)
- Process Control Software
- WinCC (PCS 7 - Basic Options)
- OS Optional Packages
- WinCC Explorer: Overview
- Tag Management
- Editors
- Compile OS
- Result of the OS Compilation
- Faceplates
- User Interface

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- Deriving Block Icons
- Create Block Icons (Settings)
- OS Configuration Steps - Example Reactor A
- Set Up OS: Single Station/Multi-Station System Changeover
- Set Up OS: Setting Computer Properties
- Set Up OS: OS Project Editor - Layout
- Set Up OS: OS Project Editor - Message Configuration
- Set Up OS: OS Project Editor - Message Display
- Set Up OS: OS Project Editor – Area
- Set Up OS: Set Up/Check AS-OS Connection
- Data Management with SIMATIC PCS 7 - Compile OS
- Exercise: Setting Up the OS (1 - Multi-Station System)
- Exercise: Setting up the OS (2 - OS Project Editor Basic Settings)
- Exercise: Setting up the OS (3 - Checking the AS-OS Connection)
- Exercise: Setting up the OS (4 - OS Compilation with Block Symbols)
- Exercise: Setting up the OS (5 - Connection Test/Runtime Test)
- SFC Visualization Option
- Exercise: Setting up the OS (6 - SFC Visualization/Runtime Test)
- Exercise: Setting up the OS (7 - Adapt Process Picture Size)
- Creating Pictures in Graphics Designer
- Configuring Objects (Example)
- Exercise: Graphics Designer (1 - Picture Size)
- Valve V2 (Example)
- Mixer (Example)
- Temperature Control (Example)
- Type Picture (Faceplate) with Process Tag
- Direct Connection (Example)
- Group Display (Function)
- Connecting the Group Display to a Process Tag (Example)
- Exercise: Graphics Designer (1 - Group Display)
- Exercise: Graphics Designer (2 - Process Picture Unit A Reactor A)
- Exercise: Graphics Designer (3 - REACTORS Area Picture)
- Reconnecting
- Exercise: Graphics Designer (5 - Runtime Test Process Pictures)
- Operating a Faceplate (PID Controller)

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- Exercise: Setting up Users
- User Administration under SIMATIC Logon
- Creating Online Trend Groups
- Message System
- Automatic Alarm Hiding
- OS Archive System
- CAS - Principle of Operation
- Configuration of OS Measured Value Archive
- Exercise: Set Up Online Trends and Archives
- Exercise: Archive Multiproject / Subproject / Library
- Notes
- AS/OS Monitoring using Lifebeat Monitoring
- Time-of-day synchronization (typical)
- Exercise: Time-of-Day Synchronization (1 / 2)
- Additional Exercise: Time-of-Day Synchronization (2 / 2)
- Exercise: Horn Configuration
- Exercise: Setting Up a Message Sequence Report
- Additional Exercise: Batch Report (1)
- Additional Exercise: Print Job
- Additional Exercise: Test
- Exercise: Creating a Customized Prototype Object (2)
- Maintenance Station (Asset Management)
- Additional Exercise: Setting up MS
- Result of Diagnostics Structure
- Diagnostics with the MS
- Navigation in the MS
- Module diagnostics
- Module Faceplate
- Maintenance Request
- Logging of the operations

9. MultiProject

- PCS 7 Multiproject
- Creating Multiprojects
- Multiproject (Moving and Editing the Project)

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- Multiproject (Save/Archive MP - 1)
- Multiproject (Save/Archive MP - 2)
- Multiproject (Restoring an Individual Project)
- Multiproject (Update Projects)
- Description of Task
- Multiproject: Preparation
- Multiproject: Prepare Distributed Working
- Multiproject: Distributed Working
- Multiproject: Restoring the Distributed Project
- Multiproject: Test AS Program with PLCSIM
- Multiproject: Prepare OS Test with PLCSIM (1)
- Multiproject: Updating the Networks
- Multiproject: Insert Picture into PH and Compile OS
- Multiproject: OS Test with PLCSIM

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