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Siemens S7 1200/1500, ProfiNet & HMI Level 1

Software: Siemens TIA Portal
PLC Type: Siemens S7 1200
Duration: 5 Days
Pre-requisites: None
Maximum Delegates: 10

Brief Description

- Be able to recognise S7 1200/1500 hardware and be able to replace modules when a fault occurs.
- Be able to operate the TIA Portal software to make it perform certain tasks.
- Understand basic S7 1200/1500 instruction set and be able to make minor modifications to software.
- Be able to backup and restore a PLC program when required.
- Be able to perform basic system diagnostics when a problem occurs.
- Be able to Troubleshoot a ProfiNet network
- Be able to change ProfiNet modules as required.
- Be able to recognise WinCC hardware and be able to replace modules when a fault occurs.
- Be able to operate the WinCC software to make it perform certain tasks.
- Understand basic concept of tags etc and communications with the PLC.
- Be able to backup and restore a WinCC program when required.
- Be able to perform basic system diagnostics when a problem occurs.

Course Content

To fault find a system you need to know EXACTLY how it works
HOW EXACTLY DOES A PLC WORK?

- Am I getting the input to the PLC?
- The Led on the output card means i am getting voltage out right? does it?
- What exactly happens in between? theres more than just a program in the CPU
- How exactly does it scan the program?
- What is this Watchdog Timer? Is it that important?
- Can I use the same output twice? That’s bad programming isn’t it?
- A PLC is a logic controller, so use a logical approach to fault find it.
- What are the 8 simple test points to check?
- The PLC is in RUN, that means theres a program right? does it?

- FORCING a bit and toggling a bit is pretty much the same yeah? depends on which PLC

Then you need to know the specifics

HOW DO I DO THE FOLLOWING? (some straight forward some not so)

- S7 1200/1500 Family hardware (Basic Specifications)
- Basic Hardware Troubleshooting
- Theory of Operation
- I/O Addressing
- Getting Started with TIA Portal
- Understanding program notation I, Q, T, C,M, D etc.
- Setting Up a Project
- Hardware Configuration
- Program Representation (LAD)
- Program Structure & Logic Block Types
- Basic Instruction Set (Timers, Counters, Flip Flops)
- Local and Global variables
- Data Types and Parameter types
- Data Blocks
- Establishing Online Connections
- Upload and Download Projects
- Diagnostic functions (Module Information / Diagnose Hardware)
- Program Monitoring
- Using Cross Reference function to aid fault finding
- Searching for specific operands and instructions
- Monitor and Modify Variables
- Rewire Function
- Program Documentation (Symbols, Comments)
- Printing Cross Reference / Program Listings etc.
- Enabling advanced diagnostics on High Feature IO Cards, e.g. No 24VDC
- ProfiNet Basics
- Troubleshooting ProfiNet Networks
- Changing ProfiNet Modules

- Getting Started with a WinCC
- How to backup and restore faulty HMI
- Understand Communications Parameters
- Understanding HMI Tag Database
- Troubleshooting a WinCC Application
- Displaying PLC and ProfiNet diagnostics on the HMI

Course Equipment (per delegate)

- S7 1200 or 1500 PLC
- WinCC HMI
- PC or Laptop

- Simulator