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Siemens S7 300/400 PLC & Networks Level 1

Software: Simatic Manager

PLC Type: Siemens S7 300 / 400 PLC

Duration: 5 Days

Pre-requisites: None

Maximum Delegates: 10

Brief Description

- Be able to recognise S7 hardware and be able to replace modules when a fault occurs.
- Be able to operate the Step 7 software to make it perform certain tasks.
- Understand basic S7 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.
- Introduction to ProfiBus Network
- Introduction to ProfiNet Network

Course Content

To fault find a system you need to know EXACTLY how it works

HOW EXACTLY DOES A PLC WORK?

- 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)

- How do I check power is ON and PLC is in right mode (RUN or Program)
- Check for a fault condition (is SF LED ON)
- Establish a link to the PLC (accessible nodes)

- If comms problem check PG/PC interface
- Create a blank project and take a backup (just in case I mess up)
- Open project for PLC and go OnLine
- Interrogate Diagnostics Buffer
- Identify if it is a hardware or software fault?
- Change the battery
- Change modules if necessary, (with spares and without spares)
- Identify if it is a PLC or Comms fault (Profibus or MPI)
- Check all settings against a template, Node Address etc.
- Check Hardware Configuration
- Clear Memory and Download program
- Check software against latest copy (Compare function)
- Monitor program
- Searching for specific operands and instructions
- Changing timer, counter values On Line
- Making minor mods Off Line and On line
- Check or create a VAT table to establish parameter status
- Force a parameter if required
- Call up reference data to assist with software diagnostics
- Archive and Retrieve project
- Display Documentation (Symbols, Comments)
- Reassign an I/O address and change software addresses (Rewire Function)
- Basic Analog Input configuration
- Printing Cross Reference / Program Listings etc.
- Configure a Profibus Network
- Troubleshoot a Profibus Network
- Configure a ProfiNet Network
- Troubleshoot a ProfiNet Network

Background information also covered

Understanding of the following:

- Number formats, bits, bytes, words, double words
- Binary, HEX, octal, floating point, integer
- Data types and parameter types, Bool etc.
- Block types
- Variable types (local and global)
- How to monitor various blocks
- Ladder programs
- Basic Instructions, contacts, Set, reset etc.
- Timers, Counters
- Comparators, Maths
- How to make minor mods
- Altering values in a VAT table
- Back tracking through a program to establish where power flow stops
- Overall reset procedure
- Fault finding tips

Course Equipment (per delegate)

- S7 300 or 400 PLC
- ProfiBus and ProfiNet Networks
- PC or Laptop
- Real IO Simulator