



IE100: Siemens SIMATIC S7 Maintenance, Configuration & Troubleshooting





Training Description:

This intensive training course covers the basic PLC and the comparison and arithmetic instruction in PLC; the analog I/O module including its installation, conversion method, addressing and application; and the PLC communication and supervisory control.

During this interactive course, participants will learn the Siemens S7 diagnostics, maintenance, configuration and troubleshooting; the selection of proper expansion module for analog inputs and outputs; the exploration of the basic S7 instruction set including move (load and transfer), timer, counter, comparison and math instructions; the data formats, data blocks and function blocks; identifying S7 tools to help troubleshoot a PLC program; setting parameters for interrupt inputs in DB1; interrogating the cause for an interrupt in the diagnostic byte; interrupting priority; configuring sequence control systems with S7-SFC; processing diagnosis with S7-PDIAG; testing user programs with S7-PLCSIM; identifying the proper tools and applying systematic skills for troubleshooting.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Apply and gain a comprehensive skill on Siemens SIMATIC S7 maintenance and configuration
- ✓ Review basic PLC and discuss the comparison and arithmetic instruction in PLC
- ✓ Explain analog I/O module including PLC communication and supervisory control
- ✓ Carryout Siemens S7 diagnostics, maintenance, configuration and troubleshooting

Training Designed for:

This course is intended for instrumentation, control, service and maintenance engineers and other technical staff who install or maintain automation systems and their application programs.

Training Program:

DAY ONE:

- ❖ Pre-Test
- ❖ Introduction
- ❖ Quick Review of Basic PLC
- ❖ Comparison Instruction in PLC
 - Compare, Equal To, Less Than, Greater Than Comparison of Variation and Development in Some PLC Brands

DAY TWO:

- ❖ Arithmetic Instruction in PLC
 - Addition, Subtraction, Multiplication, Division, Comparison of Variation and Development in Some PLC Brands
- ❖ Practical Session 1
 - Exercises Based on a Fictitious Scenario
 - Connect a Simple Discrete Input & Output to S7
 - Select the Proper Expansion Module for Analog Inputs and Outputs
 - Exploration of the Basic S7 Instruction Set including Move (Load and Transfer), Timer, Counter, Comparison & Math Instructions





- Data Formats, Data Blocks and Function Blocks
- ❖ **Analog I/O Module**
 - Installation, Conversion Method, Addressing
 - Application, Analog I/O Module in Some PLC Brands

DAY THREE:

- ❖ **PLC Communication**
- ❖ **Practical Session 2**
 - Exercises Based on a Fictitious Scenario, connect a Simple Discrete Input & Output to S7, S7 Tools to Help Troubleshoot a PLC Program, Setting Parameters for Interrupt Inputs in DB1, Interrogating the Cause for an Interrupt in the Diagnostic Byte
- ❖ **Supervisory Control**

DAY FOUR:

- ❖ **Siemens S7**
 - Hardware of the Siemens S7-300 &/or 400 PLC
 - I/O Electrical Connections for Various Modules
 - Rack Grouping, Developing, Monitoring & Documentation Software
 - General Features of the STEP 7 Family
 - IEC 1131 'Compliant' Software Structure
 - STL, LAD, CSF, SCL
 - The STEP 7 Programming Package
 - Connecting the PLC & Starting Up the Terminal
 - Choosing the Program
 - Help System
 - S7 Instructions including the Administration Functions for Existing &/or Gates
 - Flip-Flops & Several Timer Function
 - To Copy
 - To Change & to Store PLC-Programs
 - SIMATIC Manager
 - Fault Finding
 - Off-line & On-line Mode
 - Monitoring & Modification of Variables
 - Up- & Downloading Programs
 - Writing, Testing & Documenting a PLC Program
 - Identifying Data & Data Types & Interpreting the Different Formats
 - System Diagnostics
 - Searching for Errors that Cause the CPU to Go into Stop
- ❖ **Siemens S7 (continuation)**
 - Logical Errors
 - Sporadic Errors
 - To Copy, To Change and to Store the PLC-Programs
 - Fault Finding
 - Off-line & On-line Mode
 - Monitoring & Modifying Data Variables





- Forcing Variables
- Cross References
- Software Documentation
- Up & Downloading Programs
- Writing, Testing & Documenting a PLC-Program
- Identifying Data & Data Types and Interpreting the Different Types

DAY FIVE:

❖ Practical Session 3

- Interrupt Priority
- Configuring Sequence Control Systems with S7-SFC
- Process Diagnosis with S7-PDIAG
- Testing User Programs with S7PLCSIM
- The Tools & Skills for Troubleshooting

❖ Course Conclusion

❖ Post-Test and Evaluation

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request”.

Practical sessions will be organized during the course for participants to practice the theory learnt. Participants will be provided with an opportunity to carryout various exercises using one of our state-of-the-art simulators “Simatic S7” and “Siemens S7-200”.

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant’s manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.





Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:

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Training & Career Development Department