Introduction to SITRAIN

About SITRAIN

Under the name SITRAIN™, Siemens Industry Automation and Drives Technologies (IA/DT) has established a comprehensive range of training courses in more than 60 countries to greatly support our customers towards solving their tasks.

With SITRAIN™, one will learn to effectively apply automation products and to optimally adapt one’s system components.

This reaps enormous benefits: shortened start-up times, reduced down-times, and faster troubleshooting. All this achieved by the competence acquired in our courses.
Siemens Industry Automation and Drives Technologies is committed to providing quality and excellence to the worldwide automation industry. Answering the needs of the local market, the Training Center in Singapore was established on 1 January 1997. With assistance from the parent training center in Nuremberg, Germany, SITRAIN™ Singapore offers training programs with a wide range of industrial automation courses.

The Center has a dedicated team of training consultants and professional instructors, and a large investment in hands-on equipment. This ensures quality results for your training investment.
Our Scheduled Courses

Understanding the needs of our customers, all our training courses are short and concise. We provide training for users on our S7 family as well as for a wider range of IA/DT products such as HMI Panels and certified courses like Profibus, etc.

For S7 products, SIMATIC STEP-by-STEP (ST-Step) is the starting point for STEP7 learning, and forms the pre-requisite for the more advanced topic courses. Upon finishing this course, specialization in a certain topic can be done. For example, we have courses catering to specific needs such as Certified Profibus, SIMATIC PCS7 System Engineering, SIMATIC WinCC, etc.

Being a portable language within our SIMATIC range, learning S7 allows you to work with both our S7-300 and S7-400 ranges of PLCs.

The Center also offers WinCC system course, for users of SCADA solution as well as the WinCC Flexible course for users of HMI Panels (Touch Panel/Operator Panel). The Training Center in Singapore is the Regional Training Partner for SIMATIC PCS7, an advanced process control systems from Siemens. PCS7 courses are scheduled regularly in our Training Center.

Learning in the SITRAIN™ environment will bring together candidates from different backgrounds, industries and job scopes. The exposure to these differences improves the learning process and is more likely for candidates to think out of the box. They can then apply working ideas which have been employed successfully in other areas in their own fields.
Detailed Training Course Documents

Every participant receives special training course documents, which offer valuable assistance with daily work after the course.

Constant Quality Control

In our training, every participant reviews our trainers. Your open and honest opinion on our trainers is very important. We strive to consider your suggestions with the organization of the following meetings.

Registration

Please contact us via phone or email to check on the vacancy status for your chosen course. Kindly contact us before faxing in your registration. This will ensure prompt processing of your application. The registration form can be found on the last page or on our website.

For overseas trainees, the Center can assist in the arrangement of accommodation and transportation. Please contact us for more information.

Contact Us

Siemens Pte. Ltd.
SITRAIN - IA/DT Training Center
60 MacPherson Road
Singapore 348615
Tel: +65 6490 6988
Fax: +65 6490 6989
Email: adtraining.sg@siemens.com
Web: www.siemens.com.sg/ad
## Course Overview

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Course Code</th>
<th>Days</th>
<th>Price (SGD)</th>
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<tr>
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<tr>
<td>SIMATIC S7 Step-by-Step</td>
<td>ST-STEP</td>
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<td>SIMATIC HMI (Human Machine Interface)</td>
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<td>SIMATIC NET (Networking)</td>
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<td>Certified Profibus DP Engineer (CPE)</td>
<td>PROF-CPE</td>
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<td>Certified Profibus PA Module (CPA)</td>
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<td>Motion Control</td>
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<td>Micromaster MM4 Drive</td>
<td>SD-MM4</td>
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<td>MASTER DRIVES Service and Commissioning</td>
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SIMATIC STEP-by-STEP

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<td>Requirements</td>
<td>Background in Automation</td>
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This course gives participants a good foundation in SIMATIC STEP7 software environment and provides skills necessary to handle and maintain SIMATIC S7-300/400 PLC (Programmable Logic Controller).

This course also offers a great platform for those new to Siemens S7 automation systems and it forms the basis for further advanced topic courses.

- Overview of SIMATIC S7 family
- Navigating SIMATIC Manager
- Hardware Configuration
- Symbolic Addressing
- Block Architecture
- Binary and Digital Operation
- Introduction to Profibus-DP
- Manipulating Data Blocks
- Understanding FC, FB and OB
- Troubleshooting and Debugging Functions
- Basic Installation and Maintenance of PLC
SIMATIC S7 Programming 2

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<td>SIMATIC Step-by-Step (ST-STEP)</td>
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The course is directed at personnel engaged in project engineering tasks who would like to become familiar with the extended programming possibilities of SIMATIC S7.

After the course, the participant will be able to structure and create advanced S7 programs, making it possible to efficiently work with STEP 7 and thus reduce the engineering phase.

The course uses a 'hands-on' practical approach to reinforce the theoretical aspects of the training.

Content

- Using structograms as a method for program design
- Functions, function blocks and multi-instances
- (with examples using IEC Timer/Counter)
- Jump commands and Accumulator operations
- Configuration of Breakpoints as a debugging tool
- Memory Indirect addressing
- Using Error organization blocks to evaluate PROFIBUS slave downtime
- Error management with error organization blocks
- Analyzing synchronous errors with organization blocks
- Analyzing S7 diagnostic data
- Writing user messages in the Diagnostic Buffer
- Troubleshooting and error messages with an HMI device
SIMATIC WinCC

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<td>Requirements</td>
<td>General Computer Knowledge</td>
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A foundation course to provide participants with a sound undertaking of the concepts of Siemens WinCC SCADA software and the utilization of its facilities and features.

Participants will learn the correct development process in WinCC and throughout this course, lecture materials are complimented with hands-on exercises which build a working WinCC application.

**Content**

- Create and manage WinCC projects
- Integrate components between WinCC and STEP7
- Create WinCC tags with STEP7 symbol table
- Establish communications with a PLC
- Design a complex graphic
- Configure internal and external tags
- Define and Administer User Security
- Set and test WinCC Alarms and Messages
- Configure, archive and display Trends & Tables
- Configure, preview and print Reports
SIMATIC HMI Panels / WinCC Flexible

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This course provides a comprehensive review of the features and capabilities of Siemens WinCC Flexible software. Participants will perform a complete system configuration including project configuration, graphics design and system integration. Participants will also build skills with the user management tools including security, access, alarms and messaging. Throughout this course, lecture materials are complimented with hands-on exercises which built a working WinCC Flexible application.

- Understand different HMI product portfolio
- Create HMI project using WinCC Flexible
- Compile and transfer a project
- Use basic features of WinCC Flexible (e.g. Data Logging, Alarm Logging, Recipes, Scripting, Reporting, Screen Navigation, etc.)
- Create different user groups and user administration
- Create Multi-Lingual Project
- Create Faceplates
- Use advanced features of WinCC Flexible (e.g. Smart Access, Smart Service, OPC, etc.)
- Integrate project into STEP7 environment
Certified PROFIBUS - DP Engineer

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The ‘Certified PROFIBUS Engineer’ course is a worldwide recognized training program. It is standardized by PROFIBUS International to create a quality platform for PROFIBUS qualified persons who are acknowledged by an official exam.

The Standard Certified PROFIBUS Engineer course is an intensive hands-on and theoretical 3,5-days training program. On the last day there will be an exam. After passing the exam, the attendee gets the title ‘Certified Engineer’ and will be officially registered. The registration is valid for 3 years. Extension is granted after a fresh up course. This course covers in details the technology, design and operation of PROFIBUS-DP network.

**Content Content**

**Networking Basics**
- Token passing
- Masters and slaves
- Baudrates
- Message formats
- SAPs
- OSI model

**The technology of RS 485**
- Electrical specifications & measurability
- Topology
- Number of connections
- Stubs
- Termination
- Cable specifications and types
- Redundancy
- Grounding and shielding

**Network components**
- Connectors
- Repeaters
- Bus terminals
- OLMs
- Active termination
- DP/DP couplers
Test and measurement equipment
- Handheld tools
- Busmonitors
- Oscilloscopes
- Trigger tools

Bus parameters and cycle times
- Tslot, Max_TSDR, etc.
- Watchdogs
- Repeats
- Min_Slave_Intervall
- HSA

The technology of DP
- Diagnosis, Parameters and Configuration
- Sync and Freeze
- GSD files
- Cyclic and acyclic
- Interface with PLC/DCS

Practical exercises
- Creating networks with the help of configuration tools
- Using the ProfiTrace Analyzer (Live List, logging, analyzing)
- Setting bus parameters
- Class 2 functions
- Generating and reading diagnostics
- Troubleshooting (cable break, double address, faulty configuration)
Certified PROFIBUS PA Module

Course Code: PROF-CPA
Course Duration: 1.5 days
Requirements: Certified Profibus Engineer (CPE)

The Certified Profibus PA module takes 1.5 days (including the exam) and is fully concentrated on PROFIBUS PA. It is only accessible for people who have passed the Standard Certified PROFIBUS Engineer course.

Content

Differences between DP and PA

Available DP/PA couplers and links
- Currents, voltages and limits
- Connections
- Specifications
- Performance
- Required busparameters

The technology of MBP
- Electrical specifications and measurability
- Topology
- Stubs
- Termination
- Cable specifications
- Grounding and shielding

Explosion safety and solutions

Parameters and profiles
- The structure of cyclical read and control values
- Status value
- Profile GSDs and Ident numbers
- Parameters sets from a variety of instruments
- Difference and applications od FDT/DTM/DDL

Practical exercises
- Creating networks with the help of configuration tools
- Setting parameters at instruments
- Generating and reading diagnostics
- Measurement with an oscilloscope (signal- and noise analysis)
- Using the ProfiTrace Analyzer and PA Probe
- Calculating currents and voltages
SIMATIC S7 Communication

Course Code ST-COMM
Course Duration 3 days
Requirements SIMATIC Step-by-Step (ST-STEP)

A foundation course to provide participants a sound understanding of networking and communication concept in SIMATIC S7 systems and the ability to configure, to optimize and to troubleshoot communication between different S7 systems.

Content

- Understand different communication networks in S7 system (MPI, PROFIBUS, Industrial Ethernet, PROFINET)
- Configure Global Data and S7 Basis Communication using MPI networks
- Configure FDL connections using PROFIBUS networks
- Configure S7 connections using PROFIBUS or Ethernet networks
- Understand ISO and TCP/IP transport protocols
- Understand different networking components for Industrial Ethernet and PROFINET (SCALANCE)
- Configure a PC Station
- Configure OPC communication
- Understand system features of PROFINET
- Configure a PROFINET I/O system
# SIMATIC PCS7 System Engineering

<table>
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<tr>
<th>Course Code</th>
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<tr>
<td>Requirements</td>
<td>Background in Automation</td>
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</table>

This course is designed for participants who are responsible for project design, development and commissioning a PCS7 system. The goals of this course are to aggressively help the participants learn a basic system configuration and project design using standard system tools and libraries. This course begins with the participants defining a typical project and planning the system architecture. The participants will then actively build, test and debug a simple PCS7 process system exploring the AS, ES and OS engineering environments. Hands-on lab exercises are used to build experience with system engineering, process optimization and common troubleshooting.

## Content

- Define the requirements and components of a PCS7 system solution
- Perform a basic system configuration
- Build a basic CFC using standard system tools and libraries
- Build a basic SFC using standard system tools and libraries
- Build a basic OS configuration using standard system tools and tag interfacing
- Build and test basic networks communications including MPI, Ethernet and Profinbus DP
- Perform a basic system check out using standard system tools and diagnostics
- Use the Help, Documentation and On-line tools
- Perform basic system administration and project management functions
Micromaster MM4 Drive

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<td>Course Duration</td>
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<td>Requirements</td>
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</table>

The course is aimed at service and commissioning personnel. It provides the participants with basic technical knowledge for start-up and maintenance of MICROMASTER 440. The training includes some basic information and is therefore also appropriate for beginners in drives.

- Basics of induction motors
- Basics of converters
- Handling of parameters with BOP, AOP
- PC-Tools DriveMonitor and Starter
- Commissioning of V/f-characteristics and vector control
- Handling of the free programmable terminals (BiCo)
- Special functions like DC-Braking
- Faults and Alarms
- Practical exercises at training cases (MM 440)
MASTERDRIVES Service and Commissioning

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<tr>
<td>Requirements</td>
<td>Basic knowledge in Drives</td>
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This course is designed for Service and Commissioning personnel to configure the MASTER DRIVE VC (Vector Control). Simple examples help the trainees to obtain the necessary basic knowledge to allow them to use the system quickly and easily for their own applications.

**Content**

- Introduction to Master Drives
- Motor theory
- Inverter theory
- Programming of the unit
- Basic configuring steps via PMU-keypad
- Using OP1s-keypad unit Basic fault finding
- Communication using Simovis software package
- Upreading and Downloading of backup files
- Configuring of PROFIBUS-DP and SIMOLINK
- Operating Instructions (including fault list)
- Function diagrams
- Parameter List
- Practical exercises
SIMOREG DC-Master 6RA70

<table>
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<tr>
<th>Course Code</th>
<th>SD-SIMO</th>
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<tbody>
<tr>
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<tr>
<td>Requirements</td>
<td>Basic electronics knowledge would be an advantage. Familiarity with DC drives. Knowledge of Step 7 PLC software would be advantageous but not compulsory.</td>
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</table>

This course teaches you how to adapt and document the parameter settings on a DC motor, and detect and correct faults. You will reinforce your theoretical knowledge in exercises on special training equipment. On completion of the course, you will be familiar with the functions of a converter unit and its serial interfaces. You will be able to start up the unit safely and quickly. With expert fault diagnostics and correction, you will save time and optimize the availability of your plant.

Content

- Introduction of the concept of the DC Master device range
- Explanation of the functional principle and the function diagrams
- Startup, parameterization and control loop optimization
- Operating states and error handling
- The use of drive monitor software
- Data transfer, data backup with OP1S, DriveMonitor
- Peer-to-peer, SIMOLINK coupling and Profibus DP
- Trace buffer diagnostics
- Selected practical exercises and troubleshooting
### SIMATIC PLC

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### SIMATIC PCS7

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### Drives | Motion Control

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1] Scheduled classes are subjected to a minimum class size before confirmation.
2] On-site training can be provided upon request.
Call us at +65 - 6490 6988
or email: adtraining.sg@siemens.com

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