

Siemens Mechatronic Systems Certification Program
(SMSCP)

Hardware Requirements

[siemens.com/sitrain-smscp](https://www.siemens.com/sitrain-smscp)

SMSCP Partner Schools must have a mechatronic system, which includes the following components:

Level 1 system component requirements:

Basic Electrical and Mechanical Components:

Electrical components

- Conductors, wires and terminal blocks
- Electrical power supplies (including transformer, rectifier, filter, voltage regulator)
- Basic electrical components (e.g. resistors, potentiometers, capacitors, inductors, diodes and transistors)
- Relays, contactors and solenoids
- Over current protection devices (fuses and circuit breakers)
- Sensors
 - Inductive- and capacitive sensors
 - Photoelectric sensors
 - Proximity and limit switches (mechanical, reed)
- Measuring devices (multimeters, oscilloscopes)
- DC motors and Control circuits
 - Direction control
 - Speed control

Mechanical components

- Chain, belt and gear drives
- Bushings, bearings and gearboxes
- Clutches and brakes
- Conveyor belts, lifts, shuts and component storage
- Grippers, jaws and pivot devices
- Fasteners, supports and springs

Pneumatic/Hydraulic Components:

General pneumatic (hydraulic) components

- Pressure source (compressor/pump)
- Pressure regulation valve with filter and gauge
- Shut-off valve

Pneumatic (Hydraulic) actuators/cylinders

Pneumatic (Hydraulic) gating, valves and flow control

- Different DCV designs (e.g. 2/2-, 3/2-, 4/2-, 5/2-, 5/3-way)
- Flow control valves

PLC Components

NOTE: PLC components must be Siemens Series S7-300 or S7-1500

- Personal Computer with PLC Editing software (e.g. SIMATIC S7, STEP7 Professional)
- PC to PLC adapter
- PLC Components:
 - Power supply
 - CPU
 - Memory cards
 - Digital in- and output modules
 - Control Desk with (illuminated) pushbuttons, switches (n.o./n.c.) and indicators

Level 2 – Additional requirements

- Electrical Components
 - Analog sensors such as ultrasonic- or hall-effect sensors
- Electrical Machines
 - Step motors
 - Single phase and Three phase AC motors
 - Direction control
 - Speed control – variable frequency drives
- Guards and mechanical safety devices
- PLC related
 - Simulation software (e.g. SIMIT)
 - Analog In- and Output modules
 - PROFIBUS/PROFINET System with field devices
- SIMATIC HMI TP700 COMFORT with HMI Editing software
SIMATIC WinCC Advanced

Systems meeting the SMSCP Hardware Requirements

1. Amatrol Mechatronic System
For additional information, please visit their website [here](#).
2. Encon-Koester Mechatronic System
For additional information, please visit their website [here](#).
3. Festo Modular Production System (MPS) I4.0
For additional information, please visit their website [here](#).

Do you have any questions?
We will be happy to advise you personally!

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