



# SIEMENS

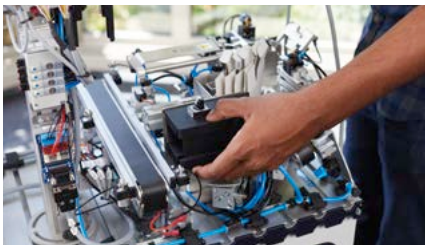
*Ingenuity for life*



## Hardware requirements

Siemens Mechatronic Systems  
Certification Program (SMSCP)

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



### Systems meeting the SMSCP hardware requirements

1. Amatrol Mechatronic System
2. Encon-Koester Mechatronic System
3. Festo Modular Production System (MPS 203) I4.0

SMSCP partner schools must have a modularized mechatronic system, which includes the following components:

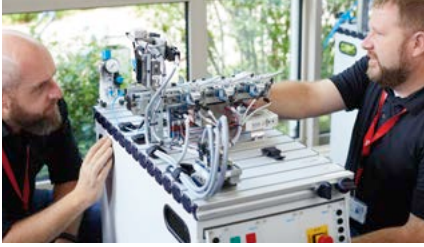
### Level 1 – requirements

#### Basic 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
- Overcurrent 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)

#### Basic mechanical components

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



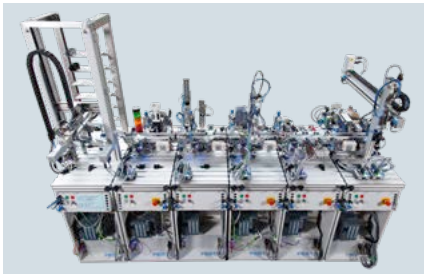
### Pneumatic/hydraulic components

- General components (pressure source (compressor/pump)/ pressure regulation valve with filter and gauge/shut-off valve)
- Pneumatic actuators/cylinders
- Pneumatic 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

PLC components must be SIMATIC S7-1500 with Industrial Ethernet PROFINET interface (legacy systems SIMATIC S7-300 are acceptable if the hardware already exists at your educational institution)

- Personal computer with PLC engineering software (e.g. SIMATIC S7 in TIA Portal, SIMATIC STEP 7 Professional)
- Digital input and output modules for the SIMATIC PLC/control panel with (illuminated) Siemens SIRIUS ACT 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 (SINAMICS G120)

### Guards and mechanical safety devices

#### PLC-related

- Simulation software (SIMIT Simulation Platform Software V10.1 or higher)
- Analog input and output modules for the SIMATIC PLC or optional analog input and output modules with SIMATIC ET 200SP PROFINET remote IO system
- SCALANCE XC208 manageable layer 2 IE switch

**SIMATIC TP700 Comfort Panel with HMI panel engineering software (e.g. TIA Portal SIMATIC WinCC Advanced)**

## Industrie 4.0 – requirements

- SIMATIC RF200 RFID system PROFINET OR IO link
- SCALANCE S615 LAN router; for protection of devices/networks
- NX with Mechatronics Concept Designer (MCD)

For NX MCD (and additional software), please contact the Academic Partner Program and complete the Grant Application:  
[siemens.com/plm/gaf](http://siemens.com/plm/gaf)



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