Modular Systems for Mechatronics Training - MPS® System 203 FESTO

Function

The Stacking magazine module separates workpieces. The Conveyor module brings the individual workpieces to the Joining station. The analog sensor at the stopper above the belt detects the position of the workpiece. If the workpiece is located with the opening facing up, an end cap can be attached with the Pick&Place module. If not, then it cannot. Transport continues to the Sorting station. An optical and an inductive sensor in the Detecting module differentiate the workpieces based on material and color. Electric deflectors then sort the workpieces onto three different slides.

Communication

A station can only pass on a workpiece to the next station if it is ready to process it. In MPS®, this OK signal is received via an I/O interface. That makes it very easy to combine stations and expand them via industrial network technology.

Decentralized participants

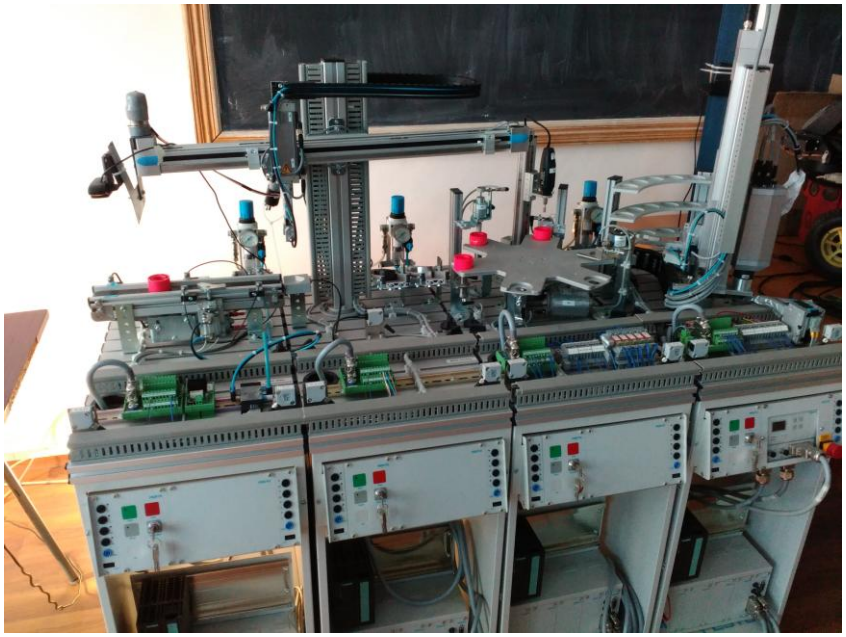
Decentralized units are increasingly important in the age of Industry 4.0. The modular approach in MPS® makes this easy to implement in projects. Network nodes or intelligent controls make the system even more flexible.

Controlling and operating

By breaking down the operation and control to individual stations, an individual workstation is created for a project team. The basic operating functions like start, stop, alignment, and a selector switch are available for programming with various controls. LEDs display the status.

Expandable

Extensions for vision systems, touch panels and data acquisition offer even more training content. Even extensions with additional stations are no obstacle and permit extension to larger production plant for training purposes.



PLC control package includes:
SIMATIC® S7-1500
3x EduTrainer® Universal with SIMATIC® S7-1512 including power supply unit

The MPS 203 Basic system includes the following products:

- Stations
- Distributing/Conveyor, joining, sorting
- Accessories
- Control technology
- PLC control package, EasyPort
- Software

Training content

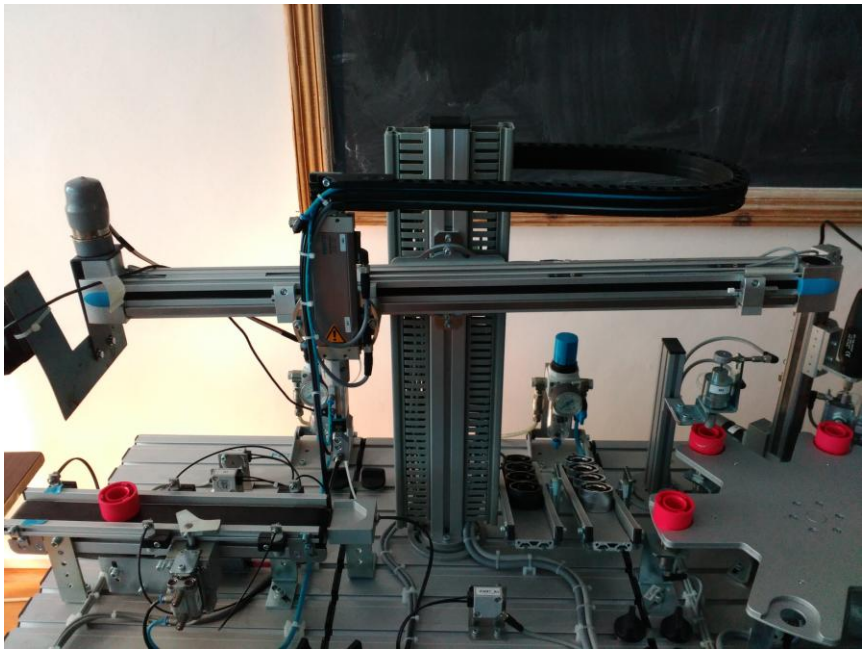
- Structure of a PLC program
- Programming alternative branches
- Programming an operating mode section and signals
- Set-up and optimization of material flow
- Optimization of setup times
- Linking of stations
- Simple communication
- Material flow control
- Enhanced I/O communication
- Commissioning of complex systems
- Teamwork and coordination

Technical data

- Operating pressure: 600 kPa (6 bar)
- Power supply: 24 V DC/4.5 A
- Round workpiece dimensions: max. 40 mm

1. Handling
Modern pick-and-place application that moves part from pick-up point to one of several drop-off locations.

- **Double-acting rodless cylinder**
- **Proximity switches sense cylinder positioning**
- **Pneumatic gripper technology**



Technical data

- Power supply: 24 V DC
- Operating pressure: 600 kPa (6 bar)
- Square/round workpiece dimensions: max. 40 mm
- Stepper motor for motor controller
- X and Z-axis adjustable at an angle of 15°
- Stroke of the X-axis: 600 mm
- Stroke of the Z-axis: 100 mm
- Interfaces: 2x 15-pin D-Sub-HD
- 8 digital input signals
- 7 digital output signals

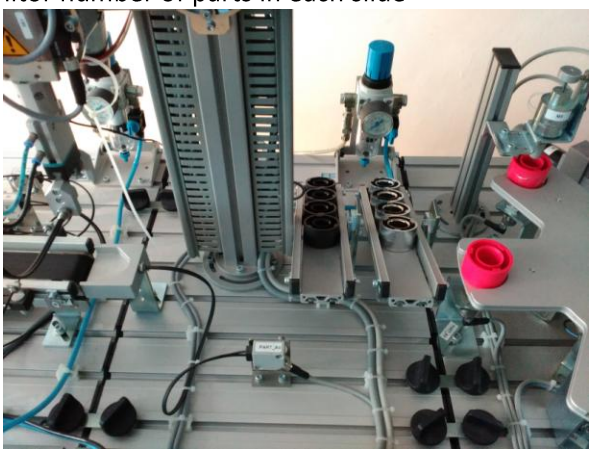
Scope of delivery

- X-axis with belt drive
- Z-axis with guided cylinder
- Stepper motor
- 2 roller lever switches for deactivating the X-axis
- Diffuse sensor
- Gripper jaws for the workpiece and box
- 2 x mini I/O terminal
- Valve: 4x 5/2-way valve (monostable)
- Mounting material for profile plate
- Technical datasheet

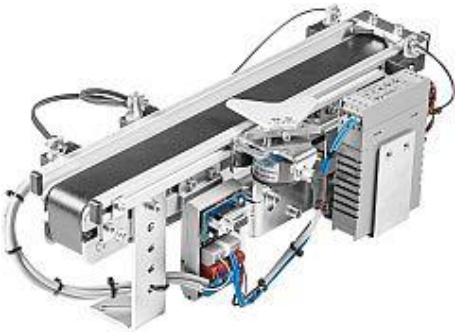
2. Sorting

- Sorts parts by color and moves them via an electrical conveyor belt.
- Sensor array to distinguish colors

- Linear motion to set deflectors
- Proximity sensors verify process completion
- Optical sensors monitor number of parts in each slide



The Conveyor module is intended for mounting on a profile plate, profile foot or slotted mounting frame with freely positionable DC motor. It is suitable for transporting and separating workpieces with a diameter of 40 mm (e.g. “Bodies” or “Cylinder for assembly” workpiece sets). The module is supplied fully assembled.



Training content

- Belt control system
- Sensors
- Reading circuit diagrams
- Buffering and separating

Technical data

- Power supply: 24 V DC
- Maximum workpiece width: 40 mm
- Length: 300, 350 or 700 mm
- Conveyor height above profile: approx. 117 mm
- 3 digital sensors
- 3 digital actuators

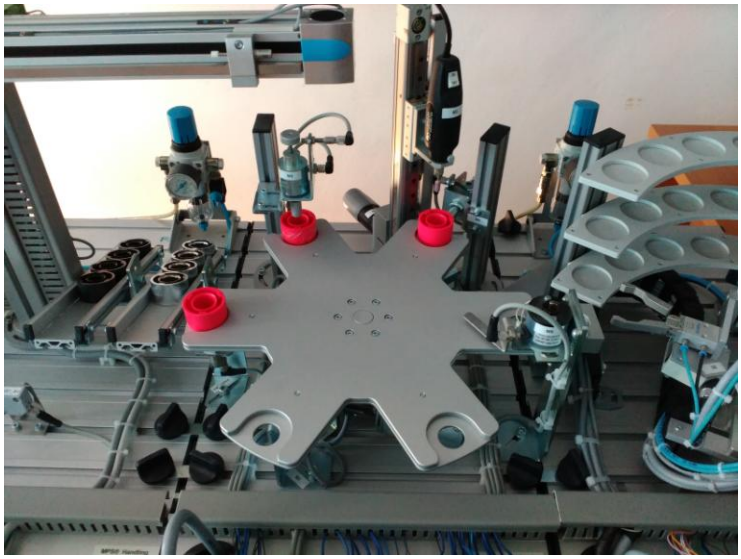
Conveyor module including:

- DC motor: 24 V DC/1.5 A with motor controller right/left
- 2 diffuse sensors
- Light barrier
- Mini I/O terminal
- Mounting material for profile plate
- Feed separator/stopper, electric

3. Processing

Electrical rotary table models common industrial processes.

- Sensors locate parts at pickup as well as varying processing points
- Proximity sensors locate correct alignment of rotary table.
- Sample applications such as machining and quality control can be taught



Rotary indexing table module

Rotary indexing table with 6 workpiece positions. The table is driven by a DC-geared motor with a series resistor.

Workpiece positions: 6

- Diameter: 350 mm
- Height: 125 mm

- Nominal voltage: 24 V
- Nominal rotational speed: 6 r.p.m. (with series resistor 47 .)
- Nominal current: 0.15 A (with series resistor 47 .)
- Nominal current: 0.5 A

The end positions (6 x 60°) can be sensed by means of an optional inductive sensor. An optional capacitive sensor for workpiece sensing can also be mounted under each workpiece position.

For holding the workpieces for processing. The workpiece is machined in four cycles and made available for transfer to the downstream station. The module is supplied complete with inductive proximity sensor and optical sensor (for signalling “workpiece present”).

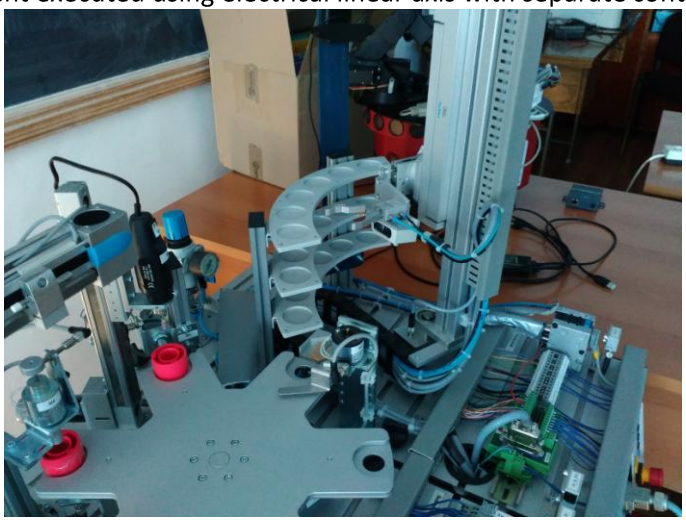
- Workpiece positions: 4
- Diameter: 260 mm
- Height: 180 mm

- Nominal voltage: 24 V
- Nominal speed: 3200 r.p.m.
- Nominal current: 0.3 A
- Nominal power output: 3.31 W
- Starting torque: 3.0 Ncm

4. Electric Storage

Teach electric drive technology and PLC controls.

- Parts storage using electric drives and PLC control
- Linear movement executed using a cylinder
- Rotary movement performed by electrical servo drive and integrated controller
- Stroke movement executed using electrical linear axis with separate controller



Pick&Place module

The Pick&Place module is a universal, 2-axis handling device for Pick&Place tasks. The position of the end-position switches, as well as mounting position and height, can be adjusted on this module. The module is supplied complete with vacuum generator, pressure switch, vacuum filter and suction gripper, valve terminal, pressure limiter and electrical interface. In another version, a parallel gripper is used instead of vacuum technology.

Technical data

- Operating pressure: 600 kPa (6 bar)
- Power supply: 24 V DC
- 4 digital sensors
- 4 digital actuators
- Stroke length, X-axis: 80 mm
- Stroke length, Z-axis: 50 mm
- Pick&Place unit, height-adjustable
- Pressure limitation along the Z-axis

Scope of delivery

- Mini I/O terminal
- Valve terminal with 2 x 5/2-way single solenoid valves and 1 x 5/2-way double solenoid valve
- 2 double-acting cylinders with guide
- 3 magnetic limit switches
- Mounting accessories for profile plate
- Parallel gripper