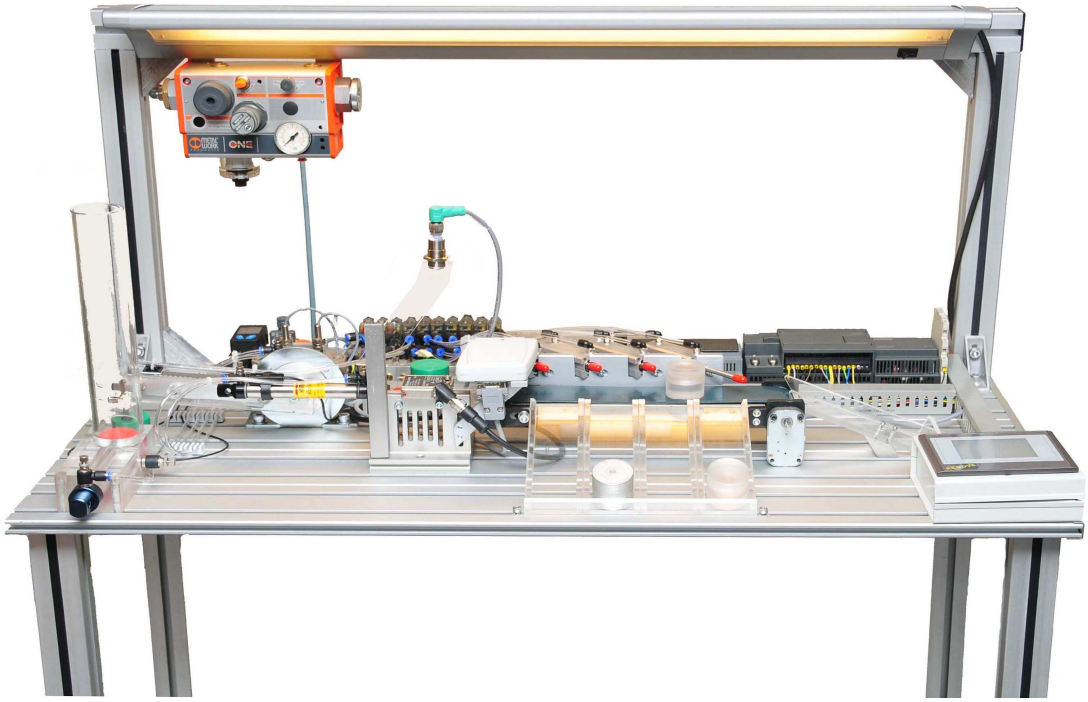
Mechatronics Training Set (FM-PSRF)

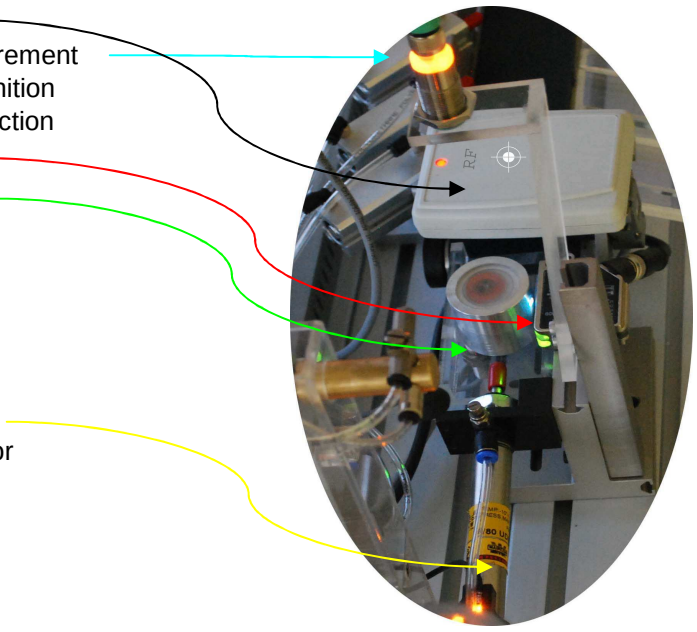


The objective of Ferma Mechatronics Training Set is to show students how to deal with various types of sensors and how to set an algorithm with a PLC.

As a different property from traditional sets, there is also RFID tags, installed in the sample parts. So, the students can select the seperation type either with industrial sensors, or with RFID reader.

The system consists of:

- RFID unit
- Ultrasonic height measurement
- Fibre Optic object recognition
- Transparent object dedection
- Colour recognition
- Inductive Sensors
- Magnetic Sensor
- Pressure measurement
- Vacum measurement
- PLC, Siemes S7-200
- Touchscreen
- Motor driven belt
- Pneumatic cylinder
- Pneumatic rotary actuator
- Vacum unit
- Electropneumatic valves
- Sample Program
- Software
- Documentation



The touchscreen software helps users, to be able create an easy setup. Besides, students can visualise the system, they can show the picture of the sample material.

They can select teh seperation type with sensors or with RF, from freely programmable touchscreen also.

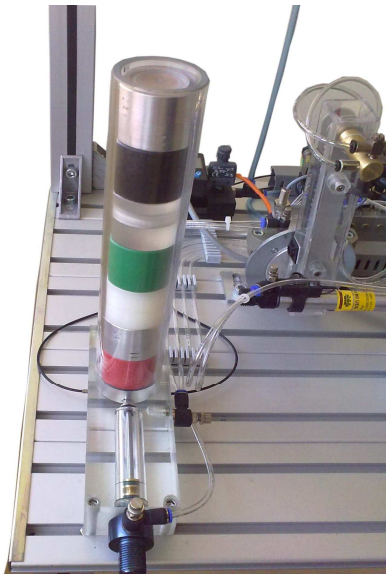
There is a sample parts magazine, which can take up to 8 parts. The part ejecting cylinder is a transparent cylinder, so users can understand the working principles of the pneumatic cylinders very easily.

Tha sample parts that can be seperable with sensors are;

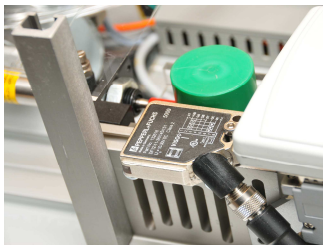
- Aluminium
- Green polyamid
- Red polyamid
- Transparent flexiglass

Tha sample parts that will be sent to the undefined section;

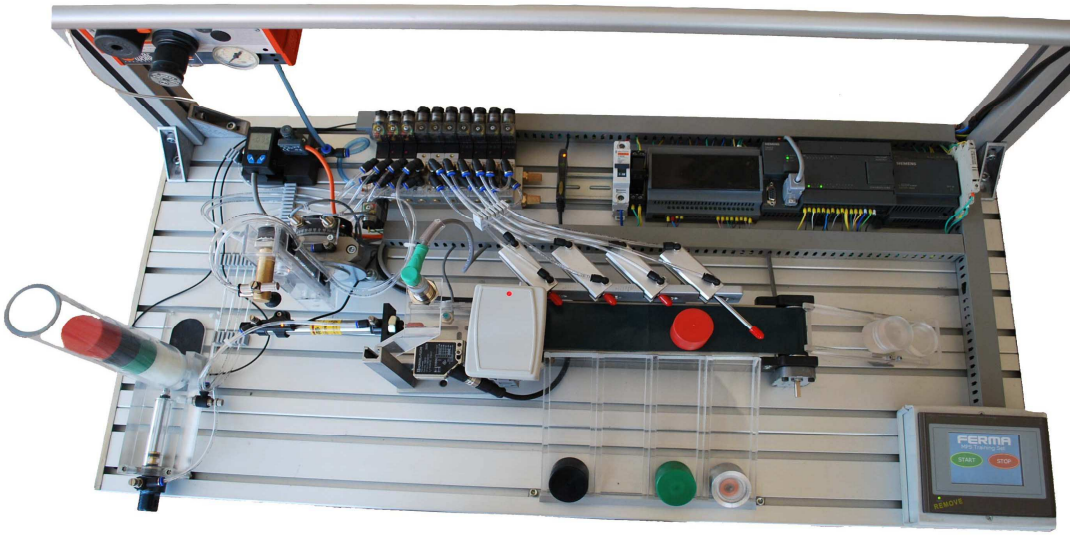
- White polyamid
- Black polyamid
- Short heigt samples



RF tag reader can read 4 samples and seperate them according to the predefined sections.



Students can define the samples, which will go to the undetermined section, by changing the RF tags, inside the parts. For short height parts, they have the change the program software also, since the default program automatically sends the shorter parts to the undeterminde / out of order section.



Available experiments, which can be applied with the sets are;

- Basic programming and understanding of an automation process flow chart
- Learning the use of industrial programming and communicating with a PLC
- Scada software programming to visualise a real mini industrial process.
- Pressure control via a pressure switch and a mechanical manometer
- Vacuum measurement via a digital vacuum sensor with LCD screen
- Arrange the related solenoid valves according to the present scenario
- Setup and piping of preesurised air systems, pipes can be installed easily by quick connections. Teachers can change the hoses, to teach the students fault detection.
- Understanding the sensor characteristics, as
    - Analog Ultrasonic height measurement sensor
    - Analog vacuum transmitter with LCD
    - Mechanical pressure manometer
    - Inductive sensor
    - Proximity sensor
    - 3 colour sensor
    - Fiber-optic sensor