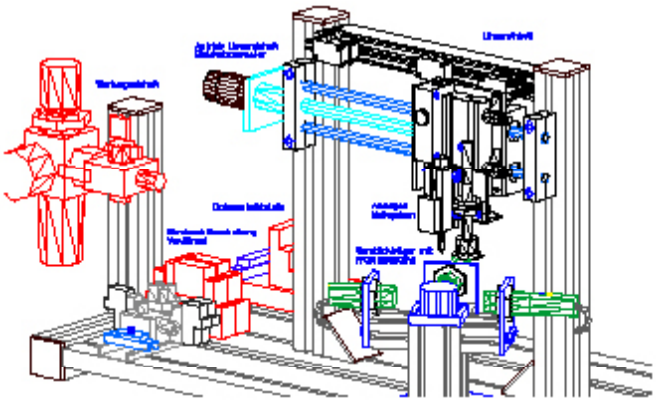
IDV
Ingenieurbüro de Vries

Mechatronic - Technology-Stations

MCS-800



Technical changes reserved
Catalogue MTCS-800 03/19

Mechatronic – Technology Stations

MCS – 800

The mechatronics technology stations are the same devices as in our catalog MCS.

However, these stations have a complete solution consisting of:

- MCS modules (usually two modules) on an ALU slot plate
- ALU trolley with wheels and two brakes
- Control panel (MCS-560)
- Maintenance unit (MCS-540)
- PLC, completely wired and provided with a sample program.
- The PLC is your choice

The stations can in turn be connected to each other and so be realized to a complete manufacturing plant.
In conjunction with our training robot (Magician), this robot can also be mounted on a trolley and thus also carry out the parts transfer.

Ideal is working with two students on a system. Afterwards, the users have to move the system together with their neighbors in a complete production plant for the purpose of communication (IO, bus).

We have a variety of systems in our program. In principle, systems can be designed as described in our MCS catalog under each individual module.

So which module can be left integrated to the right of the module.

So, a lot of possibilities.

	Description	Art.-Nr.
o	Supply station with swivel unit	MCS-801 (FMZ+SU)
o	Measuring and controlling	MCS-802 (MA+RST)
o	Taking and Sorting	MCS-803 (PPP+SORT)
o	Taking and Drilling/Polishing	MCS-804 (PPE+BAB)
o	Swivel unit and Measuring analogous	MCS-805 (SU+MA)
o	High Ware rackhouse	MCS-806 (HRL)
o	Taking and Identification	MCS-807 (PPP+RST)
o	Roboting	MCS-808 (DOBOT)
o	Analogous Measuring with Pick and place	MCS-810 (PPP+MA)
o	Pick and Place elektrically	MCS-820 (PPE)
o	Processing Drilling and control unit	MCS-840 (RST+BAB)
o	Storage	MCS-850 (LAG)
o	Linear axe (1 m)	MCS-860

Learning contents:

Sensoric

Electrical Drives

Process-control

Safety and Industrial safety

Electronic

Installation

Diagnostic

PLC-Programming

Pneumatic

Logistic

Robotic

Material Transport

Automation

Mechanic

All this learning contents are for the profession in the future, the

Mechatronics for Industry 4.0

Station Supply with swivel unit (FMZ+SU)

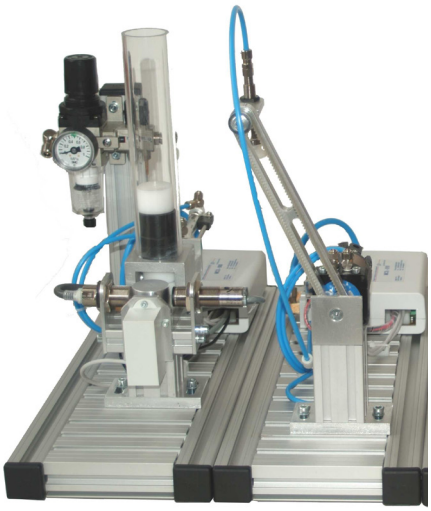
MCS - 801

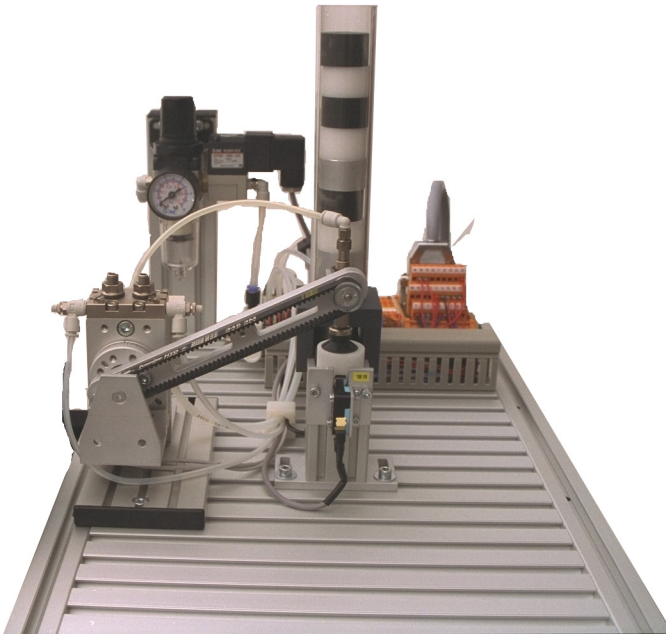
From a magazine workpieces are separated and provided on a shelf.

The level of the magazine is interrogated with a through-beam sensor and the workpiece on the tray with a microswitch.

The material properties of the workpiece are determined by means of an optical and inductive sensor.

A double-acting cylinder pushes the workpieces individually out of the drop magazine.
The end positions of the cylinder piston are detected by non-contact signaling devices (REED).
The cylinder control is carried out with an electrically operated 5/2-way valve.





The swivel converter converts workpieces between two modules with defined material transfer points.

A pneumatic swivel drive steplessly adjustable up to 180o conveys the workpieces with a vacuum gripper. A vacuum generator is mounted on the assembly.

The end positions of the cylinder pistons are queried via non-contact proximity switches (REED). The cylinder control is done with electrically operated solenoid valves.

Learning contents:

- Separate parts from a magazine
- Deploy Kolosion-proof on a shelf
- sensors (magnetic, inductive, capacitive, optical))
- double-acting cylinder
- exhaust air flow
- suction cups
- ejectors
- rotating cylinder
- sensor (magnetic)
- 5/2-way valves (Bistable and monostable).

Data

Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	4 Cylinder switches
	1 Light barrier
	1 Micro switch
	1 optical Sensor
	1 inductive Sensor
cktors:	5/2-Way valve, bi stable
	Double acting cylinder
	5/2-Way valve, uni stable
	5/3-Way valve, ventilated
	Rotating unit
	Ejector
PLC-Connectors:	8 DI, 5 DO
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1140 mm
Weight:	15 kg

Station Measuring and controlling (MA+RST)

MCS-802

Incoming workpieces from another module are moved on a workpiece carrier with a lifting device against a position measuring system.

An analog voltage signal in the range 0 ... 10V can be evaluated with a PLC at the analog input (material thickness measurement).
The workpiece can be brought to an intermediate position of the lifting device via a chute to the rotary indexing table for the purpose of testing the material properties or be discharged at the lower position.

The end positions of the cylinder piston are queried via non-contact signal transmitters (REED).
The cylinder control is carried out with an electrically operated 5/2-way valve.

The correctly sized workpieces then reach the rotary indexing table.
The electrically driven rotary indexing table conveys workpieces in a circle and positions them at an angle of 90 °.
After the test, the workpiece can be removed from another module.
A test unit with three sensors arranged above the rotary indexing table recognizes the workpieces as "present", "bright", "dark" and "metallic". The results can be output on the display.
The 90 ° positions are detected by an inductive sensor.
The motor control is done with a relay.

Learning contents:

- Material thickness measurement with linear potentiometer
- discharge of defined parts
- sensor (magnetic)
- double-acting cylinder
- 5/2-way valves
- 5/3-way valves
- Positioning with pneumatics
- exhaust air flow
- Positioning of workpieces
- Electric drives
- Material determination with different sensors
- Arrangement of several modules circular

Data

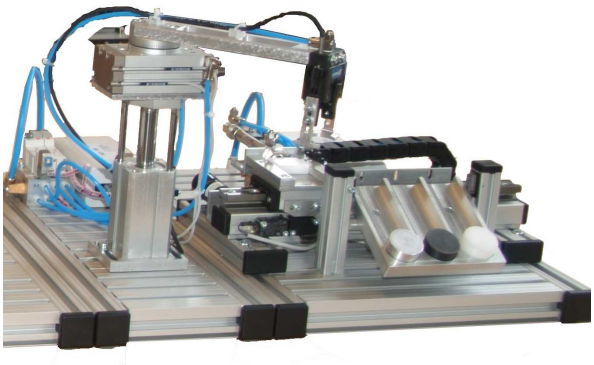
Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	1 Cylinder switches 3 REED contacts 1 analogous measuring 1 capacitive Sensor 2 inductive Sensor 1 optical Sensor
Actors:	5/2-Way valve, uni stable 5/3-Way valve, ventilated Piston rod less cylinder Motor controlling Area LED´s
PLC-Connectors:	8 DI, 7 DO, 1 AI
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1200 mm
Weight:	15 kg

Station Taking and Sorting (PPP+SORT)

MCS - 803

Pneumatic handling device with the workpieces pneumatically taken, lifted and after a swiveling movement up to max. 180 °. A double-acting anti-rotation pneumatic cylinder lifts a swivel unit with pneumatic angle gripper. Detected workpieces are lifted and conveyed to the new position with the swivel unit.

The end positions of the cylinder pistons are detected by non-contact signalers. The closed gripper is detected by an inductive sensor.



After the workpieces have been transferred by the PPP module, they are then guided past three chutes with a linear system.
A moving pneumatic output unit conveys the workpieces by material type on the chutes.

The level of the slides is monitored by a light barrier.

The linear conveyor is positioned with a forked light barrier.

The end positions of the cylinder pistons are queried via non-contact proximity switches (REED). The cylinder control is done with electrically operated solenoid valves.

Learning contents:

- o 2-axis handling
- o Angular Gripper
- o Sensor Technology
- o valves
- o Electric drives
- o Applicable contactor circuit
- o sensor (magnetic)
- o double-acting cylinder
- o 5/2-way valves
- o Photocell for level monitoring
- o Positioning with forked light barrier

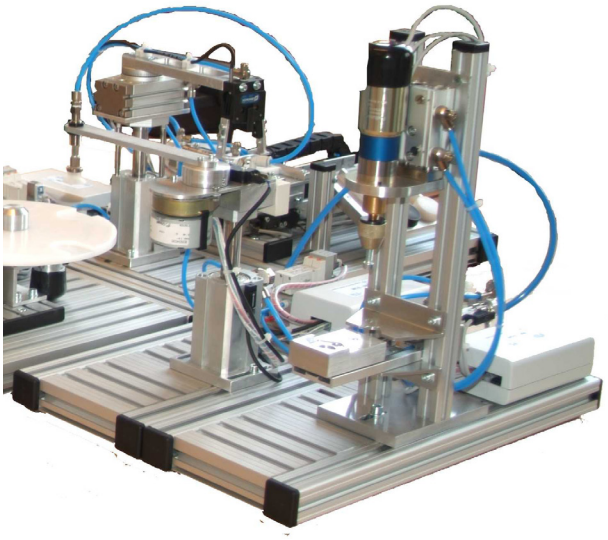
Data

Voltage supply:	24 VDC
Pressure:	5...6 ba, unlubricated
Signal devices:	1 Micro switches 3 REED contacts 1 Light barrier 1 fork light barrier 1 inductive Sensor 1 cylinder switch
Actors:	5/2-Way valve, uni stable 5/3-Way valve, ventilated Piston rod less cylinder Motor controlling Area LED´s
PLC-Connectors:	8 DI, 7 DO, 1 AI
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1200 mm
Weight:	15 kg

Station Taking and Drilling/Polishing (PPE+BAB)

MCS - 804

An electrically driven engine is lifted by a short-stroke cylinder. With a suction gripper, workpieces are picked up at the first position by another module and conveyed in a circle. At any position (ie every 10 °), these workpieces can be stored.
The 10 ° positioning is signaled by a fork light barrier.
The positions must be realized via a PLC program.
The upper end position of the cylinder piston is interrogated with a magnetic field switch.
The cylinder is controlled by an electromagnetic 5/2-way valve.
The motor drive has a slip clutch. This prevents damage due to incorrect programming.



The parts are brought by the module PPE into the pneumatically actuated drilling device. Then the workpieces are clamped and drilled (polished) with an electric drilling unit.

The drilling device is lowered with a non-rotating pneumatic cylinder and the workpiece drilled.

The end positions of the cylinder pistons are queried with REED contacts.

The cylinder control is carried out with electropneumatic directional control valves.

Learning contents:

- Electric drives
- Applicable contactor circuit
- Positioning of workpieces
- double-acting cylinder
- 5/2-way valves
- Vacuum Technology
- Linear Guides
- clamping of workpieces
- cylinder switches

Data

Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	5 cylinder switches 2 Micro switches 1 fork light barrier
Actors:	3 x 5/2-Way valve, uni stable 5/2-Way valve, bi stable cylinder Suction cup
PLC-Connectors:	8 DI, 8 DO
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1150 mm
Weight:	20 kg

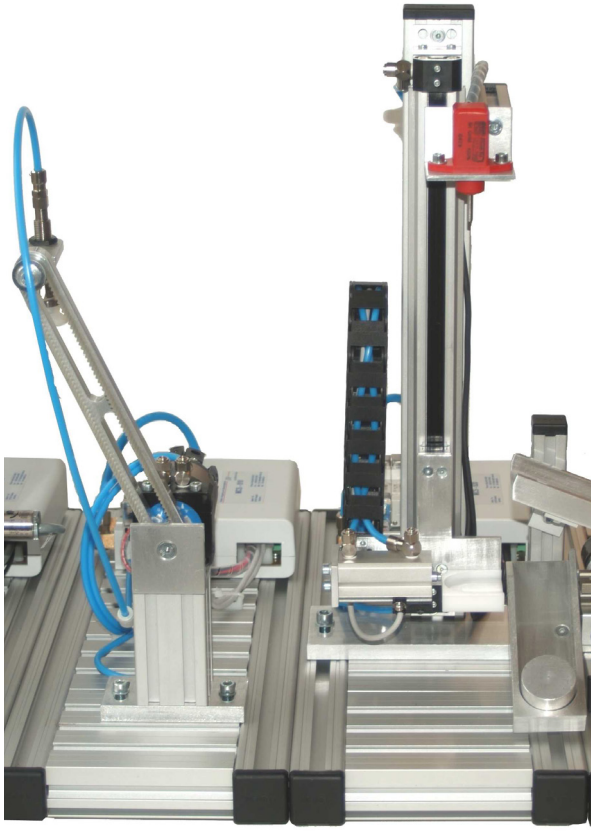
Swivel unit and measuring analogous (SU+MA)

MCS - 805

An analog voltage signal in the range 0 ... 10V can be evaluated with a PLC at the analog input (material thickness measurement).

The workpiece can be brought to an intermediate position of the lifting device via a chute to the rotary indexing table for the purpose of testing the material properties or be discharged at the lower position.

The end positions of the cylinder piston are queried via non-contact signal transmitters (REED).
The cylinder control is carried out with an electrically operated 5/2-way valve.



Learning contents:

- o suction cups
- o ejectors
- o rotating cylinder
- o sensor (magnetic)
- o 5/2-way valves (Bi stable and uni stable)
- o 5/3-way valves
- o Material thickness measurement with linear potentiometer
- o discharge of defined parts
- o double-acting cylinder
- o Positioning with pneumatics
- o exhaust air flow

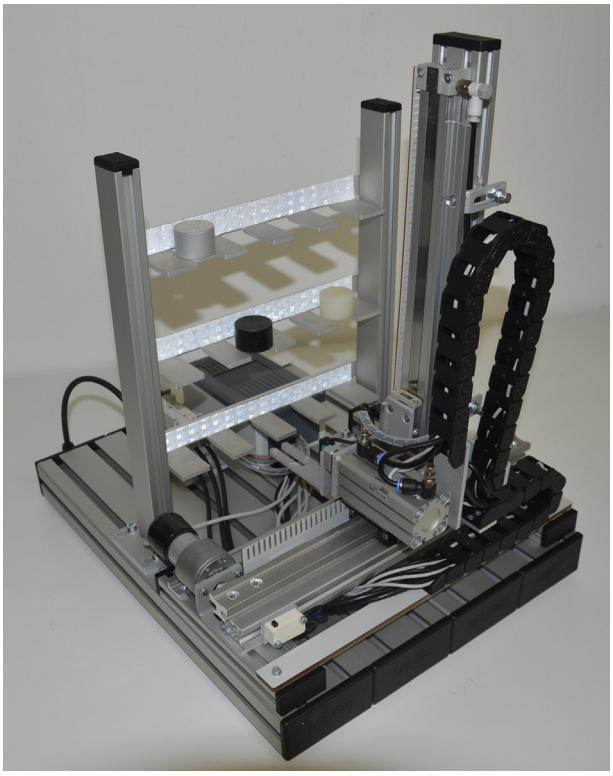
Data

Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	3 cylinder switches 3 REED switches 1 analogous way measuring
Actors:	2 x 5/2-Way valve, uni stable 2 x 5/3-Way valve, ventilated Piston rodless cylinder
PLC-Connectors:	6 DI, 6 DO, 1 AI
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1200 mm
Weight:	19 kg

Station High Ware rackhouse (HRL)

MCS - 806

An electric linear axis with belt drive and a pneumatic linear axis and a removal cylinder remove workpieces from a shelf and convey them to a transfer position. This can be right and left of the high-bay warehouse.
From these transfer positions, the workpieces can be removed and stored again for storage.
The positions of the electrical X-axis and the pneumatic Z-axis are each determined by a perforated strip with forked light barriers.
The pneumatic Y-axis is interrogated with cylinder switches.
A reflex light barrier can detect workpieces in the storage compartment.
The motor control is done with a reversing contactor circuit.
The cylinder control is carried out with electropneumatic directional control valves.



Learning contents:

- 3-axis handling
- Scanning of workpieces
- Positioning and sorting
- Electric drives
- reversing contactor
- double-acting cylinder
- 5/2 and 5/3-way valves
- cylinder switches

Data

Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	4 cylinder switches
	2 Micro switches
	2 fork light barrier´s
	1 reflection light sensor
Actors:	5/2-Way valve, uni stable
	5/3-Way valve, ventilated
	Piston rodless cylinder
	Motor contolling
PLC-Connectors:	9 DI, 5 DO
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1200 mm
Weight:	21 kg

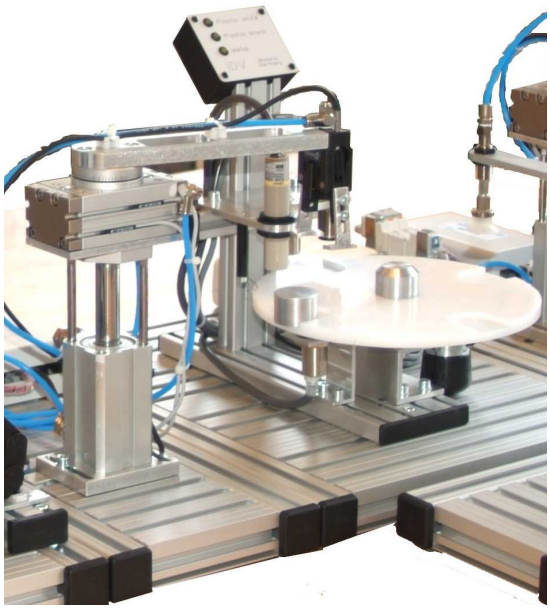
Station Taking and Identification (PPP+RST)

MCS - 807

Pneumatic handling device with the workpieces pneumatically taken, lifted and after a swiveling movement up to max. 180 °. A double-acting anti-rotation pneumatic cylinder lifts a swivel unit with pneumatic angle gripper. Detected workpieces are lifted and conveyed to the new position with the swivel unit.

The end positions of the cylinder pistons are detected by non-contact signalers. The closed gripper is detected by an inductive sensor.

After transfer of the workpieces through the PPP module, they then arrive on the rotary indexing table.
The electrically driven rotary indexing table conveys workpieces in a circle and positions them at an angle of 90 °.
After the test, the workpiece can be removed from another module.
A test unit with three sensors arranged above the rotary indexing table recognizes the workpieces as „present“, „bright“, „dark“ and „metallic“. The results can be output on the display.
The 90 ° positions are detected by an inductive sensor.
The motor control is done with a relay.



Learning contents:

- 2-axis handling
- Angular Gripper
- Sensor Technology
- valves
- Positioning of workpieces
- Electric drives
- Material determination with different sensors
- Arrangement of several modules circular

Data

Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	3 REED switches
	3 inductive sensors
	1 capacitive Sensor
	1 optical sensor
Actors:	2 x 5/2-Way valve, uni stable
	1 x 5/2-Way valve, bi stable
	Motor controlling
	Area LED`s
PLC-Connectors:	8 DI, 8 DO
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1100 mm
Weight:	17 kg

Station Roboting (DOBOT)

MCS - 808

The DOBOT Magician Advanced is the desktop all-rounder for countless applications.

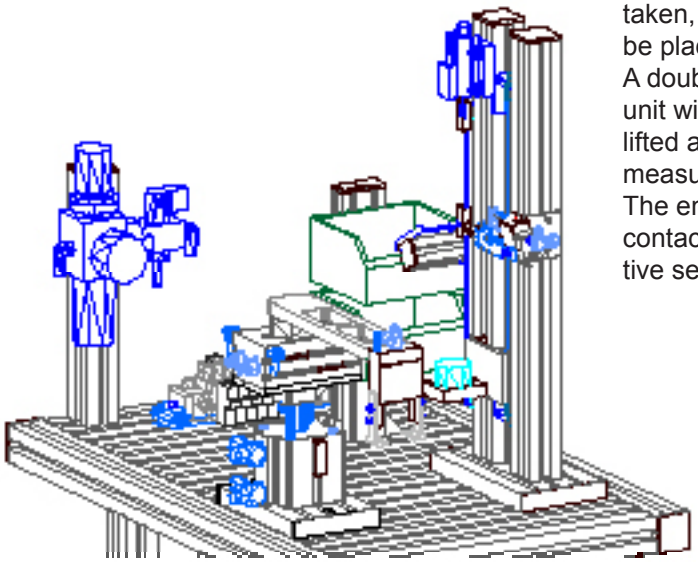
Learn or professionalize the handling of a robot arm. Invent new movement patterns and benefit from the intuitive user-friendliness. The DOBOT Magician Advanced Communication includes DOBOT Studio - the
professional and free software (for Windows and Mac) to control your
DOBOT Magician. Next to the script mode for direct programming is you
In addition, a graphical programming interface (Blocky) is available.
In this case, predefined programming modules are logically arranged using Drag‘n‘Drop.
Even easier is the teach and playback function. Here you program yours
Robotic arm intuitive and directly on the device. Hold down a button on the head of the DO-BOT Magician, move the robot arm to the desired position and let it close
programming end point.

The robot can be integrated between two other stations as a part conveyor.
He is also built like the other stations on the same ALU car.

Our special interface allows easy communication between the 24 VDC PLC signals and the 5V or 9-12V signals from the robot.

Station Measuring with Pick and Place (PPP+MA)

MCS - 810

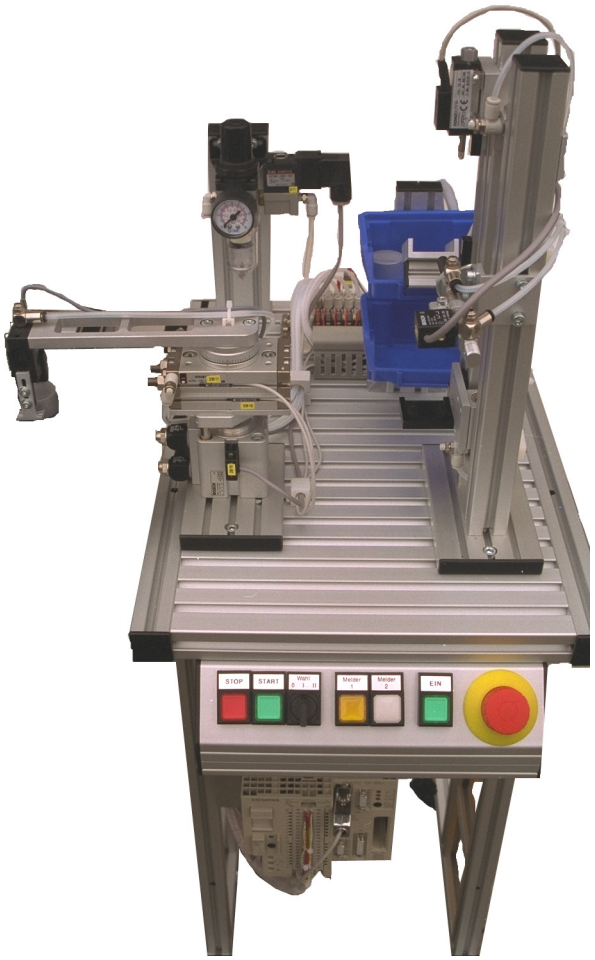


Pneumatic handling device with the workpieces pneumatically taken, lifted and after a swiveling movement up to max. 180 ° be placed again.
A double-acting anti-rotation pneumatic cylinder lifts a swivel unit with pneumatic angle gripper. Collected workpieces are lifted and conveyed with the swivel unit to the new position for measuring.
The end positions of the cylinder pistons are detected by non-contact signalers. The closed gripper is detected by an inductive sensor.

Once there, the workpieces are moved on a workpiece carrier with a lifting device against a measuring system.

An analog voltage signal in the range 0 ... 10V can be evaluated with a PLC at the analog input (material thickness measurement).
The workpiece can be transferred at an intermediate position of the lifting device via a chute of the next station or be discharged at the lower position.

The end positions of the cylinder piston are queried via non-contact signal transmitters (REED).
The cylinder control is done with an electricbetätigten 5/2-Wegeventil.



Data

Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	6 REED switches 1 cylinder switch 1 inductive sensors 1 analogous way measuring
Actors:	3 x 5/2-Way valve, uni stable 1 x 5/2-Way valve, bi stable 1 x 5/3-Way valve, ventilated Piston rodless cylinder
PLC-Connectors:	8 DI, 7 DO, 1 AI
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1100 mm
Weight:	17 kg

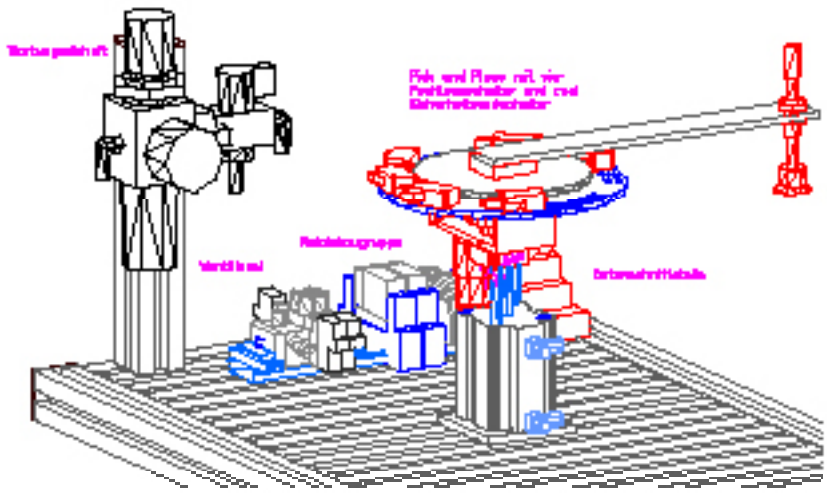
Learning contents:

- o Material thickness measurement with linear potentiometer
- o discharge of defined parts
- o sensor (magnetic)
- o double-acting cylinder
- o 5/2-way valves
- o 5/3-way valves
- o Positioning with pneumatics
- o exhaust air flow
- o 2-axis handling
- o Angular Gripper

Station Pick and Place, electrically (PPE)

MCS - 820

An electrically driven engine is lifted by a short-stroke cylinder. With a suction gripper, workpieces are picked up at the first position by another module and conveyed in a circle. At any position (ie every 10 °), these workpieces can be stored.
The 10 ° positioning is signaled by a fork light barrier.
The positions must be realized via a PLC program.
The upper end position of the cylinder piston is interrogated with a magnetic field switch.
The cylinder is controlled by an electromagnetic 5/2-way valve.
The motor drive has a slip clutch. This prevents damage due to incorrect programming.



Data

Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	1 cylinder switch
	2 micro switches
	1 fork light barrier
Actors:	2 x 5/2-Way valve, uni stable
	Motor controlling
	Cylinder
	Suction cup
PLC-Connectors:	4 DI, 4 DO
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1100 mm
Weight:	17 kg

Learning contents:

- o Electric drives
- o Applicable contactor circuit
- o Positioning of workpieces
- o double-acting cylinder
- o 5/2-way valves
- o Vacuum Technology

Station Processing Drilling and Control unit (BAB+RST)

MCS - 840

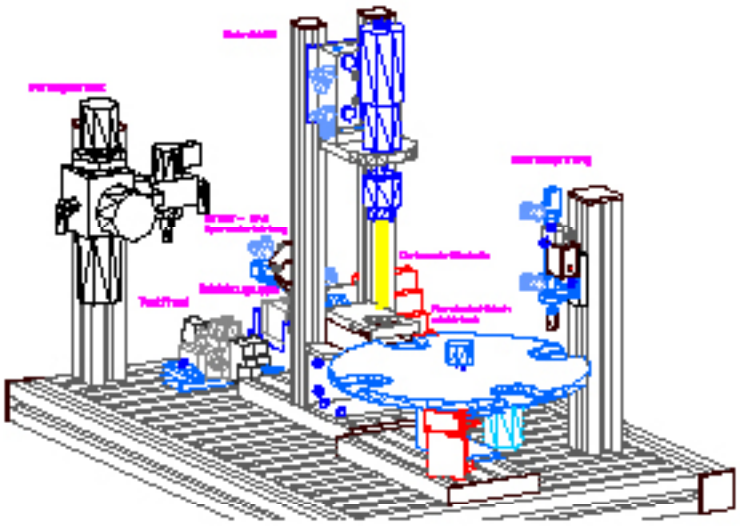
Pneumatically operated drilling device with which laid-up workpieces (coming from another module or robot) are conveyed, tensioned and drilled with an electric drilling unit.
A linear feed unit conveys laid-up workpieces under the drilling device and clamps them pneumatically.

The drilling device is lowered with a non-rotating pneumatic cylinder and the workpiece drilled.

The end positions of the cylinder pistons are queried with REED contacts.

The cylinder control is carried out with electropneumatic directional control valves.

The electrically driven rotary indexing table conveys workpieces in a circle and positions them at an angle of 90 °. The workpieces must be removed again from other units.
A test unit (pneumatic cylinder) arranged above the rotary indexing table checks the bore-hole. The 90 ° positions are detected by an inductive sensor.
The motor control is done with a relay.



Data

Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	5 cylinder switch
	1 inductive sensor
Actors:	2 x 5/2-Way valve, uni stable
	1 x 5/2-Way valve, bi stable
	Motor controlling
	Cylinder
PLC-Connectors:	6 DI, 7 DO
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1100 mm
Weight:	20 kg

Learning contents:

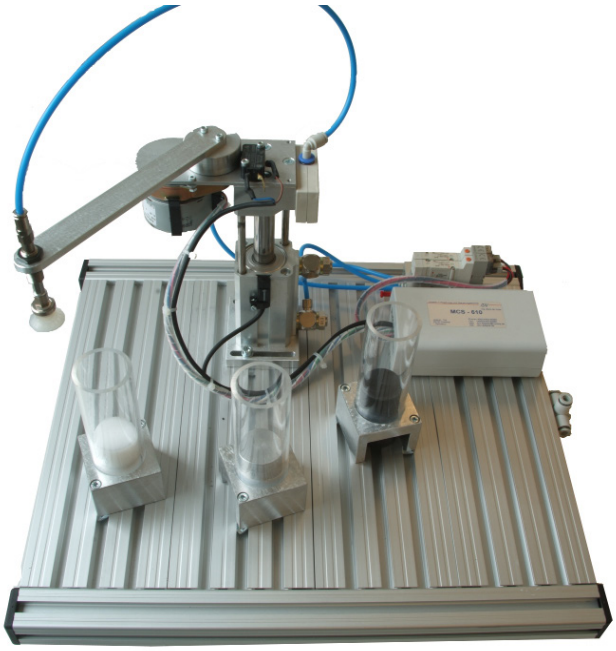
- Electric drives
- Linear Guides
- clamping of workpieces
- double-acting cylinder
- 5/2-way valves
- cylinder switches
- Positioning of workpieces
- well testing
- Arrangement of several modules circular

Station Storage (LAG)

MCS - 850

An electrically driven engine is lifted by a short-stroke cylinder. With a suction gripper, workpieces are picked up at the first position by another module and conveyed in a circle. At any position (ie every 10 °), these workpieces can be stored.
The 10 ° positioning is signaled by a fork light barrier.
The positions must be realized via a PLC program.
The upper end position of the cylinder piston is interrogated with a magnetic field switch.
The cylinder is controlled by an electromagnetic 5/2-way valve.

The motor drive has a slip clutch. This prevents damage due to incorrect programming.



Data

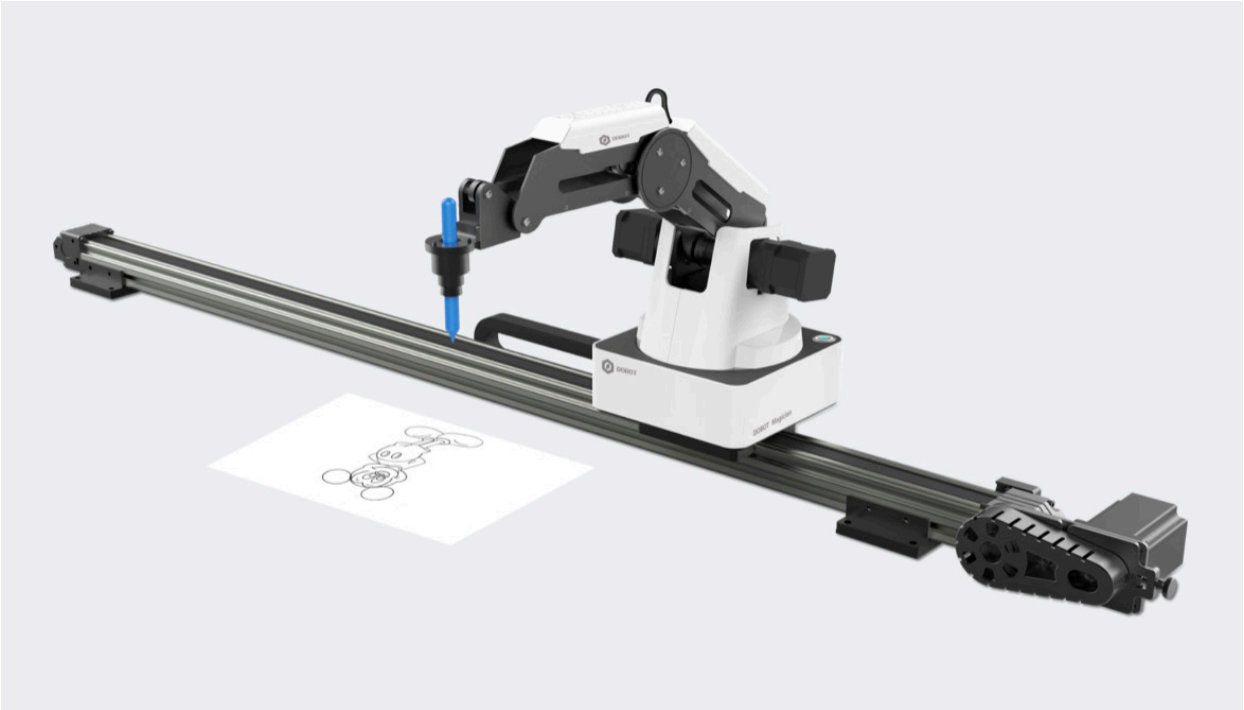
Voltage supply:	24 VDC
Pressure:	5...6 bar, unlubricated
Signal devices:	1 cylinder switch 2 micro switches 1 fork light barrier
Actors:	2 x 5/2-Way valve, uni stable Motor controlling Cylinder Suction cup
PLC-Connectors:	4 DI, 4 DO
Installation:	25-pol. D-SUB connector
Workpieces:	Cylinder 30 x 20 mm
Dimensions (WxDxH):	320 x 400 x 1100 mm
Weight:	20 kg

Learning contents:

- Electric drives
- Applicable contactor circuit
- Positioning of workpieces
- double-acting cylinder
- 5/2-way valves
- Vacuum Technology

Station Axe (LA)

MCS - 860



The linear axis in this system serves to bridge different distances (distances) from the different modules. The maximum stroke is 1 m.

Data

Load capacity	5 kg
Stroke	1000 mm
Repeat accuracy	+ - 0.01 mm
Absolute accuracy	+ - 0.25 mm
Max. Speed	150 mm / sec
Max. Acceleration	150mm / sec²

delivery

- Linear axis
- Cable set
- drag chain- Adapterplatten

Learning contents:

- o Electric drives
- o Applicable contactor circuit
- o Positioning of workpieces

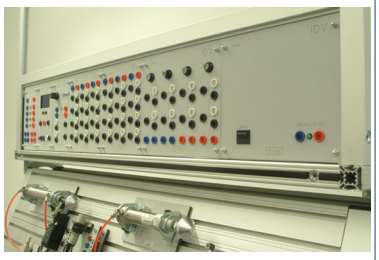
IDV
Ingenieurbüro de Vries

Other catalogues:

Didaktik in Regelungs- und Steuerungstechnik IDV Ingenieurbüro de Vries

Trainings system

Pneumatic
Elekcropneumatic



Didaktik in Regelungs- und Steuerungstechnik IDV Ingenieurbüro de Vries

Trainings system

Hydraulic

Didaktik in Regelungs- und Steuerungstechnik IDV Ingenieurbüro de Vries

Trainings system

PLC
Function simulator´s
Bus technology

Didaktik in Regelungs- und Steuerungstechnik IDV Ingenieurbüro de Vries

Roboting
Trainings system

incl. 3D-Printing

Scara-Robot

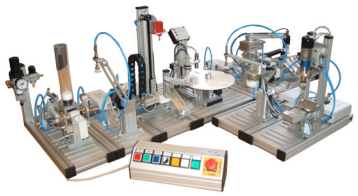
Magician-
Robot

Robot-Dobot

Didaktik in Regelungs- und Steuerungstechnik IDV Ingenieurbüro de Vries

Mechatronic-
Compact

Trainings-System



MCS

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Seminar´s
Control technology

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