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## UniTrain®

UniTrain is a multimedia e-learning system with integrated, mobile electronics lab for general education and advanced training in electrical engineering and electronics.

## UniTrain courses



## UniTrain courses

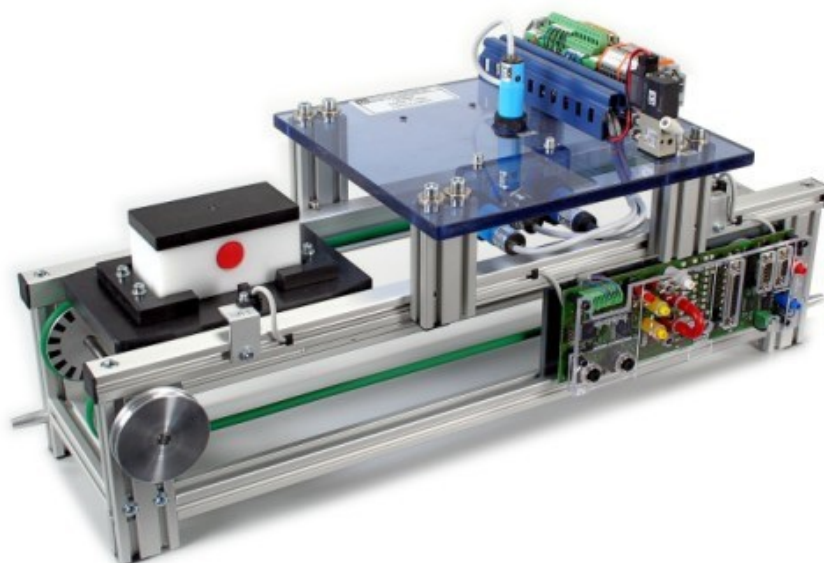
## UniTrain mechatronic courses



### **UniTrain mechatronic courses**

UniTrain multimedia courses on the topic of mechatronics provide the knowledge and skills required to understand, control, operate and maintain modern, automated mechatronics installations. With the aid of animations and numerous experiments, the various individual sub-systems are introduced, any necessary instrumentation or pneumatic cylinders are set up and adjusted and the active processes are explained. Individual mechatronic components and sub-systems are set up with the aid of detailed step-by-step instructions and automated sequences are programmed to control the equipment by means of a programmable logic controller. This should make moving up to an industrial PLC system a simple task.

## IMS 6 Testing



### IMS 6 Testing

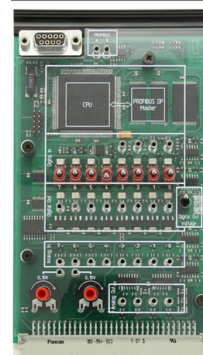
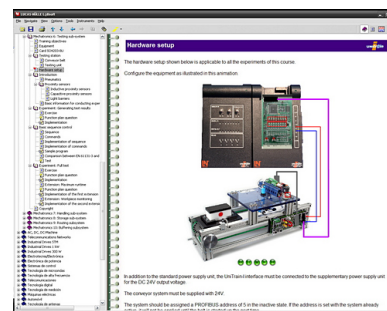
A carrier with a fully assembled workpiece is located on the conveyor belt. A stopper positions the piece alongside the sensors. The sensors detect the colour of the piece, its material and optionally its height. Test data will be saved for subsequent processes. After each successfully completed test the carrier is conveyed to the end of the belt to be passed on to the next sub-system.

## List of articles:

Pos.	Product name	Bestell-Nr.	Anz.
1	<b>Course - Mechatronics 6: Testing sub-system</b>	SO4204-8Q	1

### Includes:

- 1 Experiment card featuring CPU with PLC functionality and PROFIBUS-DP master interface, 8 digital inputs (4 using 2-mm sockets) with simulation switches and status LEDs, 8 digital outputs with status LEDs using 2-mm sockets, 8 analog inputs with 10-bit resolution, 4 analog outputs, potentiometer for simulating analog inputs, selectable level for digital signals 5/24V DC, 0- 10V for analog signals, port for external PROFIBUS equipment
- Profibus cable 1,5m
- CD-ROM with Labsoft browser, programming and course software



### Components additionally required to complete the course:

#### IMS6 Testing

#### Course contents:

- Assembly, configuration and testing of pneumatic cylinders and valves
- Optical test sensors
- Inductive test sensors
- Capacitive test sensors
- Magnetic test sensors
- Definition of a processing sequence for simple testing of a workpiece
- Programming a flasher component and a stop cylinder
- Programming a testing sequence in manual and automatic modes
- Course duration: 4 h approx.

## 2 Testing station

LM9684

1

A testing station that checks workpieces on a conveyor belt for material and colour.

- 4 Binary testing sensors (2 x optical, inductive, capacitive)
- Magnetic end-limit sensor
- Two-way stop cylinder
- 4/2-way valve
- PLC interface: 25-pin SUB-D connector
- PLC requirements: 1 x digital output, 5 x digital inputs



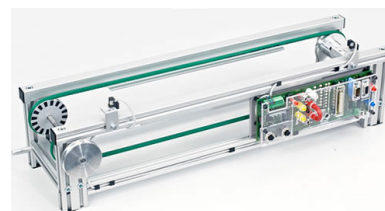
To assure functionality and a long working life for pneumatic components and controls, a maintenance unit is required, consisting of: filters, pressure control valve with pressure gauge and lubrication.

## 3 Double conveyor belt segment, 24V motor

LM9606

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Basic mechatronics module driven by a variable speed 24-V geared motor and complete with end-limit sensors and integrated PROFIBUS DP slave. Designed for basic experiments on a conveyor system or for incorporation into a complex mechatronics system for controlling the flow of materials. The conveyor belt conveys work pieces on carriers and can be used to link individual sub-systems. It is designed for connection to a PLC control system. It can be combined with other conveyor belts, 'curve' units or transfer junctions. IMS stations can be connected directly to the belt and jointly controlled via PROFIBUS.



- Length = 600 mm/23,6", width = 160 mm/6,3", belt width = 120 mm/4,7"
- Geared motor, 24 V DC
- Pulse width modulation system for controlling belt at various speeds
- Continuous speed adjustment via potentiometer or analogue input, 0-10 V
- Manual switches for movement to left or right
- 2 inductive end-limit sensors
- 2 x M12 interfaces for additional actuators/sensors
- Sockets for emergency shut-off circuit (disconnection of all voltage to output modules)
- External power supply via 4-mm safety sockets or co-axial power connector
- 9-pin SUB-D connector for contactors, LOGO! or PLC

- Incremental encoder disc for detecting position and speed via optical sensors
- Visualisation as interactive 3D model in IMS-virtual database
- Control requirements: 4 x digital inputs, 3 x digital outputs

PROFIBUS DP slave module:

- Address range: 16 digital input/outputs
- PROFIBUS DP connector: 9-pin DSUB socket
- Rotary switch for setting address
- Transmission rates of up to 6 Mbits/s
- GSD file for use with control software (e.g.: STEP7)
- 25-pin DSUB socket for connecting IMS station
- Output current: 500 mA (total current: 1 A)
- Variable speed control of conveyor belt via PROFIBUS

#### 4 Workpiece transport pallet

LM9620

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Pallets for carrying and transporting workpieces on conveyor belts. The pallet has a 4-bit identification code.

- Length = 180mm/7,1", width = 119mm/4,7", height = 15mm/0,6"
- Position sensor
- 4-bit identification code



#### 5 Workpiece, top section, white

LM9621

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- Material: plastic
- Colour: white
- Magnetic clip for attachment to bottom section
- Spring-loaded bearing for attaching bolt
- Dimensions (L x W x H): (100 x 50 x 40) mm / 3,9" x 1,97" x 1,57"



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**6 Workpiece, top section, black**

LM9622

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Material: plastic

- Colour: black
- Magnetic clip for attachment to bottom section
- Spring-loaded bearing for attaching bolt
- Dimensions (L x W x H): (100 x 50 x 40) mm / 3,9" x 1,97" x 1,57"




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**7 Workpiece, bottom section, white**

LM9623

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Material: plastic

- Colour: white
- Magnetic clip for attachment to top section
- Dimensions (L x W x H): (100 x 50 x 40) mm / 3,9" x 1,97" x 1,57"




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**8 Workpiece, bottom section, black**

LM9624

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- Material: plastic
- Colour: black
- Magnetic clip for attachment to top section
- Dimensions (L x W x H): (100 x 50 x 40) mm / 3,9" x 1,97" x 1,57"




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**9 Bolt workpiece, plastic**

LM9625

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- Material: plastic
- Diameter: 20 mm / 0,79"
- Length 50 mm / 1,97"





10 **Bolt workpiece, metal**

LM9626

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- Material: metal
- Diameter: 20 mm / 0,79"
- Length 50 mm / 1,97"



**Accessories:**

Pos.	Product name	Bestell-Nr.	Anz.
11	<b>25-pin serial interface cable, Sub-D plug/socket</b>	LM9061	1

25 pin Sub-D connection cable

- Length: 2m
- Connection: 25-pin plug / 25-pin socket
- Pin assignment: 1:1



**Additionally required:**

Pos.	Product name	Bestell-Nr.	Anz.
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12 **Compressor, low-noise**

SE2902-9L

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Extremely quiet compressed air system with compressor motor, thermo switch and automatic pressure switch. Tanks made of special steel with security valve and non-return valve, master pressure gauge, condensation drain, stop valve and maintenance unit

- Motor output: 0.34 kW
- Suction capacity: 50 l/min
- Power consumption at 8 bars: 2.9 A
- Pressure: 8 bars
- Tank capacity: 15 l.
- Noise level: 40 dB(A)/1m
- Operating voltage: 230V AC
- incl. tube and connection set
- Dimensions: 500x410x410 mm (HxWxL)
- Weight: 19 kg



13 **Tubing and accessory set for mechatronics systems**

LM9670

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Universal tubing and accessory set with the required components and adapters for connecting a compressor to mechatronic systems.

- 1 x Compressor connector with plug-in sleeve 8 mm
- 1 x Plug adapter 6 mm/8 mm
- 1 x Plug adapter 4 mm/6 mm
- 2 x Angle connectors 4 mm
- 5 x T-connectors 4 mm
- 5 x T-connectors 6 mm
- 5 x T-connectors with 6 mm/4 mm adapters
- 20 m polyurethane tubing, 4mm
- 10 m polyurethane tubing, 6mm
- 10 Stoppers for plug connectors 4 mm
- 1 x 3/2 directional control valve, manual, 5 mm

