

## Table of Contents

Table of Contents	1
UniTrain®	2
UniTrain courses	2
UniTrain mechatronic courses	3
IMS 10 Buffering	4

## 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

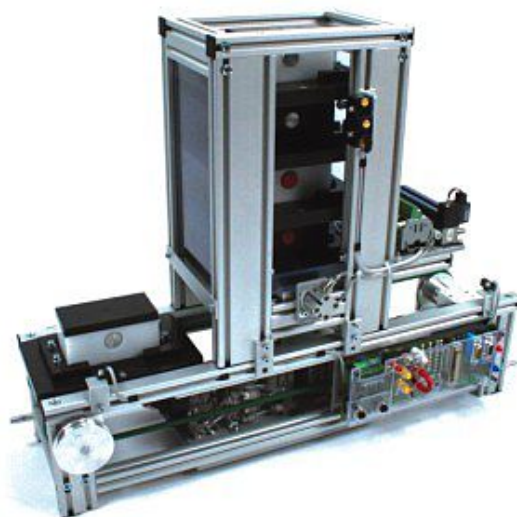
## UniTrain mechatronic courses



### 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 10 Buffering



### **IMS 10 Buffering**

The conveyor belt is equipped with two lifting units for buffering or queuing workpieces in complex mechatronics systems. The buffer controls the flow of materials. The carrier is lifted from the conveyor belt by a lifting unit and deposited in a magazine, while the belt continues moving with other pieces. Up to four laden or 10 unladen workpiece carriers can be held in store. The lifting unit can set the workpiece back onto the conveyor when necessary.

List of articles:

Pos.	Product name	Bestell-Nr.	Anz.
1	<b>Course - Mechatronics 10: Buffering sub-system</b>	SO4204-8X	1

Includes:

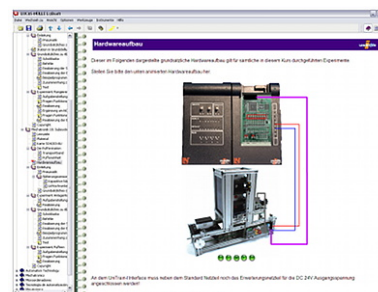
- 1 Experiment card featuring CPU with PLC functionality and PROFIBUS-DP master interface, 8 digital inputs (4 using 2 mm sockets) with simulation switches and status LEDs, 8 digital outputs with status LEDs using 2mm sockets, 8 analog inputs with 10 bit resolution, 4 analog outputs, potentiometer for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

**Additionally required components to complete the course:**

IMS 10 Buffering

Course contents:

- Assembly, calibration and testing of pneumatic cylinders and valves
- Definition of processing sequence for a buffering station
- Programming a buffering sequence in manual and automatic modes
- Programming a sequence of steps
- Course duration: 4 h approx.

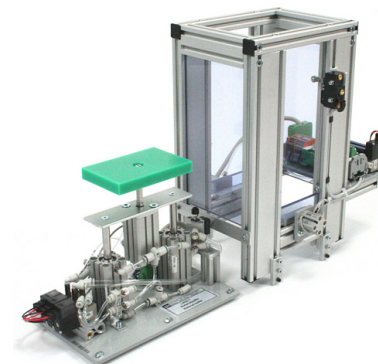


## 2 Material buffering station

LM9687

1

Station for buffering workpiece carriers within a complex mechatronics system and for controlling material flow. When integrated into a conveyor belt network, up to four loaded or ten unloaded pallets can be removed and put into a temporary holding section until they are to be fed back into the process.



- Magazine for up to four loaded or ten unloaded pallets
- Microswitch for level monitoring
- Stop cylinder, double-action
- Telescopic lifting system, consisting of two parallel, double-action lifting cylinders expanded by another twist-proof double-action lifting cylinder
- Two single-action holding cylinders operated in parallel
- 6 x limit sensors
- 4 x choke valves
- 1 x 3/2-way valve
- 3 x 4/2-way valves
- PLC interface with SUB-D 25-pin plug
- PLC requirements: 6 x digital outputs, 4 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

1

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

2

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



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5 **Workpiece, top section, white**

LM9621

1

- 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

1

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

1

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"





**8 Workpiece, bottom section, black**

LM9624

1

- 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"



**Accessories:**

Pos.	Product name	Bestell-Nr.	Anz.
9	<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.
10	<b>Compressor, low-noise</b>	SE2902-9L	1

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



11	<b>Tubing and accessory set for mechatronics systems</b>	LM9670	1
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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

