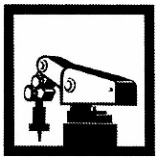
Automation Engineering / Mechatronic Systems

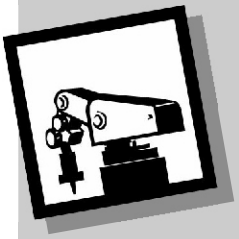
2130	SPS Board S7-300
21XX	Insert modules
2137	Touch Panel SIMATIC TP 177 B
2150	Universal Component Board I
2151	Universal Component Board II
2152	Universal Component Board III
2153	Universal Component Board IV
21XX	Insert modules
2156	Multifunction Display Board
3815	Interface with Simulation Software
3840	Sensorics Board
3911	Converter Board, 5 V / 24 V
5264	Frequency Converter
5265	AC Motor Board
99XXX	**Series** Mechatronic



hps SystemTechnik
Lehr- + Lernmittel GmbH
Altdorfer Strasse 16
88276 Berg (Germany)

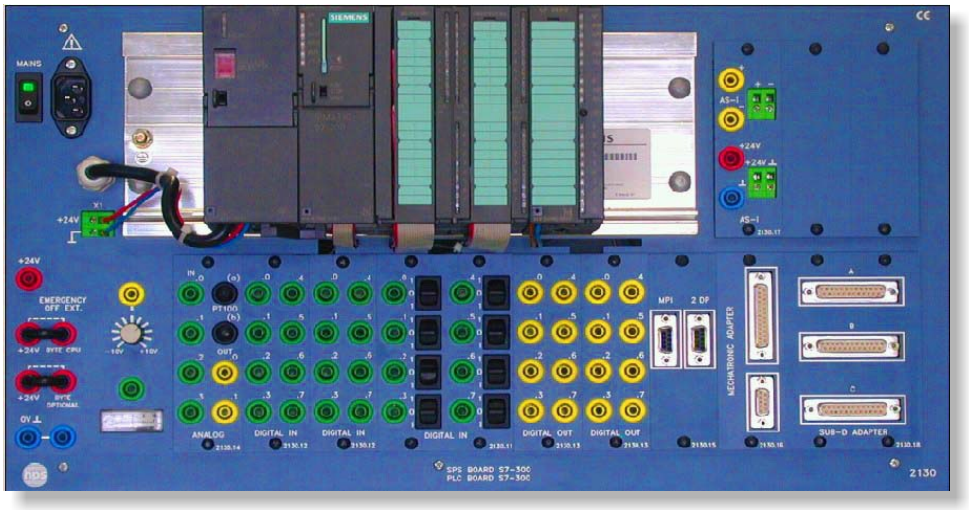
Tel.: + 49 7 51 / 5 60 75 80
Fax: + 49 7 51 / 5 60 75 77
Web: www.hps-systemtechnik.com
E-Mail: export@hps-systemtechnik.com

Automation Technology / PLC



SPS BOARD S7-300

Type 2130



Example of the configuration Type 2130.0000

Built in components:

Power supply 24 V DC / 2 A Alternatively: Power supply 24 V DC / 5 A

CPU 313C Alternatively: CPU 314C-2DP

Micro Memory Card

AS-i module CP 343-2

AS-i power supply (built in)

- **Programming and commissioning of a PLC (Siemens S7-300)**
- **Programming according to international standard IEC 1131-3**
- **Modular assembling; to your own requirement**
- **Expandable with additional input and output modules**
- **For direct connection to mechatronic applications**
- **For use with control and process simulations i.e. PLC INTERFACE BOARD (Type 3815)**

Mechanical Data

- **Material of the front panel:** Laminate (5 mm), matt blue
- **Rear front:** Grey plastic cover (angled)
- **Dimension:** 532 x 297 x 210 mm (w x h x d)
- **Weight:** approx. 4.1 kg

hps SystemTechnik
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88276 Berg (Germany)

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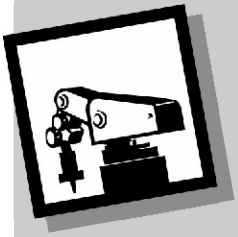
Fax: + 49 7 51 / 5 60 75 77
Web: www.hps-systemtechnik.com
E-Mail: export@hps-systemtechnik.com



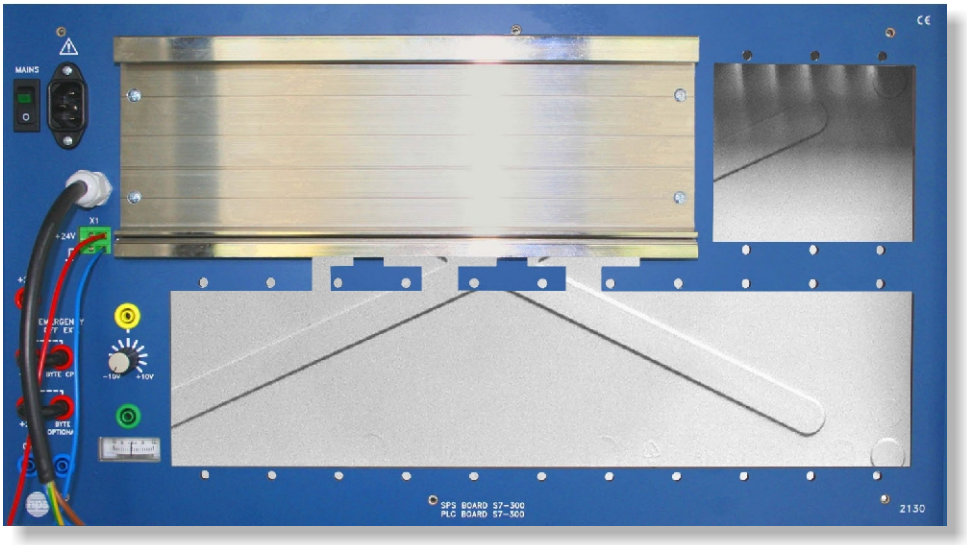
SPS BOARD S7-300

Type 2130

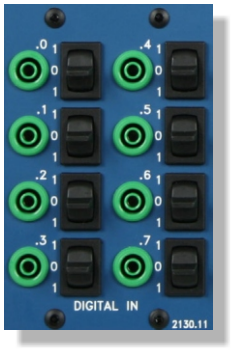
Automation Technology / PLC

Overview of the currently available insert modules, suitable for the PLC BOARD S7-300

Basic panel for the modular set-up of a S7/300C training system with a 320-mm-hat rail. Measuring instrument (centre zero point) and potentiometer –10 V to +10 V DC for analog processing as well as EMERGENCY-OFF. With built in main jack and main switch. It is possible to mount 14 insert modules (one module width).



SPS BOARD S7-300 (Type 2130)



DIGITAL IN (with switches) (Type 2130.11)

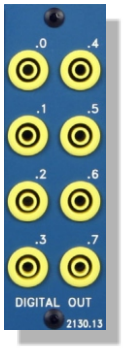
Insert module (double width)

8 digital inputs via 4 mm safety jacks or stimulation with 8 pushbutton/lock-in switches

DIGITAL IN (Type 2130.12)

Insert module (one width)

8 digital inputs via 4 mm safety jacks



DIGITAL OUT (Type 2130.13)

Insert module (one width)

8 digital outputs via 4 mm safety jacks

ANALOG (Type 2130.14)

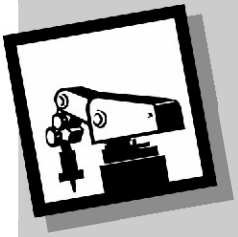
Insert module (one width)

4 analog inputs
2 analog outputs
1 PT100 input via 4 mm safety jacks

Adapter MPI and 2 DP (Type 2130.15)

Insert module (one width)

1 MPI connection
1 Profibus connection
2 DP (only to be usable with a S7/314C-2 DP)



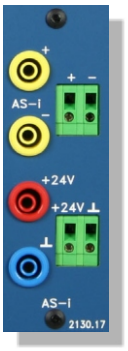
SPS BOARD S7-300

Type 2130

MECHATRONIC ADAPTER (Type 2130.16)

Insert module (one width)

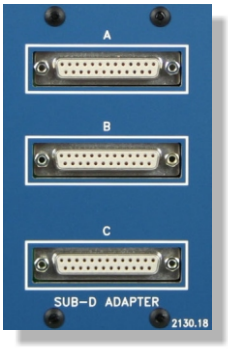
9-pin and 25-pin SUB-D adapter to connect mechatronic systems



Adapter AS-i (Type 2130.17)

Insert module (one width)

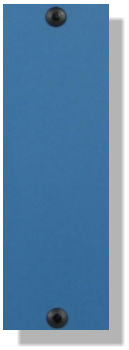
For connecting the CP 343-2 with an AS-i bus (only in combination with communicating processor and AS-i power supply)



SUB-D ADAPTER (Type 2130.18)

Insert module (double width)

3 SUB-D jacks, 25-pin, for all inputs and outputs of an S7/313C or an S7/314C-2DP



Blank panel (Type 2130.19)

Cover for one free expansion square

WORD INPUT (Type 2130.23)

Insert module (one width)

Hexadecimal coding switch, 4fold

The use of a additional I/O card is recommendable.

WORD DISPLAY (Type 2130.24)

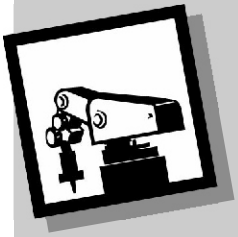
Insert module (double width)

Hexadecimal LC display, 4fold

The use of a additional I/O card is recommendable.

Blank panel (Type 2130.25)

Cover for two free expansion squares (double width)



SPS BOARD S7-300

Type 2130

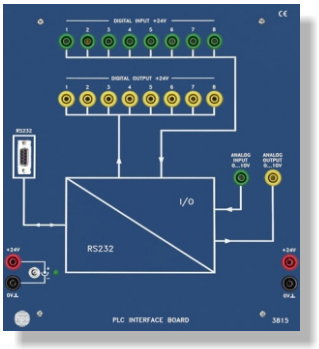
Automation Technology / PLC

Some applications of the PLC BOARDs in combination with other hps trainings systems

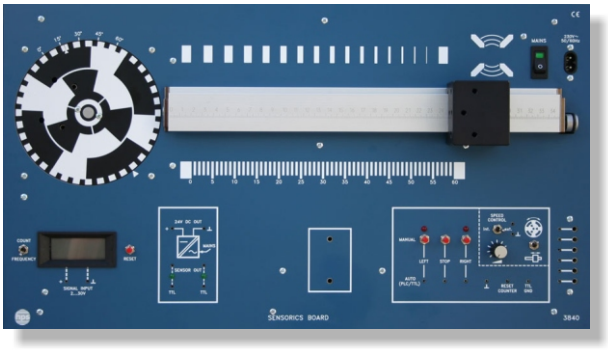
The PLC BOARD S7-300 (Type 2130) controls a simulation of different applications with the PLC INTERFACE BOARD (Type 3815).

Example:

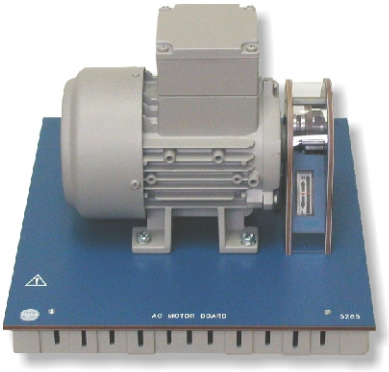
- simple motor control
- sorting system

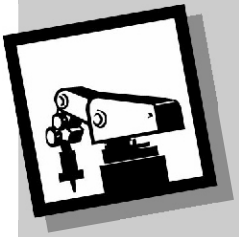


The PLC BOARD S7-300 (Type 2130) controls the linear movement of the SENSORICS BOARD (Type 3840) und analysis data of the sensors.



The PLC BOARD S7-300 (Type 2130) controls the FREQUENCY CONVERTER (Type 5264) with connected AC MOTOR (Type 5265).

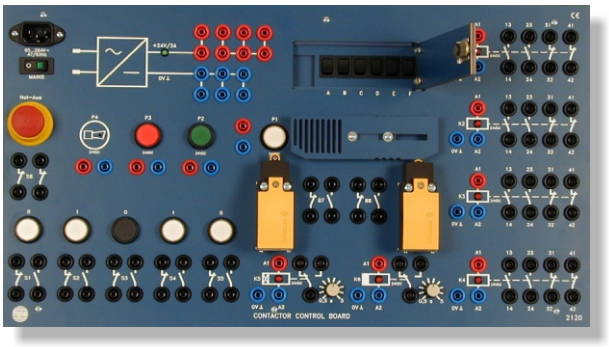




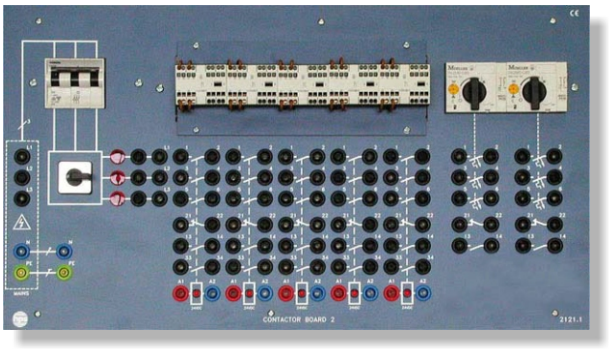
SPS BOARD S7-300

Type 2130

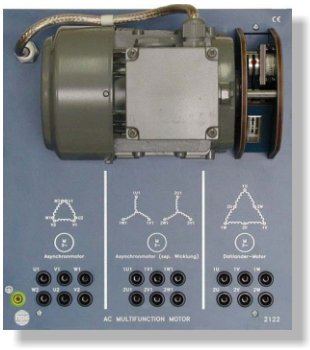
Access to the contactor control engineering with the CONTACTOR CONTROL BOARD (Type 2120), the special contactors enable the direct control with the PLC BOARD S7-300 (Type 2130).



The CONTACTOR BOARD II (Type 2121.1) and it's special 24 V DC special contactors is ideally suitable to be controlled with a PLC BOARD S7-300 (Type 2130).

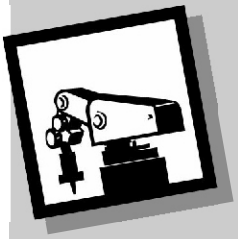


The AC MULTIFUNCTION MOTOR (Type 2122) could be used in three different operating modes, as an asynchronous motor, an asynchronous motor with separate windings for two speeds and a Dahlander motor.



Subject to technical modifications.

Automation Technology / PLC



TOUCH PANEL SIMATIC TP 177B

Type 2137

TOUCH PANEL SIMATIC TP177B (Type 2137)

- **Easy projecting with tools for projecting with operat controls and graphics.**
- **The complete software package and the connecti leads are delivered for im mediate starting/com-mission of the Touch Pan**
- **All interfaces and the slot for the MMC memory card have access from outside.**
- **The Touch Panel is used, where machines and equip-ments are operated and observed/monitored. The fields of applications are production/assembly automation, process automation und building automation.**

Mechanical Data

- **Material of the front panel:** Laminate (5 mm), matt blue
- **Rear front:** Grey plastic cover (angled)
- **Dimension:** 266 x 297 x 95 mm (w x h x d)
- **Weight:** approx. 1.5 kg

Scope of Delivery

- TOUCH PANEL BOARD with built-in TP177B PN/DB
- 1x S7 MPI cable 5 m
- 1x 2 m ETHERNET TP XP CORD RJ45/RJ45, CAT 6 cross over TP cable
- 1x WinCC flexible 2005 Advanced
- 1x WinCC flexible / Sm@rtAccess for SIMATIC Panel
- 1x WinCC flexible / Sm@rtService for SIMATIC Panel
- 1x bonus Software Update Service (SUS) (1 year)
- 1x MC-documentation on CD

Technical Data

Operating Voltage:	24 V DC; approx. 0.3 A
Built-in Touch-Panel:	Siemens TP177B PN/DB 6AV6642-0BA01

Specifications of the panel:
- Operating system: 2000 PRO, XP PRO
- High Performance 200 MHz
- Program memory 2 MB
- Alarm buffer Memory characteristics are non-volatile without battery
- Display: 5.7 inch, 320 x 240 / 256 colours

Interfaces of the TP 177B:
- 1x RS 422
- 1x RS 485
- 1x USB
- 1x MMC-Slot
- 1x Ethernet
- (PROFINET IO capable)

Subject to technical modification.

hps SystemTechnik
Lehr- + Lernmittel GmbH
Altdorfer Strasse 16
88276 Berg (Germany)
Tel.: + 49 7 51 / 5 60 75 80
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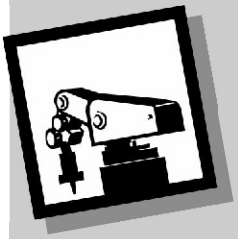
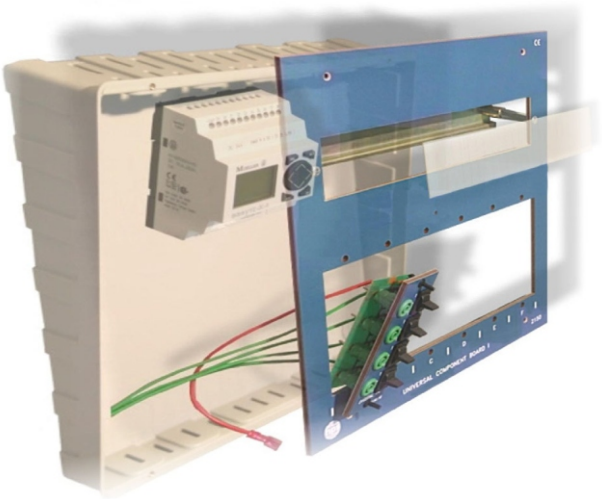
Web: www.hps-systemtechnik.com
E-Mail: export@hps-systemtechnik.com

Automation Technology



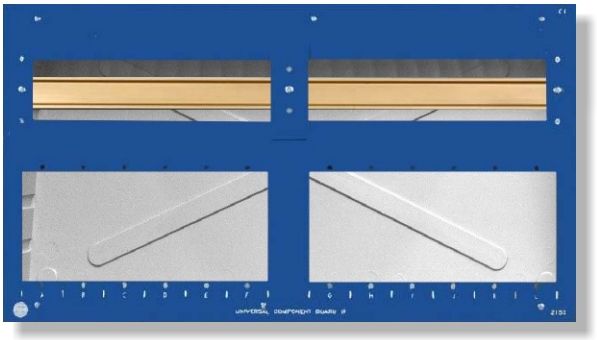
UNIVERSAL COMPONENT BOARD

Types
2150, -51, -52, -53



- **UNIVERSAL COMPONENT BOARD for the built-in of industrial components on a top hat rail**
- **Industrial components and existing trainings systems are placed into operation via 4 mm safety jacks.**
- **huge variety of insert modules**
- **low cost implementation of own ideas**
- **Possibility of accomplishment of project works**

UNIVERSAL COMPONENT BOARD (Type 2150)



UNIVERSAL COMPONENT BOARD (Type 2152)

the top hat rail is mounted inside, up to 6/12 hps- insert modules could be assembled

UNIVERSAL COMPONENT BOARD (Type 2151)

UNIVERSAL COMPONENT BOARD (Type 2153)

the top hat rail is mounted on the front, up to 6/12 hps- insert modules could be assembled

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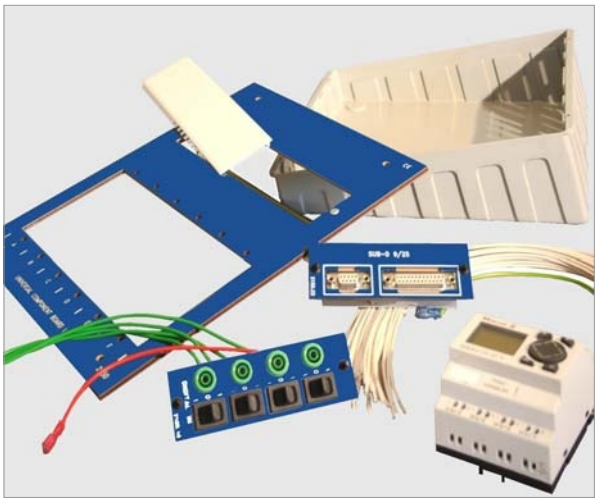
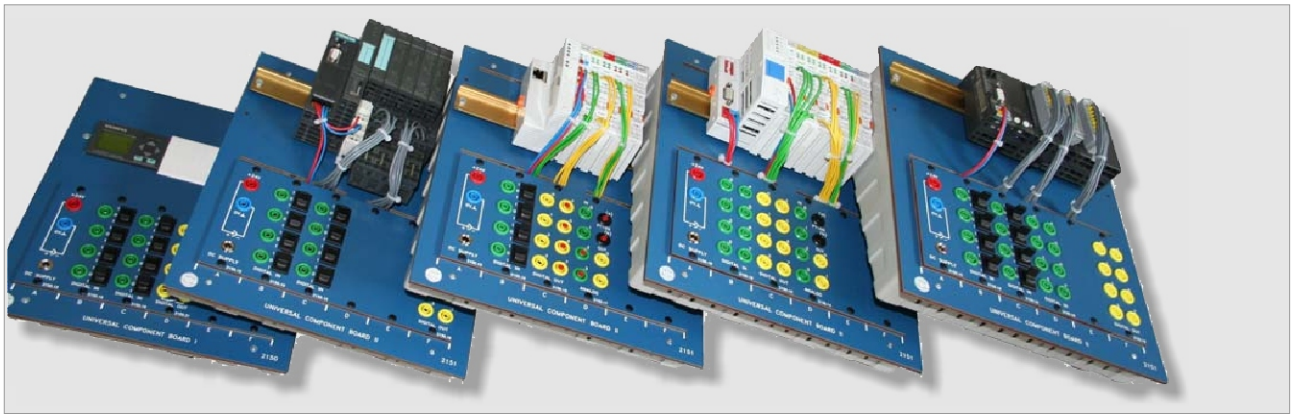
UNIVERSAL COMPONENT BOARD

Types
2150, -51, -52, -53

Automation Technology



UNIVERSAL COMPONENT BOARD I (Type 2150)



Examples for UNIVERSAL COMPONENT BOARD with varying components and insert modules

Mechanical Data

The top hat rail, that is mounted on the front, can be assembled with two varying heights. Therefore the industrial components could be mounted, which aren't eccentric placed on the top hat rail.

- **Material of the front panel:** Laminate (5 mm), matt blue
- **Rear front:** Grey plastic cover (angled)
- **Dimension:**

  UNIVERSAL COMPONENT BOARD I (Type 2150): 266 x 297 x 95 mm (w x h x d)

  UNIVERSAL COMPONENT BOARD II (Type 2151): 266 x 297 x 95 mm (w x h x d)

  UNIVERSAL COMPONENT BOARD III (Type 2152): 532 x 297 x 95 mm (w x h x d)

  UNIVERSAL COMPONENT BOARD IV (Type 2153): 532 x 297 x 95 mm (w x h x d)
- **Weight:**

  UNIVERSAL COMPONENT BOARD I: approx. 1.5 kg

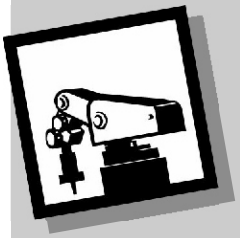
  UNIVERSAL COMPONENT BOARD II: approx. 1.5 kg

  UNIVERSAL COMPONENT BOARD III: approx. 2.0 kg

  UNIVERSAL COMPONENT BOARD IV: approx. 2.0 kg

Scope of delivery:

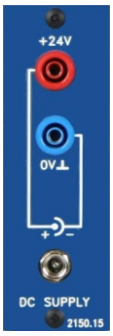
UNIVERSAL COMPONENT BOARD with mounted top hat rail and grey plastic cover. For the UNIVERSAL COMPONENT BOARDs (Type 2150 and 2152) covers are provided. With these covers the free space in the front of the board is closed after the assembly of the industrial components.



UNIVERSAL COMPONENT BOARD

Insert Modules

Overview of the currently available insert modules, suitable for the UNIVERSAL COMPONENT BOARDs



DC SUPPLY (Type 2150.15)

Insert module (one width)

Connection of 24 V DC with 4 mm safety jacks or hollow plugs for the stabilised power supply unit (Type 3816) 24 V DC / 1 A

DIGITAL IN (Type 2150.16)

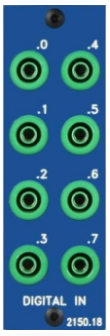
Insert module (one width)

4 digital inputs via 4 mm safety jacks and additional stimulation via 4 pushbutton/lock-in switches

ANALOG (Type 2150.17)

Insert module (one width)

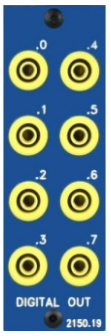
4 analog inputs, 2 analog outputs and 1 PT100 input via 4 mm safety jacks



DIGITAL IN (Type 2150.18)

Insert module (one width)

8 digital inputs via 4 mm safety jacks



DIGITAL OUT (Type 2150.19)

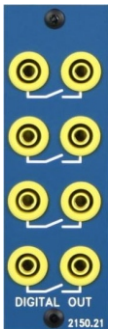
Insert module (one width)

8 digital outputs via 4 mm safety jacks

MAINS (Type 2150.20)

Insert module (one width)

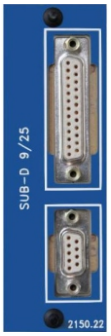
single-phase mains connection, with 2-pole mains switch, additional mains fuse and 3-core mains cable



DIGITAL OUT (Type 2150.21)

Insert module (one width)

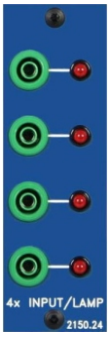
4 potential-free NOCs via 4 mm safety jacks



MECHATRONIC ADAPTER (Type 2150.22)

Insert module (one width)

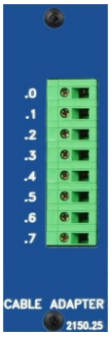
9-pin and 25-pin SUB-D adapter to connect mechatronic systems to a PLC



INPUT/LAMP (Type 2150.24)

Insert module (one width)

4 lamps, 24 V / 4 connections via 4 mm safety jacks



CABLE ADAPTER (Type 2150.25)

Insert module (one width)

for connection of 8 usual installation lines

DIGITAL IN AC (Type 2150.27)

Insert module (one width)

4 digital inputs via 4 mm safety jacks and additional stimulation via 4 pushbutton/lock-in switches 230 V AC

MAINS (Type 2150.60)

Insert module
(one width)

For 230 V AC mains connection via 4 mm safety sockets, with phase pilot lamp

Blank panel (Type 2130.19)

Cover for one free expansion square
(one width)

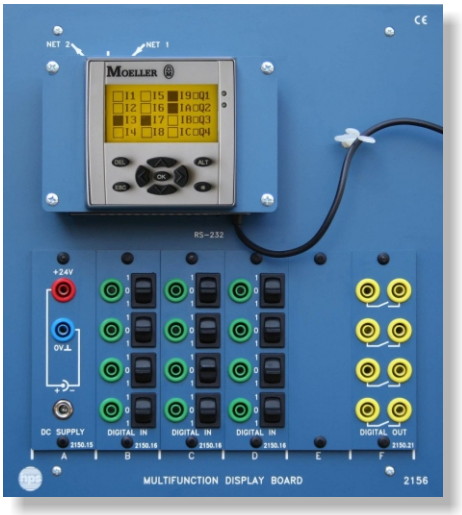
Blank panel (Type 2130.25)

Cover for two free expansion squares
(double width)

Scope of delivery for the insert modules:

Completely assembled insert modules with dowels to be built in the UNIVERSAL COMPONENT BOARD. Strands for connection of the insert module to the industrial components are provided.

Subject to technical modifications.



Front view of the
MULTIFUNCTION DISPLAY BOARD

Side view of the
MULTIFUNCTION DISPLAY BOARD

MULTIFUNCTION DISPLAY BOARD

Type 2156

- **The MULTIFUNCTION DISPLAY BOARD for fast access, provides additionally of the EASY 800-functions the visualization of texts, graphics and pictures.**
- **Provides the possibility to link up/networking with other easy-NET units.**
- **AI Inputs and Outputs are connected with 4 mm safety plugs. All 12 inputs are additionally equipped with switch for signals.**
- **Power supply with 4-mm- plugs or power supply unit type 3816 (optional).**
- **Easy to operate programming, software included.**

Mechanical Data

- **Material of the front panel:** Laminate (5 mm), matt blue
- **Rear front:** Grey plastic cover (angled)
- **Dimension:** 266 x 297 x 95 mm (w x h x d)
- **Weight:** approx. 2.0 kg

Scope of Delivery

- MULTIFUNCTION DISPLAY BOARD with built-in MFD-80 B, MFD-CP8-ME, MFD-R16
- Connecting lead easy 800-PC-CAB
- Software easy SOFT-PR (from Win 98) for programming
- inclusive documentation, manual for MFD-Titan and all control relays easy

Accessories Recommended

- Power supply unit stabilised 24 V DC / 1 A (Type 3816)

Technical Data

Operating voltage:
24 V DC; approx. 0.3 A

Built-in display with control unit:
Moeller MFD-Titan MFD-80B

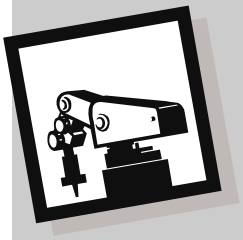
Specification of hardware:
- Graphic display 132 x 64 pixel
- Input keys integrated
- Text display
- Status LED's red and green
- 4 Cursor buttons
- 4 Button function keys
- 1 Mode button
- Design with easy-NET
- Output: 4 relay
- Inputs:12 digital

Interfaces:
- RS 232 for programming
- easy-NET bus connectors

Subject to technical modification.

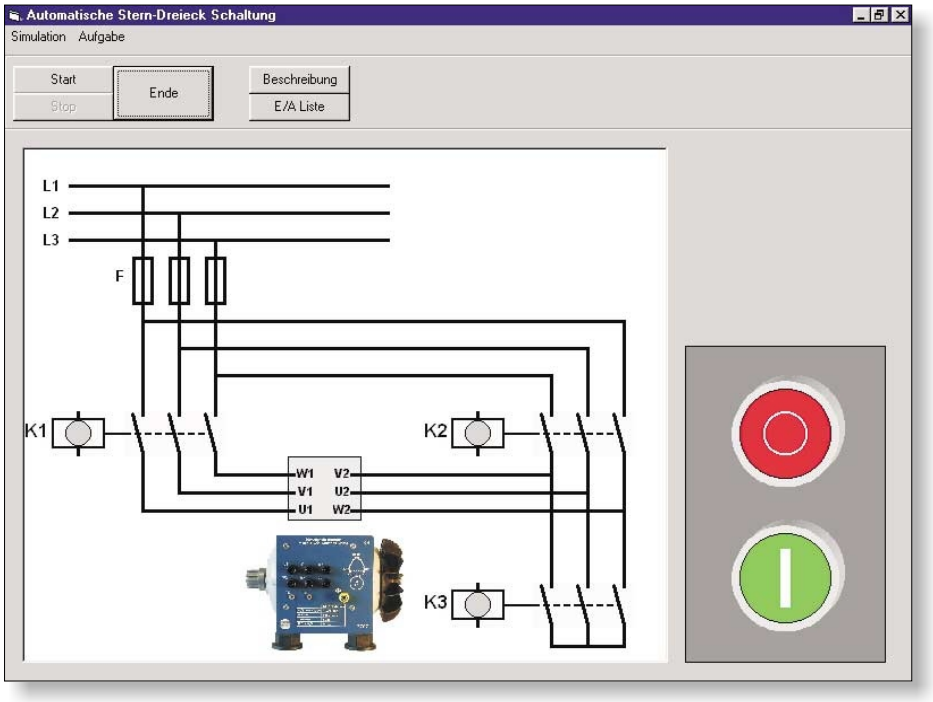
hps SystemTechnik
Competence in Training
hps SystemTechnik
Lehr- + Lernmittel GmbH
Altdorfer Strasse 16
88276 Berg (Germany)
Tel.: + 49 7 51 / 5 60 75 80
Fax: + 49 7 51 / 5 60 75 77
Web: www.hps-systemtechnik.com
E-Mail: export@hps-systemtechnik.com

Automation Technology / PLC Applications



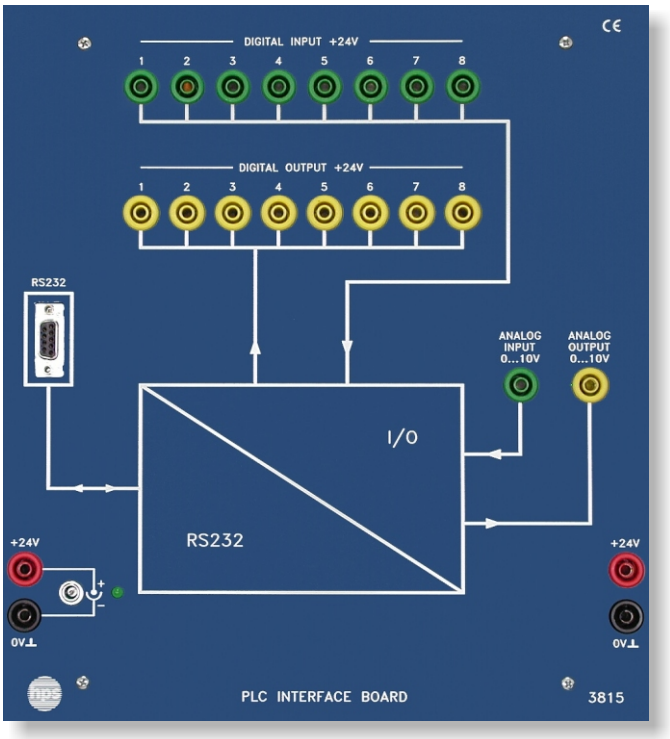
Interface with Simulation Software

Typ 3815



Simulation of a simple motor control

- **Simulation of 9 different applications with the PC, from the simple motor control up to the sorting system**
- **With animated processes**
- **Hardware link for any PLCs and miniature controls**
- **For Windows operating systems: 98, 2000, NT SP4, XP**



Front view of the PLC INTERFACE BOARD (Type 3815)

The hps „PLC Applications" training system consists of a simulation software and the PLC INTERFACE BOARD for linking to a PLC or miniature control.

With the software it is possible to simulate different processes such as traffic lights, different motor controls, a sorting plant and a level control.

The PLC INTERFACE BOARD serves for adaption of a arbitrary PLC (24 V) to a PC.

Each application must be programmed with the PLC. The function of the PLC program can be tested immediately with the simulation model.

The experiment manual is integrated in the simulation software.

hps SystemTechnik offers Type 2150 UNIVERSAL COMPONENT BOARD as a miniature control and Type 2130 PLC BOARD S7-300 as PLC.

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Competence in Training

hps SystemTechnik
Lehr- + Lernmittel GmbH
Altdorfer Strasse 16
88276 Berg (Germany)

Tel.: + 49 7 51 / 5 60 75 80
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Web: www.hps-systemtechnik.com
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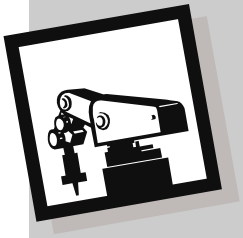


Interface with Simulation Software

Typ 3815

Accessories Included

- Software:
  Plant Simulator (Type PC 3815.2)

Accessories Required

- IBM-compatible PC:
  CPU from 500 MHz, CD-ROM drive, free serial interface, sound card recommended
  NOTE: NO USB to RS232 adapter applicable!
- PLC (24 V)
- Power supply unit: 24 V / 1.0 A (Type 3816)
- Connecting Lead RS 232 (Type 9102.50)
- 4 mm safety leads and plugs (Type 3815.1-1)

Accessories Recommended

- UNIVERSAL COMPONENT BOARD (Type 2150)
- PLC BOARD S7-300 (Type 2130)

Technical data of the PLC INTERFACE BOARD (Type 3815)

Operating voltage
- 24 V / 500 mA

Inputs
- 8 digital inputs: 24 V DC
- 1 analog input: 0 ... 10 V

Outputs
- 8 digital outputs: 24 V DC
- 1 analog output: 0 ... 10 V

Wiring of all inputs and outputs via safety jacks (4 mm)

Interface RS 232

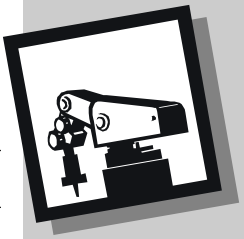
Mechanical data

The front panel of the PLC INTERFACE BOARD is made of 5 mm thick laminate, blue, matt-finished.
The individual components are integrated in the front panel.
Circuit symbols are printed in white on the front panel.
A grey plastic cover protects the rear of the unit and enables the unit to be placed on a desktop at an ergonomically favourable angle.

Dimensions
- 266 x 297 x 110 mm (w x h x d)

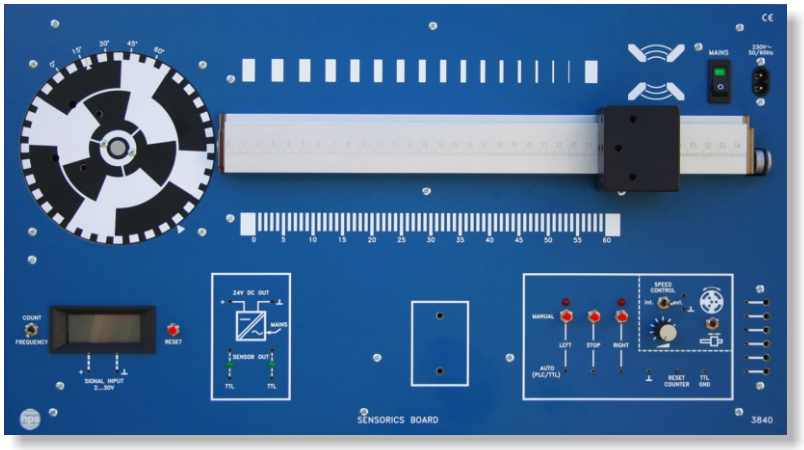
Weight
- approx. 2.4 kg

Subject to technical modifications.

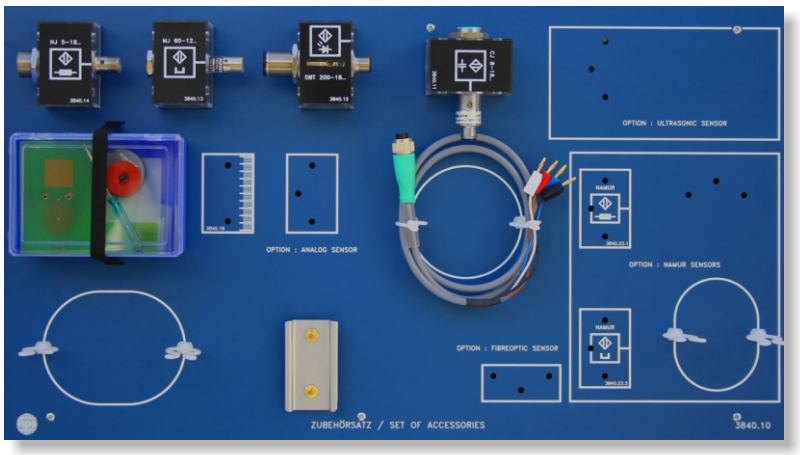


SENSORICS BOARD

Type 3840



SENSORICS BOARD (Type 3840) **Experiment assembly**



Set of Accessories (Type 3840.10) **Standard equipment**

- **Training and instruction system for sensor and automation technology**
- **With built-in power supply**
- **With integrated counter and frequency meter**
- **Rotary and linear movement with motors**
- **Clear storage arrangement of accessories on a separate Board**
- **Can be triggered with PCL, PC, TTL signals or manually**
- **Expandable with ultrasonic, fibre optic, NAMUR and analog sensors**

With the SENSORICS BOARD hps SystemTechnik offers a training concept which clearly demonstrates the principle, structure and application of industrial sensors in practice-oriented experiments. This training system is particularly suitable as an introduction for mechanical engineers, mechanics, control-, production- or hybrid technicians.

The respective market share and application in control and automation engineering have been taken into consideration in the choice of sensors.

The standard equipment contains the following sensors:

- **Inductive Sensor**
- **Capacitive Sensor**
- **Optical Sensor**
- **Magnetic Field Sensor**

Options

- **Ultrasonic Sensor**
- **Fibre Optic Sensor**
- **NAMUR Sensors**
- **Analog Sensor**

The SENSORICS BOARD has been designed in such a way that all the components required for conducting the experiments are built in. The experiments are fast and easy to set up.

The functional principle of inductive, capacitive, optical and magnetic field sensors is studied in the basic experiments.

The sensors can be plugged onto a sliding carriage which can also be controlled by these sensors.

The guide rail of the carriage has a millimeter scale.
The carriage can be moved by an adjustable-speed motor or manually.

Different material samples can be mounted in a holder and moved to record sensitivity curves.

hps SystemTechnik
Lehr- + Lernmittel GmbH
Altdorfer Strasse 16
88276 Berg (Germany)
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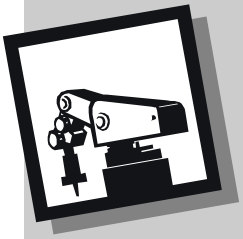
Web: www.hps-systemtechnik.com
E-Mail: export@hps-systemtechnik.com



SENSORICS BOARD

Type 3840

In addition, a motor-driven disk can be scanned sensorically. The disk exhibits metallic fields in order to be able to scan the rotary motion with the inductive sensor as well.

Both motors in the SENSORICS BOARD are provided with an electronic current cut-out.

All the accessories of the SENSORICS BOARD are stored in a clear arrangement on a separate Board.

To conduct the experiments, the SENSORICS BOARD is placed on a table or suspended in an hps rack for demonstration purposes.

The SENSORICS BOARD can be converted into a portable training unit by simply screwing it into a Box:
All the experiments can be conducted directly in the Box. Dust-free storage and protection against transport damages are further advantages of the Box version.

In the Box version the Set of Accessories (Type 3840.10) is stored in the lid of the Box.

Accessories Included

- Set of Accessories (Type 3840.10), consisting of:
  Storage Board, sensors, different material samples and connecting leads

Accessories Recommended

Experiment manual:
Sensor Technology – Components of Automation Technology“ (Type V 0140)

Technical Data

Mains connection

- Voltage: 230 V AC / 115 V AC (110 V AC);
  50 ... 60 Hz; approx. 40 VA

Integrated power supply for sensors

- 24 V DC / 250 mA (output short-circuit-proof)
- Pilot LED; U_{in}: approx. 15 V ... 30 V

Start-stop logic

- With optical indicators
- Left- and right-hand running for rotary disk or carriage
- Inputs for PLC or TTL operation; U_{in}: approx. 5 V ... 24 V

Frequency meter

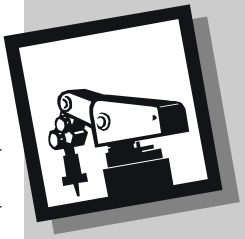
- Frequency range: 1 ... 9999 Hz
- Input level: 5 ... 24 V
- Pulse counter: 1 ... 9999

Mechanical data

The front panel of the SENSORICS BOARD is made of 5 mm thick laminate, matt blue in colour with white engraving representing the built-in function groups.
The rear of the Board is protected with a grey plastic cover. Its shape allows the Board to be placed at an ergonomically favourable angle for example on a table.

Dimensions and weights

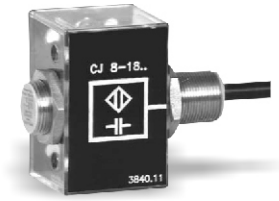
- Board version (Type 3840):
  532 x 297 x 135 mm (w x h x d);
  weight: 4.1 kg
- Set of Accessories (Type 3840.10):
  532 x 297 x 150 mm (w x h x d);
  weight: 2.5 kg
- Box version, consisting of:
  SENSORICS BOARD (Type 3840);
  Set of Accessories (Type 3840.10) and
  Box (Type 3840.20): 580 x 450 x 200 mm;
  total weight: approx. 11 kg



SENSORICS BOARD

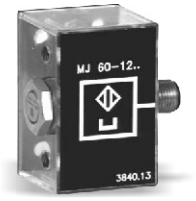
Type 3840

Sensors of the Standard Equipment



Capacitive Sensor
(Type 3840.11)

Optical Sensor
(Type 3840.12)



Magnetic Field Sensor
(Type 3840.13)

Inductive Sensor
(Type 3840.14)

The sensors are built in unbreakable transparent plastic housings or mounted onto holders (except for the Fibre Optic Sensor).

For conducting experiments the sensors are plugged onto the sliding carriage of the SENSORICS BOARD. To this end the bottoms of the transparent plastic casings as well as the holders are provided with three gold-plated laminated plugs (4 mm).

Optional Sensors

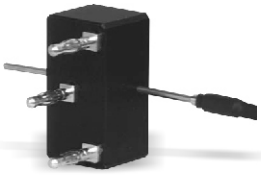
Ultrasonic Sensor
(Type 3840.21)

Material Sample for Ultrasonic Sensor

Dimensions without plugs

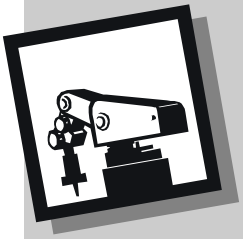
- Transparent plastic housing:
  38 x 57 x 35 mm
  (w x h x d)
- Holder:
  41 x 57 x 41 mm
  (w x h x d)

Fibre Optic Sensor
(Type 3840.22)



Optic Fibre with Holder for Fibre Optic Sensor

For experimenting the Fibre Optic Sensor is clamped onto a top-hat rail which is equipped with two laminated plugs at its bottom for plugging the top-hat rail into the SENSORICS BOARD.
The top-hat rail is part of the standard equipment.

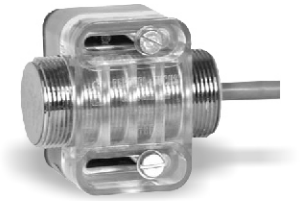


SENSORICS BOARD

Type 3840

Sensor Technology / Automation Technology

Optional Sensors



Analog Sensor
(Type 3840.24)

Subjects dealt with in experiment manual: „Sensor Technology – Components of Automation Technology“ (Type V 0140)

- Response curve
- Switching hysteresis
- Switching distance and behaviour
- Material dependence (reduction factors)
- Pulse counting / speed measurement
- Triggering of a switching process through a housing wall
- Filling level measurement
- Definition and sampling width of optical sensors
- Application possibilities for optic fibres
- Position registration and control of a transport carriage
- Tool positioning
- Barcode scanning

Optional NAMUR Sensors

Inductive Sensor
(Type 3840.23.1)

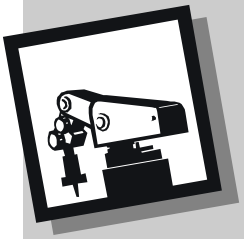
Capacitive Sensor
(Type 3840.23.2)

Post-Switch Amplifier for NAMUR Sensors
(Type 3840.23.4)

Magnetic Field Sensor
(Type 3840.23.3)

For experimenting the Post-Switch Amplifier is clamped onto a top-hat rail which is equipped with two lamella plugs at its bottom for plugging the top-hat rail into the SENSORICS BOARD. The top-hat rail is part of the standard equipment.

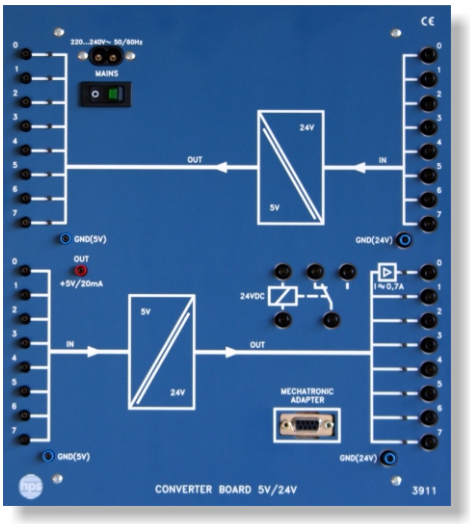
Subject to technical modifications.



Digital Technology / Automation Technology

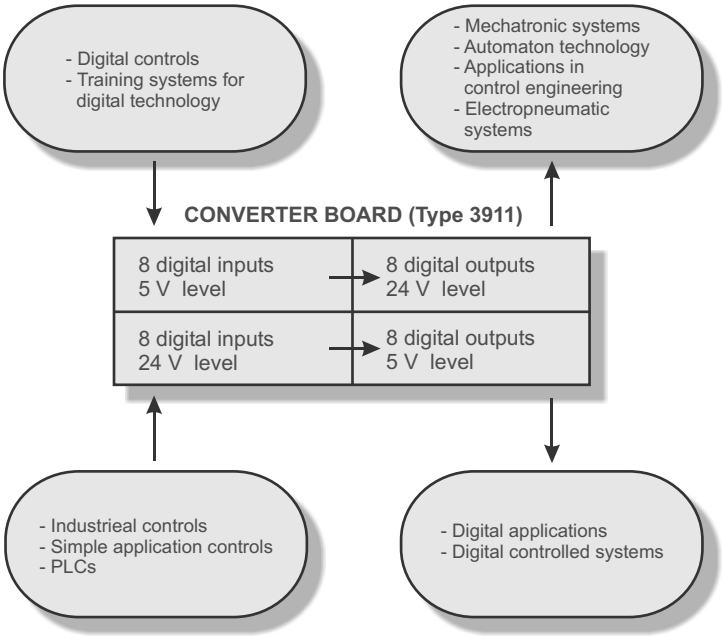
CONVERTER BOARD 5V / 24V

Type 3911



- This device can be used universally because of the level conversion from 5 V to 24 V signals and from 24 V to 5 V signals
- The 5 V and 24 V connections are separated electrically by optocouplers
- 8 digital 5 V inputs are converted to 8 digital 24 V outputs
- 8 digital 24 V inputs are converted to 8 digital 5 V outputs
- Both standard cables (2 mm and 4 mm) and safety cables can be used
- Adapter for connecting mechatronic systems
- Built-in power supply
- Freely wirable relays
- All outputs are short-circuit-proof
- The statuses of the outputs are indicated by LEDs

Application possibilities of the CONVERTER BOARD



hps SystemTechnik
Competence in Training
hps SystemTechnik
Lehr- + Lernmittel GmbH
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88276 Berg (Germany)
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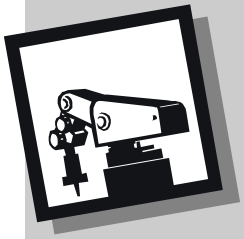


Digital Technology / Automation Technology

CONVERTER BOARD 5V / 24V

Type 3911

Technical data

Mains connection:
220 V AC ... 240 V AC / 115 V AC (110 V AC);
approx. 40 VA; 50 ... 60 Hz

Inputs and outputs:
8 inputs 24 V DC
1 output 24 V DC / 750 mA
7 outputs 24 V DC / 75 mA
8 inputs 5 V (TTL compatible)
8 outputs 5 V (TTL compatible)

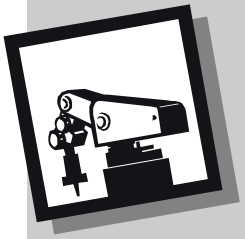
Relay:
Coil voltage 24 V DC; 1 changeover 230 V / 3 A

Mechatronic adapter:
9-pin Sub-D socket e.g. for connecting a conveyor belt

Mechanical data:
Material of front panel: laminate (5 mm thick)
Rear: angled plastic cover
Dimensions: 266 x 297 x 220 (w x h x d)
Weight: approx. 2.4 kg

Subject to technical modifications.

Drive Technology / Automation Technology



FREQUENCY CONVERTER

Type 5264

FREQUENCY CONVERTER
(Type 5264)

- **Simple commissioning**
- **Didactically designed EMC connections**
- **Can be operated on IT networks**
- **Extensive protection functions against overload, short-circuits and ground faults, I²t thermal protection**
- **Simple cable connection (safety plugs, screw clamp, socket)**
- **Compound braking for improved braking performance**
- **Wide range of parameters which allow configuration for a wide application range**
- **Programmable I/O functions**
- **Digital PID controller with freely adjustable parameters**
- **Automatic parameter adaption to changes in load**
- **Sensorless vector control with adaptive motor model**
- **High pulse frequency for low noise operation**

Optional:

- **AOP Advanced Operation Panel**
- **Profibusmodul**

Learning aims:

- **To connect and operate digital frequency converters according to EMC requirements**
- **To program and test drive and protection functions, interpret fault messages, troubleshooting**
- **Central operation and monitoring (HMI) on the PC, connection to automation systems via Profibus**

hps SystemTechnik
Lehr- + Lernmittel GmbH
Altdorfer Strasse 16
88276 Berg (Germany)

Tel.: + 49 7 51 / 5 60 75 80
Fax: + 49 7 51 / 5 60 75 77
Web: www.hps-systemtechnik.com
E-Mail: export@hps-systemtechnik.com

FREQUENCY CONVERTER

Type 5264

Required accessories

Micromasterstarter Software	6SL3072-0AA00-0AG0
PC-Inverter Connection Kit (RS232)	6SE6400-1PC00-0AA0
MICROMASTER 4 BASIC OPERATOR PANEL 4 (BOB)	6SE6400-0BP00-0AA0

Recommend accessories

Experiment book: Frequency converter with Micromaster 420 NEW!	Type V 0023 DE

Optional accessories

ADVANCED OPERATOR PANEL (AOP)	6SE6400-0AP00-0AA1
MICROMASTER 4 Profibusmodule	6SE6400-1BP00-0AA0
SIMATIC NET, Connecting cable 830-2, for Profibus	6XV1830-2AH30
Three phase induction motor	Type 2707.1
AC Motor Board	Type 5265

Technical data

Mains connection
- Mains voltage: 220 ... 240 V AC
- Mains frequency: 47 ... 63 Hz
- Internal fuse: 10 A slow blow

Motor connection
- Output voltage: 3 x 0 ... 230 V AC
- Output frequency: 0 ... 650 Hz
- Power: 0.37 kW

Three connections are available:
screw terminals, 4 mm safety jacks or a 4-pole round socket (for direct connection to the conveyor belt Type 99011).

Inputs
- 3 digital inputs: 24 V DC
- 1 analogue input: 0 ... 10 V

Outputs
- 1 analogue output: programmable, 10 bits
- 1 relays output: error contact 230 V AV

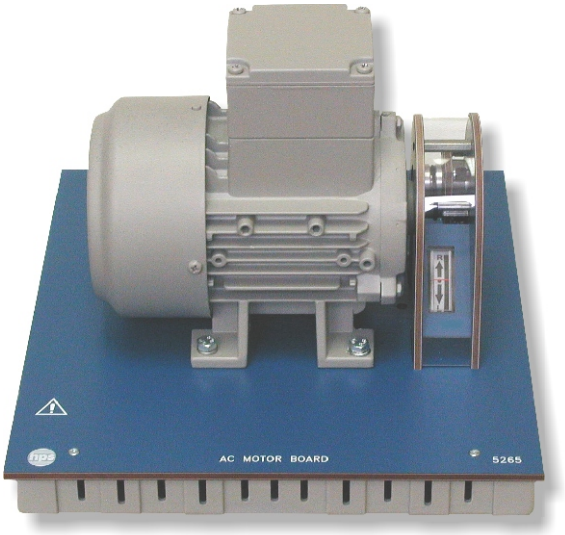
Delivered accessories
- 4 mm / 19 mm savety plugs
- power cable

System interface
- RS 485
- Optional Profibus connection

Mechanical data
- Front panel material: made of laminate (5 mm)
- Rear: angled plastic cover
- Dimensions: 266 x 297 x 220 mm (w x h x d)
- Weight: approx. 3.0 kg

Subject to technical modifications.

Drive Engineering / Automation Engineering



Front view of the
AC MOTOR BOARD

AC MOTOR BOARD

Type 5265

- **The AC MOTOR BOARD is a three-phase current asynchronous motor for connection to a frequency converter (FREQUENCY CONVERTER BOARD type 5264) according to EMC requirements.**
- **For good detection of both directions of rotation and high and low speeds, a display unit has been installed which is fed by a tachogenerator.**
- **A freely accessible tap in the motor shaft allows an exact speed measurement with a hand speedometer.**

Technical data

Mains connection

- Supply voltage:
  3 x 230 V / 50 Hz (between phases)
- Motor connecting cable:
  4 x 1.5 mm^2 shielded, length: 1.8 m
  with multicore cable end
- Current: 0.73 A
- Power: 0.12 kW
- Speed: 1350 rpm
- cos : 0.75

Mechanical data

- Material of front panel: laminate (5 mm)
- Rear: angled plastic cover
- Dimensions: 266 x 297 x 230 mm (w x h x d)
- Weight: approx. 5.5 kg

06 / 14 V02 Technical changes without prior notice!

Subject to technical modifications.

hps SystemTechnik
Lehr- + Lernmittel GmbH
Altdorfer Strasse 16
88276 Berg (Germany)

Tel.: + 49 7 51 / 5 60 75 80
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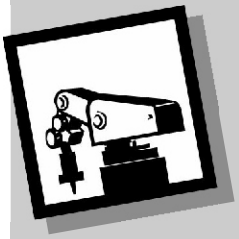
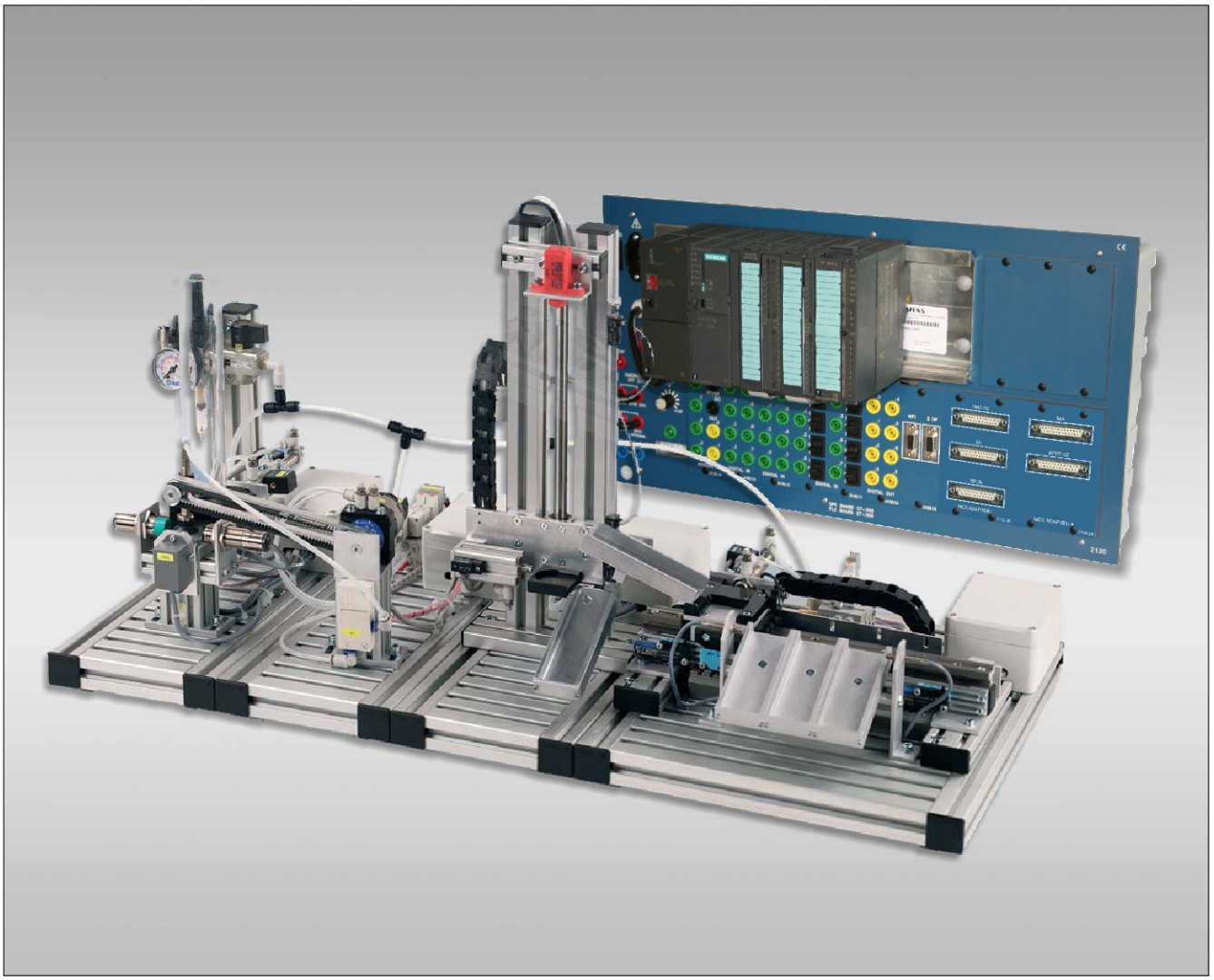
Mechatronic Compact System



MECHATRONIC



16 / 14 Technical changes without prior notice!

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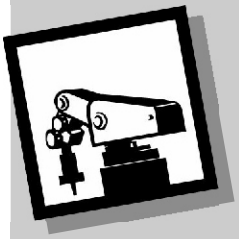
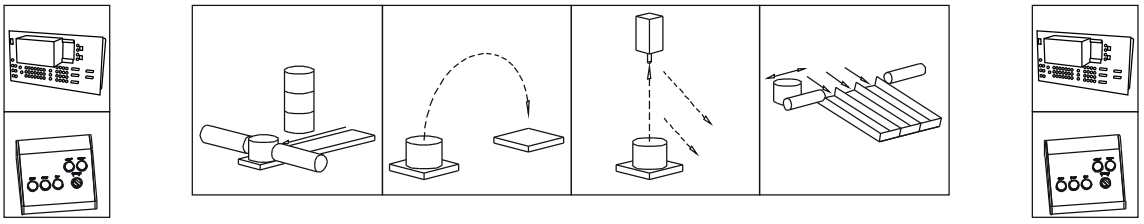


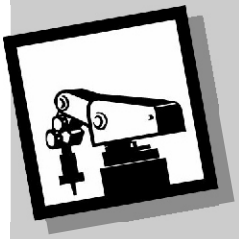
MECHATRONIC

Concept:

- Mechatronic system for practical use on worktables
- Small modules fully functional
- Various Possibilities of combinations
- Great range for team work
- Panels with grid pattern Dimensions 160 or 320 mm width and 400 mm depth
- Electro-pneumatic valve cluster for control of the pneumatic actors
- Relays for electrical drives in data interface
- Standardized interface for connection with Control unit
- Modules could be controlled with all usual PLC-systems
- Control unit connectable with PLC

Combinations:





MECHATRONIC

Table of contents:

Module distributing magazine with measuring unit — Typ 99610

Working pieces out of the gravity-feed magazine will be separated and supplied on a deposit.
The fill level of the magazine is checked by a one-way light barrier and the work piece on the deposit is checked by a micro switch. The characteristics of the working pieces will be measured by a optical and inductive sensors. A double-acting piston moves each one work piece out from the magazine. The extreme position of the piston is determined with a contact less sensor.
The control of the cylinder is done with an electric valve.

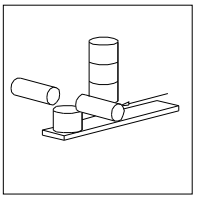
Design:

- Al-T-groove plate 160 mm x 400 mm
- Data interface
- Compact valve block
- distributing magazine for cylindrical work pieces
- measuring unit at the deposit for work pieces

Areas of training:

- Separation of working pieces out of the distributing magazine
- Working pieces supping on a deposit without collision
- micro switch for position measurement
- one-way light barrier
- optic sensor
- inductive sensor
- double-acting piston
- 5/2 directional valve, bistable

Combination



Technical data :

Sensors: 6	2 cylinder switch
	1 one-way light barrier
	1 micro switch
	1 optic sensor
	1 inductive sensor
Actors: 1	5/2 directional valve, bistable
Compressed air:	not oiled, 5 to 6 bars
Power supply:	24 V DC (SELV)
Installation:	25-pole D-SUB connector
Compact valve block	
Work piece:	Cylinder Ø 30 mm x 20 mm (option)
Dimensions:	160 x 400 x 270 mm
Weight:	3,2 kg

Articlenumbers:

Module distributing magazine with measuring unit	**99610**

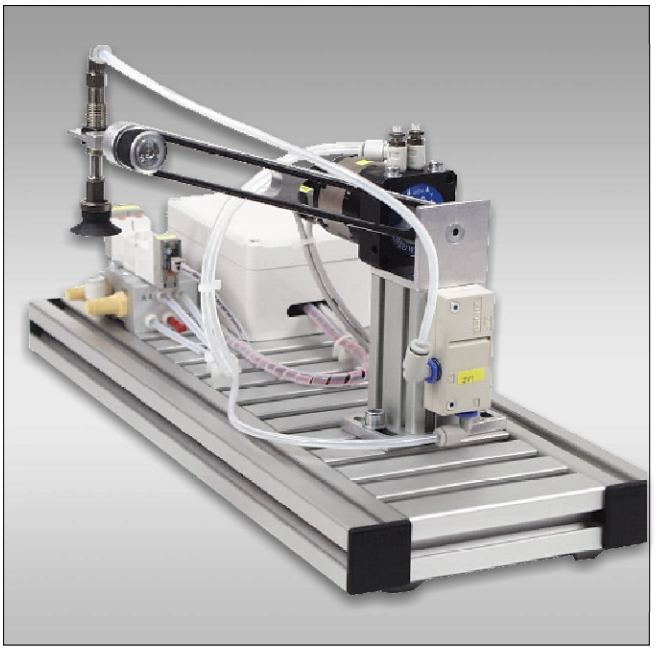
Accessoires not supplied

Set of accessories and work pieces	**99702**
Control unit	**99700**
Interface cable, 25-pin	**9102.52**

Module station gripper

Typ 99611

The gripper moves the work pieces between two modules with defined positions.
The pneumatic gripper is adjustable step less in a range of 180°. It transports the work piece with a vacuum exhaust gripper.
The vacuum exhaust is built-in the module.
Lifting device with cylinder without piston
The position of the piston is measured with a contact less sensor.
The control of the piston is done by a electric magnet valve.



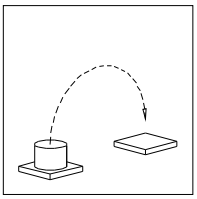
Design:

- Al-T-groove plate 160 mm x 400 mm
- Data interface
- Compact valve block
- Gripper
- Vakuum exhaust

Areas of training:

- Work pieces movement
- Gripper with wing drive
- Reed switch
- Pick up with a vacuum exhaust gripper and without a collision
- 5/2 directional valve, bistable
- 5/3 directional valve
- vacuum exhaust

Combination



Technical data :

Sensors: 2	2 Cylinder switch
Actors: 3	1 5/2 directional valve, monostable
	2 5/3 directional valve
Compressed air:	not oiled, 5 to 6 bars
Power supply:	24 V DC (SELV)
Installation:	25-pole D-SUB connector
Compact valve block	
Work piece:	Cylinder Ø 30 mm x 20 mm (option)
Dimensions:	160 x 400 x 250 mm
Weight:	3,0 kg

Articlenumbers:

Module station gripper	**99611**

Accessoires not supplied

Set of accessories and work pieces	**99702**
Control unit	**99700**
Interface cable, 25-pin	**9102.52**

Module measuring unit analog

Typ 99612

Work pieces are moved on carrier with a lifting device to the position measurement system. The position measurement device has a analog Voltage form 0 to 10V.
An analog voltage in the range from 0 to 10V can be evaluated by a PLC with analog input (material thickness measuring).
The work piece can be transferred with a pneumatic cylinder over a chute to the next station or differentiated to a depot chute. The position of the pneumatic cylinder is determined with a contact less sensor.
The control of the cylinder is done with a electric magnet valve.

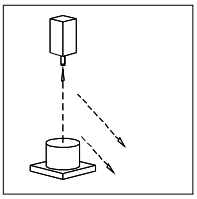
Design:

- Al-T-groove plate 160 mm x 400 mm
- Data interface
- Compact valve block
- Lifting device with cylinder without piston
- Analogy position measuring device
- Ejection device
- 2 chutes

Areas of training:

- Measurement / differentiation of material thickness with linear potentiometer
- Removal of differentiates work pieces
- Reed switch
- Double-acting pneumatic cylinder
- Cylinder without piston rod
- Removes work pieces in defined position and take out of work pieces
- 5/2 directional valve, monostable
- 5/3 directional valve, ventilated
- Positioning with a of 5/3 directional valve

Combination



Technical data:

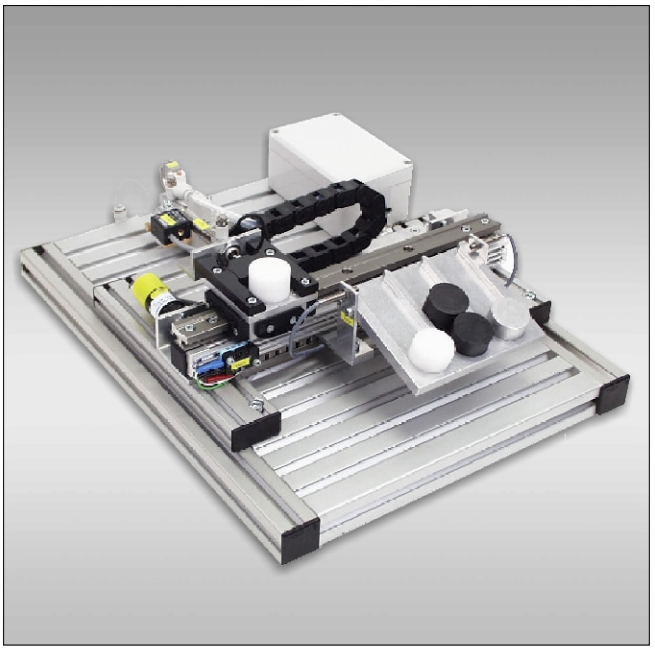
Sensors: 5
1 Cylinder switch
3 Reed switch
1 analog transmitter
Actors:3
1 5/2 directional valve, monostable
2 5/3 directional valve
Compressed air: not oiled, 5 to 6 bars
Power supply: 24 V DC (SELV)
Installation: 25-pole D-SUB connector
Compact valve block
Work piece: Cylinder Ø 30 mm x 20 mm (option)
Dimensions: 160 x 400 x 400 mm
Weight: 4,4 kg

Articlenumbers:

Module measuring unit analog	**99612**
Accessoires not supplied	
Set of accessories and work pieces	**99702**
Control unit	**99700**
Interface cable, 25-pin	**9102.52**

Module storing for work pieces three depots — Typ 99613

Work pieces will moved with a linear drive pass three chutes.
An accompanying pneumatic output unit transports the work pieces onto the chutes according to their material characteristics.
The fill level of the chutes will be monitored with a light barrier.
A fork light barrier controls the position of the work piece carrier with a perforated plate.
Sensors check the end positions of the work piece carrier with a contact lee sensor (one-way light barrier).
The control of the pneumatic output unit is done with a electric magnet valve.



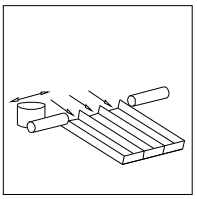
Design:

- Al-T-groove plate 350 mm x 400 mm
- Data interface
- Compact valve block
- Linear drive with pneumatic work piece carrier
- 3 Chutes
- Light barrier

Areas of training:

- Positioning with a fork light barrier
- Electrical drives
- End position with micro switch
- Reversing contactor circuit
- Light barrier for the control of a fill level
- Cylinder switch
- Double-acting pneumatic piston
- 5/2 directional valve, monostable

Combination



Technical data:

Sensors: 5	2 Micro switches
	1 Fork light barrier
	1 One-way light barrier
	1 Cylinder switch
Actors:3	2 control units motors
	1 5/2 directional valve, monostable
Compressed air:	not oiled, 5 to 6 bars
Power supply:	24 V DC (SELV)
Installation:	25-pole D-SUB connector
Compact valve block	
Work piece:	Cylinder Ø 30 mm x 20 mm (option)
Dimensions:	320 x 400 x 150 mm
Weight:	5,8 kg

Articlenumbers:

Module storing for work pieces three depots	**99613**

Accessoires not supplied

Set of accessories and work pieces	**99702**
Control unit	**99700**
Interface cable, 25-pin	**9102.52**

Control unit Type — Typ 99700

The control unit is built-in a stable case made of aluminum.
The feet fix on the control unit on the table with very good foothold.
The control panel has a 25-pole D-SUB connector for the installation at the control.

Technical data:

- 2 illuminated pushbutton, normally open contact
- 1 illuminated pushbutton, Normally closed contact
- 1 tommy switch
- 2 signal lamps
- 25-pole D-SUB connector

Articlenumber:

Control unit Type	**99700**

Pressure control unit — Typ 99701

- Filter pressure control with 5 µm half-automatic outlet port
- Filter case made of polycarbonate pressure regulator with pressure gauge, adjusting head turn able and lockable.
- 3/2-directional control valve, manual isolating valve
- The maintenance unit can be mounted on a mounting plate.
- Connection Ø 6mm connector
- Output Ø 6mm connector
- adjustment range 0,05 0,7 mpa

Further information:
The maintenance unit is not contained in the scope of delivery of the MCS module. With the handling of an entire plant, consisting of 4 MCS modules, only one maintenance unit is necessary. If each MCS module is operated, it needs the maintenance unit.

Articlenumber:

Pressure control unit	**99701**

Set of accessories and work pieces

Typ 99702

- Storage box
- Screwdriver 2 mm
- 1 crosstip screwdriver size 5
- 1 set of wrenches with ball-shaped head
- 1 tube cutter
- 8 profile connectors with screw thread
- 4 end caps aluminium profile 20x20
- 4 end caps aluminium profile 30x30
- 9 workpieces Ø30 mm
- Aluminium
  2 x H=20 mm, 1 x H=21 mm
- Plastic black
  2 x H=20 mm, 1 x H=19 mm
- Plastic light
  3 x H=20 mm

Further Information:
A Set of accessories and work pieces is recommendable/sufficient for the use a mechatronic system consisting of eight modules

Articlenumber:

Set of accessories and work pieces	**99702**