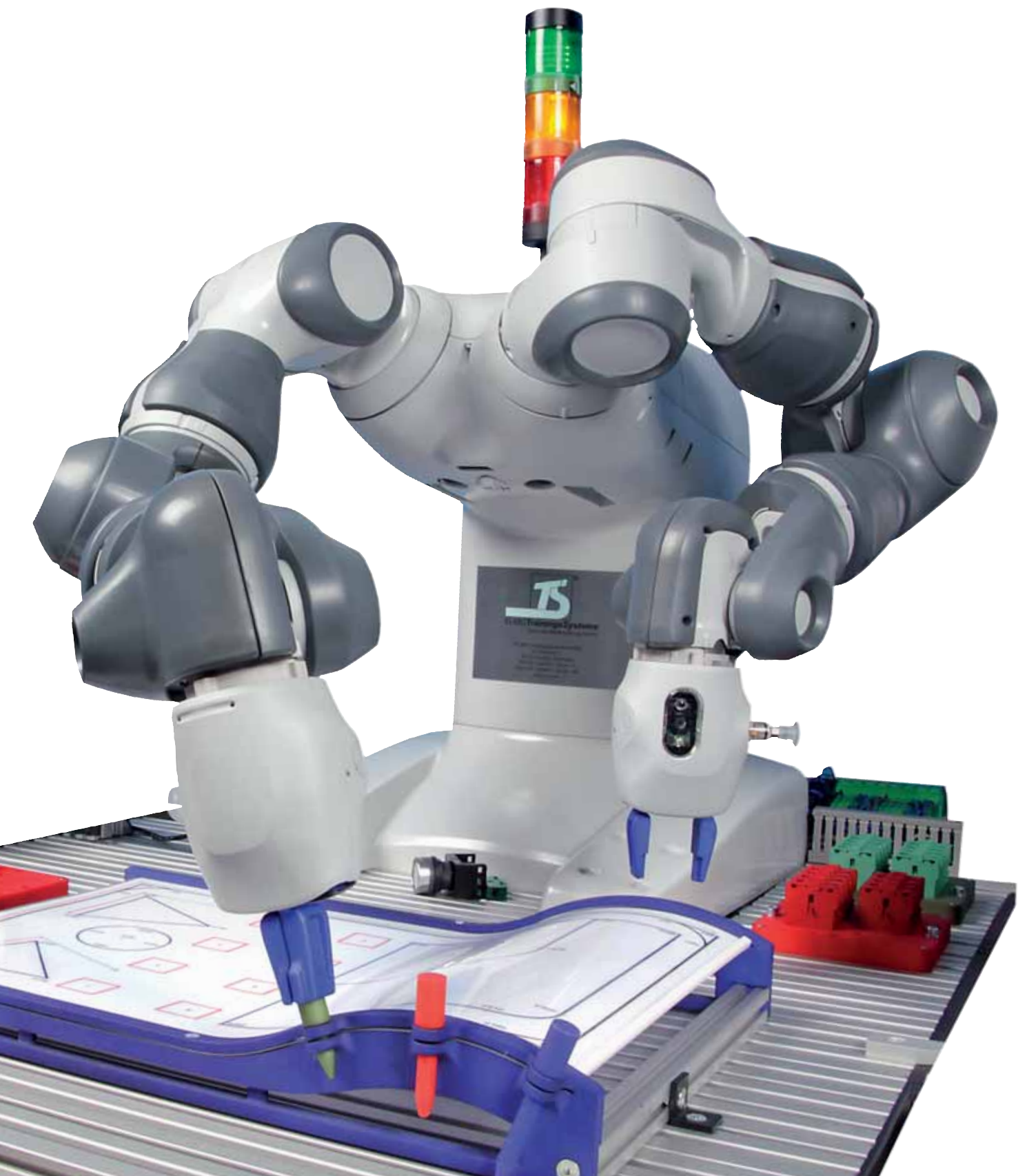




INDUSTRY 4.0

Qualification for future manufacturing processes CPS-i40®



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TECHNOLOGY AND THE HUMAN – ONE UNIT TO SUCCESS

Welcome to **ELABO*TrainingsSysteme***



ELABO*TrainingsSysteme* is your partner for in-house and institutional education and training in the professional fields of electrical engineering and metal technology.

Subjects like pneumatics, Electropneumatics, drive technology, power electronics, automation engineering, sensor systems, bus systems, instrumentation, gear technology and the complete scope of building systems engineering including renewable energies can all be counted among the strengths of the company.

The spectrum of services offered by **ELABO*TrainingsSysteme*** ranges from the planning and outfitting of complete training facilities to the provision of learning and teaching materials. Apart from the after-sales service, the offering of services is rounded off by practical workshops specially tailored for trainers and instructors.

Vocational schools, training centres of the ICC, Chamber of Crafts or the industry, polytechnics and universities are among the long-standing customers of **ELABO*TrainingsSysteme***.

A handwritten signature in blue ink, appearing to read 'Udo Urban', is placed above the name and title of the Managing Director.

Udo Urban
Managing Director

ELABO*TrainingsSysteme* GmbH

Technology that fascinates: understanding – comprehending – applying

ELABO *TrainingsSysteme* is the pioneer and market leader in the development, manufacture and sales of electrical, automation and mechatronic workstations for training and instruction.

ELABO *TrainingsSysteme* counts among the leading international manufacturers in the market environment. Located in Kinding, in the beautiful natural reserve of Altmuehltal – high-quality products and solutions are developed and manufactured for you.

In the training centre in Kinding, the focus is on the practical application of the systems and fast learning of new technologies by the customers.

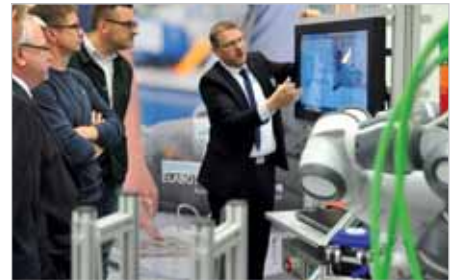
The knowledge, experience and the above-average personal involvement of the motivated employees of ELABO *TrainingsSysteme* are vital factors for the company's efficiency.



TECHNOLOGY AND MAN - A PERFECT MATCH

To plan a custom-made room concept with you, we proceed in the following steps:

› A good room concept is based on professional advice. The technical consultants of ELABOTrainingsSysteme are pleased to support you in the local planning phase. Benefit from their technical expertise and experience.



Service / seminars

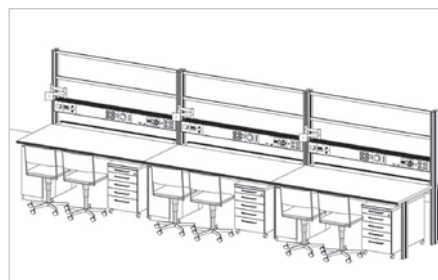
› Planning a room concept is more than selecting the furniture. Each room concept is adapted to and developed for the local requirements of the customer. Taking into account the learning contents an equipment list can be set up. As soon as the extent is defined, the storage equipment is optimised and designed.



Procurement / Design construction



Consultation / planning

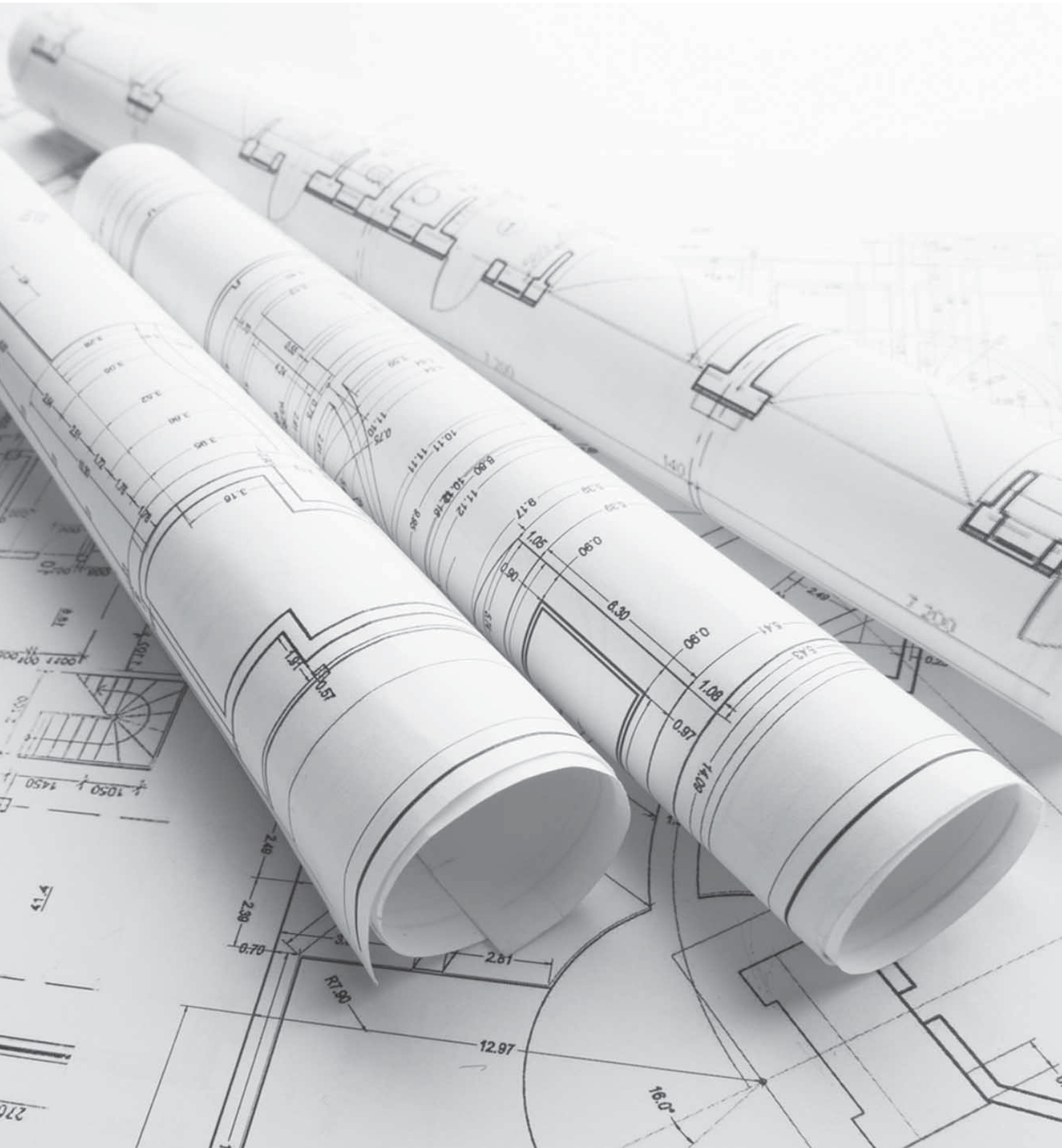


Conception



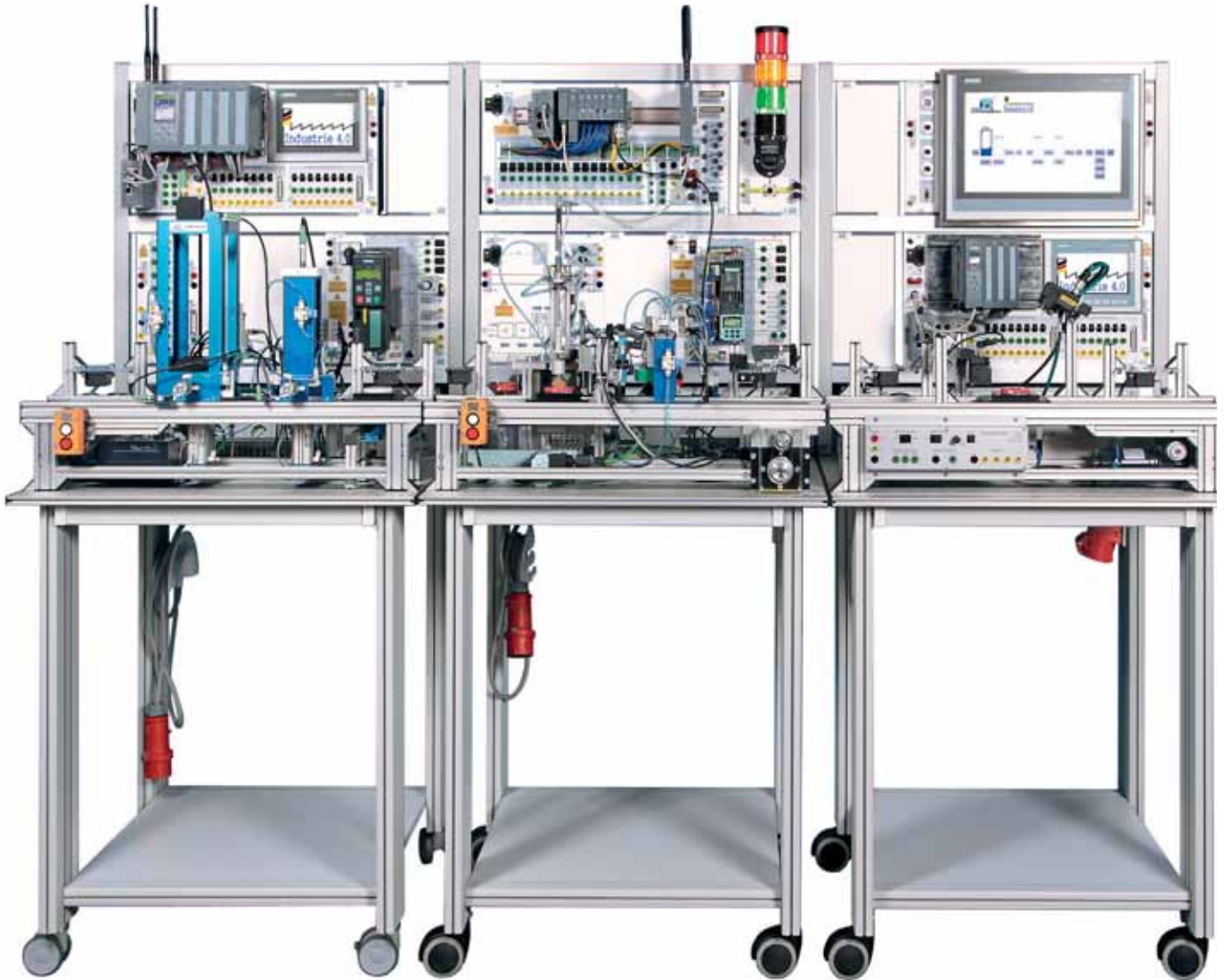
Analysis





LEARNING FACTORY 4.0 CPS-i40[®] = CYBER PHYSICAL SYSTEMS

Qualify for the Future – already Today



Industry 4.0 - Compact system

All aspects of modern manufacturing can be displayed using the latest technologies.

The system is fully networked and offers cable and wireless (industrial WLAN) PROFINET connections. Additionally, connections via PROFIBUS and AS interface can be realised. (TIA – Totally Integrated Automation).

Several bus-compatible traction inverters as well as decentral periphery are available. All stations offer RFID read/write-heads and can file away production data on an RFID tag as well as on a server (e.g. OPC, UA, SQL, ...). While the current production step is checked in each station, a final check is realised by a bus-compatible camera and other sensors in their own station.

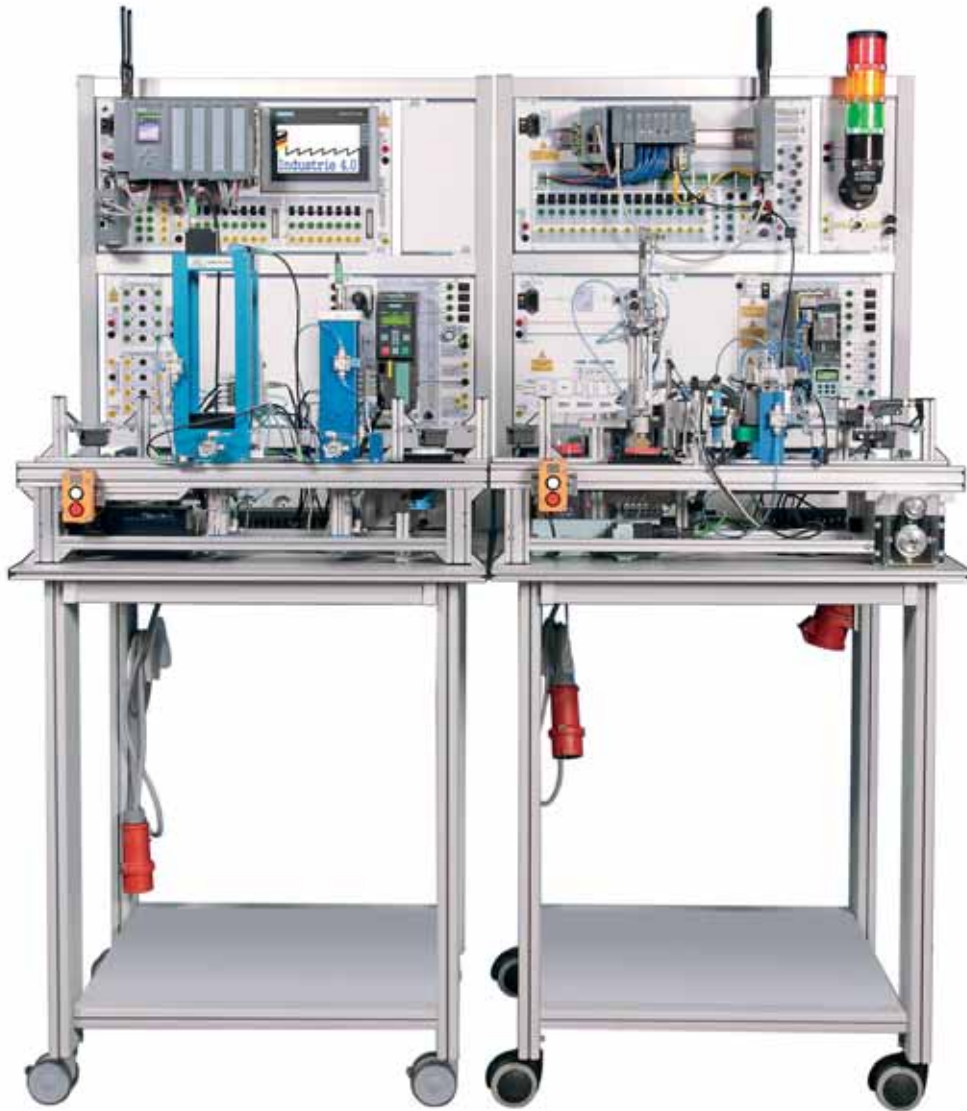


From Big-Data to SMART-Data

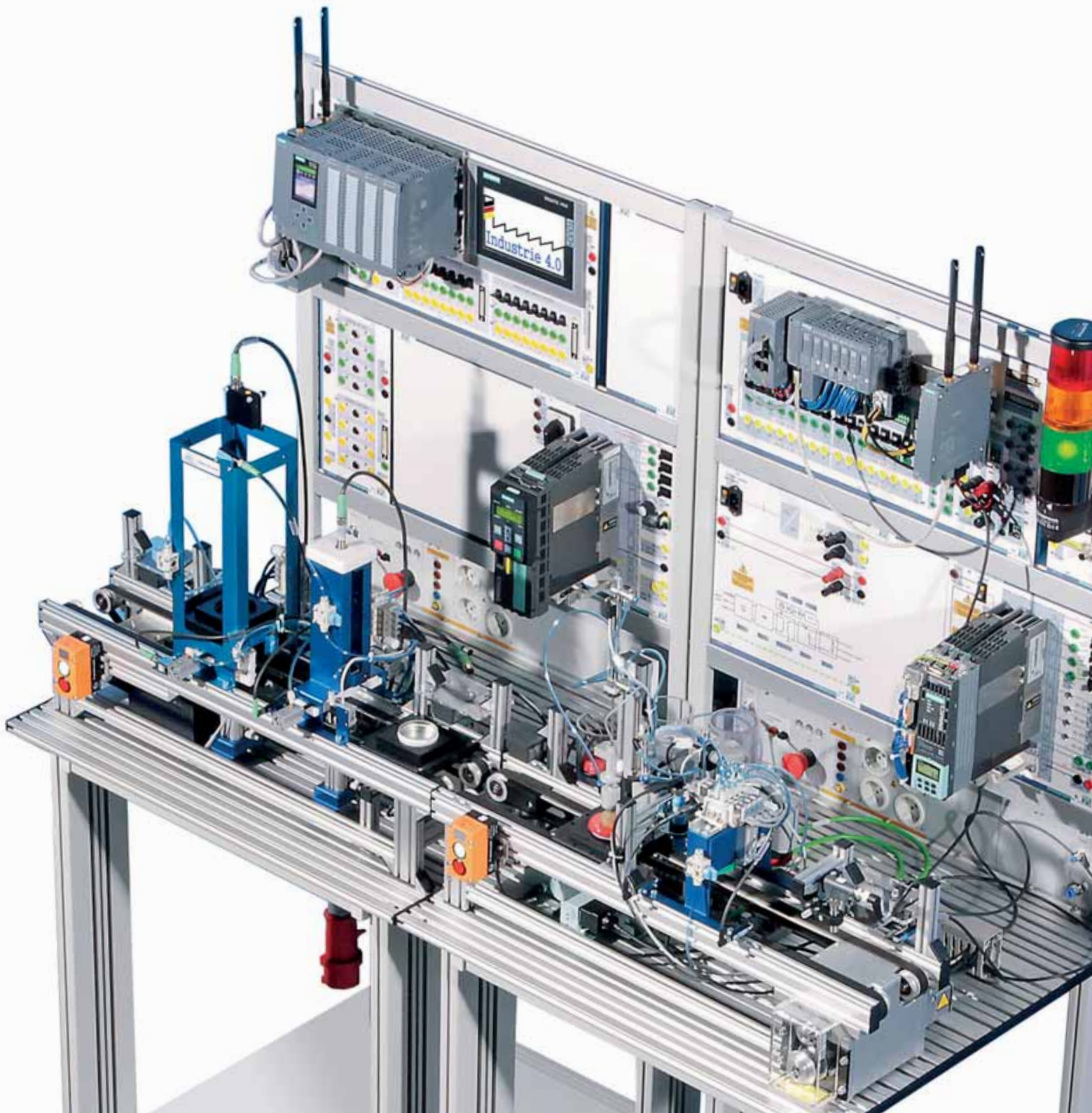
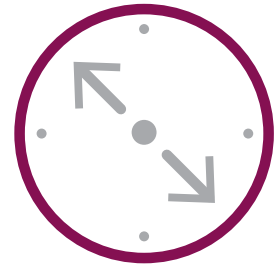


CPS-i40[®] = CYBER PHYSICAL SYSTEMS

Made to individual requirements - modular and scalable

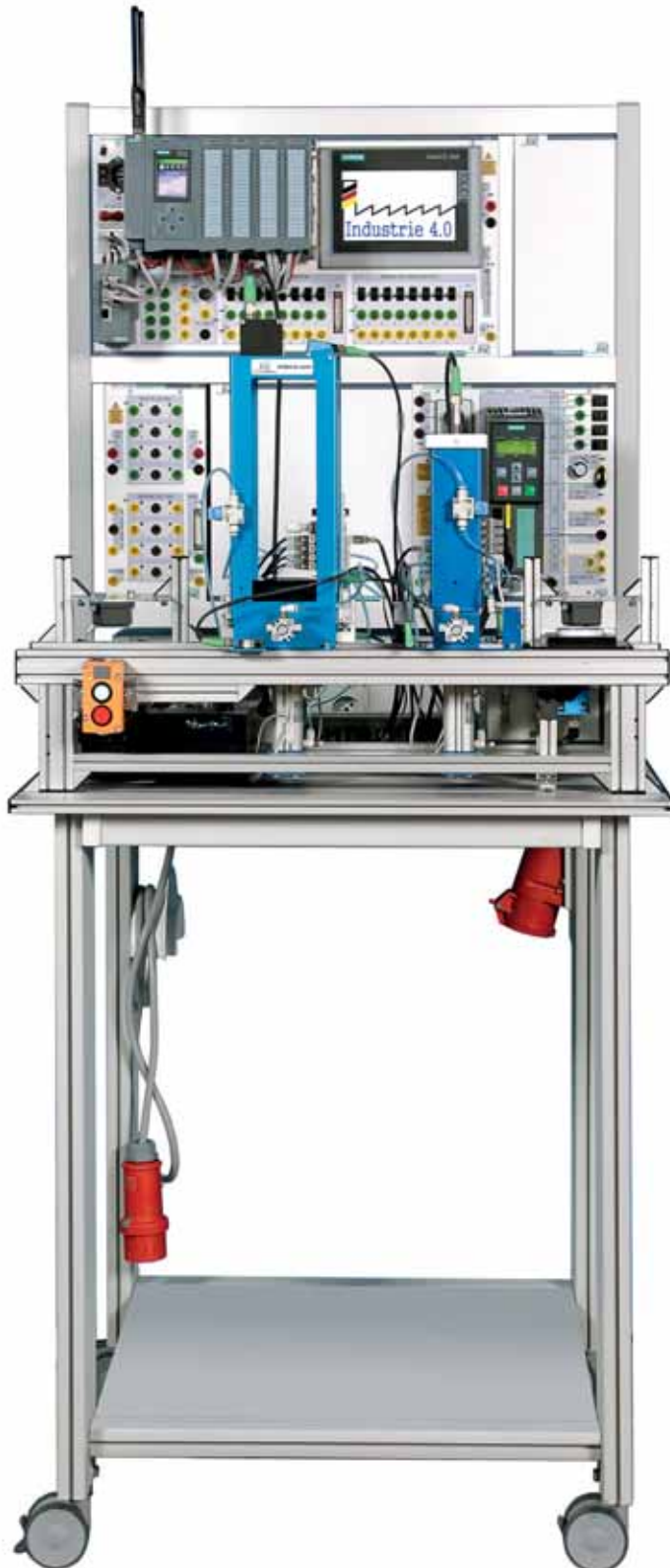


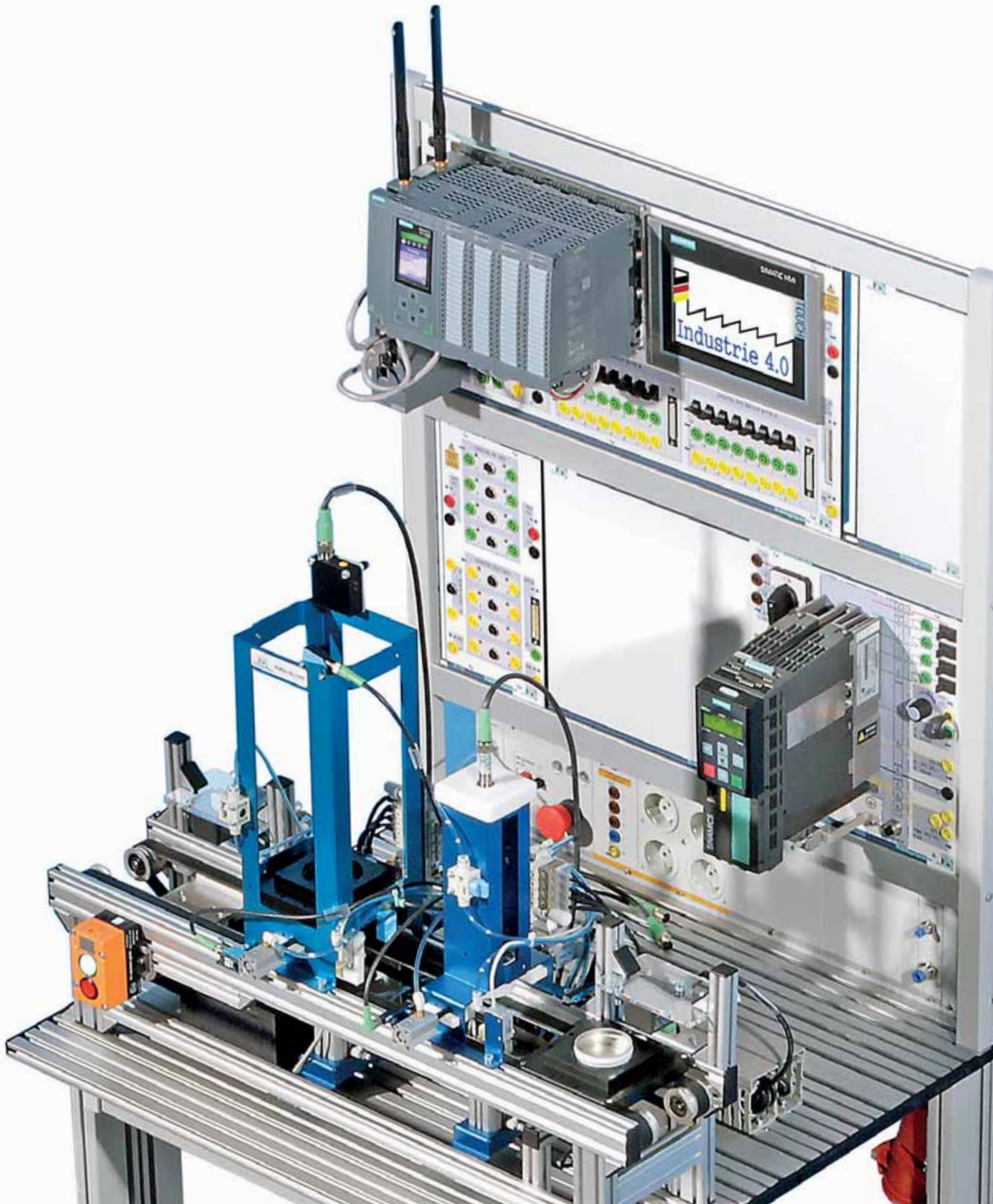
A number of product variations can be produced on one line. Each single station (CPSi40) has its own test station and can store the results. Even one-piece production isn't a problem.



CPS-i40[®] LOGISTICS / MATERIAL SEPARATION

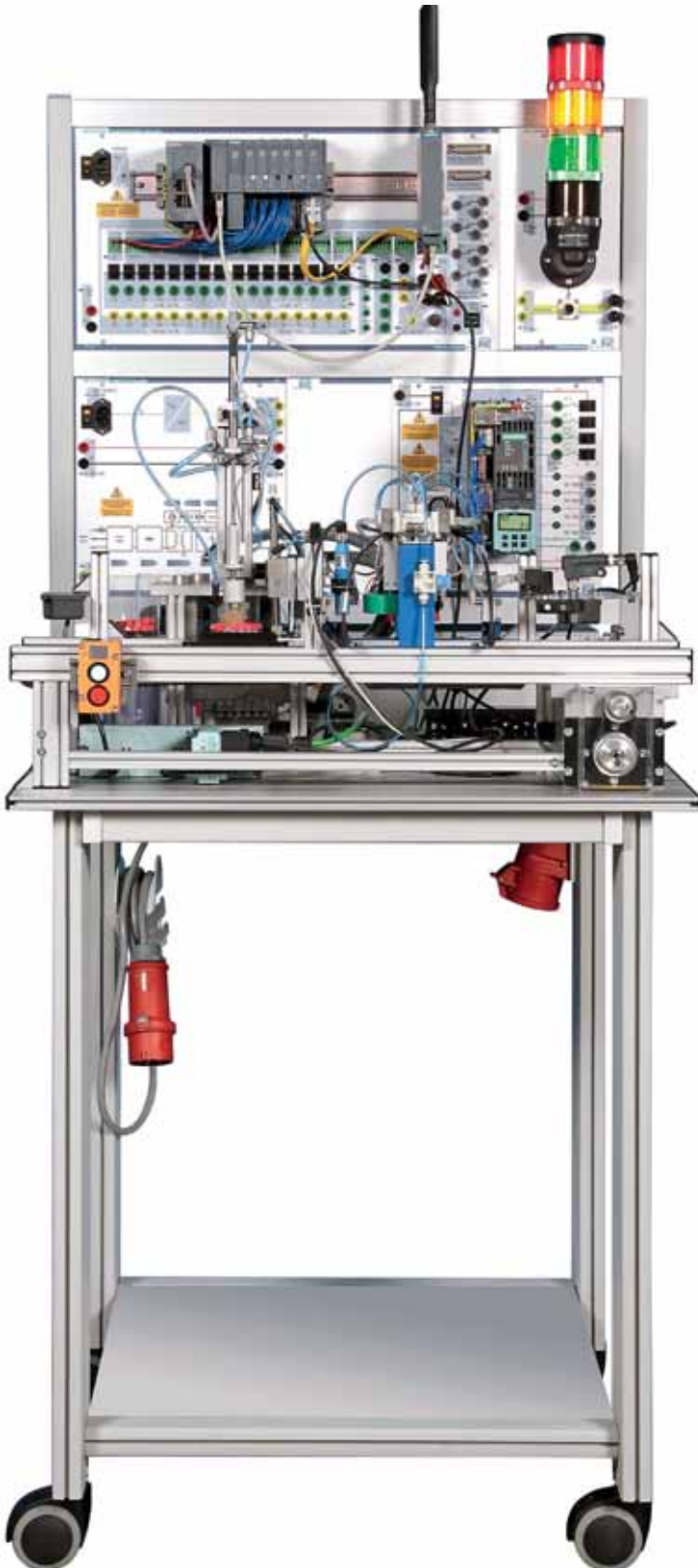
From semi-finished part to product configuration





CPS-i40[®] – PRODUCTION AND QUALITY CONTROL

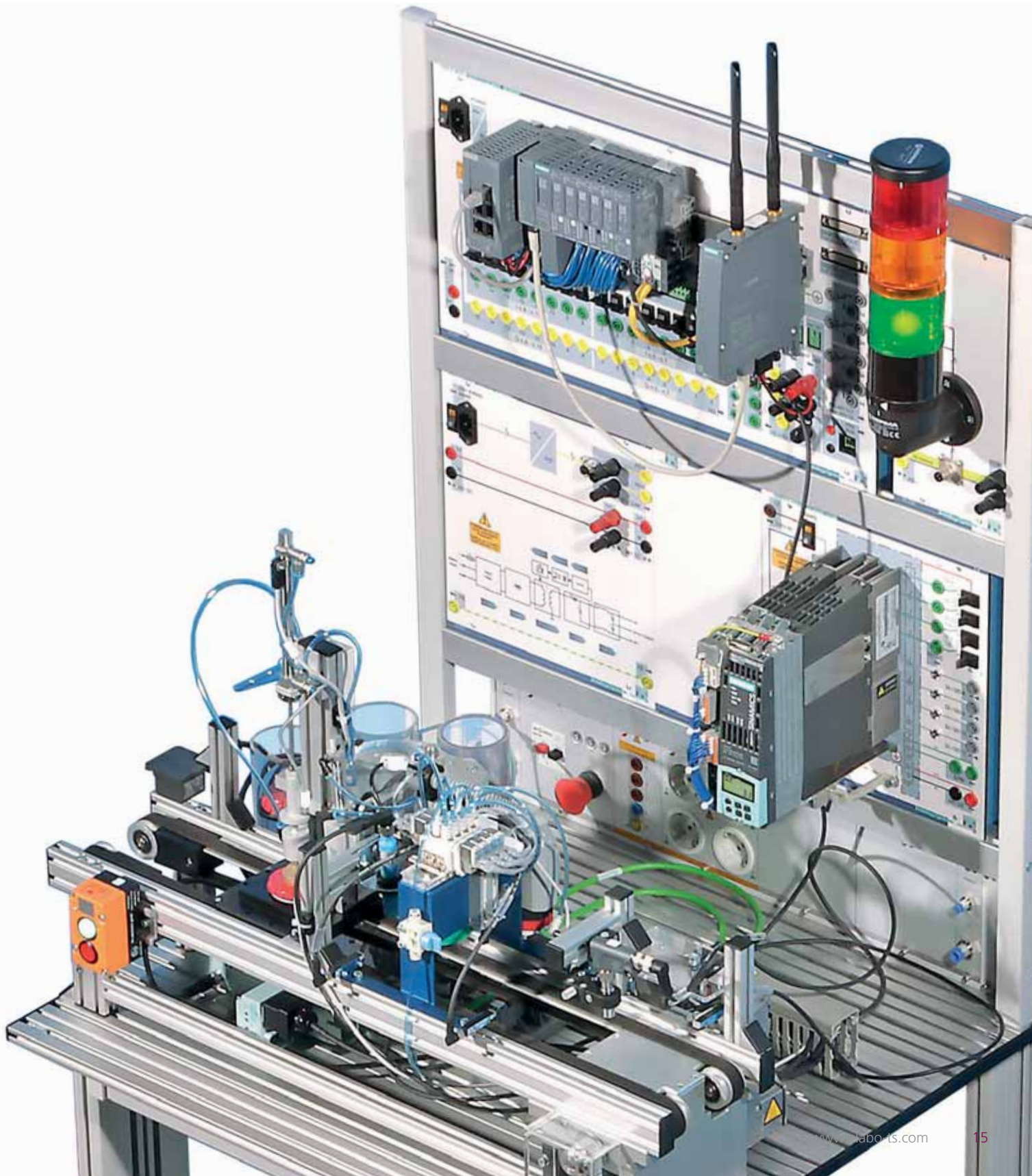
Material handling / Assembly / Supervision



› PROFINET®

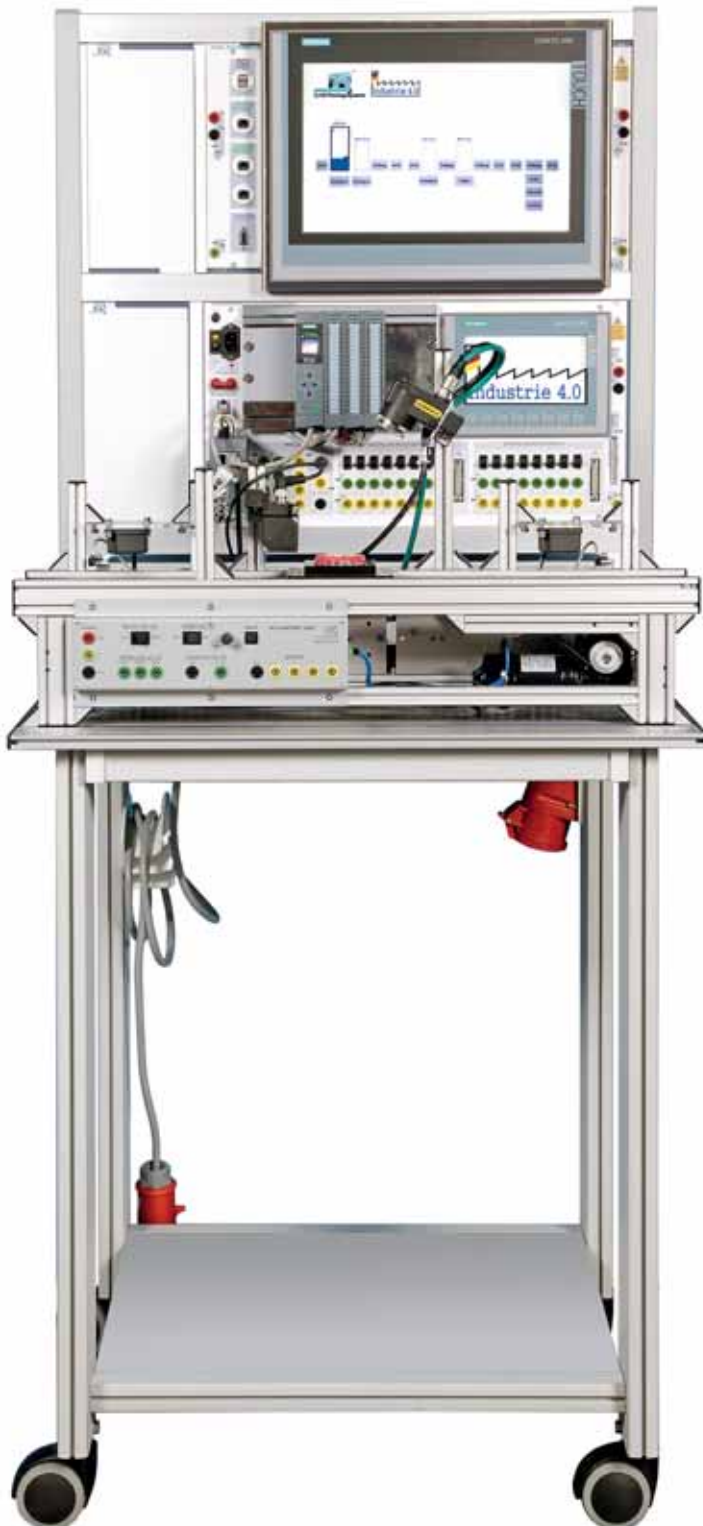
› W-LAN

› Decentral Periphery



CPS-i40[®] – QUALITY CONTROL VISION-TECH

Individual Production Monitoring



› Colour Sensor

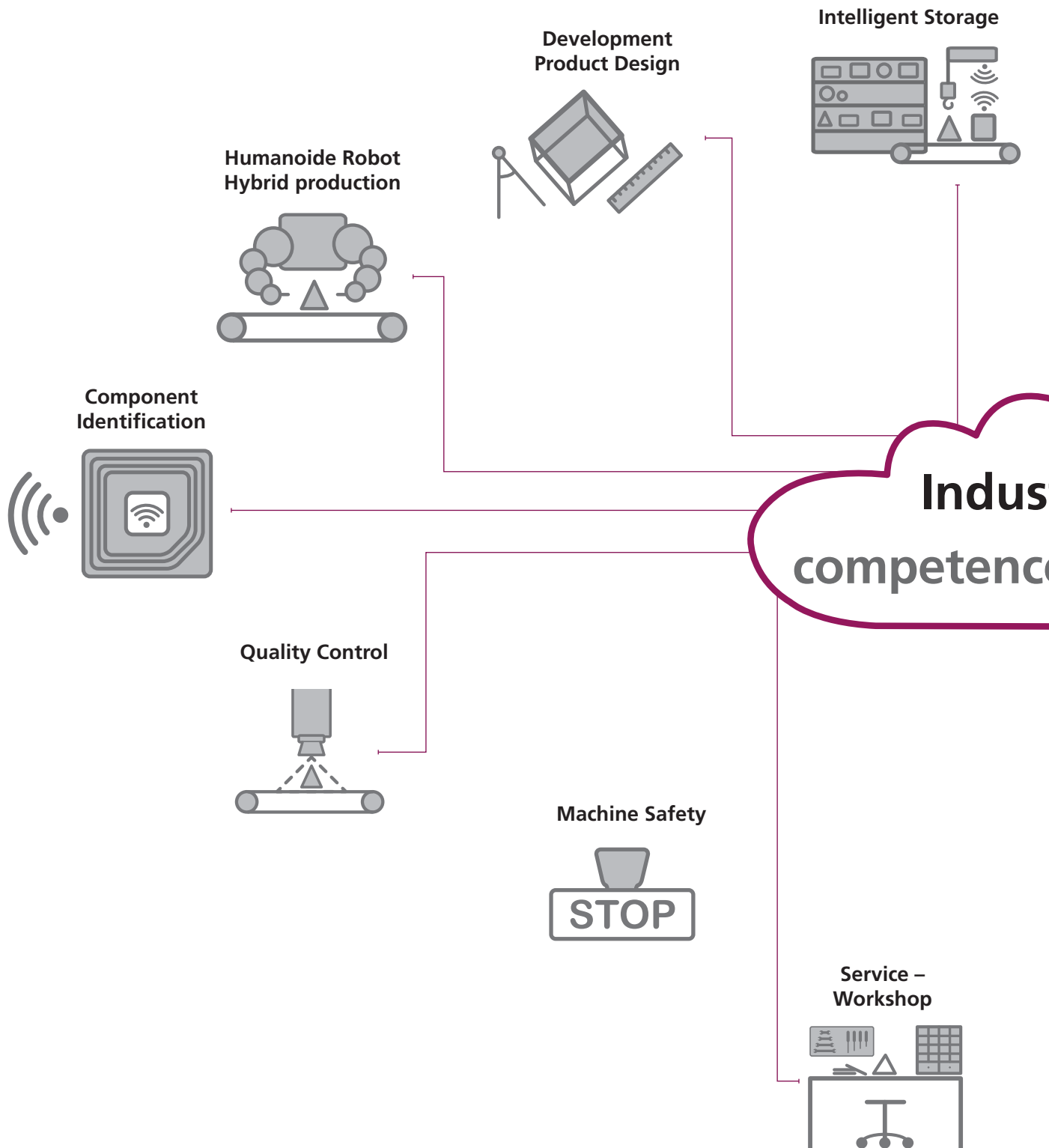
› RFID

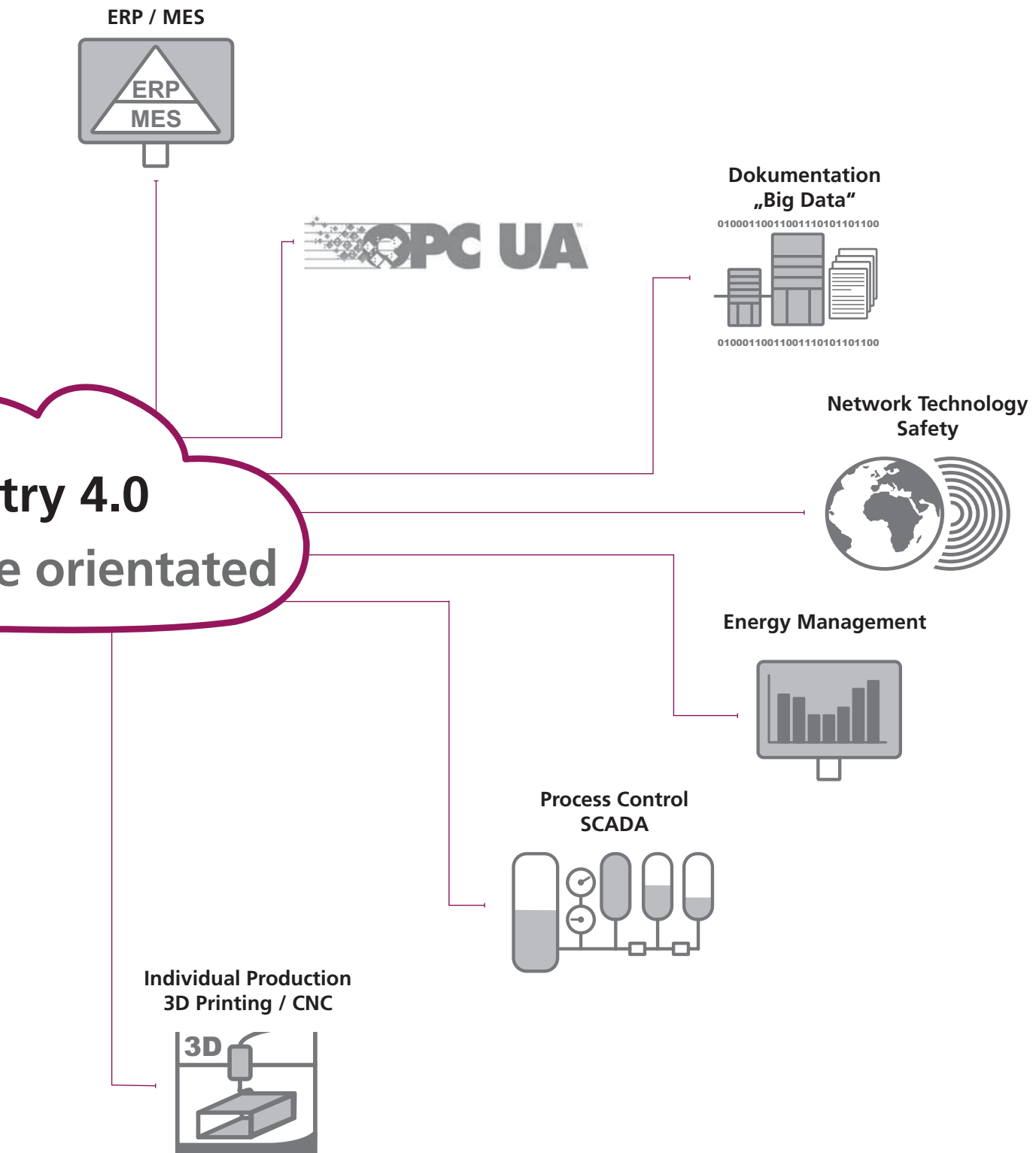
› Camera



CPS-i40® – INDUSTRIE 4.0

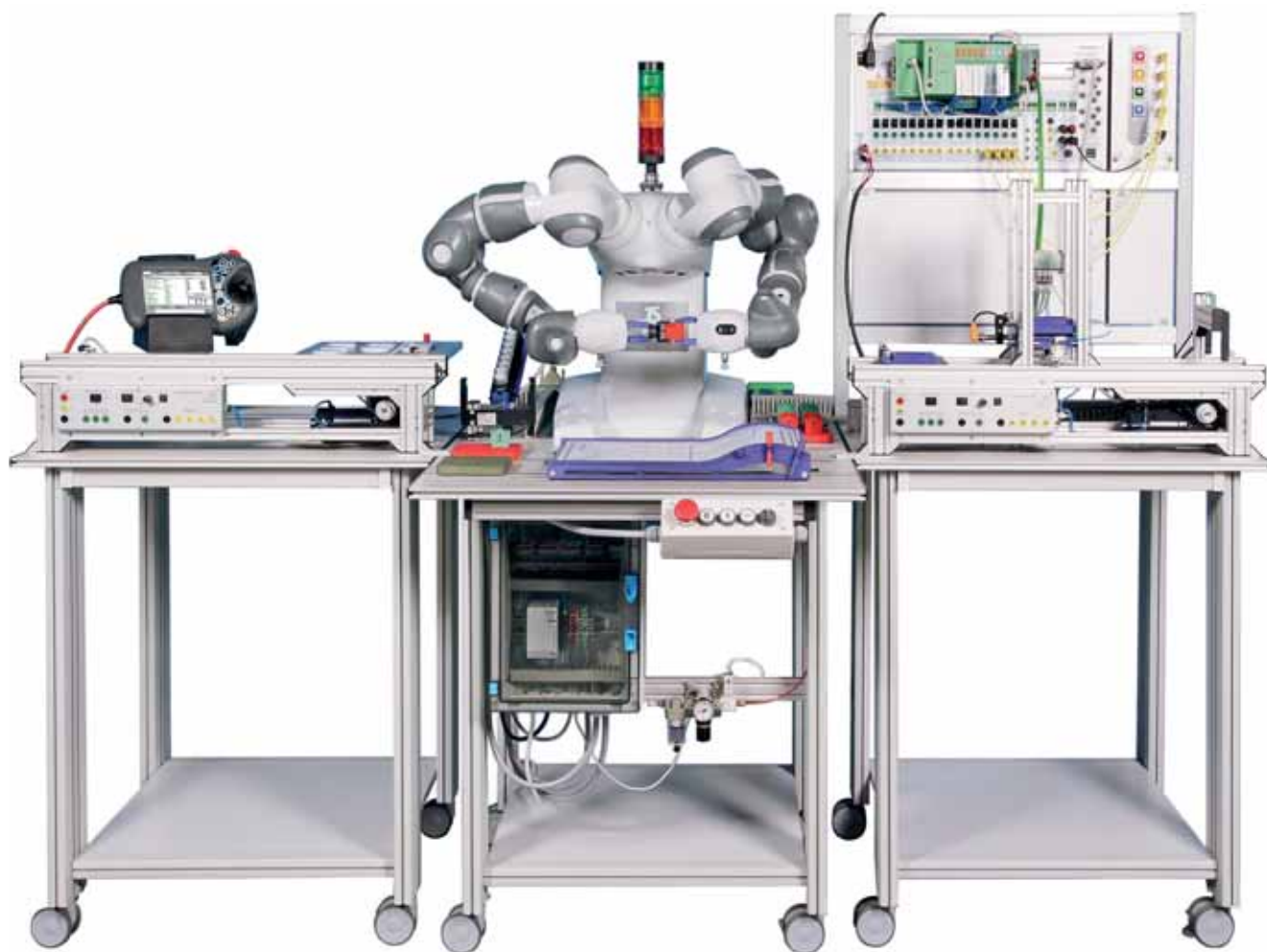
CPS – Cyber-Physical-Systems





CPS-i40® – FUTURE BETWEEN MAN AND ROBOTS

Collaborative two-arm robot



Simply genius – modular and safe

Robots are applied in industrial settings all over the world and represent a new era of really collaborative industrial robots.

Programming has been simplified for the user to a great extent.

"Programming by control" allows to enter the individual movements or steps by moving the arms and subsequent saving of individual motion sequences. The robotic system can imitate the motions carried out by the user time-efficiently and is therefore programmed intuitively. Join in robotic programming of tomorrow already today.

As a matter of course, the standard RAPID programming is supported, too.

The unique design of the two-arm robot guarantees "inherent safety". The arms are padded and there aren't any barriers or housings etc. required. So, men and robot can work together hand in hand.

Collaborative robots will play an important role in machine processing when it comes to industrial revolution „Industry 4.0“ or „Internet of things“.

Invest in the future and ensure optimum preparation of your participants for future challenges in practical work by using our training systems.



CPS-i40® – ROBOTIC STATION – TWO-ARM ROBOT

Collaborative two-arm robot with practising area



Consisting of

- › Car for mechatronic engineers
- › Switchboard with power supply
- › Two-arm robot, collaborative with right and left gripping hand
- › 2 storage modules for contacts
- › Material storage button
- › Pneumatic service unit

Technical Data

- › Operating voltage 230 AC
- › Collaborative two-arm robot
- › Left gripping hand with camera
- › Right gripping hand
- › Integrated control
- › Handheld terminal Flexpendant® Color with touchscreen
- › Device Net-Master
- › Profinet Slave
- › PC Interface
- › 2 x 7 axes
- › 24 digital in - and outputs
- › repeat accuracy 0.02 mm

No.	Designation
1	Collaborative two-arm robot
2	Training station

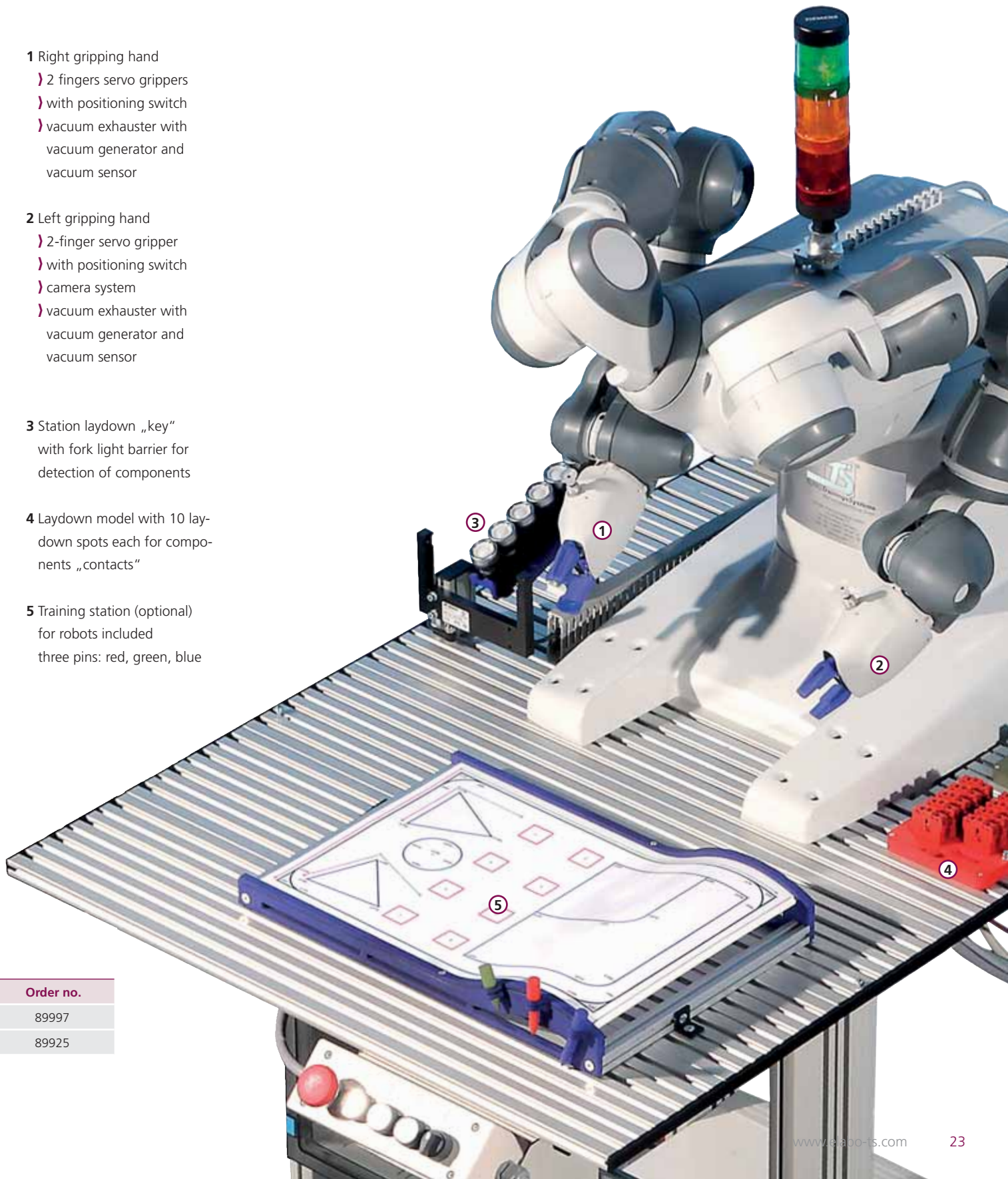
- 1 Right gripping hand
 - › 2 fingers servo grippers
 - › with positioning switch
 - › vacuum exhauster with vacuum generator and vacuum sensor

- 2 Left gripping hand
 - › 2-finger servo gripper
 - › with positioning switch
 - › camera system
 - › vacuum exhauster with vacuum generator and vacuum sensor

- 3 Station laydown „key” with fork light barrier for detection of components

- 4 Laydown model with 10 lay-down spots each for components „contacts”

- 5 Training station (optional) for robots included three pins: red, green, blue

**Order no.**

89997

89925

CPS-i40[®] – ROBOT STATION – TWO-ARM ROBOTER

Option: Application "Programming by operating"



Advantages of the system

- › No barriers, no housing, no zones necessary
- › Safety due to padded arms
- › Simple usage:
„Programming by operating“
- › Comprehensive options for communication
- › Double arm - multitasking
- › Integrated Vision –
Camera in gripper of robot
- › Certified safety

Technical data

- › see page 22



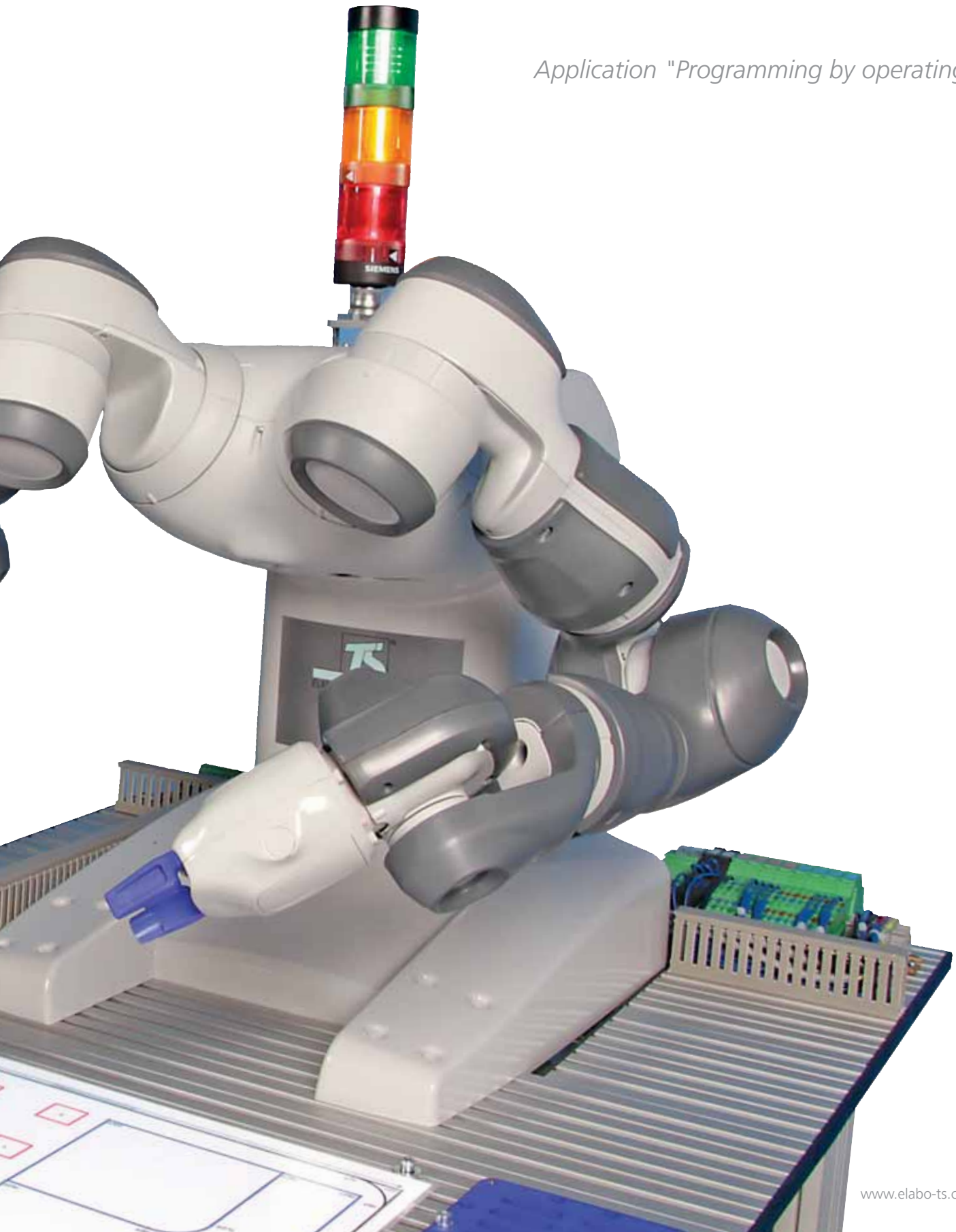
Programming by operating

- › Simple usage
- › Programming by operating simplifies programming
- › Integrated vision can handle unsorted parts
- › Communication cables are not needed for wireless tablet programming
- › Possible standard RAPID programming like other robot work





Application "Programming by operating"



CPS-i40® – ROBOTIC CELL SafetyCUBE® – PROFESSIONAL

Flexible – stand-alone or fully integrated



1



Learning objectives

- › Mounting, installation, operation and programming robot handling systems
- › Analysing motion sequences, determining reference and drive points, optimising trajectories
- › Installing, programming and testing of task-specific control and safety concepts – motion sequences with linear interpolation, joint interpolation and circular interpolation
- › Programming of trajectory movements
- › Use of different effectors (gripper, exhauster) and tools

Technical data

- › Operating voltage: 230 V 50 / 60 Hz
- › Number of axes: 6
- › Maximum lifting capacity: 3 kg (4 kg with vertical wrist)
- › Maximum speed: 6200 mm/s
- › Repeatability: ± 0.01 mm
- › FlexPendant® Color with touchscreen

- › Control unit with Ethernet interface
- › 32 digital in- and outputs
- › Emergency stop and light screen
- › Optional: Profinet interface
- › Optional: integrated vision with high-resolution camera system

No.	Designation	Order no.
1	6-Axes Robot cell Safety Cube® 3 kg	89991
2	6-Axes Roboter station PROFINET-Slave Interface	89992
3	6-Axes Roboter station PROFINET-Slave Interface and Interated Vision	89993

**Optional
Profinet interface**
) with Profinet slave interface



2

**Optional
Profinet interface
and Integrated Vision**
) with Profinet slave interface
and Integrated Vision with
(High resolution camerasystem)



3



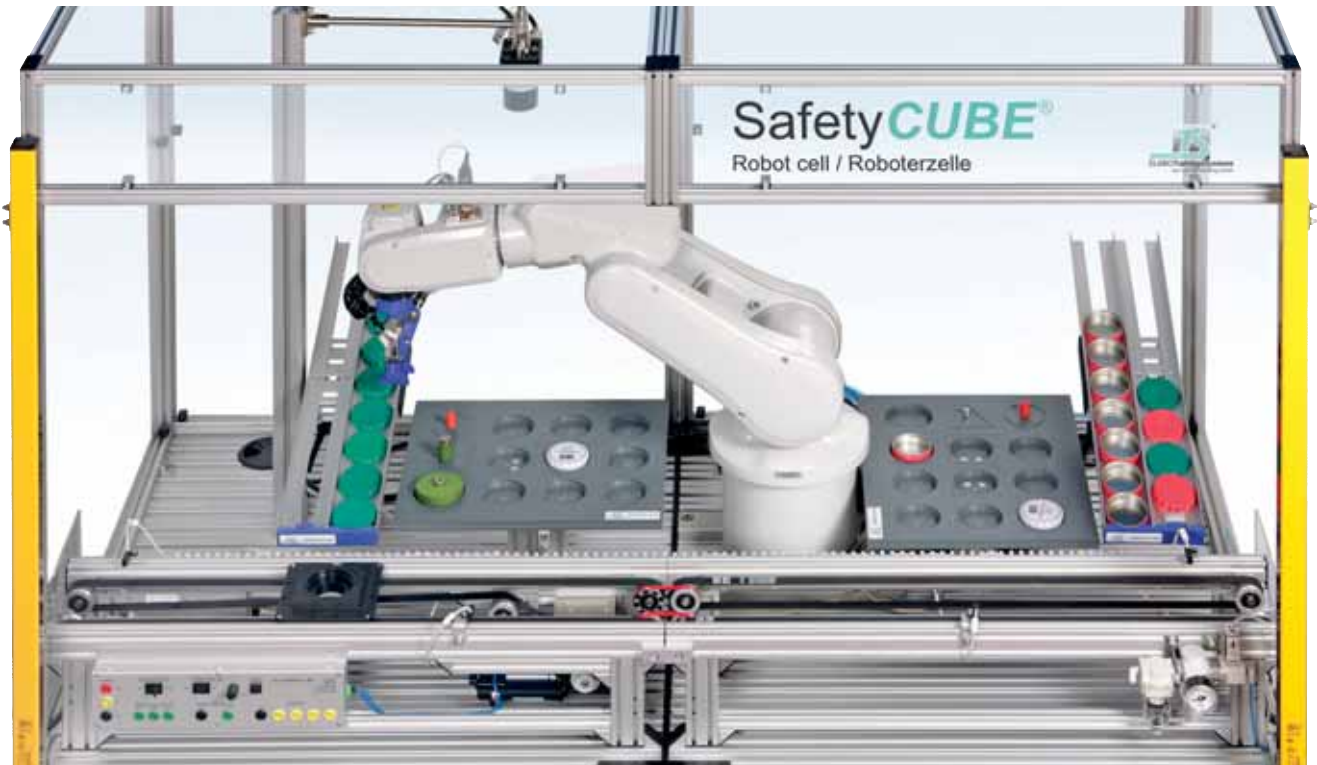


CPS-i40® SafetyCUBE®



CPS-i40® – ROBOT STATION SafetyCUBE® – ADVANCED I

Flexible Adaptation to Applications I



1

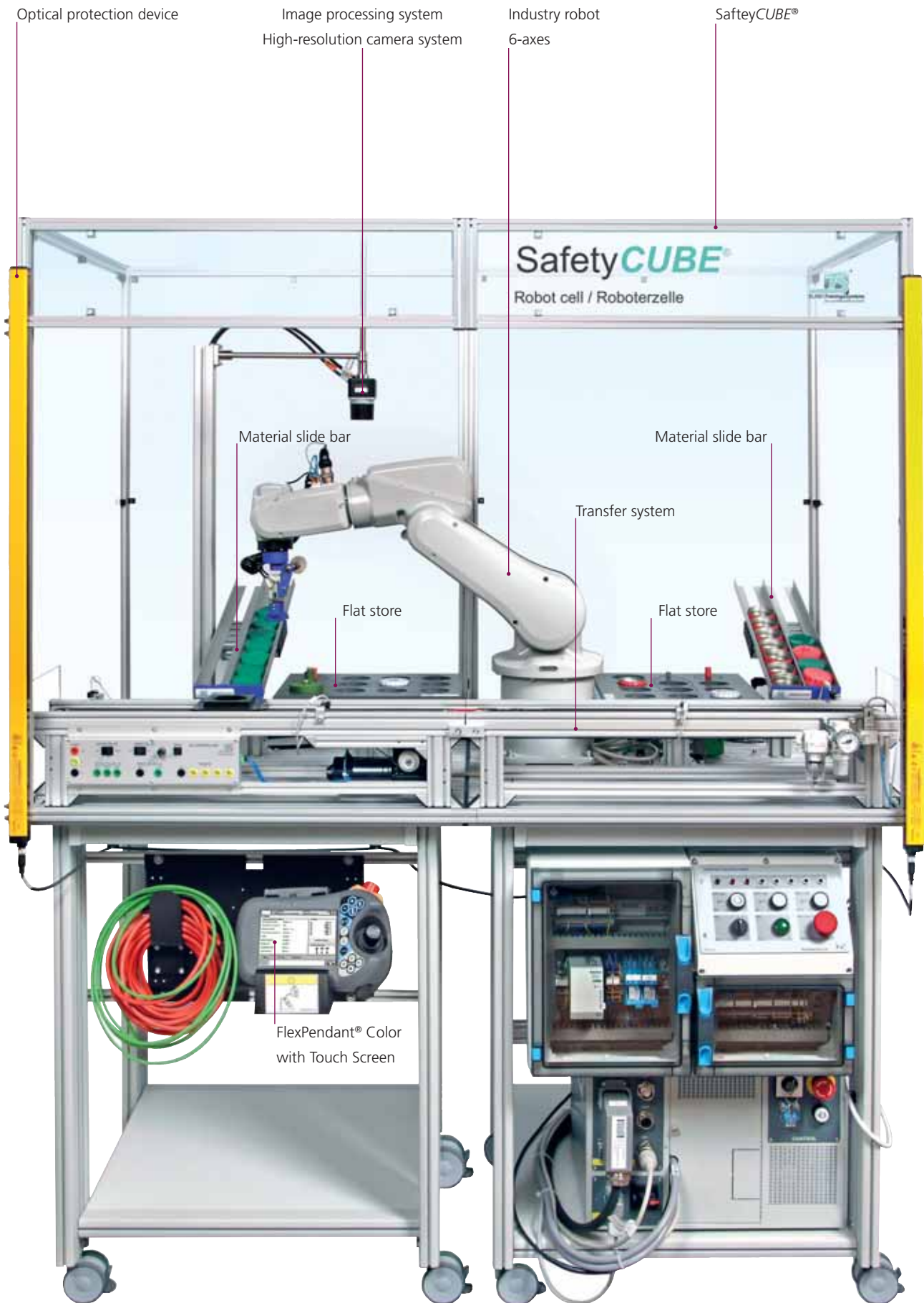
Learning objectives

- › Mounting, installation, operation and programming robot handling systems
- › Analysing motion sequences, determining reference and drive points, optimising trajectories
- › Installing, programming and testing of task-specific control and safety concepts - Motion sequences with linear interpolation, joint interpolation and circular interpolation
- › Programming of trajectory movements
- › Use of different effectors (gripper, exhaustor) and tools

Technical Data

- › Operating voltage: 230 V 50 / 60 Hz
- › number of axes: 6
- › maximum lifting : 3 kg (4 kg vertical wrist)
- › maximum speed: 6200 mm/s
- › repeatability: ± 0,01 mm
- › FlexPendant® Color with touchscreen
- › Control unit with Ethernet interface
- › 32 digital in- and outputs
- › emergency stop and light screen
- › Profinet interface
- › Integrated Vision High-resolution camera system
- › Software extension – Multitasking

No.	Designation	Order no.
1	6-Axes Robot station 3kg advanced I	89996



CPS-i40® – ROBOT STATION SafetyCUBE® – ADVANCED II

Individual configurations



1

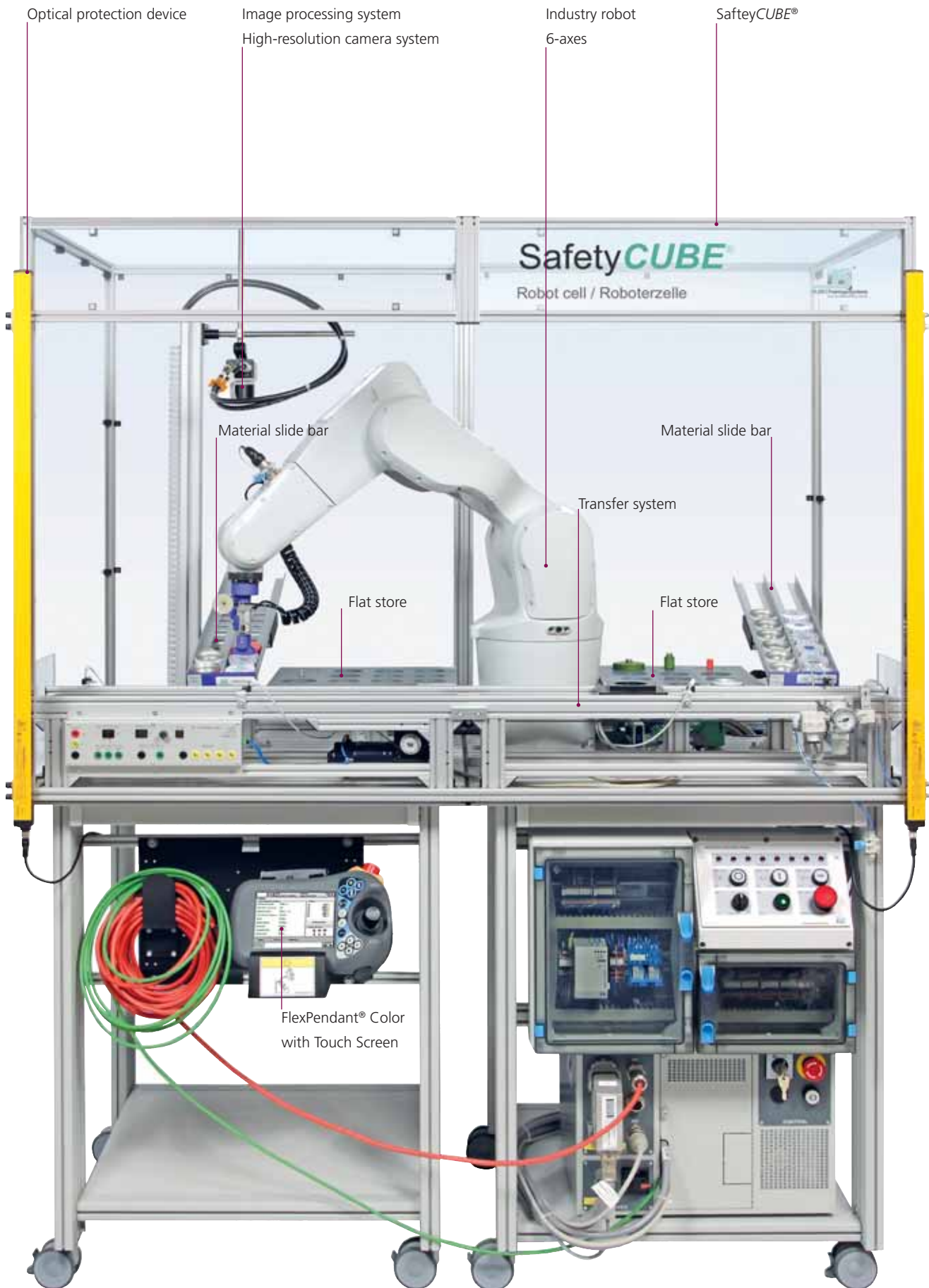
Learning objectives

- › Mounting, installation, operation and programming robot handling systems
- › Analysing motion sequences, determining reference and drive points, optimising trajectories
- › Installing, programming and testing of task-specific control and safety concepts – Motion sequences with linear interpolation, joint interpolation and circular interpolation
- › Programming of trajectory movements
- › Use of different effectors (gripper, exhauster) and tools

Technical Data

- › Operating voltage: : 230 V 50 / 60 Hz
- › Number of axes: 6
- › Maximum lifting force: 7 kg
- › 700 mm radius of cone of influence
- › Maximum speed: 7300 mm/s
- › Repeatability: ± 0,02 mm
- › FlexPendant® Color with touchscreen
- › Control unit with Ethernet interface
- › 32 digital in- and outputs
- › Emergency stop and light screen
- › Profinet interface
- › Integrated Vision high-resolution camera system
- › Software extension – multitasking

No.	Designation	Order no.
1	6-Axes Robot station 7kg advanced II	89995



QUALITY IS THE MEASURE OF ALL SUCCESS

Inspiring technologies

ELABO **TrainingsSysteme** stands for high quality and outstanding flexibility. This means that machines made by ELABO **TrainingsSysteme** are convertible, they can – thanks to the modular conception and the versatile range of accessories – be quickly and efficiently adapted to changing requirements and extended almost without limits.

Our high quality standards do not simply refer to the products made by ELABO **TrainingsSysteme**, but particularly to the training quality achieved by customers using ELABO **Trainings-Systeme** products. This also includes the process quality: ELABO **TrainingsSysteme** supports training procedures that are as troublefree as possible.

The solutions from ELABO **TrainingsSysteme** can be adapted to individual customer requirements to a great extent. Customers of ELABO **TrainingsSysteme** are supported and accompanied in the successful realisation of their training objectives by a comprehensive range of services.





WE ARE HAPPY TO HELP

Information and Consulting



We accompany you and are at your side with active advice.

Whether you need information, or some advice in advance of making an investment, or have questions regarding the daily use of the products:

Contact us – we would be happy to help:

ELABO TrainingsSysteme GmbH
Service-Center
Im Hüttental 11
85125 Kinding / Germany

Tel.: + 49 (0) 84 67 / 84 04 - 0
Fax: + 49 (0) 84 67 / 84 04 44

sales@elabo-ts.com
www.elabo-ts.com



Customer-oriented solutions

- › Presentation, product demonstrations and on-site consultancy
- › Support in the selection of educational systems according to the syllabus requirements
- › Matching of the training systems to customer requirements
- › Working out room concepts
- › Designing ergonomic workstations

Experience

- › Comprehensive range of innovative products
- › Systems and solutions from our own (in-house) production
- › Development and design, technical training systems
- › Quality right from the consultancy up to delivery and onward
- › Trainer seminars / In-house training
- › References world-wide
 - Industrial educational institutions
 - Vocational schools / technical schools
 - Chambers of crafts
 - Technical colleges / Universities

We support you

- › Installation and commissioning of the systems on-site
- › Technical support
- › Warranty and repairs
- › Instruction and training
- › Further education, training, seminars
- › Comprehensive product documentation
- › Courseware for instructors and trainees

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