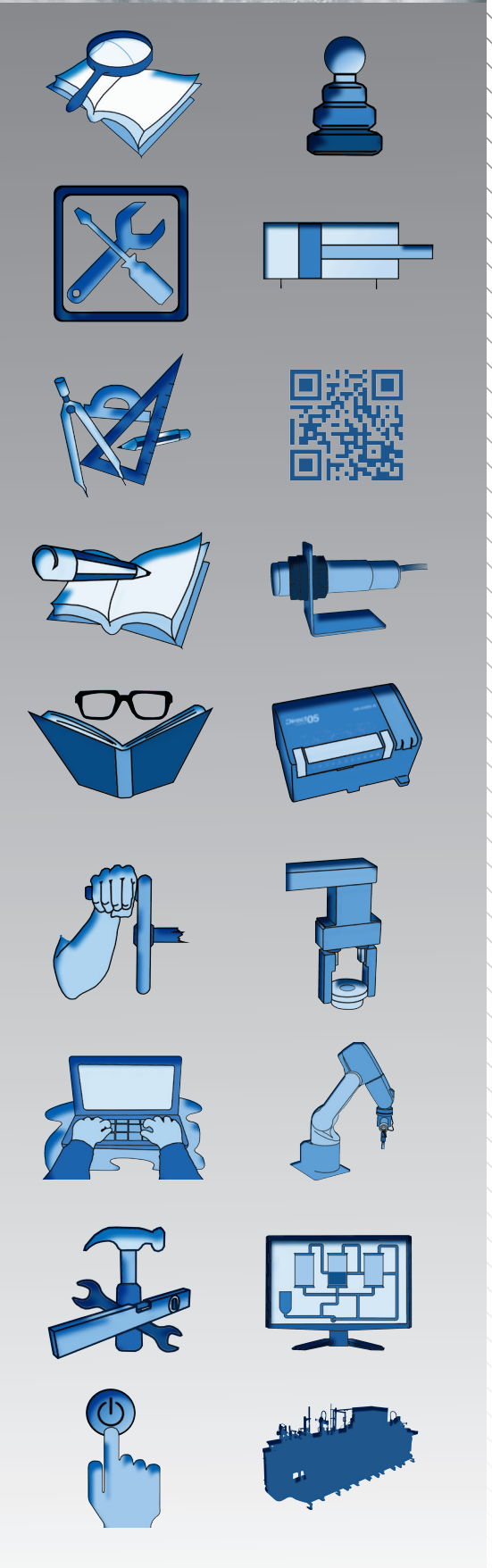


SMC®

INTERNATIONAL TRAINING

training

Introduction

We are pleased to present the new SMC International Training catalogue, issued by the educational division of SMC Corporation. Vast experience in the fields of industry and education has led us to develop a wide range of products and services to meet the need for skills training in industrial automation.

In the coming chapters, you will come across skills training systems to meet a wide variety of technical training requirements.

Didactic equipment: seventeen product families, each of them offering multiple possibilities and different configurations to develop skills in automated industrial automated technologies.

eLEARNING courses: sixteen courses imparting knowledge on the basic theory of these technologies.

Certification: a complete overall certification programme endorsed by the SMC Competence Center, a flexible concept with an international reputation.

The format of this new catalogue includes written and graphical information on all products with further details on our updated website: www.smctraining.com

We hope that this tool will meet its mark: providing you with the right solution for your industrial automation training requirements.

Do not hesitate to contact us. We will be delighted to help you.

Best regards,

Mariano Carreras
Manager SMC International Training

SMC®
INTERNATIONAL TRAINING

Worldwide leading experts in pneumatics

30% of the world market share

SMC Corporation is world leader in producing and supplying automation and pneumatic components, with over 50 years experience, working in over 75 countries.

Forbes

One of the 100 most innovative companies by Forbes

THE EDUCATIONAL DIVISION OF SMC CORPORATION

INTERNATIONAL TRAINING

Taking **INDUSTRY**'s needs as their benchmark, our products target universities, vocational training centres and technical training centres, plus major companies who provide their own training internally.

ISO 9001

What do we offer?

Training equipment

eLEARNING

Certification

automation

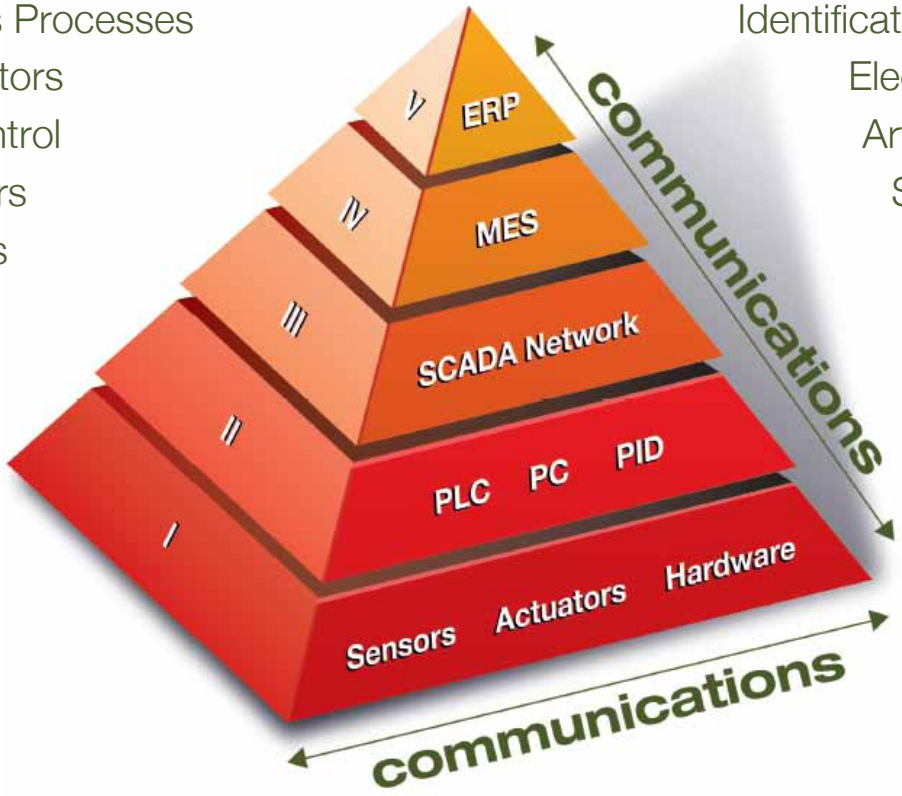
Since the beginnings of industry, the automation of manufacturing and production processes has constantly evolving. This evolution is made possible due to the integration of classic technologies like mechanics and electricity with other more modern ones such as electronics, computer science, communications, etc. playing a greater part day by day.

This integration of technologies is represented well by using a “Pyramid of Automation”, which includes the five technological levels which can be considered in an industrial environment. The technologies interrelate, both within each level and between the different levels by using industrial communications.

TECHNOLOGIES

Programmable Controllers
Continuous Processes
Electric Motors
Motion Control
Manipulators
Pneumatics
Sensors
M.E.S.
E.R.P.

Industrial Communications
Identification systems
Electrical panel
Artificial Vision
SCADA/HMI
Hydraulics
Robotics
Vacuum

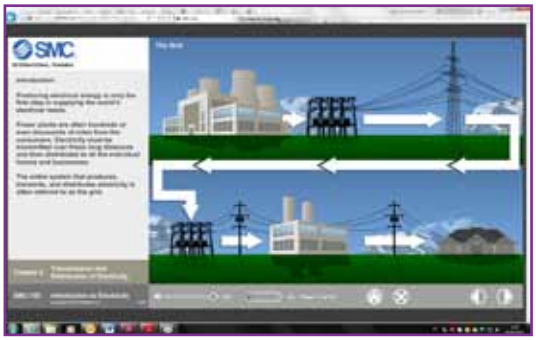


- The first level or “field level” comprises the physical devices existing in industry such as actuators and sensors.
- The second level or “control level” includes logical devices such as PCs, PLCs, PIDs, etc.
- The “supervisory level” (third level) corresponds to control and data acquisition systems (SCADA).
- The manufacturing execution systems or MES are at a higher level or “planning level”.
- The top of the pyramid (“management level”) is comprised of the company’s integrated management system (ERP).

know and know how to...

INTERNATIONAL TRAINING

@eLEARNING-200



Certification

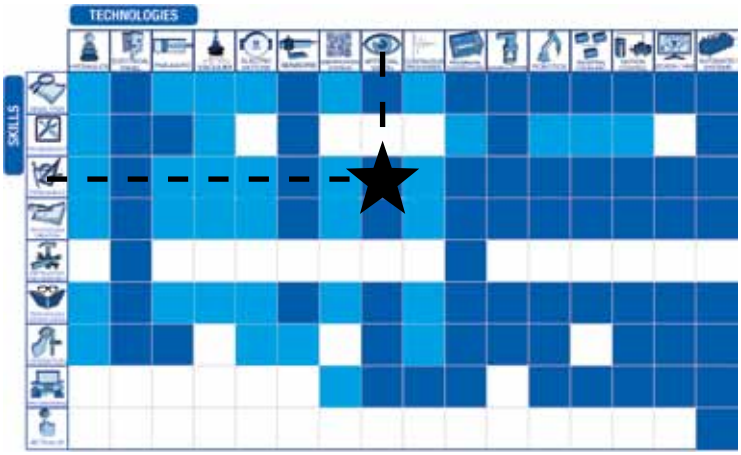
KNOW

Knowledge of the basic theory in the technologies

eLEARNING-200 courses

SMC-100 – Introduction to industrial automation
SMC-101 – Principles of pneumatics
SMC-102 – Introduction to electricity
SMC-103 – DC electricity
SMC-104 – AC electricity
SMC-105 – Solid state
SMC-106 – Introduction to wiring
SMC-107 – Introduction to electric motors
SMC-108 – Sensors technology
SMC-109 – Programmable controllers
SMC-110 – Process controls
SMC-111 – Hydraulics / electrohydraulics
SMC-113 - Robotics

DIDACTIC EQUIPMENT



KNOW HOW TO

Developing skills in applied technologies

SKILLS

Analysis
Designing
Operation
Programming
Troubleshooting
Installation and assembly
Setting up/Commissioning
Tech documentation creation
Tech documentation understanding

Certification

Information at your fingertips!

www.smctraining.com

Products...

...News

Agenda...

Instructor portal

News, events, services and pedagogic resources to make it easier to prepare classes.

Student portal

Enter and enjoy tools that will ease your daily work.

Have you done a job or a project that you would like to publish and share?
We'll give you the chance!

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The place where you can consult and download information* on your products:

Warranty

Technical diagrams

Technical documentation

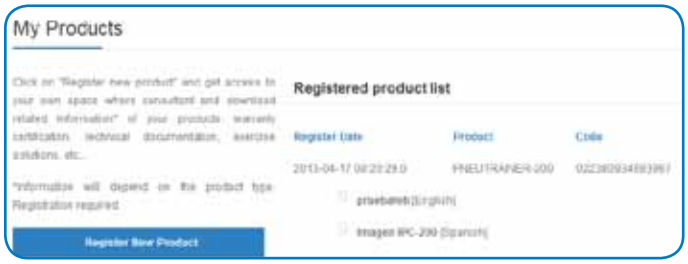
Answers to the exercises

And much more...

**The type of information will depend on the product.*

Product Configurator

Thanks to this application that will guide you through the whole process, you will be able to configure the products and accessories you need entirely as you please.



Enter My Products and quote the code included in the documentation!

022380934993967

Ask for a commitment free quotation with just one click!

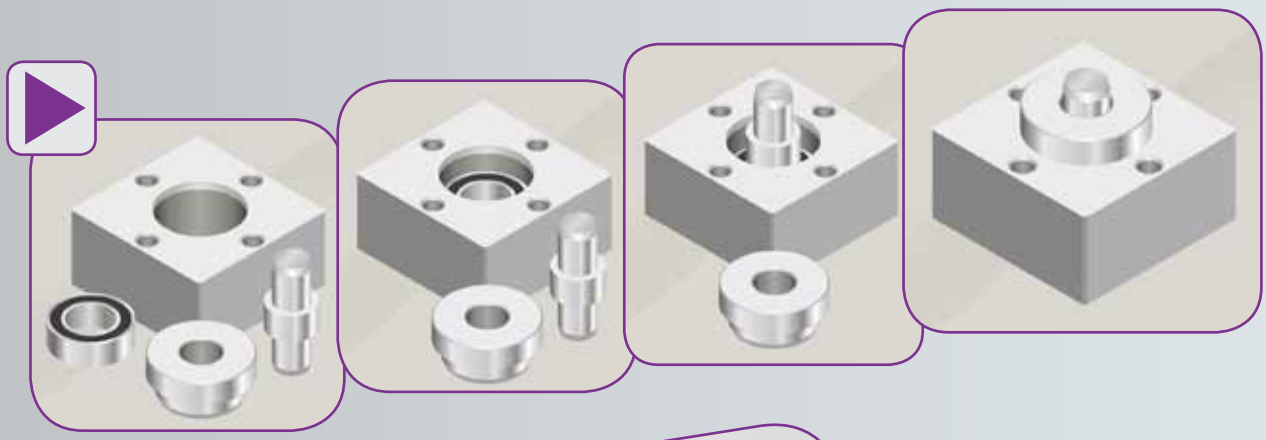
INTERNATIONAL TRAINING

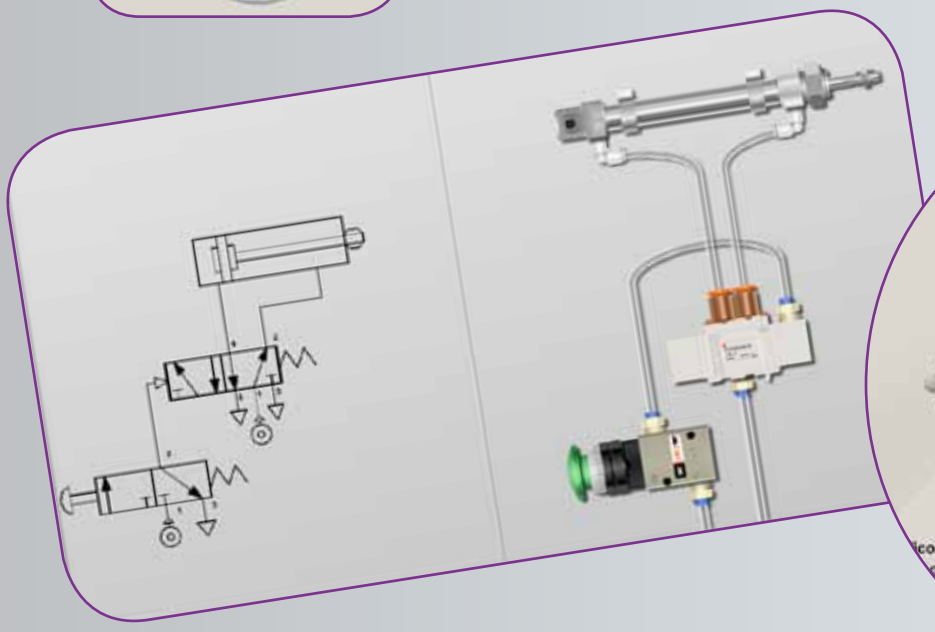
eLEARNING-200

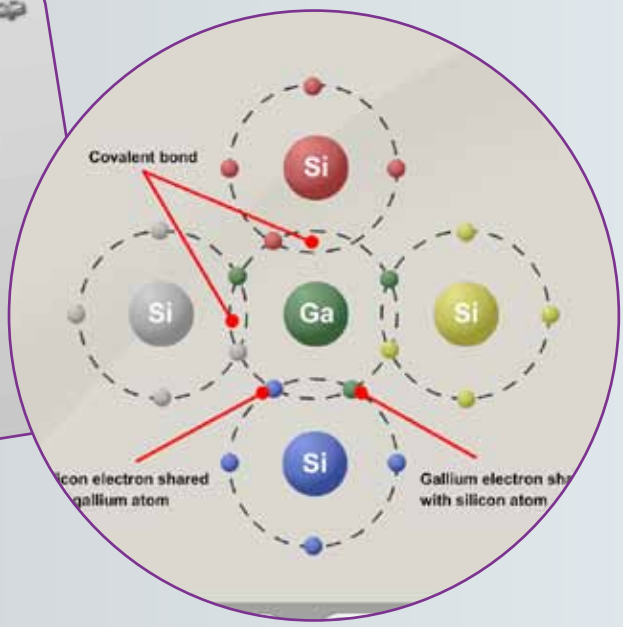
The perfect theory companion

Access to obstacle-free knowledge

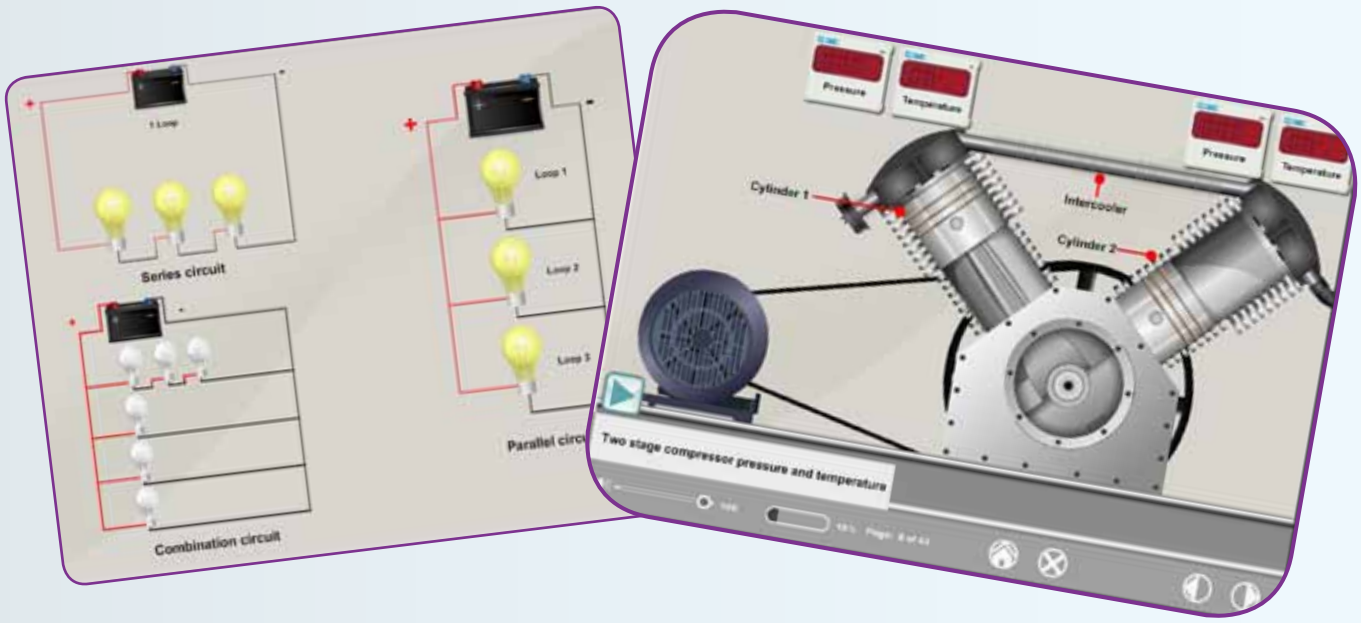
The best way of acquiring underpinning knowledge of automation technologies to support skills development







SMC
INTERNATIONAL TRAINING



Using new technologies intelligently means that knowledge can be picked up EASILY and FLEXIBLY.

Delve into the fascinating world of automation technologies with an attractive, new learning system

Find out about our eLEARNING courses @

eLEARNING-200 - The perfect theory companion

eLEARNING-200 is a flexible learning system where knowledge can be acquired dependant on the user's available time and requirements.

Users have the option to take actual classes and additional Internet courses when this suits them best.

To be able to develop different technology skills, theoretical knowledge must be acquired first. SMC International Training presents the eLEARNING-200 course programme: the perfect complement to our didactic equipment.

Access and Use

Through SMC International Training's learning management system (LMS), users can get connected and work through the different chapters and tests to complete these courses.

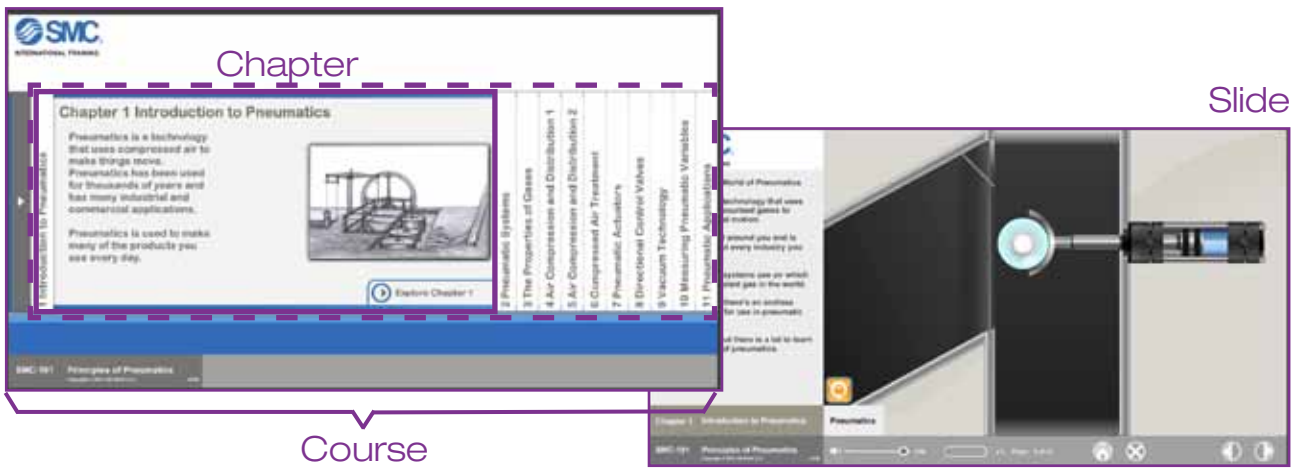
Access and use of the eLEARNING-200 courses, once purchased, is as simple as:

- Access the LMS and enter the Username and Password provided.
- Browse through the different chapters of the purchased courses.
- Each chapter ends in a TEST, validating knowledge acquisition.
- Once all course chapters have been completed, the user receives a CERTIFICATE.

Structure

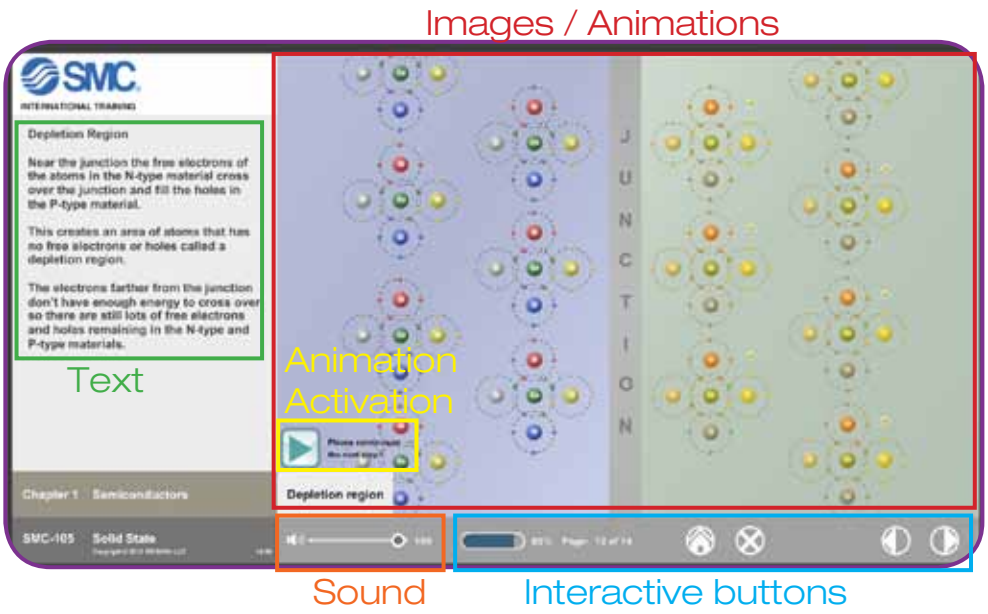
All eLEARNING-200 courses are structured as follows:

Course → Chapter → Slide



General characteristics

eLEARNING-200 comprises interactive courses, including text and images, in addition to a wide range of animation.



Language and licence type

eLEARNING-200 comprises a total of 13 courses, in different languages, with different licence types, varying according to duration and payment method. Each licence provides access to all the available courses. Each user requires a licence.

Language

eLEARNING-200 comes in two languages:

- ENGLISH
- SPANISH

**Other languages: Enquire*

Licence type

It is possible to purchase three different types of eLEARNING-200 licence, dependant on customer requirements. Licences can be SINGLE USE, ONE YEAR or TEN YEAR.

- SINGLE USE - The licence is valid for a single user, it is not reusable. It will be valid for one year once the user enrolls the course. Non un-enroll option.
- ONE YEAR - The licence is valid for a year. Valid for one user per licence. Reusable*.
- TEN YEARS - The licence is valid for 10 years. Valid for one user per licence. Reusable*.

** Reusable: it is possible to unenroll from the courses so that a new user could be enrolled again. This process can be repeated as many times before expiration of the licence.*

eLEARNING-200 - Order reference configuration

The eLEARNING-200 licence part number depends on the following parameters: language, licence type, course and number of licences required.

Each user requires a licence. Between 1 and 1000 licences can be order or an unlimited number.

Licence TYPE	
U	Single Use
Y	One Year
T	Ten Years

LANGUAGE	
0	Spanish
1	English

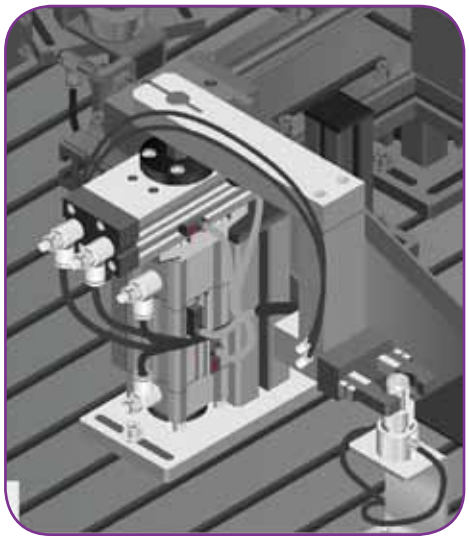
SAI _ _ 20- _ _ _

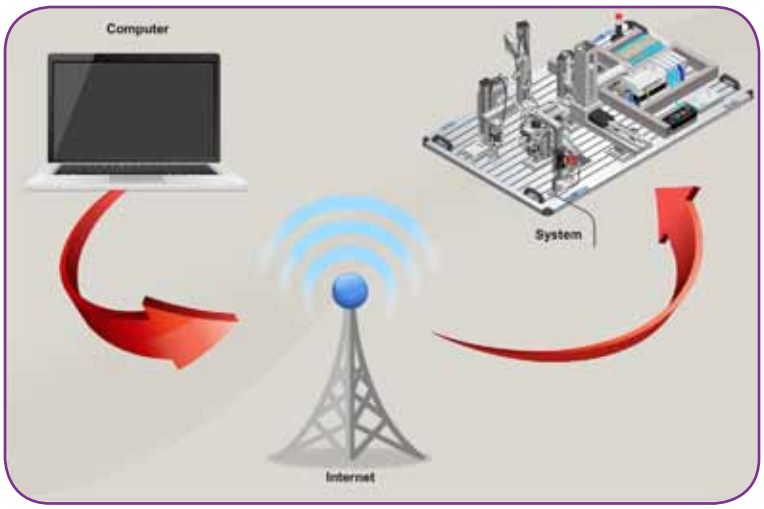
AVAILABLE COURSES PACK
SMC-100 – Introduction to industrial automation
SMC-101 – Principles of pneumatics
SMC-102 – Introduction to electricity
SMC-103 – DC electricity
SMC-104 – AC electricity
SMC-105 – Solid state
SMC-106 – Introduction to wiring
SMC-107 – Introduction to electric motors
SMC-108 – Sensors technology
SMC-109 – Programmable controllers
SMC-110 – Process controls
SMC-111 – Hydraulics / electrohydraulics
SMC-113 - Robotics

NUMBER OF LicenceS	
- - -	Unlimited
001	1 licence
002	2 licences
003	3 licences
...	...
010	10 licences
011	11 licences
012	12 licences
...	...
101	101 licences
102	102 licences
...	...
999	999 licences
000	1000 licences

SMC-100 – Introduction to industrial automation

The SMC-100 course introduces industrial automation, widening the user's knowledge on the importance, benefits and energy sources involved in these systems. It explores a specific assembly process to understand generic automated systems.



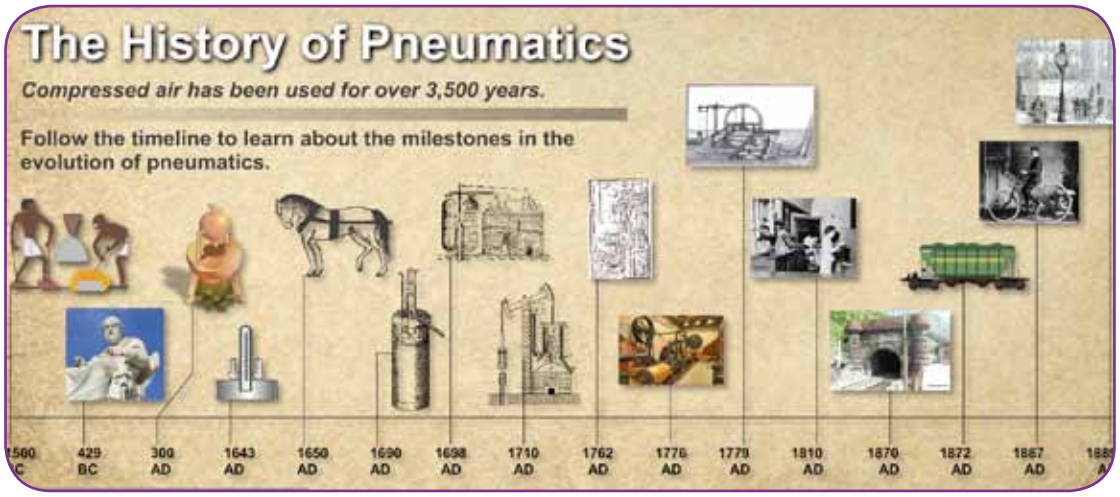


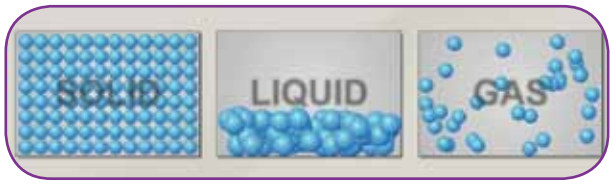
CHAPTERS

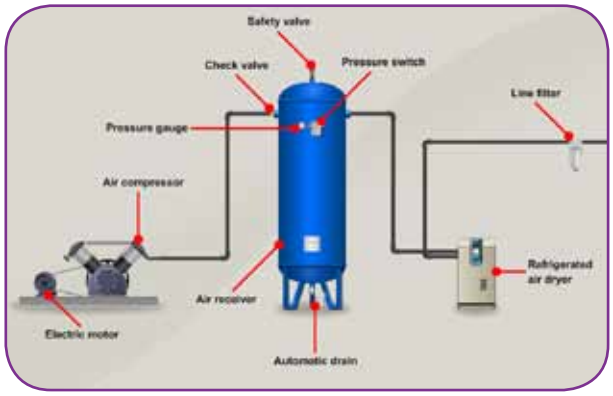
- Introduction to Automation
- Automated Process
- Automated System

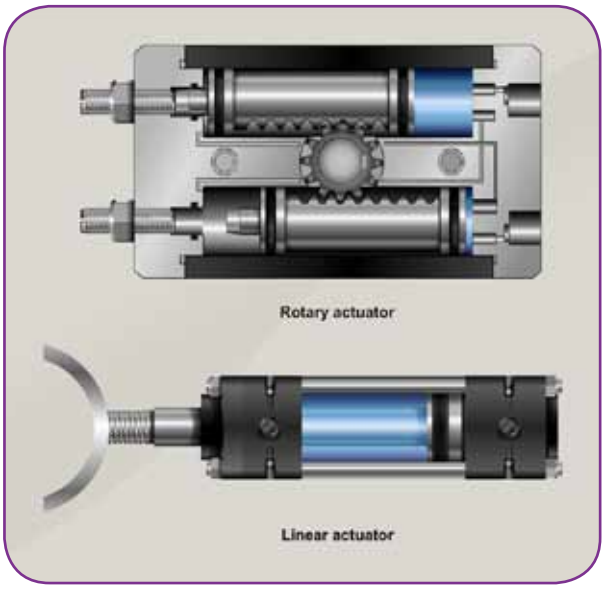
SMC-101 – Principles of pneumatics

This course introduces users to the basic principles, laws and components used in pneumatic / electropneumatic systems. It covers the types, operating principles and symbols for the different components used in industrial applications.





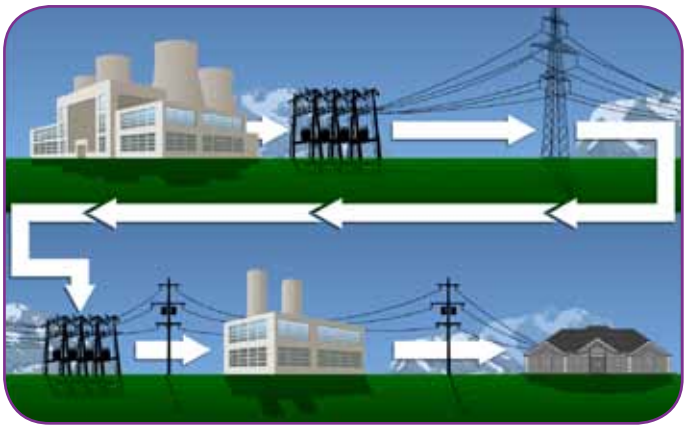


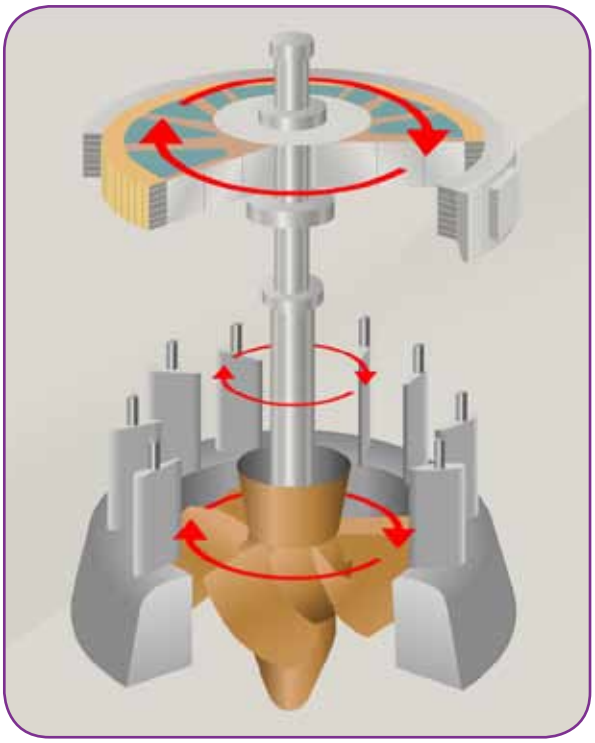


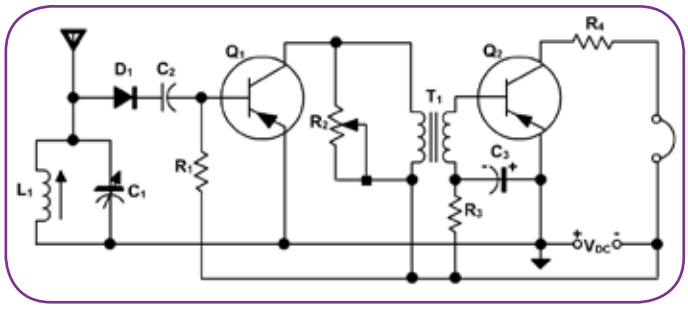
CHAPTERS	
Introduction to Pneumatics	Pneumatic actuators
Pneumatics Systems	Directional control valves
The properties of gasses	Vacuum technology
Air compression and Distribution	Measuring pneumatic variables
Compressed air treatment	Pneumatic applications

SMC-102 – Introduction to electricity

The SMC-102 course runs through the production, transport, distribution and use of electrical energy, including the components and control circuits used. The user will become familiar with different types of circuits and electrical applications and will be capable of understanding the laws and relationships between electrical parameters.



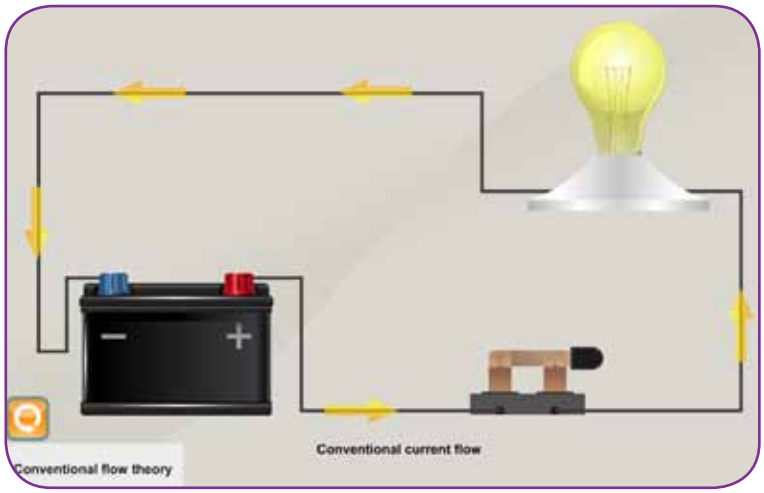


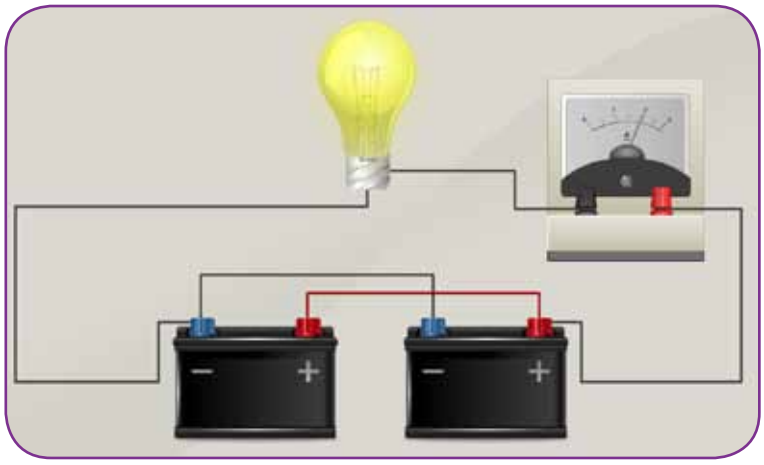


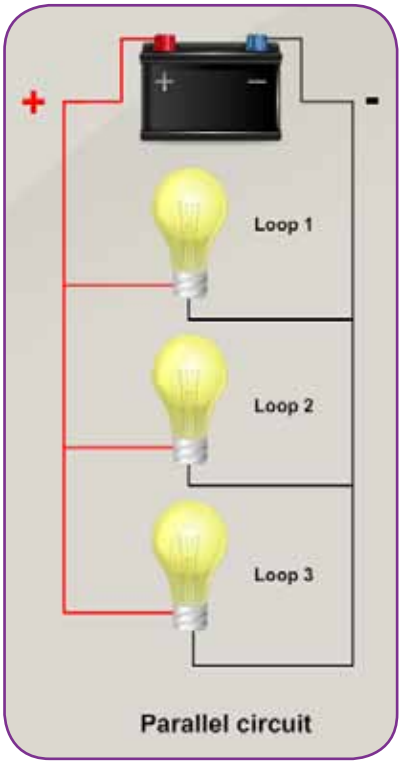
CHAPTERS	
Production of electricity	Voltage
Transmission and distribution	Electrical power
Uses of electricity	Resistance
Atomic structure	Ohm's law
Electrical circuits	Watt's law
Electrical current	

SMC-103 – DC electricity

This course focuses on the theory of direct current circuits. Working from the most common dc source, the battery, a closer look is taken at its connections, and the different types of dc receiver circuits (series, parallel, etc.).





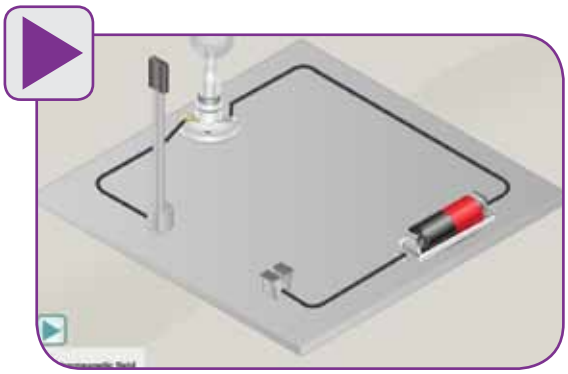


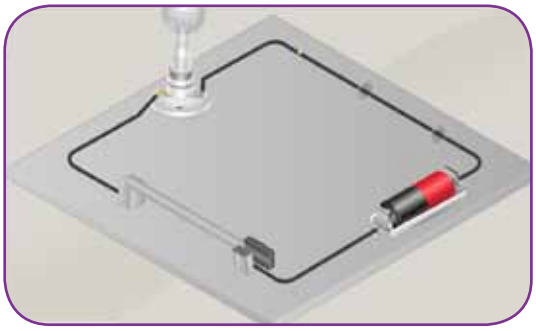
CHAPTERS

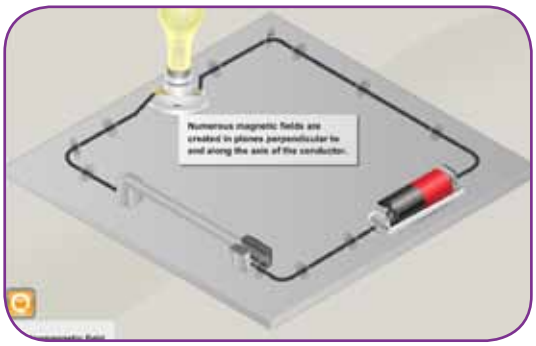
- Direct current
- Batteries
- Circuit analysis

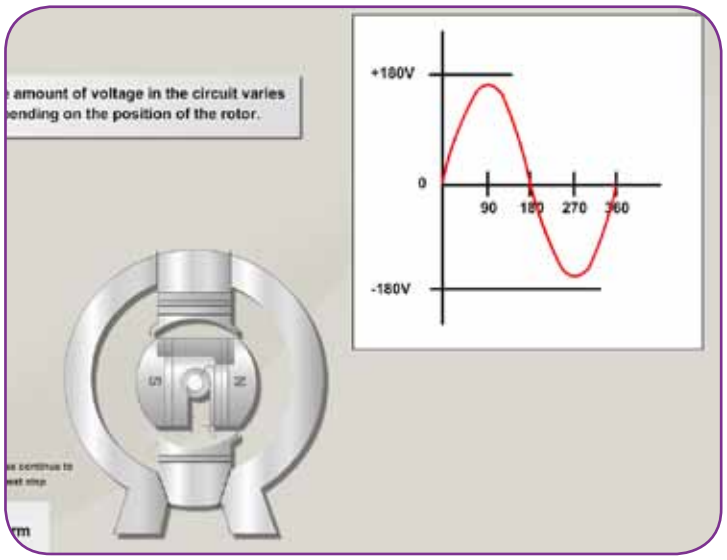
SMC-104 – AC electricity

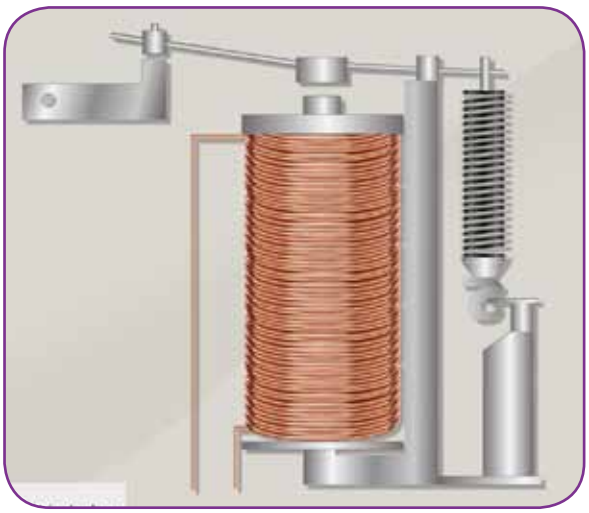
This course runs through the principles and laws associated with induction and electromagnetism as the basis for understanding how alternating current circuits work and their applications. Details of different devices including coils, relays, transformers and condensers are explained. Concepts of magnetic fields, generating alternate current, frequency, etc. complete the course.







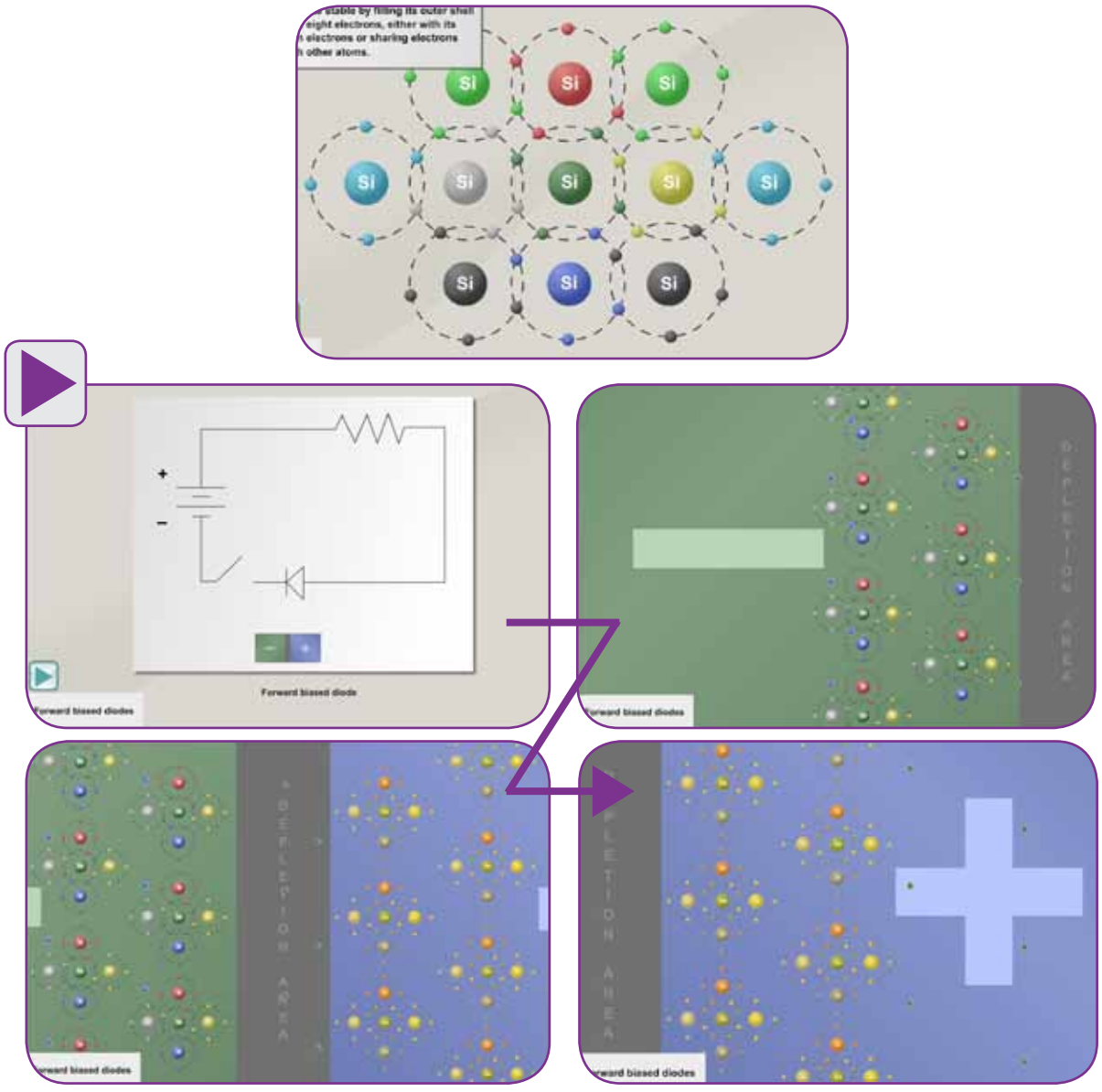




CHAPTERS
Electromagnetism
AC waveform generation
Electromagnetic devices
Transformers
Capacitors

SMC-105 – Solid state

The SMC-105 course focusses on studying solid state devices commonly used in automated equipment and facilities. Starting with the study of the operating principle for semi-conductors (PN union, etc.), the user becomes familiar with different solid state devices such as diodes, rectifiers, transistors, opto-couplers, etc.



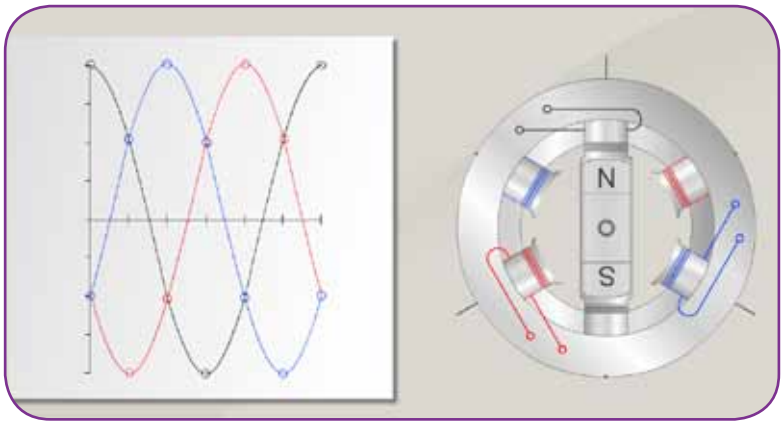
CHAPTERS

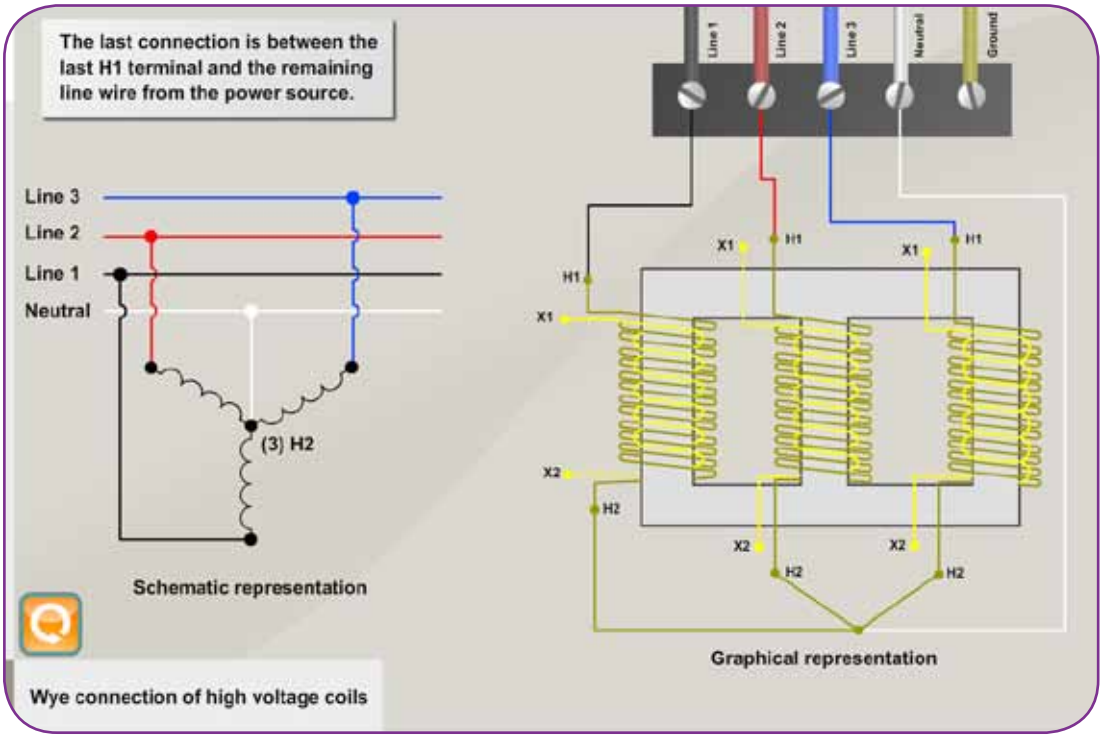
Semiconductors

Solid state devices

SMC-106 – Introduction to wiring

This course presents the components, tools and procedures used in connecting and wiring control panels and electrical facilities. It explains earthing, connectors, cable sizes and the different ways of connecting transformers.





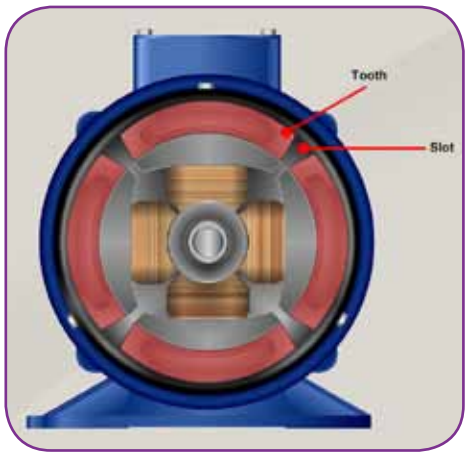
CHAPTERS

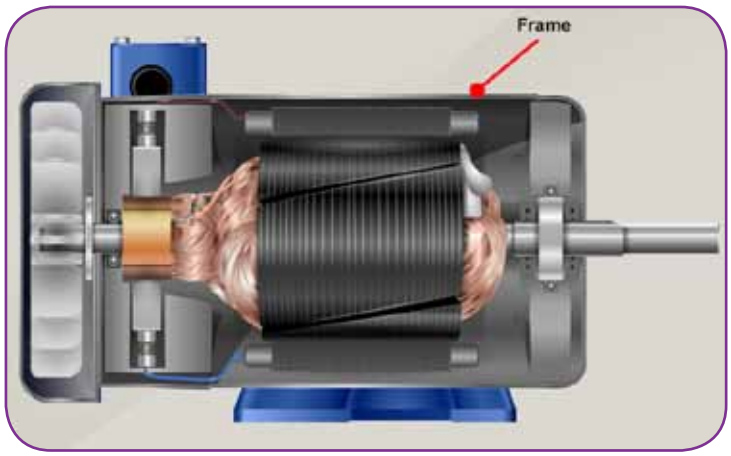
Wires, connectors and circuit protection

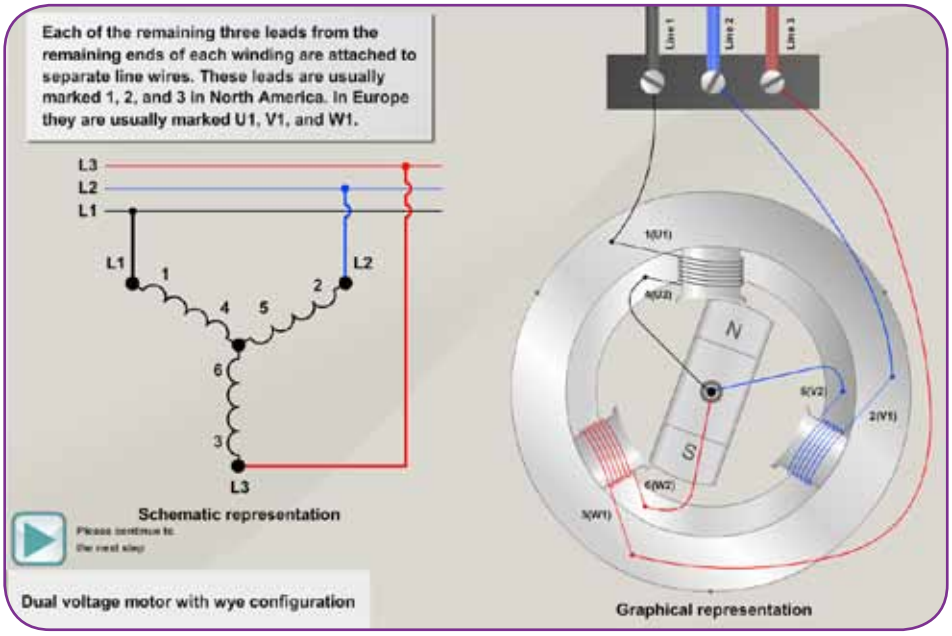
Connecting transformers

SMC-107 – Introduction to electric motors

This course studies the operating principles for basic electrical machines such as direct current and alternate current motors, both single phase and three phase. It also studies connections, implementation and the most typical applications for these motors.





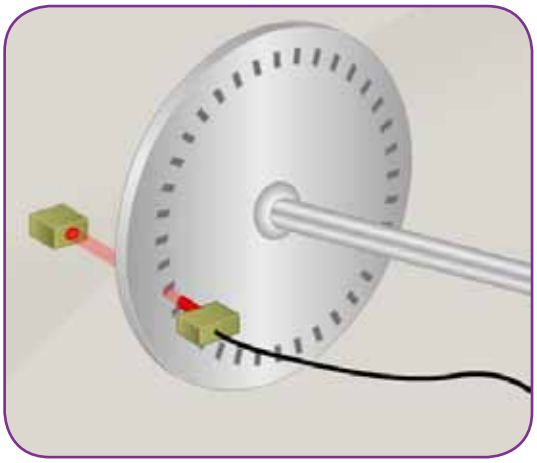


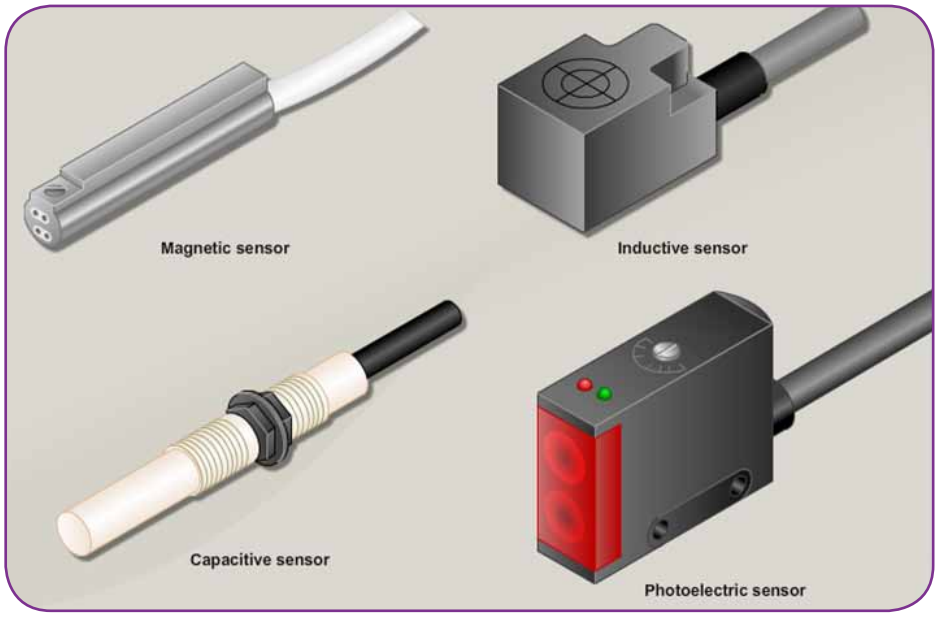
CHAPTERS

- DC motors
- Single-phase AC motors
- Three-phase AC motors

SMC-108 – Sensors technology

This course allows users to become familiar with the fascinating world of sensors and transducers used in industry. Starting with general applications, features and parameters of sensors, it runs through the different types of sensors, their application and symbols.

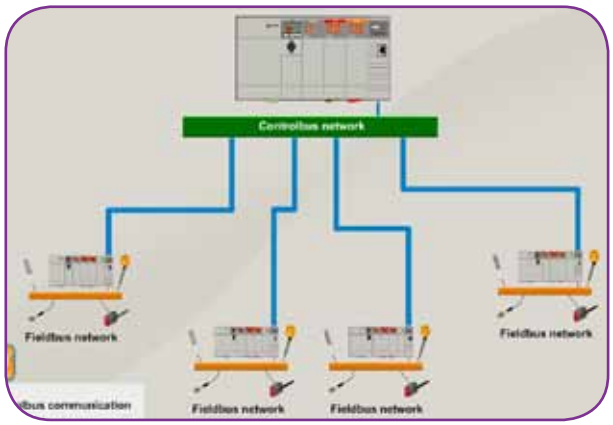


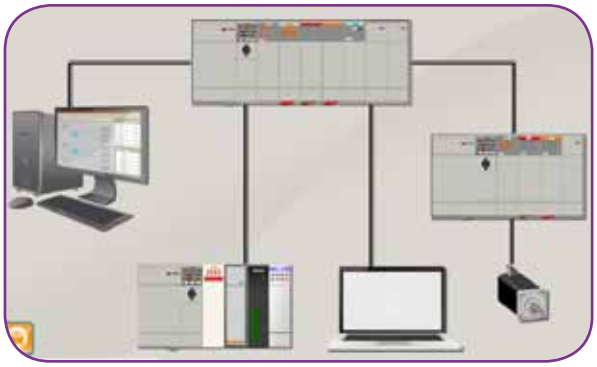


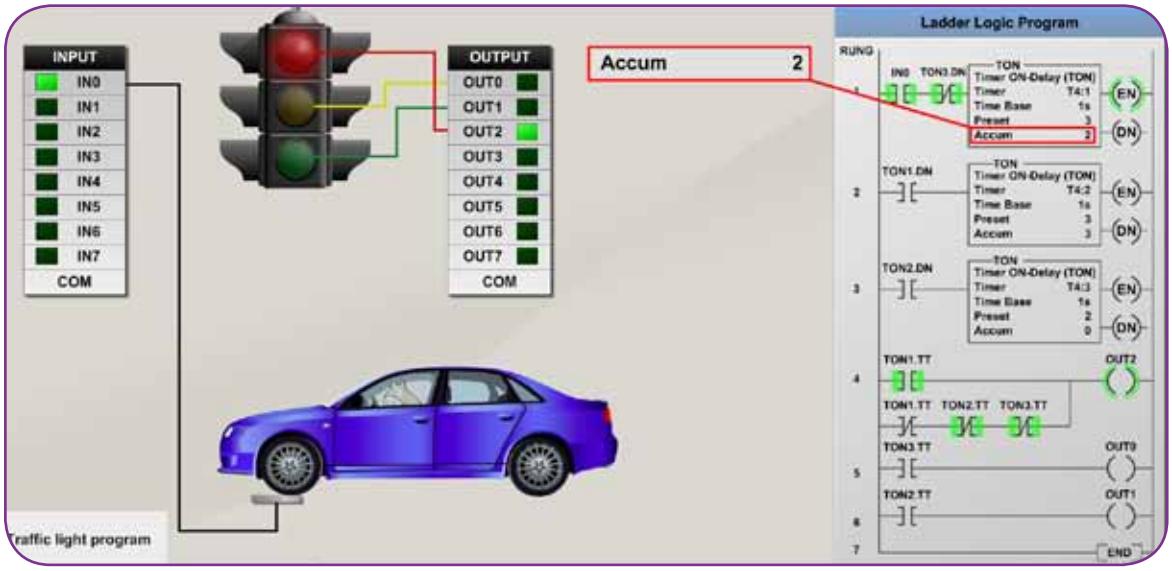
CHAPTERS

SMC-109 – Programmable controllers

The SMC-109 course runs through the different types of Programmable Controllers, focussing on a study of Programmable Logic Controllers (PLC). It introduces digital electronics to be able to understand how a Programmable Controller works. It also studies its general structure, the CPU structure, general concepts of programming and applications for these devices.





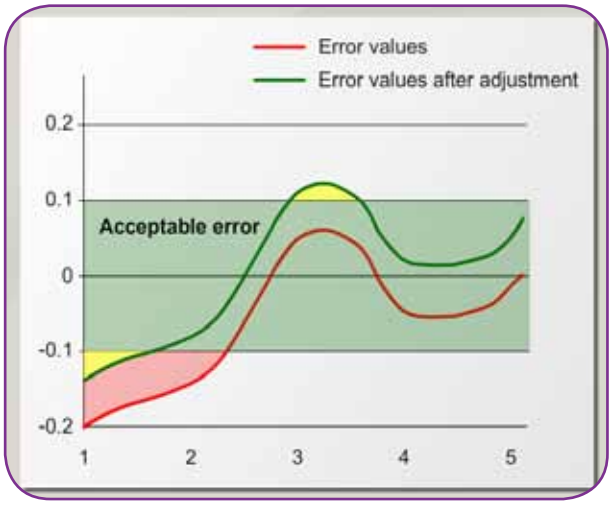


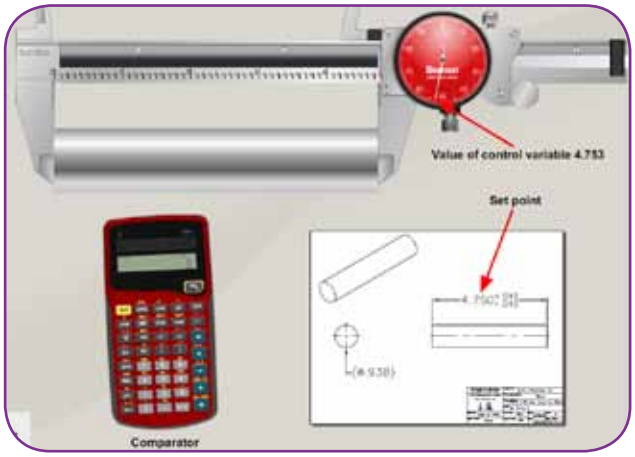
CHAPTERS

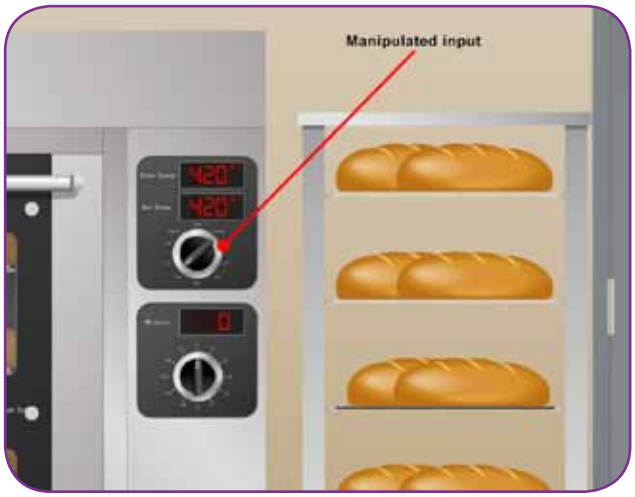
- Introduction and history
- Introduction to digital electronics
- Types and functions of PLCs
- General structure of PLC hardware
- Physical integration of PLCs
- Internal structure of the CPU
- Basic concepts of PLC programming
- Common PLC applications

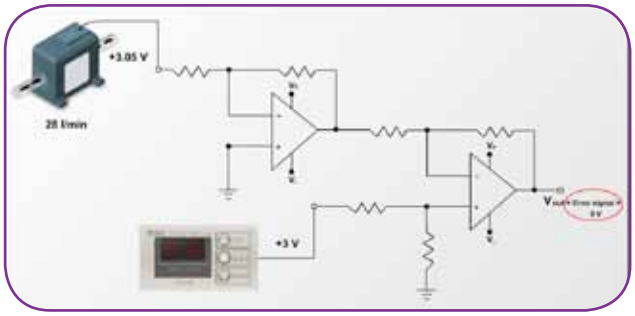
SMC-110 – Process controls

This course introduces the user to Process Control systems. The different control types are analysed, looking more closely at the different blocks making up a closed loop controller, finishing off with an introduction to multi-variable control systems.







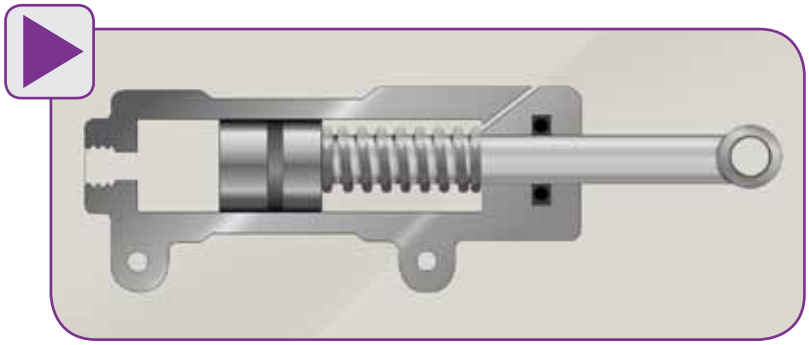


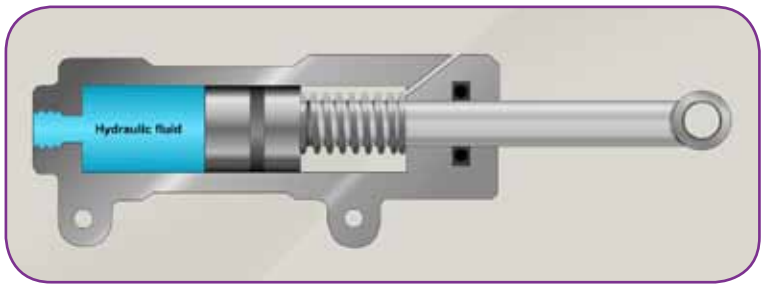
CHAPTERS

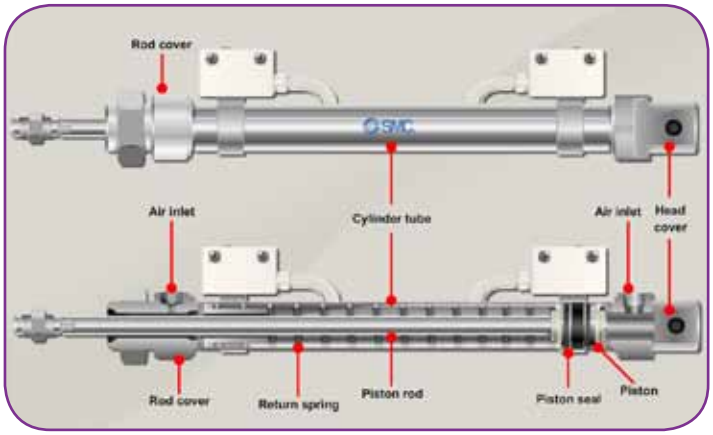
- Introduction to Process control
- Process control systems
- Set point / Comparator
- Controller (PID Control)
- Multivariable Processes

SMC-111 – Hydraulics / electro-hydraulics

The SMC-111 course focuses on studying the hydraulic systems used in automated industry. It explains the different components used in hydraulics, electro-hydraulics and proportional hydraulics, analysing their operating principles, applied physical laws and symbols.



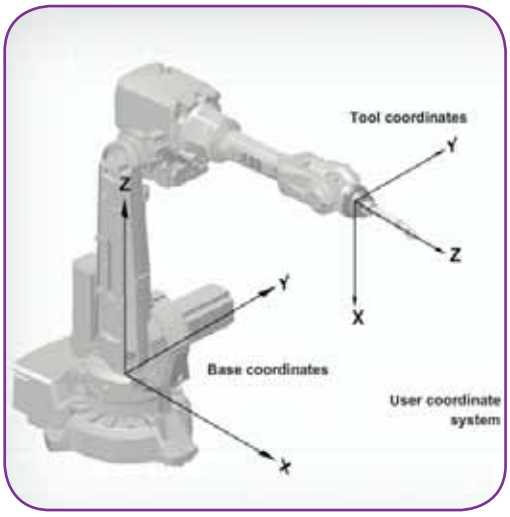


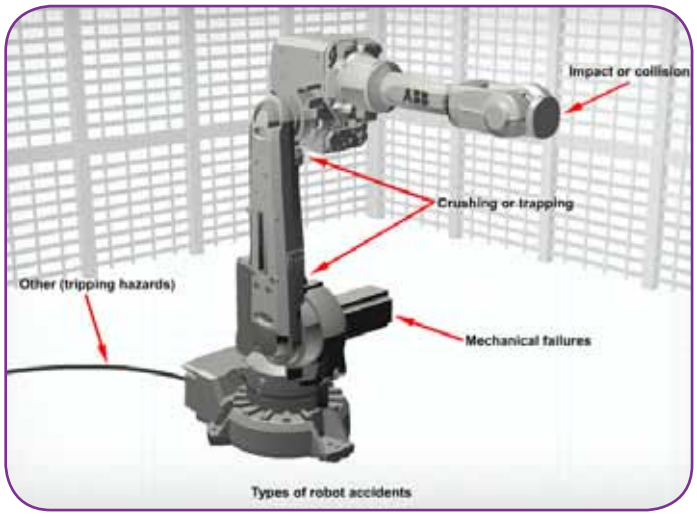


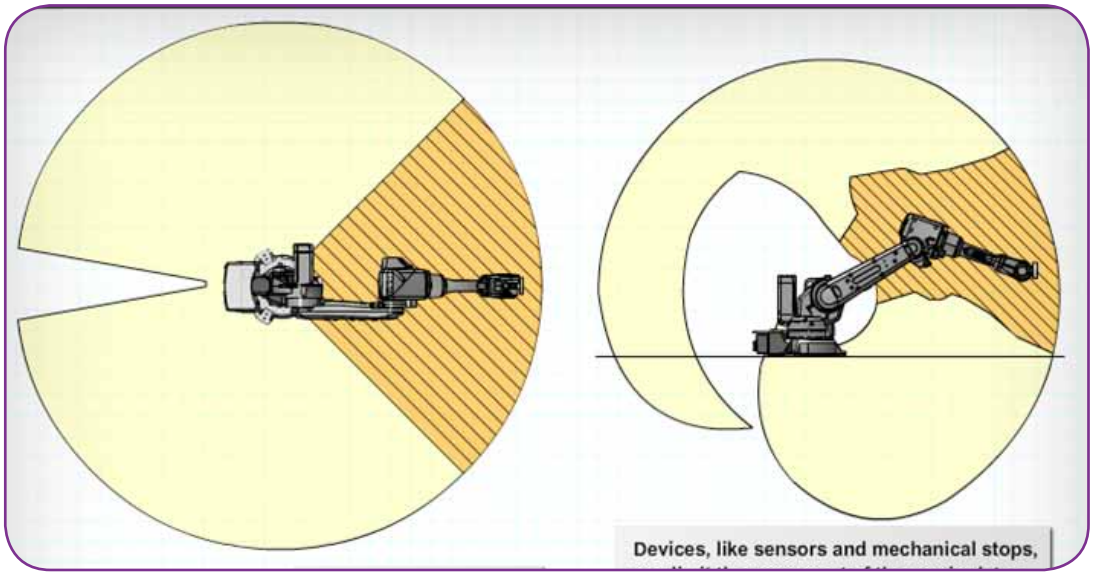
CHAPTERS	
Introduction to hydraulics	Distribution valves
Hydraulic systems	Other hydraulic components
Fluids & Pumping units	Proportional / Servo hydraulics
Safety in hydraulics systems	Applications of hydraulics
Hydraulic actuators	

SMC-113 - Robotics

In this course, once the introduction to robotic systems is complete, we explore, in greater depth, these systems' security aspects, robot structure, programming and the most common industrial applications.





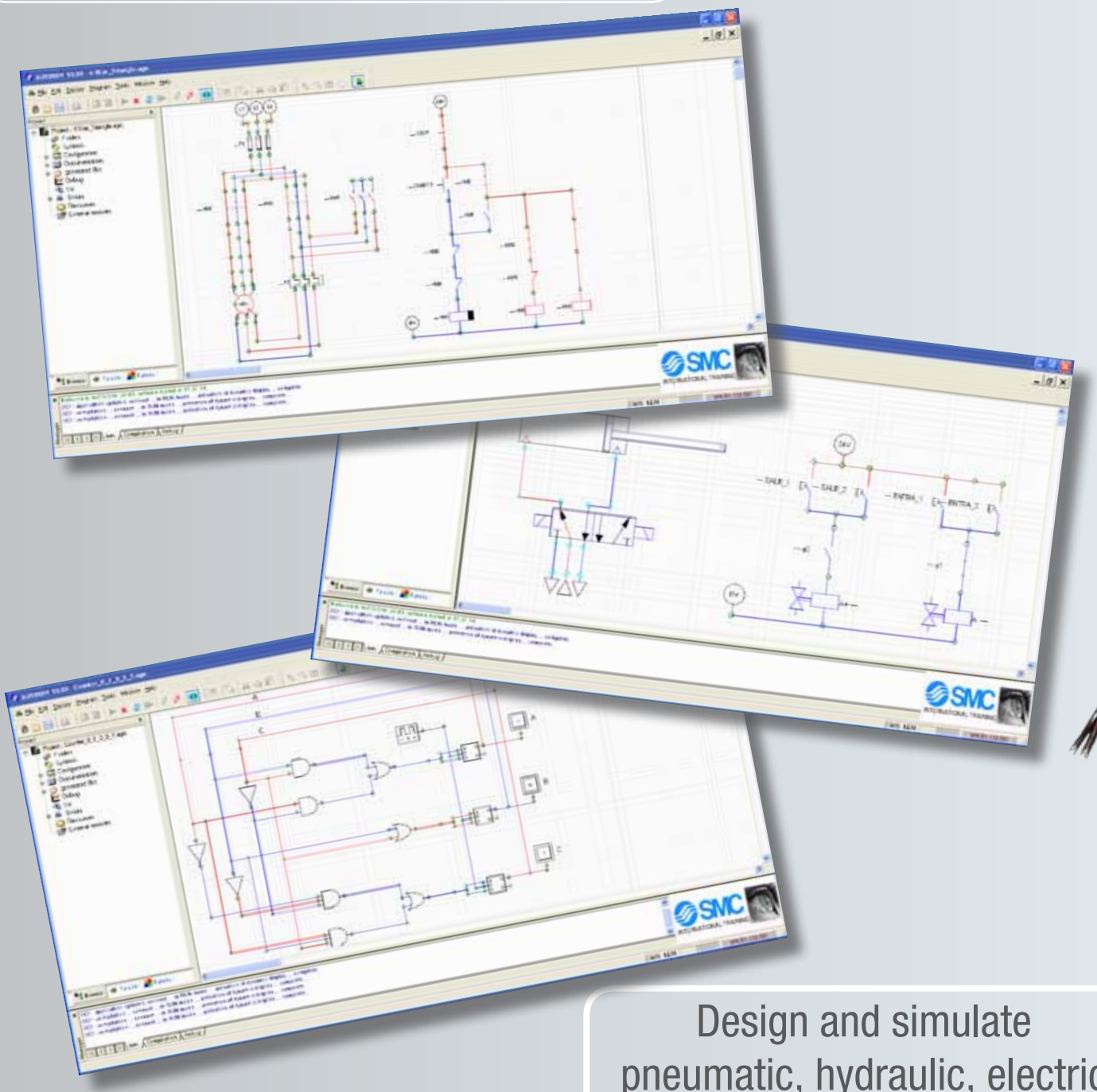


CHAPTERS	
Introduction to robotics	Controller and End effectors
Robot safety	Robot programs
Robot axes	Industrial robot applications
Robot manipulator	

autoSIM-200

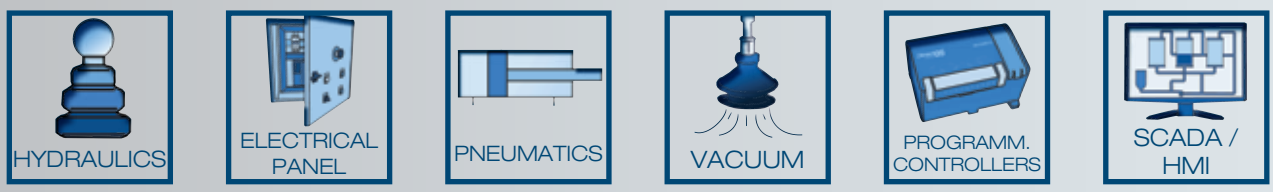
Automation Simulator

The best all-round automation simulator



Design and simulate pneumatic, hydraulic, electric and electronic circuits

In the following TECHNOLOGIES...



SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

TECH DOCUM. UNDERSTANDING

OPERATION

PROGRAMMING

Simulate, supervise and control our 3D applications from the autoSIM environment

3D

autoSIM-200 - Automation Simulator

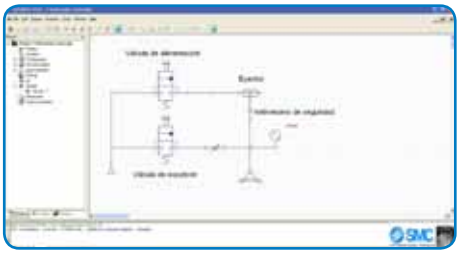
autoSIM-200 is a software for training in automation technologies that allows the user to try his / her programs on a virtual system before applying them to a physical system.

It represents the ideal complement to training equipment which, in turn, enables a more efficient use of the laboratory. It can also be used independently of actual training systems.

autoSIM-200 provides dynamic design and simulation plus control of 2D and 3D virtual machines (predefined by the user or developed by SMC International Training).

autoSIM-200 includes a virtual PLC to control the circuits / models under simulation and allows communication with our range of training systems.

Design and simulation

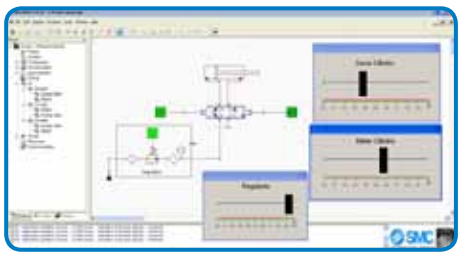


With autoSIM-200, it is possible to carry out dynamic, multi-colour simulations using pneumatic, electropneumatic, hydraulic, electrohydraulic, electrical and electronic circuits. It is also possible to carry out mathematical models of systems and acquire and process electrical signals (instrumentation).

Library component categories are displayed by means of drop-down menus, showing individual standardised symbols. It includes conventional and proportional pneumatic and hydraulic valves.

autoSIM-200 can inter-connect different blocks (Virtual PLC, 2D, 3D models, etc.).

Programming



autoSIM-200 can be used to create Grafcet diagrams, Ladder, Logigramme (logic gates) and function blocks with structured text. By running the simulation, it is possible to monitor and control the application step by step.

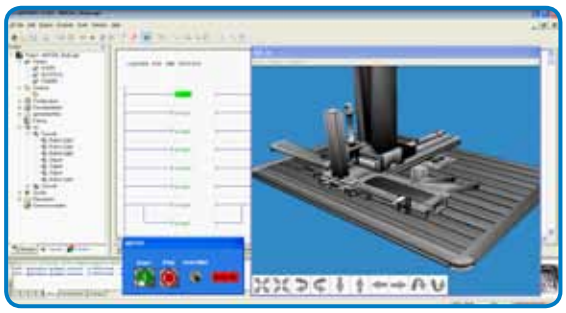
It can also generate symbol tables to address variables and create timers, counters, etc.

Monitoring and control

Using autoSIM-200, it is possible to monitor and control 3D processes. Using a data acquisition card (SAI2443), physical inputs and outputs can be supervised and controlled.

This software can import three dimensional models from 3D Studio and Solidworks. SMC International Training has product applications from the range, ready to run with the system (see 3D applications section).

Communication with real, physical equipment is possible through the OPC server and I/O cards.



I/O card

• SAI2443 USB - autoSIM-200 Interface

autoSIM-200 comes in 2 versions:

• autoSIM-200

This is the standard version. An I/O card or an OPC server is used for communication.

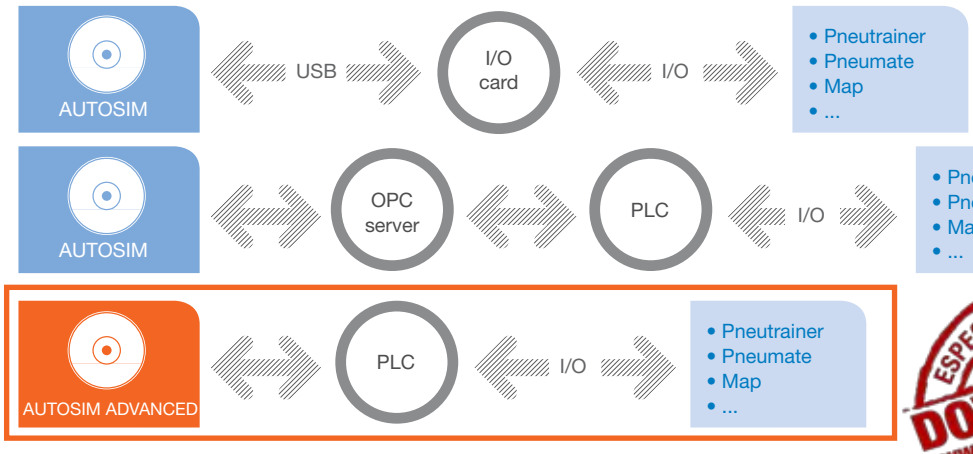
• autoSIM-200 ADVANCED

Includes all the functional features of autoSIM-200 along with post-processors that can transfer and monitor the program generated in the simulation to the following brands of PLC: Siemens, Omron, Allen Bradley, Schneider and Mitsubishi.

autoSIM-200		autoSIM-200 ADVANCED	
• SAI2252	AutoSIM-200, 1 educational licence	• SAI2352	AutoSIM-200 ADVANCED, 1 educational licence
• SAI2253	AutoSIM-200, 8 educational licences	• SAI2353	AutoSIM-200 ADVANCED, 8 educational licences
• SAI2254	AutoSIM-200, 16 educational licences	• SAI2354	AutoSIM-200 ADVANCED, 16 educational licences

*Other packages on request.

Communications



autoSIM-200 - 3D applications

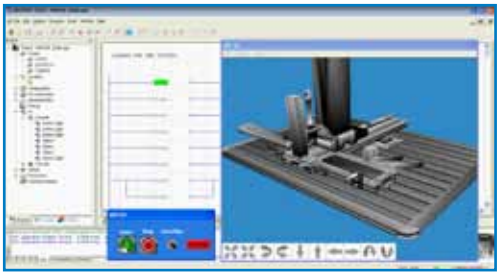
autoSIM-200 allows the user to simulate, control and supervise actual automated processes from a virtual environment.

SMC International Training has a series of 3D applications from real equipment, ready to be run in the system. autoSIM-200 or autoSIM-200 ADVANCED is required. Each application includes the following features:

- Compatibility with simulation software in automation applications.
- Independent window with 3D model, keypad and control commands.
- Access to the table of symbols for the generated program.
- Access to the libraries and to the simulation panel for components in pneumatics, electro-pneumatics, hydraulics, electro-hydraulics and electrics.

The available applications are as follows:

MAP-200 3D applications



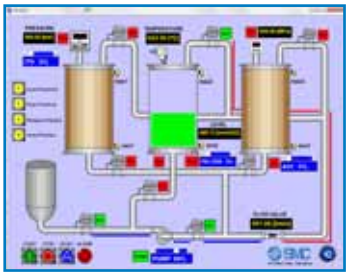
3D applications included*	Reference	Number of licences
MAP-201, MAP-202, MAP-203, MAP-204, MAP-207	SAI2527	1
	SAI2528	8
	SAI2529	16

AUTOMATE-200 3D applications

3D applications included*	Reference	Number of licences
AUTOMATE-200A	SAI2530	1
	SAI2531	8
	SAI2532	16

*autoSIM-200 or autoSIM-200 ADVANCED is required.

IPC-200 3D applications



3D applications included*	Reference	Number of licences
IPC-201C	SAI2533	1
	SAI2534	8
	SAI2535	16

MAS-200 3D applications

3D applications included*	Reference	Number of licences
MAS-201, MAS-202, MAS-203, MAS-204, MAS-205	SAI2547	1
	SAI2548	8
	SAI2549	16

FAS-200 3D applications

3D applications included*	Reference	Number of licences
FAS-201, FAS-202, FAS-203, FAS-204, FAS-205, FAS-206, FAS-207,FAS-208, FAS-209, FAS-210, FAS-211, FAS-212, FAS-213, FAS-214, FAS-215, FAS-216,FAS-220	SAI2536	1
	SAI2537	8
	SAI2538	16

FMS-200 3D applications

3D applications included*	Reference	Number of licences
FMS-201, FMS-202, FMS-203, FMS-204, FMS-205, FMS-206, FMS-207, FMS-208	SAI2523	1
	SAI2524	8
	SAI2525	16

*autoSIM-200 or autoSIM-200 ADVANCED is required.

autoSIM-200 - With this system you could...

autoSIM-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES

SKILLS

	HYDRAULICS	ELECTRICAL PANEL	PNEUMATICS	VACUUM	PROGRAMM. CONTROLLERS	SCADA / HMI
ANALYSIS	■	■	■	■	■	■
TROUBLESHOOT.	■	■	■		■	
DESIGNING	■	■	■	■	■	■
TECH DOCUM. CREATION	■	■	■	■	■	■
TECH DOCUM. UNDERSTANDING	■	■	■	■	■	■
OPERATION					■	■
PROGRAMMING					■	■

■ This shows how the autoSIM-200 is suitable to develop skills in the specific technology.

■ This shows that autoSIM-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

eLEARNING-200

Find out more about the theory behind the technologies developed in autoSIM-200 with our eLEARNING-200 courses.

RELATED eLEARNING-200 COURSES
Introduction to industrial automation (SMC-100)
Principles of pneumatics (SMC-101)
Introduction to electricity (SMC-102)
DC electricity (SMC-103)
AC electricity (SMC-104)
Solid state (SMC-105)
Introduction to wiring (SMC-106)
Sensors technology (SMC-108)
Programmable controllers (SMC-109)
Process controls (SMC-110)
Hydraulics / electrohydraulics (SMC-111)

**See eLEARNING-200 chapter for more information*

autoSIM-200 - Configuration

• Steps to follow

1.- Choose your licence type (autoSIM-200, autoSIM-200 ADVANCED).

2.- Select the number of licences.

3.- Add any chosen options (applications with number of licences).

autoSIM-200 - PC requirements

PC compatible computer with Windows XP, Windows Vista or Windows 7.
512MB free memory, graphic board (1024 x 768 x 65536 colour min.)

ENS-200

Energy saving trainer

Find out about the essential aspects of energy efficiency in compressed air installations

Save money

Put it into practice

Take care of the environment

Get training

SMC
INTERNATIONAL TRAINING

Did you know that.....?

...90% of companies use compressed air

...on average, the energy cost makes up between 10% and 20% of industrial production costs

SMC research reveals that it is possible to save up to 40% of the energy used to generate compressed air.

Enter and find out how to do it

ENERGY SAVING SOLUTIONS

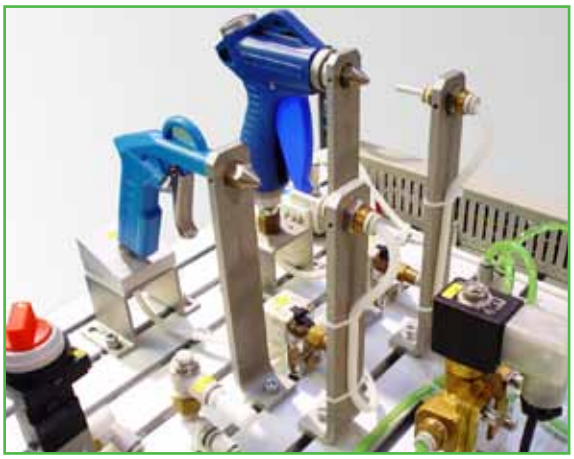
ESPECIFICATIONS
DOWNLOAD
www.smctraining.com
TECHNICAL DESCRIPTIONS

ENS-200 - Energy saving trainer

ENS-200 integrates a series of applications (vacuum, actuators and blowing) aimed at understanding and implementing the methodology associated with energy saving in compressed air installations.

ENS-200 teaches you how to detect possible excessive consumption and suggest actions to prevent it.

Users will analyse different scenarios through a series of guided activities. Each experiment shows how much has been saved, both as a percentage and in the chosen currency.



- SAI7002 ENS-200. Energy saving trainer

This equipment acts on the four fundamental pillars of energy saving in pneumatics:

• PRESSURE

Pneumatic components must be set to just the right pressure. Avoid excessive pressure as consumption is proportional to work pressure.

• SECTORISATION

To sectorise means to divide. It is possible to sectorise by differentiating between zones with different working pressure levels. It is also possible to sectorise by area, thereby minimising the impact of leaks when a zone is not active.

• MONITORING

Monitoring means to measure. Measuring makes it possible to locate defects in the facility and assess what can be saved by correcting them. Measuring can be done constantly or occasionally. Monitoring also leads to prevention, i.e. knowing when a part of the facility is beginning to consume more energy due to leaks or other faults.

• AIR QUALITY

A dirty filter generates a drop in pressure. If this filter is not replaced, the pressure must be raised to continue meeting system requirements. This poor practice has a negative impact on consumption which leads to more compressed air generation.

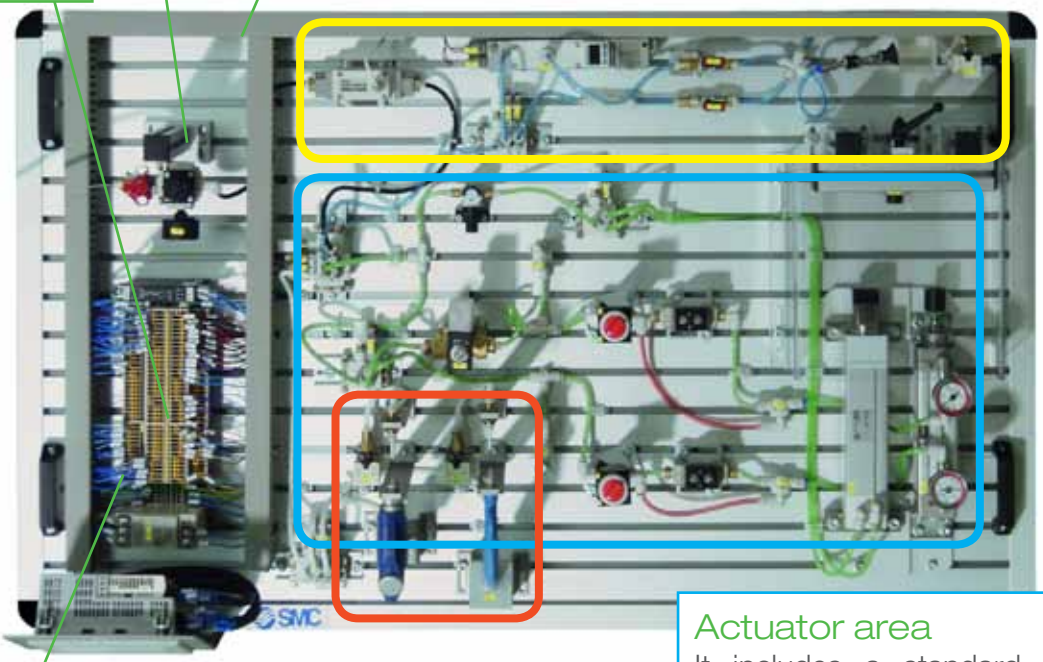
Main areas

ENS-200 includes the most common consumption sources for an automated process.

Anodised aluminium structure

Air treatment unit

Electric connection terminals



Vacuum area

ENS-200 includes venturi and multi-stage vacuum ejectors which can be used to check the impact of including high-performing elements in vacuum applications.

Actuator area

It includes a standard cylinder and a high-performing cylinder, as well as valves and controllers which can simulate leaks or analyse the impact of an incorrectly dimensioned facility. Actions and strategies can, therefore, be devised from the results obtained.

Labels for cables

Blowing area

ENS-200 includes two blower guns, built differently with varying efficiency, plus interchangeable nozzles that can be used to obtain comparative efficiency results.

HMI (Human Machine Interface) with a built-in PLC

Documentation:
- User manual.
- Practice manual.
- Theoretical course on pneumatics and energy saving concepts.
- Theoretical exercises based on a consumption calculation tool (included).

ENS-200 - With this system you could...

This trainer teaches you to come up with and implement energy efficiency solutions in compressed air facilities.

Working scenarios

PRESSURE

ENS-200 facilitates comparing the effect of adjusting the operating pressure to meet the facilities requirements using the following types of activities:

- Comparing different types of vacuum ejectors.
- Assessment of the impact of using excessively long pipes.
- Analysis of the impact of using double pressures.
- Adjustment of the network pressure to that required by each actuator.
- Comparison of various types of blow guns.
- Comparison of different various types of blow nozzle.
- Comparison of alternative various types of actuators.
- Analysis of the negative effects of excessive pressure on pneumatic facilities.

ENERGY SAVING SOLUTIONS™

SECTORISATION

ENS-200 looks at the advantages of dividing the facility into different areas, thus favouring the implementation of the following activities:

- Quantifying the advantages of positioning pressure controllers in each area.
- Quantifying the effect of leaks on the consumption and sizing of the compressor.

MONITORING

Monitoring identifies potential savings and verifies their subsequent application. ENS-200 enables:

- Checking whether a machine's consumption falls within expected limits.
- Detecting and locating leaks in a system by sequentially checking areas or actuators.

eLEARNING-200

Find out more about the theory behind the technologies developed in ENS-200 with our eLEARNING-200 courses.

RELATED eLEARNING-200 COURSES

Principles of pneumatics (SMC-101)

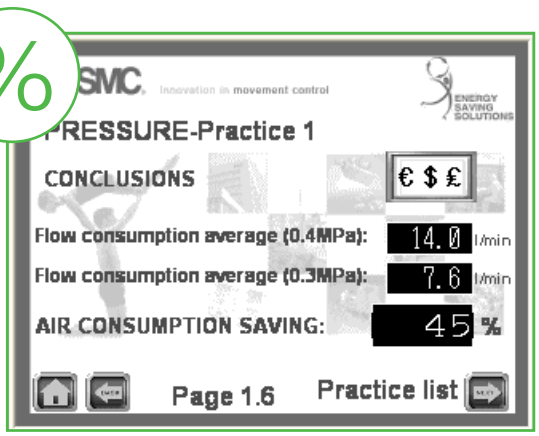
**See eLEARNING-200 chapter for more information*

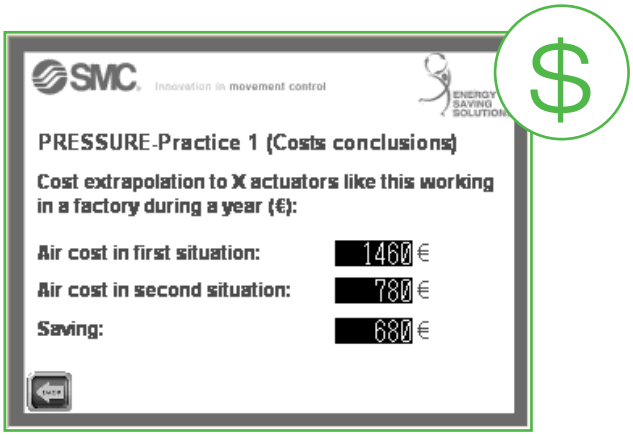
ENS-200 - How to use it

ENS-200 includes an HMI (Human Machine Interface) with a built-in PLC, interactive menus guide the user through the different activities.

The system sets up all of the parameters automatically for each exercise.

The results from measuring consumption and the savings obtained are presented as a percentage and in monetary savings.





ENS-200 - Technical features

ENS-200
1200x775x300mm

Modules	Sensors (type & qty.)	Input / Output
Vacuum area Actuator area Blowing area Control area	Pressure switch (x2) Vacuum switch (x1) Flowmeter (x1) Load cell (x1)	Digital 6/13 Analog 4/0

Actuators (type & quantity)	Other devices (quantity)
Pneumatic linear (x2) Blow gun (x2) Vacuum pad (x1) Venturi type vacuum ejector (x1) Multistage vacuum ejector with hysteresis function (x1)	2/2 cutoff valve (x1) Solenoid valve block (x3) Manual 5/2 valve with selector switch (x2) Pressure regulator with pressure gauge (x1) Bicolour pressure gauge (x2) Flow regulator - leakage simulator (x2) Pressure/Flow regulator (x2) OR flow control valve (x2) Blower nozzles (x5) Manual valve (x2) Power supply (x1)

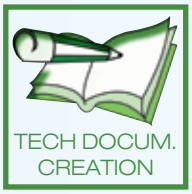
PNEUMATE-200

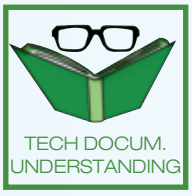
Your mate in Pneumatics!

The compact trainer to help users discover more about pneumatic and electro-pneumatic technologies.

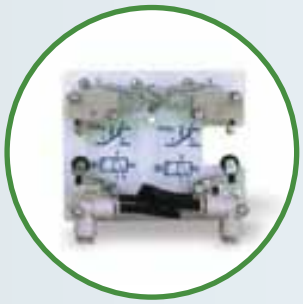
SMC
INTERNATIONAL TRAINING

Develop the SKILLS...



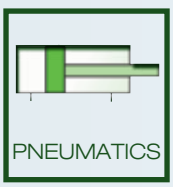


Light and portable!
Ready for use anytime anywhere.



5 options available

In the following TECHNOLOGIES...



PNEUMATE-200 - Your mate in Pneumatics!

This didactic equipment is comprised of a panel with pneumatic and/or electro-pneumatic components depending on the option selected.

The panel is printed with the standardized symbols of each of the components for easy identification. Furthermore, both the pneumatic and electro-pneumatic components come with rapid connections to speed up the practical exercises undertaken with the equipment.

PNEUMATE-200 also includes the necessary complements such as pneumatic tubing, tube cutter, tube extractor, fitting, plugs, connection cables and mains plug. Its interchangeable accessories (feeder-stamper, sliding door and ends of stroke) allows the user to start up examples of real applications using these technologies.

PNEUMATE-200 includes full documentation provided with:

- User manual.
- Self-learning course with 163 slides.
- 12 self-assessment tests.
- Multimedia CD which includes:
  - Interactive practical exercises
  - 3D simulation of all components.

PNEUMATE-200 is available in 5 options:

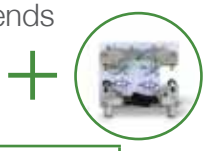
• OPTION A: Discovering pneumatic technology

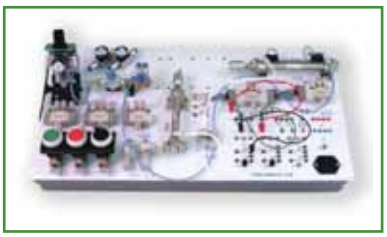
Equipment for training in basic pneumatics (without case). Also included:
- Complete documentation
- Accessories

• SAI2702 PNEUMATE-200 Option A + documentation EN (manual and CD)

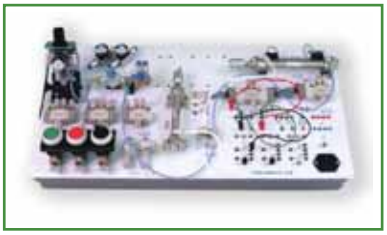
• OPTION B: Air combines with electricity!

Basic pneumatics and electro-pneumatics training equipment (without case). Also included:
- Accessory for the electric and pneumatic ends of stroke
- Complete documentation
- Accessories





• SAI2712 PNEUMATE-200 Option B + documentation EN (manual and CD)



• OPTION C: Discover the applications of this technology!

Advanced pneumatics and electro-pneumatics training equipment (without case). Includes:
- Accessory for the electric and pneumatic ends of stroke
- Sliding door accessory
- Loader-stamper accessory
- Complete documentation
- Accessories

• SAI2722 PNEUMATE-200 Option C + documentation EN (manual and CD)

• OPTION D: Ensure that it is always at your side

Advanced pneumatics and electro-pneumatics training equipment (with case). Also included:

- Carrying case
- Silent compressor
- Accessory for the electric and pneumatic ends of stroke
- Sliding door accessory
- Loader-stamper accessory
- Complete documentation
- Accessories

• SAI2732	PNEUMATE-200 Option D + documentation EN (manual and CD)

+

• OPTION E: Special cascade control

Equipment similar to option D, but supplied with a series of components required to enable cascade control. Also included:

- Carrying case
- Silent compressor
- Accessory for the electric and pneumatic ends of stroke
- Sliding door accessory
- Loader-stamper accessory
- Complete documentation
- Accessories

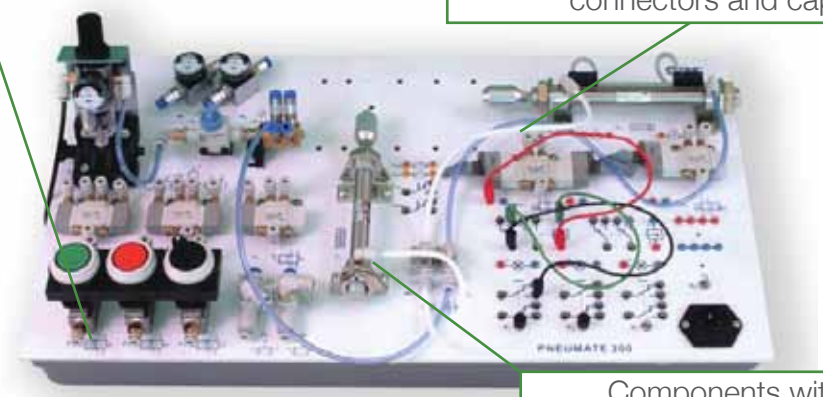
• SAI2742	PNEUMATE-200 Option E + documentation EN (manual and CD)

+

■ Common elements in all options

Panel with components and screen printed symbols

Set of extras: 4mm pneumatic tube, tube-cutter, tube extractor, set of connectors and caps

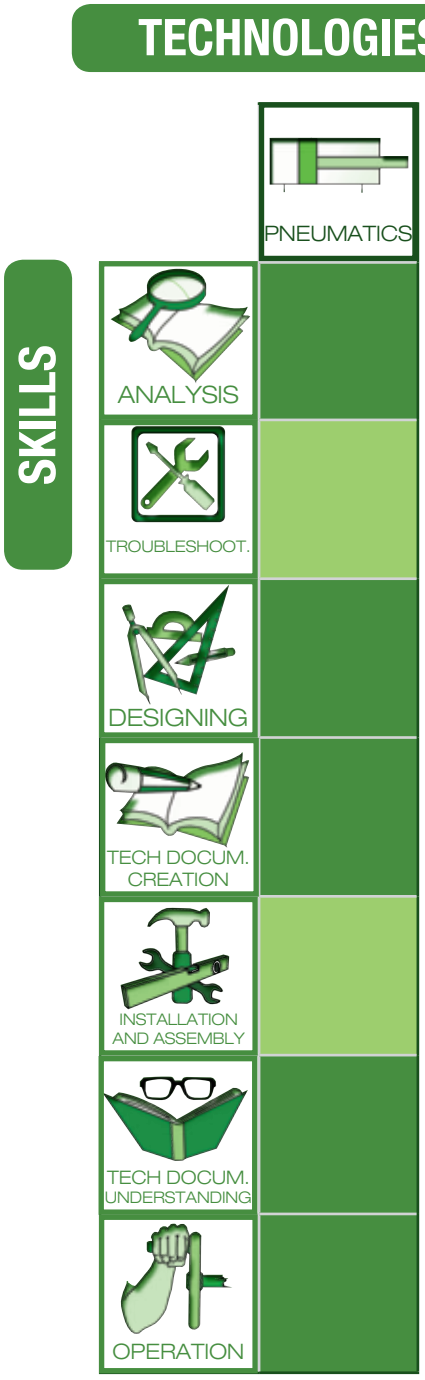


Components with connectors for 4mm tube

Complete set of documentation with multimedia CD-ROM

PNEUMATE-200 - With this system you could...

PNEUMATE-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

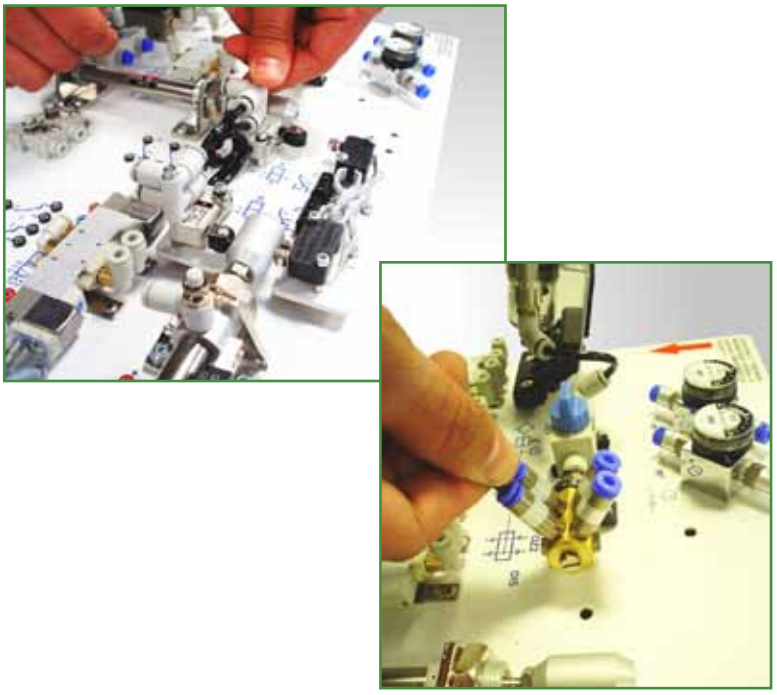


eLEARNING-200

Find out more about the theory behind the technologies developed in PNEUMATE-200 with our eLEARNING-200 courses.

RELATED eLEARNING-200 COURSES
Principles of pneumatics (SMC-101)
Introduction to electricity (SMC-102)
DC electricity (SMC-103)
AC electricity (SMC-104)
Solid state (SMC-105)

**See eLEARNING-200 chapter for more information*



This shows how the PNEUMATE-200 is suitable to develop skills in the specific technology.

This shows that PNEUMATE-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

PNEUMATE-200 - Options

PNEUMATE-200 has a series of optional extras.

• autoSIM-200

autoSIM-200 is software that can design and simulate pneumatic, electro-pneumatic, hydraulic circuits, etc. It is also used for programming them plus monitoring and control of pre-defined 2D and 3D models.

See autoSIM-200 chapter for more information.

PNEUMATE-200 - Technical features

Description	PNEUMATE A	B	C	D	E
Components					
Filter-regulator with pressure gauge	1	1	1	1	1
Air distributor with manual valve	1	1	1	1	1
Pressure gauge	2	2	2	2	1
3/2 way manual valve operated by push-button	2	2	2	2	2
3/2 way manual valve operated by selector	1	1	1	1	1
Pneumatic valve "OR"	1	1	1	1	1
Pneumatic valve "AND"	1	1	1	1	1
5/2 way pneumatic single valve	1	1	1	1	1
5/2 way pneumatic double valve	2	2	2	2	2
Single acting cylinder	1	1	1	1	1
Double acting cylinder	2	1	1	1	1
Pneumatic end of stroke	3				
Speed controller in the cylinder	2				
Speed controller	2	2	2	2	2
Magnetic cylinder sensors.		2	2	2	2
5/2 way single solenoid valve		1	1	1	2
5/2 way double solenoid valve		1	1	1	1
24Vdc Power supply		1	1	1	1
Electric push button without locking		2	2	2	2
Electric push button with locking		1	1	1	1
Indicator light		3	3	3	3
Double contact relay		2	2	2	4
Timer					2
Accessories					
Pneumatic and electric ends of stroke set. Includes (x2) electric ends of stroke and (x2) pneumatic ends of stroke.		1	1	1	1
Sliding door set			1	1	1
Loader-stamper set. Includes (x1) double acting cylinder, (x2) electric ends of stroke and (x1) magnetic detector.			1	1	1
Silent compressor. Includes connection plug.				1	1
Metal case with lock				1	1
Complements					
Connection cables		1	1	1	1
Network plug		1	1	1	1
Dimensions					
530x300x150mm	x	x	x		
570x490x180mm				x	x

PNEUTRAINER-400

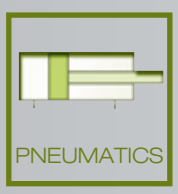
Pneumatics - Electropneumatics

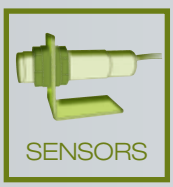
End-to-end solution for training in pneumatics and electro-pneumatics

SMC industrial systems components on panel mounting plate

Implements and controls pneumatic and electro-pneumatic circuits

In the following TECHNOLOGIES...





SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

- ANALYSIS
- TROUBLESHOOTING
- DESIGNING
- TECH DOCUM. CREATION
- INSTALLATION AND ASSEMBLY
- TECH DOCUM. UNDERSTANDING
- OPERATION
- PROGRAMMING

PNEUTRAINER-400 - Pneumatics - Electropneumatics

A fully modular and flexible system designed for the development of professional skills related to pneumatics and electro-pneumatics.

Its flexibility makes PNEUTRAINER-200 equipment adaptable to all types of user requirements and needs. It also makes a staggered investment over time possible.

Assembly panels

Based on an anodized extruded aluminium structure, these assembly panels offer various options. From the basic horizontal panel to the mobile table, we offer solutions adapted to all user requirements.

The rolling table includes a panel which enables users to work on both sides at the same time. It also includes a support shelf for component drawers and the pneumatic compressor.

All the options provide a perfect basis to carry out a range of practical activities.

Industrial materials

All the components used are industrial. Developed and manufactured by SMC and popular throughout the world, they meet the highest quality levels. The components are mounted on a base plate.

In order to be identified correctly they have a label with a corresponding reference as well as standardized symbols.

Connections

The pneumatic components incorporate instant connectors for 4 mm pipes. The electropneumatic components have 4 mm instant connecting safety cables.

Storage

The standard kits include a storage system in EUROBOX containers with trays which allow perfect identification and storage whilst occupying minimum space.

These boxes and trays can also be purchased for the storage of customized kits.

Kits

PNEUTRAINER-400 has 6 standard sets of components defined for training demands at different educational levels. Also, the user can configure personalised kits to meet their needs or to complement a previous purchase.

STANDARD KTIS	
SAI4-2281	PNEU-401: Basic pneumatics kits
SAI4-2282	PNEU-402: Advanced pneumatics kits
SAI4-2283	PNEU-403: Basic electro-pneumatics kits
SAI4-2284	PNEU-404: Advanced electro-pneumatics kits
SAI4-2285	PNEU-405: Pneumatics- electro-pneumatics kits
SAI4-2286	PNEU-406: Proportional pneumatics kits

PNEUTRAINER-400 - With this system you could...

PNEUTRAINER-400 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

SKILLS	PNEUMATICS	VACUUM	SENSORS	PROGRAMM. CONTROLLERS
ANALYSIS	■	■	■	■
TROUBLESHOOT.	■			
DESIGNING	■	■	■	■
TECH DOCUM. CREATION	■	■	■	■
INSTALLATION AND ASSEMBLY	■			
TECH DOCUM. UNDERSTANDING	■	■	■	■
OPERATION	■	■	■	■
PROGRAMMING				■

@eLEARNING-200

Find out more about the theory behind the technologies developed in PNEUTRAINER-400 with our eLEARNING-200 courses.

RELATED eLEARNING-200 COURSES

- Principles of pneumatics (SMC-101)
- Introduction to electricity (SMC-102)
- DC electricity (SMC-103)
- AC electricity (SMC-104)
- Solid state (SMC-105)
- Sensors technology (SMC-108)

**See eLEARNING-200 chapter for more information*

■ This shows how the PNEUTRAINER-400 is suitable to develop skills in the specific technology.

■ This shows that PNEUTRAINER-400 can help develop skills in the specific technology even though there are other more appropriate products in the range.

PNEUTRAINER-400 - Extra equipment

There are other products in the range to complement PNEUTRAINER-400.

• VAC-200

The VAC-200 equipment is particularly designed to develop skills related to vacuum technology.

**See VAC-200 chapter for more information.*

• autoSIM-200

autoSIM-200 is software that can design and simulate pneumatic, electro-pneumatic, hydraulic circuits, etc. It is also used for programming them plus monitoring and control of pre-defined 2D and 3D models.

**See autoSIM-200 chapter for more information.*

PNEUTRAINER-400 - Complete laboratory

Discover our proposal for laboratories and the best combination of the PNEUTRAINER-400 and other accessories in the chapter “Product packs”.

PNEUTRAINER-400 - Configuration

Getting the right PNEUTRAINER-400 configuration is as easy as:

• Steps to follow

1.- Select the panel and the necessary extras.

2.- Select the chosen standard set or a personalised configuration.

3.- For a personalised configuration, select the references required.

PNEUTRAINER-400 - Standard ktis

Ref.	Description	PNEU KITS 401	402	403	404	405	406
	Air preparation						
SAI4-2091	Air cleaning unit with 3/2 distribution valve	1	1	1	1	1	1
SAI4-2092	Distribution block	1	1	1	1	1	1
SAI4-2005	Pressure regulator with pressure gauge	1	1	1	1	1	1
SAI4-2004	1 MPa pressure gauge	1	2	1	1	1	
SAI4-2032	Soft start-up valve				1		
	Manual - mechanical valves						
SAI4-2015	3/2 NC valve, operated by push-button	2	2			2	
SAI4-2017	Double 3/2 NC valve, operated by a push-button		1				
SAI4-2018	3/2 NC/NO valve, operated by a push-button	1	1			1	
SAI4-2019	3/2 NC valve, operated by an emergency knob	1	1			1	
SAI4-2013	3/2 NC valve, operated by roller lever	2	4			2	
SAI4-2014	FC 3/2 NC valve. Operated by one-way roller lever	1	1			1	
SAI4-2016	3/2 NC switch-operated double valve	1	1			1	
SAI4-2109	5/2 push-button valve		1				
SAI4-2021	5/2 valve with 2-position selector	1	1			1	
SAI4-2025	5/3 valve with selector		1				
	Air operated valves						
SAI4-2020	3/2 NC/NO, air operated single valve	1	1			1	
SAI4-2010	3/2 NC convertible valve	1	1			1	
SAI4-2023	Air operated 5/2 single valve	1	1			1	
SAI4-2024	Air operated 5/2 double valve	3	3			3	
SAI4-2107	Block of 2 x 5/2 double valves + 1 x 5/2 single valve		1				
	Flow control equipment						
SAI4-2007	“OR” function	1	1			1	
SAI4-2124	Double "OR" valve	1	1			1	
SAI4-2006	“AND” function	1	1			1	
SAI4-2125	Double "AND" valve		1				
SAI4-2031	Single direction speed controller (double)	2	2	2	2	2	
SAI4-2033	Quick exhaust valve	1	1			1	
SAI4-2008	Check valve		1				
SAI4-2126	Speed controller with controlled check valve		2		2		
SAI4-2030	Two-direction speed controller for single acting cylinder		1				
	Actuators						
SAI4-2027	Single acting cylinder	1	1	1	1	1	
SAI4-2026	Double acting cylinder with rubber cushion	2	2	2	2	2	
SAI4-2071	Double acting cylinder with adjustable air cushion		1				
SAI4-2118	Mechanically coupled rodless cylinder		1				
SAI4-2123	Cylinder with load		1		1		
SAI4-2120	Stroke reading cylinder						1
	Pneumatics various						
SAI4-2029	Vacuum ejector with pad		1		1		
SAI4-2003	Pressure indicator (reed)		1				
SAI4-2127	Pressure vessel		1				1
SAI4-2121	Pulse counter for reading cylinder						1
SAI4-2012	Pneumatic counter		1				

Ref.	Description	PNEU KITS 401	402	403	404	405	406
	Solenoid valves						
SAI4-2050	3/2 NC single solenoid valve			1	1	1	
SAI4-2111	3/2 double solenoid valve				1		
SAI4-2053	5/2 double solenoid valve			3	3	3	
SAI4-2052	5/2 single solenoid valve			2	2	2	
SAI4-2054	5/3 closed-centre solenoid valve				1		
SAI4-2114	Block of 2 solenoid valves, 5/2 double + 1 single				1		
	Control modules						
SAI4-2056	Power supply			1	1	1	1
SAI4-2035	ON/OFF switch				1		
SAI4-2034	Emergency stop knob (electrical)				1		
SAI4-2036	Set of electrical inputs (Button pad with 3 push-buttons)			1	1	1	
SAI4-2038	Set of 3 relays			1	2	1	
SAI4-2047	Indicators (pilots, buzzer)			1	1	1	
SAI4-2040	Set of 2 timer relays				1		
SAI4-2048	Electric counter				1		
SAI4-2049	Electrical distributor			1	1	1	
SAI4-2043	Reed auto switch			4	4	4	
SAI4-2128	Solid state auto switch				2		
SAI4-2044	Inductive detector				1		
SAI4-2046	Capacitive detector				1		
SAI4-2045	Photoelectric detector				1		
SAI4-2042	Electrical end of stroke			2	2	2	
	P/V - V/P converters						
SAI4-2041	Electrical contact pressure switch			1	1	1	
SAI4-2095	Pressure switch, towards transistor				1		
SAI4-2098	Pressure gauge with electrical contact			1	1	1	
SAI4-2097	Programmable digital pressure switch. Analog / digital outputs				1		1
SAI4-2096	Vacuum pressure switch, towards transistor				1		
SAI4-2099	Programmable proportional electro-pneumatic transducer						1
SAI4-2104	Analog pressure sensor						1
SAI4-2105	Digital Pressure Display for analog sensor						1
	Accessories						
SAI2057	Set of 20m of blue tubing and 20m of flexible 4 mm white tubing.	1	1	1	1	1	1
SAI2058	Set of 10 "T" fittings	1	1	1	1	1	1
SAI2059	Set of 5 plugs, 1/8"	1	1	1	1	1	1
SAI2060	Set of 10 x 4mm plastic plugs	1	1	1	1	1	1
SAI2132	Set of 10 "Y" fittings		1		1		
SAI4-2055	Set of connection cables			1	2	1	1
TK-3	Tube-cutter	1	1	1	1	1	1
SAI4-2076	Box with trays for basic pneumatics composition	1					
SAI4-2078	Box with trays for advanced pneumatics composition		1				
SAI4-2077	Box with trays for basic electro-pneumatics composition			1			
SAI4-2079	Box with trays for advanced electro-pneumatics composition				1		
SAI4-2062	Box with trays for pneumatic-electropneumatic composition					1	
SAI4-2602	Box with trays for proportional pneumatic composition						1
SAI2307	10 m. tube black. ø6mm	1	1	1	1	1	1
TG-1	TG-1 - Tube-extractor	1	1	1	1	1	1
	Didactic support						
SAI2061	Set of manuals and documentation	1	1	1	1	1	1
SAI2070	CD-ROM, Pneumatic slides	1	1	1	1	1	1

⚠ DON'T FORGET TO ADD AN ASSEMBLY PANEL AND EXTRAS

SAI2068	Schematic clip device	SAI2028	Support bracket set
SAI2064	Vertical mounting panel for 2 work positions	SAI2088	Silent compressor 230VAC
SAI2074	Drawer unit for rolling table with lock	SAI2520	Silent compressor 110VAC
SAI2066	Drawer unit for rolling table without lock	SAI2080	Horizontal mounting panel
SAI2065	Rolling table with twin-post	SAI4-2089	Cable holder fitting

PNEUTRAINER-400 - Customized compositions

All the available pneumatic and electro-pneumatic components are described below, ordered by category.

Assembly panels and accessories

Based on an anodized extruded aluminium structure, we can offer a number of solutions for panels to carry out the practial activities proposed for the various configurations.

- Option A - Horizontal mounting panel

SAI2080 - Horizontal mounting panel

External dimensions: 700x560x25mm*. It is supported on non-slip legs. Can be converted into a vertical panel using a support bracket set (see accessories).

*Other dimensions available on request.

- Option B - Vertical mounting panel for 2 work posts

SAI2064 - Vertical mounting panel for 2 work positions

External dimensions: 1150x760x410mm*. Allows work to be carried out on both sides, optimizing investment and space.

*Other dimensions available on request.

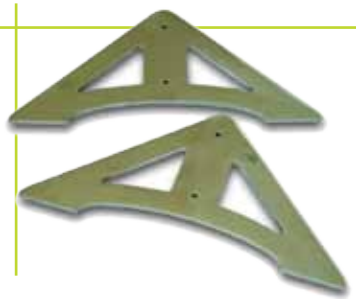
- Option C - Double sided rolling table

SAI2065 - Rolling table with twin-post

- The entire rolling frame system may be disassembled for transportation.
- The vertical panel means you can work on both sides.
- Panel dimensions: 1150x760x25mm
- It has a laminated top for horizontal work, 1200x800mm.
- The lower section features a 1200x600mm metal shelf supporting the component storage drawers, the silent compressor, etc.
- 4 high-load wheel support, 2 with brake and 2 without.
- Total dimensions: 1200x800x1700mm.

- Accessories

SAI2028 - Support bracket set



With non-slip legs, allowing the user to convert the horizontal mounting panel into a vertical panel.

Storage drawer blocks for rolling table

SAI2066 - without lock
SAI2074 - with lock

- Compact 4-drawer block with slide guides to house the component trays.
- External dimensions: 500x725x650mm.

Silent compressor

SAI2088 - Power supply 230VAC
SAI2520 - Power supply 110VAC

- Model ICO-P50
- Two-phase power supply.
- Flow rate: 50l/min.
- Maximum pressure: 0,8MPa
- Low noise level: 40dB
- Reservoir: 9 l.
- Weight: 21kg.

*Other models available on request.

SAI2068 - Schematic clip device

Allows schematics to be attached in DIN-A4 format on the panel.

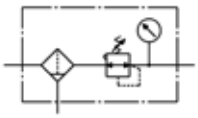
SAI4-2089 - Cable holder fitting

This supports orderly storage of connection cables.

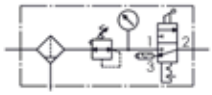
Air preparation

SAI4-2090 - Air cleaning unit

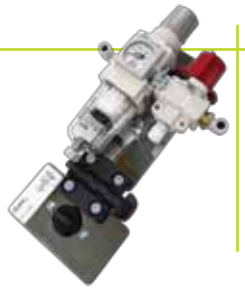
- Consisting of a filter, a regulator, and a 1 MPa pressure gau
- 5µm filtering.
- Possibility of vertical and horizontal positioning.
- Input and output prepared for 6mm tube.



SAI4-2091 - Air cleaning unit with 3/2 distribution valve

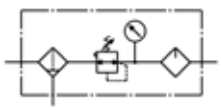


- Consisting of a filter, a regulator, and a 1 MPa pressure gauge.
- 5µm filtering.
- Includes a 3/2 discharge valve with silencer for connection and disconnection of the rest of the circuit.
- Option of vertical and horizontal positioning.

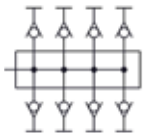


SAI4-2001 - Air cleaning unit with lubricator

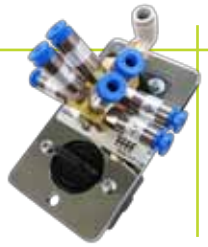
- Consisting of filter, regulator, lubricator and 1 MPa pressure gauge.
- 5µm filtering.
- Possibility of vertical and horizontal positioning.
- Input for a 6mm tube, output for a 4 mm tube.

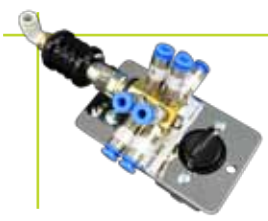


SAI4-2092 - Distribution block



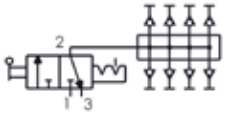
- Includes 8-outlet distribution block, one-touch fittings and non-return system.
- Direct coupling to the air cleaning unit.

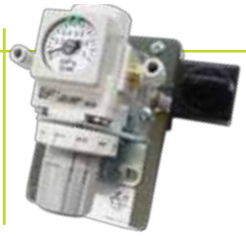




SAI4-2002 -Distribution block with 3/2 distribution valve

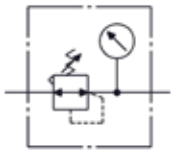
- 8-outlet distribution block, one-touch fittings and non-return system.
- Includes slide discharge valve.
- Direct coupling to the maintenance unit.
- Input for a 6mm tube, output for a 4 mm tube.





SAI4-2005 - Pressure regulator with pressure gauge

- Operating pressure 0-1 MPa.
- Includes double-scale pressure gauge (Mpa and psi).



SAI4-2004 - 1 MPa pressure gauge

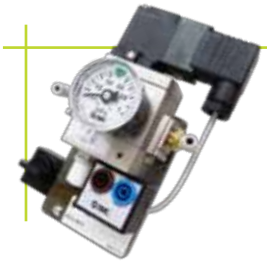
- With double-entry and double scale (0-1 MPa/ 0-140psi).

SAI4-2093 - 0,2MPa pressure gauge

- With double entry and a double scale (0-0,2MPa/ 0-35psi).

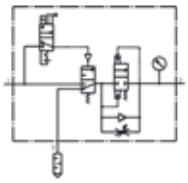
SAI4-2094 - Vacuum pressure gauge

- Pressure range (-0,1 MPa - 0MPa).
- Double scale.



SAI4-2032 - Soft start-up valve

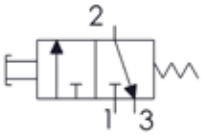
- Includes a valve which allows pressure to be implemented gradually.



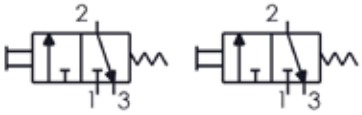
Manual - mechanical valves

SAI4-2015 - 3/2 NC valve, operated by push-button

- Industrial grade push-button, normally in closed position, spring-return.



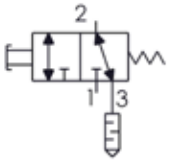
SAI4-2017 - Double 3/2 NC valve, operated by a push-button



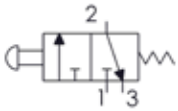
- Includes two 3/2 port industry grade push-buttons.
- Red and black colour action.
- Spring-return.

SAI4-2018 - 3/2 NC/NO valve, operated by a push-button

- Includes a 3/2 port valve, which the user can convert from normally-open to normally-closed, as required.
- Spring-return.



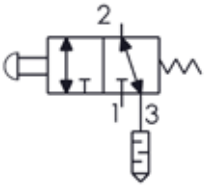
SAI4-2019 - 3/2 NC valve, operated by an emergency knob



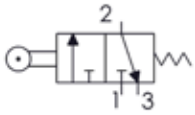
- Driven by approved emergency-type knob.
- Spring-return.

SAI4-2108 - 3/2 NC/NO valve, operated by a knob

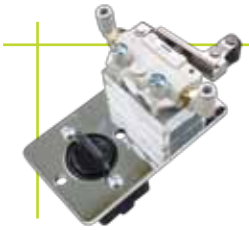
- Includes a 3/2 port valve, which the user can convert from normally-open to normally-closed, as required.
- Approved emergency knob with spring-return action.



SAI4-2013 - 3/2 NC valve, operated by roller lever

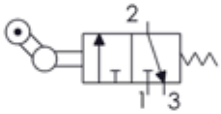


- Mechanical roller action.



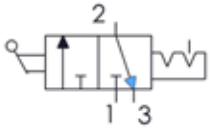
SAI4-2014 - FC 3/2 NC valve. Operated by one-way roller lever

- One-way roller lever.

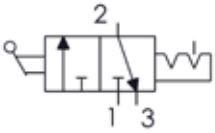


SAI4-2016 - 3/2 NC switch-operated double valve

- Includes 3/2 port valve with locking system.



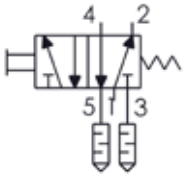
SAI4-2022- 3/2 valve, operated by toggle lever



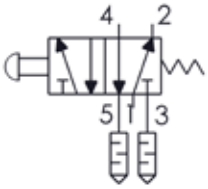
- 3/2 valve with lever and locking action.

SAI4-2109 - 5/2 push-button valve

- Flush push-button NC with spring-return.



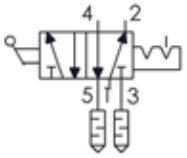
SAI4-2110- 5/2 valve operated by mushroom push-button



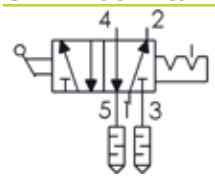
- Activated by approved emergency knob.
- Spring-return.

SAI4-2021 - 5/2 valve with 2-position selector

- Power-assisted valve driven by a locking switch.



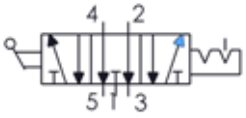
SAI4-2067- 5/2 lever-operated valve



- Lever-operated.

SAI4-2025 - 5/3 valve with selector

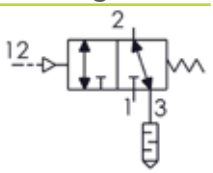
- 5/3 exhaust-centre type valve.



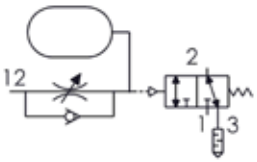
Air operated valves

SAI4-2020 - 3/2 NC/NO, air operated single valve

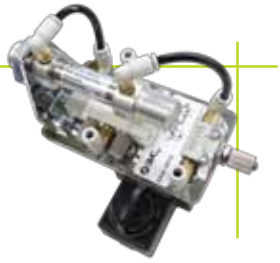
- Includes a 3/2 valve, which the user can convert from NO to NC, as required. Spring return.
- Manual over-ride.



SAI4-2010 - 3/2 NC convertible valve

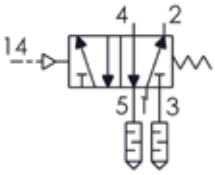


- Basic timer, convertible from NC to NO.
- Timing range, 0 to 5s.

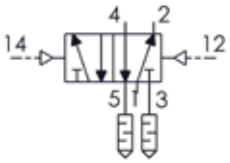


SAI4-2023 - Air operated 5/2 single valve

- Spring-return pneumatic pilot valve.
- Possibility of manual operation.



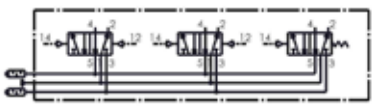
SAI4-2024 - Air operated 5/2 double valve



- Double piloting with memory function.
- Possibility of manual operation.

SAI4-2107 - Block of 2 x 5/2 double valves + 1 x 5/2 single valve

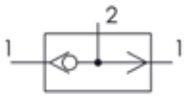
- Three valves mounted on a stainless steel plate with a system for attachment to the panel and ISO symbols.
- Possibility of manual operation.



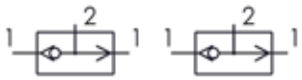
Flow control equipment

SAI4-2007 - "OR" function

- Includes a single circuit selector with logic function "OR".



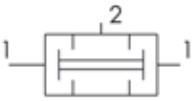
SAI4-2124 - Double "OR" valve



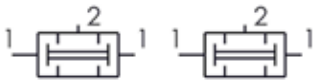
- Includes double circuit selector with logic function "OR".

SAI4-2006 - "AND" function

- Includes a single-simultaneous valve with a logic function "AND".



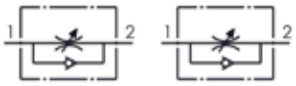
SAI4-2125 - Double "AND" valve



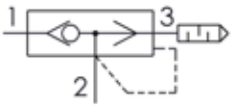
- Includes double simultaneous valve with logic function "AND".

SAI4-2031 - Single direction speed controller (double)

- Includes two single direction speed controllers, manually adjusted.



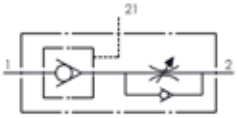
SAI4-2033 - Quick exhaust valve



- Includes a free exhaust valve with silencer.

SAI4-2008 - Check valve

SAI4-2126 - Speed controller with controlled check valve



- Integrated controlled non-return valve and speed controller.
- Allows temporary intermediate lock-out and control of speed.

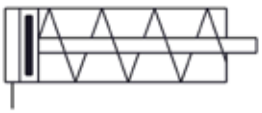
SAI4-2030 - Two-direction speed controller for single acting cylinder

- Includes two-direction speed controller for single acting cylinders.

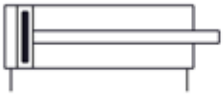
Actuators

SAI4-2027 - Single acting cylinder

- Rod normally retracted.
- Stainless steel construction Diameter 20mm. Stroke 50mm.
- Rubber cushion.



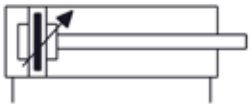
SAI4-2026 - Double acting cylinder with rubber cushion



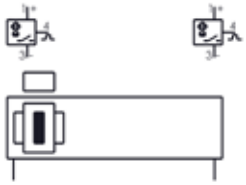
- Stainless steel construction. Exterior diameter 20mm. Stroke 100mm.
- Rubber cushion.
- Rail to house end-of-stroke auto switches.

SAI4-2071 - Double acting cylinder with adjustable air cushion

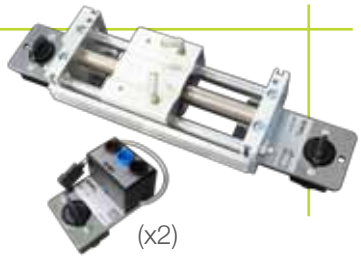
- Diameter 20mm. Stroke 100mm.
- Adjustable air cushion with built-in rail for magnetic detection.



SAI4-2117 - Magnetically coupled rodless cylinder

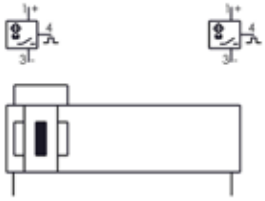


- Stainless steel construction. Exterior diameter 15mm. Stroke 100mm.
- Magnetic coupling with high holding force.
- Speed 50 to 400mm/s.
- Includes 2 solid state magnetic sensors.



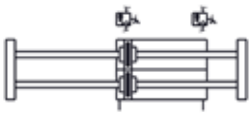
SAI4-2118 - Mechanically coupled rodless cylinder

- Exterior diameter 16mm. Stroke 100mm. Mechanically-driven.
- Speed 100 to 150mm/s.
- Option to mount detectors on either side of the casing.
- Includes 2 solid state, 3-wire sensors.

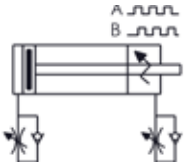


SAI4-2119 - Dual rod cylinder

- Stroke: 100mm.
- Rod with 4 support points on friction bushing.
- Speed 50 to 500mm/s.
- Rubber cushion.
- Includes 2 solid state magnetic sensors.



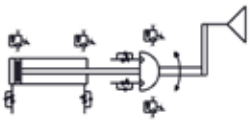
SAI4-2120 - Stroke reading cylinder



- Diameter 20mm. Stroke 50mm.
- Resolution: 0,1mm
- Measurement available for entire length of stroke.
- Direct connection to counter.
- Possibility of PLC connection.
- Incorporates two flow regulators.

** Counter not included SAI4-2121.*

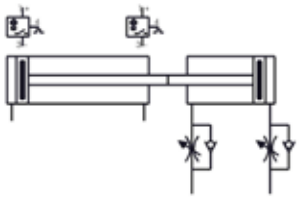
SAI4-2122 - Linear / rotary actuator with vacuum pad



- Linear cylinder and rotating actuator combined with vacuum pad terminal.
- Linear and rotating movement, independent or simultaneous.
- Diameter 32mm, stroke 25mm.
- Angle of rotation: 180º.
- Incorporates 4 flow regulators.
- Includes 4 solid state magnetic sensors.

SAI4-2123 - Cylinder with load

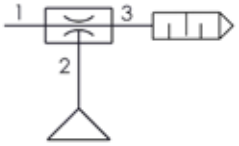
- Two cylinders, one actuator and another as a load.
- Bore 16 and 20mm, stroke 50mm.
- Using flow regulators the load applied can be varied.
- Includes two reed type magnetic sensors.



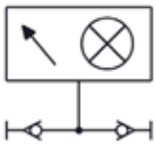
Pneumatics various

SAI4-2029 -Vacuum ejector with pad

- The unit has a vacuum ejector with pad, ø32mm
- Built-in silencer.



SAI4-2003 - Pressure indicator (reed)

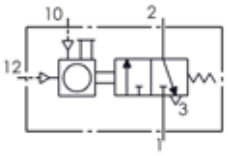


Includes a red optical gauge with a display angle of 180º.
**SAI4-2207 - Pressure indicator (green)*

SAI4-2127 - Pressure vessel

- Pneumatic capacity: 10,2ml.

SAI4-2012 - Pneumatic counter



- Pneumatic counter with preselection and reset facility.
- Automatic or manual preselection.
- Pneumatic signal once the amount of pulses selected has been reached.

SAI4-2011 - Pneumatic sequence controller

- Pneumatic sequence controller module, in four stages, including the "AND" / "OR" functions required.

SAI4-2121 - Pulse counter for reading cylinder

- Counter with 3 preselection points.
- 5-digit LCD with rear lighting.
- Power supply 24Vdc.
- PNP control output, open collector.
- Maximum count speed: 20KHz.

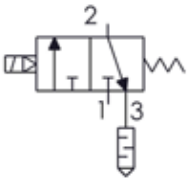
OPTION TO MOUNT AT 90°

- The attachment system to the mounting panel allows a positional change to allow the user to work transversely instead of longitudinally, for case of cylinders and also ends of stroke.

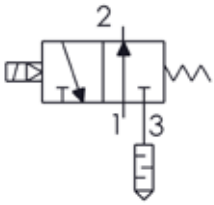
Solenoid valves

SAI4-2050 - 3/2 NC single solenoid valve

- Low consumption: 0,55W.
- LED display and surge absorber.
- Spring and air reset.
- Normally closed.
- Power-assisted system.



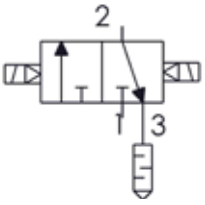
SAI4-2051 - 3/2 NO single solenoid valve



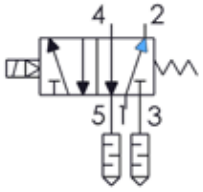
- Low consumption: 0,55W.
- LED display and surge absorber.
- Spring and air reset.
- Normally open.
- Power-assisted system.

SAI4-2111 - 3/2 double solenoid valve

- Low consumption: 0,55W.
- LED display and surge absorber.
- Spring and air reset.
- Power-assisted system.



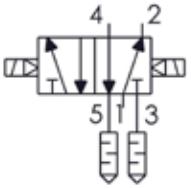
SAI4-2052 - 5/2 single solenoid valve



- Low consumption: 0,55W.
- LED display and surge absorber.
- Spring and air reset.
- Power-assisted system.

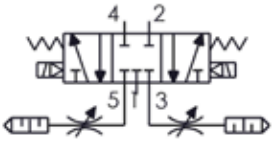
SAI4-2053 - 5/2 double solenoid valve

- Low consumption: 0,55W.
- LED display and surge absorber.
- Spring and air reset.
- Power-assisted system.



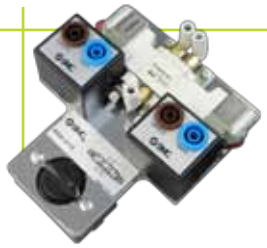
Solenoid valves

SAI4-2054 - 5/3 closed-centre solenoid valve

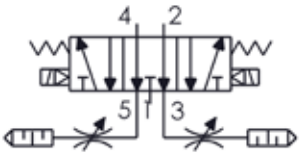


- Low consumption: 0,55W.
- LED display and surge absorber.
- 3 spring centring positions.
- Power-assisted system.
- Flow restrictors with silencer.

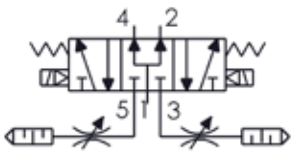
SAI4-2113 - 5/3 solenoid valve, exhaust centres



- Low consumption: 0,55W.
- LED display and surge absorber.
- Three positions with spring centring.
- Power-assisted system.
- Flow restrictors with silencer.

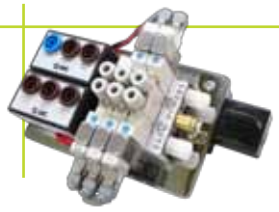


SAI4-2112 - 5/3 solenoid pressure valve

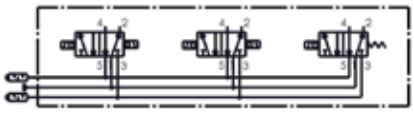


- Low consumption: 0,55W.
- LED display and surge absorber.
- Three positions with spring centring.
- Power-assisted system.
- Flow restrictors with silencer.

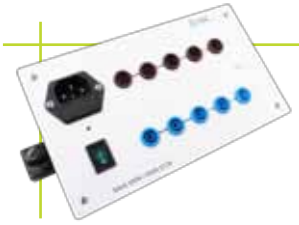
SAI4-2114 - Block of 2 solenoid valves, 5/2 double + 1 single



- Low consumption: 0,55W.
- LED display and surge absorber.
- Spring and air reset.
- Power-assisted system.
- 3-solenoid valve assembly on multiple base plate.



Control modules



SAI4-2056 - Power supply

- Input voltage: 100÷240VAC
- Output: 24VDC / 2,5A.
- Protection against short circuits.
- Input switch and LED display.
- Supply cable included.

SAI4-2035 - ON/OFF switch

- 4 mm safety terminals for use with quick connection wiring.
- Includes latching pushbutton.
- Two independent contacts, NO and NC.

SAI4-2034 - Emergency stop knob (electrical)

- 4 mm safety terminals for use with quick connection wiring.
- Includes double contact, NO and NC.

SAI4-2036 - Set of electrical inputs (Button pad with 3 push-buttons)

- 4 mm safety terminals for use with quick connection wiring.
- Two push-buttons and a latching push-button.
- Independent light indicator.
- Two push-button switch contacts.

SAI4-2038 - Set of 3 relays

- Includes three relays with 24V coil and 4 switchable contacts.
- Relay-active LED.
- 4 mm safety terminals for use with quick connection wiring.

SAI4-2037 - Relay, 3 switched contacts

- Includes relay with 24V coil and 4 switched contacts.
- LED display of active relay.

SAI4-2039 - Timed relay closure

- Includes disconnection timer relay.
- LED display showing timer status.
- Time programmable between 0,1s and 1h.
- 4 mm safety terminals for quick connection wiring.

Control modules

SAI4-2047 - Indicators (pilots, buzzer)

- Includes 8 pilot lights and a buzzer.
- Supplementary sockets for power distribution.
- 4 mm safety female sockets for quick connection wiring.

SAI4-2040 - Set of 2 timer relays

- Includes two timer relays, one for connection and the other for disconnection.
- 24V coil, with switch contact.
- LED display of timer status.
- Time programmable between 0,1s and 1h.

SAI4-2048 - Electric counter

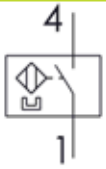
- Includes inputs for counting and discounting.
- Power supply: 24V.
- Electromechanical preselection.
- Manual or electrical reset.
- Switch contact.
- It has 4 mm safety female sockets for quick connection wiring.

SAI4-2049 - Electrical distributor

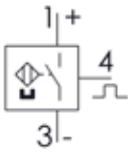
- It has 4 blocks of 4 safety female sockets of 4 mm, interconnected together.
- This allows the user to carry out simple interconnections for complex circuits on different parts of the panel.

SAI4-2043 - Reed auto switch

- Operating voltage: 24V.
- Maximum current: 40mA.
- Includes LED display.



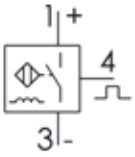
SAI4-2128 - Solid state auto switch



- Operating voltage: less than 28Vdc.
- Maximum current: 150mA.
- PNP output, open catch.
- Includes LED display.

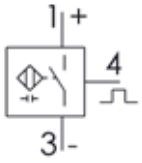
SAI4-2044 - Inductive detector

- Includes M18 inductive detector.
- Detection distance: 5mm.
- Operating voltage: 24V.
- Includes an LED indicating status and quick connection cables.

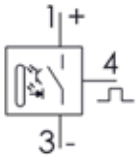


SAI4-2046 - Capacitive detector

- Includes M18 capacitive detector.
- Detection distance: 8mm.
- Status display LED.
- Operating voltage: 24V.



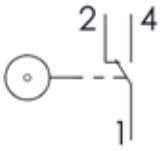
SAI4-2045 - Photoelectric detector



- Includes M18 reflection photoelectric detector.
- Detection distance: 100mm.
- Status display LED.
- Operating voltage: 24V.

SAI4-2042 - Electrical end of stroke

- Includes roller-driven end of stroke with switchable electric contact.



SAI2143-14 - MicroPLC

- Module for table mounting or panel, including the Alpha2 AL2-24MR-D controller (15 inputs and 9 outputs to relay).
- Includes simulation of analog / digital inputs.
- Includes 24Vdc power supply.
- Programming software and instructions manual.
- Includes LED output activation indicator.
- Power supply: 100-240Vac.
- Built-in power cable.

Benchtop PLC module*

SAI9367 - Benchtop Siemens PLC module

- Benchtop module or for panel which includes a Siemens S7-1200 (1212C CPU) PLC with 8 digital inputs, 6 digital outputs to relay and 2 analogue inputs.

SAI9121 - Benchtop Allen Bradley PLC module

- Benchtop module or for panel which includes an Allen Bradley Micrologix 1100 PLC with 10 digital inputs, 6 digital outputs to relay and 2 analogue inputs.

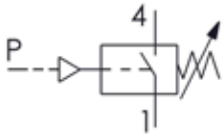
- All the inputs and outputs are accessible by female quick connection sockets for cables with 4 mm safety terminals.
- Includes simulation of analogue and digital inputs by potentiometers and switches.
- Includes LED output activation indicator.
- Includes 24Vdc power supply.
- Power supply: 100-240Vac.

**** Programming tools not included. See section "Programming tools".***
**** Consult for other PLC brands.***

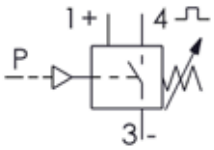
P/V - V/P converters

SAI4-2041 - Electrical contact pressure switch

- Includes pneumatic-electrical converter.
- 0-0,8MPa adjustable, with pressure indicator display.



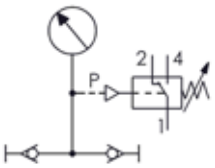
SAI4-2095 - Pressure switch, towards transistor



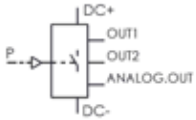
- PNP output with built-in LED display.
- Operating voltage: 12-24Vdc.

SAI4-2098 - Pressure gauge with electrical contact

- Pressure switch function included in a pressure gauge.
- Pressure range: 0 to 1 MPa.
- Ideal for checking in-line pressure.



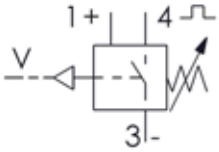
SAI4-2097 - Programmable digital pressure switch. Analog / digital outputs



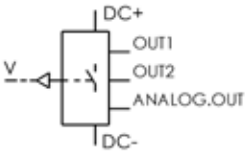
- Pressure indicator display of 3 1/2 digits.
- Operation indicator gauge.
- Adjustment of positive and vacuum pressure.
- Power supply between 12 and 24Vdc.
- Double PNP output in open catch, plus analog output.

SAI4-2096 - Vacuum pressure switch, towards transistor

- Pressure range adjustment -0,1 to 0 MPa.
- PNP output



SAI4-2072 - Programmable digital vacuum pressure switch. Analog / digital outputs

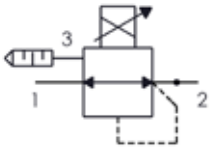


- Operating voltage: 24V.
- Consumption: 45mA.
- Pressure range: -1 to 0,1 MPa.
- Three numerical digits.
- PNP output with snap connection cables.

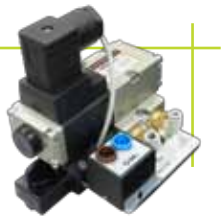
SAI4-2099 - Programmable proportional electro-pneumatic transducer

- Proportional traslances, adjustable pressure and programmable.
- 3-digit display gauge.
- Input code: 4-20mA.
- Analogic output signal: 1-5V.

SAI4-2100 - Proportional pressure valve

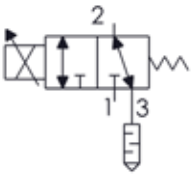


- Pressure adjustment in accordance with analog code.
- Connectable to control amplification card.
- Operating pressure: 0-1 MPa.



SAI4-2101 - Proportional flow rate valve

- Pressure adjustment in accordance with analog code.
- Connectable to control amplification card.
- Operating pressure; 0-0,1MPa.



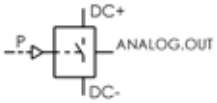
SAI4-2102 - Amplifier card for proportional valve

- Adjustment of ZERO and GAIN on the proportional valve.
- Allows control of proportional valves by analog code, 0 to 5Vdc.
- Power supply 24Vdc.

SAI4-2103 - Amplification card with PID regulator

- Adjustment of ZERO and GAIN for the proportional valve.
- Allows control of proportional valves by an analog signal, 0 to 5Vdc.
- Power supply 24Vdc.
- Includes anomaly-detection system and feed-back circuit for sensor.

SAI4-2104 - Analog pressure sensor



- Pressure range: 0 to 1 MPa.
- Supply voltage: 12 to 24Vdc.
- Output: 1 to 5Vdc.

SAI4-2105 - Digital Pressure Display for analog sensor

- Digital display of pressure for 7 types of units, 3-digit display.
- Display of absolute pressure.
- Programming of cut-off pressure.
- Supply voltage: 12 to 24Vdc.
- Number of outlets: 2 channels x 2 outlets.

Accessories

SAI2057 - Set of 20m of blue tubing and 20m of flexible 4 mm white tubing

- Polyurethane tube, exterior diameter 4mm, two-tone colour, for connections on pneumatic circuits.

** SAI2307 - 10m black piping with outer diameter of 6 mm.*

SAI2058 - Set of 10 “T” fittings

- Set of 10 one-touch fittings for 4mm tubes.

SAI2059 - Set of 5 plugs, 1/8”

- Includes a 5-plug set for pressure outputs of 1/8”.

SAI2060 - Set of 10 x 4mm plastic plugs

- Tool for plugging pressure outlets in 4mm tube.

SAI2132 - Set of 10 “Y” fittings

- Set of 10 one-touch fittings for 4mm tubes.

TK-3 - Tube-cutter

- Tool for clean cuts, perpendicular to the length of the tube.

SAI4-2055 - Set of connection cables

- Includes 30 safety quick connecting cable of 4 mm in different colours and lengths:
  - 50 cm cables: brown (x6), blue (x6) and black (x3).
  - 10 cm cables: brown (x6), blue (x6) and black (x3).

Boxes containing components

SAI4-2076 for PNEU-401
SAI4-2078 for PNEU-402
SAI4-2077 for PNEU-403
SAI4-2079 for PNEU-404
SAI4-2062 for PNEU-405
SAI4-2602 for PNEU-406

- Boxes in Eurobox format allow orderly storage of components.
- Includes printed trays with the references and locations for the components. Incorporates component anchoring system that facilitates their distribution and control.
- Allows extension of additional trays and boxes.

Trays containing components

SAI4-2133 / SAI4-2134 / SAI4-2135

TG-1 - Tube-extractor

- Tool for an easy and quick extraction of the pipe (4 and 6mm).

Set of electric connector adaptors

SAI2819 - Set of 30 adaptors from 2 to 4 mm.
SAI2820 - Set of 30 adaptors from 4 to 2 mm.

- Each set includes 30 adaptors for electrical connectors in different colours: red (x12), blue (x12) and black (x6).

Didactic support

SMC INTERNATIONAL TRAINING bases the design of its products on the model involving "Development of Competence", and so, in addition to its hardware resources, our company offers a series of teachware supplements for comprehensive training in these disciplines, in order to attain the skills described.

SAI2061 - Set of manuals and documentation

- It includes:
  * Unit specifications.
  * Operations manual.
  * Technical dossiers for all components.
  * Student dossiers with pneumatic electropneumatic activities proposed.
  * Teacher's dossiers with solutions for the activities provided for the student.

SAI2070 - CD-ROM, Pneumatic slides

- Includes a set of slides in "Power Point" format organised into chapters, which can be used to support the teacher.

SAI2273 - Pneumatic overheads file

- Contains acetate transparencies with diagrams, calculation table, etc., and also sectional pneumatic components.

SAI2137 - CD-ROM for computer-assisted teaching of Pneumatics / Electropneumatics and PLC

- Self-teaching CD-ROM courses.
  * Available in English.

VAC-200

Vacuum technology

Didactic equipment designed to develop skills in vacuum technology

Develop the SKILLS...

ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

INSTALLATION AND ASSEMBLY

TECH DOCUM. UNDERSTANDING

OPERATION

Complements the PNEUTRAINER family with the most widely used vacuum components in industry.

The different parts of the VAC-200 are kept in its storage box.

In the following TECHNOLOGIES...

VACUUM

VAC-200 - Vacuum technology

Given the increasing demand by companies for qualification in vacuum techniques, VAC-200 is been designed, a didactic system specially devised for the development of skills related to this technology.

VAC-200 complements the PNEUTRAINER (Pneumatics and electro-pneumatics trainer) family, including the most widely used vacuum components in industry.

The modular features of the equipment allow the user to design various configurations and to work on both sides of the panel, thus increasing the number of users who can carry out practical exercises at the same time.

Common elements in all options

All VAC-200 options include two modular panels that contain the most used vacuum components in the industry plus a complete set of vacuum pads and a storage box.

All components have a 6mm tubing connection.

Distributor block

PANEL A:
- Reservoir
- Vacuum gauge
- Vacuum pressure switches, solid state and programmable digital
- Programmable timer

PANEL B:
- Vacuum regulator with vacuum gauge
- Vacuum filter
- Vacuum compact ejector
- Multiphase ejector
- 3 different vacuum units (with their corresponding solenoid valves, filters, etc.)

Complete set of vacuum pads

Storage box

Complete documentation set

There are 2 options for VAC-200:

- VAC-200 for PNEUTRAINER users

Where the client has a PNEUTRAINER system, it is possible to just purchase the vacuum components (making the most of the PNEUTRAINER parts required for running VAC-200).

- Panel A
- Panel B
- Complete set of vacuum pads
- 1 distributor block

- SAI2331 Vacuum trainer (without references of PNEUTRAINER)

- Complete VAC-200

Includes all the necessary parts and devices:

- Panel A
- Panel B
- Complete set of vacuum pads
- 1 air treatment unit
- 1 distributor block
- Flexible 6 mm tube
- Set of 10 “T” fittings
- Set of 10 plastic fittings
- Set of connection cables
- 1 tube cutter tool
- 1 power supply source
- 1 block of indicators (pilots + buzzer)
- 1 block of electric inputs (3 push buttons)
- 1 aluminium panel with feet for vertical positioning and handle (dimensions: 582 x x770 mm)

- SAI2330 Vacuum trainer with documentation

VAC-200 - With this system you could...

VAC-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

SKILLS	VACUUM
ANALYSIS	
TROUBLESHOOT.	
DESIGNING	
TECH DOCUM. CREATION	
INSTALLATION AND ASSEMBLY	
TECH DOCUM. UNDERSTANDING	
OPERATION	

@ eLEARNING-200

Find out more about the theory behind the technologies developed in VAC-200 with our eLEARNING-200 courses.

RELATED eLEARNING-200 COURSES

Principles of pneumatics (SMC-101)

**See eLEARNING-200 chapter for more information*

This shows how the VAC-200 is suitable to develop skills in the specific technology.

This shows that VAC-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

VAC-200 - Options

VAC -200 has a series of optional extras.

• autoSIM-200

autoSIM-200 is software that can design and simulate pneumatic, electro-pneumatic, hydraulic circuits, etc. It is also used for programming them plus monitoring and control of pre-defined 2D and 3D models.

See autoSIM-200 chapter for more information.

VAC-200 - Technical features

Description	COMPLETE VAC-200 (SAI2330)	VAC-200 for PNEUTRAINER-200 users (SAI2331)
Panel A (Dim: 310x330mm):		
Foot mounted reservoir with non-return fittings	1	1
Solid state compact vacuum pressure switches	2	2
Vacuum pressure switch with fault prediction function	1	1
24 Vdc timer	1	1
Programmable digital vacuum pressure switches	2	2
Pressure gauge for vacuum	1	1
Panel B (Dim: 310x370mm):		
Multiphase vacuum ejector	1	1
Vacuum unit with ejector, valves, vacuum pressure switch and filter	1	1
Compact vacuum ejector	1	1
4/2 way direct operated micro solenoid valve	1	1
3/2 elastic runner solenoid valve	1	1
Vacuum module with ejector, valves, vacuum pressure switch and filter	1	1
Vacuum unit with ejector, timed valves, vacuum pressure switch and filter	1	1
Vacuum regulator with pressure gauge	1	1
Air suction filter for vacuum	1	1
Set of vacuum pads:		
Flat NBR vacuum pad with ridges	1	1
Silicone vacuum pad with gaiter	1	1
Urethane vacuum pad with gaiter	1	1
Fluorine rubber vacuum pad with gaiter	1	1
Flat NBR vacuum pad with joint	1	1
Flat NBR vacuum pad with telescope	1	1
Deep / concave NBR vacuum pad with telescope	1	1
Optional elements:		
Air treatment unit	1	
Distributor block	1	1
Flexible 6 mm tube	1	
Set of 10 "T" fittings	1	
Set of 10 plastic fittings	1	
Set of connection cables	1	
Tube cutter tool	1	
Set of 30 adaptors from 4 to 2 mm.		1
Power supply source	1	
Block of indicators (pilots + buzzer)	1	
Block of electric inputs (3 push buttons)	1	
Aluminium panel with feet for vertical positioning and handgrip (Dimensions: 582 x x770 mm)	1	
Storage chest with compartments and trays (Dim: 825x425x450)	1	1

* Only required for users of PNEUTRAINER-400

HYDROTRAINER-200

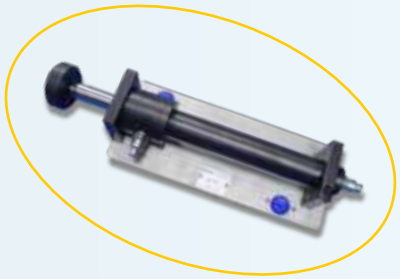
Hydraulics - Electro-hydraulics

Hydraulics and electro-hydraulics within your reach

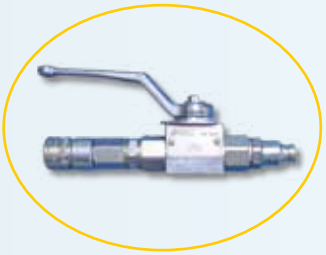
SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

ANALYSIS
TROUBLESHOOTING
DESIGNING
TECH DOCUM. CREATION
INSTALLATION AND ASSEMBLY
TECH DOCUM. UNDERSTANDING
OPERATION



Implements and controls hydraulic and electrohydraulic circuits



Industrial components on panel fastening plate

From basic hydraulics to proportional electro-hydraulics

In the following TECHNOLOGIES...

HYDRAULICS

HYDROTRAINER-200 - Hydraulics - Electro-hydraulics

Hydraulic drives continue to be used in numerous applications in automated industry. With HYDROTRAINER-200 you will be able to meet all your training requirements in the technology related to these drives.

Designed using top-quality industrial materials it has everything required in order to start working from the very first day.

Table / moving assembly frame

The moving frame within the HYDROTRAINER-200 system has a double sided assembly panel with tables sufficiently large for performing practical work at ease on either sides.

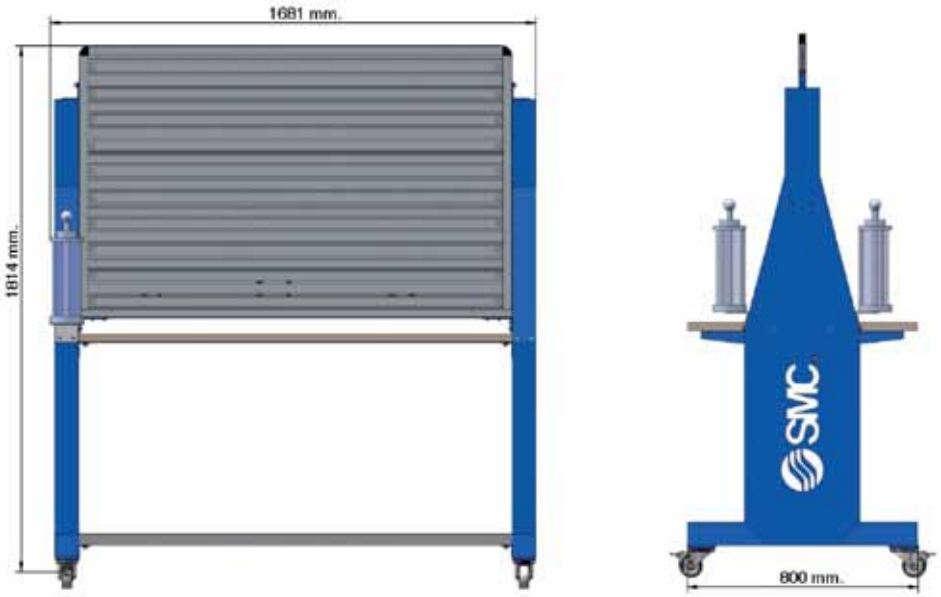
It is assembled on four wheels, two of which have a brake, which enables moving and holding it in the classroom simply and comfortably.

It includes a glass for volumetric measurements on each side of the panel.

The lower section has a support shelf for holding the hydraulic powerpack and storage drawers for components.

Dimensions

HYDROTRAINER-200 has a large enough design for working at ease. The measurements are given in mm below.



Hermetic connections

The hoses, as well as the different devices, are connected to each other with a system of quick-fit self-sealing connectors.

This system guarantees a maximum level of tightness whereby ZERO DRIPPING occurs even during connection/disconnection operations.

Fixing to the panel

Each component includes a fixing system devised in such a way as to aid the quick and simple preparation of the practical exercises.

Kits

HYDROTRAINER-200 has 5 standard kits defined to cover training requirements at different educational levels. Also, the user can configure personalised sets to meet their needs or complement a previously purchased kit.

STANDARD KITS	
SAI9506	HYD-201: Hydraulics level I kit
SAI9507	HYD-202: Hydraulics level II kit
SAI9508	HYD-203: Electro-hydraulics kit
SAI9511	HYD-206: Proportional hydraulics: level I kit
SAI9512	HYD-207: Proportional hydraulics: level II kit

HYDROTRAINER-200 - With this system you could...

HYDROTRAINER-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

SKILLS	HYDRAULICS
ANALYSIS	
TROUBLESHOOT.	
DESIGNING	
TECH DOCUM. CREATION	
INSTALLATION AND ASSEMBLY	
TECH DOCUM. UNDERSTANDING	
OPERATION	

@ eLEARNING-200

Find out more about the theory behind the technologies developed in HYDROTRAINER-200 with our eLEARNING-200 courses.

RELATED eLEARNING-200 COURSES

- Introduction to electricity (SMC-102)
- DC electricity (SMC-103)
- AC electricity (SMC-104)
- Solid state (SMC-105)
- Sensors technology (SMC-108)
- Hydraulics / electrohydraulics (SMC-111)

**See eLEARNING-200 chapter for more information*

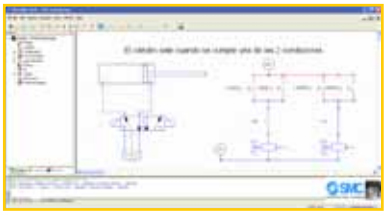
This shows how the HYDROTRAINER-200 is suitable to develop skills in the specific technology.

This shows that HYDROTRAINER-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

HYDROTRAINER-200 - Extra equipment

There are other products in the range to complement HYDROTRAINER-200.

• autoSIM-200



autoSIM-200 is software that can design and simulate pneumatic, electro-pneumatic, hydraulic circuits, etc. It is also used for programming them plus monitoring and control of pre-defined 2D and 3D models.

**See autoSIM-200 chapter for more information.*

HYDROTRAINER-200 - Complete laboratory

Discover our proposal for laboratories and the best combination of the HYDROTRAINER-200 and other accessories in the chapter “Product packs”.

HYDROTRAINER-200 - Configuration

Getting the right HYDROTRAINER-200 configuration is as easy as:

• Steps to follow

1.- Select the panel and the necessary extras.

2.- Select the chosen standard kits or the personalised configuration.

3.- In the event of preferring a personalised configuration, select the references chosen for the composition.

HYDROTRAINER-200 - Standard kits

HYD-201: Hydraulics level I kit
HYD-202: Hydraulics level II kit
HYD-203: Electro-hydraulics kit
HYD-206: Proportional hydraulics: level I kit
HYD-207: Proportional hydraulics: level II kit

Ref.	Description	HYD KITS 201	202	203	206	207
	Actuators					
SAI9239	Double-acting cylinder		1			
SAI9225	Double-rod cylinder					1
SAI9210	Double-acting differential hydraulic cylinder	1				
SAI9300	Cylinder with transducer for linear analogue position					1
SAI9230	Counterweight with lateral fixing to the panel		1			
SAI9220	Hydraulic motor		1			1
	Pressure control valves					
SAI9202	Pressure relief valve	2				
SAI9279	Pressure relief valve with fixing to the panel rail. Sequence valve		1			
SAI9218	Pilot-operated pressure relief valve. Sequence valve		1			
SAI9219	3-way pressure reducing valve		1			
SAI9301	Proportional pressure relief valve, direct control				1	
SAI9305	Pilot-operated proportional pressure relief valve					1
	Flow valves					
SAI9204	Shut-off valve with scale	1				
SAI9205	Two way flow control valve	1				
SAI9211	Non-return line valve	1				
SAI9203	Non-return choke valve	1				
SAI9208	Pressure compensated one-way non-return valve	1				
SAI9213	Piloted non-return valve	1				
	Distribution valves					
SAI9217	Distribution valve 2/2	1				
SAI9282	Distribution valve 3/2	1				
SAI9212	Distribution valve 4/2	1				
SAI9214	4/3 Manual acting valve, spring centered	1				
SAI9253	Distribution valve 2/2 roller driven		1			
SAI9224	Distribution solenoid valve 4/2			1		
SAI9226	Distribution solenoid valve 4/3			1		
SAI9302	Proportional distribution valve 4/3				1	
SAI9304	Pilot-operated proportional distribution valve 4/3				1	
SAI9308	Proportional distribution valve 4/3 with position sensor					1

Ref.	Description	HYD KITS 201	202	203	206	207
	Connection parts and accessories					
SAI9216	Set of 12 hoses with quick-fit female connectors	1				
SAI9240	Set of 10 hoses with quick-fit female connectors		1			
SAI9206	Cross distributor	1				
SAI9207	T distributor with pressure gauge	2				
SAI9209	Distributor plate with pressure gauge, 4 outlets	1	1			
SAI9221	Membrane accumulator with safety block		1			
SAI9233	Set of tubes for load losses simulation	1				
	Control modules, sensors and electrical accessories					
SAI9040	Power supply			1		1
SAI9042	Set of pushbuttons			1		1
SAI9101	Electrical inputs one push-button			1		
SAI9041	Set of 3 relays			1		2
SAI9046	Set of cables with electric connector 4 mm.			1		1
SAI9272	Set of connectors + cable for solenoids			1		
SAI9231	Electric end of stroke			3		4
SAI9229	Pressure switch			1		
SAI9271	Cable for pressure gauge			1		
SAI9309	Power supply module for two proportional coils				1	
SAI9303	Set of connectors for proportional coils				1	1
SAI9310	Digital amplifier cards PZD-PWD for proportional coils					1
SAI9311	Generator of external setpoints					1
SAI9312	Tachometer					1
SAI9313	Analogue position transducer for motor					1
SAI9314	Pressure transducer with digital indicator					1
	Didactic support					
SAI9552	Hydraulics Electro-hydraulics. User's and practical manual	1	1	1		
SAI9563	Proportional Hydraulics level I. User's and practical manual				1	
SAI9565	Proportional Hydraulics level II. User's and practical manual					1

⚠ DON'T FORGET TO ADD AN ASSEMBLY PANEL, HYDRAULIC UNIT AND EXTRAS

SAI9280	Hydraulic rolling table with double face panel	SAI9260	Set of drawers with lock
SAI9274	Hose support accessory (x2)	SAI9370	Benchtop frame with dual position panel
SAI9256	Hydraulic pump for one workstation	SAI9371	Measuring cup for benchtop frame SAI9370
SAI9261	Hydraulic pump for two workstations	SAI9372	Hose accessory (x1) for benchtop frame SAI9370

HYDROTRAINER-200 - Customized kits

The available hydraulic and electro-hydraulic components are listed below, by category.

Assembly panel, hydraulic unit and extras

SAI9280 - Hydraulic rolling table with double face panel

- The vertical panel means you can work on both sides.
- External panel dimensions: 1500x940x25 mm
- It includes a coated white top for horizontal work, 1500 x 800 mm.
- The lower section features a 1500x800 mm metal shelf containing two component storage drawer blocks and the hydraulic pump.
- 4-wheel support, two of them with brake.
- Total dimensions: 1681x800x1814 mm.
- Includes 2 measuring cups.

Hydraulic pump

SAI9256 - Hydraulic pump for one workstation
SAI9261 - Hydraulic pump for two workstations

Maximum operation pressure: 60 bar.
70 litres metal oil tank.
Gear pump flow rate: 5,5 l/min
It includes required oil, P and T connection blocks, emergency stop and start – stop push buttons.
External dimensions: 530x800x580 mm.

SAI9260 - Set of drawers with lock

- 3-drawer block with slide guides to house components.
- Lockable with key.
- External dimensions: 440x800x550mm.

SAI9274 - Hose support accessory (x2)

- Stainless steel made, the set includes two units, one for each side of the panel (for trolley SAI9280).
- It is equipped with lateral fixing system to the panel.

SAI9370 - Benchtop frame with dual position panel

- The vertical panel means you can work on both sides.
- External panel dimensions: 1500x940x25 mm
- Includes lateral structure manufactured in steel prepared for affixing accessories such as: load simulator weight, measuring cup and hose accessories.
- Total dimensions: 1584x600x1084mm.

SAI9371 - Measuring cup for benchtop frame SAI9370

- The measuring cup is a transparent container of 1.2 litres, scaled and with an anti-overflow system.
- Includes a pipe that connects the measuring cup with the hydraulic tank.

SAI9372 - Hose accessory (x1) for benchtop frame SAI9370

- It is equipped with lateral fixing system to the panel.
- Stainless steel made.

SAI9131 - Platform with wheels for the hydraulic motor

- Platform composed of base frame with 4 wheels, 2 with and 2 without brakes, to support the hydraulic motor.

** Recommended for users of SAI9370 - Benchtop frame with dual position panel.*

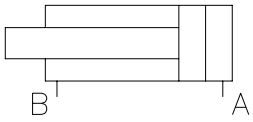
Didactic support

SAI9552 - Hydraulics Electro-hydraulics. User's and practical manual
SAI9553 - Theoretical concepts manual
SAI9563 - Proportional Hydraulics Level I. User's and practical manual
SAI9565 - Proportional Hydraulics Level II. User's and practical manual

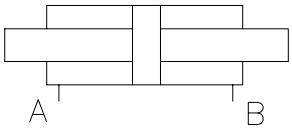
Actuators

SAI9239 - Double-acting cylinder

- In steel, ø32/ø16x 200 mm stroke.
- Area ratio 1.33:1.
- It includes two quick-fit male connectors R 1/4".
- Includes threaded cam at the end of the rod.



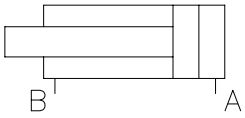
SAI9225 - Double-rod cylinder



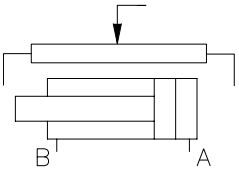
- In steel, Pmax. = 150 bar.
- Diameter ø16 x ø32 x ø16 x 300 mm stroke.
- It includes two quick-fit male connectors R 1/4".
- Includes threaded cam at the end of the rod.

SAI9210 - Double-acting differential hydraulic cylinder

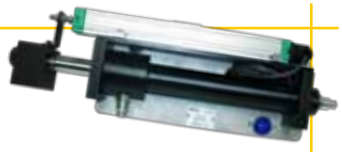
- In steel, ø32/ø22 x 200 mm stroke.
- Includes threaded cam at the end of the rod.
- It includes two quick-fit male connectors R 1/4".



SAI9300 - Cylinder with transducer for linear analogue position

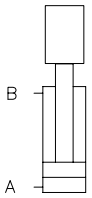


- Linear actuator with position capture.
- Diameter 32mm. Stroke: 200mm.
- Resistance R = 5 KΩ.
- With cables and 4 mm security terminals. Cable length: 1,5 m.
- It includes two quick-fit male connectors R 1/4".

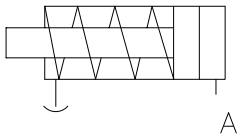


SAI9230 - Counterweight with lateral fixing to the panel

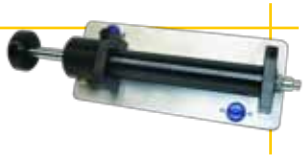
- With lateral fixing system to the panel.
- Weight: 18kg.
- Double-acting cylinder ø20/ø12 x 150 mm stroke.
- It includes transparent methacrylate screen for safety.
- It includes two quick-fit male connectors R 1/4".



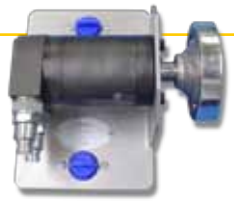
SAI9245 - Single acting cylinder



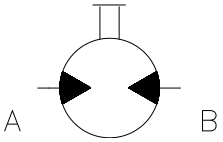
- Steel construction, ø32/ø16 x 160 mm stroke
- Includes threaded cam at the end of the rod.
- It includes one quick-fit male connectors R 1/4".



SAI9220 - Hydraulic motor



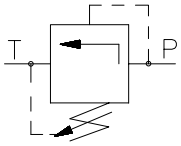
- Gerotor system. Cubic capacity: 12.5 cm3/rev.
- With steering wheel mounted on the axis.
- Includes two quick-fit male connectors, R 1/4" and fixing system to the assembly panel.



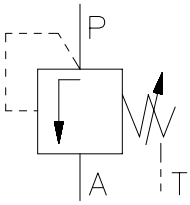
Pressure control valves

SAI9202 - Pressure relief valve

- It enables the maximum pressure value at the input to be adjusted, unloading to the tank from the adjusted value.
- Direct control.
- Pressure regulation 2÷64 bar.
- It includes quick-fit male connectors R 1/4".

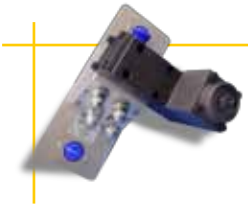


SAI9279 - Pressure relief valve with fixing to the panel rail. Sequence valve

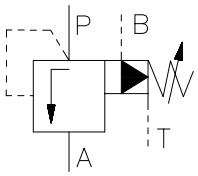


- Opens the oil flow when the preset pressure value is reached at the input.
- Direct guide control with damping.
- Control pressure: 2÷64 bar.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

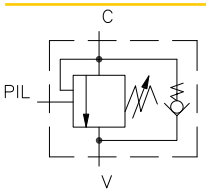
SAI9218 - Pilot-operated pressure relief valve. Sequence valve



- Two-stage limiter valve, one pilot and the and other principal It can work as a sequence valve, opening from P to A when P reaches the pressure value set.
- Indirect guide control.
- Control pressure: 2÷64 bar.
- On base plate with 4 quick-fit male connectors, R 1/4".
- Standardised valve TN6.



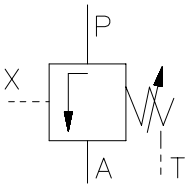
SAI9223 - Overcentre valve



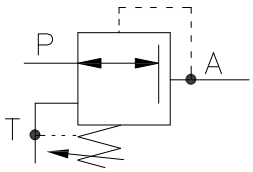
- Compensates the load which is moving the actuator.
- Load control valve. Manual adjustment.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.

SAI9283 - Pilot actuated pressure relief valve

- Opens the oil flow when the preset pressure value is reached at the pilot.
- Pressure regulation: 2÷64bar.
- Maximum flow rate: 25 l/min.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.



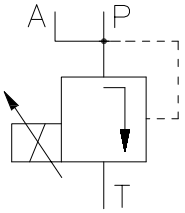
SAI9219 - 3-way pressure reducing valve



- It enables the pressure value at the output, at A, to be adjusted.
- Direct control.
- Pressure regulation 2÷64 bar.
- With relief function as well.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.

Pressure control valves

SAI9301 - Proportional pressure relief valve, direct control



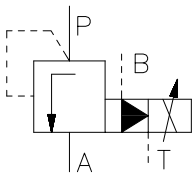
- Regulates the maximum pressure value at a point using an electric control signal.
- Direct control.
- Max. Pressure: 105bar.
- Proportional coil for 0-0,8 A.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

**A connector for SAI9303 proportional coil is required.*

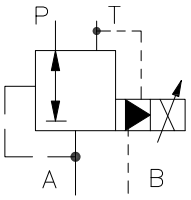
SAI9305 - Pilot-operated proportional pressure relief valve

- Regulates the maximum pressure value at a point using an electric control signal. It has a principal stage and another pilot stage.
- Pressure regulation 0÷64 bar.
- Qmax. = 60 l/min.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

**A connector for SAI9303 proportional coil is required.*



SAI9318 - Proportional pressure reducing valve. Pilot operated

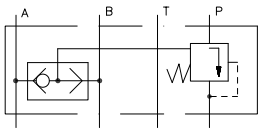


- Reduces the pressure value at a point using an electric control signal.
- Attending to the flow direction this valve may work as a pressure relief valve: P -> A: pressure reducing valve. A -> T: pressure relief valve.
- Pressure regulation: 0÷64bar. With pre-activation chamber.
- Maximum flow rate: 40 l/min.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Adjustment using a proportional coil. Standardised valve TN6.

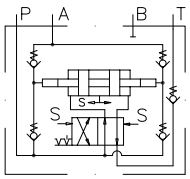
**A connector for SAI9303 proportional coil is required.*

SAI9259 - Differential valve - Pressure compensator

- It enables the flow passing through a proportional valves to be independent of the pressure value at the input and output.
- Modular assembly under TN6 size directional control valve.
- ΔP: 5bar.
- Constant flow rate due to the pressure balance between P and A or P and B.



SAI9242 - Pressure intensifier 1:4 with piloted by-pass check valve

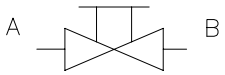


- Multiplies the value of the pressure signal by four.
- Piloted non-return valve included for by-pass function.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.

Flow valves

SAI9204 - Shut-off valve with scale

- Opens or closes the oil flow with an activation lever on a graduated scale.
- Scale from 0 to 90º.
- One quick-fit male connector and one quick-fit female connector, R 1/4".



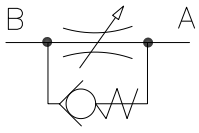
SAI9205 - Two way flow control valve

- It enables the oil flow in both directions to be adjusted.
- Manual adjustment by rotary control.
- One quick-fit male connector and one quick-fit female connector, R 1/4".

SAI9211 - Non-return line valve

- It enables the oil to flow on one direction only.
- One quick-fit male connector and one quick-fit female connector, R 1/4".
- Mounted in a hose.

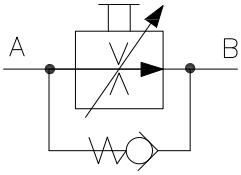
SAI9203 - Non-return choke valve



- It enables the oil flow in one direction to be adjusted and flow to be unrestricted in the opposite direction.
- Manual adjustment by rotary control.
- One quick-fit male connector and one quick-fit female connector, R 1/4".

SAI9208 - Pressure compensated one-way non-return valve

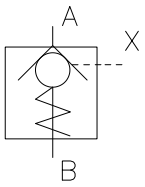
- It enables the oil flow in one direction to be adjusted, regardless of the pressure value at the input and output, while unrestricted flow is permitted in the opposite direction.
- Manual adjustable via graduated scale.
- Nominal flow rate: 3,2 l/min.
- Mounted on anodized aluminium base plate with male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.



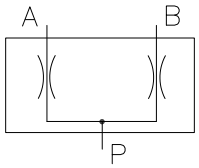
Flow valves

SAI9213 - Piloted non-return valve

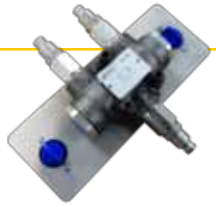
- Normally it allows the oil to pass in one direction only, but it does it in both directions when there is pressure in the pilot connection.
- With internal drainage.
- Cartridge type, for line assembly.
- Two quick-fit male connectors and one quick-fit female connector, R 1/4".



SAI9222 - Flow divider valve

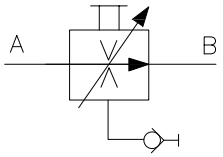


- This valve divides the input flow in two equal parts.
- Nominal flow rate: 6l/min.
- Maximum flow rate: 38 l/min.
- With male anti-leakage quick-fit connectors R1/4".

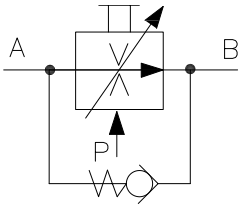


SAI9262 - 2 way pressure compensated flow control valve with "minimess" connection

- It enables the flow to be adjusted regardless of the pressure values at the input and output, in addition incorporating an auxiliary connection to measure the pressure.
- 2 way flow control valve. Hydrostatic compensation. ""Minimess"" connection.
- Nominal flow rate: 3,2 l/min.
- Manually adjustable via graduated scale.
- Standardised valve TN6.



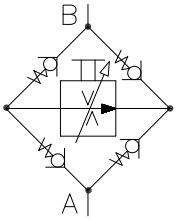
SAI9247 - 3 way pressure compensated flow control valve



- It enables the flow to be adjusted regardless of the pressure values at the input and output.
- Flow control valve. Hydrostatic compensation. 3 way. Externally piloted.
- Nominal flow rate: 3,2 l/min.
- Manually adjustable via graduated scale.
- Standardised valve TN6.

SAI9250 - Pressure compensated flow control valve with rectifier module

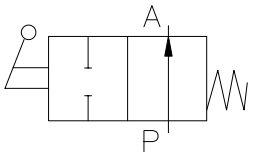
- It enables the flow to be adjusted regardless of the pressure values at the input and output, incorporating a rectifier to regulate the flow that enters and leaves the actuator.
- 2 way flow control valve. Hydrostatic compensation. ""Minimess"" connection. Rectifier circuit including four non-return valves for bidirectional operation.
- Nominal flow rate: 3,2 l/min.
- Manually adjustable via graduated scale.
- Standardised valve TN6.



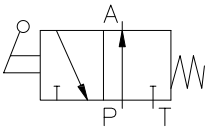
Distribution valves

SAI9217 - Distribution valve 2/2

- Manual drive. Spring reset. Normally opened.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.



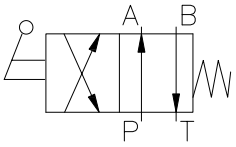
SAI9282 - Distribution valve 3/2



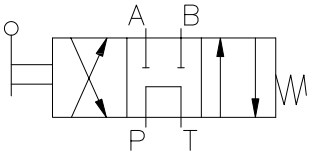
- Manual drive. Spring reset.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

SAI9212 - Distribution valve 4/2

- Manual drive. Spring reset.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.



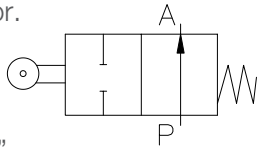
SAI9214 - 4/3 Manual acting valve, spring centered



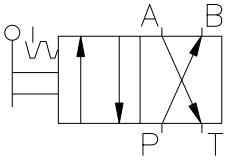
- Manual drive. Spring reset. P and T connected in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

SAI9253 - Distribution valve 2/2 roller driven

- Distributor valve 2/2 for operation from an external actuator.
- Roller driven. Spring reset.
- Normally open.
- Includes cam and accessories for cylinder assembly.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.



SAI9243 - 4/2 directional control valve, with mechanical interlock

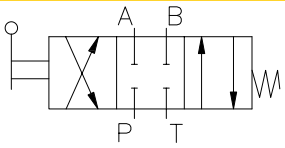


- Bistable distributor valve 4/2
- Mechanical locking manual override.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

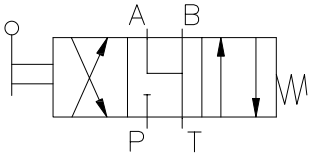
Distribution valves

SAI9215 -4/3 directional control valve. Manually operated. Closed mid-positions

- Lever operated valve. Spring centered. A, B, P and T closed in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.



SAI9241 - 4/3 distribution valve. A, B, T linked in mid-position

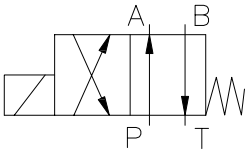


- Lever operated valve. Spring-centered. A, B and T connected in central position. P closed in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

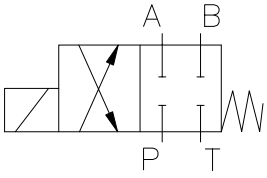
SAI9224 - Distribution solenoid valve 4/2

- Electric drive. Spring reset.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

**Connector for SAI9272 coil required.*

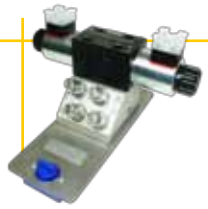


SAI9273 - 4/2 solenoid valve with closed mid-position



- 4 lines closed at rest.
- Electric drive. Spring reset.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

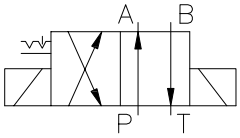
**Connector for SAI9272 coil required.*



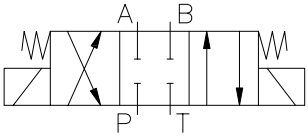
SAI9275 - 4/2 solenoid valve, with mechanical interlocking

- Mechanical interlock. Electrically operated in both sides, biestable.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

**Connectors for SAI9272 coil required.*



SAI9226 - Distribution solenoid valve 4/3



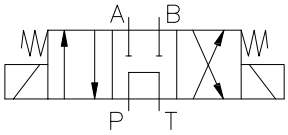
- Electric drive and spring centring.
- Closed centre.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

**Connectors for SAI9272 coil required.*

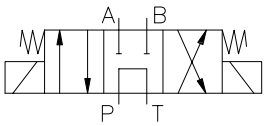
SAI9227 - 4/3 solenoid valve with relieving mid-position

- Electrically operated. Solenoids and spring centered. A-B-T linked. P closed in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

**Connectors for SAI9272 coils required.*



SAI9228 - 4/3 solenoid valve with PT-connected in mid-position



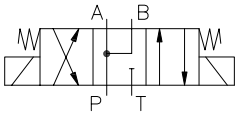
- Electrically operated: 24VDC solenoids and spring centered. P-T linked. A-B closed in central position.
- Mounted on anodized aluminium base plate with three male anti-leakage quick-fit connectors R 1/4".
- Standardised valve TN6.

** Necesarios conectores para bobinas SAI9272.*

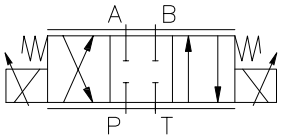
SAI9281 - 4/3 solenoid valve, A-B-P linked. T closed in mid-position

- Electrically operated. Solenoids and spring centered. A-B-P linked. T closed in central position.
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

**Connectors for SAI9272 coils required.*



SAI9302 - Proportional distribution valve 4/3



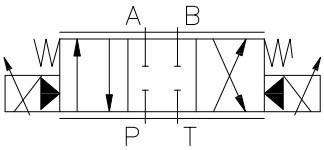
- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal.
- Direct control, spring centring. Closed centres.
- Nominal flow rate: 6 l/min.
- Pmax. = 315 bar.
- Coils at 24V, 0~0.85 A.
- On base plate with 4 quick-fix male connectors, R 1/4".
- Standardised valve TN6.

**Connectors for SAI9303 coils required.*

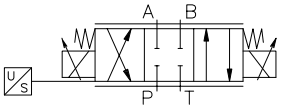
SAI9304 - Pilot-operated proportional distribution valve 4/3

- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal, with a principal stage and another pilot stage.
- Indirect control, spring centring. Closed centres.
- Pmax. = 210 bar.
- Coils at 24V, 0~0.85 A. Internal X and Y drivers
- On base plate with 4 quick-fix male connectors, R 1/4".
- Rated size 10 (TN10).

**Connectors for SAI9303 coils required.*

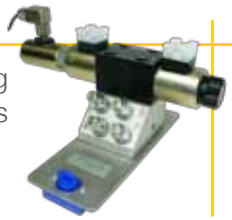


SAI9308 - Proportional distribution valve 4/3 with position sensor



- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal It incorporates position capture of the internal slide.
- Direct control. Spring centring. Closed centres.
- Nominal flow rate: 6 l/min. Pmax. = 315 bar.
- With LVDT runner position sensor
- On base plate with three quick-fit male connectors R 1/4".
- Standardised valve TN6.

**Connectors for SAI9303 coils required.*



Connection parts and accessories

SAI9216 - Set of 12 hoses with quick-fit female connectors

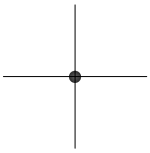
- 8 pieces NW6 x 500 mm long.
- 4 pieces NW6 x 1000 mm long.

SAI9240 - Set of 10 hoses with quick-fit female connectors

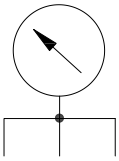
- 8 pieces NW6 x 500 mm long.
- 2 pieces NW6 x 1000 mm long.

SAI9206 - Cross distributor

- Multiple derivation of oil flow with 4 connections.
- 4 exits at 90º.
- With three quick-fit male connectors and one female R 1/4".



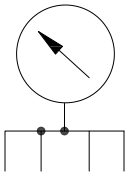
SAI9207 - T distributor with pressure gauge



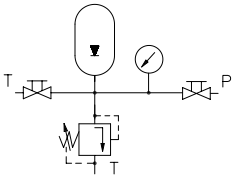
- 3 port pressure gauge.
- Pressure gauge ø63, 0÷60 bar.
- Glycerine damping.
- 3 exits at 90º, two quick-fit male connectors and one female R 1/4".

SAI9209 - Distributor plate with pressure gauge, 4 outlets

- 4 port pressure gauge.
- Diameter pressure gauge ø63, 0÷60 bar, on base plate.
- Glycerine damping.
- With four quick-fit male connectors, R 1/4".



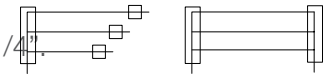
SAI9221 - Membrane accumulator with safety block



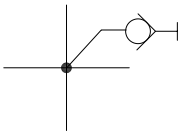
- T.U.V. type including two shutoff valves and safety valve tared above the working level.
- Charged with nitrogen, P load: 20 bar.
- It includes two quick-fit male connectors R 1/4".
- Volume: 0.7 dm3.

SAI9233 - Set of tubes for load losses simulation

- To measure pressure drops
- It includes two quick-fit male connectors R 1/4".
- 3 different diameters with the same length.
- 3 different lengths with the same diameter.



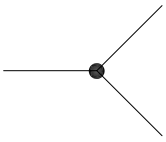
SAI9254 - Cross distributor with minimes conection



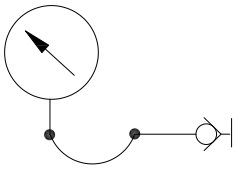
- 4 port distributor plus another auxiliary connection
- Four 90º connections and measurement point for "minimess" hose.
- 4 anti-leakage quick-fit connectors included, R 1/4", 3 male and 1 female.

SAI9255 - "Y" distributor

- 3 port distributor.
- With three Y connections.
- Includes two male quick connectors and a female R 1/4" connector.



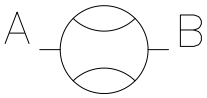
SAI9252 - Pressure gauge with "minimess" connection



- Pressure gauge with auxiliary pressure tap.
- Manometer ø63mm, P: 0÷100 bar.
- Glycerine damping.
- 500 mm length hose included. "Minimess" connector included.

SAI9238 - 1 - 9 l/min flow-meter

- Measurement range: 1 – 9 l/min.
- Transparent body with scale.
- Male and female anti-leakage quick-fit connectors, R 1/4".



Control modules, sensors and electrical accessories

SAI9040 - Power supply

- Voltage input 110V - 240VAC.
- Output: 24VDC / 5A.
- Short-circuit protection.
- Input switch and LED display.
- Built-in power cable.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

SAI9042 - Set of pushbuttons

- 2 pushbuttons with spring return.
- 2-position selector.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

SAI9101 - Electrical inputs one push-button

- 1 pushbutton with spring return.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

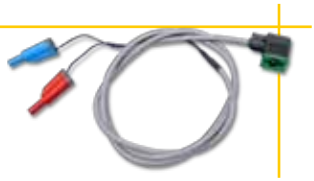
SAI9041 - Set of 3 relays

- It includes three relays with coil 24V and 4 switchable contacts.
- LED activated relay display.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

SAI9046 - Set of cables with electric connector 4 mm

- 5 red cables 1.5 m.
- 5 black cables 1 m.
- 10 yellow cables 0.5 m.
- 5 blue cables 0.25 m.

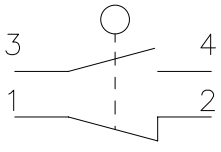
SAI9272 - Set of connectors + cable for solenoids



- Male connectors 4 mm.
- Cable 1.5 m.
- Ready to connect in solenoid vale coils.
- It includes 3 units (1 black connector and 2 grey connectors).
- LED indicators.

SAI9231 - Electric end of stroke

- Retractable roller driven.
- 1 contact NO.1 contact NC.
- Transparent body and roller with reversible position.
- 4 mm female safety connectors.



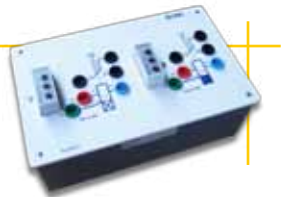
SAI9043 – Indicator light assembly

- Includes 8 indicator lights and a beeper.
- It has additional female sockets for power supply distribution.
- 4 mm female electrical safety connectors.

SAI9033 - Electric meter with pre-selection

- Includes counting and countdown inputs.
- Power supply: 24 V.
- Pre-selected electromechanics.
- Manual or electric zero clear.
- Switched contact
- 4 mm female electrical safety connectors.

SAI9057- Set of 2 timed relays



- Installed in box made of an insulating material with a system for securing to the support panel and ISO serigraph.
- Includes two timed relays: one for connection and the other for disconnection.
- With 24 V coil and switch contact.
- It has an LED timer state indicator.
- Programmable time between 0.1 sec and 1 hour.
- 4 mm electrical safety connections.

SAI4-2143 - MicroPLC

- Module for table mounting or panel, including the Alpha2 AL2-24MR-D controller (15 inputs and 9 outputs to relay).
- Includes simulation of analog / digital inputs.
- Includes 24Vdc power supply.
- Programming software and instructions manual.
- Includes LED output activation indicator.
- Power supply: 100-240Vac.
- Built-in power cable.

Benchtop PLC module*

SAI9367 - Benchtop Siemens PLC module

- Benchtop module or for panel which includes a Siemens S7-1200 (1212C CPU) PLC with 8 digital inputs, 6 digital outputs to relay and 2 analogue inputs.

SAI9121 - Benchtop Allen Bradley PLC module

- Benchtop module or for panel which includes an Allen Bradley Micrologix 1100 PLC with 10 digital inputs, 6 digital outputs to relay and 2 analogue inputs.

- All the inputs and outputs are accessible by female quick connection sockets for cables with 4 mm safety terminals.
- Includes simulation of analogue and digital inputs by potentiometers and switches.
- Includes LED output activation indicator.
- Includes 24Vdc power supply.
- Power supply: 100-240Vac.

**** Programming tools not included. See section "Programming tools".***

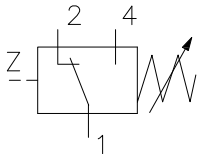
**** Consult for other PLC brands.***

Control modules, sensors and electrical accessories

SAI9229 - Pressure switch

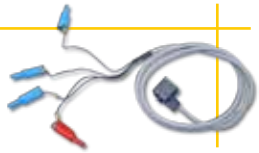
- It emits an electrical signals when the preset pressure value is reached.
- Output via switched potential-free contact.
- Pressure adjustable between 0 - 40 bar. Max. Pressure: 125bar.

**Cable for SAI9271 pressure switch required.*



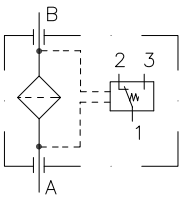
SAI9271 - Cable for pressure gauge

- Ready to connect to pressure switch.
- Male connectors ø4 mm.
- Cable length: 1.5 m.
- LED indicators.

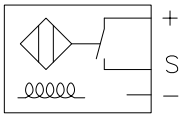


SAI9287 - In line pressure filter

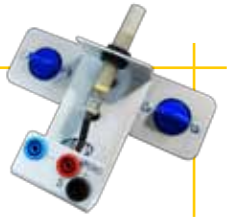
- Oil filter to fit at the high pressure input of the user circuit.
- 10 µ cartridge. B10=75. Max. Pressure: 10 bar.
- With electrical clogging indicator.
- Includes electrical connector with two LEDs (red, green) and output switched by free voltage contact.
- On base plate with three quick-fit male connectors R 1/4".



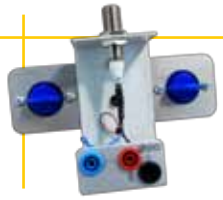
SAI9276 - Inductive sensor



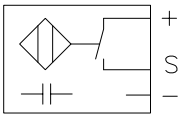
- Adjustable detection distance: 2 mm.
- M12, possibility of adjusting the detection distance.
- Transistorised output, with indicator LED.
- Three socket safety wiring on screen printed plate for correct connection.



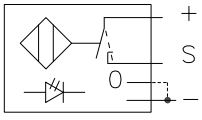
SAI9277 - Capacitive sensor



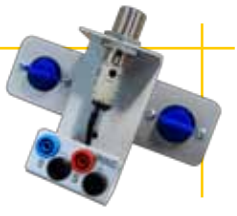
- Adjustable detection distance: 4 mm.
- M12, possibility of adjusting the detection distance.
- Transistorised output, with indicator LED.
- Three socket safety wiring on screen printed plate for correct connection.



SAI9278 - Optical sensor



- Adjustable detection distance: 100 mm.
- M18, possibility of adjusting the detection distance.
- Transistorised output, with indicator LED.
- Four socket safety wiring on screen printed plate for correct connection.



SAI9309 - Power supply module for two proportional coils

- Electronic unit for entering the electric signals to the proportional valves. Manual control.
- Potentiometer for controlling the output intensity to coils a or b.
- Dither frequency on/off switch and Dither frequency value adjustment.
- I max. = 0.9 A per coil.
- 2 ammeters for displaying the current via coils a or b.
- Overload electronic internal protection.

SAI9303 - Set of connectors for proportional coils

- Connectors with LED indicators (screen type). Long. 1.5 m.
- It includes 2 units (1 grey connector and 1 black connector).

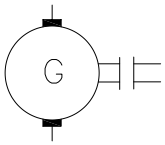
SAI9310 - Digital amplifier cards PZD-PWD for proportional coils

- Electronic unit for entering the electric signals to the proportional valves. Automatic control.
- For the control and regulation of systems with proportional solenoid valves.
- Controlled by microprocessor without potentiometers, input, reading and graphic display of parameters by PC. Internal and external set point introduction possibility.
- Acceleration / deceleration slopes.
- PID digital regulator.
- ø4 mm security terminals.
- 1 Software license included for PC. 1 communication cable included (PC – card).

SAI9311 - Generator of external setpoints

- Electronic unit for entering the electric control setpoint to the digital amplifier cards SAI9310.
- With multi-turn potentiometer, output current 0 ~ ±10 VDC.
- In screen printed insulating box, with connections by means of ø4 mm coloured safety sockets.

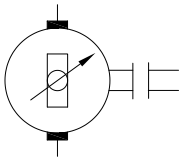
SAI9312 - Tachometer



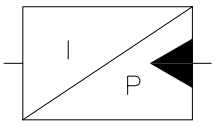
- For mounting on the motor and obtaining a voltage value in proportion with the rotation speed (speed control).
- Output 0 - +/-10 VDC. Bidirectional.
- With coupling for piston motor SAI9220.
- ø4 mm security terminals.

SAI9313 - Analogue position transducer for motor

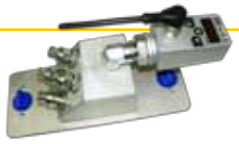
- For mounting on the motor and obtaining a voltage value in proportion to the rotation angle. (Position control).
- Output 0 ~ 10 VDC. Bidirectional.
- R = 4.7 KΩ.
- With coupling for piston motor SAI9220.
- ø4 mm security terminals.



SAI9314 - Pressure transducer with digital indicator



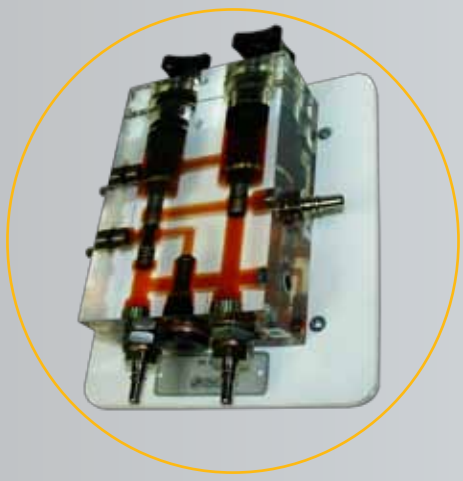
- Converts the pressure value at any point into a proportional electrical signal (V).
- Pressure range = 0 ~ 64 bar.
- Output 4 ~20 mA.
- Built-in pressure switch function.



HYDROMODEL-200

Transparent Hydraulics - Electro-hydraulics

Hydraulic and electro-hydraulic technology at a glance



Implements and controls hydraulic and electro-hydraulic circuits

SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

ANALYSIS

TROUBLESHOOTING

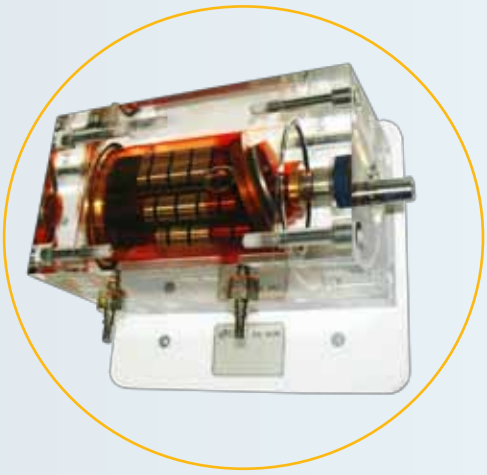
DESIGNING

TECH DOCUM. CREATION

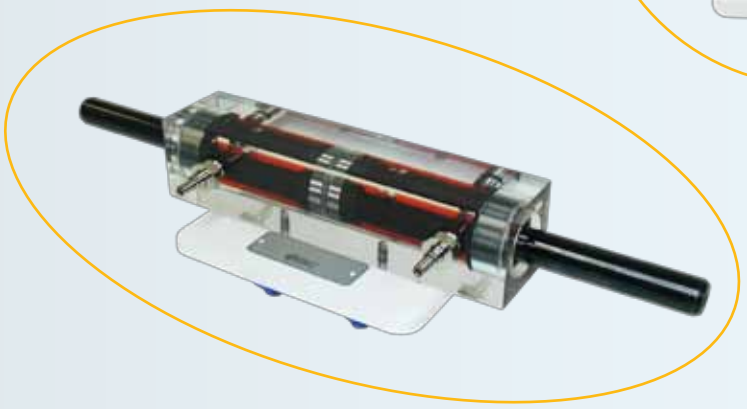
INSTALLATION AND ASSEMBLY

TECH DOCUM. UNDERSTANDING

OPERATION



Transparent methacrylate body with internal industrial metal parts



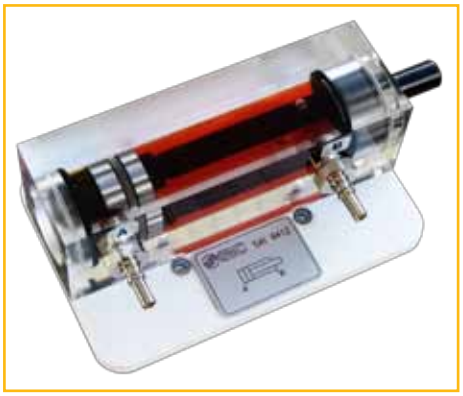
In the following TECHNOLOGIES...

HYDRAULICS

HYDROMODEL-200 - Transparent Hydraulics - Electro-hydraulics

HYDROMODEL-200 meets training needs for technology related to hydraulic components in a very visual way.

The parts are made up of a transparent methacrylate body with internal industrial metal parts. Using this system, it is possible to see inside the components as they operate, becoming familiar with them and understanding how they work.



Hermetic connections

The hoses, as well as the different devices, are connected to each other with a system of quick-fit self-sealing connectors NW4 1/8".

This system guarantees a maximum level of fluid integrity with ZERO LEAKAGE even during connection/disconnection operations.

Fixing to the panel

Each component includes a fixing system to aid quick and simple preparation of practical exercises.

Kits

HYDROMODEL-200 has 3 standard kits defined to cover training demands at different educational levels. Users can configure personalised sets to meet their own requirements or add to previously purchased equipment.

STANDARD KITS	
SAI9500	MOD-201: Transparent hydraulic level I kit
SAI9501	MOD-202: Transparent hydraulic level II kit
SAI9502	MOD-203: Transparent electro-hydraulic kit

HYDROMODEL-200 - With this system you could...

HYDROMODEL-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

SKILLS	HYDRAULICS
ANALYSIS	
TROUBLESHOOT.	
DESIGNING	
TECH DOCUM. CREATION	
INSTALLATION AND ASSEMBLY	
TECH DOCUM. UNDERSTANDING	
OPERATION	

eLEARNING-200

Find out more about the theory behind the technologies developed in HYDROMODEL-200 with our eLEARNING-200 courses.

RELATED eLEARNING-200 COURSES

- Introduction to electricity (SMC-102)
- DC electricity (SMC-103)
- AC electricity (SMC-104)
- Solid state (SMC-105)
- Sensors technology (SMC-108)
- Hydraulics / electrohydraulics (SMC-111)

**See eLEARNING-200 chapter for more information.*

This shows how the HYDROMODEL-200 is suitable to develop skills in the specific technology.

This shows that HYDROMODEL-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

HYDROMODEL-200 - Extra equipment

There are other products in the range to complement HYDROMODEL-200.

• autoSIM-200

autoSIM-200 is software that can design and simulate pneumatic, electro-pneumatic, hydraulic circuits, etc. It is also used for programming them plus monitoring and control of pre-defined 2D and 3D models.

**See autoSIM-200 chapter for more information.*

HYDROMODEL-200 - Complete laboratory

Discover our proposal for laboratories and the best combination of the HYDROMODEL-200 and other accessories in the chapter “Product packs”.

HYDROMODEL-200 - Configuration

Getting the right HYDROMODEL-200 configuration is as easy as:

PRODUCT DOWNLOAD www.smctraining.com CONFIGURATOR

• Steps to follow

1.- Select the panel and the necessary extras.

2.- Select the chosen standard kits or a personalised configuration.

3.- In the event of preferring a personalised configuration, select the references chosen for the composition.

HYDROMODEL-200 - Standard kits

Ref.	Description	KITS 201	202	203
	Actuators			
SAI9412	Double acting cylinder	1		
SAI9419	Single acting cylinder		1	
	Distribution valves			
SAI9413	4/2 directional control valve. Manually operated	1		
SAI9431	4/2 solenoid valve, spring return			1
SAI9440	4/3 solenoid valve with closed mid-position			1
	Pressure control valves			
SAI9414	Pressure relief valve (ball valve), direct control	1		
SAI9418	3 way pressure relief valve, with damping		1	
SAI9420	Pressure reducing valve, 3 way. Direct control		1	
	Flow valves			
SAI9422	Manual shut-off valve, 2 way		1	
SAI9423	Piloted check valve		1	
SAI9415	One way restrictor	1		
SAI9416	Two way flow control valve	1		
SAI9421	One way flow control valve		1	
SAI9424	Flow control valve with pressure compensation		1	
	Connection parts and accessories			
SAI9425	Set of 5 hoses		1	
SAI9408	Set of 10 hoses	1		
SAI9405	6 connection distributor on manifold	1		
SAI9407	4 connection divider		1	
SAI9406	Cross distributor with pressure gauge	1		
	Control modules, sensors and electrical accessories			
SAI9040	Power supply			1
SAI9042	Set of pushbuttons			1
SAI9041	Set of 3 relays			1
SAI9231-R	Electric end of stroke (right)			1
SAI9231-L	Electric end of stroke (left)			1
SAI9272	Set of connectors + cable for solenoids			1
SAI9046	Set of cables with electric connector 4 mm			1
	Didactic support			
SAI9496	User's and practical manual	1	1	1

⚠ DON'T FORGET TO ADD AN ASSEMBLY PANEL, HYDRAULIC UNIT AND EXTRAS

SAI2064	Vertical mounting panel for 2 work posts
SAI2065	Rolling table with twin-post
SAI9410	Portable hydraulic pump for transparent hydraulic
SAI2074	Storage drawer blocks for rolling table with lock

HYDROMODEL-200 - Customized kits

The available hydraulic and electro-hydraulic components are listed below, by category.

Assembly panel, hydraulic unit and extras

SAI2064 - Vertical mounting panel for 2 work posts

- External dimensions: 1150x760x410mm*. Allows work to be carried out on both sides, optimizing investment and space.

**Other dimensions available on request.*

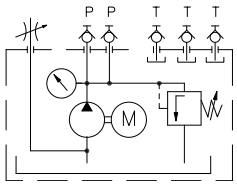
SAI2065 - Rolling table with twin-post

The entire rolling frame system may be disassembled for transportation.
-The vertical panel means you can work on both sides.
Panel dimensions: 1150x760x25mm
- It has a work-top for horizontal work, 1200x800mm.
The lower section features a 1200x600mm metal shelf containing the component storage drawers block, the portable hydraulic pump, etc.
4 wheel support, 2 of them with brake and 2 without brake, and high loading output.
Total dimensions: 1200x800x1700mm.

SAI9410 - Portable hydraulic pump for transparent hydraulic

- Transparent tank holding 6 litres.
- Gear pump. Q= 1 l/min.
- Pressure relief valve, Pmax: 10 bar.
- 3 quick connector couplings (P + 2T)
- - Single-phase motor. Start - stop switch. Filter cap and filter.
- Air bubble insertion system in the circulation oil.

** Does not include oil drum. SAI9411 necessary.*



SAI2074 - Storage drawer blocks for rolling table with lock

- Compact 4-drawer block with slide guides to house the components.
- External dimensions: 500x725x650mm.
- With security lock.

SAI9411 - Oil with special red colouring

- Specially coloured oil for using with transparent elements.
- Quantity required for portable hydraulic pump.

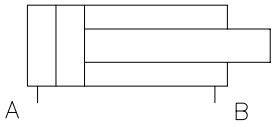
Didactic support

SAI9496- User's and practical manual
SAI9553 - Theoretical concepts manual

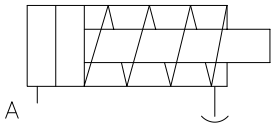
Actuators

SAI9412 - Double acting cylinder

- ø20/ø10 x 58mm of stroke.
- Max. Pressure: 10bar.



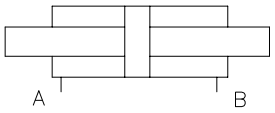
SAI9419 - Single acting cylinder



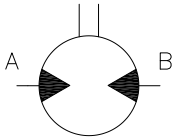
- ø20/ø10 x 40mm of stroke. Spring return.
- Max. Pressure: 10bar.

SAI9457 - Double rod cylinder

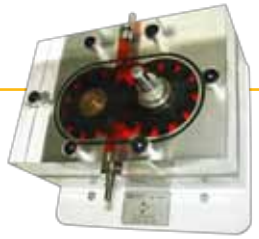
- ø14/ø20/ø14 x 100mm of stroke.
- Max. Pressure: 10bar.



SAI9401 - External gear motor

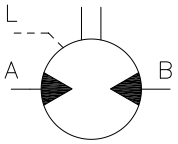


- Two-way hydraulic motor, with external gears.
- With two gears with 12 teeth and one shaft.

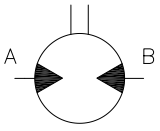


SAI9436 - Axial piston motor

- Two-way hydraulic motor with axial pistons.
- 7 metal pistons Ø12 over inclined plane.
- Connections A, B and L drainage.



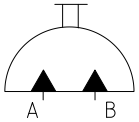
SAI9435 - Vane motor



- Two-way vane hydraulic motor with one shaft. 8 vanes acting on eccentric rotor.

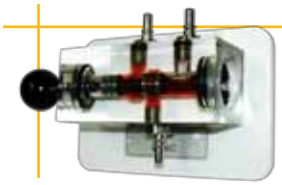
SAI9438 - 180º rotary actuator

- Oscillating two-way hydraulic motor.
- Angle of rotation: 180º. One shaft.

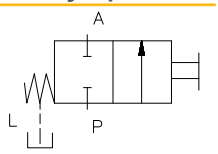


Distribution valves

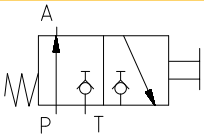
SAI9442 - 2/2 directional control valve. Manually operated



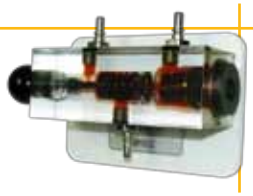
- Manually-operated and spring return.
- With drainage.



SAI9445 - 3/2 directional control valve. Manually operated. Seat type

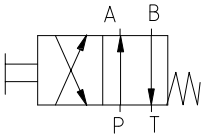


- Manually-operated and spring return.
- Max. Pressure: 10bar.

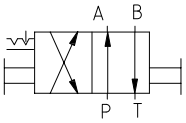


SAI9413 - 4/2 directional control valve. Manually operated

- Manually-operated and spring return.
- Max. Pressure: 10bar.



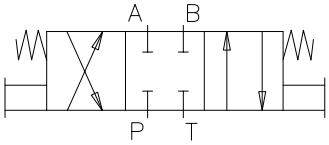
SAI9446 - 4/2 directional control valve. Manually operated. Mechanical interlocking



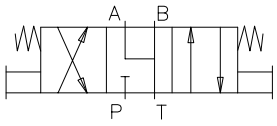
- Manual operation on both sides.
- Max. Pressure: 10bar.

SAI9447 - 4/3 directional control valve. Manually operated. Closed mid-position

- Manual operation on both sides and spring centered.
- Max. Pressure: 10bar.



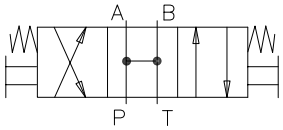
SAI9449 - 4/3 directional control valve. Manually operated. Relieving mid-position



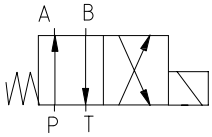
- Manual operation on both sides and spring centered.
- Max. Pressure: 10bar.

SAI9450 - 4/3 directional control valve. Manually operated. P-A-B-T linked in mid-position

- Manual operation on both sides and spring centered.



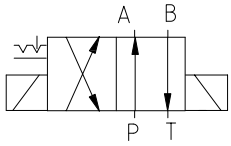
SAI9431 - 4/2 solenoid valve, spring return



- Coil-operated and spring return.
- Max. Pressure: 10bar. Low consumption coil (12w).

**Connector for SAI9272 coil required.*

SAI9482 - 4/2 solenoid valve with mechanical interlocking



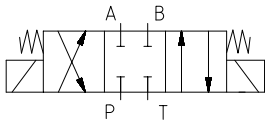
- Bistable. Coil-operated on both sides.
- Max. Pressure: 10bar. Low consumption coil (12w).

**Connector for SAI9272 coil required.*

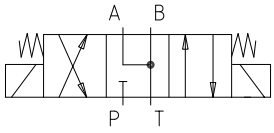
SAI9440 - 4/3 solenoid valve with closed mid-position

- Coil-operated on both sides and spring centered.
- Max. Pressure: 10bar. Low consumption coil (12w).

**Connector for SAI9272 coil required.*



SAI9483 - 4/3 solenoid valve. A-B-T linked in mid-position



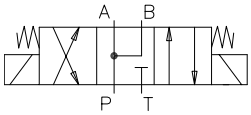
- Bistable. Coil-operated on both sides.
- Max. Pressure: 10bar. Low consumption coil (12w).

**Connector for SAI9272 coil required.*

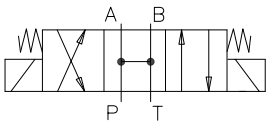
SAI9484 - 4/3 solenoid valve. A-B-P linked in mid-position

- Bistable. Coil-operated on both sides.
- Max. Pressure: 10bar. Low consumption coil (12w).

**Connector for SAI9272 coil required.*



SAI9485 - 4/3 solenoid valve. A-B-P-T linked in mid-position



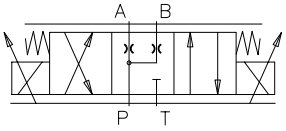
- Bistable. Coil-operated on both sides.
- Max. Pressure: 10bar. Low consumption coil (12w).

**Connector for SAI9272 coil required.*

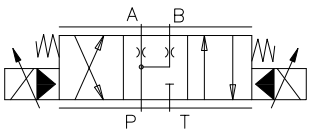
SAI9403 - 4/3 proportional directional control valve, direct control.

- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal.
- A, B and P connected in mid-position. T closed.
- Coil-operated on both sides. Spring centered.
- Max. Pressure: 10bar. 24Vcc / I nominal: 0.8A coils.

**Connector for SAI9303 coil required.*



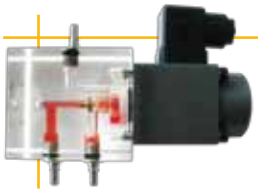
SAI9404 - 4/3 proportional directional control valve.



- Distributor valve 4/3 with gradual opening, depending on the value of the electrical control signal, with a principal stage and another pilot stage.
- Pilot-operated. External pilots X and Y. Spring centered. A, B and P connected in mid-position. T closed.
- Coil-operated on both sides.
- Max. Pressure: 10bar. 24Vcc / I nominal: 0.8A coils.

**Connector for SAI9303 coil required.*

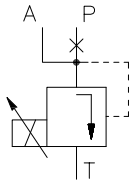
Pressure control valves



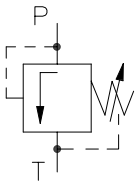
SAI9402 - Proportional pressure relief valve, direct control

- Regulates the maximum pressure value at a point using an electric control signal.
- Coil-operated 24Vcc / I nominal: 0.8A.
- Max. Pressure: 10bar.

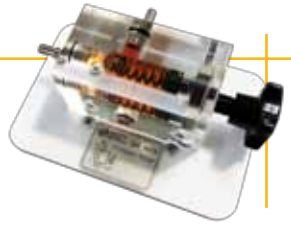
**Connector for SAI9303 coil required.*



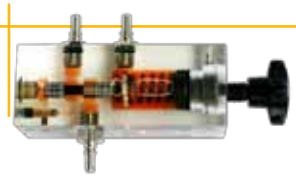
SAI9414 - Pressure relief valve (ball valve), direct control



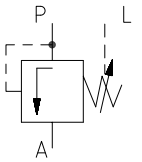
- It enables the maximum pressure value at the input to be adjusted, unloading to the tank from the adjusted value.
- Manual adjustment using the twist handle.
- Max. Pressure: 10bar.



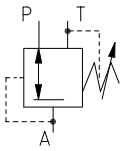
SAI9418 -3 way pressure relief valve, with damping



- Opens the oil flow when the preset pressure value is reached at the input.
- Direct control. Manual adjustment by rotary knob.
- Max. Pressure: 10bar.

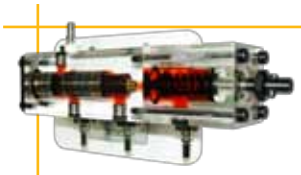


SAI9420 - Pressure reducing valve, 3 way. Direct control

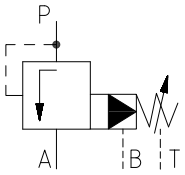


- It enables the pressure value at the output, at A, to be adjusted.
- Manual adjustment by rotary knob.
- Max. Pressure: 10bar.

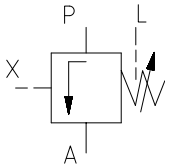
SAI9459 - Pressure relief valve. Pilot operated



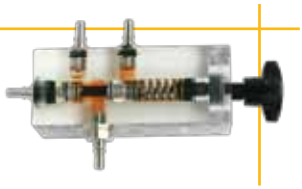
- Two-stage limiter valve, one pilot and the and other principal It can work as a sequence valve, opening from P to T when P reaches the pressure value set.
- Manual regulation by rotary knob.
- Max. Pressure: 10bar.



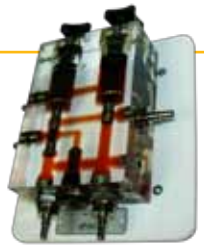
SAI9460 - Discharge valve



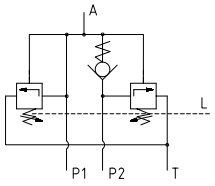
- Opens the oil flow when the preset pressure value is reached at the pilot.
- Discharge valve by external pilot.
- Manual regulation by rotary knob.
- Max. Pressure: 10bar.



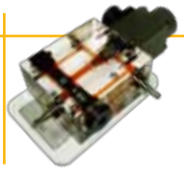
SAI9463 - High - Low pressure circuit



- Manual adjustment by two rotary knobs.
- Max. Pressure: 10bar.
- Comprised of a circuit of two adjustable limit valves and a non-return valve.
- All in the same body.



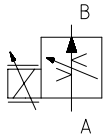
Flow valves



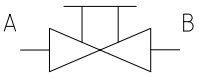
SAI9439 - Proportional flow control valve with pressure compensation

- Coil-operated 24Vcc / I nominal: 0.8A
- Max. Pressure: 10bar.

**Connector for SAI9303 coil required.*



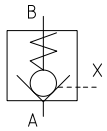
SAI9422 - Manual shut-off valve, 2 way



- Opens or closes the oil flow with an activation lever.
- Manual rotary actuation.
- Max. Pressure: 10bar.

SAI9423 - Piloted check valve

- Normally it allows the oil to pass in one direction only, but it does it in both directions when there is pressure in the pilot connection.
- Max. Pressure: 10bar.

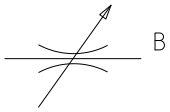


SAI9415 - One way restrictor

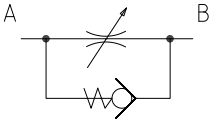
- It enables the oil to flow on one direction only.
- Max. Pressure: 10bar.

SAI9416 - Two way flow control valve

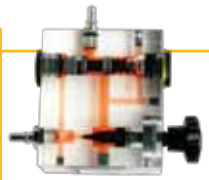
- It enables the oil flow in both directions to be adjusted.
- Two-way flow control valve, with two ports, needle. Manual adjustment by rotary knob.
- Max. Pressure: 10bar.



SAI9421 - One way flow control valve

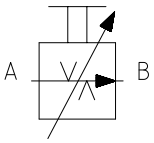


- It enables the oil flow in one direction to be adjusted and flow to be unrestricted in the opposite direction.
- One-way.Manual adjustment by rotary knob.
- Max. Pressure: 10bar.

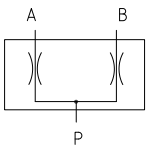


SAI9424 - Flow control valve with pressure compensation

- It enables the flow to be adjusted regardless of the pressure values at the input and output.
- Manual regulation by rotary knob.
- Max. Pressure: 10bar.



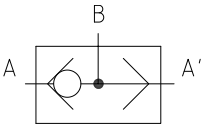
SAI9468 - Flow divider



- Flow divider valve: it divides the inlet flow into two equal parts.
- Max. Pressure: 10bar.

SAI9469 - Circuit selector with logic function “OR”

- Max. Pressure: 10bar.

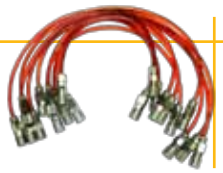


Connection parts and accessories

SAI9425 - Set of 5 hoses

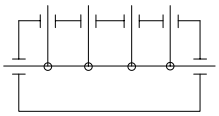
- Set of 5 transparent polyurethane tubes.
- Max. Pressure: 10bar. 520 mm length.

SAI9408 - Set of 10 hoses



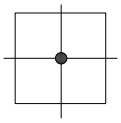
- Set of 10 transparent polyurethane tubes.
- Max. Pressure: 10bar. 520 mm length: 6 units. 350 mm length: 4 units.

SAI9405 - 6 connection distributor on manifold



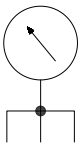
- Max. Pressure: 10bar.

SAI9407 - 4 connection divider



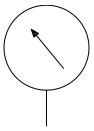
- Max. Pressure: 10bar.
- With three self-sealing plugs and 1 socket.

SAI9406 - Cross distributor with pressure gauge



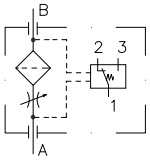
- Distributor with 3 connections with pressure gauge from 0 to 16 bar.
- With two self-sealing plugs and 1 socket.

SAI9461 - Pressure gauge without container



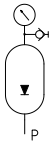
- Without box or scale for viewing the internal mechanism.
- Max. Pressure: 10bar.
- With one self-sealing plug and one socket.

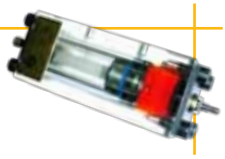
SAI9462 - Pressure filter with clogging indicator



- Oil filter to fit at the high pressure input of the user circuit.
- Potential-free output by switched contact.
- Max. Pressure: 10bar.

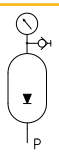
SAI9464 - Piston accumulator





- Max. Pressure: 10bar.
- Load pressure (nitrogen): 4 bar.

SAI9466 - Diaphragm accumulator



- Max. Pressure: 10bar.
- Load pressure (nitrogen): 4 bar.

Control modules, sensors and electrical accessories

SAI9309 - Power supply module for two proportional coils

- Potentiometer for controlling the output intensity to coils a or b.
- I max. = 0.9 A per coil.
- Overload electronic internal protection.
- Dither frequency on/off switch and Dither frequency value adjustment.
- 2 ammeters for displaying the current via coils a or b.

SAI9303 - Set of connectors for proportional coils

- Connectors with LED indicators (screen type). Long. 1.5 m.
- It includes 2 units (1 grey connector and 1 black connector).
- Indication on screen of light intensity proportional to the intensity value.

SAI9040 - Power supply

- Voltage input 110V - 240VAC.
- Output: 24VDC / 5A.
- Short-circuit protection.
- Input switch and LED display.
- Built-in power cable.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

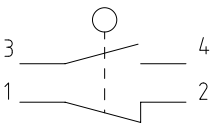
SAI9042 - Set of pushbuttons

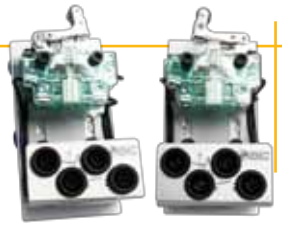
- 2 pushbuttons with spring return.
- 2-position selector.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

SAI9041 - Set of 3 relays

- It includes three relays with coil 24V and 4 switchable contacts.
- LED activated relay display.
- 4 mm female electrical safety connectors.
- Insulating box with screen printed lid.

SAI9231-R / SAI9231-L - Electric end of stroke (right / left)





- Retractable roller driven.
- R=right. L=left.
- 1 contact NO.1 contact NC.
- Transparent body and roller with reversible position.
- 4 mm female safety connectors.

SAI9272 - Set of connectors + cable for solenoids

- Male connectors 4 mm. Cable 1.5 m.
- Ready to connect in solenoid vale coils.
- It includes 3 units (1 black connector and 2 grey connectors).
- LED indicators.

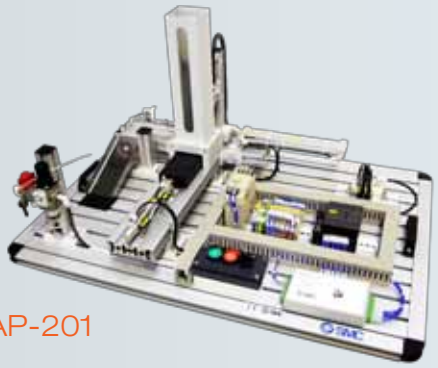
SAI9046 - Set of cables with electric connector 4 mm

- 5 red cables 1.5 m.
- 5 black cables 1 m.
- 10 yellow cables 0.5 m.
- 5 blue cables 0.25 m.

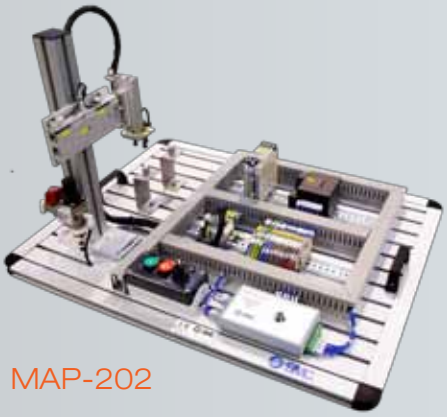
MAP-200

Handling systems

7 options to choose from to study different mechanical handling techniques

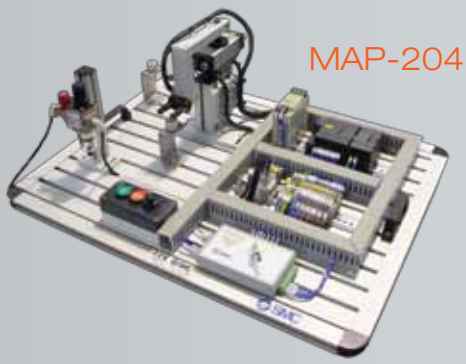


MAP-201

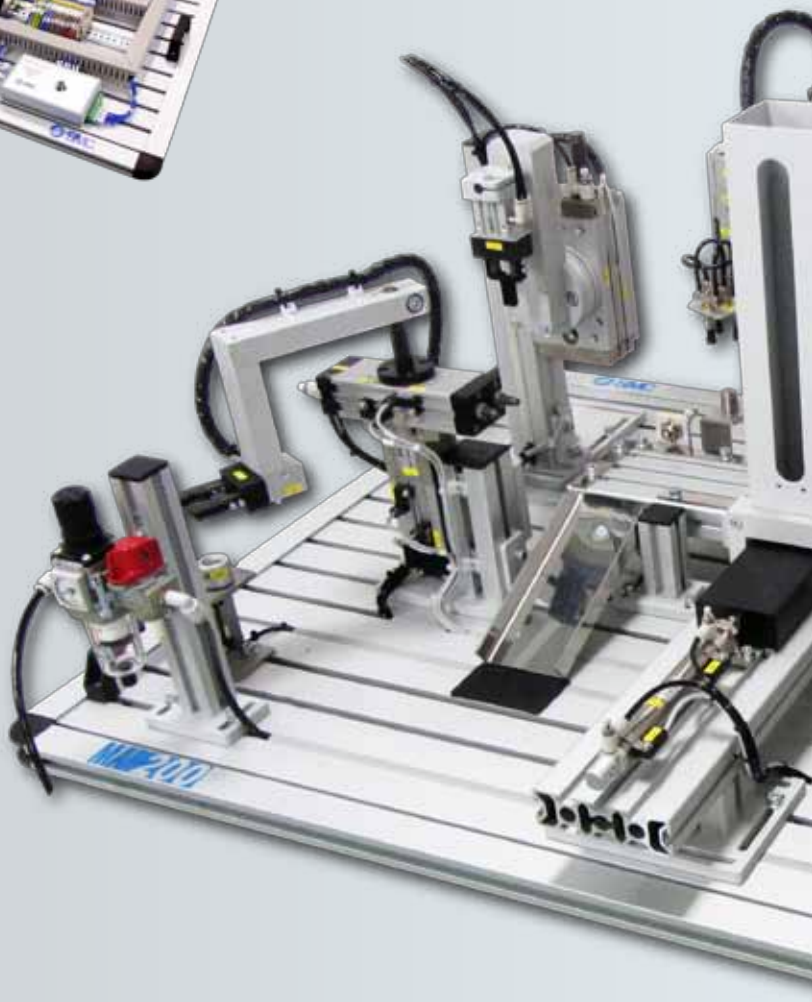


MAP-202

MAP-203

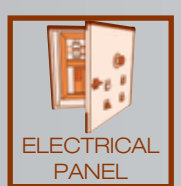


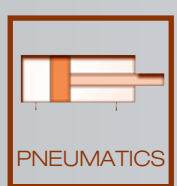
MAP-204

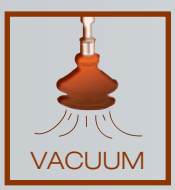


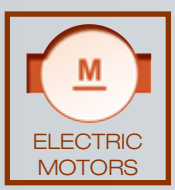
MAP-205

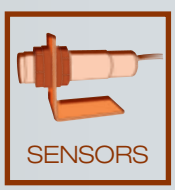
In the following TECHNOLOGIES...

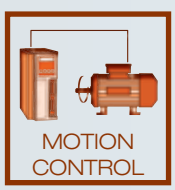










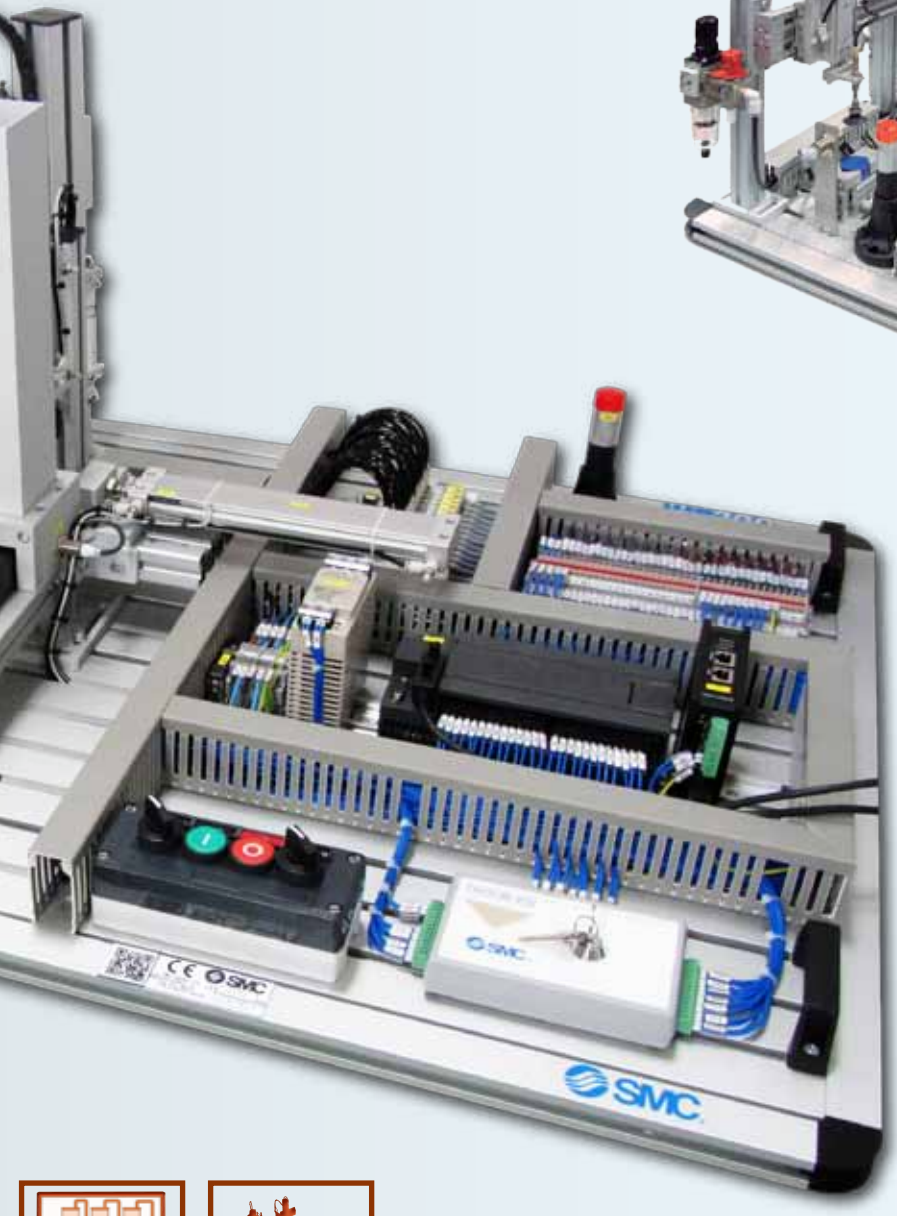


INTERNATIONAL TRAINING

Develop the SKILLS...

MAP-206

MAP-207



- ANALYSIS
- TROUBLESHOOTING
- DESIGNING
- TECH DOCUM. CREATION
- INSTALLATION AND ASSEMBLY
- TECH DOCUM. UNDERSTANDING
- OPERATION
- PROGRAMMING

- SCADA / HMI
- AUTOMATED SYSTEMS

MAP-200 - Handling systems

The MAP-200 series consists of seven independent and different training systems.

MAP-201, MAP-202, MAP-203 and MAP-204

Each of these carries out a simple assembly process by reproducing subsets of more complex processes found in industry. They can all incorporate the TROUB-200 trouble-shooting simulation system.

These four pieces of equipment are offered in three different versions to meet each client's different requirements:

- Without PLC: It comes assembled, adjusted and wired up. The PLC is not included.
- With PLC: It is supplied fully assembled, programmed and tested. We have a wide variety of PLC brands. Please consult availability.
- Assembly kit: The equipment is supplied as a complete kit with of parts. In addition to the practical activities normally available, the student can carry out assembly and equipment adjustment as well as pneumatic and electrical wiring. The assembly instructions and drawings provided in the documentation guide the student through the building and wiring tasks. This version does not include a PLC.

MAP-205

In just one system, all the functions of the four previous pieces of equipment form a complete assembly-dismantling process. MAP-205 incorporates the troubleshooting system TROUB-200, which generates up to 16 different breakdowns to be diagnosed by the user.

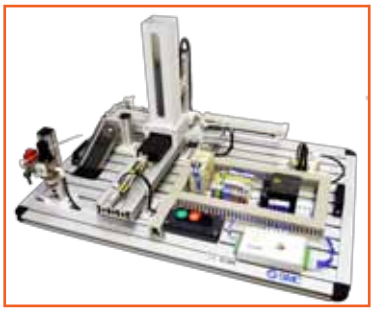
MAP-206

It is designed to develop electrical actuator skills.

MAP-207

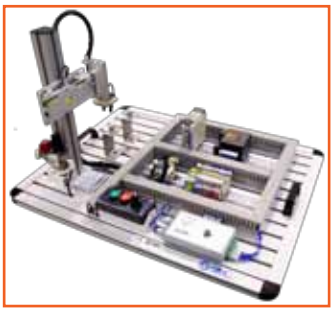
This is a part classification manipulator. It comes in two versions depending on its control system: an external PLC or a PC with autoSIM-200.

The seven machines in the MAP-200 family are described below.



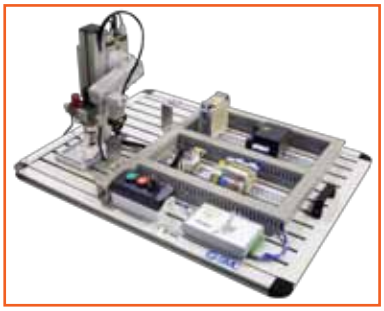
• MAP-201

Gravity feeds parts which are checked for orientation. If the part is incorrectly positioned, it is rejected.



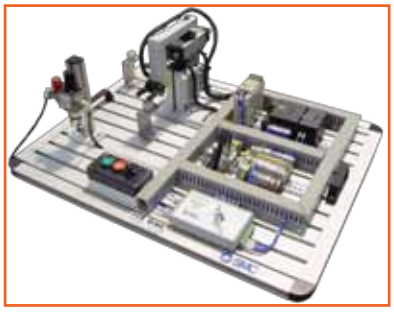
• MAP-202

Performs a Pick & Place movement of a part using vacuum grippers.



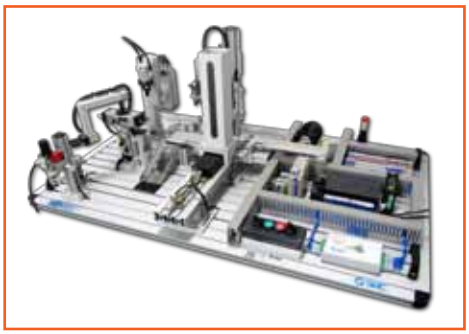
• MAP-203

Moves a part from one position to another using a rotating manipulator fitted with an inside gripper.



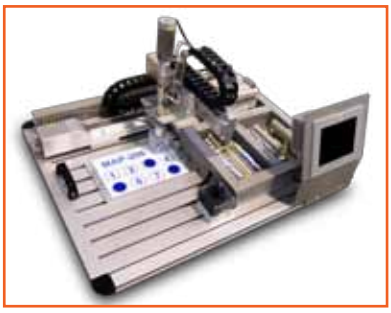
• MAP-204

Transfers a part from one position to another using a roto-linear manipulator fitted with an external gripper.



• MAP-205

Integrates the four systems: MAP-201, MAP-202, MAP-203, MAP-204, forming an assembly minicell. It carries out the complete assembly-disassembly process in four parts. It includes the troubleshooting simulation system.



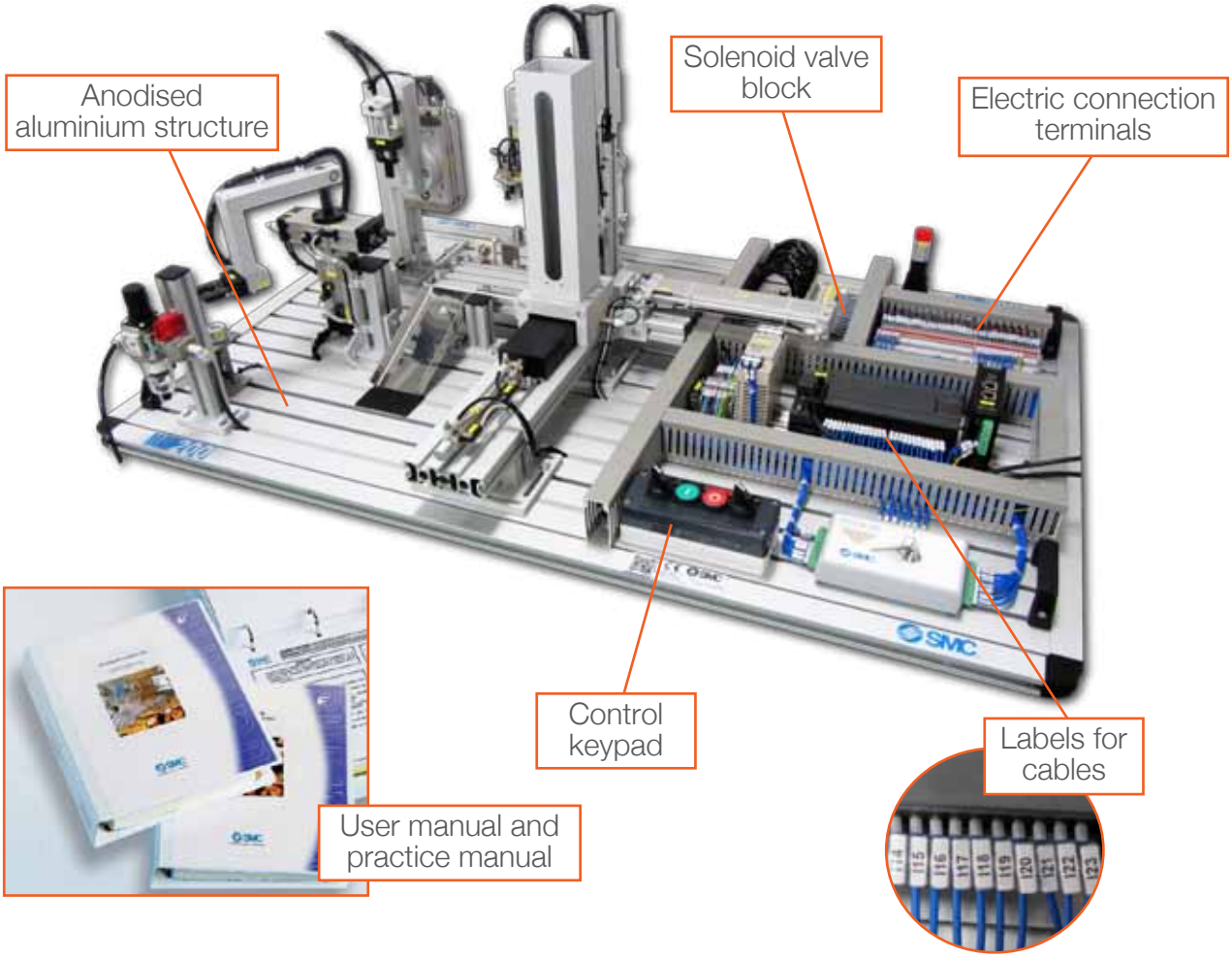
• MAP-206

It can perform different handling operations on metal parts using a system of 3 electrical Cartesian axes, two of them servo-controlled.

• MAP-207

It performs an automated process of classification and rejection of components made of various materials and sizes.

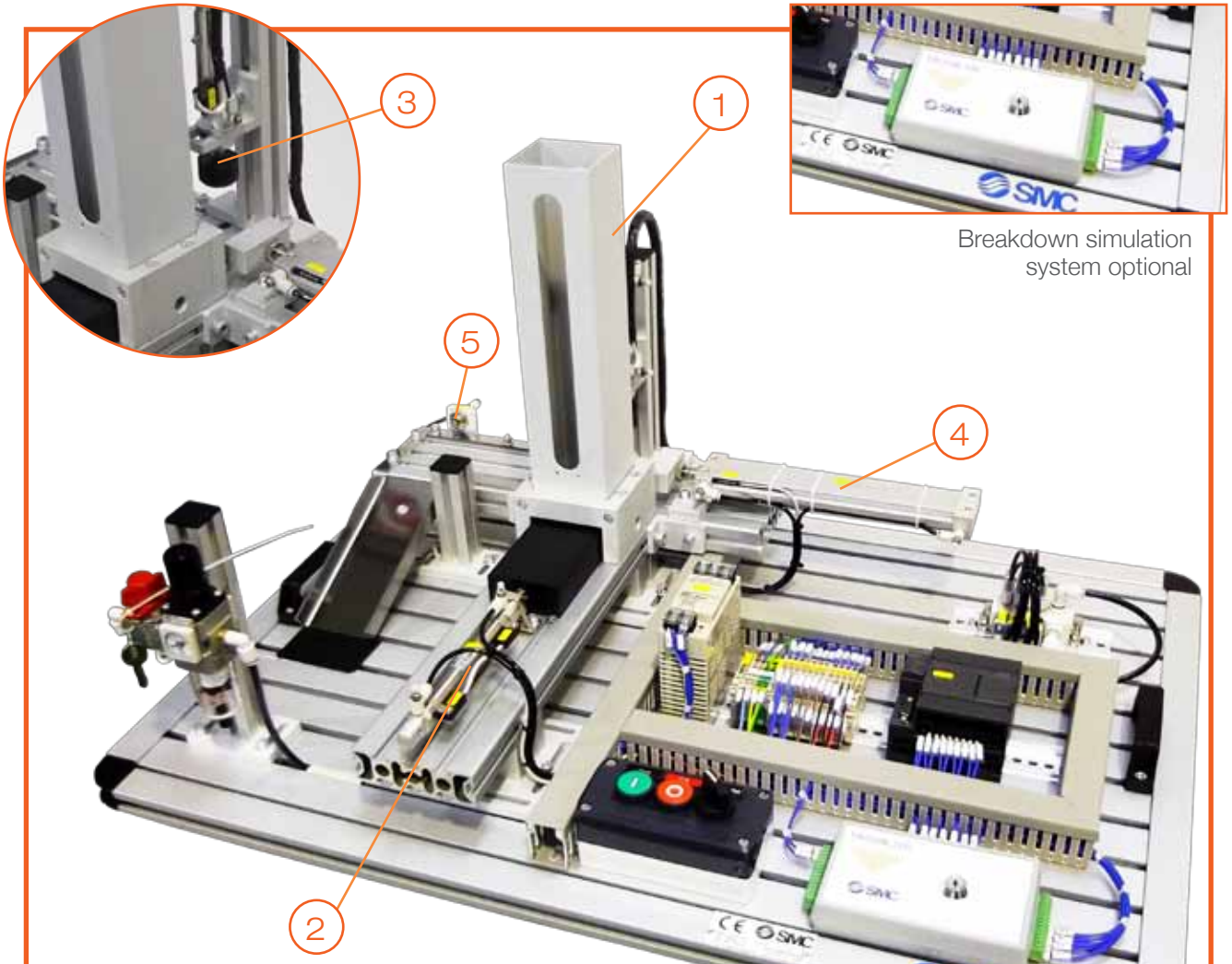
Common elements for all equipment.



MAP-201 - Part feeder with detector and ejector for incorrect parts

A gravity feeder houses the parts in a column (1). Each part has a non-symmetrical interior housing and is ejected by a pneumatic cylinder (2). The correct orientation of the part is verified using a cylinder with a plunger (3). After verification, an oval section pneumatic cylinder (4) moves the work-piece to the final position. Otherwise, a single acting cylinder (5) removes the part via the evacuation ramp.

The equipment is offered in three versions: with PLC, without PLC and as an assembly kit. Includes the option of integrating a trouble shooting box.



Breakdown simulation system optional

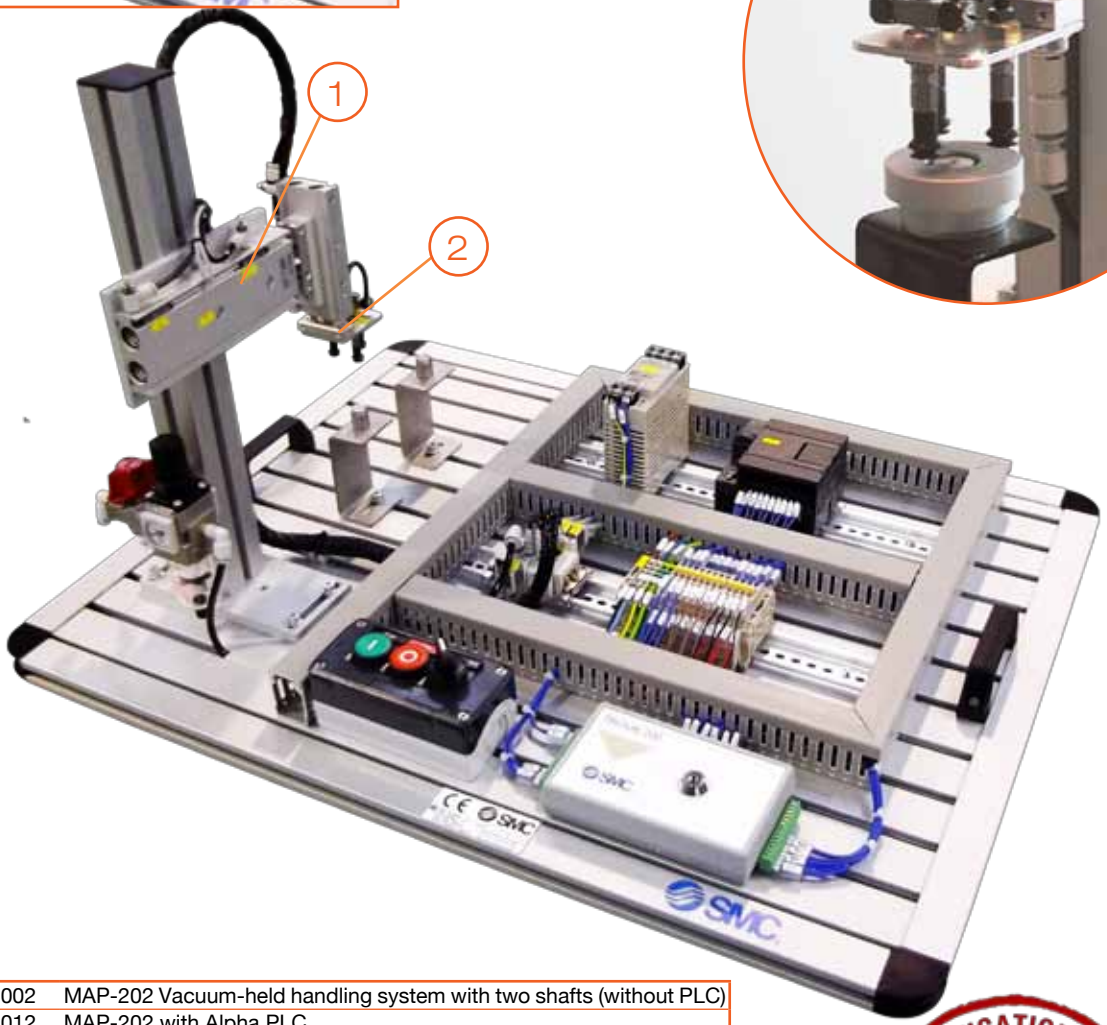
• SAI1001	MAP-201 Part feeder with detector and ejector for incorrect parts (without PLC)
• SAI1011	MAP-201 with Alpha PLC
• SAI1021	Assembly kit for MAP-201 manipulator
• SAI1111	MAP-201 with Siemens PLC
• SAI1211	MAP-201 with Omron PLC
• SAI1311	MAP-201 with Mitsubishi PLC
• SAI1411	MAP-201 with Allen-Bradley PLC
• SAI1511	MAP-201 with Schneider PLC

MAP-202 - Vacuum-held handling device with two shafts

This is a cartesian handling device with two shafts (1) which moves a part from one position to another, holding it with a set of three vacuum pads (2).

The equipment is offered in three versions: with PLC, without PLC and as an assembly kit. Includes the option of integrating a trouble shooting box.

Breakdown simulation system optional



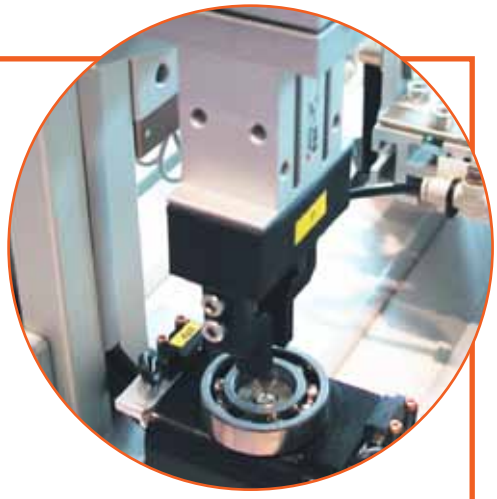
• SAI1002	MAP-202 Vacuum-held handling system with two shafts (without PLC)
• SAI1012	MAP-202 with Alpha PLC
• SAI1022	Assembly kit for MAP-202 manipulator
• SAI1112	MAP-202 with Siemens PLC
• SAI1212	MAP-202 with Omron PLC
• SAI1312	MAP-202 with Mitsubishi PLC
• SAI1412	MAP-202 with Allen-Bradley PLC
• SAI1512	MAP-202 with Schneider PLC

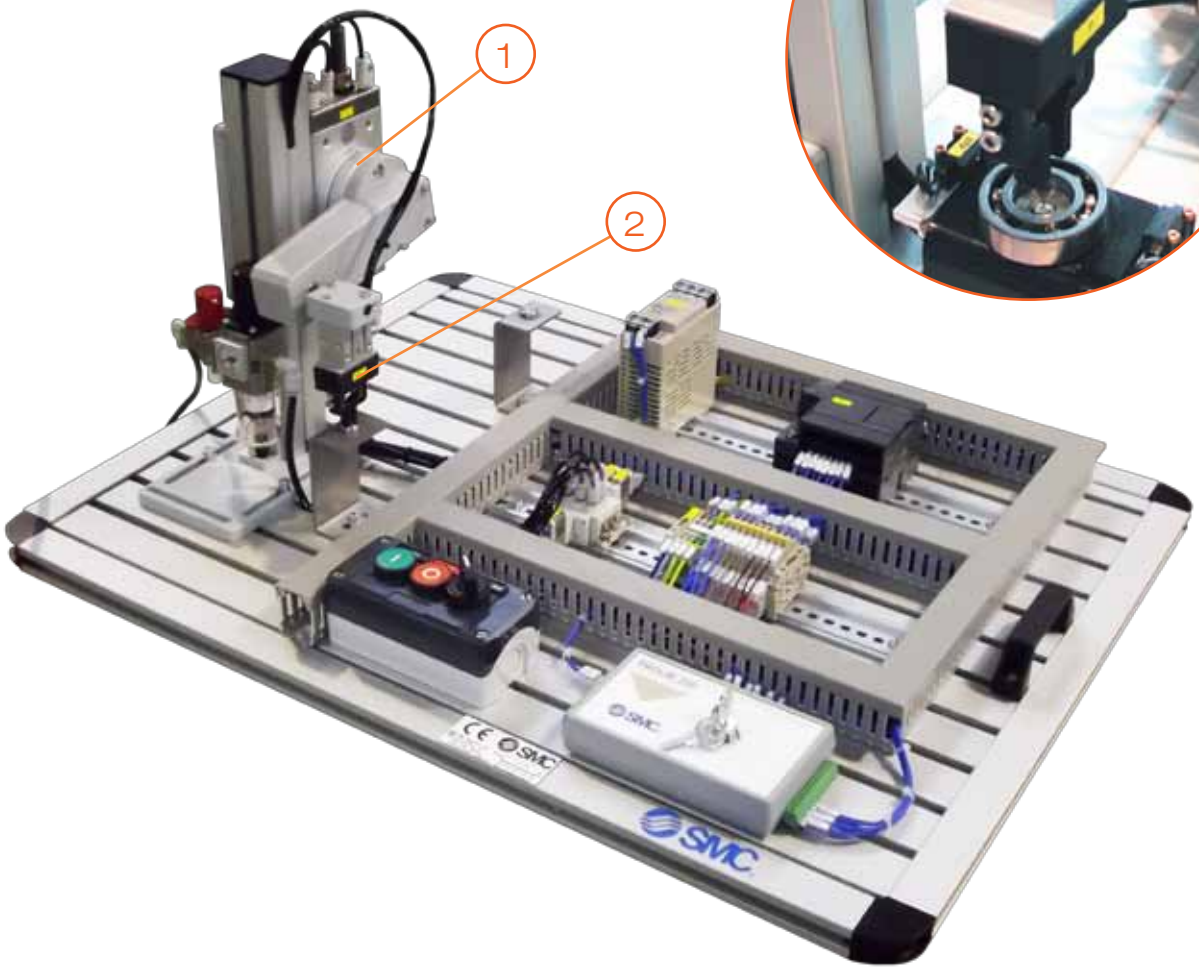
MAP-203 - Vertical revolving handling device with internal gripper

This module uses a revolving handling device (1) with an internal gripper (2) which moves the part from one position to another.

The equipment is offered in three versions: with PLC, without PLC and as an assembly kit. Includes the option of integrating a trouble shooting box.

Breakdown simulation system optional



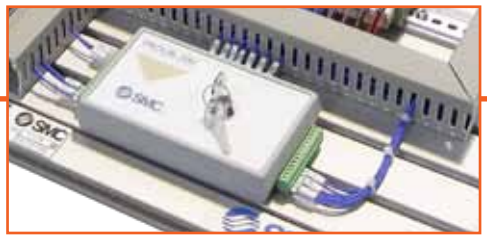


• SAI1003	MAP-203 Vertical revolving handling system with internal gripper (without PLC)
• SAI1013	MAP-203 with Alpha PLC
• SAI1023	Assembly kit for MAP-203 manipulator
• SAI1113	MAP-203 with Siemens PLC
• SAI1213	MAP-203 with Omron PLC
• SAI1313	MAP-203 with Mitsubishi PLC
• SAI1413	MAP-203 with Allen-Bradley PLC
• SAI1513	MAP-203 with Schneider PLC

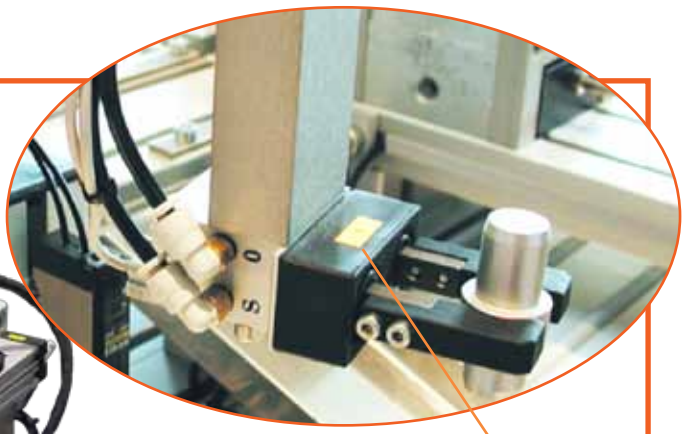
MAP-204 - Horizontal rotolinear handling device with external gripper

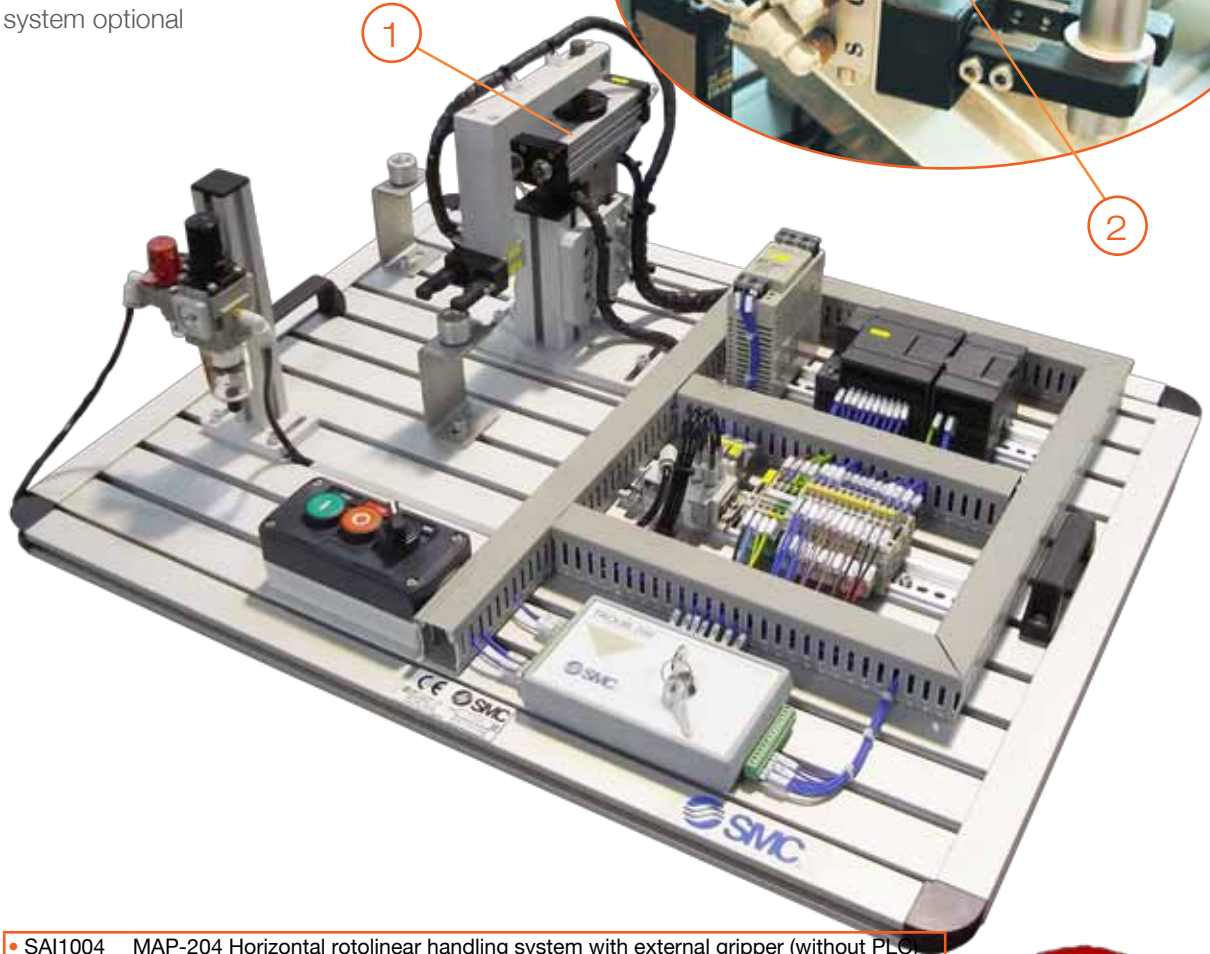
It consists of a roto-linear handling device (1) fitted with an external pneumatic gripper (2) which moves a part from one position to another.

The equipment is offered in three versions: with PLC, without PLC and as an assembly kit. Includes the option of integrating a trouble shooting box.



Breakdown simulation system optional





• SAI1004	MAP-204 Horizontal rotolinear handling system with external gripper (without PLC)
• SAI1014	MAP-204 with Alpha PLC
• SAI1024	Assembly kit for MAP-204 manipulator
• SAI1114	MAP-204 with Siemens PLC
• SAI1214	MAP-204 with Omron PLC
• SAI1314	MAP-204 with Mitsubishi PLC
• SAI1414	MAP-204 with Allen-Bradley PLC
• SAI1514	MAP-204 with Schneider PLC

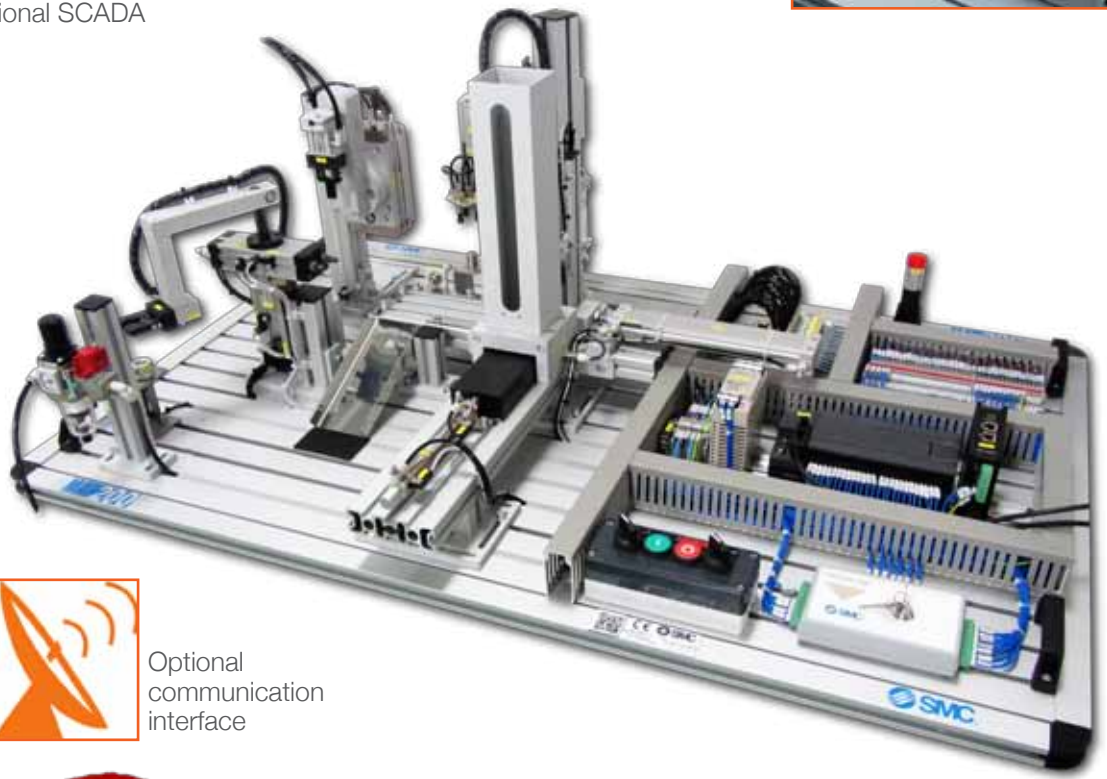
MAP-205 - The integrated solution: assembly minicell

MAP-205 integrates the four didactic handling systems, MAP-201, MAP-202, MAP-203 and MAP-204, into an assembly mini-cell. It carries out a complete assembly process of four parts.

The assembly process consists of feeding a base, checking whether it is in the correct position, inserting a bearing, then a shaft and finally a cover. The dismantling process can be performed in the same way.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user. Includes the option of integrating a communication interface that allows the user to access the PLC remotely and perform necessary remote maintenance tasks over the Internet.

Optional SCADA



Optional communication interface

•	SAI1005	MAP-205 Assembly minicell (without PLC)
•	SAI1125	MAP-205 with Siemens PLC
•	SAI1225	MAP-205 with Omron PLC
•	SAI1325	MAP-205 with Mitsubishi PLC
•	SAI1425	MAP-205 with Allen-Bradley PLC
•	SAI1525	MAP-205 with Schneider PLC

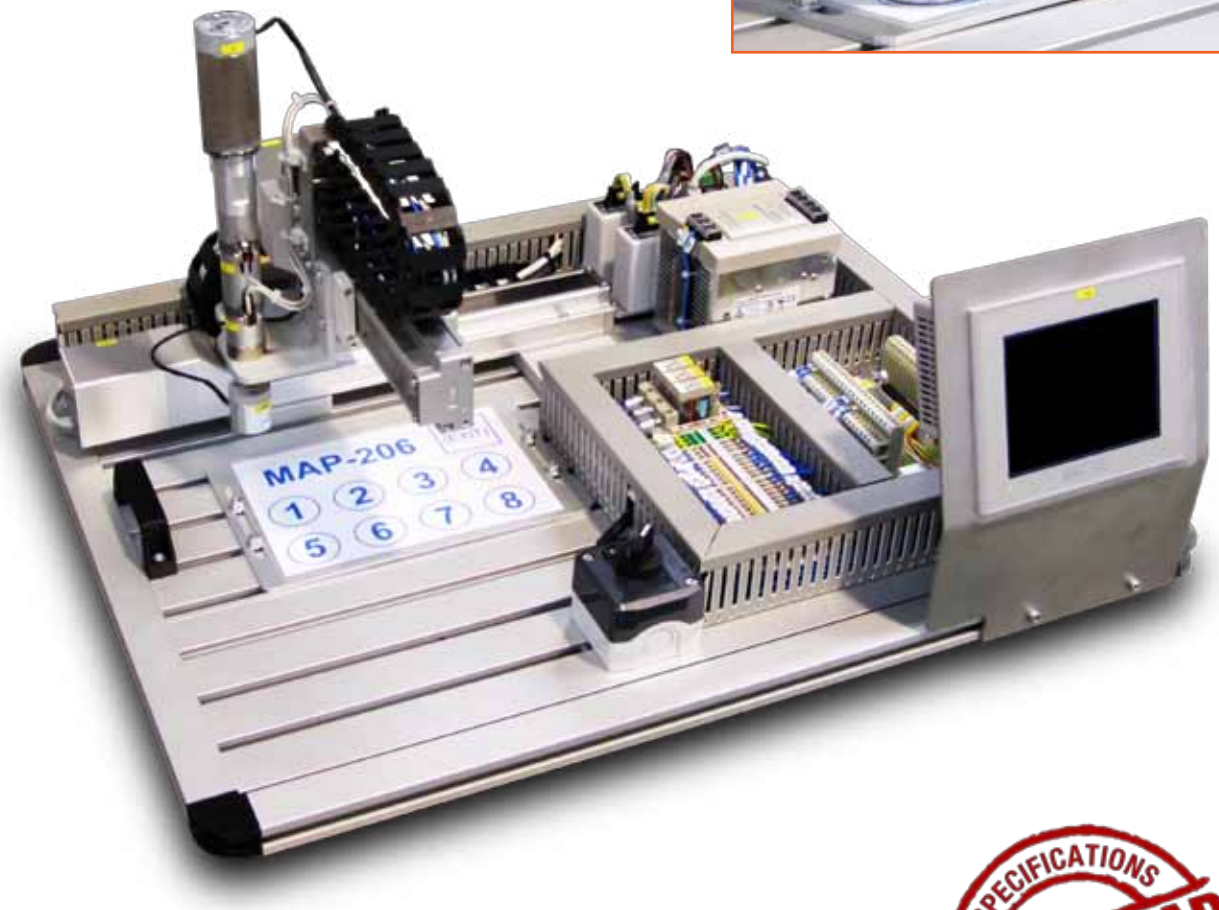
MAP-206 Handling device using electric actuators

MAP-206 is an ideal way of becoming familiar with the electric actuators. The operation carried out by the module consists of locating metal parts into one of its storage positions.

It has three electric axes, two of which are servo-controlled (X - Y), which allow the handling device to reach any part of the warehouse and the coin container. The other (Z) axis is comprised of an electric cylinder driven by a DC motor, which incorporates an electromagnet for handling the pieces.

MAP-206 includes a touchscreen HMI with a built-in PLC which gives access to controlling the system and the different operating modes.

Parts to be handled

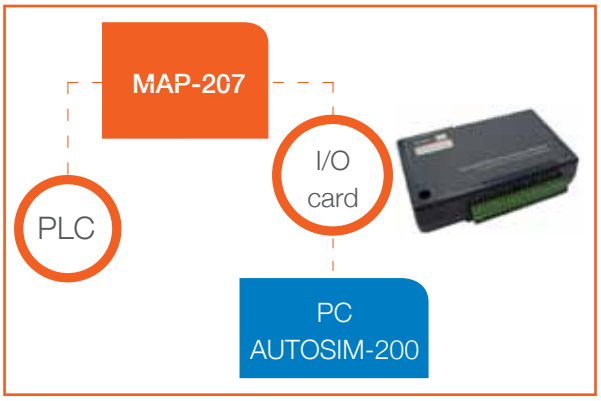


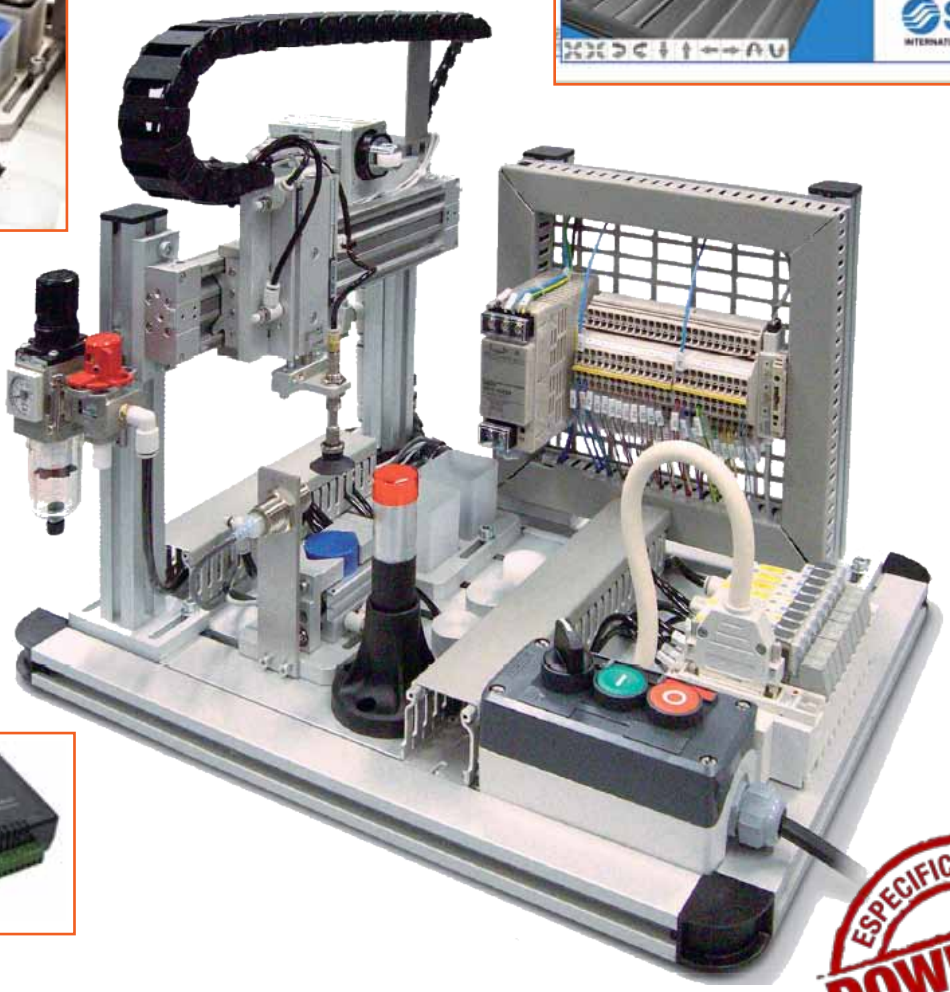
• SAI1723 Electric actuator handling device with HMI

MAP-207 - Handling device for parts classification

MAP-207 performs an automated process of classification and rejection of components made of various materials and sizes (up to 6 different types of pieces). It classifies the largest into different containers and rejects the smallest.

It is compact and easy to transport. In addition, it is designed with components that are widely used in industry. Its design is flexible which allows control from a PC with autoSIM-200 or an external PLC.





Optional I/O card

• SAI1701 MAP-207 Parts classifier

MAP-200 - With this system you could...

MAP-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES

SKILLS

SKILLS \ TECHNOLOGIES	ELECTRICAL PANEL	PNEUMATICS	VACUUM	ELECTRIC MOTORS	SENSORS	PROGRAMM. CONTROLLERS	MANIPULATORS	MOTION CONTROL
ANALYSIS	■	■	■	■	■	■	■	■
TROUBLESHOOT.	■	■	■		■	■	■	■
DESIGNING	■	■	■	■	■	■	■	■
TECH DOCUM. CREATION	■	■	■	■	■	■	■	■
INSTALLATION AND ASSEMBLY	■	■	■		■	■	■	
TECH DOCUM. UNDERSTANDING	■	■	■	■	■	■	■	■
OPERATION	■	■		■		■	■	■
PROGRAMMING						■		■

■ This shows how the MAP-200 is suitable to develop skills in the specific technology.

■ This shows that MAP-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

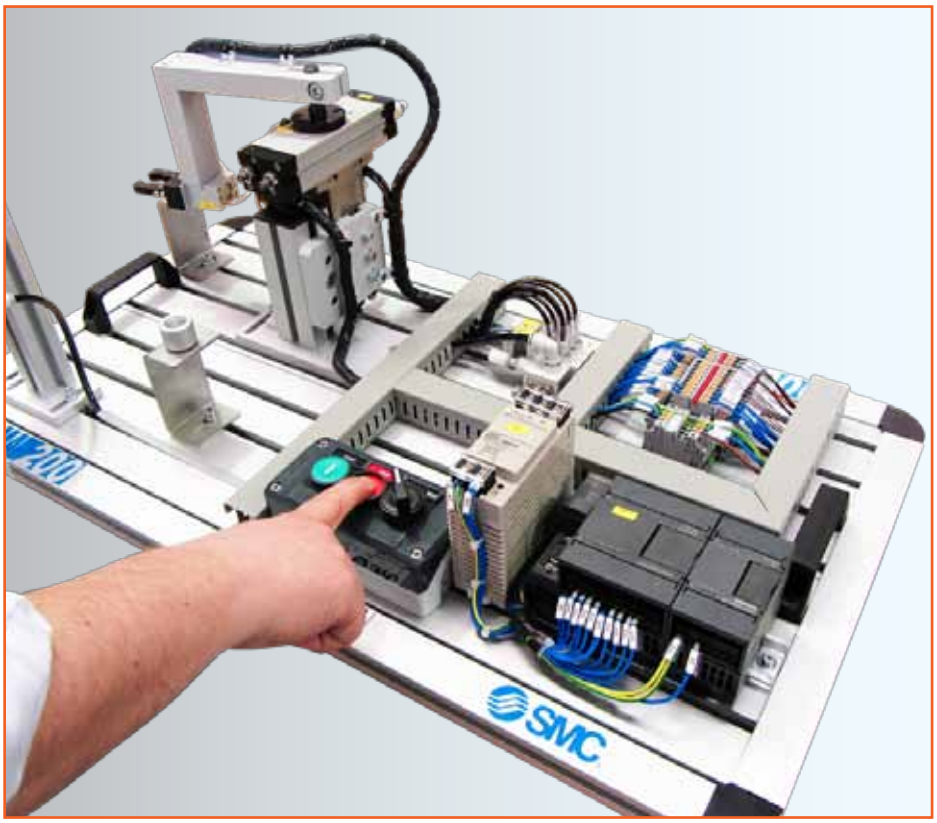
eLEARNING-200

Find out more about the theory behind the technologies developed in MAP-200 with our eLEARNING-200 courses.

SCADA/ HMI	AUTOMATED SYSTEMS
	●
	●
	●
	●
	●
	●
	●

RELATED eLEARNING-200 COURSES
Introduction to industrial automation (SMC-100)
Principles of pneumatics (SMC-101)
DC electricity (SMC-103)
Solid state (SMC-105)
Introduction to wiring (SMC-106)
Sensors technology (SMC-108)
Programmable controllers (SMC-109)

**See eLEARNING-200 chapter for more information*



● Developing skills in technology applicable to MAP-205.
■ Developing skills in technology applicable to MAP-206.

MAP-200 - Options

MAP-200 has a series of optional extras.

• Support legs

Makes the system self-standing without needing a worktop or bench.

• SAI1897	MAP-201 LEGS KIT
• SAI1898	MAP-202,203,204 LEGS KIT
• SAI1896	MAP-205 LEGS KIT
• SAI1893	MAP-206 LEGS KIT
• SAI1894	MAP-207 LEGS KIT

• Programming tools

The programming tools comprise the appropriate programming software and cables for the chosen PLC.

*See Programming Tools chapter

• SCADA: Supervisory Control and Data Acquisition

This is a standard-use software application in industry, making it easier to supervise and control processes from the computer screen.

Options valid for MAP-205.

• SAI1029	SCADA application MAP-205

• Troubleshooting box

For the MAP-201, MAP-202, MAP-203 and MAP-204 equipment, it is possible to include the TROUB-200 troubleshooting simulation system that can generate up to 16 different dysfunctions to be detected by users.

• SAI1019	Troubleshooting box for MAP-201 / MAP-202 / MAP-203 / MAP-204

• I/O card

For the MAP-201, MAP-202, MAP-203, MAP-204 and MAP-207 modules, there is the option of including an input / output card. This card can control the equipment using a PC through autoSIM-200.

• SAI2443	USB - AUTOSIM-200 INTERFACE

• MAP-200 application for autoSIM-200

We have a 3D application where users can simulate, supervise and control MAP-200 from an autoSIM environment.

• SAI2527	3D simulator for MAP-200 handling systems, 1 license
• SAI2528	3D simulator for MAP-200 handling systems, 8 licenses
• SAI2529	3D simulator for MAP-200 handling systems, 16 licenses

**autoSIM is required. See autoSIM-200 chapter*

• Remote communication interface

With this device, the user will be able to access the PLC remotely and perform necessary remote maintenance tasks over the Internet.

• SAI1020	Remote communication interface for MAP-205

MAP-200 - Configuration

Getting the right MAP-200 specification is as easy as:

• Steps to follow

1.- Select the finish level for the equipment (Kit, without PLC or with PLC).

2.- Choose the type of handling (the equipment).

3.- In the event of having selected equipment with PLC, pick the PLC.

4.- Add any optional extras.

PRODUCT DOWNLOAD www.smctraining.com CONFIGURATOR

MAP-200 - Technical features

MAP-201 **770x580x445mm**	Modules	Sensors (type & qty.)	Input / Output
	Part feeder Position verification Displacement Rejecting incorrect parts	Auto-switch, Reed type (x4)	Digital 7/4
	Other devices (quantity)	Actuators (type & quantity)	
	Air treatment unit (x1) Speed controllers (x6) Power supply source (x1)* Control PLC **	Pneumatic linear (x4)	
MAP-202 **740x400x445mm**	Modules	Sensors (type & qty.)	Input / Output
	Part diversion	Auto-switch,Reed type(x4) Vacuum pressure switch (X1)	Digital 8/4
	Other devices (quantity)	Actuators (type & quantity)	
	Air treatment unit (x1) Speed controllers (x4) Vacuum pad(x3)-Vacuum ejector(x1) Power supply source (x1)* Control PLC **	Pneumatic linear (x2)	
MAP-203 **740x400x345mm**	Modules	Sensors (type & qty.)	Input / Output
	Part diversion	Auto-switch, Reed type (x3)	Digital 6/3
	Other devices (quantity)	Actuators (type & quantity)	
	Air treatment unit (x1) Speed controllers (x2) Power supply source (x1)* Control PLC **	Pneumatic rotary actuator (x1) Pneumatic gripper (x1)	
MAP-204 **740x400x285mm**	Modules	Sensors (type & qty.)	Input / Output
	Part diversion	Auto-switch, Reed type (x4) Solid state (x2)	Digital 9/3
	Other devices (quantity)	Actuators (type & quantity)	
	Air treatment unit (x1) Speed controllers (x4) Power supply source (x1)* Control PLC **	Pneumatic rotolinear actuator (x1) Pneumatic gripper (x1)	

* Not included in kit version.
** Options: Without PLC, Siemens, Omron, Mitsubishi, Allen Bradley, Schneider. Not included in kit version.

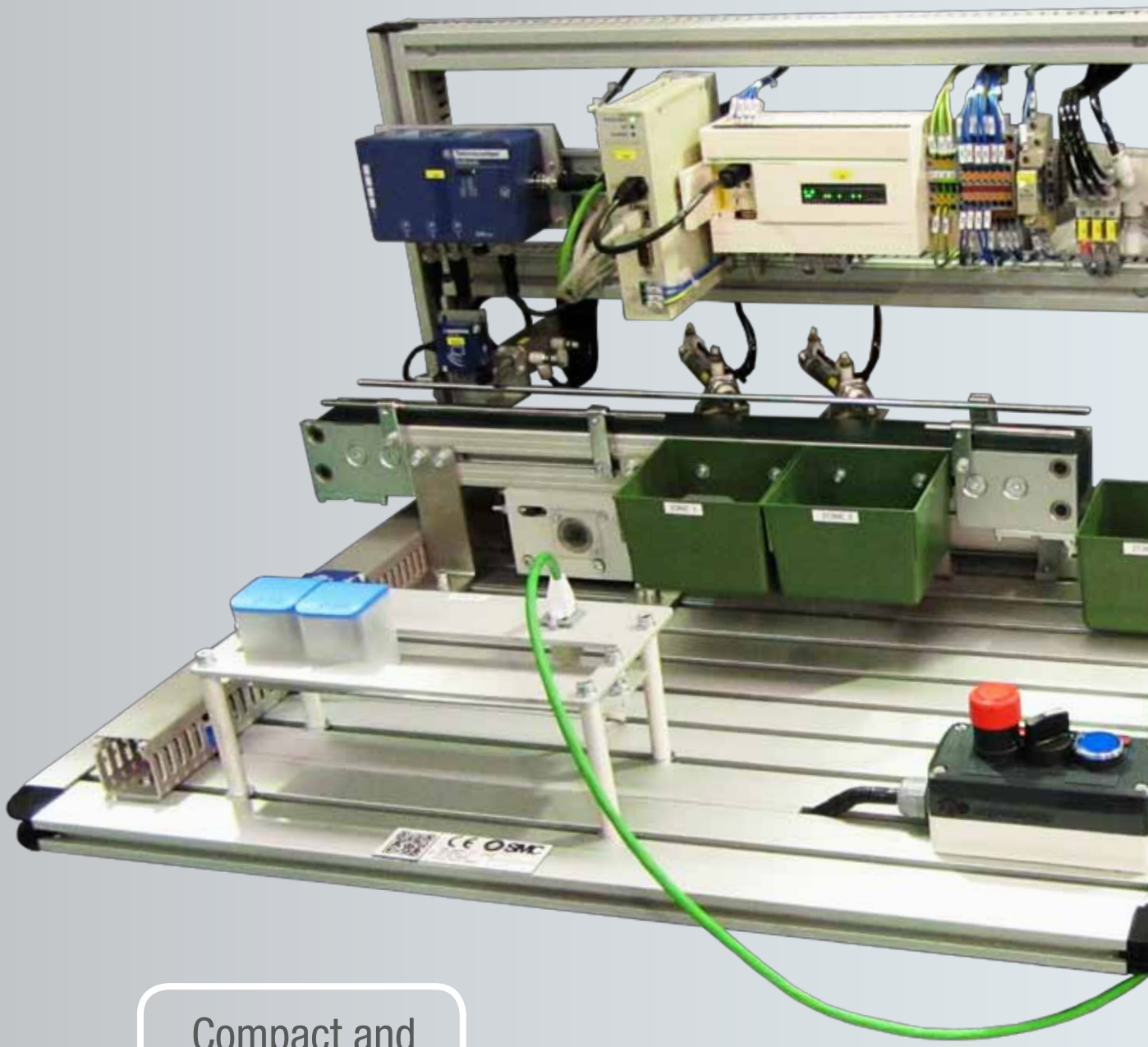
MAP-205 **1200x762x445mm**	Modules	Sensors (type & qty.)	Input / Output
	Base feeder Position verification Displacement Rejecting an inverted base Bearing assembly Insertion shaft in the assembly Positioning of the lid	Auto-switch, Reed type (x15) Inductive detector (x1) Barrier type photocell (x2) Vacuum pressure switch(X1) Solid state (x2)	Digital 24/15
	Other devices (quantity)	Actuators (type & quantity)	
	Breakdown simulation box (x1) Air treatment unit (x1) Speed controllers (x17) Power supply source (x1) Control PLC **	Pneumatic linear (x6) Pneumatic rotary actuator (x1) Pneumatic roto-linear actuator (x1) Pneumatic gripper (x2)	
MAP-206 **750x590x400mm**	Modules	Sensors (type & qty.)	Input / Output
	Positioning axis Warehouse	Auto-switch, Reed type (x2) Encoder (x2)	Digital 10/15
	Other devices (quantity)	Actuators (type & quantity)	
	Touch HMI with built-in PLC (x1) HMI programming software (x1) HMI visualisation software from PC(x1) CC regulator (x1) Servo-driver (x2) Power supply source (x1)	24VDC electrical linear (x1) Servo-motor electrical linear (x2) Electromagnet (x1)	
MAP-207 **500x400x400mm**	Modules	Sensors (type & qty.)	Input / Output
	Feeding and detecting the parts Rejection manipulator Displacement manipulator Stopper	Auto-switch, Reed type (x7) Magnetic adjustment (x1) Vacuum pressure switch (X1) Inductive detector (x1)	Digital 13/10
	Other devices (quantity)	Actuators (type & quantity)	
	Air treatment unit (x1) Speed controllers (x9) Vacuum pad(x1)-Vacuum ejector(x1) Power supply source (x1) Three-colour indication light (x1) Magnetic adjustment amplifier (x1)	Pneumatic linear (x4) Pneumatic gripper (x1)	

* Not included in kit version.
** Options: Without PLC, Siemens, Omron, Mitsubishi, Allen Bradley, Schneider. Not included in kit version.

LOG-200

RFID logistics trainer

The trainer which includes RFID technology within the context of a logistics application



Compact and easy to use!

INTERNATIONAL TRAINING

Develop the SKILLS...

ANALYSIS

DESIGNING

TECH DOCUM. CREATION

INTERPRETACIÓN DOCUMENT.

OPERATION

PROGRAMMING

Monitor deliveries from your software application over the Internet!

In the following TECHNOLOGIES...

ELECTRICAL PANEL

ELECTRIC MOTORS

IDENTIFICATION SYSTEMS

INDUSTRIAL COMMUNIC.

SCADA / HMI

LOG-200 - RFID logistics trainer

LOG-200 is focused on studying RFID technology in a logistics application, using only industrial components. It also includes a Web server that can access the system over the Internet.

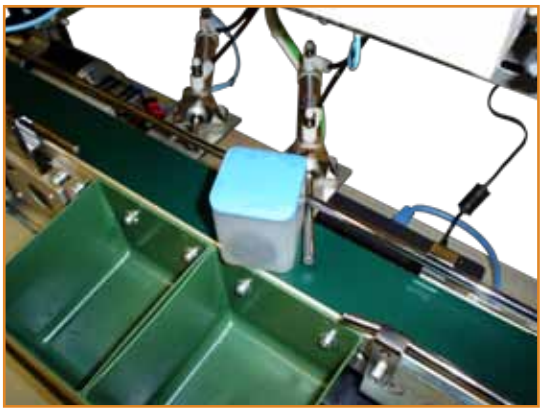
LOG-200 uses the following RFID devices:

- RFID read/write module - it enables reading and writing information in each of the tags.
- RFID Controller - It brings together and manages up to 3 RFID stations.
- "Tags" - They store the relevant information to maintain the traceability of objects.

RFID Controller

RFID read/write module

Tags



LOG-200 displays the information contained in each "tag" through the RFID controller and the PLC sends the right information to each actuator to place each container in its correct location. In addition, information for each object can be accessed over the Internet by means of a Web server that communicates with the PLC.

• SAI2961	LOG-200 with Schneider PLC
• SAI2963	LOG-200 with Omron PLC
• SAI2964	LOG-200 with Siemens PLC
• SAI2965	LOG-200 with Allen Bradley PLC

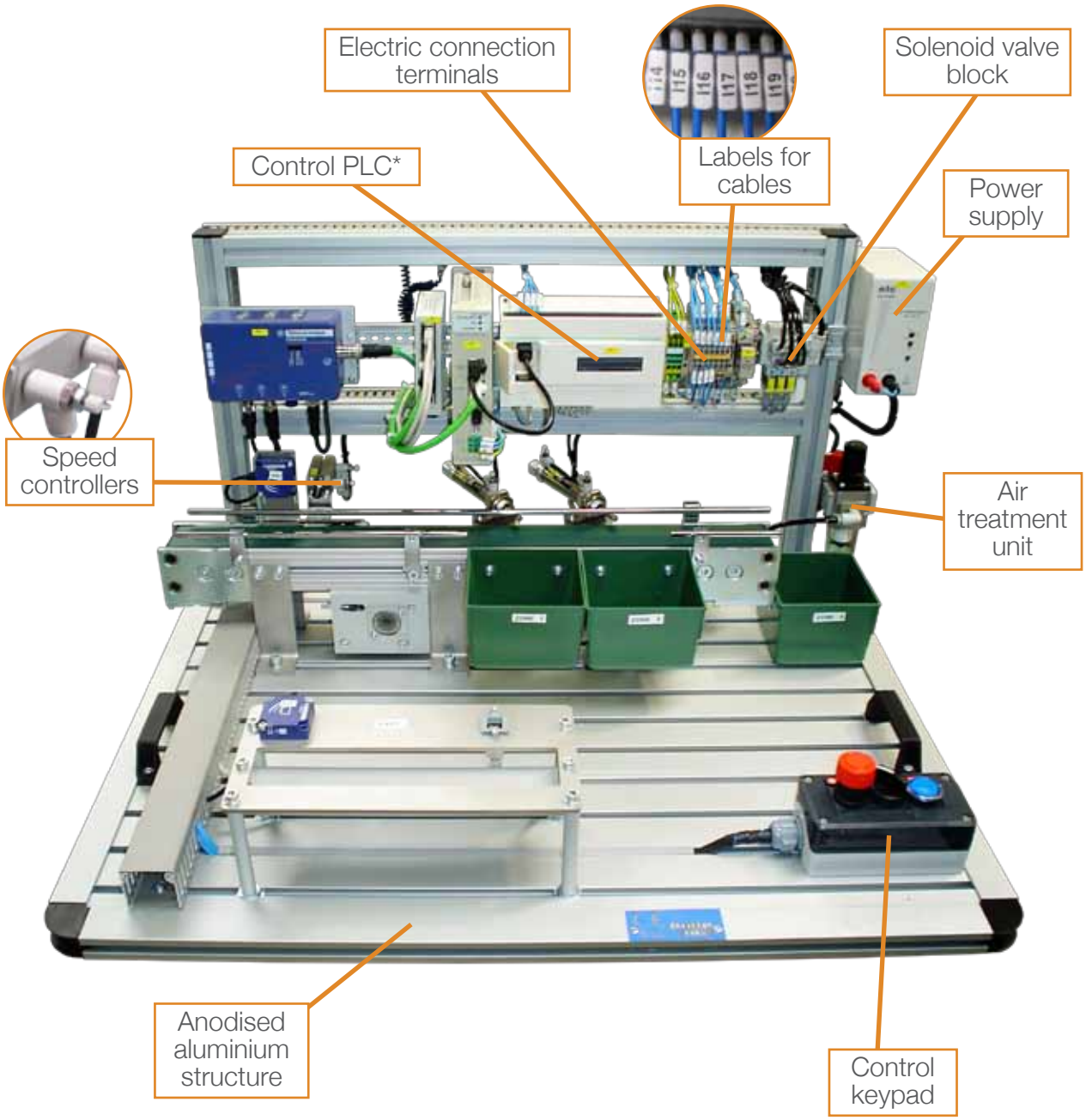
LOG-200 includes 2 different software applications:

- Web server software - it can set up a website to track the object's traceability over the Internet.
- SCADA software - sets up a remote application to read/write information on RFID tags.

Web server software

SCADA software

General elements of the equipment

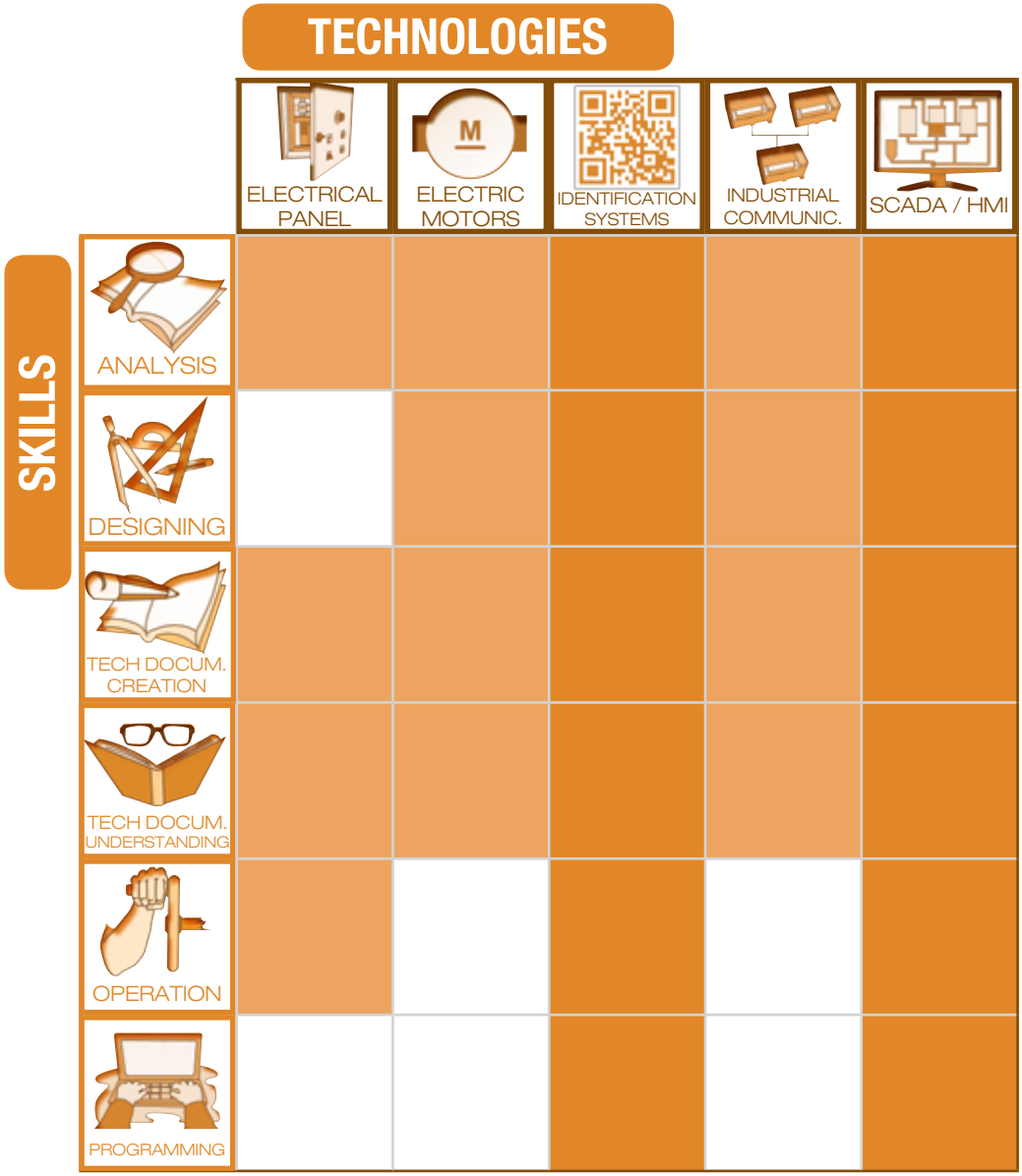



User manual

*Options: PLC Siemens, Omron, Allen Bradley, Schneider or without PLC.

LOG-200 - With this system you could...

LOG-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).



This shows how the LOG-200 is suitable to develop skills in the specific technology.

This shows that LOG-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

@ eLEARNING-200

Find out more about the theory behind the technologies developed in LOG-200 with our eLEARNING-200 courses.

**See eLEARNING-200 chapter for more information*

RELATED eLEARNING-200 COURSES

- Introduction to industrial automation (SMC-100)
- Solid state (SMC-105)
- Sensors technology (SMC-108)
- Programmable controllers (SMC-109)

LOG-200 - Options

LOG-200 has a series of optional extras.

• Programming tools

The programming tools comprise the appropriate programming software and cables for the chosen PLC.

*See Programming Tools chapter

• Support legs

Makes the system self-standing without needing a worktop or bench.

• SAI2968 LOG-200 LEGS KIT

LOG-200 - Configuration

Getting the right LOG-200 specification is as easy as

• Steps to follow

1.- Choose the equipment dependant on the PLC.

2.- Add any optional extras.

PRODUCT DOWNLOAD www.smctraining.com CONFIGURATOR

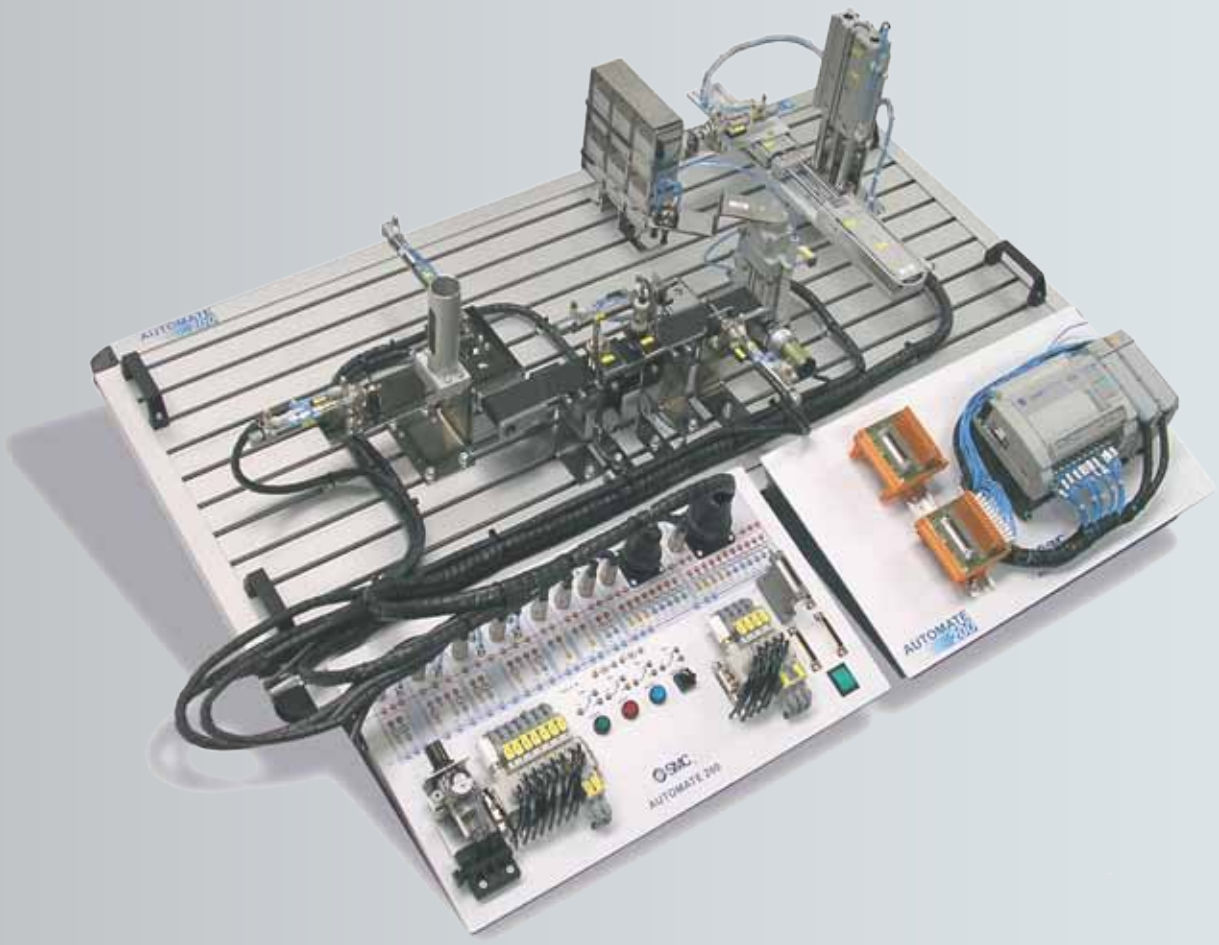
LOG-200 - Technical features

LOG-200 770x590x450mm	Modules	Sensors (type & quantity)	Input / Output
	Writing zone Reading zone Expedition	RFID (x2)	Digital 3/4
	Other devices (quantity)	Actuators (type & quantity)	
	RFID concentrator (x1) Web server (x1) Hub (x1) Circular tag (x5) Rectangular tag (x10)	DC motor (x1) Pneumatic linear (x3)	

AUTOMATE-200

Welcome to the world of automation

Automation within your reach



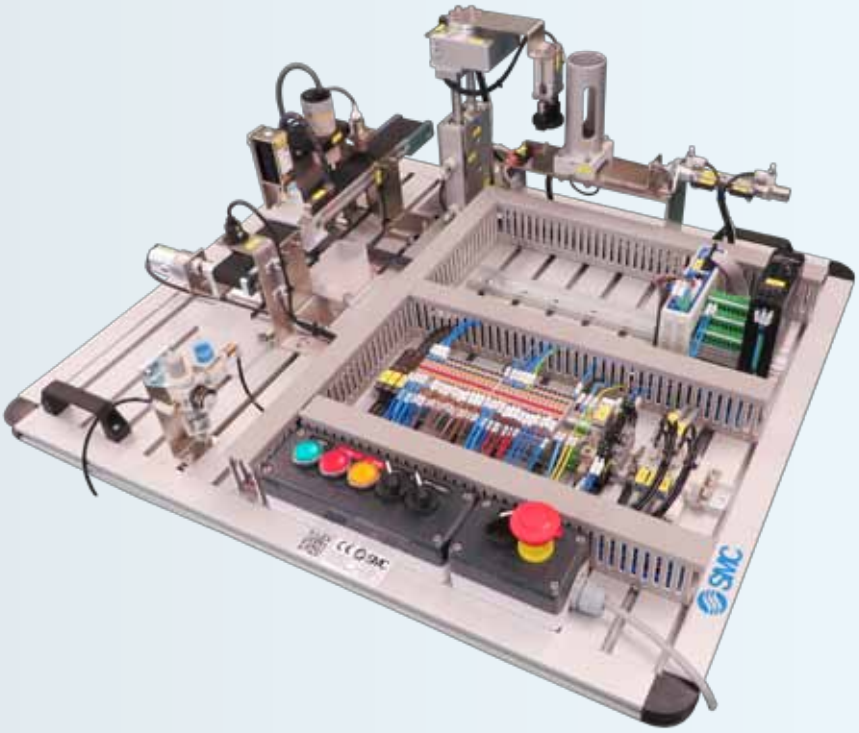
Easy and intuitive learning of the basic principles of automation

In the following TECHNOLOGIES...

PNEUMATICS | VACUUM | ELECTRIC MOTORS | SENSORS | PROGRAMM. CONTROLLERS | MANIPULATORS | AUTOMATED SYSTEMS

SMC
INTERNATIONAL TRAINING

Develop the SKILLS...



ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

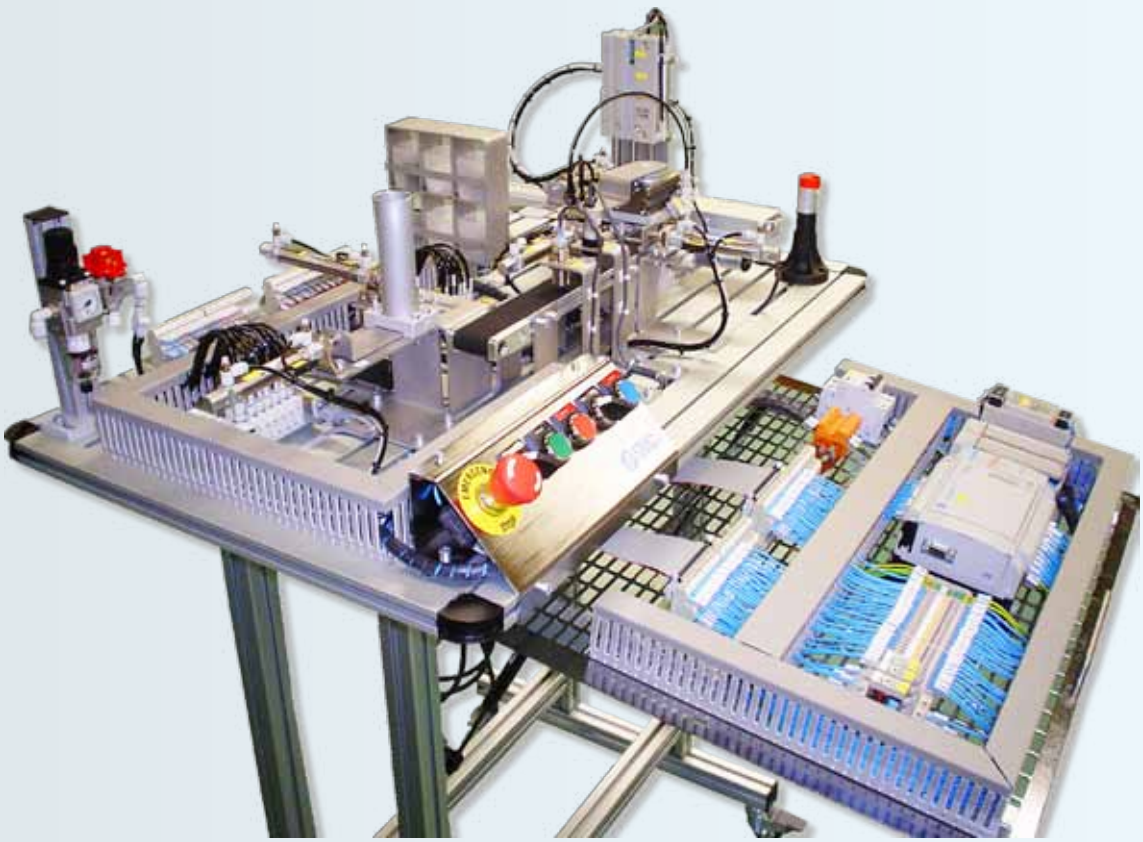
INSTALLATION AND ASSEMBLY

TECH DOCUM. UNDERSTANDING

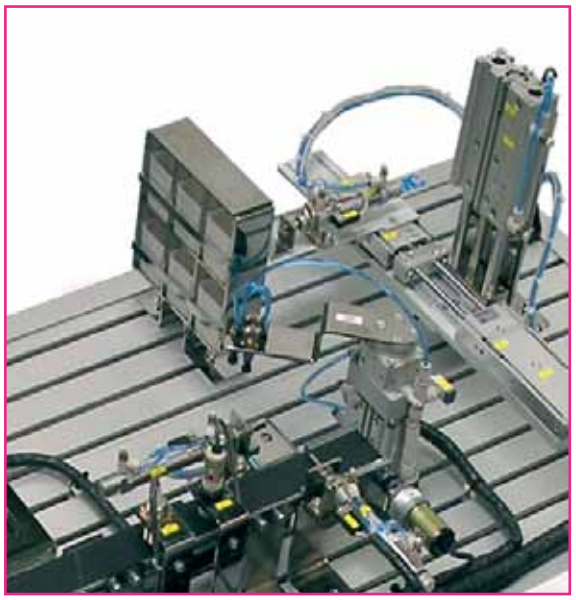
OPERATION

PROGRAMMING

Three different versions adapted to the user's different needs



AUTOMATE-200 - Welcome to the world of automation



AUTOMATE-200 is SMC International Training's response to the increasing demand for the introduction of a technological culture in training centers.

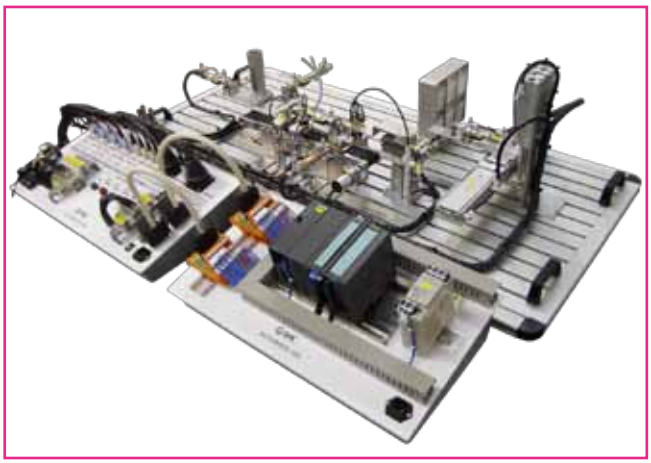
Using a recycling plant for solid urban waste as a reference, a fully modular design system has been developed for a training environment. The integration of the technologies in automated processes brings familiarization to the user of this fascinating world.

With this system, the student uses an integrated and motivating context to become familiar with technologies such as pneumatics, sensors, electric motors, PLCs, etc., in an enjoyable and intuitive way. Using completely industrial components we develop skills in analysis, troubleshooting, designing, creating technical documentation, setting up/commissioning, understanding technical documentation, operation and programming.

AUTOMATE-200 includes up to ten functional blocks that can produce an infinite number of configurations, emulating different processes and making it possible to perform an endless number of activities with different levels of difficulty.

The raw material used in the process includes parts with different colours (light/ dark), materials (plastic/ metal) and shapes (with or without hole). During the last phase of the process, the parts are sorted and stored in containers.

AUTOMATE-200 is available in 3 different versions:

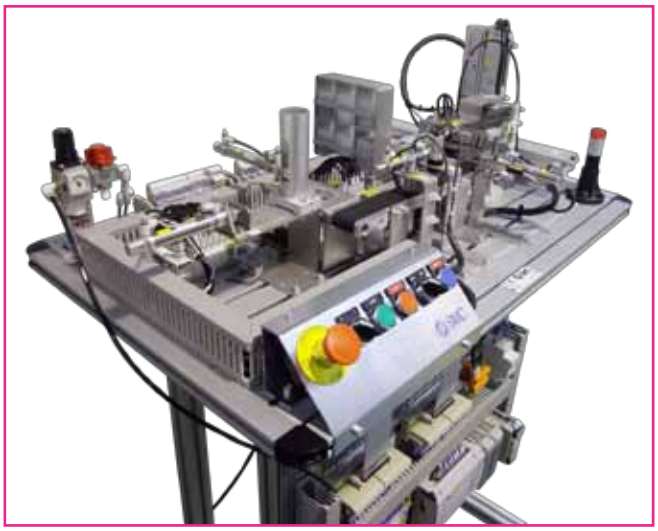


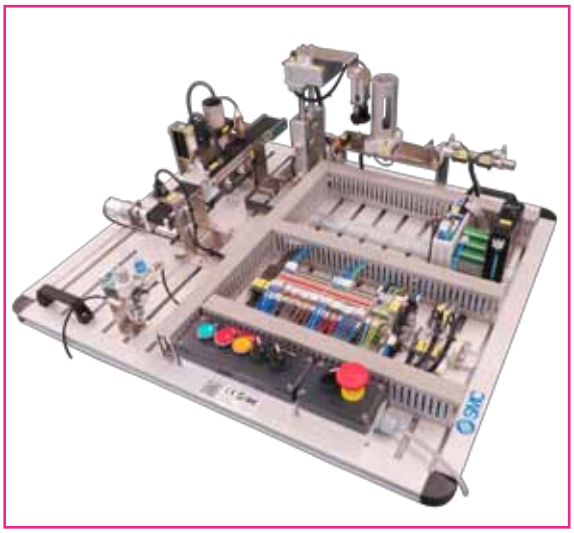
• AUTOMATE-200A
Instant connection wiring!

It has two control panels, manual and via a PLC, prepared for rapid connection to the functional modules.

• AUTOMATE-200B
Take it wherever you want!

This version, in addition to including the functional modules of the 200A version, is mounted on a trolley base with a fold-away control panel for the PLC and all electrical connections.

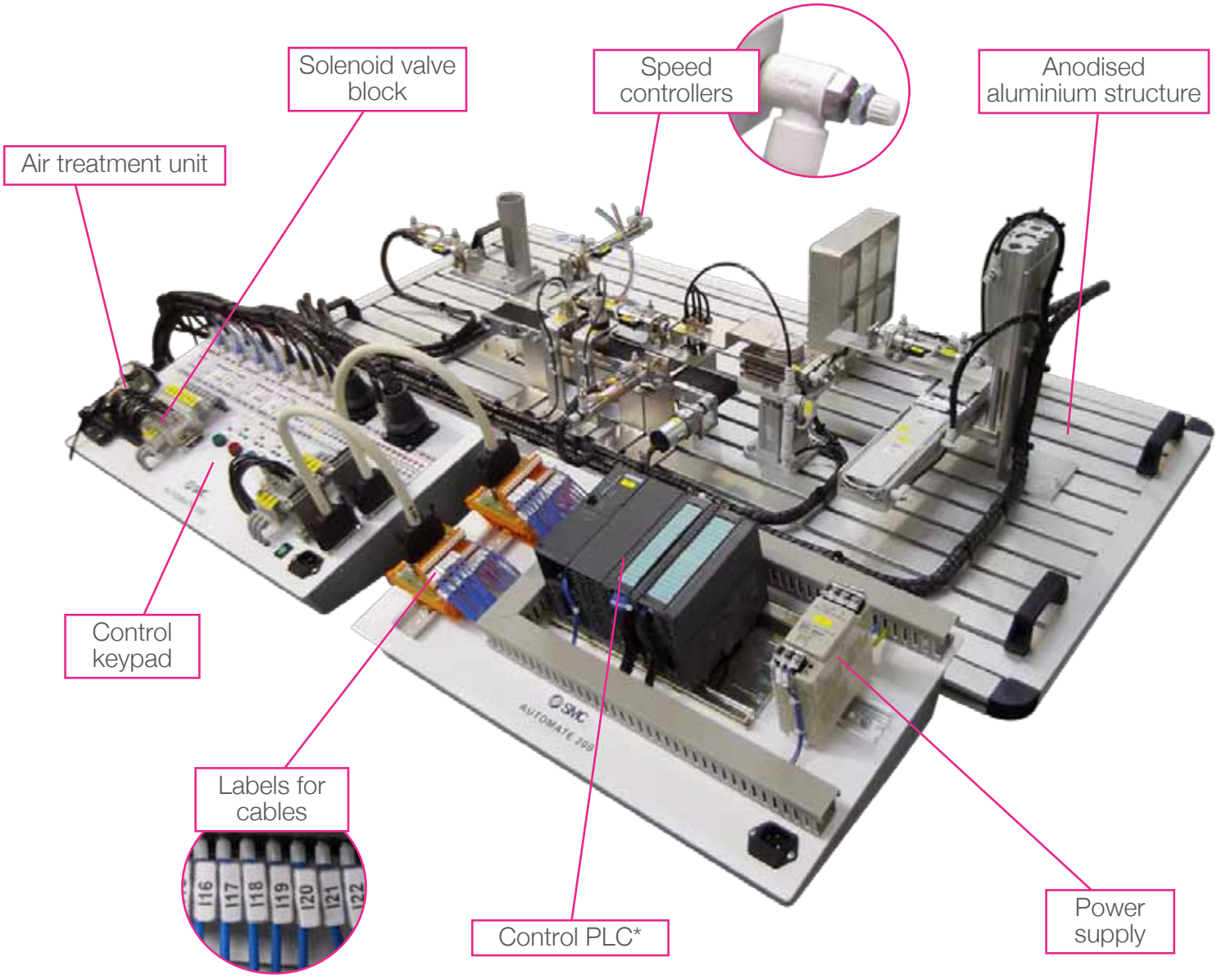




• AUTOMATE-200C
The most compact in the range!

Where space is at a premium,the compact version of AUTOMATE-200, includes all the essential AUTOMATE-200 features in a small footprint.

Common elements in all versions



*Options: PLC Omron, Allen Bradley, Mitsubishi or Siemens

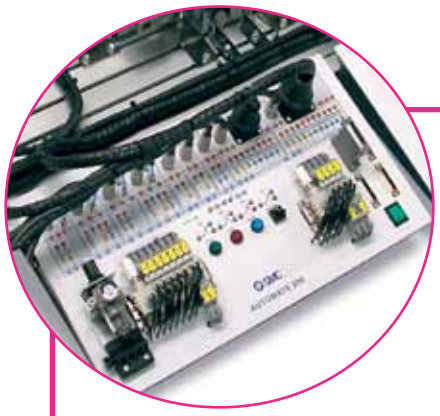
User manual and practice manual

Multimedia CD

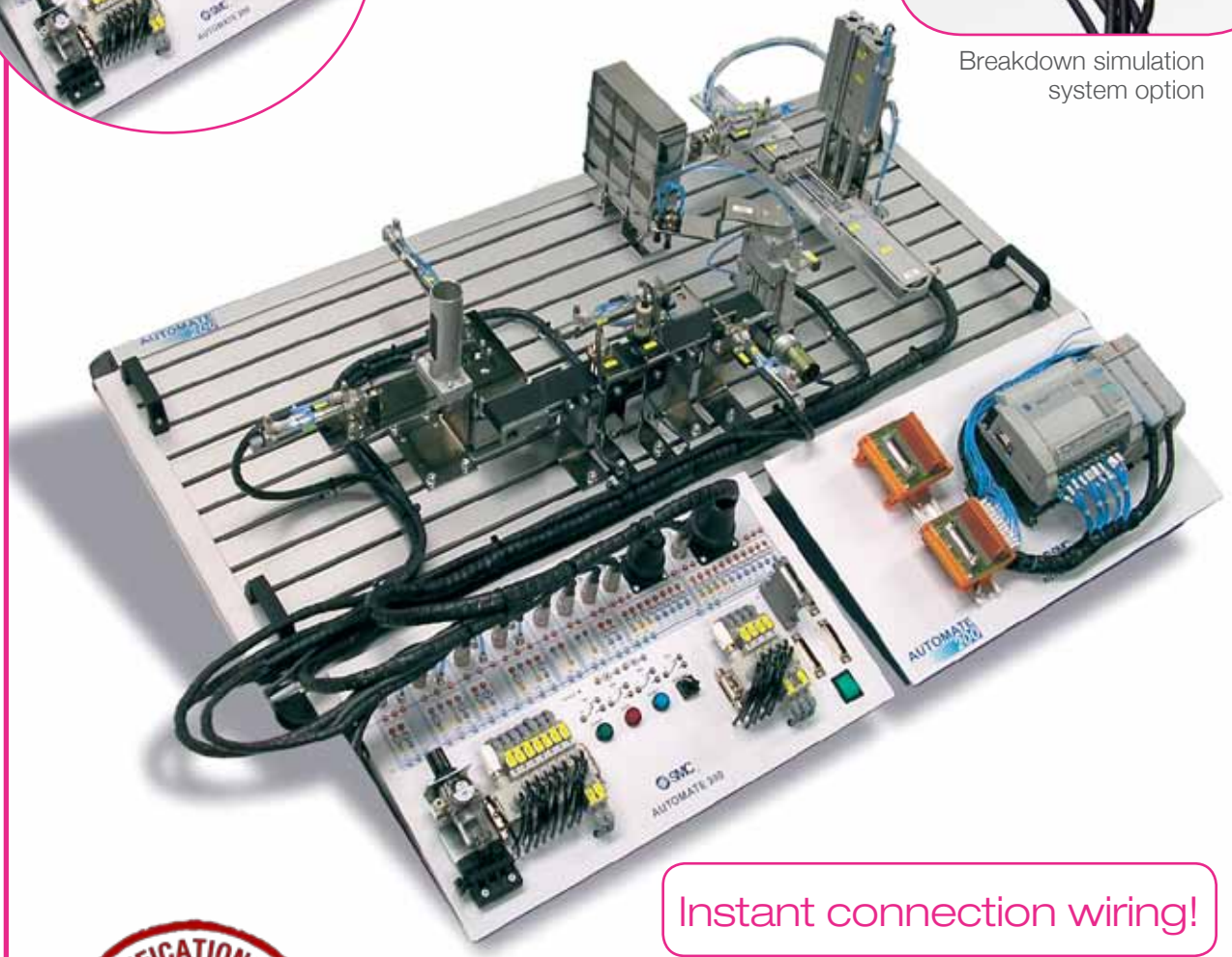
AUTOMATE-200A

This table-top version has two control panels. The first controls the functional modules by means of wired logic to the actuator and sensors using fast electrical connections. The second controls the process from the built-in PLC.

The troubleshooting simulation system TROUB-200 can be included, which generates up to 16 different breakdowns to be diagnosed by the user.



Breakdown simulation system option



Instant connection wiring!

• SAI2998	AUTOMATE with Allen Bradley PLC
• SAI2997	AUTOMATE with Siemens PLC
• SAI2996	AUTOMATE with Omron PLC
• SAI2995	AUTOMATE with Mitsubishi PLC

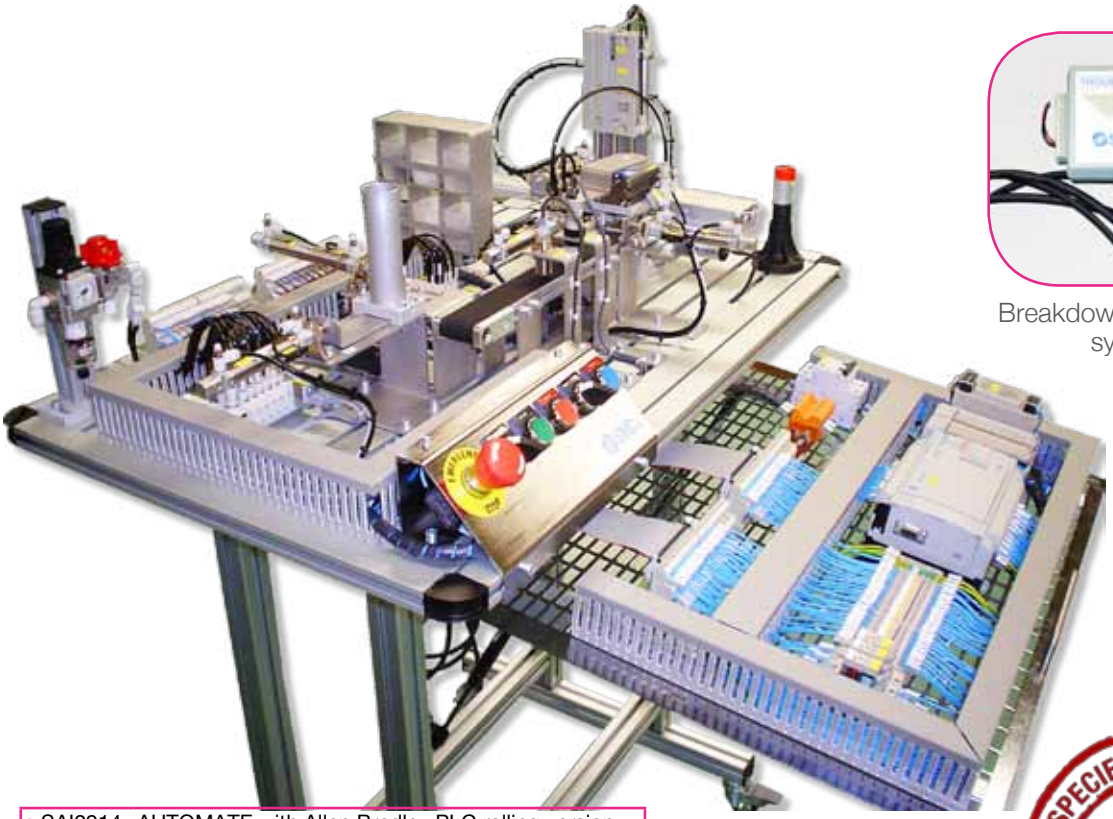
AUTOMATE-200B

As this version is mobile, it can be transported effortlessly round the classroom.

In addition to the functional modules included in the AUTOMATE-200A version, it incorporates a control panel with a fold-away PLC and coded electrical connections on a terminal board.

The troubleshooting simulation system TROUB-200 can be included, which generates up to 16 different breakdowns to be diagnosed by the user.

Rolling frame!



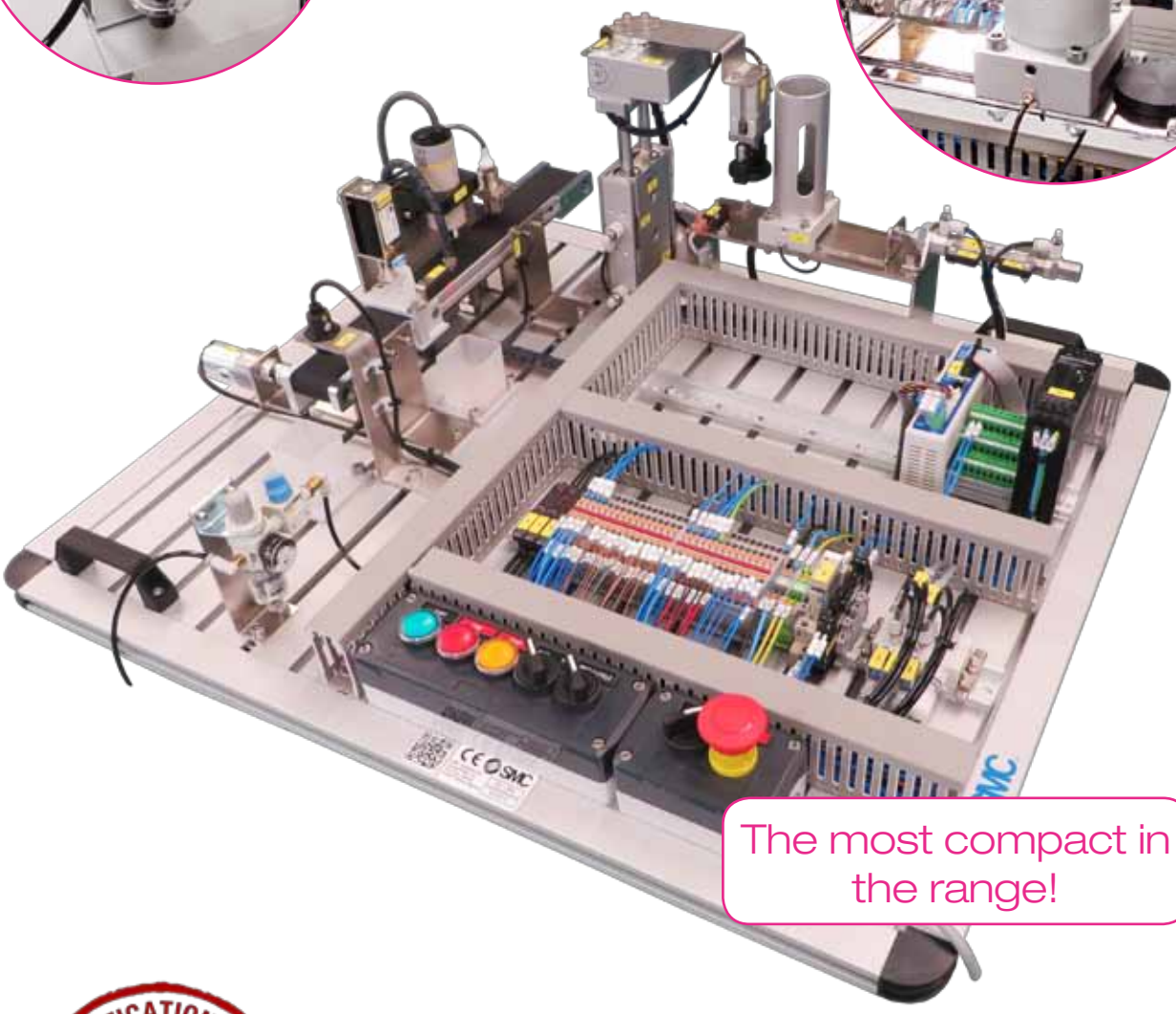
Breakdown simulation system option

- SAI2914 AUTOMATE with Allen Bradley PLC rolling version
- SAI2915 AUTOMATE with Siemens PLC rolling version
- SAI2916 AUTOMATE with Omron PLC rolling version
- SAI2917 AUTOMATE with Mitsubishi PLC rolling version

AUTOMATE-200C

AUTOMATE-200C is the compact version of AUTOMATE-200.

It includes all the essential parts of the AUTOMATE-200 family on a single, smaller base directly connected to the control PLC.



The most compact in the range!

•	SAI2918	AUTOMATE compact with Allen Bradley PLC
•	SAI2919	AUTOMATE compact with Siemens PLC
•	SAI2920	AUTOMATE compact with Omron PLC
•	SAI2921	AUTOMATE compact with Mitsubishi PLC

"Sierra College Mechatronics Trainer"

AUTOMATE-200 - With this system you could...

AUTOMATE-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES

SKILLS

	PNEUMATICS	VACUUM	ELECTRIC MOTORS	SENSORS	PROGRAMM. CONTROLLERS	MANIPULATORS	AUTOMATED SYSTEMS
ANALYSIS	■	■	■	■	■	■	■
TROUBLESHOOT.					■		■
DESIGNING	■	■	■	■	■	■	■
TECH DOCUM. CREATION	■	■	■	■	■	■	■
INSTALLATION AND ASSEMBLY	■						
TECH DOCUM. UNDERSTANDING	■	■	■	■	■	■	■
OPERATION	■			■	■	■	■
PROGRAMMING					■		■

■ This shows how the AUTOMATE-200 is suitable to develop skills in the specific technology.

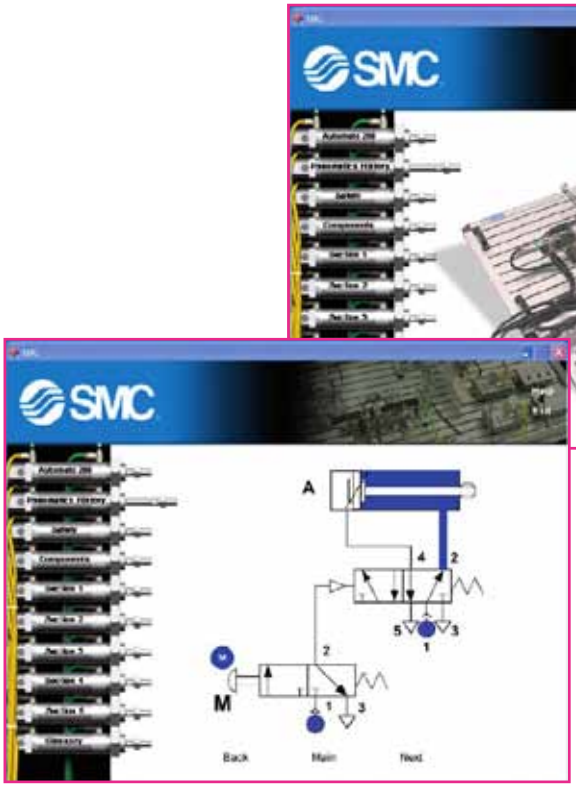
■ This shows that AUTOMATE-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

eLEARNING-200

Find out more about the theory behind the technologies developed in AUTOMATE-200 with our eLEARNING-200 courses.

RELATED eLEARNING-200 COURSES
Introduction to industrial automation (SMC-100)
Principles of pneumatics (SMC-101)
Introduction to electricity (SMC-102)
DC electricity (SMC-103)
Solid state (SMC-105)
Sensors technology (SMC-108)
Programmable controllers (SMC-109)

**See eLEARNING-200 chapter for more information*



The multimedia DVD includes:

- Guide for the teacher with theory and technical information for all system components.
- PLC guide (Allen Bradley) with the basic concepts and programming guide necessary to be able to program the control system.
- Theoretical and practical activities with answers and solutions.
- Troubleshooting guide with answers to the most common problems.

AUTOMATE-200 - Options

AUTOMATE-200 has a series of optional extras.

• Programming tools

The programming tools comprise the appropriate programming software and cables for the chosen PLC.

*See Programming Tools chapter

• SCADA: Supervisory Control and Data Acquisition

This is an industrial standard software application, making it easier to remotely supervise and control processes from a computer screen.

• SAI2924	SCADA application AUTOMATE-200

• AUTOMATE-200 application for autoSIM-200

We have a 3D application where users can simulate, supervise and control AUTOMATE-200 from an autoSIM environment.

• SAI2530	3D simulator for AUTOMATE-200, 1 license
• SAI2531	3D simulator for AUTOMATE-200, 8 licenses
• SAI2532	3D simulator for AUTOMATE-200, 16 licenses

**autoSIM is required. See autoSIM-200 chapter*
*** Not availabe in AUTOMATE-200C version*

• Troubleshooting simulation system for AUTOMATE-200

The troubleshooting simulation system TROUB-200 can be included in the AUTOMATE-200A and AUTOMATE-200B versions, which generates up to 16 different breakdowns to be diagnosed by the user.

• SAI2980	AUTOMATE-200 Troubleshooting box system

AUTOMATE-200 - Configuration

Getting the right AUTOMATE-200 specification is as easy as:

• Steps to follow

1.- Select the right version.

2.- Choose the PLC.

3.- Add any optional extras.

AUTOMATE-200 - Technical features

AUTOMATE-200A
1200x865x350mm

Modules	Sensors (type & qty.)	Input / Output
Vertical feeder Platform with part detector Colour detector Conveyor belt Belt drive Hole detector Material detector Roto-linear handling device with suction pads Part classifier Warehouse	Auto switch, Reed type (x10) Photoelectric (x1) Fiber optic (x2) Vacuum pressure switch (x1) Inductive (x1)	Digital 18/21

Other devices (quantity)	Actuators (type & quantity)
Manual control panel (x1) PLC control panel (x1)	Pneumatic linear (x9) Pneumatic rotary actuator (x1) DC motor (x1) Vacuum pad (x3) - Vacuum ejector (x1)

AUTOMATE-200B
900x580x1200mm

Modules	Sensors (type & qty.)	Input / Output
Vertical feeder Platform with part detector Colour detector Conveyor belt Belt drive Hole detector Material detector Roto-linear handling device with suction pads Part classifier Warehouse	Auto switch, Reed type (x10) Photoelectric (x1) Fiber optic (x2) Vacuum pressure switch (x1) Inductive (x1)	Digital 19/19

Other devices (quantity)	Actuators (type & quantity)
Three-colour indication light (x1) Rolling table Folding control panel	Pneumatic linear (x9) Pneumatic rotary actuator (x1) DC motor (x1) Vacuum pad (x3) - Vacuum ejector (x1)

AUTOMATE-200C
645x760x290mm

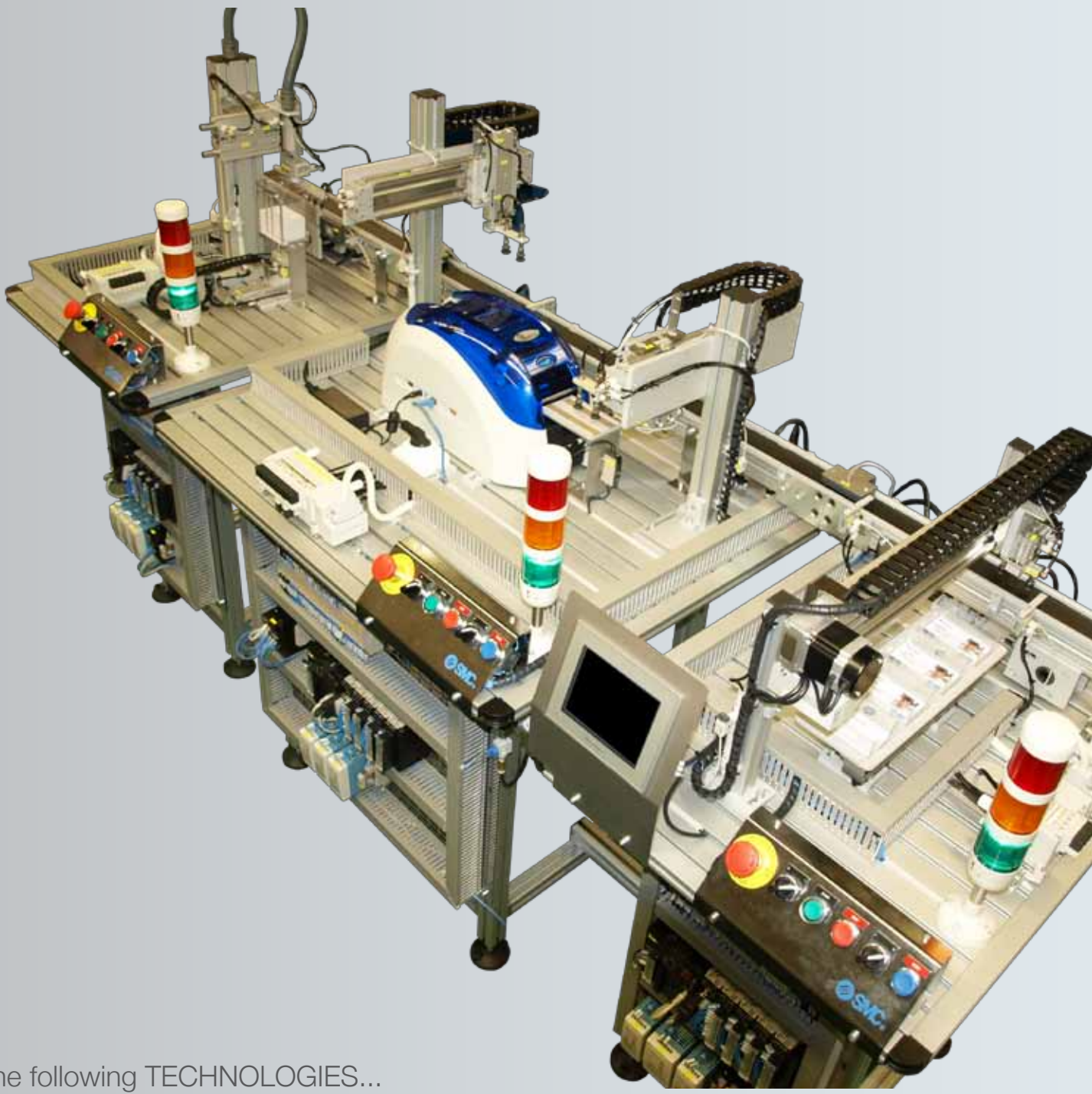
Modules	Sensors (type & qty.)	Input / Output
Vertical feeder Roto-linear handling device with pneumatic gripper Conveyor belt Material detector Presence detector End of conveyor belt detector Part sorting	Auto switch, Reed type (x4) Photoelectric (x1) Fiber optic (x3) Inductive (x1) Capacitive (x1) Micro-switch (x1)	Digital 20/16

Other devices (quantity)	Actuators (type & quantity)
Step by step driver servo Vcc (x1)	Pneumatic linear (x2) Pneumatic gripper (x1) Step by step motor servo Vcc (x1) DC motor (x1) Solenoid (x1)

CPS-200

Cards Printing System

Smart cards printing automated production system



In the following TECHNOLOGIES...

ELECTRICAL PANEL | PNEUMATICS | VACUUM | ELECTRIC MOTORS | SENSORS | IDENTIFICATION SYSTEMS | PROGRAMM. CONTROLLERS | MANIPULATORS

SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

TECH DOCUM. UNDERSTANDING

OPERATION

PROGRAMMING

SETTING UP

Learn by making intelligent personalised cards!

Includes RFID technology and colour printer

INDUSTRIAL COMMUNIC.

MOTION CONTROL

SCADA / HMI

AUTOMATED SYSTEMS

CPS-200 - Cards Printing System

This automated production system uses the context of printing smart cards for learning, it is composed of 3 stations. Smart cards are widely used for access control and identification.

With this equipment is possible to have fun learning how to operate, programme and maintain a complete automated production system. It includes RFID read/write technology to inspect and customise smart cards. Furthermore it includes an HMI (Human Machine Interface) for controlling the process.

The resulting product can be used by the user as an identification card.

CPS-200 is made up of three stations, each carrying out part of the process.

• CPS-201: Card dispenser

The first station is in charge of supplying the system with blank cards from a vertical feeder and it checks that the card is empty.

•CPS-202: Card printer

The second station prints out the cards which arrive from the first station and returns them to the conveyor belt once printed.

• CPS-203: Card classification/storage

The third and last station stores the printed cards in 4 different positions depending on predefined criteria.

Common element in all stations

*Options: PLC Omron, Allen Bradley or Siemens.

CPS-201 - Card dispenser

The first station supplies the system with blank cards from a vertical feeder. The system reads the card to check that it is empty and places it on the conveyor belt. If the card is not empty, it is rejected.

The raw material to be used is a SmartCard® with an integrated RF chip.

• SAI7021.1	CPS-201 Card feeding station with Allen Bradley PLC
• SAI7121	CPS-201 Card feeding station with Omron PLC
• SAI7221	CPS-201 Card feeding station with Siemens PLC

CPS-202 - Card printer

The card supplied by the first station arrives at the second station using the conveyor belt where the SmartCard® is printed on both sides and in full colour. Once the card has been printed, the handling system returns it to the conveyor belt.

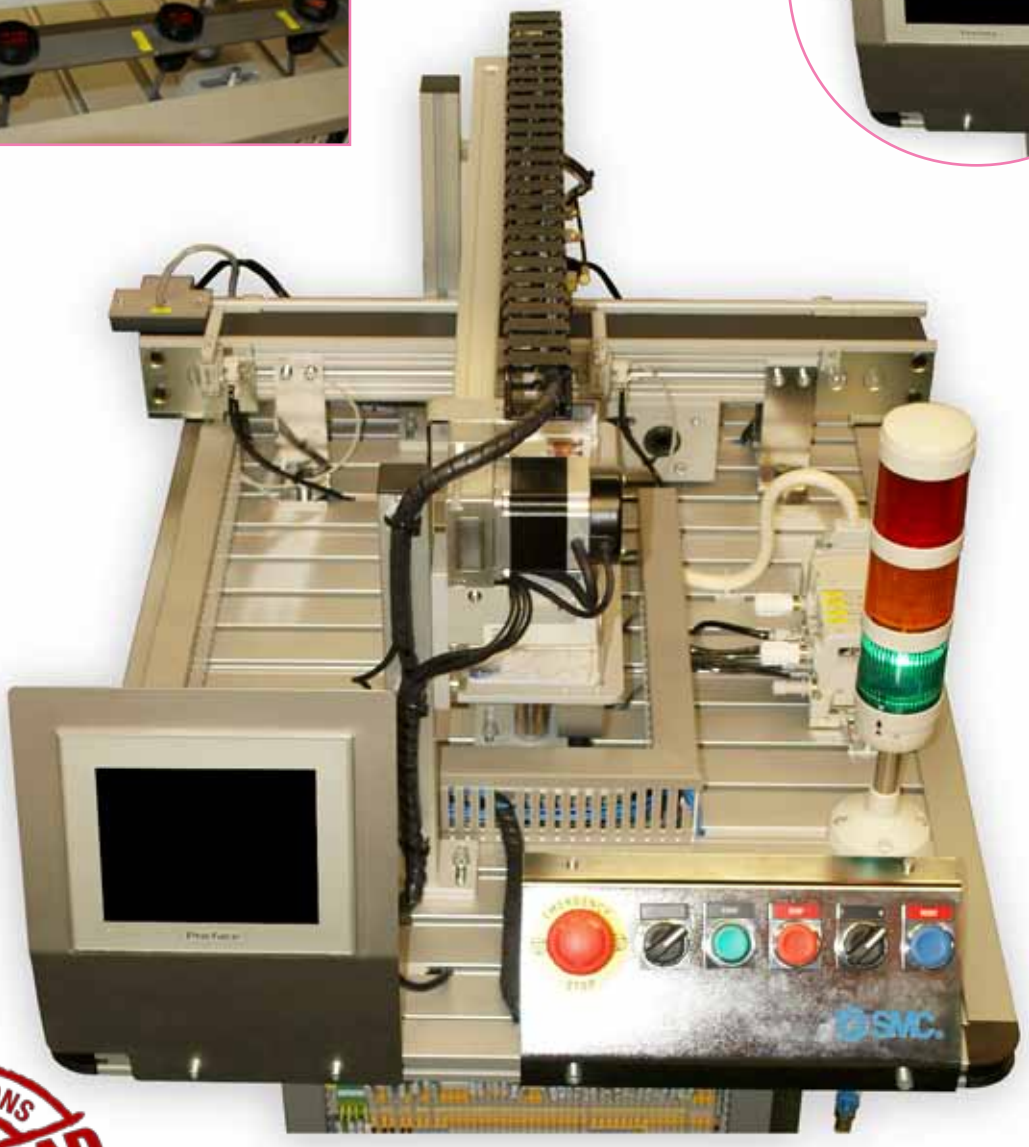
- SAI7022 CPS-202 Card printing station with Allen Bradley PLC
- SAI7122 CPS-202 Card printing station with Omron PLC
- SAI7222 CPS-202 Card printing station with Siemens PLC

CPS-203 - Card classification/storage

Travelling along the conveyor belt, the printed card comes to the third and final station. The printed cards are stored here in 4 different positions depending on different criteria.

It has an HMI screen that offers information on the status of the different storage positions and helps to control the positions in which the cards are sorted.

HMI operator terminal



• SAI7023	CPS-203 Card classification station with Allen Bradley PLC
• SAI7123	CPS-203 Card classification station with Omron PLC
• SAI7223	CPS-203 Card classification station with Siemens PLC

CPS-200 - Options

CPS -200 has a series of optional extras.

• Programming tools

The programming tools comprise the appropriate programming software, the industrial system communication programming software and cables for the chosen PLC.

See Programming Tools chapter

CPS-200 - Configuration

Getting the right CPS-200 specification is as easy as:

• Steps to follow

1.- Choose the PLC.

2.- Select the required stations.

3.- Add any optional extras.

• Considerations

- Any station can operate independently and be purchased separately.

- In order to work with the full system, you will need the CPS-202 station.

CPS-200 - Technical features

CPS-201 600x762x1250mm	Modules	Sensors (type & quantity)	Input / Output
	Smart Cards feeding module Card insertion / reject handling device	Auto switch, Reed type (x10) Vacuum pressure switch (x2)	Digital 18/11
	Other devices (quantity)	Actuators (type & quantity)	
	Vacuum pad(x5)-Vacuum ejector(x2) RFID serial device (x1) Belt motor starter relay (x1) Reject container (x1)	Pneumatic linear (x4) Pneumatic rotary actuator (x1) DC motor (x1)	
CPS-202 962x762x1400mm	Modules	Sensors (type & quantity)	Input / Output
	Card feeding handling Card movement manipulator Card printing module	Auto switch, Reed type (x12) Reflex photocell (x1) Vacuum pressure switch (x2)	Digital 21/16
	Other devices (quantity)	Actuators (type & quantity)	
	Vacuum pad(x4)-Vacuum ejector(x2) RFID serial device (x1) Belt motor starter relay (x1) Double-sided colour card printer	Pneumatic linear (x8) DC motor (x1)	
CPS-203 962x762x1400mm	Modules	Sensors (type & quantity)	Input / Output
	Warehouse module	Auto switch, Reed type (x4) Proximity photocell (x4) Vacuum pressure switch (x1)	Digital 20/12
	Other devices (quantity)	Actuators (type & quantity)	
	Vacuum pad(x2)-Vacuum ejector(x1) HMI operator terminal (x1) RFID serial device (x1) SMC e-Actuator driver (x1) Belt motor starter relay (x1) Card container (x4)	Pneumatic linear (x3) Step-step motor electrical axis (x1) DC motor (x1)	

CPS-200 - With this system you could...

CPS-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

SKILLS	ELECTRICAL PANEL	PNEUMATICS	VACUUM	ELECTRIC MOTORS	SENSORS	IDENTIFICATION SYSTEMS	PROGRAMM. CONTROLLERS	MANIPULATORS
ANALYSIS	■	■	■	■	■	■	■	■
TROUBLESHOOT.							■	
DESIGNING	■	■	■	■	■	■	■	■
TECH DOCUM. CREATION	■	■	■	■	■	■	■	■
TECH DOCUM. UNDERSTANDING	■	■	■	■	■	■	■	■
OPERATION	■	■				■	■	■
PROGRAMMING						■	■	
SETTING UP								

■ This shows how the CPS-200 is suitable to develop skills in the specific technology.

■ This shows that CPS-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

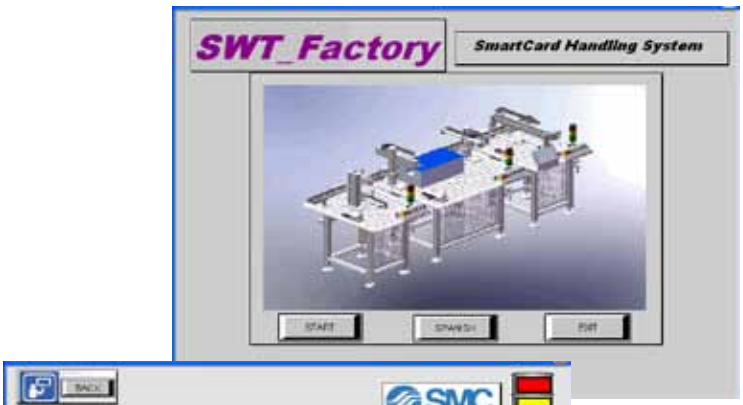
eLEARNING-200

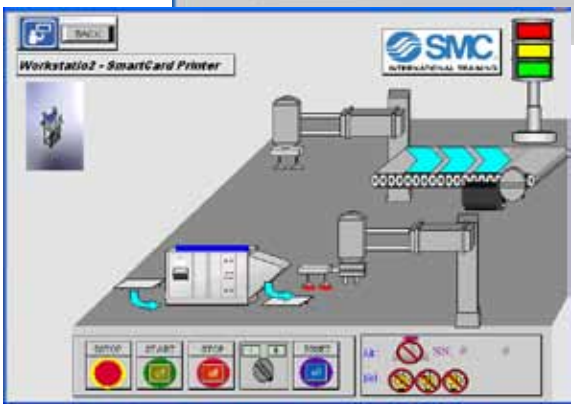
Find out more about the theory behind the technologies developed in CPS-200 with our eLEARNING-200 courses.

INDUSTRIAL COMMUNIC.	MOTION CONTROL	SCADA / HMI	AUTOMATED SYSTEMS

RELATED eLEARNING-200 COURSES
Introduction to industrial automation (SMC-100)
Principles of pneumatics (SMC-101)
Introduction to electricity (SMC-102)
DC electricity (SMC-103)
Solid state (SMC-105)
Sensors technology (SMC-108)
Programmable controllers (SMC-109)

**See eLEARNING-200 chapter for more information*

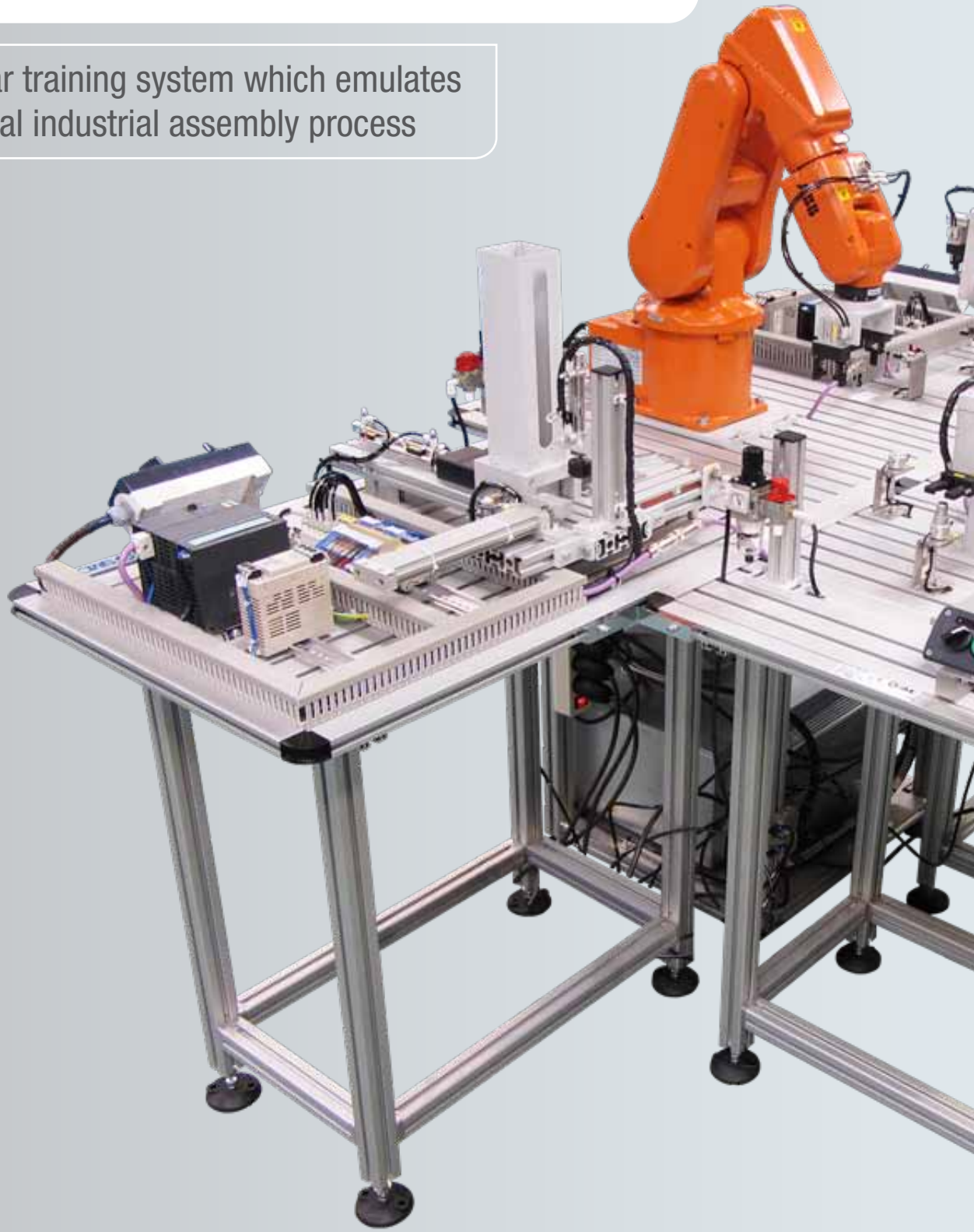




MAS-200

Modular assembly system

Modular training system which emulates a real industrial assembly process



In the following TECHNOLOGIES...

ELECTRICAL PANEL | PNEUMATICS | VACUUM | SENSORS | IDENTIFICATION SYSTEMS | PROGRAMM. CONTROLLERS | MANIPULATORS | ROBOTICS

SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

TECH DOCUM. UNDERSTANDING

OPERATION

PROGRAMMING

SETTING UP

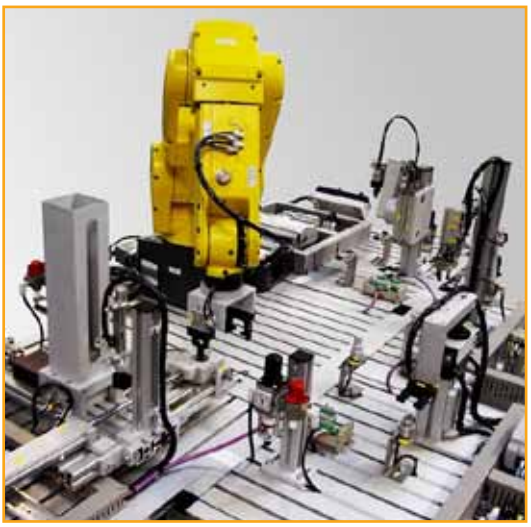
Five completely autonomous stations that can be assembled to form a complete manufacturing cell

INDUSTRIAL COMMUNIC.

SCADA / HMI

AUTOMATED SYSTEMS

MAS-200 - Modular assembly system



MAS-200 is a modular training system which emulates a real industrial assembly process, incorporating the technologies required by today's automated industry. The complete system consists of five stations. The various parts of the final assembled product (base, bearing, shaft and lid) are fed into four of the stations. The fifth station is located between the others and is responsible for transferring and assembling the parts.

The modular features of the equipment allow a vast range of options since the stations are completely autonomous, but can be assembled to form a complete manufacturing cell. The design of the MAS-200 allows simple and quick extraction of the stations, assisting individual work with each of them. All the components of which the MAS-200 is comprised are used in the industry, allowing the user to gain detailed knowledge of the technologies currently used in automated industry.

The MAS-200 system includes an optional SCADA tool which enables:
- Access to the status of the various field devices.
- Display, management and storage in the PC of information collected during the process.
- Control and modification of the process in real time.
- Display of the various phases of the process via a graphical interface.
- Recognition of alarms in the event of system failures.
- Generation of data logs and statistical data.

Each of the MAS-200 system stations carries out part of the process.

• MAS-201: Feeding of the base with detection and ejection of incorrect parts

This station feeds the base which supports the final assembled product.

• MAS-202: Positioning of the lid

This station allows the insertion of a lid into the workpiece.

• MAS-203: Insertion of the bearing

The third MAS-200 station feeds a bearing.

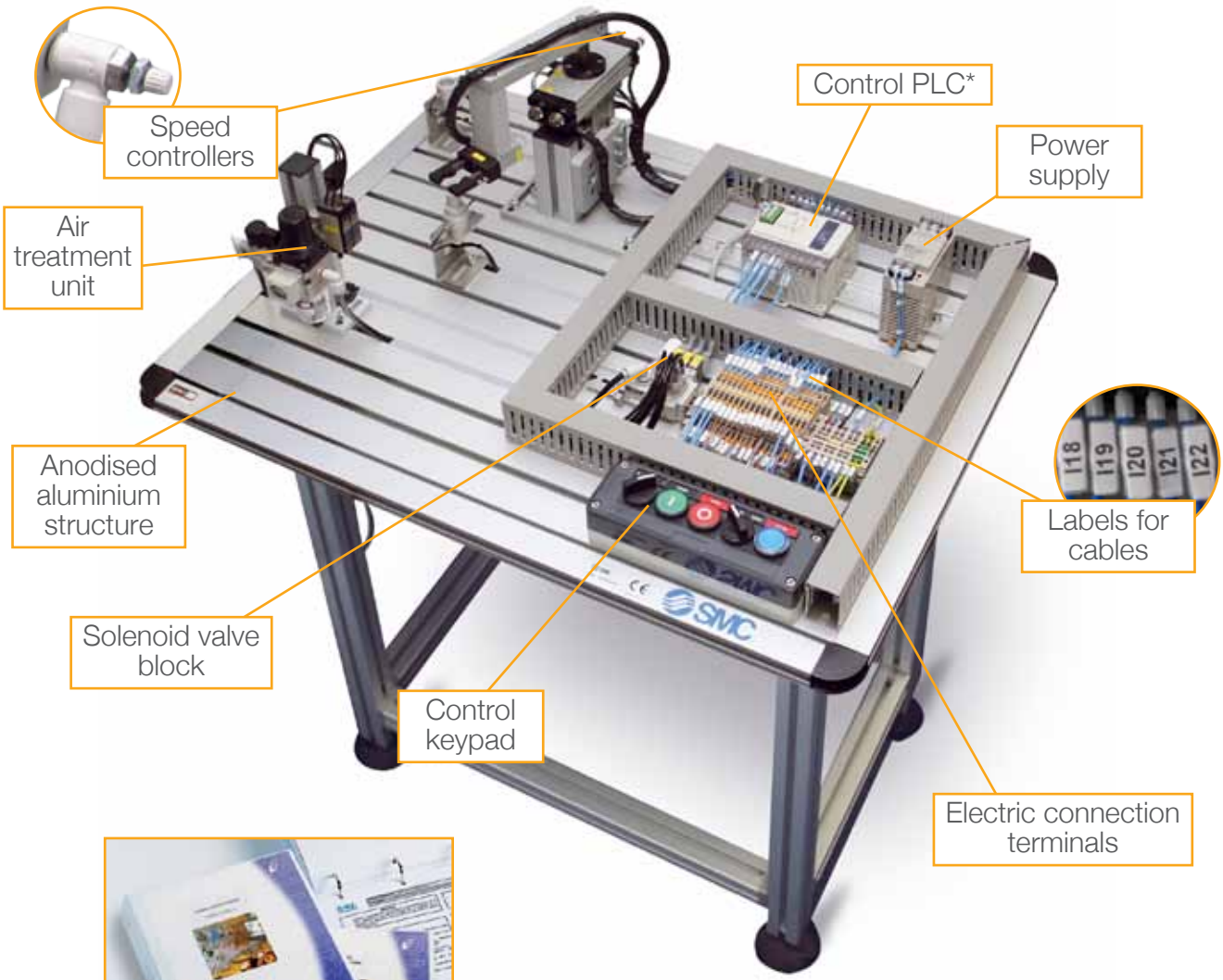
• MAS-204: Insertion of the shaft

This station, MAS-204, feeds a shaft for the workpiece.

• MAS-205: Transfer of the parts

The fifth and last MAS-200 station is responsible for the assembly or disassembly of all the components. There are two versions of this station: one of them with a pneumatic index plate and the other with a six axis robot.

Common element in all stations



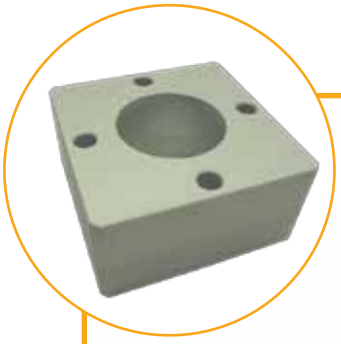
User manual and practice manual

*Options: PLC Siemens, Omron, Mitsubishi, Allen Bradley or without PLC.

MAS-201 - Feeding of the base with detection and ejection of incorrect parts

The first station feeds the base for the final assembled product, checks for orientation and moves it to the assembly position (located in the same station).

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.



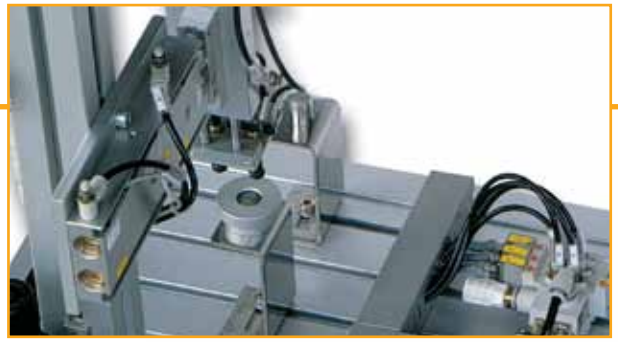
Breakdown simulation system

• SAI6041	MAS-201 Feeding of the base with Omron PLC
• SAI6001	MAS-201 Feeding of the base with Allen Bradley PLC
• SAI6011	MAS-201 Feeding of the base with Siemens PLC
• SAI6021	MAS-201 Feeding of the base with Mitsubishi PLC
• SAI6031	MAS-201 Feeding of the base without PLC

MAS-202 - Positioning of the lid

This station inserts a lid into the workpiece. The lid is moved from its initial position, where its presence is detected, to the assembly position.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.



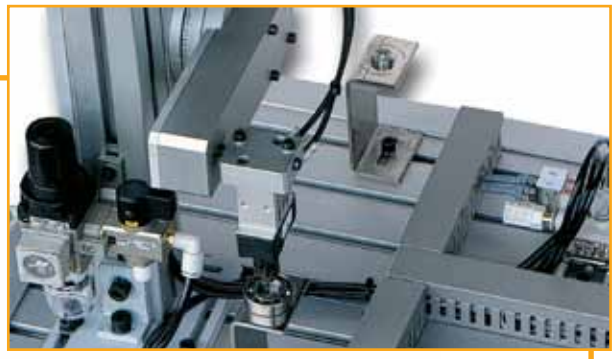
Breakdown
simulation system

- SAI6042 MAS-202 Positioning of the lid with Omron PLC
- SAI6002 MAS-202 Positioning of the lid with Allen Bradley PLC
- SAI6012 MAS-202 Positioning of the lid with Siemens PLC
- SAI6022 MAS-202 Positioning of the lid with Mitsubishi PLC
- SAI6032 MAS-202 Positioning of the lid without PLC

MAS-203 - Insertion of the bearing

The third station feeds a bearing. The bearing is moved from its initial position to the assembly position. Presence detection exists in both positions.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.



Breakdown simulation system

•	SAI6043	MAS-203 Insertion of the bearing with Omron PLC
•	SAI6003	MAS-203 Insertion of the bearing with Allen-Bradley PLC
•	SAI6013	MAS-203 Insertion of the bearing with Siemens PLC
•	SAI6023	MAS-203 Insertion of the bearing with Mitsubishi PLC
•	SAI6033	MAS-203 Insertion of the bearing without PLC

MAS-204 - Insertion of the shaft

This station, MAS-204, feeds a shaft for the workpiece. As in previous stations, the material, the shaft, is moved from its initial position to the assembly position. Presence detection exists in both positions.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown
simulation system

• SAI6044	MAS-204 Insertion of the shaft with Omron PLC
• SAI6004	MAS-204 Insertion of the shaft with Allen-Bradley PLC
• SAI6014	MAS-204 Insertion of the shaft with Siemens PLC
• SAI6024	MAS-204 Insertion of the shaft with Mitsubishi PLC
• SAI6034	MAS-204 Insertion of the shaft without PLC

MAS-205 - Transfer of the parts

The fifth and last MAS-200 station is responsible for the assembly or disassembly of all the components which have been supplied by each of the supporting stations. There are two versions of this station, comprised of either an index plate with two handling devices or a robot with six axis.

The PLC in this station is a network master to the PLCs from the other stations. It contains the control panel, fitted with keypad, alarm, power supply, master PLC, pressure switch and the connections required for air and power.

MAS-205A: Pneumatic transfer

Breakdown simulation system

• SAI6045	MAS-205A Pneumatic transfer station with Omron PLC
• SAI6005	MAS-205A Pneumatic transfer station with Allen-Bradley PLC
• SAI6015	MAS-205A Pneumatic transfer station with Siemens PLC
• SAI6025	MAS-205A Pneumatic transfer station with Mitsubishi PLC
• SAI6035	MAS-205A Pneumatic transfer station without PLC

MAS-205B: Robotized transfer

In this version, the study of robotics is introduced. It is a widespread technology in the many sectors of automated industry.

The robot carries out assembly and disassembly tasks of all the parts comprising the turning mechanism. The robot has two grippers to hold the parts. It includes a programming console. A wide range of robots is offered. Please check availability.

•	SAI6046	MAS-205B: Robotized transfer station with Omron PLC
•	SAI6006	MAS-205B: Robotized transfer station with Allen Bradley PLC
•	SAI6016	MAS-205B: Robotized transfer station with Siemens PLC
•	SAI6026	MAS-205B: Robotized transfer station with Mitsubishi PLC
•	SAI6036	MAS-205B: Robotized transfer station without PLC

MAS-200 - With this system you could...

MAS-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES

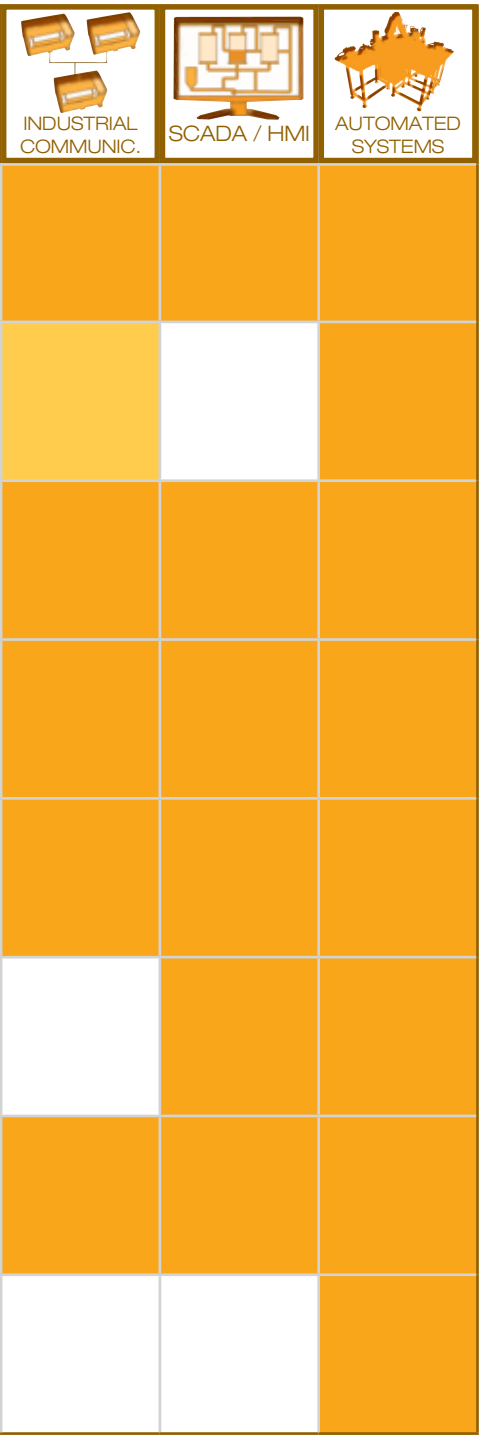
SKILLS	ELECTRICAL PANEL	PNEUMATICS	VACUUM	SENSORS	IDENTIFICATION SYSTEMS	PROGRAMM. CONTROLLERS	MANIPULATORS	ROBOTICS
ANALYSIS	■	□	□	□	□	■	■	■
TROUBLESHOOT.	■	■	□	■		□	■	□
DESIGNING	■	□	□	□	□	■	■	■
TECH DOCUM. CREATION	■	□	□	□	□	■	■	■
TECH DOCUM. UNDERSTANDING	■	□	□	□	□	■	■	■
OPERATION	■	■				■	■	■
PROGRAMMING					□	■		■
SETTING UP								

■ This shows how the MAS-200 is suitable to develop skills in the specific technology.

□ This shows that MAS-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

eLEARNING-200

Find out more about the theory behind the technologies developed in MAS-200 with our eLEARNING-200 courses.



RELATED eLEARNING-200 COURSES
Introduction to industrial automation (SMC-100)
Principles of pneumatics (SMC-101)
Introduction to electricity (SMC-102)
DC electricity (SMC-103)
Solid state (SMC-105)
Introduction to wiring (SMC-106)
Sensors technology (SMC-108)
Programmable controllers (SMC-109)
Robotics (SMC-113)

**See eLEARNING-200 chapter for more information*

MAS-200 - Options

MAS-200 has a series of optional extras.

• Programming tools

The programming tools comprise the appropriate programming software, the industrial system communication programming software and cables for the chosen PLC.

*See Programming Tools chapter

• SCADA: Supervisory Control and Data Acquisition

This is a standard-use software application in industry, making it easier to supervise and control processes from the computer screen.

• SAI6008	MAS-200 SCADA application

• MAS-200 application for autoSIM-200

We have a 3D application where users can simulate, supervise and control MAS-200 from an autoSIM environment.

• SAI2547	3D simulator for MAS-200, 1 license
• SAI2548	3D simulator for MAS-200, 8 licenses
• SAI2549	3D simulator for MAS-200, 16 licenses

autoSIM is required. See autoSIM-200 chapter

MAS-200 - Configuration

Getting the right MAS-200 specification is as easy as:

• Steps to follow

1.- Choose the PLC.

2.- Select the required stations.

3.- Add any optional extras.

• Considerations

- Any station can operate independently and be purchased separately.

- To work with the full system, you need either version of the MAS-205 station.

MAS-200 - Technical features

MAS-201 843x580x1300mm	Modules	Sensors (type & quantity)	Input / Output
	Part feed Position verification Displacement Incorrect part rejection	Auto switch, Reed type (x4) Inductive (x1)	Digital 9/5
	Other devices (quantity)	Actuators (type & quantity)	
	Breakdown simulation system (x1)	Pneumatic linear (x4)	
MAS-202 743x580x1300mm	Modules	Sensors (type & quantity)	Input / Output
	Part transfer	Auto switch, Reed type (x4) Vacuum pressure switch (x1)	Digital 9/5
	Other devices (quantity)	Actuators (type & quantity)	
	Breakdown simulation system (x1) Vacuum pad(x3)-Vacuum ejector (x1)	Pneumatic linear (x2)	
MAS-203 743x580x1200mm	Modules	Sensors (type & quantity)	Input / Output
	Part transfer	Auto switch, Reed type (x3) Barrier type photocell (x2)	Digital 9/4
	Other devices (quantity)	Actuators (type & quantity)	
	Breakdown simulation system (x1)	Pneumatic rotary actuator (x1) Pneumatic gripper (x1)	
MAS-204 743x580x1120mm	Modules	Sensors (type & quantity)	Input / Output
	Part transfer	Auto switch, Reed type (x4) Fiber optic photocell (x2) Solid state (x2)	Digital 12/4
	Other devices (quantity)	Actuators (type & quantity)	
	Breakdown simulation system (x1)	Pneumatic rotolinear (x1) Pneumatic gripper (x1)	
MAS-205A 743x400x1320mm	Modules	Sensors (type & quantity)	Input / Output
	Handling parts by external gripper Handling parts by internal gripper Dividing plate	Auto switch, Reed type (x10)	Digital 15/10
	Other devices (quantity)	Actuators (type & quantity)	
	Breakdown simulation system (x1) Bar code reader (x1)	Pneumatic linear (x8) Pneumatic gripper (x2)	
MAS-205B 743x580x1550mm	Modules	Sensors (type & quantity)	Input / Output
	Robot		Digital 7/6
	Other devices (quantity)	Actuators (type & quantity)	
	Robot controller unit (x1) Programming console (x1)	Six axis robot (x1) Pneumatic gripper (x2)	

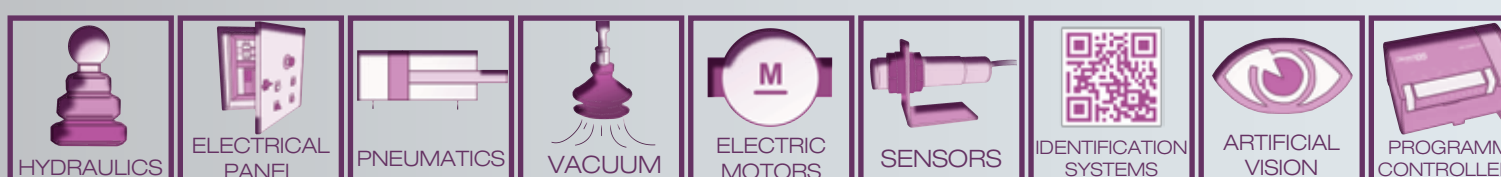
FAS-200

Flexible assembly system

New flexible assembly system for mechatronics and automation skills training

Many technologies in the same system

In the following TECHNOLOGIES...



SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

INSTALLATION AND ASSEMBLY

TECH DOCUM. UNDERSTANDING

OPERATION

PROGRAMMING

SETTING UP

More stations within the same space!

M. RS | MANIPULATORS | ROBOTICS | INDUSTRIAL COMMUNIC. | MOTION CONTROL | SCADA / HMI | AUTOMATED SYSTEMS

FAS-200 - Flexible assembly system

FAS-200 is a flexible and compact assembly system which includes industrial automation technologies.

FAS-200 comprises up to 18 independent stations with integrated control. This modular equipment features a higher number of stations in the same space, which means that more users will be able to work at the same time.

In addition, it enables making a staggered investment, i.e. starting with an initial basic configuration which can be easily enhanced by adding workstations.

FAS-200 offers professional skills training to suit the world of industry using standardised industrial components.

The different process stations assemble a turning mechanism. To provide the system with greater flexibility, the stations adapt to a wide variety of assemblies, introducing variations in the materials, colours and part sizes. The combination of all these options means that a total of 24 different assemblies can be produced enabling the use of production management strategies.

Each of the FAS-200 system stations carries out part of the process.

- FAS-201: Base feeding / verification station

This stations feeds the base for the rotation mechanism and verifies that its orientation / position is correct.

- FAS-202: Base rejection / transfer station

The second station positions the correctly placed bases on the pallet and rejects those which are incorrect.

• FAS-203: Bearing feeding / transfer station

This station supplies the bearing and moves it to the measuring position. There are two types of bearings with different heights.

• FAS-204: Bearing measuring / transfer station

The FAS-204 station measures the height of the bearing provided by the previous station.

• FAS-205: Hydraulic pressing station

This station emulates the pressing of the bearing against the base.

• FAS-206: Transfer station to the hydraulic press

The FAS-206 station feeds work-piece to the press and picks it up / drops it onto the pallet.

• FAS-207: Shaft classification station

This station feeds the assembly shafts and verifies their material and position. Two types of shafts exist with different materials.

• FAS-208: Shaft rejection / transfer station

The eighth station rejects the with incorrect material or faulty positioning and inserts the correct ones into the work-piece.

• FAS-209: Lid classification station

This station feeds and inspects that are to be added to the work-piece. There are 6 different types of lids with varying material, colour and height.

• FAS-210: Lid rejection / transfer station

The tenth station rejects incorrect lids or inserts them onto the pallet if they are of the required type for the work-piece.

• FAS-211: Screw dispensing station

FAS-211 feeds and transfers the screws to the following station.

• FAS-212: Screw insertion station

The FAS-212 station inserts the four screws into the base.

• FAS-213: Robotised screwing station

This station integrates robotics technology. The robot screws in the four screws inserted in the product by the previous station.

• FAS-214: Transfer and visual inspection station

This station performs the quality control for work-piece using an artificial vision system.

• FAS-215: Rejection station after visual inspection

This station rejects the work-piece if the inspection result is unsatisfactory.

• FAS-216: Storage station

The product is removed from the production line and stored using electric actuators.

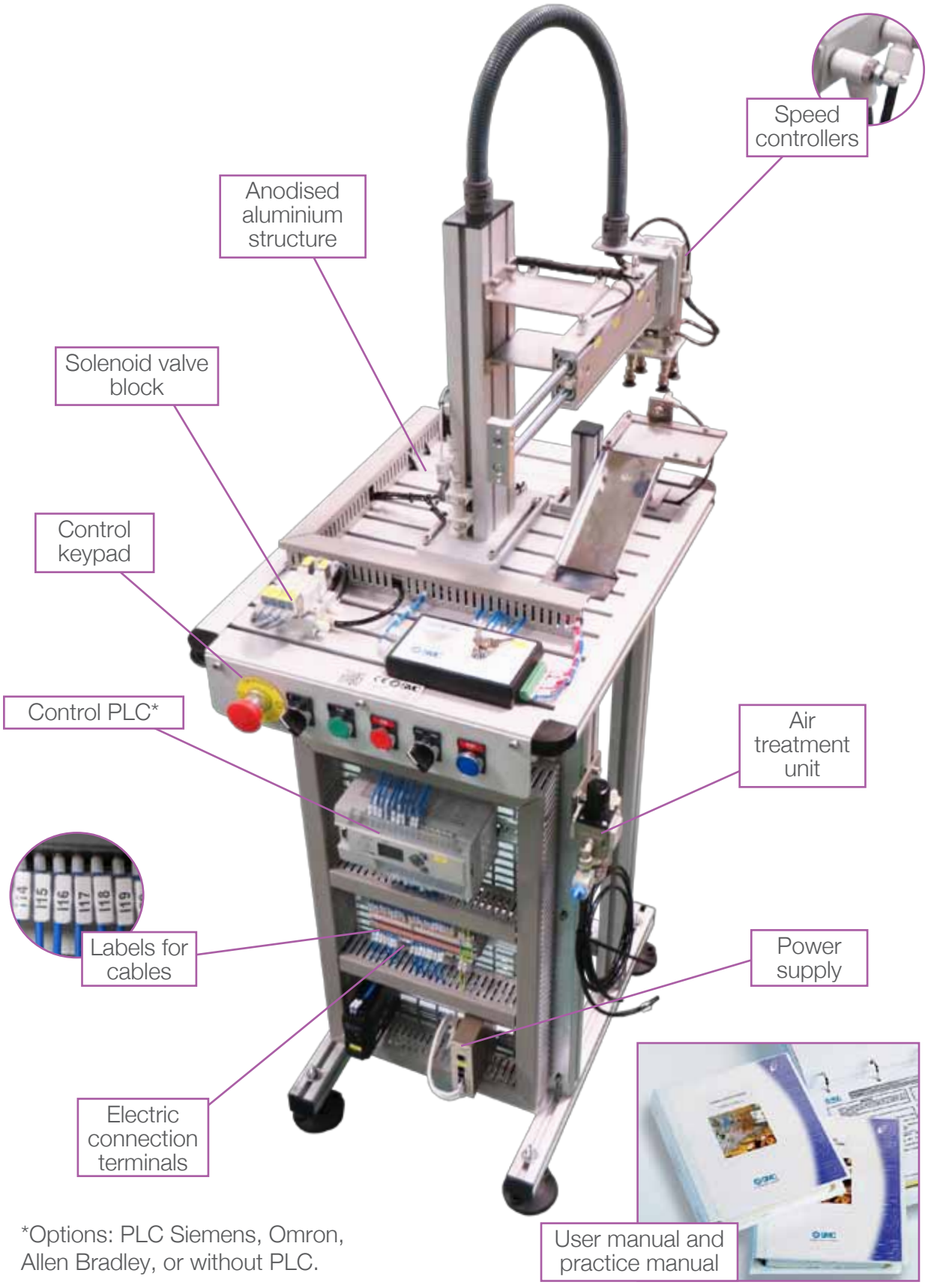
• FAS-220: Pallet transfer station

This stations transfers the pallet from one transfer line to another in a parallel transfer configuration.

• FAS-230: Linear transfer for 4 stations

The FAS-230 station transports the pallet between the stations. Each transfer connects 4 stations.

Common elements in all stations

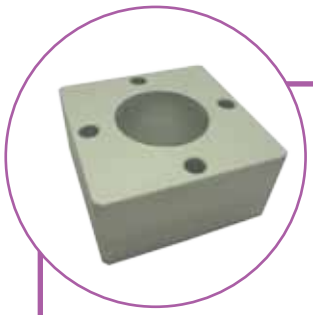


*Options: PLC Siemens, Omron, Allen Bradley, or without PLC.

FAS-201: Base feeding / verification station

This station feeds the base that serves as support to the assembled product and verifies its correct orientation.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.



Breakdown simulation system

- SAI4201 FAS-201 with Siemens PLC
- SAI4217 FAS-201 with Omron PLC
- SAI4241 FAS-201 with Allen Bradley PLC
- SAI4301 FAS-201 without PLC

FAS-202: Base rejection / transfer station

This second station positions the correctly placed bases on the pallet and rejects those which are incorrect.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown simulation system

- SAI4202 FAS-202 with Siemens PLC
- SAI4218 FAS-202 with Omron PLC
- SAI4242 FAS-202 with Allen Bradley PLC
- SAI4302 FAS-202 without PLC

FAS-203: Bearing feeding / transfer station

This station supplies the bearing and moves it to the measuring position. Bearings can be inserted with two different heights.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown simulation system

- SAI4203 FAS-203 with Siemens PLC
- SAI4219 FAS-203 with Omron PLC
- SAI4243 FAS-203 with Allen Bradley PLC
- SAI4303 FAS-203 without PLC

FAS-204: Bearing measuring / transfer station

This station measures the height of the bearing provided by the previous station and inserts it into the base. The measurement is performed using a series of actuators and a probe that acts on a linear potentiometer. In the event that the bearing height is not suitable, it will be rejected.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown simulation system

- SAI4204 FAS-204 with Siemens PLC
- SAI4221 FAS-204 with Omron PLC
- SAI4244 FAS-204 with Allen Bradley PLC
- SAI4304 FAS-204 without PLC

FAS-205: Hydraulic pressing station

In this phase of the process is emulated the pressing of a bearing is emulated.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown simulation system

- SAI4205 FAS-205 with Siemens PLC
- SAI4222 FAS-205 with Omron PLC
- SAI4245 FAS-205 with Allen Bradley PLC
- SAI4305 FAS-205 without PLC

FAS-206: Transfer station to the hydraulic press

This station feeds the work-piece to the FAS-205, the hydraulic pressing station. After pressing it picks it up / drops it on the pallet.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown simulation system

- SAI4206 FAS-206 with Siemens PLC
- SAI4223 FAS-206 with Omron PLC
- SAI4246 FAS-206 with Allen Bradley PLC
- SAI4306 FAS-206 without PLC

FAS-207: Shaft classification station

This station feeds the assembly shafts and verifies their material and position. Two types of shafts exist depending on the material: aluminium and nylon. This increases the number of possible finished products which are assembled, while also increasing the didactic capacities of the FAS-200.

The different operations undertaken in this station are distributed around an index plate. The operations are: shaft feeding, measuring shaft height and material detection.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Gravity feeder

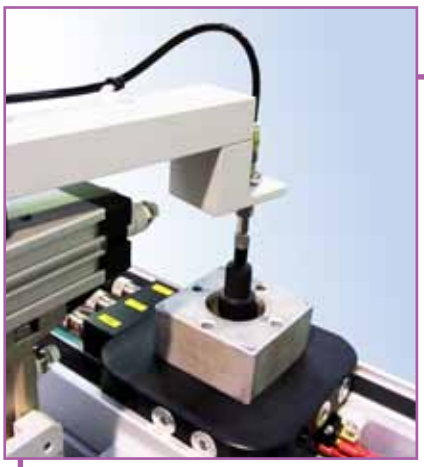
Breakdown simulation system

- SAI4207 FAS-207 with Siemens PLC
- SAI4224 FAS-207 with Omron PLC
- SAI4247 FAS-207 with Allen Bradley PLC
- SAI4307 FAS-207 without PLC

FAS-208: Shaft rejection / transfer station

This station rejects the shafts which are incorrectly aligned or are the wrong material and inserts the correct ones into the work-piece.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.



Breakdown simulation system

- SAI4208 FAS-208 with Siemens PLC
- SAI4225 FAS-208 with Omron PLC
- SAI4248 FAS-208 with Allen Bradley PLC
- SAI4308 FAS-208 without PLC

FAS-209: Lid classification station

This station feeds and inspects the lids to be assembled in the work-piece. There are 6 different types of lids depending on the material (aluminium or nylon), colour (light or dark) and height (high or low).This variety offers the station more didactic possibilities. The operations carried out in this station are distributed around an index plate.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown simulation system

- SAI4209 FAS-209 with Siemens PLC
- SAI4226 FAS-209 with Omron PLC
- SAI4249 FAS-209 with Allen Bradley PLC
- SAI4309 FAS-209 without PLC

FAS-210: Lid rejection / transfer station

The tenth station rejects the lids or inserts them in the work-piece if the lid provided by the previous station is of the required type.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

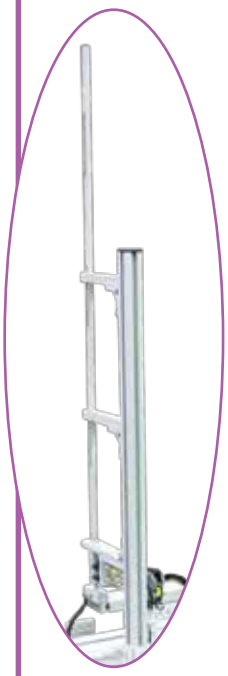
Breakdown simulation system

- SAI4210 FAS-210 with Siemens PLC
- SAI4227 FAS-210 with Omron PLC
- SAI4250 FAS-210 with Allen Bradley PLC
- SAI4310 FAS-210 without PLC

FAS-211: Screw dispensing station

This station feeds and transfers the screws to be assembled in the work-piece to the following station.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.



Gravity feeder

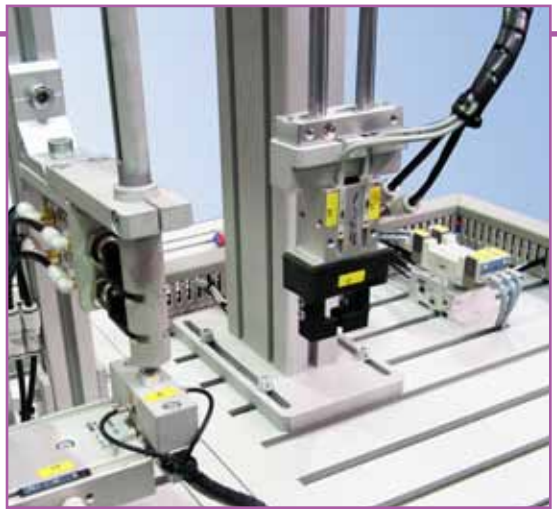
Breakdown simulation system

- SAI4211 FAS-211 with Siemens PLC
- SAI4228 FAS-211 with Omron PLC
- SAI4251 FAS-211 with Allen Bradley PLC
- SAI4311 FAS-211 without PLC

FAS-212: Screw insertion station

This station inserts the screws into the base of the work-piece. Given that screw feeding is carried out at only one point, an additional mechanism has been included in the transfer to carry out the successive rotations of the pallet.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.



Breakdown simulation system

- SAI4212 FAS-212 with Siemens PLC
- SAI4229 FAS-212 with Omron PLC
- SAI4252 FAS-212 with Allen Bradley PLC
- SAI4312 FAS-212 without PLC

FAS-213: Robotised screwing station

This station integrates robotics technology which is widely used in automated environments.

In this part of the process, an industrial robot fastens the four screws inserted into the product by the previous station.

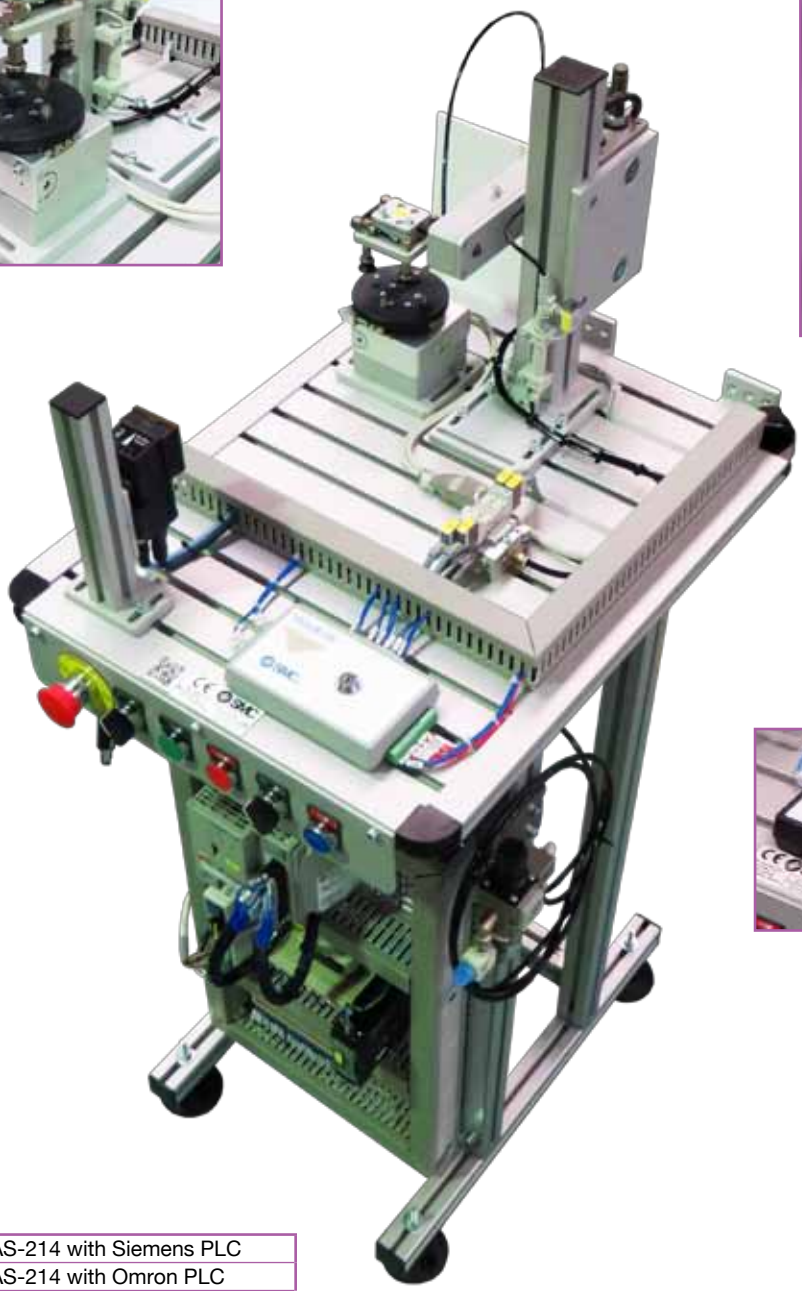
**Check available robot options.*

- SAI4213 FAS-213 with Siemens PLC
- SAI4231 FAS-213 with Omron PLC
- SAI4253 FAS-213 with Allen Bradley PLC
- SAI4313 FAS-213 without PLC

FAS-214: Transfer and visual inspection station

This station performs the quality control of the work-piece using an artificial vision system. From the inspection position, an artificial viewing system examines the assembled components.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.



Breakdown simulation system

- SAI4214 FAS-214 with Siemens PLC
- SAI4232 FAS-214 with Omron PLC
- SAI4254 FAS-214 with Allen Bradley PLC
- SAI4314 FAS-214 without PLC

FAS-215: Rejection station after visual inspection

This station rejects the work-piece if the inspection result is unsatisfactory.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

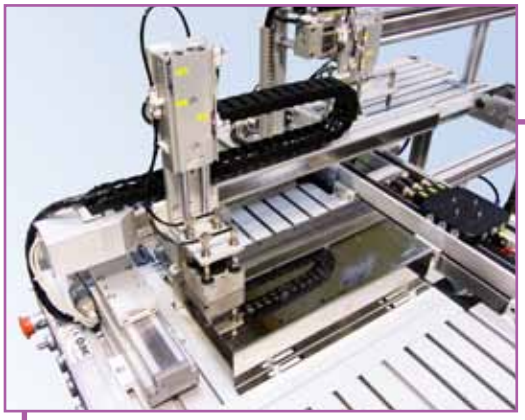
Breakdown simulation system

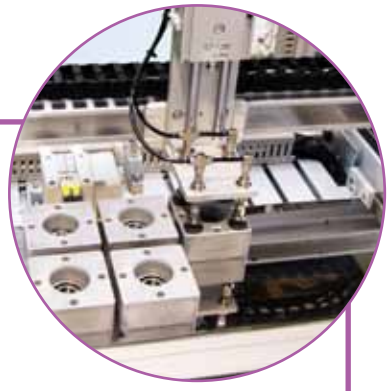
- SAI4215 FAS-215 with Siemens PLC
- SAI4233 FAS-215 with Omron PLC
- SAI4255 FAS-215 with Allen Bradley PLC
- SAI4315 FAS-215 without PLC

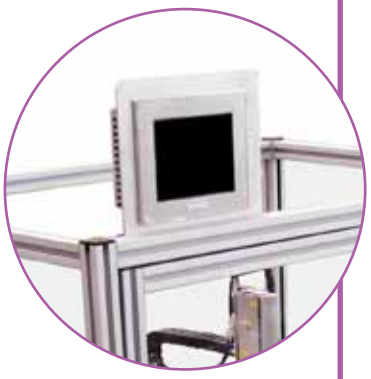
FAS-216: Storage station

This station stores the finished product.

The warehouse has been set up using a system based on three coordinate shafts, one of them servo-controlled.







Optional HMI screen SAI0811

- SAI4216 FAS-216 with Siemens PLC
- SAI4234 FAS-216 with Omron PLC
- SAI4256 FAS-216 with Allen Bradley PLC
- SAI4316 FAS-216 without PLC

FAS-220: Pallet transfer station

This station transfers the pallet with the work-piece from one transfer to another in a parallel configuration.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown simulation system

- SAI4220 FAS-220 with Siemens PLC
- SAI4235 FAS-220 with Omron PLC
- SAI4257 FAS-220 with Allen Bradley PLC
- SAI4317 FAS-220 without PLC

FAS-230: Linear transfer for 4 stations

The FAS-230 transports the pallet between the stations. Each transfer connects 4 stations.

• SAI4230 FAS-230 linear transfer for 4 stations

FAS-200 - With this system you could...

FAS-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES

SKILLS

	HYDRAULICS	ELECTRICAL PANEL	PNEUMATICS	VACUUM	ELECTRIC MOTORS	SENSORS	IDENTIFICATION SYSTEMS	ARTIFICIAL VISION	PROGRAMM. CONTROLLERS	MA
ANALYSIS	■	■	■	■	■	■	■	■	■	
TROUBLESHOOT	■	■	■	■		■			■	
DESIGNING	■	■	■	■	■	■	■	■	■	
TECH DOCUM. CREATION	■	■	■	■	■	■	■	■	■	
INSTALLATION AND ASSEMBLY		■							■	
TECH DOCUM. UNDERSTANDING	■	■	■	■	■	■	■	■	■	
OPERATION	■	■	■		■	■		■	■	
PROGRAMMING							■	■	■	
SETTING UP										

■ This shows how the FAS-200 is suitable to develop skills in the specific technology.

■ This shows that FAS-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

eLEARNING-200

Find out more about the theory behind the technologies developed in FAS-200 with our eLEARNING-200 courses.

ANIPULATORS	ROBOTICS	INDUSTRIAL COMMUNIC.	MOTION CONTROL	SCADA / HMI	AUTOMATED SYSTEMS

RELATED eLEARNING-200 COURSES

- Introduction to industrial automation (SMC-100)
- Principles of pneumatics (SMC-101)
- Introduction to electricity (SMC-102)
- DC electricity (SMC-103)
- Solid state (SMC-105)
- Introduction to wiring (SMC-106)
- Sensors technology (SMC-108)
- Programmable controllers (SMC-109)
- Hydraulics / electrohydraulics (SMC-111)
- Robotics (SMC-113)

**See eLEARNING-200 chapter for more information*

FAS-200 - Options

FAS -200 has a series of optional extras.

• Programming tools

The programming tools comprise the appropriate programming software, the industrial system communication programming software and cables for the chosen PLC.

*See Programming Tools chapter

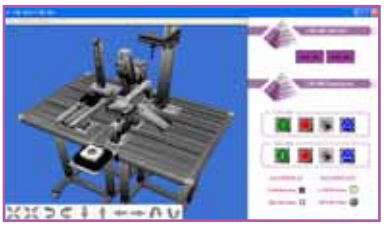
• SCADA: Supervisory Control and Data Acquisition

This is a standard-use software application in industry, making it easier to supervise and control processes from the computer screen.

• SAI4998	SCADA APPLICATION FAS-200

• FAS-200 application for autoSIM-200

We have a 3D application where users can simulate, supervise and control FAS-200 from an autoSIM environment.



• SAI2536	3D simulator for FAS-200, 1 licence
• SAI2537	3D simulator for FAS-200, 8 licences
• SAI2538	3D simulator for FAS-200, 16 licences

**autoSIM is required. See autoSIM-200 chapter*

FAS-200 - Configuration

Getting the right FAS-200 specification is as easy as:

• Steps to follow

1.- Choose the PLC.
2.- Select the required stations.
3.- Add any optional extras.

• Considerations

- Any station can operate independently and be purchased separately.
- The following stations must be ordered together in these configurations of 2 or more stations.
  - The FAS-201 and FAS-202 stations, feeding and transfer of the bases.
  - The FAS-203 and FAS-204 stations, feeding and measuring / transfer of the bearings.
  - The FAS-205 and FAS-206 stations, transfer and hydraulic pressing.
  - The FAS-207 and FAS-208 stations, classification and transfer of the shafts.
  - The FAS-209 and FAS-210 stations, classification and transfer of the lids.
  - The FAS-211 and FAS-212 stations, feeding and insertion of the screws.
  - The FAS-214 and FAS-215 stations, transfer and rejection after visual inspection.

- To work with the full system, it is necessary to include a FAS-230 transfer for every 4 stations.
- In order to work with the full system, we recommend:
  - The FAS-201 and FAS-202 stations, feeding and transfer of the bases.
  - FAS-216 storage station.

Some possible configurations

Configuration of 2 stations without transfer

Configuration of 4 stations with transfer

Configuration of 8 stations with transfer

Configuration of 10 stations with transfer

FAS-200 - Technical features

FAS-201
450x600x1310mm

Modules	Sensors (type & quantity)	Input / Output
Base feeder Position verification Movement to the point of transfer	Auto switch, Reed type (x4) Inductive (x1)	Digital 9/5
Other devices (quantity)	**Actuators (type & quantity)**	
Three-colour indication light (x1) Breakdown simulation system (x1)	Pneumatic linear (x3)	

FAS-202
450x600x1500mm

Modules	Sensors (type & quantity)	Input / Output
Incorrect base handling device Insertion of the base in the pallet	Auto switch, Reed type (x4) Vacuum pressure switch(x1)	Digital 9/7
Other devices (quantity)	**Actuators (type & quantity)**	
Vacuum pad(x4) - Vacuum ejector(x1) Breakdown simulation system (x1)	Pneumatic linear (x3)	

FAS-203
450x600x1320mm

Modules	Sensors (type & quantity)	Input / Output
Bearing feeder Transfer to the measuring station	Auto switch, Reed type (x4) Microswitch (x1)	Digital 9/7
Other devices (quantity)	**Actuators (type & quantity)**	
Three-colour indication light (x1) Breakdown simulation system (x1)	Pneumatic linear (x1) Pneumatic gripper (x1) Pneumatic rotary actuator (x1)	

FAS-204
450x600x1410mm

Modules	Sensors (type & quantity)	Input / Output
Height measurement Bearing insertion	Auto switch, Reed type (x6) Linear potentiometer (x1)	Digital 10/9 Analog 1/0
Other devices (quantity)	**Actuators (type & quantity)**	
Breakdown simulation system (x1)	Pneumatic linear (x4) Pneumatic gripper (x1) Pneumatic rotolinear (x1)	

FAS-205
450x600x1370mm

Modules	Sensors (type & quantity)	Input / Output
Pulling out set Bearing pressing	Auto switch, Reed type (x6) Security magnetic (x1)	Digital 10/5
Other devices (quantity)	**Actuators (type & quantity)**	
Breakdown simulation system (x1) Safety relay (x1) Hydraulic equipment (x1) Frequency converter (x1)	Pneumatic linear (x2) Hydraulic linear (x1)	

FAS-206
450x600x1210mm

Modules	Sensors (type & quantity)	Input / Output
Insertion/extraction of the product in process Feeding the hydraulic press	Auto switch, Reed type (x5) Vacuum pressure switch(x1)	Digital 10/5
Other devices (quantity)	Actuators (type & quantity)	
Vacuum pad (x4) - Vacuum ejector(x1) Breakdown simulation system (x1)	Pneumatic rotary actuator (x1) Pneumatic linear (x1)	

FAS-207
450x600x1800mm

Modules	Sensors (type & quantity)	Input / Output
Indexing plate Shaft feeder Shaft height measurement Detection of material	Auto switch, Reed type (x4) Inductive (x1) Capacitive (x1)	Digital 8/6
Other devices (quantity)	Actuators (type & quantity)	
Three-colour indication light (x1) Breakdown simulation system (x1)	Pneumatic linear (x7) Pneumatic rotary actuator (x1) Pneumatic gripper (x1)	

FAS-208
450x600x1310mm

Modules	Sensors (type & quantity)	Input / Output
Incorrect shaft rejection Shaft insertion	Auto switch, Reed type (x8) Vacuum pressure switch(x2)	Digital 14/10
Other devices (quantity)	Actuators (type & quantity)	
Vacuum pad (x2) - Vacuum ejector(x2) Breakdown simulation system (x1)	Pneumatic rotolinear (x1) Pneumatic linear (x3)	

FAS-209
450x600x1400mm

Modules	Sensors (type & quantity)	Input / Output
Indexing plate Lid feeder Indexing plate load Detection of material Lid height measurement	Auto switch, Reed type (x6) Inductive (x1) Microswitch (x1) Capacitive (x1) Photoelectric (x1) Linear encoder (x1)	Digital 10/7
Other devices (quantity)	Actuators (type & quantity)	
Breakdown simulation system (x1) Three-colour indication light (x1) Pressure regulator (x1)	Pneumatic linear (x5) Pneumatic rotolinear (x1) Pneumatic gripper (x1)	

FAS-200 - Technical features

	Modules	Sensors (type & quantity)	Input / Output
FAS-210 450x600x1310mm	Incorrect lid removal Lid insertion	Auto switch, Reed type (x7) Vacuum pressure switch(x1)	Digital 12/10
	Other devices (quantity)	Actuators (type & quantity)	
	Breakdown simulation system (x1) Vacuum pad(x3) -Vacuum ejector(x1)	Pneumatic linear (x3) Pneumatic rotolinear (x1) Pneumatic gripper (x1)	
FAS-211 450x600x1910mm	Modules	Sensors (type & quantity)	Input / Output
	Screw feeder Transfer handling device	Auto switch, Reed type (x2) Fibre optic photocell (x1)	Digital 7/5
	Other devices (quantity)	Actuators (type & quantity)	
	Breakdown simulation system (x1) Three-colour indication light (x1)	Pneumatic linear (x3)	
FAS-212 450x600x1550mm	Modules	Sensors (type & quantity)	Input / Output
	Screw insertion handling device	Auto switch, Reed type (x4) Solid state auto switch (x2)	Digital 10/5
	Other devices (quantity)	Actuators (type & quantity)	
	Breakdown simulation system (x1)	Pneumatic linear (x2) Pneumatic gripper (x1)	
FAS-213 450x760x1700mm	Modules	Sensors (type & quantity)	Input / Output
	Shafts and lids warehouse Robot tools Robot arm and controlling components		Digital 7/7
	Other devices (quantity)	Actuators (type & quantity)	
	Robot controlling unit (x1) Robot programming console (x1)	Electric screwing tool (x1) 6 axis robot (x1)	
FAS-214 450x600x1200mm	Modules	Sensors (type & quantity)	Input / Output
	Insertion/extraction handling device Rotary table Artificial vision industrial system	Auto switch, Reed type (x3) Vacuum pressure switch(x1) Artificial vision camera (x1)	Digital 13/13
	Other devices (quantity)	Actuators (type & quantity)	
	Vacuum pad(x4)-Vacuum ejector(x1) Servocontroller (x1) Vision processing unit (x1) Breakdown simulation system (x1) Vision system programming software and cable (x1)	Pneumatic rotary actuator (x1) Electric turntable (x1)	

FAS-215
450x600x1500mm

Modules	Sensors (type & quantity)	Input / Output
Faulty product removal	Auto switch, Reed type (x4) Vacuum pressure switch(x1)	Digital 9/6
Other devices (quantity)	Actuators (type & quantity)	
Vacuum pad(x4)-Vacuum ejector(x1) Breakdown simulation system (x1)	Pneumatic linear (x2)	

FAS-216
450x600x1800mm

Modules	Sensors (type & quantity)	Input / Output
Vertical axis Positioning axes	Auto switch, Reed type (x4) Digital vacuum pressure switch (x1)	Digital 13/12
Other devices (quantity)	Actuators (type & quantity)	
Vacuum pad(x4)-Vacuum ejector(x1) Servocontroller (x1) Driver programming software and cable (x1)	Pneumatic linear (x2) Servo-controlled linear actuators (x1)	

FAS-220
900x410x1310mm

Modules	Sensors (type & quantity)	Input / Output
Pallet transfer	Auto switch, Reed type (x4) Vacuum pressure switch(x1)	Digital 9/6
Other devices (quantity)	Actuators (type & quantity)	
Vacuum pad(x4)-Vacuum ejector(x1) Breakdown simulation system (x1)	Pneumatic linear (x2)	

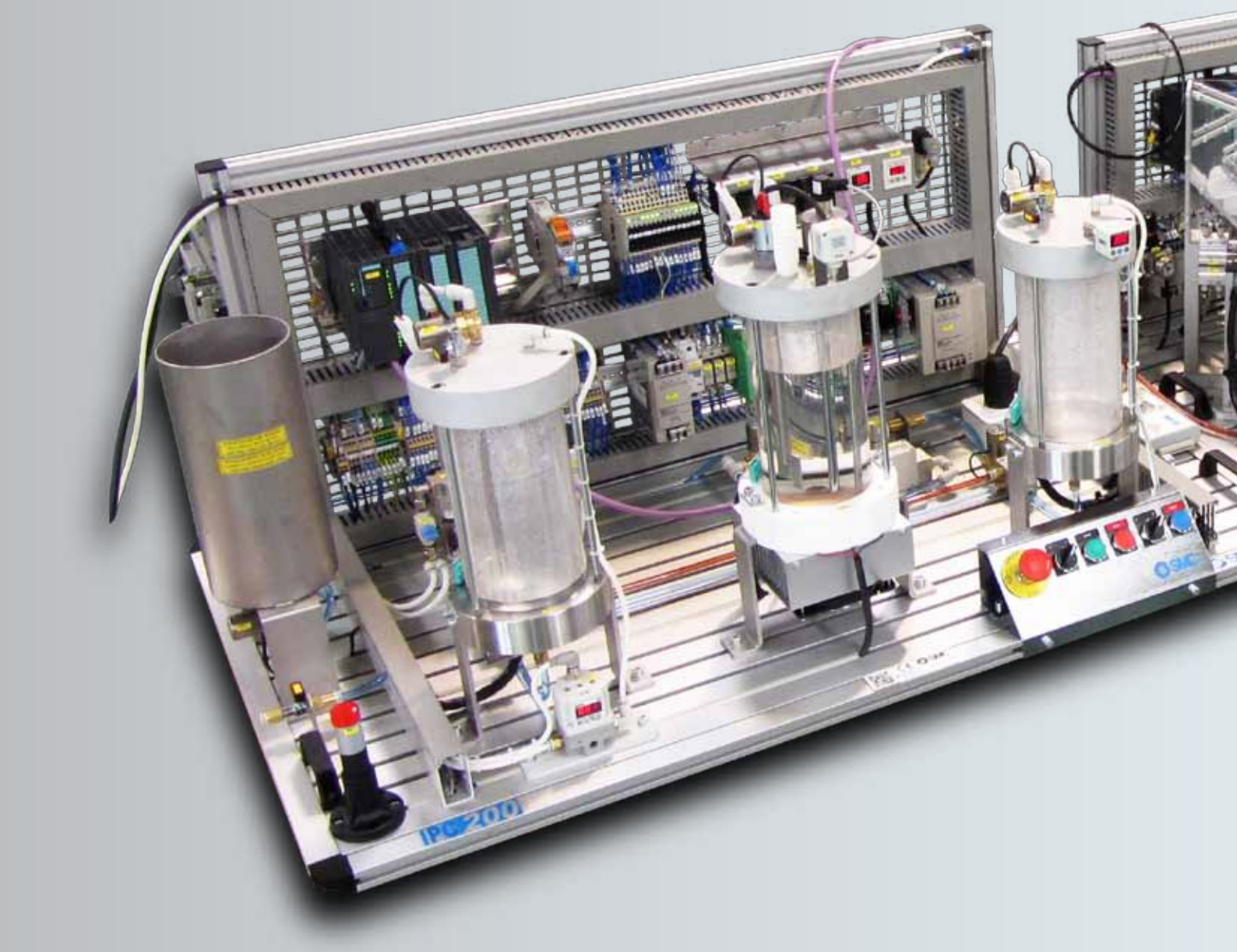
FAS-230
1800x320x940mm

Modules	Sensors (type & quantity)	Input / Output
Transfer	Inductive (x6) Microswitch (x2)	Digital 8/2
Other devices (quantity)	Actuators (type & quantity)	
	Pneumatic linear (x2) DC motor (x1)	

IPC-200

Industrial process control

A complete training system in the field of Industrial Process Control

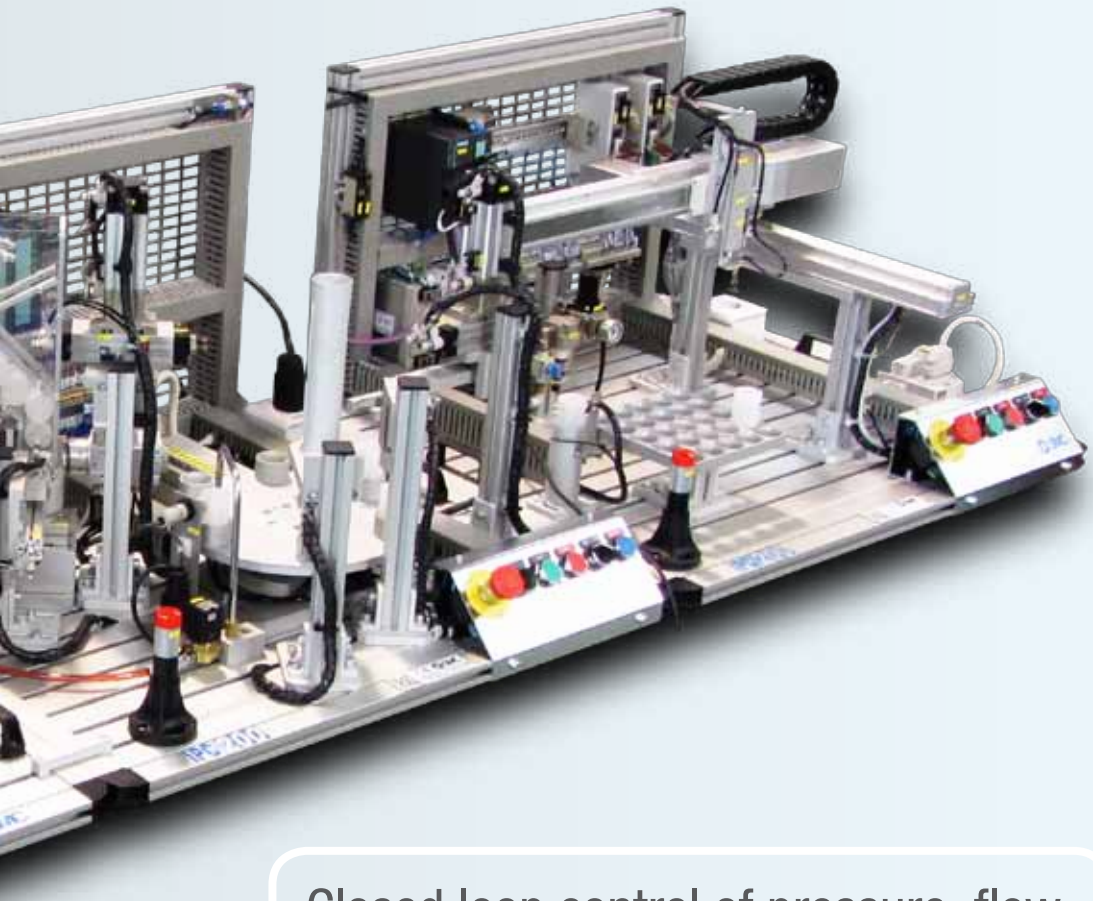


In the following TECHNOLOGIES...

- ELECTRICAL PANEL
- PNEUMATICS
- VACUUM
- ELECTRIC MOTORS
- SENSORS
- CONTINUOUS PROCESSES
- PROGRAMM. CONTROLLERS
- MANIPULATORS

SMC
INTERNATIONAL TRAINING

Develop the SKILLS...



ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

TECH DOCUM. UNDERSTANDING

OPERATION

PROGRAMMING

SETTING UP

Closed loop control of pressure, flow, temperature and level

Modular and flexible system built with industrial materials

INDUSTRIAL COMMUNIC.

MOTION CONTROL

SCADA / HMI

AUTOMATED SYSTEMS

IPC-200 - Industrial process control

Fully modular and flexible equipment, comprised of three modules which can work individually or as a complete process line. Various configurations can be created to adapt the IPC-200 equipment to our users different requirements and budgets.

IPC-200 emulates a liquid production and bottling plant and includes the technologies used in continuous process industry, such as pneumatics, electric motors, sensors, continuous processes, programmable controllers, industrial communications, etc.

The training system has been developed by an expert team of engineers and pedagogues to enhance professional skills.

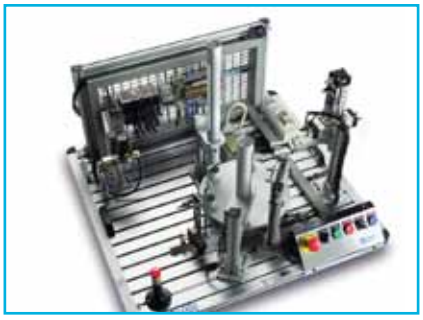
IPC-200 is built entirely from industrial materials so that student works with the same elements found in the working environment.

IPC-200 is composed of three stations each of which carries out one part of the process.

• IPC-201: Production station

The first station simulates the production phase by processing liquid. There are two versions: the first concentrates on digital control elements and the other is directed towards the regulation and control of analogue variables.

- Temperature
- Pressure
- Level
- Flow rate

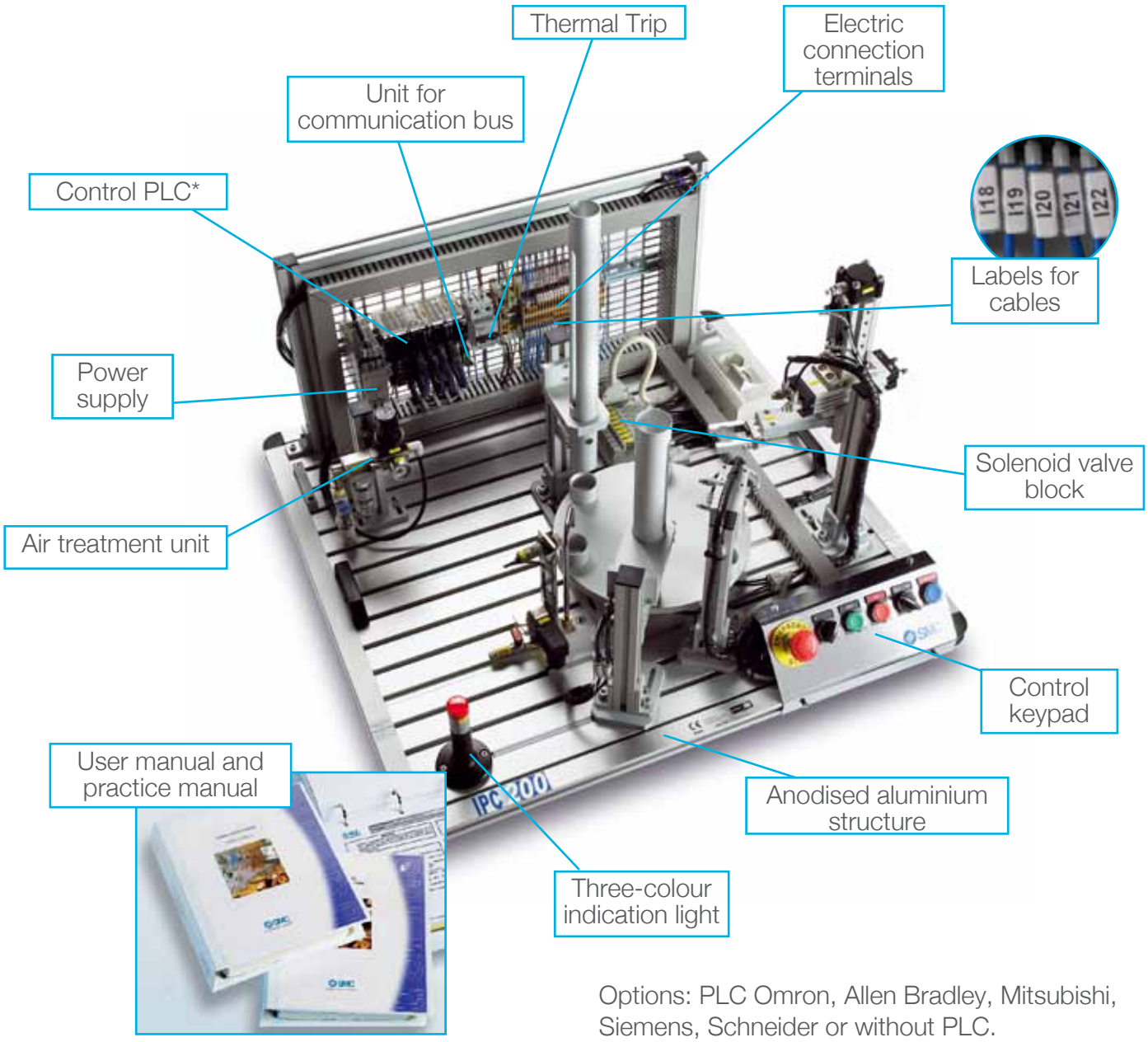


• IPC-202: Bottling station

The second station reproduces the liquid bottling phase. There are also two versions depending on the type of container feeder.

• IPC-203: Palletizing station
The third station stores the containers in a warehouse with 25 positions.

Common element in all stations



Options: PLC Omron, Allen Bradley, Mitsubishi, Siemens, Schneider or without PLC.

IPC-201 - Production station

This first station represents the production and mixing of the liquid. It has three tanks: two at the side which store the raw material (liquid) and another in the middle where the mixing takes place.

There are two versions of this station: one can control digital and the other analogue variables.

IPC-201 - Production station

•	SAI8001	IPC-201 Production station with Omron PLC
•	SAI8051	IPC-201 Production station with Allen-Bradley PLC
•	SAI8061	IPC-201 Production station with Mitsubishi PLC
•	SAI8111	IPC-201 Production station with Siemens PLC
•	SAI8200	IPC-201 Production station with Schneider PLC
•	SAI8041	IPC-201 Production station without PLC

IPC-201C - Production station for the regulation and control of analogue variables

This version of the production station incorporates a series of elements regulate and control TEMPERATURE, LEVEL, PRESSURE and FLOW RATE.

This equipment is specially designed for the development of professional skills required in continuous process industry (in sectors such as food, pharmaceutical, chemical, petroleum, etc.).

Breakdown simulation system

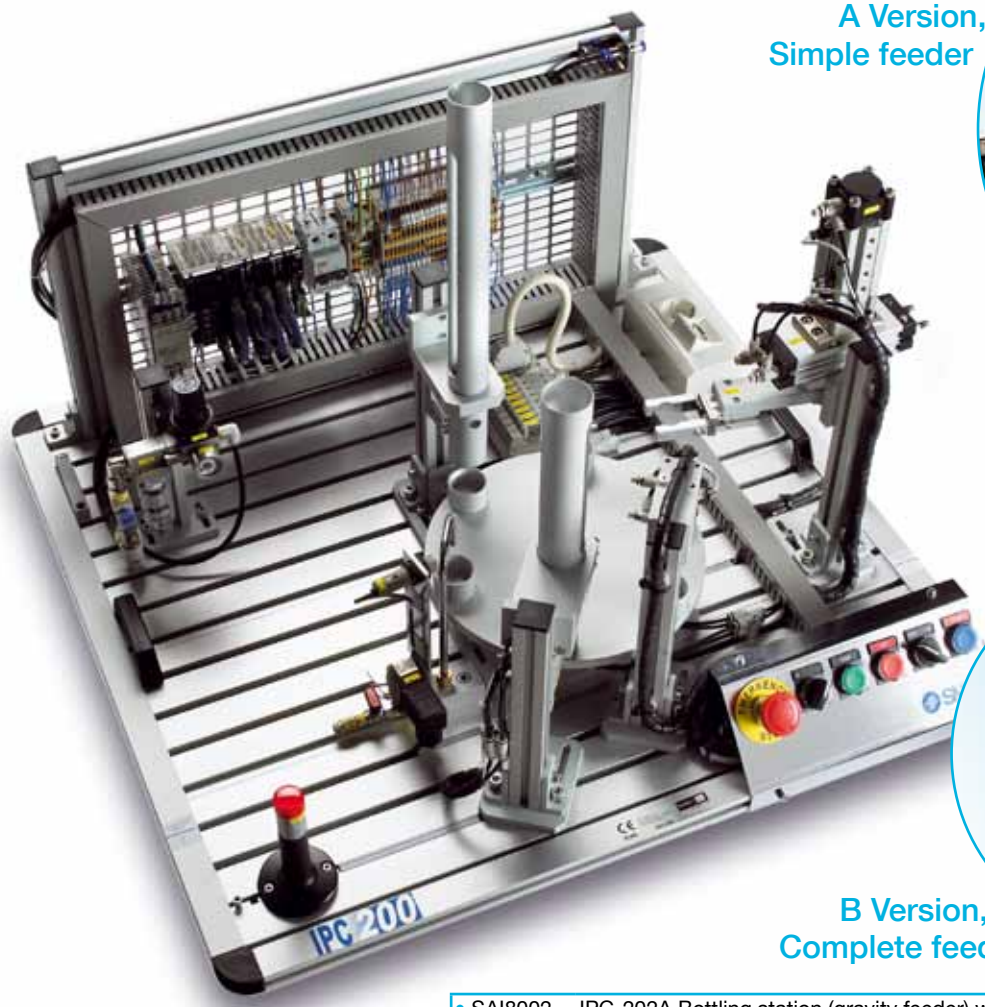
SCADA application included!

• SAI8005	IPC-201C Production station (analogue variables) with Omron PLC
• SAI8121	IPC-201C Production station (analogue variables) with Allen-Bradley PLC
• SAI8066	IPC-201C Production station (analogue variables) with Mitsubishi PLC
• SAI8020	IPC-201C Production station (analogue variables) with Siemens PLC
• SAI8201	IPC-201C Production station (analogue variables) with Schneider PLC
• SAI8031	IPC-201C Production station (analogue variables) without PLC

IPC-202 - Bottling station

The second IPC-200 station fills the bottles and feeds and positions lids. The bottles then move on to a third station for storage. All the operations carried out are distributed around a 6 positions index plate.

There are two versions of this station, depending on the bottle feeding module selected: a version with a gravity bottle feeder and another with a more complex feeder with position detection and automatic correction.



A Version,
Simple feeder

B Version,
Complete feeder

• SAI8002	IPC-202A Bottling station (gravity feeder) with Omron PLC
• SAI8052	IPC-202A Bottling station (gravity feeder) with Allen-Bradley PLC
• SAI8062	IPC-202A Bottling station (gravity feeder) with Mitsubishi PLC
• SAI8092	IPC-202A Bottling station (gravity feeder) with Siemens PLC
• SAI8202	IPC-202A Bottling station (gravity feeder) with Schneider PLC
• SAI8046	IPC-202A Bottling station (gravity feeder) without PLC

• SAI8003	IPC-202B Bottling station (complete feeder) with Omron PLC
• SAI8053	IPC-202B Bottling station (complete feeder) with Allen-Bradley PLC
• SAI8063	IPC-202B Bottling station (complete feeder) with Mitsubishi PLC
• SAI8113	IPC-202B Bottling station (complete feeder) with Siemens PLC
• SAI8203	IPC-202B Bottling station (complete feeder) with Schneider PLC
• SAI8042	IPC-202B Bottling station (complete feeder) without PLC

IPC-203 - Palletizing station

This station reproduces a 25 positions automatic warehouse by using a system based on three cartesian coordinate (two horizontal electric axes and one vertical pneumatic axis).

• SAI8004	IPC-203 Palletizing station with Omron PLC
• SAI8054	IPC-203 Palletizing station with Allen-Bradley PLC
• SAI8064	IPC-203 Palletizing station with Mitsubishi PLC
• SAI8094	IPC-203 Palletizing station with Siemens PLC
• SAI8204	IPC-203 Palletizing station with Telemechanique PLC
• SAI8043	IPC-203 Palletizing station without PLC

IPC-200 - With this system you could...

IPC-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES

SKILLS	ELECTRICAL PANEL	PNEUMATICS	VACUUM	ELECTRIC MOTORS	SENSORS	CONTINUOUS PROCESSES	PROGRAMM. CONTROLLERS	MANIPULATORS
ANALYSIS	■	■	■	■	■	●	■	■
TROUBLESHOOT.	■	■	■		■	●	■	■
DESIGNING	■	■	■	■	■	●	■	■
TECH DOCUM. CREATION	■	■	■	■	■	●	■	■
TECH DOCUM. UNDERSTANDING	■	■	■	■	■	●	■	■
OPERATION	■	■		■	■	●	■	■
PROGRAMMING						●	■	
SETTING UP								

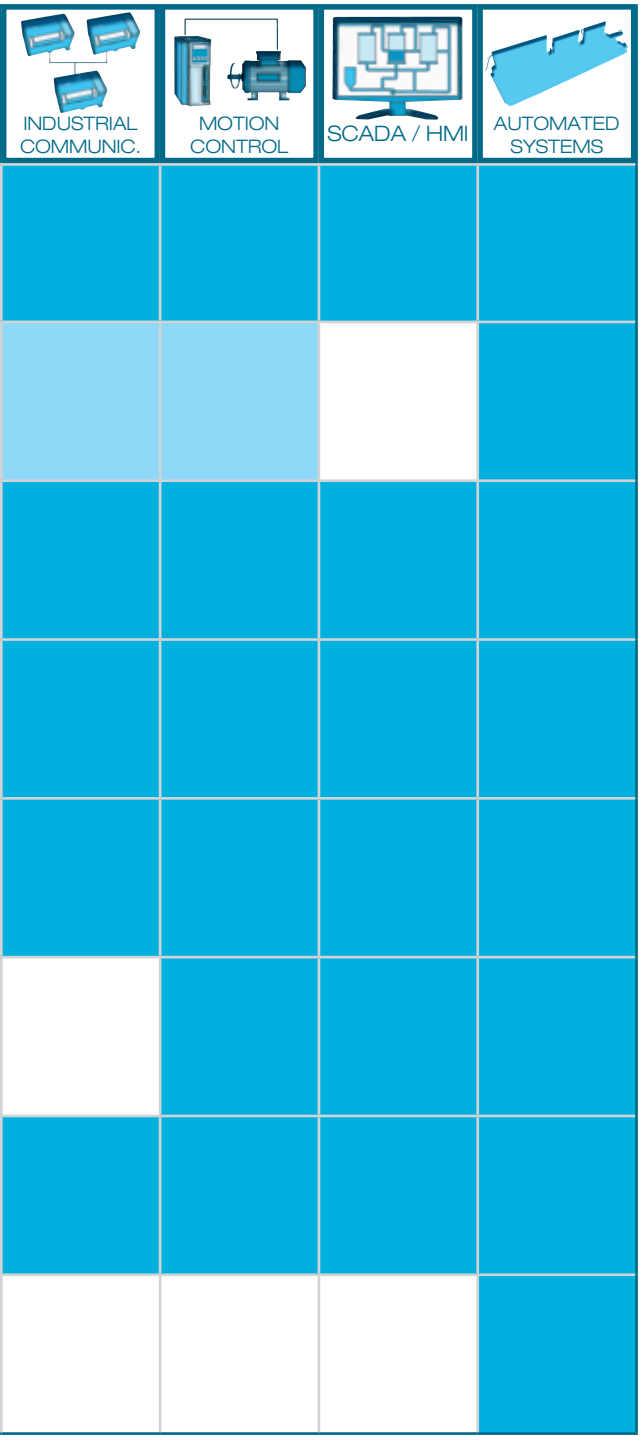
■ This shows how the IPC-200 is suitable to develop skills in the specific technology.

■ This shows that IPC-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

● Developing skills in technology applicable to IPC-201C.

eLEARNING-200

Find out more about the theory behind the technologies developed in IPC-200 with our eLEARNING-200 courses.



RELATED eLEARNING-200 COURSES

- Introduction to industrial automation (SMC-100)
- Principles of pneumatics (SMC-101)
- Introduction to electricity (SMC-102)
- DC electricity (SMC-103)
- Solid state (SMC-105)
- Introduction to wiring (SMC-106)
- Introduction to electric motors (SMC-107)
- Sensors technology (SMC-108)
- Programmable controllers (SMC-109)
- Process controls (SMC-110)

**See eLEARNING-200 chapter for more information*

IPC-200 - Options

IPC-200 has a series of optional extras.

• Support legs

Makes the system self-standing without needing a worktop or bench.

• SAI8904	IPC-201C LEGS KIT
• SAI8905	IPC-201 / 202 / 203 LEGS KIT

• Programming tools

The programming tools comprise the appropriate programming software, the industrial system communication programming software and cables for the chosen PLC.

*See Programming Tools chapter

• SCADA: Supervisory Control and Data Acquisition

This is a standard-use software application in industry, making it easier to supervise and control processes from the computer screen.

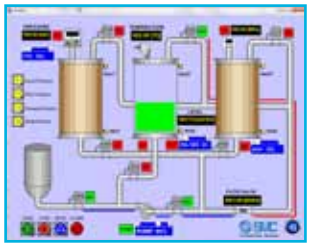
• SAI8006	SCADA application IPC-200

• IPC-200 application for autoSIM-200

We have a 3D application where users can simulate, supervise and control IPC-201C from an autoSIM environment.

• SAI2533	3D simulator for IPC-200, 1 license
• SAI2534	3D simulator for IPC-200, 8 licenses
• SAI2535	3D simulator for IPC-200, 16 licenses

**autoSIM is required. See autoSIM-200 chapter*



IPC-200 - Configuration

Getting the right IPC-200 specification is as easy as:

• Steps to follow

1.- Choose the PLC.

2.- Select the required stations.

3.- Add any optional extras.

• Considerations

- Any station can operate independently and be purchased separately.

- To work with the full system, you need either option for the IPC-202 station (A or B).

IPC-200 - Technical features

IPC-201
800x762x550mm

Modules	Sensors (type & quantity)	Input / Output
Left side tank module Middle tank module Right side tank module	Capacitive (x6) Pressure switch (x3) Pressure transducer (x1)	Digital 14/8
Other devices (quantity)	**Actuators (type & quantity)**	
Display (x1) Manual valve (x2)	DC motor (x1) Fluid solenoid valve (x3)	

IPC-201C
1200x762x600mm

Modules	Sensors (type & quantity)	Input / Output
Auxiliary tank module Left side tank module Middle tank module Right side tank module	Capacitive (x6) PT100 temperature probe (x1) Flow switch (X1) Differential pressure (x1) Pressure transducer (x1)*	Digital 16/16 Analog 5/4
Other devices (quantity)	**Actuators (type & quantity)**	
PID controller (x3) PWM regulator (x2) Signal conditioning (x1) Displays (x3) Manual valve (x4) Breakdown simulation system(x1)	DC pump (x1) Peltier valves (x2) DC motor (x1) Proportional valve (x1) Fluid solenoid valve (x7) Pressure transducer (x1)*	

* Included in electro-pneumatic pressure regulator

IPC-202
(OpcA) 800x760x615
(OpcB) 800x760x550

Modules	Sensors (type & quantity)	Input / Output
Bottle feeder - 202A - Simple - 202B - Complete Insertion on revolving plate Dividing plate Bottle filling Lid feeder Lid pressing Extraction from the index plate	Auto switch, Reed type (OptA x11/ OptB x16) 3 wires auto switch (x2) Photoelectric (x1)	(opc A) Digital 15/10 (opc B) Digital 24/16
Other devices (quantity)	**Actuators (type & quantity)**	
Manual valve (x1) Breakdown simulation system (optional)	Pneumatic linear (OpcA x5/OpcB x9) Pneumatic rotolinear (x2) Pneumatic rotary actuator (OptA x0/OptB x1) Pneumatic gripper (OptA x3/OptB x4)	

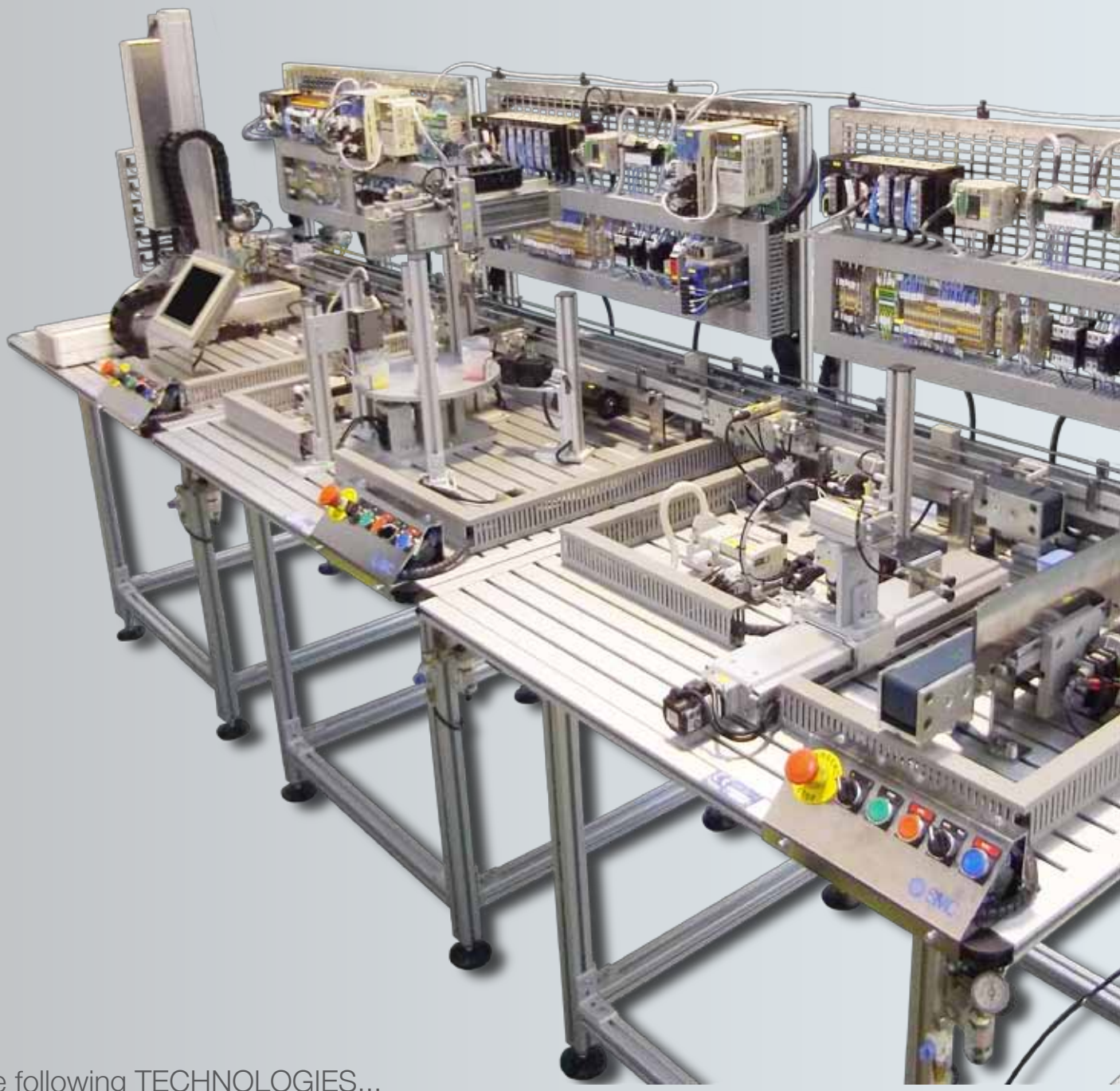
IPC-203
800x762x495mm

Modules	Sensors (type & quantity)	Input / Output
Waiting position Vertical shaft Linear electric shaft	Fibre optic (x2) Vacuum pressure switch (x1) Auto switch, Reed type (x2)	Digital 16/15
Other devices (quantity)	**Actuators (type & quantity)**	
Positioning drivers (x2) Vacuum pad (x1) - Vacuum ejector (x1)	Pneumatic linear (x1) Electrical linear (x2) Servomotor (x2)	

ITS-200

Innovative Training System

Develop your skills with the most cutting-edge industrial technology in sensors and servo-drives



In the following TECHNOLOGIES...

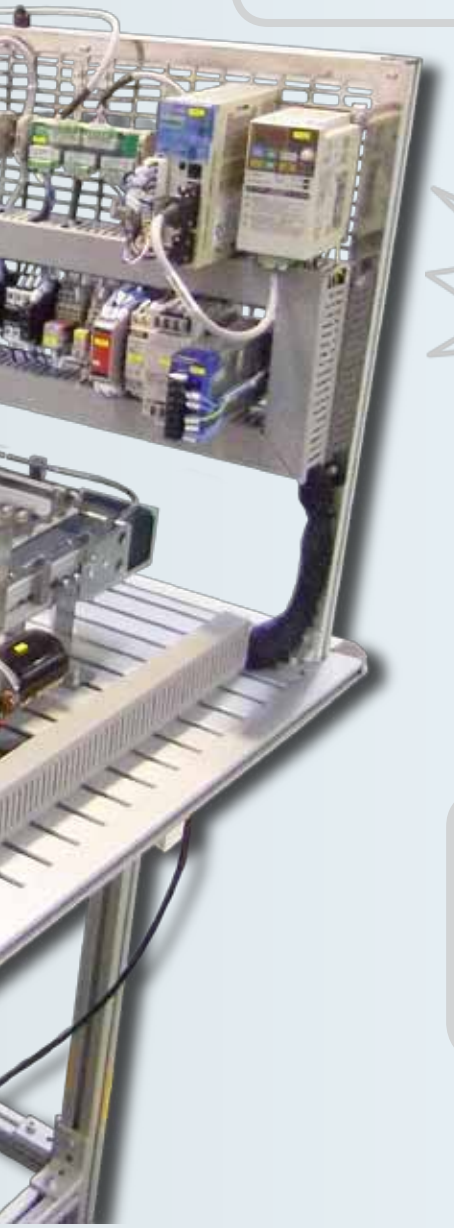
ELECTRICAL PANEL | PNEUMATICS | VACUUM | ELECTRIC MOTORS | SENSORS | IDENTIFICATION SYSTEMS | ARTIFICIAL VISION | PROGRAMM. CONTROLLERS

SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

Drives
- DC
- AC with Inverter Control
- Servomotors

Sensors
- Artificial vision
- Laser
- Colour
- Fiber Optic



RFID

Continuous operating mode, without having to add raw materials

ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

TECH DOCUM. UNDERSTANDING

OPERATION

PROGRAMMING

SETTING UP

MANIPULATORS

INDUSTRIAL COMMUNIC.

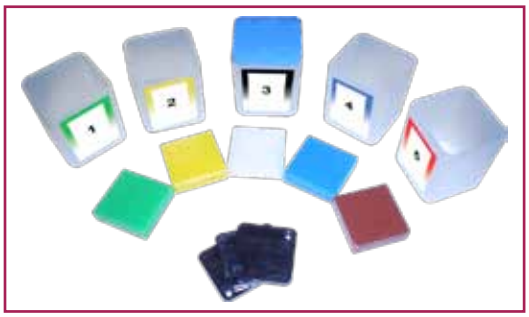
MOTION CONTROL

SCADA / HMI

AUTOMATED SYSTEMS

ITS-200 - Innovative Training System

The ITS-200 system provides professional training in industrial automation, more specifically in the field of state-of-the-art servo drive and sensor systems.



The product is taken from storage, transported from one station to another and returned to store indefinitely. The system can therefore operate continuously without needing to add more raw material. This allows it to be controlled from a distance for remote management and remote maintenance work.

All of the components used in the system are industrial. Each station includes its own PLC. The stations can be easily extracted from the system so that work can be carried out autonomously. Quick release connections are included in the electrical cables and pneumatic pipes.

ITS-200 is composed of three stations each of which carries out one part of the process.

- ITS 201: Automatic warehouse

The station extracts products from the warehouse and transfers them to the conveyor belt or vice versa.

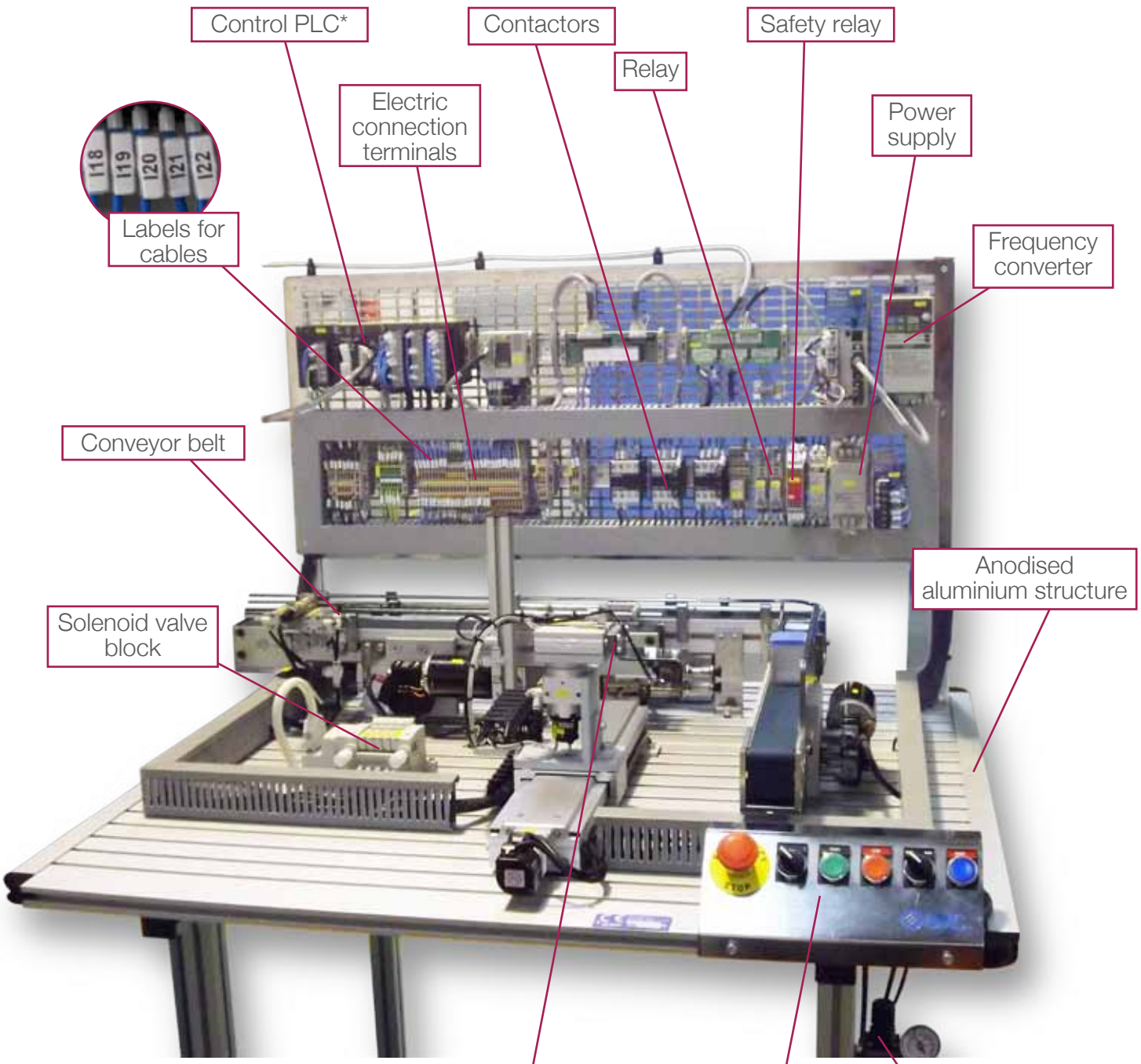
- ITS 202: Inspection

The second station inspects the different workpieces. The results of this inspection are transferred to the RFID memory inside each product.

- ITS 203: Classification and delivering

The third and last station classifies the different products and dispatches them depending on the data stored in the RFID memory.

Common element in all stations



User manual and practice manual

*Options: PLC Omron, Allen Bradley or Siemens.

ITS-201 - Automatic warehouse

The first station represents an automatic warehouse where the containers are stored and picked up. Material movement is selected by a HMI (Human-Machine Interface). Using the HMI terminal, it is also possible to view the material classified in the ITS-203 station and change the speed of any return belt, via the network connection.

The part is a moulded-plastic container which includes a number code and an identifying colour. Inside is an RFID tag and coloured nylon blocks. A blue lid may also be fitted.

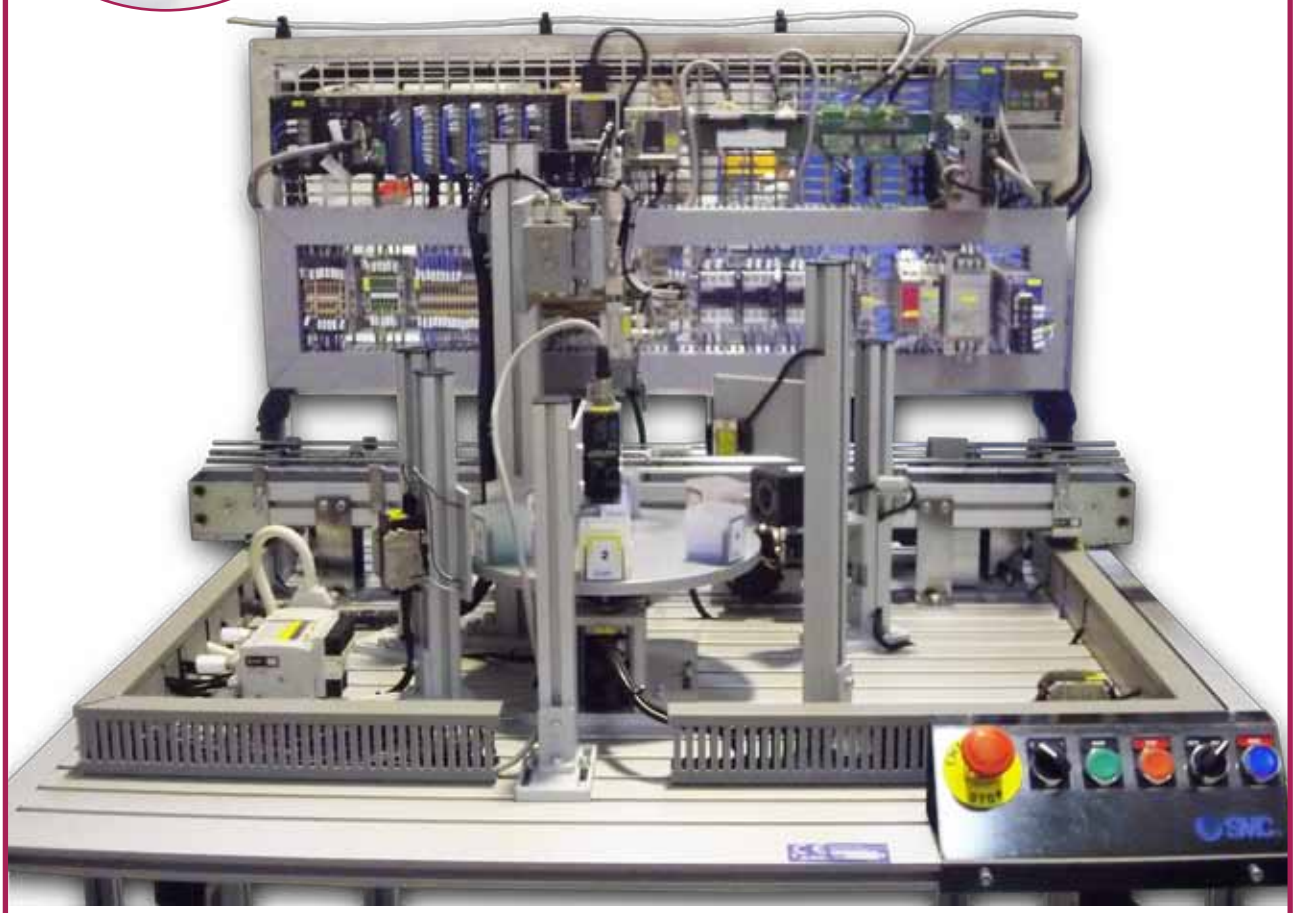
HMI screen

• SAI3110	ITS-201 with Allen Bradley PLC
• SAI3120	ITS-201 with Siemens PLC
• SAI3130	ITS-201 with Omron PLC

ITS 202: Inspection

The second station inspects the contents of the different products: if the jar has a lid or not, the material colour, the product height and the label's numerical code.

The results of this inspection are transferred to the RFID memory inside each product being.



- SAI3210 ITS-202 with Allen Bradley PLC
- SAI3220 ITS-202 with Siemens PLC
- SAI3230 ITS-202 with Omron PLC

ITS 203: Classification and delivering

The third station represents an automated delivery system where the containers are classified into 5 different positions or they are rejected.

The station classifies the different products and dispatches them according to the data stored in the RF memory.

• SAI3310	ITS-203 with Allen Bradley PLC
• SAI3320	ITS-203 with Siemens PLC
• SAI3330	ITS-203 with Omron PLC

ITS-200 - Options

ITS -200 has a series of optional extras.

• Programming tools

The programming tools comprise the appropriate programming software, the industrial system communication programming software and cables for the chosen PLC.

*See Programming Tools chapter

ITS-200 - Configuration

Getting the right ITS-200 specification is as easy as:

• Steps to follow

1.- Choose the PLC.

2.- Select the required stations.

3.- Add any optional extras.

• Considerations

- Any station can operate independently and be purchased separately.

- In order to work with the full system, you will need the ITS-202 station.

ITS-200 - Technical features

ITS-201 **940x1060x1645mm**	Modules	Sensors (type & quantity)	Input / Output
	Loading/Unloading Cylinder Positioning shafts Conveyor belts	Auto switch, Reed type (x7) Vacuum pressure switch (x1) Photocells (x21)	Digital 42/22
	Other devices (quantity)	Actuators (type & quantity)	
	Vacuum pad (x2) - Vacuum ejector (x1) Servo-controller (x2)	Pneumatic linear (x5) Servo-controlled linear actuators (x2) Pneumatic rotary actuator (x1) DC motor (x1) AC motor (x1)	
ITS-202 **940x1060x1520mm**	Modules	Sensors (type & quantity)	Input / Output
	Index plate Two-shaft handling device Material checking positions Conveyor belts	Auto switch, Reed type (x5) Solid state auto switch (x2) Fiber optic photocell (x1) Chromatic phtocell (x1) Laser (x1) Artificial vision camera (x1) Photocell (x1) RF reading/writing aerial (x1)	Digital 35/33 Analog 1/0
	Other devices (quantity)	Actuators (type & quantity)	
	Servo-controller (x1) Vision processor unit (x1) RF identification system (x1)	Pneumatic linear (x6) Servo-controlled turning actuator (x1) Pneumatic gripper (x1) DC motor (x1) AC motor (x1)	
ITS-203 **940x1060x1520mm**	Modules	Sensors (type & quantity)	Input / Output
	Rejection of material Electro-pneumatic handling device Conveyor belts	Auto switch, Reed type (x5) Vacuum pressure switch (x1) RF reading/writing aerial (x1) Photocell (x1)	Digital 16/16
	Other devices (quantity)	Actuators (type & quantity)	
	Vacuum pad (x2) - Vacuum ejector (x1) Servo-controller (x1) RF identification system (x1)	Pneumatic linear (x4) Servo-controlled linear actuator (x1) DC motor (x2) Pneumatic rotary actuator (x1) AC motor (x1)	

ITS-200 - With this system you could...

ITS-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES

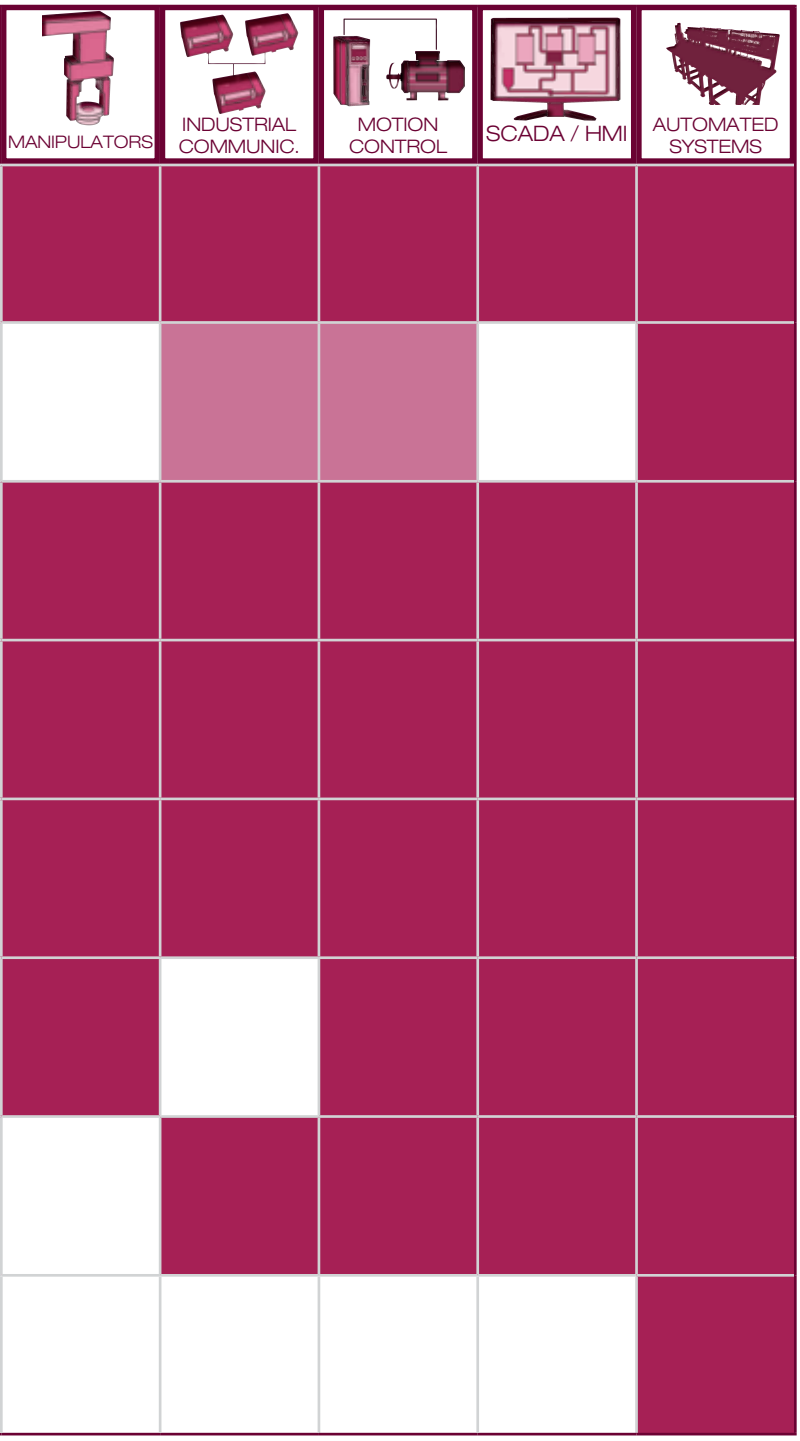
SKILLS	ELECTRICAL PANEL	PNEUMATICS	VACUUM	ELECTRIC MOTORS	SENSORS	IDENTIFICATION SYSTEMS	ARTIFICIAL VISION	PROGRAMM. CONTROLLERS
ANALYSIS	■	■	■	■	■	■	■	■
TROUBLESHOOT.								■
DESIGNING	■	■	■	■	■	■	■	■
TECH DOCUM. CREATION	■	■	■	■	■	■	■	■
TECH DOCUM. UNDERSTANDING	■	■	■	■	■	■	■	■
OPERATION	■	■		■	■	■	■	■
PROGRAMMING						■	■	■
SETTING UP								

■ This shows how the ITS-200 is suitable to develop skills in the specific technology.

■ This shows that ITS-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

eLEARNING-200

Find out more about the theory behind the technologies developed in ITS-200 with our eLEARNING-200 courses.



RELATED eLEARNING-200 COURSES
Introduction to industrial automation (SMC-100)
Principles of pneumatics (SMC-101)
Introduction to electricity (SMC-102)
DC electricity (SMC-103)
Solid state (SMC-105)
Introduction to wiring (SMC-106)
Introduction to electric motors (SMC-107)
Sensors technology (SMC-108)
Programmable controllers (SMC-109)

**See eLEARNING-200 chapter for more information*

FMS-200

Flexible integrated assembly systems

Integrated training in industrial automation

In the following TECHNOLOGIES...

SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

INSTALLATION AND ASSEMBLY

TECH DOCUM. UNDERSTANDING

OPERATION

PROGRAMMING

SETTING UP

A fully modular and flexible system, made of industrial components

PROGRAMM. CONTROLLERS

MANIPULATORS

ROBOTICS

INDUSTRIAL COMMUNIC.

MOTION CONTROL

SCADA / HMI

AUTOMATED SYSTEMS

FMS-200 - Flexible integrated assembling systems

The modular features of this flexible automation cell enables the introduction of variations in its stations so that they adapt to the different requirements of companies and training centers. From a simple configuration of one station only (working fully autonomously) to a complex configuration with eight or ten stations, the possibilities are endless.

In addition, it facilitates a staggered investment, i.e. starting with an initial simple configuration which can be easily enhanced by adding workstations.

All the components in the FMS-200 are used in industry, so that the user can work with real elements at all times making the learning process more meaningful.

The system includes a whole series of feeding, handling, verification and loading operations etc. carried out using components from different technologies (pneumatics, hydraulics, sensors, robotics, communications, control and HMI.).

FMS-200 includes the breakdown simulation system which generates up to 16 different breakdowns to be diagnosed by the user.

The different process stations assemble a turning mechanism. To provide the system with greater flexibility, stations adapt to a wide variety of assemblies, introducing variations in the materials, colours and part sizes. The combination of all these possibilities means that a total of 24 different assemblies can be obtained enabling the use of production management strategies.

The control panel is completely modular and can be rapidly disassembled so the user can design and integrate a new control.

Each station of FMS-200 carries out one part of the process.

• FMS-201: Body supply

In this station, the base which acts as the support to the assembled product is fed.

• FMS-202: Bearing selection/ supply

In this station, the bearing is assembled in the base housing. Bearings with different heights can be selected.

• FMS-203: Hydraulic press

This phase of the press fits bearing inserted in the previous station using a hydraulic ram.

• FMS-204: Shaft selection/ supply

The shaft is inserted into the product. There are two types of shafts manufactured from different materials: aluminium and nylon.

• FMS-205: Cover selection/ supply

This station inserts a lid on the set of parts. There are 6 different types of lids: depending on material, colour and height.

• FMS-206: Screws supply

This station inserts four screws in the base of the workpiece.

• FMS-207: Robotized screwing

The seventh FMS-200 station integrates robotics technology. The robot screws in the four screws inserted in the product by the previous station. In addition, shaft and lid assembly exchange operations can be carried out.

• FMS-208: Automatic warehouse

This station stores the finished products.

• FMS-209: Paint drying in oven

During this phase of the assembly a paint drying process is simulated using a polycarbonate oven.

• FMS-210: Quality control using artificial vision

The incorporation of this station in the FMS-200 family represents the integration of the quality control technology via artificial vision. The workpiece is transferred to the inspection position in which an artificial vision camera examines it against a known good part. Size, shape, missing holes can all be verified.

The transfer system:

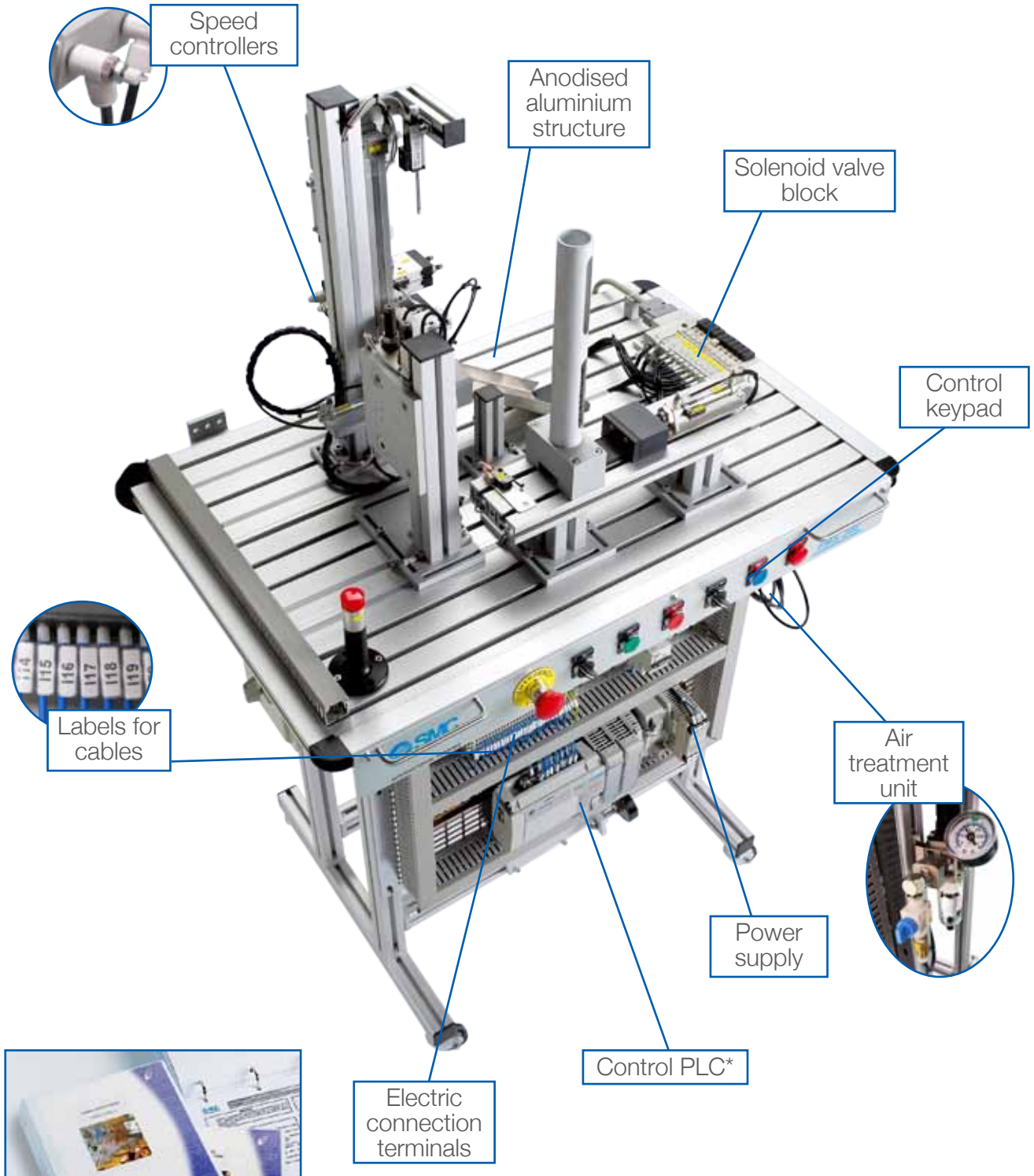
• Linear transfer

This is a rectangular transfer system through on which pallets containing the workpiece circulate around the stations.

• Modular transfer

In this FMS-200 version, each of the stations includes an individual transfer section. Multiple combinations of layouts can be developed, with the option of joining stations at 90º or 180º (section in curve, straight section).

Common element in all stations

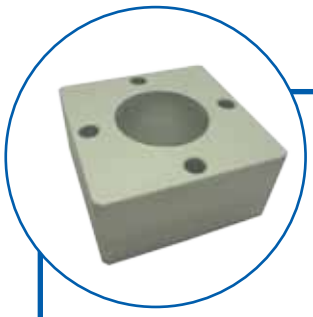


*Options: PLC Siemens, Omron, Mitsubishi, Allen Bradley, Schneider, or without PLC.

FMS-201 - Body supply

In this station, the base which acts as the support to the workpiece is fed, its orientation is verified and, if correct it is moved to the pallet located in the transfer system. If the base orientation is incorrect the base will be rejected.

The troubleshooting simulation system is included, which generates up to 16 different breakdowns to be diagnosed by the user.



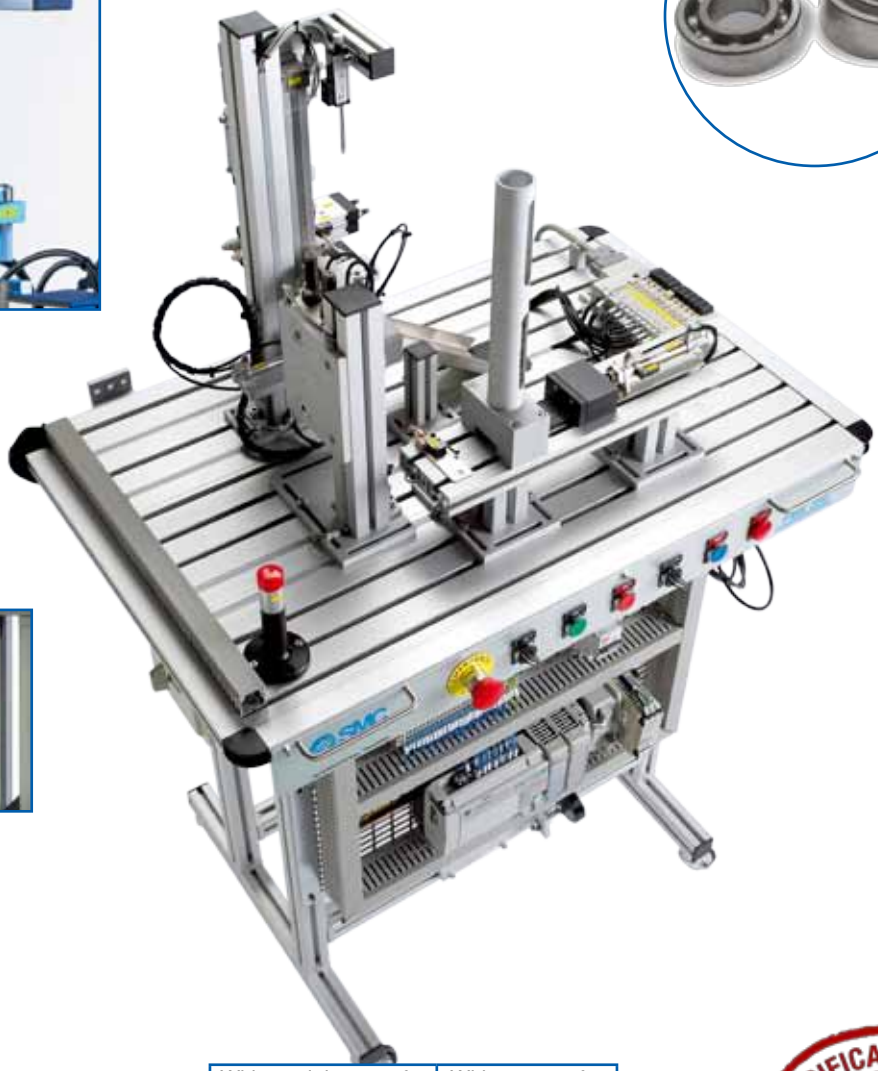
Breakdown simulation system

	With modular transfer	Without transfer
FMS-201 Body supply with Mitsubishi PLC	SAI0135	SAI0100
FMS-201 Body supply with Siemens PLC	SAI0163	SAI0114
FMS-201 Body supply with Allen Bradley PLC	SAI0133	SAI0120
FMS-201 Body supply with Omron PLC	SAI0149	SAI0124
FMS-201 Body supply with Schneider PLC	SAI0153	SAI0123
FMS-201 Body supply without PLC	SAI0170	SAI0122

FMS-202 - Bearing selection/ supply

In this station, the bearing is positioned in the base housing. To extend didactic options, bearings with different heights can be selected. To do this, a bearing height measurement is taken using a linear potentiometer. If the bearing height is not correct, it will be rejected.

The troubleshooting simulation system is included, which generates up to 16 different breakdowns to be diagnosed by the user.



Breakdown simulation system

	With modular transfer	Without transfer
FMS-202 Bearing supply with Mitsubishi PLC	SAI0235	SAI0200
FMS-202 Bearing supply with Siemens PLC	SAI0263	SAI0214
FMS-202 Bearing supply with Allen Bradley PLC	SAI0233	SAI0220
FMS-202 Bearing supply with Omron PLC	SAI0264	SAI0224
FMS-202 Bearing supply with Schneider PLC	SAI0265	SAI0229
FMS-202 Bearing supply without PLC	SAI0270	SAI0222

FMS-203 - Hydraulic press

This phase of the process presses the bearing inserted in the previous station by a hydraulic ram. Press fitting is simulated to facilitate the subsequent disassembly of the components and their re-use. Nevertheless, all the elements comprising the module are completely industrial.

The lower part of the station contains all of the hydraulic equipment which is required to feed the press cylinder with high pressure oil.

The troubleshooting simulation system is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown simulation system

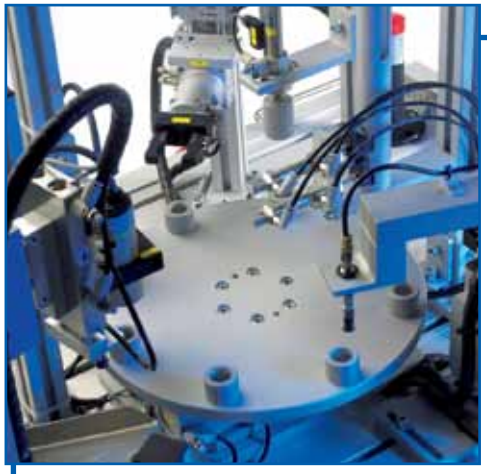
	With modular transfer	Without transfer
FMS-203 Hydraulic press with Mitsubishi PLC	SAI0335	SAI0300
FMS-203 Hydraulic press with Siemens PLC	SAI0363	SAI0314
FMS-203 Hydraulic press with Allen Bradley PLC	SAI0333	SAI0320
FMS-203 Hydraulic press with Omron PLC	SAI0364	SAI0324
FMS-203 Hydraulic press with Schneider PLC	SAI0365	SAI0323
FMS-203 Hydraulic press without PLC	SAI0370	SAI0322

FMS-204 - Shaft selection/ supply

In this fourth workstation, the shaft is assembled onto the workpiece coming from the previous station. There are two types of shafts depending on their material: aluminium and nylon. This increases the number of possible finished products, while also increasing the didactic capacities of the FMS-200.

The different operations undertaken in this station are distributed around an index plate. The operations are: shaft feeding, measuring shaft height, positioning the shaft in the correct orientation, material detection, removal of an incorrect shaft and finally the insertion of the shaft into the assembly.

The troubleshooting simulation system is included, which generates up to 16 different breakdowns to be diagnosed by the user.



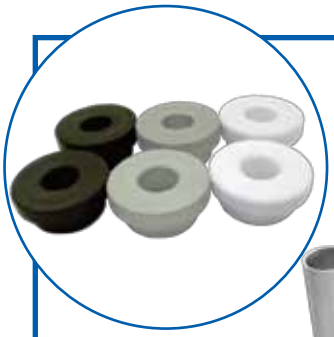
Breakdown
simulation system

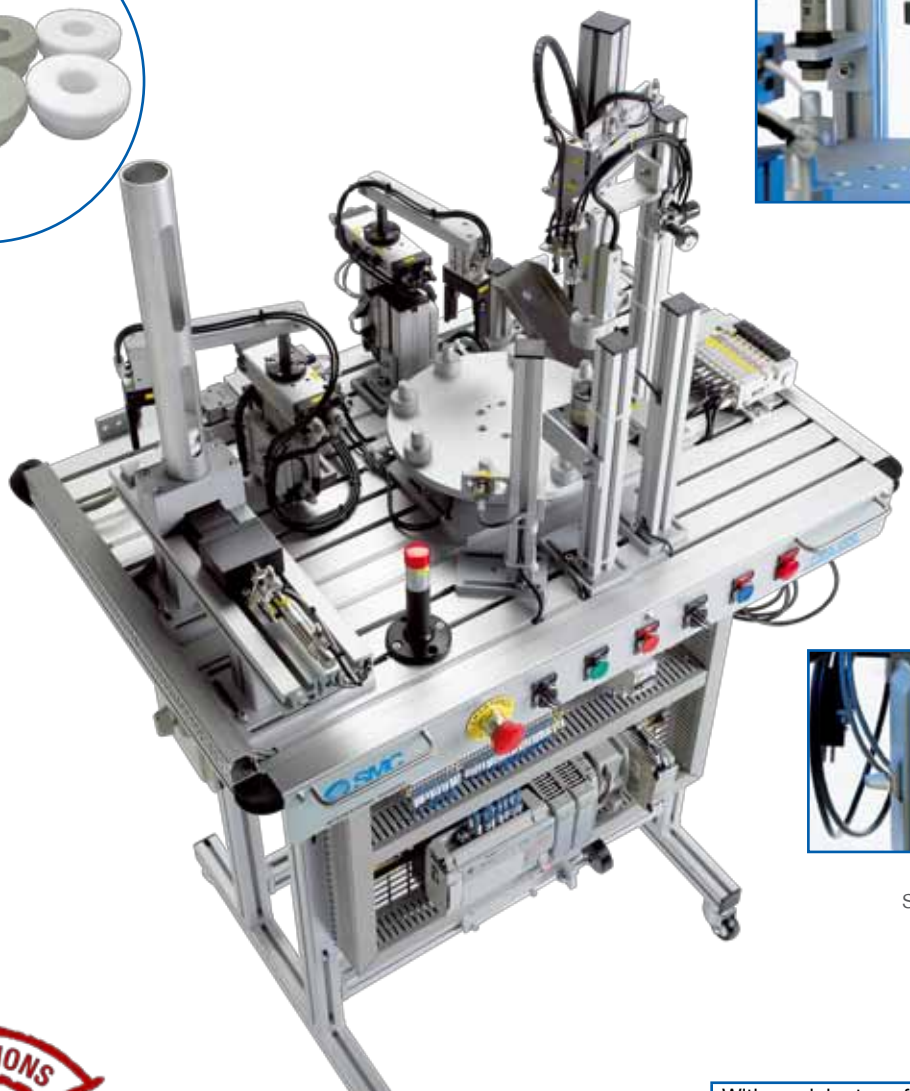
	With modular transfer	Without transfer
FMS-204 Shaft supply with Mitsubishi PLC	SAI0435	SAI0400
FMS-204 Shaft supply with Siemens PLC	SAI0473	SAI0414
FMS-204 Shaft supply with Allen Bradley PLC	SAI0433	SAI0420
FMS-204 Shaft supply with Omron PLC	SAI0464	SAI0424
FMS-204 Shaft supply with Schneider PLC	SAI0465	SAI0423
FMS-204 Shaft supply without PLC	SAI0470	SAI0422

FMS-205 - Cover selection/ supply

This station inserts a lid on the set of parts which have been assembled in the previous stations. There are 6 different types of lids: depending on the material (aluminium or nylon), colour (light or dark) and height (high or low). This variety offers the station more didactic options due to a whole series of verification and measuring operations that are carried out. The different operations undertaken in this station are distributed around an index plate.

The troubleshooting simulation system is included, which generates up to 16 different breakdowns to be diagnosed by the user.





Breakdown simulation system

	With modular transfer	Without transfer
FMS-205 Cover supply with Mitsubishi PLC	SAI0535	SAI0500
FMS-205 Cover supply with Siemens PLC	SAI0551	SAI0519
FMS-205 Cover supply with Allen Bradley PLC	SAI0553	SAI0520
FMS-205 Cover supply with Omron PLC	SAI0550	SAI0524
FMS-205 Cover supply with Schneider PLC	SAI0554	SAI0523
FMS-205 Cover supply without PLC	SAI0552	SAI0522

FMS-206 - Screws supply

The sixth station supplies and inserts four screws in the base of the workpiece. Given that feeding is only carried out at only one point, an additional mechanism has been included in the transfer system to carry out successive rotations of the pallet. This element is comprised of a lifting cylinder and rotary actuator.

The troubleshooting simulation system is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Breakdown
simulation system

	With modular transfer	Without transfer
FMS-206 Screws supply with Mitsubishi PLC	SAI0635	SAI0600
FMS-206 Screws supply with Siemens PLC	SAI0637	SAI0616
FMS-206 Screws supply with Allen Bradley PLC	SAI0633	SAI0620
FMS-206 Screws supply with Omron PLC	SAI0638	SAI0624
FMS-206 Screws supply with Schneider PLC	SAI0639	SAI0623
FMS-206 Screws supply without PLC	SAI0650	SAI0622

FMS-207 - Robotized screwing

The seventh FMS-200 station integrates robotics technology which is widely used in automated environments.

An industrial robot is used to screw in the four bolts supplied by the previous station. The robot has a tool attached with a pneumatic gripper and an electric screwdriver and the station table includes material stores (with capacity for 6 lids and 6 shafts). In addition to the screwing operation, the robot can also be used for assembly and dismantling operations, plus exchanging material between stores.

These applications support an extensive range of possible programs for the robot controller which significantly extends its didactic capacities.

**Check available robot options.*

	With modular transfer	Without transfer
FMS-207 Robotized screwing with Mitsubishi PLC	SAI0762	SAI0700
FMS-207 Robotized screwing with Siemens PLC	SAI0763	SAI0716
FMS-207 Robotized screwing with Allen Bradley PLC	SAI0733	SAI0720
FMS-207 Robotized screwing with Omron PLC	SAI0760	SAI0724
FMS-207 Robotized screwing with Schneider PLC	SAI0764	SAI0723
FMS-207 Robotized screwing without PLC	SAI0761	SAI0722

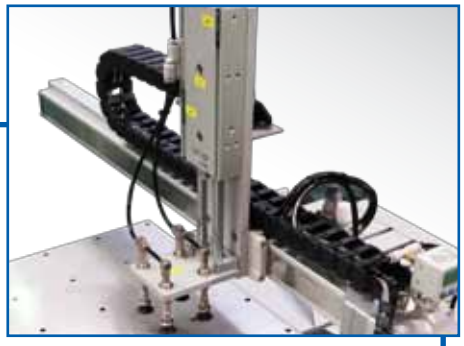
FMS-208 - Automatic warehouse

This phase of the assembly process consists of the storage of finished products.

In FMS-200, the warehouse has been set up using a system based on three coordinate shafts, two of them servo-controlled (X-Y axis) and a third vertical pneumatic shaft (Z axis) for collection / deposit of the material.

There is an optional version that includes a colour touch screen operator terminal.

Optional HMI screen SAI0811



	With modular transfer	Without transfer
FMS-208 Storage station with Mitsubishi PLC	SAI0835	SAI0800
FMS-208 Storage station with Siemens PLC	SAI0863	SAI0813
FMS-208 Storage station with Allen Bradley PLC	SAI0833	SAI0820
FMS-208 Storage station with Omron PLC	SAI0849	SAI0824
FMS-208 Storage station with Schneider PLC	SAI0851	SAI0823
FMS-208 Storage station without PLC	SAI0850	SAI0822

FMS-209 - Paint drying

The paint drying phase is simulated using a polycarbonate oven. The workpiece is inserted into the oven which uses a bulb to simulate the paint drying process. Once this has finished, the product leaves the oven to go on to the next phase of the process. The system allows the user to modify the temperature value and the transit time of the assembly through the oven dependant on the requirements of the workpiece.

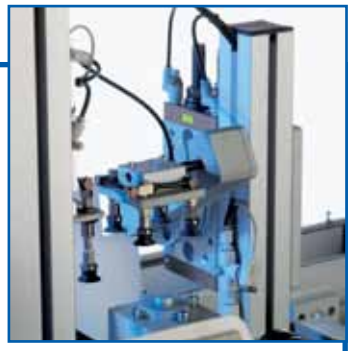
	With modular transfer	Without transfer
FMS-209 Paint drying station with Mitsubishi PLC	SAI0181	SAI0171
FMS-209 Paint drying station with Siemens PLC	SAI0177	SAI0173
FMS-209 Paint drying station with Allen Bradley PLC	SAI0182	SAI0174
FMS-209 Paint drying station with Omron PLC	SAI0176	SAI0172
FMS-209 Paint drying station with Schneider PLC	SAI0183	SAI0180
FMS-209 Paint drying station without PLC	SAI0179	SAI0175

FMS-210 - Quality control using artificial vision

The incorporation of this station in the FMS-200 family provides the integration of the artificial vision technology which is in frequent use in automated productive processes for quality control. The product in process coming from the previous station is transferred to the inspection position in which an artificial vision camera examines a series of variables in two of the four bolts. The results obtained from the examined variables are used to perform quality control of the product in process.

The troubleshooting simulation system is included, which generates up to 16 different breakdowns to be diagnosed by the user.

Artificial vision camera



Breakdown simulation system

	With modular transfer	Without transfer
FMS-210 Quality control station with Mitsubishi PLC	SAI0281	SAI0271
FMS-210 Quality control station with Siemens PLC	SAI0277	SAI0273
FMS-210 Quality control station with Allen Bradley PLC	SAI0283	SAI0274
FMS-210 Quality control station with Omron PLC	SAI0282	SAI0272
FMS-210 Quality control station with Schneider PLC	SAI0276	SAI0280
FMS-210 Quality control station without PLC	SAI0279	SAI0275

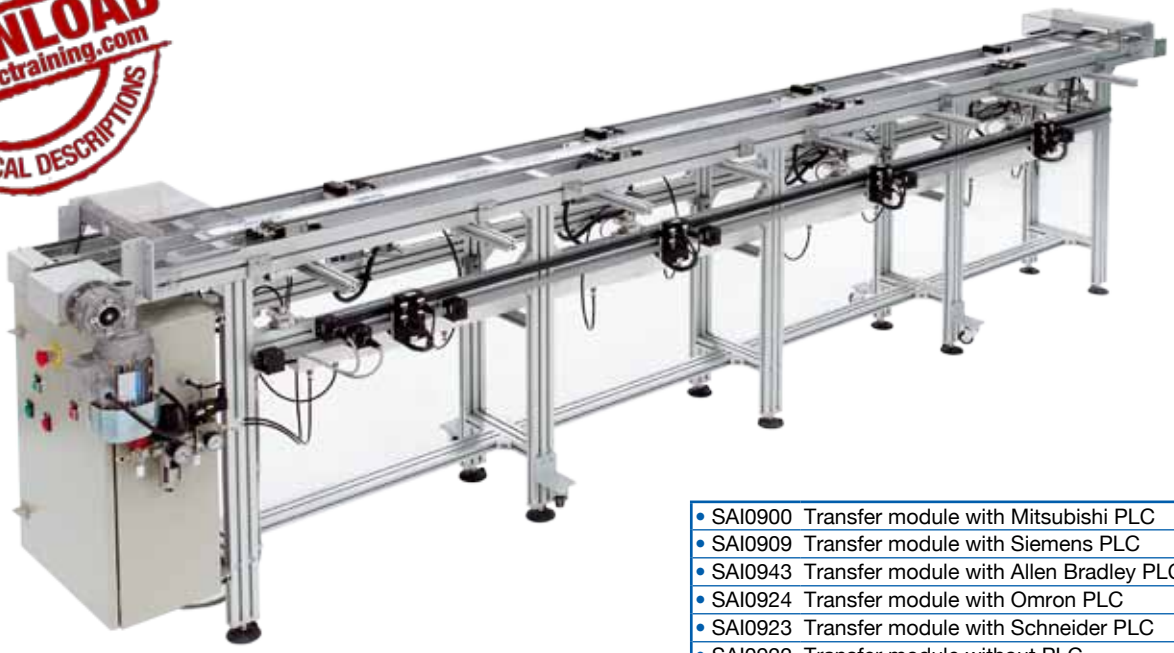
The transfer system

In order to provide the most flexible solutions for our customers needs, FMS-200 is available in two different versions: with a four meters long linear transfer system or with modular transfer sections coupled to each station. The two options are described below.

Linear transfer

This is a rectangular transfer system through which the pallets containing the workpiece circulate around the stations. These pallets are provided with a binary identification system.

It allows the integration of up to a maximum of eight workstations which are easily and quickly connected.



- SAI0900 Transfer module with Mitsubishi PLC
- SAI0909 Transfer module with Siemens PLC
- SAI0943 Transfer module with Allen Bradley PLC
- SAI0924 Transfer module with Omron PLC
- SAI0923 Transfer module with Schneider PLC
- SAI0922 Transfer module without PLC

In addition, the linear transfer enables extension and/or modification of the stations without having to construct a new interface. This supports making a staggered investment over a period of time, starting with a simple configuration and progressively extending stations.

The transfer includes the following elements:
- Command and control cabinet.
- Connections conduit.
- Air treatment unit.
- Emergency stop button.
- Retaining stops and pallet lifters (both located at the height of each process station).
- Pallet identification system.
- Buffers, risers and pallet turners.
- Product in process transport pallets.

Modular transfer

In this FMS-200 version, each of the stations includes an individual transfer section. Multiple combinations of layouts can be developed, with the possibility of joining stations at 90º or 180º.

The retainers and pallet lifters, electrical connections, air vents and the other elements required for the operation of each transfer are included in each of the corresponding stations.

This system also allows scalability of the product over time, enabling a greater number of stations to be joined.

FMS-200 - With this system you could...

FMS-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES

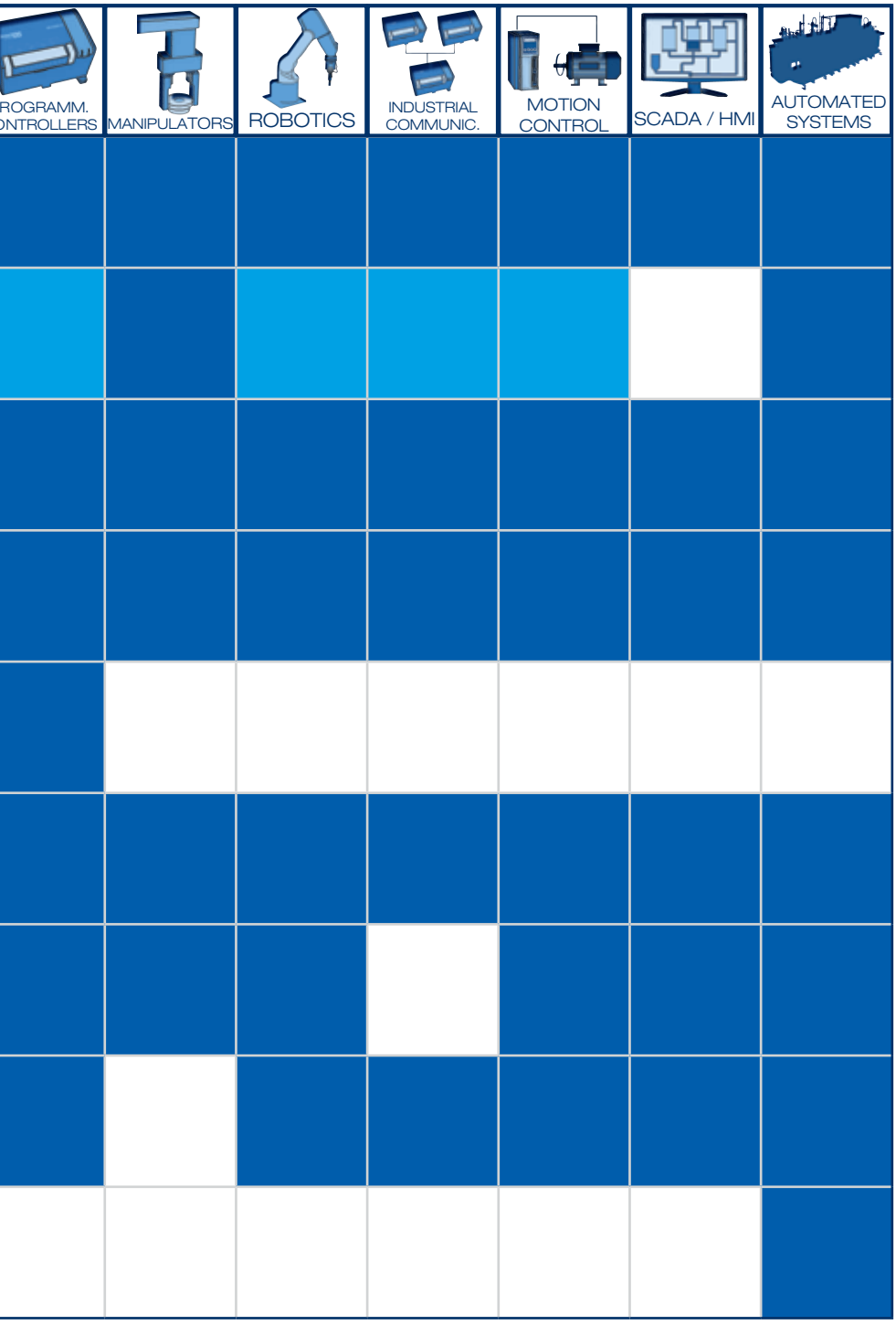
SKILLS	HYDRAULICS	ELECTRICAL PANEL	PNEUMATIC	VACUUM	ELECTRIC MOTORS	SENSORS	IDENTIFICATION SYSTEMS	ARTIFICIAL VISION	CONTINUOUS PROCESSES
ANALYSIS	■	■	■	■	■	■	■	■	■
TROUBLESHOOT	■	■	■	■		■			
DESIGNING	■	■	■	■	■	■	■	■	■
TECH DOCUM. CREATION	■	■	■	■	■	■	■	■	■
INSTALLATION AND ASSEMBLY		■							
TECH DOCUM. UNDERSTANDING	■	■	■	■	■	■	■	■	■
OPERATION	■	■	■		■	■		■	■
PROGRAMMING							■	■	■
SETTING UP									

■ This shows how the FMS-200 is suitable to develop skills in the specific technology.

■ This shows that FMS-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

eLEARNING-200

Find out more about the theory behind the technologies developed in FMS-200 with our eLEARNING-200 courses.



RELATED eLEARNING-200 COURSES

- Introduction to industrial automation (SMC-100)
- Principles of pneumatics (SMC-101)
- Introduction to electricity (SMC-102)
- DC electricity (SMC-103)
- AC electricity (SMC-104)
- Solid state (SMC-105)
- Introduction to wiring (SMC-106)
- Introduction to electric motors (SMC-107)
- Sensors technology (SMC-108)
- Programmable controllers (SMC-109)
- Process controls (SMC-110)
- Hydraulics / electrohydraulics (SMC-111)
- Robotics (SMC-113)

**See eLEARNING-200 chapter for more information*

FMS-200 - Options

FMS -200 has a series of optional extras.

• Programming tools

The programming tools comprise the appropriate programming software, the industrial system communication programming software and cables for the chosen PLC.

*See Programming Tools chapter

• SCADA: Supervisory Control and Data Acquisition

This is a standard-use software application in industry, making it easier to supervise and control processes from the computer screen.

• SAI0048	SCADA application FMS-200

• FMS-200 application for autoSIM-200

We have a 3D application where users can simulate, supervise and control FMS-200 from an autoSIM environment.

• SAI2523	3D simulator for FMS-200, 1 license
• SAI2524	3D simulator for FMS-200, 8 licenses
• SAI2525	3D simulator for FMS-200, 16 licenses

*autoSIM is required. See autoSIM-200 chapter

FMS-200 - Configuration

Getting the right FMS-200 specification is as easy as:

• Steps to follow

1.- Choose the PLC.
2.- Select the transport system type.
3.- Select the required stations.
4.- Add any optional extras.

• Considerations

- Any station can operate independently and be purchased separately.
- To work with the full system, it is recommended to use:
  - FMS-201 station: Body supply.
  - FMS-208 station: Automatic warehouse.
- With linear transfer, the maximum number of process stations is 8.

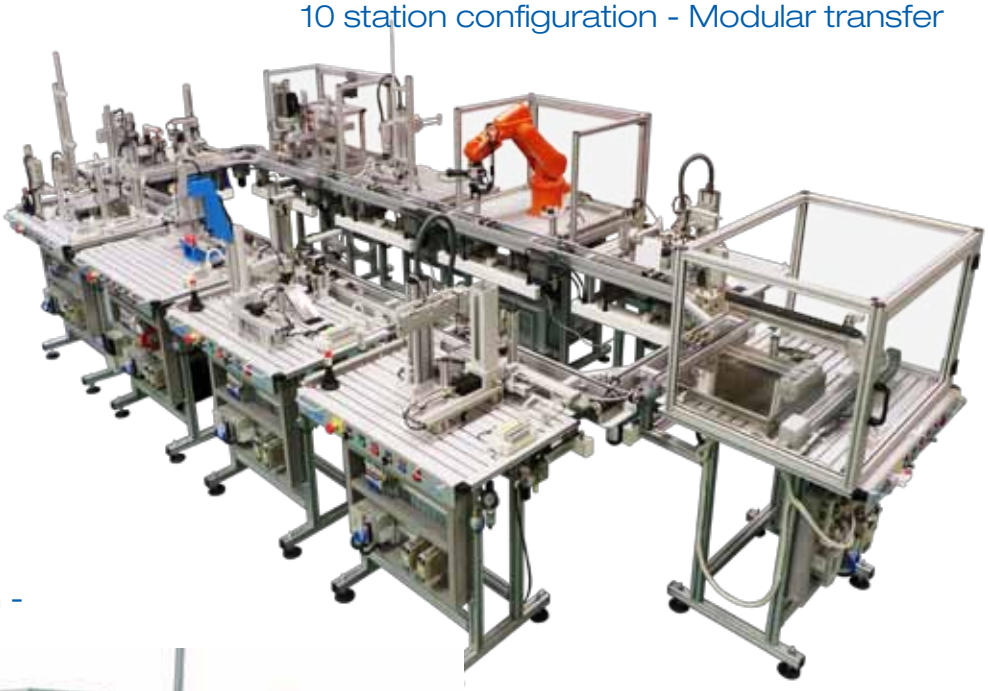
Example of possible configurations

8 station configuration - Linear transfer

6 station configuration - Linear transfer

4 station configuration - Linear transfer

10 station configuration - Modular transfer



6 station configuration - Modular transfer

4 station configuration - Modular transfer

FMS-200 - Technical features

FMS-201
900x580x1480mm

Modules	Sensors (type & quantity)	Input / Output
Base feeding Position verification Displacement Rejection of incorrect base Insertion on pallet	Auto switch, Reed type (x8) Vacuum pressure switch(x1) Inductive (x1)	Digital 14/10
Other devices (quantity)	**Actuators (type & quantity)**	
Vacuum pad(x4)-Vacuum ejector(x1) Three-colour indication light (x1) Breakdown simulation system (x1)	Pneumatic linear (x6)	

FMS-202
900x580x1430mm

Modules	Sensors (type & quantity)	Input / Output
Bearing feeding Transfer to the measuring station Height measuring Bearing insertion	Auto switch, Reed type (x10) Microswitch (x1) Linear potentiometer (x1)	Digital 15/13 Analog 1/0
Other devices (quantity)	**Actuators (type & quantity)**	
Three-colour indication light (x1) Breakdown simulation system (x1)	Pneumatic linear (x4) Pneumatic gripper (x2) Pneumatic rotolinear (x1) Pneumatic rotary actuator (x1)	

FMS-203
900x580x1400mm

Modules	Sensors (type & quantity)	Input / Output
Insertion / extraction of the workpiece Press feeding Bearing pressing	Auto switch, Reed type(x11) Vacuum pressure switch(x1) Security magnetic (x1)	Digital 16/10
Other devices (quantity)	**Actuators (type & quantity)**	
Vacuum pad (x4) - Vacuum ejector (x1) Breakdown simulation system (x1) Safety relay (x1) Hydraulic equipment (x1) Frequency converter (x1)	Pneumatic rotary actuator (x1) Pneumatic linear (x3) Hydraulic linear (x1)	

FMS-204
900x580x1800mm

Modules	Sensors (type & quantity)	Input / Output
Dividing plate Shaft feeding Shaft height measuring Position shaft in the correct position Shaft material detection Removal of incorrect shaft Insertion of the shaft in the assembly	Auto switch, Reed type(x12) Inductive (x1) Capacitive (x1) Vacuum pressure switch(x2)	Digital 20/16
Other devices (quantity)	**Actuators (type & quantity)**	
Three-colour indication light (x1) Vacuum pad(x2)-Vacuum ejector(x2) Breakdown simulation system (x1)	Pneumatic rotolinear (x1) Pneumatic linear (x9) Pneumatic rotary actuator (x1) Pneumatic gripper (x1)	

FMS-205
900x580x1400mm

Modules	Sensors (type & quantity)	Input / Output
Dividing plate Lid feeding Loading station Material detection Lid measuring Removal of the incorrect lid Lid insertion	Auto switch, Reed type(x13) Inductive (x1) Micro-switch (x1) Capacitive (x1) Photoelectric (x1) Linear encoder (x1) Vacuum pressure switch(x1)	Digital 24/16
Other devices (quantity)	**Actuators (type & quantity)**	
Breakdown simulation system (x1) Three-colour indication light (x1) Vacuum pad(x3)-Vacuum ejector(x1) Pressure regulator (x1)	Pneumatic linear (x7) Pneumatic roto-linear (x2) Pneumatic gripper (x2)	

FMS-206
900x580x1930mm

Modules	Sensors (type & quantity)	Input / Output
Screw feeding Transfer Screw insertion handling device	Auto switch, Reed type (x6) Fibre optic photocell (x1) Solid state auto switch (x2)	Digital 13/9
Other devices (quantity)	**Actuators (type & quantity)**	
Breakdown simulation system (x1) Three-colour indication light (x1)	Pneumatic linear (x5) Pneumatic gripper (x1)	

FMS-207
900x580x1500mm

Modules	Sensors (type & quantity)	Input / Output
Shaft and lid stores Robot tools Robot arm and controller components	Auto switch, Reed type(x1) Security magnetic (x1)	Digital 12/12
Other devices (quantity)	**Actuators (type & quantity)**	
Robot controlling unit (x1) Robot programming console (x1) Security lock (x1) Safety relay (x1)	Electric screwing tool (x1) Pneumatic gripper (x1) 6 axis robot (x1)	

FMS-208
900x580x1500mm

Modules	Sensors (type & quantity)	Input / Output
Vertical shaft Positioning axes	Auto switch, Reed type(x2) Digital vacuum pressure switch(x1) Security magnetic (x1)	Digital 16/15
Other devices (quantity)	**Actuators (type & quantity)**	
Vacuum pad(x4)-Vacuum ejector(x1) Servo-controller (x2) Driver programming software and cable (x1) Safety relay (x1) Security lock (x1)	Pneumatic linear (x1) Servo-controlled linear actuators (x2)	

FMS-209
900x580x1500mm

Modules	Sensors (type & quantity)	Input / Output
Insertion/extraction handling device Electric shaft Oven	Auto switch, Reed type (x7) Vacuum pressure switch(x1) PT100 temperature probe(x1) Security magnetic (x1)	Digital 23/24
Other devices (quantity)	**Actuators (type & quantity)**	
Vacuum pad(x4)-Vacuum ejector(x1) Servo-controller (x2) Potentiometer (dimmer) (x1) PID temperature controller (x1) Safety relay (x1) Driver programming software and cable (x1) Security lock (x1)	Pneumatic linear (x4) Pneumatic rotary actuator (x1) Servo-controlled linear actuator with brake (x2) 90º track AC motor with analogue control (x1)	

FMS-210
900x580x1500mm

Modules	Sensors (type & quantity)	Input / Output
Insertion/extraction handling device Revolving table Artificial vision system Evacuation of the faulty product in process	Auto switch, Reed type (x7) Vacuum pressure switch(x2) Artificial vision camera (x1)	Digital 18/18
Other devices (quantity)	**Actuators (type & quantity)**	
Vacuum pad(x8)-Vacuum ejector(x2) Servo-controller (x1) Vision processing unit (x1) Breakdown simulation system (x1) Vision system programming software and cable (x1)	Pneumatic rotary actuator (x1) Pneumatic linear (x2) Electric turntable (x1)	

LINEAR TRANSFER
4250x700x1040mm

Modules	Sensors (type & quantity)	Input / Output
Linear transfer	Auto switch, Reed type (x4) Inductive (x24) Micro-switch (x8) Capacitive (x2)	Digital 43/21
Other devices (quantity)	**Actuators (type & quantity)**	
Frequency converter (x1) Modules for field bus (x10)	Pneumatic rotary actuator (x1) Pneumatic linear (x13)	

MODULAR TRANSFER
1000x210x970mm

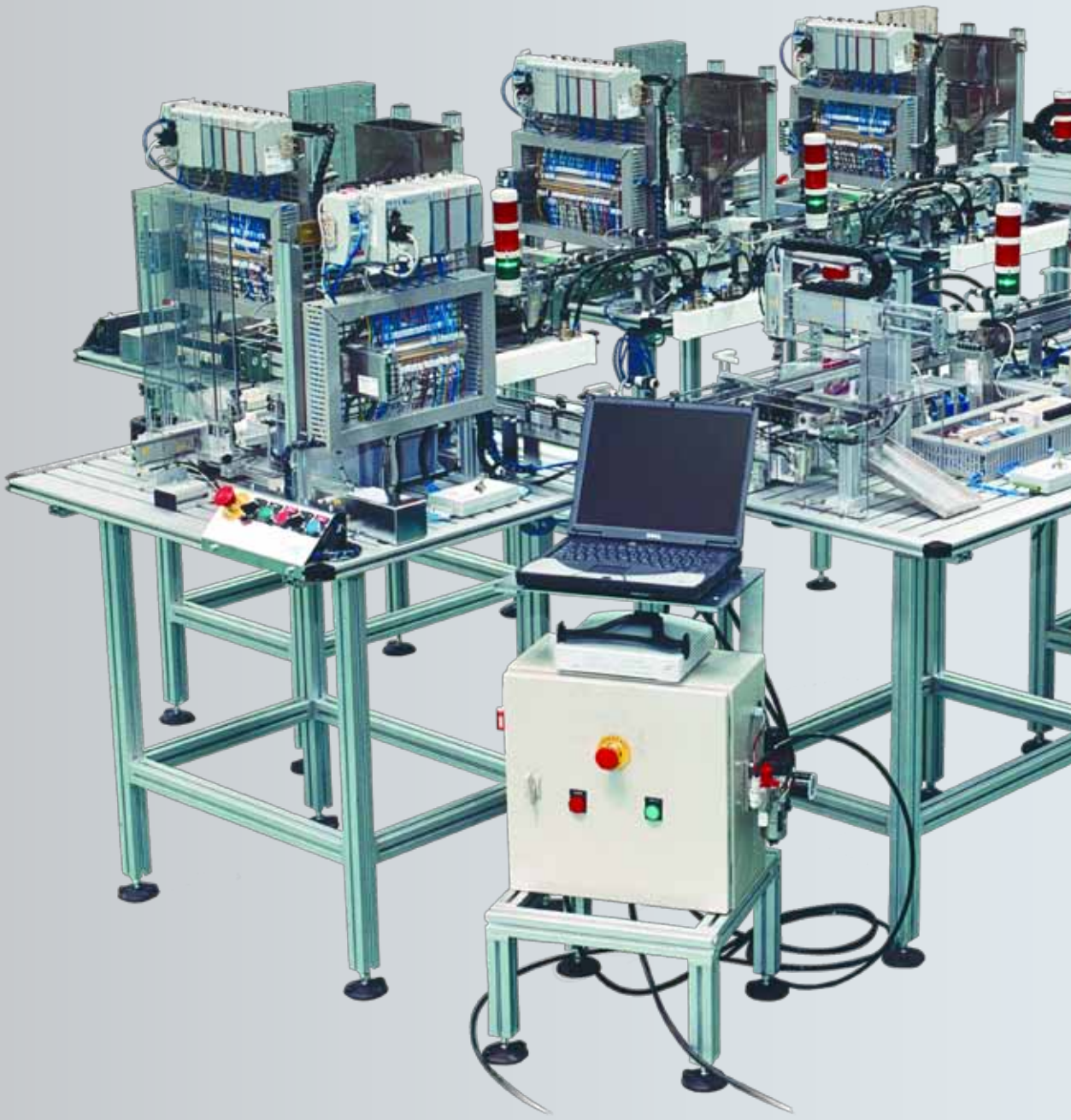
Modules	Sensors (type & quantity)	Input / Output
Modular transfer	Inductive (x3) Micro-switch (x1)	Digital 4/2 Digital 4/3 * Digital 4/4 **
Other devices (quantity)	**Actuators (type & quantity)**	
Modules for field bus (x1)	DC motor (x1) Pneumatic linear (x1/x2*/x2**) Pneumatic rotary actuator (x1)**	

* Only in modular transfer for FMS-202 and FMS-207 stations.
** Only in modular transfer for FMS-206 station.

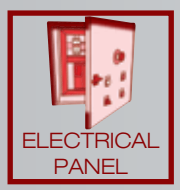
HAS-200

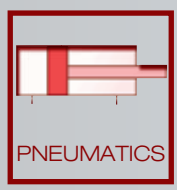
Highly automated system

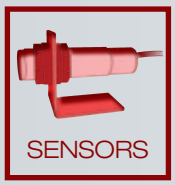
HAS-200 reproduces a real production process with full production management



In the following TECHNOLOGIES...







SMC
INTERNATIONAL TRAINING

Develop the SKILLS...

ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCUM. CREATION

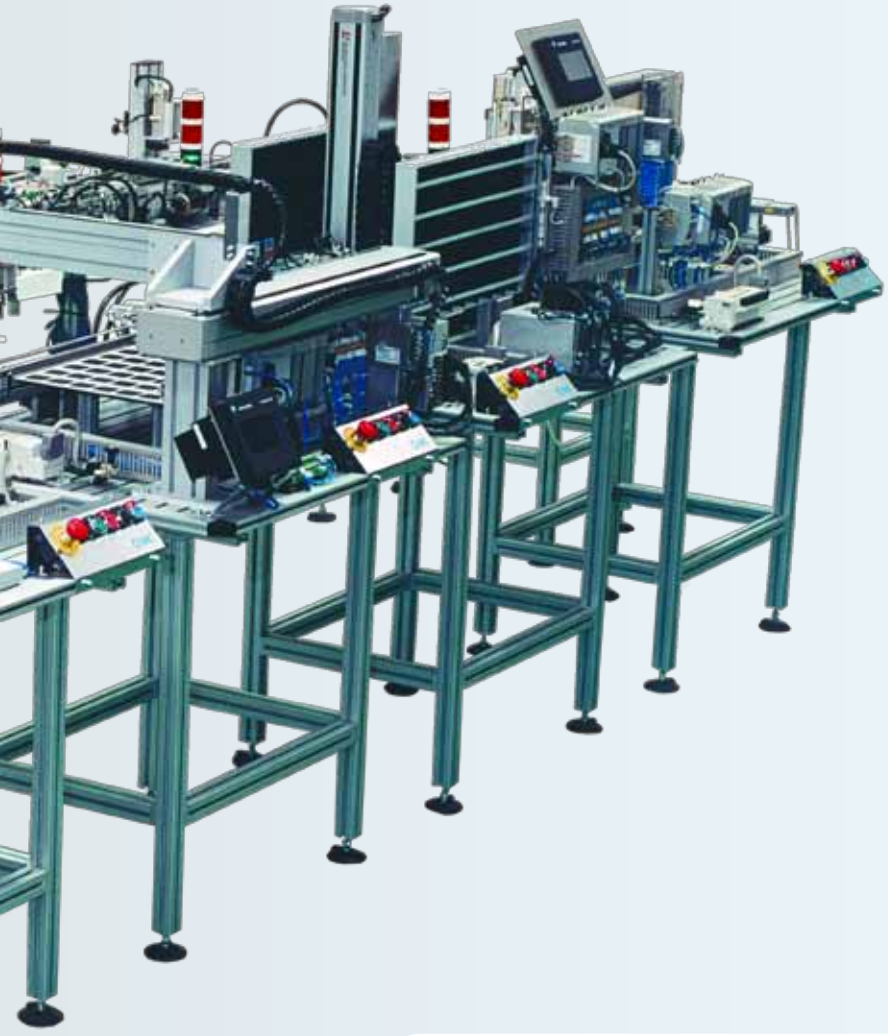
TECH DOCUM. UNDERSTANDING

OPERATION

PROGRAMMING

SETTING UP

Tomorrow's factory within the education system's grasp



Scale the summit of the automation pyramid

INDUSTRIAL COMMUNIC.

MOTION CONTROL

SCADA / HMI

MES Manufacturing Execution System

M.E.S.

ERP ENTERPRISE RESOURCE PLANNING

E.R.P.

AUTOMATED SYSTEMS

HAS-200 - Highly automated system

The HAS-200 system reproduces a production process with a high level of automation which helps to develop the professional capacities required in diverse sectors (automotive, semiconductors, food, pharmaceutical, etc.).

Aspects such as aesthetics, user motivation and the development of transversal skills (such as teamwork etc.) have also been taken into account in the conception and design process.

At university level, the HAS-200 system represents a powerful development platform for research projects.

The product/ process

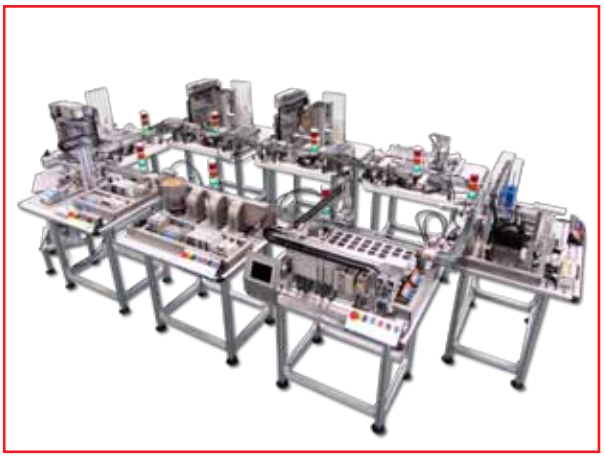
HAS-200 allows the user to manufacture 19 different products. The raw material includes containers with four types of label (red, blue, yellow and multi-coloured). Each label has a bar code to identify the product throughout the process.

Varying quantities of “beads” are poured into these containers, enabling the combination of 19 different “recipes”.

Once the requested quantity has been filled, the containers are covered with a lid and a label is added that includes the manufacturing date, etc. The product is then sent to the dispatch station or warehouses.

Within the process, both the material weight and height is measured. These two variables are analysed by Statistical Process Control (SPC) for decision-making and will be stored in the database for generation of logs, etc.

The modular system



HAS-200 is fully modular system of up to 11 workstations, a raw material store station and the control cabinet. Each workstation has a section of conveyer belt which allows great flexibility in layout design.

All the stations have a control panel/ keypad as well as a three- colour indicator tower and a top-of-the-range PLC which controls in manual or integrated mode.

The connection between the station and the management system is via an Ethernet network that enables great speed in the data flow and standardisation on a worldwide level.

Each of the HAS-200 system stations carries out part of the process.

• HAS-201: Multi-coloured container feeding

This station supplies the system with empty containers to be filled with multicoloured beads in the production stations.

• HAS-202, HAS-203 and HAS-204: Production

The production stations perform the feeding, filling and weighing of the blue (HAS-202), yellow (HAS-203) and red (HAS-204) containers, respectively. This also enables filling the multi-coloured containers coming from station HAS-201.

• HAS-205 and HAS-206: Checking

These two stations have to measure the height of the raw material contained in the containers.

The HAS-205 station uses a linear encoder for measuring, whilst the HAS-206 station takes the measurement using a linear potentiometer.

• HAS-207: Lid positioning

In this station the lid is positioned on the container and a label is printed with the manufacturing date and/or other information in order to identify the final product.

• HAS-208: Vertical storage

This station makes it possible to store containers, either semi-manufactured or as a finished product. It can hold up to 81 containers. The storage cells are arranged vertically.

• HAS-209: Horizontal storage

This station stores containers, either semi-manufactured or as a finished product. It can hold up to 56 containers. The storage cells are arranged horizontally.

• HAS-210: Palletizing

This station removes the final product from the process, placing it in two ramps for palletizing and dispatch.

• HAS-211: Raw material store

This station allows the storage of raw material: containers, lids and “pearls” in different colours: blue, yellow and red.

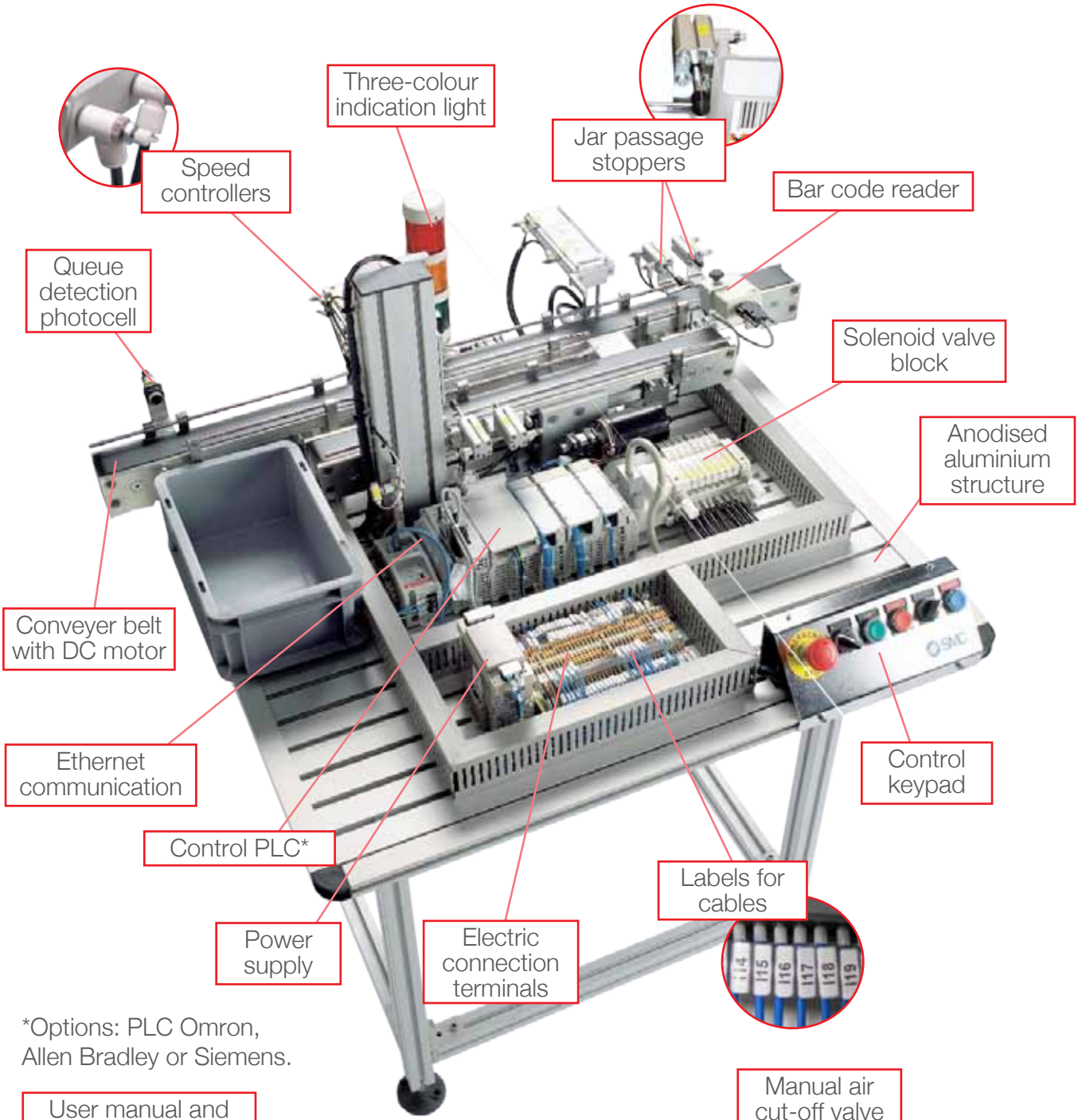
• HAS-212: Recycling station

This station classifies the mixed raw material used in HAS-200 according to the colour.

• Control cabinet

This includes the general air supply and electric network, general emergency and switch the Ethernet network.

Common element in all stations



*Options: PLC Omron, Allen Bradley or Siemens.

User manual and practice manual

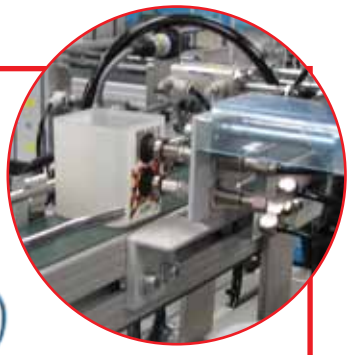
Manual air cut-off valve

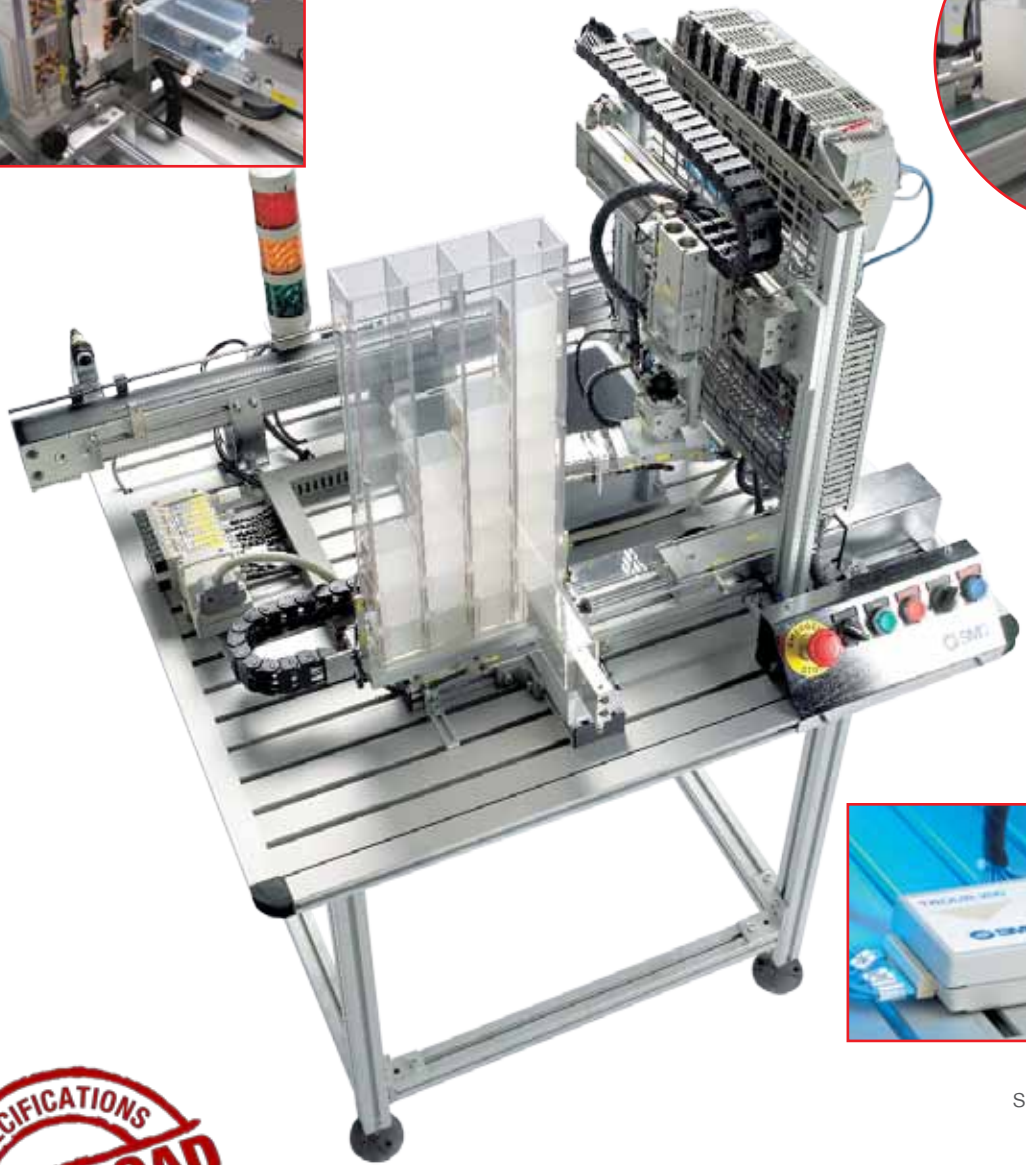
HAS-201 - Multi-coloured container feeding

This station supplies the system with multicoloured empty containers to be filled in the production stations.

The containers are stored in a gravity feeder and are extracted from it by a pneumatic cylinder. They are moved to the conveyor belt by a series of pneumatic actuators.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be diagnosed by the user.





Breakdown simulation system

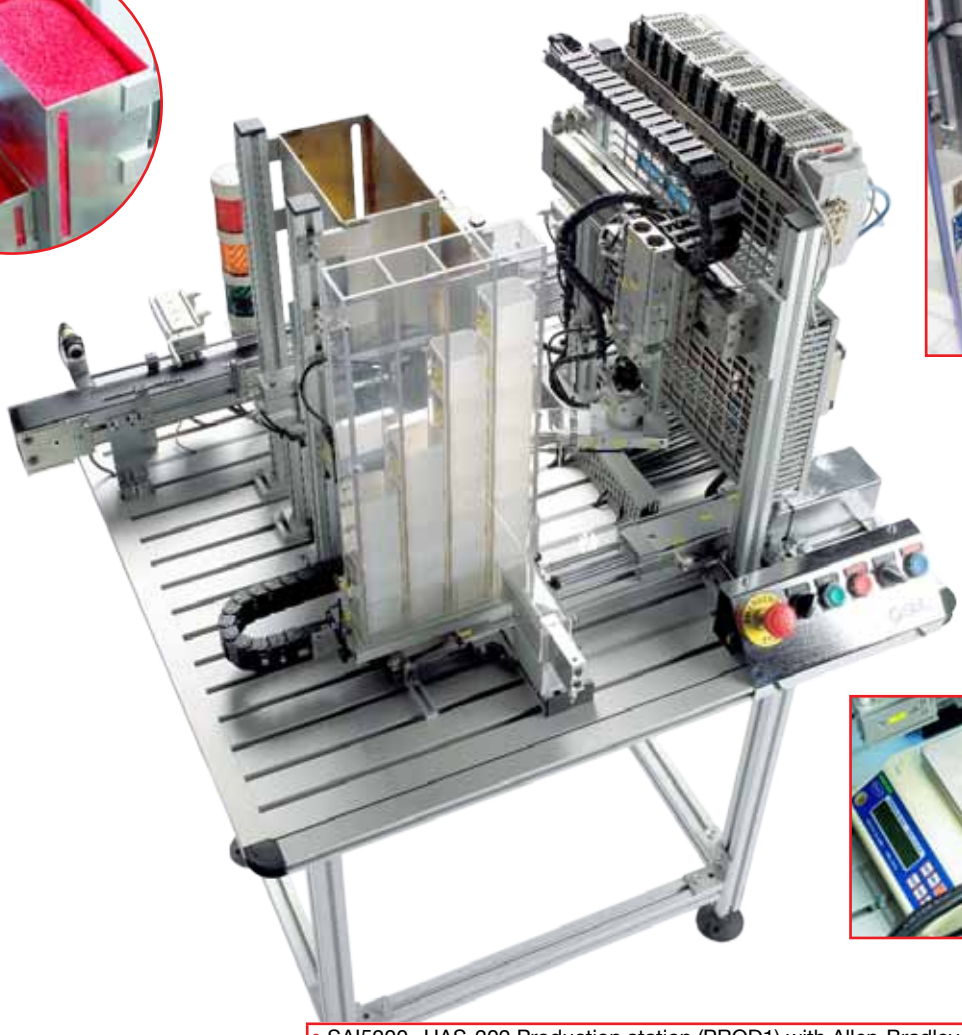
•	SAI5100	HAS-201 Multicoloured container feeding station with Allen-Bradley PLC / ETHERNET
•	SAI5110	HAS-201 Multicoloured container feeding station with Siemens PLC / ETHERNET
•	SAI5120	HAS-201 Multicoloured container feeding station with Omron PLC / ETHERNET

HAS-202, HAS-203 and HAS-204 - Production

The production stations perform the feeding, filling and weighing of the blue (HAS-202), yellow (HAS-203) and red (HAS-204) containers, respectively. This also fills the multi-coloured containers from station HAS-201.

The containers are stored in a gravity feeder. They are extracted from it by pneumatic cylinder. The containers are filled with primary material stored in the hoppers and are then taken to the conveyor belt.

These stations have precision scales fitted with an RS-232 interface to output the data to the PLC and with LCD display for visualization.



Precision scales

- SAI5200 HAS-202 Production station (PROD1) with Allen-Bradley PLC / ETHERNET
- SAI5230 HAS-202 Production station (PROD1) with Siemens PLC / ETHERNET
- SAI5240 HAS-202 Production station (PROD1) with Omron PLC / ETHERNET
- SAI5300 HAS-203 Production station (PROD2) with Allen-Bradley PLC / ETHERNET
- SAI5310 HAS-203 Production station (PROD2) with Siemens PLC / ETHERNET
- SAI5320 HAS-203 Production station (PROD2) with Omron PLC / ETHERNET
- SAI5400 HAS-204 Production station (PROD3) with Allen-Bradley PLC / ETHERNET
- SAI5410 HAS-204 Production station (PROD3) with Siemens PLC / ETHERNET
- SAI5420 HAS-204 Production station (PROD3) with Omron PLC / ETHERNET

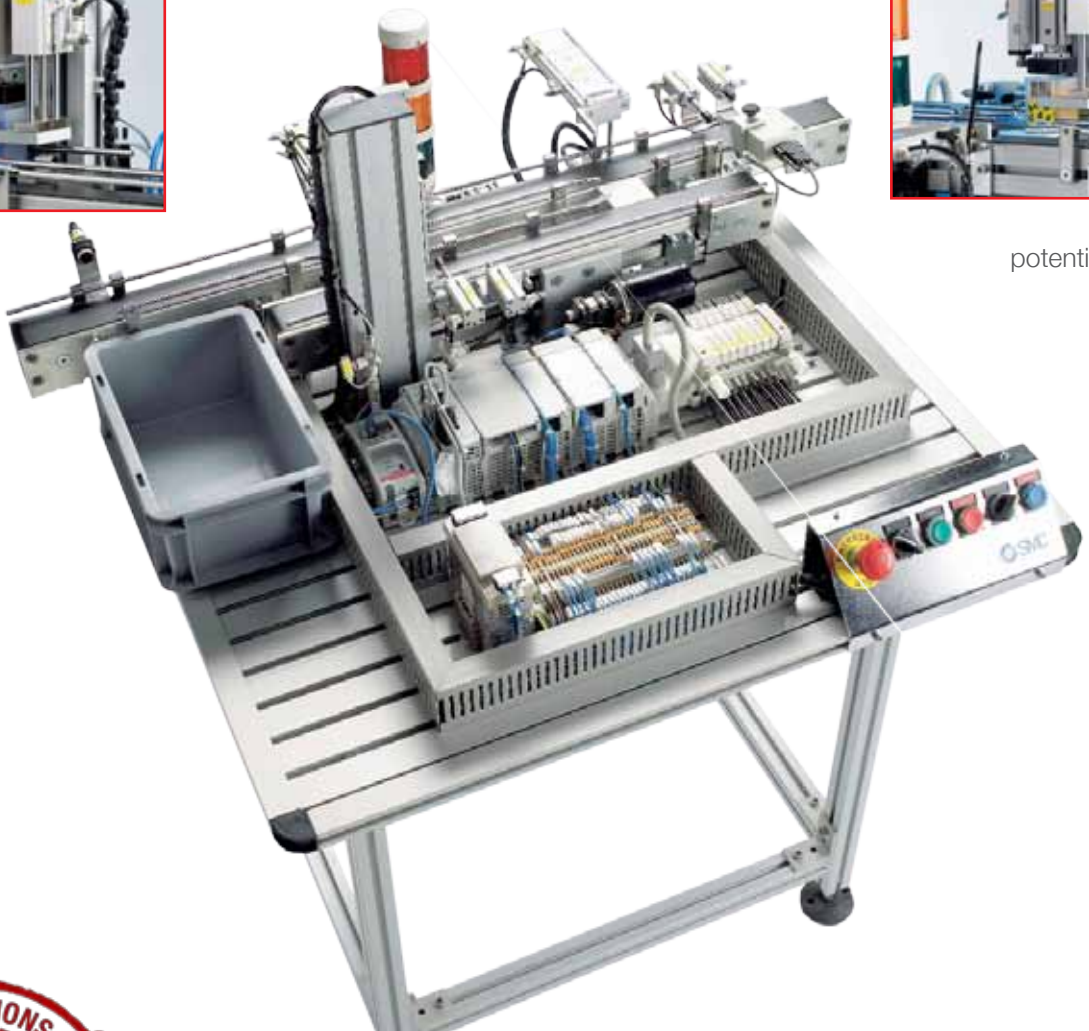
HAS-205 and HAS-206 - Checking

These two stations have to measure the height of the raw material contained in the containers. They are differentiated by how they measure the height: one of them uses a linear encoder (HAS-205), while the other takes the measurement using a linear potentiometer (HAS-206), which generates an analogue measurement in proportion to the displacement.

The design of the module allows the study of concepts related to bottle necks, quality control, buffers, statistical control of processes etc.

Linear encoder

Analog potentiometer



•	SAI5500	HAS-205 Checking station (CHECK1) with Allen-Bradley PLC / ETHERNET
•	SAI5510	HAS-205 Checking station (CHECK1) with Siemens PLC / ETHERNET
•	SAI5520	HAS-205 Checking station (CHECK1) with Omron PLC / ETHERNET
•	SAI5600	HAS-206 Checking station (CHECK2) with Allen-Bradley PLC / ETHERNET
•	SAI5610	HAS-206 Checking station (CHECK2) with Siemens PLC / ETHERNET
•	SAI5620	HAS-206 Checking station (CHECK2) with Omron PLC / ETHERNET

HAS-207 - Lid positioning

In this station the lid is correctly positioned and a label is printed with the manufacturing date and/or other information in order to identify the final product.

The lids are stored in a gravity feeder, from which they are extracted and fitted onto the container. A printer produces the labels to be attached to the top of the lid once the container is closed. The user can modify the PLC program to personalize this label with the type of legend to be printed (date, expiry date, etc.).

• SAI5700	HAS-207 Positioning of the lid station with Allen-Bradley PLC / ETHERNET
• SAI5710	HAS-207 Positioning of the lid station with Siemens PLC / ETHERNET
• SAI5720	HAS-207 Positioning of the lid station with Omron PLC / ETHERNET

HAS-208 - Vertical storage

Comprised of two electric servo controlled shafts, this warehouse is able to store up to 81 semi-finished or finished containers. It has an operator terminal (HMI) to view the contents of the warehouse. The HMI will also let the user manoeuvre a container between different cells, transfer from or to the conveyer belt.

This station reliably reproduces an industrial automated storage system.

Operator terminal HMI

• SAI5800	HAS-208 Vertical storage station with Allen-Bradley PLC / ETHERNET
• SAI5820	HAS-208 Vertical storage station with Siemens PLC / ETHERNET
• SAI5830	HAS-208 Vertical storage station with Omron PLC / ETHERNET

HAS-209 - Horizontal storage

It has a servo controlled electric shaft and another actuated by a stepper motor. It allows up to 56 containers to be stored, both finished and semi-finished.

It has an operator terminal (HMI) to view the contents of the warehouse. The HMI will also let the user manoevre a container between different cells, transfer from or to the conveyer belt.

Operator terminal HMI

• SAI5900	HAS-209 Horizontal storage station with Allen-Bradley PLC / ETHERNET
• SAI5910	HAS-209 Horizontal storage station with Siemens PLC / ETHERNET
• SAI5920	HAS-209 Horizontal storage station with Omron PLC / ETHERNET

HAS-210 - Palletizing

This station removes the final product from the process, placing it in two ramps for palletizing and dispatch.

The final product is grouped in blocks of four units which are dispatched when the lot has been completed.

The troubleshooting simulation system TROUB-200 is included, which generates up to 16 different breakdowns to be identified by the user.

Breakdown simulation system

• SAI5000	HAS-210 Palletising station with Allen-Bradley PLC / ETHERNET
• SAI5011	HAS-210 Palletising station with Siemens PLC / ETHERNET
• SAI5020	HAS-210 Palletising station with Omron PLC / ETHERNET

HAS-211 - Raw material store

This manages the storage of raw material: containers, lids and “pearls” in different colours: blue, yellow and red. The station comes with 144 containers (36 of each type), 144 lids and 6kg of “pearls” of each colour.

The feeders for the containers and lids have the same characteristics as the process stations so changes can be made quickly once any one of the feeder stations is emptied. The tanks with “pearls” are also easy to extract in order to refill the production stations.

EASY EXTRACTION

• SAI5050	HAS-211 Raw material store

• SAI5070	Red “pearls” (2kg)
• SAI5071	Blue “pearls” (2kg)
• SAI5072	Yellow “pearls” (2kg)

• SAI5078	Set of 50 containers
• SAI5079	Set of 50 lids

HAS-212 - Recycling station

HAS-212 completes the production process by recycling the primary material to be used again.

This station classifies the primary material mixed in different containers by colour. The mixed “pearls” are put into the container by vibration and a turning movement. It then sends them one by one on to a conveyor belt and then, using chromatic sensors and blowing, they are separated by colours into hoppers.

• SAI5980	HAS-212 Recycling station with Allen-Bradley PLC / ETHERNET
• SAI5979	HAS-212 Recycling station with Siemens PLC / ETHERNET
• SAI5978	HAS-212 Recycling station with Omron PLC / ETHERNET

Control cabinet

The control cabinet includes the general air supply and electric network, emergency stop button and green and red indicator lights. It also includes, on the right side of the cabinet, an air treatment unit, and the main power switch on the left side.

There is also an Ethernet switch on the cabinet to communicate between stations. A stainless steel tray is fixed to the top, large enough to hold a lap-top computer.

A laptop is offered as an option with all the required programs already installed. Please consult for availability.

- SAI5950 Control cabinet without PC

3Dsupra: 3D supervisor

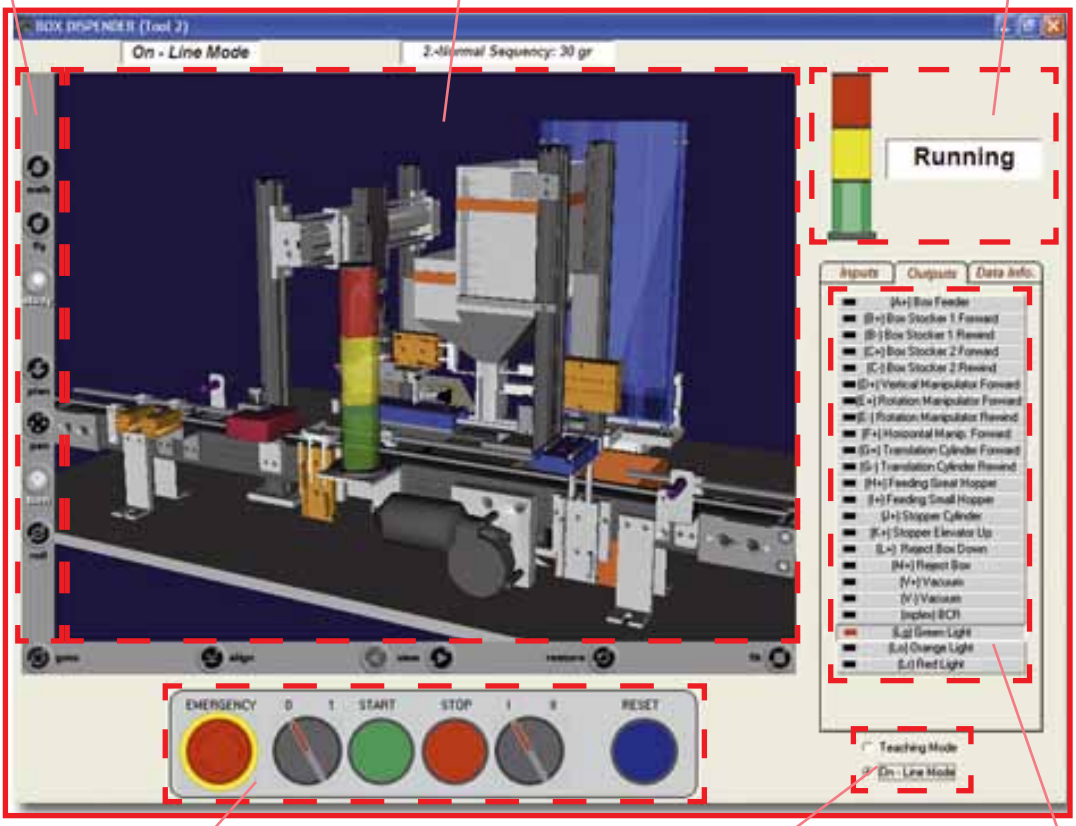
One of the applications included in the HAS-200 system is the 3D supervisor. Its design takes into account various aspects which make it extremely attractive and useful in a training environment.

On-screen visor control (zoom, rotation, etc.).

Interactivity in three dimensions!

3D display of the operation in each workstation.

Information regarding signal tower status.



Reproduction of the workstation control panel. Facility to operate push buttons.

Information concerning the status of the inputs/outputs and the relevant variables (bar code, weight, etc.).

- ONLINE mode (operation of the station).
- TEACHING mode (allowing the simulation of the on-screen movement).

• SAI5062 3Dsupra: 3D supervisor

3Dsupra has been developed by CGIP-UPC for SMC International Training

Ed-MES - Educational Manufacturing Execution System

EdMES is modular software that reproduces real situations and the most relevant functions associated with the “Manufacturing execution / management system”. All the modules have an ONLINE mode (control over the machine) and a TEACHING mode which allows the user to study concepts associated with a specific module.

• SAI5063 EdMES: Educational manufacturing execution system

Integrated production management!

Functions	Assignment
Order & Dispatcher	Sends out the work orders and programming for all orders in the system.
Material Movement	Necessary to introduce the user to the plant lay-out.
Data Collector	Responsible for compiling all the information generated and/or required by the system.
Inventory Tracking & WIP	Necessary to carry out traceability for the products produced.
Statistical Process Control (SPC)	It is used to check the quality of both process and product.
Maintenance Management	Function for preventive, predictive and corrective maintenance.
Alarm Summary	Single viewer for all warnings, notifications and errors in the production system.
Overall Equipment Efficiency (OEE)	This function analyses the system's efficiency.
Data Base Tool	The Ed-MES system includes the motor and the database viewer and integrates all the production data through a relational database.

In addition, Ed-MES includes Agents (Buffer agent, Raw material agent and Maintenance agent) that, tied in with its teaching aims, are functions that generate problems in parts of the system.

HAS-200 - With this system you could...

HAS-200 comes up with different practical activities targeting skills in the technologies featuring in the table (below).

TECHNOLOGIES

SKILLS

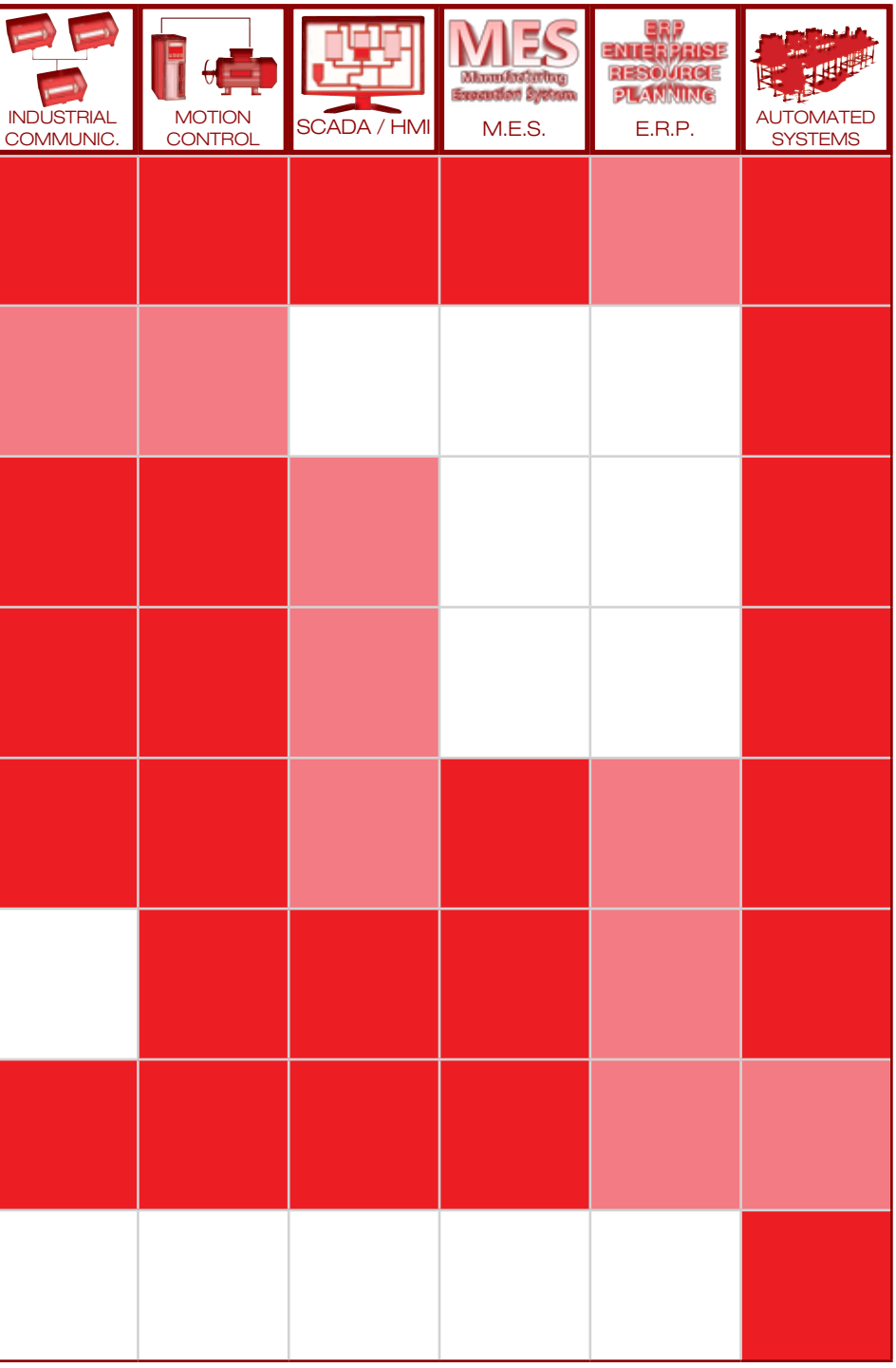
	ELECTRICAL PANEL	PNEUMATICS	VACUUM	ELECTRIC MOTORS	SENSORS	IDENTIFICATION SYSTEMS	PROGRAMM. CONTROLLERS	MANIPULATORS
ANALYSIS	■	■	■	■	■	■	■	■
TROUBLESHOOT.	■	■		■	■		■	■
DESIGNING	■	■	■	■	■	■	■	■
TECH DOCUM. CREATION	■	■	■	■	■	■	■	■
TECH DOCUM. UNDERSTANDING	■	■	■	■	■	■	■	■
OPERATION	■	■		■		■	■	■
PROGRAMMING						■	■	
SETTING UP								

■ This shows how the HAS-200 is suitable to develop skills in the specific technology.

■ This shows that HAS-200 can help develop skills in the specific technology even though there are other more appropriate products in the range.

eLEARNING-200

Find out more about the theory behind the technologies developed in HAS-200 with our eLEARNING-200 courses.



RELATED eLEARNING-200 COURSES

- Introduction to industrial automation (SMC-100)
- Principles of pneumatics (SMC-101)
- Introduction to electricity (SMC-102)
- DC electricity (SMC-103)
- Solid state (SMC-105)
- Introduction to wiring (SMC-106)
- Sensors technology (SMC-108)
- Programmable controllers (SMC-109)

**See eLEARNING-200 chapter for more information*

HAS-200 - Options

HAS -200 has a series of optional extras.

• Programming tools

The programming tools comprise the appropriate programming software, the industrial system communication programming software and cables for the chosen PLC.

*See Programming Tools chapter

• Portable computer

The control cabinet, in the upper part includes a tray for supporting a laptop.

• SAI5064 Portable computer

HAS-200 - Configuration

Getting the right HAS-200 specification is as easy as:

• Steps to follow

1.- Choose the PLC.
2.- Select the required stations.
3.- Add any optional extras.

• Considerations

- Any station can operate independently and be purchased separately.
- In order to work with the full system, you will need at least:
  - A production station: HAS-202, HAS-203 or HAS-204.
  - HAS-207 station: Positioning of the lid
  - HAS-210 station: Palletizing
  - The control cabinet
- Integrated configurations should have an even number of stations. It is possible to include an empty station with a conveyor belt for the containers to move around.

Possible configurations

Complete configuration - 10 stations

+ HAS-211 station: Raw material store
+ HAS-212 station: Recycling station

8 station configuration

6 station configuration

4 station configuration

HAS-200 - Technical features

HAS-201
900x762x865mm

Modules	Sensors (type & quantity)	Input / Output
Container feeding Container displacement Conveyer belt	Auto switch, Reed type (x13) Barrier type photocell (x2) Proximity photocell (x1) Vacuum pressure switch (x1)	Digital 22/16

Other devices (quantity)	Actuators (type & quantity)
Breakdown simulation system (x1) Vacuum pad(x2)-Vacuum ejector(x1) BCR serial device (x1) Reject container (x1)	Pneumatic linear (x7) Pneumatic rotary actuator (x1) DC motor (x1)

HAS-202
HAS-203
HAS-204
900x762x865mm

Modules	Sensors (type & quantity)	Input / Output
Container feeding Container displacement Hoppers Scales Conveyor belt	Auto switch, Reed type (x15) Barrier type photocell (x2) Proximity photocell (x2) Reflex photocell (x1) Vacuum pressure switch (x1)	Digital 26/22

Other devices (quantity)	Actuators (type & quantity)
Vacuum pad(x2)-Vacuum ejector(x1) BCR serial device (x1) Scales serial device (x1) Reject container (x1)	Pneumatic linear (x13) Pneumatic rotary actuator (x1) DC motor (x1)

HAS-205
900x762x865mm

Modules	Sensors (type & quantity)	Input / Output
Digital measuring module Buffer Conveyor belt	Auto switch, Reed type (x8) Proximity photocell (x1) Vacuum pressure switch (x1)	Digital 15/14 Fast counting 1/0

Other devices (quantity)	Actuators (type & quantity)
Vacuum pad(x1)-ejector(x1) Buffer motor starter relay (x1) BCR serial device (x1) Pressure regulator (x1) Reject container (x1)	Pneumatic linear (x8) Cylinder with stroke reading (x1) DC motor (x2)

HAS-206
900x762x865mm

Modules	Sensors (type & quantity)	Input / Output
Analog measuring module Buffer Conveyor belt	Auto switch, Reed type (x8) Proximity photocell (x1) Vacuum pressure switch(x1)	Digital 15/14 Analog 1/0

Other devices (quantity)	Actuators (type & quantity)
Vacuum pad(x1)-Vacuum ejector(x1) Buffer motor starter relay (x1) Linear potentiometer (x1) BCR serial device (x1) Reject container (x1)	Pneumatic linear (x9) DC motor (x2)

HAS-207
900x762x865mm

Modules	Sensors (type & quantity)	Input / Output
Lid feeding Feeding labels and handling lids Conveyor belt	Auto switch, Reed type (x10) Barrier type photocell (x1) Proximity photocell (x1) Vacuum pressure switch(x3)	Digital 20/15

Other devices (quantity)	Actuators (type & quantity)
Vacuum pad(x5)-Vacuum ejector(x3) Blower using a roller valve (x1) BCR serial device (x1) Thermal printer (x1) Reject lid container (x1)	Pneumatic linear (x10) DC motor (x1)

HAS-208
900x762x865mm

Modules	Sensors (type & quantity)	Input / Output
Warehouse Conveyor belt	Auto switch, Reed type (x5) Proximity photocell (x1) Vacuum pressure switch(x1)	Digital 32/27

Other devices (quantity)	Actuators (type & quantity)
Vacuum pad(x2)-Vacuum ejector(x1) HMI operator terminal (x1) BCR serial device (x1) Positioning driver (x2) Pressure regulator (x1)	Pneumatic linear (x4) Pneumatic rotary actuator (x1) Servo-controlled electric axis (x2) DC motor (x1)

HAS-209
900x762x865mm

Modules	Sensors (type & quantity)	Input / Output
Warehouse Conveyor belt	Auto switch, Reed type (x3) Proximity photocell (x1)	Digital 29/25

Other devices (quantity)	Actuators (type & quantity)
Pneumatic rotary actuator (x1) HMI operator terminal (x1) BCR serial device (x1) Positioning driver (x2) Pressure regulator (x1)	Pneumatic linear (x4) Servo-controlled electric axis (x1) Step-step motor electrical axis (x1) DC motor (x1)

HAS-210
900x762x865mm

Modules	Sensors (type & quantity)	Input / Output
Container movement manipulator Platform module Conveyor belt	Auto switch, Reed type (x9) Proximity photocell (x1) Vacuum pressure switch(x1)	Digital 16/12

Other devices (quantity)	Actuators (type & quantity)
Breakdown simulation system(x1) Vacuum pad(x1)-Vacuum ejector(x1) BCR serial device (x1)	Pneumatic linear (x10) DC motor (x1)

HAS-211
600x762x865mm

Modules
Pearl container cylinder (x3) - 6kg/colour Container loader (x4)- 36 containers/colour Lid loader (x1) - 144 lids

HAS-212
900x762x865mm

Modules	Other devices (quantity)
Vibrating feeder Sorting conveyor belt Conveyor belt	Blower using a valve (x3) Vibrating feeder (x1) Motor starter relay (x1) Pressure regulator (x1)

Sensors (type & quantity)	Input / Output
Digital fibre colour sensor (x3)	Digital 8/8

CONTROL CABINET
205x407x400mm

Modules	Sensors (type & quantity)
Power Distribution, Air	Pressure switch (x1)

Other devices (quantity)
Filtering unit + Air Treatment (x1) Switch for the Ethernet network (x1) General emergency button (x1)

PRODUCT PACKS

Complete pre-configured solutions

Discover our proposals for complete laboratories with pneumatic and hydraulic technology

INTERNATIONAL TRAINING

What are product packs?

The combination of various products in our range that provide solutions to the most common needs.

Discover the pack that best suits your needs

PNEUMATICS / ELECTROPNEUMATICS PACK

SAI7378

1 station with 2 workstations
(up to 6 students)

- Aquire knowledge
- Design and simulate the circuits
- Test and operate the real circuits with more than 30 activities available

Composition of the pack:

Part Number	Description	Qty.
SAI2065	Rolling table with twin-post	1
SAI2074	Drawer unit for rolling table with lock	2
SAI4-2285	PNEU-405: Pneumatics- electro-pneumatics kits	2
SAIU020-001	SINGLE USE licence for the eLEARNING-200 pack of courses	6
SAI2252	AutoSIM-200, 1 educational license	2
SAI7376	Poster of the composition PNEU-405	1

List of activities for PNEU-405:

PNEUMATICS	
• Direct control of a single acting cylinder.	• Delay in a control signal.
• Indirect control of a single acting cylinder.	• Activation of a control signal according to the pressure.
• Indirect control of a double acting cylinder.	• Stamping device.
• Control of a double acting cylinder with bistable valve.	• Frame press.
• Control of a double acting cylinder from two independent locations.	• Holding device.
• Control of a double acting cylinder from two simultaneous locations.	• Stamping wooden parts.
• Regulation of the speed of a double acting cylinder.	• Distribution of boxes.
• Increase in the speed of a double acting cylinder.	• Control of casting ladle.
• Memory function with a monostable valve.	• Warehouse clearance.
• Detection and control of the position of a cylinder.	• Distribution and separation of parts.

ELECTROPNEUMATIC	
• Single control of a single acting cylinder with a monostable electrovalve.	• Detection and control of the position of a double acting cylinder with mechanical stroke limiters.
• Single control of a double acting cylinder with a monostable electrovalve.	• Detection and control of the position of a cylinder with magnetic detectors.
• Control of a single acting cylinder with bistable electrovalve.	• Sequence with choice of single or continuous cycle.
• Control of a double acting cylinder with bistable electrovalve.	• Transfer of packets.
• Control with a monostable electrovalve, with bistable effect (memory).	• Riveting device.

Complete laboratory

Part Number	Description	Qty.
SAI7378	Pneumatics / electropneumatics pack	4
SAI2254	AutoSIM-200, 16 educational licenses	1
SAI7377	Posters of symbols	1
SAI7343	Pneumatic magnetic symbols kit	1

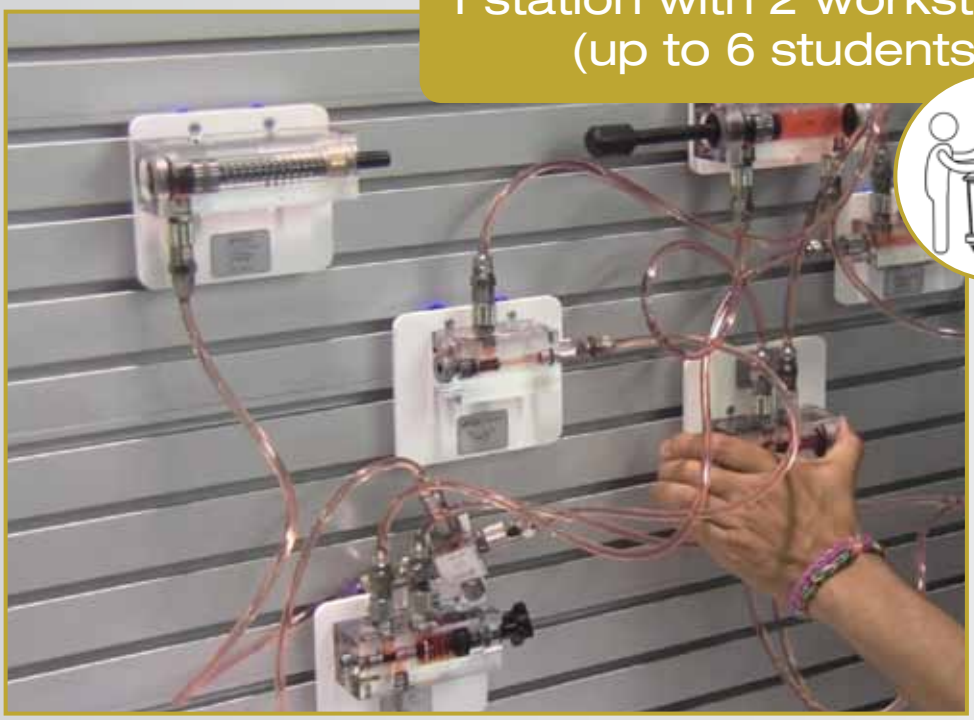
4 stations with 2 workstations (up to 24 students)

SAI7379

PNEUMATICS/ TRANSPARENT HYDRAULICS PACK

SAI7400

1 station with 2 workstations (up to 6 students)



- Aquire knowledge
- Design and simulate the circuits
- Test and operate the real circuits with more than 30 activities available

Composition of the pack:

Part Number	Description	Qty.
SAI2065	Rolling table with twin-post	1
SAI2074	Drawer unit for rolling table with lock	2
SAI4-2281	PNEU-401: Basic pneumatics kits	1
SAI9500	MOD-201: Transparent hydraulic level I kit	1
SAI9501	MOD-202: Transparent hydraulic level II kit	1
SAI9410	Portable hydraulic pump for transparent hydraulic	1
SAI9411	Oil with special red colouring	1
SAIU020-001	SINGLE USE licence for the eLEARNING-200 pack of courses	6
SAI2252	AutoSIM-200, 1 educational license	2
SAI7401	Poster of the composition PNEU-401	1
SAI7402	Poster of the compositions MOD-201 and MOD-202	1

List of activities for PNEU-401, MOD-201 and MOD-202:

PNEUMATICS	
• Direct control of a single acting cylinder.	• Delay in a control signal.
• Indirect control of a single acting cylinder.	• Activation of a control signal according to the pressure.
• Indirect control of a double acting cylinder.	• Stamping device.
• Control of a double acting cylinder with bistable valve.	• Frame press.
• Control of a double acting cylinder from two independent locations.	• Holding device.
• Control of a double acting cylinder from two simultaneous locations.	• Stamping wooden parts.
• Regulation of the speed of a double acting cylinder.	• Distribution of boxes.
• Increase in the speed of a double acting cylinder.	• Control of casting ladle.
• Memory function with a monostable valve.	• Warehouse clearance.
• Detection and control of the position of a cylinder.	• Distribution and separation of parts.

TRANSPARENT HYDRAULICS	
• Gear pump, lock up valve (or flow valve here with the same function), pressure gauge.	• Flow rate regulation valve.
• Pressure limiter valve.	• Resistance to fluid passage.
• Stopcock (distributor).	• Differential circuit.
• Single acting cylinder.	• Back pressure.
• Double acting cylinder.	• Check valve with choke.
• Check valve.	• Check valve with unblocking.
• Flow valve (choke valve).	

Complete laboratory

Part Number	Description	Qty.
SAI7400	Pneumatics / transparent hydraulics pack	4
SAI2254	autoSIM-200, 16 educational licenses	1
SAI7377	Posters of pneumatic symbols	1
SAI7390	Posters of hydraulic symbols	1

4 stations with 2 workstations (up to 24 students)

SAI7403

HYDRAULICS / ELECTROHYDRAULICS PACK

SAI7391

1 station with 2 workstations (up to 6 students)

- Aquire knowledge
- Design and simulate the circuits
- Test and operate the real circuits with more than 30 activities available

Composition of the pack:

Part Number	Description	Qty.
SAI9280	Hydraulic rolling table with double face panel	1
SAI9274	Hose support accessory (x2)	1
SAI9261	Hydraulic pump for two workstations	1
SAI9260	Set of drawers with lock	2
SAI9506	HYD-201: Hydraulics level I kit	2
SAI9507	HYD-202: Hydraulics level II kit	2
SAI9508	HYD-203: Electro-hydraulics kit	2
SAIU020-001	SINGLE USE licence for the eLEARNING-200 pack of courses	6
SAI2252	AutoSIM-200, 1 educational license	2
SAI7389	Poster of the composition (HYD-201 - HYD-202 - HYD-203)	1

List of activities for HYD-201, HYD-202 and HYD-203:

HYDRAULICS	
• Pressure generation. Pump specifications.	• Speed adjustment. Adjustment at the output.
• Directly operated pressure limiter valve.	• Speed adjustment in subtraction.
• Distributor valves 2/2, 3/2, 4/2.	• Check valve with unblocking (piloted).
• Double acting cylinder.	• Back pressure. Uniform advance of the piston.
• Check valve.	• Input and output flow regulation.
• Flow rate regulation valve.	• Pressure reducer valve.
• Flow regulation valve with pressure compensation.	• Indirect control pressure limiter valve.
• Adjustable choke valve with check.	• Consecutive control depending on the pressure valve (circuit with sequence valves).
• Resistance to fluid passage (load losses).	• Quick feed circuit (two speeds).
• Distributor valve 4/3.	• Hydraulic motor.
• Differential circuit.	• Accumulator.
• Pressure adjustment.	• Pressure regulation circuit.
• Speed adjustment. Adjuadjustmentstment at the input.	• Speed adjustment Differences between choke and pressure compensated flow regulator.

ELECTROHYDRAULIC	
• Feed and return circuits from one cylinder at will.	• Circuit with pressure switches.
• Self-retaining in an electronic-hydraulic circuit.	• Control of a cylinder with mechanical interlocking.
• Control of a double acting cylinder with stroke limiters.	• Drive with intermediate stop Electrical interlocking.
• Drive progress with initial conditions.	• Sequential circuit according to the pressure and route.
• Circuit with initial safety condition and intermediate stops at will.	

Complete laboratory

Part Number	Description	Qty.
SAI7391	Hydraulics / electrohydraulics pack	4
SAI2254	AutoSIM-200, 16 educational licenses	1
SAI7390	Posters of hydraulic symbols	1
SAI9553	Basics of hydraulic theory in English	1

4 stations with 2 workstations (up to 24 students)

SAI7392

CERTIFICATION

SMC Competence Center

Complete International Certification programme based on the skills development associated to Automation technologies

Why SMC Competence Center?

Because…

…different industrial sectors are moving towards automated processes.

…manufacturing companies are demanding skilled workers (operators, technicians, engineers) in the new technologies associated with automation.

...SMC, by being the worldwide leader in providing solutions to the global market is aware of the real industrial need.

SMC
INTERNATIONAL TRAINING

...SMC International Training has specialized in identifying the skill demands in automation and provide training solutions to face the challenge.

…technical colleges and universities require the expertise and support from industry leaders to satisfy the demands from their community.

...SMC wants to contribute to this demand by structuring a powerful programme providing international standard certification in automation / mechatronics.

Reach the top of the automation pyramid

SMC Competence Center - The model

SMC International Training has developed a Competence Center model where all participants contribute and receive skills.

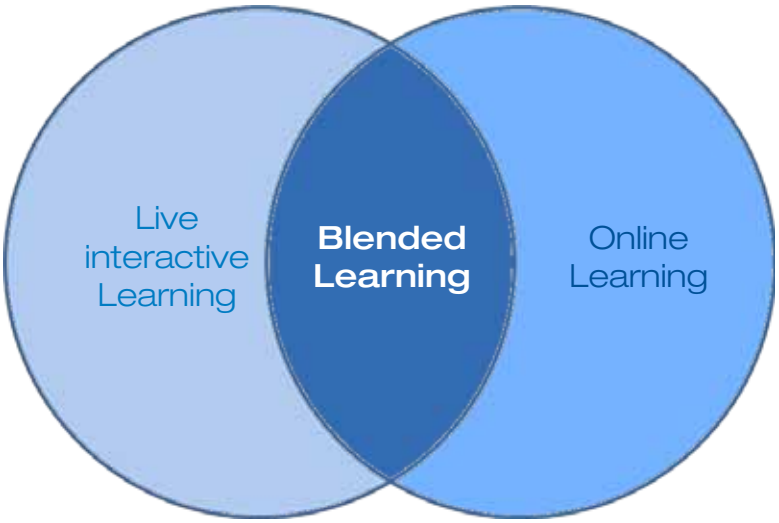
Receiving / Providing	SMC International Training	Partner college	Teachers	Students
SMC International Training		Consultancy, equipment adapted to programmes and certification	Training, assessment and certification	Certification
Partner college	Local knowledge, equipment acquisition and facilities		Salaries and support	Facilities, programme and certification
Teachers	Training under SMC standards	Technical expertise and SMC certification		Training
Students		Tution fees		

SMC Competence Center - The methodology

Blended learning provides the perfect combination to accomplish the training objectives.

Highly interactive e-learning modules allows the student to go through the fundamentals of the different technologies, whereas the state of the art training equipment allow the development of different skills needed in the automated industry.

Online assessment of the fundamentals and skills evaluation on the equipment, will allow the center to certify the students with a recognized international industrial certification.



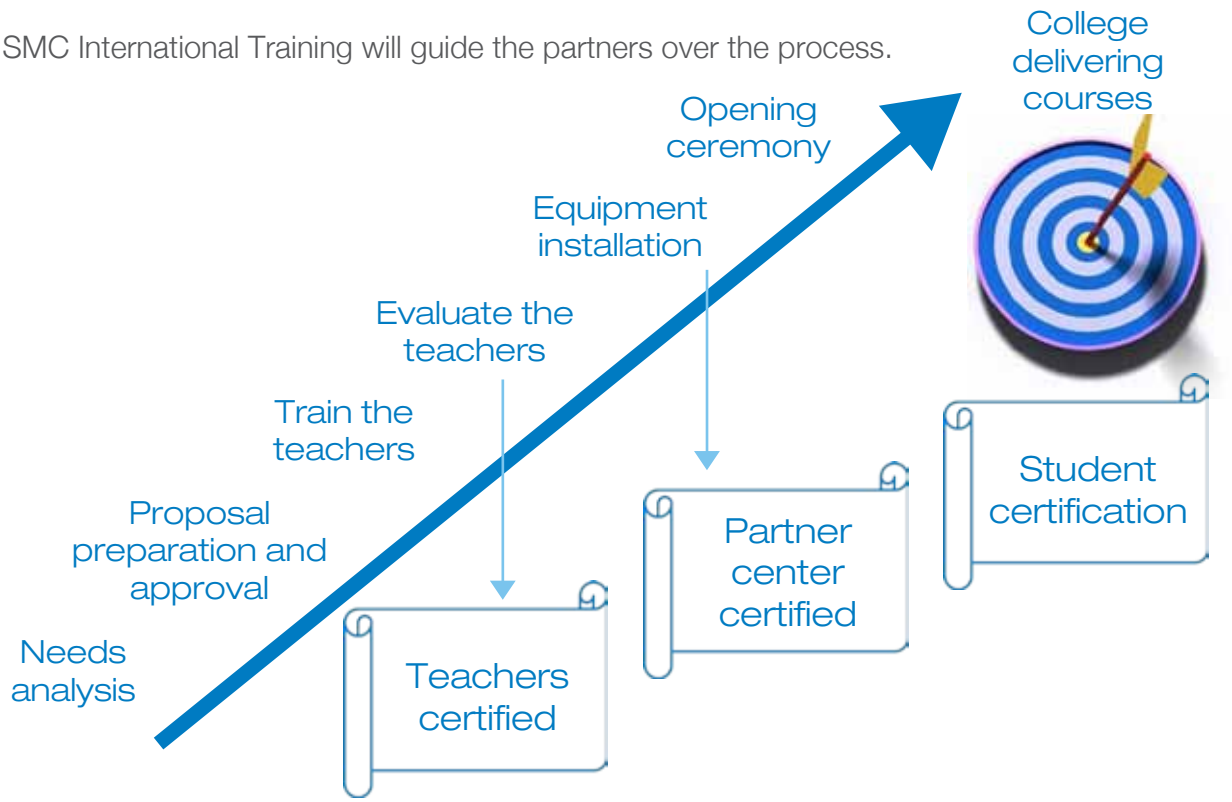
SMC Competence Center - Flexibility

The wide range of courses and training equipment will allow this model to adapt to any technical programme in the fields of automation, industrial processes and mechatronics.

The equipment also enables the center to use controls/robots used in local industry. SMC International Training team is able to support most of the recognized PLC and robotics brands in the global market and integrate them into the training systems. The partner college can choose to suit local demand.

SMC Competence Center - The process

SMC International Training will guide the partners over the process.



SMC Competence Center - Benefits

With SMC Competence Center the winners are:

Partner college	Teacher	Student
Prestige	Training to industrial standards	Skill development
Income / ROI	Upskilling	Credited programme
International network Competence Center	Certification	International Industrial Certification
	International network membership	

PROGRAMMING TOOLS

PLC PROGRAMMING TOOLS - SOFTWARE AND CABLE

PLC		SOFTWARE PLC			CABLE
BRAND	MODEL	NAME	LANGUAGE	REFERENCE	REFERENCE
Allen Bradley	MicroLogix	RSLogix Micro starter	EN	SAI7336	SAI7242
Allen Bradley	MicroLogix	RSLogix Micro starter	ES	SAI7335	SAI7242
Allen Bradley	CompactLogix	RSLogix 5000 Lite Edition	ES, EN, PT, FR, DE, IT, JP, KO, ZH	SAI7245	SAI7242
Omron	CP1L	CX-One	ES, EN, FR, DE, IT, JP, KO, ZH	SAI0037	SAI7242
Omron	CJ	CX-One	ES, EN, FR, DE, IT, JP, KO, ZH	SAI0037	SAI7242
Siemens	S7-1200	Step 7 Basic	ES,EN, FR, DE, IT, ZH	SAI7243	SAI7242
Siemens	S7-1500 S7-300 PN	Step 7 (Tia portal)	ES,EN, FR, DE, IT, ZH	SAI7261	SAI7242
Mitsubishi	FX SERIES	GX-Works	EN	SAI7249	SAI0006
Mitsubishi	Alpha	(AL-PCS/ WIN-EU)	ES,EN, FR, DE, IT, SE	SAI7266	SAI7260
Schneider	Twido	Twido Suite	ES,EN, FR, DE, IT, ZH	SAI7264	SAI7252

Note 1: *In the event that the software / PLC and industrial systems communications programming cable coincide, it is not necessary to duplicate it.*

Note 2: *The references include unit quantities.*

Note 3: *ZH=Chinese, EN=English, FR=French, DE=German, IT=Italian, JP=Japanese, KO=Korean, PT=Portuguese, ES=Spanish, SE=Swedish*

INDUSTRIAL SYSTEMS COMMUNICATIONS CONFIGURATION TOOLS - SOFTWARE AND CABLE

PLC	INDUSTRIAL COMMUNICATION	INDUSTRIAL COMMUNICATIONS SOFTWARE			CABLE
BRAND / MODEL	STANDARD	NAME	LANGUAGE	REFERENCE	REFERENCE
Allen Bradley - MicroLogix	Ethernet/IP	RSLogix Micro starter	EN	SAI7336	SAI7242
Allen Bradley - MicroLogix	Ethernet/IP	RSLogix Micro starter	ES	SAI7335	SAI7242
Allen Bradley - Compact-Logix	Ethernet/IP	RSLogix 5000 Lite Edition	ES, EN, PT, FR, DE, IT, JP, KO, ZH	SAI7245	SAI7242
Omron	Ethernet/IP	CX-One	ES, EN, FR, DE, IT, JP, KO, ZH	SAI0037	SAI7242
Siemens S7-1200	Profinet	Step 7 Basic	ES,EN, FR, DE, IT, ZH	SAI7243	SAI7242
Siemens S7-300 PN / S7-1500	Profinet	Step 7 (Tia portal)	ES,EN, FR, DE, IT, ZH	SAI7261	SAI7242
Mitsubishi FX series	RS-485, Profibus, Ethernet/IP	GX-Works	EN	SAI7249	SAI0006
Schneider Twido	Modbus	Twido Suite	ES,EN, FR, DE, IT, ZH	SAI7264	SAI7252
Schneider Twido	Modbus/TCP	Twido Suite	ES,EN, FR, DE, IT, ZH	SAI7264	SAI7242

Note 1: *In the event that the software / PLC and industrial systems communications programming cable coincide, it is not necessary to duplicate it.*

Note 2: *The references include unit quantities.*

Note 3: *ZH=Chinese, EN=English, FR=French, DE=German, IT=Italian, JP=Japanese, KO=Korean, PT=Portuguese, ES=Spanish, SE=Swedish*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