7 options to choose from to study different mechanical handling techniques

In the following TECHNOLOGIES...

- ELECTRICAL PANEL
- PNEUMATICS
- VACUUM
- ELECTRIC MOTORS
- SENSORS
- PROGRAMM. CONTROLLERS
- MANIPULATORS
- MOTION CONTROL

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Develop the SKILLS...

MAP-206

MAP-207

ANALYSIS

TROUBLESHOOTING

DESIGNING

TECH DOCS.

CREATION

INSTALLATION

AND ASSEMBLY

TECH DOCS.

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.

Anodised aluminium structure
Solenoid valve block
Electric connection terminals
Control keypad
User manual and practice manual
Labels for cables
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.
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.

- 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.

- 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.
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

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAI1005</td>
<td>MAP-205 Assembly minicell (without PLC)</td>
</tr>
<tr>
<td>SAI1125</td>
<td>MAP-205 with Siemens PLC</td>
</tr>
<tr>
<td>SAI1225</td>
<td>MAP-205 with Omron PLC</td>
</tr>
<tr>
<td>SAI1325</td>
<td>MAP-205 with Mitsubishi PLC</td>
</tr>
<tr>
<td>SAI1425</td>
<td>MAP-205 with Allen-Bradley PLC</td>
</tr>
<tr>
<td>SAI1525</td>
<td>MAP-205 with Schneider PLC</td>
</tr>
</tbody>
</table>
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.
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.
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).

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.

**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.*
MAP-200 - Options

MAP-200 has a series of optional extras.

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

• 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.

* 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.

• 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.
# MAP-200 - Technical features

<table>
<thead>
<tr>
<th>MAP-201</th>
<th>770x580x445mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modules</td>
<td>Sensors (type &amp; qty.)</td>
</tr>
<tr>
<td>Part feeder</td>
<td>Auto-switch, Reed type (x4)</td>
</tr>
<tr>
<td>Position verification</td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td></td>
</tr>
<tr>
<td>Rejecting incorrect parts</td>
<td></td>
</tr>
<tr>
<td>Other devices (quantity)</td>
<td>Actuators (type &amp; quantity)</td>
</tr>
<tr>
<td>Air treatment unit (x1)</td>
<td></td>
</tr>
<tr>
<td>Speed controllers (x6)</td>
<td></td>
</tr>
<tr>
<td>Power supply source (x1)*</td>
<td></td>
</tr>
<tr>
<td>Control PLC **</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAP-202</th>
<th>740x400x445mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modules</td>
<td>Sensors (type &amp; qty.)</td>
</tr>
<tr>
<td>Part diversion</td>
<td>Auto-switch, Reed type (x4)</td>
</tr>
<tr>
<td></td>
<td>Vacuum pressure switch (x1)</td>
</tr>
<tr>
<td>Other devices (quantity)</td>
<td>Actuators (type &amp; quantity)</td>
</tr>
<tr>
<td>Air treatment unit (x1)</td>
<td></td>
</tr>
<tr>
<td>Speed controllers (x4)</td>
<td></td>
</tr>
<tr>
<td>Vacuum pad(x3)-Vacuum ejector(x1)</td>
<td></td>
</tr>
<tr>
<td>Power supply source (x1)*</td>
<td></td>
</tr>
<tr>
<td>Control PLC **</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>MAP-203</th>
<th>740x400x345mm</th>
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<tbody>
<tr>
<td>Modules</td>
<td>Sensors (type &amp; qty.)</td>
</tr>
<tr>
<td>Part diversion</td>
<td>Auto-switch, Reed type (x3)</td>
</tr>
<tr>
<td>Other devices (quantity)</td>
<td>Actuators (type &amp; quantity)</td>
</tr>
<tr>
<td>Air treatment unit (x1)</td>
<td></td>
</tr>
<tr>
<td>Speed controllers (x2)</td>
<td></td>
</tr>
<tr>
<td>Power supply source (x1)*</td>
<td></td>
</tr>
<tr>
<td>Control PLC **</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>MAP-204</th>
<th>740x400x285mm</th>
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</thead>
<tbody>
<tr>
<td>Modules</td>
<td>Sensors (type &amp; qty.)</td>
</tr>
<tr>
<td>Part diversion</td>
<td>Auto-switch, Reed type (x4)</td>
</tr>
<tr>
<td></td>
<td>Solid state (x2)</td>
</tr>
<tr>
<td>Other devices (quantity)</td>
<td>Actuators (type &amp; quantity)</td>
</tr>
<tr>
<td>Air treatment unit (x1)</td>
<td></td>
</tr>
<tr>
<td>Speed controllers (x4)</td>
<td></td>
</tr>
<tr>
<td>Power supply source (x1)*</td>
<td></td>
</tr>
<tr>
<td>Control PLC **</td>
<td></td>
</tr>
</tbody>
</table>

* Not included in kit version.
** Options: Without PLC, Siemens, Omron, Mitsubishi, Allen Bradley, Schneider. Not included in kit version.
### MAP-205

**1200x762x445mm**

<table>
<thead>
<tr>
<th>Modules</th>
<th>Sensors (type &amp; qty.)</th>
<th>Input / Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base feeder</td>
<td>Auto-switch, Reed type (x15)</td>
<td></td>
</tr>
<tr>
<td>Position verification</td>
<td>Inductive detector (x1)</td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>Barrier type photocell (x2)</td>
<td></td>
</tr>
<tr>
<td>Rejecting an inverted base</td>
<td>Vacuum pressure switch (x1)</td>
<td></td>
</tr>
<tr>
<td>Bearing assembly</td>
<td>Solid state (x2)</td>
<td></td>
</tr>
<tr>
<td>Insertion shaft in the assembly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positioning of the lid</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Other devices (quantity)**

- Breakdown simulation box (x1)
- Air treatment unit (x1)
- Speed controllers (x17)
- Power supply source (x1)
- Control PLC **

**Actuators (type & quantity)**

- Pneumatic linear (x6)
- Pneumatic rotary actuator (x1)
- Pneumatic roto-linear actuator (x1)
- Pneumatic gripper (x2)

### MAP-206

**750x590x400mm**

<table>
<thead>
<tr>
<th>Modules</th>
<th>Sensors (type &amp; qty.)</th>
<th>Input / Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positioning axis</td>
<td>Auto-switch, Reed type (x2)</td>
<td>Digital 10/15</td>
</tr>
<tr>
<td>Warehouse</td>
<td>Encoder (x2)</td>
<td></td>
</tr>
</tbody>
</table>

**Other devices (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)

**Actuators (type & quantity)**

- 24VDC electrical linear (x1)
- Servo-motor electrical linear (x2)
- Electromagnet (x1)

### MAP-207

**500x400x400mm**

<table>
<thead>
<tr>
<th>Modules</th>
<th>Sensors (type &amp; qty.)</th>
<th>Input / Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeding and detecting the parts</td>
<td>Auto-switch, Reed type (x7)</td>
<td>Digital 13/10</td>
</tr>
<tr>
<td>Rejection manipulator</td>
<td>Magnetic adjustment (x1)</td>
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</tr>
<tr>
<td>Displacement manipulator</td>
<td>Vacuum pressure switch (x1)</td>
<td></td>
</tr>
<tr>
<td>Stopper</td>
<td>Inductive detector (x1)</td>
<td></td>
</tr>
</tbody>
</table>

**Other devices (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)

**Actuators (type & quantity)**

- 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.