

TRAINING SYSTEMS & MODELS

Training panels



P. 141 - 151

Fieldbus



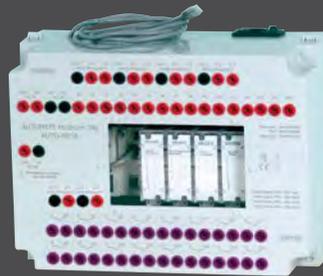
P. 152 - 153

Training systems



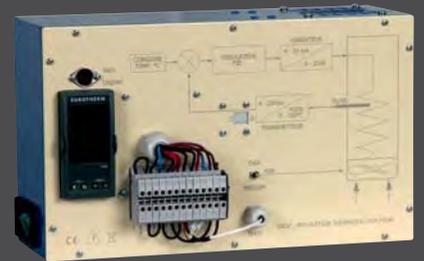
P. 154 - 163

PLC



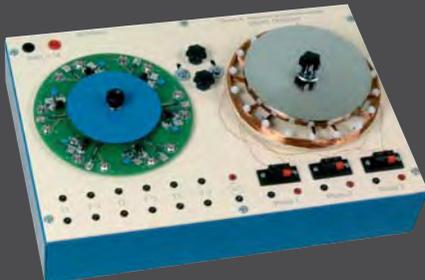
P. 164 - 167

Regulation



P. 168 - 177

Motor system



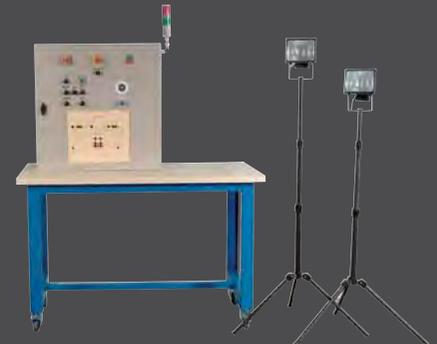
P. 178 - 182

Programming



P. 183 - 186

Energy



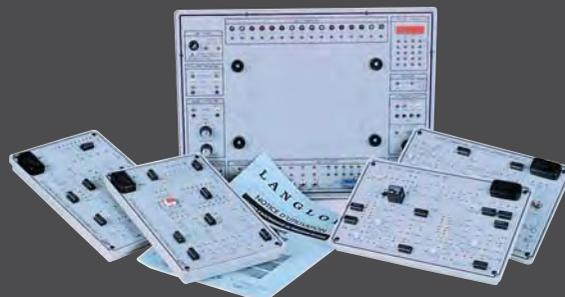
P. 187 - 190

Sensors



P. 191 - 195

Circuit lab



P. 196 - 200

Test units



P. 201 - 202

Home PLC panel



Using PROGRAMIX, students automate a house with the PLC. This easy-to-use software offers a wide range of user-friendly functions: clock, timer switch, counter, etc. The "Simulation" function tests the programme before it is used for real.

Features of the base

- Base on large wheels
- easy to move.
- Dim. L x W x H: 1500 x 690 x 1980mm
- Melamine surface: 1200 x 1700mm

Components located on the panel

- A modular table with protective devices (30mA).
- 1 PLC
- 3 lighting circuits (outside, living room and kitchen)
- 1 dusk-to-dawn switch with its own cell
- 1 500W convector
- 1 adjustable thermostat
- 1 external temperature probe
- 1 electric roller blind with Up/Down switch
- 1 intrusion detector and 1 siren
- 1 remote telephone transmitter
- 1 remote telephone set

Features of the programmable interface

- 12 inputs
- 8 dry contact outputs
- 1 local programming and status display
- 1 CD-based programming software package
- 1 RS232 lead between the PC and the programmable

- Panel supplied with a full wiring diagram and all of the detailed instructions for each component.
- The items on the panel may be different from one series to another depending on manufacturer alterations.

PROPOSED HOME AUTOMATION SCENARIOS

- Closing the blind and switching on the heating if the external temperature drops.
- Remotely controlling the alarm, the lighting and the blind, by telephone.
- Controlling the lighting and roller-blinds so it looks as if the house is occupied
- Controlling the lighting and roller-blinds depending on how bright it is outside
- A range of other scenarios are also possible

IMPORTANT: The panel is fitted with a stand-alone telephone line. Commands sent from the telephone set that is supplied with the system are not routed via the school's telephone network or via the public telephone network.



ref. PROGRAMIX-C



ICO cables (placed between the 2 melamine plates that the panel comprises) connect the components together.

Home automation management of energy saving



ref. CHAUFIX-C

This panel presents the home automation management of energy saving functions by using electric management modules. It uses modern products such as pilot wire heating, control of roller-blinds, a power manager, a load shedding function and remote control via a telephone.

A home automation scenario illustrates the general operation of all this equipment.

Features of the base

- Base on large wheels
- Easy to move.
- Dim. L x W x H: 1500 x 750 x 1980mm.
- Melamine surface: 1200 x 1700mm.

Panel components

- 1 power manager
 - weekly programming of 8 heating areas with pilot wire
 - adjustment to the nearest minute
 - copy/paste function for simpler programming
 - programmable absences of between 1 and 99 days
 - control according to the external temperature
 - single-phase load shedding
 - control of 2 relay outputs
 - 220V power supply
- 2 radio break contacts designed to switch off the convectors
- 1 external temperature probe
- 1 telephone transmitter associated with a telephone and a unit
- 1 telephone interface
 - communicates with the power manager
 - voice assistance and interphone dialogue.
 - indicates the temperature of the part
 - allows the roller-blind, heating and lighting to be controlled via the telephone.
- 2 500W convectors with pilot wire
- 1 roller-blind with Up/Down switch
- 1 external light
- 1 modular table
- A set of circuit breakers, including a 30mA residual current type
- Control switches for the roller-blind and lighting

- Panel supplied with a comprehensive wiring diagram and all of the detailed instructions for each component.
- The items on the panel may be different from one series to another depending on manufacturer alterations.

IMPORTANT: The panel is fitted with a stand-alone telephone line. Commands sent from the telephone set that is supplied with the system are not routed via the school's telephone network or via the public telephone network.

PROPOSED HOME AUTOMATION SCENARIOS

- Pilot wire control of the two convectors, programming to reflect your lifestyle (presence in the room or otherwise, night/day/time range, etc.)
- Load shedding of 1 or 2 convectors depending on the current consumption.
- Heating control according to fluctuations in the external temperature.
- Roller-blind moves up or down by means of a control button, or in automatic mode according to the external temperature.
- Convectors are automatically switched off as soon as a window is opened.
- Remote control of the electric roller-blind, convectors and external lighting via the telephone.

Students must wire the various components (roller-blind, convectors and automatic switchboard, etc.) and program the management module. All of the marked connections are wired to a terminal block.



Home automation panel with touchscreen and radio components



Compatible with our wireless anti-intrusion alarm control panel.
Ref GES-92
See page 148

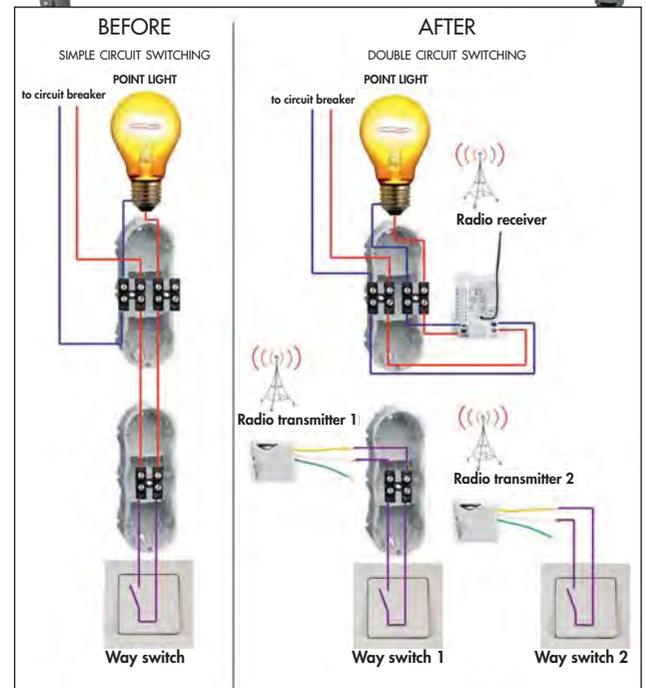
ref. DOMOPLUS

The DOMOPLUS panel includes home automation items for studying, programming and cabling the communicating radio components used in housing renovation. Controlled by switch, remote telephone or colour touchscreen, these control lighting, openings (blinds, gates), heating, sprinklers, etc. To familiarize students with the cabling, each electrical component is connected using a terminal strip to its control or receiver module. A removable translucent plate covers the connections and protects the electrical contacts.

Components located on the panel:

- 1 modular panel equipped with 5 circuit-breakers and one differential 30mA
- 5 lighting circuits "living room" "kitchen" "garage" "garden" Including: 5 one-way switches, 2 two-way switches, 1 double switch, 1 radio switch, 7 radio transmitters, 4 radio receivers, 1 radio receiver with dimmer, 1 radio door opening detector, 4 lamps.
- 3 motor opening circuits:
 - 1 motor roller shutter (230v) with 1 Up/Down switch + 1 radio transmitter + 1 Up/Down radio receiver.
 - 1 garage door and 1 gate (simulated by 2 boxes with indicator lights) + 2 Open/Close pushbuttons + 2 radio receivers
- 1 heater 500W + 1 radio receiver.
- 1 sprinkler pump (simulated by indicator light) + 1 radio receiver.
- 1 remote control by telephone including: 1 autonomous telephone line (without link to school's telephone network), 1 telephone handset + 1 transmitter combined with 2 radio receivers controlling 2 lighting sets or the roller shutter.
- 1 touchscreen 480x272 pixels capable of managing the radio components of the dwelling with built-in tutorial for component configuration. Coloured icons for intuitive programming of the various scenarios, e.g. closing the roller shutter, simultaneous switching off of lamps, and start of sprinkling. One function restores the factory settings.

IMPORTANT: *The panel is fitted with a stand-alone telephone line. Commands sent from the telephone set that is supplied with the system are not routed via the school's telephone network or via the public telephone network.*



Coupling a receiver + transmitter pair through the protection window by pressing a contact.

Home energy use panel



ref. ECODOM-C



ICO cables (placed between the 2 melamine plates that the panel comprises) connect the components together

With ECODOM, students tackle measuring power, currents, load shedding and the ideal settings for domestic lighting and heating circuits

Features of the base

- Base on large wheels
- easy to move.
- Dim. L x W x H: 1500 x 690 x 1980mm
- Melamine surface: 1200 x 1700mm

Components located on the panel

- 1 watt-hour meter displaying:
 - The total power consumed for tariff 1 and 2.
 - The partial power consumed for tariff 1 and 2.
 - The instantaneous active power consumed.
 - The max. active power for tariff 1 and 2.
- 1 500mA mains installation residual current circuit breaker at the front of the unit, after the meter.
- 1 modular table consisting of:
 - 1 circuit breaker protection set, including 1 30mA residual current type.
 - 1 adjustable cut-off device with 2 secondary circuits
 - 9 modules with 4mm safety terminals, including:
 - 7 for measuring currents
 - 2 for measuring voltages (mains and low-voltage).
- 4 lighting circuits with fitted circuit breaker
 - for an 18W fluorescent tube
 - for a wall light with a 100W incandescence light bulb
 - for a wall light with a 20W energy-efficient light bulb
 - for a 50W low-voltage spotlight
- 3 heating circuits with
 - two 1000W convectors.
 - a 600W radiant.

- Panel supplied with a full wiring diagram and all of the detailed instructions for each component.
- The items on the panel may be different from one series to another depending on manufacturer alterations.

PRACTICAL APPLICATIONS INCLUDE

- Measuring instantaneous consumption and consumption over time using the watt-hour meter.
- Varying consumption according to usage between two periods
- Distributing power consumption between two tariffs
- Managing overconsumption (watt-hour meter and load shedding)
- Measuring the two voltages available on the panel
- Measuring the current using modules fitted with safety terminals (Without modification, currents are measured using a standard ammeter or a hook-on ammeter).

Jumper wires panel



ref. BASIFIL-1



Standard home components are interconnected on this panel using safety terminals. All of the double insulation components are fitted with safety terminals.

Features of the base

- Base on large wheels
- easy to move.
- Dim. L x W x H: 1500 x 690 x 1980mm
- Melamine surface: 1200 x 1700mm

Components located on the panel

- 1 single-phase 30mA residual current circuit breaker (1)
- 2 10A circuit breakers (1)
- 1 16A circuit breaker (1)
- 1 dusk-to-dawn switch with cell (1)
- 1 timer (1)
- 1 remote control switch (1)
- 1 clock (1)
- 2 40W light bulkhead luminaires
- 2 simple lighting circuit breakers
- 2 two-way switches
- 2 simple push-buttons
- 2 16A 2P+E sockets
- 1 roller-blind control
- 2 connection terminal blocks
- 1 heating indicator light
- 1 500W convector
- 1 roller-blind

Other components: upon request

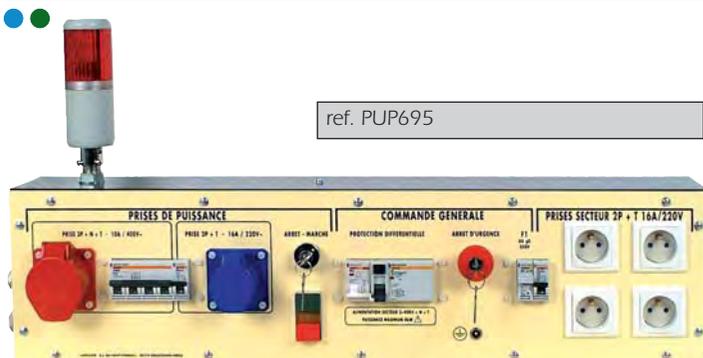
(1) items in a transparent case. High-visibility components.

- Panel supplied with a full wiring diagram and all of the detailed instructions for each component.
- The items on the panel may be different from one series to another depending on manufacturer alterations.

PRACTICAL APPLICATIONS INCLUDE:

- A simple introduction to circuit protection.
- Simple switching on and dubbing of phases and neutrals.
- Two-way switch fitting.
- Fitting a light with a timer.
- Fitting a light with a dusk-to-dawn switch
- Fitting a light with a remote control switch.
- Circuits controlled by the timer switch (clock).
- Creating a sockets circuit.
- Supplying power to a radiator with a built-in thermostat.
- Controlling a roller-blind

Industrial power unit



ref. PUP695

Fully-wired power console, ready to be connected to the 3-phase mains, designed to supply a maximum total power of 4kW with:

- emergency stop + On/Off button with lamp, and memory function.
- 1 30mA residual current circuit breaker
- 1 three-phase industrial socket +N+E with its circuit breaker.
- 1 single-phase industrial socket + E with its circuit breaker.
- 1 key-operated switch + 1 double push-button which prevents the use of industrial sockets
- 4 2P+E+circuit breaker protection sockets
- 1 single-colour remote signal beacon, total length: 800mm
- single colour: beige

Access control & Light control systems

The GES series is a series of wiring, programming, and study panels.

- 1 educational, reinforced electrical cabinet and modular equipment. 220V AC power supply. Protected by circuit breakers, including one 30mA.
- Base on wheels, dimensions: 750 x 670mm Height: 950mm
- White melamine panel. Dimensions: 1000 x 750mm.
- The unit is supplied fully wired, in working order, with a wiring diagram, operating principle and detailed instructions for each component.

ACCESS CONTROL SYSTEM (BY SWIPE CARDS & ENTRY SYSTEM)



Profile view



Front view



Electrical cabinet



Control swipe cards



Terminal block built into the cabinet



Electric door opener

COMMUNICATING

Panel used for studying, wiring and programming access control in three simulated "rooms". These "rooms" are closed off by swinging doors that are locked using an electric door opener system.

The student is required to interconnect the control module, the local readers, the entry system, the electric door openers, the push-buttons and their power supplies. All of the marked connections are wired to a terminal block. The student also programs the swipe cards and the digicode.

TECHNICAL FEATURES AND EQUIPMENT

- 1 access control module, 6 swipe cards and 1 entry system.

ref. GES-2-COM

GES-2 no communicating, without PLC

THE MONITORING SOFTWARE

Allows you to:

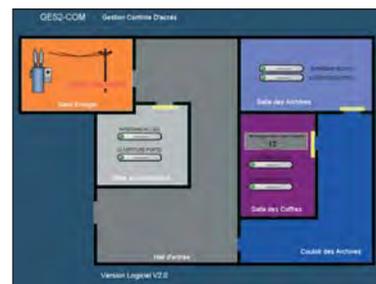
- acquire and display PLC variables
- Monitor and control of process
- create your own monitoring

Displays:

- access to each room
- door locking
- the mains power

controls:

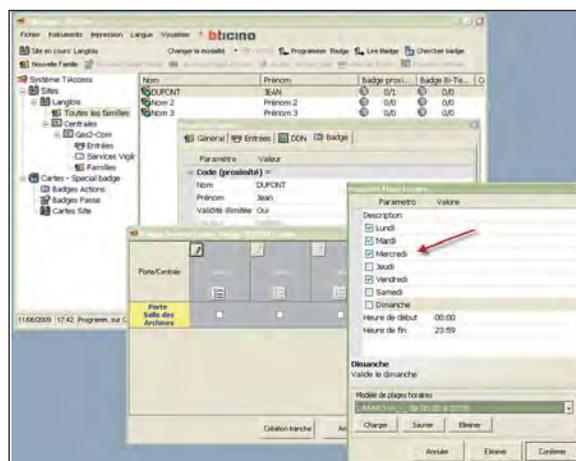
- access to rooms granted or denied



PROGRAMMING SOFTWARE BADGES PROVIDED

allows:

- To set the access door, for each door
- To set access permissions for users according to the hours and days of the week.
- To set the user and administrator badges based on their access authorization level.



These panels are supplied with PLC and a monitoring software.

FEATURES OF THE MONITORING SOFTWARE

- 9 24VDC inputs / 7 binary outputs
- Programming: sequential function chart or ladder language
- Ethernet connection to the IP computer network
- Software supplied with ladder language programme
- Fully functioning program: Supplied

ENTRY ACCESS & VIDEO ACCESS CONTROL SYSTEM



COMMUNICATING

THE MONITORING SOFTWARE

Allows you to:

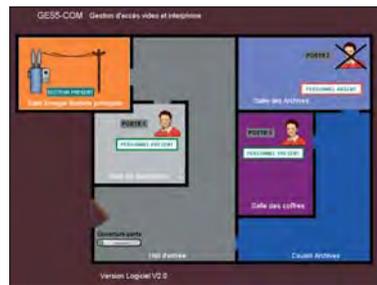
- acquire and display PLC variables
- Monitor and control of process
- create your own monitoring

Displays:

- a call
- power to the electric door opener
- the mains power

controls:

- opening the electric door latch



ref. GES-5-COM

ref. GES-5 no communicating, without PLC

Panel used for studying and wiring a building access system, with video monitoring and communication via the entry phone.

The student is required to interconnect the "street" end video unit, the videophone and the entry phones, the control buttons and the electric door opener. All of the marked connections are wired to a distributor and a terminal block.

TECHNICAL FEATURES AND EQUIPMENT

- 1 door, opening onto the "street", with electric door opener
 - 1 "street" video unit comprising: a camera / a loudspeaker / a 4-button caller keypad (one for each area)
 - 1 "building" videophone with a screen that is linked to the camera
 - 3 "building" entry phones
- The videophone and entry phones have a button which controls the electric door opener
- 1 4-channel distributor for interconnecting the videophone and entry phone



LIGHT CONTROL FOR A BUILDING



COMMUNICATING

THE MONITORING SOFTWARE

Allows:

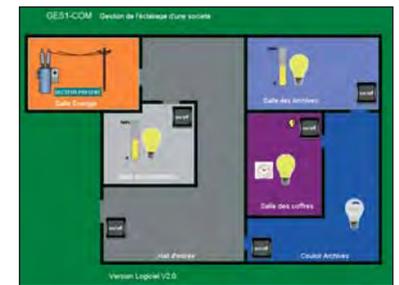
- the acquisition and display of PLC variables
- the monitoring and control of the process
- to create your own monitoring
- to create your own PLC program
- to configure an analogue card for a PLC

Displays:

- The status of spotlights in the 6 control rooms

controls:

- the lighting in each room



ref. GES-11-COM

ref. GES-11 no communicating, without PLC

Management panel to light the 6 rooms simultaneously. The student is required to interconnect the regulating modules, the sensors and the spotlights. All of the marked connections are wired to a terminal block.

TECHNICAL FEATURES AND EQUIPMENT

- 1 push button operated remote dimmer switch to control the spotlight brightness
- 1 push button operated remote dimmer switch to control brightness and a pre-sense sensor equipped with a 0-10V output to vary the lighting of spotlights depending on the amount of daylight.
- 1 dusk-to dawn switch to control the compact fluorescent lamp depending on the amount of daylight.
- 1 push-button operated timer with switch-off warning
- 1 presence detector with dusk-to-dawn cell to control a fluorescent tube
- 1 daily timer switch with infrared presence detector to control an incandescent lamp

NB: In this version, the TWIDO is also equipped with an analogue input card for the acquisition of 0-10V signals coming from the remote dimmer switch.



Anti-intrusion units

The GES series is a series of wiring, programming, and study panels.

- 1 educational, reinforced electrical cabinet and modular equipment. 220V AC power supply. Protected by circuit breakers, including one 30mA. (except GES-92)
- Base on wheels, dimensions: 750 x 670mm Height: 950mm
- White melamine panel. Dimensions: 1000 x 750mm.
- The unit is supplied fully wired, in working order, with a wiring diagram, operating principle and detailed instructions for each component.

ANTI-INTRUSION UNIT ON BUS WIRE



GES-7 is a programming and wiring panel for a BUS wired (two wires) anti-intrusion alarm unit. This unit monitors two areas in the business premises by means of a passive infrared sensor, a dual-technology intrusion sensor (infrared + microwave frequency) and two magnetic sensors which are triggered if the windows are opened. A keypad for entry code, which is built into the unit, activates or deactivates monitoring of the area.

A second remote keypad performs the same operation remotely. A contacts/BUS wiring interface makes it possible to connect any type of sensor with a contact opening onto the BUS network.

A stand-alone fire sensor is supplied with the GES-7.



Supplied with 2 detectors & 1 fire detector

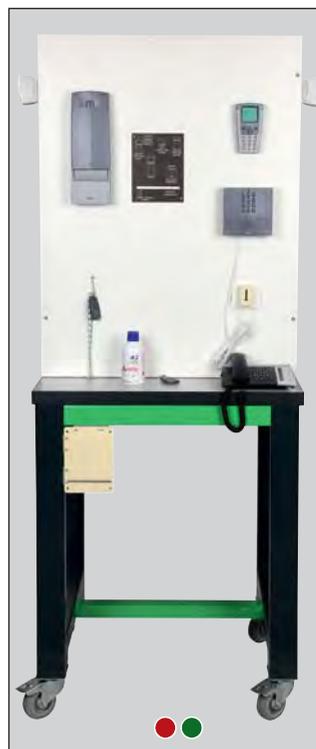
ref. GES-7

Students build the interconnections and carry out the programming between the unit on the one hand and the various sensors, keypads for code entry and siren on the other hand. All of the outputs are marked and attributed to a terminal where the wiring takes place.

TECHNICAL FEATURES AND EQUIPMENT

- 1 BUS unit monitors two areas and displays the events log. The built-in keypad activates and deactivates monitoring. 10 different codes: 1 master, 1 installer, 8 users.
- 1 radio keypad (information + controls) fitted with an LCD display.
 - displays the system status
 - controls the activation and deactivation of monitoring
 - customises the installation by clearly naming the system elements on an alphanumeric keypad.
- 1 siren with four different tones (intrusion – fire – technical – emergency)
- 1 dual technology intrusion sensor (infrared + microwave frequency). 12m range (90°)
- 1 infrared sensor
- 2 break contacts for protecting access points (doors and windows, etc.)
- 1 8 contacts/BUS interface for connecting contact sensors to the network.
- 1 optical smoke detector, with its own aerosol for testing purposes.

WIRELESS ANTI-INTRUSION UNIT



GES-92 is a panel used for studying and programming a wireless anti-intrusion alarm unit with a built-in siren. The unit is fitted with 2 passive infrared sensors and a magnetic sensor which is triggered if the window is opened. The keypad for code entry enables or disables the alarm remotely. A transmitter associated with an automatic switchboard reports any triggering of the alarm via a remote telephone. The transmitter is easy to program, thanks to its built-in keypad.

A stand-alone fire sensor is supplied with the GES-92.



Supplied with 2 detectors & 1 fire detector

ref. GES-92

Students program the unit, the various sensors, the keypad for code entry, the siren, the automatic switchboard and the transmitter.

TECHNICAL FEATURES AND EQUIPMENT

- 1 radio unit fitted with a siren which can be disabled. 4 programmable tones (intrusion, fire, technical and emergency).
- 1 radio keypad for receiving information and remote control, with LCD display: activation and deactivation. Fully on and partially on. 3 access codes: 1 master, 2 users. Log of the last 200 events. Information about the system status: activated and deactivated, open doors, etc. Siren test. System configuration. Allocation of sensors to partially on.
- 2 infrared sensor. 12m range
- 2 radio remote controller 4 buttons. Range 100 to 300m.
- 2 break contacts for protecting access points (doors and windows, etc.)
- 1 optical smoke detector with its own aerosol.
- 1 telephone interface
- 1 telephone
- 1 telephone transmitter carries out all the alarm transmission and reception functions. Voice assistance and interphone dialogue. 4 programmable telephone numbers. Message which can be personalised. Built-in keypad for activating and deactivating monitoring and for programming telephone numbers.

IMPORTANT: The panel is fitted with a stand-alone telephone line. Commands sent from the telephone set that is supplied with the system are not routed via the school's telephone network or via the public telephone network.

GES-3-COM and GES-6-COM supplied with PLC and a monitoring software.

FEATURES OF THE MONITORING SOFTWARE

- 9 24VDC inputs / 7 binary outputs
- Programming: sequential function chart or ladder language
- Ethernet connection to the IP computer network
- Software supplied with ladder language programme
- Fully functioning program: Supplied

INTRUDER ALARM CONTROL SYSTEM



COMMUNICATING THE MONITORING SOFTWARE

Allows you to:

- acquire and display PLC variables
- Monitor and control of process
- create your own monitoring

Displays:

- the status of the infrared and magnetic detectors
- the ON/OFF status of the alarm
- the room where the intrusion took place
- the mains power
- the status of the siren

controls:

- the monitoring and shutdown
- the siren



ref. GES-3-COM

ref. GES-3 no communicating, without PLC

Panel used for studying, wiring and programming an alarm unit that monitors three areas in the business premises, via two infra-red detectors and a magnetic detector triggered when the window is opened. In addition to the features on the basic model, the **GES-3-COM** version also has a PLC to connect to the Ethernet network and a PC monitoring software program. The student is required to interconnect the unit, the infrared detectors, the magnetic contact, the keypad, the siren and the flashing light. All of the marked connections are wired to a terminal block. The student is also required to programme the access code.

TECHNICAL FEATURES AND EQUIPMENT

- 1 stand-alone alarm unit (powered by mains and battery)
- 1 power supply for the sensors
- 2 infrared detectors
- 1 keypad for code entry (4 numbers)
- 1 siren
- 1 flashing light
- 1 magnetic door-opening detector fitted on the window



FIRM DOOR CONTROL SYSTEM



COMMUNICATING THE MONITORING SOFTWARE

Allows you to:

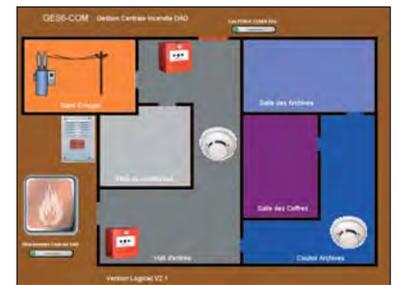
- acquire and display PLC variables
- Monitor and control of process
- create your own monitoring

Displays:

- opening of the emergency exit
- power supply to the electric bolt
- mains power on

controls:

- opening the electric door latch
- powering the siren
- Resetting the independent initiating detector



ref. GES-6-COM

ref. GES-6 no communicating, without PLC

GES-6 is a wiring and study panel for an independent initiating detector. The independent initiating detector detects a fire using 2 optical smoke detectors and 2 manual triggers. If a warning occurs, a magnetic bolt allows an emergency exit door to open. The student is required to interconnect the optical smoke detectors, the manual triggers, the independent initiating detector and the electric bolt. All of the marked connections are wired to a terminal block.

TECHNICAL FEATURES AND EQUIPMENT

- 2 resettable manual triggers with diaphragms
- 2 optical smoke detectors They can be activated using an aerosol that is supplied with the panel
- 1 independent initiating detector fitted with a maintenance-free battery (3 hours autonomy)
 - with reset push-button
 - with operating test push-button
- 1 door with electric bolt



Panel for studying a fire alarm in a dormitory



Front view

MAQFEU includes the main components making up a fire alarm with emergency lighting control for dormitory surveillance. Two sides mounted on wheeled frame for passing the doors. The student will learn about the cabling and programming of a real fire alarm control and signalling central unit. Supplied set up, with detailed instructions for each component and practical assignments on CD.

Dimensions: 1500 x 750mm Height 1980mm. Very easy to move.

ref. MAQFEU



Rear view

FRONT: DORMITORY SURVEILLANCE ROOM

- 1 electrical cabinet includes the residual current and magneto-thermal protection devices and all the cables of the various components on terminal strip. By following the diagram, students cable directly onto the terminal strip and not onto the component terminals which may be deteriorated. A multi-function BTM remote control from a central point puts all the SELUs to rest with mains outage. A light column, attached to the cabinet, shows voltage presence.
- 1 fire alarm control and signalling central unit ECS-CMSI 2 loops. In conformity with standards EN 54-2 (1997), EN 54-4 (1997), NF S 61-934, NF S 61-935, NF S 61-936 and NF S 61-940. This conventional central unit is designed to meet the requirements of the Fire Safety System category A.
- 1 Emergency electrical supply (AES) 24VDC for managing power supply to magnetic locks of the 2 emergency exits.
- 1 red manual call point with soft cover. With reset key.
- 1 automatic rate-of-rise device 57°C. Average detection area 30m2.
- 1 audible alarm device
- 3 illuminated action indicators for reporting the alarm using red LEDs.
- 1 box with 2 indicator lamps repeats the state of the 2 emergency exit doors.
- 1 box with 2 pushbuttons enables remote resetting of the emergency lighting and emergency exits.



BACK: 2 DORMITORIES AND 1 CORRIDOR

- 1 summary panel repeats the different information of the alarm central unit and voltage presence.
 - 1 self-contained audible alarm unit BAAS with emergency battery 6V
 - 3 red manual call points with soft cover. With reset key.
 - 1 call point with soft cover for unlocking the emergency exits. With reset key.
 - 2 optical smoke detectors. Detection area about 50m2
 - 1 automatic rate-of-rise device 57°C. Average detection area 30m2.
 - 2 burst type magnetic locks 24V with integral pushbutton attached to the 2 doors of the emergency exits.
 - 2 self-contained emergency home lighting units TWO-FUNCTION (BAES-BAEH). All LED lighting. Integral battery. Specially designed for buildings with sleeping quarters.
 - 1 self-contained emergency lighting unit EVACUATION (BAES). Integral battery.
- BAES = safety marking and lighting
BAEH = evacuation of premises in the event of failure of the normal lighting system

Security lighting control system

COMMUNICATING

- 1 educational, reinforced electrical cabinet and modular equipment. 220V AC power supply. Protected by circuit breakers, including one 30mA.
- Base on wheels, dimensions: 750 x 670mm Height: 950mm
- White melamine panel. Dimensions: 1000 x 750mm.
- The unit is supplied fully wired, in working order, with a wiring diagram, operating principle and detailed instructions for each component.
- 1 PLC and Vijeo Designer® software: 9 24VDC inputs / 7 binary outputs - Software supplied with ladder language programme - Programming: sequential function chart or ladder language - Fully functioning program: Supplied - Ethernet connection to the IP computer network



Front view



ref. GES-41-COM

ref. GES-41 no communicating, without PLC



Rear view

LED safety lighting unit control panels with two types of operation: stand-alone addressable or supplied from a central source. The student is required to inter-connect the lighting units, the remote controls, the anti-panic unit, the central source as well as configure the addressable self-contained emergency lighting units from the URAVISION software. In the version GES-41-COM, the student can also create a monitoring to display and control the process

TECHNICAL FEATURES AND EQUIPMENT

Front panel: Units power supply from a central source

- 2 LED 'EVACUATION' lighting units
- 2 LED 'MOOD' lighting units
- 1 BTM modular remote control
- 1 switching unit controlling the "MOOD" lighting units.
- 1 central source (LSC), equipped with a sealed battery, 48V/160W voltage, 4 fuse outputs, digital display of the operating voltage, drain current, indicator lights for the mains power on, battery operations, battery charging and faults.
- 1 forced operation switch for the 'MOOD' lighting.
- 1 spotlight connected to the mains, showing its presence.

Back panel: Power supply for the stand-alone units.

- 1 addressable, LED 'MOOD' and self-contained emergency lighting unit (BAES), with information transferred to the PC.
- 1 addressable, LED 'EVACUATION' and self-contained emergency lighting unit (BAES), with information transferred to the PC.
- 1 addressable, 'BI-FUNCTIONAL' LED and self-contained emergency lighting unit (BAES), with information transferred to the PC.
- 1 modular BTI URAVISION interface for the ETHERNET connection between the self-contained emergency lighting unit network and the computer.
- 1 manual unit shutdown control
- 1 spotlight connected to the mains, showing its presence.

CONFIGURATION SOFTWARE for the addressable self-contained emergency lighting unit supplied with GES-41 and GES41-COM

User-friendly, only a few minutes are required to start using this software. Each self-contained emergency lighting unit has its own address. Configuration information and faults detected on the self-contained emergency lighting units are permanently stored in a database. PC connection using a RJ45 connector



Profile view

MONITORING SOFTWARE PROGRAM SUPPLIED

Allows you to:

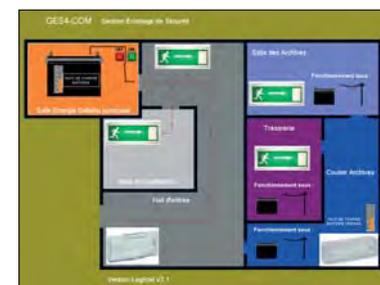
- acquisition and display of PLC variables
- monitoring and control of the process
- you to create your own monitoring

Displays:

- battery-operated
- the presence of a voltage on the lighting unit terminals

Controls:

- the activation of the anti-panic unit
- the activation of the security lighting units



Fieldbus study models

MAQ-OPEN and MAQ-NET are models for studying fieldbus communication between different automation components. Students will learn about the cabling (cable assembly), configuration (software setting) and parameter programming of the different buses required for proper operation. The wire frame for components is attached to a wheeled frame for passing the doors. The 2 models can be interconnected by mixing the fieldbuses. Other components can be added on request: Please contact us. Wheeled frame dimensions: 750 x 670mm Height 1950mm

STUDY MODEL FOR PROFINET AND PROFIBUS BUSES - SIEMENS® COMPONENTS



ref. MAQ-NET



SIEMENS

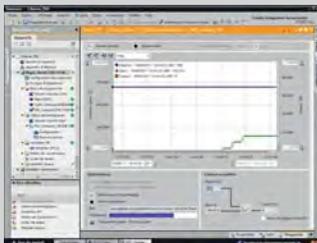
MAQ-NET includes SIEMENS® components and enables study of the Profinet and Profibus buses. Power supply from three-phase mains 3 x 400V + N + E.

- 1 power supply unit with user and appliance protection (30mA) distributes voltage 24VAC to the speed controller (for the PLC, HMI, offset I/O interfaces and 400VAC-3p+E) .
- 1 "machine" box with 3 PB, 3 switches, 7 indicator lamps and 3 PB and 3 switches for simulating sensors.
- 2 "machine" boxes each with 4 indicator lamps and 2 PB and 2 switches for simulating sensors.
- 1 PLC SIMATIC S7-1200. 14I / 10O. Integral Ethernet port.
- 1 Profibus interface
- 1 ETHERNET switch 4 ports RJ45
- 1 HMI colour touchscreen 5.7" with Profinet RJ45 port
- 1 interface ET200S 4I/4O offset with Profinet coupler
- 1 interface ET200S 4I/4O offset with Profibus coupler
- 1 speed controller SINAMICS G120C 0.55kW with integral graphic terminal.
- 1 Asynchronous motor 230/400V- 0.12kW with fan for viewing rotation.
- 1 set of Profinet, Profibus leads.
- 1 set of Profinet, Profibus connectors for mounting.
- 20 metres of Profinet, Profibus cable.
- 1 Starter software for programming the speed controller.
- 1 CD includes the instructions for the different components and the practical assignments and programming examples for the PLC, the speed controller and the HMI.

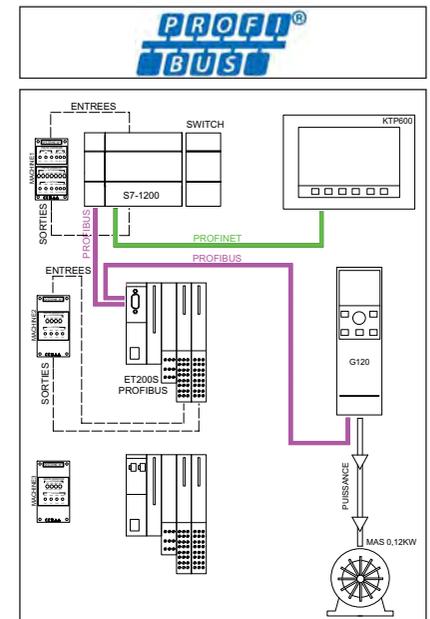
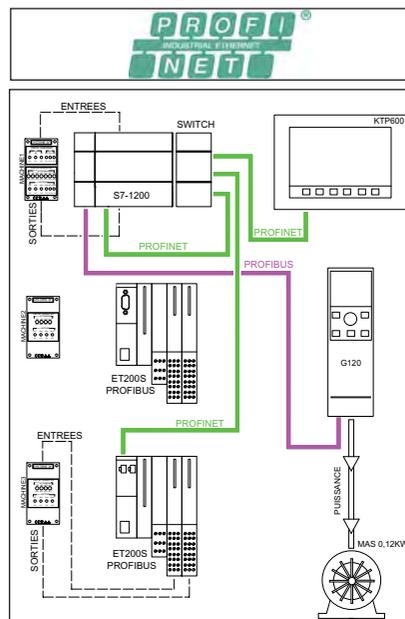
SOFTWARE OPTION

LOG-STEP is highly intuitive. On-line help and the practical assignments let students learn quickly with the different programming screens. Single workstation licence. Compatible with Windows XP Home/Pro, 7 Home/Pro 32bits. Recommended PC configuration: Dual Core Processor 2Ghz or equivalent, RAM 2GB and screen resolution 1280x1024.

For programming the PLC and the touchscreen HMI.



ref. LOG-STEP



STUDY MODEL FOR MODBUS CANOPEN AND ETHERNET BUSES - SCHNEIDER® COMPONENTS

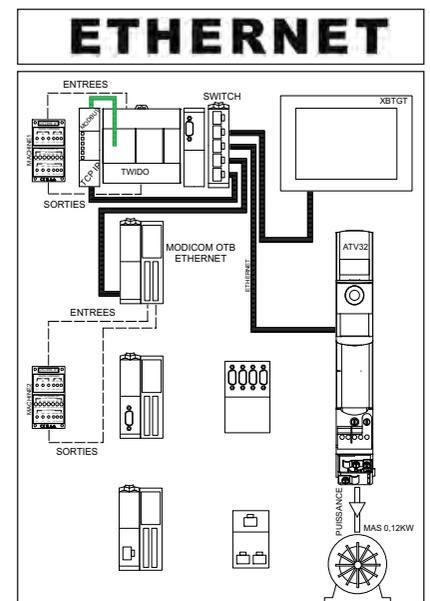
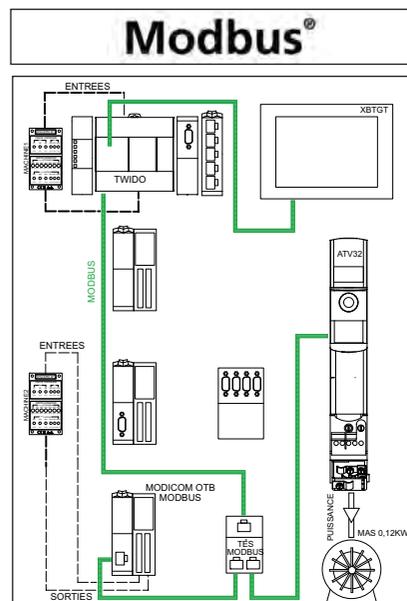
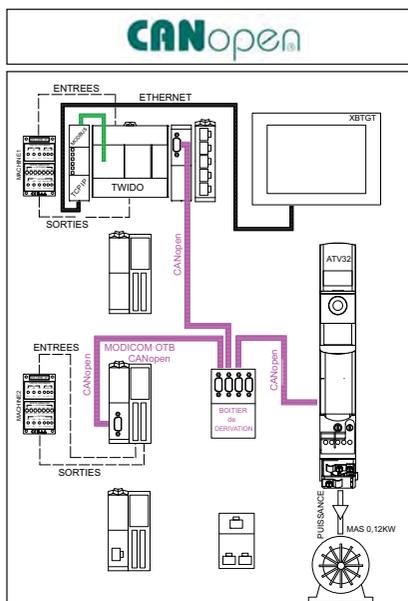


ref. MAQ-OPEN

MAQ-OPEN includes Schneider® components and enables study of the Modbus Series, CANopen and Ethernet buses.

Power supply from mains 230V-2P+E.

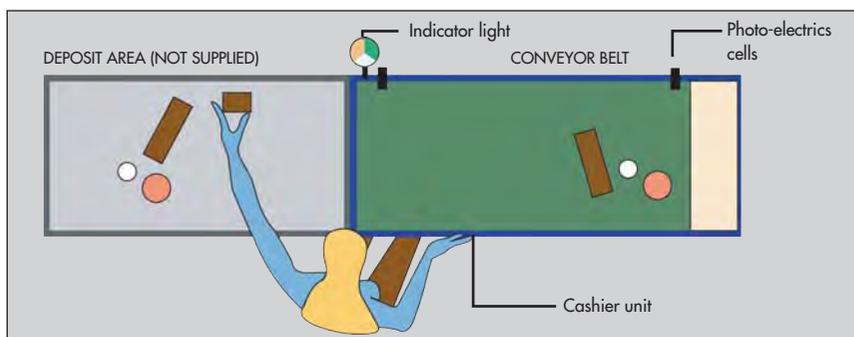
- 1 power supply unit with user and appliance protection (30mA) distributes voltage 24VAC to the speed controller (for the PLC, HMI, offset I/O interfaces and 230VAC-2p+E).
- 2 "machine" boxes each with 3 PB, 3 switches, 7 indicator lamps and 3 PB and 3 switches for simulating sensors.
- 1 PLC TWIDO 14 inputs /10 outputs
- 1 TCP-IP interface
- 1 CANopen interface
- 1 ETHERNET switch 5 ports RJ45
- 1 touchscreen HMI 3.8" with Ethernet and COM1 ports
- 1 Modicom interface 12I/8O offset with Ethernet coupler
- 1 Modicom interface 12I/8O offset with Modbus coupler
- 1 Modicom interface 12I/8O offset with CANopen coupler
- 1 Modbus junction box 1I and 2O RJ45
- 1 CANopen junction box 4 ports
- 1 speed controller ATV32-0.18kW with Ethernet, Modbus and CANopen ports.
- 1 asynchronous motor 230/400V- 0.12kW with fan for viewing rotation.
- 1 multifunction programming graphic terminal with large monochrome screen (8 lines) 240x160 pixels for programming the speed controller
- 1 set of Ethernet, Modbus and CANopen leads.
- 1 set of Ethernet, Modbus and CANopen mounting connectors.
- 20 metres of Ethernet and CANopen cable
- 1 TWIDO Soft for PLC programming.
- 1 Vijéo designer software for programming the HMI.
- 1 SoMove software for programming the speed controller ATV32.
- 1 CD includes the instructions for the different components and the practical assignments and programming examples for the PLC, the speed controller and the HMI.



Supermarket checkout simulator



ref. TAPIX



TAPIX is a conveyor belt for a cash register with the same features as the ones you would find in a supermarket. It comprises a conveyor belt driven by a gear motor, a control unit used by the cashier, an indicator light showing the status of the cash till and start and end of belt sensors. Two TAPIX models are available:

- model with just a connection console
- model with a control console and a test cabinet.

Frame on wheels

Dimensions : 1600 x 650 x 1150mm (Height without indicator light)

MIMIC CONSOLE ALLOWING ELECTRICAL CONNECTION

- 1 HARTING® rapid connector (on the console) for connecting sensors, the cashier unit and the status indicator light.
- 1 set of safety terminals (on the console) bringing together the wiring for the motor's terminal board.
- This area can take a HARTING® rapid connection interface if the user does not have any electrical measurements to take from the motor.
- The TAPIX system will only operate once the console has been connected to an external electrical cabinet.

CASHIER UNIT CONNECTED TO THE CONSOLE

It comprises all of the various controls that the cashier requires.

- "Till open" push-button
- "Last customer" push-button
- "Information request" push-button
- 3-position switch:
 - (1) Forced belt operation:
The belt will continue to move forwards.
 - (2) Automatic operation of belt:
The belt will move forwards depending on the objects that are placed on it
 - (3) Switch off belt
- The cashier unit will only operate once the console has been connected to an external electrical cabinet.

STATUS INDICATOR LIGHT CONNECTED TO THE CONSOLE

Indicates the status of the till to customers

- Green = till open
- Orange = last customer
- White = Call

A label placed next to each level specifies what they mean.

- The status indicator light will only operate once the console has been connected to an external electrical cabinet.

PHOTO-ELECTRIC CELLS CONNECTED TO THE CONSOLE

- Placed at the start and end of the belt, they detect
 - the presence of an item on the belt, which in turn activates the belt
 - that items are building up at the end of the belt, which in turn shuts down the belt
- These cells are of the NO, dry contact output type
- The cells will only operate once the console has been connected to an external electrical cabinet (24VDC).

GEAR MOTOR

Three-phase 220/380V. The motor's terminal board, which protrudes onto the console, enables the user to add an ammeter or a wattmeter in order to measure the current and power.

SET OF CABLES

Set of two 3-metre-long cables supplied with TAPIX



Model with test cabinet and monitoring



ref. TAPIX-ARM-GD

ref. TAPIX-CAB Model with wired grid

These versions are identical to TAPIX, only the connection console is replaced by a control panel and a test cabinet. The setting up of the grid is immediate.

4 Harting® connectors connect the grid to the test cabinet end the control panel. The right panel of the test cabinet is equipped with the buttons and the indicator lights necessary to the startup of the student's grid.



REF.	TAPIX-S	TAPIX-S-T6
PLC programming software	▪	▪
Monitoring software for touchscreen		▪
Monitoring software for PC	▪	
5.7 inch colour touchscreen		▪

FEATURES OF THE POWER CONSOLE

- Console which is used for safe testing and supplies the three-phase and 24V power.
- Circuit breaker, in front of the power source
- General residual current circuit breaker protection.
- General emergency stop and Start/Stop
- 2 circuit breakers for protecting the three-phase and 24V power supply
- Cabinet door safety contact control.

FEATURES OF THE TEST CABINET

- 800 x 600 x 250mm steel cabinet
- Plate on door with actuators and control lamps wired to the HARTING® connector.
- Free spaces for the addition of control accessories DIAM 22.
- Rapid hanging and connection of a grid no bigger than 750 x 550mm.
- Door safety contact
(power to the cabinet is cut off automatically if the door is opened)
- 4 fixed connectors on grid, to be wired by students
- 4 rapid connection jacks to the sensors, controls and motor.

KEY-OPERATED DOOR OVERRIDE

- Allows the live cabinet to be used with the door open if the switch has been activated. Operates with a different key to the No.455.

MONITORING ON TAPIX SYSTEMS ENABLES THE USER

TO DISPLAY

- till open information
- last customer information
- information request details
- Presence of items on the belt
- The build-up of items on the belt
- Motor operation
- Mains power on 400V
- 24V mains power on

TO CONTROL

- till open information
- last customer information
- information request details
- the operation of the motor

You can also create your own monitoring.

5.7-INCH TOUCHSCREEN, COLOUR

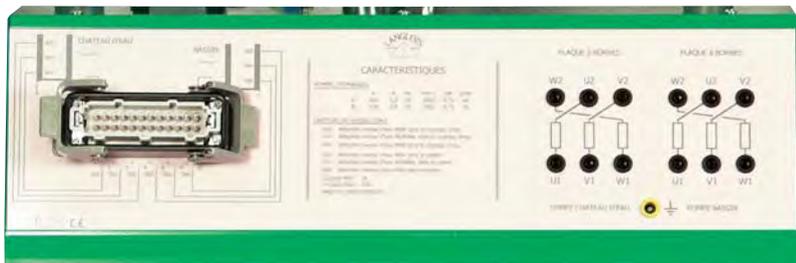
- High-visibility 256-colour TFT screen
- Communication, via RJ45 connector, for the TCP/IP ETHERNET network
- Adjustable contrast and brightness
- 24V DC/0.3A power supply
- Dim. 130 x 104 x 41mm

The systems which include a monitoring function are all supplied assembled and fully wired. Detailed instructions with full features of each component and tutorial supplied.

Drinking water distribution simulator



ref. CHATO

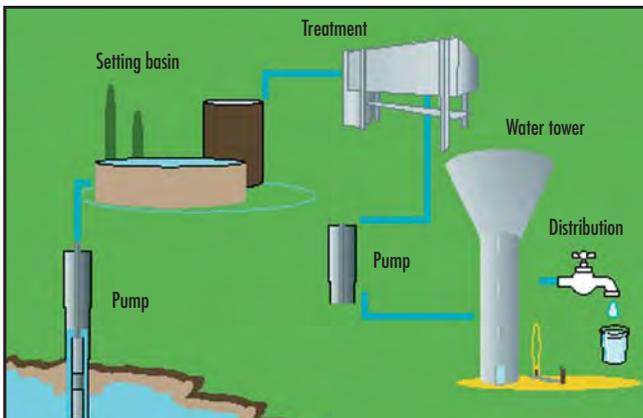


SYSTEM DESCRIPTION (CHATO)

- 1 150-litre tank simulates a river.
 - 1 60-litre transparent tank simulates the settling basin. Fitted with 3 water-level sensors.
 - 1 motorised pump draws the water from the river and transports it to the settling basin
 - 1 60-litre transparent tank simulates the water tower. Fitted with 3 water-level sensors.
 - 1 motorised pump draws the water from the settling basin and fills the water tower
 - 1 tap drains the water tower.
 - 1 valve drains the settling basin.
 - 2 valves at the motorised pump output can be used to adjust the flow-rate of the water.
 - 2 emergency overflows
 - 1 mimic console for electrical connections
 - 1 HARTING® rapid connector (on the console) for sensor connections.
 - 1 set of safety terminals (on the console) for connection to the motor(s) of the pump(s).
- The student can measure currents by inserting measuring instruments. An interface (∅ 4mm terminals / male Harting connector) plugs into the 13 terminals for connection to the control cabinet. A detailed synoptic on the interface explains each connection's function.
- 1 set of 2 cables (3m), for rapid connection to your cabinet.
 - 750 x 1500mm base on wheels enables you to move the system

MIMIC CONSOLE SUPPLIED WITH CHATO

- Very user-friendly console which offers rapid connections and a measuring function
- Left-hand section with a male Harting connector to water-level sensors
- Central section summarises the main features of the system
- Right-hand section with the safety terminals to the motor(s) of the pump(s).
- Directly on safety terminals or through the rapid connection interface



The water that comes out of our taps is drinkable and has travelled a long way. In some cases, it is pumped from rivers and then undergoes various treatment processes before it becomes fit for drinking. It flows into a settling basin, at the bottom of which the heaviest materials are deposited, then it is filtered through layers of sand and sterilised, in order to remove bacteria. This clean water is then transported by means of pipes and pumping before it is stored in a water tower. These provide consumers with a constant pressure. The CHATO system enables students to simulate this entire circuit, from the stage where water is pumped from rivers to the stage where it arrives in people's homes.

SENSORS



- Dry-contact horizontal level sensors.
- max voltage 24V
- Max current 3A

150L TANK



- Simulate the river.
- Plastic tank with drain plug.
- Installed on a base so it can be moved with the system.

TAP



Simulates domestic water consumption. Connected by hoses to the tank that simulates the river.

DRAIN VALVES



Used to drain the tank, e.g. to simulate reservoir maintenance.

SET OF 2 CABLES



Set of two 3-metre-long cables supplied with CHATO.
1 interconnection cable for sensors and 1 interconnection cable for motors

PUMPS & FLOW CONTROL VALVES

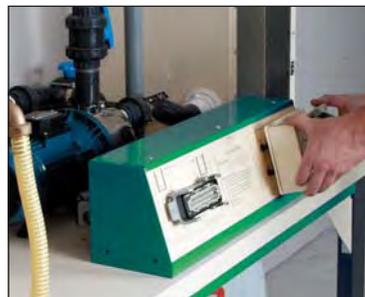
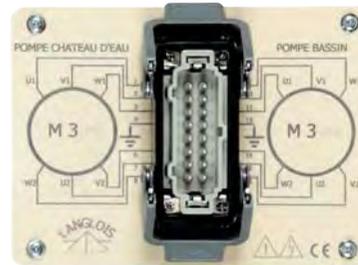


- PUMPS**
- 230/400V 3-phase motor (SINGLE-PHASE UPON REQUEST)
 - Power 750W
 - Stainless-steel body and turbine
 - Auto-start

- FLOW CONTROL VALVES**
- 1 for setting tank pump
 - 1 for water-tower pump

RAPID CONNECTION INTERFACE FOR THE PUMPS

This unit is plugged directly into the mimic console, transforming the 12 safety terminals 4mm into a HARTING® industrial rapid connector



Drinking water supply simulator with electrical cabinet



WATER
TOWER

TRANSPARENT TANKS MADE FROM UNBREAKABLE LEXAN



ref. CHATO-4-GD

SYSTEM DESCRIPTION (CHATO-4-GD)

- 1 150-litre tank simulates the river.
- 1 motorised pump draws the water from the river and transports it to the settling basin
- 1 60-litre transparent tank simulates the settling basin. Fitted with 3 water-level sensor (all or nothing).
- 1 motorised pump draws the water from the settling basin and fills the water tower.
- 1 60-litre transparent tank simulates the water tower. Fitted with 3 water-level sensor (all or nothing).
- 1 tap empties the water tower.
- 1 valve drains the settling basin.
- 2 valves at the motorised pump output can be used to adjust the flowrate of the water.
- 2 emergency overflows
- 750 x 1500mm base on wheels enables you to move the system
- 1 test cabinet (see description below)
- 1 power console (see description below)



TECHNICAL FEATURES OF THE CABINET

800 x 600 x 250mm steel cabinet, supplied with a grid.

- 1 Plate on door with unwired control lamps and actuators.
- 2 Free spaces for the addition of DIAM 22 control components
- 3 Rapid connection and hanging of the grid (not exceeding 750 x 750mm).
- 4 Door safety contact
- 5 Fixed connectors on grid, to be wired by students
- 6 Male Harting® connectors to level sensors, to motorised pumps, to the 400 and 24V power sources and to the control panel.

DOOR OVERRIDE

Key-operated door override switch. Allows the live cabinet to be used with the door open if the switch has been activated. Operates with a different key to the No.455.

TECHNICAL FEATURES OF THE CONSOLE

Console which makes testing safe, with control of the cabinet door's safety contact.

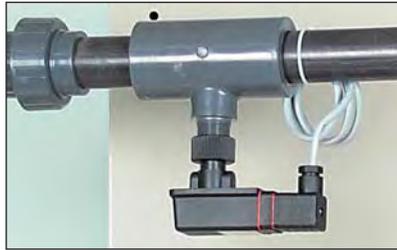
- A Circuit breaker, in front of the power source
- B General residual current circuit breaker 30mA.
- C General emergency stop and Start/Stop
- D 2 circuit breakers for protecting the three-phase and 24V power supply

Options for drinking water supply simulator



DESCRIPTION OF THE COMPONENTS OF DRINKING WATER SUPPLY SIMULATOR: SEE PREVIOUS PAGE

ALL OR NOTHING FLOW SENSOR



ref. CO-DEB

Detects water flowing in the PVC pipe of the CHATO circuit. An NO or NC contact at the sensor output sends information to a PLC or a contactor.

Features

- Can be fitted in any position
- PVC connection Diam: 40mm to be stuck on
- Switchable, potential-free contact
- NO or NC 1A/230VAC
- Electrical connection via a DIN connector

FLOW INDICATOR WITH FLOAT



A moving float in a transparent tube indicates the pump's water flowrate in cubic meter/hour

Features

- Upright fitting
- Measuring scale: 0.6 to 6 cubic meter/hour
- Ascending fluid
- Float and stop
- PVC connection Diam: 40mm (to be stuck on)

ref. FLO-DEB

HYDROSTATIC PRESSURE SENSOR OPTION



ref. CHATO-NIV

Hydrostatic pressure sensor allowing the water level in the tank to be measured. The 4...20mA signal, output from the sensor, varies linearly according to the height of the water (maximum 60cm). Sensor features:

- stainless steel case
- piezoelectric measuring cell
- welded diaphragm
- IP65 protection
- outputs 4...20mA, 2 wires 10-30V DC
- accuracy on the scale +/- 0.5%

FLOWMETER



ref. CHATO-DEBIT

The sensor shows the flowrate of the water on the display unit when it leaves the pump. Students can observe a change in the flowrate, depending on the valve setting. 4-20mA signal output on Ø4mm safety terminals.

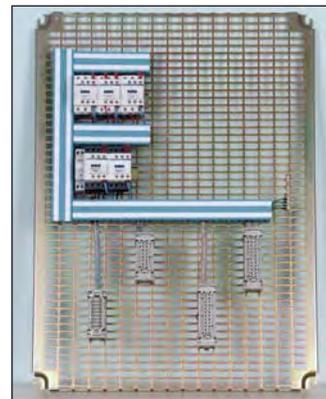
GRID & PLATE FOR PLCS



Wired door plate and grid for system operation with a Twido PLC. Supplied with programming and training software.

ref. CHATO-AUTO

GRID & PLATE FOR RELAY



Wired door plate and grid for system operation with relay.

ref. CHATO-REL

FAULT SIMULATOR UNIT



Unit with concealed switches to simulate sensor faults. 6 switches linked to 6 sensors. Unit fixed onto the system's frame.

ref. CHATO-PAN

Drinking water supply simulator with monitoring



THE MONITORING ENABLES THE USER

TO DISPLAY

- The water-levels
- The settling basin pump feed
- The water tower pump feed
- Movement of the water from the river into the settling basin
- Movement of the water in the settling basin to the water tower
- 400V mains presence
- 24V mains presence

TO CONTROL

- the settling basin pump feed manually
- the water tower pump feed manually
- the cycle start

TO SIMULATE

- the detection of the 6 water level sensors

FEATURES OF THE PLC SUPPLIED

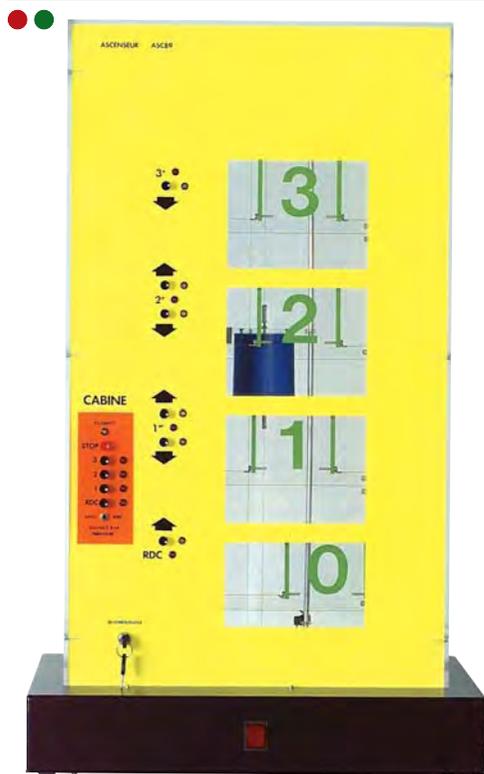
- sequential function chart or ladder language programming
- 220V mains power supply.
- 14 inputs 24V DC on terminal
- 10 binary outputs 220V/2A on terminal
- RJ45 Ethernet output, used for connecting the PLC to the IP computer network.
- The programming software and index in the form of ladder language is supplied.

REF.	CHATO-4S	CHATO-4S-T6
Base on the reference CHATO-4-GD	▪	▪
PLC programming software	▪	▪
Monitoring software VijeoDesigner		▪
5.7 inch colour touchscreen, with its mains lead		▪

The monitoring VijeoDesigner allows you easily to create your own programming.



Didactic lift



ref. ASC89-24 LOGIC CONTROLS IN 24V

ref. ASC89-05 LOGIC CONTROLS IN 5V

The ASC89 lift is a model which may be connected to a PLC or any microprocessor system. It comprises 24 outputs and 21 inputs. You can only use a part of input/outputs if you want to do easy programmes

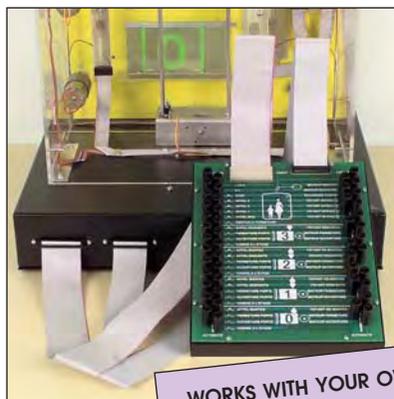
MAIN FEATURES :

- Opening and closing of the doors on each floor is done by electric servo motors.
- The rear of the lift is visible through the sides and the bottom which are transparent
- The route of the lift is sensed at each floor by a photo-detectors.
- Two limit switches, high & low, (without program control) stop the lift if there is an error in the program.
- All of the buttons and switches are fitted with de-bounce circuits.
- The outputs are protected against the possibility of a short-circuit.
- The rear sliding door is of a transparent Plexiglass design and there is no manual access possible, as there is risk of damaging the servomotor.

The mechanical controls are sturdy and can withstand any likely faults.

4 LEVELS EACH LEVEL HAS	1 electrically opening door - 1 photo-detector for 'door closed' - 1 photo-detector for 'door-open' 2 safety limit switches for door open/close (No control from the program possible) 1 button to call the lift 'up' (except the 3rd floor) with indicator lamp. 1 button to call the lift 'down' (except the ground floor) with indicator lamp 1 lamp to indicate the presence of the lift - 1 photodetector to indicate the presence of the lift
CONTROLS INSIDE THE LIFT	4 buttons for each floor - 1 stop button 1 switch to simulate a blocked door 4 lights for each floor - 1 light inside the lift (simulating the lighting)
UNIT SUPPLIES POWER TO	the motors - the LED - internal logic to the unit.
OTHERS SPECIFICATIONS	Dims 780 x 480 x 440mm Weight 15kg Supply 220V The unit is available in two driving logic values, 24V or 5V.

INTERFACES FOR DIDACTIC LIFT (CHOOSE ONE OF THEM)



WORKS WITH YOUR OWN PLC

ASMAT is an interface allowing a quick connection to the ASC89 lift from a PLC. To help in quickly identifying the functions of the connectors, small symbol and piece of text next to each connector, allowing immediate understanding of its function. The operating sense: Lift - PLC or PLC - Lift. It is clearly indicated by vertical arrows. Metal box: 22 x 272 x 32mm. Weight: 250g.

CONNECTION	CONNECTION
ASMAT - LIFT	ASMAT - PLC
Two flat cables with: One connector for the inputs and the other for the outputs.	The front face of the board has two columns of 4mm plugs, which are used to connect to the PLC with normal leads. The plugs on the left are for the inputs to the PLC, on the right for the outputs.

ref. ASMAT

TWIMAX PLC which can control the 24V lift via ASMAT interface. Ref. TWIMAX See page 165.

- AUTOMASC** is delivered in a plastic box including:
- a 30 inputs / 26 outputs TWIDO PLC (dry contacts)
 - a USB connection interface with the PC
 - supplies for the PLC outputs
 - All cables to the lift, mains cable.

AUTOMASC is connected to the lift rear connectors with 2 flat cables, one for inputs, the other one for outputs.

PROGRAMMING

User can program AUTOMASC with 2 languages: Instructions list or contact language.

You can program it from PC, using the software (included)

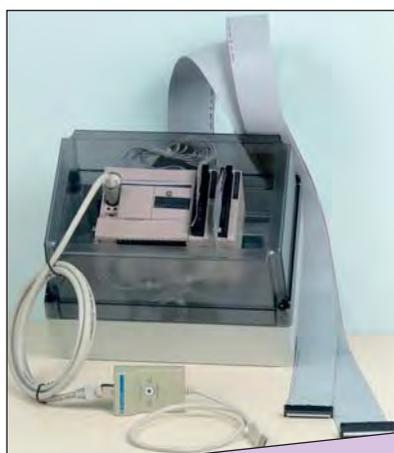
Delivered with a program designed for complete functioning of the lift.

OTHER FEATURES

The front panel is transparent to see many LED, showing the PLC state. AUTOMASC is supplied with a demo program, which can be modified or completed. The technical leaflet indicates the corresponding between the lift inputs and outputs and the ones of the PLC, allowing the development of a complete program.

Mains: 220/240V - 50Hz - 50VA - Dimensions: 350 x 190 x 170 mm - Weight: 2.7kg

ref. AUTOMASC



INTERFACE WITH INTEGRATED PLC

Motorized gates



ref. PO-PB2

- Double casement
- Current consumed 0.8A
- Max power 200W.
- Speed reduction ratio 1/296

ref. PO-PC1

- Sliding
- Current consumed 1.5A
- Max power 290W.
- Speed reduction ratio 1/30

The two automatic operations enable users to study automatic or semi-automatic opening and closing of an electric gate in complete safety. They use standard market parts that are commonly used for these automatic operations. The consoles are connected together using 4mm and 2mm leads, such as the different control parts (push-buttons, etc.), sensors (photoelectric cells, etc.) and other actuators (gear motor, etc.).

COMPONENTS INVOLVED IN THE AUTOMATIC OPERATIONS (common to both gates)

- 1 frame on wheels with brake.
- 1 or 2 gear motors, depending on the selected automatic operation model.
- 2 pairs of photoelectric cells, to secure the opening and closing of the gate.
- 1 unit fitted with an electronic card controls the operation of all of the different settings (such as closure time-delay, activating the remote control, etc.).
- 1 gate opening and closing remote control
- 1 gate operation indicator light.
- 3 consoles, consisting of 4mm safety terminals for the 220V and 2mm for the extra-low voltage, containing the wiring for:
 - the key-operated "gate opening and closing" push-button
 - the gear motor(s), the light, the 24V power supply for the cells and the mains power supply
 - for the 4 photoelectric cells
- 1 fault simulator unit enables the user to create a malfunction in the photoelectric cells.
- 1 set of keys for unlocking the door mechanically.

FEATURES (common to both gates)

- Emergency stop circuit breaker
- 220V AC mains power supply
- Power supply to photoelectric cells: 24V AC. (internal power supply).
- Fault simulator unit with 4 circuit breakers, causing a fault on each cell.
- Life-time pre-lubrication using grease.
- Dimension of the unit: 1400 x 800 x 1700mm / Weight 130kg
- Sold with all connection diagrams and all the various settings to be entered for the smooth operation of the gates.

TUTORIALS ARE SUPPLIED WITH AUTOMATIC FUNCTIONS

- Wiring of all of the components
- Adjusting the various operating settings
- Measuring the properties of gear motors and comparing these values with the ones for the rating plate.
- Looking for one or more faults

Conveyor belt



ref. PSY4001

The PSY4001 unit has 12 inputs/outputs, mimicing an industrial conveyor system with a range of sensors. All of the input/output switches are of the latching type. This unit can be driven by a PLC, micro-computer or sequential logic system. Connection to the unit is by Ø4mm leads (outputs : situated high on the left, inputs : situated high on the right). The control buttons are located next to the activation switches allowing manual control without any automation.

- Breaking capacity of the 7 outputs: 30Vcc 1A
- Inputs controlled by closing a single contact
- All of the power supplies necessary for operating the unit are integrated into the unit.
- Supply 220VAC.

INPUTS ON THE UNIT

- 2 solenoids to eject non-conforming pieces, at the middle and end of the belt
- 1 incremental counter input from 0 to 99 with a digital readout
- 1 control switch for the motor
- 1 belt acceleration control switch from 12mm/s to 18mm/s

OUTPUTS FROM THE UNIT

- 1 «reset to zero» which closes a contact when the operator presses the reset button.
- 2 limit switches at either end of the belt, with LEDs to indicate their state
- 3 photo detector barriers :
 - Barrier No.1 - for detecting objects which are too high
 - Barrier No.2 - for detecting objects of medium height
 - Barrier No.3 - for detecting an accumulation of pieces at the end of the conveyor
- 1 programmable counter which switches when the preselected value is reached. This setting is made by 2 incremented dials on the front of the unit.

EQUIPMENT AND CHARACTERISTICS

- Conveyor belt:
 - Depth 60mm
 - Usable length: 570mm
- Dimensions: 670 x 296 x 80mm Weight 14kg

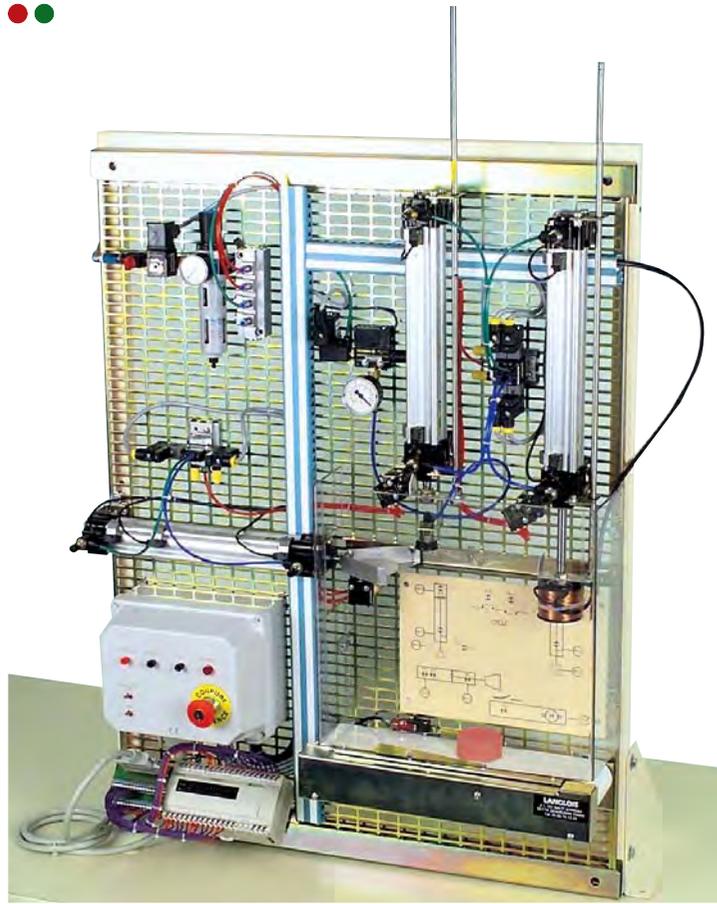
12 PRACTICAL WORKS

- Ejection of objects
- Sorting of objects of different heights
- Changing the speed of the belt
- Simple counting
- Counter stopping of the belt
- Selective counting of objects depending on their height
- Selective counting with stopping controlled by the preset value on the counter

ACCESSORIES SUPPLIED

2 reflective parts of high object detection.
A description of the 7 workbooks.

Pneumatic handling line



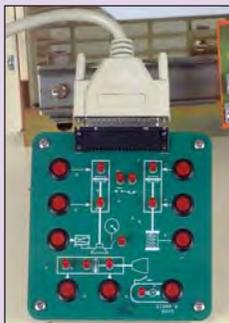
ref. PNEU99 with PLC and TWIDO software

ref. PNEU98 without PLC

GENERAL CHARACTERISTICS

This line with conveyor belt allows the introduction to pneumatic components to be combined with programming on any automated system (in positive or negative logic). A manual control box delivered can be connected to the input-output socket in place of the PLC. The manual control box drives the actuators and shows the state of the sensors. It thus facilitates the purely pneumatic study of the components, the problems linked with speed of displacement, cushioning the end of travel, control of rate, needle screw, accuracy of magnetic detectors etc.

A manual gives details of the operation of all the electro-pneumatic components used and their adjustment. Several cycles are described, including one complete with its grafcet.



MANUAL CONTROL BOX

This box contains 9 push buttons corresponding to each actuator and 11 indicator lights which give information about the state of the sensors.

It allows very slow observation of pneumatic phenomena and learning about the basic regulation of flow control, actuator speed, and detector positions..

OPERATING CYCLE

The parts placed on the conveyor belt are held by the vacuum suction grip of a first pneumatic jack, then placed on the horizontal jack, grasped by the electromagnet jack undergoing a complete handling cycle before being returned to the belt.

PNEUMATIC COMPONENTS

- 3 double effect pneumatic jacks Ø32mm. Travel 250mm, each equipped with:
 - flow reducers allowing fine adjustment of their movement
 - magnetic position detectors (2 or 3 per actuator) with LED
 - quick-fit joints for Ø4mm tubes
 - 2 5/2 electropneumatic distributors
 - 1 5/3 electropneumatic distributor
- All distributors are fitted with
- 24V DC coils
 - LED visual display of the state of the coils
 - quick-fit joints for Ø4mm tubes
 - fitted on mountings with silencers
- Vacuum generator
- One of the actuators is fitted with a suction grip with its vacuum system. An adjustable threshold vacuostat delivers an electrical presence or absence of vacuum signal. A vacuummeter allows visual checking on the vacuum.
- Jacks protection
- To avoid any risk of destroying a pneumatic jack, an entirely pneumatic logic system (without student access) prevents the simultaneous movement of the horizontal jack with a vertical jack.

ELECTRIC BOX

- Contains a regulated 24V DC 2A source to feed the PLC if necessary if it does not have an internal supply. The necessary supplies to the model.
- A Start cycle button, a Stop cycle button,
- a reset button.
- a general emergency button stopping the electric and pneumatic supplies.
- The connector which the user connects to the PLC or to the manual control box.

USER'S PROTECTION

- A transparent color door is a barrier between the pneumatic jacks and the user's hand. The opening turns off the air pressure

TWIDO PLC (only for PNEU99 version)

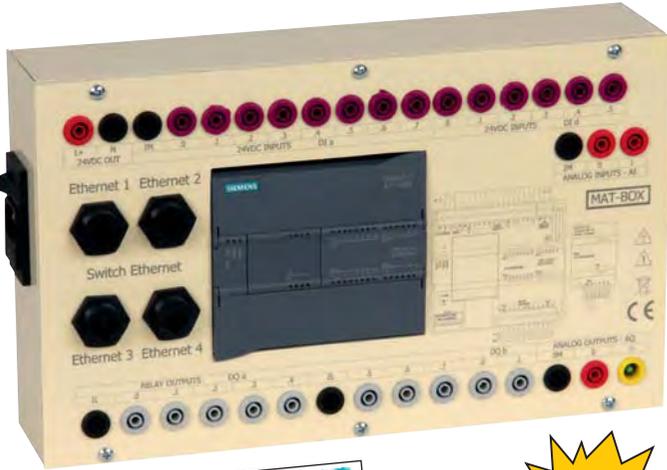
- 14 inputs / 10 outputs
- 2 languages : Grafcet instructions, ladder language.
- Programming : from a PC using a TWIDO software (included).

OTHER CHARACTERISTICS

The conveyor belt is either controlled by the automatic system and the end of belt detection switch or by being forced into operation. An electromagnet illustrates picking up by a magnetic field. PNEU is delivered on a 1000x750mm chassis with lateral fixing brackets on a table. The model is delivered ready for use (the electric part is completely wired and all the pneumatic connections made). The quick-fit joints allow dismounting/reassembly of pneumatic interconnections with Ø4mm tubes of various colors.

Integrated PLC units

PROGRAMMABLE LOGIC CONTROLLER S7-1200



ref. MAT-BOX

SIEMENS

NEW

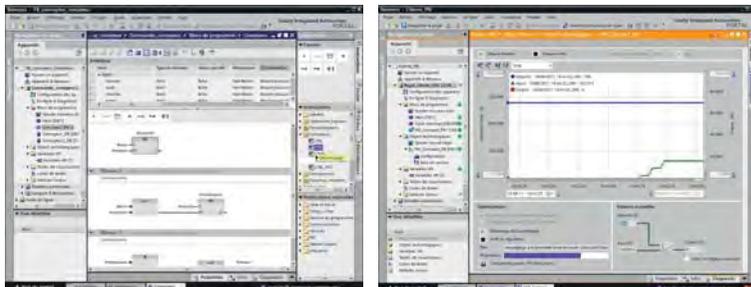
MAT-BOX is a SIEMENS® SIMATIC S7-1200 PLC unit fitted with safety terminals 4mm to facilitate the connection of sensors and other actuators. The integral PROFINET interface ensures communication simplicity for programming, link to the HMIs and CPU-to-CPU dialogue. The LOG-STEP software (not supplied) is applications focussed. Intelligent, it offers simple and intuitive editors for efficient PLC configuration.

TECHNICAL CHARACTERISTICS OF THE PLC

- CPU S7-1200 / 1214C with integral PID function
- 14 binary inputs 24VDC
- 2 analogue inputs 0-10VDC
- 10 binary outputs 2A Max on resistive charge
- 1 analogue output 0-10VDC or 4-20mA
- 1 mini Switch 4 integral RJ45 ports to link, e.g. an HMI screen, 2 PCs and another PLC.
- The PLC's cabling diagram is printed on the box front.
- Mains power supply 230VAC-50/60Hz by socket + switch unit.
- Dimension 330x200x80mm.
- Supplied with:
 - 1 Ethernet RJ45 3-m cable.
 - 6 detailed practical assignments (PLC configuration, use and programming.)

SOFTWARE OPTION

LOG-STEP is very intuitive. Thanks to the online help and the tutorials, the student start to use quickly and easily the different programming screens. Single license. Compatible with XP Home/Pro, Seven Home/Pro 32 bits only. Recommended minimum configuration: Core Duo 2GHz processor or equivalent, 2Gb of RAM, screen resolution 1280 x 1024. For programming the optional TOUCH-BOX (see opposite).



Function blocks programming

PID function programming

ref. LOG-STEP

TOUCHSCREEN HMI FOR MAT-BOX



ref. TOUCH-BOX

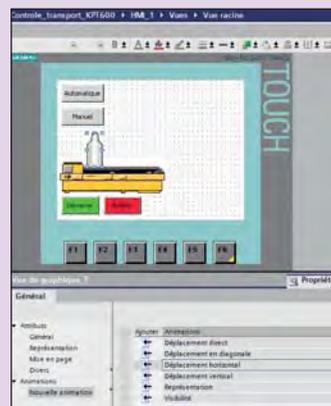
SIEMENS

NEW

TOUCH-BOX is a SIEMENS SIMATIC KTP600 Basic touchscreen HMI unit. RJ45 connectors link the screen to the Ethernet or directly to a SIEMENS PLC. LOG-STEP software (not supplied) is required for screen programming.

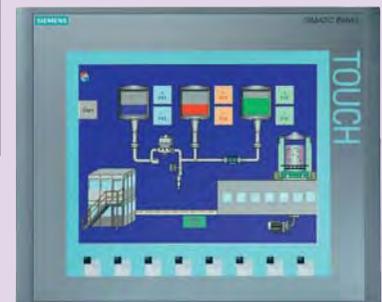
FEATURES

- Touchscreen 5.7" (115.2 x 86.4mm)
- TFT 256 colours
- Resolution 320x240 pixels
- Membrane keypad. 6 function keys
- 512KB useful memory for user data
- 1 Ethernet RJ45 connector
- Mains power supply 230VAC-50/60Hz by socket + switch unit.
- Dimension 330x200x80mm.
- Supplied with:
 - one Ethernet RJ45 3-m cable.
 - one set of detailed practical assignments (Word and PDF document on CD) allows students to learn, step-by-step, to configure and create an application with a PLC.



Example of programming page from the software STEP7 Basic

Screen with an automation application



TWIDO PLC - BASIC MODEL



ref. AUTO-BOX

TWIDO PLC with $\varnothing 4$ mm safety terminals on the inputs and outputs

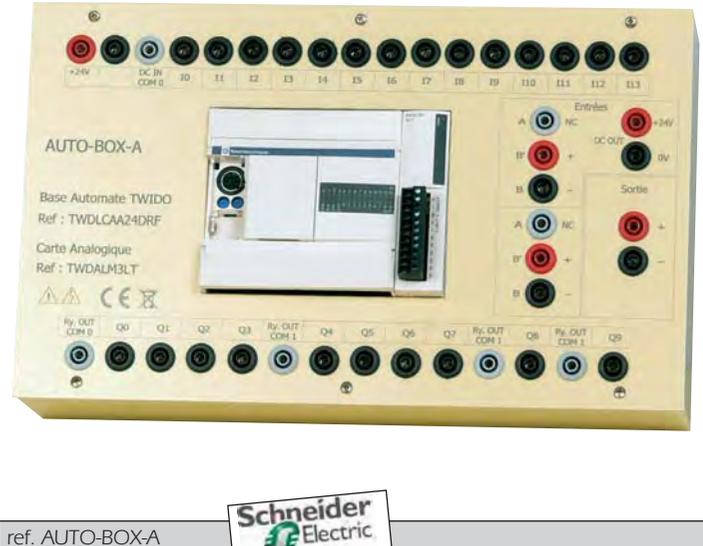
FEATURES OF THE PLC

- 14 inputs 24V DC
- 10 binary outputs Max. 2A
- 220V mains power supply by means of socket unit + switch
- Dimensions: 330 x 200 x 80mm

VERSION WITH 30 INPUTS & 26 OUTPUTS

ref. TWIMAX

TWIDO PLC - WITH BUILT-IN ANALOGUE CARD



ref. AUTO-BOX-A

We have added to the AUTOBOX (opposite) an analogue input/output card allowing the acquisition of various analogue values encountered in industrial applications:

- High-level voltage (0-10V) or current (4-20mA) outputs.
- Type K, J and T low-level thermocouple inputs.
- Type Pt100 3-wire low-level thermocouple inputs

FEATURES OF THE ANALOGUE CARD

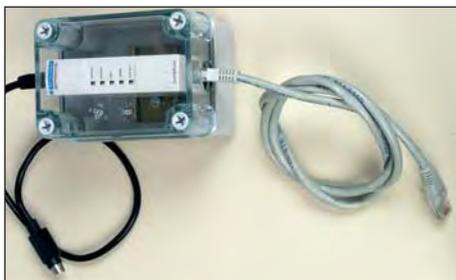
- direct connection to the PLC
- 1 output 0-10V or 4-20mA
- 2 PT100 inputs

AUTO-BOX and AUTO-BOX-A are supplied with programming software and connection lead between the PC and PLC.

SPECIFICATIONS OF THE TWIDO AND M340 PROCESSORS BUILT INTO PLCs

REF. BUILT IN PLCs	AUTO-PRO	AUTO-PRO-A	AUTO-BOX	AUTO-BOX-A
Built-in processor	M340	M340	TWIDO	TWIDO
I/O modules	SEPARATE (makes repairs easier)	SEPARATE (makes repairs easier)	IN 1 SINGLE UNIT	IN 1 SINGLE UNIT
10/100 Mbit RJ45 Ethernet connection	BUILT-IN	BUILT-IN	NO	NO
Memory card	YES (8MB)	YES (8Mb)	NO	NO
Internal bits	512	512	256	256
Internal words	32464	32464	3000	3000
No. of 24V inputs	16	16	14	14
No. of binary outputs	16	16	10	10

TCP-IP INTERFACE



IP-BOX is a communication interface for the connection of a PLC to a TCP/IP ETHERNET computer network.

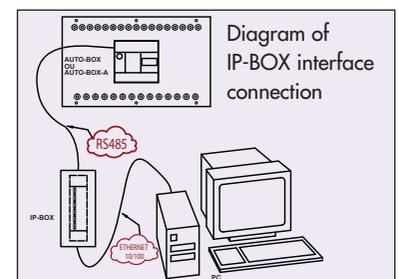
ref. IP-BOX

FEATURES

- Does not require any external power supply
- Dim: 100 x 80 x 90mm

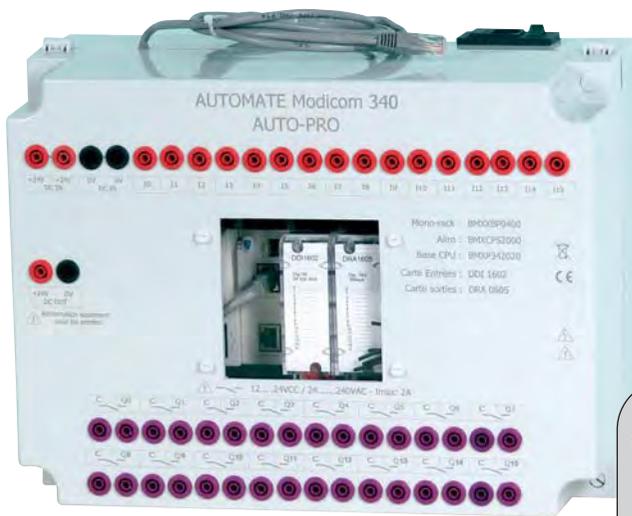
SUPPLIED ACCESSORIES

- RS485 cable for connection to the PLC.
- RJ45 cable for connection to the PC.



Integrated PLC units

M340 PLC - BASIC MODEL



AUTO-PRO has 2 available slots

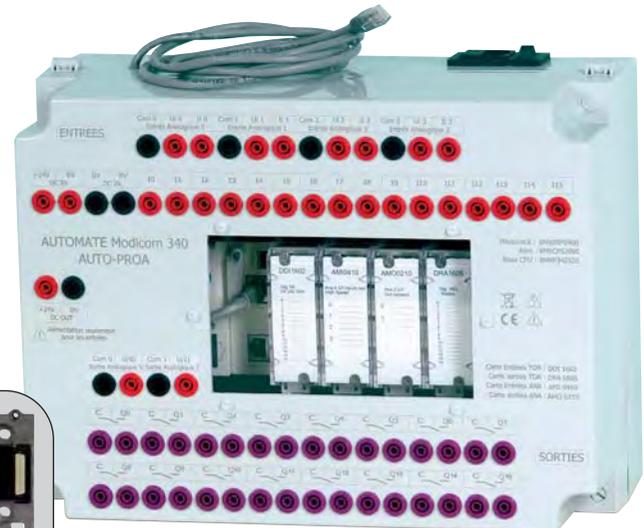
ref. AUTO-PRO

MODICOM M340 PLC with safety terminals (4mm in diameter) on the inputs and outputs. PLC fitted with a TCP/IP Ethernet link. A memory card, which is supplied with the PLC, is used for saving the application and storing files.

FEATURES

- M340-P34 MODICOM processor base with YCP/IP Ethernet module on RJ45.
- 230V/24V DC power module.
- Binary input module with 16 isolated channels, 24V DC
- Binary output module with 16 channels, 2A max.
- 8MB memory card
- General power supply by mains cable
- Dim. 360 x 270 x 170mm

M340 PLC - WITH 2 BUILT IN ANALOGUE MODULES



ref. AUTO-PROA

We have added two analogue output and input cards to the PLC presented above for the acquisition of analogue quantities encountered in industrial applications.

- Analogue input module
Isolated high-level inputs
4 voltage/current channels
 $\pm 10V / 0-10V / 0-5V / 1-5V / \pm 5V / 0-20mA / 4-20mA / \pm 20mA$
- Analogue output module
Isolated high-level outputs
2 voltage/current channels
 $\pm 10V / 0-20mA / 4-20mA$

AUTO-PRO and AUTO-PROA are compatible with the software UNITY Small / UNITY Medium / UNITY Large / UNITY Extra Large

SOFTWARE UNITY SMALL



ref. UNITY-SMALL

Multilingual software used for programming our AUTO-PRO and AUTO-PROA PLCs. Can be used to easily convert your programs created with PL7.

Languages

- Instruction lists (IL)
- Ladder (LD)
- Structured Text (ST)
- Function Block Diagram (FBD)
- Sequential Function Chart (SFC)/Grafset

Programming service

- Multi-task programming (master, fast and event-driven)
- Functional view and functional modules
- DFB editor and DFB instances
- EF function block libraries and EFB function blocks
- Adjustable control loop
- Programmable control loop (with FB library)
- System diagnostics
- Application diagnostics

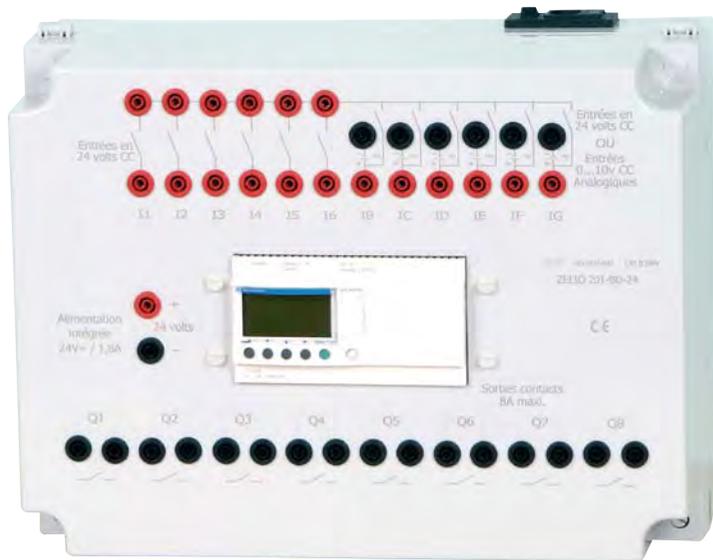
Adjustment and display service

- PLC simulator
 - Animation of hypertext links in graphical programming languages
 - Single-step execution, breakpoint
 - Display point
 - System screens
 - Diagnostic viewer
- #### Other services
- Creation of hyperlinks
 - Application converters (Concept, PL7)
 - Utilities for updating the PLC operating system
 - Communications driver for Windows 2000/XP

Supplied with the PLC connection cable

Programmable controls system

BASIC MODEL



ref. ZELIO-201-24

This unit is a programmable interface working as a PLC with orders (inputs) and contacts (outputs). Its particularity is to integrate a clock which sets controls. Its programming software is very easy to use. Among its various and user-friendly functions, the function "SIMULATION" which allows to check the program before using it in real condition.

Dimensions of the box: 360 x 270 x 170mm

Sum up of functions and possibilities of the unit and its software:

- 12 inputs 24V DC, 6 can be wired in analogue inputs 0-10V
- 8 dry contacts outputs
- a display indicating state and local programming
- 6 keys for local programming

MODEL WITH TCP-IP ETHERNET MODULE



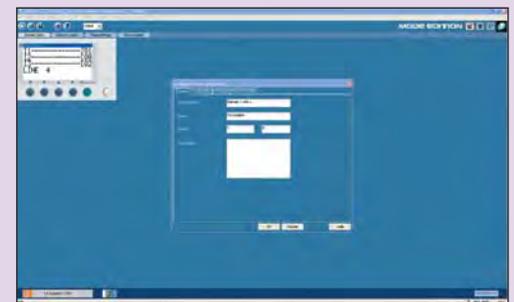
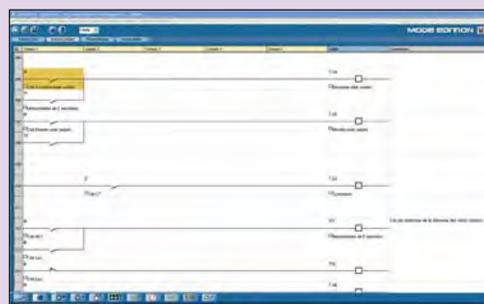
ref. ZELIO-NET

We have added to the ZELIO-201-24 (opposite) a network communication module which can be used to connect the ZELIO to the Ethernet using the Modbus TCP protocole

Ethernet module features:

- direct connection to the ZELIO
- female RJ45 reinforced cable
- a communication display LED (LK/ACT 10/100)
- a STATUS display LED (STS)

SOFTWARE SUPPLIED WITH ZELIO-201-24 AND ZELIO-NET



The multilanguage software also has :

- 3 programming languages
- a good viewing of clock settings
- a free keyboarding of associated comments for the follow up of steps.
- a simplified communication between the unit and the PC (serial connection)
- a direct display of the text on the unit display
- a visualization of outputs state
- an input/output computer simulation by a simple click on the mouse.

Help function for user

Besides its help function always available as a Search Menu, the software has a demo video functioning like a VCR. Short films show the main steps for programming the system.

System for water level & flow regulation by PID



ref. DESNIV (supplied with loop calibrator 4-20mA)

OPERATING PRINCIPLE

The objective is to adjust the water-level in a transparent polycarbonate column –diameter 160mm, height 1370mm. A pump draws the water from a 50-litre tank at the bottom of the column. The water constantly flows through the setting valve from the column towards the tank under gravity. The PID regulator receives the “water-level” information from a 4-20mA sensor. It compares this signal with the level reference and controls the pump delivery via a frequency variator.

The system operates in two modes: servo control and regulation. In regulation mode, a manual valve creates the disturbance.

DESIGN

The DESNIV model uses only industrial components.

- A PID regulator – 4-20mA standard on the measuring input and on the output.
- An industrial three-phase pump, with a bronze body
- A differential pressure level sensor
- An industrial frequency variator

The column is large in size, as is the volume of water it contains. Therefore, it has high inertia. This means that the physical phenomena are very similar to those for high-capacity tanks used by the pharmaceutical and oil industries. Pressure differences due to the significant height of the water column can be used to adjust the water-level to the nearest 5mm.

The inputs and outputs for the following are grouped together on a terminal block which is separate from the electrical cabinet: sensor, regulator, variable speed drive and 24V DC power supply. Students wire up the control and measuring loops on this terminal block. They cannot come into contact with dangerous voltages, as these are confined to the electrical cabinet. The maximum voltage that can be accessed on the student terminal block is 24V DC.

The terminal block and the components allow all wiring errors and fault finding exercises.

The “water-level” and “pump delivery” curve charts (curve charts used to determine the static gain, loop gain and critical gain, the dead time and the time constant) are noted either manually (the slow speed of the phenomena means that this procedure is possible), or using a PC combined with LOGINIV software (option) and the associated interface, or by using general software.

The DESNIV model does not need to be connected to the water network. In order to prevent any overflow, a binary level sensor stops the pump if the water rises up to the top section of the column.

Power supply: 230VAC. Overall dimensions: 1100 x 670mm Height: 1980mm

EDUCATIONAL OBJECTIVES

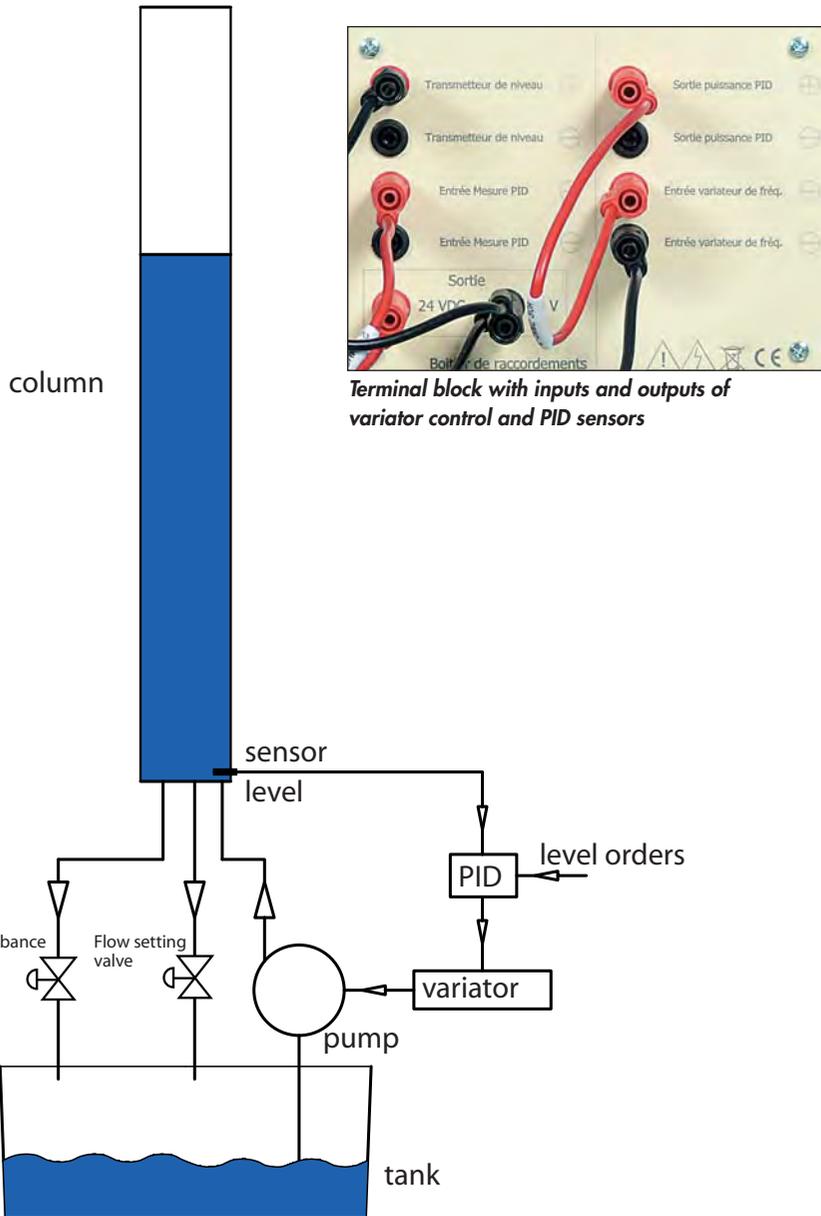
- Calculating the scale range of a level measurer using hydrostatic pressure in the dry column. Adjusting the level transmitter
- Calculating the scale range and the zero offset of a level measurer using hydrostatic pressure in the wet column. Adjusting the level transmitter
- Wiring, implementing and adjusting components: level transmitter, PID regulator and variable speed drive.
- Measuring currents as in industry, without opening the loops, with a multimeter, on the conversion resistance terminals.

LIST OF TUTORIALS CONCERNING THE MEASURING CIRCUIT + CORRECTIONS

- Wiring the measuring loop which comprises the 4-20mA output differential pressure transmitter, a 24V DC power supply and the PID.
- Calibrating the level transmitter Dry column method.
- Calibrating the level transmitter Wet column method.
- Producing a calibration sheet for the transmitter, and a calibration curve.
- Calculating the scale range of the transmitter.
- Measuring the current in the loop, without opening it.
- Using a calibrator for measuring the transmitter current or generating a 4-20mA current on the PID input.

LIST OF REGULATION TUTORIALS + CORRECTIONS

- Producing a regulation loop diagram, with a view to wiring the correction component and the measuring circuit
- Producing an operating diagram through the identification of various components, namely: the regulator, the correction component and the process.
- Identifying the quantities at play, namely: the adjusted quantity, controlled variable, correcting variable and disturbances
- Determining the direction of the regulator depending on the direction of the process and the correction component
- Determining the static features of the procedure, with a view to calculating the following adjustments: integration constant, dead time
- Implementing various empirical methods for setting PID correctors
- Testing the performance of the loop, in servo-control mode and in regulation mode
- Displaying on a flatbed plotter or PC, or by manual measuring, the responses of the PID adjusters, by requesting the measurement input by position or speed level
- Implementing and verifying a level measurement for a dry column or a wet column



Terminal block with inputs and outputs of variator control and PID sensors

SUPPLIED WITH A 4-20MA LOOP CALIBRATOR

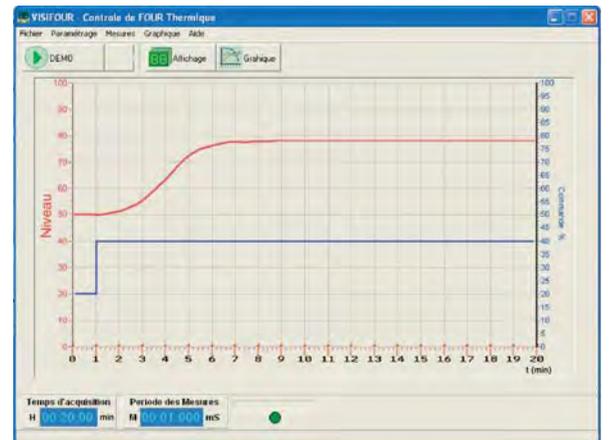


- Programming in % of the output span to supply a typical intensity like 4 – 8 – 12 – 16 or 20mA
- linear ramps, manual ramps, auto ramps
- Display: 5 digits
- Carry case, user's manual, external battery Pack (for 6x 1.5V AA batteries)
- Input for mains adapter DC 12V (not included)
- Dimensions : 88x168x26mm Weight : 330g

ref. VA100

RANGE	RESOLUTION	ACCURACY
4 - 20 mA	1µA	0.025% + 5µA
0 - 20mA	1µA	0.025% + 5µA
0 - 24mA	1µA	0.025% + 10µA
4 - 20V	1mV	0.05% + 5mV
0 - 20V	1mV	0.05% + 5mV
0 - 24V	1mV	0.05% + 10mV

LOGINIV INTERFACE & SOFTWARE (OPTION)



ref. LOGINIV

This PC interface – connected to the DB9 outlet – and software are used to record and draw graphs of instantaneous water level and control signal of the pump speed directly on PC. The connection to PC is made by USB.

Additional functions

- Numerical display of the two measurements
- Cursor function
- Compilation of data in a spreadsheet
- Zoom function



Wired grid including with a speed controller



Pressure sensor and disturbance valves

Level control system by means of PLC & touchscreen



ref. REGULEAU

REGULEAU IS SUPPLIED ALREADY WIRED AND READY FOR USE WITH TUTORIALS, INSTRUCTIONS, SOFTWARE PLC AND MONITORING PROGRAMS.



REMOVABLE GRID QUICKLY TAKEN THROUGH HARTING ® PLUGS.

REGULEAU is a level control system relying on a PLC and touchscreen, which can be used in three detection modes, using

- 3 binary floats
- 4 height-adjustable conductive probes
- 1 4-20mA hydrostatic pressure sensor

The water drawn from the lower tank supplies the upper tank (where the sensors are located) before running away via a manual valve. The PLC's PID and the variable flow pump allow a level control.

EDUCATIONAL OBJECTIVES

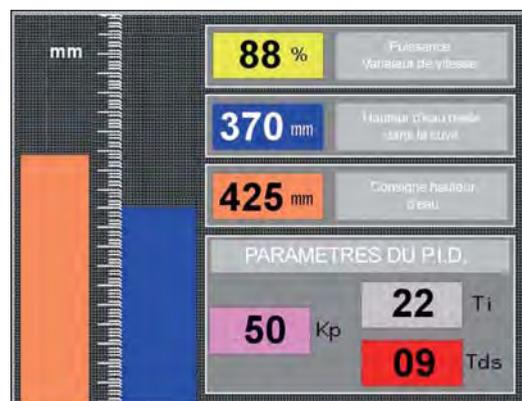
- to produce wiring diagrams
- to configure the PLC (TWIDO)
- to program the PLC (TWIDO)
- to configure the Ethernet links (PC / TWIDO / TOUCHSCREEN)
- to configure the touchscreen
- to program the touchscreen
- to configure 4-20mA water level control using the PID inside the PLC
- to wire the grid (grid with Harting connector option)
- Understand the functioning of the level regulation by PID, probes & sensors

COMPONENTS PARTS OF THE MODEL

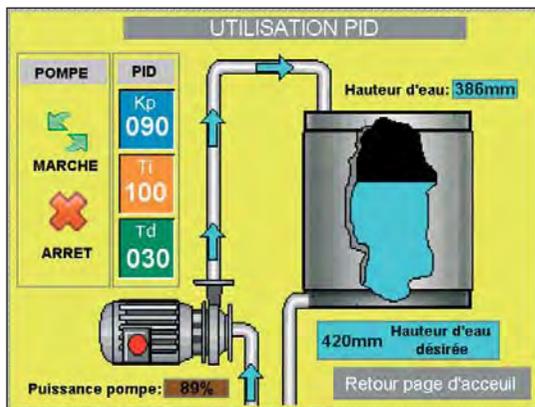
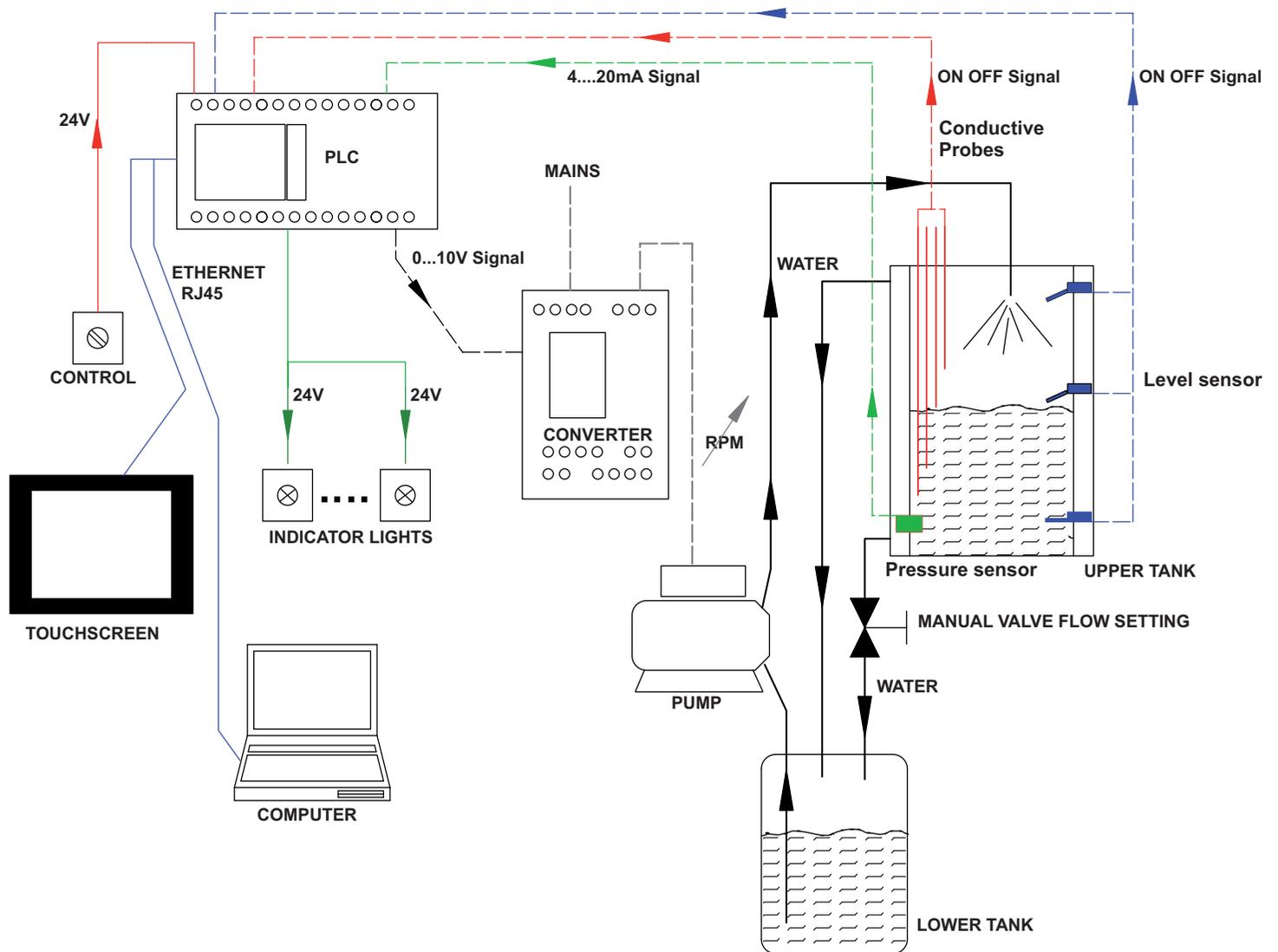
- 1 100L lower tank
- 1 transparent 60L upper tank, graduated in cm
- 3 level sensors with binary float (24V-3A).
- 4 50cm long Ø 6mm conductive probes.
- 1 hydrostatic pressure sensor.
Rating: 4-20mA output for 0-600mm water level
- Cabinet and console
- 1 5.7" TFT touchscreen
- 1 4-port RJ45 Ethernet hub
- 1 three-phase speed controller
- 1 PLC with software, fitted with a TCP/IP interface for the RJ45 link to a PC and the touchscreen.
14 Inputs + 10 Binary Outputs (24V)
1 analogue input 4-20mA
1 analogue output 4-20mA and 0-10V
- 1 30mA residual current circuit breaker. thermal-magnetic circuit breakers
- 230V power supply
- Base with wheels + brake. 1500 x 750mm

ACTION OF THE MONITORING

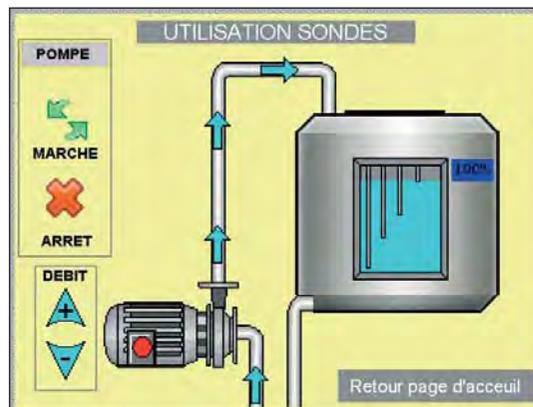
- starting and stopping the system
- choice of level control type
- water level and settings bargraphs
- display and adjustment of the PID parameters
- display of the speed controller's power in correlation with the pump delivery
- adjusting the settings



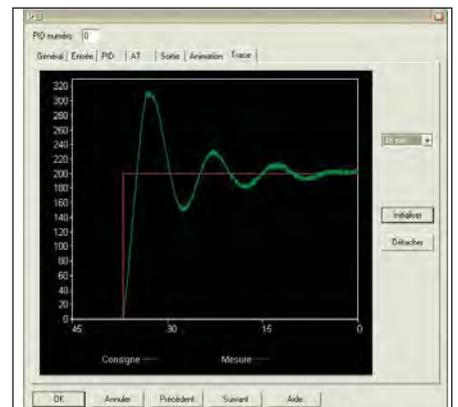
Example of monitoring on the touchscreen



PID status on the touchscreen



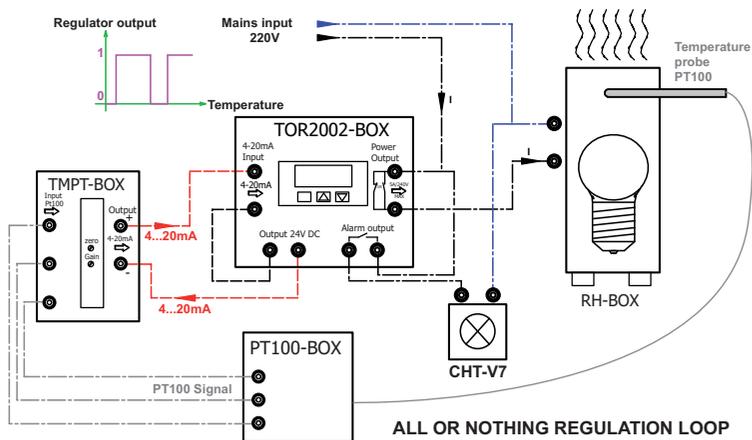
Probes status on the touchscreen



Automatic drawing of the measuring value/order value

Temperature control

ALL OR NOTHING TEMPERATURE CONTROL



ALL OR NOTHING REGULATION LOOP

ref. REGULATOR

Set of items for the study of an all-or-nothing temperature regulation loop with a PT100 sensor and 4-20mA signal.

REGULATOR MAIN FEATURES



- ALL OR NOTHING REGULATOR
Ref. TOR2002-BOX - See Page 175



- PT100 / 4-20mA TEMPERATURE CONVERTER
Ref . TMPT-BOX - See page 174



- TEMPERATURE PROBE
Ref . PT100-BOX - See Page 174



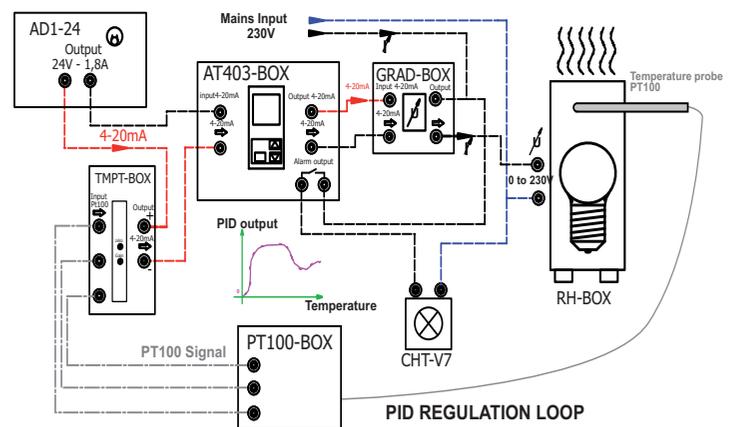
- HEATING UNIT
Ref . RH-BOX - See page 176



- HOUSING COMPONENT
Ref . CHT-V7 - See page 111

REGULATOR is delivered with all the safety leads necessary for the wiring, a technical leaflet for each item and the wiring diagrams.

TEMPERATURE CONTROL BY PLC



PID REGULATION LOOP

ref. REGULIDE

Set of items for the study of a 4-20mA temperature regulation loop with a PT100 sensor and a SCR unit. The whole circuit is controlled by a PID regulator.

REGULATOR MAIN FEATURES



- PID REGULATOR
Ref . AT403-BOX - See page 175



- HEATING UNIT
Ref . RH-BOX - See page 176



- SCR POWER CONTROL
Ref . GRAD-BOX - See Page 176



- DC POWER SUPPLY
Ref . AD1-24 - See page 175



- TEMPERATURE PROBE
Ref . PT100-BOX - See Page 174



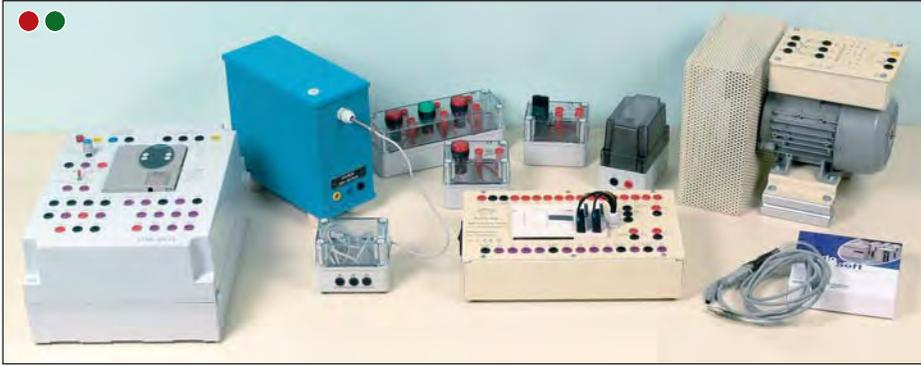
- HOUSING COMPONENT
Ref . CHT-V7 - See page 111



- PT100 - 4-20mA
TEMPERATURE CONVERTER
Ref . TMPT-BOX - See page 174

REGULIDE is delivered with all the safety leads necessary for the wiring, a technical leaflet for each item and the wiring diagrams.

Temperature control by PLC



ref. REGULAIR

Unit used for studying an analogue control loop with Pt100 sensor and also 4-20mA 0-10V control signal. Users can configure the PID, which is inside the PLC, via the software and observe changes in the temperature settings.

SUPPLIED READY FOR OPERATION WITH THE TECHNICAL INSTRUCTIONS, THE PROGRAMMING SOFTWARE AND THE PLC PROGRAMS WHICH CORRESPOND TO THE VARIOUS TUTORIALS TO BE UNDERTAKEN.

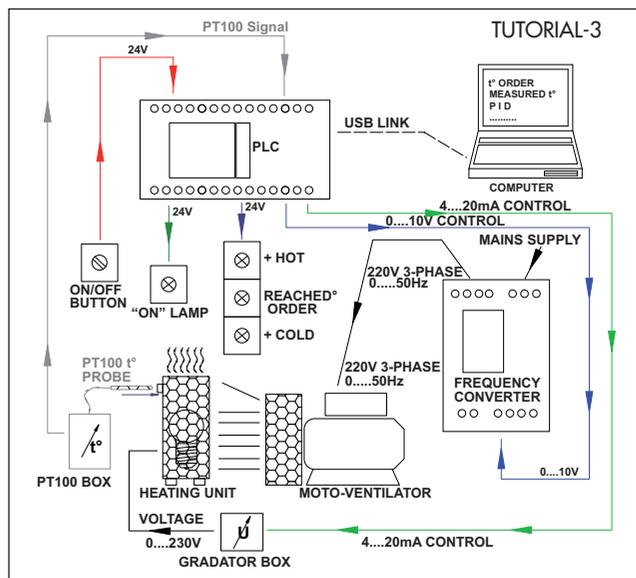
ALL OF THE COMPONENTS CAN BE SOLD SEPARATELY.

TUTORIALS CAN BE CARRIED OUT WITH THE REGULAIR MODEL

TUTORIAL-1 STUDY OF THE 0-10V CONTROL

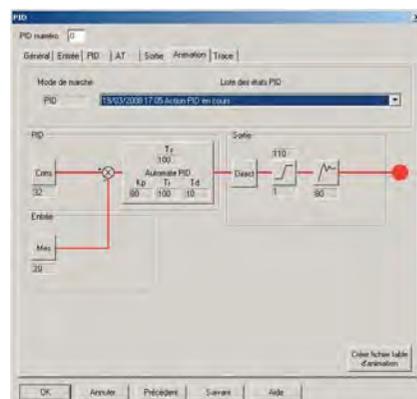
TUTORIAL-2 STUDY OF THE 4-20mA CONTROL

TUTORIAL-3 STUDY OF THE TEMPERATURE REGULATION BY PID



For each tutorial, students must:

- Develop the PLC program
- Configure the speed controller (tutorial-1 and tutorial-3)
- Produce the wiring diagram
- Wire the components
- Modify and observe the speed settings (tutorial-1), temperature settings (tutorial-2) and PID settings in order to regulate the temperature around a setting (tutorial-3)
- Using the PLC, measure on the PC the setting and instantaneous temperature curves (tutorial-3)



PID function from the PLC. The values of the settings, temperature, power output and the proportional and derived coefficients are completely configurable.

REGULAIR MAIN FEATURES

- **Electric fan**
230/400V three-phase asynchronous motor
Rated speed: 1500 RPM
Power supply via safety terminals 4mm



Electric fan shown without its protection cover

- **SCR power unit**
Single-phase SCR power unit
Connection by means of safety leads
4-20mA control
1 max. output: 15A
Dim: 100 x 80 x 90mm

- **Heating unit**
230V mains power supply by means of safety terminals
75W lamp
Max. heating temperature of approximately 90°C
Can accommodate temperature probes up to 7mm in Ø

- **Pt100 box**
Pt100 Temperature Probe – 3 wires
Connection by means of safety leads
Cable length: 90cm
Dim: 10x 80 x 90mm

- **PLC Unit**
14 inputs (24V)
10 binary outputs
1 Pt100 analogue input
2 outputs 0...10V and 4...20mA
Mains power supply by means of socket unit + switch
PLC programming software

- **Speed variator (frequency converter)**
220V mains input
Output to 230V three-phase motor
1 input 0...10V
Protection against short circuits
Protection against overloads
Protection against phase outages
Connection by means of safety terminals

- **Control units + lamps**
1 2-position switch
4 24V lamps (3Red + 1Green)
Connection by means of safety leads
2 outputs 0...10V or 4...20mA
Mains power supply by means of socket unit + switch

Sensors for regulation

THERMOSONDE PT100

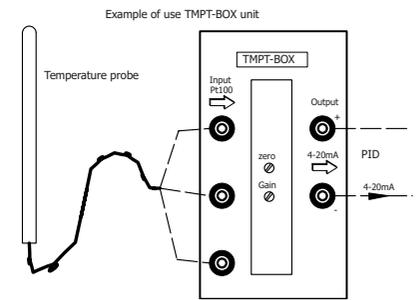
FEATURES

- Connection by safety leads
- Dims: 100 x 80 x 90mm
- Cable length: 90cm



ref. PT100-BOX

PT100 - 4-20mA TEMPERATURE CONVERTER



- This unit allows the connection of a temperature probe to the 4-20mA input of the PID.
- Adjustment of the signal gain & zero thanks 2 potentiometers
- Compatibility with the 2 or 3 wires temperature probes (see PT100-BOX)
- Input/output connection on safety sockets 4mm
- Works without any external supply
- DIMS: 77 x 106 x 92 mm

ref. TMPT-BOX

TABLE OF SENSOR + CONVERTER ASSEMBLIES

Common features:

- Single-phase mains input 90 to 260VAC on safety sockets 4mm.
- 4-20mA output on safety sockets 4mm
- Zero setting and outing adjustment by potentiometers on the front of the case
- Sensor removable from the converter
- Dimensions: 120 x 120 x 100 mm



Ref.	Type	Range
CIA-HUMT	Moisture	10 to 95% HR
CIA-AMT	Air velocity	0-30m/s
CIA-RPMT	Speed	0-2000 rpm - 0-20000 rpm
CIA-LXT	Luminosity	2 - 20 - 50kLux / 3 ranges
CIA-TMPT-PT100	Temperature	-100 to +400°C



ref. CIA-HUMT



ref. CIA-RPMT



ref. CIA-LXT



ref. CIA-TMPT

Regulators for regulation

ALL-OR-NOTHING REGULATOR



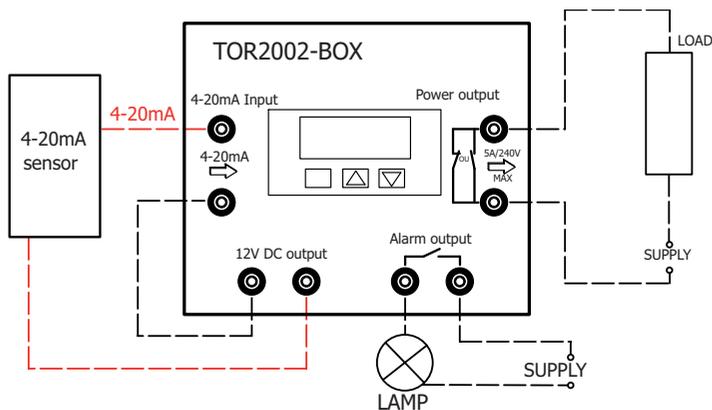
The regulator unit controls in all-or-nothing the supply of the load from a 4-20mA signal.

EXAMPLES OF USE Enter the order value directly in the regulator.

When the 4-20mA signal from the sensor reaches the order value, the state of the dry contact changes and opens (or closes) the supply circuit of the load (programming of the contact state: NO or NC).

Supply of the unit in 230V (power cord)

ref. TOR2002-BOX



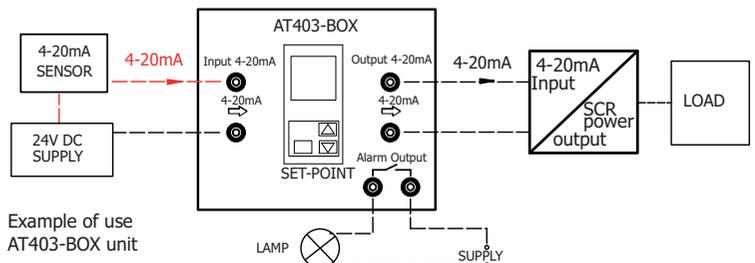
- 4-20mA input on safety sockets 4mm
- 10 000 counts configurable display
- Settings of the display :
 - For 4mA input, the display shows 0000
 - For 20mA input, the user can choose the value displayed between 1999 and 9999 and move the decimal point.
- Example of a 5bars converter: :
 - For 4mA, display indicates 0.000
 - For 20mA, select 5.000 (for the maximum value)
- Output: 250VAC / 5A relay on safety sockets 4mm
- Output: 24VDC (allow the wiring a 4-20mA loop without an external supply)
- Alarms: high and low, relay output on safety sockets 4mm
- Linear functioning or with hysteresis
- DIMS: 145 x 185 x 100 mm

PID REGULATOR



The PID regulator is the correcting component into a regulation loop for the monitoring of a process (boiler, compressor, pump ...). It receives a 4-20mA signal from the sensor which is the image of the value to regulate (temperature, pressure, flow...). It compares it to the set-point (programmed in the PID) and drive the process to reduce the difference "process variable / set-point"

ref. AT403-BOX



Example of use
AT403-BOX unit

TECHNICAL FEATURES

- Automatic tuning and manual PID
- 4 digits display for the instant value
- 4 digits display for the set-point
- Bar graph image of the power output
- 4-20mA input on safety sockets 4mm
- 4-20mA output on safety sockets 4mm
- 250V / 5A relay output on safety sockets 4mm
- Alarms output (high & low) on safety sockets
- Internal timer
- Supply: 240VAC - 50Hz
- DIMS: 145 x 185 x 100mm

DC POWER SUPPLY

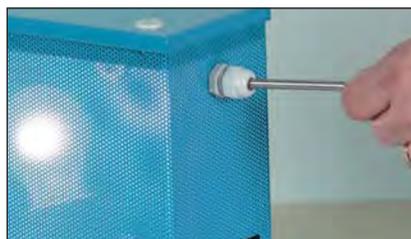


24V / 1.8A DC Supply
Output on safety sockets 4mm
Protection: overload and short-circuit:
by electronic limitation

ref. AD1-24

SRC power control and loads for regulation

HEATING UNIT



ref. RH-BOX

Heating unit fitted with a 75W lamp and completely safe 230V power supply, thanks to two 4mm double channel terminals. The Pt100 temperature probe, with a maximum diameter of 7mm, can be inserted sideways (e.g. PT100-BOX).

Powered via 230V mains supply or SCR power unit (e.g. GRAD-BOX), which regulates the light intensity and therefore the temperature in the unit. This temperature can be measured by a temperature probe (e.g. PT100-BOX)

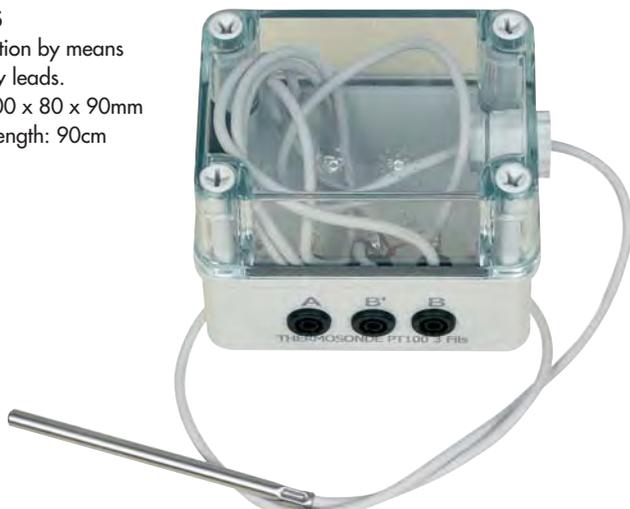
FEATURES

- 75W incandescent lamp – E27
- Mains power supply via 2 safety terminals
- Inlet port can accommodate temperature probe up to 7mm in Ø
- Dim: 250 x 250 x 110mm

PT100 TEMPERATURE SENSOR

FEATURES

- Connection by means of safety leads.
- Dim: 100 x 80 x 90mm
- Cable length: 90cm



ref. PT100-BOX

SCR POWER CONTROLS

These SCR power units control the power in the charge by varying the conduction time of the thyristors according to the control current 4 – 20mA

The power, the output power, the control input 4-20mA and the potentiometer can be used on 4mm safety terminals.

A potentiometer front allows to vary the conduction time. Compatible with resistive load only.



Ref.	CIA-GRA30M	CIA-GRA30T
Supply type	Single-phase	3-phase
Main supply	230VAC	3 x 400VAC
Auxiliary supply	-	220VAC from mains (for the cooling fan)
Output voltage	230VAC	3 x 400VAC
Max. output current	30A	30A
Control	4-20mA and/or potentiometer	4-20mA and/or potentiometer
Dimensions	290 x 190mm x 135mm	390 x 280mm x 185mm

SINGLE-PHASE SCR POWER CONTROL



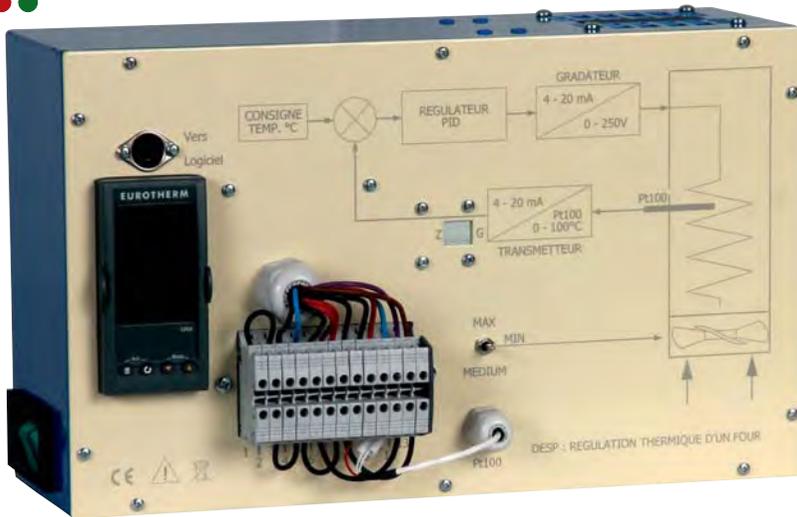
Controls the power in the charge by varying the conduction angle of the thyristors according to the control current of 4-20mA. Can be connected directly to the built-in PLC unit ref. AUTO-BOX-A.

FEATURES

- Connection by means of safety leads.
- Max. current output: 15A
- Dim: 100 x 80 x 90mm

ref. GRAD-BOX

System for heat regulation by P.I.D.



ref. DESP

This small oven, where an air stream is used to bring the parts to the correct temperature, is equipped with PID to control the temperature accurately to within a tenth of a degree.

The DESP model uses only industrial components. The PID control system - 4-20mA standard for measuring input and output - controls air stream temperature. To prevent any risk of burning, oven power has been limited to 250W and air temperature to 100°C.

The student wires the Pt100 3-wire probe, 4-20mA measuring loop, 4-20mA control loop, temperature transmitter, and loop power supply to the terminal strip.

Current is measured at the conversion resistance using a multimeter, without opening the loops. Maximum accessible voltage (without dismantling the apparatus): 24VDC. The system operates in two modes: automatic and control. In the latter case, an adjustable-speed fan sets up a disturbance. The terminal strip and components are suitable for demonstrating all types of wiring errors and troubleshooting. The temperature and thermostat control current graphs (used to determine static, loop, and critical gains, as well as dead time, and the time constant) are produced either manually (possible due to the slow changes in temperature), or on a PC using LOGIFOUR software (option) and PC interface.

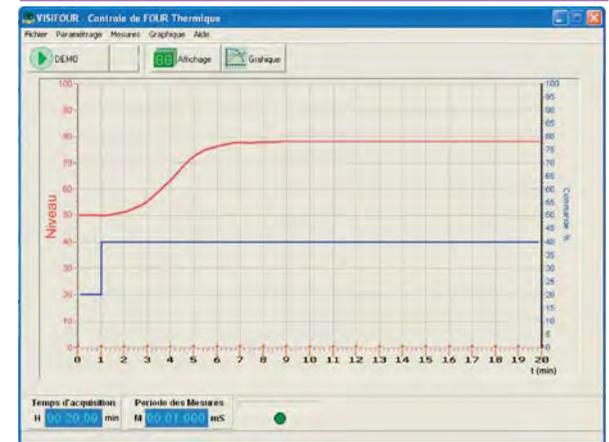
Proposed exercises and corrections

- Wiring a 4-20mA standard measuring loop with Pt100 probe and transmitter
- Calibrating the Pt100/4-20mA converter using a decade box (not supplied)
- Preparing a calibration sheet and graph
- Recognizing and testing a Pt100 probe. Calculating the current running through the Pt100.
- Measuring a loop current without opening the loop
- Using a 4-20mA calibrator
- Drawing a functional diagram and determining the roles of the various components
- Drawing a diagram of the control loop and a wiring diagram
- Identifying the controlled, controlling, and disturbance variables
- Determining the direction of controller action depending on the direction of the process and correcting unit.
- Determining the static characteristics of the process (static gain, dead time, and time constant) in order to calculate the transfer function.
- Determining the oscillation period, the critical loop gain and the integrated ratio.
- Determining thanks to the Broida's and Pessen's models, the corrector P, I and D
- Displaying the response curves with the three controllers: P, I, and D
- Adjusting the PID controllers and testing in both modes: automatic and control
- Testing the various empirical methods for adjusting PID controllers
- Training in troubleshooting using failure simulations

CHARACTERISTICS

- Supply : 230VAC
- Dimensions : 350 x 200 x 122 mm
- Weight : 3.7kg

OPTION INTERFACE & LOGICIEL LOGIFOUR



ref. LOGIFOUR

This PC interface – connected to the DB9 outlet – and software are used to record and draw graphs of temperature and heating control directly on PC. The connection to PC is made by USB.

ADDITIONAL FUNCTIONS

- Digital display of the two variables
- Cursor function
- Data transfer to plotter
- Zoom function

4-20mA LOOP CALIBRATOR (OPTION)



- Programming in % of the output span to supply a typical intensity like 4 – 8 – 12 – 16 or 20mA
- linear ramps, manual ramps, auto ramps
- Display: 5 digits
- Carry case, user's manual, external battery Pack (for 6x 1.5V AA batteries)
- Input for mains adapter DC 12V (not included)
- Dimensions : 88x168x26mm Weight : 330g

ref. VA100

RANGE	RESOLUTION	ACCURACY
4 - 20 mA	1µA	0,025% + 5µA
0 - 20mA	1µA	0,025% + 5µA
0 - 24mA	1µA	0,025% + 10µA
4 - 20V	1mV	0,05% + 5mV
0 - 20V	1mV	0,05% + 5mV
0 - 24V	1mV	0,05% + 10mV