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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

**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.

**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

**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.
Home automation system

The DOMOSYS panel comprises the main home automation features. This panel comprises the main functions for the home: external lighting, internal lighting, roller-blind, heating, hi-fi equipment, telephone control and their wireless controls. These wireless controls, which have been developed using the X2D communication protocol, are compatible with an existing wired installation. They can replace standard wired circuit breakers, while retaining manual control.

Each circuit breaker can be programmed very simply and controlled remotely using a 4-channel radio remote control. Together with a remote handset, a telephone transmitter can be used for remotely controlling the external lighting and alarm activation (siren replaced by a lamp). A multi-area radio remote control can be programmed to control the hi-fi system, all of the lights, the opening and closing of the roller-blind and the heating. Students understand and adjust the items which make up a home automation system.

**Components located on the panel**

- 1 protective modular table (30mA residual circuit breaker)
- 6 circuits with radio and wire programmable switch (= Prog Radio + Wire)
- External lighting of the luminary using a two-way switch: 1 standard switch and 1 on/off switch (Prog Radio + Wire)
- Living room bracket lighting, simple lighting and on/off timer switch (Prog Radio + Wire)
- Kitchen lighting (low-voltage spotlight) using a remote control switch (Prog Radio + Wire)
- Bedroom lighting (bedside lamp) using a remote dimmer switch from a transmitter (Prog Radio)
- Raising/lowering of the roller-blind using a switch (Prog Radio + Wire)
- 500W convector heating and adjustable thermostat (Prog Radio + Wire)
- 1 lamp simulating the activation of an alarm system.
- 1 programmable radio remote control which controls 4 different circuits.
- 1 telephone control circuit fitted with a 2-channel telephone transmitter.
- 1 offset telephone handset
- 1 multi-channel, radio-programmable, tactile remote control.
- 1 hi-fi system with remote control

**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 protective modular table (30mA residual circuit breaker)
- 6 circuits with radio and wire programmable switch (= Prog Radio + Wire)
- External lighting of the luminary using a two-way switch: 1 standard switch and 1 on/off switch (Prog Radio + Wire)
- Living room bracket lighting, simple lighting and on/off timer switch (Prog Radio + Wire)
- Kitchen lighting (low-voltage spotlight) using a remote control switch (Prog Radio + Wire)
- Bedroom lighting (bedside lamp) using a remote dimmer switch from a transmitter (Prog Radio)
- Raising/lowering of the roller-blind using a switch (Prog Radio + Wire)
- 500W convector heating and adjustable thermostat (Prog Radio + Wire)
- 1 lamp simulating the activation of an alarm system.
- 1 programmable radio remote control which controls 4 different circuits.
- 1 telephone control circuit fitted with a 2-channel telephone transmitter.
- 1 offset telephone handset
- 1 multi-channel, radio-programmable, tactile remote control.
- 1 hi-fi system with remote control

**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.**

**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.
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

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

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: brown (beige front panel)
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-9)
- 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.

ANTH-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.

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 telephone interface
- 1 telephone
- 1 telephone transmitter.

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

WIRELESS ANTI-INTRUSION UNIT

GES-9 is a panel used for studying and programming a wireless anti-intrusion alarm unit with a built-in siren. The unit is fitted with a passive infrared sensor, a dual intrusion sensor (infrared + microwave frequency) 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-9.

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.
- 1 infrared sensor. 12m range
- 1 dual technology intrusion sensor: (infrared + microwave frequency)
- 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
- Software supplied with ladder language programme
- Programming: sequential function chart or ladder language
- Fully functioning program: Supplied
- Ethernet connection to the IP computer network

FIRE ALARM CONTROL SYSTEM

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

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INTRUDER ALARM CONTROL SYSTEM

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

COMMUNICATING

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. 

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

COMMUNICATING

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
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.

**LIGHTING 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 spotlights
- the mains power
controls:
- the lighting in each room

**SECURITY LIGHTING CONTROL SYSTEM**

**COMMUNICATING**

**THE MONITORING SOFTWARE**

Allows you to:
- acquire and display PLC variables
- Monitor and control of process
- create your own monitoring

Displays:
- battery-operated
- a voltage on the lighting unit terminals
controls:
- the activation of the anti-panic unit
- the activation of the security lighting units

Panel used for studying, programming and wiring four spotlights and one fluorescent lamp lighting five rooms in the business premises. The student is required to interconnect the regulating modules (remote dimmer switch, remote control switch and clock), the sensor (photo-electric cell) and the spotlights. All of the marked connections are wired to a terminal block.

**TECHNICAL FEATURES AND EQUIPMENT**

- 1 button-operated remote dimmer switch for spotlight brightness
- 1 button-operated remote dimmer switch for fluorescent lamp brightness.
- 1 button-operated remote control switch for a spotlight
- 1 spotlight daily timer switch
- 1 photo-electric cell which measures the ambient lighting and adjusts the brightness of a spotlight

Panel used for studying and wiring security lighting. It operates in two independent modes, permanent mode or intermittent mode.

The student has to interconnect the lighting units, the anti-panic unit, the central battery and the “mains power fault” detector. All of the marked connections are wired to a terminal block.

**TECHNICAL FEATURES AND EQUIPMENT**

**Front panel**
- 2 security lighting units
- 1 forced operation switch for the security lighting
- 1 anti-panic lighting unit
- 1 communication unit which controls the anti-panic lighting
- 1 manual unit shutdown control
- 1 maintenance-free central battery for permanent lighting, with digital voltage and drain current display, indicator lamps: mains power on, battery operation, battery discharge, fault.
- 1 spotlight connected to the mains showing the mains voltage.

**Back panel**
- 2 stand-alone security lighting units, with maintenance-free internal battery
- 1 stand-alone anti-panic lighting unit with maintenance-free internal battery
- 1 manual unit shutdown control
- 1 spotlight connected to the mains showing the mains voltage.
- If a general shutdown occurs, the remote control cuts off the battery power to prevent discharge.
These panels are supplied with PLC and a monitoring software.

**FEATURES OF THE MONITORING 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

**ACCESS CONTROL SYSTEM BY SWIPE CARDS & ENTRY SYSTEM**

**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

**ENTRY ACCESS & VIDEO ACCESS CONTROL SYSTEM**

**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

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.

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
Model of modbus input/output communicating interface

As communication between automated systems plays a major role in level 5 to level 1 tertiary and industrial training, this product (educational and one that can be integrated in automated systems) is particularly attractive. The slave’s adaptability makes it possible first of all to learn about the MODBUS protocol, which is widely used and highly educational by design. This model also offers the ability to reintroduce MODBUS frames, for integrating the slave into a network and ordering it to perform different tasks (I/O binary and analogue) by means of Schneider® PLC communication functions and others...

According to the Modbus RTU protocol, this field communication slave allows:
- displaying RS232 and RS485 signals and converting them
- using PLC communication functions: WRITE_VAR, EXCH...
- acquiring analogue quantities
- updating and interfacing protected binary inputs/outputs
- transparently analysing frames exchanged on the bus.
- @slave: 1 to 255; 8N1 format; 19200 and 9600 bps
- 3 5A-250V relay outputs
- 2 0-10V protected analogue inputs

The software delivered (XP, Vista, W7 compatible) makes it possible to:
- interact directly with the slave through a computer via the serial or USB port
- study the composition of the information in RS232 format
- communicate with other systems, such as a speed controller, a contact-starter, etc., to configure them and perfect their operations individually
- simulate a Modbus master in the event one does not have (or does not have enough of) a Modbus extension coupled to a PLC.
- acquire data from analogue inputs and present them in a grid and an Excel graph
- offer sensor calibration correction parameters.
- make up Modbus frames with the composition of the CRC16

Tutorials delivered with the model:
- RS232 bearing calibration
- interaction with and control of the model, an ATV 31, a TESYS contact
- Modbus communication functions of TSX and TWIDO APIs in uses requiring an ATV

Model delivered with a PC connection cord, the dialogue software with the model and the tutorials described above.
Configuration of a VDI system (Voice Data Image)

A V.D.I. system includes a patch panel, an automatic switchboard PABX or IPBX and an IP camera to create a computer network with monitoring and a call network with video monitoring system. **B3-RES+** is delivered wired, completely connected, ready to operate, with a wiring schematic, operating principle and detailed instructions for each device. A technical manual and a pedagogical manual are supplied with the system...

**PRODUCTS SUPPLIED**

1. **Computer network patch panel**  
   TECHNICAL FEATURES  
   SEE PAGE 118

2. **Caméra IP**  
   TECHNICAL FEATURES  
   SEE PAGE 119

3. **IP PABX switchboard & phones**  
   TECHNICAL FEATURES  
   SEE PAGE 119
Description of the component parts of the VDI system

1 COMPUTER NETWORK PATCH PANEL

The computer patch panel is supplied already wired and ready to operate, with wiring diagram, operating principle, and detailed instructions for each device. A technical manual and a pedagogical manual are supplied with the computer patch panel.

Computer network patch panel is a 19-inch computer bay which is equipped with all the necessary hardware for creating an Ethernet computer network.

Computer network patch panel is delivered already wired and configured, and can be used to network several computers, IP cameras (see option), an IP-based private automatic branch exchange (IP PBAX) with its telephone sets (see options) and any other system with an RJ45 Ethernet connection. An inverter, which is built into the computer bay, supplies power to the PCs’ CPUs, even if the mains power fails.

GENERAL FEATURES

- 220V mains power supply.
- Base on large wheels
- Easy to move
- Dim. 1600 x 800 x 670
- Patch panel dim.: 12U x 540 x 600 (double casing)

COMPONENTS AND FEATURES OF THE COMPUTER PATCH PANEL:

- Rackable 19-inch patch panel, 24 RJ45/RJ11 ports. The RJ45 connectors clip onto the plate and can easily be replaced. No crimping tool is required for wiring the RJ45 connectors. The connectors can be reused.
- Rackable 224-RJ45 port, 19-inch hub - 10-100 Mbit/s. Ready for use, plug-and-play, no administration or configuration required. (Please consult us for an adjustable hub). Supplied with 10 patch cables.
- Rackable 19-inch terminal board fitted with mains connectors that are protected by a 16A circuit-breaker.
- 220V/600VA inverter
- 2 side raceways, left and right, with direct clipping, 670mm in length, equipped with a total of:
  - 8 built-in RJ11-compatible RJ45 connectors.
  - 3 220V sockets, backed up by the inverter
  - 1 220V mains connector, not backed up
- Double-cased 19-inch metal 12U cabinet. SECURIT-glazed front door and solid rear door with lock and key. Mounted on a base with large wheels
  The unit is very easy to move.
Once this IP camera has been connected to one of the computer panel Ethernet ports, it enables you to create a video monitoring system for several PCs, which are in turn themselves connected to the computer panel network.

**Features**
- Indoor use
- Colour image
- 25 images/second
- 3-metre Ethernet cable supplied
- Powered by 230V/6V mains adapter unit

**LAN controller option**

LA-1011 is a LAN (Local Area Network) tester used for testing RJ11, RJ45 and BNC connections. Two rows of illuminated segments (one for transmitting and the other for receiving) symbolise the voltages at each end of the cable. They highlight compliant, cut, crossed or short-circuited connections. The long cables are monitored using the remote control unit.

- Examining the manual or automatic interconnections.
- A built-in multimeter with a 2000-count display allows standard measurements: VDC, VAC, IDC, IAC, OHM and sound continuity test.
- Automatic shutdown
- Dimensions/Weight: 162 x 74 x 44mm / 308g
- CEI1010 Pol2 CAT III: 600V

**Supplied accessories**
1 test cable with 2 RJ45s / 2 BNC test cables
2 RJ45/RJ11 adapters / One pair of measurement leads
Batteries / Instructions / Anti-shock sheath and storage case
Supermarket checkout simulator

**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.

**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.

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.
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.

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

TRANSPARENT TANKS MADE FROM UNBREAKABLE LEXAN

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 flowrate 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 (Ø 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

**PUMPS & FLOW CONTROL VALVES**

- 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

**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
Drinking water supply simulator

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 sensors.
- 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 sensors.
- 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 (for all CHATO references)
- 800 x 600 x 250mm steel cabinet, supplied with a grid.
- Plate on door with unwired control lamps and actuators.
- Free spaces for the addition of DIAM 22 control components.
- Rapid connection and hanging of the grid (not exceeding 750 x 750mm).
- Door safety contact.
- Fixed connectors on grid, to be wired by students.
- Male Harting® connectors to level sensors, to motorised pumps, to the 400 and 24V power sources and to the control panel.
- Circuit breaker, in front of the power source.
- General residual current circuit breaker 30mA.
- General emergency stop and Start/Stop.
- 2 circuit breakers for protecting the three-phase and 24V power supply.

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 (for all CHATO references)
 Console which makes testing safe, with control of the cabinet door’s safety contact.
- Circuit breaker, in front of the power source.
- General residual current circuit breaker 30mA.
- General emergency stop and Start/Stop.
- 2 circuit breakers for protecting the three-phase and 24V power supply.
All or nothing flow sensor

Detected 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 flow rate 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)

Flowmeter

The sensor shows the flow rate of the water on the display unit when it leaves the pump. Students can observe a change in the flow rate 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.

Grid & plate for relay

Wired door plate and grid for system operation with relay.

Hydrostatic pressure sensor option

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%

Fault simulator unit

Unit with concealed switches to simulate sensor faults. 6 switches linked to 6 sensors. Unit fixed onto the system’s frame.
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
- Mains power on 400V
- 24V mains power on

**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.**

<table>
<thead>
<tr>
<th></th>
<th>CHATO-4S</th>
<th>CHATO-4S-T6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base on the reference CHATO-4-GD</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>PLC programming software</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Monitoring software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.7 inch colour touchscreen, with its mains lead</td>
<td>•</td>
<td></td>
</tr>
</tbody>
</table>

The monitoring software allows to create easily your own application.
Didactic lift

The ASC89 lift is a model which may be connected to a PLC or some microprocessors. 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)
3. 1 button to call the lift ‘up’ (except the 3rd floor) with indicator lamp
4. 1 button to call the lift ‘down’ (except the ground floor) with indicator lamp
5. 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**
The motors · the LED · internal logic to the unit.

**OTHERS**
Dims 780 x 480 x 440mm · Weight 15kg · Supply 220V
The unit is available in two driving logic values, 24V or 5V.

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

Interfaces for didactic lift

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**
**ASMAT - LIFT**
Two flat cables with:
One connector for the inputs and the other for the outputs.

**ASMAT - PLC**
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.

**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)

**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
Motorized gates

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
- 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

Pneumatic handling line

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...
The PSY4001 unit has 12 inputs/outputs, mimicking 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.

### 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

**M340 PLC - BASIC MODEL**

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**

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
  - ±10V / 0-10V / 0-5V / 1-5V / ±5V / 0-20mA / 4-20mA / ±20mA
- Analogue output module
  - Isolated high-level outputs
  - 2 voltage/current channels
  - ±10V / 0-20mA / 4-20mA

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

Unity Small software

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)/Grafcet

**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**
**TWIDO PLC - BASIC MODEL**

TWIDO PLC with ø4mm 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

**TWIDO PLC - WITH BUILT-IN ANALOGUE CARD**

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

---

**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**

<table>
<thead>
<tr>
<th>REF: BUILT IN PLCs</th>
<th>AUTO-BOX</th>
<th>AUTO-BOX A</th>
<th>AUTO-PRO</th>
<th>AUTO-PRO A</th>
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<tr>
<td>Built-in processor</td>
<td>TWIDO</td>
<td>TWIDO</td>
<td>M340</td>
<td>M340</td>
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<tr>
<td>I/O modules</td>
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<td>IN 1 SINGLE UNIT</td>
<td>SEPARATE (makes repairs easier)</td>
<td>SEPARATE (makes repairs easier)</td>
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<td>Memory card</td>
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<tr>
<td>Internal words</td>
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<tr>
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<td>14</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>No. of binary outputs</td>
<td>10</td>
<td>10</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>
Programmable controls system

**BASIC MODEL**

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
- 8 keys for programming

**MODEL WITH TCP-IP ETHERNET MODULE**

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 protocol.

**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.
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 Broido’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

**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