

CAME GROUP

URBACO



ISO 14001

AUTOMATIC BOLLARDS

**USER'S MANUAL
SIEMENS LOGO! PLC
Reference: RCPULOGO24RC**

**THIS MANUAL IS INTENDED FOR TECHNICAL STAFF IN CHARGE OF THE INSTALLATION,
THE OPERATION AND THE MAINTENANCE OF THIS PRODUCT.**



**CAUTION!
ELECTRICAL SHOCK
HAZARD**
Strictly comply with
security and protection
orders.

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1. PRESENTATION

1.1. General features:

This manual describes the commissioning and operation of the SIEMENS LOGO! PLC for the management of URBACO pneumatic- and hydraulic-driven automatic retractable bollards (1 programme for each type of drive).

This PLC shows 8 inputs, 4 outputs, a LCD display screen and a keypad with 6 keys.

The PLC runs one complete access site with traffic lights.

The use of the upper limit switch is not mandatory. On the other hand, the lower limit switch must be connected! Both limit switches together ensure the safe operability and the detection of faults within the system.

The screen and the keypad are designed to analyse defaults, to programme operations, to set the date and the time and to visualise real time input/output status.

Programming is done by the user and subject to memory backup conservation (at least 80 hours) in case of a power outage.

In case of memory loss (e.g. power outage for more than 48 hours), the original programming is automatically reloaded.

This PLC can only be used in stand-alone configurations. It cannot be connected to any centralisation network.

The expansion module gives additional functions (control inputs, safety device input, default indications, bollard position status and vehicle detection).

It is recommended to comply with the following to ensure good use of an access site controlled by one or several automatic retractable bollards:

SECURITY RULES FOR A GOOD USE OF AN ACCESS SITE CONTROLLED BY AUTOMATIC RETRACTABLE BOLLARD(S)

So as to ensure a good functioning of the access site, URBACO recommends the following:

- **Place a vertical sign post showing «retractable bollard obstacle» ahead;**
- **Equip automatic systems with traffic lights warning of bollard status or position (red and amber, blinking)**

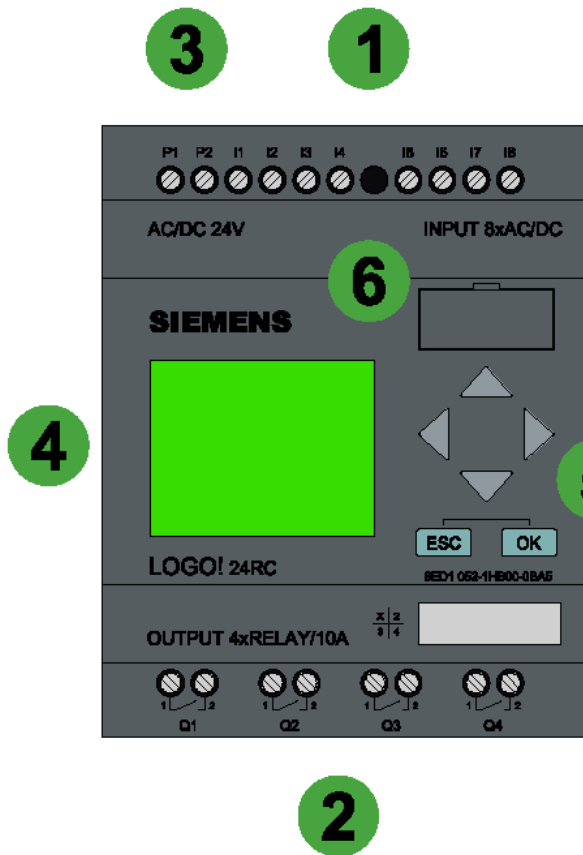
For access control systems, URBACO recommends that vehicles **necessarily stop before the bollard and wait until it is fully retracted** (and respect the red turning to blinking amber if the access site is equipped with traffic lights) **before proceeding**.

During the automatic rise of bollards once a vehicle has passed, other vehicles should by no means try and drive **one after the other** through **access without each stopping before the bollard**.

INFORMATION AND EDUCATION OF USERS

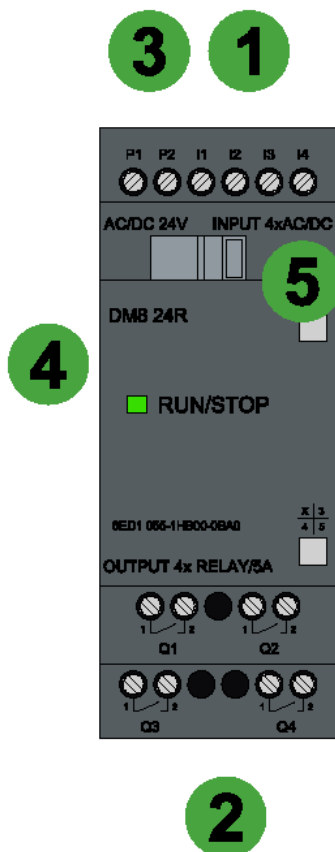
The access operator must absolutely inform users how the system works and how properly to use it. URBACO will not be held responsible in case of mishandling or security rules not being respected.

1.2. The LOGO! PLC :



- 1- Connection terminal for inputs
- 2- Connection terminal for outputs
- 3- PLC power supply terminal P1/P2 24VAC
- 4- LCD screen (multicharacters)
- 5- Keypad with 6 keys (arrows: up, down, right, left and ESC and OK keys)
- 6- Memory cartridge

1.3. The LOGO! expansion module:



- 1- Connection terminal for inputs
- 2- Connection terminal for outputs
- 3- Expansion terminal power supply
- 4- Visualisation LED RUN/STOP
- 5- PLC connection lever

2. TECHNICAL DATA

LOGO! PLC with 24VAC power supply, 24VAC inputs and relay outputs.

General technical data:

Dimension (W x H x D)	:	72 x 90 x 55 mm / 2.83 x 3.54 x 2.16 in
Weight	:	Approx. 190 g / 6.70 oz
Data retention	:	
Inputs/Outputs, built-in	:	8 Inputs / 8 Outputs

Homologations:

- Ambient weather conditions	:	
Ambient temperature	:	CEI 60068-2-1 (low temperature) CEI 60068-2-2 (high temperature)
Relative humidity	:	CEI 60068-2-30
Pollutants	:	CEI 60068-2-42 and CEI 60068-2-43
- Ambient mechanical conditions	:	
Vibrations	:	CEI 60068-2-6
Shock	:	CEI 60068-2-27
Drop	:	CEI 60068-2-31
Free fall (packaged)	:	CEI 60068-2-32
- Electromagnetic compatibility (EMC):	:	
Noise emissions	:	EN 55011/A EN 55022/B, EN 50081-1 (residential area)
Electrostatic discharge	:	CEI 6100-4-2 (Severity 3)
Electromagnetic fields	:	CEI 6100-4-3
HF currents	:	CEI 61000-4-6
Burst pulses	:	CEI 61000-4-4 (Severity 3)
High energy surge	:	CEI 61000-4-5 (Severity 3)
- Safety to IEC / VDE	:	CEI 60664, CEI 61131-2, EN 50178

Power supply:

Input power supply	:	24 VAC – 47 to 63 Hz
Permissible range	:	20.4 to 26.4 VAC
Input current	:	40 to 110 mA

Environment:

Temperature range	:	0° to +55°C // 32°F to 131°F
Power loss	:	0.9 to 2.7 W
Storage	:	-40°C to +70°C // -40°F to +158°F

Inputs:

Type	:	Alternative power
Voltage	:	24 VAC

Outputs:

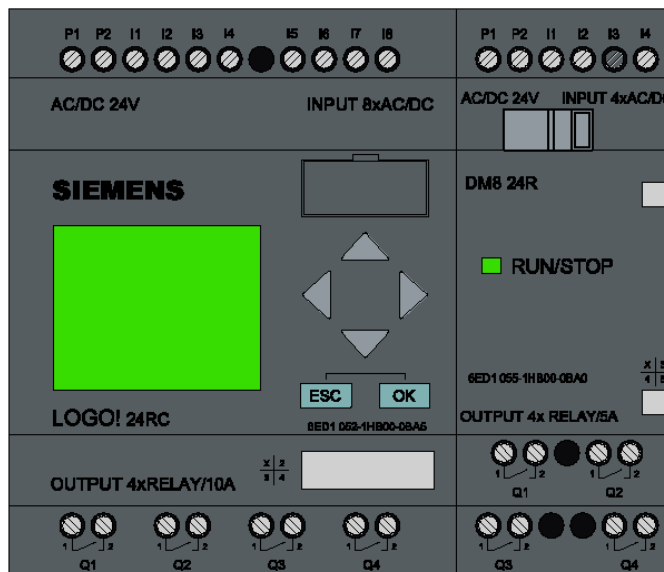
Type	:	Relay outputs, dry contacts
Continuous current	:	max 10 A per relay

3. CONFIGURATION OF PLC / EXPANSIONS ACCORDING TO ACCESS

3.1. PLC alone:



3.2. PLC and expansion module:



Note: To run several access sites, the PLC panel must have as many LOGO! PLCs as there are access sites (3 access sites = 3 LOGO! PLCs)

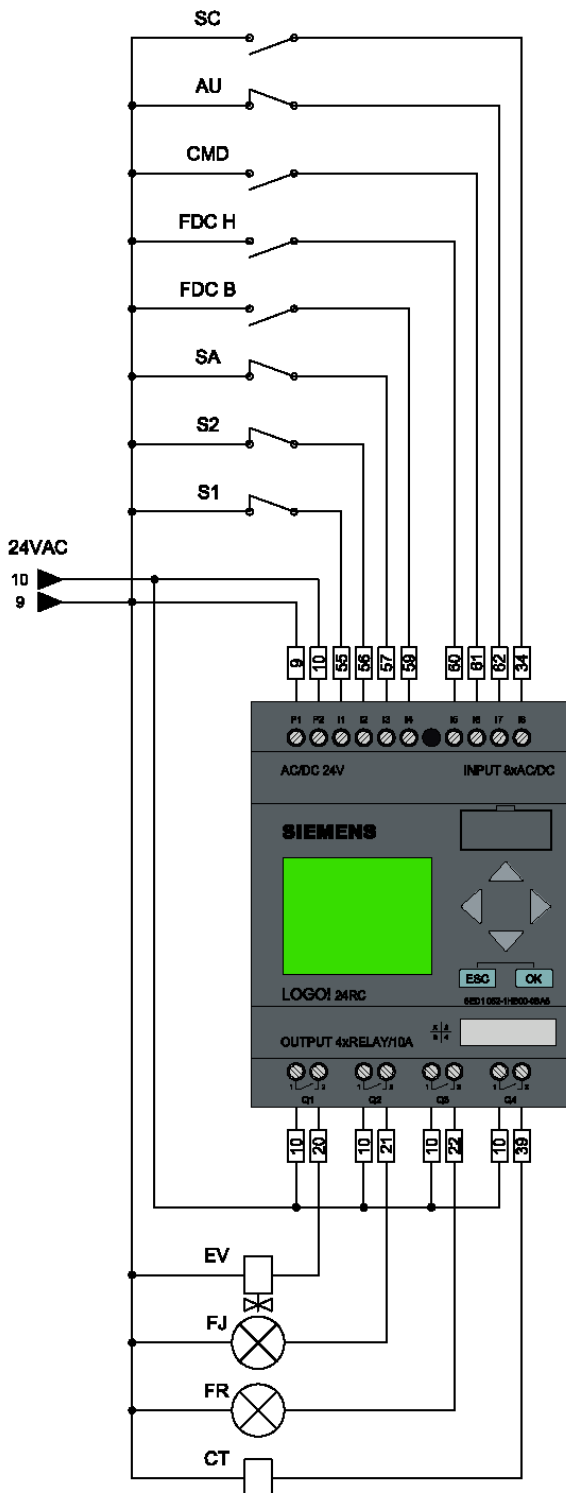
4. INSTALLATION AND CONNECTIONS

4.1. Fixation:

The SIEMENS LOGO! PLC as well as expansions are designed for symmetrical DIN-rail mounting. The whole set may be locked or unlocked with a hook.

4.2. Standard connections:

4.2.1. Standard access connection:



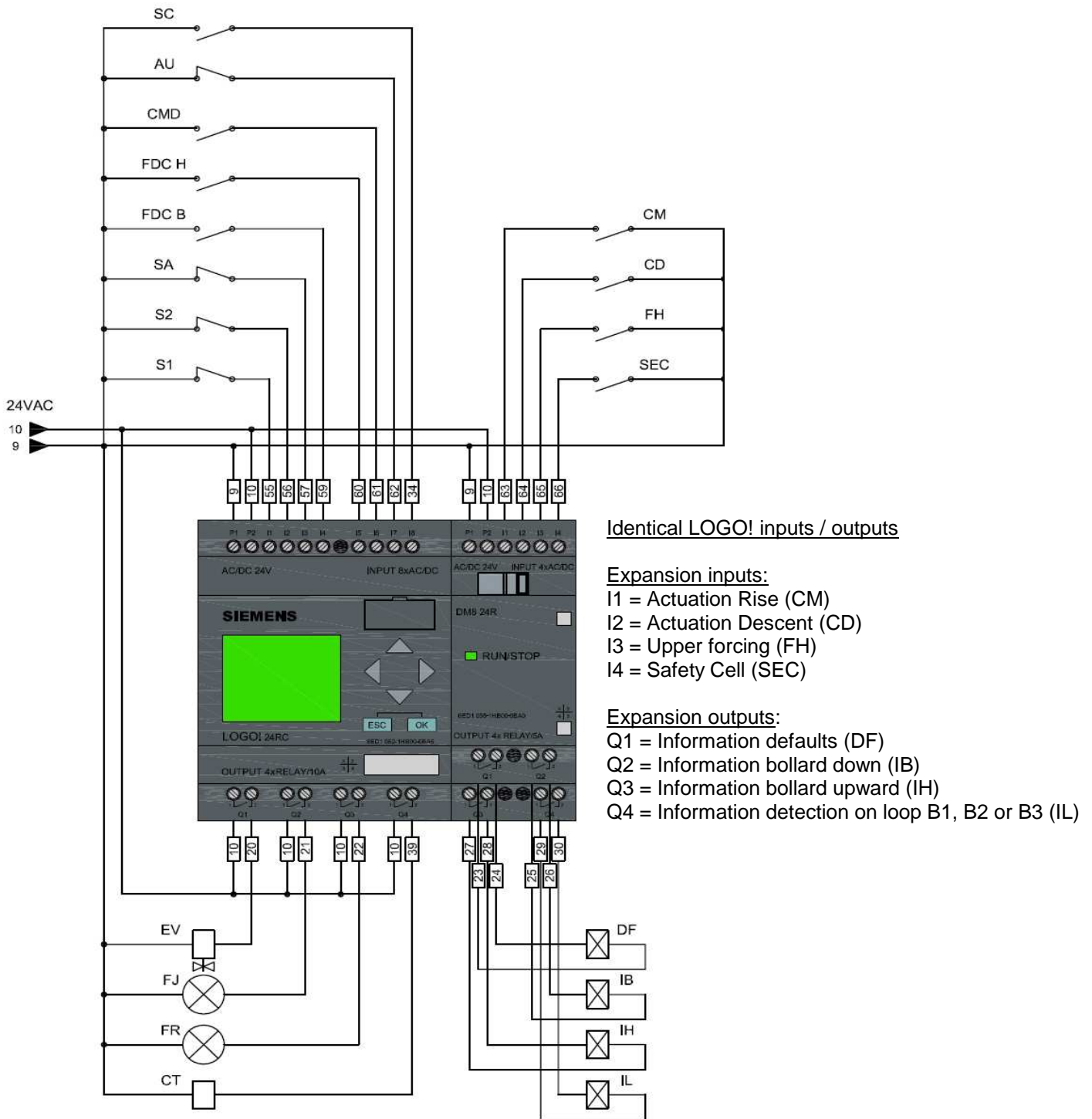
Inputs:

- I1 = Contact Presence / Safety Loop N°1 (S1)
- I2 = Contact Safety N°2 (S2)
- I3 = Contact Free Exit (SA)
- I4 = Lower limit switch (FDC B)
- I5 = Upper limit switch (FDC H)
- I6 = Actuation descent or rise/descent (CMD)
- I7 = E-descent (forced) (AU)
- I8 = Compressor surveillance (SC)

Outputs:

- Q1 = Solenoid valve (EV)
- Q2 = Traffic light, amber (FJ)
- Q3 = Traffic light, red (FR)
- Q4 = Contactor Motor (CT)

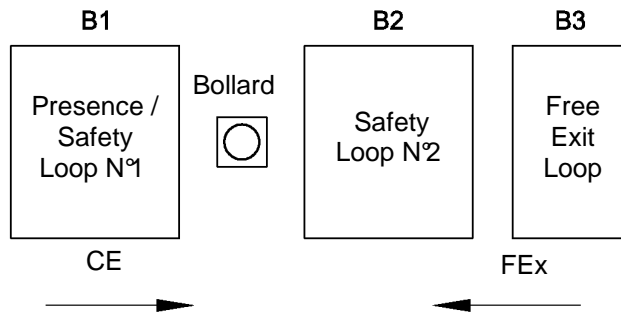
4.2.2. Standard access connection with expansion module:



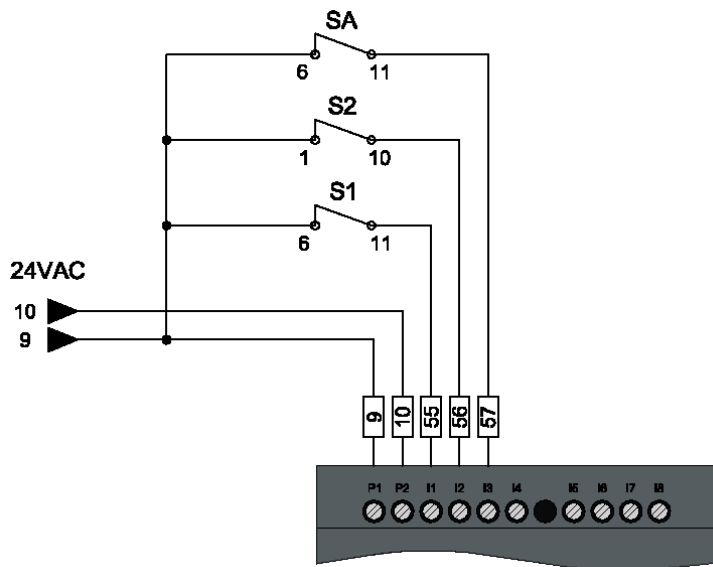
4.3. Connection of the operation logic mode:

4.3.1. Controlled entrance and Free exit:

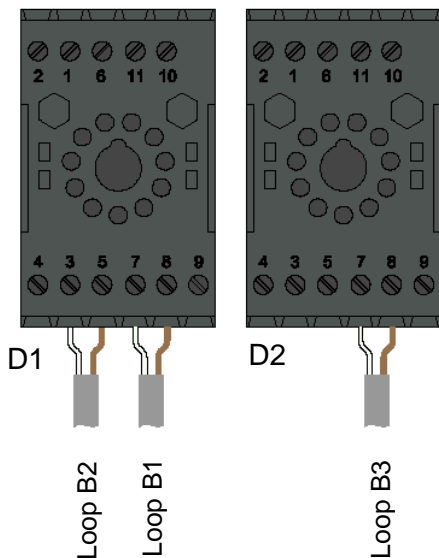
a) Installation of loops:



b) Connection of contacts:



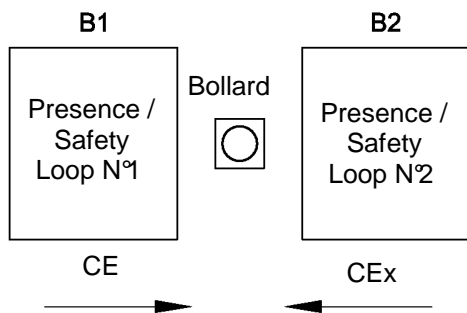
c) Connection of loops:



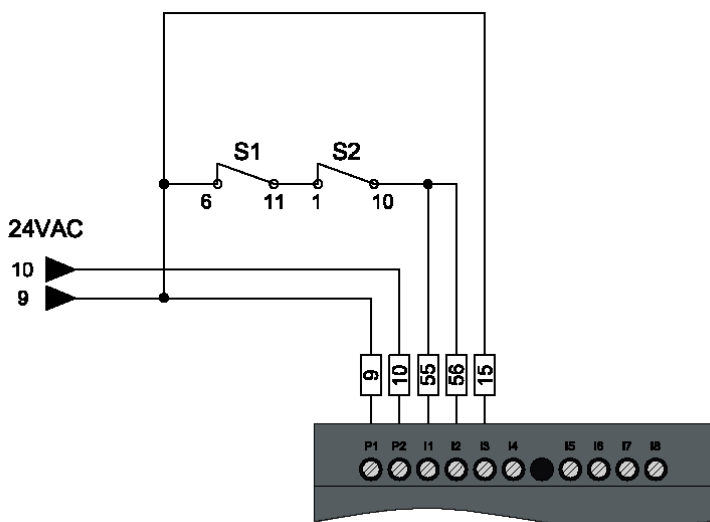
D1: Socket for Safety Loops (B1 and B2) Detector
 D2: Socket for Free Exit Loop Detector

4.3.2. Controlled Entrance and Controlled Exit:

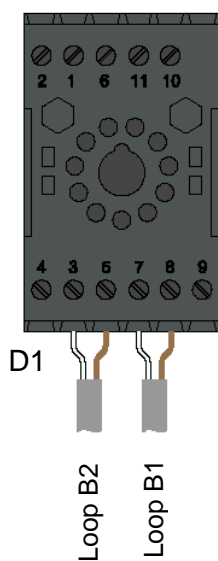
a) Installation of loops:



b) Connection of contacts:



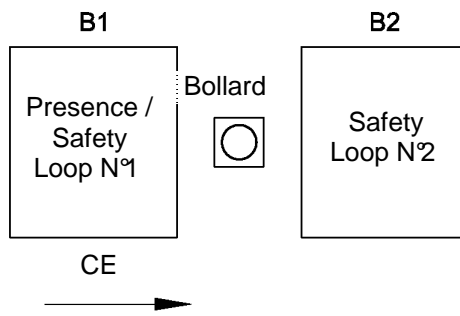
c) Connection of loops:



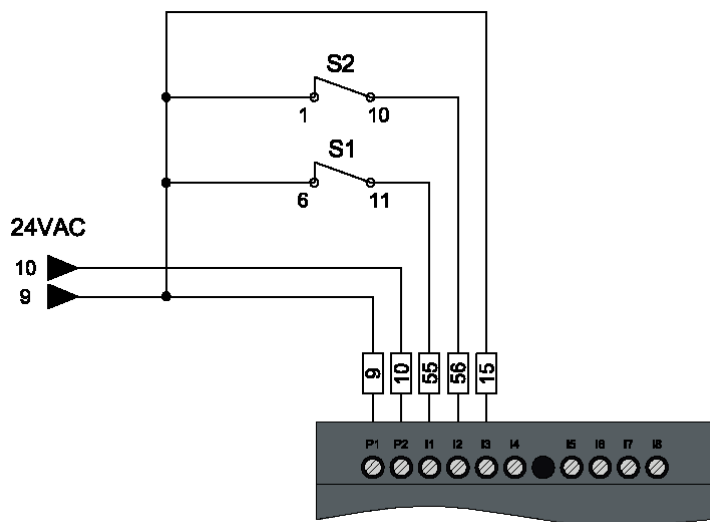
D1: Socket for Safety Loops (B1 and B2) Detector

4.3.3. Controlled Entrance and Forbidden Exit:

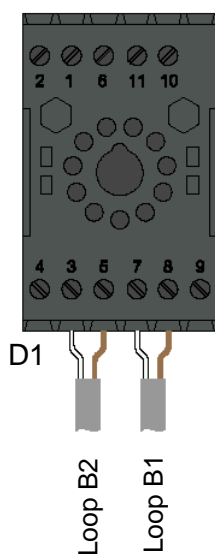
a) Installation of loops:



b) Connection of contacts:



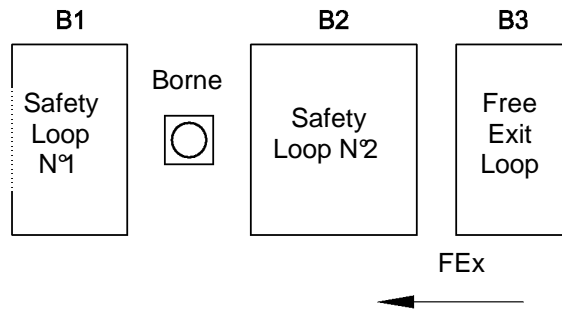
c) Connection of loops:



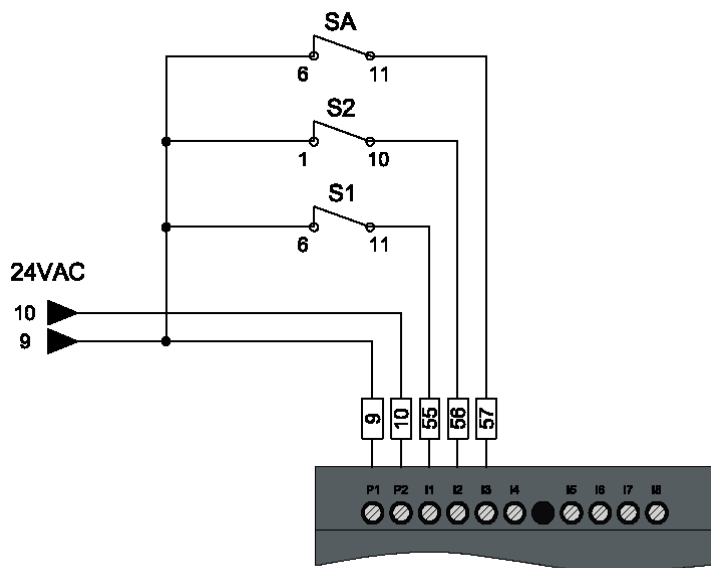
D1: Socket for Safety Loops (B1 and B2) Detector

4.3.4. Free exit:

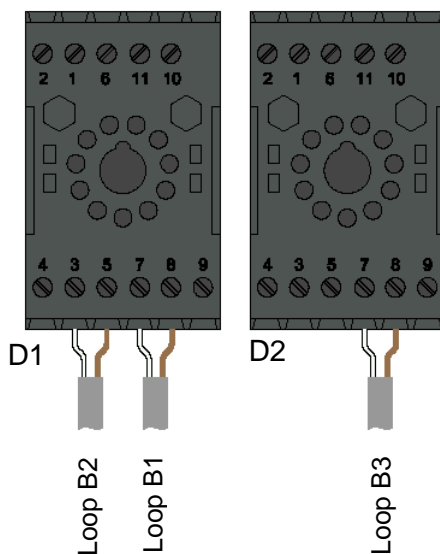
a) Installation of loops:



b) Connection of contacts:

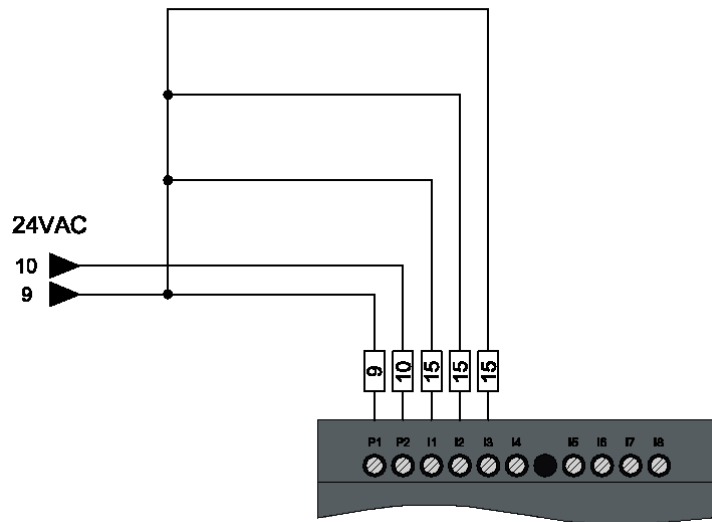


c) Connection of Loops:



D1: Socket for Safety Loops (B1 and B2) Detector
 D2: Socket for Free Exit Loop Detector

4.3.5. None (without loop):



5. THE PROGRAMME CARTRIDGE

5.1. Presentation:

The programme cartridge is an EEprom which carries the bollard management programme. It transfers the programme into the PLC.

Note: This cartridge is not delivered together with the systems installed. The programme is transferred into the PLC in our factory.

5.2. Programme Update or Reloading Procedure:

To copy a programme from the cartridge into the PLC, proceed as follows:

- 1) Plug the programme cartridge in.
- 2) Activate the programming mode of the PLC (ESC / >Stop).

```
>Program..
  Card..
  Clock..
  Start..
```

- 3) Move ">" on 'Card': Key ▼ or ▲.
- 4) Press **OK**. You access transfer menu.
- 5) Move ">" on 'Card → LOGO!': Key ▼ or ▲.

```
> [=]->Card
  Card-> [=]
  Copy
  Protect
```

[=] = PLC

- 6) Press **OK**

The PLC downloads the programme from the cartridge. When downloading into the LOGO! PLC is over, the menu is displayed on screen.

Note: The memory cartridge may remain inserted; it does not hinder the PLC operability. However, if you want to remove the cartridge, you may do so without turning the PLC off. This can be done while the system is 'ON'.

5.3. Types of URBACO programmes downloadable into the LOGO! PLC:

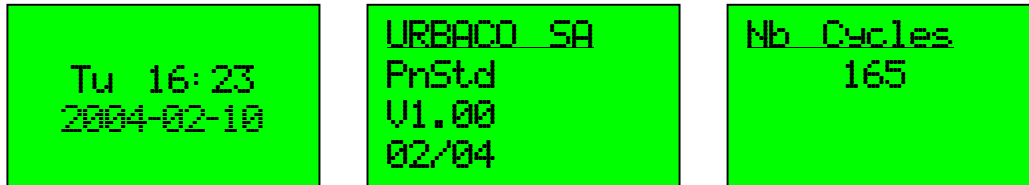
Two different programmes are available:

A programme for pneumatic bollards (PnStd) and a programme for hydraulic bollards (HyStd). Make sure you are using the right programme (or else you may damage the equipment).

6. PLC VISUALISATION AND PROGRAMMING

6.1. Presentation:

The display screen and keypad presented with the PLC are the viewing elements for states, defaults and other messages. They also are used to programme the various data values. In standard operational mode, date and time, programme version or the number of cycles are displayed.



Keys ▲ ▼ are used to change screen vertically, move within the programme, as well as increase or decrease the value of a data.

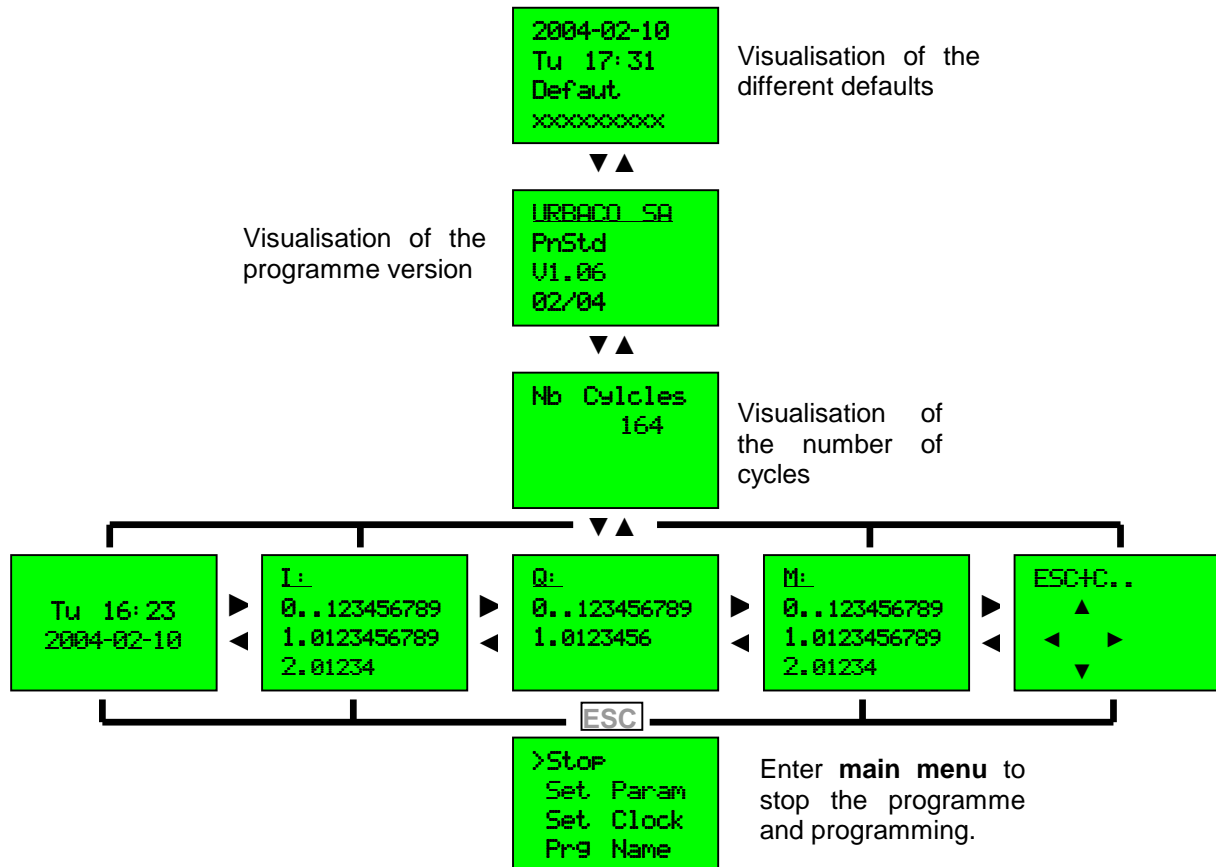
Keys ◀ ▶ are used to change screen horizontally, move onto the various characters displayed for a programmed value (tens, units, seconds...).

The **ESC** key is to be used to go back to the previous menu level in case a mistake in entering occurred at one stage.

The **OK** key is used to call for a programme value, to validate it, or enter the selected menu.

6.2. Visualisation:

It is possible to visualise date and time with the screen, but also the programme version, list entrances, list exits, view compressor defaults, lower limit switch default (automatic clearance in case lower limit switch only returns), upper limit switch default, and simultaneous upper and lower limit switches defaults. In terms of defaults, the time and date are indicated. The various keys are used to navigate between the different screen views.

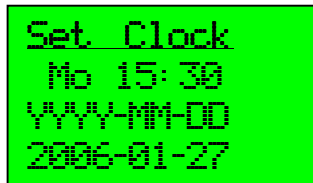


6.3. Programming:

6.3.1. How to set time and date:

It is possible to set time and date in programming mode.

- 1) Activate programming mode.
- 2) In programming menu, select "**Set Clock**" (Key ▼ or ▲) and press on **OK**.



Cursor is positioned on the day of the week.

- 3) Select the day of the week: Key ▼ or ▲.
- 4) Move the cursor onto next position: Key ◀ or ▶.
- 5) Modify the value displayed with key ▼ or ▲.
- 6) Set time, repeat steps 4 and 5.
- 7) Set date, repeat steps 4 and 5.
- 8) Confirm your entry: press **OK**.

6.3.2. Operation parameters:

CompTime: Compressor surveillance time

For pneumatic installations: it stands for the maximum length of time the compressor can be operational. Beyond that limit, it is admitted there must be an air leak.

Default value: set on 5 minutes in our factory.

For optimal operability, this value must not be less than 1 minute.

For hydraulic installations: it stands for the maximum length of time the hydraulic group can be operational.

The group only works during bollard rise.

Default value: set on 10 seconds in our factory.

As a general rule, this value must not be changed.

Autom.: Type of operation mode (automatic or manual)

For pneumatic and hydraulic installations:

ON = automatic operation mode: the bollard will automatically rise once vehicle clears access.

OFF = manual operation mode: the bollard needs to be actuated upward again.

Default value: ON (automatic operation mode).

PreWarn: Notification time

For pneumatic and hydraulic installations:

Notification (warning) time triggers signal (red light) on for the length of time programmed before the bollard rises again.

Default value: set on 2 seconds in our factory.

If this value is too high, it favours vehicles following one another.

U.L.S.: Connection of the upper limit switch

Only for pneumatic installations:

ON = operation mode with upper limit switch

OFF = operation mode without upper limit switch

Default value = OFF (without upper limit switch).

For hydraulic installations, the upper limit switch is mandatory.

FreeExit: Time set for free exit

For pneumatic and hydraulic installations:

This value stands for the length of time a vehicle must be over the free exit loop and on the 2nd safety loop to trigger the bollard descent.

Default value = set on 2 seconds in our factory

YL Fix: Operation mode of amber light

For pneumatic and hydraulic installations:

ON = amber light is steady

OFF = amber light is flashing

Default value: OFF (flashing).

RL Fix: Operation mode of red light

For pneumatic and hydraulic installations:

ON = red light is steady

OFF = red light is flashing

Default value: OFF (flashing).

Ctrl.Act: Condition sur une commande descente

For pneumatic and hydraulic installations:

ON = descent actuation with vehicle detected present on presence / safety loop N°1.

OFF = descent actuation without presence detection

Default value: ON.

LLS Time: Operation time of lower limit switch

For pneumatic and hydraulic installations:

This value defines a maximum length of time for detection of lower limit switch default.

If the PLC doesn't see the lower limit switch has been reached in a preset time, default is reported.

Default value: set on 7 seconds in our factory

If this value is too short, the lower limit switch defaults may be reported too frequently when in fact bollard is working correctly.

ULS Time: Operation time of upper limit switch

For pneumatic and hydraulic installations:

This value defines a maximum length of time for detection of lower limit switch default.

If the PLC doesn't see the upper limit switch has been reached in a preset time, default is reported.

Default value: set on 7 seconds in our factory

If this value is too short, the upper limit switch defaults may be reported too frequently when in fact bollard is working correctly.

For pneumatic installations, if FDC H = OFF, the time for upper limit switch detection is like simulating a bollard upward.

SecuTime: Safety time lapse

For pneumatic and hydraulic installations:

This value defines the time set for activation of safety zone once the bollard is triggered upward. During that temporisation, any vehicle detected will trigger the bollard down.

Default value set on 5 seconds in our factory.

If this value is too high, it favours vehicles following one another.

Lock : Time set for bollard locking up.

For hydraulic installations only:

This value defines pressure setting of the hydraulic group when the bollard reaches its upward position.

Default value set on 1 second in our factory.

This value must not be too high to avoid premature wearing and deterioration of the group.

SULate: Triggering of solenoid valve delayed

For hydraulics only:

This value is set to delay the solenoid valve command so as to launch the hydraulic group at full rate

Pre-set value: 0.5 second

This value must not be set beyond 3 seconds so as to avoid premature deterioration of the group.

7. OPERATION

7.1. Power on:

(When all connections have been done and when a programme has been downloaded into the PLC)
The bollard is retracted (down).

When PLC is switched on, the programme starts running.

If the loops are clear, the red light flashes for a while before bollard starts rising (adjustable).

The red light flashes or remains steady depending on programming while the bollard is rising.

Once the bollard is upward, the light stays steady red.

7.2. Power outage:

The bollard goes down (retracts).

When power is back on, see §V.7.1.

7.3. Operation on an automatic descent actuation (normal passage):

Autom. = ON and Ctrl.Act = ON:

The descent actuation is only considered if a vehicle presence is detected over presence / safety loop N^o1. In this situation, the bollard immediately goes down (retracts underground), the vehicle drives through and the bollard rises again once the safety loops B1 and B2 have been cleared and after time lapse delay before rise (depending on programming).

Autom. = ON and Ctrl.Act = OFF:

The descent actuation is considered without a vehicle presence being detected over presence / safety loop N^o1. In this situation, the bollard immediately goes down (retracts underground), the vehicle drives through and the bollard rises again once the safety loops B1 and B2 have been cleared and after time lapse delay before rise (depending on programming)

7.4. Operation: manual mode:

Autom. = OFF:

The bollard goes down with a control impulse on CMD and rises again with another control impulse on CMD; or the bollard goes down with a control impulse on CD and rises again with a control impulse on CM (expansion module)

7.5. Operation: forced descent:

When the push button is engaged (I7=0), the bollard immediately goes down (retracts underground) and remains as such for as long as the button is engaged. When the push button is released, (I7=1), the bollard rises again as for a normal passage.

7.6. Operation on free exit:

If a vehicle presence is detected at the same time over the free exit loop and the safety loop N^o2 for as long as 2 seconds (adjustable), the bollard will automatically go down (retract).

The bollard rises again as for a normal passage.

7.7. Safety during bollard rise:

When the bollard is rising, any presence detected over safety loops will result in the immediate descent of the bollard for as long as the upper limit switch is not activated.

7.8. Locking in the upward position:

As soon as the upper limit switch is activated (bollard in the upward position), the bollard is locked up and no detection on loops will make it go down (retract).

7.9. Operation of compressor surveillance (for pneumatic installations):

A dry contact from the pressure gauge is used to control the length of time when the compressor is on duty. When the motor is on, the contact is closed; when the motor stops, the contact opens. As soon as the compressor starts, time lapse delay starts as well and if, after 5 minutes (adjustable) the compressor is still on, one will assume there is an air leak somewhere and operating will stop.

7.10. Compressor management (for pneumatic installations):

The compressor works on its own. The 230V power supply is continuous in normal operating mode. The pressure gauge built in the compressor controls the start / stop status of the compressor to maintain air pressure within the circuit.

7.11. Operation of the hydraulic groups (for hydraulic installations):

Motor start / stop actuation is operated from the PLC. The group is only powered to make the bollard go up. When the upper limit switch is activated, power is supplied to the group for 1 second to set circuit under pressure before it stops. The solenoid valve built in circulates the oil between the tank and the cylinder.

Detail of operation stages (standard group):

EV=1 and motor =1: the bollard rises

EV=1 and motor =0: the bollard is maintained upward

EV=0 and motor =0: the bollard goes down (retracts)

7.12. Fail-safe device (negative security) (option):

For pneumatic installations, a NF solenoid valve is connected to the main solenoid valve exhaust. This solenoid valve is permanently powered (exhaust possible). In case of a power outage, exhaust is no longer possible and the bollard remains upward.

For hydraulic installations, a specific group is designed with NF solenoid valve and manual descent lever. The LOGO! programme will also be specific.

7.13. Maximum number of bollards per access site:

For pneumatic installations, the number of bollards is determined by:

- 1) The solenoids valves used. Each PLC output only tolerates a maximum of 10A current.
- 2) The type of compressor used. A table chart gives indications on how many bollards are suitable by compressor.

For hydraulic installations, the number of bollards is determined by:

- 1) The volume of oil taken from the group tank for the whole circuit.
- 2) How much time it takes for the bollards to rise compared to applicable standards (max 10 seconds)

7.14. Position Lights:

Red Light:

- Steady when the bollard is upward.
- Flashing when the bollard is in motion (adjustable)

Amber Light:

- Flashing or steady when the bollard is down (adjustable)

7.15. Defaults:

Default	PLC reaction
Compressor surveillance time lapse over	Compressor switches off Bollard goes down Amber light flashing Screen displays «Compressor default»
Hydraulic group time in operating mode over	Group switches off Bollard maintained upward
Loss of limit switch in upward locked position	For pneumatic installations: The bollard remains locked upward Red light, steady For hydraulic installations: Power is supplied to group again
Upper and lower limit switch at the same time	Bollard goes down Red light, steady Screen «Upper/Lower L.S. Error»
No lower limit switch while descending or Loss of lower limit switch when bollard is down	Red light steady Screen displays «L.L.S. Error » This default is automatically acknowledged if the lower limit switch is reached again.
No upper limit switch while rising	Bollard goes down Amber light, flashing Screen displays «U.L.S. Error»

A default is discharged and solved when the PLC is switched off.

7.16. Expansion module:Inputs:

A rise actuation and a descent actuation are available to differentiate both actions ordered for situations with a specific actuator.

The bollard may be forced upward. No descent actuation will then be considered.

A safety input with 'normally open' contact allows the use of photocells for instance.

Outputs:

Relay 4 types of information about the access site: Defaults, bollard down, bollard upward and presence detected over loops.

8. MAINTENANCE

No special maintenance is prescribed for the PLC. Technical checkups are however recommended every now and then to control the overall state of equipment (dust, humidity...), safety elements (vehicle detection, sensors), operability of actuators (beepers, contactless cards...) as well as to tighten loose screws if necessary.

Periodicity of checkups is left to operator's judgement depending on where the system is installed and how often it is on duty (intensive use or not).

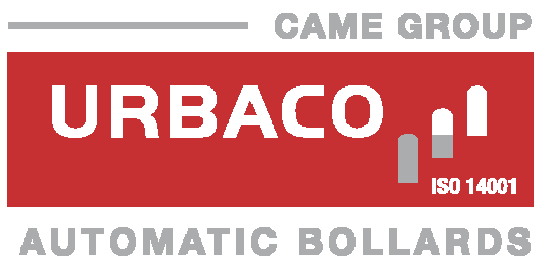
9. TROUBLE SHOOTING

Problem	Solutions
PLC is switched off	<ul style="list-style-type: none">- Check power supply- Check connections- check fuses
External actuator is not active	<ul style="list-style-type: none">- Check power supply and connections- Check that not vehicle presence has been detected (depending on programming)- Check programming or/and configuration
Bollard will not rise	<ul style="list-style-type: none">- One of the safety sensors has detected something. Clear perimeter of anything likely to be detected.- One of the safety sensors is «hooked»: Reset sensor without any vehicle over loops- PLC is in manual mode. Review programming.- Check emergency stop- Check inputs
Traffic lights are not working properly	<ul style="list-style-type: none">- Check connection of limit switches (inversion)
Compressor will not start	<ul style="list-style-type: none">- Check fuses- Check connections- Check compressor

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URBACO S.A. - Z.A. du Couquiou 84320 ENTRAIGUES – FRANCE

International calls: +33 490 480 800 Fax: +33 490 480 088

E-mail: export@urbaco.fr