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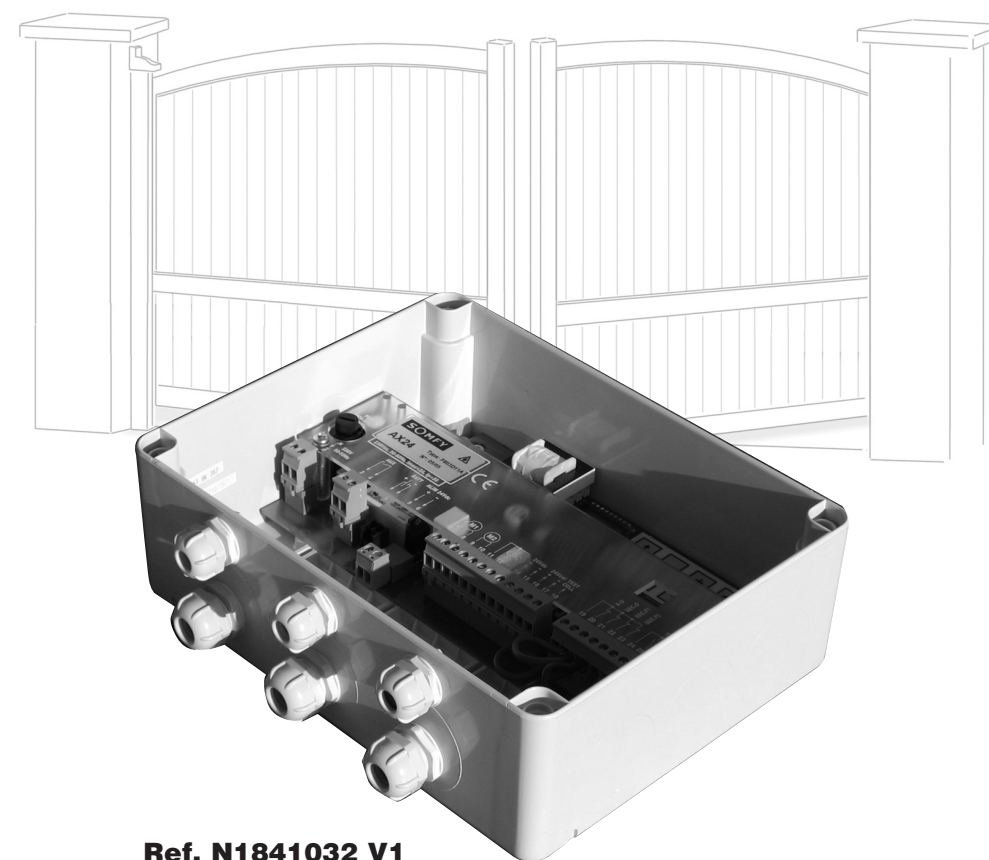
In its concern to constantly improve its offer, SOMFY reserves the right to modify the characteristics and components of this product at any time if it should be deemed useful.
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Utilisable en UE, CH
Egalement en ECU, CH
Egalement en ECU, CH
Utilizable en la UE, CH

Version 1 – 01/2006

AX 24^{NS} CONTROL UNIT



Ref. N1841032 V1

HOME
MOTION BY

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Welcome

Before installing this product, please read the attached safety instructions. SOMFY declines all responsibility and cancels its warranty if these instructions are not respected. SOMFY cannot be held responsible for changes of industry standards made after the publication of this booklet.

This control unit ensures an installation (with or without safety accessories) compliant with European standards (EN 12445, EN 12453, EN 12978, EN 13241) when the parameter limits mentioned on page 14 are respected. It is the installer's responsibility to measure the thrust forces on site in order to guarantee compliance with the EN 12453 (annex A) standard.

CE We, SOMFY, declare that this product conforms to the essential requirements and other pertinent clauses of Directive 1999/5/EC. A conformance declaration can be found on our website: www.somfy.com/ce

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1 Description

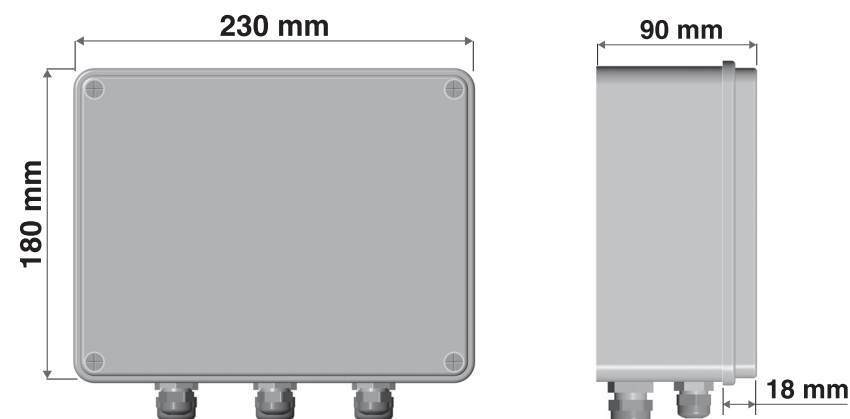
■ Intended use

The AX24^{NS} is designed to control one or two DC motors of 150 W (24 V) maximum power per motor, for opening and closing swinging gates.

■ Main features

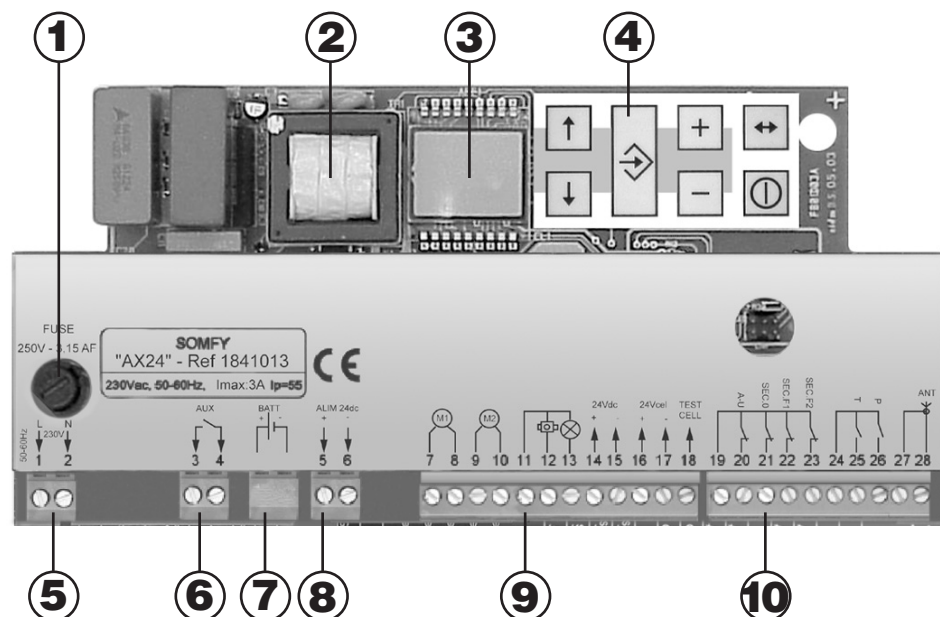
- Independent regulation of the torque of each motor.
- Programming carried out via a keyboard and drop-down menu.
- System status displayed on an LCD screen.
- Fault-finding aid by fault display on the screen.
- Cycle counter.
- Thermal safety on the motor controller.
- Speed variation.
- Self-learning function

■ Dimensions



1 Description

■ Presentation of the electronic card



- 1 Protection fuse
- 2 Transformer
- 3 LCD screen
- 4 Programming keyboard
- 5 230 V connector
- 6 Auxiliary contact output
- 7 Back-up battery connector
- 8 24V input (not used)
- 9 Connectors for motors and 24V power supply
- 10 Safety and control inputs

1 Description

■ Characteristics

General power supply	220-240 Vac / 50-60 Hz
Protection fuse	5 x 20 – 3,15 AF
Power supply of accessories with overload control system	24 V DC / 1,2 A max
Operating temperature	-15°C to +55°C
Protection index	IP55
Usage class	< 250 cycles/day
Thermal safety on motor controller	Yes
Protection plate	1
Disconnectable connectors	5
Auxiliary outputs	500 W max.
Memorised remote commands	16
Class II	Yes

■ Safety circuit management

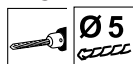
Emergency stop Pressing this causes immediate stoppage of the gate.		
A1	A1 Closing safety systems SEC.F1 SEC.F2	Any safety anomaly detected during closing causes stoppage of the gate (possibility of total or partial reopening, depending on parameter A1).
A0	Opening safety systems SEC.O	Any safety anomaly detected during opening causes stoppage of the gate (possibility of total or partial reclosing, depending on parameter A0).
A7	Danger Zone protection	It is possible to configure protection of the "Danger Zone" swept by the gate. This function uses the SEC.F1 input; when configured it enables the following safety functions: - A detection before opening the gate prevents any movement. - A detection during closing of the gate causes stoppage then reopening.
A2 A6	Self-test	The correct operation of the safety circuits can be check automatically (parameters A2 to A6) at the end of each opening/closing cycle. A fault on any safety function prevents all movement.
	Warning signal	Gate movement is indicated by the flashing orange light (sequenced output 2 x 15 W, 24 V DC). It is possible to fit zone lighting on the auxiliary output (500 VA, 230 V AC).

2 Preparing the casing

- 1 Remove the cover.

- 2 **Attention!**
The elec-tronic card
must not be removed.

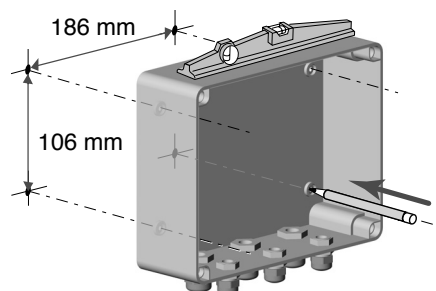
- 3 Drill the fixing holes at the rear of the case (5 mm drill) taking great care not to damage the electronic card.



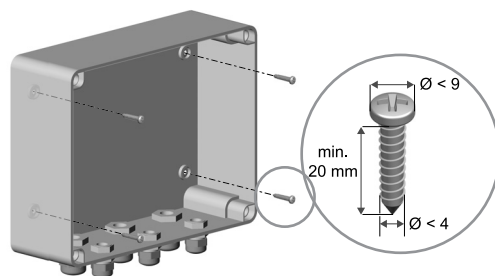
- 4 Use the case as a template to mark the mounting points on the support.



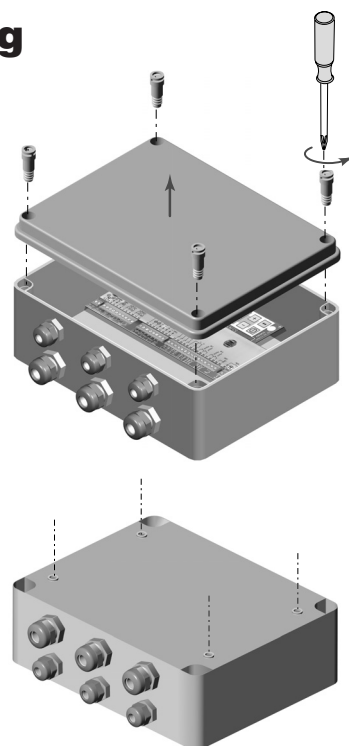
Drill the support.



- 5



After fixing the casing on the wall, fit the plugs provided on the heads of the fixing screws to ensure weather protection.



3 Installing the control unit

■ Fitting the cables

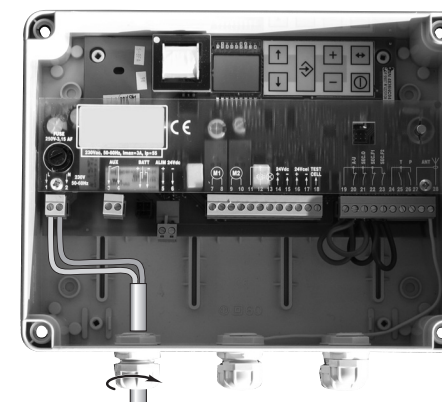
The section of the cables connecting the motor to the electronics depends on the length "L" needed:

$0 < L < 10 \text{ m}$	1 mm^2
$10 \text{ m} < L < 15 \text{ m}$	1.5 mm^2
$15 \text{ m} < L < 25 \text{ m}$	2.5 mm^2

- 1 Insert the cables and adjust their length.

- 2 Tighten the glands.

- Attention: incorrect fitting of the cables through the glands can degrade the IP55 protection index.**



- 3 The electrical supply cable must be:

- exclusively reserved for the gate,
- 1.5 mm² minimum section,
- equipped with a protection (10 A fuse or breaker) and a differential device (30 mA),
- equipped with an omnipolar switch (as per EN 60335-1 standard),
- installed according to current electrical safety standards.

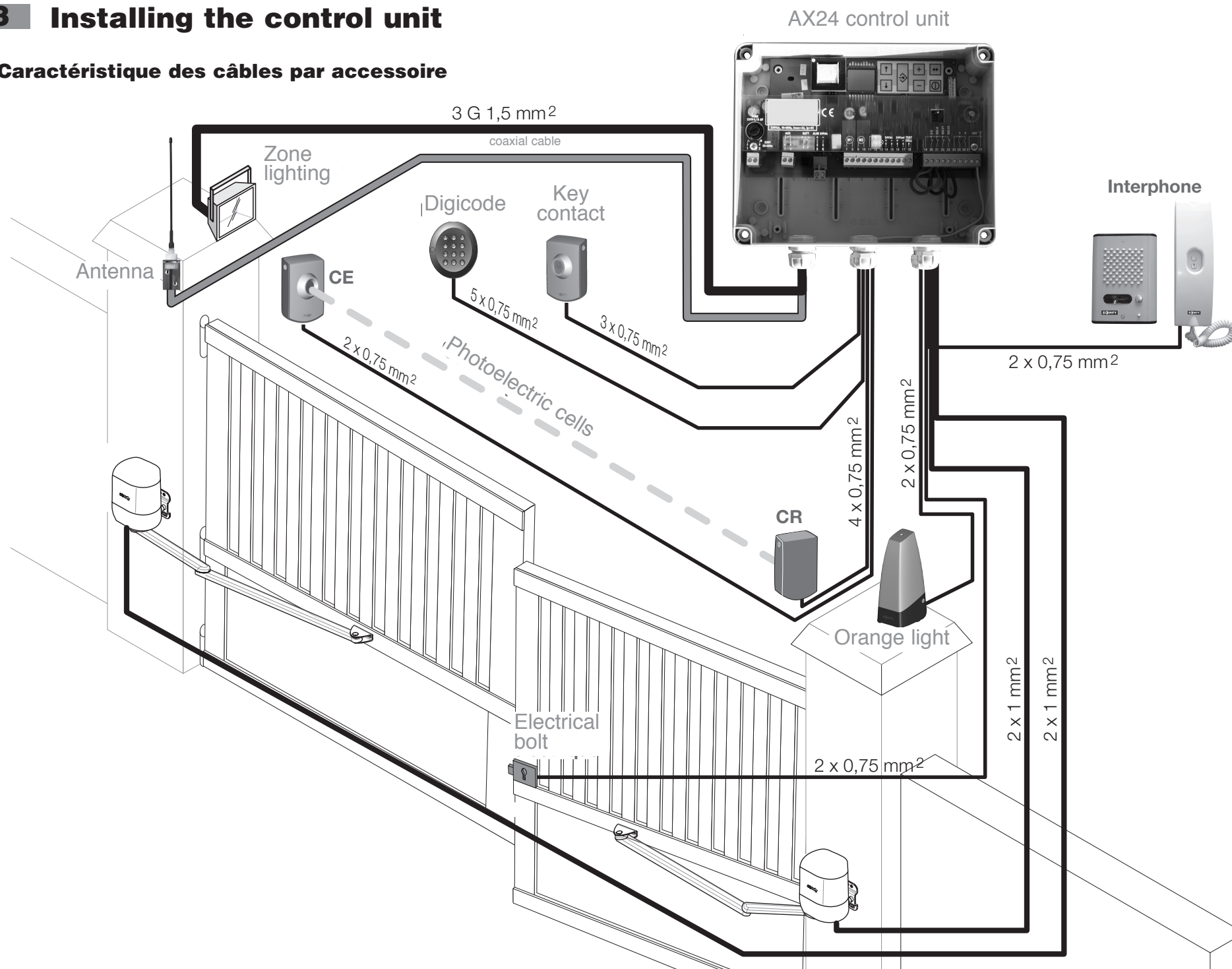
■ Connecting the unit

- For your safety, these operations must be made with the power supply disconnected.**

Auxiliary contacts	1 dry contact (230 V AC, Pmax = 500 VA)	terminals 3 and 4
Electrical bolt output	1 powered contact (24 V / 1.5 A or 12 V / 3 A) for the use of an electrical bolt or electromagnetic locking plate. This contact can be "NC" or "NO" depending on the programming.	terminals 11 and 12
Photocell self-test	The 24 V DC photoelectric cells are self-tested by cutting the 24 V power supply of the emitting cell.	terminals 16 and 17
	The "reflex" cells and feeler bar ampli are self-tested via the "TEST CELL" terminal of the AX24NS.	terminal 18

3 Installing the control unit

■ Caractéristique des câbles par accessoire



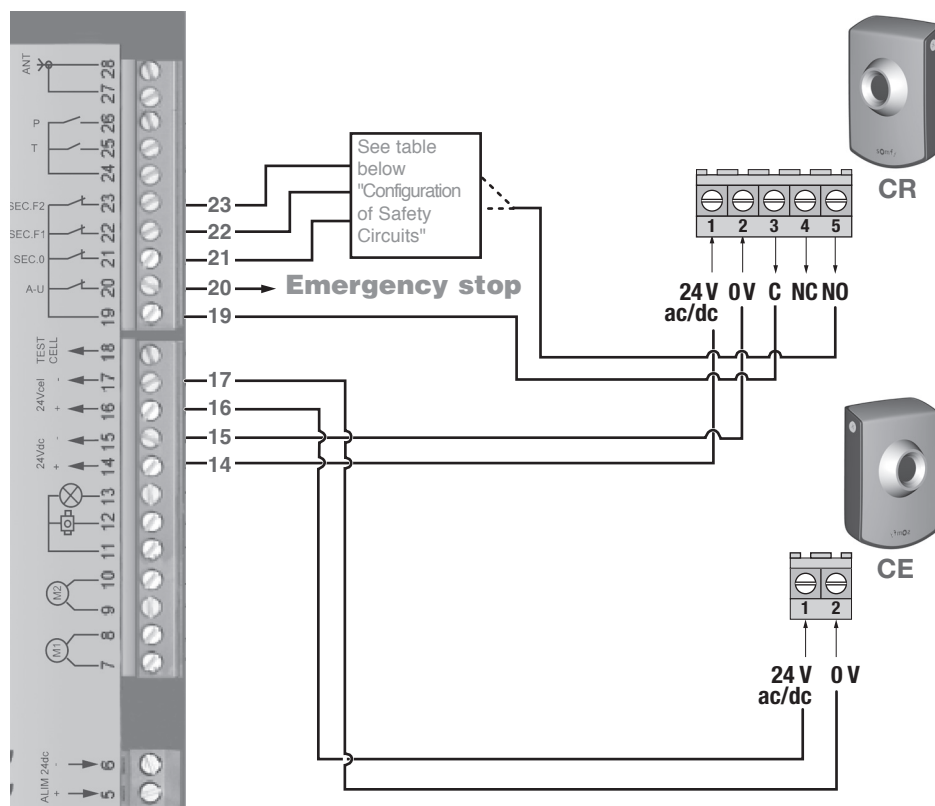
English



3 Installing the control unit

■ Wiring of the accessories (continued)

● Wiring of the photoelectric cells

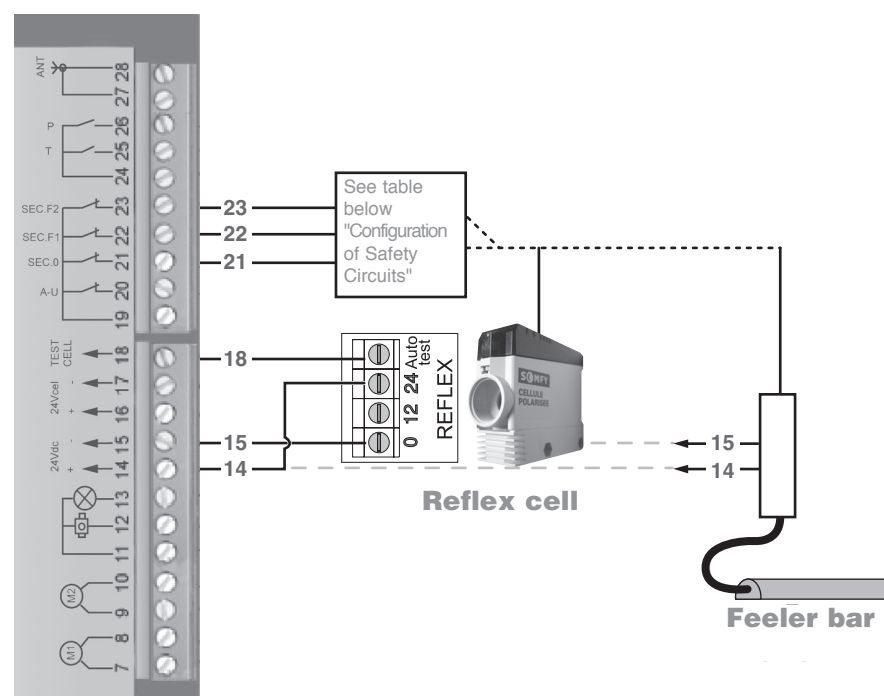


Configuration of Safety Circuits			
Emergency stop - Safety circuits	No emergency stop - Safety circuits	Emergency stop - No safety circuits	No emergency stop - No safety circuits

3 Installing the control unit

■ Wiring of the accessories (continued)

● Wiring the reflex cell and the feeler bar



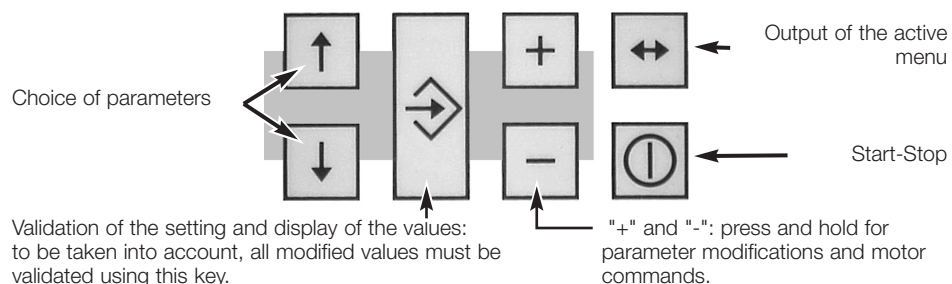
 **If one or more safety inputs are unused, it is imperative to connect them to terminal 19 using an electrical wire.**

For example, in the case "No emergency stop - Safety circuits" (column 2 of the table opposite), terminal 20 must be connected to terminal 19.

4 Parameter setting

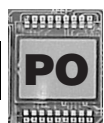
■ The user interface

The configuration is carried out using the internal keyboard of the AX24NS.

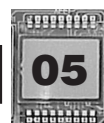


Example:

Press on

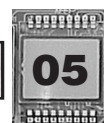


Press on



Display of the value of "P0" = "05"

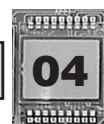
Press on



"P0" remains at "05"

or

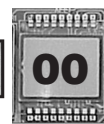
Press on



"P0" changes to "04"

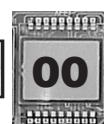
or

Press on



"P0" changes to "00"

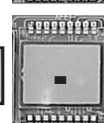
Press on



"P0" to validate the modification (example "P0" changed to "00")

or

Press on



to cancel the modification and return to the initial display

4 Parameter setting

■ How to set the parameters

Modify the parameter values only when the gate is stopped and closed. After setting the parameters, check the correct operation of the safety accessories.

■ Operating modes: P0

The AX24^{NS} has several operating modes (configured by P0): some of them require mandatory installation of safety accessories (see page 20).

P0 = 0	Automatic	Gate closed: a command pulse causes opening. The gate recloses automatically at the end of the closing timer. Gate in the process of opening: a command pulse has no effect. Gate in the process of closing: a command pulse causes reopening.
P0 = 1	Semi-automatic	Gate closed: a command pulse causes opening. During opening, a command pulse has no effect. Gate open: a command pulse causes closing. During closing, a command pulse causes reopening.
P0 = 2	Blocking	After opening of the gate, a passage in front of the cells assigned to the closing safety circuits (SEC.F1 and SEC.F2) causes closing of the gate after a timing period (parameter t2). If there is no passage in front of the cells, the blocking mode commands the closing of the gate at the end of the automatic closing timer (parameter t0).
P0 = 3	Sequential	A command pulse causes opening; another command pulse causes stoppage of the movement; another pulse causes closing, and so on.
P0 = 4	Sequential + Timer	Like sequential mode, but with automatic closing of the gate at the end of the timer (parameter T0). A pulse during the timer period or the closing interrupts the closing.
P0 = 5	Press and hold mode	The "+" key of the internal keyboard controls the opening. The "-" key of the keyboard controls the closing. In this operating mode, no safety devices are active, with the exception of the emergency stop and the torque limiter.

4 Parameter setting

■ Programming the remote controls (parameter "F0")

Each key of a given remote control can control one of the three functions: total opening only, total + pedestrian opening or auxiliary control.

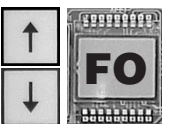
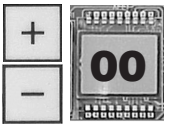
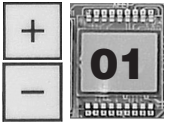
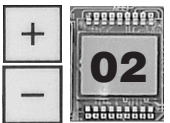
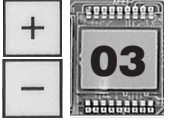
□ "Total + pedestrian opening" mode:

To give the remote control key the "total + pedestrian opening" function, it must first be programmed for total opening mode (F0=00) then reprogrammed for pedestrian opening mode (F0=01).

During use, the control is differentiated by the time of holding the key depressed on the remote control:

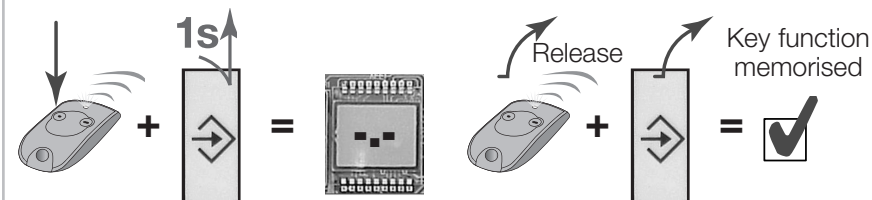
- brief press (less than 0.5 seconds) for pedestrian opening (only one gate panel opens);
- long press (longer than 0.5 seconds) for total opening (2 gate panels).

● For each remote control

1 Select the parameter "F0" 	2 Validate 	3 Select the function to be assigned to the key Total opening (2 gate panels)  or Pedestrian opening (1 gate panel)  or Auxiliary command  or  configured in F3 Global erase of the remote controls 
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4 Parameter setting

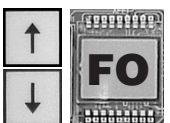
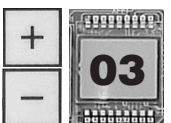
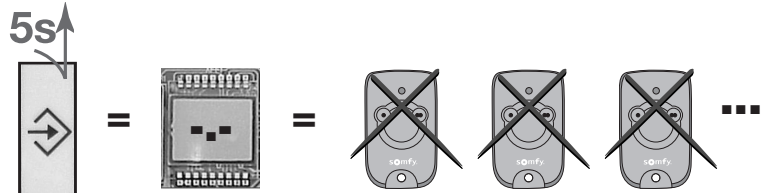
4 Memorise a remote control key by pressing simultaneously on this key and on the validation key on the keyboard



5 Exit from the mode by pressing on



■ Erasing the remote controls (parameter "F0")

1 Select the parameter "F0" 	2 Validate 	3 Select the function "03" 
4 Delete all the remote controls by pressing for 5 seconds on the validation key of the keyboard 		

4 Parameter setting

■ Self-learning

The purpose of self-learning is to measure the travel and opening angle of the gate panels, to assign speeds, time delays and the automatic torque.



The learning affects the following parameters: P2, P4, P5, P6, P7, P8, P9, PA, Pb. All these parameters can be modified after the learning to refine the gate movement.

The learning will be completed only after a complete closing movement. A stoppage during the movement delays the end of the learning by one cycle.

The learning is performed under the control of the user, without safety cells and without a warning signal.



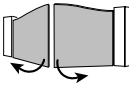
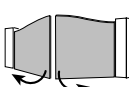
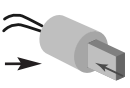
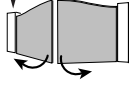
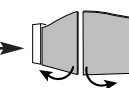
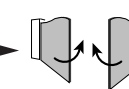
If your installation includes an electric lock, set the parameter "F1" before starting the self-learning.

● Start the self-learning

- Put the gate panels in an intermediate position. Set the operating mode "P0" as required (except the value "05" which is forbidden), confirm  and start the self-learning "P3" at "01".
- Validate  then quit the menu , The screen now shows "H1".
- Generate an opening command by the external control or by the radio (once it has been programmed).
- The gate panel(s) should open. Check that the overlapping gate panel (wired on M1) starts first, otherwise check the motor connections. The screen displays "H2" (opening).
- Wait for complete opening.
- When the screen displays "H1", generate a new command to close.
- The gate should start closing. The screen displays "H4" (closing).
- After the closing, the self-learning is terminated. The screen now shows "C1".

4 Parameter setting

■ Main settings

	Parameter	Value	Operation
With or without notice	P1	1	With  → 2s → 
		0	Without  → 
1 or 2 motors	P2	1	1 motor
		0	2 motors
With or without hammer pulse	F1	1	With    → 
		0	Without
Opening and closing timer	Pa	0 to 10 s	 opening delay: 0 - 10 s → 
	Pb	0 to 10 s	 closing delay: 0 - 10 s → 
In the case of a double gate (with two articulating panels), this enables the opening / closing of the second panel to be delayed.			

4 Parameter setting

■ Conserving the conformity to the standards

● Forces (EN 12453 (annex A))

The default parameter values “**P6 = 5**” (high speed) and “**P8 = 2**” (low speed position) produced by the self-learning have been chosen to ensure maximum safety during use and pre-setting of the installation to comply with the **EN 12453 annexe A** standard.

Depending on your installation and respecting the limits of the table below, you may be able increase the high speed “**P6**” to enhance the operating speed without affecting user safety.

Depending on the motor used, respect the values of the parameter “**P6**” (high speed) and “**P8**” (low speed position) of the following table:

Motor	Length of gate panel	Weight of gate panel	Bending of the arm	P6 max	P8 min
AXOVIA multi ^{NS}	1,5 à 2,5 m	100 kg	15 cm	10	1
		150 kg		8	1
		300 kg		6	2
AXOVIA 220A ^{NS}	1 m	100 kg		5	2
		200 kg		4	2
	2 m	100 kg		8	2
		200 kg		4	2
AXOVIA 180B ^{NS}	Keep the default parameters of the AX24 ^{NS}				

● Operating modes (EN 12453 Table 1)

List of mandatory accessories:

Thrust forces	Sequential mode (P0=3)	Other modes (P0≠3)
Less than those defined by EN 12453 (Annexe A)	No accessory is obligatory	- Flashing orange lamp - Zone lighting - Set of photoelectric cells
Higher than the limits defined by EN 12453 (Annexe A)	Feeler bar	- Feeler bar - Flashing orange lamp - Zone lighting - Set of photoelectric cells

4 Parameter setting

■ Complete list of parameters

Parameter	Function	Value	Setting
P0	Operating mode	0	Automatic
		1	Semi-automatic
		2	Blocking
		3	Sequential
		4	Sequential + Timer
		5	Press and hold (keys + and -)
P1	Notice	0	Without notice
		1	With notice
P2	1 or 2 motors	0	2 motors
		1	1 motor
P3	Start self-learning	0	Pressing "Valid" starts the self-learning, display of H1 in learning phase (see p.11)
		1	
P4	Setting motor torque 1	00 to 10 (10)	Set torque from 40 to 100%
P5	Setting motor torque 2	00 to 10 (10)	Set torque from 40 to 100%
P6	Setting motor high speed 1&2	00 to 10 (05)	Set low-speed from 00 to 10
P7	Setting motor low speed 1&2	00 to 10 (04)	Set position from 00 to 10
P8	Setting low-speed position	00 to 10 (02)	Set position from 00 to 10
P9	Setting pedestrian opening position	00 to 08 (05)	Set position from 00 to 08 (active only in single-motor mode 1)
Pa	Setting opening time delay	00 to 10 (02)	Set position from 00 to 10
Pb	Setting closing time delay	00 to 10 (04)	Set position from 00 to 10
			Pb=0 Forbidden on swinging gate
A0	Opening safety action	0	Stoppage
		1	Total re-inversion
		2	Partial re-inversion
A1	Closing 1 and 2 safety action	0	Stoppage
		1	Total re-inversion
		2	Partial re-inversion
A2	Opening safety self-test	0 1	Without self-test With self-test
A3	Photoelectric cell self-test by cutting power supply on closing 1 safety	0 1	Without self-test With self-test
A4	Photoelectric cell self-test by cutting power supply on closing 2 safety	0 1	Without self-test With self-test
A5	Reflex cell or feeler bar self-test on closing 1 safety	0 1	Without self-test With self-test

The values shown in **boldface** are the factory settings.

4 Parameter setting

Parameter	Function	Value	Setting
A6	Reflex cell or feeler bar self-test on closing 2 safety	0 1	Without self-test With self-test
A7	Danger Zone on closing 1 safety input	0 1	Without Danger Zone With Danger Zone
F0	Memorisation of radio codes 16 remote commands (maximum)	0 1 2 3	Total control Pedestrian control Auxiliary Global erasing of the radio codes by pressing and holding VALID for 5 seconds
F1	Hammer pulse	0 1	Without hammer pulse With hammer pulse
F2	Electrical bolt / electromagnetic locking plate	0 1 2 3	Electrical bolt 12V Electrical bolt 24V Electromagnetic locking plate Gate open tell-tale
F3	Selection of auxiliary output function	0 1 2 3 4 5	Contact for timer Gate open tell-tale Monostable radio channel Bistable radio channel Zone lighting Intrusion alarm by occulted cells
F4	Keyboard locking	55 xx	Keyboard unlocked Keyboard locked (any other number)
F5	Display accessories' consumption	xx	Current in Amps
U0 U1 U2	Cycle counter	xx xx xx	Tens and units Thousands and hundreds Hundreds and tens of thousands
"Example: U2=05 U1= 43 U0=12 : 54,312 cycles"			

● Setting the timers

Parameter	Function	Value	Setting
t0	Reclosing time (free passage)	00 to 99 (05)	Increment by 1 sec.
t1	Lighting time after the end of cycle	00 to 10 (00)	Increment by 1 min.
t2	Waiting time for passage in front of the cell	00 to 99 (00)	Increment by 1 sec.
t3	Acceleration time up to high speed (motors 1 and 2)	00 to 03 (02)	Increment by 1 sec.

The values shown in **boldface** are the factory settings.

4 Parameter setting

■ Operation on battery

The safety circuits are no longer operative.

In the case of two gate panels, the movements are made one panel at a time.

It is impossible to memorise a radio code, change a parameter, delete settings or use the start/stop push-button.

The orange warning light, the 24V outputs and the auxiliary contact are no longer powered.

Autonomy: 24 hours without movements or 1 to 10 cycles depending on the motors and panels used.

■ Anti-intrusion operation

In the event of attempted intrusion, the motor is powered at maximum torque in closing direction for 5 seconds.

5 Fault-finding

■ Control of operation and troubleshooting

Display	Meaning	Display	Meaning
C1 / H1	Waiting for a command	E1	Opening safety contact fault
C2 / H2	Gate opening in progress	E2	Closing 1 safety contact fault
C3	Waiting for re-closing	E3	Closing 2 safety contact fault
C4 / H4	Gate closing in progress	E4	Opening safety self-test fault
C5	Danger Zone safety occulted	E5	Closing 1 safety self-test fault
C6	Opening safety cell occulted	E6	Closing 2 safety self-test fault
C7	Closing safety cell occulted	E7	24V overload, excessive current
C8	Movement forced by the keyboard	E8	Intrusion fault
C9	Emergency stop pressed	E9	Power supply thermal safety
Ca	Self-test of safety circuits in progress	Ea	Motor short-circuit safety
Cb	Permanent command	Eb	Learning not completed
Cd	Operation in battery mode	D0-D9	History of the last 10 faults
		Dd	Clear the faults (press and hold "VALID" for 5 seconds)

If the AX24^{NS} displays a fault permanently, clear the faults in the **"Dd"**. If no parameter can be modified, check the value of **"F4"**.