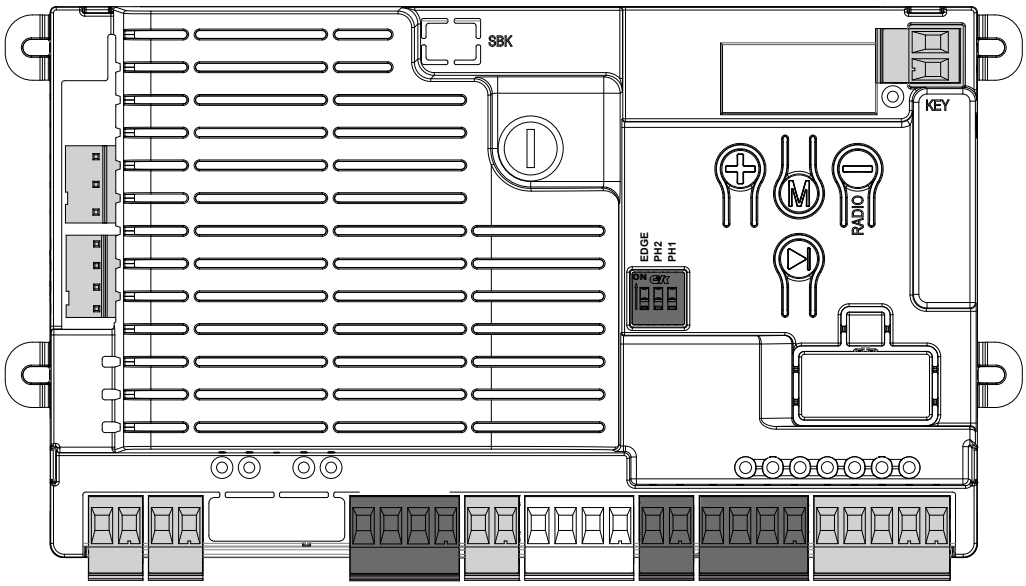
Instructions and warnings for installation and use
Istruzioni ed avvertenze per l'installazione e l'uso
Instructions et avertissements pour l'installation et l'usage
Instrucciones y advertencias para su instalación y uso
Instruções e advertências para a instalação e utilização
Instrukcje i zalecenia dotyczące instalacji i użytkowania
Anleitungen und Hinweise zu Installation und Einsatz



CT20324
CT20324E

Control unit for two 24 Vdc motors, for swing gates
Centrale per due motori 24 Vdc, per cancelli a battente
Logique de commande pour deux moteurs 24 Vdc, pour portails battants
Central para dos motores de 24 Vdc para puertas de batiente
Unidade para dois motores 24 Vdc, para portões de batente
Centrala dla dwóch silników 24 Vdc, do bram skrzydłowych
Steuergerät für zwei Drehtor-Motoren 24 Vdc

Management System ISO 9001

www.tuv.com
ID 9105043769

INDEX

1 - SAFETY WARNINGS

⚠ WARNING !

ORIGINAL INSTRUCTIONS - important safety instructions. Compliance with the safety instructions below is important for personal safety. Save these instructions.
Read the instructions carefully before proceeding with installation.

The design and manufacture of the devices making up the product and the information in this manual are compliant with current safety standards. However, incorrect installation or programming may cause serious injury to those working on or using the system. Compliance with the instructions provided here when installing the product is therefore extremely important.

If in any doubt regarding installation, do not proceed and contact the Key Automation Technical Service for clarifications.

Under European legislation, an automatic door or gate system must comply with the standards envisaged in the Directive 2006/42/EC (Machinery Directive) and in particular standards EN 12453; EN 12635 and EN 13241-1, which enable declaration of presumed conformity of the automation system.

Therefore, final connection of the automation system to the electrical mains, system testing, commissioning and routine maintenance must be performed by skilled, qualified personnel, in observance of the instructions in the “Testing and commissioning the automation system” section.

The aforesaid personnel are also responsible for the tests required to verify the solutions adopted according to the risks present, and for ensuring observance of all legal provisions, standards and regulations, with particular reference to all requirements of the EN 12453 standard which establishes the test methods for testing door and gate automation systems.

⚠ WARNING !

Before starting installation, perform the following checks and assessments:

ensure that every device used to set up the automation system is suited to the intended system overall. For this purpose, pay special attention to the data provided in the “Technical specifications” section. Do not proceed with installation if any one of these devices is not suitable for its intended purpose;

check that the devices purchased are sufficient to guarantee system safety and functionality;

perform a risk assessment, including a list of the essential safety requirements as envisaged in Annex I of the Machinery Directive, specifying the solutions adopted. The risk assessment is one of the documents included in the automation system’s technical file. This must be compiled by a professional installer.

Considering the risk situations that may arise during installation phases and use of the product, the automation system must be installed in compliance with the following safety precautions:

never make modifications to any part of the automation system other than those specified in this manual. Operations of this type can only lead to malfunctions. The manufacturer declines all liability for damage caused by unauthorised modifications to products;

if the power cable is damaged, it must be replaced by the manufacturer or its after-sales service, or in all cases by a person with similar qualifications, to prevent all risks;

do not allow parts of the automation system to be immersed in water or other liquids. During installation ensure that no liquids are able to enter the various devices;

should this occur, disconnect the power supply immediately and contact a Key Automation Technical Service. Use of the automation system in these conditions may cause hazards;

never place automation system components near to sources of heat or expose them to naked lights. This may damage system components and cause malfunctions, fire or hazards;

all operations requiring opening of the protective housings of various automation system components must be performed with the control unit disconnected from the power supply. If the disconnect device is not in a visible location, affix a notice stating: “MAINTENANCE IN PROGRESS”:

connect all devices to an electric power line equipped with an earthing system;

the product cannot be considered to provide effective protection against intrusion. If effective protection is required, the automation system must be combined with other devices;

the product may not be used until the automation system “commissioning” procedure has been performed as specified in the “Automation system testing and commissioning” section;

the system power supply line must include a circuit breaker device with a contact gap allowing complete disconnection in the conditions specified by class III overvoltage;

use unions with IP55 or higher protection when connecting hoses, pipes or cable glands;

the electrical system upstream of the automation system must comply with the relevant regulations and be constructed to good workmanship standards;

users are advised to install an emergency stop button close to the automation system (connected to the control PCB STOP input) to allow the door to be stopped immediately in case of danger;

this device is not intended for use by persons (including children) with impaired physical, sensory or mental capacities, or with lack of experience or skill, unless a person responsible for their safety provides surveillance or instruction in use of the device;

before starting the automation system, ensure that there is no-one in the immediate vicinity;

before proceeding with any cleaning or maintenance work on the automation system, disconnect it from the electrical mains;

special care must be taken to avoid crushing between the part operated by the automation system and any fixed parts around it;

children must be supervised to ensure that they do not play with the equipment.

⚠ WARNING !

Packaging components (cardboard, plastic, etc.), duly separated, must be placed in the appropriate bins. Device components such as electronic boards, metal parts, batteries, etc. must be separated and differentiated. For the methods of disposal, the rules in force in the place of installation must be applied. DO NOT DISPOSE IN THE ENVIRONMENT!

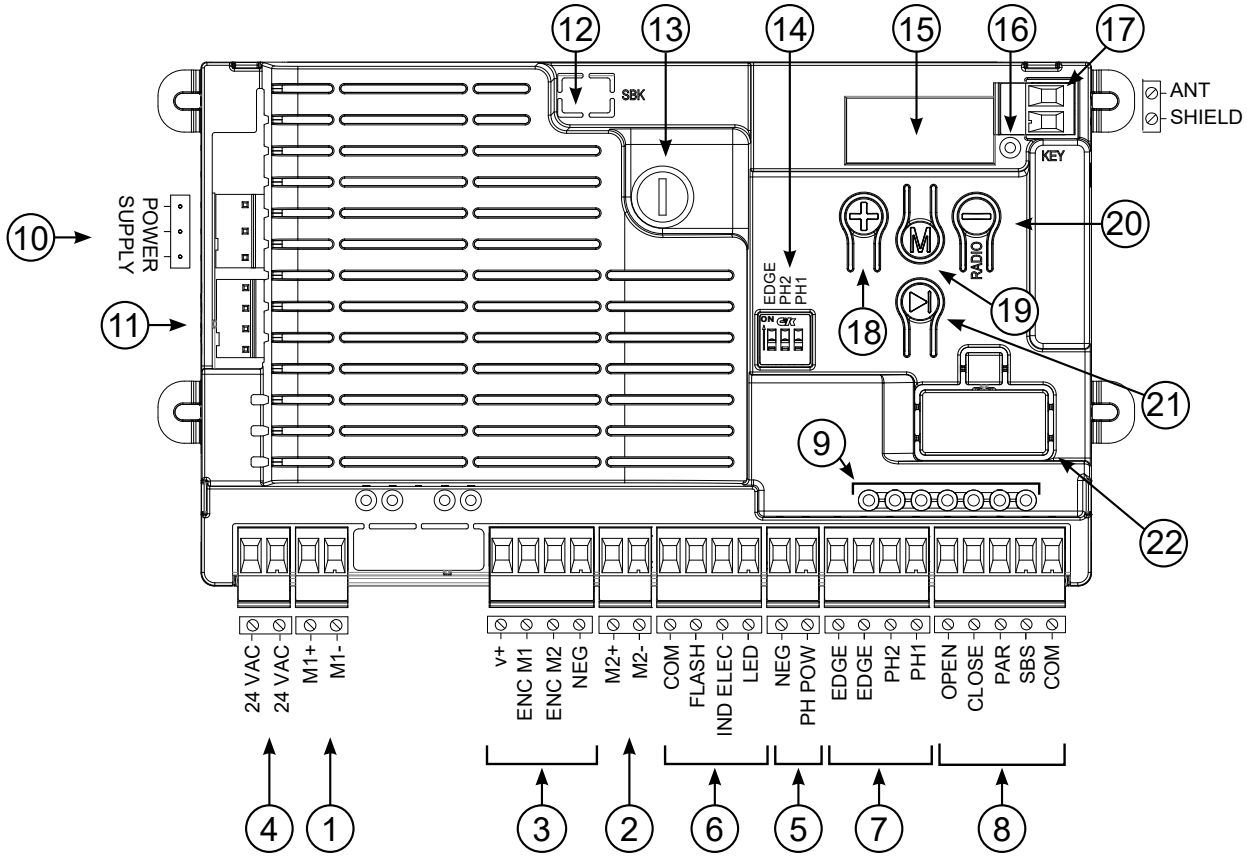
KEY AUTOMATION S.r.l. reserves the right to amend these instructions if necessary; they and/or any more recent versions are available at www.keyautomation.com

2 - INTRODUCING THE PRODUCT

2.1 - Description of the control unit

The CT20324 control unit is the most modern and efficient control device for two 24VDC Key Automation gear motors for swing leaf gates; any other use is to be considered improper and is therefore prohibited. The CT20324 control unit can also be configured to operate with a single motor 24VDC.

The 5-digit/14-segment display of the CT20324 control unit makes it easier to read the acronyms, facilitating programming and monitoring of the automation; the menu structure allows easy setting of work times and operating modes.



2.2 - Description of the connections

1. Motor 1 (M1)
2. Motor 2 (M2)
3. Encoder input M1 and M2
4. 24VAC power supply for safety devices and accessories
5. 24VDC power supply (unregulated) for safety devices (radio safety edge, photocells)
6. Connections for flashing light, electric lock/open gate indicator light, courtesy light,
7. Inputs for safety devices (Safety edge/STOP, photocells)
8. OPEN, CLOSE, PAR, SBS control inputs
9. Status LED indicators: EDGE/EDGE, PH2, PH1 safety devices (red colour); OPEN, CLOSE, PAR, SBS controls (green colour)
10. Central power supply (secondary transformer 24VAC + PE)
11. KBP/KBPN spare battery (optional)
12. SBK, fitting for connection to an energy savings module
13. 1.6 AT fuse (timed)
14. EDGE/EDGE, PH1, PH2 safety devices disabling
15. 5-digit/14-segment display
16. LED indicator (green colour) of radio functions or error reporting
17. Antenna
18. Button ⊕ (UP)
19. Button Ⓜ (MENU)
20. Button ⊖ (DOWN-RADIO)
21. Button ⏯ (SBS)
22. Optional interfaces connector (Kube, PowerBus)

2.3 - Models and technical characteristics

CODE	DESCRIPTION
CT20324	Control unit for two 24 VDC gearmotors for swing gates, in box (trasformer 150 VA, 230 V input)
CT20324E	Control unit for two 24 VDC gearmotors for swing gates, in box with encoder (trasformer 250 VA, 230 V input)
CT20324L	Control unit for two 24 VDC gearmotors for swing gates (trasformer 150 VA, 115 V input)
CT20324EL	Control unit for two 24 VDC gearmotors for swing gates (trasformatore 250 VA, 230 V input)

- Electronic protection against short circuit and overload on the FLASH, IND/ELEC and LED outputs
- Protection of 24VAC and PH-POW outputs via resettable fuses
- Automatic obstacle detection
- Auto-learning of travel length
- Disabling of unused safety inputs via dip switches: it is not necessary to insert jumpers on the respective input terminals (paragraph 4.2)

TECHNICAL SPECIFICATIONS	CT20324	CT20324E	CT20324L	CT20324EL
Power Supply	230Vac (+10% - 15%) 50/60 Hz		115 Vac (+10% - 15%) 50/60 Hz	
Nominal power	210W maximum	280W maximum	210W maximum	280W maximum
Maximum output current 24VAC	200 mA (24 VAC)			
PH-POW maximum output current	250 mA (24 VDC non-regulated)			
Maximum FLASH output power	15 W (24 VDC)			
Maximum LED output power	15 W (24 VDC)			
Maximum power for the “IND/ELEC” output	5 W (24 VDC) / 15 VA (12 VDC)			
Accessory fuses	2.0 AT (timed)			
Power line fuses	1.6 AT		3 AT	5 AT
Integrated radio receiver	433.92 MHz OOK			
Antenna	wire or cable antenna RG58			
Number of saved transmitters	150			
Can be used in saline, acidic or explosive atmosphere environments	NO			
IP protection class	IP54			
Overall dimensions	222 x 110 x 275 H mm			
Weight	3,87 kg	4,46 kg	3,87 kg	4,46 kg

2.4 - List of cables required

The following table shows the cables necessary for connection of the various devices in a typical system.
The cables must be suitable for the type of installation; for example, we recommend a cable type H03VV-F for installation indoors or H05RN-F/H07RN-F if installed outdoors.

ELECTRIC CABLE TECHNICAL SPECIFICATIONS		
CONNECTION	**CABLE**	**MAXIMUM PERMITTED LIMIT**
Control unit power transformer input	3 x 1,5 mm²	if less than or equal to 20 m
	3 x 2,5 mm²	if greater than 20m, (connect the earth wire near the control unit)
Flashing light (FLASH) Courtesy light (LED)	3 x 0.55 mm²	20m
Antenna	RG58 cable	10 m (recommended < 5 m)
Electric locking (IND/ELEC)	2 x 1.5 mm²	10m
Photocells (transmitter)	2 x 0.55 mm²	20m
Photocells (receiver)	4 x 0.55 mm²	20m
Safety edge	2 x 0.55 mm²	20m
Key switch	4 x 0.55 mm²	20m
Motors power supply (M1 and M2)	2 x 1.5 mm²	10m
Encoder cables	4 x 0.55 mm²	10m

3 - PRELIMINARY CHECKS

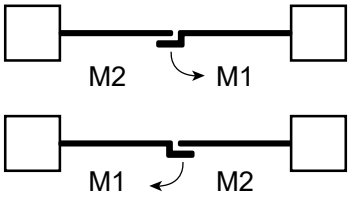
Before installing the product, perform the following checks and inspections:
check that the gate, the door or the barrier is suitable for automation; the weight and size of the gate or door and the balance of the barrier boom must be within the operating limits specified for the automation system in which the product is installed;
check that the gate or door has firm, effective mechanical safety stops;
make sure that the product fixing zone is not subject to flooding;
high acidity or salinity or nearby heat sources might cause the product to malfunction;
in case of extreme weather conditions (e.g. snow, ice, wide temperature variations or high temperatures), friction may increase, causing a corresponding rise in the force needed to operate the system; the starting torque may therefore exceed that required in normal conditions;
check that when operated by hand the gate, the door or the barrier moves smoothly without any areas of greater friction or derailment risk;
check that the gate, door or the barrier is well balanced and will therefore remain stationery when released in any position;
check that the electricity supply line to which the product is to be connected is suitably earthed and protected by an overload and differential safety breaker device;
the system power supply line must include a circuit breaker device with a contact gap allowing complete disconnection in the conditions specified by class III overvoltage;
ensure that all the material used for installation complies with the relevant regulatory standards.

4 - PRODUCT INSTALLATION

4.1 - Electrical connections

⚠ WARNING ! **Before making the connections, ensure that the control unit is not powered up.**

MOTORS CONNECTION	
Power supply connection terminal board	
M1 +	Power supply of motor M1 +
M1 -	Power supply of motor M1 -
M2 +	Power supply of motor M2 +
M2 -	Power supply of motor M2 -

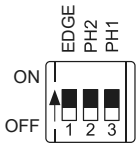


POWER SUPPLY CONNECTOR	
L	Power supply live 230 Vac (120 Vac) 50-60 Hz
N	Power supply neutral 230 Vac (120 Vac) 50-60 Hz
⏚	Earth

DIP SWITCH

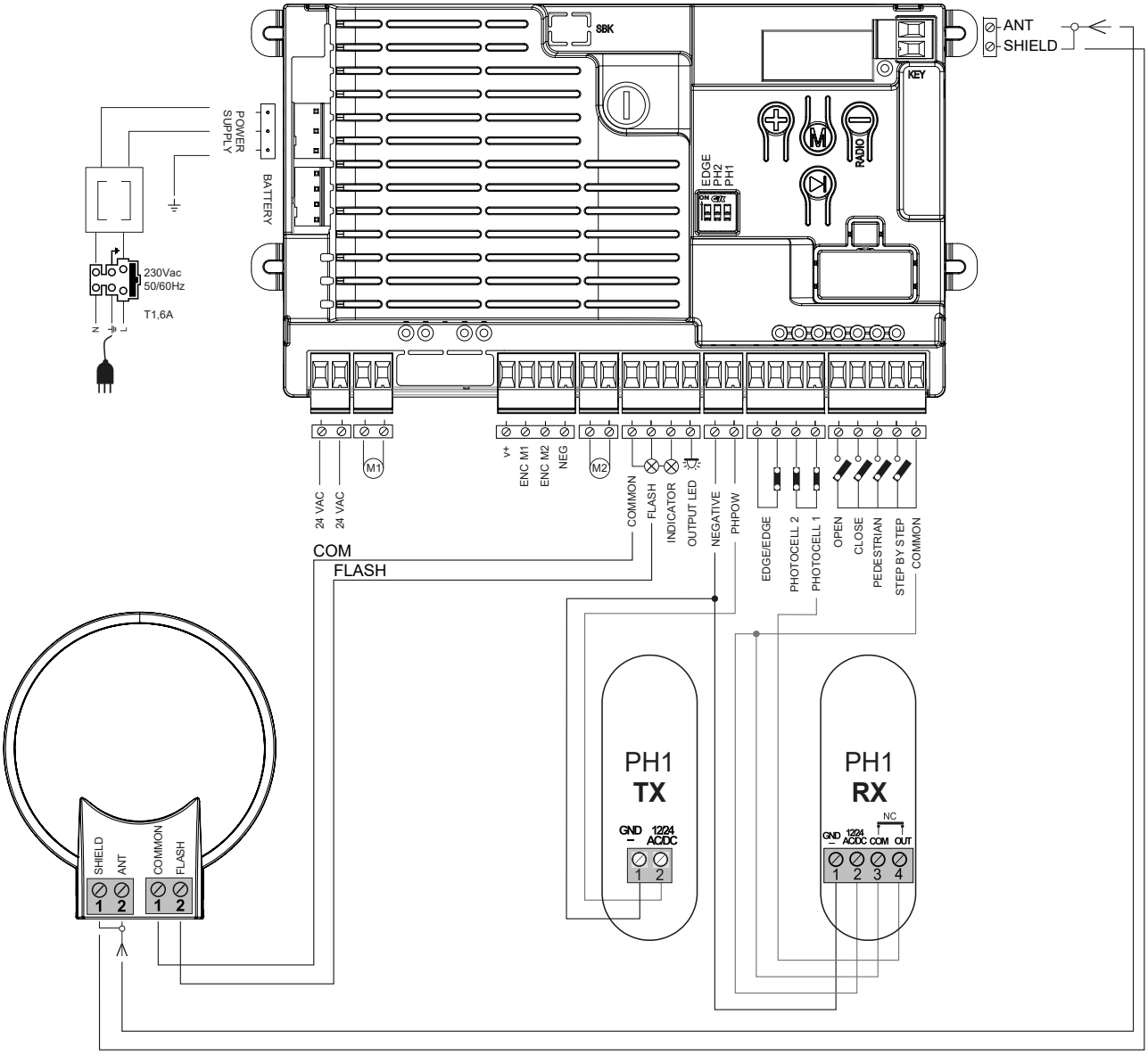
Set on “ON” to disable inputs EDGE, PH1, PH2
This procedure avoids to bridge the terminal board inputs.

⚠ WARNING ! **with the dip switch ON, the safety devices are disabled.**



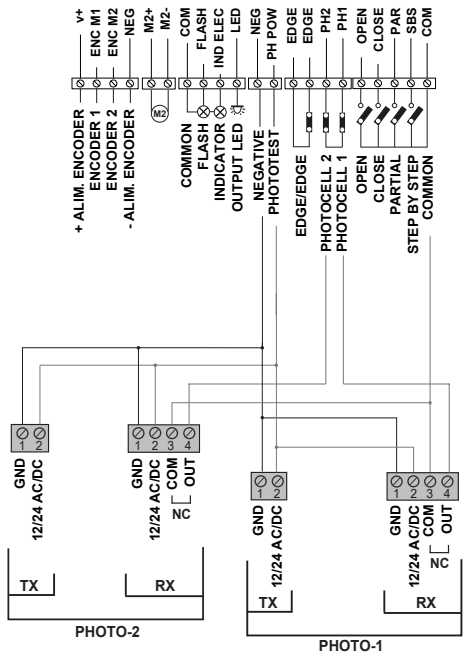
EXAMPLE: With only 1 photocell connected set EDGE and PH2 to ON

To disable, follow the procedure at paragraph 4.2



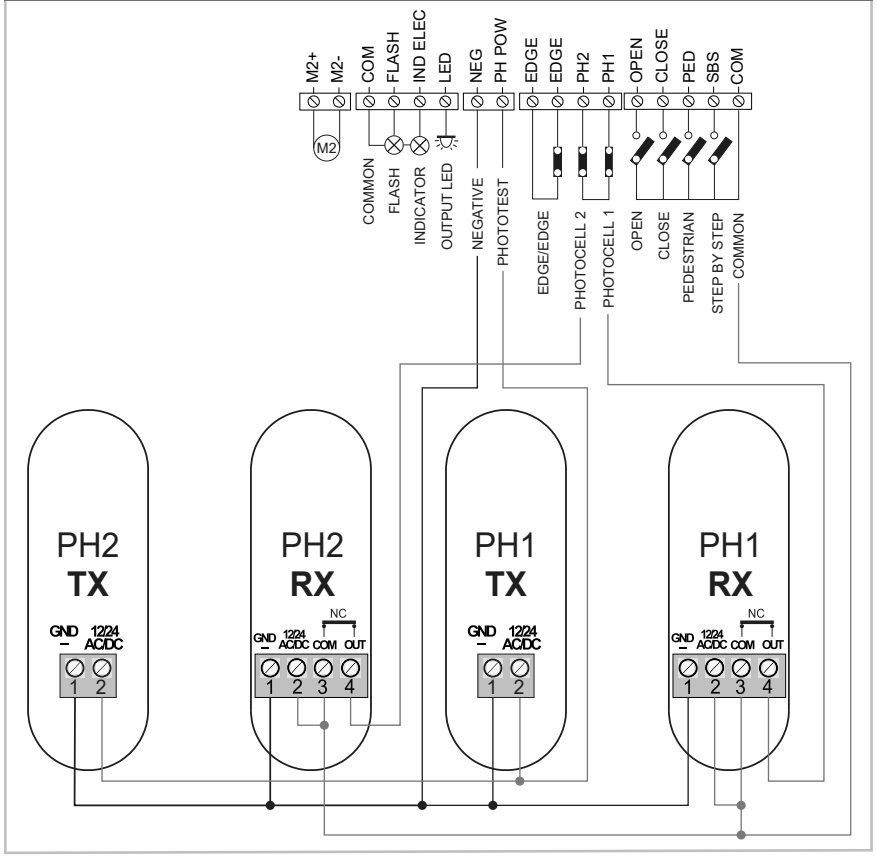
EN

ELECTRICAL CONNECTIONS FOR ENERGY SAVING



⚠ WARNING ! To enable STAND BY see paragraph 5.1, point 12. Only during this function PHOTOTEST is not possible

ELECTRICAL CONNECTIONS FOR PHOTO1 AND PHOTO2



SAFETY AND CONTROL DEVICE CONNECTORS

24 VAC	Accessory power supply 24VAC non-regulated 200mA MAX; **not active during battery operation**
24 VAC	
COM	Common positive for FLASH - IND/ELEC - LED and accessories outputs
IND/ELEC	IND, gate open warning light output, 24VDC 5W MAX ELEC, electric lock output 12VDC 15VA MAX selectable with the INDIC LIGHT parameter
LED	Courtesy light output, 24VDC non-regulated 15W MAX also controllable via radio remote control
NEG	Negative power supply for accessories
PH-POW	Positive power supply for PH1 and PH2 photocells; operating mode configurable with the PHOTO TEST parameter
EDGE/EDGE	8k2/NC safety edge contact input; operating mode configurable with the EDGE parameter
EDGE/EDGE	⚠ WARNING ! with the EDGE dip switch in the ON position the input is always disabled
PH2	PH2 opening photocell NC input; at any time during opening/closing, the intervention of the photocell (opening of the contact) causes the movement to immediately stop. Closing the contact restores the opening operation. The operating modes can be configured with the PHOTO 2 SETUP parameter ⚠ WARNING ! with the PH2 dip switch in the ON position the input is always disabled
PH1	PH1 closing photocell NC input; at any time during closing, the intervention of the photocell (opening of the contact) causes blocking and reversal of the direction of travel. While PH1 is active it is not possible to close the gate. The operating modes can be configured with the PHOTO 1 SETUP parameter ⚠ WARNING ! with the PH1 dip switch in the ON position the input is always disabled
OPEN	NO OPENING command input; MAN PRESENT function configurable with the HOLD TO RUN parameter
CLOSE	NO CLOSING command input; MAN PRESENT function configurable with the HOLD TO RUN parameter
PAR	NO PARTIAL OPENING command input; MAN PRESENT function configurable with the HOLD TO RUN parameter
SBS	NO STEP-BY-STEP command input (SBS); upon each activation the commands AP (open) - ST (stop) - CH (close) are executed in succession; the operating modes are configurable with the SBS SETUP parameter. MAN PRESENT function configurable with the HOLD TO RUN parameter
COM	Common positive inputs PH2, PH1, OPEN, CLOSE, PAR, SBS
SHIELD	Antenna - shield
ANT	Antenna - signal

4.2 - Disabling the safety devices

EDGE

The control unit provides (default setting) for the installation of a safety edge connected to the EDGE/EDGE inputs; in the event of a missing or incorrect connection, the operation of the automation is inhibited. In a system where a safety edge is not to be installed, its use can be disabled by setting the EDGE dip-switch to ON.

⚠ WARNING ! confirm the safety edge deactivation by pressing and holding the buttons ⊕ and ⊖ until the EDGE LED stops flashing.

PHOTO 2

The control unit provides (default setting) for the installation of one or more photocells connected to the PH2 input, in the event of a missing or incorrect connection, the operation of the automation is inhibited. In a system where a PH2 is not to be installed, its use can be disabled by setting the PH2 dip-switch to ON.

⚠ WARNING ! confirm the PH2 deactivation by pressing and holding the buttons ⊕ and ⊖ until the PH2 LED stops flashing.

PHOTO 1

The control unit provides (default setting) for the installation of one or more photocells connected to the PH1 input, in the event of a missing or incorrect connection, the operation of the automation is inhibited. In a system where a PH1 is not to be installed, its use can be disabled by setting the PH1 dip-switch to ON.

⚠ WARNING ! confirm PH1 input deactivation by pressing the ⊕ and ⊖ buttons simultaneously and holding them down until the PH1 led stops flashing.

4.3 - Display during normal operation

When first switched on, the control unit shows a scrolling text on the display indicating: board model, firmware version and serial number and as last information MOTOR SETUP to indicate that it is necessary to select the type of motor to begin configuring the system. To select the type of motor, scroll the list with the UP ⊕ and DOWN-RADIO ⊖ buttons;

at the motor concerned, press and hold down the MENU button Ⓜ until DONE appears on the display.

⚠ WARNING ! The ADVANCED PARAMETERS (paragraph 5.2) table shows the correspondence between the motor model and the numbers on the display. The following table shows the messages displayed during normal operation of the automation:

MESSAGE	MEANING
LEARN TODO	The door travel has not been learned; perform the auto-learning procedure
READY	Gate closed, control panel restarted
OPEN ING	The gate is opening
CLOSE ING	The gate is closing
STOP OPEN	The gate was stopped during the opening manoeuvre
STOP CLOSE	The gate was stopped during the closing manoeuvre
FOTO 1	PH1 intervention (photocell 1)
FOTO2	PH2 intervention (photocell 2)
ALIGN MENT	The automation is performing the realignment procedure
OPEN	Gate open, automatic closing timer not active
PAR TIAL	The gate is performing a partial opening
PART OPEN	The gate is stopped in the partially open position
TIME CLOSE	The gate has reached the open position and automatic re-closing is active; the flashing dash indicates that the countdown is active. During the last ten seconds, the seconds remaining until reclosing are indicated
TIME PART	The gate has been opened with the PAR command and the automatic re-closing timer from partial opening is active; during the last ten seconds, the seconds remaining until re-closing are indicated
LEARN STOP	Auto-learning procedure blocked due to safety intervention or intentional stop
LEARN OPEN1	Auto-learning of leaf 1 opening travel
LEARN OPEN2	Auto-learning of leaf 2 opening travel
LEARN CLOS1	Auto-learning of leaf 1 closing travel
LEARN CLOS2	Auto-learning of leaf 2 closing travel
SLOW OPEN1	Personalised learning of the slowdown point during leaf 1 opening
SLOW OPEN2	Personalised learning of the slowdown point during leaf 2 opening
SLOW CLOS1	Personalised learning of the slowdown point during leaf 1 closing
SLOW CLOS2	Personalised learning of the slowdown point during leaf 2 closing

4.3.1 - Error messages on the display

To cancel the error message on the display, after having eliminated the cause of the anomaly, perform a complete opening or closing manoeuvre, i.e. until the relevant limit switch is reached. Alternatively, briefly press the Ⓜ MENU button (the automation does not perform any movement).

MOTOR OVERLOAD	The current of a motor has increased very rapidly
OVER LOAD1	1. The gate has struck an obstacle
OVER LOAD2	2. Excessive friction in the movement of the leaf
SAFETY EDGE	**The control unit has detected the activation of the safety edge**
EDGE	1. The safety edge is active
	2. The safety edge is not connected correctly
PHOTOCELL TEST	**The photocell or safety edge test has failed**
FOTO TEST	1. Check the correct functioning of the photocells
	2. Check the photocell connections
ENCODER	**The physical encoder does not respond**
ENC ERROR	1. Check the correct operation of the encoder
	2. Check the correct connection of the encoder

4.3.2 - Error messages on flashing light

The events reported in the following table are signalled by the flashing light and the KEY LED present in the control unit.

FLASHING INDICATION AND LED KEY ON CONTROL UNIT	EVENT	DESCRIPTION
2 quick flashes + pause + 1 flash	auto-learning	Auto-learning phase in progress
4 quick flashes + pause, for three times	Obstacle detected	A leaf has struck an obstacle
2 quick flashes + pause, for three times	Photo1 / Photo2	A photocell has been activated
5 quick flashes + pause, for three times	Safety edge	The safety edge has been activated
3 quick flashes + pause, for three times	The photo test has failed	The photocells or sensitive edge test has failed
6 quick flashes + pause, for three times	Short circuit overload	Anomaly in one of the FLASH, ELS/SCA or LED outputs
7 quick flashes + pause, for three times	Encoder Error	M1 or M2 motor encoder anomaly

4.3.3 - Status messages on display

Repeatedly pressing the ⊕ (UP) button displays additional information described in the following table. To return to the normal status, press the Ⓜ (MENU) button.

DISPLAY	MEANING
READY, OPENING, EDGE, FOTO TEST, ecc.	Automation status
NCY 500	Total number of complete opening + closing manoeuvres
I M1= 1200	Instantaneous current absorbed by motor M1, given in mA
I M2= 1200	Instantaneous current absorbed by motor M2, given in mA
CT20324 FW 2.0 SN 635A33F4	Card type – firmware version – card serial number

4.4 - Autolearning of the travel stroke

Upon the first start-up or in the event of a modification of the equipment model, which involves restoring the factory values, the message LEARN TO DO appears on the display and the auto-learning procedure of the operating parameters must be performed (width of the movement angle of the doors, slowdown points in opening and closing, ...).

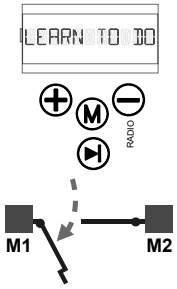
⚠ WARNING ! ONLY during the first installation the display will show MOTOR SETUP, to select the type of motor installed.
Select the type of motor with (UP) and (DOWN-RADIO) and confirm by keeping the (MENU) button pressed until DONE appears on the display: 1 = RAY2224, 2 = REP2224, 3 = UND24, 4 = STAR3024 - STAR2024, 5 = RAY4224E

⚠ WARNING ! Select the correct motor before starting the auto-learning procedure (MOTOR SETUP, paragraph 5.2 - Advanced parameters).

4.4.1 - Autolearning of the travel stroke and main parameters

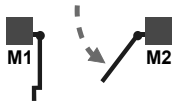
1. Unlock the gear motors, bring the doors to approximately half their travel and lock the gear motors again.

2. To start the learning procedure, press and hold the ⊕ (UP) and Ⓜ (MENU) buttons at the same time; after approximately two seconds the leaf relating to M1 begins to open slowly; the display shows LEARN OPEN 1.



⚠ WARNING ! If the leaf moves in the closing direction, stop the movement by pressing the ⊖ (DOWN-RADIO) button; press the ⏯ (SBS) button to resume the learning procedure with the direction of movement reversed.

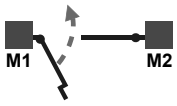
3. Once the maximum opening point has been reached, the door relating to M1 stops; the leaf relating to M2 slowly starts to open; the display shows OPEN2 LEARN.



⚠ WARNING ! If the leaf moves in the closing direction, stop the movement by pressing the ⊖ (DOWN-RADIO) button; press the ⏯ (SBS) button to resume the learning procedure with the direction of movement reversed.

4. Once the maximum opening point has been reached, the leaf relating to M2 stops; after approximately 2 seconds it slowly starts to close; the display shows CLOSE2 LEARN

5. The auto-learning operation of the leaf travel relative to M2 ends when the closing point is reached. After approximately two seconds the leaf relating to M1 slowly begins to close; the display shows CLOSE 1 LEARN.



6.The auto-learning operation of the leaf travel relative to M1 ends when the closing point is reached. The auto-learning operations are completed.

⚠ WARNING ! The travel auto-learning operations must be fully and correctly completed before putting the equipment into operation; their interruption is only possible by intervening on the safety devices (EDGE/STOP, PH2, PH1) or by cutting off power to the control unit.

7. After having correctly completed the travel auto-learning procedures, perform a few complete opening and closing manoeuvres of the gate to check its correct functioning.

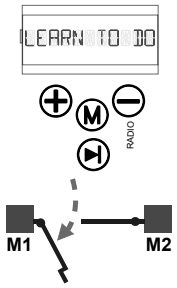
After having successfully completed the auto-learning it will be possible to modify the operating parameters by accessing the BASE and/or ADV (paragraph 5).

4.4.2 - Autolearning of the travel stroke and main parameters, with customised decelerations

The default low speed travel length is 20% of the total travel length. It is possible to change the default value of the travel width performed at low speed, both in opening and closing, by acting on the LENGTH SLOW parameter in the BASE menu by selecting P (customised). See paragraph 5.1

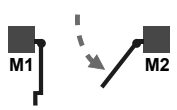
1. Unlock the gear motors, bring the doors to approximately half their travel and lock the gear motors again.

2. To start the learning procedure, simultaneously press and hold the ⊕ (UP) and Ⓜ (MENU) buttons for approximately two seconds; after about two seconds the leaf relating to M1 begins to open slowly; the display shows LEARN OPEN 1.



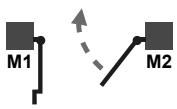
⚠ WARNING ! If the leaf moves in the closing direction, stop the movement by pressing the ⊖ (DOWN-RADIO) button; press the ⏯ (SBS) button to resume the learning procedure with the direction of movement reversed.

3. Once the maximum opening point has been reached, the leaf relating to M1 stops; the leaf relating to M2 starts to open slowly; The display shows OPEN2 LEARN.

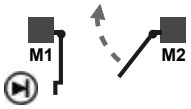


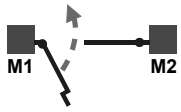
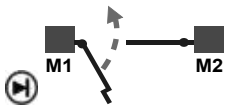
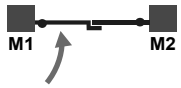
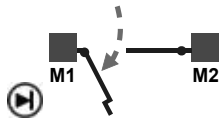
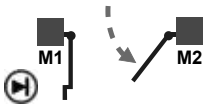
⚠ WARNING ! If the leaf moves in the closing direction, stop the movement by pressing the ⊖ (DOWN-RADIO) button; press the ⏯ (SBS) button to resume the learning procedure with the direction of movement reversed.

4. Once the maximum opening point has been reached, the leaf relating to M2 stops; after approximately 2 seconds it slowly starts to close; the display shows CLOSE2 LEARN.



5. Having reached the point where it is necessary to start the slowing down phase (closing), press the button ⏯ (SBS); the display shows CLOSE SLOW.



6. The auto-learning operation of the leaf travel relative to M2 ends when the closing point is reached. After approximately two seconds the leaf relating to M1 slowly begins to close; the display shows CLOSE1 LEARN.	
7. Having reached the point where it is necessary to start the slowing down phase (closing), press the button ⏯ (SBS); the display shows CLOS1 SLOW.	
8. The auto-learning operation of the leaf travel relative to M1 ends when the closing point is reached. After approximately 2 seconds the M1 leaf begins to open again and the display shows OPEN1 LEARN.	
9. Once the point has been reached where it is necessary to begin the slowing down phase of opening of the M1 leaf press the button ⏯ (SBS); the display shows OPEN1 SLOW.	
10. Once the maximum opening point has been reached, the leaf relating to M1 stops; subsequently the relevant leaf opening begins at M2; the display shows OPEN2 LEARN.	
11. Once the point has been reached where it is necessary to begin the slowing down phase of opening of the M2 leaf press the button ⏯ (SBS); the display shows OPEN2 SLOW.	
12. Once the maximum opening point has been reached, the leaf relating to M2 stops; subsequently the closing manoeuvre of both doors is performed. When both doors have reached the closed position, the auto-learning procedure of the travel with personalised slowdown points is finished. ⚠ WARNING ! If during the various opening/closing manoeuvres one of the deceleration points is not set, it will automatically be set to 20% of the total travel length. ⚠ WARNING ! The travel auto-learning operations must be fully and correctly completed before putting the equipment into operation; their interruption is only possible by intervening on the safety devices (EDGE/STOP, PH2, PH1) or by cutting off power to the control unit.	
13. After having correctly completed the travel auto-learning procedures, perform a few complete opening and closing maneuvers of the gate to check its correct functioning.	
After having successfully completed the auto-learning it will be possible to modify the operating parameters by accessing the BASE and/or ADV (paragraph 5).	

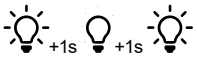
4.5 - Radio remote control management

To save the buttons of a radio remote control, delete them or delete all the saved radio remote controls, use the RADIO menu. To access the RADIO menu, press the ⊖ (DOWN-RADIO) button for approximately two seconds; the wording RADIO MENU appears alternatively on the display.
NOTE: the control unit exits the RADIO menu after seven seconds of inactivity or by briefly pressing the Ⓜ (MENU) button.

NOTE: to facilitate saving operations, thereby minimising any interference, it is advisable to disconnect the receiver's antenna wire; therefore, the procedure only works near the control panel itself.

⚠ WARNING ! Once the operations have been completed, reconnect the antenna wire of the control panel receiver.

4.5.1 - Memorisation of buttons of a radio remote control

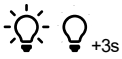
1. Exit any menu, press and hold the button ⊖ (DOWN-RADIO) until the display shows, alternatively, RADIO MENU.	
2. Press and release the (DOWN-RADIO) button ⊖ a number of times equal to the function to be activated: once for the STEP BY STEP output (LEARN SBS), twice for the PARTIAL output (LEARN PAR),three times for the ONLY OPEN output (LEARN OPEN), 4 times for the LIGHT ON/OFF output (LEARN LIGHT), 5 times for the LEARN ALL OUTPUT (key 1= SBS, key 2 = PARTIAL, key 3 = ONLY OPEN, key 4 = LIGHT ON/OFF). **NOTE:** if the courtesy lights are activated by radio remote control, they will only be deactivated by radio remote control.	
3. Immediately after pressing the button ⊖ (DOWN-RADIO), the KEY LED briefly flashes a number of times corresponding to the selected function interspersed with a pause of approximately one second.	
4. Near the control unit, within seven seconds press the button on the radio remote control to which to associate the selected function; keep the radio remote control button pressed for a few seconds. **NOTE:** for the pre-set function (5) press any button	

5. A long flash (approximately three seconds) of the KEY LED confirms correct storage. ⚠ WARNING ! If the KEY LED emits a series of short flashes, the radio remote control button you are trying to memorise is already present in the memory. **NOTE:**after having memorise the radio remote control button, within seven seconds, it is possible to associate another button of the same radio remote control or any button of another radio remote control, to the same function, repeating the operations from point 3.	

4.5.2 - Deletion of a memorised button of a radio remote control

Exit any menu, press and hold the button ⊖ (DOWN-RADIO) until the display Shows alternatively, RADIO MENU.	
1. Press and hold the button ⊖ (DOWN-RADIO) until the KEY LED lights up; release the button.	
2. Within seven seconds, press and hold the button of the radio remote control to be deleted from the receiver's memory until the KEY LED starts flashing; release the button.	
3. Confirm deletion of the radio remote control by pressing the button ⊖ (DOWN-RADIO)	
4. A long flash of the KEY LED indicates that the radio remote control has been deleted.	
5. The control unit exits the RADIO MENU after seven seconds of inactivity or by briefly pressing the button Ⓜ (MENU)	
If the transmitter you wish to delete was originally memorized using the LEARN ALL output (see paragraph 4.5.1, phase 2), the deletion procedure mentioned above will delete all the functions associated with the buttons of that transmitter.	

4.5.3 - Deletion of the entire receiver memory

Exit any menu, press and hold the ⊖ (DOWN-RADIO) button until the display alternately shows RADIO MENU.	
1. Press and hold down the ⊖ (DOWN-RADIO) button until the KEY LED lights up (approximately three seconds); keep the button ⊖ (DOWN-RADIO) pressed until the KEY LED turns off; release the button.	
2. After releasing the button the KEY LED starts to flash slowly; count the flashes.	
3. At the third flash, briefly press the button ⊖ (DOWN-RADIO).	
4. A long flash of the KEY LED indicates that all the radio remote controls have been deleted.	
5. The control unit exits the RADIO MENU after seven seconds of inactivity or by briefly pressing the button Ⓜ (MENU)	

4.5.4 - Memorisation of a button of a new radio remote control using a radio remote control already saved in memory

It is possible to add the button of a new radio remote control to a control unit in which at least one radio remote control has already been memorised	
1. Near the control unit, press and hold the button of the new radio remote control to be added to the control unit for at least five seconds	
2. Near the control unit, press and hold down for at least three seconds the button of the already memorised radio remote control to which the function to be duplicated on the new radio remote control is associated. **NOTE:** if step 1. has been correctly performed, the automation does not perform any manoeuvre and it is possible to proceed with memorisation.	
3. Near the control unit, press and hold the same button on the new radio remote control used in point 1 for at least three seconds.	
4. Near the control unit, press and hold the same button on the old radio remote control used in point 2 for at least three seconds. **NOTE:** the procedure has been correctly performed if the automation executes the command just memorised.	
If the procedure is not completed, after a few seconds the control panel receiver returns to normal operation.	

4.6 - Factory parameters reset

To return all the parameters to their default values or to change the type of equipment on which the control panel is installed, proceed as follows:

1. Press and hold the button Ⓜ (MENU); the display shows in sequence BASE ADV; release the button near the text ADV.
2. Scroll through the menu items with the buttons ⊕ (UP) and ⊖ (DOWN-RADIO) until reaching MOTOR SETUP
3. Press and hold the button Ⓜ (MENU); release the button when the display starts flashing; the number displayed indicates the type of motor in use.
4. Select with the buttons ⊕ (UP) and ⊖ (DOWN-RADIO) the type of motor; press and hold the button Ⓜ (MENU). The display shows a countdown from 50 to 0; release the button when the text DONE appears.
5. The control unit exits the MENU after seven seconds of inactivity or by briefly pressing the Ⓜ (MENU) button.

⚠ WARNING ! If the type of motor is changed, all the values are returned to the factory value and it is necessary to perform a new auto-learning procedure for the travel.

5 - SYSTEM CUSTOMISATION

The configuration menus of the equipment operating functions are divided into BASE and ADV (basic/advanced). The following tables show the description of each basic parameter with the respective minimum, maximum and default values.

1. Press and hold the button Ⓜ (MENU); the display shows in sequence BASE and ADV, release the button at the wording BASE to access the basic menu.
2. Scroll through the menu items with the buttons ⊕ (UP) and ⊖ (DOWN-RADIO) until reaching the desired parameter
3. Press and hold the button Ⓜ (MENU) until the display flashes; release the buttonⓂ (MENU)
4. To change the value, use the buttons ⊕ (UP) and ⊖ (DOWN-RADIO) ; to confirm the new value press and hold the button Ⓜ (MENU) until the display stops flashing
5. To exit the menu, briefly press the button Ⓜ (MENU)

NOTE: to view the value of any parameter simply enter the relevant menu (BASE or ADV) using steps 1 and 2 of the procedure just described. Once the desired parameter has been identified, the display alternately shows the name of the parameter and the value. To exit the menu, briefly press the button Ⓜ (MENU)

5.1 - Basic parameters

	PARAMETERS	DESCRIPTION	DEFAULT	MIN	MAX	UNIT
1	AUTO CLOSE	Automatic re-closing time (0 = off)	0	0	900	s
2	PHOTO CLOSE	Re-closing time after the transit on PH1 (0 = off)	0	0	30	s
3	REACT TIME	Obstacle sensitivity 0 = maximum impact force 10 = minimum impact force	3	0	10	
4	OPEN SPEED	Door speed in opening 1 = minimum speed 5 = maximum speed	4	1	5	
5	SL-OP SPEED	Door speed during the slowing down phase in opening 1 = minimum speed 5 = maximum speed	1	1	5	
6	CLOSE SPEED	Door speed in closing 1 = minimum speed 5 = maximum speed	4	1	5	
7	SL-CL SPEED	Door speed during the slowing down phase in closing 1 = minimum speed 5 = maximum speed	1	1	5	

8	SBS SETUP	Determines the operating mode of the step-by-step control (SBS) 0 = normal AP-ST-CH-ST-AP-ST… 1 = alternate STOP AP-ST-CH-AP-ST-CH… 2 = alternate AP-CH-AP-CH… 3 = condominium mode 1; from an open position, the closing manoeuvre begins when the automatic re-closing timer expires **NOTE:** closure does not take place if AUTOCLOSE = 0 4 = condominium mode 2; an SBS command performs the closing manoeuvre only if the leaf is in the open position.	0	0	4	
9	DELAY LEAF2	Delay of the leaf relative to M2 during opening	2	0	300	
10	LENGH SLOW	Travel width at low speed (slowing down phase) both during opening and closing P = customised (paragraph 4.4.2)	20	0	100	%
11	BLACK OUT	Determines the behaviour of the control panel when switched on 0 = no action 1 = executes, if possible, the closing command	0	0	1	
12	STAND BY	If active, in closed position, disables PH-POW power supply	0	0	1	
13	1/2 MOTOR	Number of system doors	2	1	2	

5.2 - Advanced parameters

	PARAMETERS	DESCRIPTION	DEFAULT	MIN	MAX	UNIT
1	FOTO1 SETUP	Determines the behaviour of the automation, starting from the closed position, 0 = if PH1 is engaged it does not execute any opening command 1 = if PH1 is engaged it still executes the opening command	1	0	1	
2	FOTO2 SETUP	Verifies the engaged status of PH2 0 = active both during the opening and closing maneuvers 1 = only active during the opening manoeuvre	0	0	1	
3	PHOTO TEST	Photocell functionality test 0 = no tests 1 = checks the functionality of the photocells connected to terminal PH1 2 = checks the functionality of the photocells connected to terminal PH2 3 = checks the functionality of the photocells connected to terminals PH1 and PH2	0	0	3	
4	TYPE EDGE	Determines the type of safety edge connected to the EDGE/ EDGE terminals 0 = STOP NC contact 1 = 8k2 safety edge 2 = NC sensitive edge	0	0	2	
5	SETUP EDGE	Determines in which situations the intervention of the safety edge connected to the EDGE/ EDGE inputs should be evaluated 0 = status of the EDGE/EDGE input evaluated only during the closing manoeuvre; the intervention involves a total opening manoeuvre 1 = intervenes both in opening and closing stopping the automation and reversing the direction of travel for approximately 2 seconds 2 = intervenes both in opening and closing stopping the automation and reversing the direction of travel for approximately 0.5 seconds	0	0	2	

6	TEST EDGE	Safety edge test 0 = disabled 1 = active	0	0	1	
7	SETUP PART	Length of the partial opening travel (PAR) expressed as a percentage of the total travel. **NOTE:** only the leaf relating to the M1 motor opens	50	0	100	%
8	CLOSE PART	Automatic re-closing time from partial opening PAR (0 = off)	0	0	900	s
9	FLASH SETUP	Determines the behaviour of the FLASH output 0 = output always active (not flashing) during the opening and closing manoeuvre 1 = output flashing during the opening and closing manoeuvre	1	0	1	
10	PRE SETUP	Determines the pre-flashing modes of the FLASH output (deactivated if PRE TIME = 0) 0 = pre-flashing before each opening and closing manoeuvre 1 = pre-flashing before each closing manoeuvre 2 = pre-flashing before each opening manoeuvre	0	0	2	
11	PRE TIME	Determines the duration of the pre-flashing (0 = off)	0	0	20	s
12	PRE TIME	Courtesy light configuration 0 = on during the manoeuvre and, at the end of the manoeuvre, for the TIME TIME LIGHT 1= on if the gate is not closed for the TIME TIME LIGHT with the gate closed. 2 = lit for a TIME LIGHT time after each command (OPEN, CLOSE, PAR, SBS)	0	0	2	
13	TIME LIGHT	Courtesy light switching on time. **NOTE:** the courtesy light can also be turned on and off by radio remote control; if turned on by radio emote control, it can only be turned off by radio remote control.	0	0	900	s
14	HOLD TORUN	Enables the “man present” functionality on the SBS, PAR, OPEN and CLOSE inputs ⚠ WARNING ! enabling the function, the operation of the radio remote controls is inhibited	0	0	1	
15	INDIC LIGHT	Determines the operation of the IND/ELEC output 0 = off 1 = gate open indicator active if the gate is not closed 2 = proportional gate open indicator - Slow flashing during opening - Fast flashing during closing - Two flashes + pause if stopped and not closed 3 = electric lock 4 = magnetic lock, output active if the gate is closed. ⚠ WARNING ! interface the magnetic lock with a relay with 24VDC coil and set ELECT TIME ≠ 0.	0	0	4	
16	CYCLE SERVI	Specifies the number of manoeuvres before reporting a maintenance request. **NOTE:** the signalling occurs using the FLASH output; if closed it flashes continuously	10	0	200	X1000 cycles
17	SETUP SERVI	Enables maintenance request reporting 0 = disabled 1 = active	0	0	1	
18	ELECT TIME	Electric lock activation time or magnetic lock deactivation time.	2	1	10	s
19	EL-OP SETUP	Water hammer on opening (0 = off). When closed, it pushes to close before opening; it is used to facilitate the release of the electric lock	0	0	100	100 ms
20	EL-CL SETUP	Water hammer on closing (0 = off). At the end of the closing manoeuvre, the motor is kept active for the set time; it is used to facilitate the coupling of the electric lock.	0	0	100	100 ms
21	RELEA TIME	Release on opening and closing limit switches. 0 = no release 10 = maximum release In the presence of light gates, it reduces the bending of the leaf.	0	0	10	

22	BOOST SETUP	If active, it provides maximum acceleration upon starting 0 = disabled 1 = active	0	0	1	
23	DELAY LEAF 1	Leaf delay relating to M1 in closing from open gate.	1	0	20	s
24	ENCOD SETUP	Sets the encoder type 0 = virtual encoder 1 = physical encoder **NOTE:** the value depends on the type of motor selected.	0	0	1	
25	MOTOR SETUP	Determine the type of automation on which the control unit is installed: **1 = RAY2224,** **2 = REP2224,** **3 = UND24,UND24E*** **4 = STAR3024 - STAR2024,** **5 = RAY4224E***	1	1	4	

* Available on CT20324E and CT20324EL only. For UND24E, manually set ENCOD SETUP to 1.

6 - TESTING AND COMMISSIONING THE AUTOMATION SYSTEM

The system must be tested by a qualified technician, who must perform the tests required by the relevant standards in relation to the risks present, to check that the installation complies with the relevant regulatory requirements, especially the EN 12453 standard which specifies the test methods for gate and door automation systems.

6.1 - Testing

All system components must be tested following the procedures described in their respective operator's manuals;

ensure that the recommendations in Chapter 1 - Safety Warnings - have been complied with;

check that the gate or door is able to move freely once the automation system has been released and is well balanced, meaning that it will remain stationery when released in any position;

check that all connected devices (photocells, safety edges, emergency buttons, etc.) are operating correctly by performing gate or door opening, closing and stop tests using the connected control devices (transmitters, buttons or switches);

perform the impact measurements as required by the EN12453 standard, adjusting the control unit's speed, motor force and deceleration functions if the measurements do not give the required results, until the correct setting is obtained.

6.2 - Commissioning

Once all (and not just some) of the system devices have passed the testing procedure, the system can be commissioned;

the system's technical dossier must be produced and kept for 10 years. It must contain the electrical wiring diagram, a drawing or photograph of the system, the analysis of the risks and the solutions adopted to deal with them, the manufacturer's declaration of conformity for all connected devices, the operator's manual for every device and the system maintenance plan;

fix a dataplate with the details of the automation, the name of the person who commissioned it, the serial number and year of construction and the CE marking on the gate or door;

also fit a sign specifying the procedure for releasing the system by hand;

draw up the declaration of conformity, the instructions and precautions for use for the end user and the system maintenance plan and consign them to the end user;

ensure that the user has fully understood how to operate the system in automatic, manual and emergency modes;

the end user must also be informed in writing about any risks and hazards still present;

⚠ WARNING ! after detecting an obstacle, the gate or door stops during its opening travel and automatic closure is disabled; to restart operation, the user must press the control button or use the transmitter.

7 - INSTRUCTIONS AND WARNINGS FOR THE END USER

Key Automation S.r.l.produces systems for the automation of gates, garage doors, automatic doors, roller blinds and car-park and road barriers. However, Key Automation is not the manufacturer of your complete automation system, which is the outcome of the analysis, assessment, choice of materials and installation work of your chosen installer. Every automation system is unique, and only your installer has the experience and skill required to produce a safe, reliable, durable system tailored to your needs, and above all that complies with the relevant regulatory standards. Although your automation system complies with the regulation safety level, this does not rule out the presence of “residual risk”, meaning the possibility that hazards may occur, usually due to reckless or even incorrect use. We would therefore like to give you some advice for the correct use of the system:

• before using the automation system for the first time, have the installer explain the potential causes of residual risks to you;

• keep the manual for future reference, and pass it on to any new owner of the automation system;

• reckless use and misuse of the automation system may make it dangerous: do not operate the automation system with people, animal or objects within its range of action;

• a properly designed automation system has a high level of safety , since its sensor systems prevent it from moving with people or obstacles present so that its operation is always predictable and safe. However, as a precaution children should not be allowed to play close to the automation system, and to prevent involuntary activation, remote controls must not be left within their reach;

• as soon as any system malfunction is noticed, disconnect the electricity supply and perform the manual release procedure. Never attempt repairs on your own; call in your installation engineer. In the meantime the door or gate can be operated without automation once the geared motor has been released using the release key supplied with the system. In the event of safety devices out of service arrange for repairs to the automation immediately;

• in the event of malfunctions or power failures: while waiting for the engineer to come (or for the power to be restored if your system is not equipped with buffer batteries), the door or gate can be used just like any non-automated installation. To do this, the manual release procedure must be carried out;

• manual release and operation: first bear in mind that the release procedure can only be carried out with the door or gate stationery.

• Maintenance: Like any machine, your automation system needs regular periodic maintenance to ensure its long life and total safety . Arrange a periodic maintenance schedule with your installation engineer. Key Automation recommends that maintenance checks should be carried out every six months for normal domestic use, but this interval may vary depending on the level of use. Any inspection, maintenance or repair work must only be carried out by qualified staff.

• Never modify the automation system or its programming and setup parameters: this is the responsibility of your installation engineer.

• Testing, routine maintenance and any repairs must be recorded by the person who performs them and the documents must be conserved by the system’s owner.

The only procedures you are capable of, and which you are recommended to perform, are cleaning of the photocell glass and removal of any leaves or stones that may obstruct the automation system. To prevent anyone from activating the gate or door, release the automation system before starting. Clean only with a cloth dipped in a little water.

At the end of its useful life, the automation system must be dismantled by qualified personnel, and the materials must be recycled or disposed of in compliance with the legislation locally in force.

If after some time your remote control seems to have become less effective, or stops operating completely, the battery may be flat (depending on the level of use, this may take from several months up to more than a year). You will realise this because the transmission confirmation light does not come on, or only lights up for a very short time.

Batteries contain pollutants: do not dispose of them with normal waste but follow the methods specified by the local regulations.

Thank you for choosing Key Automation S.r.l.; please visit our Internet site www.keyautomation.com for further information.

DICHIARAZIONE DI INCORPORAZIONE DI QUASI MACCHINA

DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY

Il sottoscritto Nicola Michelin, Amministratore Delegato dell'azienda
The undersigned Nicola Michelin, General Manager of the company

Key Automation s.r.l., via Meucci 23, 30027 San Donà di Piave (VE) – ITALIA

dichiara che il prodotto tipo:
declares that the product type:

CT20324
Centrale di comando per l'automazione di cancelli a 1 o 2 motori 24Vdc, con ricevente 433,92 MHz integrata
Control unit for gates up to 2 24Vdc motors, with embedded 433,92 MHz receiver

Models:
Models:

CT20324, CT20324L, CT20324E, CT20324EL

E' conforme a quanto previsto dalle seguenti direttive comunitarie:
Complies with the following community (EC) regulations:

Direttiva macchine / *Machinery Directive 2006/42/EC*
Direttiva compatibilità elettromagnetica / *EMC Directive 2014/30/EU*
Direttiva bassa tensione / *Low voltage Directive 2014/35/EU*
Direttiva radiofrequenza */ RED Directive 2014/53/EU*
Direttiva RoHS / *RoHS Directive 2011/65/EU*

Secondo quanto previsto dalle seguenti norme armonizzate:
In accordance with the following harmonized standards regulations:

EN IEC 55014-1:2021, EN IEC 55014-2:2021
EN 60335-1:2012+A15:2021, EN 60335-2-103:2015
EN IEC 61000-3-2:2019, IEC 61000-3-3:2013 + A2:2021
EN IEC 61000-6-1:2019, EN IEC 61000-6-3:2021
EN ISO 13849-1:2015, EN ISO 13849-2:2012
EN 12453:2017 + A1:2021
ETSI EN 301 489-1 V2.2.3:2019, ETSI EN 301 489 V2.3.2:2023
EN 62233:2008

Dichiara che la documentazione tecnica pertinente al prodotto è stata redatta conformemente a quanto previsto dalla direttiva 2006/42/CE Allegato VII parte B e verrà fornita a fronte di una richiesta adeguatamente motivata dalle autorità nazionali.
Declares that the technical documentation is compiled in accordance with the directive 2006/42/EC Annex VII part B and will be transmitted in response to a reasoned request by the national authorities.

Dichiara altresì che non è consentita la messa in servizio del prodotto finchè la macchina, in cui il prodotto è incorporato, non sia stata dichiarata conforme alla direttiva 2006/42/CE.
He also declares that is not allowed to use the above mentioned product until the machine, in which this product is incorporated, has been identified and declared in conformity with the regulation 2006/42/EC.

San Donà di Piave (VE), 01/06/23

Amministratore Delegato
General Manager
Nicola Michelin

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