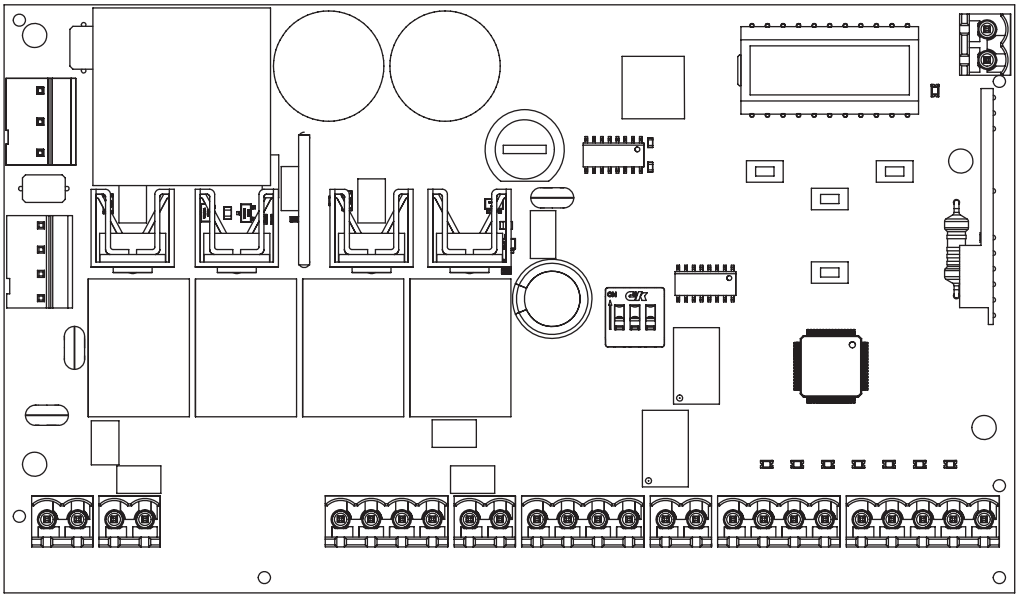
KEY AUTOMATION

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



CT20224
CT20224E

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

CE

Management System
ISO 9001

www.tuv.com
ID 9105043769

EN

INDEX

1 - SAFETY WARNINGS

⚠ ATTENTION !

ORIGINAL INSTRUCTIONS - important safety instructions. Follow the instructions since incorrect installation can lead to severe inquiry! 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.

⚠ ATTENTION !

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 Service Centre. 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;

⚠ ATTENTION !

The drive shall be disconnected from its power source during cleaning, maintenance and when replacing parts. 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;

this appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved;

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;

that the drive cannot be used with a driven part incorporating a wicket door unless the drive can only be operated with the wicket door in the safe position;

install any fixed control at a height of at least 1,5m and within sight of the door but away from moving parts;

after installation, ensure that parts of the door do not extend over public footpaths or roads;

when the appliance is provided with a separate stop button, that stop button shall be unambiguously identifiable;

install the automation exclusively on gates operating on flat surfaces, that is, they are not installed on an up or down tilt;

install exclusively on gates that are sturdy enough and suitable to withstand the loads generated by the automation itself;

do not subject the automation to direct jets of water, such as sprinklers or pressure washers;

if the automation system exceeds 20 kg in weight, it must be handled using safety lifting devices (IEC 60335-2-103: 2015);

provide appropriate safety protections in order to avoid crushing and becoming trapped between the moving guided part and any surrounding fixed elements;

make sure that any protection or safety devices, in addition to the manual release, work correctly;

place the automation identification plate at a clearly visible point;

keep the manuals and technical files of all the devices used to create the automation;

at the end of the automation installation it is advisable to hand over the manuals relating to the warnings intended for the end user;

⚠ ATTENTION !

Frequently examine the installation for imbalance where applicable and signs of wear or damage to cables, springs and mounting. Do not use if repair or adjustment is necessary.

⚠ ATTENTION !

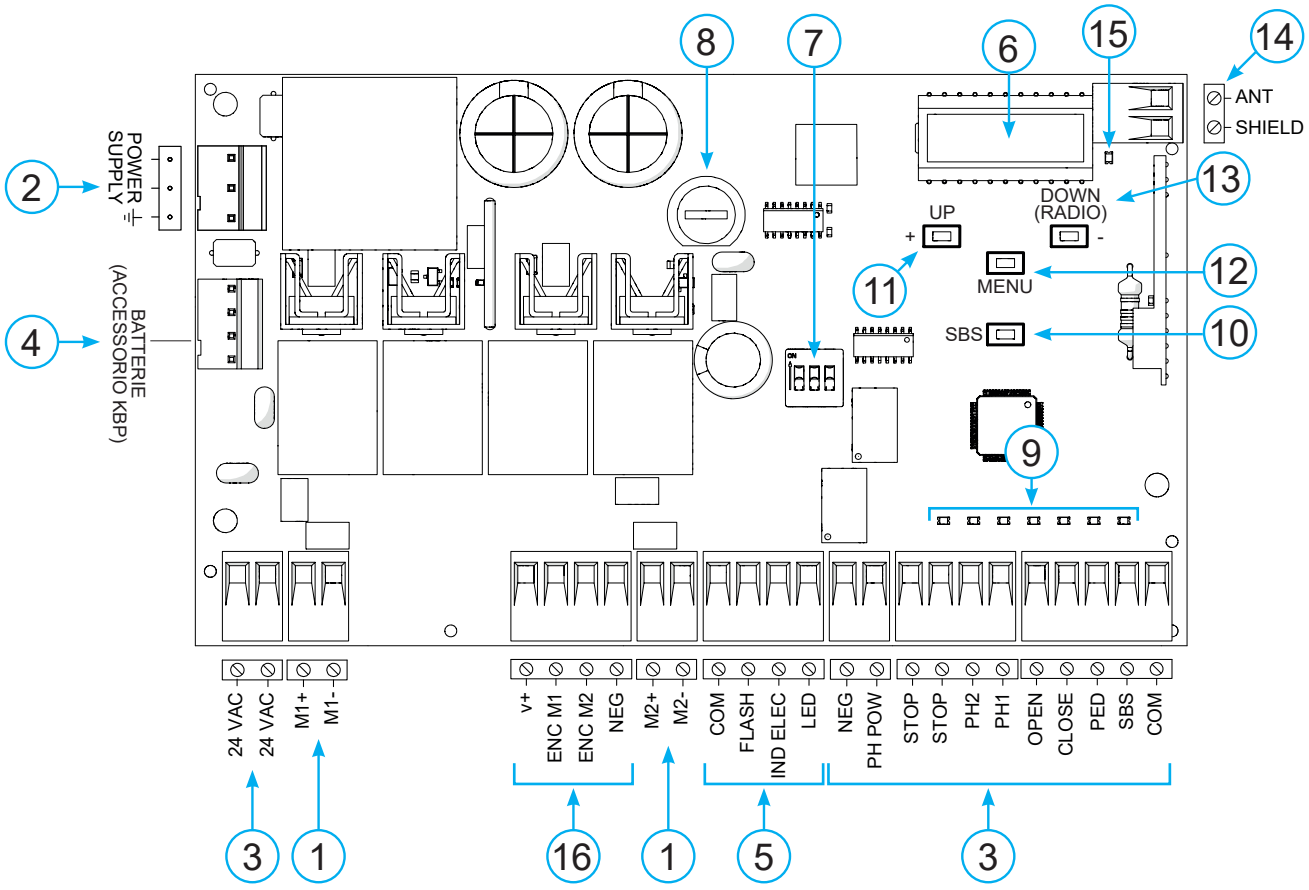
The automation system component packaging material must be disposed of in full observance of current local waste disposal legislation.

Key Automation reserves the right to amend these instructions if necessary; they and/ or any more recent versions are available at www.keyautomation.it.

2 - INTRODUCING THE PRODUCT

2.1 - Description of the control unit

The CT20224 control unit is the most modern, efficient system for the control of Key Automation motors for the electric opening and closure of swing gates.
All other, improper, use of the control unit is forbidden. The CT20224 has a display allowing easy programming and constant monitoring of the input status; the menu structure also allows easy setting of working times and operating modes.



2.2 - Description of the connections

1. Motor power supply connections
2. Transformer power supply connections
3. 24Vdc and 24Vac output connections to controls and safety devices
4. Connector for battery charger KBP
5. Connection of flashing light, courtesy light, gate open indicator light/electric lock
6. Functions display
7. Safety device dip switch
8. Fuse 2AT slow-acting
9. STOP-PH2-PH1-OPEN-CLOSE-PAR-SBS safety led and led input led
10. STEPPING SBS button
11. UP + button up
12. MENU button menu
13. DOWN - (DOWN) button down and radio menu
14. Antenna
15. KEY led
16- Encoder connections (CT20224E)

2.3 - Models and technical characteristics

CODE	DESCRIPTION
900CT20224	24V control unit for two swing gate motors
900CT20224L	24V control unit for two swing gate motors (115 V)
900CT20224E	24V control unit for two swing gate motors with Encoder

- Power supply with protection against short-circuits inside the control unit, on motors and on the connected accessories;
- Obstacle detection;
- Automatic learning of working times;
- Safety device deactivation by means of dip switches: there is no need to bridge the terminals of safety devices which are not installed - the function is simply disabled by means of a dip switch.

TECHNICAL SPECIFICATIONS	CT202 24	CT202 24E	CT202 24L
Power supply (L-N)	230Vac (+10% - 15%) 50/60 Hz		115Vac (+10%-15%) 50/60 Hz
Rated power	maximum 210W	maximum 280W	maximum 210W
Photocell power supply output	24Vdc (without regulation) maximum 250mA		
Output for Vac accessories power	24 Vac without regulation 200 mA / 24 Vdc without regulation 250 mA		
Flashing light output	24Vdc (without regulation) 15W		
Courtesy light output	24Vdc (without regulation) 15W		
Electric lock output	12Vac 15VA maximum		
Gate open warning light output	24Vdc (without regulation) 5W		
Antenna input	50Ω type cable RG58		
Encoder	no	yes	no
Operating temperature	-20°C + 55°C		
Accessory fuses	2AT		
Power supply line fuses	1.6AT		3.15AT
Max. number of transmitters storage	150		
Use in particularly acid, saline or explosive atmospheres	NO		
Protection class	IP54		
Control unit dimensions	222 x 110 x 275 mm		
Weight	3,93 kg		

2.4 - List of cables required

The cables required for connection of the various devices in a standard system are listed in the cables list table.
The cables used must be suitable for the type of installation; for example, an H03VV-F type cable is recommended for indoor applications, while H07RN-F is suitable for outdoor applications.

ELECTRIC CABLE TECHNICAL SPECIFICATIONS		
Connection	**cable**	**maximum allowable limit**
Control unit power supply line	1 x cable 3 x 1,5 mm^2	20 m *
Flashing light, courtesy light Antenna	3 x 0,5 mm^2 ** 1 x cable type RG58	20 m 20 m (advised < 5 m)
Electric lock	1 x cable 2 x 1 mm^2	10 m
Transmitter photocells	1 x cable 2 x 0,5 mm^2	20 m
Receiver photocells	1 x cable 4 x 0,5 mm^2	20 m
Sensitive edge	1 x cable 2 x 0,5 mm^2	20 m
Key-switch	1 x cable 4 x 0,5 mm^2 **	20 m
Motor power supply line	1 x cable 2 x 1,5 mm^2	10 m
Encoder power supply line	1 x cable 3 x 0,5 mm^2	10 m

* If the power supply cable is more than 20 m long, it must be of larger gauge (3x2.5mm^2) and a safety grounding system must be installed near the automation unit
** Two cables of 2 x 0.5 mm^2 can be used as an alternative

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;

heck 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;

he 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;

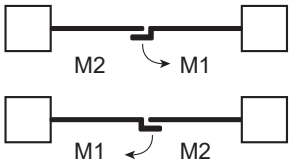
ensure that all the material used for installation complies with the relevant regulatory standards.

4 - PRODUCT INSTALLATION

4.1 - Electrical connections

WARNING - Before making the connections, ensure that the control unit is not powered up.

MOTOR 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 -

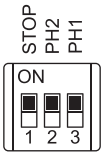


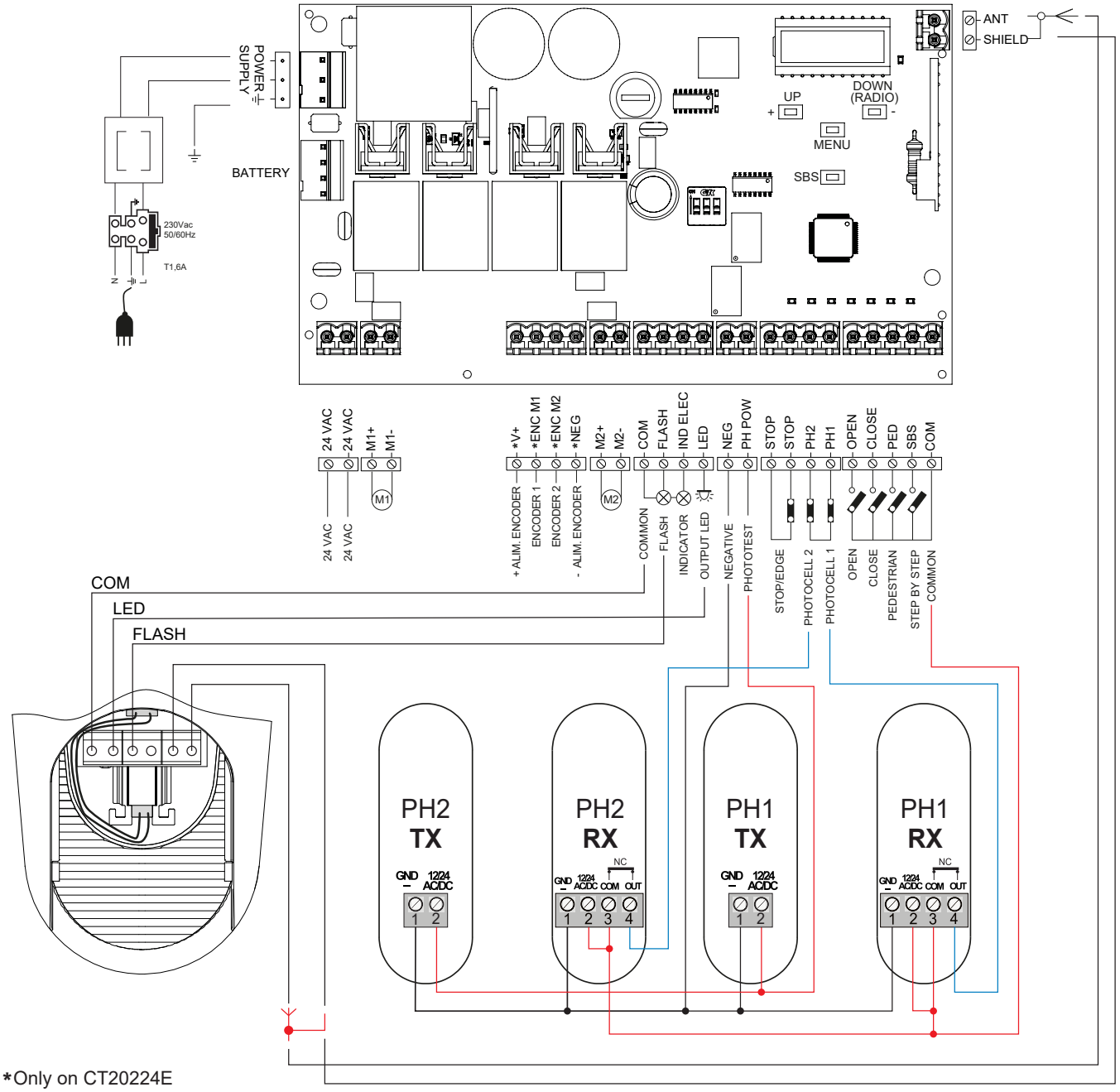
POWER SUPPLY CONNECTOR	
L	Power supply live 230 Vac (120 Vac) 50-60 Hz
N	Power supply neutral 230 Vac (120 Vac) 50-60 Hz
⏚	Earth

DIP SWITCH

Set on “ON” to disable inputs STOP, PH1, PH2
Eliminates the need to bridge the terminal board inputs.

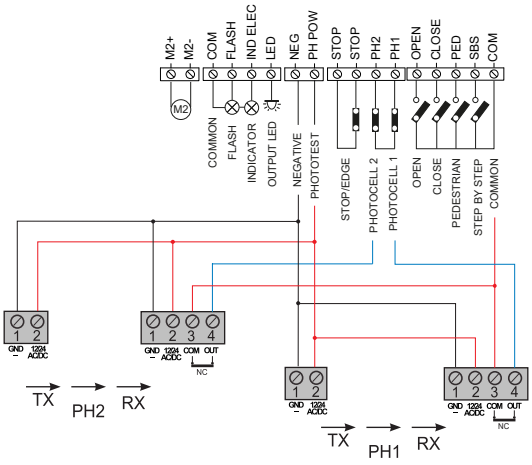
WARNING - with the dip switch ON, the safety devices are disabled





*Only on CT20224E

ELECTRICAL CONNECTIONS FOR ENERGY SAVING



SAFETY AND CONTROL DEVICE CONNECTORS

24 VAC	Accessories power supply 24 Vac without regulation, 200 mA (with battery operation output not active)
24 VAC	Accessories power supply 24 Vac without regulation, 200 mA (with battery operation output not active)
COM	Common for the FLASH-IND-LED outputs
FLASH	Flashing light output 24Vdc (without regulation), maximum 15W
IND/ELEC	IND output for gate open indicator light 24 Vdc not regulated 5W MAX / Electric lock output 12Vac, 15VA maximum selectable with parameter I n.d.
LED	Courtesy light output 24Vdc (without regulation), maximum 15W, controllable also via radio ON-OFF command (radio channel 4 selecting FC.Y. = 2, tC.Y. = 0)
NEG	Photocell power supply negative
PH-POW	Photocells PH1 and PH2 power supply positive; phototest can be selected with parameter tP.h. 24 Vdc, 250 mA
STOP	STOP safety device, NC contact between STOP and STOP (warning, with dip switch 1 ON the safety device input is off). This input is classified as a safety device; the contact can be deactivated at any time, cutting out the automation system and disabling all functions, including Automatic Closure. Safety sensor edge, ON/OFF, NC contact or resistive 8K2 between STOP and STOP. Input selectable with parameter Ed.n.
PH2	Photocells (opening), NC contact between PH2 and COM (warning, with dip switch 2 ON the PHOTOCELL 2 safety device input is off). The photocell is tripped at any time during opening of the automation system, halting operation immediately; the automation system will continue opening when the contact is restored. In the event of intervention on closure (parameter Ph.2. = 0) the device stops and on release re-opens
PH1	Photocells (closing), NC contact between PH1 and COM (warning, with dip switch 3 ON the PHOTOCELL 1 safety device input is off) The photocell is tripped at any time during closing of the automation system, halting operation immediately and reversing the travel direction
OPEN	OPEN command NO contact between OPEN and COM Contact for the HOLD-TO-RUN function. The gate OPENS as long as the contact is held down
CLOSE	CLOSE command NO contact between CLOSE and COM Contact for the HOLD-TO-RUN function. The gate CLOSES as long as the contact is held down
PAR	PARTIAL command NO contact between PAR and COM Used to open the gate partially, depending on the software setting (not active in barrier/up-and-over mode)
SBS	STEPPING command NO contact between SBS and COM Open/Stop/Close/Stop command, or as set in the software
COM	Common for the PH2-PH1-OPEN-CLOSE-PAR-SBS inputs
SHIELD	Antenna - shield -
ANT	Antenna - signal -

4.2 - Display during normal operation

In “NORMAL OPERATING MODE”, i.e. when the system is powered up normally, the 3-figure LCD display shows the following status messages:

MESSAGES	MEANING
- -	Gate closed or switch-on after shutdown
OP	Gate opening
CL	Gate closing
SO	Gate stopped during opening
SC	Gate stopped during closure
F 1	Photocell 1 tripped
F2	Photocell 2 tripped
HA	Gate stopped by external event

MESSAGES	MEANING
AL1	Re-alignment procedure
oP	Gate stopped without automatic reclosure
OPd	Gate in partial opening mode
PE	Gate in partial opening position without automatic reclosure
-tC	Gate open with timed reclosure - Flashing dash counting in progress Dash replaced by figures 0..9 countdown (last 10s)
-tP	Gate in partial opening position with timed reclosure - Flashing dash counting in progress Dash replaced by figures 0..9 countdown (last 10s)
L--	Learning stopped due to activation of safety device or motor inversion
LOP	Learning on M1 opening
LO.P.	Learning on M2 opening
LCL	Learning on M1 closing
LC.L.	Learning on M2 closing
SOP	Point of M1 deceleration on opening (only during stroke learning)
SO.P.	Point of M2 deceleration on opening (only during stroke learning)
SCL	Point of M1 deceleration on closing (only during stroke learning)
SC.L.	Point of M2 deceleration on closing (only during stroke learning)

EVENT	DESCRIPTION	FLASHING INDICATION AND CONTROL UNIT KEY LED
opening	Gate opening	
closure	Gate closing	
automatic closure	Gate open with timed reclosure active	
stop during closure	Gate stopped during closure	
stop during opening	Gate stopped during opening	
open	Gate completely open without automatic reclosure	
closed	Gate completely closed	
programmation	During the programming phase	2 quick flashes + pause + 1 flash
obstacle M1/M2	Motor 1/2 obstacle detected	4 quick flashes + pause, 3 times
photo 1!	Photocell 1 tripped	2 quick flashes + pause, 3 times
photo 2!	Photocell 2 tripped	2 quick flashes + pause, 3 times
sensitive edge!	Sensitive edge tripped	5 quick flashes + pause, 3 times
partial opening	Partial opening in progress	
automatic partial closure	Gate opening to partial position with timed reclosure activated	
realignment	Realignment after a manual release	
phototest error	Phototest error detected	3 quick flashes + pause, 3 times
IND/ELEC error	Electric lock / gate open light line overload	6 quick flashes + pause, 3 times

Malfunctions
This section lists a number of malfunctions which may occur.

SURGE OVERLOAD ALARM	The motor's current drawdown has increased very quickly
E0L	1. The gate has hit an obstacle (M1)
	2. There is friction on the leaf of M1
E0.L.	1. The gate has hit an obstacle (M2)
	2. There is friction on the leaf of M2
SAFETY EDGE ALARM	The control unit has received a signal from the safety edge
EEd	1. The safety edge has been pressed.
	2. The safety edge is not connected correctly
PHOTOCELL ALARM/SAFETY EDGE	Phototest fail outcome
EPH	1. Check the photocell and the safety edge connections
	2. Check that the photocells and the safety edg are operating correctly
ENCODER ALARM	Encoder encoder (only if encoder is present)
EEn	1. Check the encoder connections.
	2. Check that the encoder are operating correctly.

After eliminating the cause of the alarm, to delete all errors simply press the "DOWN" button or press the SBS (STEPPING) command

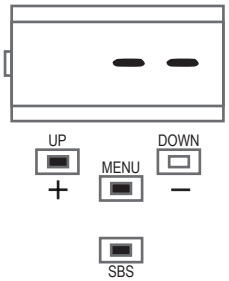
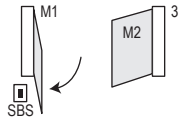
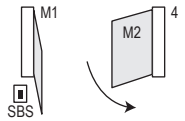
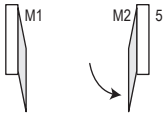
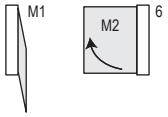
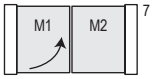
The display returns to the normal screen.

Press "UP" to read the following parameters on display.

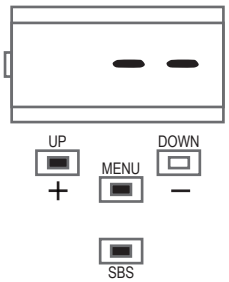
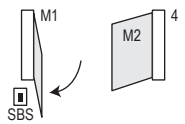
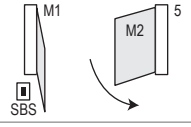
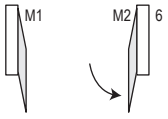
DISPLAY	MEANING
Status display (--, OP, CL, SO, ecc.)	Description of the control unit (--, OP, CL, SO, ecc.)
Maneuvers performed	Counter displays alternating the thousands (without dots) and the units (with dots)
Motor current 1 [A]	Motor current absorption (e.g. 1.5=1.5A)
Motor current 2 [A]	Motor current absorption (e.g. 1.5=1.5A)

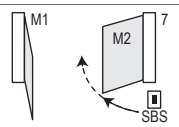
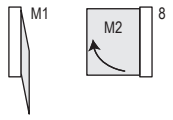
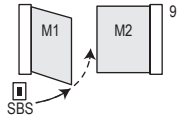
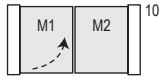
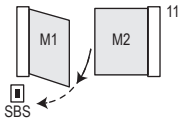
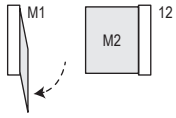
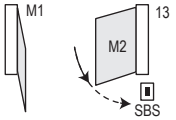
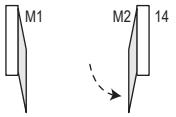
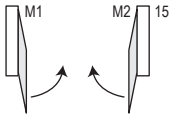
4.3 - Autolearning of the travel stroke

The first time the control unit is powered up, an autolearning procedure must be carried out to acquire fundamental parameters such as the travel stroke length and deceleration points.

AUTOLEARNING OF THE TRAVEL STROKE AND MAIN PARAMETERS	
The decelerations will be those set in the menu, with the same percentage during both opening and closing. **CAUTION: if manual programming of deceleration intervals is required, go to the next table** **CAUTION! check that mechanical end stops (compulsory) are present and secure. The motors must always reach the mechanical end stop**	
1. Move the gate manually to mid-travel	
CAUTION: 2. Before proceeding with programming, use parameter de.f. to select the type of motor to be programmed (see paragraph 6, configuration of parameter de.f.). If this phase is not completed, this may cause serious damage to the automation!	
3. Press the pushbuttons UP and MENU at the same time for at least 5 seconds until LOP is displayed, then (if necessary) press DOWN (see figure). Ensure that motor M1 is activated first; otherwise, press DOWN, turn the power off and invert connections M1 and M2. Repeat the procedure from step 3. If the first manoeuvre is NOT opening, press DOWN to stop the self-learning process. Then press SBS to restart acquisition: the leaf resumes movement in the correct direction	
4. Motor M1 opens at low speed until it reaches the mechanical opening end stop. On reaching the mechanical end stop on opening of M1 motor M2 starts automatically in opening mode (the display shows LO.P.). If motor M2 moves in closing, stop by pressing DOWN and resume movement using SBS (the leaf resumes movement in the correct direction)	
5. The motor M2 opens at low speed until reaching the mechanical opening end stop.	
6. After a couple of seconds, motor M2 starts up automatically at low speed until reaching the mechanical closing end stop (the display shows LC.L.)	
7. On reaching the mechanical opening end stop of M2, motor M1 closes at low speed until reaching the mechanical closing end stop, thus completing the programming phase (the display shows LCL)	

All the main parameters are set with the default settings by the control unit. To customise the installation, proceed as described in point 4.6 below.

AUTOLEARNING OF THE TRAVEL STROKE AND MAIN PARAMETERS, WITH CUSTOMISED DECELERATIONS	
Deceleration intervals can be personalised by the user, according to the procedure below **CAUTION! check that mechanical end stops (compulsory) are present and secure. The motors must always reach the mechanical end stop**	
1. Move the gate manually to mid-travel	
CAUTION: 2. Before proceeding with programming, use parameter dE.F. to select the type of motor to be programmed (see paragraph 6, configuration of parameter dE.F.). If this phase is not completed, this may cause serious damage to the automation!	
3. CAUTION: enter the main menu to set the parameter LSI = pas per the table in paragraph 4.6	
4. Press the pushbuttons UP and MENU at the same time for at least 5 seconds until LOP is displayed, then (if necessary) press DOWN (see figure). Ensure that motor M1 opens first; otherwise, press DOWN, turn the power off and invert connections M1 and M2. Repeat the procedure from step 4. If the first manoeuvre is NOT opening, press DOWN to stop the self-learning process. Then press SBS to restart acquisition: the leaf resumes movement in the correct direction	
5. Motor M1 opens at low speed until it reaches the mechanical opening end stop. On reaching the mechanical end stop on opening of M1 motor M2 starts automatically in opening mode (the display shows LO.P.). If motor M2 moves in closing, stop by pressing DOWN and resume movement using SBS (the leaf resumes movement in the correct direction)	
6. The motor M2 opens at low speed until reaching the mechanical opening end stop. After a couple of seconds, the motor M2 closes at low speed (the display shows LC.L.)	

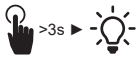
7. **On reaching the point where motor M2 closing deceleration is required, press SBS.** M2 motor movement continues at low speed (the display shows SC.L.)	
8. On reaching the mechanical end stop of motor M2, motor M1 starts closing	
9. **On reaching the point where motor M1 closing deceleration is required, press SBS. M1 motor movement continues at low speed** (the display shows SCL)	
10. When motor M1 reaches the closed position, motor M1 stops and restarts in opening	
11. **On reaching the point where motor M1 opening deceleration is required, press SBS.** M1 motor movement continues at low speed (the display shows SOP)	
12. When motor M1 reaches the open position, motor M1 stops and motor M2 starts in opening	
13. **On reaching the point where motor M2 opening deceleration is required, press SBS.** M2 motor movement continues at low speed. (the display shows SO.P.)	
14. When motor M2 reaches the open position, motor M2 stops	
15. M1 and M2 resume closing according to the offset parameter entered in the menu, i.e. the gate closes automatically according to the set travel	
16. Run a number of opening, closing and stop manoeuvres, to check that the system is stable and there are no assembly defects.	

The deceleration points not assigned manually will be automatically set at 20% of the control unit stroke

4.4 - Learning a transmitter

A transmitter can be “learned” via the specific programming menu or by remote memorisation, using a previously memorised transmitter.

MEMORISING A REMOTE CONTROL	
If you are in programming mode exit pressing the MENU button until -- appears. Press the DOWN (RADIO) button for more than 2 seconds. Until the display shows the word “rad” (radio), then release the button	
1. Press and release the DOWN (RADIO) button a number of times equal to the number of the output to be activated: once for output STEP BY STEP, twice for output PARCIAL, three times for output ONLY OPEN, four times for output LIGHT ON/OFF, five times for output PRESET (button 1 = output 1, button 2 = output 2, button 3 = output 3, button 4 = output 4)	
2. The KEY LED will flash a number of times equal to the number of the output selected, with 1 second pauses between flashes	
3. Press the button of the remote control to be memorised within 7 seconds, holding it down for at least 2 seconds	
4. If the memorisation has been successful, the KEY LED will give one long flash	
5. To memorise another remote control on the same output, repeat point 3	
N.B If no commands are given for 7 seconds, the receiver automatically quits the programming mode	

DELETING A REMOTE CONTROL	
If you are in programming mode exit pressing the MENU button until -- appears. Press the DOWN (RADIO) button for more than 2 seconds. Until the display shows the word "rAd" (radio), then release the button	
1. Press the DOWN (RADIO) button until the LED lights up (about 3 seconds)	
2. Press the button of the remote control to be deleted within 7 seconds, holding it down until the KEY LED goes out. Release the remote control button	
3. About 1 second after the button is released, the KEY LED starts to flash	
4. Confirm the deletion by pressing the DOWN (RADIO) button	
5. If the deletion has been successful, KEY LED will give one long flash	
N.B If no commands are given for 7 seconds, the receiver automatically quits the programming mode	

CLEARING THE ENTIRE RECEIVER MEMORY	
If you are in programming mode exit pressing the MENU button until -- appears. Press the DOWN (RADIO) button for more than 2 seconds. Until the display shows the word "rad" (radio), then release the button	
1. Press the DOWN (RADIO) button and hold it down until the LED lights up (about 3 seconds) and then goes out (about 3 seconds). Release the button	
2. About 1 second after the button is released, the KEY LED starts to flash	
3. Press the DOWN (RADIO) button as the LED flashes for the third time	
4. If the deletion has been successful, the KEY LED will give one long flash	

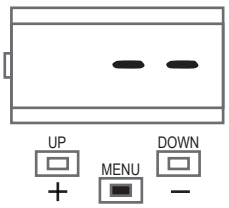
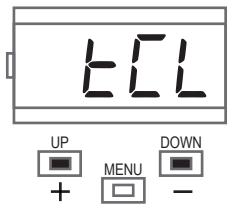
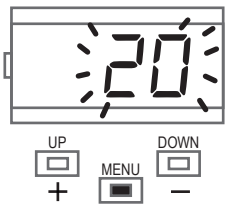
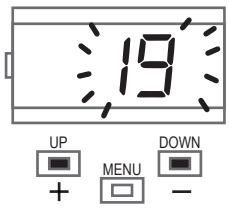
MEMORIZZAZIONE A DISTANZA DI UN RADIOCOMANDO CON RADIOCOMANDO GIÀ IN MEMORIA	
A transmitter can be memorised without accessing the receiver. The user needs to have a transmitter memorised previously, after which the procedure is as described below. The remote copy procedure must be carried out in the area served by the receiver.	
1. Press the button of the new remote control to be memorised, holding it down for at least 5 seconds	
2. Press the button of the old remote control to be copied (if phase 1 has been successful, the automation system will not respond)	
3. Press the button of the new remote control to be memorised, holding it down for at least 3 seconds	
4. Press the button of the old remote control to be copied, holding it down for at least 3 seconds, to confirm and quit the programming mode	
N.B If no commands are given for 7 seconds, the receiver automatically quits the programming mode	

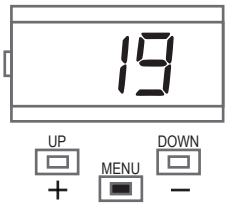
4.5 - Customising the system - Basic Menu

If necessary, users may select a basic menu which allows modification of the control unit's basic parameters. To select the basic menu proceed as described below.

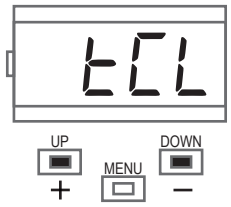
WARNING: to be certain of accessing the NORMAL OPERATION display state, the starting point for accessing the basic menu, press the MENU button twice

Exampling of modifying a BASIC MENU parameter

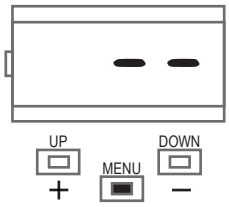
			
Press the MENU button for 1 second to access the basic menu.	After accessing the BASIC MENU, press the + and – buttons to scroll through the functions.	To access the value modification function, press the MENU button for 1 second, until the value starts to flash quickly.	Press the + and – buttons to to modify the value.



Press the MENU button for 1 second to display the parameter in order to save the modified value, or MENU quickly to quit the function without saving.



Press the + and – buttons to scroll through the functions to modify other parameters.



Press the MENU button quickly to quit the menu.

	PARAMETERS	DESCRIPTION	DEFAULT	MIN	MAX	UNIT
1	tCL	Automatic reclosure time (0 = off)	0	0	900	s
2	ttr	Reclosing time after transit on PH1 (0 = off)	0	0	30	s
3	SEI	Sensitivity on obstacles 0 = Maximum impact force 10 = Minimum impact force	3*	0	10	
4	SFO	Motor speed during opening 1 = minimum 2 = low 3 = medium 4 = high 5 = maximum	4	1	5	
5	SSO	Motor speed during opening deceleration phase 1 = minimum 2 = low 3 = medium 4 = high 5 = maximum	1	1	5	
6	SFC	Motor speed during closing 1 = minimum 2 = low 3 = medium 4 = high 5 = maximum	4	1	5	
7	SSC	Motor speed during closing deceleration phase 1 = minimum 2 = low 3 = medium 4 = high 5 = maximum	1	1	5	
8	SbS	STEP BY STEP or SBS configuration: 0 = Normal (AP-ST-CH-ST-AP-ST…) 1 = Alternate STOP (AP-ST-CH-AP-ST-CH…) 2 = Alternate (AP-CH-AP-CH…) 3 = Apartment block – timer **(N.B** tCL **≠ 0)** 4 = Apartment block with immediate reclosure	0	0	4	
9	dLY	Second leaf delay on opening	2	0	300	
10	LSI	Deceleration distance 0 to 100 = Motor deceleration percentage during opening and closure	20	0	100	%
11	bLt	Post blackout procedure 0 = No action, remains stationery 1 = Closure	0	0	1	s
12	Sby	Energy saving: enables photocell switch-off when gate is closed 0= disabled 1= enabled	0	0	1	
13	nMt	Number of motors 1 = 1 motor 2 = 2 motors	2	1	2	

* STAR Default = **5**

5 - 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 EN12445 standard which specifies the test methods for gate and door automation systems.

5.1 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, sensitive 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 EN12445 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.

5.2 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.

6 - FURTHER DETAILS - ADVANCED MENU

The Advanced menu allows the system to be further customised by modifying parameters not accessible from the basic menu.

To access the ADVANCED menu, press the MENU button and hold it down for 5 seconds.

To modify ADVANCED MENU parameters, proceed as described for the BASIC MENU.

N.B. Some default functions/display items may vary with respect to the type of motor selected.

	PARAMETERS	DESCRIPTION	DEFAULT	MIN	MAX	UNIT
1	SP.h.	Use of PHOTO1 when starting from closed 0 = PHOTO1 is checked 1 = The gate starts even with PHOTO1 excited	1	0	1	
2	Ph.2.	Use of PHOTO2 0 = Enabled during both opening and closing AP/CH 1 =Only enabled during opening AP	0	0	1	
3	tP.h.	Photo-device test 0 = off 1 = PHOTO1 on 2 = PHOTO2 on 3 = PHOTO1 and PHOTO2 on	0	0	3	
4	Ed.n.	STOP/EDGE input selection 0 = STOP contact (NC) 1 = Resistive safety edge (8k2) 2 = Contact safety edge (NC)	0	0	2	
5	iE.d.	Sensitive edge tripping mode 0= only tripped during closure with direction reversal 1 = stops the automation (during both opening and closure) and retreats from the obstacle	0	0	1	

	PARAMETERS	DESCRIPTION	DEFAULT	MIN	MAX	UNIT
6	tE.d.	Edge test 0 = off 1 = on	0	0	1	
7	LP.o.	Partial opening	50	0	100	%
8	tP.C.	Time for automatic closure from partial opening (0=off)	0	0	900	s
9	FP.r.	Flashing light output setup 0 = Steady 1 = Flashing	1	0	1	
10	tP.r.	Pre-flashing time (0 = off)	0	0	20	s
11	FC.y.	Courtesy light setup 0 = On at end of operation for time TCY 1 = On if gate not closed + duration of TCY 2 = On if courtesy light timer (TCY) time not out	0	0	2	
12	tC.y.	Courtesy light on time	0	0	900	s
13	dE.A.	Hold-to-run 0 = off 1 = on	0	0	1	
14	Ind.	0 = deactivated 1 = gate open light ON/OFF 2 = gate open light proportional - Slow flashing with gate opening - Quick flashing with gate closing - Steady light if gate open - 2 flashes + pause with gate stationary (position other than closed) 3 = Electric lock 4 = Magnetic electric lock function with output active when gate/door is closed N.B. interface with an external relay with 24 Vdc winding. To activate this function, the pre-flash must be enabled at the recommended value of 1 sec (tP.r. ≠ 0)	0	0	4	
15	SE.r.	Service interval cycle threshold (0 = off)	10	0	200	x 1000 cycles
16	SE.F.	Enabling of continuous flashing indicating service required with SE.r. ≠ 0 (only active with gate closed) 0 = off 1 = on	0	0	1	
17	EL.t.	Electric lock activation time in seconds	2	1	10	s
18	HA.o.	Water hammer on opening 0 = disabled	0	0	100	*100ms
19	HA.c.	Water hammer on closing 0 = disabled	0	0	100	*100ms
20	rE.L.	Motor release from closed/open limit switch. Useful for lightweight gates 0 = off 1 to 10 release levels (1 = minimum release, 10 = maximum release)	0**	0	10	
21	St.P.	High-speed motor start-up 0 = on 1 = off	0***	0	1	
22	dn.1	Leaf 1 closing delay with gate open 0 = Off 1 = 1 to 20 Seconds On	1	0	20	
23	En.C.****	1 = Off (use of virtual encoder) 2 = On (use of motor's physical encoder)	1	1	2	
24	nE.P.****	1 to 10 pulses per revolution of the physical encoder	4	1	10	
25	dE.F.	Reset to default values 1= RAY2224 2= REP2224 3= INT24/UND24 4= STAR2024/ STAR3024 5= RAY4224E****	1	1	5	

To set the default values: 1) access the advanced programming function; 2) select the "dEF" parameter"; 3) activate the modification mode ("0" on display"); 4) accept the modification (press "MENU" and hold it down). A countdown should now appear: 49,48...,1 down to "don". Release the button when finished.

** Default STAR e REP = **1**
*** Default STAR = **1**
**** Only on CT20224E

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.it for further information.

NOTE

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:

CT20224
Centrale di comando per l'automazione di cancelli a 1 o 2 motori 24Vdc
Control unit for gates up to 2 24Vdc motors

Modello:
Model:

CT20224, CT20224E, CT20224L

E' conforme a quanto previsto dalle seguenti direttive comunitarie:
Is in conformity 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 RoHS / *RoHS Directive* 2011/65/EU

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

EN 55014-1:2006 + A1:2009 + A2:2011
EN 55014-2:1997 + A1:2001 + A2:2008
EN 62233:2008
EN 60335-1:2012 + A1 + A11, EN 60335-2-103:2015
EN 61000-3-2:2014, EN 61000-3-3:2013
EN 61000-6-2:2005, EN 61000-6-3:2007
EN 60950-1:2006: + A11:2009 + A1:2010 + A12:2011 + A2:2013

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), 18/07/17

Amministratore Delegato
General Manager
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