AUTOMATIC SYSTEMS

GATE CONTROL UNIT
installation and manual

EASY B232

version 2.7

CE

1. Introduction

EASY B232 gate control unit is used to control drives of double leaf gates powered by alternating voltage 230V, 50 Hz, max power 350W. With the cooperation of the Easy RX radio card of the capacity of 35 remote controls DTM433MHz series (secured transmission based on the Keeloq system), the driver gains the radio control function.

The drive has a function of slowing down the move during the start and/or stopping and adjustment of servomotor power. By adjusting the right mode of the driver we can complete automation system with function of the automatic gate closure after time (time of auto closure is regulated from 1 up to 120 seconds), function of photo closure (automatic closure of the gate with time 5 seconds, started after the infringement and repeated dismissal of photocells) EASY 232 has output of gate bolt control and additional output with manual and radio steering, which can work under the bistable procedure (connect/disconnect) or monostable (connect for 4 sec.), intended for connecting outside device.

Signal lamp power output 230 VAC / 50 Hz, enables connecting both lamp with the contact breaker built in, as well as without (recommended). Additionally the driver is equipped with the signal lamp output LED 24 VDC/ 6W.

The operation of control unit depends on chosen work mode, see p. 5.4.

2. . Technical data

Basic parameters

- Power supply	230 AC V, 50 Hz
- Power consumption in non-active status	8VA
- Operational temperature (min./max.)	-20°C /+55°C
- External dimensions (width. x depth x height)	180 x 95 x 241 mm or 120 x 80 x 166 mm
- Installation	surface mounted
- Weight	1,1 kg
- IP	55

Outputs/Inputs

- Servomotor output (voltage / maximum power/in built condenser/quantity)	230VAC / 2 x 350W / none/ 2
- Signal lamp output transmitted	max. 230VAC/6A and OC max. 24VDC/6W
- Periphery power output (photocells, bolt, etc.)	24V DC, 0,5A
- Photocells transmitter power supply output	OC type (see function PHOTO-TEST)
- Gate bolt output	12V DC, engaged for 8 sec. on the start of opening
- Additional output	relay (potential free) max. 1A/30V AC/DC operating in bistable or monostable mode engaging time 4 sec (programmable with DIP-SWITCH, p.5.2.1)
- Photocell inputs/ number	NC type / 3
- Manual steering input OPEN A	NO type
- Manual steering input OPEN B	NO type
- Additional channel manual steering input OPEN C	NO type
- Manual steering input STOP	NC type

Steering part

- Regulation of opening and closing time and soft start/stop phases	1 sec. to 255 sec. (exact to 1 sec.) – learning function
- Power of servomotors regulation	yes, separately for servomotor 1 and 2
- Regulation of second leaf delay	with the help of potentiometers from 1 to 15 seconds
- 8 modes of servomotor work	programmable with DIP-SWITCH, p.5.4
- Start with maximum strength	programmable with DIP-SWITCH, p.5.2.1
- Auto-closing gate function	yes, regulation with the help of potentiometer from 1 to 120s
- Photo-closing function	yes, constant time after which the gate is closed 5 sec
- Pushing with increased power after closing, start with increased power	programmable with DIP-SWITCH, p.5.2.1
- Initial work of signal lamp	programmable with DIP-SWITCH, p.5.2.1
- Photo test (testing of photocells before the gate move)	yes, p. 5.2.1
- Equipment user interface	DIP-SWITCH to set control unit operation mode and switching additional functions, LEARN button to conduct learning of opening and closing time (slowdown), signal LED diodes
- Device configuration memory	non-transistory
- Radio steering	in option through connection for radio receiver available on the board

Radio part – receiver EasyRX

- Radio module	superheterodyne, ensuring high reliability, repeatability and resistance to radio noise
-Transmission protection	64-bit dynamically changing Keeloq®
- Modulation type/ frequency	ASK / 433,92 MHz
- Input aerial impedance	50 W
- Aerial	internal, terminals for external aerial connection
- Outputs	digital steering output
- Memory capacity	35 remote controls, every with individual number in memory
- Remote control configuration	possibility to subscribe any of three functions (OPEN A, OPEN B, OPEN C) to any remote control button
- Possibility to delete all memory	yes
- Possibility to delete single remote control	yes
- Possibility to subjoin remote control without the necessity to access control unit button	yes (remote subjoin function of remote control)
- Remote subjoin function block	yes

3. Installation

3.1. Important notice

Electrical and automation installations of the drive must be made by experienced and qualified personnel according to all regulations in force. Device is designed to operate with dangerous 230V/50Hz voltage, turn all power off while installing. EASY B232 control unit is classified as „ Gate and automatic doors" category which indicates special safety measures. The installers task is safe installation of the device which enables maximum reduction of risks connected with its operation. The person performing the installation without compliance with all regulations is responsible for any presumptive damages caused by the device.

3.2. Device description and installation method

EASY B232 control unit is main board and casing. Main board (Fig. 1) has built-in power supply adaptor and execution circuit made on special relays and couplings to connect power of servomotor and protecting, steering and signalling elements. Moreover, it is equipped with the microprocessor control unit with the interface on LED diodes, DIP-SWITCHes, MICROSWITCH button and rotational potentiometers. The casing of the control unit has IP 55 level of tightness. Impairments placed in the lower part of the casing are for placing fixing bolts which mount the control unit to the surface. Impairments in the side parts of the casing are to lead installation wires of the control unit. After making the hole it is necessary to apply attached rubber gland of the diameter 25mm. The wires should be led to the device through lower part of the casing. While making holes in the casing it is necessary to guarantee required "IP" tightness. The presence of the supply voltage is being signalled with LED POWER diode lighting.
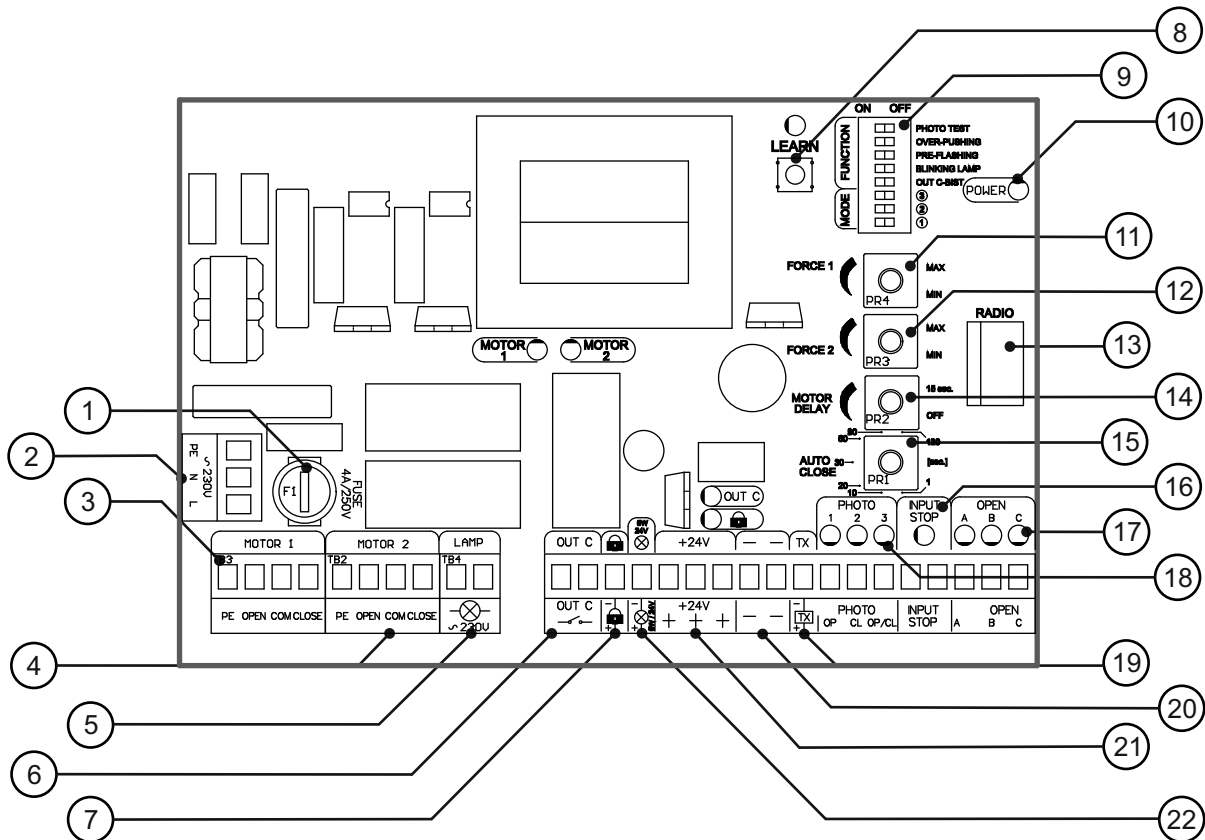

Fig. 1. Main board

1. fuse (4A/250V, T)
2. power supply connector 230V AC
3. connector for engine 1
4. connector for engine 2
5. signal lamp connector, 230V AC, max. 6A

6. additional relay output (NO)
7. gate bolt output 12VDC
8. LEARN button used while programming
9. DIP-SWITCH which is to set the operations mode and to control additional functions
10. LED diode signalling presence of power on the control unit board
11. first servomotor power regulation
12. second servomotor power regulation
13. radio receiver connector EasyRX
14. delay of the leaf regulation
15. closing time regulation
16. STOP button connector (NC)
17. manual steering buttons OPEN A, B and C connector
18. photocells outputs connector OP, CL and OP/CL
19. photocell transmitters power connector (necessary with photo test usage) – mass potential "-"
20. common accessories connector (mass potential)
21. accessories Power connector (+24V)
22. LED lamp connector (mass potential max. 6W)

3.3. Description of electric connections of EASY B232 control unit

Only qualified specialist, having suitable qualifications, can perform connecting to electrical grid 230 VAC. The delivered control unit is at once ready for the work, all required terminals are connected with themselves, and every installed safety devices is stuck instead of the small wire bridge (jumper).

3.3.1. Network power terminals 230VAC, 50Hz (L, N, PE)

This connector is envisaged for connecting control unit power from electric grid 230VAC, 50 Hz. The powering circuit to which the control unit will be connected, should be equipped with the switch cutting the inflow of the electricity to the steering board. We add the phase cable to the L terminal, to the N terminal neutral cable, and to the PE terminal protective cable (yellow-green).

3.3.2. Terminals for connecting the servomotors MOTOR1, MOTOR2 (PE, OPEN, COM, CLOSE)

Servomotor which opens as first (important when the leaves open "lap") should be connected to MOTOR 1 terminals. Second servomotor should be connected to MOTOR 2 terminals. Engine condensers, proper for this type of servomotor, should be connected between OPEN and CLOSE terminals of the servomotors. The servomotor opening wire should be connected to OPEN terminal, closing wire to CLOSE terminal, common wire to COM terminal and servomotor protection wire to PE terminal.

3.3.3. Terminals for 230V (LAMP) signal lamp connection

Terminals are used to connect the lightning or the visual signalling of the current state of servomotor work. We connect lamp leads 230 V, max. 6A directly to LAMP terminals in the control unit (fig. 2.). In case of the lamp with the contact breaker built in, Blinking Lamp function should be turned off (see p. 5.2.1).

3.3.4. Terminals for 24V/6W signal lamp connection

Terminals are to connect LED lamp to 24V, maximum power 6W. We connect it to 24V/6W and +24V terminals (fig. 2). In case of the lamp with the contact breaker built in, Blinking Lamp function should be turned off (see p. 5.2.1).

3.3.5. Gate bolt connection terminals (🔒)

Control unit is equipped with output which can steer 12 VDC gate bolt. It is necessary to remember about maximum load of accessories power supply output, all together 0,5A.

3.3.6. Additional output terminals (OUT C)

Control unit is equipped with the relay with NO type contacts led out with maximum load capacity of 30 VAC/DC 1A, enabling the steering with additional device, such as electric strike, additional control unit, lighting (with applying additional relay of the appropriate load capacity) etc. The output is engaged with manual steering OPEN C button or with the button of the remote control. Depending on the settings of the OUTC-BIST microswitch (the channel works in bistable or monostable mode engaging time 4 s).

CAUTION!

Switchboard settings unsuited to installation conditions can soon lead to its damage and loss of warranty! After the completion of installation making stage and connecting the devices, the switchboard should absolutely be programmed in order to adapt its operating parameters to the current installation, in particular it is necessary:
- always to set the power of the servomotor
- always to programme opening and closing times

All the envisaged connections should scrupulously followed. In the uncertain situation it is forbidden to try out, only to read relevant detailed technical cards of installed devices. Incorrect making of connections can cause serious damage in the control unit and remaining devices.

D O   N O T   C O N N E C T   A D D I T I O N A L   P A R R A L E L   E N G I N E S .

EASY B232
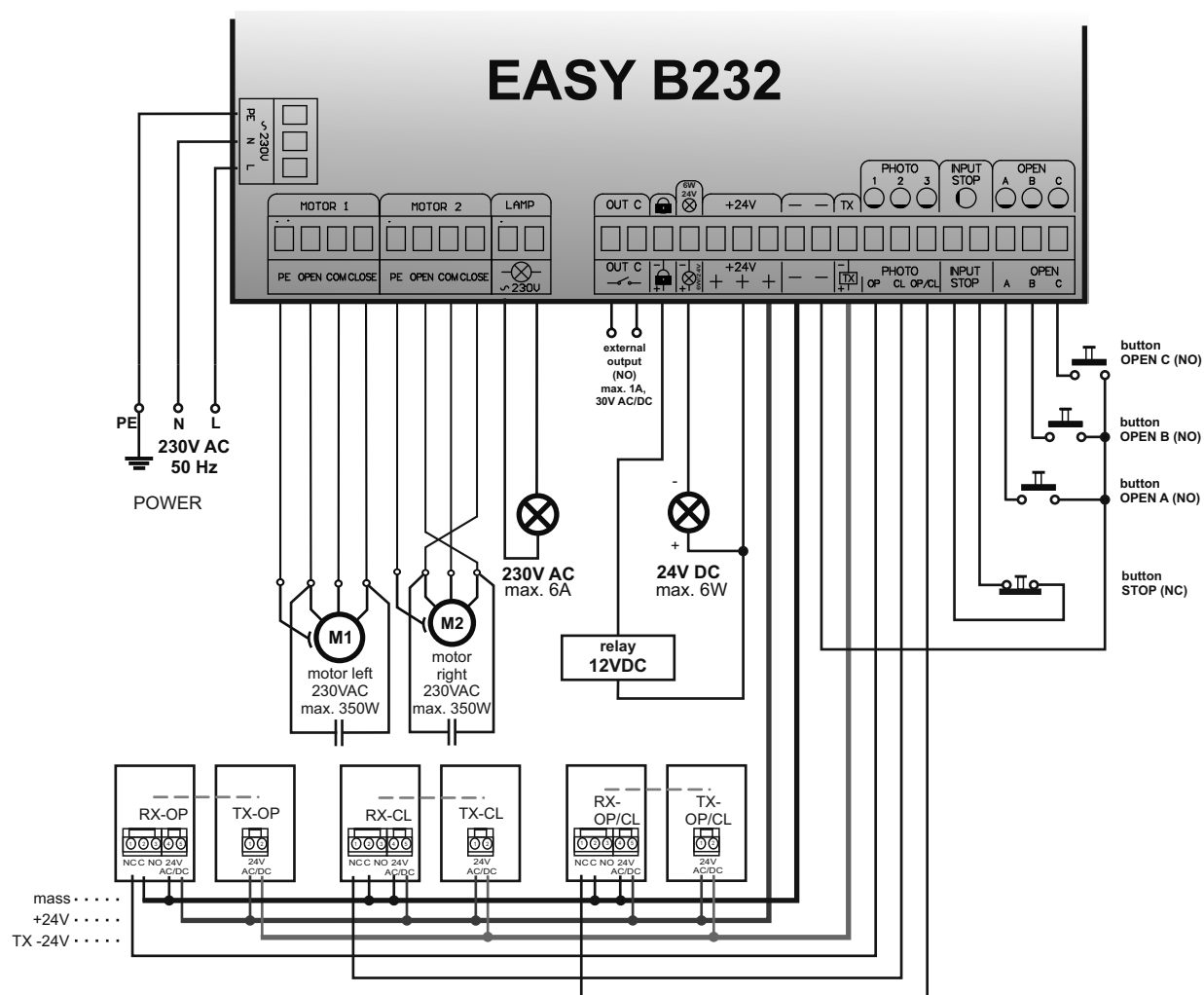
- **unused photocells inputs should be connected to TX terminal**
- **unused STOP input should be bridged by wire (jumper)**
- **unused NO terminals should be left unconnected**

Fig. 2. Elektric diagram.

3.3.7. Accessories power supply terminals (+24VDC)

Control unit is equipped with accessories power supply outputs 24VDC max. load 0,5A. The outputs have three equal screw terminals with mass potential (0V) and two equal terminals with the +24V potential.

3.3.8 Terminals for TX, PHOTO OP, PHOTO CL and PHOTO OP/CL photocells connection

If applied photocells are powered by 24V, with separate receiver and transmitter supply, then the following connections are applicable: "+" of transmitter and receiver power supply to the output of accessories supply +24 VDC, "- " transmitter power supply to the TX terminal (output OC type), and "-" of receiver power supply to mass as standard. If photocells have a shared power supply for the transmitter and the receiver, then their "-" of power supply to the TX output. Such a way of connecting, allows to use PHOTO-TEST function which checks photocells operation before every move of the gate and blocks the move in case of detecting the breakdown. PHOTO-TEST function improves the security level significantly. In order to engage PHOTO-TEST function, see p. 5.2.1. PHOTO OP input is dedicated to the photocell installed parallel to the line of the gate movement, it secures the zone of the stroke of the gate. PHOTO CL input is dedicated to the outside photocell (outside premises) installed parallel to the edge of entrance, PHOTO OP/CL input is dedicated to the inside photocell (on the area of premises), installed parallel to the edge of entrance. Unused sockets of photocells should be connected with TX terminal (all sockets of photocells are connected with wire factory-made (bridged).

3.3.9. Manual steering INPUT STOP and OPEN (A, B, C) terminals

Momentary button (monostable) of NC type should be connected to INPUT STOP terminals. If the button is not used, the terminals should be clenched with a wire. Momentary buttons of NO type can be connected to OPEN A and OPEN B terminals. These momentary buttons will control the work of the control unit according to the adjusted mode (see table of modes of the control unit). It is possible to connect the momentary button of NO type to the OPEN C terminal. This button will activate additional channel output OUTC. All unused inputs of NO type should be left not connected. Activating the button of the manual steering consists in its momentary pressing. OPEN A, B and C inputs are functional equivalent of radio receiver channels (channel A, B and C).

3.3.10. EasyRX radio receiver connector

This connector enables the control of servomotor with the help of DTM433MHz series remote controls by the additional board of the radio receiver. The receiver communicates with the control unit through the local data bus which makes it impossible to connect other radio receivers to the connector. The installation and the programming are described in p. 6 of this manual.

4. Description of control unit operations

Control unit is immediately ready to work after switching on the power supply. After pressing any button of the programmed remote control or releasing the controlling input, appropriate function of the control unit is performed. In the operation mode, the current state is signalled with the help of the signal output and LED diodes. In sleeping mode all red diodes should shine, and green ones remain turned off. Immediately after switching on the power supply the first move is opening.

4.1. Gate leaves synchronization

When one servomotor encounters an obstacle, which prevents its further movement it does not cause the stop of the second one. In such case there is a possibility of gate leaves desynchronizing which can be important when the closing order of the leaves is relevant. It is necessary to synchronize such gate again. It should be performed as follows:
engage OPENING movement
wait for full opening of both gate leaves (it May be necessary to engage CLOSING Direction and then OPENING).

5. Programming of EASY B232 control unit

EASY B232 control unit is programmed to needs of the given installation using the LEARN button with the LEARN diode, DIP-SWITCH microswitches with the division into two sections FUNCTION and MODE and three rotational potentiometers.
In order to conduct the process of the programming efficiently it is necessary to keep the following order :
- analyse tables with individual operational modes and choose appropriate with the help of DIP-SWITCH MODE part
- turn on or turn off chosen functions off in FUNCTION section

- set the leaf delay time and/or auto closing time
- make adjustment of the strength of the towing power of servomotors with potentiometers FORCE 1 i 2
- conduct the learning (in the simplified mode, p. 5.5 or in extended mode p. 5.6)
- check the correctness of operation and if necessary repeat the programming

5.1. LEARN button

LEARN button is used in learning procedure (p. 5.5 and 5.6) and to confirm changes in the settings of the potentiometers (p. 5.3).

5.2. DIP-SWICH

DIP-SWICH (fig.3) allows turn on or turn off individual

Rysunek 3. DIP-SWITCH.

functions easily and make changes in the operational mode of the control unit. The changes of settings are immediate after switching and do not require additional confirmation

5.2.1 DIP-SWITCH FUNCTION section

We can perform the following settings in this group:
PHOTO-TEST turned on (ON) or turned off (OFF). Turning on causes photocells barrier testing right before the beginning of the servomotor movement. This function protects against engaging the servomotor when the photocell underwent the breakdown what could lead to dangerous situation. Testing the crash barrier is conducted only right before initiating the move of the servomotor, never in sleeping mode. Turning on the function of the phototest causes no disorders in the work of the control unit when the photocell is repeatedly disturbed in sleeping mode (e.g. by animals or playing children). Phototest won't be conducted in the event when the move of the servomotor is a result of switching the direction as a result of disturbing the photocell.

OVER-PUSHING start of the servomotor with the maximum power turned on (ON) or turned off (OFF).

PRE-FLASHING preliminary, five-second signalling of the lamp before the move of the gate turned on (ON) or turned off (OFF).

BLINKING LAMP controlling with lamp without the contact breaker built in (ON) or with lamp with its own contact breaker (OFF). The lamp without the contact breaker allows to use the additional signalling of the state of the gate by lamp flickering with different time intervals.

OUTC-BIST allows for the work of the additional channel in bistable mode (ON) or monostable 4 seconds (OFF).

5.2.2. DIP-SWITCH MODE section

It is used to set one of eight modes of the control unit operation. Depending on the needs the most suitable mode

Fig. 4. Potencjometers.

should be chosen after prior analysis of the settings MODE table (p. 5.4). In order to avoid possible irregularities in action of controlling equipment adjust the mode when the state of control unit is "closed". After the change of operational mode of the control unit it is good to turn off the power supply for few seconds which results in control unit restart.

5.3. FORCE 1, FORCE 2, MOTOR DELAY and AUTO CLOSE control potentiometers

CAUTION!
After the change of the any set parameter with the help of the potentiometer LED LEARN diode will start flickering announcing the need to approve changes with short pressing the LEARN button. Only after such confirmation control unit changes the settings. During the change of the given parameter, a speed of pulsing of LED LEARN diode changes what gives some idea of the value of the adjusted parameter.
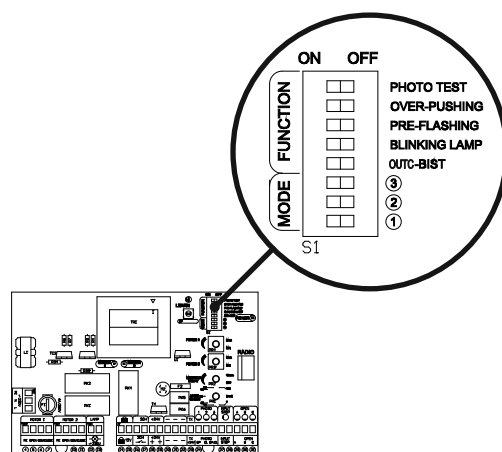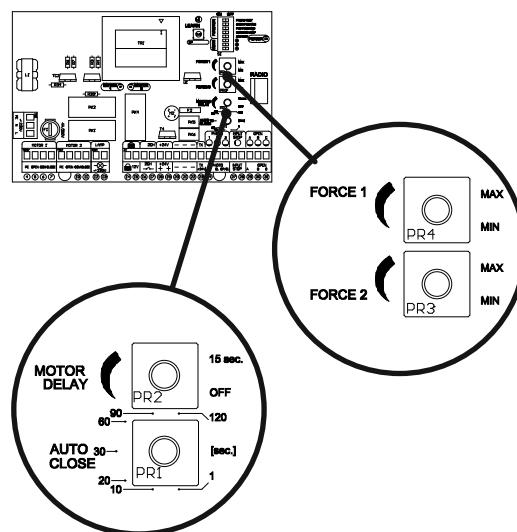
Control unit enables to regulate the power of servomotors. Regulation takes place separately for every servomotor with the help of potentiometers (respectively FORCE 1 fot the first servomotor and FORCE 2 for the second servomotor)

If it is necessary to delay the movement of one of the leaves, MOTOR DELAY time is set (0...15sek.).While OPENING the move of servomotor 2 is delayed and while CLOSING the move of servomotor 1 is delayed. The delay of the movement is only when the leaf is in the final closing or opening position. The delay while OPENING is max. 3 sec. even when higher parameter value is set with the help of MOTOR DELAY potentiometer.

AUTO CLOSE potentiometer allows non-linear regulation of the automatic time of gate closing in the scope from 1 up to 120 seconds. The non-linearity of the regulation is the fact that initial changes of the potentiometer axis angle give small increase in the autoclosing time, however after exceeding the half of the accessible angle of the values rotation the delays increase much more quickly, all the way to the maximum value. The scale was drawn for better understanding.

CAUTION!
Decreasing the operational power of the servomotor has positive influence on safety conditions, as well as to the vitality of mechanical fittings.
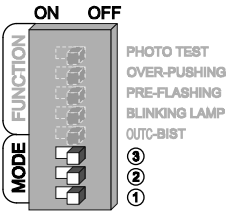
5.4. Przełącznik DIP-SWITCH sekcja MODE - tryb (logika) pracy sterownika EASY B232
DIP-SWITCH MODE section - EASY B232 control unit operation mode (logic)
Below there are operation modes of EASY control unit. It is necessary to analyse the user needs and next choose appropriate among available.

5.4.1. 1/A mode
Automatic mode, it has function of auto closing the gate after the set time - maximum 120 seconds. Function of the wicket active, function of photo closing disabled.

Tab. 1. 1/A mode

| 1/A mode					
	closed	**opens**	**closing**	**stopped**	**open**
OPEN_A	opens the gate and close after auto-closing time		rewers	closes the gate	closes the gate/partially (countdown autoc-losing time)
OPEN_B	opens partially and close after auto-closing time		rewers	closes the gate/partially	closes the gate/partially (countdown autoc-losing time)
INPUT STOP	blocks OPEN A/B	stop	stop	blocks OPEN A/B	stop
PHOTO OP	blocks OPEN A/B	rewers	blocks OPEN A/B	blocks opening	
PHOTO CL			rewers	blocks closings	auto shutdown counting time stopped until the obstacle removed
PHOTO OP/CL	blocks OPEN A/B	stop until unlock, opens	stop until unlock, opens	blocks OPEN A/B	auto shutdown counting time stopped until the obstacle removed

* If after removing an obstacle there are fewer than 5 seconds left to automatic closing then the time of automatic closing is increased up to 5 seconds.
** When the last move was opening the wicket, it opens the gate.

5.4.2. 2/S mode

This mode, similarly to 1/A, is automatic mode, it has function of auto closing the gate after max. 120 seconds. Function of the wicket and photo closing active
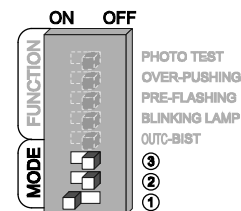
Tab. 2. 2/S mode

2/S mode					
	closed	**opens**	**closing**	**stopped**	**open**
OPEN_A	otwiera bramę i zamyka po czasie autozamykania***	rewers **	rewers	closes the gate	countdown autoc-losing time
OPEN_B	otwiera furtkę i zamyka po czasie autozamykania	rewers	rewers	closes the gate/partially	countdown autoc-losing time
INPUT STOP	blocks OPEN A/B	stop	stop	blocks OPEN A/B	stop
PHOTO OP	blocks OPEN A/B	rewers	blocks OPEN A/B	blocks opening	
PHOTO CL		blocks closings	rewers	blocks closings	5s after unlock, closes*
PHOTO OP/CL	blocks OPEN A/B	stop until unlock, opens	stop until unlock, opens	blocks OPEN A/B	5s after unlock, closes*

* If after removing an obstacle there are fewer than 5 seconds left to automatic closing then the time of automatic closing is increased up to 5 seconds.

** When the last move was opening the wicket, it opens the gate.

5.4.3. 3/E mode

Semi automatic mode with wicket function, without auto and photo closing.
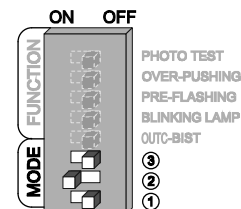
Tab. 3. 3/E mode

3/E mode					
	closed	**opens**	**closing**	**stopped**	**open**
OPEN_A	opens the gate	stop *	rewers	closes the gate *	closes
OPEN_B	opens partially	stop	rewers	closes the gate/partially	closes
INPUT STOP	blocks OPEN A/B	stop	stop	blocks OPEN A/B	blocks OPEN A/B
PHOTO OP	blocks OPEN A/B	rewers	blocks OPEN A/B	blocks opening	
PHOTO CL		blocks closings	rewers	blocks closings	blocks OPEN A/B
PHOTO OP/CL	blocks OPEN A/B	stop until unlock, opens	stop until unlock, opens	blocks OPEN A/B	blocks OPEN A/B

.* When the last move was opening the wicket, it opens the gate.

5.4.4. 4/EP mode

Semi automatic mode – step by step. OPEN A and OPEN B control respectively: open-stop-close, in the event when the gate is opened: close-stop-open. Function of the wicket active, function of auto and photo closing disabled.

PHOTO TEST
OVER-PUSHING
PRE-FLASHING
BLINKING LAMP
OUTC-BIST
③
②
①
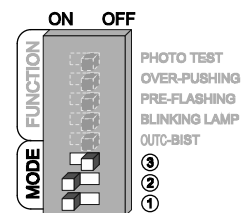
Tab. 4. 4/EP mode

4/EP mode					
	closed	**opens**	**closing**	**stopped**	**open**
OPEN_A	opens the gate	stop *	stop	rewers *	closes
OPEN_B	opens partially	stop	stop	rewers	closes
INPUT STOP	blocks OPEN A/B	stop	stop	blocks OPEN A/B	blocks OPEN A/B
PHOTO OP	blocks OPEN A/B	rewers	blocks OPEN A/B	blocks opening	
PHOTO CL	blocks OPEN A/B	blocks closings	rewers	blocks closings	blocks OPEN A/B
PHOTO OP/CL	blocks OPEN A/B	stop until unlock, opens	stop until unlock, opens	blocks OPEN A/B	blocks OPEN A/B

*When the last move was opening the wicket, it opens the gate.

5.4.5. 5/B mode

Semi automatic mode. The easiest in operation, without wicket, auto and photo closing functions.

ON   OFF

PHOTO TEST
OVER-PUSHING
PRE-FLASHING
BLINKING LAMP
OUTC-BIST
③
②
①
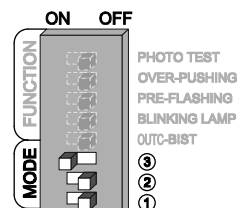
Tab. 5. 5/B mode

5/B mode					
	closed	**opens**	**closing**	**stopped**	**open**
OPEN_A	opens		rewers	opens	
OPEN_B				closes	closes
INPUT STOP	blocks OPEN A/B	stop	stop		blocks OPEN A/B
PHOTO OP	blocks OPEN A	stop	blocks OPEN A	blocks OPEN A/B	
PHOTO CL			stop	blocks OPEN A/B	blocks OPEN A/B
PHOTO OP/CL	blocks OPEN A	stop	stop	blocks OPEN A/B	blocks OPEN A/B

5.4.6. 6/C mode

Mode which requires the constant presence of the operator. The gate movement lass as long as the button is pressed. Radio frequency disabled in this mode.
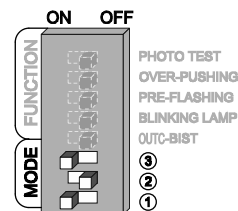
Tab. 6. 6/C mode

6/C mode					
	closed	**opens**	**closing**	**stopped**	**open**
OPEN_A	opens		stop	opens	
OPEN_B		stop		closes	closes
INPUT STOP	blocks OPEN A	stop	stop	blocks OPEN A/B	blocks OPEN B
PHOTO OP	blocks OPEN A	stop		blocks OPEN A	
PHOTO CL			stop	blocks OPEN A/B	blocks OPEN A/B
PHOTO OP/CL	blocks OPEN A	stop	stop	blocks OPEN A/B	blocks OPEN A/B

5.4.7. 7/PA mode

Mode, in which the special stress is put for the better verification of the move that undergoes through the gate. The resignation from reversing direction of the servomotors operation and continuing the move after removing an obstacle shorten the time when the gate is open. It reduces the chance of rushing (driving) to the area of unauthorized people. Functions of auto closing, wicket and photo closing active.
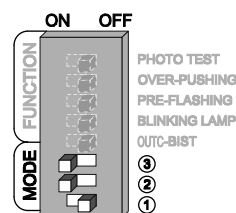
Tab. 7. 7/P mode

7/PA mode					
	closed	**opens**	**closing**	**stopped**	**open**
OPEN_A	opens the gate and close after auto-closing time	stop **	rewers	closes the gate	closes the gate/ partially(countdown autoclosing time)
OPEN_B	opens partially and close after auto-closing time	stop	rewers	closes the gate/partially	closes the gate/ partially (countdown autoclosing time)
INPUT STOP	blocks OPEN A/B	stop	stop	blocks OPEN A/B	stop
PHOTO OP	blocks OPEN A/B	rewers	blocks OPEN A/B	blocks openings	
PHOTO CL	blocks OPEN A/B		stop closings until unlock	blocks closings	5s after unlock, closes*
PHOTO OP/CL	blocks OPEN A/B	stop until unlock, opens	stop until unlock, opens	blocks OPEN A/B	5s after unlock, closes*

* If after removing an obstacle there are fewer than 5 seconds left to automatic closing then the time of automatic closing is increased up to 5 seconds.

** When the last move was opening the wicket, it opens the gate.

5.4.8. 8/P mode

Semi automatic mode – step by step. OPEN A and OPEN B control respectively: open-stop-close, when the gate is open: close-stop-open. Wicket and autoclosing functions active, photo closing disabled.

Tab. 8. 8/P mode

<table>
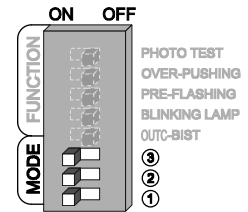<tr><th colspan="6">8/P mode</th></tr>
<tr><th></th><th>closed</th><th>opens</th><th>closing</th><th>stopped</th><th>open</th></tr>
<tr><td>OPEN_A</td><td>opens the gate and close after auto-closing time</td><td>stop *</td><td>stop</td><td>rewers *</td><td>closes the gate/ partially(countdown autoclosing time)</td></tr>
<tr><td>OPEN_B</td><td>opens partially and close after auto-closing time</td><td>stop</td><td>stop</td><td>rewers</td><td>closes the gate/ partially (countdown autoclosing time)</td></tr>
<tr><td>INPUT STOP</td><td>blocks OPEN A/B</td><td>stop</td><td>stop</td><td>blocks OPEN A/B</td><td>blocking OPEN A/B</td></tr>
<tr><td>PHOTO OP</td><td>blocks OPEN A/B</td><td>rewers</td><td>blocks OPEN A/B</td><td>blocks openings</td><td></td></tr>
<tr><td>PHOTO CL</td><td>blocks OPEN A/B</td><td></td><td>rewers</td><td>blocks closings</td><td>blocks OPEN A/B</td></tr>
<tr><td>PHOTO OP/CL</td><td>blocks OPEN A/B</td><td>stop until unlock, opens</td><td>stop until unlock, opens</td><td>blocks OPEN A/B</td><td>blocks OPEN A/B</td></tr>
</table>

* When the last move was opening the wicket, it opens the gate.

5.5. Learning in SIMPLIFIED mode

It is simple and fast form of setting the times of closing and opening in the control unit. The procedure does not allow to set slowdown Turing start and stop.

In order to execute learning procedure correctly it is necessary to:
- make sure that connected photocells work correctly and peripheral switches of the servomotor are placed correctly
- set the gate in the position of full closure (with the help of manual steering buttons or buttons of the programmed remote control), if necessary disarrange servomotor and close the gate manually, next arrange again.
- make sure that there is no obstacle in the way of photocells barriers, and on the way of the move of the gate,
- press and hold LEARN button up to the moment when LEARN diode goes on (we dismiss it within 2 seconds, if we don't do it the control unit proceeds to the extended mode of learning)
- press LEARN button again for a short time (for conducting auto learning any OPEN A, OPEN B, OPEN C button or button programmed on the remote control can be used instead of LEARN button
- leaves start the movement towards opening
- second pressing (of the earlier chosen button) – the leaves stop, LED LEARN diode goes off

5.6. Learning in EXTENDED mode

This procedure requires more involvement in the process the learning from the fitter, than in case of the simplified mode. The fitter is able to set slowdown times at opening, slowdowns at closing, opening and closing according to personal needs for every leaf separately.

In order to execute learning procedure correctly it is necessary to:
- make sure that connected photocells work correctly and internal peripheral switches of the servomotors (if present) are set correctly
- set the gate in the position of full closure (with the help of manual steering buttons or buttons of the

programmed remote control), if necessary disarrange servomotor and close the gate manually, next arrange again.

- make sure that there is no obstacle in the way of photocells barriers, and on the way of the move of the gate,
- press and hold LEARN button up to the moment when LEARN diode goes on (after about 3 seconds)
- press LEARN button shortly again (for learning you can use instead of LEARN button any OPEN A, OPEN B, OPEN C button or remote control button programmed on the radio card) begins slowed movement of the first leaf towards opening. From this moment only this chosen button will be used in the learning procedure.
- second pressing – leaf 1 increases speed to standard opening speed
- third pressing – leaf 1 is slowed down
- fourth pressing – leaf 1 stops
- fifth pressing – leaf 2 starts slowed move towards opening
- sixth pressing – leaf 2 increases speed to standard opening speed
- seventh pressing – leaf 2 is slowed down
- eighth pressing – leaf 2 stops
- ninth pressing – leaf 2 starts slowed move towards closing
- tenth pressing – leaf 2 increases speed to standard closing speed
- eleventh pressing – leaf 2 is slowed down
- twelfth pressing – leaf 2 stops
- thirteenth pressing – leaf 1 starts slowed move towards closing
- fourteenth pressing – leaf 1 increases speed to standard closing speed
- fifteenth pressing – leaf 1 is slowed down
- sixteenth pressing – leaf 1 stops and the procedure is finished, LEARN LED diode goes off.

In order to set the zero time of slowing down, it is necessary to press learning button again for less than 1 sec during slowed movement of control unit. Respectively to programme the delay phase it must last at least 1 sec.

CAUTION!

Disturbing photocells while learning, won't cause stopping of the servomotor! If needed, it is possible to stop the move of the gate with manual steering STOP button. It will also interrupt learning operation and restore all parameters the work of the control unit to the values as before initiating the learning function. During the procedure photocells barriers should not be disturbed and it is necessary to provide free move of the gate, without any obstacles on its way.

6. EasyRX dedicated radio receiver

CAUTION!
EasyRX radio card is intended exclusively for the cooperation with EASY B231- DTM6 control unit produced by DTM System. It should not be used autonomously.

6.1. General information

This receiver expands functional possibilities of EASY control unit to remote steering with DTM 433MHz series remote controls.

6.2. Receiver card installation

It is the best to start the installation of the receiver from connecting the aerial to it. Next, receiver in the form of the card - board with the edge connector should be pressed into the socket with the RADIO description on a control unit board on the right-hand side (4 pins), side where buttons are placed towards the connector.

6.3. Subscribing remote controls to the receiver

The receiver has three identically programmed channels A, B and C. They are functional equivalents of OPEN A, OPEN B and OPEN C inputs in the control unit). In case of the second and third channel we act the same as during the programming of the remote control in the first channel (using the button of the second and third channel respectively). In order to programme any button of the remote control in the first channel it is necessary to:

- press and hold first channel A button
- when first channel A button is pressed, press chosen button of the remote control
- first channel A diode flickers which indicates success of the operation
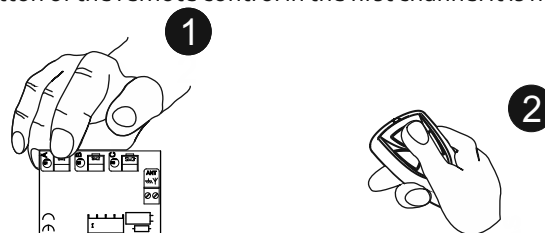- release the button

6.4. Terminals for aerial connection

In the brand new receiver an inside aerial 170 mm long is connected to the terminal. To increase the range of the radio remote control, it is necessary to connect outside stubby aerial. To connect the coaxial cable of the outside aerial to the terminal (centre vein of the cable) and to the terminal (cable screen). In order to achieve the optimum radio reach it is important to remember about:

- negative influence of the receiver with energetic devices and metal objects in the aerial neighbourhood,
- negative influence of radio interference from other sources,
- negative influence of high-density housing, wet or reinforced concrete walls.
- shorten range with used remote control battery
- increasing range with increasing height of receiver aerial location

PRESS AND HOLD A BUTTON + PUSH NEW REMOTE BUTTON — TIME

Fig. 5. Subscribing remote control OPEN A to the receiver.

6.5. Remote subscribing of new remote control

The radio EasyRX card has a program enabling simple subscribing of the new remote control for the user without the need for the access to buttons. This function is only useful when you have a remote control already subscribed in the memory. To subscribe new remote control in this way it is necessary to proceed according to fig. 6.

CAUTION!
Possibility of adding remote control without the access to the control unit dramatically decreases the level of security against third parties.
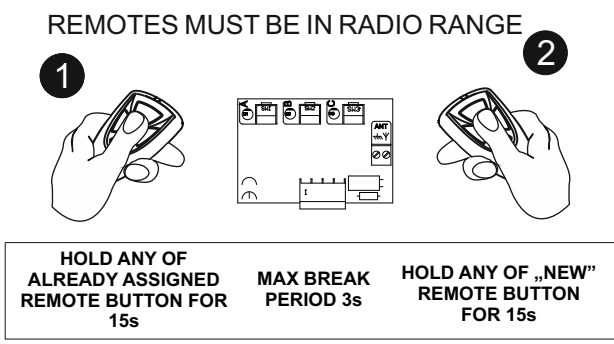

REMOTES MUST BE IN RADIO RANGE

HOLD ANY OF ALREADY ASSIGNED REMOTE BUTTON FOR 15s — MAX BREAK PERIOD 3s — HOLD ANY OF „NEW" REMOTE BUTTON FOR 15s — TIME

Fig. 6. Remote subscribing of new remote control.

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6.6. Blocking of remote subscribing of remote control

It is a function which prevents all remote controls, both already subscribed as well as the one subscribed in the future, from participating in the process of remote subscribing of new remote control.

In order to protect the device against unauthorized attempts to subscribe additional remote control (particularly essential in areas with protected access of users), it is recommended to block the function of remote subscribing of remote controls. In order to block this function, we press A and B buttons of the radio receiver simultaneously and next we release one of them (it does not matter which as long as the second remains pressed all the way to the end of the procedure). After about 4 sec. A diode turns on (it means that currently the blocking of remote subscription is turned off), we hold the button all the time. After 4 consecutive seconds B diode turns on (it means that the function of remote subscription will be blocked). When we release the button kept, the card will remember settings and remote subscribing of remote controls will be blocked. The procedure of unblocking is the same, but we release the button when OPEN A diode turns on.

In the factory settings (after formatting), the blocking of remote subscribing of remote controls is turned off.
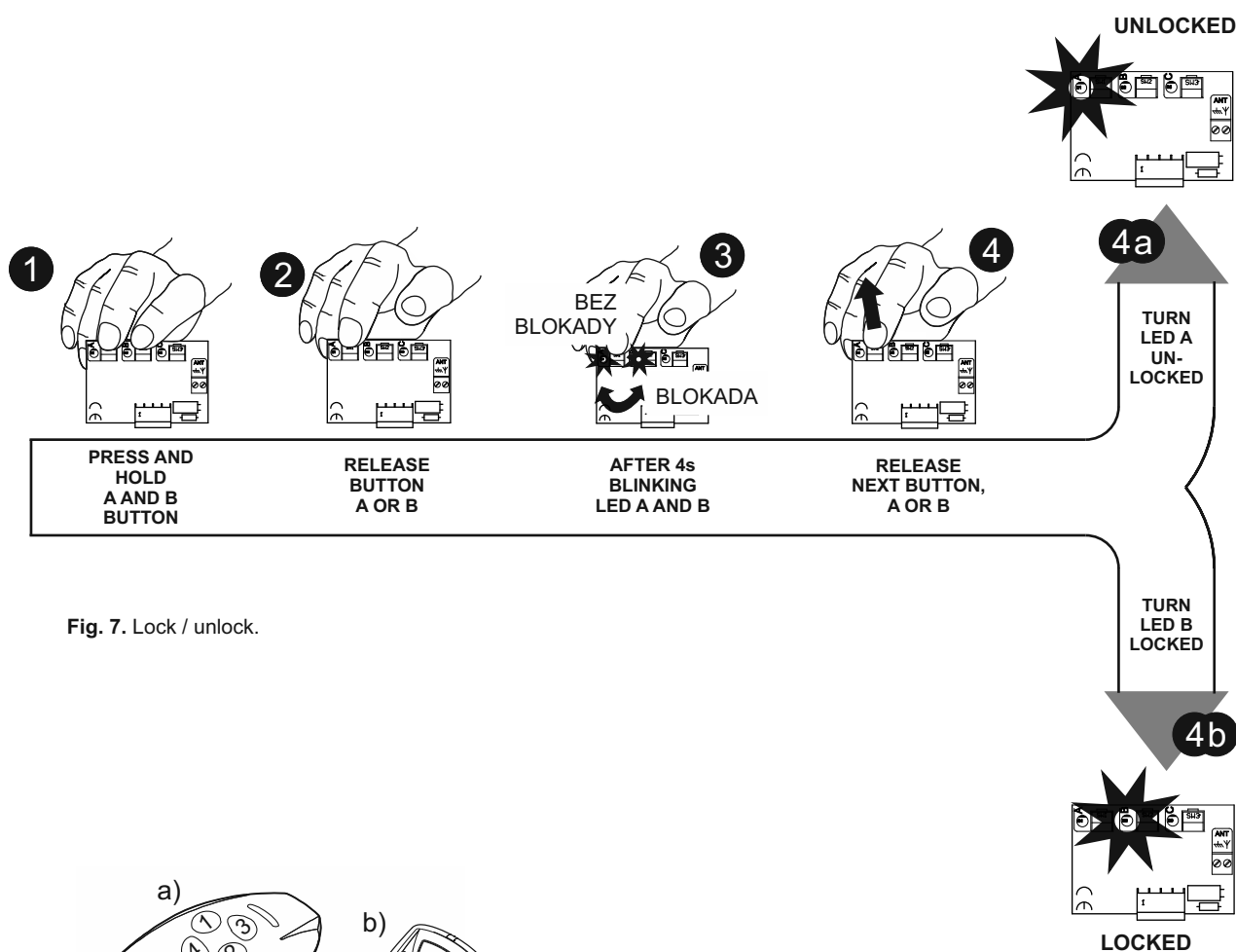

UNLOCKED

1 PRESS AND HOLD A AND B BUTTON

2 RELEASE BUTTON A OR B

3 BEZ BLOKADY / BLOKADA — AFTER 4s BLINKING LED A AND B

4 RELEASE NEXT BUTTON, A OR B

4a TURN LED A UN-LOCKED

4b TURN LED B LOCKED

LOCKED

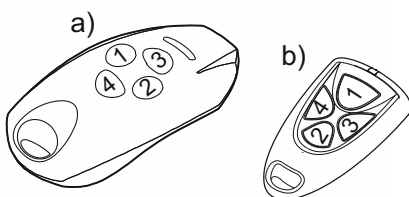**Fig. 7.** Lock / unlock.

a)

b)

Fig. 8. Remote: a) NEO, b) VICTORY

6.7. Deleting of the remote control from memory

Deleting single remote control from the receiver memory is as follows:
- press and hold A and B buttons,
- press the button of remote control which is to be deleted.

CAUTION!
Holding the buttons on the card for too long (more than 10 seconds) may lead to format of the memory and as a result to the removal of ALL remote controls.

| PRESS AND HOLD A BUTTON | + | PUSH DELETING REMOTE BUTTON | TIME |
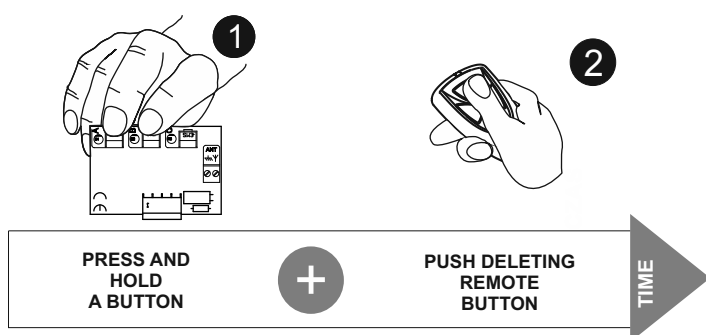
Rysunek 9. Deleting remote.

6.8. Deleting of all remote controls from card memory

We delete all remote control from the receiver memory when we press and hold for more that 15 seconds A and B buttons.
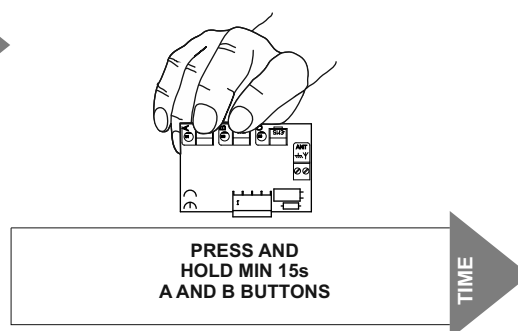

| PRESS AND HOLD MIN 15s A AND B BUTTONS | TIME |

Fig. 10. Formatting card.

CAUTION!
Format process of the memory card causes irreversible removal of all remote controls and turning off the block of remote subscribing of remote controls.

6.9. Board of radio receiver EasyRX

1. channel A signal diode
2. A channel button
3. channel B signal diode
4. B channel button
5. connector of the card
6. channel C signal diode
7. C channel button
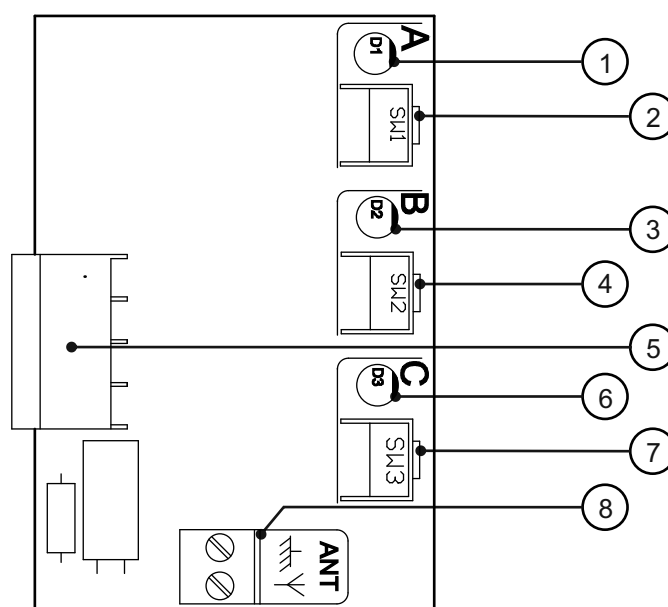8. aerial connector

7. Acceptance tests

Fig. 11. EasyRX board.

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7.1. General remarks

After installing control unit and all cooperating devices, especially safety devices, final trials should be performed to check the entire automation. These trials should be executed by the competent staff, being aware of existing dangers! Final trials are the most important phase at the realization of automation. Individual components, as the engine, photocells, and the like, can require the peculiar control and because of this, executing checking procedures, included in the manual of given components are recommended.

- if the servomotor contains peripheral switches breaking the power-driven circuit, it is necessary to make sure that at this stage they won't disconnect the servomotor in the unexpected moment.

- in case of the resignation from the installation of manual steering buttons, it is necessary to remember about bridging the terminals. The lack of the bridge will make any move of the servomotor impossible.

- in case of the resignation from the photocell installation, the input (PHOTO OP, PHOTO CL or PHOTO OP/CL) should be bridged with TX terminal.

- in case of the resignation from the protecting EDGE installation, it is necessary to connect input with the mass terminal "-"

7.2. Final trials schedule the following stages
7.2.1. Movement direction control

Check whether at steering of OPENING function, automation physically moves towards opening. If the movement is towards closing or any movement is missing it is necessary to disconnect control unit power supply and exchange the connections of servomotor wires to OPEN and CLOSE terminals. Check again.

7.2.2. Control unit programming

It is necessary to set all required control unit operation parameters such as times of closing and opening of the control unit, possible phases of slowing down and towing force of servomotor.

7.2.3. Security check

If photocells are installed, it is necessary to cause manual disturbance of the OP photocell, on the controller board a PHOTO diode should go out 1. Act the same for the CL photocell and OP/CL if are installed. In sleeping mode when optical crash barriers aren't disturbed, signalling PHOTO diodes 1, 2 and 3 should shine. If it isn't so, it means error in photocells operation (incorrect connecting, not synchronizing the transmitter with the receiver or the failure of the photocell).

7.2.4. Control of servomotor move steering functions

Check OPEN A, OPEN B and STOP functions using remote control button or manual button. After consecutive impulses from the button the sequence of servomotors move should take place according to the chosen operational mode.

7.2.5. Setting the power

The desirable strength of the towing power of the servomotor should be adjusted, with the help of the potentiometer of the strength of servomotors adjustment. Proper setting of the power of the servomotors operation, has a key importance for safety conditions, as well as the vitality of mechanical fittings. Usually servomotors operation with power rating is not necessary, it should be adjusted individually to installation conditions (taking into consideration the weight of gate leaves, tensions occurring after the closing or opening of the gate leaves, existing resistance or exposing to strong wind, etc.) Special attention should be paid to stresses arising after closing or opening the leaves, as well as predict consequences of the accidental lock of the obstacle between the leaves of the gate. It should be remembered, that the less the value of the parameter, the less powers will work on the possible obstacle appearing in the way of the gate. Adjusting the power of operational servomotors, one must realize the resistance of the gate leaves, as well as their instability in time (influence of weather conditions, wearing out etc.) so the operational power cannot be too small, it must provide solid leaf movement in the whole scope of the gate operation.

8. Warranty.

DTM System provides operational and ready to use devices. The producer gives 24 months warranty from the selling date to the end customer. This time is counted according to the producer warranty labels or serial numbers placed on every product. Producer obliges himself to repair the device for free if during the warranty period there are problems which come because of his fault. Broken device should be supplied on customer's expense to the place of purchase and enclose clear and brief description of the breakage. The cost of mount/dismount is covered by the user. The warranty does not cover: batteries in the remote controls, faults caused by improper usage, user self repairs and adaptations, lightning strikes, voltages or short circuits in the electrical grid. Appropriate legal acts regulate details of the warranty.

CE DTM System hereby declares that the gate controller complies with Directive 2014/53 / EU. The full text of the EU Declaration of Conformity is available at the Internet address: www.dtm.pl

The intention of the WEEE Directive (Directive 2002/96/EC on waste electrical and electronic equipment) is to reduce the amount of hazardous substances in waste. The underlying purpose is to promote the avoidance, recovery and risk-free disposal of waste.