

AUTOMATION SYSTEMS

CONTROLLER FOR GARAGE OPENER

Manual for installers

GO-CB

Version 1.3





SECURITY OF IMPLEMENTATION OF THE AUTOMATION SYSTEM

Before starting the installation, carefully read the entire installation and operation manual of the product. Non-observance and non-compliance with the notes in this manual may lead to an accident in which people are injured or property damage occurs.

The driver ensures correct and safe operation only if the installation and use comply with the following safety rules. DTM System is not responsible for accidents resulting from improper use or unprofessional installation of devices.

- Do not leave the packaging materials within the reach of children, as they are potentially dangerous;
- This product was designed and manufactured exclusively for the intended use described in this documentation. Using it for any other purpose may adversely affect the technical condition and operation of the device and is a potential source of danger;
- DTM System is not responsible for the consequences of improper use, not in accordance with the intended use;
- Do not install the device in an environment with an increased risk of explosion or aggressive air;
- Automatic gates should comply with the standards as well as with any applicable local regulations, they must comply with the requirements of EN 12604;
- DTM System is not responsible for the consequences of design defects of the driven elements or for their deformation that may occur during use;
- The installation must conform to the requirements of EN 12453.
- Before starting any work on the system, disconnect all power sources;
- The electrical installation to which the automation is connected must comply with the applicable standards and be properly made;
- The installer should provide the device with a residual current device ensuring that the devices are cut off from the main power supply. The standards require a separation of the contacts of at least 3mm in each pole (EN 60335-1). It is recommended to use a 6A thermal fuse with a circuit breaker for all circuits;
- Take care to protect the power circuit with a differential switch with a threshold of 30mA;
- Safety mechanisms (EN 12978 standard) provide protection against the risks associated with the movement of moving mechanical parts, such as crushing, snagging or detachment;
- DTM System is not responsible for the safety and efficient operation of the device in the event of using components that are not products offered by DTM System;
- When servicing use only original parts;
- Do not modify the device components in any way;
- The end user should be informed about the method of operation, handling in case of failure and about the dangers of using the device;
- The device can only be operated by properly trained adults
- Control devices should be out of the reach of children in order to protect the automation system against accidental activation;
- Service is only permitted by qualified personnel;
- During assembly or repair work, be careful not to wear jewelry, watches or loose clothing;
- After installation, it is necessary to check that the device is correctly set and that the devices controlled and the safety system are working properly;
- Crush or injury protection systems (e.g. photocell systems) must work properly after the drive has been mounted and connected to the mains;
- The radio remote control may only be used when a safe force value is set;
- The radio remote control may only be used if it is possible to observe the door movement and there are no people or objects in the movement area.



SAFETY IN THE USE OF THE AUTOMATION SYSTEM

Non-observance and non-compliance with the notes in this manual may lead to an accident in which people are injured or property damage occurs. Please read the following warnings carefully. The gate drive ensures correct and safe operation only if the installation and use comply with the following safety rules. DTM System is not responsible for accidents resulting from improper use or unprofessional installation of devices.

- During the operation of the automation system, both children and adults must keep a safe distance from the operating automation.
- The automation system can only be operated by properly trained adults.
- Control devices should be kept out of the reach of children in order to protect the automation system against accidental activation.
- Movement between the gate leaves is allowed only when it is fully open.
- Movement of the automation elements should not be impeded, all obstacles hindering the movement should be removed.
- Signal lamps and signboards must be efficient and clearly visible.
- Manual operation of the system is only possible when the power supply is disconnected.
- In the event of a failure, disconnect the power supply and then call the service center for necessary repairs.
- Do not repair or maintain the device yourself. The device may only be serviced by qualified personnel.
- Make sure that the persons who install, maintain or operate the device follow these instructions. Keep these instructions in a place that you can refer to them quickly when needed.

WARRANTY

DTM System delivers the equipment in working order and ready for use and provides a 24-month warranty from the date of purchase by the end customer. The warranty period is determined on the basis of warranty seals or the manufacturer's production batch markings placed on each product. DTM System undertakes to repair the device free of charge if during the warranty period there are defects due to the manufacturer's fault. The defective device must be delivered to the place of purchase at your own expense, with a short, unambiguous description of the damage. The cost of disassembly and assembly of the device is borne by the user. The warranty does not cover any damage resulting from improper use, unauthorized adjustments, alterations and repairs as well as damage resulting from lightning, overvoltage or short circuit of the power supply network. The detailed terms and conditions of granting a guarantee are regulated by relevant legal acts.



1. General information

The GO-CB controller is designed to work with the GO series garage door actuators. It enables both remote and manual control of the garage actuator. Thanks to the safety inputs, it meets the requirements of safety standards in gate automation.

2. Technical data

- power supply 230 VAC / 50Hz
- current consumption / at rest 1A / 0.04 A
- fuse 3A (dimensions 6,3x32mm)
- protection class IP-20
- temperature range -20°C to +50°C
- built-in lighting / lighting time permanent LED / 4min.
- automation control wall button / radio remote controls
- frequency 433MHz / in Duo version 433MHz and 868MHz
- remote controls memory 150 remotes in total
- input for safety devices yes, photo input
- accessories power output yes, + 24VDC max. 100mA
- operating modes: open, close, step by step, close after time, airing
- photo input operating modes: stop, reverse when closing, stop, 100mm retraction when opening

- retraction of the trolley after closing yes

3. Installation

3.1. Important reminder



WARNING! Electrical installations and automation of the drive must be performed by experienced and qualified personnel in accordance with applicable legal regulations.



There are dangerous voltages of 230V 50Hz in the devices, all connections must be made when the voltage is off. The installer's task is to mount the system safely enough to minimize the risks associated with its use. Anyone who installs the device without complying with all applicable regulations is responsible for any damage that the device may cause.

3.2. Description of controller components

The drive head consists of the motor and the controller in one housing. In order to start up, make the appropriate electrical connections of safety and control elements (accessories connector), power the drive correctly (230VAC power plug) and program the controller using buttons on the control panel. The presence of the supply voltage is indicated by the lighting of the dot on the LED display.

CAUTION!

The control panel settings that are not adjusted to the installation conditions may soon lead to its destruction and loss of warranty! After completing the stage of creating the installation and connecting devices, it is necessary to program the controller in order to adjust the operating parameters to the current installation. In particular, you should always set the opening and closing times as well as the drive power - by determining the end positions of the gate during self-learning. Alternatively, after the self-learning increase threshold overload.

The intended connections must be scrupulously observed. In case of uncertainty, do not try, but read the relevant detailed technical sheets of the installed devices. Incorrect connections may cause serious damage to the controller and other devices.

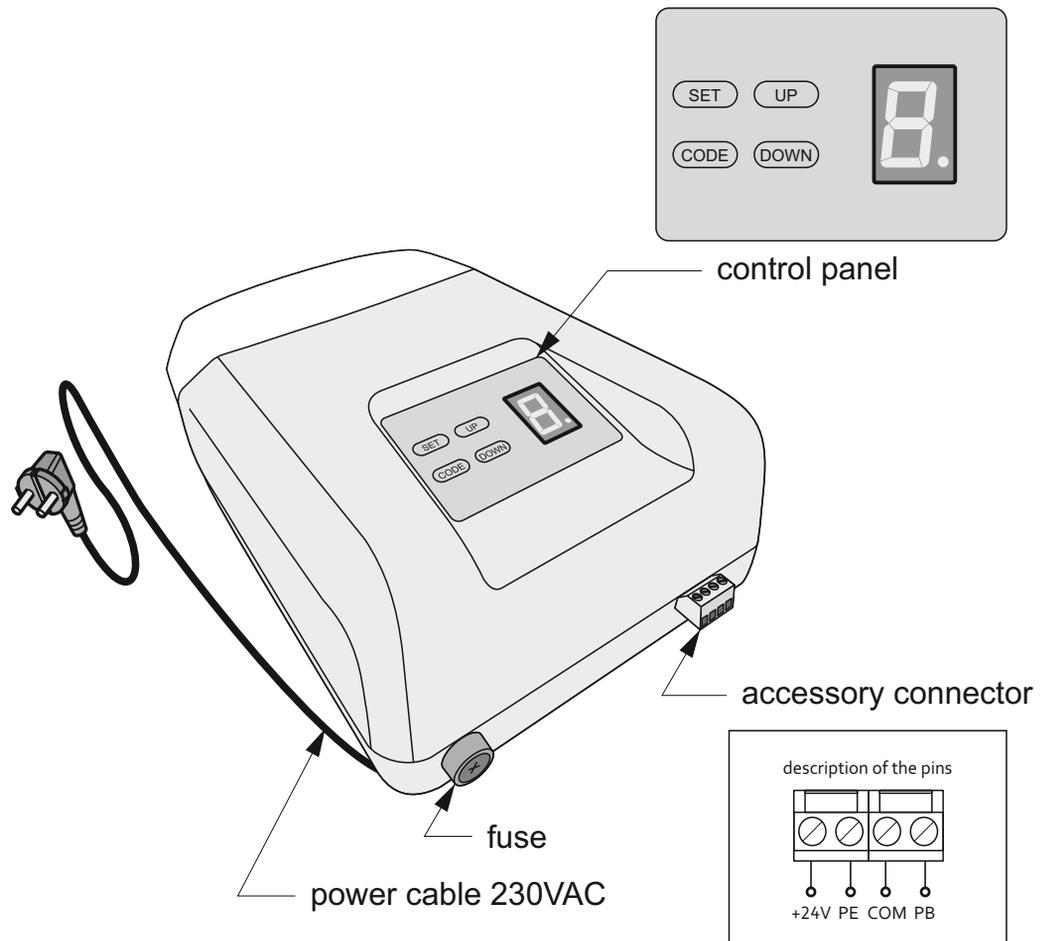


Fig.1. View of the GO series drive with the most important elements marked.

3.3. Description of electrical connections of the GO-CB controller

3.3.1. Mains supply, plug 230VAC, 50Hz

The drive is powered from a socket located maximum 0.5 m from the drive head.

3.3.2. 24VAC accessory power supply terminals

The power supply for accessories is provided on the terminals + 24V (DC) and COM. The maximum load of the electronically protected output (PTC) is 100mA.

3.3.3. Terminals for connecting photocells

Connect the photocells to the PE and COM terminals. The photocells are factory operated in reverse mode when closing. The operating mode can be modified in the controller menu.

3.3.4. Manual control terminals

The manual control button is connected to the PB and COM terminals. The NO type momentary button must be connected. The input only works in step-by-step (SBS) control mode.

4. Programming the GO-CB controller

Programming is performed using a seven-segment LED display and SET, CODE, UP, DOWN buttons located on the drive's panel.

After pressing the **SET** button for 1.5 seconds, the controller settings programming menu appears.

After pressing the **CODE** button for 1.5 seconds, the remote control programming menu appears.

Switching between menu options is done using the **UP** and **DOWN** buttons.

The entry into a given programming option follows after pressing the **SET** button. To exit a given programming option one level higher, press the **CODE** button.



The controller automatically exits the programming menu after 45 seconds of inactivity.

In the factory, the controller does not have the load characteristics memorized, therefore learning is required.

Without the learning, the automation will not start. An attempt to start the controller without learning results in the appearance of a message in the form of the letter "L" blinking for three seconds.

The message also appears in the case of an interruption of learning.

4.1. Programming the controller settings

Entering the controller settings menu consists in pressing the SET button for 1.5 seconds. Subsequent functions in the menu are marked with symbols displayed on the controller panel.

From the programming menu it is possible to set the following controller functions:

A - automatic learning (simplified)

H - semi-automatic learning (extended)

P - overload regulation

F - photocell operating mode

b - gate mechanical stresses elimination

c - auto-closing time

n - number of cycles of the gates

r - reset settings

4.1.1. Automatic learning. Learning in simplified mode [A]

It is a simple and quick form of determining the gate's end positions. To start the automatic learning process, enter the controller menu by holding down the SET button for 1.5 seconds. The symbol A appears on the display. Confirm the start of the automatic learning process by pressing the SET button.

Automatic learning takes place in the following stages:

- searching for the maximum low position. The lower dash in the display flashes.
- searching for the maximum top position. The upper dash in the display flashes.
- return to lower position. Animation of the gate movement on the display.
- cycle of opening and closing the gate.

During automatic learning, the controller search for extreme positions by detecting that the gate movement is blocked. Both the lower and upper positions can be "indicated" by using the remote control assigned to the STOP or SBS function and by using the SET button on the display panel.

During the opening and closing cycle in the automatic learning process, care should be taken to ensure that the gate movement is not disturbed.

In order for automatic learning to be successful, all steps must be completed.

If, during the automatic learning process, the controller detects that the maximum permissible motor current is exceeded, the automation will not start, and when you try to start, the display will show a message in the form of a blinking „P.“



The photocells and overload detection do not work during auto learning. In order to correctly establish the maximum upper position, a mechanical stop on the drive rail is required. In the absence of this, it is recommended to use the semi-automatic (extended) learning mode [H].

4.1.2. Learning in a semi-automatic mode. Learning in extended mode [H]

out the learning, in the controller menu, hold down the SET button for 1.5 seconds. The display will show A, press DOWN to the learning function marked with H. Confirm the start of the learning process with the SET button.

Learning takes place in the following stages:

- searching for the maximum low position. The lower dash in the display flashes. Use the UP / DOWN buttons to set the door to the zero position (maximum low). When the gate is in the correct position, press SET.
- searching for the maximum top position. The upper dash on the display is flashing Use the UP / DOWN buttons to set the door to the maximum opening position (maximum upper). When the gate is in the correct position, press SET.
- return to lower position. Animation of the gate movement on the display. The gate automatically returns to the zero position.
- cycle of opening and closing the gate.

In the up and down search phases it is possible to correct the position before confirming the step.

During the learning process, during the opening and closing cycle, care should be taken to ensure that the gate's movement is not disturbed.

In order for the learning to end correctly, it is necessary to complete all the stages.

If during the learning process the controller detects that the maximum allowable motor current is exceeded, the automation will not start, and when you try to start, the display will show a message in the form of a blinking letter "P".



The photocells and overload detection do not work while learning in extended mode.

4.1.3. Overload regulation [P]

It is possible to increase the permissible overload of the motor current. Its value can be adjusted in the range of 0-3, which means adding to the factory set permissible overload value from 0 to 30%.

To adjust the overload, press and hold the SET button for 1.5 seconds. The display will show A, press DOWN to adjust the overload, marked by the symbol P. Confirm with the SET button. The display will show a value ranging from 0 to 3. Use the UP and DOWN buttons to set the desired value. Confirm with the SET button. The P symbol flashes on the display, indicating that the settings have been saved.

Manual correction of the parameters programmed by the controller may cause the automation to fail to meet the PN-EN 12453: 2002 standard in terms of safety in the use of motorized gates.

4.1.4. Photocell operating mode [F]

The photocell can work in one of the four operating modes:

- reverse when closing [r]
- stop when closing [S]
- reverse when closing, stop with about 100 mm retraction when opening [r.]
- stop when opening and closing [S.]

o select the photocell operating mode, press and hold the SET button for 1.5 seconds. The display will show A, use DOWN button to select the mode selection function, marked by the symbol F. Confirm with the SET button. The display shows the symbol of the photocell operating mode r, S, r., S .. Use the UP and DOWN buttons to set the required mode. Confirm with the SET button. The F symbol flashes on the display, indicating that the settings have been saved.

Violation of the photocell when the gate is in the idle state is signaled by a flashing "F" sign on the display.

4.1.5. "Step back" function. Gate mechanical stresses elimination [b]

This function eliminates the gate mechanical stresses after it is closed. If the function is activated, then after closing the gate, the controller will make a slight rotation of the motor in the opening direction in order to eliminate mechanical stresses.

To activate / deactivate the function, press and hold the SET button for 1.5 seconds. The display shows A, use the DOWN button to go to the gate mechanical stresses elimination function, marked with the b symbol. Confirm with the SET button. The parameter symbol appears on the display. Use the UP and DOWN buttons to set the required y value to enable the function, n to disable the function. Confirm with the SET button. The b symbol flashes on the display, indicating that the settings have been saved.

4.1.6. Auto-closing time [c]

It is possible to set a time for automatic closing of the gate. When the timer is active, the countdown starts only when the gate is fully open. A flashing digit appears on the display, measuring the time remaining until the gate is closed. The time is measured in minutes, and when it is less than 10 seconds, the displayed time counts the seconds remaining until auto-closing.

To enable / disable the auto-closing time, press and hold the SET button for 1.5 seconds. A will appear on the display, use the DOWN button to go to the auto-closing function, marked with the symbol c. The display will show a value ranging from 0 to 9. Use the UP and DOWN buttons to set the required value, where 0 means that the function is disabled, and values from 1-9 time in minutes after which auto-closing starts. Confirm with the SET button. The c symbol flashes on the display to indicate that the settings have been saved.

4.1.7. Number of cycles [n]

The controller allows you to display the number of complete cycles of opening / closing the gate in thousands.

To check the number of cycles performed by the gate, press and hold the SET button for 1.5 seconds. The display will show A, use the DOWN button to go to the number of cycles marked with the n symbol. The display will show a value ranging from 0 to 9, representing the number of complete cycles performed by the gate in thousands. In case when the gate has made more than 9999 cycles, the digit 9 will flash.

To reset the counter of cycles performed by the gate, after checking the number of cycles, press the SET button for 2 seconds. The n symbol flashes on the display, indicating that the cycle counter is reset..

4.1.8. Settings reset [r]

It is possible to reset the gate settings and restore the factory settings.

Settings reset:

- forces the necessity to conduct gate learning
- clears the overload adjustment values
- sets the photocell operating mode to reverse when closing
- activates the gate mechanical stresses elimination function
- disables auto-closing of the gate
- enables the function of easy remote adding
- removes Galactic code from the controller
- does not delete added remotes!**

To reset the controller settings, press and hold the SET button for 1.5 seconds. The display shows A, press DOWN to reset the settings, marked with the symbol r. The display will show a counter with the value 3. Pressing the SET button three times, where each press decreases the value of the counter, the factory settings will be restored. The r symbol flashes on the display to indicate that the factory settings have been restored.

4.2 Remotes menu

Entering the remote control settings menu consists in pressing the CODE button for 1.5 seconds. Subsequent functions in the menu are marked with symbols displayed on the controller panel.

In the remote control programming menu it is possible to:

- O** assign a remote control button to the gate opening function
- C** assign a remote control button to the gate closing function
- S** assign a remote control button to the stop function
- 3** assign a remote control to the SBS function
- P** assign a remote control to the airing function
- u** delete a single remote control from the controller's memory
- b** enable / disable the blockade of easy remote adding
- G** set / delete Galactic code
- d** erase the remotes memory

4.2.1. Adding a remote button to the function

Adding the remote control to the controller consists in adding the remote control button to the function:

- O** - open - opening
- C** - close - closing
- S** - stop - stop
- 3** - SBS - step by step

To add a remote control button to the function, press and hold the CODE button for 1.5 seconds. The display shows O, press DOWN to select the selected function, marked with the symbol O, C, S, 3, confirm your choice by pressing the SET button. The counter will appear on the display, displaying the number 3. Press the remote button to be added to the function three times. Each press causes the counter to decrease. After pressing the remote control button three times, the display shows o confirm adding with the SET button or reject it with the CODE button. Correct adding is indicated by the o symbol flashing on the display.

In order to change the assignment of functions to buttons, it is necessary to carry out the adding procedure again.

4.2.2. Airing function [P]

The airing function provides a slight unsealing of the door (lifting 1 cm) to ensure ventilation in the garage.

To use the airing function, it is necessary to add a remote control button to the ventilation function P.

To add a remote control button to the airing function, press and hold the CODE button for 1.5 seconds. The display will show O, use the DOWN button to select the airing function, marked with the P symbol, confirm your selection by pressing the SET button. The counter will appear on the display, displaying the number 3. Press the button of the remote control which is to be assigned to the airing function three times. Each press causes the counter to decrease. After pressing the remote control button three times, when the counter shows o, confirm it with the SET button or reject it with the CODE button. Correct adding is indicated by the o symbol flashing on the display.

Using the airing button when the gate is in a position other than ventilation will set the gate to the ventilation position. Pressing the airing button when the gate is in the airing position will close the door.

4.2.3. Quick adding a remote

The controller allows you to quickly add the remote control.



In the quick adding procedure, it is possible to assign a button only to a step by step (SBS) function.

In order to add a remote control button to the SBS function in the quick assigning procedure, press the UP button and hold it for more than 2s, during this time press the selected remote button.

Correct adding is indicated by the o symbol flashing on the display.



If in the quick adding procedure a remote is used, the button of which is already assigned to the controller, the remote will be removed. Deletion is indicated by d blinking on the display.

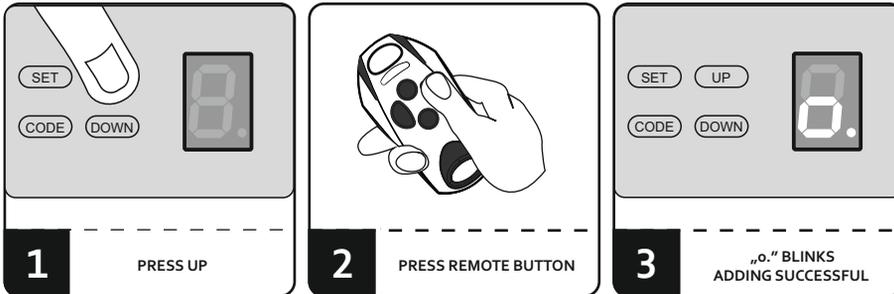


Fig. 2. Quick remote adding.

4.2.4. Deleting a single remote control [u]

The controller allows you to delete a single remote. Delete is only possible for a physically owned remote.

Delete of a single remote is possible with the use of the remote deleting function, marked in the menu with the u symbol, and by the quick deleting function.

In order to remove a single remote from the controller via the menu, press and hold the CODE button for 1.5 seconds. The display shows 0, use the DOWN button to select the remote deleting function, marked with the u symbol. Confirm with the SET button. The counter will appear on the display, showing the number 3. Press the button of the transmitter to be deleted three times. Each press causes the counter to decrease. Press the button three times when the counter shows d, confirm the deletion with the SET button or reject it with the CODE button. Correct removal of the remote control is indicated by the blinking of the d symbol on the display.

To delete a single remote from the controller by quick deleting function, press and hold the DOWN button for more than 2 seconds, and then press the button of the remote to be deleted. Correct removal of the remote control is signaled by the flashing symbol d on the display.

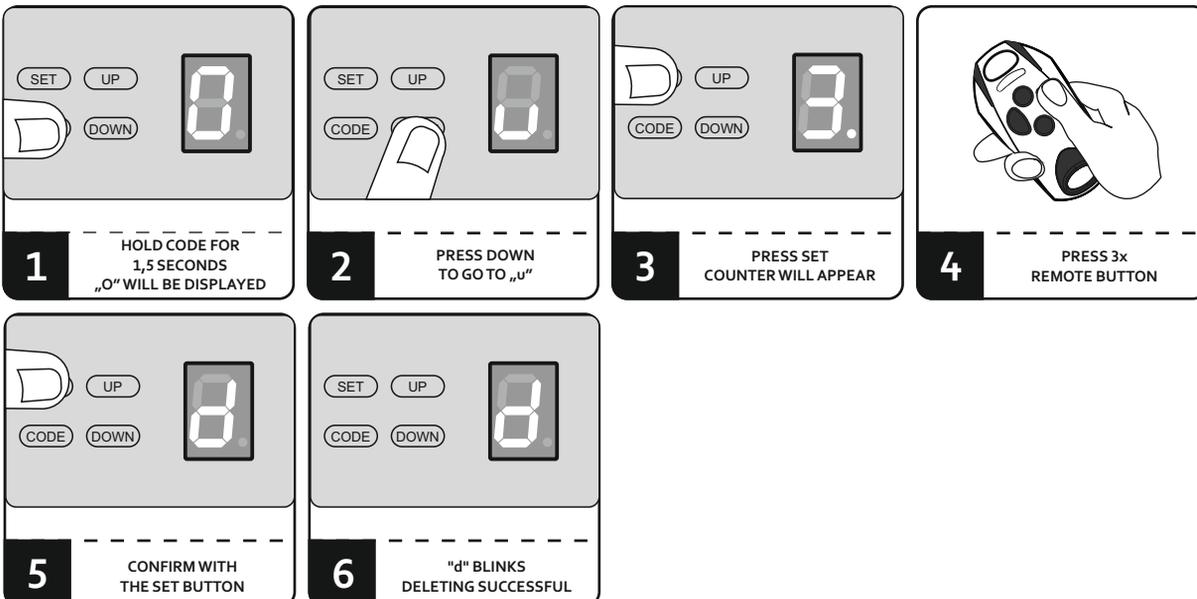


Fig. 3. Deleting single remote via menu.

4.2.5. Easy remote adding

The remote adding function allows you to add a remote control without having to physically access the controller. The condition for success is the necessity to be within the radio range of the controller and to have a previously assigned remote control.

In order to remotely add a remote control:

- ☒ press the button of the already added remote for 15 seconds within the range of the controller. After 15 seconds, the o symbol flashes in the display.
- ☒ within 3 seconds, press and hold down the button of the remote to be added for 15 seconds. After 15 seconds, the o symbol flashes on the display, which means that the remote was assigned remotely. The "new" remote will be added with the same button configuration as the "old" remote used in the procedure.

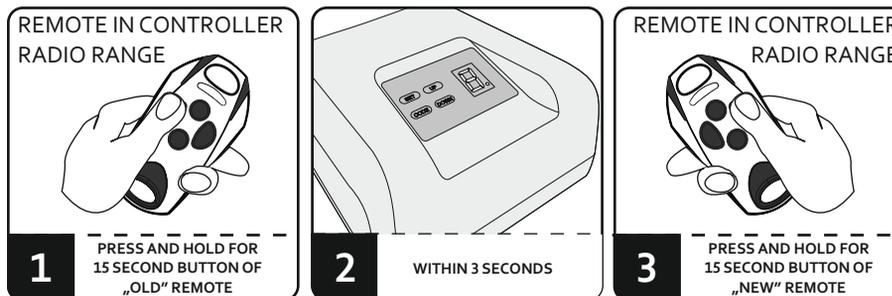


Fig. 4. Easy remote adding.

Easy remote adding function is not available when:

- ☒ enabled blockade of remote adding remotes,
- ☒ the use of remotes of different types or operating at different frequencies in the procedure.

Unsuccessful adding of the remote control may be caused by:

- ☒ weak battery of any of the remote controls,
- ☒ radio interference that could occur during the remote adding procedure,
- ☒ receiver's memory is full.

4.2.6. Locking /unlocking the easy remote adding function [b]

In order to protect the device against unauthorized attempts to add an additional remote, the function of easy adding remote controls should be blocked.

In order to lock / unlock the function of easy remote adding, press and hold the CODE button for 1.5 seconds. The display shows O, use the DOWN button to select the function of blocking / unblocking easy remote assigning, marked with the symbol b. Use the UP and DOWN buttons to set "y" - to enable the lock, "n" - to disable the lock. Confirm your selection by pressing the SET button. The b symbol flashes on the display, indicating that the settings have been saved.

4.2.7. Setting / deleting Galactic code from the controller [G]

The GALACTIC function enables adding to the controller remotes programmed and configured outside the installation, without the need to use the controller buttons.

The GALACTIC function is available only for selected DTM868MHz remote controls.

To enter the authentication code to the controller, it is necessary to have a remote control with the GALACTIC function, with the authentication code set, using the GPROG programmer.

To enter / delete the authentication code to the controller, press and hold the CODE button for 1.5 seconds. O appears on the display, use DOWN button to select Galactic function, marked with G symbol. Confirm by pressing SET. A flashing n symbol will appear on the display - if there is no GALACTIC code in the controller or a flashing y symbol - if the controller has already set a code. The n / y symbol will flash for 10 seconds. During this time, you should press any two buttons on the remote with the Galactic code entered. Entering the code is indicated by the o symbol flashing on the display. The deletion of the Galactic code is signaled by the flashing symbol d on the display.

To delete the code, you must have a remote control with which the code was entered.

4.2.8. Adding a remote control with the Galactic function

The condition for successfully entering the remote control with the Galactic function to the receiver is the compliance of the authentication codes set in the controller and the remote control.

In order to add a remote control, within the range of the controller, press and hold any two buttons of the remote control for 5 seconds.

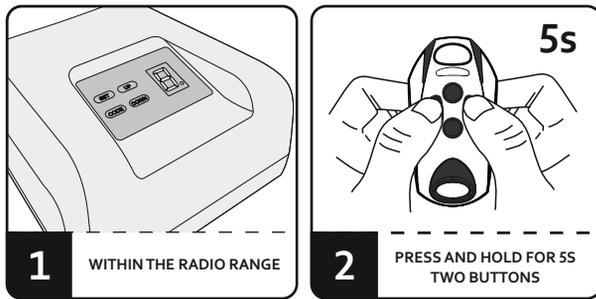


Fig. 5. Adding a remote with the Galactic function.

Unsuccessful adding of the remote control may be caused by:

- incompatibility of authentication codes set in the transmitter and controller,
- low battery of the remote,
- radio interference that may have occurred during the procedure,
- controller memory is full.

4.2.9. Deleting the remote control memory [d]

To delete all remotes added to the controller, press and hold the CODE button for 1.5 seconds. The display will show 0, press DOWN to delete the remotes memory, marked with the symbol d. The display will show a counter with the value 3. Pressing the SET button three times, where each press decreases the value of the counter, all remotes will be deleted from the controller. The 0 symbol flashes on the display, signaling the process of deleting the remotes memory, then d flashes to indicate that the remotes are removed from the memory.

5. Acceptance tests

5.1. General remarks

After installing the controller and all cooperating devices, especially the safety devices, final tests should be made to check the entire automation. These tests should be performed by competent personnel who are aware of the risks involved! Final tests are the most important phase in the implementation of automation. Individual components such as the motor, photocells, etc. may require specific checks and therefore it is recommended to follow the checking procedures in the manuals for the relevant components.

If you do not want to install safety devices, remember to permanently short-circuit the terminals for safety devices. The absence of a bridge will prevent any movement of the drive.

5.2. Final tests include the following steps

5.2.1. Checking the direction of movement

Check whether the automation is physically moving in the opening direction when the OPENING function is activated. In the event that movement is in the closing direction or there is no movement, check the electrical connections and / or repeat the programming procedure.

5.2.2. Safety devices control

If the photocells are installed, you must manually cause an interrupt of the photocells and check the response of the drive. Likewise, check other safety devices, if any are installed.

5.2.3. Checking the functions controlling the movement of the actuator

Check remote control buttons and / or manual control button. After successive impulses from the buttons, the correct sequence of gate movement should be performed.

5.2.4. Overload protection control

After starting gate closing, physically block the movement of the gate leaf. This should be done safely and with increased caution. Evaluate the force needed to block the gate in such a way that the controller automatically stops the gate movement. Repeat the process for the opening direction. If necessary, correct the set force value. After correcting the setting, perform the above test again. The force necessary to block the gate, which will automatically disable the actuator, must be low enough so that the gate does not pose a risk of injury (especially to the child).

If the overload protection is not satisfactory, use other safety devices (e.g. safety edges, additional photocells, etc.).

DISPOSAL

Electrical or electronic devices cannot be disposed of with household waste. Correct disposal of the device enables the Earth's natural resources to be preserved for longer and prevents environmental degradation.

WARRANTY

The manufacturer DTM System provides the equipment in working order and ready for use. The manufacturer provides a warranty for a period of 24 months from the date of purchase by the end customer. The warranty period is determined on the basis of the manufacturer's warranty seals placed on each product. The manufacturer undertakes to repair the device free of charge if during the warranty period there are defects due to the manufacturer's fault. The defective device must be delivered to the place of purchase at your expense, including copies of the proof of purchase and a brief, unambiguous description of the damage. The cost of disassembly and assembly of the device is borne by the user. The warranty does not cover batteries in remote controls, any damage resulting from improper use, unauthorized adjustments, alterations and repairs as well as damage caused by lightning, overvoltage or short circuit of the power supply network. The detailed terms and conditions of granting a guarantee are regulated by relevant legal acts.

CE DTM System hereby declares that the device complies with Directive 2014/30/EU, 2014/35/EU.

The full text of the EU declaration of conformity is available at the internet address.

www.dtm.pl



Electrical or electronic devices cannot be disposed of with household waste. Correct disposal of the device enables the Earth's natural resources to be preserved for longer and prevents environmental degradation.



design and production
of electronic devices
gate automation