

SLIMBAT2 wireless photocell MANUAL

v.1.1

1. Description of the device

The wireless photocell is a safety element in gate automation. Between the transmitter and the receiver, the infrared beam is created, forming invisible to the human eye barrier. The emergence of obstacles (eg. Car) in photocell operation zone causes the receiver reaction involving switching of the output relay and change of input state in gate controller.

With the battery-powered transmitter, safety barrier can be created in places with no power cord. An example would be the entrance gate with the installation of a cable arranged on one side only. The photocell is designed to work both indoors and outdoors.

2. Specifications and utility

- ▶ guaranteed operating range: 1-15m
- ▶ adjustable viewing angle: 200° horizontal
- ▶ power supply of receiver: 12...24VAC/DC ±10%
- ▶ current consumption of the receiver: max. 25mA
- ▶ power supply of transmitter: battery 3,6V/8,5Ah type C
- ▶ trigger input T: change of state 0-12...24VAC/DC
- ▶ receiver output
(type / maximum load): NO or NC / 1A (24V AC/DC)
- ▶ dimensions of the housing
(W. X D. X H): 38x36x145mm
- ▶ mounting method: surface mounted housing, splash-proof, IP-54
- ▶ housing material: ABS, polycarbonate covers
- ▶ operating temperature (min./max.): -20°C / +55°C
- ▶ weight: 210g
- ▶ battery life:

Mode \ Range	7m	15m
FAST	1 year	8 months
TRIG (20 cycles/24h)	3 years	2 years
SLOW	8 years	5 years

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3. Construction of the device

3.1. Receiver

Fig. 1 shows the signal elements (LEDs) and regulatory elements (jumper J1, J2). The exact description can be found in the tables below.

The SL LED is particularly helpful for verifying the proper operation of the photocell in TRIG mode.

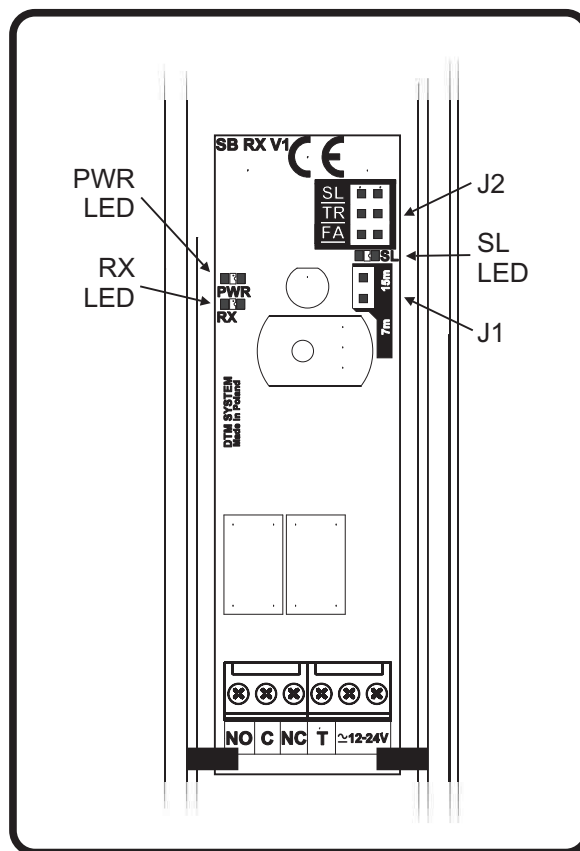


Fig.1. View of the receiver.

Screw connection	Description
≈12-24V	power connector
T	input triggering fast operation mode of photocell
NO/C/NC	control output NO or NC in a duplicate system which ensures the high level of security

LEDs	Description
PWR	LED indicates power supply
RX	LED indicates the absence of obstacles between the photocells
SL	LED indicates transmitter operation mode, LED lights-SLOW mode

Jumpers	Description
J1	range setting 7m or 15m
J2	operation mode setting: SL (SLOW), TR (TRIG), FA (FAST)

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3.2. Transmitter

Fig. 2 shows the signal and regulatory elements.

LOW BAT LED indicates low battery with cyclical blinks. Battery socket allows convenient and quick replacement.

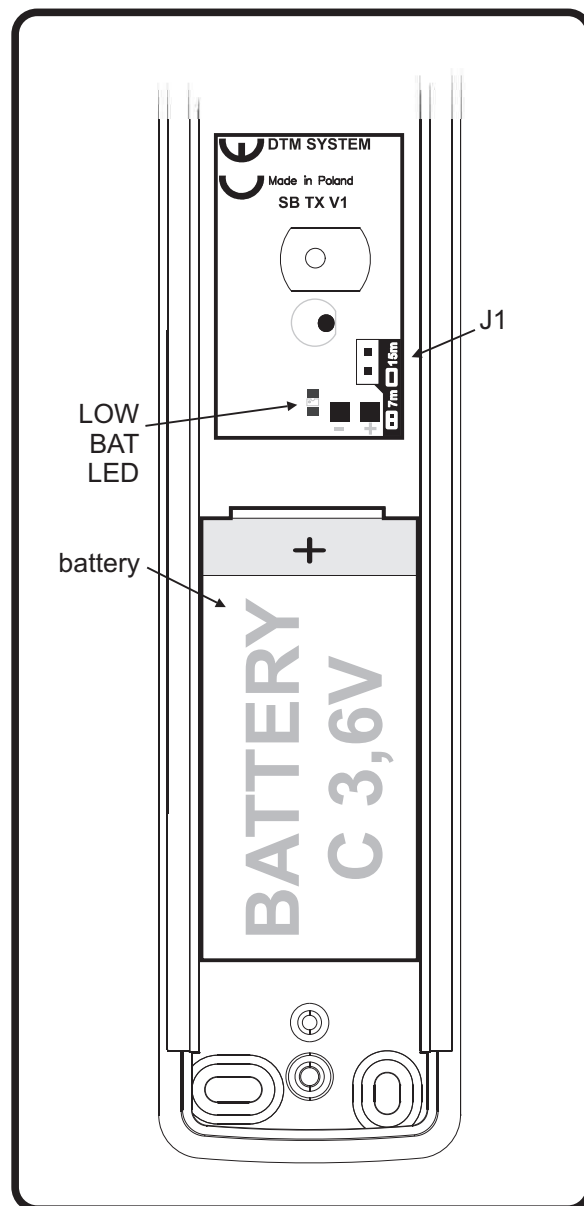


Fig.2. View of the transmitter.

LED	Description
LOW BAT	LED indicates low battery
Jumper	Description
J1	range setting 7m or 15m

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4. Configuration

4.1. Range

The range setting is done with jumper J1 on the transmitter and receiver.



The transmitter and receiver must be set to the same range.

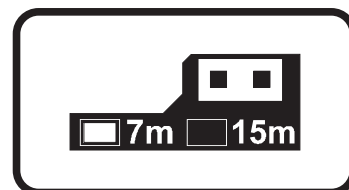


Fig.3. Jumper J1 in transmitter and receiver.

J1	Range setting
off	maximum range 7m
on	maximum range 15m

4.2. Operating mode

Mode setting is done with jumper J2 on the receiver.

SL (SLOW) - allows you to reduce energy consumption from the battery, the cost of extending the response time of the photocell to obstacle appearance. Photocell in this mode does not comply with safety standards PN-12445.



Fig.4. Jumper J2.

TR (TRIG) - allows to reduce the consumption of battery power at a time when supervised by a photocell automation system is at rest. In this mode, the photocell after power on (fig.5) or if a change is detected at the input T (Fig.5b) switches the operating mode to FAST and operates in accordance with the safety standard PN-EN12445. After about 90s photocell switches to SLOW mode (slow down, saving battery life). If the input T is not connected or is in a low state when power on, the photocell goes into a fast mode

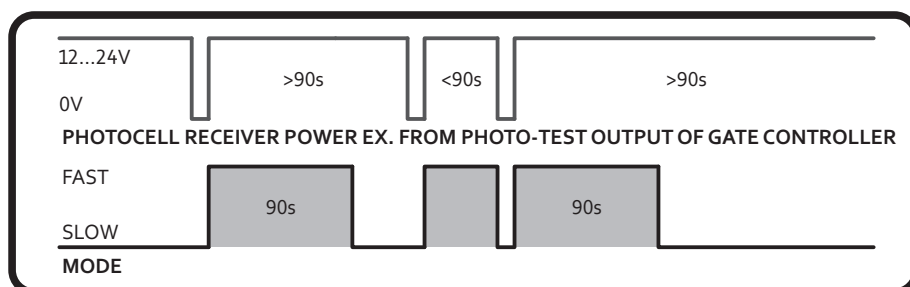


Fig.5a. Way to control the photocell with receiver power input.

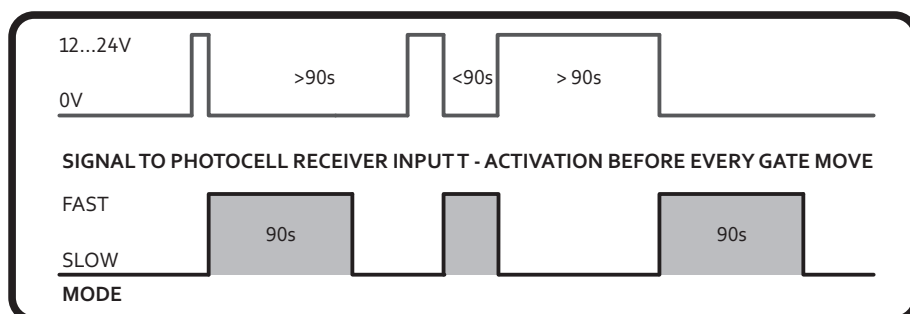


Fig.5b. Way to control the photocell with input T.

J2 (receiver)	Operation mode setting
SL	SLOW mode
TR	SLOW mode with FAST mode activation
FA	FAST mode

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FA (FAST) - allows you to ensure a rapid response (according to PN-EN 12445) for the duration of the photocell. This mode is not recommended because of faster battery consumption.



Setting distance and mode of operation affect the battery life. If possible, we suggest using the TRIG mode and set the range to 7m.

4.3. Photocell operation under specific conditions

If the photocell operates in an environment exposed to uncontrolled reflections of the infrared, a situation in which the photocell does not react to the emergence of obstacles in the protected area can occur. In order to avoid this situation, move the jumper J1 from position 15m to 7m which will reduce the power of photocell transmitters. (Fig.1, 2).

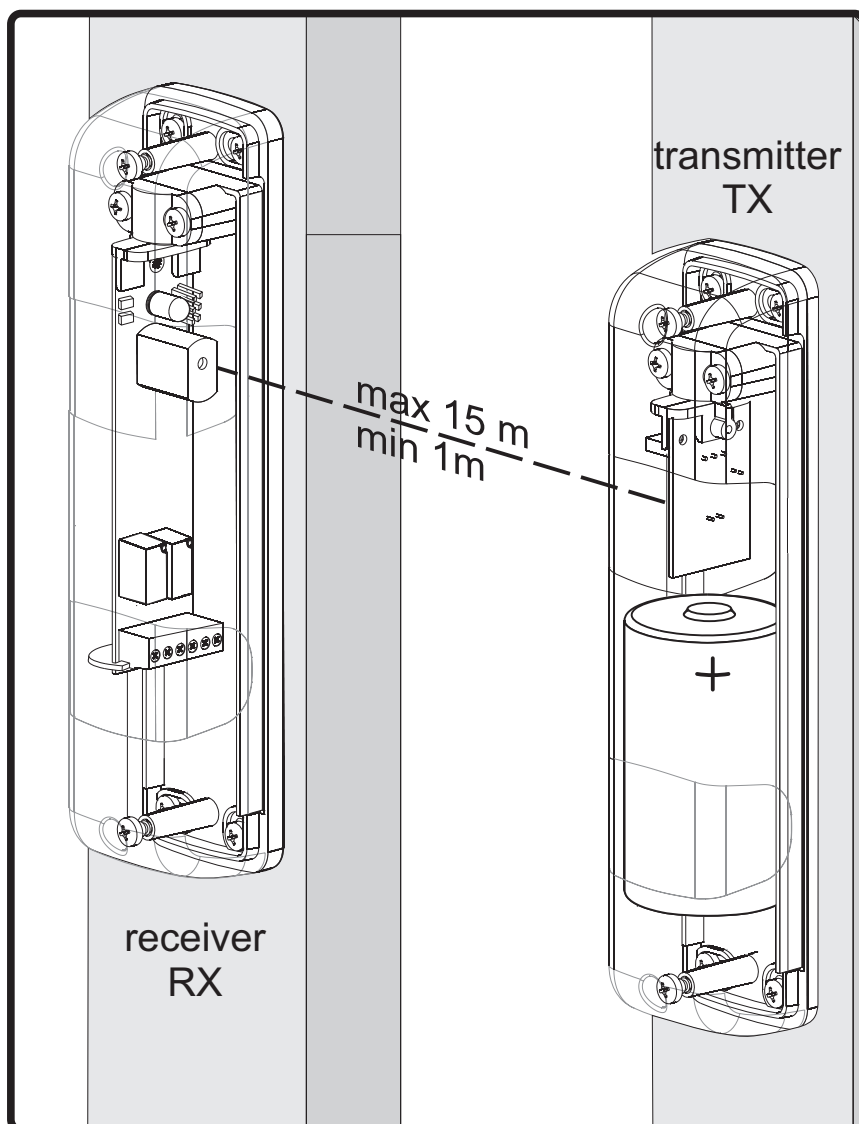


Fig. 6 Example location of the transmitter and receiver.

5. Installation

For proper functioning of the photocell, transmitter and receiver must be installed in one axis at a height of 40 - 60 cm from the ground. The distance between the transmitter and receiver should not be less than 1 meter. With the ability to rotate the electronic boards inside the housing in the range of 200° (Figure 7), photocells can be mounted in a plane parallel to the barrier line they have to create (Figure 6). The photocells should be mounted vertically so that the terminal blocks and the moisture drain holes in the cover were in the lower part of the housing (Figure 7).

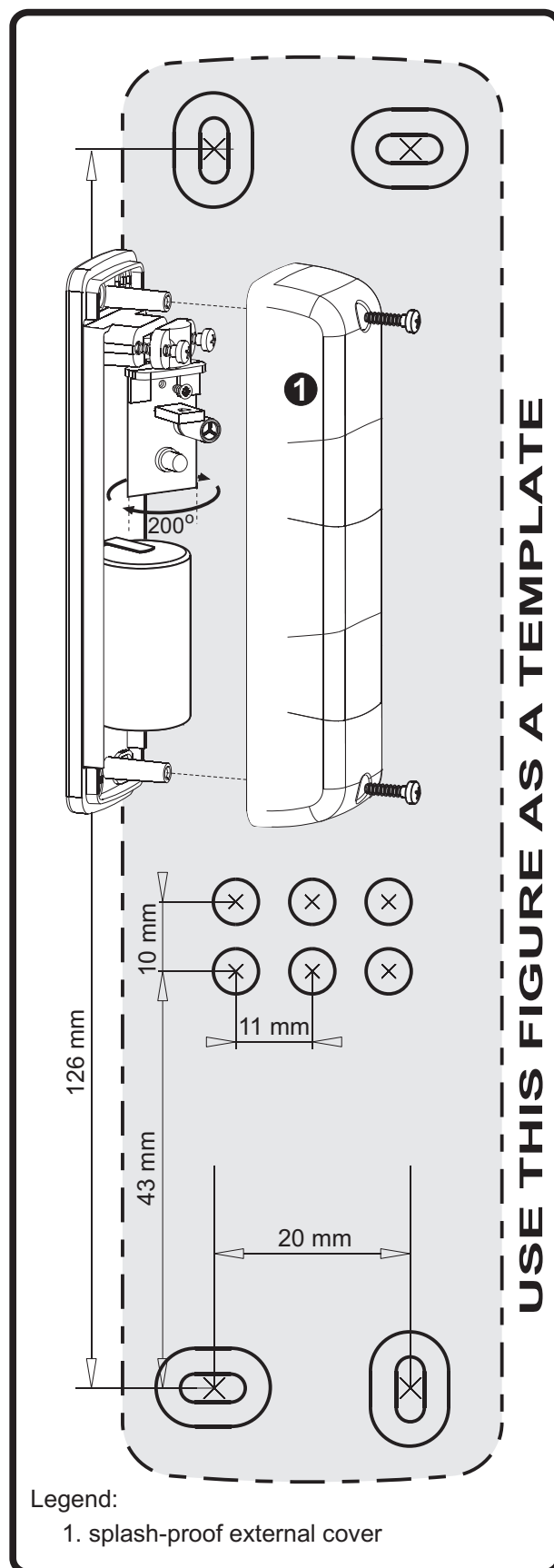
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Do not install reflecting mirrors or screens in the operating area of the photocell, the receiver should be mounted on the less sunny side, do not install the photocell receiver in the environment with a lighting of foreign light, especially coming from fluorescent lights, as this may interfere with the barrier. Be careful not to contaminate the optical elements of the transmitter/receiver.

After the mechanical installation an electrical connection should be done. The connection should be carried out in accordance with an exemplary diagram shown in Figure 8, and according to the following description:

- ▶ connect control output of photocell receiver to the correct input in the gate controller. Pay special attention to the control mode (NC or NO) required in the control board unit. The standard solution of optical sensors operating mode in the gate automation is the NC configuration;
- ▶ if you intend to use the battery-saving function, connect the power of the photocell receiver to the photo-test output of gate controller. Every time the power is off, transmitter switches to the FAST mode for 90s. If you can not use the output of photo-test, you can connect photocell receiver input T to the output of the positive polarity, which runs during the gate movement, for example flashing lamp. If the output is OC (open collector), where the potential is minus, connect resistor 8,2K Ω between the input T and the positive power potential;
- ▶ put the battery in the transmitter (note the correct polarity));
- ▶ connect the power supply to the corresponding screw terminals of the



Receiver power supply:	12-24V AC/DC	Operating temp.:	-20°C / +55°C
Transmitter battery:	3,6V type C	Housing IP :	54
Range:	1 - 15m	Dimensions:	35x30x110mm

receiver;

- ▶ properly connection and photocells power supply indicate PWR LED and the RX LED in the receiver (if RX LED does not light, adjust the position of the plates in the transmitter and receiver relative to each other);
- ▶ perform acceptance tests.

6. Acceptance tests

After photocell connection, it is necessary to test the reaction of the receiver at the intersection of infrared barriers. Note that automatic gate must be tested with regard to PN-EN 12445.

The fulfillment of this standard requires photocell operation using the trigger input T, or FAST mode if the trigger input T is not connected. The test should be carried out as follows:

- ▶ connect the power of the transmitter and the receiver, then check whether the RX LED on the receiver is on;
- ▶ if you used operation in TRIG mode using the input T check operation using the SL LED - every transition to the SLOW mode is signaled by the LED.;
- ▶ when SL LED is off (FAST mode operation) move the roller having a diameter of 5 cm and a length of 30 cm perpendicularly intersecting the optical axis between the transmitter and the receiver, first near the transmitter TX, then near the RX and midway between them. Each time the photocell should switch from standby to the state of alarm, which is visible through the RX LED.

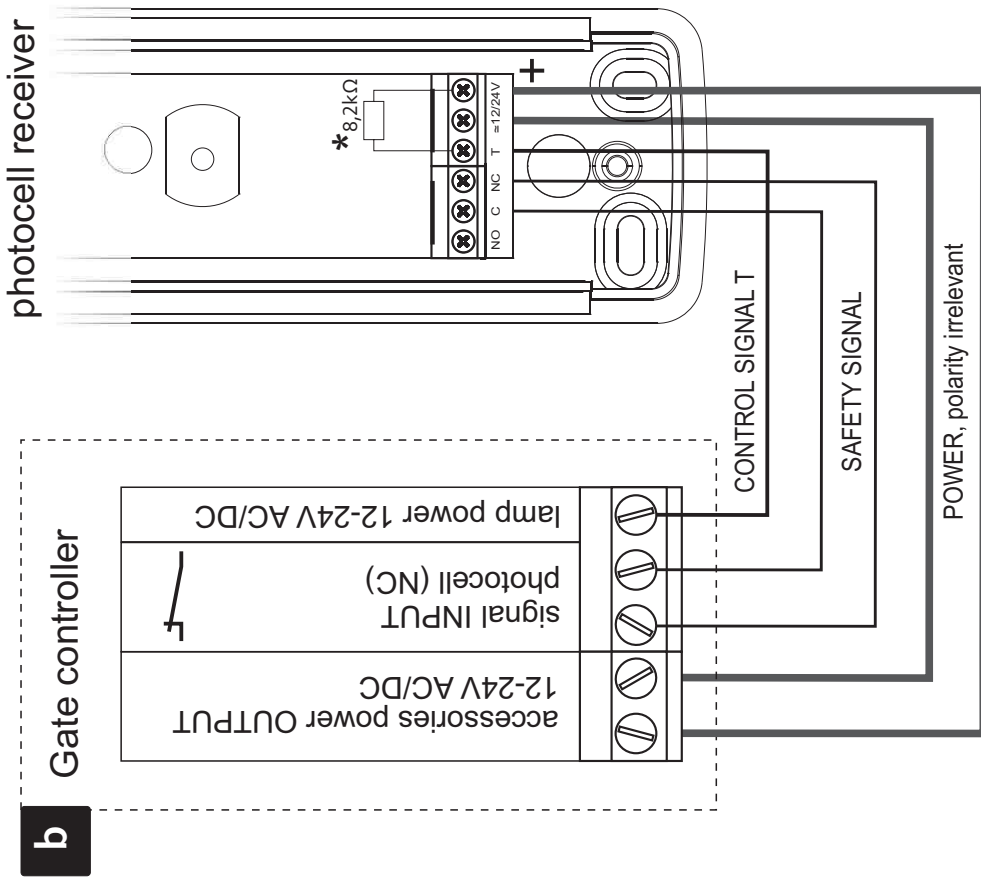
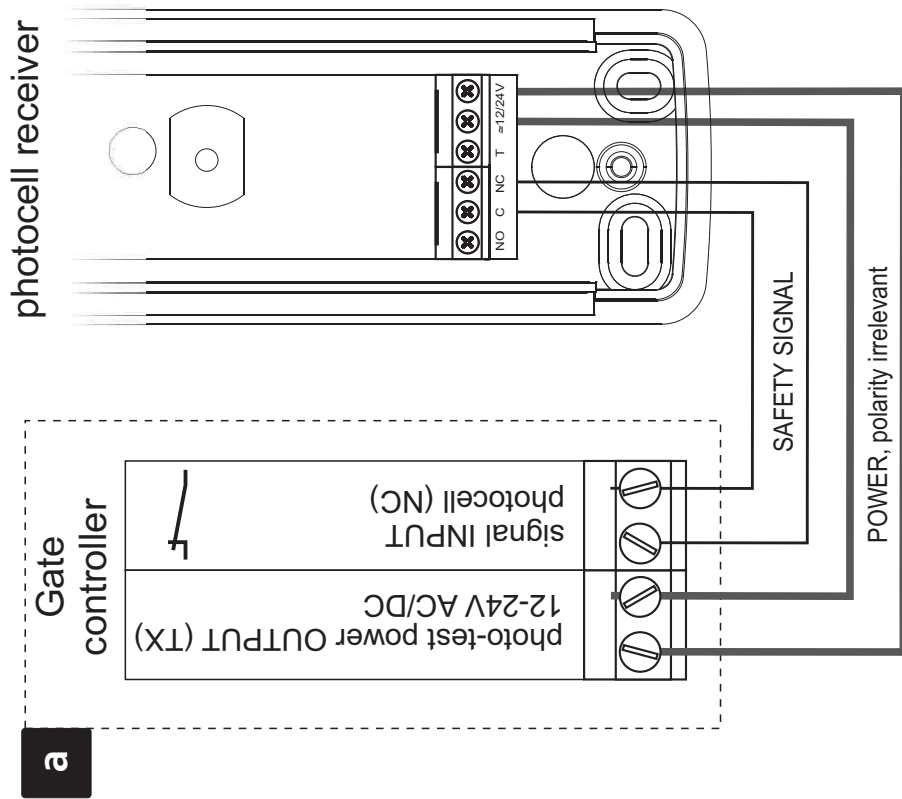
7. Warranty

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.



Electrical devices cannot be thrown with municipal waste. Proper utilization of the devices gives the possibility of saving the Earth's natural resources for longer and prevents the degradation of the Environment.

CONNECTION SCHEME



*If the output is OC (open collector), where the potential is minus, connect resistor 8,2k Ω between the input T and the positive power potential

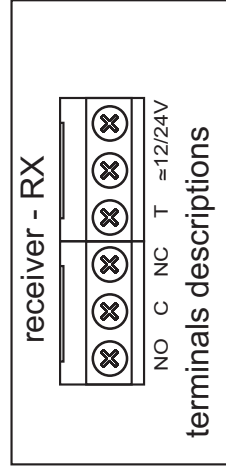


Fig.8. Example wiring diagram of photocell connected to the photo-test output (a) and to the signal lamp output (b).