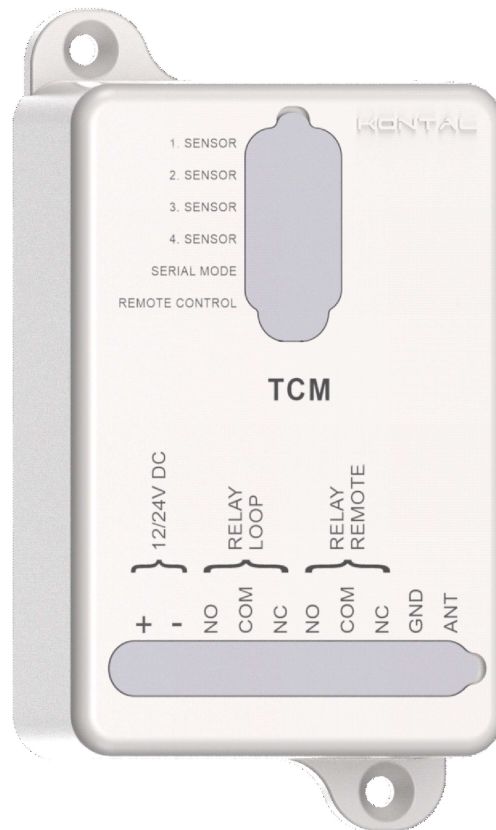


TCM

WIRELESS VEHICLE DETECTOR (Mini)



KONTAL

CE



Before operating the device, be sure to read this user manual carefully. Follow the steps described in the installation, electrical connection, and initial startup sections with attention. After completing these steps, the product owner/user must keep this manual in a known and easily accessible location for the entire service life of the product.

- Store the product in a dry environment. Otherwise, malfunctions may occur.
- In battery- or accumulator-powered products, batteries and accumulators are not covered under warranty. Similarly, failures caused by battery discharge or leakage in products that have exceeded their shelf life are not covered under warranty.
- All service and repair operations must be carried out exclusively by Kontal Elektronik technical service. The product must not be tampered with by unauthorized personnel.
- The operating voltage of each product is indicated on the label. Do not supply the device with a voltage different from the specified value.



- ✓ Failure to comply with the above-mentioned conditions may result in fire, serious personal injury, or damage to the product or the structure in which it is installed. In such cases caused by user negligence or misuse, **Kontal Elektronik San. ve Tic. Ltd. Şti.** assumes no responsibility.
- ✓ This symbol will be used to highlight important notes in the following sections.



- ✓ Do not touch the power supply terminals of the device with bare hands.
- ✓ This symbol will be used to indicate warnings related to voltage in the following sections.



- ✓ This symbol on the label indicates that the device operates with a DC supply voltage.



- ✓ This symbol on the label indicates that the device is equipped with reinforced insulation.



- ✓ This symbol on the product or its packaging indicates that the product must not be disposed of as household waste. Instead, it should be delivered to designated collection points for the recycling of electrical and electronic equipment. Improper disposal or destruction of the product may have adverse effects on the environment and human health.



- ✓ This document and its revisions are the legal property and responsibility of **KONTAL ELEKTRONİK SAN. VE TİC. LTD. ŞTİ.** Any unauthorized modification or alteration is strictly prohibited.



- ✓ Ensure that the system is properly grounded for the device to operate reliably.

1. DESCRIPTION

The TCM control card is an electronic control board that can output when it detects a signal from the transmitter sensors or remotes defined in its memory. It is generally used in parking systems, site entrances, automatic opening and closing of barriers or automatic ticket issuance to determine whether there is a vehicle in the targeted place on the ground. In addition to these, it can also be used in industrial doors, bollard systems and PVC doors. The transmitting sensor (TS/KS), which will be fixed to the ground, detects the density of the metal that will come on it and communicates with the controller (TC/TCM) and the desired device is controlled thanks to the relay or relays on the control card.

The TCM card can also be used as a ROLAN model remote control receiver and can be used to control any system separately with the remote relay output or with Security Mode (both the vehicle sensor and the remote data together).

1.1 BOX CONTENT

1x TCM	1x TCM USER MANUAL
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**For special orders, the box contents may vary depending on the project or customer requirements.*

2. TECHNICAL FEATURES

Model	: TS 1P / TS 2P / KS
Product Code	: K185-01 / K203-01 / K199-01
Battery Type	: 3,6V DC *
Operating Frequency	: 433,92MHz
Output Power	: ~0,06W
Maximum Current	: 17mA
IP Class	: IP68
Working Distance	: <35m**
Operating Temperature	: -25 °C +55 °C
Weight	: 1128 gr. / 1178 gr.
Dimensions (Width x Length x Depth)	: 245 x 245 x 37 mm

Model	: TCM
Product Code	: K207-02
Operating Voltage	: 12/24V DC
Maximum Current	: 15mA @24V
Operating Frequency	: 433,92MHz
Contact Type	: Dry Contact NO/NC
Max. Contact Power	: 250VAC/220VDC 2A
Transmitter Sensor Capacity	: 4
Operating Temperature	: -25 °C +55 °C
Weight	: 95,5 grs
Dimensions (Width x Length x Depth)	: 66 x 116 x 26 mm

- **TCM:** TOSBA CONTROLLER MINI (RECEIVER CARD, CONTROL CARD)
- **TS 1P:** 1 BATTERY TOSBA SENSOR, **TS 2P:** 2 BATTERY TOSBA SENSOR, **KS:** 1 BATTERY KOSTEBEK SENSOR

*	There are two supply inputs on the transmitting sensor (TS/KS) board. One or two batteries can be optionally installed in these inputs. It can work for about 4 years for the passage of 1000 vehicles per day with a single battery (TS 1P / KS), and up to 8 years with two batteries (TS 2P).
**	The operating distance varies according to the environment and weather conditions in which the transmitter sensor is used.
☐ When the battery of the transmitter sensor is low, the receiver card will give a warning and the buzzer will beep to notify this situation. In this case, the battery of the respective sensor needs to be replaced.	



The battery used to supply the sensor is not rechargeable.
The battery used can be replaced by those who install the product or have knowledge of the product.

System Startup

This product is sent to you with the transmitter sensor deactivated. It does not react to any controls and metal masses. When the first energization is applied, the POWER LED stays on, the REMOTE CONTROL LED flashes 3 times and the 1,2,3 and 4th SENSOR LED's turn on the system in the passive position.

3. WIRELESS VEHICLE DETECTOR AND USAGE

The TCM control card is an electronic control card that gives output when it detects a signal from the sensors (TS/KS) or remotes (Kontal ROLAN models) defined in its memory.

3.1. System Communication

The wireless metal mass detector consists of a control card and transmitter sensors defined in its memory. Communication between the control board and the sensors is "transceiver". This communication is carried out with the control card (TCM) and sensors defined in its memory (maximum:4).

In this communication, the transmitting sensor (TS/KS) detects the metal bulk density of the vehicle overcoming it and sends data to the control board. Then it waits for a response from the control card (TCM) that the information has been received. If there is a response, it continues its normal operation, and if there is no response from the controller, it continues to send data at certain periods to indicate that there is a vehicle on it, this process will continue as long as there is a vehicle on the transmitter sensor.

3.2. Wireless Vehicle Detector Settings

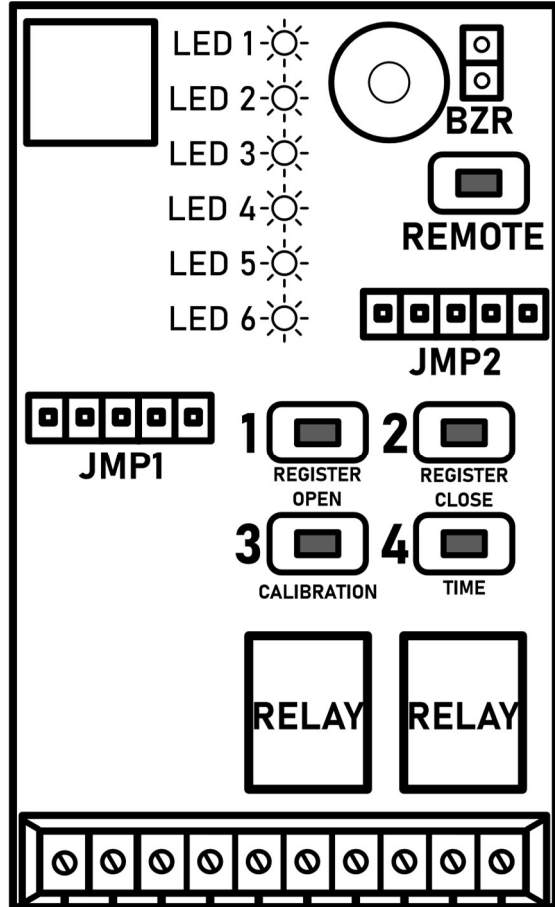
In the wireless vehicle detector system, there are buttons on the control card (TCM) that will allow various settings to be made. By using these buttons, settings such as teaching/deleting, calibration and relay pull times of the transmitter sensors can be made to the control card.

4. RECEIVER SETTING MENUS

4.1. SENSOR REGISTER



It is recommended that the places where you will use the sensors have a magnetic field value between 20uT and 60uT. The position of the sensor must not be changed during or after the registration process. Calibration should be done after the installation is completed.



In order to teach the transmitter sensor (TS/KS) to the control card, you need to use the REGISTER buttons on the control card. In this process, first of all, you need to introduce the 1st Sensor by pressing the **REGISTER OPEN** button. The **REGISTER CLOSE** button is not active for the first operation. Even if this button is pressed, the system will not enter sensor learning mode. After the first sensor is taught, if a sensor is taught to the system with the REGISTER CLOSE button, the operating logic of the system is set to Serial Mode. In this case, when the data is received from the opening sensor first, the relay will become active and the relay will become passive after a vehicle passes over the closing sensor. In each learning process, the receiver will assign the card sensor numbers in turn. In other words, the first taught sensor will be number 1, and then the taught sensors will be 2, 3 and 4, respectively. A maximum of 4 transmitting sensors can be taught in total.

- Press the **REGISTER OPEN button** for 0.5 seconds to register an open sensor. There will be a beep from the buzzer. Your card is now in sensor learning mode.

- Press and release the button on the sensor you want to teach within 10 seconds.
- When you press the button on the sensor card, you will hear a beep 2 times from the buzzer of the receiver card.
- After the buzzer sound, the receiver card has learned the sensor. When it detects a magnetic field change on the sensor, the receiver card will pull the relay and the LED with the corresponding sensor number will remain lit.

-
- Press the **REGISTER CLOSE button** for 0.5 seconds to register close sensor. There will be a beep from the buzzer. Your card is now in sensor learning mode.
 - Press and release the button on the sensor you want to teach within 10 seconds.
 - When you press the button on the sensor card, you will hear a beep 2 times from the buzzer of the receiver card.
 - After the buzzer sound, the receiver card has learned the sensor. The **SERIAL MODE** LED on the receiver card will be activated.

4.1.1.SYSTEM MODES

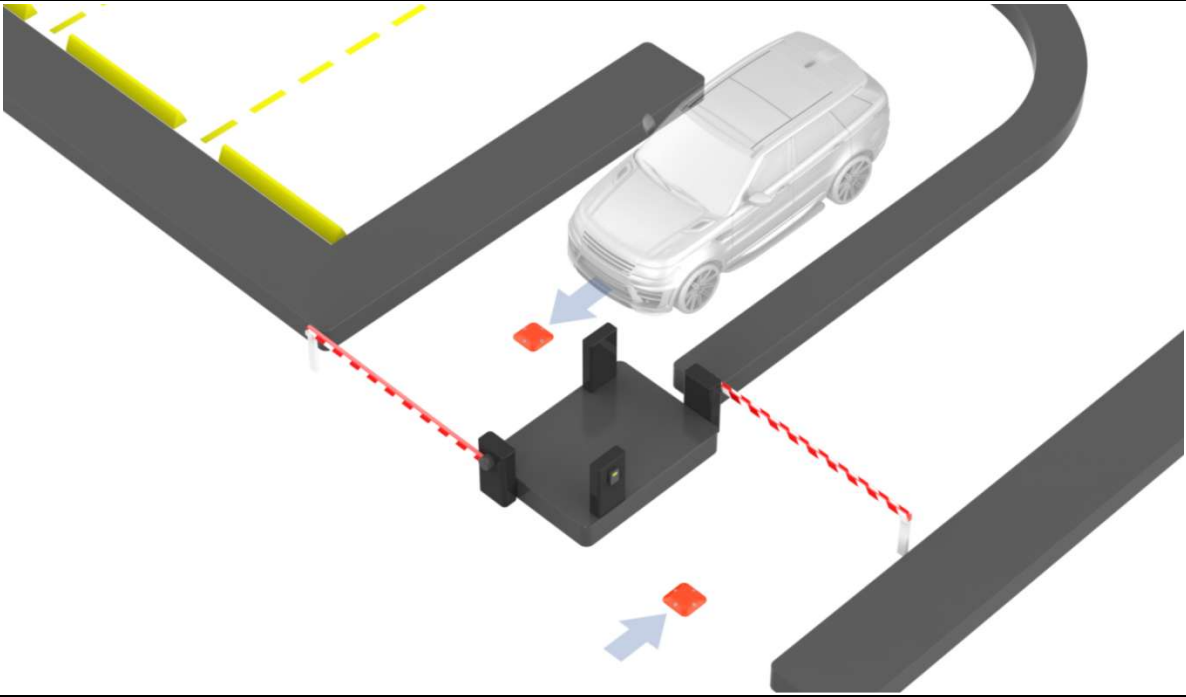


Figure 1 - Normal Mode (Parallel Mode)

When there is a vehicle on all sensors registered in normal mode, it gives a relay output, and when the vehicle exits, it makes the relay passive. **Figure 1** shows sensor placement in normal mode, and **Figure 2** shows sensor placement in serial mode.

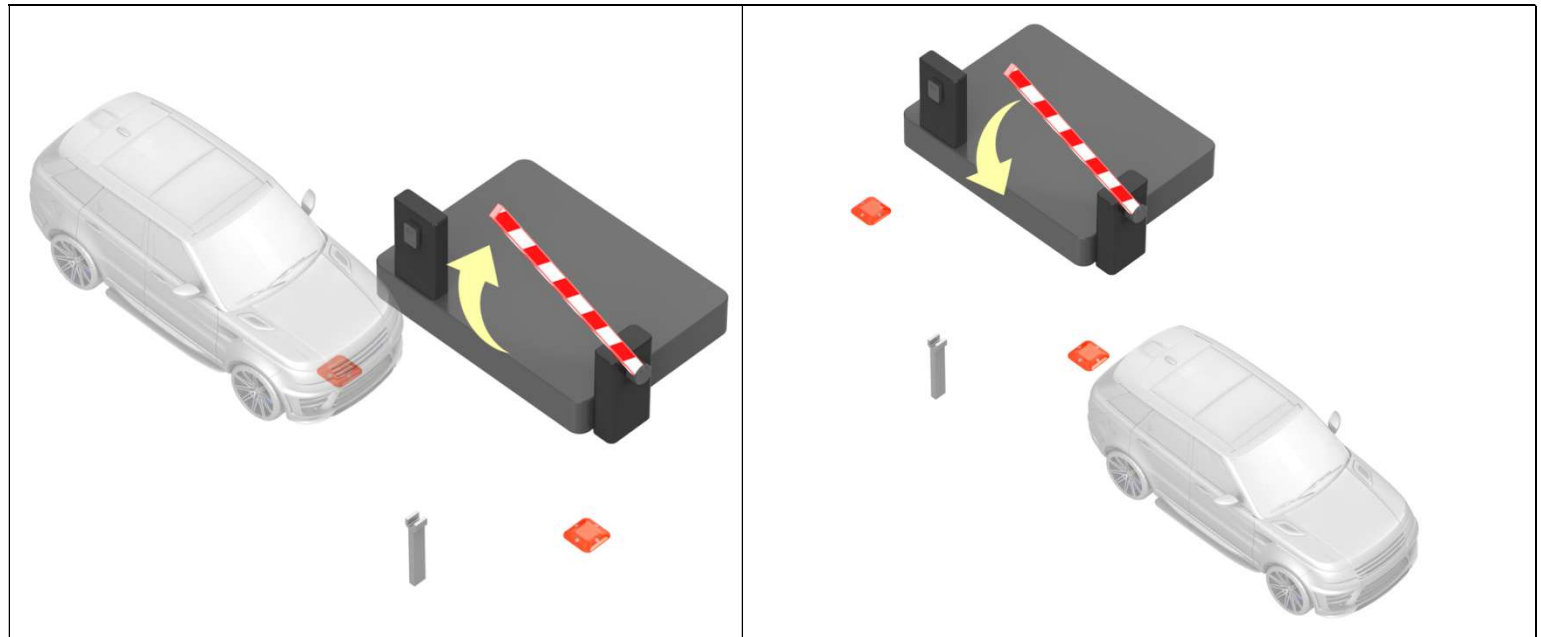
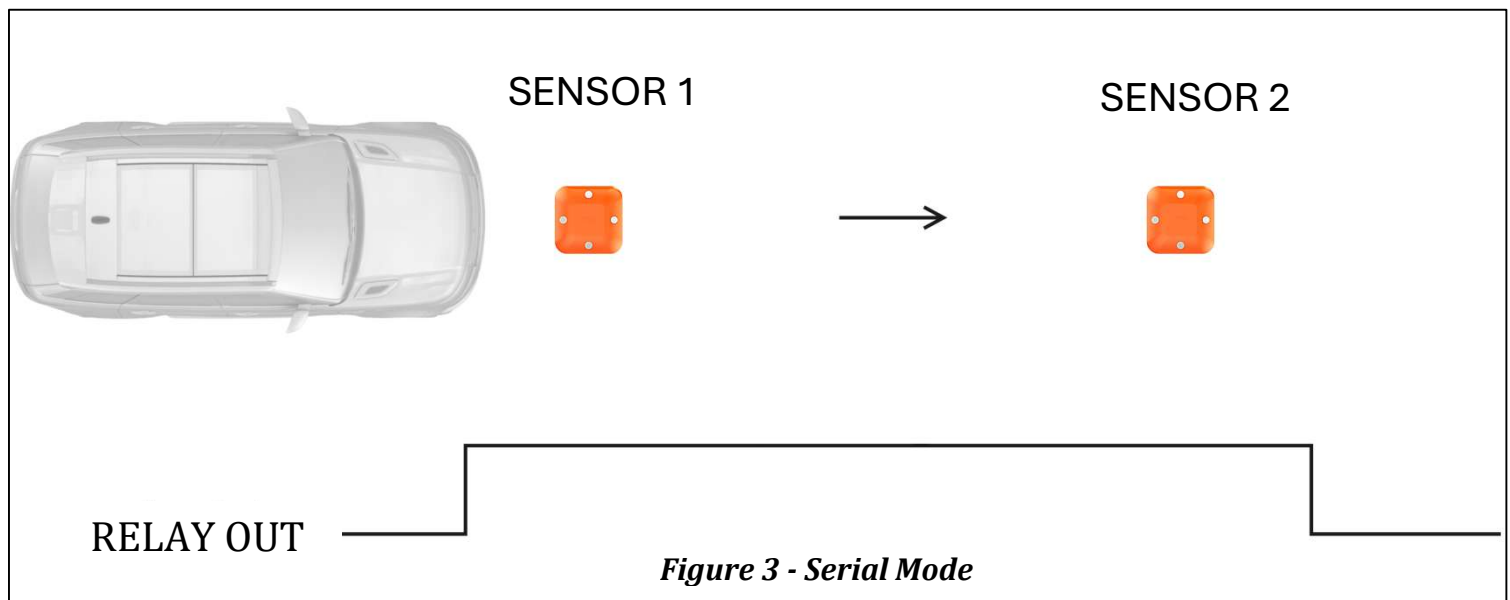


Figure 2 - Serial Mode

Serial mode is the mode used with open and close sensors (TS/KS) mounted on the same way. In this mode, transmitter sensors are placed on both sides of the barrier. In this way, the vehicle approaches and moves away from the barrier can be controlled. It is required that the vehicle passes through one of the open sensors and one of the close sensors. Vehicles coming in the wrong direction can be detected and no trigger is given. For example, when the vehicle moving from left to right is detected by open sensors, the barrier is opened and kept open. After the vehicle continues to move forward and comes over the close sensors and leaves, the barrier is lowered.



The image above shows the relay outputs of the system operating in serial mode. As soon as the vehicle moves from left to right, the trigger is given from the relay output as soon as it comes over the **sensor1**, the relay output remains on the trigger until the vehicle passes over the **sensor2** and leaves, and the relay output is deactivated when the vehicle leaves the **sensor2**.

4.2. SENSOR CALIBRATION

During the operation process of the system, many different magnetic field changes may occur due to various reasons. This can cause the system to trigger itself or even remain constantly on. In such a case, a sensor that has detected will not be able to react to magnetic field changes. The control card has a **SENSOR CALIBRATION** mode specifically for such situations. For calibration;

- Press and hold the **CALIBRATION** button on the receiver card until the buzzer sounds.
- After you take your hand off the button, the buzzer will sound for a second and your card will be in the calibration menu.
- Within 10 seconds, you must press one of the buttons containing the number of the relevant sensor you want to calibrate (1,2,3 or 4).
- When you press the button, the corresponding LED on the receiver card of the sensor you want to calibrate will remain lit. At this stage, wait until the buzzer beeps 2 times without taking any action (maximum 5 minutes).
- When the buzzer beeps 2 times, the process will be successful and the system will exit this mode and continue its standard operation.
- In order to exit the calibration menu without performing the above operations, you must either wait 10 seconds while the buzzer is beating once a second, or you must press the button number 3 twice at 0.5 seconds intervals. As a result of these actions, the card will return to its standard operation.

4.3. SETTING RELAY TIME

In this process, it is set how long the relay will remain active when there is a detection. This feature cannot be used in serial mode. Follow the steps below to set the time.

- Disconnect the TCM card from power.
- Press the **TIME** button on the card and energize the card while you hold down the button.

- A beep will come from the buzzer on the card. After this stage, take your finger off the button.
- The card has entered the time adjustment mode.
- The buzzer will sound once a second. By counting this sound, you can adjust how long the relay stays active. When you reach the time you want, you can save the time by pressing the **TIME** button again.
- The maximum time to set is 25 seconds. Over this time, the system is automatically set for 25 seconds and the card exits the time adjustment mode.
- If **you want to reset the time, you** must enter the time setting mode by performing the above operations from the beginning. While in this mode, you can reset the time by pressing the **CALIBRATION** button.

4.4. DELETING SENSORS FROM MEMORY

You can delete a sensor that you do not want to use from memory in 2 ways. The first method is to delete by showing a metal object to the sensor, and the second method is (wipe) hardware reset.

NOTE: When you reset the receiver to factory settings hardware, the sensor will not receive information that it has been deleted. For this reason, cut off the energy of the sensor, hold down the button on it and re-energize it. When the LEDs on the sensor flashes 4-5 times, you can take your finger off the button of the sensor. With this method, the sensor will also be restored to its factory settings and reset, waiting to be taught to a receiver again.

4.4.1. DELETING WITH SENSOR

- Disconnect the card from power.
- Press the REGISTER CLOSE button on the card and hold it.
- Re-energize the card.
- The buzzer on the card will beep and become silent. After the buzzer is silent, take your finger off the button.
- The buzzer will start beeping at one second intervals. This is the deletion mode. Within 10 seconds, press the numbered button of the sensor you want to delete. (For example: If you want to delete the 2nd sensor, you need to press the button number 2).
- After pressing the corresponding button, the sensor LED with that number will remain lit. At this stage, you need to show a metal object to the sensor. In this way, the sensor will send a data to the receiver card.
- When data is received from the sensor within 25 seconds, the receiver will send the deletion information to the sensor and perform the deletion process on the receiver and sensor.

Thus, the receiver will delete the information of the corresponding sensor from its memory. The sensor will also become inactive and ready to be taught to the same receiver or another receiver.

4.4.2. HARDWARE DELETE

- Disconnect the card from power.
- Press the REGISTER OPEN button on the card.
- Re-energize the card.
- The buzzer on the card will beep and become silent, followed by a beep 4 times.
- With this step, the receiver card has been restored to factory settings and all sensors have been deleted. You can release the button.

With this method, the receiver will delete all the information belonging to the sensors in the card memory. However, the sensors will not have received the information that they have been deleted. When you apply this method, you need to do the hardware delete process for the sensors. For this reason, cut off the energy of the sensor, hold down the button on it and re-energize it. When the LEDs on the sensor flashes 4-5 times, you can take your hand off the button of the sensor. With this method, the sensor will also be restored to its factory settings and reset, waiting to be taught to a receiver again

4.5. OPERATION WITH REMOTES

The TCM receiver card operates in harmony with the **ROLAN series** remotes produced by Kontal Elektronik. To control the receiver card with a remote control, you need to register a ROLAN series remote to its memory. The maximum **memory of the receiver is 500 remotes**. When used with a remote control, you can get output from the RELAY REMOTE terminals, which is the 2nd Relay of the system.



In order for the operations described below to be performed correctly, ROLAN remotes must be programmed with the LCD CODER device purchased by your company or the code must be assigned by our company (ROLAN MK models). The system can **ONLY LEARN REMOTES WITH THE SAME RECEIVER CODE**. In other words, you cannot teach a remote with a different code with that receiver to that receiver.

(More information on: <https://www.kontal.com/en/product/codder/>)

4.5.1. REGISTERING REMOTES

You need to do the following steps to register a remote to your receiver card.

- Make the power connection of the receiver card.
- Press the REMOTE button on the receiver card.
- The buzzer on the receiver card will beep and the REMOTE-CONTROL LED will remain lit.
- At this stage, take your hand off the button and press the relevant button of the remote you want to register.
- The LED on the receiver card will flash 2-3 times and the buzzer will beep 2-3 times and continue to beep.
- You have successfully completed the remote teaching process.
- If you want to teach another remote, you can continue the teaching process by pressing the relevant button of the new remote before the buzzer is silenced.
- To exit this mode, either wait 10 seconds or you can press the button of the remote you have previously taught the system. In this way, the buzzer will be silent and the LED will turn off. The process of exiting the mode will be successful.

When the button of the taught remote is pressed, the REMOTE-CONTROL LED will light up and the relay will output. After staying like this for about 0.5 seconds, the LED will turn off and the relay output will be cut off.

4.5.2. DELETING THE REMOTES FROM TCM CARD

You need to do the following steps to delete the controls on the receiving card.

- Disconnect the receiver card from power.
- Press and hold the REMOTE button on the receiver card.
- Make the power connection of the receiver card.
- The buzzer on the receiver card will flash 2-3 times and the REMOTE-CONTROL LED will flash 2-3 times.
- After this stage, you can take your finger off the button.
- The receiver has cleared all remotes in its memory.

If you have taught a company code (coded with LCD Coder) to your ROLAN series remote control, the remote control you will teach to the receiver card again must be one of your remote controls with a company code. In other words, after a company code is assigned to your system, other company codes or MK coded remote controls cannot be used in that system.

5. USING THE TCM RECEIVER CARD IN SECURITY MODE

The mode in which we can use the TCM card in connection with both the wireless vehicle detector and the remote control is called **SECURITY MODE**.

In order to activate this mode, you need to remove the jumper hats on J1 and J2. When this mode is selected, the system will output via the **RELAY REMOTE** relay only. The RELAY LOOP will always be in a passive state, which means the system will operate with only one relay. When a vehicle is detected by one of the open sensors, the control detection is active for **120 seconds**, and when the open command comes from a remote control registered in the system, the RELAY REMOTE output of the TCM card will output for approximately 0.5 seconds. At the end of 120 seconds, even if the open command comes from the remote, the system will not give an exit.

If the receiver card is operating in serial mode, the command to close will terminate the remote's active time when one of the close sensors send the signal. In order for the system to be active again, an opening command must come from one of the open sensors.

6. SENSOR BATTERY STATUS INFORMATION

When the battery of a sensor registered to the TCM card falls below the specified level, the sensor sends **battery low** data. In this case, the relevant LED of the sensor on the TCM card and the buzzer on the card give a **warning 5 times** and become inactive.

If the sensor's battery has reached the level of running out, it sends the data that **the battery is running out** to the receiver and the relevant LED of the sensor on the TCM card turns on and off, and the buzzer beeps **continuously**. In this case, you need to replace the battery of the sensor. After replacing the battery, you can return the system to its previous operating state by pressing and holding the TIME button on the TCM receiver card for 0.5 seconds.

If you do not want to hear the buzzer sound on TCM, you can prevent the card from giving an audible warning by removing the BZR jumper hat.

7. USAGE AREAS

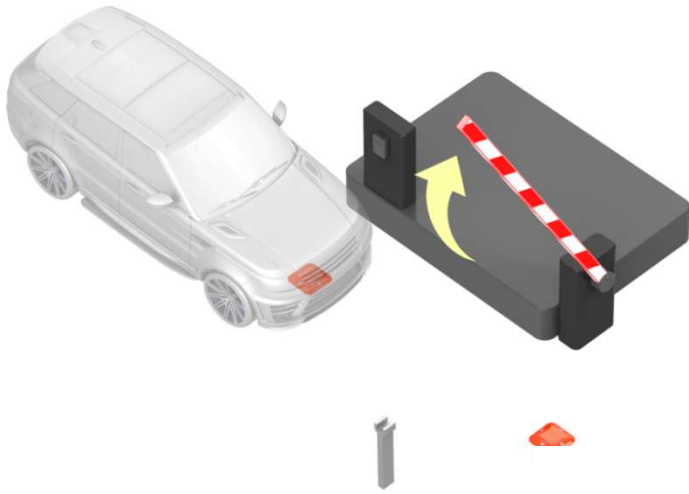


Figure 4 – Use in Arm Barrier

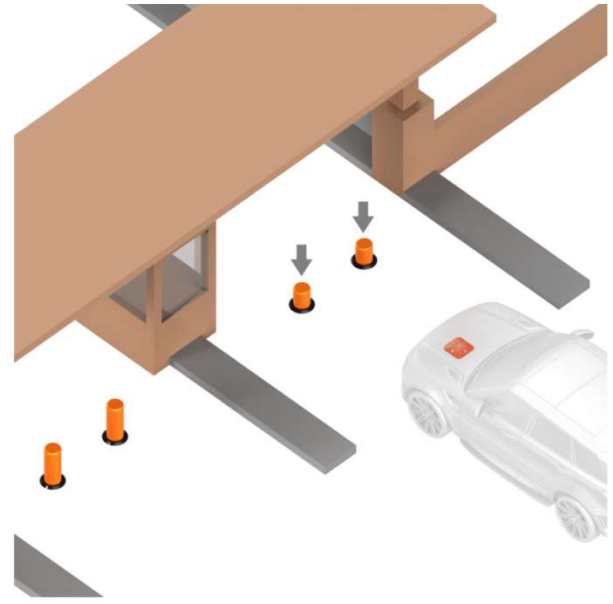


Figure 5 – Use in Bollard

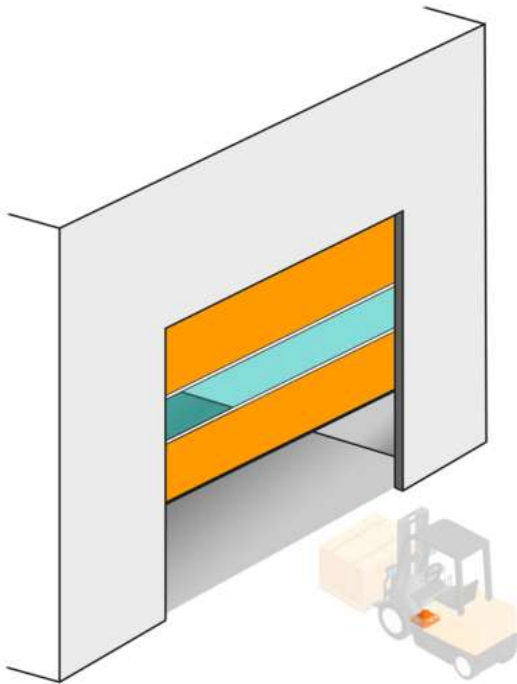


Figure 6 – Use in Shutter

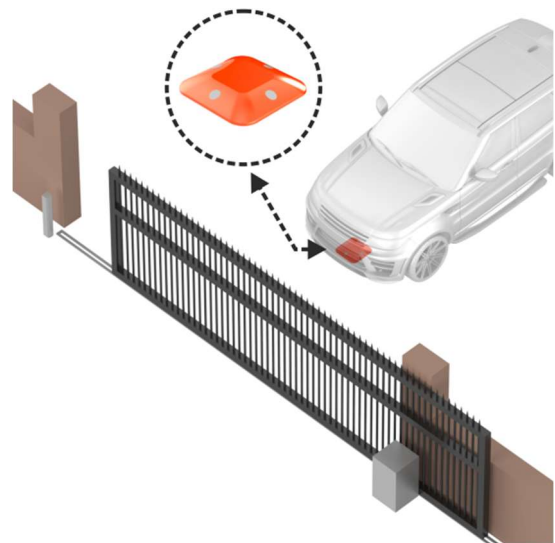


Figure 7 – Use in Swing Door

Wireless vehicle detector is a product that can be used wherever there is a vehicle entrance and exit. It is frequently used in barriers, swing doors, bollards and shutters. By using **GAF (K008-01)**, one of our company products, the doors in these three areas can be easily controlled.

8. CONNECTION DIAGRAM

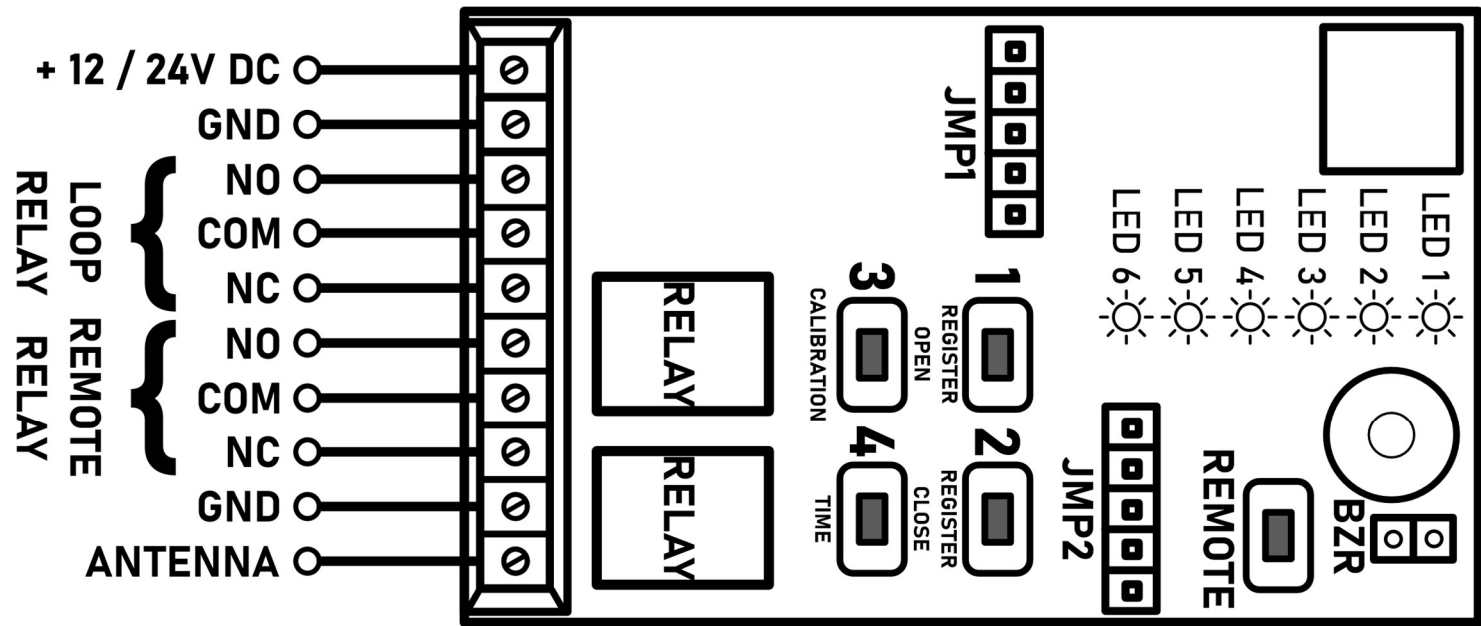


Figure 8 - TCM Connection Diagram



Make sure that the TCM controller mount is not more than 2 meters.

9. INSTALLATION



Before registering a transmitter sensor on your control card, install your products (transmitter sensor) in the places where you will use them. During the recording process and after recording, the position of the transmitter must not change or be moved. The sensor that has moved in any way must be recalibrated from the calibration menu.

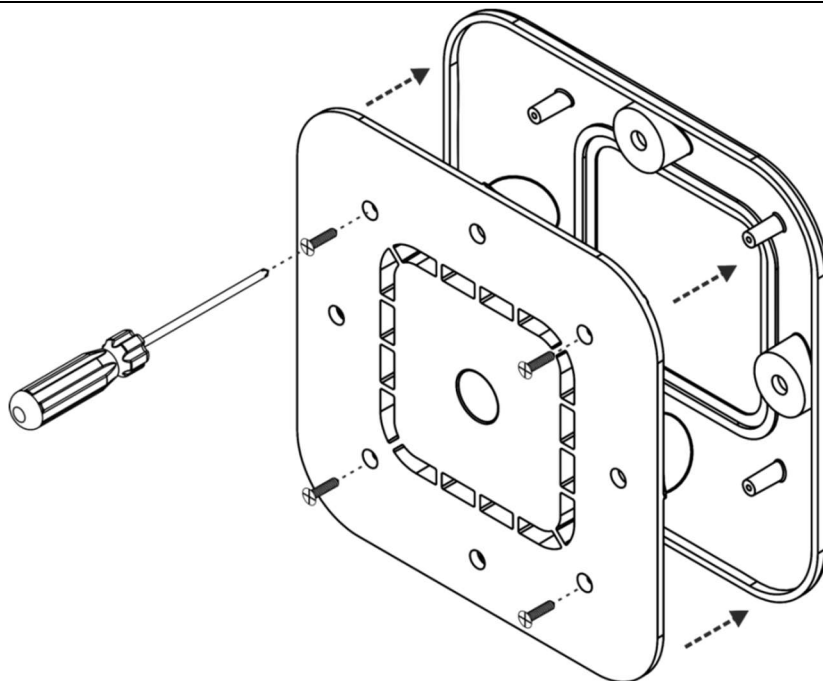


Figure 9 - Opening the top plastic with the help of a screwdriver

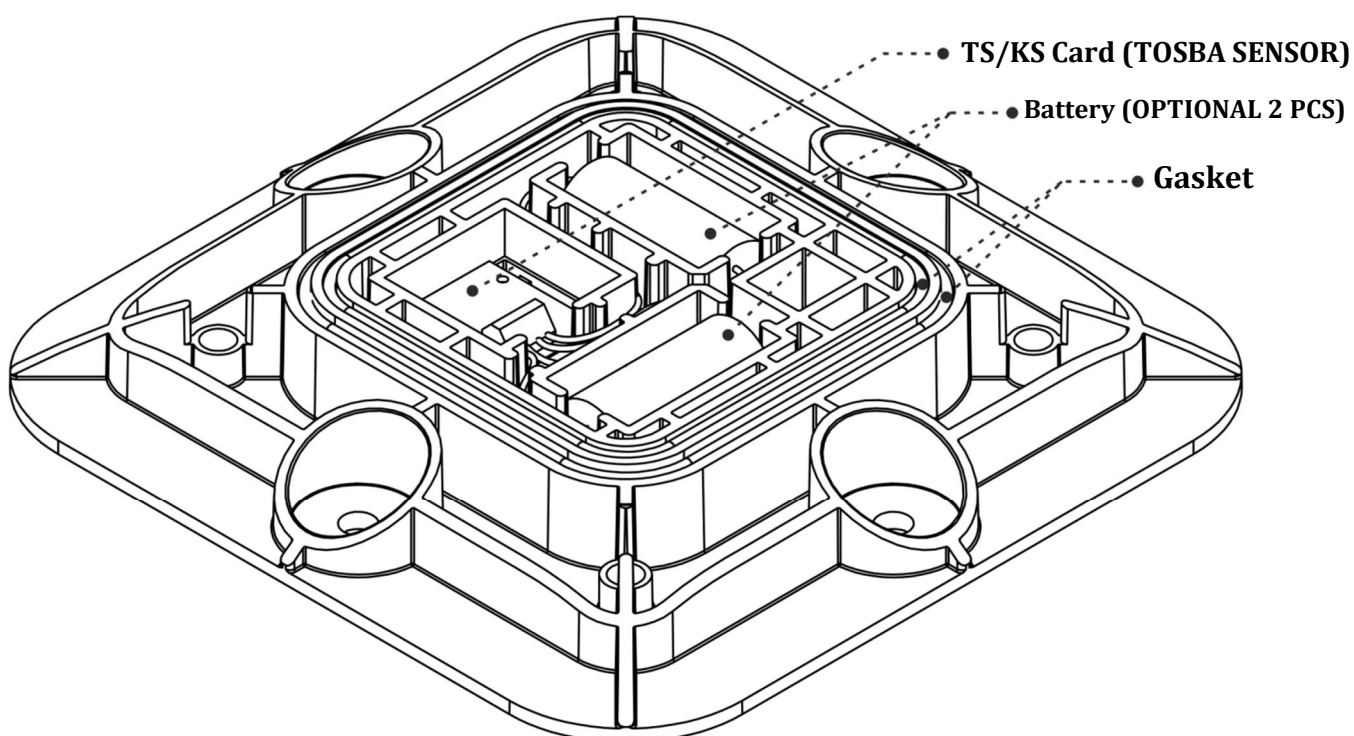


Figure 10 - TS board internal structure



Make sure your TS card has its gasket installed to prevent water leakage.

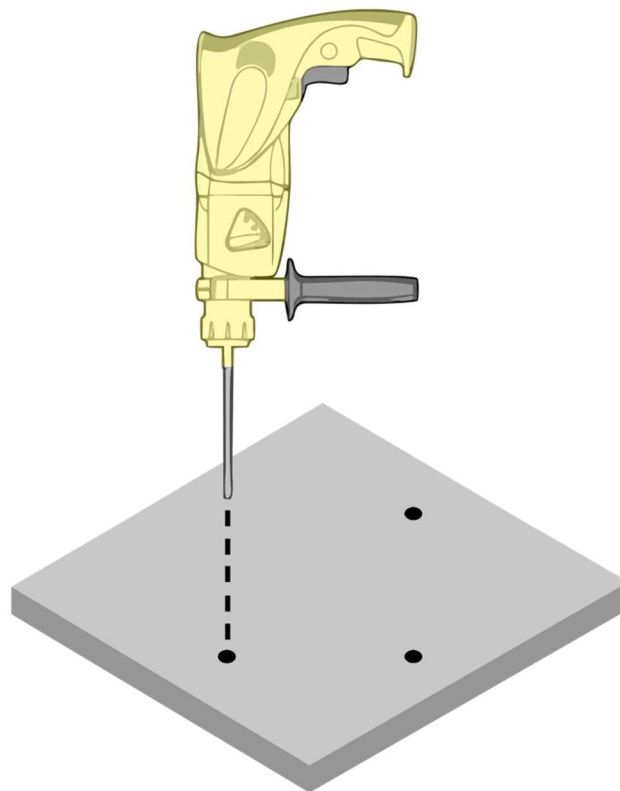


Figure 11 - With a drill, 10 mm diameter 105 mm long metric screws and 16 mm diameter dowels will be drilled into the asphalt floor.

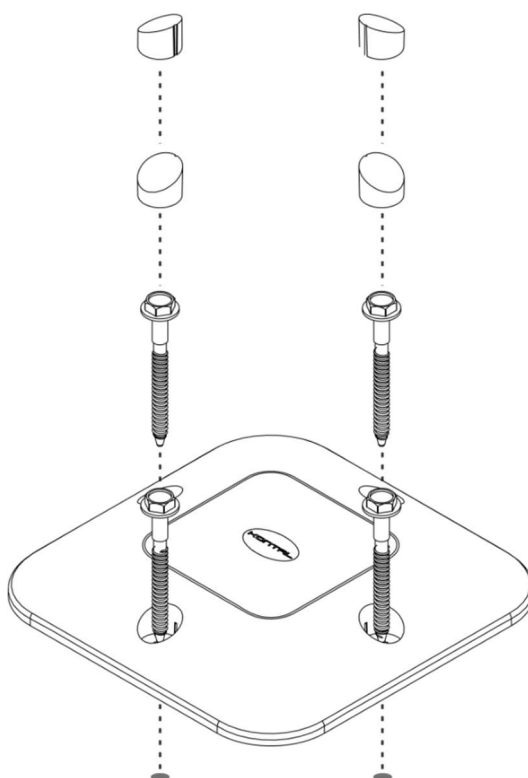
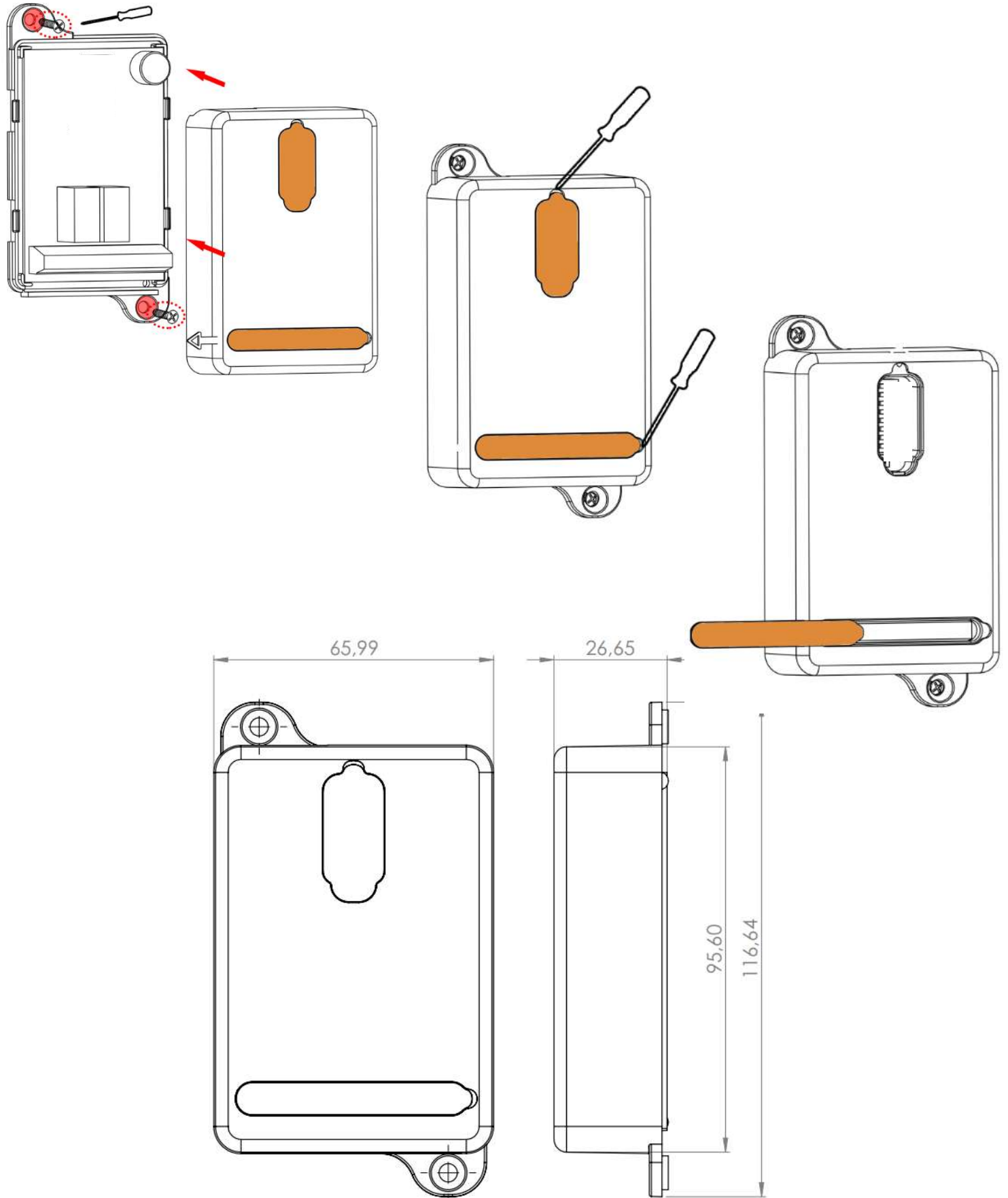


Figure 12 - The assembly will be completed by attaching screws and protective plastics.



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