810 BT 820 BT 830 BT 840 BT

**TECHNICAL** DESCRIPTION



## **GSM-CAR ALARM**

# UNLIMITED AUTOM BILE CONTROL

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### Alarm description



### Alarm description

### **Preliminary introduction**

The alarm was designed for the following purposes:

- · For protecting a vehicle from theft while it is parked and from hijacking while it is being operated on the road.
- For notifying the vehicle's owner that the alarm has been triggered while in parking.
- For providing the vehicle users with the possibility of remotely starting and shutting down the engine to warm up or cool down the interior (optional feature, may require ESM-250 remote start module).
- For locating the vehicle and for viewing vehicle's tracks and travel history on the map (an optional GPS/GLONASS-270 module is required). The alarm comes with the integrated GSM modem which provides full control over the vehicle and the alarm itself via the special mobile application Prizrak (available at the App Store and Google play), telematic web service «Prizrak Monitoring», phone call, SMS messages. Vehicle owner's authentication is verified by carrying the Key-ID tag, Slim-tag, Smartphone tag (Bluetooth Smart technology) in the vehicle's range and/ or by entering PIN code with vehicle's original buttons. The alarm is equipped with the embedded tilt/displacement and shock sensors and it may be upgraded with optional external sensors. 2CAN technology makes it possible for the alarm to simultaneously operate with two CAN-buses at the same time, improving the alarm functionality for some vehicles. Web-application-Integrator (https://int.tecel.ru/) contains information

on the alarm compatibility with specific vehicles, and the list of vehicles compatible with the alarm as well as the information on peculiarities of

Main advantages of the alarm:

vehicle functionality.

- the alarm may be controlled with vehicle's standard remote key, KeyID-tag, mobile phone and with standard vehicle's buttons;
- remote and automatic engine start;
- there is no need to hide a spare key inside the vehicle to remote start it (not available fore all cars, see Integrator to check the feature availability for a specific vehicle).

### Prizrak 8xx/BT series new features:

- Short range radio channel based on Bluetooth 4.2;
- Habitual radio tags Key tag «Key-ID» and Slim-tag support Bluetooth Smart (2.4 GHz radio channel based on Bluetooth 4.2);
- Settings of the main alarm unit can be adjusted via Bluetooth (special TEC-prog USB-Bluetooth adapter required);
- Any 8xx/BT series car alarm can be upgraded with radio tags;
- The default settings for the authentication method in Prizrak-810 and Prizrak-820 have been changed. Once radio tags have been
  registered into the alarm, they can be used for authentication without having to perform additional adjustments;
- The HCU-230 hood compartment module is now controlled via Bluetooth (there is no need to route wires into the engine compartment anymore);
- Integrated diagnostic system based on OBD II protocol (diagnostic can be carried out via the smartphone app);
- Intelligent system for erasing diagnostic trouble codes that appear after triggering the engine blocking, after remote starting the vehicle's
  engine or engine heater;
- Dual SIM card compatibility (only for 4G systems);
- Supports the broadband cellular network technology of the fourth generation 4G (only the systems with 4G GSM modem).

### Terminology

GSM code: the code is used in oder to get a vehicle registered in the mobile app «Prizrak», telematic Web service «Prizrak monitoring» and for controlling the alarm via phone calls or SMS.

User's personal GSM code is located on the plastic card under the protective film. GSM code may be changed by the alarm user during day-byday exploitation (via the mobile app or a phone call). The temporary GSM code «1111» was designed for installation and adjustment convenience. It is valid before a vehicle has travelled 10 km after the alarm installation. Thereupon, the system will request to enter an unique user's GSM code.

Programming button. The programming button is used for entering the PUK code, for adjusting various alarm features and etc. It is allowed to use as the programming button:

the embedded Key-ID button.

one of the vehicle's factory buttons. In most vehicles the button is assigned automatically, but it may also be programmed by an installer.
 Radio tag (Key-tag «Key-ID» and/or Slim tag): an electronic key that must be always carried around when operating a vehicle. Key-ID tag is destined for comfortable use in combination with OEM smart key and is securely protected against intellectual hacking. Slim tag has miniature dimensions and is designed to be kept together with vehicle's documents.

Authentication. Authentication is a procedure for verifying wheather a vehicle owner is authorized to drive the vehicle or not, to be more specific it is a radio tag and/or PIN code identification. Radio tag and PIN code are two independent authentication contours, to disable each contour – two different authentication procedures should be carried out. CDL – central door locking system.

### **Optional equipment**

The use of an optional equipment provides new possibilities and allows to enhance security and comfort level during the vehicle exploitation. Hood compartment unit HCU-230 – was designed for controlling the aftermarket electromechanical hood locks via an encoded communication channel.

CAN-relay Implant 1A (2x3) – wireless engine locking relay. Data exchange between the main alarm unit and CAN-relay Implant is carried out over CAN interface – reliable connection is guaranteed even at the strongest interferences in airwaves.

Autoscanner CheckControl: the CAN relay immobilizes a vehicle either via a special CAN bus command or by cutting a low-current electrical circuit; by shunting the vehicle's sensors.

GPS/Glonass-270 module – provides accurate vehicle location. If this module is not connected to the main alarm module - the current vehicle location is determined via LBS (Location-based Servises). The vehicle location is determined based on the signals of the closest cell-phone towers. The alarm detects a signal from the nearest cell-phone tower and displays the vehicle location near that tower (this doesn't provide an accurate location).

Key-ID tag (Bluetooth Smart) – equipped with the embedded button which can be used to lock/unlock the vehicle's central door locking system and the vehicle owner authentication. The embedded button can also be used as the programming button, assuming that this feature was properly set up.

Slim tag (Bluetooth 4.2) – is used for vehicle owner authentication. It is possible to purchase optional radio tags for Prizrak-810/BT or Prizrak 820/BT.

Hood compartment unit HCU-230/BT (Bluetooth) – was designed for controlling the aftermarket electro-mechanical hood locks and the other equipment located in the engine compartment. Bluetooth technology allows to avoid running the alarm wires from the cabin into the engine compartment.

### Upgrading the alarm with optional radio tags

Any alarm modification from the 8xx/BT series can be equipped with optional radio tags. It is possible to program up to 8 radio tags into one alarm unit. A radio tag can be used for authentication right after it has been registered into Prizrak-810/BT or Prizrak-820/BT, no additional adjustments required.

Prizrak-800 Style doesn't support a vehicle owner authentication with radio tags, though the alarm functionality can be improved by equipping it with optional tags. The Table Nº2 shows the alarm functionality before and after equipping it with optional radio tags.

Table 1	The alarm func	tionality com	narison table	before and a	after adding	ontional	tans
Tubic 1.	The alarminute	tionality com	parison table	before and a	and adding	optional	luys

Alarm features	Prizrak-800 Style	Prizrak-810/820	Prizrak-830/840
Authentication with radio tag	$\mathbf{O}/\mathbf{O}$		₽∕₽
Vehicle locking/unlocking with Key-ID tag			
Radio tag serch for «Disarming confirmation after unlocking the vehicle with OEM remote»	$\mathbf{O}/\mathbf{O}$		₽∕₽
CDL unlocking blockage when radio tag is not in range	$\Theta/\Theta$		₽/₽
«Free hands» during remote start mode operaton			₽∕₽

One radio tag can't be registered into several alarm modules at the same time.

### Mobile application «Prizrak»

The mobile application «Prizrak» – is a software designed and developed for managing the vehicle security system «Prizrak». The software allows registered users to obtain all important information about the vehicle state from the screen of a smartphone and provides convenient control over the alarm features from virtually anywhere: remote starting the engine, arming/disarming, locking/unlocking, adjusting the shock and tilt/displacement sensors, locating the vehicle and etc.

The mobile app «Prizrak» is available for download in the App Store and Google Play.



1. Authorization

 $\widehat{\mathbf{U}}$ 

PRIZRAK

3. Confirmation



an e-mail.



Log into an exisiting account of the Prizrak

system or web service Prizrak monitoring.

You can create a new account if you don't

have one yet using your cellphone number or

Scratch off the protective slip on the plastic card

secret GSM code, enter the four-digit code in the

supplied with the Prizrak system to reveal the

app to register your vehicle.

Free mobile application

In case if your smarthone is not equipped with QR code scanner – type in the search bar (Google Play or App Store) application name – Prizrak.

### Getting your vehicle registered into the mobile app «Prizrak»

#### 2. Users' access



Type in the number located under the bar code of the plastic card supplied with the Prizrak device or scan the bar code using your smartphone's camera. Tap the link «I don't have a card» if you don't have one and follow further the instructions.

### 4. Completing the registration



Give your vehicle a name (any name). You may select a color for the app interface and upload a photo. Press the button «Continue» to complete vehicle registration.

### Telematic service «Prizrak monitoring»

The telematic web service «Prizrak monitoring» allows analyzing vehicle's trips and events occured duaring a selected period of time: view the vehicle's tracks, fuel consumption, various events.

### **Control via SMS**

It is possible to control your alarm via text messages of the following format:

Access code∗Command№#Parameter.

Access code – a code to access the system.

Command  $N^{\underline{o}}$  – a command code of the voice menu.

Parameter - it is used in addition to some commands when necessery.

For example: 1111\*822# (this is the command to disarm the alarm; in this example the access code is the factory code «1111»).

### **Control via phone call**

The alarm functions can be managed via phone call. Ability to control the alarm via the voice menu may be very helpful in case if the system temporarily loses the internet connection and it is not possible to use the mobile app as well as if you don't use smartphones at all.

### Smart voice menu structure



### Alarm system operating algorithms

### Arming/Disarming

To arm the alarm press the OEM remote lock 🔒 button or lock the doors with keyless entry system, or twist the car key in the driver's door lock cylinder into locked position. The alarm will warn you of its arming by one siren chirp and LED will flash. After a while the LED flashes will become less frequent in order to save car's battery energy. To disarm the alarm press OEM remote unlock 🕏 button, or unlock the vehicle with keyless entry system. The alarm will emit 2 siren chirps, LED will fade. It is also possible to arm/disarm the alarm with the Key-ID tag button. Automatic rearming

The alarm will automatically rearm 1 minute after disarming via phone or Key-ID tag if all doors, hood and trunk remained closed. If a vehicle has been disarmed with OEM remote key then the «automatic rearming» operates according to the vehicle manufacturer algorithms. The «automatic rearming» function is very convenient when a vehicle has been disarmed unintentionally. The function is disabled by default (see Menu 2. «User functions configuration»).

### Open compartment warning

If you have left a door, hood or trunk opened and armed the alarm, it will warn you with 3 siren chirps. LED will inform you of what exactly you have forgotten to close by a certain number of flashes:

- Two flashes the hood is opened.
- Three flashes the trunk is opened.
- Four flashes the door (doors) opened.

The alarm can not monitor penetration into a car through an unclosed compartment. It is possible to just close the opened door/s (hood, trunk) without disarming and re-arming the vehicle, and then the alarm will automatically take that compartment under control.

### Alarm triggering

The alarm is equipped with two built-in digital sensors: shock and tilt/displacement sensors. Through these sensors the alarm reacts to such external impacts as shocks, bumps and vibrations or attempts to tow a car away. An optional sensor may be connected to the alarm if needed (multiplex or standard one).

While in armed mode the alarm responds to impacts in two ways: warning and alert. Warning is triggered if shock sensor has been slightly impacted. In this case the siren will chirp several times.

Alert will trigger if any door, hood or trunk has been opened, when the tilt/displacement sensor has been triggered and when the shock sensor has been hardly impacted.

Meanwhile the alarm will go off and hazard lights will flash during 30 seconds.

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### The sensors sensitivity can be adjusted in the mobile app or via phone call.

#### Automatic annoyance override

In case if the alert has been triggered from one of the sensors three times within an hour – the alarm will start ignoring that sensor. The alarm will start responding to that sensor if only there is no any impact on that sensor within the next hour. This function cancels the alarm panic, but not the warning signals.

### Diagnosing the alarm triggers when disarming

The alarm will send you an SMS message or call you (depending on the chosen setting) to notify you about the reason why the alarm panic has triggered.

The trigger history is also available in the mobile app «Prizrak», web-service «Prizrak monitoring» and in the intelligent voice menu.

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The intelligent voice menu provides more detailed information on the alarm trigger history.

When disarming, there will be 4 siren chirps and LED will start indicating the alarm trigger causes in case if it has been triggered (see Table 2).

### Teble 2. Alarm trigger memory

LED flashes	Alarm trigger reason
- <u>₩</u> x1	«Automatic annoyance override» feature triggered
<u></u> 逝 x2	Hood opened
<u>峃</u> x3	Trunk opened
<u>ﷺ</u> x4	Door (doors) opened
<u></u>	Shock sensor triggered (alert)
<u>尚</u> x6	Shock sensor triggered (warning)
<u></u>	Tilt/displacement sensor triggered
<u></u>	Additional sensor triggered (alert)
<u>峃</u> x9	Additional sensor triggered (warning)

#### Arming with sensors exclusion

There are situations when disabling the siren sound is preferable when alarm is triggered from sensors. To disable the sensors:

- 1 Arm the alarm.
- 2 Not later than in the next 3 seconds press the OEM remote lock button , the siren will emit a long intermittent sound then after a pause one chirp the warning mode is disabled. The alarm will not be reacting to slight impacts on the vehicle.
- 3 Not later than in the next 3 seconds press the OEM remote unlock button 🖨, the siren will emit a long intermittent sound then after a pause 2 chirps all sensors are disabled.

### Releasing the trunk without disarming

The trunk lid can be released with the OEM remote or keyless entry system while the alarm is armed. While the trunk is being opened the alarm quits reacting to the sensors, but will still monitor doors so the vehicle remains secured from intrusion. As soon as the trunk is closed, the system takes it under control and re-enables all sensors.

#### «Beach mode» function

The function is convenient in summer time when the car owner is having rest at the beach and is afraid to carry around the car key, radio tag and smartphone because they may be stolen or lost. A car owner may leave all those belongings inside the car. For vehicle locking/unlocking is used a secret code which is not set by default and is subject for assigning by an installer. The code is entered with one of the vehicle's exterior button such as keyless entry system buttons located on the door handles (if available), trunk lid buttons or with an additionally installed button (see page 27).

### Radio tag search for disarming confirmation

If this feature is enabled the alarm performs the radio tag search each time the car is unlocked with factory remote key or keyless entry system and it will fully disarm if only the alarm has detected the radio tag.



The radio tag search is performed 30 seconds after arming the alarm. The alarm emits intermittent beeps while the radio tag is being searched. The alarm will trigger in 10 seconds after opening any door, hood, or trunk if the radio tag is not detected in range of the vehicle. If the alarm has triggered, turn the vehicle's ignition ON and complete the authentication procedure in order to switch off the siren and disarm the alarm system.

### Vehicle's CDL unlocking blockage if radio tag is not in range (protection against Relay Attack)

The function will not allow a would-be-thief to get access into the vehicle using Relay Attack equipment that retranslates the original signals of vehicle's factory remote key. This feature will also block access into the vehicle if the original car key has been stolen (If the vehicle is equipped with aftermarket pin door blockers). The vehicle's doors will unlock if only the system detects a tag in range of the vehicle.

### Remote starting the engine and controlling the engine heater

The alarm provides the possibility of automatic and remote start of a vehicle's engine or an engine pre-heater.

This feature makes the vehicle expluatation more comfortable-you will always be able to warm up or cool down the vehicle interior beforehand. Moving off with warm engine decreases the engine wear and extends its service life.

The vehicle can be remote started by sending a command via phone or automatically, depending on settings of automatic engine start.

There are several methods to remote start a vehicle: via the mobile app, via phone call, SMS message, from the vehicle's original remote. Depending on the engine temperature, battery voltage settings, pre-selected time and days of the week, the system can start the engine automatically (e.g. for 15 minutes every 3 hours).

In order to remote start the vehicle or engine pre-heater press the «lock» , button 3 times on the vehicle's smart key. Time interval between the button presses shouldn't exceed 3 seconds. The feature is available in 15 seconds after arming a vehicle with factory smart key. If you made a mistake – take a 5 second pause and try again.

To shut down the engine or engine pre-heater with vehicle's smart key repeat the same «3-x lock» 🔒 procedure.

### Getting a vehicle ready for the remote start

- 1 Park your vehicle in an open area.
- 2 Adjust the most convenient climate system operating mode for worming up or cooling down the vehicle's cabin.
- 3 Set the gear shift lever to P (Parking) if your vehicle equipped with AT (Automatic) transmission and shut down the engine. Enable the «Remote start ready» mode for vehicles equipped with the manual transmission.
- 4 Arm the vehicle.

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#### Enabling the remote start ready mode (only for MT vehicles)

- 1 When the vehicle is completely stationary and the engine is running press and hold the brake pedal.
- 2 Engage the parking brake.
- 3 Release the brake pedal.
  - Take the car's key out of the ignition switch, the engine should keep running.

Skip the step Nº4 if the vehicle is equipped with the engine start/stop button.

- 5 Depending on the settings for enabling the Remote start ready mode:
- exit the car and close the driver's door (all doors as well as hood and trunk should remain closed), the engine will shut down;
- arm the vehicle, the engine will shut down.

The «Remote start ready» mode will be cancelled if after enabling it, any door, hood or trunk is opened. The remote start ready mode should be re-enabled to be able to remote start the vehicle.

### Unlocking/Locking while the vehicle is running via remote start

Some vehicles don't react to the factory smart key commands while the engine is running. In such cases, to unlock or lock the vehicle's doors you may use:

- the integrated button of the Key-ID tag.
- · the «Free hands» feature (vehicle automatic unlocking/locking when a radio tag is in range).
- mobile app «Prizrak».
- control via phone call or SMS.

### Driving off while the engine is running via remote start

Perform the following actions depending on a vehicle: Vehicles with the engine start/stop button and automatic transmission (if the remote start wiring is connected to the engine start/stop button and the brake pedal).

- 1 Open the driver's door while the vehicle is running via remote start;
- 2 Press and hold the brake pedal.
- 3 Shift the gear lever to «D», «R» or «N». Hazard lights will flash 3 times.
- 4 Complete an authentication procedure. Wait until the confirmation trill sounds and start driving.

Vehicles with engine start/stop button and automatic transmission (if remote start wiring is connected to high current circuits of the car): Push the start/stop button required amount of times to switch on the ignition (this doesn't work on all vehicles). Vehicles with engine start/stop button and manual transmission:

- 1 Unlock the vehicle while it is running via remote start.
- 2 Press and hold the brake pedal (if you release the brake pedal the engine will shut down).
- 3 Release parking brake. Hazard lights will flash 3 times.
- 4 Complete authentication procedure. Wait for confirmatory sound and start driving.



If you have released the brake pedal and the engine has shutdown before switching the gear lever/releasing the parking brake, wait until the remote start ready mode is cancelled (in approximately 5 seconds the hazard lights will flash 3 times), turn on the ignition by pushing the Start/Stop button, carry out authentication and start driving.

Vehicles with classic ignition switch (the transmission type is not important):

- 1 Unlock the vehicle when the remote start mode is running:
- 2 Insert the car's key into the ignition switch without applying on the brake pedal and twist the key to the «IGN» position.
- 3 Press the brake pedal. Hazard lights will flash 3 times.
- 4 Complete authentication procedure. Wait for confirmatory sound and start driving.

### Immobilizer

Immobilizer – the anti-theft feature was designed for protecting the vehicle from carjacking while in parking. The immobilizer feature enters the «Guard» mode if the ignition has been switched off for more than 3 sec. Once the feature has switched to «Guard mode» – it is required to complete an authentication procedure (see Table 3 «Authentication methods») otherwise the vehicle will be immobilized:

- the vehicle will be immobilized after attempting to drive away without authentication (if «Speed monitoring» function is enabled and is supported by a particular vehicle. Check this function in the Integrator);
- the vehicle will be immobilised in 5 seconds after the ignition is switched on if the «Speed monitoring» feature has been disabled or is not supported by a particular vehicle.

### AntiHiJack

AntiHiJack is a feature designed for protecting a vehicle from hijacking while it is being operated on the road and while it is parked. AntiHiJack enters the «Guard» mode in the following situation:

- The ignition has been off for more then 3 sec. (if Immobilizer feature is disabled, if Immobilizer is enabled the alarm follows the Immobilizer feature algorithms).
- The driver's door has been opened.

After switching to Guard mode, AntiHiJack function sequentially passes through several phases, and if it is not deactivated by a radio tag and/or PIN code-the vehicle will be immobilized. Phases are shifted just only while the ignition is ON. After switching the ignition OFF, the alarm remembers the last phase of the AntiHiJack and the feature will continue to operate when the ignition is switched back ON. The AntiHiJack may be deactivated in any phase and at any moment by carrying out an authentication procedure.

The «Guard» mode is divided into the following phases:

- Waiting phase;
- Warning phase;
- Engine locking phase.

Waiting phase. AntiHiJack in this phase follows two different algorithms-depending on possebility of «Speed monitoring».

The AntiHiJack waits until the vehicle covers a set distance starting from the moment of «Guard» mode activation if the «Speed monitoring» has been implemented and/or supported by a particular vehicle.

If «Speed monitoring» hasn't been implemented (disabled in the «Hardware configuration» menu) or is not supported by a vehicle, than the «Waiting phase» is devided into three stages:

- Waiting for the driver's door to be closed.
- Waiting for a preset amount of brake pedal applications.
- Pause before shifting to «Warning» phase.
- Warning phase is devided into two stages.
- · Vehicle's driver warning about necessity to enter PIN code.
- Warning the other drivers on the road of possible dangerous situation by flashing the vehicle's hazard lights (during 10 seconds) due to
  upcoming vehicle immobilization.
  - The warning beeps will keep informing the driver about necessity to enter PIN code.

*Engine locking phase*. the engine locking is triggered, the alarm beeper emits warning beeps and the alarm switches on the hazard lights. The warning beeps and hazard lights will switch off in 15 sec. AntiHiJack remains in engine locking phase until a PIN code is entered.

If «Engine blocking at a safe speed» is enabled — the engine will only be blocked when the vehicle's speed drops below 30 km/h or after it comes to a complete stop, this depends on the settings of the «Engine blocking at a safe speed» feature.

The «Engine blocking at a safe speed» feature reduces the possibility of road accidents when the AntiHiJack is triggered.

After switching the ignition off the alarm disables hazard lights and driver audio warning signals. If Immobilizer function hasn't switched into the «Guard» mode (see the Immobilizer feature section) then after switching the ignition ON — hazard lights and driver audio warning signals will be activated for 15 seconds. Herewith, AntiHiJack allows starting the engine, but prevents vehicle driving according to the same algorithms as the Immobilizer feature does.

If the Immobilizer feature has switched into the «Guard» mode – then after turning the ignition off, AntiHiJack will stop its operation and the alarm follows the Immobilizer feature algorithms.

### Gas pedal locking (forced stop)

The feature will immobilize the vehicle if AntiHiJack is triggered, considering the settings of the «Engine blocking at a safe speed». To implement this function it is obligatory that the vehicle supports the «Speed monitoring». At the end of Warning phase, if vehicle speed hasn't increased within 5 seconds or brake pedal has been pressed within 3 seconds – the gas pedal lock will be triggered for 2 sec. and then disabled for 5 seconds. This can be repeated for 5 times. Every time gas pedal lock triggers – time duration for which the gas pedal locking will be released, reduces for 1 second. After the 5-th time the gas pedal lock will be permanent.

It is a must that for «Gas pedal locking» function operation the «Safe engine locking» function to be enabled.

### Immobilizing a vehicle by imitating the engine Start/Stop button push

The feature has been developed for vehicles equipped with the Start/Stop button (Push-to-Start button). This anti-theft feature allows to shutdown the engine by imitating the Start/Stop button push, making the engine blocking very similar to a usual engine shutdown. To implement such engine locking the alarm output with the programmed feature № 57 («Immobilizing a vehicle by imitating the engine Start-stop button push») must be connected to a proper wire of the Start/Stop button. When a pulse signal is applied to that wire — the engine must shutdown.

#### **Operation algorithm:**

- 1 If the Immobilizer feature has triggered:
- For vehicles with A/T when the gear lever is shifted from «P» or «N» to «D» the signal is generated on the output until the engine shuts down.
- For vehicles with M/T when the vehicle starts moving the signal is generated on the output until the engine shuts down.
- 2 If AntiHiJack has triggered:

The output will generate the signal after the vehicle comes to a complete stop. If the alarm doesn't recieve the speed data from the CAN-bus, the vehicle's engine will be blocked according to the Immobilizer feature operating algorithms when starting the engine next time.

Settings of the options «Engine locking at a safe speed» and «Ability to start the engine before carrying out authentication» don't affect the operating algorithms of the «Immobilizing a vehicle by imitating the engine Start/Stop button push».



### Using a smartphone as a radio tag (except of Prizrak 800/Style/BT)

The alarm has a feature allowing to use a smartphone\* as a radio tag. To be able to use your smartphone as a tag, install the mobile application «Prizrak ID» and register your vehicle. The app may be downloaded from an official app platform depending on the operating system of your smartphone (IOS or Android). A smartphone that is going to be used as a tag has to be paired with the alarm system via the application «Prizrak ID». You may use your smartphone as the primary authentication method or as a backup method, e.g., if a radio tag is damaged, lost or forgotten somewhere. The authentication process using the smartphone is carried out the same way as the authentication with a regular radio tag. The mobile application has a useful feature: «Prizrak deactivation via smartphone only active when smartphone screen is unlocked» that has

been designed to keep the vehicle protected in case if the smartphone has been stolen. If enabled this feature will prevent authentication using the stolen smartphone until the smartphone screen is unlocked (e.g., graphical key, fingerprint, Face-ID).

The operating system of a smartphone may cancel activity of some applications (e.g. for energy saving reasons). If the smartphone has quit out of the app, or you have quit out of the app manually, tap on the Prizrak ID icon to reactivate it. This may not be convenient when AntiHiJack feature is triggered. It is recommended that you always have a regular radio tag with you.

### Pairing a smartphone with the alarm



Pairing is carried out via the mobile application Prizrak ID. The entire pairing (registration) process is accompanied with pop-up instructions. A secret Bluetooth code is required in order to pair (register) a smartphone with the alarm. The code is located under the

A secret Bluetooth code is required in order to pair (register) a smartphone with the alarm. The code is located under the protective film of the plastic card which is supplied with the alarm.

An installer is not allowed to scratch off the protective film of the Bluetooth code. However, the functionality of the smartphone tag mode can be checked during the installation process by using the temporary code which allows to register the vehicle in the mobile application Prizrak ID. The temporary code is valid until the vehicle travels 10 km after the alarm has been fitted to the vehicle. The "Prizrak ID" app will remind the car owner to delete a smartphone that has been registered with the temporary code.

\*A smartphone must support Bluetooth 4.2 with (BLE) technology. The software version of the smartphone shouldn't be lower than 6.0 for Android and 12 for IOS.

### Pairing (registration) sequence

Download and install the mobile app "Prizrak ID" on your smartphone. All further actions have to be performed inside the car:

- Switch the vehicle's ignition ON. Carry out authentication (see page 23).
- 2 Run the mobile app «Prizrak ID».
- 3 Give your vehicle a name (any name).



- 4 Enter Bluetooth code located on the plastic card and tap the button "Continue".
- 5 The list of all Key ID tags, Slim tags and smartphones paired with the alarm will appear on the screen (including smartphone tags with temporary access). You may delete all smartphone tags you are not planning to use in the future. Tap the button «Continue».
- 6 The Prizrak logo on your smartphone's screen means that the smartphone has been successfully paired.

### **Deleting smartphone tags**

Proceed to the "List of registered tags" in the mobile app Prizrak ID in order to selectively delete the smart-phone tags you're not planning to use in the future.

In case you don't use the mobile app "Prizrak ID" and you are not able to view the "List of registered tags" in the app, you may delete all paired smartphone tags from the alarm's memory in the special programming menu (see page 38).

### Radio tag (Key-ID tag and Slim-tag)

A radio tag\* – is an electronic key that a vehicle's owner must always carry around when operating the vehicle. The alarm will automatically detect a radio tag before the vehicle motion begins. There will be the confirmatory sound when a radio tag is detected.

There are two types of radio tags the system can operate with: Slim tag and Key-ID tag. The standard alarm set of Prizrak 830/BT and 840/ BT includes 2 (two) Slim tags, Prizrak 810/BT and Prizrak 820/BT are not supplied with radio tags.

Any Prizrak 8xx/BT series can be upgraded with any type of radio tags. No more than 8 radio tags can be registered into one alarm module. A radio tag can be used for authentication right after it has been registered into the Prizrak-810 or 820 alarm module. No additional adjustments required.

Unlike the Slim tag which was mostly designed for a vehicle owner authentication, the Key-ID tag has much wider functionality range. The Key-ID tag can be used not only to lock and unlock the vehicle's locks, but also to arm and disarm the alarm, this is very handy when the vehicle is running via remote start as some vehicles quit responding to the commands of their original remotes when the engine is running.

The embedded button of the Key-ID tag may be used as the programming button in order to make settings, enable/disable valet mode, enter a secret PUK code.



\* The radio tags validate a vehicle's owner by the dialog authentication principle. The Bluetooth Smart technology (2.4 Ghz radiochannel based on Bluetooth 4.2) is responsible for data transmission.



The Key ID tag and the Slim tag can operate simultaneously and complement each other improving the vehicle security level and allowing to retain control over the vehicle in case if one of the tags has been lost or stolen. For this purpose, the Key ID tag may be adjusted only for locking/unlocking the vehicle's doors and the owner's authentication will be carried out only via the Slim tag which should be kept in a secure place (wallet, vehicle documents and etc.). It is recommended to entrust adjustment of this feature to a professional installer.

### **Battery replacement**

Five short beeps following after detecting the tag by the alarm system mean that the battery of the radio tag must be replaced. CR-2032 battery type is used in the Key-ID tag and CR-2025 is used in the Slim-tag. Visit a workshop to have the radio tag battery replaced by an installer or do it yourself.



If the ambient temperature is below zero, batteries may perform worse due to retarding of chemical reactions inside the battery. It can make identification of radio tag more difficult, especially if it has been exposed to low temperature for a long time. To restore the battery performance just warm it up.



### **Authentication methods**

Authentication is a procedure of verifying whether the driver is authorized to drive the vehicle or not. Every time prior to driving, the authorized vehicle driver should have a special radio tag within the vehicle and/or enter a secret PIN code combination using the dash buttons, or steering wheel buttons. The authentication is carried out either after turning the ignition ON or after starting the engine. If the authentication has been completed successfully, the alarm's external LED turns off and the built-in buzzer emits the confirmation sound. A preferred authentication method can be easily set during the installation process without having to enter a secret PUK code. As soon as the vehicle has travelled 10 km after installing the alarm system, the authentication method can be changed only after entering the secret PUK code located on the plastic card supplied with the device. Futhermore, a long warning beep will sound every time after completing the authentication if duaring installation of the alarm the authentication method has been changed to «PIN code or tag». To disable the long warning beep, enter PIN code to confirm that you are familiar with it and are able to use it when needed.

### Table 3. Authentication methods

Authentication methods	Authentication methods description		
Tag (factory value for Prizrak-830 and Prizrak-840)	A tag must be in range		
PIN code*	Enter PIN code	Wait for confirmatory trill.	
Tag or PIN code (factory values for Prizrak-810	A tag must be in range		
and Prizrak-820)	If a tag can't be used, enter PIN code		
Tag and PIN code (three-factor authentication)	A tag must be in range. Enter PIN code	There should be two confirmatory trills. The LED will fade.	

### Warning beeps after authentication

Additional warning beeps (in addition to the confirmation trill) following after authentication remind the driver of necessity to take particular actions (refer to the table 4).

### Table 4. Warning beeps following after authentication

Warning signal	Reason	Recommended actions
Long	The default PIN code hasn't been changed	The default PIN code (two presses on one button) shold be changed
	Valet mode is enabled	The Service/Valet mode should be deactivated
	The authentication method «Radio tag» has been changed to «Tag or PIN code»	PIN code should be entered at least one time (to confirm that the authentication method was changed under your will)
Five short	It is recommended to replace the radio tag battery	The tag's battery should be replaced

### Maximum protection in dangerous places

Disabling the anti-theft features of the system using a tag is the most convenient authentication method. In most cases this authentication method is enough to protect the vehicle. However, when leaving your vehicle in potentially dangerous places (for example, in public parking lots or suspicious lonely places) - maximum security level can be engaged quickly and temporally. Authentication method can be quickly changed from «Tag or PIN code» to «Tag and PIN code» without having to reprogram the alarm.

To quickly engage maximum security:

- Turn the ignition on.
- Wait for the radio tag identification (confirmatory trill). 2

Within the next 10 seconds:

- Open and then close the driver's door. 3
- Enter the PIN code, wait for confirmatory trill. 4
- 5 Turn the ignition off.
- Wait for two confirmatory trills, indicating that «Tag and PIN code» authentication method has been engaged. 6

### **Disarming AntiHiJack with a tag**

This feature allows to combine vehicle protection at parking and comfortable driving when AntiHiJack function is active.

Choose the authentication method «Tag and PIN code», enable the feature «Disabling AntiHiJack with a tag»

Hence, you'll have to enter PIN code to deactivate the Immobilizer feature and wait until a tag is detected by the system.

If the AntiHiJack feature activates while the car is being operated – the tag will be automatically detected by the alarm, making the AntiHiJack feature to disarm. This allows to keep your eyes on the road since you'll not be distracted from driving while entering a secret PIN code combination. If the tag can't be detected by the alarm for some reason (e.g., disharged battery, the tag is lost or demaged) – you may always disable

AntiHiJack by entering the pre-set PIN code.

### **PIN code**

PIN code is a secret pressings combination on one or more OEM vehicle interior buttons. Please refer to the Integrator to find out the list of buttons available for use as PIN code buttons on a particular vehicle.

PIN code is a one-, two-, three- or four-digit number. Each digit may consist of figures from 1 to 9.

PIN code may be easily changed as many times as needed either by an installer during installation or by an end alarm user at any time.

In order to ensure the proper secrecy level-the factory-set PIN code two- (2) presses on «PB» - programming button) must be changed. If it hasn't been changed then each time after entering the factory PIN code, the alarm emits a long warning beep reminding about necessity to change the PIN code.

### PIN code entering sequence:

- The sequence to enter PIN code is the following:
- Turn the ignition ON or start the engine.

Enter PIN code. While entering one of the PIN digits, keep in mind that pressings duration and pauses between figures within one digit 2 shouldn't exceed 1 second. Make a two second pause after entering each digit of the PIN code. 3 Wait for confirmation (it is the confirmatory trill).

- The default PIN code is «2»; it is entered by using the Programming button (please see the Integrator). It is not allowed to set PIN-code «1» - one press on one button.

#### Possible PIN code combinations

The buttons	(◀, ♥, ♥, ♥, ♥, ♥	are used as an example. Consult with your installation specialist to find out the list of available buttons
	for y	your vehicle or visit the online data base — Integrator (https://int.tecel.ru/).

### Entering PIN code with a single button

Single digit PIN code «2»:	Two digit PIN code «11»:	
(a)~1 sec.	G	
Entering PIN co	de with multiple buttons	
Obey the sequence of pressing t	he buttons when entering a PIN code:	
Single digit PIN code «4»:	Two digit PIN code «2-2»:	
Attention! PIN-code entry is carried out only with vehicle's in Key-ID tag.	terior buttons, it is not possible to enter a PIN code using the button of	the

### **PUK code**

The PUK code is used:

- to change an authentication method (if the vehicle has covered 10 km after the alatm installation).
- in case if a PIN code is forgotten or a radio tag is lost or damaged.
- PUK code is a 4 digit number located under the protective film of the plastic card that is included in the alarm set. PUK code disables all anti-theft features of the alarm no matter what authentication method was set.

PUK code is entered with a programming button making a two second pause after entering each digit of the PUK code. The PUK code may be entered with the built-in button of the Key-ID tag while the ignition is OFF.

PUK code entry sequence:

- Switch ON the vehicle's ignition or start the engine;
- 2 Enter a PUK code;
- 3 Wait for the confirmatory trill;

If you made a mistake while entering the PUK code, wait 3 seconds and re-enter the PUK code.

After the PUK code has been entered successfully, it is possible to set up a new PIN code. If you are intended to temporary disable all antitheft and comfort features of the alarm (to activate service/valet mode) - within 10 seconds after entering the PUK code, press the programming button 6 times.



The vehicle's doors may lock and unlock while entering PUK code with the Key-ID button. You don't have to pay attention to that, keep entering the PUK code digits - the alarm will still recognize your actions as an attempt to enter the PUK code.

### Service/Valet mode

The mode was designed for situations when necessary to conceal the fact that the alarm is equipped with an anti-theft device. Service (valet) is the operating mode that temporarily disables all anti-theft and comfort functions (automatic windows closure, Immobilizer, AntiHiJack, control of an additional electro-mechanical hood lock, remote engine start, and etc.).

Service mode allows an alarm user to leave the vehicle in a workshop, at a dealership to perform maintenance or repair works, at a car wash station and etc., without notifying anybody of the alarm presence in the vehicle. There is no need of telling anybody a secret PIN code combination or handing over a unique tag to unauthorized peaople. While in this mode the alarm will not be interfering any maintenance works and it can't be detected by any diagnostics equipment.

The alarm warns about the enabled «Service/ valet mode» with a long beep after each authentication.

There are two ways to enable/disable the «Service/Valet» mode:

### 1st way:

The valet mode can be enabled/disabled remotely via phone by using the mobile app or by calling the alarm's SIM number and dialling the command «829».



It is required to enter a PUK code via phone.

### 2nd way:

In order to enable or disable the valet mode:

- 1 Switch ON the ignition.
- 2 Complete an authentication procedure.
- No later than in 10 seconds, press the programming button 6 times. 3
- 4 Wait for the confirmation:
- the mode has been enabled -1 short beep, one LED flash, and one confirmatory trill; the mode has been disabled -2 short beeps, two LED flashes and confirmatory trill.

### Service/valet mode automatic deactivation

The service mode will automatically turn off as soon as the vehicle travels 10 km after activating it. Thanks to this feature, you don't have to warry that your vehicle remains unguarded if you forget to disable the service mode. The alarm automatically enables all security features and the vehicle remains protected.

You may disable the «Service/valet mode automatic deactivation» in two ways:

- by changing the corresponding setting of the alarm. The service mode will not be automatically deactivated until the setting is changed back to «ON».
- By entering PUK code before activating the service/valet mode:
- Switch ON the ignition; 1
- 2 Enter the PUK code;
- No later than in the next 10 seconds press the programming button 6 times. The «Service/valet mode» will not deactivate automatically, 3 until you do it yourself, regardless of distance the vehicle travels after enabling it.

### **Optional features**

The alarm allows implementing some additional features in order to enhance comfort level and anti-theft capabilities.

#### Vehicle's geolocation

The vehicle's location can be easily viewed at any moment in the smartphone application «Prizrak» or at the web service Prizrak monitoring. It requires installing the GPS/GLONASS-270 module. To locate the vehicle, you simply need to send an appropriate text message command, use the intelligent voice menu or the smartphone application.

#### Automatic windows closure

The system can be programmed so that the alarm would automatically close the vehicle's windows after arming (see Integrator if the function is available on a specific vehicle).

### Electromechanical hood lock control

You can enhance the anti-theft capabilities of the alarm by inatalling an additional electro-mechanical hood lock (not included in the alarm kit). You can program the alarm so it would latch the electromechanical hood lock when arming the vehicle and unlatch it only after the alarm acknowledges the vehicle user.

### Central door locking (CDL) control

If a vehicle is not equipped with such OEM functions as latching the vehicle's doors as soon as the vehicle has started to move. and unlatching the doors right after the ignition is turned OFF, then it is possible to implement these functions on the vehicle. The function is not available for some vehicles (visit the web data-base Integrator for details).

#### Microphone

The external microphone of the alarm system allows you to hear what is happening inside the car at any time. To do this, you need to dial the alarm's phone number and follow the voice menu tips.

### Aftermarket parking distance control

The alarm system has been designed with flexible algorithms to control aftermarket parking sensors. There are three control modes available, and the system can be controlled by using the original vehicle interrior buttons.

### Installing the alarm

### The alarm installation sequence

### Step 1

 Connect the alarm to the vehicle's harness in accordance with the wiring diagram supplied with the alarm kit, this technical guide and with the information provided at: https://int.tecel.ru/.

### Step 2

- Supply +12 V to the alarm unit and perform a vehicle interfacing procedure (refer to chapter «Interfacing the alarm with a vehicle»).
- If a vehicle requires the alarm to be connected to the so called «wired buttons» (refer to the Integrator), program the specially designed
  programmable inputs according to a type of the vehicle's wired buttons. The buttons should be programmed within 15 minutes after
  interfacing the alarm with a vehicle. There is no need to program those buttons that the alarm is able to «sense» via CAN-bus.
- Complete the sycronization with OEM vehicle immobilizer when implementing the remote engine start feature, if it is available for a specific vehicle (refer to the Integrator «BUILT-IN KEYLESS REMOTE START» feature).

#### Step 3

Register your vehicle in the mobila app «Prizrak» (refer to the chapter «Registration in the mobile app Prizrak»). Use the temporary GSM code — «1111» to get registered and to check the mobile app functionality. Don't remove the protective films located on the plastic card as these are the secret codes intended for use by the vehicle owner.

### Step 4

Test the alarm functionality:

- radio tags operation (if available);
- mobile app «Prizrak» functionality;
- central door locking, «Comfort» feature, hazard lights control and etc.;
- sensors operation (adjust sensitivity if needed).
- remote engine start and engine heater control (if implemented)
- PINToDrive<sup>®</sup> and AntiHiJack functioning;
- GSM engine locking.

Step 5

- After checking the functionality of the alarm system, make sure the wires and other components are mounted firmly. Assemble the vehicle according to the manufacturer's instructions. Don't forget to plug back all the vehicle's original connectors to their places.
- Make a note in the user's manual about the name and location of the button that was assigned as the programming button.

#### Installation recommendations

Fit the main alarm module into the vehicle's interior. Position the main alarm module inside the vehicle so that the GSM antenna is distanced from the vehicle's wire harness, electronic control modules and vehicle's body iron parts at a minimum of 70 mm. You may rotate the GSM antenna at an angle of 60-180 degrees (figure 1). It is not allowed to mount the main alarm module in the areas that may contain liquids and foreign objects as well as moving mechanical parts that may cause damages to the main alarm module or its wire harness.

The main alarm module must be mounted tightly and have a close contact with the vehicle's body parts in order to ensure proper operation of the alarm sensors.

Do not mount the alarm components and the wire harness cables in a close proximity to moving parts and mechanisms of the vehicle (e.g. steering wheel column, gas and brake pedal, clutch pedal, window wiper mechanism and etc.).

It is not allowed to connect the alarm outputs directly to the loads greater than the outputs nominal value-this will lead to their malfunction. Use the specially designed relay units (e.g. PRM-210) developed by «TEC electronics» or produced by other companies in order to decrease electric loads on the X2 (6 pin) connector when connecting the alarm wires for the engine remote start to the vehicle's high-energy power circuits (e.g. starter, ignition and etc.). Always use the appropriate wire gauge if you connect the alarm wires to high-energy power circuits and protect the system from the short-circuit by installing the protective fuses.

It is recommended to replace the mini GSM antenna included in the standard alarm set with an optional external GSM antenna in case if it is planned to exploit the vehicle in areas with poor cellular network reception.

The external GSM antenna provides higher performance characteristics. Thanks to its construction, it is possible to position the external GSM antenna inside the vehicle in a place where the screening effect of the vehicle's body is less intensive.



Figure 1. GSM antenna orientation of the main alarm module

### Wire harness description

Alarm inputs/outputs assignment is described in the Table 4. Connectors pin numeration is shown in figure 1. Inputs/outputs adjustment is carried out in the programming menu (see section «Hardware functions configuration»).



Figure 1. Connectors pin numeration, view from the wire harness side

Table 5. Wire harness descriptio

N⁰	Wire colour	Wire type	Wire function	Current, mA		
	X1 (24-pin)					
1	Grey/blue	DATA2 (RX)	Immo/ LIN/ ComfortControl Mazda/CDL control on Mazda	-		
2	Yellow	TP-BUS	Digital data bus. Designed for connection of ECM-250, GPS/GLONASS-270, HCU-230	-		
3	Black	Temperature sensor (-)	External temperature sensor (TEC-0077-16)	-		
4	Green	Programmable output (-)	CDL alternative control (Lock – for a double wire control/lock and unlock for a single wire control)	300		
5	Blue	Programmable output (-)	CDL alternative control (Unlock – for a double wire control)	300		
6	White/black	Programmable output (-)	Wired engine locking control	300		
7	Blue/red	Programmable output (+/-)	Hazard lights alternative control	300		
8	Brown	CAN2	CAN2-L			
9	Brown	CAN1	CAN1-L			
10	Grey/black	Programmable input (-)	Refference ground/Digital negative button			
11	Yellow/red	FSK	Communiacation channel with the relay pLine			
12	Black	Power GROUND	System power source GROUND			
13	Grey/green	DATA2 (TX)	Immo/LIN/ ComfortControl Mazda/CDL control on Mazda			
14	Blue/yellow	LIN	An aftermarket heater control via (Webasto, Eberspächer) data bus «Wbus» protocol			
15	Black/white	Temperature sensor (+)	External temperature sensor (TEC-0077-16)			
16	Orange/ green	Programmable input/ output (-)	Driver's door opening imitation/Driver's door pin switch input			
17	Green/black	Programmable input (-)	Hood			
18	Pink/green	Programmable input (+)	Brake pedal position monitoring			
19	White/red	Programmable input (+)	Vehicle's OEM alarm panic			
20	Brown/yellow	CAN2	CAN2-H			
21	Brown/red	CAN1	CAN1-H			
22	Grey/yellow	Programmable input (+)	Analog button/Digital positive button			
23	Pink /black	Programmable output (+/-)	Siren control (supplied with the alarm)	1300/150		
24	Red	Power +12 V	System power source +12 V			
			X2 (6-pin)	1		
1	Yellow/white	Programmable output (+)	ACC (remote start)	300		
2	Yellow/black	Programmable output (+)	Ingnition 2 (remote start)	300		
3	Yellow/red	Programmable output (+)	Starter motor (remote start)	300		
4	Yellow/green	Programmable output (-)	Key is in ignition switch (remote start)	300		
5	Yellow	Programmable output (+)	Ignition (remote start)	1200		
6	Yellow/blue	Programmable output (-)	OEM immobiliser bypass module activation (remote start)	300		
			X3 (8-pin)			
1	Green/red	Programmable input (-)	Trunk			
2	Orange/white	Programmable	Other doors			

3	Black/yellow	Programmable input (-)	Parking brake		
4	Red/white	Programmable input (+)	Alert inhibit when releasing trunk while the car is armed		
5	White/blue	DATA1 (RX)	Immo/ Fortin/ iDataLink/ LIN		
6	White/green	DATA1 (TX)	Immo/ Fortin/ iDataLink/ LIN		
7	Violet/yellow	Input (-)	Not used		
8	Green/yellow	Input (+)	Not used		
			X4 (2-pin LED connector)		
1		Light Emitting Diode	LED (+)		
2		Light Emitting Diode	LED (-)		
	MIC connector (blue, 4-pin)				
1-4	1-4 Microphone connector				
	GPS/Glonass connector (black, 4-pin)				
1-3	}	GPS/Glonass-270 conr	nector		

### X1 (24-pin) connector pinout description

Pins №1, № 13. The digital data bus designed for controlling the vehicle's immobilizer keyless bypass when implementing the «Remote engine start» feature (menu 1.2. option №1), refer to the web data-base Integrator.

*Pin №2*. Digital data-bus TP-BUS designed for communication with optional peripheral devices.

*Pins* №3, № 15. External temperature sensor. May be installed in the vehicle's interior or outboard, as well as in the engine compartment. *Pin* №4. Alternative CDL control output. CDL lock for double wire control scheme or lock/unlock for single wire (trigger) control scheme (menu 1.2, option №2).

Pin №5. Alternative CDL control output. CDL «lock» for double wire control scheme (menu 1.2, option №3).

Pins №6. The output is connected to one of the relay coil terminals which is used for blocking the engine start (menu 1, option №22).

Pin №8, №20. Data-bus CAN 2. Is connected when required (refer to the Integrator).

Pin №9, №21. Data-bus CAN 1. Is connected to the vehicle's CAN-bus (refer to the integrator).

*Pin №10.* The input is used when required to connect to vehicle's buttons in case if the information on the interior buttons is not transmitted via the vehicle's CAN-bus. It can be connected to either «Digital negative» buttons or to «Refference ground» wire under the steering wheel (menu1, option №4).

Pin Nº11. (for Prizrak 820/BT and 840/BT). The communication bus with the pLine relay. Should be connected to a vehicle's wire with commutated/ non-commutated +12 V.

Pins №14. Data-bus W-bus. Is used to control aftermarket engine heaters Webasto and Eberspacher.

*Pin №16.* Driver's door opening imitation output. It also can be programmed as «Driver's door pin switch input» in case if information on the latter is absent on the CAN-bus.

*Pin №18.* Brake pedal position monitoring input. Is connected to an appropriate output of the vehicle's brake pedal terminal switch in case if the vehicle's CAN-bus does not contain brake pedal position data (refer to the Integrator files).

*Pin Nº22.* The input is used for connection to the vehicle's interior buttons in case if they are absent in the CAN-bus. The input is connected to either «Digital positive» buttons or to «Resistive» buttons of the steering wheel (menu 1, Nº4).

### pLine relay-221 description and installation recommendations

### Table 6. Relay's wire harness description

Colour	Wire type	Wire function	Current
Red	pLine relay communication channel and power source	+12 V	1 А/20 мА*
Black	Power	Chassis Ground	-
Yellow	Common contact	Output for engine locking	10 A
Yellow/black	Normally closed terminal	Output for engine locking	10 A
Yellow/white	Normally open terminal	Output for engine locking	3 A**

\*Current drain during transmission mode (pulse) 1A, during reception mode-up to 20 mA \*\*Is limited by wire gauge.

You may cut any circuit in the vehicle which provides engine immobilisation even the one to which you are intended to connect «Communication channel and FSK relay power supply»wire.

After installing the system it is recommecned to check the communication between pLine relay and the alarm.

Relay has a built-in accelerometer for vehicles that have no information about speed on the CAN-bus, and enables extra features for vehicles that have information about speed on the CAN-bus:

Locks the engine even if there is no speed information on the CAN-bus.

Accelerometer allows starting the engine and locking it if the vehicle starts moving.

It is not recommended to install the relay in places that vibrate heavily while the engine is running. This helps prevent false movement detections due to excessive vibrations passed to accelerometer.

Factory default sensitivity settings are set assuming that there are almost no vibrations transfered from the engine to the accelerometer. This helps prevent false movement detections due to excessive vibrations passed to accelerometer.

- It is allowed to install only one pLine-221 relay on one vehicle.
  - Relay works as normally closed relay.
    - If same circuit that is used for connection with the alarm is being cut, «Communication channel and FSK relay power supply» wire
      must be connected to one of the wire ends which shows +12 V when ignition is ON.
    - The «Communication channel and FSK relay power supply» wire must be connected to a vehicle electrical circuit with switched +12 V.
    - The input must register +12 V when the vehicle's engine is running (it is allowed to connect to the ignition, injectors, ignition coil electrical circuits and etc.).

The settings of the feature «Ability to start the engine before authentication» don't effect anything if only a pLine-221 relay is used for engine blocking.

### Implementing the remote engine start feature

The alarm provides an opportunity to implement the remote and automatic engine start feature. Very many tested cars support the «OEM keyless immobilizer bypass» function. This feature allows to implement the remote engine start without having to hide a spare key inside the vehicle or purchasing a third-party bypass equipment, vehicle's factory immobilizer is turned off with the Prizrak's encrypted intellectual digital algorithms during remote or automatic engine start operation.

The X2 (6-pin) connector outputs have been designed specially for the remote start feature and they are connected to appropriate vehicle's electrical circuits (e.g. ACC, Ignition, Starter and etc.). By default the outputs are configured for the remote start «diagram №3» (refer to the «Prizrak 8xx/BT connection diagram»). In most cases for typical cars those outputs are sufficient to remote start a vehicle. However, there are situations when a special task should be solved, this can be done by means of TECprog2 which allows to preview one of 28 standard remote start «Timing diagrams» and choose one that best matches your needs. More than that, you can create your own «Custom» timing diagram. The remote start features may be assigned to any programmable output (not only X2 (6-pin) outputs).

It is possible to re-program the remote start features by using a programming button, but only within one «Timing diagram» (see Programing algorithm of the option №50 «Remote start output»). The TECprog2 software is the most convenient and easiest way to adjust the remote start outputs and features.

The alarm is compatible with the ECM-250 remote start module. The module substantially expands quantity of outputs required for the remote start, though it is not necessary for standard situations. The alarm is already endowed with a sufficient amount of outputs required for implementing the remote/automatic engine start of any level of difficulty.

All methods for implementing the remote/automatic engine start feature are described below:

1st method. By means of the built-in keyless bypass module. This methot may be used for the majority of supported vehicles. Visit our web data-base – Integarator to clarify what vehicles are compatible for this function.

2nd method. By using the 3V immobilizer bypass which is called «12V/3V voltage converter (immobiliser bypass)». The converter has been designed for vehicles that are not compatible with «keyless immobilizer bypass» feature and equipped with engine stat/stop button. Herewith, one of the vehicle's factory keys must be hidden inside the vehicle. The red and black wires of the converter have been designed for soldering to key battery contacts. If a classic immobilizer bypass module of a third-party manufacturer is used for the remote start – it should be connected according to its documentation.

3rd method. By means of a third party remote start module or an immobilizer bypass equipment (Fortin, iDataLink and etc.).

The alarm is capable to control the Fortin and iDataLink modules via encrypted protocol. There are two special outputs located in the X1 (24-pin) alarm connector that should be connected to corresponding wires of Fortin or iDataLink module, those are: pin №1 Data2 (RX) and pin №13 Data2 (TX). Connect the alarm to the TECptrog2 and select the corresponding control protocol (it is possible to use a programming button in order to set up the control protocol, refer to the «Keyless bypass module parameters adjustment» menu).

The alarm allows to control the third party bybass modules with «analog» signals as well. There are four features that should be assigned to any programmable outputs and connected to a corresponding bypass module: №30 «A third party remote start module control», №35 Fortin/ iDataLink double wire status control-»GWR», №36 «Fortin/iDataLink module double wire status control «Start», №40 Fortin/iDatalink single wire pulse control. Connect the X2 (6-pin) connector outputs to corresponing remote start circuits if needed (e.g. ignition, starter, ACC and etc.), use a relay module if required.

### 1st step. Interfacing the alarm with a vehicle

Alarm programming (adjustment) is carried out on a PC via the TECprog2 software or with a vehicle's programming button.

### Vehicle's make and model identification:

Vehicles compatible with the alarm are divided into groups. Each group is divided into subgroup; each group and subgroup has it's own number (see the web data-base «Integrator»). Interfacing means group and subgroup identification by the alarm.

### There are three vehicle interfacing methods:

On the PC. Connect the alarm to a PC via USB-cable, run the Tecprog2 and select a vehicle.

Automatic identification

After CAN-bus wires and power source are connected, perform a few simple actions (on most vehicles it is Ignition turning ON/OFF and

arming/disarming OEM alarm with remote key) – group and subgroup will be identified automatically. You just need to control identification correctness by carefully counting audio beeps (group number – pause, subgroup number – pause). Identification procedure is vehicle-specific and can be found at the Integrator. If a vehicle group consists of two digits, each digit will be indicated separately. For example: group 35, subgroup 2 will be indicated as follows: 3 long beeps – 1 second pause, 5 long beeps – 2 seconds pause, 2 short beeps – 4 seconds pause.

Manual identification (forced interfacing).

This method is used when it is not possible to interface the alarm by using the 1st and 2nd interfacing methods. This method may be handy when a vehicle manufacturer has updated the vehicle and some data running on the CAN-bus has changed. In this case some alarm features may become unavailable because such interfacing procedure doesn't consider vehicle configuration. Manual interfacing is performed by using the built-in programming button. Prior to performing the manual interfacing procedure make sure that the module's memory is cleared (group and subgroup isn't already programmed) and the CAN-bus wires are not connected. The interfacing process will cancel If the built-in programming button remains touchlless within 60 sec during the manual group/subgrgroup setup.

Manual interfacing description:

- Supply +12 V to the alarm unit. Wait for intermittent beeps. 1
- 2 Enter the «Menu 1» by pressing the programming button 10 times no later than in 10 seconds after supplying power to the module. There will be 3 confirmatory beeps if everything has been done correctly.
- 3 Press the programming button 1 time in order to select the option Nº1 «Vehicle model». The alarm will start emitting single short intermittent beeps.
- Enter the vehicle's groupe number by pressing the programming button a corresponding number of times (refer to the Integrator). 4
- Enter a vehicle's subgroup number by pressing the programming button a corresponding number of times (refer to the Integrator)
- If a vehicle's group is a two digit number than enter the first number, wait for 2 seconds and enter the second number. The alarm will start emitting a series of beeps corresponding to the vehicle's group.

Make sure that the vehicle's model has been programmed correctly by listening to the emitted beeps:

- press the programming button 1 time if correct.
- press the programming button 2 times if not correct. Repeat a vehicle's model setup starting from the step №4.

### Programming the steering wheel (resistive) buttons.

- Right after the alarm has identified the vehicle model, turn the vehicle's ignition ON and wait for at least 5 seconds.
- Press (one by one) and hold (for approximately 2 sec) all steering wheel buttons until you hear a beep, if you don't hear a beep then the 2 button will not be programmed and it will not be available for use. The buttons confirmed by beep will be available.
- Turn the ignition OFF wait for the confirmatory trill. 3
- 4 Turn the ignition ON.
- Assign one of the available buttons as the programming button by pressing on it for not less than 5 seconds until you hear a long beep. 5 You should start teaching the system the analog buttons within 15 minutes after the alarm has identified the vehicle. If more than 15 minutes passed - reset the alarm to the factory settings, repeat the alarm interfacing procedure and make all the settings again.

Programming digital (positive and negative) buttons.

- In order to teach the alarm a vehicle's «positive» and/or negative button:
- Set the alarm to operate with digital buttons. (Menu 1. Option №4). Note that this option can only be modified by using the built in button 1 and before the PIN code is entered for the first time with analog or digital buttons. Any further modifications will be possible only after resetting the alarm to default settings.
- 2 Connect the alam input №7 to a «negative» button and\or №16 to a «positive» button and assign one of the connected buttons as the programming button by turning the ignition ON, pushing the button and holding it for at least 5 seconds (until you hear a long beep). The button must be programmed within 15 minutes after the alarm interfacing with a vehicle. If more than 15 minutes have passed reset the alarm to the factory default settings and reprogram the alarm.

### 2nd step. Configuring the alarm

At the stage two is carried out the hardware functions conficuration, the user's functions conficuration and is selected a prefferable authentication method.

There are 10 independant programming menus (see «Table 7»). The alarm may be connected directly to a PC via a mini-USB cable (no additional equipment required). This allows to quickly update the alarm firmware, setup required vehicle model, customize inputs/outputs configuration, enable different user's functions and etc. The programming may be performed either before or after interfacing the alarm with the vehicle. Download the TECprog2 PC software in order to program the alarm.

### Table 7. Codes for programming menus

Menu name	Menu code	Number of beeps	Designation
Menu 1	10	3	Hardware functions configuration
Menu 1.2	11	6	Programmable inputs/outputs configuration
Menu 2	12	4	User settings
Built-in sensors adjustment	8	5	Shock and tilt/displacement sensors adjustment
Remote engine start mode settings	16	7	Remote engine start settings
Engine heater settings	17	8	Operating mode adjustment for an autonomous engine heater
Built-in keyless bypass module settings	18	9	The built-in immobilizer key less bypass module is used to deactivate a vehicle's OEM immobilizer during the remote engine start
PIN code change	14	1	
HCU-230/BT hood compartment unit settings	20	10	HCU-230/BT hardware features configuration
«Diagnostic trouble codes» reading feature settings	21	11	The built-in «DTC reading» feature configuration

### **Configuring hardware features**

Programming is carried out according to the «Menu 1», «Menu 1.2».

Menu	1. Harc	lware	features	configuration
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Nº	Option	Values range	Default values	Note
1	Vehicle model	-	-	Is setup automatically, should be adjusted manually if needed
2	Wired engine locking type	1 – 2	2	1 — Normally open (NO) relay control; 2 — Normally closed (NC) relay control
3	Engine blocking at a safe speed	1 – 3	1	1 – disabled. The engine is locked regardless of vehicle's speed; 2- at speed 30 km/h and slower; 3- when the vehicle is completely stopped
4	Inputs adjustment when connecting to analog buttons	1 – 2	1	The inputs N $P10$ , 22 (connector X1, 24-pin) are connected to: 1 – to the steering wheel (resistive) buttons; 2 – to positive and/or negative buttons (the multi-purpose programmable inputs)
5	Ability to simultaneousely control the OEM security system and the central door locking	1 – 2	1	1 — enabled; 2 — disabled;
6	Sequantial CDL unlocking	1 – 2	2	Is used for controll via a phone or Key-ID tag: 1 — enabled; 2 — disabled. For control via phone
8	Vehicle's CDL control	1 – 4	4	<ul> <li>1 - control via a single wire (considering the CDL status);</li> <li>2 - control via a single wire (regardless of CDL status);</li> <li>3 - double wire control; 4 - control via CAN-bus</li> </ul>
9	_	_	_	-
10	«Comfort» feature operation duration	1 - 6	3	1 - 10 sec;3 - 30 sec;6 - 60 sec.
11	Supplementary sensors type (shock, volume)	1 – 2	1	<ul> <li>1 — Multiplexed (for connection to multiplexed sensors);</li> <li>2 — Standard (for connection to the sensors with devided «warning» and «trigger» outputs)</li> </ul>
12	Ability to start the engine before carrying out authentication	1 – 2	1	1 – ON; 2 – OFF. (The setting «2-OFF» doesn't affect anything if only a relay pLine-221 is used to block the engine)
13	Activation requirements for optional PDC sensors	1 – 3	1	By shifting the gear lever to: 1 — «R» position; 2 — «D» or «R» with switching off possibility before the ride ends; 3 — «R» with switching off possibility before the ride ends
14	PDC control button			Can be used a vehicle's button which the alarm can «sense» via CAN-bus; vehicle's original analog (resistive) or digital button (positive or negative)
15	Speed monitoring for immobiliser and AntiHiJack features	1 – 2	1	$1-{\rm ON}$ , $2-{\rm OFF}$ . Affects the operating algorythm of Immobilizer and AntiHiJack features
16	Quantity of brake pedal presses before AntiHiJack feature is triggered	1 – 7	3	Quantity of brake pedal applications is needed to be set up in order to determine the AntiHiJack feature operating algorithm if «Speed monitoring for Immobilizer and AntiHiJack features» is turned OFF or not available. The setting doesn't affect anything if «Speed monitoring» is ON and is available for a particular vehicle
17	GSM-engine locking	1 – 2	1	1 – ON; 2 – OFF
18	Voltage value for low-battery warning	1 – 15	11,3	1 – 10,6 V; 8 – 11,3 V; 15 – 12 V
19	Communication quality check between the main alarm module and the relay pLine-221 (for Prizrak 820, 840 only)	-	_	It is very necessary to check communication quality between the main alarm module and the relay pLine-221 after the installation
20	Relay pLine built-in accelerometer sensitivity adjustment (for Prizrak- 820, 840 only)	1 – 4	1	1 – maximum; 2 – high; 3 – low; 4 – minimum. Adjust sensitivity after the installation

21	«Tag operating mode or entering PIN code when disarming»	1 – 7	1	1 – OFF; 2 – radio tag search for disarming confirmation from vehicle's OEM remote; 3 – disable vehicle unlocking with OEM remote key until the radio tag is detected; 4 – disable vehicle unlocking with OEM remote key in dangerous places until the radio tag is detected; 5 – disable vehicle unlocking with OEM remote key until the radio tag is detected (constant radio tag search); 6 – disable vehicle unlocking with OEM remote key in dengerous places until the radio tag is detected (constant radio tag search); 7 – PIN code entry for disarming confirmation from vehicle's remote key
22	Vehicle's fuel tank capacity	1 – 30	1	1 – capacity is not set, the fuel level is displayed in %; 2 – 20 L; 3 – 150 L; This setting is used for fuel level conversion from % into L. If the fuel level is not available in vehicle's CAN-bus or it is transferred in liters then this setting doesn't affect anything
23	Alarm panic delay when vehicle's perimeter violated (for disarming with keyless entry system)	1 – 5	1	1 – OFF; 2 – 0,5 sec; 3 – 1,0 sec; 4 – 2 sec; 5 – 3,0 sec.
24	Engine locking via CAN-bus	1 – 3	2	1 – is carried out by the main alarm module; 2 – disabled; 3 – is carried out by CAN-relay Implant
25	Vehicle's perimeter monitoring pause	1 – 2	2	1 – enabled; 2 – disabled
26	«Beach mode»	-	-	-
27	-	-	_	-
28	External temperature sensor assignment (main alarm module supplementary temperature sensor mounting location)	1 – 3	1	1 – engine temperature sensor; 2 – interior temperature sensor; 3 – ambient temperature sensor
29	Heating and ventilation activation during remote start mode («Seasonal comfort»)	1 – 2	2	1 – enabled; 2 – disabled. Configuration of actuated heating devices and ventilation. May be configured in TECprog or via smartphone application. Seats ventilation, side mirrors heating, heated seats, steering wheel, rear window heating available
30	Embedded electro-mechanical relay adjustment of «Can-relay Implant»	1 – 3	3	1 – Normally open (NO); 2 – Normally closed (NC); 3 – not used
31	«CAN-relay Implant» diagnostic	1 – 7	_	1 – ready for operation; 2 – not registered; 3 – registration procedure is running; 4 – registration failed; 5 – no communication with CAN-relay; 6 – CAN-relay firmware update required; 7 – Error in connection to CAN-bus
32	Can-relay implant reset to default values	1 – 2	_	In order to reset CAN-relay to factory values: • press the programming button once; • wait for the confirmatory trill. The alarm will inform about the option status by a series of 2 beeps and LED flashes. 1 – registered; 2 – not registered (was reset to default values)
33	CAN-bus via which is carried out communication with the CAN-relay Implant	1 – 3	1	<ol> <li>1 - CAN-relay is automatically searched on every available CAN-bus;</li> <li>2 - CAN-relay is searched on CAN1;</li> <li>3 - CAN-relay is searched on CAN2</li> </ol>
34	Microphone	1 – 2	1	1 – enabled; 2 – disabled
35	CDL control with the Key-ID embedded button	1 – 7	1	By pressing the embedded button is carried out: 1 - CDL locking/unlocking; $2 - CDL$ locking; $3 - CDL$ unlocking; $4 - CDL$ locking/unlocking when a vehicle is remote started; $5 - CDLlocking when a vehicle is remote started; 6 - CDL unlocking when avehicle is remote started; 7 - CDL is not controlled$
36	Vehicle's owner authentication with the Key-ID tag	1 – 2	1	1 – permitted; 2 – prohibited
37	Using the Key-ID tag's embedded button as the programming button	1 – 2	1	1 – permitted; 2 – inhibited. The Key-ID embedded button is not possible to use for programming
38-39	_	_	_	or entering PUK code if this menu option is set to the value «2»
40	Ex-user GSM settings reset when changing car owner	_	_	It is recommended to run this procedure before a car is sold or right after buying a secondhand car with installed GSM-alarm Prizrak (TEC). After ex-user settings reset is completed: the access code (GSM code) will be reset to the factory code «1111», all previous users' telephone numbers and notification settings will be deleted. Travel log and events log will be also cleared. 1 – exe-owner settings are set (it is required to reset the system to change the car owner); 2 – no settings are set (the alarm is ready for new owner). To reset exe-user personal profile settings-press the PB once (1 time) and wait for confirmatory trill. The alarm will automatically exit the programming mode
41	Executing the algorithms created in the «Programming studio» (programmable logic)	1 – 2	1	1 – enabled; 2 – disabled
42	Steering wheel location in the vehicle	1 – 2	1	1 - the steering wheel is on the right side; $2 -$ on the left side. These settings are used for proper displaying of the driver's door in the mobile app

				<ol> <li>1 - by «reading» all necessary information out of the CAN-bus.</li> <li>2 - by getting the analog signals via the special programmable inputs without «training» the alarm;</li> <li>3 - start «training» procedure (it is described in the chapter «Slave mode adjustment»);</li> <li>4 - via the programmable analog inputs after the alarm has «learned» the analog signals.</li> </ol>
43	Slave mode operation	1 – 4	1	In order to put to work the «Slave» mode via the analog programmable inputs, it is required to connect the «Hazard lights monitoring», «CDL «lock» pulse monitoring», «CDL «unlock» pulse monitoring» programmable inputs to the appropriate electrical circuits in the vehicle (refer to the table 9 «Programmable inputs features» № 15. 18, 19).
				Select the value «2» of the option №43 if when locking the vehicle with the OEM remote key or the keyless access system the hazard lights flash once and when unlocking-twice. If the vehicle's hazard lights behavior is different or the «Slave mode» doesn't work then the «Slave» analog signals «learning» procedure should be performed by selecting the value «3», which is described in the chapter «Slave mode adjustment». The value «4» will assign automatically, once the alarm has learned those signals

The option №13. «PDC activation algorithm»:

 «Activation by shifting to «R». Front and rear parking sensors turn ON after shifting the gear lever to «R» position or after pressing the control button. The sensors turn OFF either after the vehicle speed exceeds 15 km/h or after pressing on the control button.

- Activation by vehicle's speed after shifting the gear lever in «D» or «R» positions with switching OFF possibility before the trip ends». The
  front parking sensors turn ON if the vehicle's speed drops below 15 km/h. The rear parking sensors turn ON when the vehicle is moving
  backwards at speed below 15 km/h. All sensors can be deactivated by pressing the control button. The sensors can be re-activated by
  cycling the ignition OFF and then back ON, or by pressing the control button.
- «Activation by reverse gear with switching OFF priority in «R» position and with switching OFF possibility before the trip ends». The
  algorithm is similar to «Activation by shifting to «R» the difference is that if the sensors are deactivated with the control button, they will
  not re-activate by shifting to «R». It will be possible to turn them back ON by switching the ignition OFF and than back ON or by pressing
  the control button.

The option  $N^{\circ}$  25. «Perimeter monitoring pause». Some vehicles' OEM alarm systems trigger as soon as their engines are remote started. The feature was designed to disable the OEM alarm panic by imitating violation of the vehicle's perimeter during the standard on-board diagnostics pause. In order to imitate the vehicle's perimeter violation the feature  $N^{\circ}23$  «Timer channel» should be assigned to any programmable output. The option  $N^{\circ}$  10 «Timer channel operation duration» (see Menu 1) must be programmed for value «1» – 10 sec. The output is connected to the driver's door pin-switch or to the hood pin-switch.

Nº	Connection terminal	Programmable inputs/outputs	Values range	Default values
1		Leads №1 and №13. DATA2 (RX) DATA2 (TX)	1 – 5	1 – Data bus of the integrated keyless bypass module «TEC electronics»; 2 – LIN data bus. It is connected to a vehicle's LIN-bus if necessary (refer to the Integrator); 3 – «ComfortControlMazda» module control data bus; 4 – CDL control in Mazda vehicles; 5 – the built-in keyless bypass module «TEC» for Toyota/Lexus (IMO, IMI, refer to the integrator)
2		Output №4 (-)	1 – 59	52- alternative CDL control. CDL «lock» for double wire control or lock/unlock for single wire control
3		Output №5 (-)	1 – 59	53 – alternative CDL control. CDL «unlock» for double wire control
4		Output №6 (-)	1 – 59	54 – wired engine locking (NC/NO relay control)
5		Output №7 (+/-)	1 – 59	51 – hazard lights alternative control
6		Output №7 polarity	1 – 2	2 – negative polarity (LED off)
7		Output №23 (+/-)	1 – 59	55 – panic/warning chirps to the siren
8	X1 (24-pin)	Output №23 polarity	1 – 2	1 – positive polarity (LED on)
9		Input/Output (-) №16	1 – 33	24 - driver's door pin-switch input/driver's door opening imitation output
10		Lead №16 function	1 – 2	1 – the electrical lead is used as an input; 2 – the lead functions as input/output (default value): The electrical lead functions as both the input of the driver's door pin switch and as the output for «Driver's door opening imitation» if the option №10 of this menu is set for value «2». It will not be possible to change this algorithm. In case if this electrical lead is ptogrammed for value «1» – the input can be programmed for any feature available in the Table 9
11		Input №10 (-)	1 – 33	Rrefference GND/Digital negative button
12		Input №17 (-)	1 – 33	2 – hood position monitoring
13		Input №18 (+)	1 – 33	1 – brake pedal monitoring
14		Input №19 (+)	1 – 33	25 – OEM alarm system panic monitoring
15		Input №22 (+)	1 – 33	Positive signal/Digital positive botton

### Menu 1.2. Programmable inputs/outputs configuration

16		Output №1 (+)	1 – 59	50 (5) — ACC (remote start)
17		Output №2 (+)	1 – 59	50 (6) — IGN 2 (remote start)
18	X2	Output №3 (+)	1 – 59	50 (3) — starter motor (remote start)
19	(6-pin)	Output №4 (-)	1 – 59	50 (2) — key is in ignition switch (remote start)
20		Output №5 (+)	1 – 59	50 (4) — IGN (remote start)
21		Output №6 (-)	1 – 59	50 (1) – a third-party immobilizer bybass module power source (remote start)
22		Input №1 (-)	1 – 33	16 – trunk
23		Input №2 (-)	1 – 33	28 – other doors
24	ХЗ	Input №3 (-)	1 – 33	13 – parking brake
25	; (8-pin)	Input №4 (+)	1 – 33	7 – alarm panic override when trunk lid releasing
26		Outputs №5 and №6 DATA1 (RX) DATA1 (TX)	1 – 4	1 – a third party keyless bypass module control (default value); 2 – LIN; 3 – Fortin or iDataLink bypass modules control; 4 – integrated keyless bypass module «TEC» for Toyota/Lexus (IMO, IMI data bus, refer to the integrator)

### Table 8. Programmable outputs features

Nº	Feature name	Feature description
0	The output is not used	There is no voltage potential
1	«Armed» status	A constant level potential is generated while in «Armed» mode
2	Pulse when «Arming»	A pulse of 0,8 sec. is formed right after arming the alarm; when AntiHiJack is triggered
3	Pulse when «Disarming»	A pulse of 0,8 sec. is formed when disarming the alarm
4	Pulse right after vehicle's owner authentication	A pulse of 0,8 sec. is formed right after authentication
5	Vehicle's OEM alarm panic status	The ouput generrates a constant level signal after triggering the vehicle's original security system (if equipped)
6	Panic to a pager	The output genarates a constant signal during 30 seconds after violating the vehicle's perimeter (doors, hood, trunk) or triggering any sensor oa the alaem
7	Panic/warning pulses to vehicel's klaxon	A pulse signal is formed during 30 sec. if while in armed mode the vehicle's perimeter is violated (door/s opened, hood, trunk; when arming/disarming). The feature may be implemented on vehicle's without OEM alarm system. The potential disappears right after disarming the alarm. Is used when connecting to the vehicle's klaxon
8	Doors, hood and trunk	A constant signal is formed when a pre-programmed door, hood or trunk is opened
9	-	-
10	Vehicle's OEM button pressure	A constant level signal is formed while any pre-programmed button is being pressed
11	Ignition	A constant signal is formed when the ignition is on (and when the engine is started)
12	ACC	A constant level signal is formed while the vehicle ACC is ON (the first key position of the ignition switch can match with ignition)
13	The engine is running	A constant signal is formed while the engine running
14	Engine RPM	A pulse signal is formed with frequency of 1 pulse per second that is proportional to 20 revolutions per minute of the crankshaft. The reflected RPM are approximate, not precised
15	Gear lever position	A constant signal is formed if the gear lever is shifted to a programmed position: for AT transmission – R, N, D; for manual transmission-only R*
16	The vehicle is moving	A constant level signal is formed if vehicle's speed exceeds a certain threshold value (it is different for each vehicle, and is in range of 5 10 km/h)
17	Front parking sensors control (power supply)	A constant level signal is formed according to a pre-programmed algorithm for parking distance control
18	Reare parking sensors control (power supply)	operation
19	Vehicle's speed	A pulse signal is formed with frequency of 1 pulse per second which is proportional to vehicle's speed of 1 km/h. The reflected speed is approximate, not precised
20	Brake	A constant level signal is formed when the brake pedal is applied
21	Parking brake	A constant level signal is formed while the parking brake is engaged
22	Parking (marker) lights	A constant level signal is formed while the marker lights are ON
23	Timer channel («Comfort»)	A constant level signal is generated during a pre-selected time (10-60 sec.) after arming the alarm. The time may be set up by intervals of 10 sec.
24	Starter or OBDII diagnostics bus blocking (NC relay control)	A constant level signal is generated: while the CAN-bus is active prior to authentication and also when AntiHiJack is triggered
25	Pulse for hood lock latching	A pulse signal is formed duiring 0,8 sec.: after vehicle arming; when immobilizer, AntiHiJack is triggered. The signal is not formed if the hood is being open
26	Parking distance control LED indicator output	Is used for parking distance system status indication. If the operation algorithm is «Activation by reverse gear» or «Activation by reverse gear with switch off priority» — the LED glows when the parking sensors are activated. If the algorithm is «Activation by speed» — the LED glows when the sensors are deactivated
27	Aftermarket parking heater control	Assign this feature to any programmable output in order to control the engine heater in the «analog» way. To display the status of engine heater in the app, assign to any programmable input the feature «Engine heater status»

28	Pulse for driver's door opening imitation	A 1,5 sec. duration pulse is generated which imitates that a vehicle's owner is getting out of the car. For ACC turning off after remote start mode operation is terminated
29	Trunk release pulse	A pulse of 0,8 sec. duration is generated. It is necessary to assign any alarm digital output to be able to unlook the trunck via the app or GSM menu
30	A third party remote engine start module control	A constant level signal is generated from the moment of engine start and until the ignition is turned off. The signal is generated regardless of using the ESM-250 module; regardless of connection settings to ignition switch or to Start/stop button. The feature will start functioning only after it is assigned to a digital output, and only after that the remote starter programming menu will be available as well as the remote starter control commands and smart voice menu settings
31	Gas pedal locking (NC relay control)	Is designed for vehicle immobilization when the AntiHiJack is triggered, while taking into account «Safe engine locking mode» settings
32	Pulse to latch pin door blockers	A pulse of 0,8 sec. duration is generated to latch aftermarket pin doors blockers
33	Pulse to unlatch pin doors blockers	A pulse of 0,8 sec. duration is generated to unlatch aftermarket pin doors blockers
34	Normally open relay control for CDL unlocking blockage	The alarm generates a signal on the output after receiving the unlocking command from the OEM remote and detecting a tag. The signal will be generated until the system is armed. The signal is generated constantly when CAN-bus is active; when service mode is turned ON or if the authentication method has been changed to «PIN code»
35	Double wire status control Fortin/iDataLink — «GWR»	The features operate simultaneously. Are used for remote starter Fortin module control. If these functions have been assigned to programmable outputs — it will be impossible to use ESM-250
36	Double wire status control Fortin iDataLink — «Start»	module and the functions №37, №38, №39. In order to be able to use ESM-250 module and the features №37, №38, №39 — re-programme the outputs to any other features
37	Steering wheel unlock control (remote start for Toyota/Lexus)	Is used for remote engine start on certain Toyota/Lexus vehicles, (refer to the Integrator)
<u>38</u> 39	-	-
40	Single wire pulse control Fortin/ iDataLink	Is used for Fortin/iDataLink modules control
41	Engine heater status via LED indicator	In case if an engine heater (OEM heater or aftermarket one) has been started via Prizrak (TEC) system by any means then the LED will be glowing (if the LED output activated) while the engine heater is functioning
42	Dashcam control	A signal is generated: when the ignition is ON; within 5 minutes after the alarm is triggered (warning or panic); If panic is triggered via smartphone. If the alarm has been triggered or panic activated via smartphone repeatedly then a DVR operation will be extended for 5 minutes more
43	Heating control during remote start mode operation (status control)	In 30 seconds after the engine has been started with remote start system — a constant level signal is generated on the outputput. The signal will remain active until the remote start mode is terminated. Is used for activation of heated mirrors, seats, steering wheel, rear window heating and etc
44	Normally closed relay control for vehicle's CDL unlocking blockage	The output generates a constant level signal while the car is armed. As soon as the alarm receives the unlocking command from the original remote key or keyless entry system and detects a tag, the output stops generating the signal
45	Service (valet) mode status	A constant level signal is present on the output while the system is in service (valet) mode
46	Heating control in the remote engine start mode (pulse control)	In 30 sec. after the engine has been remote started: one, two or three pulses are generated (depending on the settings). It is used for side mirrors, seats, steering wheel, rear window heating activation. The pulses for heating deactivation are not generated
47	Remote engine start status	The output generates a constant level signal while the remote start is running
48	Starter control (remote engine start for specific vehicles)	It is used when implementing the remote engine start feature on particular cars
49	«Ignition» control. (remote engine start for specific vehicles)	It is used when implementing the remote engine start feature on particular cars
50	Output for the remote start. The feature is assigned to suit individual needs	Refer to the «Feature №50 programming algorithm «Remote start output», page 25
51	Hazard lights alternative control	A programmable output with the assigned feature «Hazard lights alternative control». It is designed for controlling the vehicle's hazard lights when there is no control over the CAN-bus. The output should be connected to the wire harness of the hazard lights button. It is configured automatically after interfacing the alarm with a vehicle, But may be adjusted manually if needed
52	CDL alternative control. Pulse to «Lock» for double wire control or pulse to lock/unlock for single wire control	It is used if there is no contrlol over CDL via CAN-bus. The output is assigned automatically after the alarm interfacing with a vehicle, but may be adjusted manually if needed
53	CDL alternative control. «Unlock» command for double wire control	It is used when there is no control over CDL via CAN-bus. The output is assigned automatically after the alarm interfacing with a vehicle, but may be adjusted manually if needed
54	Wired engine lockig by controlling a NO or NC relay	The output is used for NO or NC relay control. The output operation is dependant on a selected operation algoroithm $-$ «Wired engine locking type». The default setting is: NC engine locking.control
55	Panic/Warning signals to the siren	The output designed for syren control. The output №8 (24 pin)
56	Engine heater circulation pump control	The output generates a constant level signal while the engine heater is running and within two minutes after turning OFF the ignition
57	Engine blocking by imitating the start/stop button push	Refer to the chapter: «Engine blocking by imitating the Start/Stop button push»
58	An external beeper control	A signal on the output is formed according to the embadded beeper operation algorithm. When this feature is assigned to any programmable output the embadded beeper stops working
59	Programmable logic output	A signal is formed according to an operating algorithm developed in the «Programming studio»

 $^{\ast}$  Any gear lever position allowing to drive forward (D, S, M ,L and etc.).

### Table 9. Programmable inputs features

Nº	Feature name	Feature description
1	Brake pedal position monitoring	Connect this input to the brake pedal pin switch output in cased if there is no brake pedal position data running on the vehicle's CAN-bus
2	Hood position monitoring	Connect this input to the hood pin switch in cased if there is no hood position data running on the vehicle's CAN-bus
3	Doors	Connect this input to the doors pin switches if there is no data running on the vehicle's CAN-bus
4	CDL «locked» (status)	Connect this input to the CDL slocked/uiplocked, status wires in ease if there is no such date running on the
5	CDL «unlocked» (status)	vehicle's CAN-bus
6	Ignition monitoring	If it is not possible to read the Ignition status data out of the vehicle's CAN-bus (for example, when a specific vehicle's electrical circuits are being blocked) then this alarm input must be connected to the vehicle's wire with constant +12 volts when the Ignition is ON. After assigning this feature to any programmable input — the alarm stops analyzing such data on the CAN-bus. In order to make the alarm analyze the ignition status data on the CAN-bus again, reprogram this input to any other feature or reset the alarm to default settings.
7	The alarm panic override when trunk lid is being released with the factory remote or keyless access	Connect this input to the vehicle's wire that controls the trunk lid actuator in case if after opening the trunk with the OEM remote unlock button or with keyless entry system the alarm is triggered. The alarm monitors this input during «armed mode» only. When the trunk lid release command is detected the alarm will be ignoring the sensors (shock, tilt/disdplacement) and the trunk pin switch within 5 sec. until the trunk is fully opened. In 5 sec. once the trunk lid is closed – the alarm continues monitoring the sensors and the trunk lid pin switch
8	PDC control button	Is used for parking sensors control with an additional button (in case if it is not possible to use CAN-bus buttons)
9	Afetrmarket engine heater status	Assign this feature to any programmable input to implement the analog control over an aftermarket engine heater. Assign to any programmable output the feature «Aftermarket heater control»
10	Windshield wipers status	The systems monitors the Windshield wipers status if only the «Remote start ready mode» has been egaged. The long warning beep informs the vehicle owner that the windshield wipers are ON when the signal is present on the input
11	Brake pedal pressure ignoring when using a third-party remote starter equipment	When using the third-party remote engine start modules
12	Remote engine start mode termination	A signal applied to the input cancels the remote engine start or inhibits the engine start
13	Parking brake	The function is used if there is no parking brake data on vehicle's CAN-bus
14	CAN-bus «awakening»	Is used in exceptional cases only (refer to the Integrator)
15	Hazard lights status monitoring	The input is used when «Slave» is implemented via analog inputs. A programmable input with preprogrammed feature «Hazard lights status monitoring» is connected to a high-current circuit controlling the turn indicators.
16	Trunk	The input is used if there is no hood position data on vehicle's CAN-bus
17	Wired «PIN code button» (Digital positive or negative)	For PIN code entry and other purposes
18	CDL «lock» pulse monitoring	The input is used on vehicles where «Slave» is implemented via analog inputs. A programmable input with programmed feature «CDL «lock» pulse monitoring» is connected to the central locking control wire – «lock» circuit
19	CDL «unlock» pulse monitoring	The input is used on vehicles where «Slave» is implemented via analog inputs. A programmable input with programmed feature «CDL «unlock» pulse monitoring» is connected to the central locking control wire – «unlock» circuit
20	Supplementary sensor input №1	
21	Supplementary sensor input Nº2	For connection to a supplementary sensor
22	Running engine status while in armed mode	A signal applied to the input allows the alarm to determine the engine's running status during the remote/ automatic engine start mode, turbotimer mode, ignition support mode. In other modes a signal on the input is being ignored and information on the engine status is taken from the vehicle's CAN-bus. This input has a priority above the «Engine is running» status taken from the CAN-bus: the alarm senses that information via the analog input. The signals may be either constant level or pulse
23	Engine pre-heater activation input	A signal applied to the input allows to trigger a factory installed or an aftermarket engine heater. While the signal is present at the input – the engine heater is running (status control)
24	Driver's door pin switch input	Use in exceptional cases when there is no data on the driver's door on a vehicle's CAN-bus (refer to the integrator)
25	Vehicle's OEM alarm system panic monitoring	The input is connected to a vehicle's circuit that registers a constant level voltage while the factory security system is in panic mode. It should only be connected in exceptional cases when there is no data on the CAN- bus regarding the status of the vehicle's factory security syste
26	Radio tag search activation	If a signal is applied to this input, the alarm will start searching for radio tags in range of the vehicle during 1 minute. The alarm will disarm and generate a signal to unlock the vehicle after detecting a radio tag. Radio tag search will cancell in 1 minute or if the alarm is re-armed. The feature will be functioning if in «Menu 1» option №21 «Tag operating mode or entering PIN code when disarming» is set up for «Disabling vehicle unlocking with OEM remote key until a tag is detected» or «Disabling vehicle unlocking with OEM remote key in dangerous places until a tag is detected», and in «Menu 2» (User's settings) option №12
		«Authentication method», any method is selected except of «PIN code»
27	Input for the «Beach mode» button	«Authentication method», any method is selected except of «PIN code» The input is used when implementing the «Beach mode» feature (refer to chapter «Adjusting beach mode» for details)

29	The input for keyless bypass module synching	It is used in exceptional cases during the alarm synching with a vehicle's factory immobizer (refer to the Integrator)
30	CDL «lock» input	A signal applied at this input triggers CDL locking
31	CDL «unlock» input	A signal applied at this input triggers CDL unlocking
32	CDL «lock/unlock» input	A signal applied at this input locks the CDL if it is unlocked and unlocks the CDI if it is locked
33	Programmable logic input	A signal applied at this input is processed by an operating algorithm created in the «Programming studio»

**Programming sequence** 

Turn the ignition to the ON position.

2 Complete an authentication procedure.

It is possible to enter the default PIN code «2» with the built-in programming/reset button of the alarm in case if a vehicle hasn't yet travelled 10 km after installing the alarm.

- 3 Press and release the programming button 10 times within 10 seconds after an authentication procedure is complete in order to enter the «Menu 1», the alarm will emit 3 beeps and the LED will flash 3 times. To enter the «Menu 1.2» press and release the programming button 11 times, the alarm will emit 6 beeps and LED will flash 6 times to confirm that the «Menu 1.2» is successfully selected.
- Select a desired option Nº within a programming menu. Press and release the programming button a number of times that corresponds 4 to the desired option №, the alarm will emit a certain number of beeps and LED flashes. E.g., in order to advance from the option №2 «Wired engine locking» to the option №16 «Number of brake pedal applications», press and release the programming button 14 times. The alarm will inform about the new selected option number by a corresponding series of beeps and LED falshes. In case if the option № consists of two digits, the first digit is indicated with a long beep and the second digit is indicated with a short beep: the option Nº10 is indicated with one beep;
  - the option Nº11 is indicated with 1 long beep, 1 second pause and 1 short beep.
- Change the selected option setting to a desired one by pressing and holding the brake pedal. The alarm will inform about the current 5 option setting by a corresponding number of beeps, the beeps length will also change.
- Change the option value by pressing and releasing the programming button number of times required to advance within the same option from the current option value to a desired one. Keep in mind that after the last option value goes the first one. Release the brake pedal, the alarm will stop indicating the setting of the option and will start indicating the current number of the option within the menu. Now you may proceed to configuring another menu option or exit the programming menu.
- 7 The feature №8 «Doors, hood, trunk» programming algorithm:
  - 7.1 Set up any combination of doors, hood, trunk for indicating their statuses on the appropriate programmable output. In the programming menu this algorithm is called «Doors».

7.2 With the brake pedal held proceed to option Nº8, the alarm will inform about the chosen option number by series of 8 beeps (2 times). After that it will be emitting intermittent audible signals. As soon as you hear intermittent signals - release the brake pedal. The alarm will keep emitting intermittent sounds. Open only those doors (you may do it in advance) which you need to be indicated on that output, the doors you don't want to be indicated should be closed. Depress the brake pedal again and keep it down, the alarm emits 8 beeps - the doors are now assigned to the output. If you don't press the brake pedal and exit the programming menu, the alarm will save in its memory the previouse option value.

- The feature Nº10 (refer to the Table 8 «Programmable outputs configuration») «Vehicle's OEM button pressure» programming algorithm. Programming algorithm for feature №10 – Factory buttons. With the brake pedal held proceed to the option №10. The alarm will emit 2 series of 1 long beep, and then will start emitting short intermittent audible signals. Holding the brake pedal press a desired button (please refer to the Integrator to check the list of available buttons for a specific vehicle). If the alarm recognizes the button, it stops emitting intermittent signals and returns to a current option number indication by a series of 1 long beep. Release the brake pedal, the alarm will start indicating a current Table 8 option number. If you release the brake pedal before the alarm has learned a button, the alarm will exit this option, save previous option settings, and will go back to a current option number indication.
- The feature №15 «Gear lever position» programming algorithm.

With the brake pedal pressed advance to the option  $\mathbb{N}^{15}$ . The alarm emits 2 series of 1 long and 5 five short beeps, and then will start emitting short intermittent beeps. While still holding the brake pedal pressed, shift the transmission to a required position: «P, N, D»\* or «R» (gear lever might be set into the necessary position beforehand). For an automated gearbox – «R, N, D»\* gear lever position may be programmed, and for manual transmission you can only program «R» position. Release, then press again the brake pedal. The alarm will stop emitting short intermittent beeps and returns to the current option value indication by a series of 1 long and 5 short beeps. Release the brake pedal, the alarm will go back to the menu option number indication. If you do not press the brake pedal- the alarm will abort programming of this option, save the previous settings and automatically exit the program mode.

10 Parking distance control button programming algorithm (PDC).

With the brake pedal pressed select the option №14 - Menu 1. The alarm will start emitting short intermittent beeps. Press and hold the selected button for a certain amount of time (if the alarm recognizes the button, the system will stops emitting short beeps while the button is being pressed):

- Short button press control hold the button for at least 2 seconds.
- Long button press control (2.5 sec) hold the button from 2 to 5 seconds.
- Status button press control hold the button for at least 5 seconds. Release the button, the alarm emits one beep and stops indication

Release the brake pedal, the alarm will return to to the current option number indication.

11 The feature №46 «Heating turning on during remote start mode» (impulse control).

With the brake pedal held proceed to the option Nº46. The alarm will inform about the option status by 2 series of 4 long and 6 short beeps. After that the alarm starts indicating the number of pulses which will be generated on the relative output for heating turning on.

- 1 pulse one beep,
- 2 pulses 2 beeps, 3 pulses 3 beeps.

If you would like to change the number of pulses-release the brake pedal and press the PB a corresponding number of times and by listening to the audible signals make sure that you have chosen the required number of pulses. Then press and hold the brake pedal again - the alarm quits indicating the option status and starts indicating the current option number.

### The feature №50 «Output for the remote start».

While holding the brake pedal pressed proceed to the option №50. The alarm will indicate the current option value with two series of 5 long beeps. Thereafter, the alarm will start indicating the feature number according to the assigned remote start timing diagram. E.g. the timing diagram №3 is set up by default, the output №4 is set up as «Key is in the ignition switch». For the otput «Key is in the ignition switch» of the timing diagram Nº3 is assigned the value «2».



The numbers of the remote start mode features are unique and described in the «Remote engine start connection diagrams for Prizrak 8xx/BT».

By using the programming button is possible to change a remote start feature just only within one remote engine start diagram. Whenever you'd like to change a remote start diagram (to assign at an output another feature within one remote engine start diagram)-release the brake pedal and press the programming button a required number of times making sure that the correct value has been assigned. Then press the brake pedal again – the alarm starts indicating the selected option number – 5 long beeps, release the brake pedal.

13 To move on to the next option withing the programming menu, press the PB the required number of times to advance through the programming menu from the current option number to a desired one. For instance: to move from the option №2 «Wired engine locking» to option№8 «CDL alternative control» press the PB 6 times. Keep in mind that after the last option number goes the first one. The alarm will automatically exit the programming mode and will save all current setting in the nonvolatile internal memory after the ignition is turned off or in 60 seconds after the last action is made in the menu and if brake pedal is not applied.

### 14 The feature №59 «Programmable logic output» programming algorithm.

Whenever an output is used in the «Programming studio» to implement a specific task — it must be adjusted as the programmable logic output by assigning to it the feature №59 and assigning to it a vertual ouptput channel that is used in the «Programming studio».

Holding the brake pedal pressed, proceed to the option status. The alarm will indicate the option status with series of 5 long and 9 short beeps. then the alarm starts indicating the current feature value (a number of a virtual channel).

To change the setting (to set up a different virtual channel number) release the brake pedal and push the programming button a number of times required to shift from the current virtual channel number to a desired one. By listening to the indication beeps, make sure the correct value was selected. After that press and hold the brake pedal again — the alarm will indicate the menu option status-5 long and 9 short beeps. Release the brake pedal — the alarm will stop indicating the current option value and will get back to indicating the current option number.

### 15 The feature №33 «Programmable logic input» programming algorithm.

Whenever an input is used in the «Programming studio» to implement a specific task – it must be adjusted as the programmable logic input by assigning to it the feature N $^{\circ}33$  and assigning to it a vertual input channel that is used in the «Programming studio». Holding the brake pedal pressed, proceed to the option status. The alarm will indicate the option status with series of 3 long and 3 short beeps, then the alarm starts indicating the current feature value (a number of a virtual channel).

To change the setting (to set up a different virtual channel number) release the brake pedal and push the programming button a number of times required to shift from the current virtual channel number) release the brake pedal and push the indication beeps, make sure the correct value was selected. After that press and hold the brake pedal again – the alarm will indicate the menu option status – 3 long and 3 short beeps. Release the brake pedal – the alarm stops the option status indication and indicates the current option number.

If 60 seconds of inactivity expire when the brake pedal is not pressed, or if the ignition switch is turned off, the alarm will save all configuration settings and exit the programming mode.

### Adjusting the feature «Disable vehicle unlocking until the radio tag is detected» (protection against Relay Station Attack)

In order to successfully impement the feature «Disable vehicle unlocking until the radio tag is detected»:

1 Select the radio tag operating mode (see option №21 «Menu1», «Tag operating mode or entering PIN code when disarming».

2 Carry out the vehicle unlocking blockage by one of the provided methods.

### There are 4 radio tag operating modes when disarming a vehicle:

Mode №1. Radio tag search begins only after the alarm receives the command for vehicle unlocking from OEM remote key or keyless entry system. Depending on radio frequency congestion the unlocking (time lapse) expectation can take up to a few seconds.

Mode №2. Radio tag search is very similar to the Mode №1, but in order to use this operating mode the feature «Maximum protection in dangerous places» should be activated. In option №21 «Radio tag search or PIN code entry when disarming», «Menu 1», select the value №4.



Modes №3 and №4 are characterized with increased current consumption by the alarm itself (approximately 30 mA) and by the radio tag's battery.

The radio tag's battery lifetime depends on the vehicle operating conditions, but in any case using the permanent radio tag search mode leads to decreased radio tag's battery life.

Mode №3. Radio tag search is carried out constantly (in «armed mode»).

During the mode operation the alarm is «searching» the Radio tag constantly. After the unlocking command is received from OEM remote, the CDL will unlock right away if the RFID has already been identified. In order to use this mode: in option №21 «Tag operating mode or entering PIN code when disarming», «Menu 1», select the value №5. Mode №4. RFID tag search — is very similar to «Mode №3», In exception that the function «Maximum protection in dangerous places» must to be enabled. In order to use this function: in option №21 «Tag operating mode or entering PIN code when disarming», «Menu 1», select the value №6.

### Mode №3. Radio tag search is carried out constantly (in «armed mode»).

During the feature operation the alarm is «searching» the radio tag constantly. After receiving of the unlocking command from OEM remote, the CDL will be unlocked right away if the RFID has already been identified. In order to use this mode: in option Nº21 «Tag operating mode or entering PIN code when disarming».

Mode №4. RFID tag search — is very similar to «Mode №3», In exception that the function «Maximum protection in dangerous places» must to be enabled.

In order to use this function: in option №21 «Radio tag search or PIN code entry when disarming», «Menu 1», select the value №6.

### Methods of blocking the the vehicle's doors:

Each method may be implemented separately or together with other methods:

- PIN-door electro-mechanical blockers installation. The control over the electro-mechanical door blockers is carried out via the
  programmable outputs with the assigned functions №32 «Pin doors blockers latching» and №33 «PIN doors blockers unlatching».
- The pin door blockers will latch after arming (if all doors, hood and trunk lid are closed). Pin door blockers will unlock after vehicle unlocking with OEM remote and Radio tag identification.
- CDL unlocking blockage via CAN-bus. No additional connections required. Not all vehicles support this function due to vehicles' electonics specificity (see the Integrator).
- Vehicle electrical circuits commutation which are responsible for CDL functioning. The commutation is controlled via programmable
  outputs with the assigned functions №34 «NO relay control for vehicle CDL unlocking blockage» and/or №44 «NC relay control for
  vehicle CDL unlocking blockage».

### Output №34 «NO relay control for vehicle's CDL unlocking blockage» operating algorithm.

The signal on the output is generated after receiving of the unlocking command from OEM remote or keyless entry system and Radio tag detection. The alarm keeps the output active until the vehicle is armed. The signal is generated constantly (while CAN-bus is active if «Service mode» is enabled or authentication method «PIN code» is selected). Output Nº44 «NC relay control for vehicle's CDL unlocking blockage». A constant level signal is generated on the programmable output during «armed mode», it will vanish after the alarm receives the unlocking command from the OEM remote or keyless entry system and Radio tag identification.

### Vehicle unlocking if RFID is lost or damaged.

If a Radio tag is lost or damaged it is possible to unlock the vehicle using a cellphone (via smart voice menu or smartphone application). There is no need of a radio tag to be in range to unlock the vehicle via a cellphone, the car's doors will unlock right after the alarm receives the unlocking command (the alarm will generate signals on the appropriate outputs allowing to unlock the car's doors).

### Adjusting the «Beach mode»

The feature is convenient in summer time when the car owner is having rest at the beach and is afraid to carry around the car key, radio tag and smartphone, because they may be stolen or lost. The car owner may leave all those items inside the car. To lock/unlock the vehicle is used a secret code which is not set by default and is subject for assigning by an installer. The code is to be entered with one of the doors buttons, trunk buttons or with an additionally installed button.



If the vehicle has been locked with OEM remote, keyless entry system or with driver's door lock cylinder then it will not be possible to unlock the car doors by entering a secret code.

### Secret code

A secret code is a button pressing combination. The button must be connected to the alarm's programmable input with the assigned function №27 «Beach mode code». The code is a 1, 2, 3 or 4 digit number. Each digit is a 1 to 9 number.

The secret code might be changed quickly and as many times as needed during installation or by car owner during everyday vehicle exploitation.

Secret code entry sequence:

1 Close all doors, hood, trunk lid.

2 Enter a secret code by pressing the button evenly. Make sure that while dialing one of the digits the push duration and pauses between pushes don't exceed 1 sec. Keep 2 sec. pause between the digits.

### «Beach mode» programming sequence

- 1 Assign the function №27 «Beach mode code» to any programmable input except of the inputs №7 and №16 (refer to «Menu 1.2. Programable inputs/outputs configuration»).
- 2 Connect the chosen input to a button located outside of the vehicle (door handle button, trunk lid button).
- 3 In the «Menu 1» «Hardware functions configuration» select the option №26 «Beach mode code» and assign a secret code.
- 4 Now you need to test the function operation, this is necessary in order to make sure the car is unlocked properly, fore example, after self-rearming.

#### Secret code programming/changing

- 1 Turn ignition ON.
- 2 Complete the authentication procedure.
- Within 10 sec. after the authentication is complete press the programming button 10 times. The alarm will emit 3 beeps and LED flashes.
   According to the «Menu1» select the option №26 «Beach mode». Therefor, press the PB 26 times. The alarm will indicate the selected
- option number by series of 2 long and 6 short beeps and LED flashes.
- 5 Press and release the brake pedal.
- 6 6 Program/change a secret code with the button chosen for secret code entry.
- 7 Wait for confirmation by 1 beep and LED flash.
- 8 8 Re-enter the secret code.
- 9 Wait for confirmation:
- 2 beeps and LED flashes, then a trill mean that the secret code has been changed, the alarm exits the programming mode.
- long warning beep a secret code hasn't been changed. A mistake is made during secret code entry.
- Repeat the secret code programming/changing procedure starting from the step №6.
- It is possible to exit the secret code programming/changing mode without saving any changes by turning the ignition OFF.

#### «Beach mode» testing procedure

- If you program the feature but don't complete testing procedure then after 10 km of driving the car the function will be blocked. It
- will be available again only after resetting the system to factory settings.
- During testing procedure the OEM car key has to be outside the vehicle.
- Close all doors, hood, trunk lid
- 2 Open and close the driver's door.
- 3 Enter a secret code the doors will lock:
- 4 Wait for siren chirp (approximately 1 minute). The siren is chirped 1 time every 15 seconds.
- 5 Enter a secret code:
- If you do it correctly the doors will unlock. Don't open any door, hood or trunk lid.
- If you fail to enter the code correctly the doors will remain locked, re-enter the code.

If you are sure that it is entered correctly but the doors remain locked-it means that testing procedure hasn't been complete. Check all connections and whether the vehicle supports such function (try to re-assign the function to any other programming input).

- 1 Wait for the siren chirp (maximum 6 minutes). It allows to check whether the doors would unlock after self-rearming.
- 2 Enter the secret code the doors should unlock (after self-rearming).
- 3 Within 30 sec. open a door you will hear a trill which confirms that the testing procedure has been complete and the «Beach mode» feature will operate permanently.

### Diagnostic mode

The mode allows to test the «Beach mode» function operation. With brake pedal held while you are in the option №26 «Beach mode», the alarm beeper emits indication sounds:

- 1 Silence the function disabled.
- 2 1 beep the function enabled.
- 3 2 beeps the testing procedure not completed.
- 4 3 beeps the function is blocked after vehicle has covered 10 km (resetting to factory settings required).
- 5 4 beeps the function is not assigned to the input (if the input was changed after assigning the function).
- 6 5 beeps incorrect input is used (inputs №7 or №16).

Release the brake pedal, the alarm will exit the diagnostic mode. Secret code might be programmed/changed.

### Adjusting the built-in sensors

### Table 10. Built-in sensors

Nº	Option function	Values range	Default values	Note
1	Shock sensor warning	0 - 8	4	0- the zone is disabled;8 - maximum sensitivity
2	Shock sensor trigger	0 - 8	4	0- the zone is disabled;8 - maximum sensitivity
3	Shock sensor trigger	0 - 8	4	0- the zone is disabled;8 - maximum sensitivity

Programming sequence

1 Turn the ignition ON.

2 Complete the authentication procedure

3 Within 10 sec. after an authentication is complete press the PB 8 times, the alarm will emit 5 beeps and LED flashes.

- 4 Select a required option number by pressing the PB the number of times, corresponding to a desired option number. The alarm will inform about the selected option number by series of beeps and LED flashes.
- 5 Now it is possible to customize the option value by applying and holding the brake pedal. The alarm will indicate the current option value by series of beeps and LED flashes.
- 6 Change the option value by pressing the PB a number of times required for shifting from current value to a desired one. The alarm will inform about the new option value by series of beeps and LED flashes. Keep in mind while shifting within the option, that after the last option value goes the firs one.

The alarm will automatically exit the programming mode and will save all current setting in nonvolatile internal memory after the ignition is turned off with brake pedal released. And also the alarm will exit the menu in 10 seconds after the last action is made in the menu and if brake pedal is not applied.

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The built-in shock sensor can be tested quickly and conveniently by temporarily exiting the programming menu. While adjusting any built-in shock sensor zones, turn the ignition OFF. The alarm will not emit any sound. Test the shock sensor after arming the alarm (the windows comfort closure function is disabled during testing), besides this the alarm operates as usual. After turning the ignition back ON, the alarm comes back to the same programming menu option as it has been before temporary exit for shock sensor testing.

If the ignition is not turned ON within 10 minutes after testing is finished, the alarm saves the current sensor sensitivity value and automatically exits the «Built-in sensor adjustment» menu and trill will sound.

### Configuring the engine heater settings

### Table 11. Engine heater settings

Nº	Option name	Values range	Default values	Description
1	Parking heater operation permit/ prohibit	1 – 2	1	1 – permit; 2 – prohibit
2	Stand-alone pre-heater operation in the supplementary heater mode	1 – 2	2	1 – ON; 2 – OFF
3	Engine heater conrol protocol	1 – 8	_	1 – Webasto; 2 – Eberspächer; 3 – automatic adjustment; 4 – factory fitted Webasto for VAG (Multivan T6); 5 – factory fitted Webasto for RR Evoque (2011-2013); 6 – factory fitted Eberspächer for RR Evoque (2011- 2013)/Sport (2014); 7 – control over protocol disabled: 8 – factory-fit Eberspächer for Toyota
4	Engine heater shut off criterion	1 – 3	1	1 - by time; $2 - by$ engine temperature; $3 - by$ engine temperature or by time
5	Engine pre-heater operation duration	1 - 12	3	1-10 minutes;3 - 30 minutes; 12 - 120 minutes
6	Engine pre-heater shut down temperature	1 – 7	5	1 – 0°C; 5 – 50°C; 7 – 70°C
7	Car's battery voltage to shut off the engine pre-heater	1 - 11	9	1 – 10,5 V; 9 – 11,3 V; 11 – 11,5 V
8	Factory installed engine heater control via CAN-bus permit/inhibit	1 – 2	1	1 – permit; 2 – inhibit
9	Engine heater activation code with vehicle's interior buttons	-	-	The code programming is carried out similarly to PIN code change algorithm. It is possible to enter the code only with the ignition turned ON
10	Engine heater control via OEM remote key	1 – 2	2	1 – ON; 2 – OFF
11	Operating algorithm for the output «Aftermarket heater control»	1 – 6	1	1 – status control; 2 – pulse control 2,5 sec; 3 – pulse 3 sec; 4 – pulse 1,5 sec; 5 – pulse 1 sec; 6 – pulse 0,8 sec
12	Autonomous ventilation operating duration	1 – 4	1	1 – OFF; 2-10 minutes; 3-20 minutes; 4-30 minutes

### **Programming sequence**

Turn the ignition to the ON position.
 Complete an authentication procedure.

3 Within 10 sec. after authentication is completed press the PB 17 times, the alarm will emit 8 beeps and LED flashes.

4 Select a required option by pressing the PB the number of times corresponding to a desired option number. The alarm will indicate the selected option number by series of beeps and LED flashes.

5 Now it is possible to change the option value by pressing and holding the brake pedal. The alarm will inform about the current option value with series of beeps and LED flashes.

6 Change the option value by pressing the PB a number of times required for shifting from current value to a desired one. The alarm will inform about the new option value by series of beeps and LED flashes. Keep in mind while shifting within the option, that after the last option value goes the firs one.

The alarm will automatically exit the programming mode and will save all current setting in nonvolatile internal memory after the ignition is turned off with brake pedal released. And also the alarm will exit the menu in 10 seconds after the last action is made in the menu and if brake pedal is not applied.

### Configuring the remote/automatic engine start feature

### Table 12. Remote/automatic engine start feature settings

Nº	Option name	Values range	Default values	Note
1	«Free hands» function during remote start mode	1 – 3	2	1 – The CDL is unlocked after RFID tag is identified, engine will keep running; 2 – OFF; 3 – Engine shuts down when RFID is identified, CDL will remain locked
2	ESM-250 module remote start diagram	3 - 27	3	Set up one of the standard remote start schemes (timing diagrams). All timing diagrams can be found in TECprog2, Any timing diagram may be customized according to specific needs
3	«Ignition support» feature	1 – 2	2	1 – enabled; 2 – disabled
4	Engine run time in the ignition support mode	1 – 15	5	1 - 1 minute; $2 - 2$ minutes; $3 - 3$ - minutes; $4 - 10$ minutes; $5 - 20$ minutes; $15 - 120$ minutes
5	«Turbotimer» function	1 – 5	1	1 — enabled; 2 — operation time 1 minute; 3 — 2 minutes; 4 — 3 minutes; 5 — adjusts automatically
6	External temperature sensor function (connected to ESM-250)	1 – 2	2	<ul> <li>1 – engine temperature sensor;</li> <li>2 – interior temperature sensor</li> </ul>
7	Ignoring brake pedal application when vehicle is remote started	1 – 3	2*	1 - brake pedal is ignored when the vehicle is being remote started; $2 - brake application cancels the remote start; 3 - the brake pedal is ignored during the entire remote start cycle$
8	Engine shut down after releasing the brake pedal	1 – 2	2*	1 – enabled; 2 – disabled
9	Brake pedal engaging via CAN-bus	1 – 2	2*	1 – enabled; 2 – disabled
10	Engine shutdown when disarming	1 – 2	2*	1 – enabled; 2 – disabled
11	Engine shutdown conditions during remote start mode	1 – 3	1	1 - by time; $2 - by$ engine temperature; 3 - by engine temperature or by time
12	Engine type	1 – 3	1	1 – diesel; 2 – petrol; 3 – hybrid
13	Starter crank delay (for diesel)	1 – 20	2	1 – 1 sec;20 – 20 sec
14	Engine's RPM at idle speed	1 – 6	_	1 – 600 RPM;6 – 1100 RPM. It is adjusted automatically, can be set up manually if needed
15	Engine run time during remote start mode	1 – 12	3	1 – 10 minutes;3 – 30 minutes;12 – 120 minutes
16	Engine shutdown temperature during remote start mode	1 - 14	12	1 - «15°C»; 2 - «20°C»; 12 - «70°C»; 14 - «80°C»
17	Low-temperature engine start	1 – 8	1	1 - «-30°C»; 2 - «-20°C»; 3 - «-15°C»; 4 - «-10°C»; 5 - «-5°C»; 6 - «0°C»; 7 - «5°C»; 8 - «10°C»
18	Low-battery voltage engine start	1 – 15	8	1 – 10,6 V; 2 – 10,7 V; 8 – 11,3 V; 15 – 12 V
19	Engine run time to recharge the car's battery	1 – 6	3	1 – 10 min;3 – 30 min;6 – 60 min
20	Tarnsmission type selection	1 – 4	_	<ol> <li>Automatic transmission(AT); 2 – Manual transmission (MT); 3 – control is not preformed;</li> <li>4 – manual transmission with «neutral» status; Adjusts automatically, can be set up manually if needed</li> </ol>
21	«Remote engine start» feature	1 – 2	2	1 – ON; 2 – OFF
22	Driver's door opening imitation ignore duration (for third-party remote start modules only)	1 – 5	1	1 – ignore disabled (getting out of the vehicle imitation is also disabled); 2 – 1,0 sec; 3 – 3sec; 4 – 5 sec; 5 – all doors are ignored starting from the moment of remote start command until the engine is actually started and within 5 sec after the ignition is switched off
23	Driver's door opening imitation right after remote start mode is terminated	1 – 5	1	1-via CAN-bus and pulse 0,4 sec; $2-pulse-0,4$ sec; $3-1$ ,0 sec; $4-4,5$ sec; $5-3,5$ sec
24	CDL automatic re-locking after remote start is terminated	1 – 2	1	1 – ON; 2 – OFF
25	Vehicle rearming right after remote start mode is terminated	1 – 2	1	1 — permit; 2 — prohibit
26	Engine pre-heating time with parking heater	1 – 4	2	1 – 10 min;2 – 20 min;4 – 40 min
27	Engine pre-heating temperature with parking heater	1 – 10	3	1 - «-10°C»; 2 - «-5°C»; 3 - «0°C»; 10 - «50°C»
28	Engine start delay after pre-heating	1 – 5	1	1 – OFF; 2–3 min.; 3 – 5 min; 4 – 10 min; 5 – 15 min
29	Remote engine start control with OEM remote key	1 – 2	2	1 – ON; 2 – OFF
30	Remote engine start via CAN bus	1 – 2	2	1 – ON; 2 – OFF
31	Ignoring all parameters during remote engine start	1 – 2	2	1 – ON; 2 – OFF
32	Enabling remote start ready mode (manual transmission)	1 – 2	1	1 – by driver's door closing; 2 – by arming
33	Window wipers are «ON» sonic warning for the remote start	1 – 2	2	1 – ON; 2 – OFF
34	Time period for «driver's door opening imitation»	1 – 3	1	<ul> <li>1 – after remote start; 2 – prior to remote start;</li> <li>3 – prior to and after remote start</li> </ul>

35	«Turbotimer» feature engaging	1 – 2	2	1 — after shifting the gear lever to «P» (Parking) and parking brake engaging; 2 — After shifting the gear lever to «P». For vehicels with mechanical transmission (MT) the «Turbo-timer» freature is engaged if only the «Safe neutral procedure» will be completed.
36	Parking brake ignoring during remote engine start mode	1 – 3	2	<ul> <li>1 – Parking brake is ignored prior to remote start;</li> <li>2 – Parking brake inhibits remote start;</li> <li>3 – Parking brake is ignored during entire remote start mode cycle</li> </ul>
37	Speed ingoring when the engine is being remote started	1 – 3	2	1 – Speed data is ignored when the vehicle is being remote started; 2 – Speed data inhibits remote start; 3 – Speed data is ignored during the entire remote start mode cycle

\* The value may automatically change for a specific vehicle (refer to the Integrator).

### **Programming sequence**

- 1 Turn the ignition ON.
- 2 Complete an authentication procedure.
- 3 Within 10 sec. after authentication is completed press the PB 16 times, the alarm will emit 7 beeps and LED flashes.
- 4 Select the required option by pressing the PB the number of times corresponding to the desired option number. The alarm will indicate the selected option number by series of beeps and LED flashes:
  - the option №10 indication one long beep.
  - the option №11 indication 1 long beep, 1 second pause, 1 short beep.
- 5 Now it is possible to change the option value by pressing and holding the brake pedal. The alarm will inform about the current option value by series of beeps and LED flashes.
- 6 Change the option value by pressing the PB a number of times required to shift from the current value to a desired one. The alarm will inform about the new option value by series of beeps and LED flashes. Keep in mind while shifting within the option, that after the last option value goes the first one.

The alarm will automatically exit the programming mode and will save all current setting in nonvolatile internal memory after the ignition is turned off with brake pedal released or it will also exit the menu in 10 seconds after the last action is made in the menu and if brake pedal is not applied.

### Table 13. Built-in keyless immobilizer bypass module parameters adjustment

Nº	Option name	Values range	Default value	Description
1	Keyless bypass module control protocol	1 – 3	-	1 – Fortin; 2 – iDataLink; 3 – «TEC electronics»
2	Syncing with OEM immobiliser	1 – 4	_	1 – Sync complete; 2 – Sync not complete; 3 – Start the sync; 4 – Sync not possible
3	Keyless bypass «TEC-electronics» connection method (OEM immobiliser type)	_	_	Is adjusted automatically. Can be set up manually if needed
4	OEM alarm system operating mode (remote start)	1 – 3	_	1 – OEM alarm operates in standart mode: 2 – OEM alarm is disabled. The OEM alarm system will not «arm»; 3 – «Disarming» and «Arming» the OEM alarm system prior to remote engine start

### **Programming sequence**

1 Turn ignition ON.

2 Complete the authentication procedure.

If the vehicle hasn't covered 10 km after the alarm installation and the default PIN code is not changed, then it is possible to use the default PIN code – (2) by pressing the built-in PB twice.

- 3 Within 10 sec. after authentication is completed press the PB 18 times, the alarm will emit 9 beeps and LED flashes.
- 4 Select the required option by pressing the PB the number of times corresponding to a desired option number. The alarm will indicate the selected option number by series of beeps and LED flashes.
- 5 Now it is possible to change the option value by pressing and holding the brake pedal. The alarm will inform about the current option value by series of beeps and LED flashes.
- 6 Change the option value by pressing the PB a number of times required to advance from the current value to a desired one. The alarm will inform about the new option value by series of beeps and LED flashes. Keep in mind while shifting within the option, that after the last option value goes the first one.

The alarm will automatically exit the programming mode and will save all current setting in nonvolatile internal memory after the ignition is turned off with brake pedal released or it will also exit the menu in 10 seconds after the last action is made in the menu and if brake pedal is not applied.

### Syncing procedure with vehicle's original immobilizer

- 1 Turn the ignition ON.
- 2 Complete an authentication procedure.



If the vehicle hasn't covered 10 km after the installation and the default PIN code is not changed, then it is possible to use the default PIN code  $- \approx 2$ » by pressing the built-in PB twice.

- 3 Within 10 sec. after the authentication press the PB 18 times, the alarm will emit 9 beeps and LED flashes.
- 4 Select the option №2 «Sync with OEM immobiliser» by pressing the PB twice. The alarm will emit series of 2 beeps and LED flashes.
- 5 Now it is possible to change the option value by pressing and holding the brake pedal. The alarm will inform about the current option value by 2 beeps and LED flashes (the factory value of this option is «2-sync not completed»).
- 6 Select the value №3 «Start the sync» by pressing the PB 1 time (once). The alarm will inform about the new option value by series of 3 beeps and LED flashes. Release the brake pedal.
- 7 Turn the ignition OFF. The alarm will continue emitting series of 3 beeps and LED flashes.
- 8 Turn ignition ON trill will sound. The alarm will now automatically exit the programming menu.



- Specific vehicles require a series of actions to be performed after turning the ignition OFF (the description of necessary actions are listed in the Integrator).
- The expectation time for confirmatory trill can take up to 5 minutes. During that time the alarm is beeping continuously.
- 9 Take the car's key away. Remote start the car (fore example, via smartphone app «Prizrak»). After that the syncing procedure is finished. If any error occurs during «Syncing» process – the system informs about that by a long warning beep and automatically exits the programming menu. Check all connections and perform the «Syncing» procedure again.

There can be the following value changes of option «Sync with OEM immobilizer» during the programming process:

- If sync has been completed then it is possible to change the option value from «1 sync is passed» to «3 start sync».
- If sync hasn't been completed you can change «2 sync not completed» to «3 start the sync».
- It is impossible to change the value «4 sync not possible» to any other value (the keyless immobilizer bypass function is not available on the vehicle).
- It is impossible to change the value «1 sync is completed» to «2 sync not completed» and vise versa.

### Adjusting the analog «SLAVE» feature

It is designed for vehicles that don't transmit all necessary data via their CAN-bus which is required for the «Slave» feature functioning. In order this feature to operate properly, the alarm has to analyse the hazard lights and central door locking system operation when arming/ disarming the vehicle with vehicle's original remote key. In order the alarm be able to «read» this data, it is needed to assign the features N<sup>o</sup> 15, 18, 19 to any programmable inputs and connect them to the appropriate circuits in the vehicle where the hazard lights and central door locking statuses appear when arming/disarming.

In the Menu 1 «Hardware features configuration», option Nº43 – «Slave mode operation» set up the value «2» in case when arming the vehicle with the OEM remote key or keyless entry system the hazard lights flash once and when disarming-twice.

If the vehicle's hazard lights behavior is different from that listed above or the «Slave mode» doesn't work when the option N $^{\circ}43$  is set for value «2» – then the «Slave» analog signals «learning» procedure should be performed by selecting the value «3». The procedure is described below:

During the «learning» procedure the alarm's embedded beeper performs indication of the selected options and values with audio beeps (hereinafter-beeps).

- 1 Switch the ignition to the ON position; Perform an authentication procedure.
- 2 Within 10 seconds after the authentication enter the Menu 1 by pressing and releasing the programming button 10 times;
- 3 beeps followed after that confirm that the correct program menu has been chosen. If the number of beeps is different an error occurred.
- 3 Press and release the programming button 43 times:
- the alarm confirms the actions with 4 long ad 3 short beeps.
- 4 Press and hold the brake pedal:
- confirmation the number of beeps indicate the current option value.
- 5 Holding the brake pedal, advance to the value «3», each button press enhances the number of the current value by one. Keep in mind that after the last value number goes the first one:
  - confirmation -3 beeps will sound.
- 6 Release the brake pedal and switch the ignition to the OFF position:
  - confirmation 1 beep;
  - make sure all doors are closed.
- 7 Lock the vehicle from the «lock» button of the OEM remote key or use keyless entry system.
- confirmation 1 beep.
- 8 Press the «lock» button on the OEM remote key or use the keyless entry system one more time:
- confirmation 1 beep.
- 9 Press the «lock» button on the OEM remote key for the third time or arm the car with keyless entry system:
   confirmation 2 beeps.
- 10 Unlock the vehicle from the «unlock» button of the OEM remote key or use keyless entry system:
  - confirmation 1 beep;
  - all further actions are performed to test the «Slave mode».
- 11 Lock the vehicle with the factory remote key or keyless entry system:
- confirmation 1 klaxon honk or 1 siren chirp.
- 12 Unlock the vehicle with the factory remote key or keyless entry system:
  - confirmation 2 klaxon honks or 2 siren chirps;
  - trill will sound, confirming successful «learning» procedure completion; The alarm exits the program mode and automatically saves the value «4 – via the programmable analog inputs after the alarm has «learned» the analog signals.

### «Diagnostic trouble codes reading» feature adjustment

The system is equipped with a feature called «Diagnostics trouble codes reading» that allows to read vehicle's diagnostic trouble codes via standard OBDII protocol (ISO 15765). In order to implement such a feature on a vehicle – the system's CAN1 or CAN2 must be connected to the diagnostics CAN-bus, refer to the Integrator to check this feature compatibility with a specific vehicle. The user's diagnostic interface is available in the mobile app «Prizrak» that provides possibility to read and erase diagnostic trouble codes. Furthermore, it is possible to find out more information on the trouble code in the internet-the app will automatically generate a request in the search system. More than that, the diagnostics system can automatically erase the trouble codes (without user's participation) appeared after engine locking trigger or engine pre-heater operation.

### Erasing fault codes appeared after engine locking

Very often in modern vehicles apper trouble codes after triggering the engine locking, but this doesn't mean that there is a critical problem with vehicle's electronics. This is a normal reaction of the vehicle's on-board diagnostic system to an anti-theft engine locking. The integrated diagnostic feature allows to automatically erase such trouble codes, but only in case they appear after an anti-theft engine locking. If a trouble code appears for any other reason-it will not be erased.

Add into the system's memory trouble codes appeared due to the engine locking: delete all the trouble codes (if present) in the car, trigger the engine locking and if any trouble codes are detected, save them into the alarm by means of the TECprog2 software.

There is one more method to add trouble coudes into the alarm memory if they are initiated by triggered engine locking:

- 1 Erase all trouble codes that appeared after you had mounted an an engine locking device (e.g. a relay).
- 2 Start the engine and trigger the engine locking (e.g. start driving without entering a PIN code).
- **3** Turn the ignition off.
- 4 Start the engine. A trouble code will be detected.

5 Wait for 30 seconds. Make sure the trouble codes are erased.

- The trouble codes caused by triggered engine locking are erased immediately after the ignition is turned ON.
- Each time within 2 minutes after the engine locking is triggered the system monitors presence of new trouble codes that weren't
  programmed into it. If a new fault code is detected, it will be automatically erased, saved into the system's memory and in the future
  it will be erased each time right after the engine locking is triggered.

### Erasing fault codes appeared after engine pre-heating

The vehicle's on-board diagnostics can detect a fault code in case if the alarm controls an engine pre-heater and/or the climate system. A fault code may appear due to the climate system was activated when the ignition was switched off or due to the deviation in the engine temperatures before and after an aftermarket engine heater operation. The alarm is able to erase fault codes only in case if it activated an aftermarket engine heater or the climate system by itself.

To adjust the automatic fault codes erasure it is required to add the fault codes that appear after an aftermarket heater and/or the climate system operation into the system's memory. For that purpose:

- all trouble codes in the vehicle must be erased beforehand in case if they are present;
- · turn on an aftermarket engine pre-heater via the mobile app or the intellectual voice menu;
- check if any trouble code has appeared;
- add the fault code into the alarm memory using the TECprog2 software.

### Table 14. Adjusting the «Diagnostic trouble codes reading» feature

Nº	Option name	Default values	Available values
1	Diagnostic feature operating mode (refer to the Integrator)	1	1 — diagnostics OFF; 2 — diagnostics via CAN1; 3 — diagnostics via CAN2
2	Vehicle's diagnostic protocol (refer to the Integrator)	1	1 – standard ID (11 bit); 2 – extended ID (29 bit); 3 – protocol Mercedes
3	Clearing fault codes automatically caused by the engine locking	2	1 – ON; 2 – OFF
4	Clearing fault codes automatically caused by the engine heater operation	2	1 – ON; 2 – OFF
5	Conditions to automatically clear fault codes	1	1 - if at least one of the saved codes is detected; 2 - if only unsaved codes not detected

### Programming sequence

- 1 Switch the ignition to the ON position;
- 2 Complete authentication procedure;
- Within 10 seconds after authentication press and release the programming button 21 times, the alarm emits 11 beeps and LED flashes.
   Select a required option number within the menu by pressing and releasing the programming button the number of times corresponding to a desired option number. The alarm will indicate a selected option number by a series of beeps and LED flashes.
- 5 In order to change the option value press and hold the brake pedal. The alarm will indicate the current option value by a series of beeps and LED flashes, the beeps duration will change.
- 6 Change the option value by pressing and releasing the programming button the number of times required to advance from the current value to a desired one. The alarm will indicate the selected value by a series of beeps and LED flashes. Keep in mind that after the last option value goes the first one.
- 7 In order to save all settings in the nonvolatile internal memory and exit the programming mode-release the brake pedal and switch the ignition to the OFF position. Do not allow more than 10 seconds to lapse between steps if the brake pedal is released or the program mode will be automatically exited and you will have to start over.

### Configuring the hood compartment module HCU-230/BT

	Table 15. Hood compartment unit HCU-230/BT settings						
Nº	Option name	Default values	Description				
1	«Registering the hood compartment unit HCU-230/ BT module»	_	Refer to the chapter «HCU-230/BT module registration»				
2	Communication check with the HCU-230/BT module	_	-				
3	Cancelling registration of the HCU-230/BT module	_	Refer to the chapter «Cancelling registration of the HCU-230/BT module» module registration				
4	Input/output 2 (pink/black) assignment	1	1 – Panic/warning signals to the siren; 2 – enginie locking (NC realay control); 3 – programmable output; 4 – programmable input; 5 – engine temparature sensor; 6 – ambient temperature sensor				
5	The input/output №2 adjustment (pink/black)	_	In the option N <sup>o</sup> 4 select the value 3 or 4. Set up a featuere in range $1-59/$ , 33				
6	Input/output №2 polarity set up (pink/black)	1	1 – positive polarity; 2 – negative polarity				
7	Output №3 standard features adjustment	4	1 – panic/warning signals to the siren; 2 – engine locking (normally closed (NC) relay control); 3 – programmable output; 4 – electro-mechanical hood lock latching				
8	Input/output №3 operation adjustment	-	Select the value 3 in the option №7. Select any value in range from 1–59				
9	Output №4 standard features adjustment	4	<ul> <li>1 - Panic/warning signals to the siren; 2 - enginie locking</li> <li>(NC realay control); 3 - programmable output;</li> <li>4 - electro-mechanical hood lock unlatching</li> </ul>				
10	Input/output №4 operation adjustment	_	Select the value 3 in the option №9. Select a value in range of 1-59				
11	Input/output satandard features adjustment	3	1 – engine locking (NC relay control); 2 – programmable output; 3 – programmable input; 4 – engine temparature sensor; 5 – ambient temperature sensor doors; 6 – engine preheeaters Webasto or Eberspächer control				

12	Input/output №5 (white/'black) operation adjustment	2	Select the value 3 in thew option №11. Assign any of the 1-59/1-33 features
13	HCU-230 integrated accelerometer sensitivity adjustment	4	1 — minimum;8 — maximum
14	Siren/klaxon control (on any of the outputs)	1	1 – siren; 2 – klaxon control

### **Programming sequence**

- 1 Switch the ignition to the ON position.
- 2 Complete authentication procedure;
- 3 Within 10 seconds press the programming button 20 times, the alarm will indicate that the correct menu has been successfully entered by emitting 10 beeps and LED flashes.
- 4 Select a desired option by pressing and releasing the programming button the number of times corresponding to the option number. The alarm will indicate the selected option number by a series of beeps and LED flashes.
- 5 Select a desired option value by pressing and holding the brake pedal, The alarm will indicate the current option value by a series of beeps and LED flashes., the beeps length will change.
- 6 Still holding the brake pedal, select a desired option value by pressing and releasing the programming button the number of times required to advance from the current option value to a desired one. The alarm will indicate the new option value by a series of beeps and LED flashes. Keep in mind that after the last option value number goes the first one. After releasing the brake pedal and turning the ignition to the OFF position, the alarm will exit the programming mode saving the settings in the nonvolatile memory. Do not allow more than 10 seconds to lapse between steps when the brake pedal is not pressed or the program mode will be automatically exited and you will have to start over.

### Registering the hood compartment module HCU-230/BT module

Registration is the «pairing» procedure of the HCU-230 module with the main alarm module.

The registration is carried out on a PC via the TECprog2 software or with the programming button by entering the special programming menu. The hood compartment module will not work with another main alarm module after registration is complete until registration of the HCU-230 is voided (refer to the chapter «Cancelling registration of the HCU-230/BT module».

### HCU-230/BT module registration via TECprog2

- 1 Install the main alarm module and the hood compartment module on a vehicle and supply +12 V to both modules.
- 2 Launch the TECprog2 software, plug in the alarm via mini USB-cable or connect to the alarm via Bluetooth (using the special TECprog USB bluetooth adapter) and follow the instructions.
- The registration procedure may be completed without installing the modules on a vehicle, it can be done on the table, however, the modules must be supplied with +12 V.

### Registering the module by using the programming button and the special programming menu

The registration procedure is available only during the first 2 minutes after power has been supplied to the HCU module.

I Install the main alarm module and the HCU on a vehicle and supply power to both modules.

- 2 Turn the vehicle's ignition ON and complete an authentication procedure (enter PIN code and/or wait until the radio tag is detected) confirmation trill will sound.
- 3 Enter the menu «Hood compartment unit HCU-230/BT settings» within 10 seconds after authentication is complete by pressing and releasing the programming button 20 times. The system will emit 11 beeps and flash the LED 11 times to confirm that the menu has been successfully entered.
- 4 Select the option №1 «Registering the hood compartment unit HCU-230/BT» by pressing and releasing the programming button 1 time. The alarm will indicate the selected option number by a repeated single beep and one LED flash.
- 5 Press and hold the brake pedal. The alarm will indicate if any hood compartment module is already registered into the main alarm module: one beep and one LED flash an HCU module has already been registered; silence no module registered.

If a module has already been registered into the main alarm unit and another (new) module is being registered then the previously registered module will be erased from the alarm's memory. The alarm will be working with only the newly registered HCU-230/BT module.

- 6 In order to register the new module press the programming button 1 time. The alarm will begin searching. There will be an intermittent sound during the search:
- if the alarm has detected one available module for «pairing» the registration procedure will start immediately, herewith the beeps length will change.
- if the alarm has detected two or more available modules a long beep will sound. The registration process will terminate and the beeps length will change. Turn the vehicle's ignition OFF and wait for at least two minutes then start the procedure all over again.
- 7 Successful registration is followed by the confirmation trill and a short single repeated beep indicating that one module has been registered.
- 8 Release the brake pedal and switch the ignition OFF. The confirmation trill will sound.

### Cancelling registration of the HCU-230/BT module

The procedure may be useful in case if the already installed module should be paired with another (new) alarm unit. After the «Cancelling registration of the HCU-230/BT module» procedure has been completed, it is possible to re-register the module into another alarm unit.



If HCU module registration is voided, the other pre-set settings will not be reset to default settings. In order to reset the module to default settings-perform the «Resetting to default settings» procedure.

There are three ways to reset the module.

### 1st way. By using the TECprog2

Run the TECprog2 software, plug in the alarm via mini USB-cable or connect to the alarm via Bluetooth (using the special TECprog USB bluetooth adapter) and follow the instructions.

### 2nd way. Without the main Prizrak alarm module

1 Unpower the module.

2 Connect the input/output №2 and Input/output №5 to the vehicle's ground.

- **3** Supply power to the module.
- 4 Disconnect the input/output №2 and Input/output №5 from the vehicle's ground.
- 5 Within the next 10 seconds supply 5 negative pulses to the module input/output №2 and Input/output №2.

### 3rd way. Resetting the module to default settings using the programming button and the special programming menu

The HCU module and the main alarm unit must be installed on a vehicle and supplied with power.

- 1 Turn the vehicle's ignition ON and complete an authentication procedure (enter PIN code and/or wait until the radio tag is detected) confirmation trill will sound.
- 2 Enter the menu «Hood compartment unit HCU-230/BT settings» within 10 seconds after authentication is complete by pressing and releasing the programming button 20 times. The system will emit 11 beeps and flash the LED 11 times to confirm that the menu has been successfully entered.
- 3 Select the option №3 «Hood compartment unit HCU-230/BT registration» by pressing and releasing the programming button 3 times. The alarm will indicate the selected option number by a series of 3 beeps and 3 LED flashes.
- 4 Press and hold the brake pedal. The alarm will indicate if any hood compartment module is already registered into the main alarm module:
- one beep and one LED flash an HCU module has already been registered;
- silence-no module registered.
- 5 Press the programming button 1 time, the alarm will inform about the start of the cancellation process process by short intermittent beeps.
- 6 6. The confirmation beep will sound if the registration is successfully voided. Hereafter you may exit the programming menu by switching the vehicle's ignition OFF.

The system emits a long warning beep if an error occurs while cancelling the module registration. You will have to start over.

### Customizing the user features

### Menu 2. User settings

				OFF				
Nº	Option name	Default values	LED	LED Number of beeps		Number of beeps		
1	Immobilizer		01	1		0		
2	AntiHiJack	UN	UN	I	UFF	Z		
3	Travel distance before AntiHiJack triggers	1	Values rang Set up the d	e from 1 to 10; 1 listance for immo	- 100 meters; bilizing the ve	10 - 1000 meters. ehicle		
4	Siren operation after the alert has triggered	4	Values rang warning is for arming/ (maximum l	e 1 to 4: 1 – ser triggered; 3 – I disarming (refer audness)	en OFF; 2 — s oudness for to the optior	siren doesn't sound when warning is the same as n №11); 4 — siren is ON		
5	Radio tag search sonic indication for disarming confirmtion							
6	Sonic confirmation after authentication and radio tag detection when disarming	ON	ON	1	OFF	2		
7	«Service/Valet» mode automatic deactivation		ÖN					
8	CDL latching when driving off	OFF						
9	CDL unlatching when the ignition is turned off	UFF						
10	Windows, side mirrors, sunroof automatic closure («Comfort»)	4	Values range from 1 to 5 : 1 – Windows closure; 2 – windows and side mirrors closure; 3 – windows and sunroof closure; 4 – window sunroof, side morrors closure; 5 – OFF (closure is not performed)					
11	Siren chirps loudness when arming/disarming	4	Values rang loudness; 3	e from 1 to 4: 1 – – medium; 4 – r	silent arming naximum	/disarming; 2 – minimum		
12	Authentication method (PUK code required)	1/3	<ul> <li>Values range from 1 to 4: 1 - Radio tag; 2 - PIN code; 3 - Radio-tor PIN code; 4 - Radio-tag and PIN code.</li> <li>By default the authentication method for Prizrak-810/, and Prizrak 820/BT is the method №3 (radio-tag or PIN code) Once an optional Radio-tag is registered into the system starts working right away and no additional settings require. It is not possible to select the authentication methods №4 and 1 Prizrak-810/BT and Prizrak 820/BT before a radia tag is registered.</li> </ul>					
13	Over speeding alert	4	Values range from 1 to 10: $1 - \text{over speeding is not monitored}; 2 - 110 \text{ km/h}; 4 - 130 \text{ km/h}; 10 - 190 \text{ km/h}. Allows to adjust the speed value for over speeding alert which will be sent to the alarm user$					
14	New radio-tags registration	-	Range from	0 to 8				
15	Radio-tags detection quality test	Allows to de	etermine zone d	es inside and out	side the vehi	cle where radio tags are		
16	AntiHiJack feature automatic deactivation with a tag	OFF		1 – ON		2 – OFF		
17	Automatic rearming	OFF		1 – ON 2 – OFF				

#### Programming sequence

1 Turn the vehicle's ignition ON.

2 Complete authentication;

3 Within 10 sec. after the authentication enter the corresponding programming menu by pressing and releasing the programming button 12 times (or the integrated Key-ID button). The alarm will emit 4 short beeps to confirm that everything has been done correctly.

- 4 Select a desired menu option by pressing and releasing the programming button the number of times that corresponds to a required option number. the alarm will indicate a selected menu option by a series of beeps and LED flashes. If the option number is a two digit number: tens a long beep, ones a short beep. E.g.:
  - the option №10 indication one long beep;
  - the option №11 indication one long beep, 1 sec. pause, one short beep.
- 5 Press and hold the brake pedal to change the option value. The alarm will indicate the current option value setting by a series of beeps and LED flashes, the beeps length will change.
- 6 Press the programming button (or the integrated Key-ID button) the number of times required to advance from the current value to a desired one. Keep in mind that after the last option value goes the first one.
- 7 Release the brake pedal. Now it is possible to choose another option number or exit the programming menu.
- 8 In order to shift from the current option number to a desired one-press and release the programming button (or the Key-ID button) the number of times required to advance from the current option number to a desired one. E.g. to advance form the option №2 «AntiHiJack» to №8 «CDL latch when driving off» press and release the programming button 6 times (or the Key-ID button).

To finish programing and exit the programming menu just simply turn the ignition OFF, confirmation trill will sound. The alarm will automatically exit the programming menu if within 60 seconds no actions are performed and the brake pedal is not pressed.

It is allowed to enter the default PIN code «2» with the built-in programming button for authentication if a vehicle hasn't covered 10 km after the alarm installation and the default PIN code hasn't been changed.

PUK code is required In order to change the authentication method (the option №12): it is hidden under the protective layer on the plastic card (quick reference card). There is no sonic indication while entering the PUK code digits, the confirmatory trill will only sound if the PUK code has been entered correctly. After that the alarm will indicate the current option value with a relative series of beeps.



PUK code is not required if:

- 1 The vehicle hasn't travelled 10 km after installing the alarm system («Speed monitoring» feature is available and enabled);
- 2 If the vehicle's ignition hasn't been switched ON during 20 minutes constantly after the alarm installation (if «Speed monitoring» is not supported by the vehicle or is disabled in the alarm settings).

### Registering new radio tags

### New radio tags registration

Programm all desired radio tags within one procedure. The radio tags that are not taking part in programming will be erased form the alarm's memory.

### **Registration sequence**

- 1 Use one of the radio tags for authentication. Disassemble all the other radio tags and take the batteries out of them beforehand. In case if for authentication the radio tag is not required (For authentication is used PIN code or PUK code) - take the batteries out of each radio tag.
- 2 Perform the authentication procedure. The alarm will emit the confirmatory trill indicating that the authentication is successful.
- 3 Press and release the programming button 12 times, the alarm will emit 4 short beeps and 4 LED blinks.
- 4 Press and release the programming button 14 times, the alarm will emit series of 1 long and 4 short beeps.
- 5 Press and hold the brake pedal. the alarm will indicate the number of already registered radio tags by series of beeps and LED flashes. The number of emitted beeps indicates the number of stored tags in the system's memory.
- 6 Place a battery into one of the radio tags. Wait for short intermittent beeps that signifying that the radio tag registration procedure has started. After a radio tag has been successfully registered the alarm will indicate the total number of radio tags programmed into the system's memory by series of beeps and LED flashes. Make sure the number of indicated beeps and LED flashes matches the number of registered tags. If an error occurs during the «registration» procedure the long warning beep will sound and the alarm returns to the total number of registered tags indication.
- 7 Insert the battery into the next radio tag, wait until the tag is registered, repeat the steps described above if more radio tags are planned to be registered.
- 8 Release the brake pedal and turn the vehicle's ignition OFF after the last radio tag has been registered, the confirmatory trill will follow.

### Testing detection quaility of a radio tag

Perform this procedure when the engine is running. It is recommended to slightly increase and decrease the engine's RPM while testing the radio tags.

### **Testing procedure**

- 1 Complete authentication. The alarm will emit the confirmatory trill indicating that the authentication is successful.
- 2 Press and release the programming button 12 times, the the alarm will emit 4 short beeps and 4 LED blinks.
- 3 Press and release the programming button 15 times, the alarm will emit 1 long and 5 short beeps to indicate that the option №15 of the programming memu has been successfully selected.
- 4 Press and release the brake pedal during 10 seconds until a sonic signal is sounded. Release the brake pedal. the alarm will turn on the constant radio tag search mode.
- 5 Verify the radio tag detection quality by moving the radio tag to different places of the vehicle's interior.
- 6 The confirmatory trill emitted every 3 seconds indicates the reliable radio tag detection.
- 7 To exit the option «Radio tag detection quality test» press the brake pedal or simply turn the ignition OFF.

### **Changing PIN code**

- 1 Turn the vehicle's ignition off.
- 2 Complete authentication.
- 3 Within 10 seconds after the authentication press and release the programming button 14 times. The alarm will emit one beep and LED flash to confirm that the «PIN code change» mode has been successfully entered.
- 4 Set up the new PIN code. Any button of the vehicle that responds with beep when being pressed can be used to set up the new PIN-code combination.
- 5 Wait for confirmation: 1 beep and LED flash.
- 6 Repeat the new PIN code.
- 7 Wait for confirmation:

- 2 short beeps and LED flashes and confirmatory trill mean that the PIN code has been changed and the alarm exits the programming mode.
- one long warning beep means that the PIN code hasn't changed due to a mistake was made when setting the new PIN code. Repeat the «PIN-code change» procedure, starting from the step №4.

It is possible to exit the programming mode and leave all previous settings unchanged by turning the vehicle's ignition OFF.

- It is not possible to change or set up a new PIN code if the authentication method is «Radio tag».
  - It is not allowed to set up the PIN code «1» one push of one button.

### Changing the programming button

- 1 Reset the alarm to default values.
- 2 Perform the alarm interfacing procedure with a vehicle.
- 3 «Teach» the alarm the analog buttons if they are connected to the vehicle's harness and are going to be used for PIN code entry (refer to the chapters: «Programming digital (positive and negative) buttons»; «Programming the steering wheel (resistive) buttons»).
- 4 In order to assign as the programming button any vehicle interior button that the alarm is able to «sense» either via CAN-bus or via analog inputs, press the selected button and hold it for more than 5 seconds until a long confirmatory beep is emitted. The programming button can be assigned within only 15 minutes after the alarm interfacing with a vehicle is complete.

### Customizing the operating mode for SIM cards

### Only for Prizrak-810/BT 4G.

The procedure for adjusting the operating mode of the SIM cards by using the built-in programming (reset) button is described below. During the adjustment process, the alarm's built-in beeper and LED emit indication beeps and light signals.

If the option number or option value is a two-digit number: the first digit will be indicated with long beeps and the second digit with short beeps. E.g. 12 will be indicated with one long, two short beeps and LED flashes, 25 – two long, five short beeps and LED flashes. It is possible to use the built-in programming button for authentication if the vehicle hasn't yet travelled 10 km after installing the alarm

system and the default PIN code "2" hasn't been changed.

The alarm automatically exits the programming mode after switching the ignition off at any moment or 10 seconds after performing the last action in the programming menu if the brake pedal is not pressed.

The configuring sequence:

- 1 Switch the vehicle's ignition ON.
- 2 Carry out authentication. Within 10 seconds enter the programming menu by pressing and releasing the programming button 24 times;
   the alarm emits 14 beeps to confirm that the menu has been entered. A different number of beeps means an error you will have to start over.
- 3 Press and release the programming button the number of times corresponding to the option number you wish to change. Each push of the programming button increases the option number by one. The numbers change in the circle, after the last option number goes the first one.
  - the alarm indicates the selected option number by corresponding number of beeps and LED flashes.
- Now it is possible to customize the option value by pressing and holding the brake pedal.
- the alarm will indicate the current option value by a series of beeps and LED flashes.
- 5 Change the option value by pressing the PB the number of times required to advance from the current value to the desired one.
   the alarm will inform about the new option value by series of beeps and LED flashes. Keep in mind while shifting within the option that after the last option value goes the first one.
- 6 If you'd like to proceed to another option within the menu, release the brake pedal you will get back to the step 3 of the programming sequence.
  - the alarm indicates the option number you have just exited;
  - press and release the button the number of times required to access the desired option number;
- 7 To exit the programming menu, switch off the ignition.

N⁰	Option description	Default settings	Possible settings. The default settings are highlighted in bold
	1		
1	SIM cards operation and priority	1	<ul> <li>1 - Priority for SIM1. 2 - Priority for SIM2. 3 - Equal priority.</li> <li>4 - SIM1 is active (SIM2 disabled). 5 - SIM2 is active (SIM1 disabled) SIM card priority - set the main SIM card which will be used for cellular network connection. If the priority SIM card loses network connection, the alarm will switch to the backup SIM card. The alarm will switch back to the priority SIM card if it reestablishes cellular connection.</li> <li>Equal priority - both SIM cards are always active. The alarm will switch to another SIM cards loses network connection.</li> </ul>
2	Frequency of sending SMS messages from SIM1	6	1 – every 29 days. 2 – every 44 days. 3 – 89 days. 4 – 119 days. 5 – 179 days. 6 – SMS disabled. This feature determines frequency of sending a paid SMS message containing the SIM card balance in order to prevent the SIM card blockage by the cellular network provider due to infrequent use. The SMS will be sent to a phone number of the "User1".
3	Frequency of sending SMS messages from SIM2	3	1 – every 29 days. 2 – every 44 days. 3 – 89 days. 4 – 119 days. 5 – 179 days. <b>6 – SMS disabled.</b> This feature determines frequency of sending a paid SMS message containing the SIM card balance in order to prevent the SIM card blockage by the cellular network provider due to infrequent use. The SMS will be sent to a phone number of the "User1"

### Table 16. SIM card settings (menu 24)

4	Frequency of requesting balance from SIM1	2	1 – every 1 hour; <b>2 – every 2 hours;</b> 3 – 4 hours; 4 – 8 hours; <b>5 – 24 hours;</b> 6 – balance is not requested.
5	Frequency of requesting balance from SIM2	5	1 – every 1 hour; 2 – every 2 hours; 3 – 4 hours: 4 – 8 hours; 5 – 24 hours; 6 – balance is not requested.
6	Internet in roaming for SIM1	2	1 – ON; <b>2 – OFF</b>
7	Pop the trunk	2	1 – ON; <b>2 – OFF</b>

### **Programming examples**

### Example 1

**Objective:** you'd like to change the default setting of the output Nº7 «Normally closed relay control» to «Normally open relay control». **Sequence:** 

- 1 Turn the ignition on.
- 2 Complete authentication procedure and wait for confirmation.
- 3 No later then in 10 seconds after authentication enter Menu 1 by pressing a PB 10 times. If all the actions are done correctly, the alarm will emit 3 beeps and LED flashes.
- 4 According to the «Menu 1», select the option №2 «Wired engine locking» by pressing the PB 2 times. The alarm will inform you about the chosen menu option number by a series of 7 beeps and LED flashes.
- 5 Enter option 2 by pressing and holding the brake pedal. The alarm will indicate the current option value by 2 beeps and LED flashes as the default value is «2» «Normally closed relay control».
- 6 Select the normally open relay control by pressing and releasing the Programming button 3 times. The alarm will inform you about the chosen menu option with series of 1 beep.
- 7 Exit the programming mode by turning the ignition off.

### Example 2

**Objective:** Objective: you would like to change the factory settings of the alarm and increase the AntiHiJack trigger distance from 100 to 300 meters.

Sequence:

- Turn the ignition ON.
- 2 Complete the authentication procedure and wait for confirmation.
- 3 Within 10 second after confirmatory trill enter «Menu 2» by pressing the programming button 12 times. If all the actions are done correctly, the alarm will emit 4 beeps and LED flashes.
- 4 According to the «Menu 2», select the option №3 «Travel distance before «AntiHiJack triggers», by pressing the Programming
- 5 button 3 times. The alarm will confirm the selected menu option number by a series of 3 beeps and LED flashes to confirm that you selected the correct option.
- 6 Enter option №3 by pressing and holding the brake pedal. The alarm will indicate the current option value by the series of repeated single beep and LED flash, as the current (default) option value «1» (100 meters).
- 7 Change option №3, to do so (still holding the brake pedal pressed) press and release the programming button 2 times to advance from the value 1 to 3 (1 + 2 = 3). The alarm will inform you about the chosen option value by a series of 3 beeps and LED flashes to confirm that the value 3 is selected (300 meters).
- 8 Exit the programming mode by turning the vehicle's ignition off.

### **Resetting to default values**

There is the special procedure provided to reset the alarm to default values, once the procedure is complete the alarm's nonvolatile memory will be cleared of previous settings – vehicle make and model, PIN code and etc.

### If the alarm is installed on a vehicle

- 1 Unpower the alarm.
- 2 Press and hold pressed the built-in PB (see «Alarm connection diagram»).
- 3 With the PB still held plug the device back into the connector (sypply power). There will be the intermittent continuouse beeps.
- 4 Release the button (wait until the intermittent beeps are teminated).
- 5 Turn the ignition ON and complete the authentication procedure (Enter PIN code and/or wait until RFID is identified) the confirmatory trill will be heard.
- 6 Wait for the intermittent continuous beeps signifying that the alarm has been reset to the default settings. Unplug the device (unpower the alarm). This will reset all alarm features to the default settings.

#### In case if the alarm is not installed on a vehicle

- The reset can be done in 3 ways:
- 1 With the built-in button provided that the factory PIN code hasn't been changed and the vehicle hasn't travelled 10 km after the alarm installation.
- 2 By PUK code entry with the built-in button.
- 3 By installing the Prizrak (TEC) module on the same vehicle model as earlier. (considering that you know the PIN code and/or you have at least one RFID tag).

The actions sequence for the first two ways:

- Press and hold the built in programming button (see «Alarm connection diagram»).
- 2 Still holding the PB plug the device in (supply power to it). The alarm will be emiting continuous beeps.
- 3 Release the button, wait until the short beeps are terminated.
- 4 If the vehicel hasn't covered 10 km after the installation and the factory PIN code hasn't been changed then enter the PIN code «2» with the built-in PB. Otehrwise enter the PUK code with the built-in PB-trill will be heard.
- 5 Wait for continuous beeps signifying that the module is now reset to the factory default settings.



### Table 17. SMS commands to control the GSM car alarm Prizrak

Command name	Command code	Parameter
Arm	822	-
Disarm	823	-
Request the SIM card balance	842	-
Service mode	829	ON – activate service mode; OFF – deactivate service mode
Vehicle search in the parking lot	827	ON – start searching; OFF – stop searching
Panic control	824	ON – activate; OFF – deactivate
Pop the trunk	828	ON – open
GSM engine blocking	825	ON – activate; OFF – deactivate
Remote start the engine/Prolong the engine run time	835	-
Pre-heat and start the engine	834	-
Cancel the remote start	836	-
Remote start the engine heater/prolong the heater run time	832	-
Turn off the engine heater	833	-
A quick access command assigned to the key «2»	2	Depends on the assigned command
A quick access command assigned to the key «3»	3	Depends on the assigned command
A quick access command assigned to the key «4»	4	Depends on the assigned command
A quick access command assigned to the key «5»	5	Depends on the assigned command
A quick access command assigned to the key «6»	6	Depends on the assigned command

### **Programming studio**

The «Programming studio» is a free web interface of the visual development environment. The studio is available at https://studio.tecel.ru. To be able to use the «Programming studio», it is necessary to sign up. If you've ever been registered at the web site of TEC electronics, you may use the same login and password to sign in the «Programming studio».

The «Programming studio» offers adding new features to the Prizrak car alarm systems by creating your own program. The program is built up using virtual units which represent the operating parameters of a vehicle and the alarm system. Changing these parameters can be «tied» to control over the programmable outputs and implementation of the specific functions by the alarm system. To add a program created in the «Programming studio», run the TECprog2 software; go to «My programs» and upload the created program into Prizrak. When using in your algorithm a programmable input or output, adjust it as the input or output of the programmable logic. These adjustments can be made in the TECprog2 software or by using the programming button.



### GSM-alarm Prizrak (TEC) 8xx/BT wiring diagramm

### **STANDART NOTIFICATION PROFILES**

- "Standard". The default setting.
  "Careful" and "Carefree" profiles work in tandem. An alarm user with "Carefree" profile simply exploits the vehicle and the alarm while the user with "Careful" profile takes care of the car and receives all alerts and notifications from the alarm.
- "Rescuer". This profile has been designed for a reliable person an alarm user can count on. The alarm will notify the "Rescuer" •
- if AntiHiJack triggers. "Parental control". Is perfect for parents. The alarm will notify about the AntiHiJack trigger and if Speed threshold is exceeded.

You are free to choose either one of the profiles described above or customize your individual notification settings.

I "Standard";	II "Carefree";	III "Carefull";	IV "	Rescuer";		V "I	Parental c	ontrol"
Notification list				I	II	III	IV	V
Alerts from the alarm	and anti-theft systems					1	1	
1. Alarm trigger when	perimeter is violated			<b>\$</b>	<b>%</b>	<b>%</b>	-	_
2. Alarm trigger after a	attempting to start the eng	gine		<b>~</b>	<b>%</b>	<b>%</b>	-	_
3. Sensors are triggere	ed			<b>S</b>	<b>%</b>		-	_
4. Sensors warning					-		-	_
5. AntiHiJack trigger				-	-	<b>%</b>	<b>\$</b>	<b>%</b>
6. OEM alarm system	trigger			<b>~</b>	<b>%</b>		-	_
Alerts form the remot	e start sytem							
1. Remote engine star	t					_	-	_
2. Warning of forthcor	ning engine shut down					-	-	_
3. Engine shut down b	y remote start system					-	-	_
4. Engine start failure by remote start syst	or engine emergency shut tem	down					-	-
5. Warning of window (when getting out o	s wipers are ON when pre <sub>l</sub> f a car)	paring for remote start				_	-	-
6. Warning of window is running	s wipers are ON when rem	note engine start mode					-	-
7. Parking engine heat	ter automatic startup					-	-	-
8. Warning of forthcor	ning parking engine heate	r shut down				_	-	-
9. Parking engine heat	ter automatic shut down					-	-	-
10. Parking engine he	ater startup failure or an e	mergency shutdown					-	-
Alerts from the measu	uring system							
1. Over speeding				-	-		-	
2. Low battery voltage	)			<b>%</b>	-	<b>%</b>	-	-
3. Low RFID battery vo	oltage				-		-	-
4. Low fuel level in tar	ık warning				-		-	_
5. Critical engine temp	erature			<b>~</b>	-	<b>%</b>	-	_
6. Low SIM card balar	ice						-	_
Other alerts and notif	cations							
1. Date and time are n	ot set up				-		-	_
2. Factory PIN-code w	arning				-		-	_
3. Operating mode cha	anging or driving with activ	vated "Service mode"			-		-	-
4. Wrong access code	e (GSM-code)				-		-	-
5. Acces code (GSM-c	ode) entry is blocked				-		-	_
6. System settings cha	ange				-		-	-
7. User telephone num	nber deletion				-		-	-
8. Roaming enabling/o	disabling					-	-	

### Alarm elements installation scheme in a vehicle



Mark in the picture the alarm elements location. This may help to quickly find them later





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Keep this scheme out of reach of unauthorized persons.

### Standard alarm set

Item name	Number of items
Main alarm module	1
Slim-tag (for Prizrak 830/BT and 840/BT)	2
External LED	1
Siren	1
Relay pLine-221 (Only for Prizrak 820, 840)	1
Microphone TEC-4120	1
Wire harness	1
Temperature sensor	1
SIM-card	1
Quick reference card	1
User guide	1
Equipment technical passport	1
Wiring diagram	1
Packing	1

### Product specifications and operating conditions

Parameter	Value
Power supply voltage, V	9 15
Maximum current drain during standby mode, mA (when the vehicle's CAN-bus is not active)	15
Operating temperature, °C	-40 +85
Storage temperature, °C	-40 +85
Maximum relative humedity, %	95

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