INTELLECTUAL theft prevention SYSTEM 510

PRIZRAK

TECHNICAL
SPECIFICATION

Table of Contents

Chapter I. Immobilizer Description

Introduction

Prizrak-510 intellectual theft prevention system (hereinafter referred to as **Immobilizer**) is designed for vehicle theft prevention should such an incident occur while the vehicle is parked or should hijacking be the case. Besides, the Immobilizer is equipped with additional service features: Comfort feature control, electro-mechanic hood lock control and central locking control.

In order to receive information on Immobilizer connection to a given vehicle and on the list of vehicles compatible with the Immobilizer along with information on its functionality please use Integrator software product files (hereinafter referred to as Integrator files).

Terms

Programming button – one of original buttons of the vehicle used for programming the immobilizer (see Integrator files for information on which button is used in each given vehicle). When using the Immobilizer, the Programming button is not redefined. The button can be redefined only during the installation of the Immobilizer in the vehicle. The button integrated in the Integrator files' case can be used as Programming Dutton.

Security – it is the condition of Immobilizer that is entered by locking the vehicle's doors in any way provided by the vehicle manufacturer (with the lock cylinder on driver's door, keyless access system, remote control, or re-arming etc.) that includes arming of the original vehicle alarm. Secure condition is left by unlocking the doors with the original remote control or vehicle keyless access system and by entering the PIN code.

Comfort feature – is the original function that allows not only locking vehicle's doors but also closes the vehicle's windows (possibly with the sun roof) with the original remote control and (or) with the key.

Speed control – allows setting the locking activation algorithm for Immobilizer and Anti HiJack features. Speed control can be activated and de-activated in user settings programming menu. Certain vehicles may not support this feature (please see Integrator files for details).

Guard mode – is an active operation mode of Immobilizer and Anti HiJack features: should one of these features enter the Guard mode, it is necessary to enter the correct PIN code; otherwise the Engine locking will occur.

Engine locking – is the locking and preventing the vehicle's engine from operation with help of a relay.

PIN and PUK codes

PIN code

PIN code is a secret combination of original vehicle button(s) pressings. Please see the Integrator files for the list of original buttons perceived by the Immobilizer. PIN code needs to be entered prior to driving the vehicle.

PIN code is a one-, two-, three- or four-digit number. Each digit is a figure from 1 to 9.

PIN code can be promptly changed numerous times by both technical specialists during Immobilizer installation or by you during day-to-day vehicle use

Factory default settings:

PIN code – 2 is entered with the Programming button – see Integrator files. Upon Immobilizer installation the factory-set PIN code is to be changed for the purposes of providing the proper secrecy level. If the PIN code is not changed, a beep tone will be activated after factory-set PIN code entering in order to remind the necessity of PIN code changing.

PUK code

In case if the vehicle owner loses the PIN code, the Immobilizer supports the entering of the PUK code.

PUK code completely replaces the PIN code but cannot be changed during operation.

PUK code is located under the protective layer on the plastic card. PUK code entering is carried out by Programming button with 2-second pause after each digit. PUK code can be entered with the integrated Programming button and with the original vehicle button assigned as the Programming button

Only the vehicle owner must know the PUK code

Upon successful PUK code entering a new PIN code can be programmed

PIN code entering

PIN code is entered with vehicle ignition and engine on by steadily pressing the original vehicle's buttons. When entering one of the PIN digits, please make sure that pressing or pause duration is no longer than 1 second.

Please keep the pause of approximately 2 seconds in between the digits. If you made a mistake while entering the PIN code, please wait for longer than 3 seconds and re-enter the PIN code.

PIN code entering sequence

◇ Turn the ignition and engine on Enter the PIN code
◇ Wait for audible confirmation trill

Available PIN code options

 , , , , - buttons are used as an example. Please refer to the Integrator software files for the list of buttons perceived by the unit.

Single-button PIN code entering

One-digit PIN code:

Two-digit PIN code:

Multiple buttons PIN code entering

When entering the PIN code you need to keep in mind the button pressing sequence.

One-digit PIN code:

Two-digit PIN code:

Immobilizer feature

Immobilizer feature is designed for preventing the vehicle from being stolen from its parking area. Immobilizer enters the Guard mode when the ignition is turned off for longer than 30 seconds. If the Immobilizer feature is in Guard mode then it is necessary to enter the correct PIN code otherwise the engine will be locked:

- ◊ The engine will be turned off right after the vehicle starts moving if the Speed control is on and is supported by the vehicle.
- ◊ The engine will be turned off within 5 seconds after the ignition has been turned on if the Speed control is off or is not supported by the vehicle.

Immobilizer can leave the Guard mode and the engine lock can be unlocked by entering the PIN code without turning the ignition off prior to the procedure.

You do not need to enter the PIN code again if the ignition has been off for less than 30 seconds.

Anti HiJack feature

Anti HiJack is the function that prevents the vehicle from being hijacked or stolen from its parking area.

Anti HiJack enters the Guard mode in the following cases:

- ◊ The ignition has been turned off for longer than 30 seconds (in case if Immobilizer feature was not on; if it was on then the Immobilizer will follow its algorithms).
- ◊ Driver's door has been opened.

Upon entering the Guard mode, Anti HiJack feature passes a sequence of phases and in case if the Guard mode has not been deactivated, the feature will activate the Engine locking.

Changing of phases takes place only when the ignition is on. When ignition has been turned off the Immobilizer will save its current condition and will continue its operation when the ignition is back on.

Anti HiJack's Guard mode can be deactivated at any phase by entering the PIN code.

Guard mode includes the following phases:

- ◊ Idle phase
- ◊ Alarm phase
- ◊ Locking phase

Idle phase

In this phase Anti HiJack follows two different algorithms depending on the availability of Speed control.

If the Speed control is available, Anti HiJack waits until the vehicle covers a set distance from the moment of Guard mode activation. Upon that, Anti HiJack goes into the Alarm phase.

If the Speed control is not available, Idle phase consists of three stages:

- ◊ Waiting for driver's door closing
- ◊ Waiting for a certain number of brake pedal pressings
- ◊ Pause before Alarm phase initiation

Alarm phase.

This phase consists of two stages:

- ◊ Driver warning on the necessity of entering the PIN code (10 seconds). It is carried out by an audible sound alert.
- ◊ Warning the other drivers on the road on the possible hazardous situation due to the upcoming engine locking (10 seconds). It is carried out by vehicle hazard lights warning the other drivers.

If at any of the stages mentioned above attempts of entering the PIN code shall occur, the stage's duration may be increased up to 20 seconds, but the overall phase duration cannot be longer than 30 seconds.

Locking phase.

Engine locking is activated. Hazard lights will be on for 15 seconds. Anti HiJack will be in the locking phase until the PIN code is entered.

When safe locking mode is on (see Immobilizer hardware settings programming (Menu 1) section), Engine locking will be activated only if the vehicle's speed is 30 km/h or less. If the vehicle speed exceeds 30 km/h the Immobilizer will wait for speed decrease for an unlimited amount of time (while the vehicle is moving). As soon as the speed goes as low as 30 km/h the immobilizer will lock the engine

Use of safe locking mode allows mitigating the risk of collisions when Engine locking is activated.

When the ignition is off Anti HiJack turns the hazard lights and audible driver warning signals off. If the Immobilizer feature has not entered the Guard mode (see the Immobilizer feature section) then, upon the next ignition activation Anti HiJack will activate audible driver warning and hazard lights for 15 seconds. In the meantime Anti HiJack feature allows starting the engine but will prevent driving following the same algorithms as Immobilizer feature.

If the Immobilizer feature has entered the Guard mode, then, upon ignition's deactivation Anti HiJack feature will stop its operation and Immobilizer will follow the algorithms of Immobilizer feature.

Maintenance mode

Maintenance mode is an operation mode when all theft prevention and service functions of Immobilizer are temporarily deactivated.

With Maintenance Mode on, entering the PIN code is not needed when driving the vehicle, which is helpful when the car needs to be put for maintenance in the service center. Still, in order to enter the Programming mode, it is necessary to enter the PIN code.

When the ignition is turned on in Maintenance mode, a long audible tone is sounded that reminds on the fact that the Immobilizer is in maintenance mode. The audible tone can be turned off for secrecy level increase.

In order to activate or deactivate the Maintenance mode you need to do the following:

1. Turn the ignition on Enter the PIN code and wait for confirmation
2. Press and release the Programming mode button 6 times (start doing it no later than 10 seconds after PIN code entering).Please wait for confirmation that you have successfully performed the actions:
   - ◊ 1 audible signal and 1 sound trill mean that the Maintenance mode is ON.
   - ◊ 2 audible signals and 1 sound trill mean that the Maintenance mode is OFF.
3. Turn the ignition off.

Additional features

The Immobilizer has additional features improving the vehicle security level.

Comfort feature control

The Immobilizer can be programmed so that the vehicle's windows are closed when the vehicle's security is Armed. Please see Integrator files for supported vehicles.

Electro-mechanic hood locks control

The Immobilizer allows closing an accessory hood lock simultaneously with vehicle locking and opening the hood lock when the PIN code has been entered.

Central locking control

If the vehicle is not equipped with the following functions:

- ◇ Doors locking during driving
- ◇ Doors unlocking upon turning the ignition off They can be carried out by the Immobilizer. Please see Integrator for list of supported vehicles.

Chapter II. Connection

Immobilizer Inputs/Outputs

Immobilizer Inputs / Outputs functionalities are described in the Immobilizer port description Table. Connection pin numeration is indicated on fig. 1. Aside from outputs with set functions Immobilizer is equipped with two programmable outputs each of which can be assigned with one of 20 functions (see CAN bus adapter features table). These outputs are set for controlling an accessory hood lock. Output configuration is carried out via programming (see Immobilizer hardware functions programming (Menu 1)).

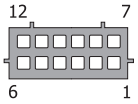

Fig. 1. Port connector pins enumeration from wiring viewpoint

Table 1. Immobilizer port description

No.	Color	Type	Function	Current, mA
1	Brown/red	CAN	CAN-H vehicle data bus	–
2	White/black	- output	Engine locking	150
3	Gray/green	- output	Programmable negative output (Arming impulse by default)	50
4	Gray/blue	- output	Programmable negative output (PIN code entering impulse by default)	50
5	Blue/red	+/- output	Alternate hazard lights control 1)	150
6	Black	power supply	Ground	– 2)
7	Brown	CAN	CAN-L vehicle data bus	–
8	Pink/Green	+ input	Brake lights condition control 3)	1,5
9	-	-	-	–
10	Gray/yellow	+ input	Analog button/Positive button	–
11	Gray/black	- input	Reference ground/Negative button	–
12	Red	power supply	+12 V	200(3,5) 4)

1) – Is an output with convertible electrical polarity. Polarity is set automatically upon unit interfacing with the vehicle. This output is used for alternate hazard lights control in vehicles that do not support CAN bus control.

2) – Useful current of output No. 6 depends on connected load of the negative outputs

3) – Input No. 8 is to be connected only in vehicles where CAN bus does not contain data on brake pedal position (see Integrator files).

4) – Maximum useful current rate in transfer and idle modes is indicated.

Outputs No. 2, 3, 4 are protected from short circuit, inductive eruptions, overheating and maximum demand surpassing.

Immobilizer pin connectors' description

Pins No. 1 and 7. "CAN-H and CAN-L vehicle data bus" are connected to vehicle CAN bus (see "Integrator files").

Pin No. 2. "Engine lock" is connected to one of relay coil contacts, which is used for engine operation or ignition lock. The output can be set for controlling a normally-open or normally-closed relay.

Pin No. 3. Programmable negative output ("Arming impulse" by default).

Pin No. 4. Programmable negative output ("Vehicle PIN code entering impulse" by default).

Pin No. 5. "Alternate hazard light control" is used for hazard light controlling on vehicles where CAN bus control is not available. Please see Integrator files software product for information on vehicle-specific connection features.

Pin No. 6. "Ground" is connected to vehicle body in one of the locations determined by vehicle manufacturer for original equipment ground connection.

Pin No. 8. "(+) Input" brake lights control. It is used only in cases when vehicle CAN bus does not contain data on brake pedal position (see Integrator files). In such cases input No. 8 is to be connected to brake pedal terminal switch output. Should the CAN bus contain brake pedal position data the input's function is lost and can be restored only when settings are reset to factory default ones.

Pin No. 9. is not in use Pin No. 10. "(-) Input. Analog button/Positive button". Depending on control button type choice one of the following functions is used:

- ◇ Analog button is connected to the corresponding vehicle wire at the steering wheel contact helix port (see Integrator files).
- ◇ Positive button is connected to the positive button (the one controlled by +12V voltage). It is used in case if there are no original vehicle buttons perceived by the Immobilizer.

If the vehicle has original buttons controlled via CAN bus that are perceived by the Immobilizer, this input may be discarded.