

We would like to thank you  
for choosing

**StarLine R6**

underhood unit

and wish you

many successful and safe drives!

Revision No. 2  
October 2016

## General

The StarLine R6 underhood unit protects your vehicle from theft by blocking its engine and prevents intruders from accessing the underhood compartment by means of the hood lock intellectual control.



*StarLine R6 may only be used in combination with the 6th Generation StarLine security systems (X96, M96, etc.)*

Data between the main unit of a security system and a StarLine R6 are transferred via the Bluetooth Smart (BLE) protocol using a data interception protection algorithm used during device registration.

### **Benefits of StarLine R6 underhood unit:**

- watertight housing;
- small dimensions of the unit allow for hiding it in a place any intruder would have a hard time reaching into;
- engine temperature monitoring via an external sensor supplied within the package;
- integrated motion sensor;
- hood lock and engine block intellectual control in case of a lost connection with the main unit of a security system.

## Delivery package

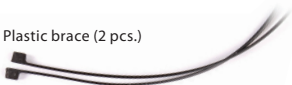
- 1 Main unit with wires.



- 2 Temperature sensor.



- 3 Plastic brace (2 pcs.)



- 4 Installation manual.



## Specifications

Parameter	Value
Supply voltage, V	8 – 18
Current consumption, mA	1,2
Maximum current at LOCK and UNLOCK outputs, A	12
Maximum permitted switched current via relay contacts, A	10
Operating temperature range, °C	от –40 до +85
Temperature sensor measuring range, °C	от – 40 до +150
Control pulse duration of hood control, s	0,8
Dimensions, mm	94×24×13

## Operation description

### Operation modes

The **StarLine R6** underhood unit has two operation modes:

- normal;
- standalone.

#### Normal mode

In normal mode the **StarLine R6** communicates with the main unit and receives its control commands for engine block, hood lock, and the alarm siren. The **StarLine R6** monitors the state of the hood, ignition, engine temperature, and transfers these data to the main unit.

#### Standalone mode

The **StarLine R6** would switch over to the standalone mode in case of communication loss with the main unit for more than 30 seconds indicating this with a alarm siren signal.

The **StarLine R6** standalone mode has two submodes:

- **armed**

**StarLine R6** enters this submode, if the security system has been armed prior to the communication loss. After the alarm siren stops, the **StarLine R6** will lock the vehicle hood.

**StarLine R6** independently controls locking, the hood lock, and the alarm siren.

- **disarmed**

**StarLine R6** enters this submode, if the security system has been disarmed prior to the communication loss.

**Locking, hood lock, and alarm siren control is not performed in this mode.**

After connection with the main unit of the security system is reestablished, the **StarLine R6** will automatically return to the *normal operation mode*.

## Engine blocking

### *Normal mode*

While in the normal operation mode, the **StarLine R6** blocks the engine at a command of the main unit.

### *Standalone mode*

While in the standalone mode, the engine can be blocked by either of the following events:

- *when the ignition is turned on*

The engine will be blocked the moment the ignition is turned on.

- *when the vehicle starts moving (if the **IGN** wire is disconnected)*

The engine will be blocked for 30 seconds after the vehicle starts moving, then the **StarLine R6** will unlock the engine until the next attempt to move the vehicle. After three attempts, the **StarLine R6** will lock the engine until the connection with the security system is reestablished.

## Control of bonnet lock

- *While in the normal mode*, hood lock control is done with main unit commands.
- *While in the standalone mode*, if the system had been armed before, the **StarLine R6** would lock the hood whenever communication with the main unit is lost.

## Alarm siren control

*While in the normal mode*, alarm siren control is done with main unit commands.

*In the standalone mode*, the **StarLine R6** independently controls the alarm siren.

The **StarLine R6** turns on sound alarm in the following situations:

- communication with the main unit is lost (30 s long intermittent alarm siren signal);
- either of the following security zones is disturbed:
  - hood, motion sensor (30 s long continuous alarm siren signal);
  - ignition (continuous alarm siren signal until the ignition is turned off).

## General installation requirements

The **StarLine R6** underhood unit is designed for installation on vehicles with 12 V voltage.

The **StarLine R6** should be installed under the vehicle hood. Locate the unit in a hidden place so that it would not contact moving parts of the vehicle. Fasten the housing with plastic braces.

### Connection of power circuits

Power supply is connected using two wires: +12 V (**BAT** wire) and "ground" (**GND** wire).

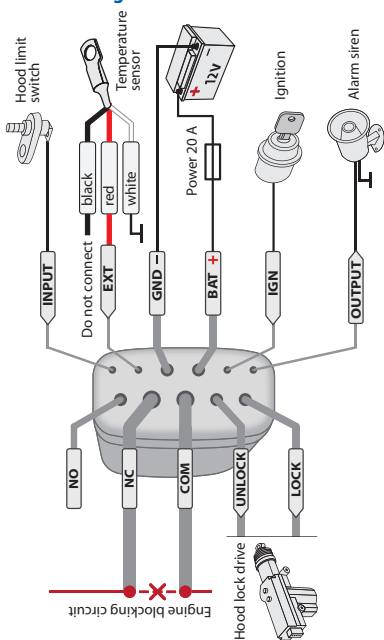
First of all, connect the "ground" wire. For connection to the "ground" use the "ground" bolt or nut. At that, crimp the terminal on the wire for the corresponding fastener diameter. The "ground" wire shall not be connected to the body by means of a self-tapping screw. The connection point should be treated with corrosion-preventive compound.

In order to connect +12 V (the **BAT** wire), you will need to use regular circuits of the vehicle with constant +12 V voltage and a minimum cross section of 2 mm<sup>2</sup>, or connect directly to the car's battery. The **BAT** wire should be connected via the fuse included in the delivery set.



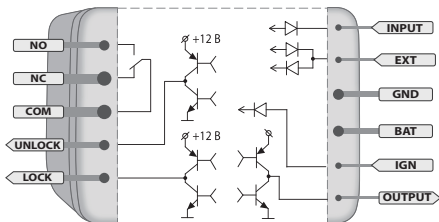
## Wiring diagram

### Connection diagram



## Description of external outputs

### Diagram of external outputs

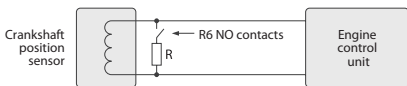


### Designation of external outputs

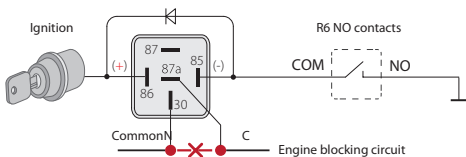
Marking	Assignment
<b>GND</b>	Ground (-)
<b>BAT</b>	Power (+)
<b>IGN</b>	Ignition (+)
<b>NO</b>	Normally open contact of relay (NO)
<b>NC</b>	Normally closed contact of relay (NC)
<b>COM</b>	Common relay contact
<b>UNLOCK</b>	Hood lock open pulse
<b>LOCK</b>	Hood lock close pulse
<b>INPUT</b>	Hood limit switch input (-)
<b>OUTPUT</b>	Output to the alarm siren (+)
<b>EXT</b>	Temperature sensor input

**IGN wire** – input for connection to the vehicle ignition. The **IGN** wire shall have the potential of +12 V during ignition switch-on and engine operation.

**NO, NC, COM wires** – outputs of the built-in electromechanical relay, are connected to the engine blocking circuit. Blocking can be performed using normally closed (**COM** and **NC**) and normally open (**COM** and **NO**) contacts. When wiring these circuits, it is necessary to observe the length and cross-section of wires used for switching, because switched current can be significant. If current in the blocked circuit exceeds 10 A, an additional external relay should be used.



*Example of using NO contacts for blocking*



*Connection of external blocking relay*

**UNLOCK, LOCK wires** – power outputs for controlling the hood lock electrical drive. The outputs are built according to the power scheme (the maximum output current is 12 A), therefore no additional power modules are required for lock control. Whenever the hood is unlocked, a +12 V pulse is generated at the **UNLOCK** wire for 0.8 s. Whenever the hood is locked, a +12 V pulse is generated at the **LOCK** wire for 0.8 s.

Output	"Open" pulse	"Close" pulse
<b>UNLOCK</b>	+	-
<b>LOCK</b>	-	+

**INPUT wire** – this wire is connected to the hood limit switch, letting the system monitor the hood status

**OUTPUT wire** – alarm siren control output. The maximum permitted current is 2 A. Connect one of the alarm siren wires with the **OUTPUT** wire, and connect the other wire with the "ground".

**EXT wire** – temperature sensor input. The two-wire temperature sensor should be connected to the wires **EXT** and **GND** with any polarity.

## Registering the underhood unit

If a **StarLine R6** underhood unit was purchased separately from the security system, it must be registered within the main unit memory.

### Registration procedure for StarLine R6 unit:

1. Switch off the ignition.
2. Disconnect the **BAT**, **OUTPUT** and **INPUT** wires from the car circuits.
3. Disarm the vehicle (refer to the security system manual) and switch the security system to the device registration mode.
4. Interconnect the **OUTPUT** and **INPUT** wires of the **StarLine R6**.
5. Supply power (**BAT** and **GND** wires).
6. In 10 seconds after successful registration the security system will generate sound signal.
7. Disconnect the **BAT** wire from the car circuits, then open the **OUTPUT** and **INPUT** wires.
8. Check operation of the **StarLine R6**.

The manufacturer reserves the right to change the design and elements without prior notification

Manufacturer:  
Limited Liability Company  
"Scientific and Production Association StarLine"  
(LLC "SPA StarLine")  
194044, Russia, Saint Petersburg,  
9 Komissara Smirnova Str., letter A, office 204



