Connection of Executive Units to the Outputs of the Tracking Device. Control Relay

User Manual

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Necessary Tools, Devices, Materials

To connect Galileosky tracking device (hereinafter – tracking device) to a power relay of a vehicle, one should have:

1. Electrical tools.
2. A set of connecting wire.
3. A control relay.
5. The tracking device for a satellite monitoring Galileosky (hereinafter – tracking device) of one of the modifications. Follow the link to study a detailed instruction on activation and setting of the tracking device

https://galileosky.com/podderzhka/dokumentaciya.html
General Information

Relay is an electric or electronic device (key) designed for closing or opening of an electric circuit, when changes of electric or non-electric input signal are assigned.

Electro-magnetic relay is an electromechanic device closing or opening mechanic electric contacts, when electric current is brought to a relay. Electric current generates a magnet field, that causes a travel of a ferromagnetic relay armature mechanically connected with contacts and further travel of contacts commutates an external electric circuit (Pic. 1):

1 – coil; 2 – relay armature; 3 – contacts

Sometimes devices that open or close contacts, when some value, not necessarily electric, is changed, are called a relay. These are devices sensitive to temperature (a thermo relay), illumination (a light relay), level of sound pressure (an acoustic relay), etc. In addition, different timers are sometimes called a relay, e.g. a timer of a car turn indicator, a timer of switching on/off of household devices (time delay relay).
Automobile Relay

Tracking devices can control various executive devices by means of a signal applied from outputs of the tracking device (OUT1, OUT2, etc.) to a control relay. As in most cases tracking devices are installed into vehicles, it is recommended to use automobile relays as control relays.

Selection of a control relay is carried out in accordance with its technical specifications, such as supply voltage value (V), power consumption value (W), commutated current value (A), admissible continuous current of contacts value (A), dropout voltage value (V), response voltage value (V), number and type of contacts, dimensional specifications, maintenance conditions (range of operating temperature, vibration, dust concentration, explosion hazard, air humidity). Any relay has a certain response time value (i.e. contributes an additional delay to a control scheme), that should be taken into account when making an algorithm of operation. Usually, response time value of a relay is up to 0.1 sec. There are also high-speed relays with response time value of up to 0.02 sec. maximum.

Relays, designed for operation in electrical network of a vehicle, have various specifications depending on their aim:

- Nominal voltage value: 12V or 24V.
- Electric power supply range: from 10V to 32V.
- Current value consumed by a control coil: up to 0.2A depending on the type and manufacturer.
- Maximum current value in a power circuit: up to 70A depending on the type and manufacturer.
- Direct-current resistance value of a coil may be from 80 to 680 Ohm depending on the type and manufacturer.

Relay contacts have typical indication (Pic. 4):

- 30 — common contact (power contact «+»)
- 87 — common contact
- 87а — NC contact
- 87б — NO contact
- 88 — common contact 2
- 85 and 86 — control contacts (relay bobbin «-» and «+»)

In accordance with initial state of contacts, there are relays with (Pic. 4):

1. Normally closed contacts (4 contacts).
2. Normally opened contacts (4 contacts).
3. Bridging contacts (5 contacts).
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(version 5 dated from June 27, 2018)

ATTENTION! Admissible current at transistor outputs (OUT1, OUT2, etc.) of the tracking device must not be higher than 0.08A. Exceedance of this parameter may lead to a failure of an output or the whole device.

Therefore, value of this parameter should be taken into consideration, when selecting a relay.

For example, current strength of electric coil of a standard relay 90.3747-10 designed for Russian-produced vehicles, may reach I=0.15A, when coil voltage supply value is U=12V and control coil resistance is R=80 Ohm (calculations are made by Ohm’s law). Such current strength value is inadmissible for operation with transistor outputs of the tracking device.

The following automobile relays are compatible with operation of the tracking devices:

MEYLE 100 951 0001
MEYLE 100 830 0015
MEYLE 114 830 0001
PANASONIC production run CQ
PANASONIC production run CP
PANASONIC production run CT
Connection of Controlled Devices to the Tracking Device

Depending on the device model, a control relay should be connected to one of the transistor outputs (OUT0…OUT3). A scheme of control relay installation for operation with the device in a vehicle is provided below. The scheme implies installation of a diode parallel to the assembled relay, in order to prevent a reverse current at the outputs of the tracking device (OUT0…OUT3) after circuit opening [Pic. 5]:

When a transistor of one of the device’s outputs is being opened (OUT0…OUT3) ground short circuit occurs, electric current appears at a relay coil. Electro-magnetic field of a relay coil influences a relay operating mechanism and closes relay contacts; it leads to appearance of electric current at a controlled device.

Setting of initial state of outputs of the tracking device is carried out on tab “Ins/Outs” in Configurator program (Pic. 6) or by means of command:

Command format `out v, s`
Parameters `v` – ordinal number of an output (count from zero output);  
`s` – desired condition (0 – transistor output in opened condition; 1 – transistor output in closed condition).

Note:
Transistor outputs control.  
When one output is being controlled, condition of other outputs remains unchanged.
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By default, all transistor outputs are closed.

Example
Request: out 1, 1
Response: OUT(3..0) = 0010
All outputs are opened, except for the first.

Algorithm of operation of the device’s output is set on tab “Settings” -> “Signaling settings” in Configurator (Pic.7):

In the tracking devices with Easy Logic support operation of outputs can be set in the field of algorithms (Pic.8):
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Connection of control relay of a vehicle to Galileosky tracking devices is completed, the tracking device is ready for operation.

RSA “Galileosky”, LLC produces satellite monitoring equipment for GPS and GLONASS real time vehicles monitoring. The tracking devices determine the mobile object location recording the time and route as points with geographical coordinates and send the data to the server to be further processed and sent to the traffic controller panel.

In addition, a number of other vehicle parameters are recorded: the state of analog and discrete inputs of the tracking device and the state of digital interfaces.

The tracking devices can be used in any vehicle.