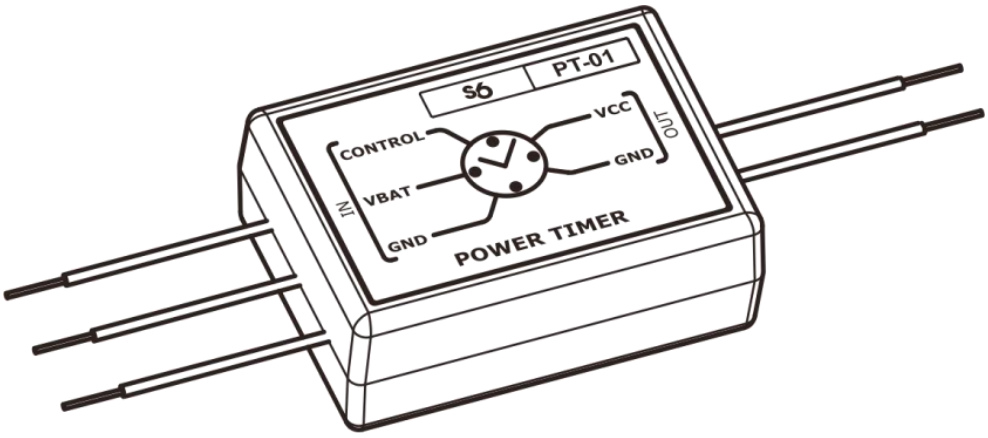
POWER TIMER



S6 PT-01

OPERATION MANUAL

Version 2.0

TECHNOTON®

Contents

Revision history

Version	Date	Editor	Description of changes
2.0	05.2017	OD	Basic version

Terms and definitions

Onboard equipment (OE) — Telematics System Elements, directly installed in Vehicle.

Conductive interference – unpredictable electromagnetic phenomena in onboard power network of vehicle, leading to temporary decrease in quality of operation of Onboard equipment or permanent outage of equipment.
Conductive interference in power networks of Onboard equipment is described by ISO 7637-2.
Conductive interference in signaling networks of Onboard equipment is described by ISO 7637-3

Telematics terminal (Tracking device, Telematics unit) is a unit of Telematics System for reading signals of Vehicle standard and additional sensors, getting location data and transmitting the data to the Server.

Telematics system — complex solution for real-time and after trip vehicle monitoring and control. Main vehicle parameters monitored: route, fuel consumption, operation time, technical condition of vehicle, safety. Consists of OE, Communication channels, Telematics service ORF 4.

Vehicle — an object controlled within Telematic system. Usually Vehicle means a truck, tractor or bus, sometimes a locomotive or river boat. From Telematics system point of view, stationary objects are also considered to be vehicles: diesel gensets, stationary tanks, boilers/burners.

Introduction

Rules and recommendations, stated in this Operation Manual are related to S6 PT-01 power timer (further – S6 PT-01). This document contains information about design, principle of operation, characteristics and instructions on operation of power timer, developed by TECHNOTON JV, Minsk, BELARUS.

S6 PT-01 — is a tool for Telematics systems, used for automatic power supply management of Onboard equipment and its electrical protection.

S6 PT-01 features:

- Compliance with European and national automotive standards and directives;
- Continuous operation of Telematics system in 24/7 mode while power supply from onboard network is switched off;
- Efficient protection of telematics sensors against influence of Conductive interference and short circuits in onboard electrical network of Vehicle;
- Long-term operation of telematics sensors while ignition is turned off and without a need of battery recharge;
- No configuration needed;
- Applicable for all kinds of vehicles, not dependent on EURO standard;
- Resettable fuse ensures automatic recover of power supply after electrical network failure;
- Easy installation and connection.

ATTENTION: When operating S6 PT-01 strictly follow recommendations stated in this Operation Manual.

Technoton guarantees compliance of S6 PT-01 with requirements to technical and legal regulations at observance of storage, transportation and operation conditions, described in this Operation Manual.

ATTENTION: The manufacturer reserves the right to modify S6 PT-01 specifications that do not lead to a deterioration of the consumer qualities without prior customer notice.

1 General information and technical specifications

1.1 Purpose of use and application area

S6 PT-01 power timer is designed for:

1) Power supply management of Onboard equipment of Telematics system while automotive power network is switched off.
2) Trouble-free operation of Telematics system units during transition processes in automotive onboard power network which take place when starting/stopping engine.
3) Electrical power protection of Onboard equipment.

Area of application — Onboard equipment of Telematics systems (see figure 1).

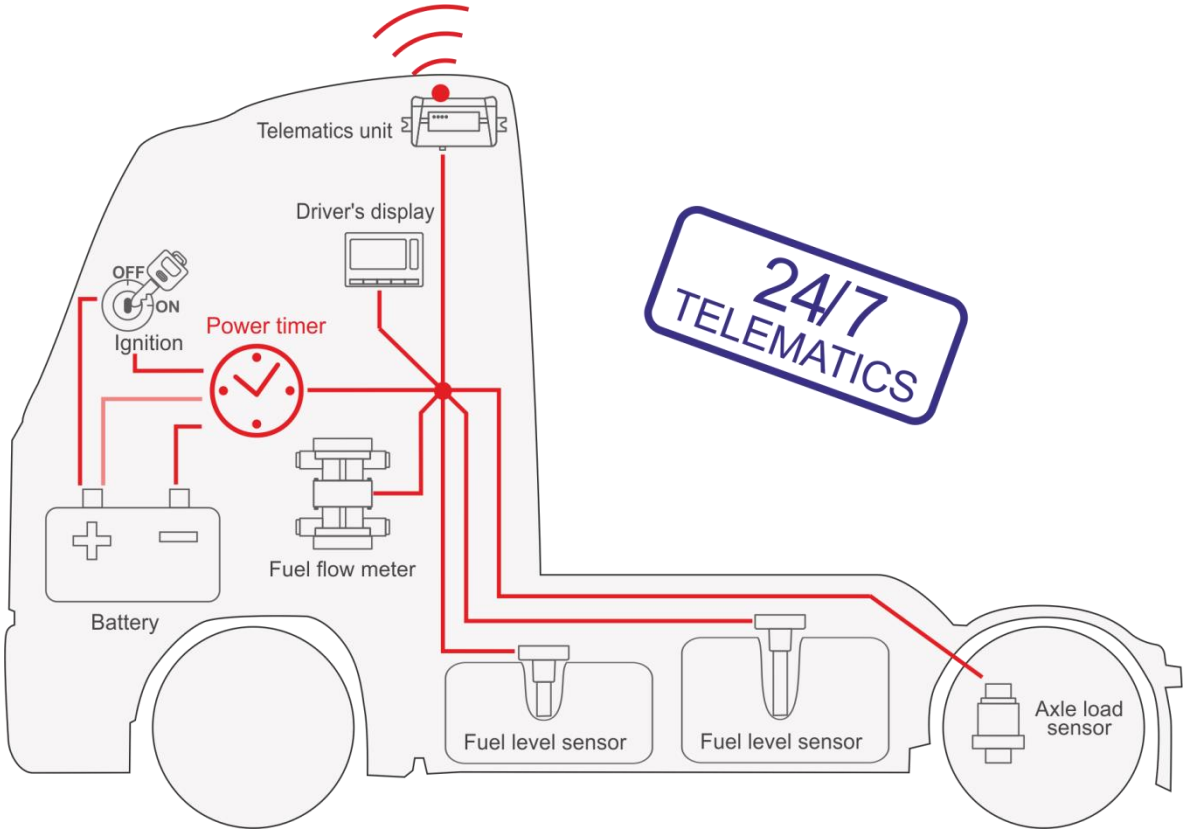


Figure 1 — Using S6 PT-01 power timer

When operating Telematics system, some parameters, like fuel volume in tank or axle load, should be monitored not only when Vehicle is working, but also outside working hours – when vehicle is stopped or parked. At the same time, simultaneous power supply of telematics unit and several sensors from onboard network when ignition is turned off can cause fast battery discharge.
Voltage spikes and Conductive interference in automotive onboard network, occurring during transients when engine starts/stops or when switching electrical equipment, can lead to unstable operation or even failure of Telematics system elements.

Power supplying Onboard equipment through power timer ensures:

- **when onboard network is switched OFF** — Telematics system operates in 24/7 mode (Onboard equipment is automatically powered for 180 seconds each 30 minutes);
- **when onboard network is switched ON —** Powering on/off of Onboard equipment occurs after stabilization of transients in power network (automatic 15-second delay after switching ignition on, automatics 180-second delay after switching ignition off);
- **constant protection** of Telematics system units against Conductive interference and power spikes in onboard power network.

Due to power timer application, fleet operator can precisely reveal fuel drain from vehicle's fuel tank even when ignition is turned off, e.g. on the rest days (see figure 2).

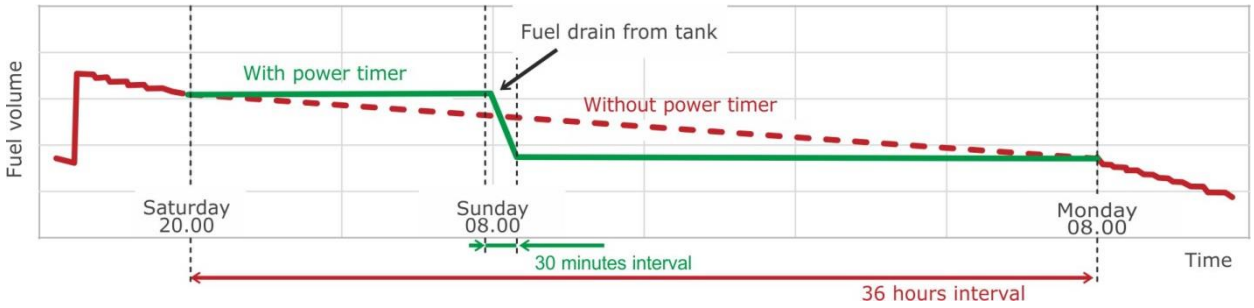
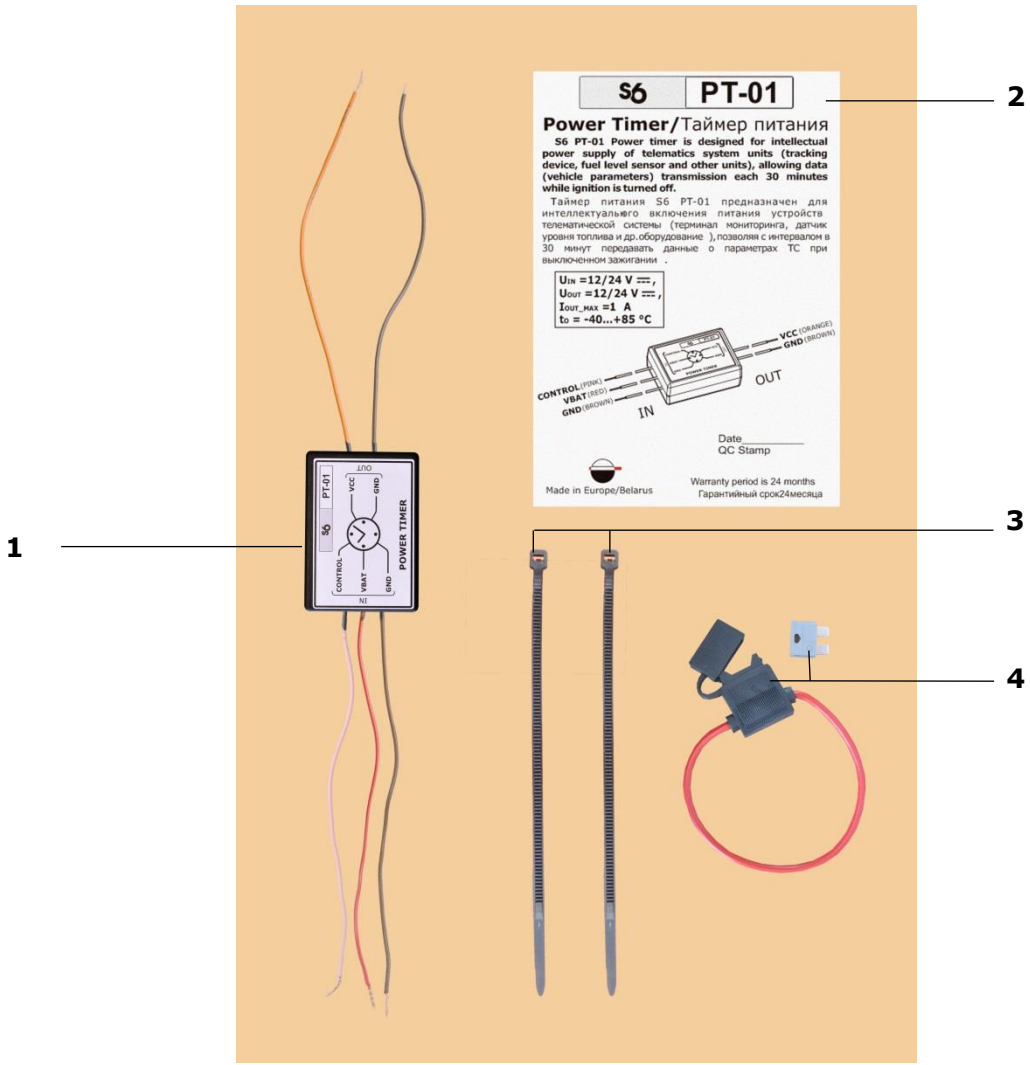


Figure 2 — Example of identifying fuel drain from tank Event through using S6 PT-01 power timer

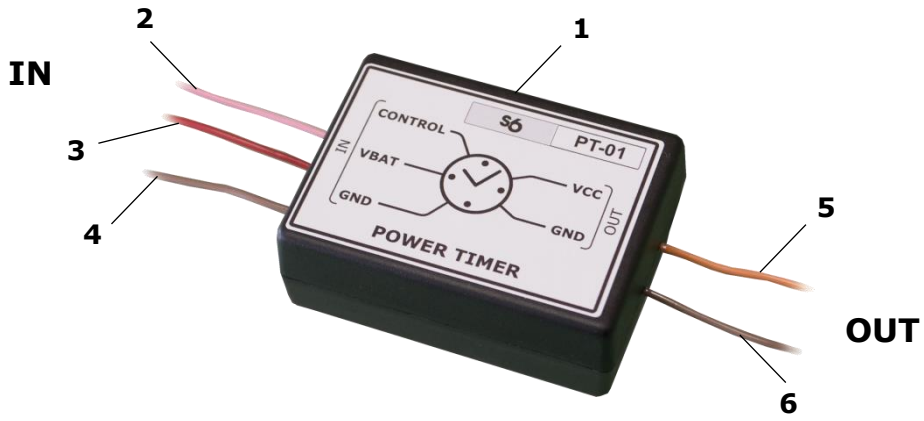
1.2 Exterior and delivery set



1	S6 PT-01 power timer	– 1 pc.;
2	Specification containing basic technical characteristics	– 1 pc.;
3	Cable tie	– 2 pcs.;
4	Fuse with holder (2 A)	– 1 pc.

Figure 3 — Exterior and delivery set of S6 PT-01

1.3 Design and principle of operation



1 – body with PCB inside;

2 – **CONTROL** wire (pink) for sending control signal, turning on/off onboard power network of vehicle;

3 – input wire **VBAT** (red) for connecting powering "+" of battery;

4 – input wire **GND** (brown) for connecting "-" of vehicle frame;

5 – output wire **VCC** (orange) for connecting voltage of protected powering to telematics sensors;

6 – output wire **GND** (brown) for connecting "-" of vehicle frame.

Figure 4 — S6 PT-01 power timer design

Input wires of S6 PT-01 (**VBAT** and **GND**) are connected to correspondent wires of onboard power network of vehicle.

Control wire for sending signal (**CONTROL**) is connected:

- after main battery switch (on vehicles with power network switch disconnecting powering "+" of battery);
- after frame switch (on vehicles with power network switch disconnecting "-" of frame).

When power network of vehicle is switched off, each 30 minutes PCB of power timer automatically conducts voltage of protected powering through **VCC** wire to telematics sensors for 3 minutes.

When turning ON onboard power network of vehicle, voltage conduct of protected powering "+" starts with 15-second delay.

When turning OFF onboard power network of vehicle, voltage conduct of protected powering "+" automatically stops in with 180-second delay (see figure 5).

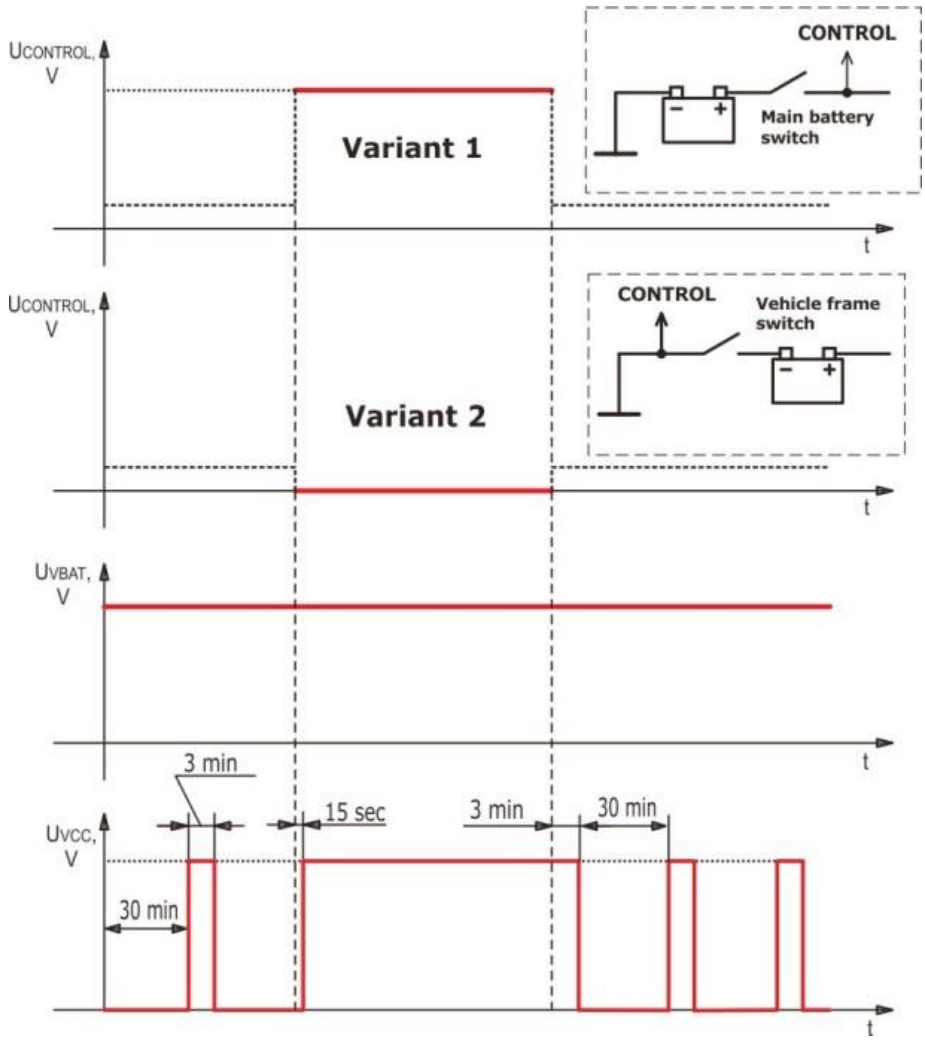


Figure 5 —Timing diagram of S6 PT-01

1.4 Electronic protection against Conductive interference in onboard power network of Vehicle

S6 PT-01 ensures constant electronic protection of Onboard equipment powering against influence of basic types of Conductive interference in onboard power network:

1) Pulse 1 — interference, occurring when switching off inductive loads (see figure 6a).

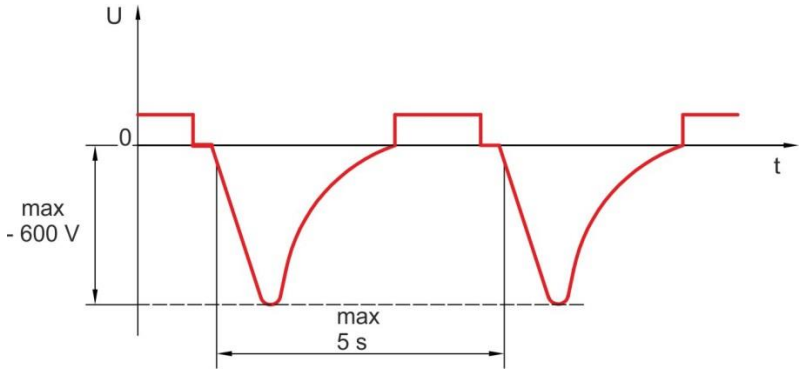
2) Pulse 2a — interference, occurring on sudden interruption of current in parallel equipment resulting from inductivity of wires (see figure 6b).

3) Pulse 2b — interference from automotive DC engines occurring after switching ignition off (see figure 6c).

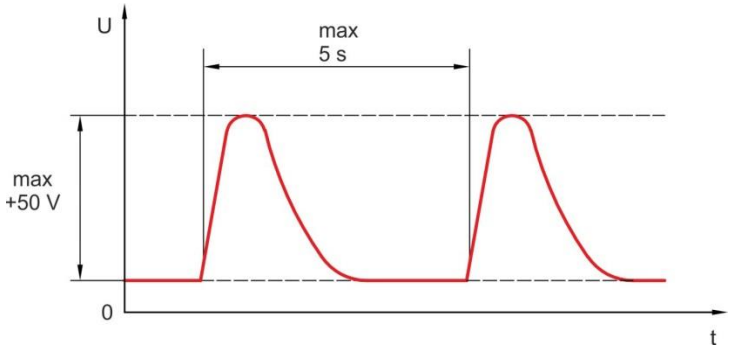
4) Pulse 3a/3b — interference, occurring during switching. E.g. turning on fan, heater, windshield washer (see figure 6d).

5) Pulse 4 — Deep (up to 16V) voltage drop on engine start (see figure 6e).

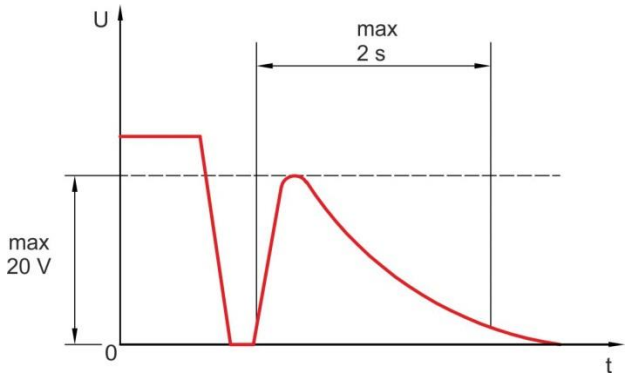
6) Pulse 5a/5b — transient on battery switching off, while generator is running (see figure 6f).



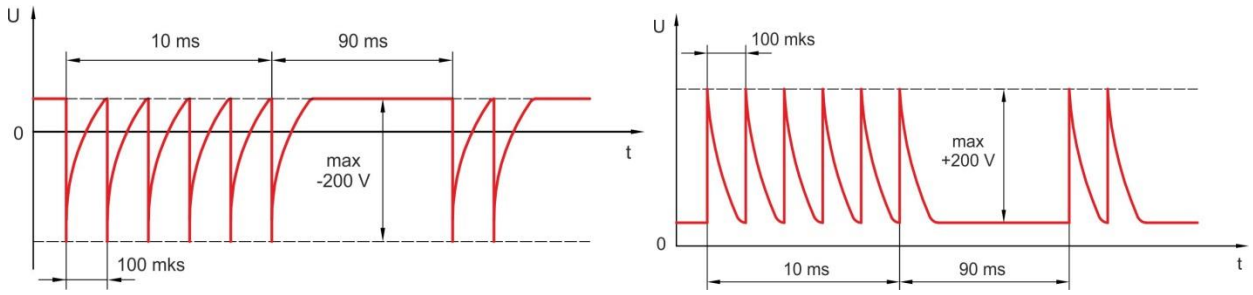
a) pulse 1



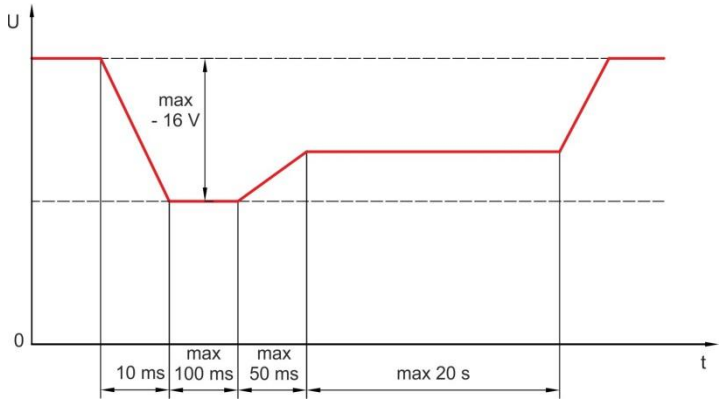
b) pulse 2a



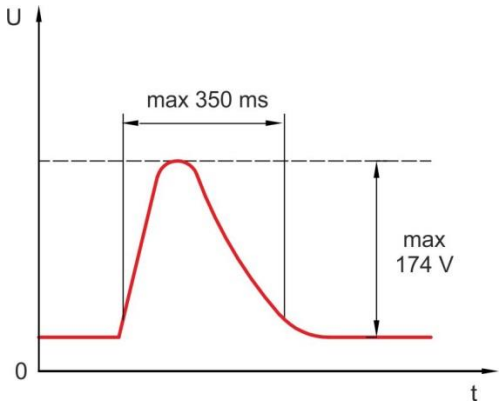
c) pulse 2b



d) pulses 3a/3b



e) pulse 4



f) pulses 5a/5b

Figure 6 — Types of conductive interference in onboard power network of Vehicle from which S6 PT-01 protects

1.5 Technical specifications

Table 1 — Technical specifications of S6 PT-01

Parameter, measuring unit	Value
Nominal supply voltage (input), V	12 or 24
Nominal supply voltage (output), V	
Maximal output current, mA, not more than	1
Temperature range, °C	from -40 to +85
Ingress protection rating	IP40
Dimensions, mm, not more than	see figure 7
Weight, kg, not more than	0.1

1.6 Overall dimensions

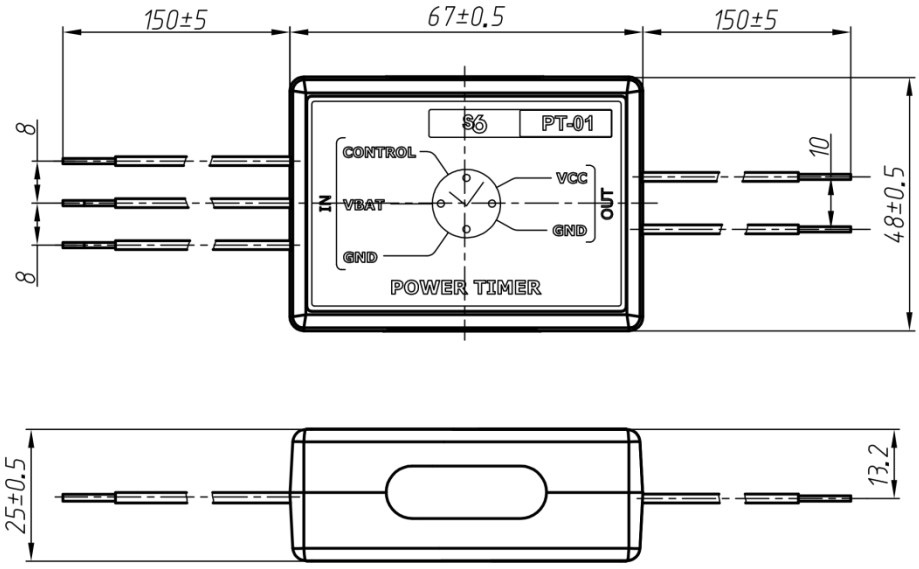


Figure 7 — Overall dimensions of S6 PT-01

2 Connecting S6 PT-01

ATTENTION: Strictly follow safety rules of automobile repair works as well as local safety rules of the customer company when mounting power timer. Before connecting S6 PT-01 carefully study documents and schemes for equipped Vehicle.

2.1 Exterior inspection prior to starting works

It is necessary to conduct S6 PT-01 exterior inspection for the presence of the possible defects arisen during transportation, storage or careless use. Contact the product supplier if there any defects.

2.2 Operational limits

For S6 PT-01 installation find dry place, protected against aggressive impact of external environment.

S6 PT-01 should not be mounted near heating or cooling equipment (e.g. climate control system).

Proper place of S6 PT-01 installation is driver's cabin. When mounting under the automobile hood ensure placement at least 30 cm away from rotating or heating surfaces.

2.3 Electrical connection

IMPORTANT:

1) Prior to starting work switch off power supply of the Vehicle electrical circuits, by switching off battery or disconnecting terminals from battery.

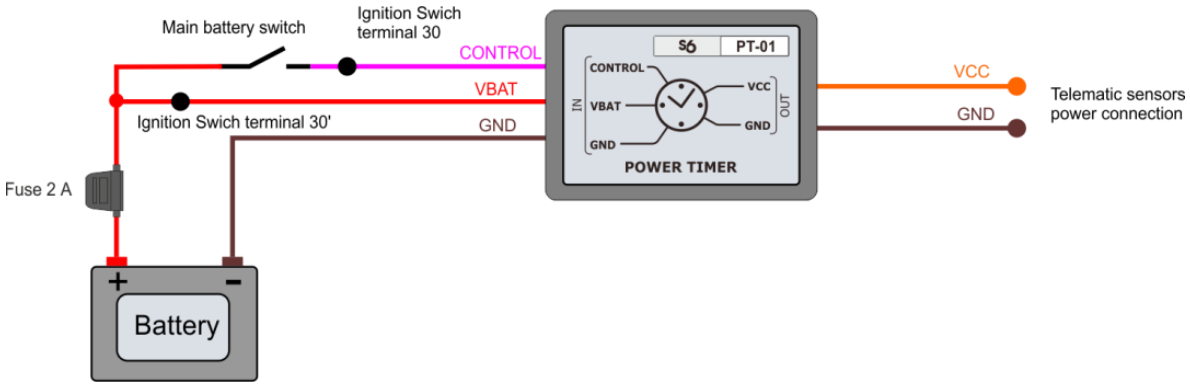
2) Check frame quality, resistance between any place of frame and "-" of battery or frame switch terminals should not exceed 1 Ohm.

3) When connecting S6 PT-01 to onboard electrical network of Vehicle, use **fuse** from delivery set in accordance to scheme of connection. Nominal fuse current is not more than 2 A.

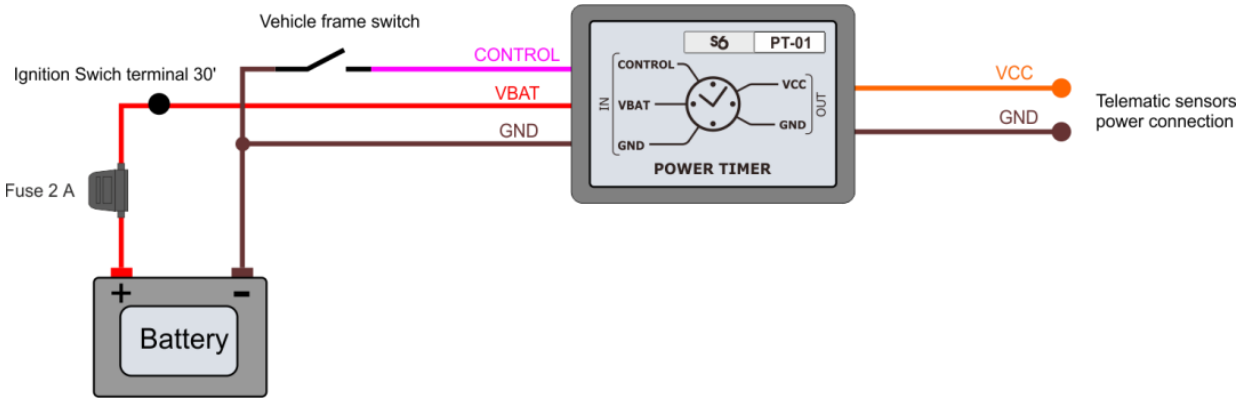
To connect S6 PT-01 wires, it is recommended to use clamps (see figure 8).

Figure 8 — Clamps for S6 PT-01 connection

Electrical connection of S6 PT-01 is carried out as per connection schemes (see figure 9) and wire assignment table 2.



a) on Vehicles with power network switch disconnecting powering "+" of battery



b) on Vehicles with power network switch disconnecting "-" of frame

Figure 9 —S6 PT-01 connection schemes

Table 2 — S6 PT-01 wire assignment

Wire			Signal	
Marking	**Color**		**Name**	**Type**
CONTROL	Pink		Control signal	Analog, voltage from 0 to 36 V
VBAT	Red		Powering voltage	Analog, voltage from 9 to 36 V
GND	Brown		Frame "-"	—
VCC	Orange		Voltage of protected powering	Analog, voltage from 9 to 36 V
GND	Brown		Frame "-"	—

Make sure you connect Onboard equipment to the output power wires of S6 PT-01 in accordance to operation manuals of connected Onboard equipment.

After finishing electrical connection, fasten S6 PT-01 case to any suitable element of the vehicle using two cable ties from deliver set (see figure 10).

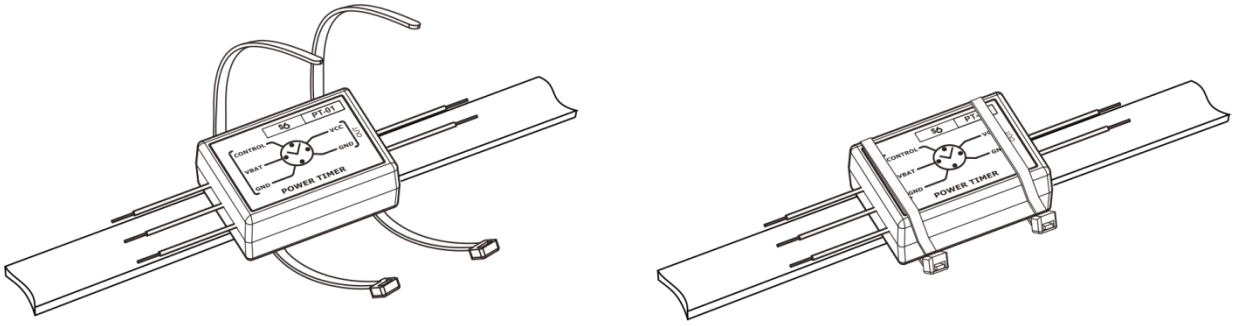


Figure 10 — Fastening S6 PT-01 case with cable ties

3 Functioning check

S6 PT-01 stars operation immediately after its power wires are electrically connected as per 2.3.

Correctness of S6 PT-01 connection is determined through correspondence of output voltage VCC appearance algorithm to time diagrams, as described on picture 5.

4 Packing

S6 PT-01 is delivered in plastic pack. Specification sheet from pack contains information on: product name and purpose of use, electrical characteristics, input/output wires purpose, manufacture date and Quality Control seal.

5 Storage

S6 PT-01 is recommended to be stored in dry enclosed areas or other premises with natural ventilation, without simulated climatic conditions and unheated warehouses.

S6 PT-01 storage is allowed only in original packaging at temperature range from -50 to +40° C and relative humidity up to 98 % at 25 °C.

Do not store S6 PT-01 in the same room with substances that cause metal corrosion and/or contain aggressive impurities.

6 Transportation

Transportation of S6 PT-01 is recommended in closed transport that provides protection for S6 PT-01 from mechanical damage and precipitation.

Air environment in transportation compartments should not contain acid, alkaline and other aggressive impurities.

7 Utilization/re-cycling

S6 PT-01 does not contain harmful substances and ingredients that are dangerous to human health and environment during and after the end of life and recycling.

S6 PT-01 does not contain precious metals in amount that should be recorded.

Contacts

Manufacturer

Tel/fax: +375 17 240-39-73

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http://s6.jv-technoton.com

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Technical support

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Annex A
Videography

Animation “Power Timer”.

Check out the link: https://www.youtube.com/watch?v=XaV76pVrOI8

Other Technoton videos are on the YouTube channel which is regularly updated:

https://www.youtube.com/channel/UCq7EF3DHrgl7fOWB2ynsR-A