GGK

# GPS GSM Communicator

**Datasheet**

June 2017

1   Features

- GPS GSM Communicator by SoftIdea is online car security and monitoring system. It protects car against theft and allows online monitoring of car position and status.

- Uses GPS, GSM, GLONAS, cooperates with CAN bus.

- Includes an accelerometer, an optical tamper detection and other peripherals according to application requirements (PANIC button, CRASH module, wireless keypad, RFID driver identification etc.).

- Continuously evaluates monitored signals. In case of unauthorized manipulation it presents the position of the protected vehicle and additional information to prevent the car from being stolen or to facilitate the search for a stealed vehicle.

- Comprises interface for protection desk center, fleet management, service and configurable user interface (web application and application for Android and iOS).

- Uses sophisticated methods and algorithms for a high degree of protection:
  ◦ Detection of attempts to disrupt their own activities
  ◦ Adaptive self-consumption control, allowing longer internal battery operation
  ◦ Choice of information transfer method depending on external conditions
  ◦ An optimized proprietary transfer protocol that allows the transfer of a large number of parameters at low cost to the SIM card data limit.

- Supports vehicles of leading manufacturers from 2004 to the present, including the latest models.

- Is configurable to provide a wide range of applications.

- Has very low power consumption.
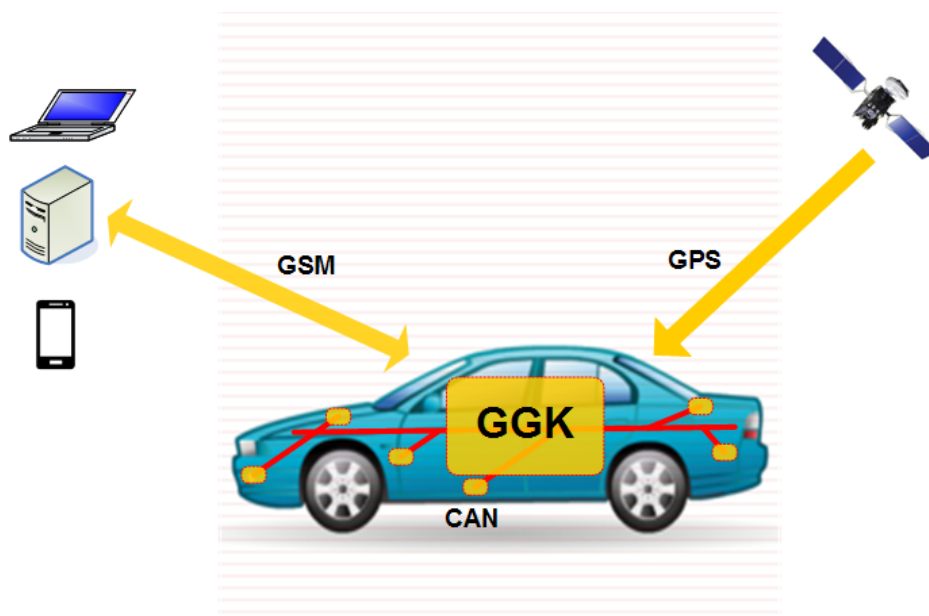
2   Architecture

The GGK core is a hardware device installed in a protected vehicle. The device is powered externally by the vehicle power supply (battery and alternator). The device contains an internal battery that draws power only after a power failure or disconnection of the external power supply. Recharging the internal battery can only be done when the vehicle is lit. The device communicates through the GSM network with the server part, and the authorized person has an online user interface available to obtain up-to-date information about the status of the protected vehicle and perform all required operations. The GGK includes the following subsystems in the standard configuration:

- GSM modem allows two-way communication with the server part using GPRS, SMS and CSD
- GPS receiver determines the position of the vehicle
- Accelerometer to detect movement and / or tampering with the device or car
- Optical tamper detector to detect tampering with the device
- Module for communicating with the CAN bus of the vehicle
- Interface for connecting the diagnostic software
- Interface for peripheral connection
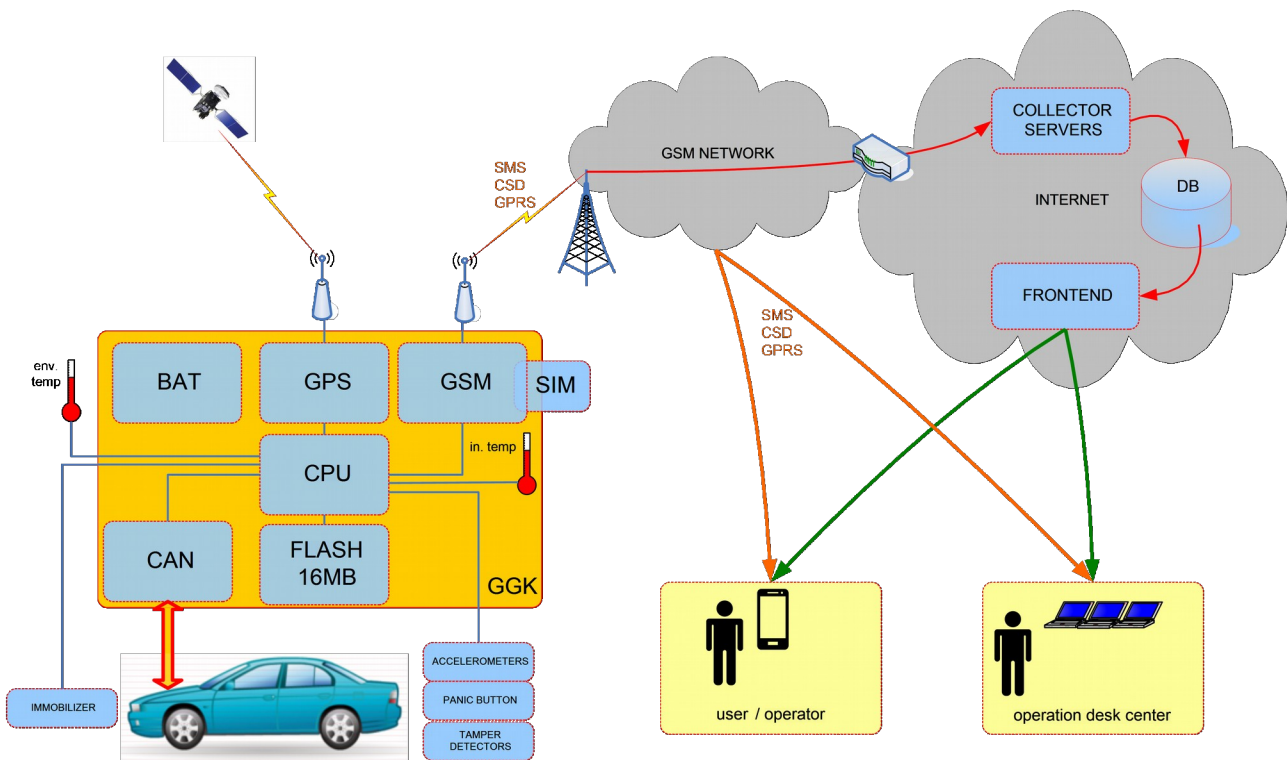
3   Function

Principal task of the GGK is to monitor and protect the vehicle and in the event of an ALARM state to inform operator and to enter into a mode allowing for the longest possible tracking and searching of the stolen vehicle.

3.1 Alarm

ALARM status is declared if:
- The vehicle was opened in a non-standard manner
- The built-in security device has declared an alarm (CAN detection)
- The position of the guarded vehicle has changed
- The battery was disconnected
- An attempt was made to disassemble the device
- The PANIC button was pressed (not included in the standard)
- Vehicle deformation was detected while driving (the CRASH module is not part of the standard equipment)

3.2 Power management

The following table describes the GGK power management modes determining the power consumption. The device switches between individual modes according to the built-in algorithms or on the operator's request. The subsystems marked red are mostly inactive in the given mode. Green subsystems are active in the given mode.

MODE	UNGUARDED					GUARDED				
TRACKING			CPU	GSM	GPS	OPTO	ACC			
SAVINGS	CPU	GSM	GPS	OPTO	ACC	CPU	GSM	GPS	OPTO	ACC
SLEEP	CPU	GSM	GPS	OPTO	ACC	CPU	GSM	GPS	OPTO	ACC
OFF			CPU	GSM	GPS	OPTO	ACC			

In TRACKING mode all subsystems are active. This mode is automatically triggered when:
- an alarm is triggered
- after the ignition has been switched on
- or is manually triggered by the operator.

In the SAVINGS mode some subsystems are turned off to save energy. For a guarded vehicle in this mode the position change is monitored by the accelerometer ACC. Motion detection causes an alarm to be triggered and a transition to the TRACKING mode.

In SLEEP mode some subsystems are turned off to save energy. In this mode, the device does not communicate continuously with the server part but periodically wakes up and falls asleep. After the wakeup the device performs uploading of the status to the server part and takes over any new operator instructions. This mode is activated in the following way:

- The operator manually activates the SLEEP mode defining the wake-up period

- Is automatically triggered if the battery voltage drops considerably; This allows for an extended period of activity for example in the case of tracking of a stolen vehicle.

For a guarded vehicle in this mode, the position change is monitored by the accelerometer ACC. Motion detection causes the alarm state to be entered and transition to the TRACKING mode.

In the OFF mode all subsystems are inactive and the device does not consume energy from the internal battery. This mode is designed for medium-term storage of the device out of operation. In this mode the device is supplied by the manufacturer. The length of time the device can be stored is limited only to the internal battery self-discharge process with a new device this is about 6 months. The device may be switched OFF by the operator **after the external power supply has been disconnected**. After the external power is connected the device is started and automatic deployment is made to the server database. From now on the vehicle is available in the user interface.

The device enters GUARDED mode automatically 35 seconds after vehicle gets locked in the standard way (key lock) what is detected by the CAN subsystem from the vehicle bus. After the vehicle is unlocked, the device enters the UNGUARDED mode.

3.3 Ignition detection

Active ignition is detected by one of the following methods:

- If the supply voltage increases above the configurable decision level[1]

- From the CAN BUS

4   Supported vehicles

make / model	from year	to
AUDI, ŠKODA, VW, SEAT	2004	now
VOLVO XC90	2007	now
VOLVO XC60	2012	now
PORSCHE	2007	now
BMW	2010	now
DODGE	2012	now
JEEP	2012	now
CHRYSLER	2012	now
FIAT	2012	now
MERCEDES	2007	now
RENAULT	2010	now
LAND ROVER	2014	now
JAGUAR	2014	now
RANGE ROVER	2014	now

---

1   The phenomenon is used of on-board voltage increase after the engine is started

SOFTIDEA

5 Connector diagram
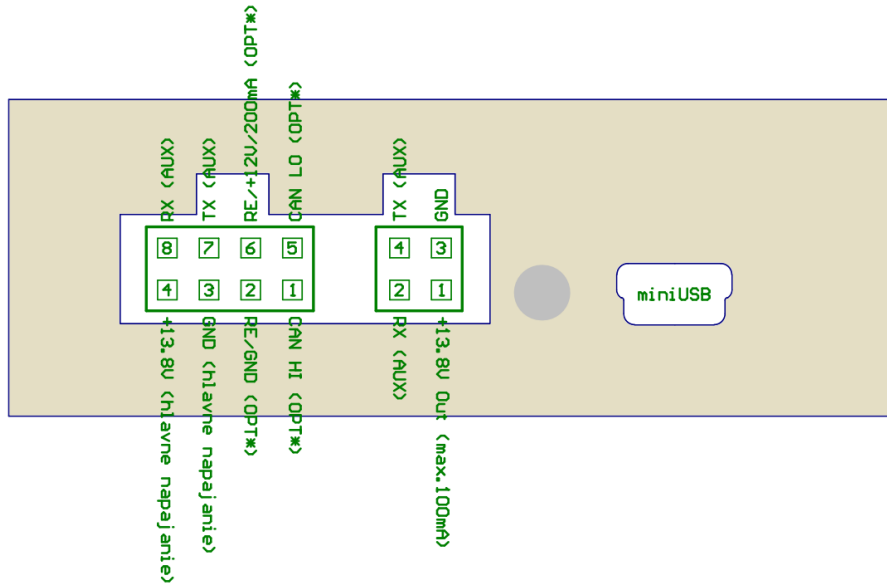
6 LED indication

The device indicates its status and possible error messages through two LEDs. The meaning of LEDs is described in the following tables.

| Red LED	Meaning
Constantly ON	Wrong SIM configuration
	Wrong PIN, wrong SIM card
	Wrong modem (if SIM OK)
Quickly flashes (5/s)	Wrong configuration or unknown data on SIM
cca 1 min. after reset still blinking (1/s)	Problem with registering in the GSM network
Off	GSM is in SLEEP
Slowly blinking (1/5s)	OK

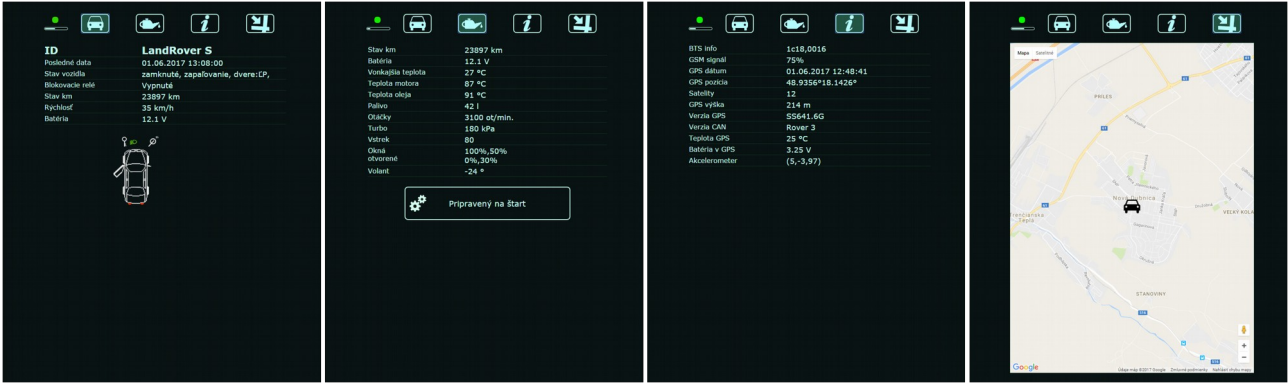| Green LED	Meaning
Quickly flashes (5/s)	Wrong GPS module.
cca 5 min. after reset still blinking (1/s)	Problem with GPS signal
Off	GPS is in SLEEP
Slowly blinking (1/5s)	OK

7 User interface

In this chapter there are examples of the GGK user interface. The meaning of the symbols is in the following figure.
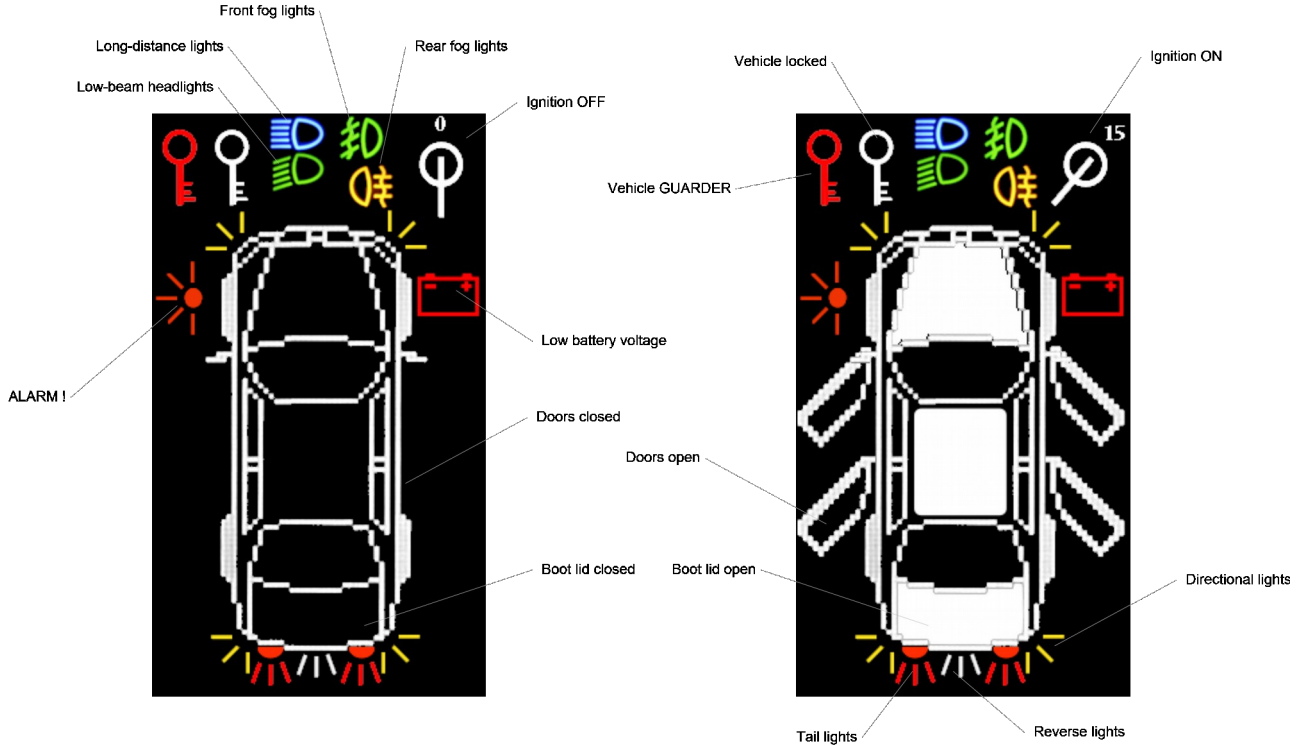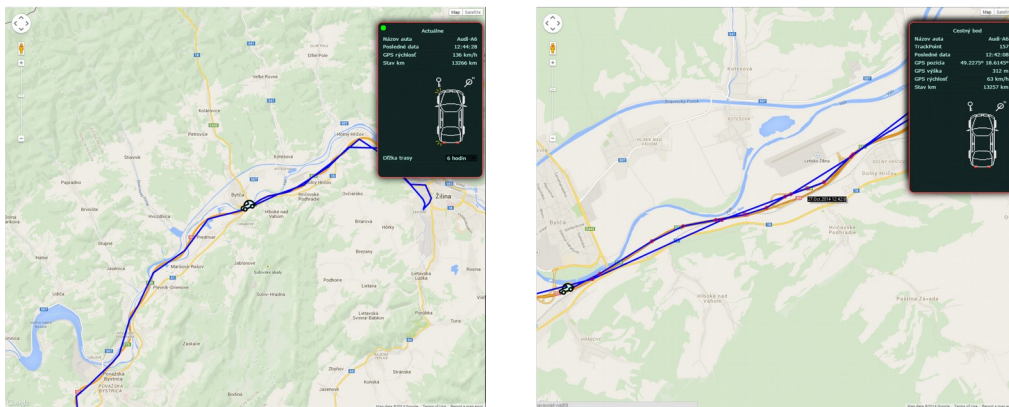

7.1 Android application
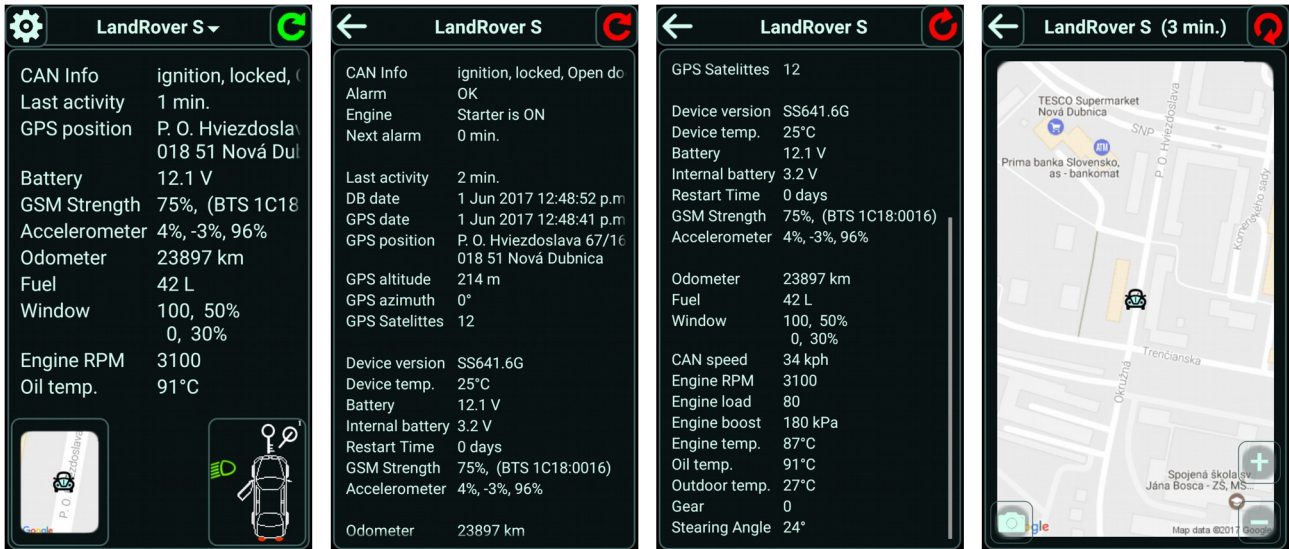
7.2 Web application - user

7.3 Web application – operation desk center, service

SoftIdea

8   Technical data

Supply voltage	:	10 to 16 V
Working temperature	:	-40 to 80 °C

Power consumption from vehicle power supply
- Maximum peak : 180 mA
- Average, ignition on : 40 mA
- Average, ignition off : 11 mA
- Emergency mode[1] : <7 mA
- OFF mode : <3 mA

Indicative time activity on built-in battery (no onboard power supply available) :
- TRACKING : min 6 hours
- comb. SAVINGS + TRACKING : min 24 hours
- SLEEP : min 7 days

Adaptation of optical tamper detector[2]	:	100 hours
Optical tamper detector OFF[3]	:	5 hours

9   Standards

The GGK device complies with the requirements of the following standards:

99/05/EC	Directive of the European Parliament and of the council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity, in short referred to as R&TTE Directive 1999/5/EC
2004/108/EC	Directive on electromagnetic compatibility
2006/95/EC	Directive on electrical equipment designed for use within certain voltage limits (Low Voltage Directive)
2002/95/EC	RoHS Directive
95/94/EC	Automotive EMC Directive

---

1   The auto-enabled SLEEP mode if the battery voltage dropped significantly
2   During this time the optical tamper detector adapts to the ambient lighting conditions at the installation site
3   The optical tamper detector is inactive for 5 hours after putting the device into operation and its adaptation is suspended. During this time the device should be fully installed in the vehicle.

Head office:
SoftIdea s.r.o. , Svätoplukova 14, 901 01 Malacky, Slovakia
Customer Service:
Sliačska 2D, 831 02 Bratislava, Slovakia
tel.: +421 2 444 60 444, 450
fax.: +421 2 446 40 441
GPS: 48°10'23.63"N, 17°07'21.75"E

http://www.softidea.sk
info@softidea.sk