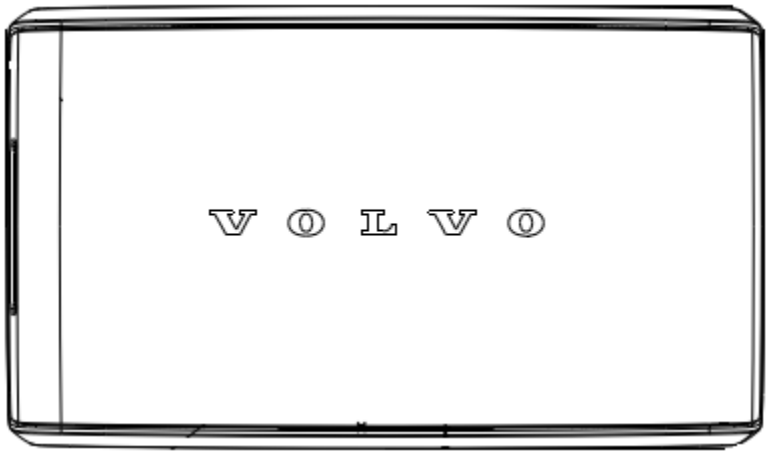
MARQUARDT

Technical Description

GK2



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1. Functional description

The GK2, as a passive entry vehicle key, is part of a driving authorisation system, which further consists of a Body Control Unit and up to 8 UWB vehicle modules.

The Body Control Unit in the vehicle initiates the communication to the GK2 over Bluetooth LE. After successful identification, a time-of-flight measurement is triggered bidirectionally between the UWB vehicle module and the GK2.

The distance is measured between the UWB vehicle module and the GK2 by means of the time of flight based on speed of light.

The components exchange encrypted data for car access, to start the engine and to locate the key.

2. User manual

GK2 and vehicle BNCM establish a connection and exchange data through BLE.

The distance measurement is a bidirectional communication between key and GU1. The key is called verifier and sends first to the GU1. The GU1 is called prover and sends back, after receiving the verifier signal. The key then computes the distance from the time of flight.

The Body Control Unit in the vehicle can automatically operate functions such as unlocking measurements depending on the distance of the key.

3. Technical Data

Temperature range

Working temperature	-40°- +85° C

Data of RF-Part(UWB)

Transmission mode	bidirectional RF 2 channels

Receiver

Channel frequencies	Channel 5: 6489.6 MHz Channel 9: 7987.2 MHz
10 dB bandwidth	＞500 MHz per channel

Frequency tolerance (production, aging, temperature)	+/-20 ppm
Sensitivity	-90 dBm
Modulation:	PM
Frequency deviation	+/- 125 MHz
Antenna:	integrated PCB antenna, combined for Rx / Tx

Transmitter:

Center frequency	see Rx
Frequency tolerance (production, aging, temperature)	+/-20 ppm
Transmitter power	EIRP with PCB antenna ＜-41.3 dBm/MHz
Modulation:	PM
Antenna:	integrated PCB antenna, combined for Rx / Tx

Data of RF-Part(BLE)

Transmission mode	BLE 5.0 40 channels

Receiver

Channel frequencies	2402MHz ~ 2480MHz
Bandwidth	2MHz per channel
Frequency offset	+/-150kHz
Frequency drift	+/-50kHz
Sensitivity	＜-90 dBm
Modulation:	GFSK
Antenna:	integrated PCB antenna, combined for Rx / Tx

Transmitter:

Center frequency	see Rx
Bandwidth	2MHz per channel

Frequency offset	+/-150kHz
Frequency drift	+/-50kHz
Transmitter power	EIRP ＜10dBm
Modulation:	GFSK
Antenna:	integrated PCB antenna, combined for Rx / Tx

Rough mechanical dimensions	66.7 X 39X 14.3 mm
Weight:	34 g ±15%

Device may not be employed for the operation of toys. Operation onboard an aircraft, a ship or a satellite is prohibited.

WARNING

Do not ingest the battery, Chemical Burn Hazard

(The remote control supplied with) This product contains a coin/button cell battery. If the coin/button cell battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death.

Keep new and used batteries away from children.

If the battery compartment does not close securely, stop using the product and keep it away from children.

If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.

WARNING

1. Replacement of a battery with an incorrect type that can defeat a safeguard;

Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion;

Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas

A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas

2.  The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

3.  CAUTION For coin/button battery used, please refer for further information to the user manual

FCC Regulations:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution:

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Radiation Exposure Statement:

The product is a low power device and its output power is lower than FCC SAR exemption level.

ISED Notice

- This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
  1) this device may not cause interference, and
  2) this device must accept any interference, including interference that may cause undesired operation of the device.
- Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio

exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1) l'appareil ne doit pas produire de brouillage, et
2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

❷ This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter, except tested built-in radios.

❷ Cet appareil et son antenne ne doivent pas être situés ou fonctionner en conjonction avec une autre antenne ou un autre émetteur, exception faites des radios intégrées qui ont été testées.

❸ The County Code Selection feature is disabled for products marketed in the US/ Canada.

❸ La fonction de sélection de l'indicatif du pays est désactivée pour les produits commercialisés aux États-Unis et au Canada.

Radiation Exposure Statement:

The product is a low power device and its output power is lower than IC SAR exemption level.

Déclaration d'exposition aux radiations:
Le produit est un dispositif de faible puissance et sa puissance de sortie est inférieure au niveau d’exemption de IC SAR.