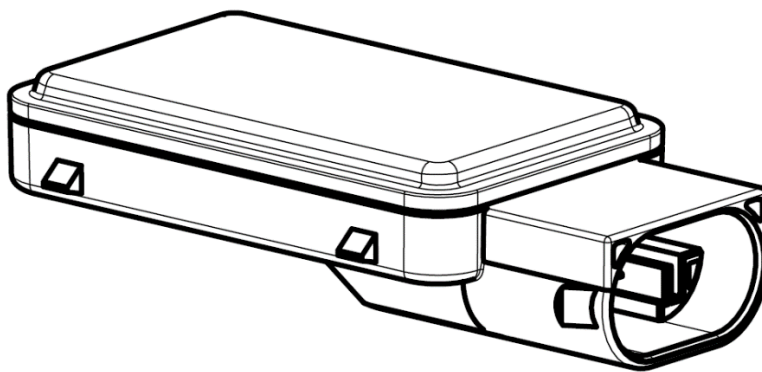


Technical Description

GU1



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Initial version : 31.03.2023
Revision :
Version: 1.0

1. Functional description

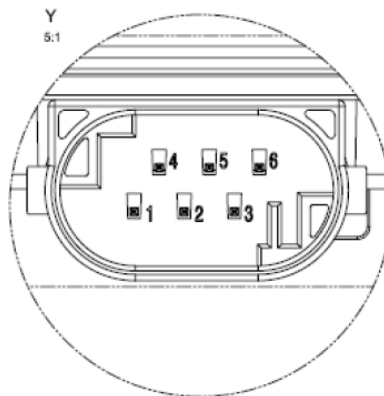
The GU1 is part of a driving authorization system in a car. It is used to measure the distance between the key and the car based on the speed of light. In a car six GU1 modules are used. The distance is measured between the key and each GU1 using the time of flight of an UWB signal.

The communication with the body controller unit is realized with a single wire interface.

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

2. User manual

The GU1 has a six pin connector as interface to the car / body controller.



Pin 1

- Switched power supply from body controller
- 12 V

Pin 2-3

- CAN Data bus

Pin 4-5

- Daisy Chain In/Out

Pin 6

- GND
- Connected to the body controller

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 verifier/prover sequences is repeated on 2 channels for one module in the car. Then the sequence is repeated with the next module.

3. Technical Data

Temperature range

Working temperature -40°- +85° C

Data of RF-Part

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

Rough mechanical dimensions	72.8 X 39.5 X 18.7 mm
Weight:	50 g

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

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:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

ISED Notice

- ❶ 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.
- ❶ 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:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé.