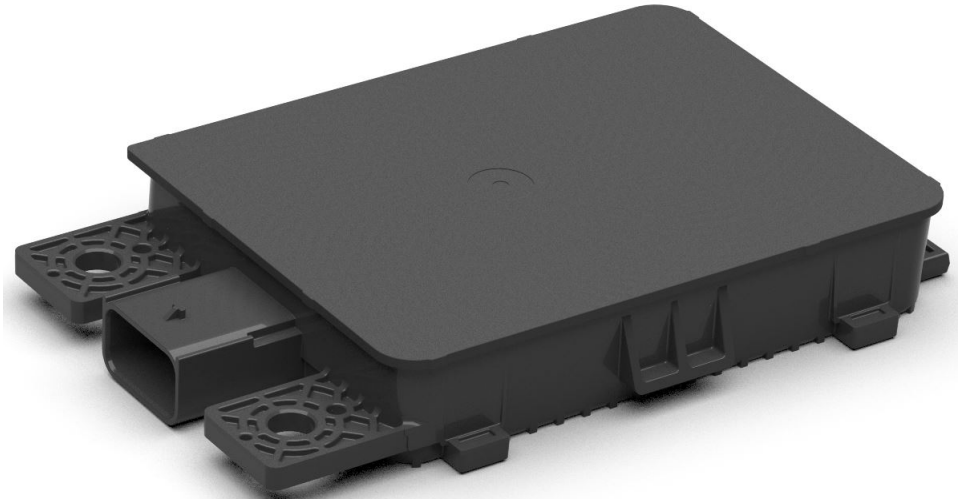
RS 5.5 – User's Guide



The RS 5.5 is an advanced driver assistant system, to warn the driver of the ego vehicle against potential collisions with other road users to the side, to the rear and to the front of the ego vehicle.

This system is not meant to encourage aggressive driving. The absence of a warning will not guarantee the absence of other road users. Responsibility for the safe operation of the vehicle remains with the driver.

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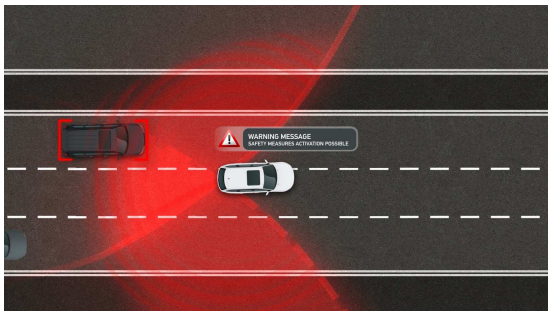
1 Functions

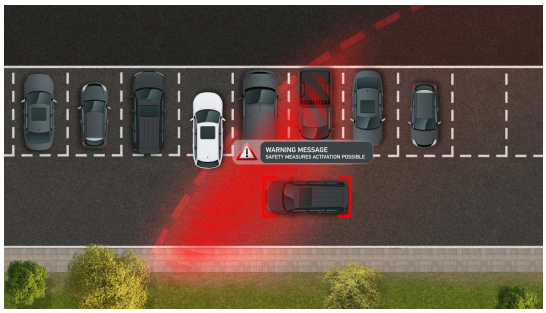
The sensor is capable to detect other objects. With this recognition capability it covers for example the following functionalities:

1.1 Blind-spot detection and lane-change warning



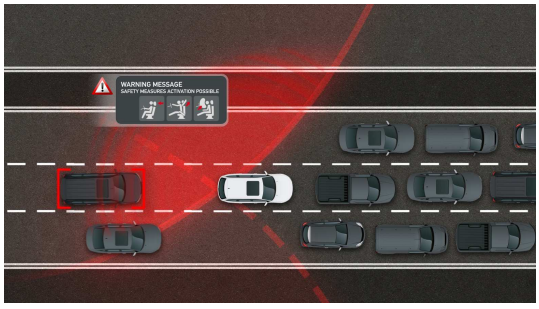
These functions monitor the neighboring lanes and warn the driver of the ego vehicle when an intended lane change could cause a collision with other traffic participants.

1.2 Rear traffic alert



This function monitors the difficult to see zone at the rear side of the ego vehicle and warns the driver against possible collisions with other moving road users when reversing out of a parking space.

1.3 Pre-crash rear



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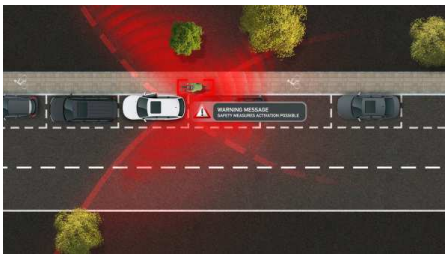
This function monitors the lane behind the ego vehicle and initiates safety measures when a crash from behind is unavoidable.

1.4 Safe exit



This function monitors the area next to the car doors on the passenger's and on the driver's side to the back and to the front and warns the driver if the car door cannot be opened safely.

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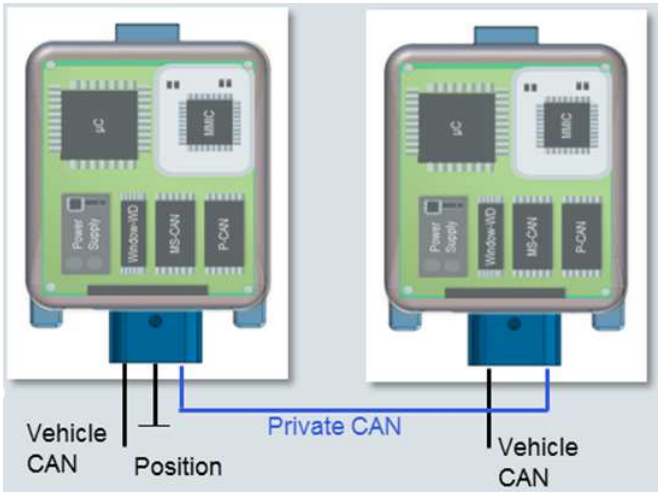
2 System Architecture

The system consists of two or more radar sensor units which are mounted in the front or rear corners of a vehicle or on the left and right sides of a vehicle so that the respective peripheral sectors of the vehicle can be observed.
The units interchange data between each other and the vehicle via the sensor CAN-bus.
All units incorporate an RF part and a microcontroller to perform the radar signal processing.



Block diagram of example system architecture.

Technical Data

Supply voltage	+9 V … +18 V
Power consumption	typ. 3.7 W
Operating frequency range	76000 MHz ... 77000 MHz
Modulation bandwidth	< 1000 MHz
Modulation	FMCW (fast chirps)
Rated Antenna feed power	10 dBm (peak)
Conducted antenna power	6.6 dBm
Rated Maximum Output Power (EIRP average)	25 dBm
Rated Maximum Output Power (EIRP peak)	30 dBm
Antenna type	Microstrip patch array
Transmit antenna gains	Mode a = approx. 15 dBi Mode b = approx. 20 dBi
Operating temperature range	-40°C ... +85°C

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3 Vehicle Integration

Since RADAR waves can penetrate plastics, the sensor integration is possible behind the bumper fascia and thus invisible from the exterior. However, the plastic and other materials which surround the sensor may cause bending, refraction and reflection of the RADAR waves. Distances, clearances, selected radii and other constructive elements in their arrangement can lead to constructive or destructive interference of the RADAR waves. That must be avoided by choosing a suitable integration position.

The sensors should be positioned in the vehicle at a height of 400 to 700 mm above the road surface. If that cannot be fulfilled, then the deviating installation height must be agreed upon with Hella GmbH. & Co. KGaA.

Warning: The radar sensor should be installed and operated with minimum distance of 20 cm between the radiator and the human body.

3.1 Spatial orientation of the sensors

The RS5.5 sensors can be mounted in the front and/or rear area of a vehicle under defined angles:

Rear side integration: approx. 45 deg

Front side integration: approx. 45 deg

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4 Legal text requirements

Note: This User's Guide is not intended for the end user. The RS5.5 Advanced Driver Assistance System is not sold separately from the vehicle. All the full legal texts must be provided by the OEM in the User's Manual of the vehicle.

European Union (required in all the official EU languages depending where the product is marketed):

Hereby, Hella GmbH & Co. declares that the radio equipment type RS5.5 is in compliance with Directive 2014/53/EU.
The full text of the EU declaration of conformity is available at the following internet address:
www.hella.com/OEM

Technical information:
Frequency band: 76 ... 77 GHz
Transmission power: mode a = 20 dBm (average) EIRP, mode b = 25 dBm (average) EIRP

Manufacturer and Address:
Hella GmbH & Co. KGaA
Rixbecker Straße 75, 59552 Lippstadt, Germany

USA:

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

Radio frequency radiation exposure Information: This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Canada (both English and French language required):

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference.
(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.

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps. Ce transmetteur ne doit pas etre place au meme endroit ou utilise simultanement avec un autre transmetteur ou antenne.

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