User Manual for
24 GHz Blind-Spot Radar Sensor
SRR2-A
AUTHORS

<table>
<thead>
<tr>
<th>Name</th>
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<th>Section</th>
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<tbody>
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<td>Frequency Management WW</td>
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<td>2010-12-16</td>
<td>Frank Gruson</td>
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2 Purpose

In this document an operational description of Continental’s 24 GHz blind spot radar sensor SRR2-A is given. Sufficient information is provided to understand the operation principle, the set up and the tuning of the radar sensor.
3 System operational description

The Blind Spot Monitoring (BSM) system is designed to assist the driver by monitoring blind spots on both sides of the vehicle to the rear in certain situations such as when changing lanes on roads and freeways.

The BSM system monitors the detection areas on both sides of the vehicle to the rear when the vehicle speed is about 32 km/h (20 mph) or more, and notifies the driver of vehicles in the detection area by illuminating the BSM warning light. If the turn signal lever is operated in the direction the BSM warning light is illuminated, the system warns the driver of the vehicle in the detection area with a beep sound.

The radar sensors are equipped inside the rear bumper.
▼ BSM Warning Light/Beep

**BSM warning light**

Equipped on the left and right door mirrors.

This warning light illuminates for a few seconds when the ignition is switched ON.
If the BSM system detects a vehicle in the detection area while the vehicle is driven at a speed of about 32 km/h (20 mph) or more, the BSM warning light illuminates on the side of the vehicle where the rear on-coming vehicle is detected.

*(depending on the implementation by the customer)*
4 SRR2-A sensor warning activation zone

**Target Vehicle:**
Vehicle measured by the radar sensor

**Subject Vehicle:**
Vehicle on which radar sensor is installed

**Relative Speed:**
\[ v_{rel} = v_{target} - v_{subject} \]

**Warning Activation Zone:**
Parameterized zone where warning on a relevant object should be enabled

**Warning Status:**
LED icons represent the warning status to the driver:
Grey = OFF, Red = ON

*Note: All warning preconditions in this document are Continental proposals only.*

**Figure 1:** SRR2-A warning activation zone
5 SRR2-A sensor component description

The SRR2-A sensor consists of the following components:

- Plastic housing with sensor CAN connector and sealing
- RF antenna board which is plugged into the housing
- EMC shield to protect the RF board from digital noise of the ECU board
- An aluminum back cover closes the sensor and serves as a mounting area for the sensor to be mounted to the car. Typical mounting angle is 20°C with respect to the driving direction.

![Figure 2: SRR2-A sensor drawing](image-url)
6 SRR2-A sensor software operation

Only one operational mode exists which does radar measurements with FM frequency modulation. The sensor operates in this mode during the complete lifetime in the host car.

The sensor SW of the test sensors for type approval is configured in such a way that the sensor enters its operational mode once a 12 V battery supply is applied to the supply pin and 0V of the battery is applied to the GND pin. No CAN message protocol or diagnostic handshake protocol is necessary in this special mode.
7 SRR2-A radiation hazard

This BSM (blind spot monitoring) device emits intentional electromagnetic radiation in the 24.05 to 24.25 GHz frequency range.

At a distance of 20cm from the sensor, the radiated power is 0.0027mW/cm².

<table>
<thead>
<tr>
<th>Channel</th>
<th>MPE Distance (cm)</th>
<th>DUT Output Power (dBm)</th>
<th>DUT Antenna Gain (dBi)</th>
<th>Power Density (mW/cm²)</th>
<th>Limit (mW/cm²)</th>
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<tr>
<td>N/A</td>
<td>20.0</td>
<td>-1.23</td>
<td>12.5</td>
<td>0.0026659</td>
<td>0.0266595</td>
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Data from “Test report 206-11R1” of COMPLIANCE WORLDWIDE, INC, section 6, page 18

This value is a factor of 370 below the legal human exposure protection limit of 1 mW/cm² (MPE) in Europe and US.
8 SRR2-A equipment authorization

This BSM device complies with part 15 of the FCC rules (15.249), with RSS-310 of Industry Canada, and with EN 302 858 of ETSI/CEPT on a Class 1 basis.

Operation is subject to the following 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.
3. This device may only work when the vehicle is in operation.

In Europe operation is allowed in the R & TTE countries:

<table>
<thead>
<tr>
<th>Country</th>
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In addition, SRR2-A complies with the radio regulations of Japan, China, Korea, Russia, Ukraine, Singapore, Australia, New Zealand, Mexico and many other countries worldwide.

For countries not mentioned in this chapter and not mentioned on the car’s user manual, the SRR2-A radar device has to be deactivated.
9 SRR2-A labeling (on sensor)

USA: FCC-ID: OAYSRR2A
(Warning statement will be written in user manual, as the sensor is smaller as a hand and the label is not visible to the end user)

Canada: Canada 310
(Category 2 equipment)

China: CMIIT ID: 2011DJ2982

Korea: + KCC-CEM-C1A-SRR2A

Japan: 204Y51100100

Russia: AB 28

EU: CE
10 SRR2-A labeling (in users manual)

USA:  
FCC-ID: OAYSRR2A

This device complies with part 15 of the FCC Rules and Industry Canada RSS-310. 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.

Canada:  
Canada 310 (category 2 equipment)

China:  
CMIIT ID: 2011DJ2982

Korea:  
KCC-CEM-C1A-SRR2A

Japan:  
R 204YS1010000

Russia:  
AB 28

Ukraine:  

EU:  
+ Declaration of Conformity to R&TTE directive 1999/05/EC
(CANADA)
IC: 4135A-SRR2A
This vehicle is equipped with a 24 GHz blind spot monitoring (BSM) radar system, which complies with the radio standards specification RSS-310 of Industry Canada. Operation is subject to the following 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.

(MEXICO)

NOTE
During printing time of this user manual the approvals listed below are granted. Further countries may become available or actual certification identifiers may be subject to change or update.

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