Annex acc. to FCC Title 47 CFR Part 15
relating to
s.m.s. smart microwave sensors GmbH
UMRR-0C0103-272301-070704
UMRR-0C0104-272301-070704

Annex no. 5
User Manual
Functional Description

Title 47 - Telecommunication
Part 15 - Radio Frequency Devices
Subpart C – Intentional Radiators
Measurement Procedure: ANSI C63.4-2009

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User Manual / Functional Description of the test equipment (EUT)

Sensor description:

The main task of the UMRR is the detection of any reflectors in the field of view, to measure the distance, the relative speed and the angle to the shortest reflector (and to other reflectors), to detect motion and to track (filter) the results over time.

For this **general purpose measurement application**, range and relative radial speed and the angle value of each reflector inside the antenna beam are measured and the results are reported via the communication links cycle by cycle.

Transmit Signal:

The UMRR transmit frequency is located in the 24 GHz ISM band (24000 MHz to 24250 MHz), the used bandwidth is smaller than 250 MHz. The maximum transmit power is 12.7dBm. Antenna type 39 is used, consisting of one transmit and twelve receive antennas, both linear polarized. The 2 way 3 dB cut-off angle in az. +-28deg. and in el. +-5deg. The antenna has two main lobes. The greater main lobe is at +17°, counting clockwise, the second at -20°.

Designated use:

The device uses different FMCW transmit signal waveforms for distance and speed measurement. The UMRR general purpose medium range radar is suitable for any application where the distance to and relative radial speed of large objects has to be measured.

Typical applications are:

- Automotive: measure shortest distance to obstacle.
- Robotics: measure shortest distance to obstacle.
- Security: detect motions and measure distance to moving object.
- Traffic management: detect moving objects, count those, measure speed and measure distance to moving object.
- Cranes: measure distance to ground.
- Aircraft: measure distance to ground.
- The detection range depends on object size. Very large reflectors can be detected at a range of more than 500 m.

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Declaration of Conformity for USA:

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.

Usually this is followed by the following 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.

Note: 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 case harmful interferences 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 or more 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.

Declaration of Conformity for CANADA:

Declaration of Conformity in English:
This device complies with RSS-310 of Industry Canada. Operation is subject to the condition that this device does not cause harmful interference.

Déclaration de conformité en francais:
Cet appareil est conforme au CNR-310 d'Industrie Canada. Son exploitation est autorisée sous réserve que l'appareil ne cause pas de brouillage préjudiciable.

Declaration of Conformity for EUROPE:

The UMRR-0C0103-272301-070704 has been marked with the CE mark. This mark indicates the compliance with the EC Directive 1999/5/EC. A full copy of the Declaration of Conformity can be obtained from s.m.s, smart microwave sensors GmbH, 38108 Braunschweig, Germany or via E-Mail. Please contact us at info@smartmicro.de.

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