JRC Mobility
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User Manual for RADAR SENSOR

Contents

1. Purpose

This document explains of JRC Mobility's (hereinafter JRC-M's) RADAR SENSOR. Sufficient information is provided to understand the operation principle, the set up and the tuning of the radar sensor.

2. General information

JRC-M's RADAR SENSOR measures the distance, velocity, azimuth and received power corresponding to each target. Such information is to be transformed from the radar, every measuring cycle on the basis of Frequency Modulated Continuous Wave (FMCW).

Figure 1 shows a photograph of JRC-M's RADAR SENSOR with the bracket.

Figure 1: JRC-M's RADAR SENSOR with the bracket

Figure 2 shows a photograph of the main cable (including the power cable and RS-485 communication cable) to be connected to the JRC-M's RADAR SENSOR.

Figure 2: Main Cable (The power supply cable and RS-485 communication cable)

Figure 3 illustrates the connection from the JRC-M's RADAR SENSOR to power supply and communication equipment.

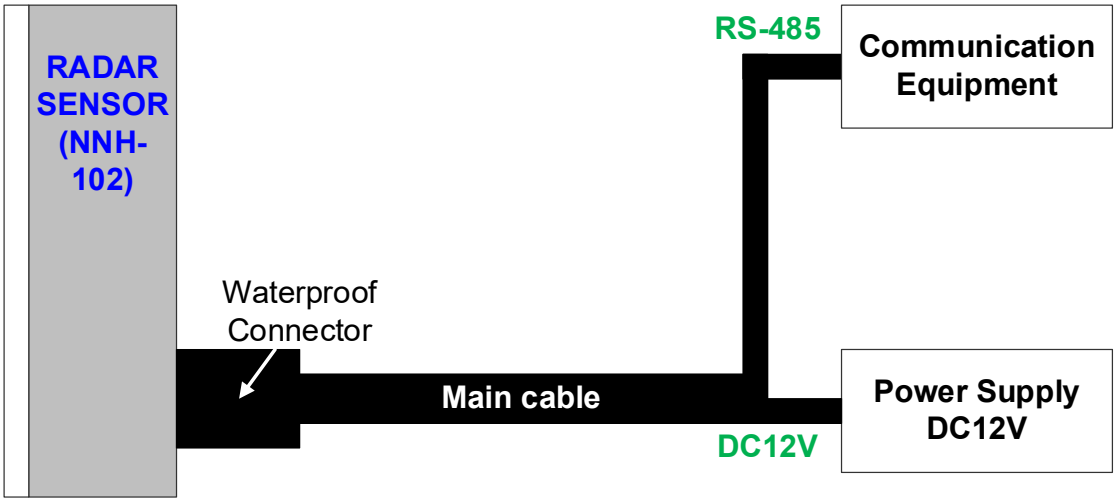

Figure 3: Connection from the JRC-M's RADAR SENSOR to power supply and communication equipment.

JRC-M's RADAR SENSOR is mounted on an Unmanned Ground Vehicle (UGV) with four wheels (tires) for smart agriculture, as illustrated in Figure 4.
JRC-M's RADAR SENSOR is used to prevent the UGV from colliding surrounding obstacles.

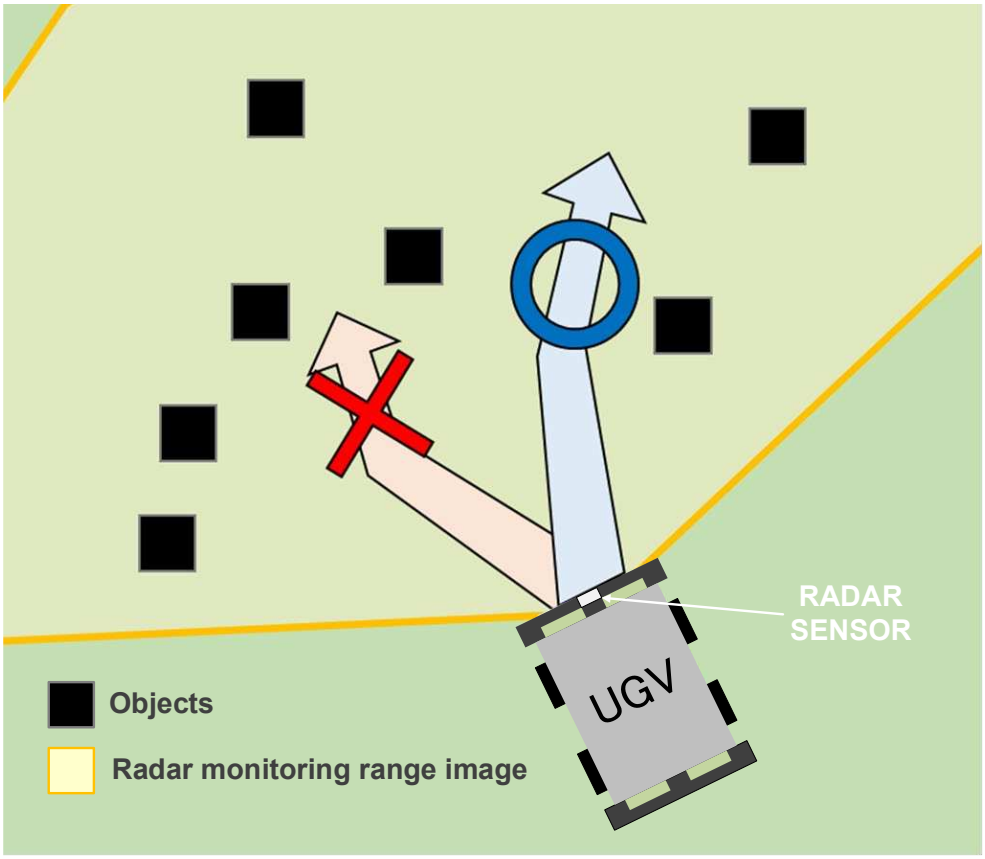

Figure 4: Image of the concept of JRC-M's RADAR SENSOR

3. JRC-M's RADAR Sensor Component Description

JRC-M's RADAR SENSOR consists of the following components:

- Plastic molded radome through which the radar beams are emitted.
- Radio Frequency (RF) Printed Circuit Board (PCB) including the antenna which is placed between the housing and the radome.
- Power supply wirings and communication wirings inside the housing, connecting the PCB and the waterproof connector.
- Aluminum housing with waterproof connector for power supply cable and RS-485 communication cable.

4. JRC-M's RADAR SENSOR Software Operation

Only one operational mode is implemented; JRC-M's RADAR SENSOR measures at the regular intervals of FMCW. JRC-M's RADAR SENSOR operates in this mode, as long as the power is supplied by the UGV.

5. Troubleshooting

Figure 5 shows the JRC-M's RADAR SENSOR with its rubber cap on the back opened. In the normal state of the operation of JRC-M's RADAR SENSOR, the LED is blinking.

Figure 5: JRC-M's RADAR SENSOR with its rubber cap on the back opened

Do not touch the parts on the board. Touching the parts may cause malfunction or failure.

Be sure to close the rubber cap when maintenance operation has been completed. Otherwise, water, mud, etc. may enter the radar housing, causing malfunction or failure.

6. **Information to be included in User Manual**

The following information must be included in the user manual to ensure continued FCC regulatory compliance.

Radiofrequency radiation exposure Information:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC RF Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

End of Documents