The RXS-F-12 radar detects objects in three pre-defined zones. The detected objects are presented as a low voltage on the corresponding three open collector outputs. These outputs can be used to drive an alarm- or monitoring system.

**General description**

The RXS-F-12 is a collision avoidance radar system. The purpose is to detect obstacles beside a truck or forklift and to warn the driver on a monitoring system. The Radar gives information of a target at 3 different distance thresholds which are configured by the manufacturer.

The RXS-F-12 is available in a number of different types defined by the pre-programmed distance thresholds. Installation is quick and easy. The system works in the free 24.125GHz ISM-band.

**Application**

When installed on a vehicle, the RXS-F-12 detects moving or stationary objects. Separation of the targets is based on range; the closest target is always considered for the distance presented. When a target is detected, depending on the range, the corresponding open collector output(s) switches off. With these outputs a warning system could be controlled to inform the driver. The RXS-F-12 works as a stand alone unit. Multiple modules could be installed to cover more areas. The sensitivity is set to detect persons and larger objects. A minimum relative speed of 0.01m/s is required between the sensor and the detected objects.

**General technical data**

- **Supply voltage:** 9 to 30V
- **Supply current:** 130mA (typ.)
- **Open collector:**
  - Switched on: <0.5V difference-voltage from +power supply at 40mA
  - High impedance: <5µA at 0V
- **Output current of open PNP:** 50mA max.
- **Output voltage of open PNP:** supply voltage - 1V
- **Transmit frequency:** 24.000 – 24.250GHz
- **Max. transmit power:** 20dBm (EIRP)
- **ETSI 300 / 440 compliant with 250MHz bandwith**
- **Detection range:** 0.2m...30m (configurable)
- **Truck width:** 2m...4m (configurable)
- **Antenna beam:** 11º x 90º (+/-5.5º x +/-45º)
- **Readout period:** 71ms
- **Sensitivity:** Ability to detect a person of average child size
- **Resolution:** +/- 2cm
- **Dimensions (lxwxh):** 100 x 100 x 42 (mm)
- **Mounting possibility:**
  - 4x M4 holes at the back side
  - 82 x 82 mm in square
- **Housing:** Rated IP67, waterproof and vibration proof

**Absolute maximum values**

- **Supply voltage:** 0...30V
- **Maximum current on open collector:**
  - short circuit proofed up to 5sec;
  - short circuit current: >40mA
- **Operating temperature:** -40° to +60°
- **Storage temperature:** -30°...+100°C
Module Interface

The radar system has the following interface:

- Power supply +9 to 30V (brown wire) and GND (ground, blue wire)
- 3 open collector outputs

The PNP transistors are connected to the positive power supply internally.

- open collector 1: black wire, for the first distance threshold at 2m
- open collector 2: white wire, for the second distance threshold at 4m
- open collector 3: grey wire, for the third distance threshold at 6m

After switching on the power to the radar, an internal periodic readout will start every 71ms. This means that every 71ms, the open PNP outputs may change.

If there is no obstacle, all outputs are switched on, that means they have high level.
If there is an obstacle closer than 6m, the third output becomes low level.
If there is an obstacle closer than 4m, the second output becomes low level. The third output remains on low. If there is an obstacle closer than 2m, the first output becomes low level. All outputs are low now.

There are two types of cables available: a 4 pin cable and a 5 pin cable. When a 4 pin cable is used, the third open collector (grey wire) is not available.

The circular connectors used are industrial standard, rated IP68. The four pin connector type is the GS04M12x1,5VA and the five pin connector type is the GS05M12x1,5VA.

Installation

The installation of the RXS-F-12 is with the connector facing down. For the RXS-radar types with larger threshold distances, the installation height has to be such, that the
radar beam doesn’t touch the ground before the largest threshold.

*It is not necessary for persons to keep a safety distance from the running radar because in any consideration, the limits of electrical fields in the EU recommendation 1999/519/EC are not exceeded.*

**Available type numbers**

The suffix in the part number indicates the antenna opening and the pre-defined thresholds for the three open collectors. To illustrate this: the RXS-F-12 2/4/6 has an antenna 3dB beamwidth of 11° x 90° and the thresholds are set to 2 meters for the first open collector, 4 meters for the second open collector and 6 meters for the third open collector. A beam width of 11° x 11° is also available. Upon request, different distance thresholds for the Open Collector Outputs can be programmed as well.

**Drawing and dimensions of the housing in mm**

*View on the front side of the housing:*
Side view of the housing (with position of the M12 connector and membrane):

View on the backside, the mounting side:

4x M4 tapped holes with a depth of 10 mm