The RXS-F-20HT radar detects relative large, moving and stationary objects and sorts the found distances 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-20HT is a large object detection radar system. It is designed to reliably detect a large object and neglect smaller objects or targets. The radar is equipped with three open PNP-collector outputs. When there is no obstacle in the detection range of the radar, these outputs are normally-switched on. Whenever an obstacle moves to the radar and reaches any of the defined distance thresholds, the corresponding open collector output is switched off. Installation is quick and easy with all settings configured. The system works in the free 24.125GHz ISM-band.

**Application**

The RXS-F-20HT is designed with a relative higher threshold for switching the open collector outputs (in comparison to the RXS-F-10). Only targets which are giving a relative larger reflection are considered. The targets with a relative smaller reflection are ignored. For example, the threshold sensitivity is set to switch the open collector on detecting a metro or train and not to give an alarm on detection of (a) human being(s) or animals. This allows a very easy integration in an elaborate detection and or alarm system. The radar has a built in self-test, when a failure occurs all the collector outputs will be closed.

**General Technical Data**

- **Supply voltage:** 9 to 30V (secured against false polarity)
- **Supply current:** 130mA (typical)

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
- Maximum current on open collector:
  - short circuit proofed up to 5sec;
  - short circuit current: >40mA

- **Transmit frequency:** 24.000 – 24.250GHz
- **Maximum transmit power:** 20dBm (EIRP)
- **FCC and ETSI 300 / 440 compliant with 50MHz bandwith**
- **Detection range:** 0.2m...30m (configurable)
- Antenna beam option 1:
  - horizontal: 90° (+/-45°) (typical)
  - vertical: 11° (+/-5.5°) (typical)
- Antenna beam option 2:
  - horizontal: 11° (+/-5.5°) (typical)
  - vertical: 11° (+/-5.5°) (typical)
- **Readout period:** 71ms
- **Sensitivity:** Ability to detect a person of average child size
- **Resolution:** +/- 2cm

- **Dimensions:** (lxwxh): 100 x 100 x 42 (mm)
- **Mounting:** 4x M4 holes at the back side

- **Environmental:**
  - Housing: Rated IP67, waterproof and vibration proof
  - Operating temperature: -40° to +60°
  - Storage temperature: -30° to +100°C
Module Interface

The circular connectors used are industrial standard, rated IP67. The five pin connector type is the GS05M12x1,5VA.

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

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.
After switching on the radar, an internal periodic readout will start every 71ms. This means that every 71ms, the open collector outputs may change. If there is no large obstacle, all outputs are switched on, that means they have a high level. If there is a relative large obstacle, closer than 6m, the third output becomes a low level. If there is a large obstacle closer than 4m, the second output becomes low level and the third output remains on low. If there is a large obstacle closer than 2m, the first output becomes low level and all outputs are low now.

Installation

The installation of the RXS-F-20HT 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. For $x = 2$ m, $y = 4$ m and $z = 6$ m, the optimum height would be $\pm 0.6$ m ($z = 6 \times \tan 5.5^\circ$)

![Figure 1. Side view on the advised installation](image)

Available type numbers

The suffix in the part number indicates the pre-defined thresholds for the three open collectors. To illustrate this: the RXS-F-20HT 2/4/6 has an antenna 3dB beam width of $90^\circ \times 11^\circ$ (horizontal x vertical) and the thresholds are set to 2 m for the first open collector, 4 m for the second open collector and 6 m for the third open collector. A beam width of $11^\circ \times 11^\circ$ is also available. Upon ordering, different distance thresholds or zones can easily be added to the part number. As an example: RXS-F-20HT X/Y/Z. Where X is the first zone, Y is the second and Z is the third. The minimum configurable value for X is 1.5 m.
Drawing and dimensions of the housing in mm

- 100mm (height)
- 100mm (width)
- 30mm
- 82mm
- 82mm
- M12 connector
- Gorget membrane

4 times M4 tapped holes, depth 10mm