RADARXENSE

RXS-DR-10

Speed & Range Measurement Radar

- Measures speed of approaching and receeding targets
- Range information comes with the measured speed from a target
- Minimum speed is 10 cm per second

The RXS-DR-10 radar measures the velocity of an approaching or receeding target. Range information is also measured for this target. Information on the moving target is presented in a telegram sent over the serial line output.

General description

The RXS-DR-10 radar module measures the velocity of a moving target. The target giving the strongest signal is represented at the RS422 output. The relative speed, the distance to the target and the signal strength value can be found in the readout telegram. Installation is quick and easy. The system works in the free 24 GHz ISM-band.

Application

Every 10ms, a telegram is sent out over the RS422 serial line. In this 10ms timeframe, the target giving the strongest reflection is taken into account in the telegram, even if another target is closer to the radar but giving a smaller reflection.
The measured relative speed, together with the range and the signal strength value, are presented in the telegram.
A relative small Doppler and therefore speed can be measured; the minimum speed is 10 cm per second. Both positive and negative speeds are measured. The radar should be aligned in such a way that the target of interest is positioned well inside the 11 by 11 degree beam.

General technical data

Supply voltage: 9 to 30V, 12V (typ.)
(secured against false polarity)
Supply current: 140mA (typ.)
Transmit frequency: 24.000 – 24.250GHz
Maximum transmit power: 20dBm (EIRP)
ETSI 300 / 440 compliant with 250MHz bandwidth
Antenna beam: 11º x 11º (+/-5,5º x +/-5,5º)
Readout period: 10ms
Sensitive distance range: 0.3...100m
Relative Speed range: -70m/s...+70m/s
Minimum speed: 10cm/s
Accuracy: 0.5%

Output resistance (RS422): 136ohm
Output voltage (RS422): 5V (diff.)

Dimensions (lxwxh): 100 x 100 x 42 (mm)
Mounting possibility:
• 4x M4 holes at the back side
• 82 x 82 mm in square
Housing and connectors: Rated IP67, waterproof and vibration proof
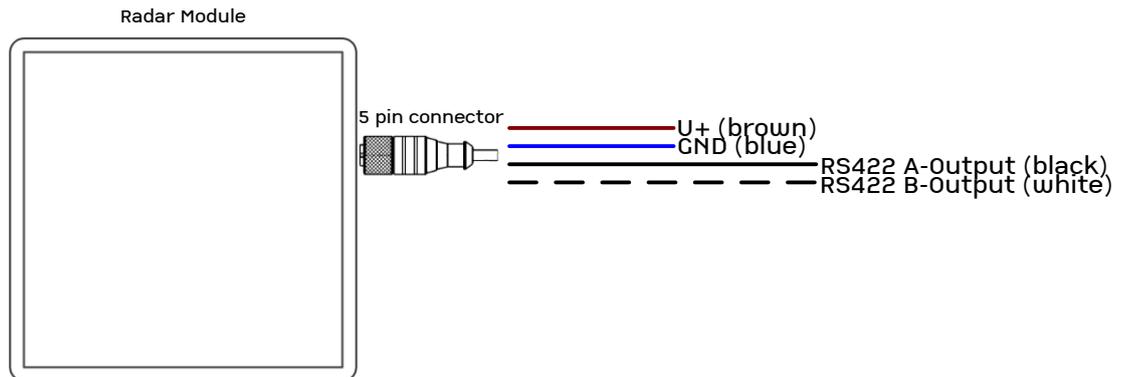
Absolute maximum values

Operating temperature: -20° to +60°
Storage temperature: -30° to +80°C

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Module Interface

The circular connectors used are industrial standard, rated IP67. The four pin connector type is the GS04M12x1,5VA.

Radar Module

5 pin connector
U+ (brown)
GND (blue)
RS422 A-Output (black)
RS422 B-Output (white)

The radar system has the following interfaces:
- Power supply +9 to 30V (brown wire) and GND (ground, blue wire)
- RS422 serial interface; A-output (black wire) and B-output (white wire)

Readout Description

The RS422 communication interface output has the following specification:
- Interface specification: 19200, 8, N, 1

The RXS-DR-10 radar module begins to operate 4 seconds after switching on the system. Every 10ms, a telegram is sent out over the serial line. A readout telegram is also given in case of measuring noise.

The readout telegram consists of:

Byte 1:   0x7e (integer 126) constant
Byte 2:   0x7e (integer 126) constant
Byte 3:   0x7e (integer 126) constant
Byte 4:   distance between Radar and target in cm (lower Byte)
Byte 5:   distance between Radar and target in cm (higher Byte)
Byte 6:   relative speed of the target in cm/s (signed integer; positive = approaching; negative = receeding, lower Byte)
Byte 7:   relative speed of the target in cm/s (signed integer; positive = approaching; negative = receeding, higher Byte)
Byte 8:   signal stength in dB

The influence of the 10 degree cosine factor is considered in the readout, this readout value does not need any further correction.

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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.

Drawing and dimensions of the housing in mm

4mm
38mm
35mm
65mm
100mm
100mm
M12 connetor
Goretex membrane

4 times M4 tapped holes, depth 10mm
9mm
100mm
82mm
9mm
82mm

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