Sensitivity and Maximum Range
Application Note AN-06

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The values indicated here are intended to give you a 'feeling' of the attainable detection range together with the overall sensitivity defined in the datasheet of an Rfbeam module. It is not possible to define an exact RCS (radar cross section) value of real objects because reflectivity depends on many parameters.

The RCS variations however influence the maximum range only by $\sqrt[4]{\sigma}$.

Maximum range for Doppler movement depends mainly on:
- Module overallsensitivity D_{system}:   can be found in the datasheet
- Carrier frequency f_0:   24.125GHz
- Radar cross section RCS ("reflectivity") of the object $\sigma^{1)}$: $1m^2$ approx. for a moving person
                                                                           $>50m^2$ for a moving car

Note [1] RCS indications are very inaccurate and may vary by factors of 10 and more.

The famous "Radar Equation" may be reduced for our K-band module to the following relation:

$$r = 0.0167 \cdot 10^{\frac{-s}{40}} \cdot \sqrt[4]{\sigma}$$

Please note, that range values also highly depend on the performance of signal processing, environment conditions (i.e. rain, fog), housing of the module and other factors.