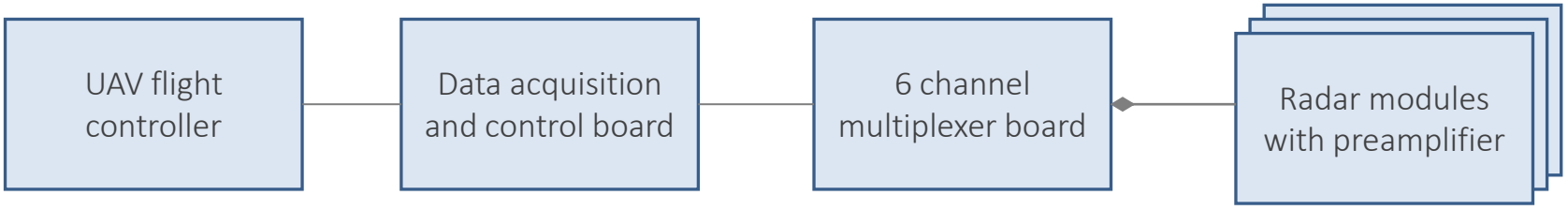
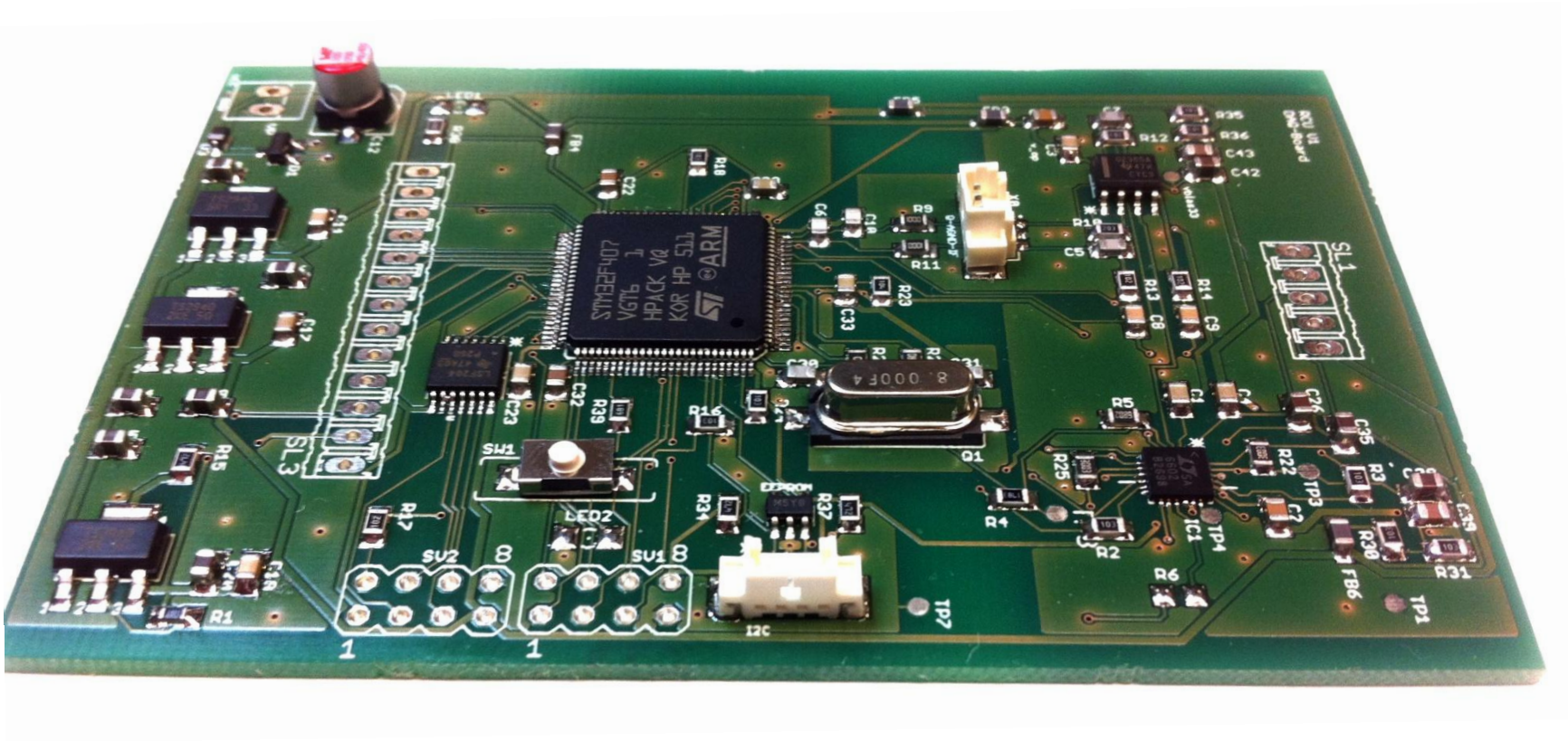
General project description – Radar ranging project

The aim of this Project is an embedded system capable of detecting nearby obstacles. Determining distance is realized by using the FMCW (frequency modulated continuous wave) method in combination with common 24 GHz short range radar modules featuring a VCO (voltage controlled oscillator).
Autopilot systems for small UAVs (unmanned aerial vehicle) like the Ardupilot project can profit from this system in order to obtain sense and avoid capabilities.

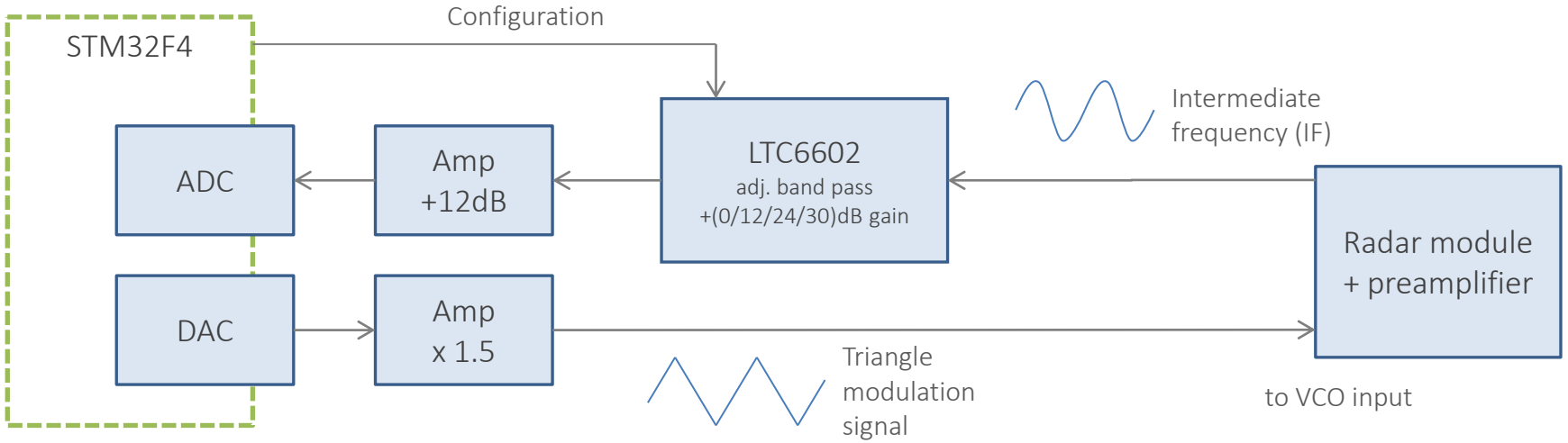


Sense and avoid setup

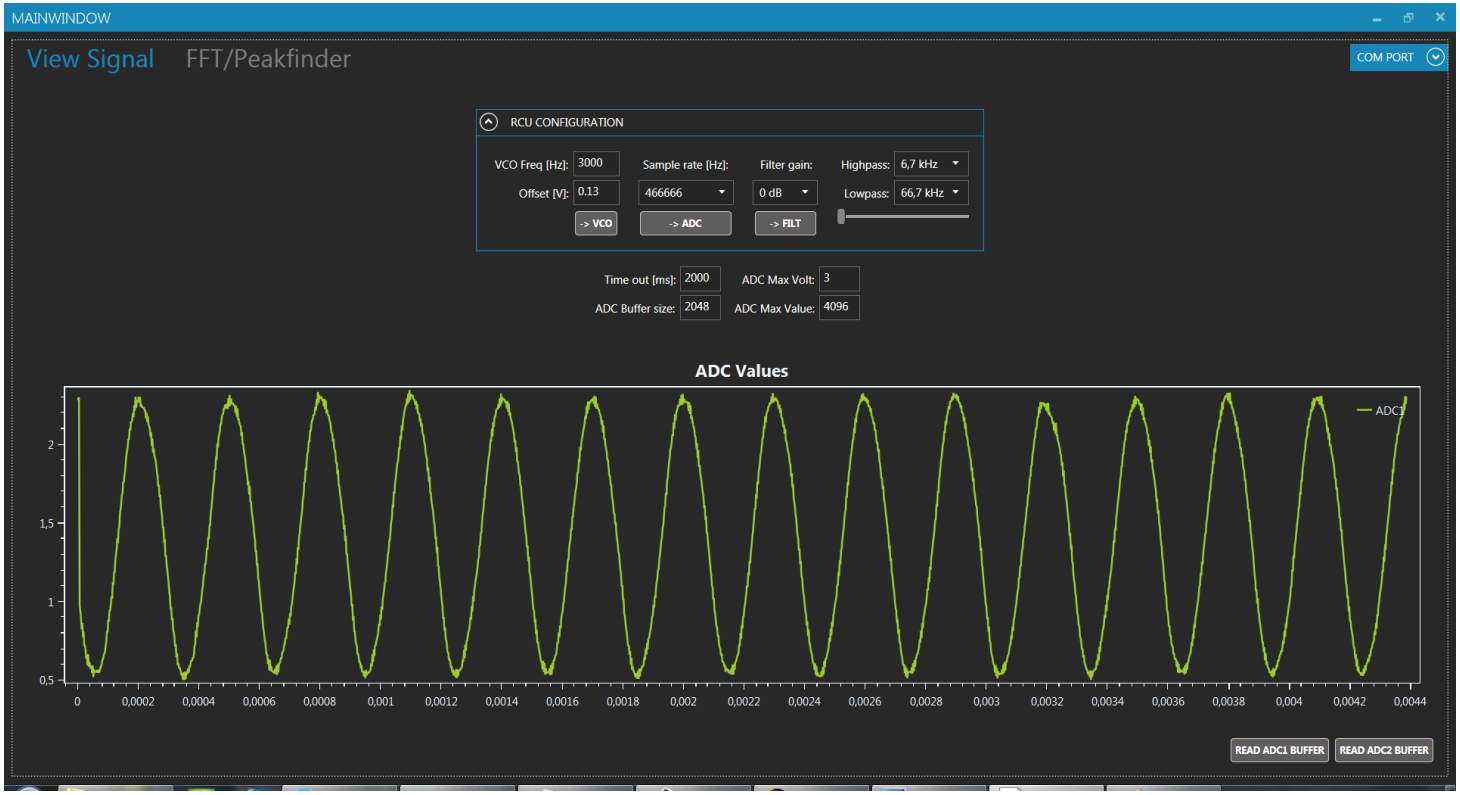
RCUv1: Radar control unit - data acquisition board



RCUv1: Data acquisition board – Basic hardware layout



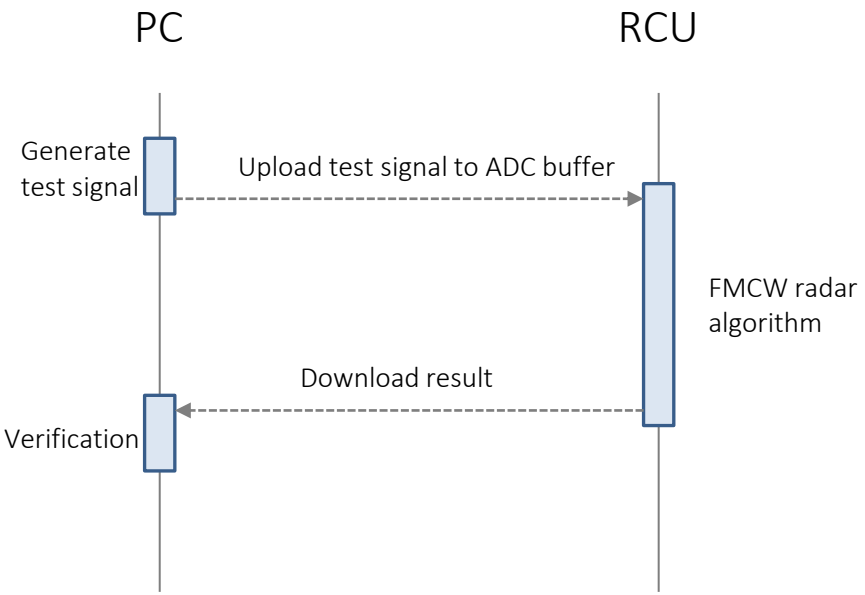
Component test program (alpha version)



A strongly damped 10kHz sine test signal captured by the RCU board.

Algorithm development

The radar analysis algorithm will be designed tested in a hardware-in-the-loop setup.



A simulated reflected radar signal will be uploaded to the RCU-module and processed by the implemented algorithm. The result of the algorithm is downloaded, and further, be analyzed.