# Customer Needs

Since this is an ongoing project, the basic hardware functionality and the interprocessor communication was implemented by the previous Team (Team Bumblebee). The customer needs of Team Bumblebee are documented in their Final Report [VERWEIS AUF TEAM BUMBLEBEE FINAL REPORT SEITE 5, 3.1 Analysis of Customers Needs]. The current remaining customer needs are as follows:

**Basic Needs:**

* X-Copter shall be a universal platform able to be fitted with a variety of sensors
* Stable power supply
  + Measuring the required power and guarantee a stable power supply that is sufficient to meet the needs of the system.
* Verification of Construction Stability
  + Ensure that the basic construction of the multi copter is working properly. In order to receive fast test results, a commercial flight controller has to be integrated
* Choosing and commissioning remote control
* Remote controlled test flight with commercial flight controller

**Logging and Sensors:**

* Evaluating sensor data
* Positional Tracking
* Automatic Compensation of Position in Space
* Logging of all sensor data (raw, filtered and PID-output)
* Choosing a fitting software solution for ground station
* Communication with ground station over the air
* Visualisation of sensor data on ground station

**Own flight controller software**

* Implementation of own flight controller
  + The first version of the flight controller should offer the bare minimum functions to fly the X-Copter model, however it has to be designed in a way that it can be given added functionality in the future. An example is would be to offer improvements to its stabilization capability by adding more sensors and data (e.g. magnetometer, barometer). Furthermore, it should provide a connection to a ground monitoring station, using a communication protocol which was originally developed for a commercial Flight controller called "Pixhawk".
* µCOSII as real time operating system for NIOSII-CPUs (OS needed for MCAPI)

**Future development**

* 3D Environment Mapping with two 3D Cameras
  + A powerful external system for calculating 3D-data might be needed (mobile i7?)
* Autonomous Flight
* Collision control for the upper hemisphere (upper half of the X-Copter)