

Project manual
Masterquad 2015

in the degree course ASM-SB
of the Faculty Graduate School
ASM2

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Professor: Prof. Dr. Jörg Friedrich

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1 Project goals

1.1 Temporal scope and milestones

Start of project: March 23, 2015

End of project: June 19, 2015

1. Milestone: April 1, 2015
 - Hardware selected
2. Milestone: May 11, 2015
 - HAL drivers finalized
3. Milestone: May 25, 2015
 - First prototyp with flying capabilities
 - First simulation prototype for autonomous landing
4. Milestone: June 15, 2015
 - First prototyp with position hold and autonomous landing capabilities

1.2 Intended contentual goals

- Selecting new hardware for an exisiting quadrocopter system
- Setting up a Real-Time Operating System (linux-based) for new hardware
- Do extensive testing on new sensors (behaviour, sensor models, etc.)
- Develop an autonomous landing functionality for the new Quadrocopter platform
- Develop a position hold functionality (GPS-hold) for new Quadrocopter platform

1.3 Contentual framework

- Select new hardware (Raspberry-based with Linux capability)
- Setting up RTOS (Preempt RT Kernel)
- Writing HAL drivers for new Hardware
- Writing a sensor fusion for orientation filtering and signal enhancement
- Integrate existing control software (if possible)
- Setup of sensor models to simulate landing control
- Setup of flight model to simulate position hold

2 Personnel

2.1 Contact information

- **Oliver Breuning**
Email: olbrgs00@hs-esslingen.de
- **Martin Brodbeck**
Email: mabrgs00@hs-esslingen.de
- **Jürgen Schmidt**
Email: juscgs00@hs-esslingen.de
- **Philipp Woditsch**
Email: phwogs00@hs-esslingen.de

2.2 Roles and Responsibilities

Oliver Breuning

- Documentation Quality Manager
- Software Developer

Martin Brodbeck

- Product Quality Manager
- Software Developer

Jürgen Schmidt

- Project Manager
- Software Developer

Philipp Woditsch

- Software Developer
- Testing Quality Manager

3 Workings

3.1 Reporting and meetings

There will be a weekly meeting with Prof. Dr. Friedrich to discuss the progress of the project. Progress will be shown by reports (documentation files, stored doc* in SVN), project plan status (data in track+) and files in the subversion system. Furthermore, whenever the project team will have a internal meeting, a meeting report will be created. This meeting report can be additionally used for status reporting.

A template of a meeting report can be found in the subversion system at

`/doc/pm/meetings/meetingReport_template.docx` .

A finalized meeting report shall be stored in `/doc/pm/meetings` in SVN, following the naming convention **meetingReport_YYYYMMDD.docx**. If there will be more than one meeting per day, the report file shall be extended. Each report shall be stored as a **docx-file** and a **PDF**.

Important remark:

The author of the report and all participated team members have to be named!

3.2 Documentation

The project team will deliver the following documents:

- Project manual (`/doc/pm`)
- Technical drawing of hardware (`/doc/se`)
- Bill of materials (`/doc/se`)
- Software structure & concept (`/doc/se`)
- Testing concept for sensors (`/doc/se`)
- User manual of project (`/doc/se`)

All documents will be created during the development. The project team will keep the content of the documentation as close as possible to the actual progress of development.

3.3 Team communication

3.3.1 Meetings

The project team will have **meeting on a weekly basis**, on fridays. The progress of the current week will be discussed. Problems will be clarified and - if needed - the project plan will be adapted to the latest occurrences.

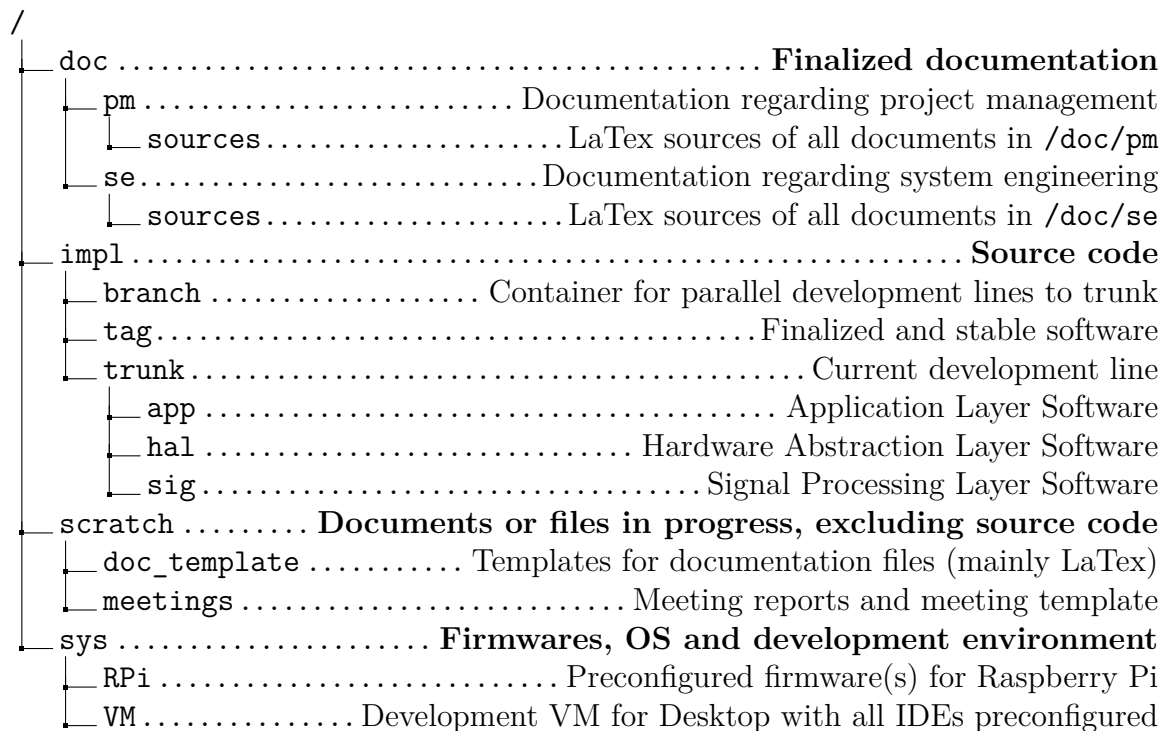
3.3.2 Code reviewing

Additionally, whenever a task for software implementation will be near to 'completed' the **source code** will be **reviewed** by another team member to ensure the software quality and style guide conformity.

3.4 Groupware conventions

3.4.1 Folder structure in SVN

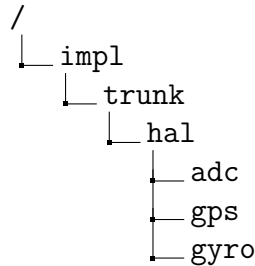
For version controlling, the subversion system shall be used. Every team member will regard the following given folder structure in order to keep a structured and organized working flow.



Within the folders

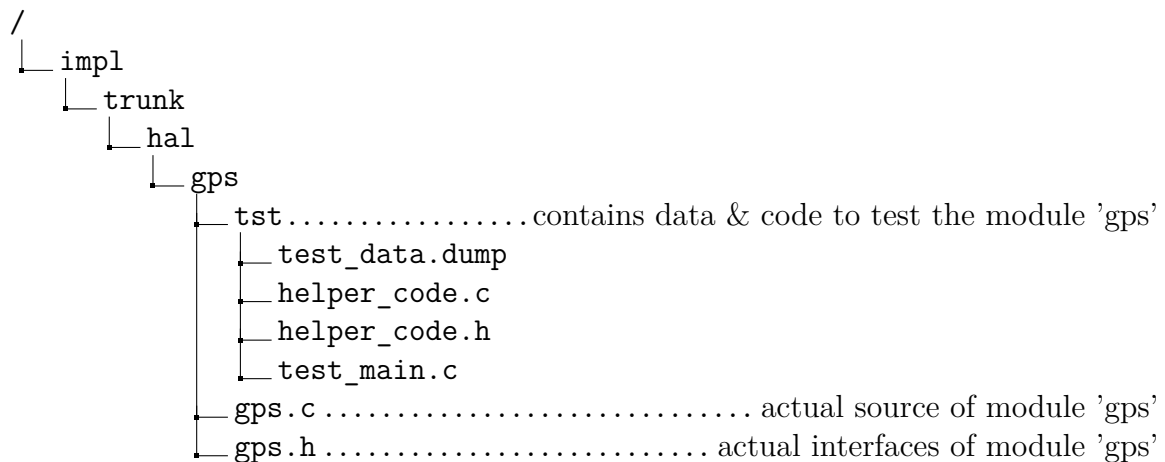
- /impl/trunk/app
- /impl/trunk/hal
- /impl/trunk/sig

a subfolder for each functional unit shall be created. The functional units shall be considered as depicted in /doc/se/software_concept.pdf. Example:



3.4.2 Storing test files

For each software component, a separate test should be written to ensure the software quality. All source code files and test data files to run a test shall be saved in a separate subfolder named `tst`. Example:



Important note:

The `tst`-folder will **not** be moved to the tags folders! All data in /imp/tags is considered to be well tested and stable. Therefore, the test data is not required to move.