Open Thesis / Project:

Firmware Development for Particle Sensor Systems

Motivation & Summary

Particle sensors play a critical role in environmental monitoring and industrial applications, and their research requires self-made instruments. This project focuses on developing firmware for an STM32 microcontroller to control HV modules and allow precise data acquisition, real-time processing, and communication with a Raspberry Pi as a user interface. The firmware shall ensure robust set voltages up to 5 V, accurate logging of implemented T, RH%, and p sensors, and integration of safety measures. Additionally, a user interface can be realized using the Raspberry Pi.

Recommended Prior Knowledge

- Embedded programming in C
- Communication protocols (e.g., UART, SPI)
- Familiarity with STM32 microcontrollers
- Understanding of sensor calibration and data processing

Thesis Type

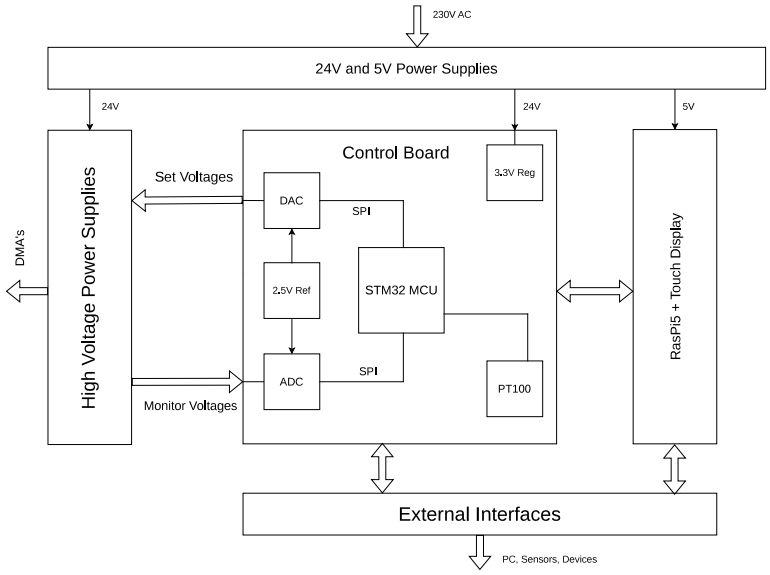
- Bachelor's Thesis

Student Target Groups

- Computer Science (CS)
- Information and Computer Engineering (ICE)
- Electrical Engineering (EE)

Goals & Tasks

- Develop firmware for interfacing with particle sensors and ensuring accurate data capture
- Implement data logging with timestamps for environmental analysis
- Document the firmware thoroughly
- Enable communication with external systems (e.g., Raspberry Pi or PC) for advanced data processing



Contact & Information

EMS: Dr. Martin Kupper (martin.kupper@tugraz.at)
ITI: Dr. Tobias Scheipel (tobias.scheipel@tugraz.at)