

Engineering research traineeship at the National Institute for Mechanics and Microtechnologies (ENSMM) in Besançon, France

As part of its internationalization strategy, ENSMM is offering a paid 5-month internship opportunity to students from partner universities.

We are looking for a highly motivated intern for the Time & Frequency Department of the FEMTO-ST laboratory

Website: <http://www.femto-st.fr/fr/Departements-de-recherche/TEMPS-FREQUENCE/Presentation/>

Keywords: electronics – mechatronics – programming in C langage – linux - instrumentation

Subject :

You can choose one of the two subjects proposed in appendices.

Contact : joel.imbaud@ens2m.fr

Expected starting date : 01/09/2018

Expected duration : 5 months (no more than 31/12/2018)

Conditions for application:

- Currently registered as an undergraduate or graduate student at an ENSMM partner institution. Please note that doctoral students are not eligible.
- Final year of Bachelor degree or currently studying for a Master's degree
- English language requirement: B1 CECR minimum
- Completed application form (attached) together with supporting documents
- Visa formalities, visa and travel costs are the applicant's responsibility.

Please send the completed application form and requested documents with the object line 'ENSMM SRI Intern' to: joel.imbaud@ens2m.fr AND relations.internationales@ens2m.fr

DEADLINE FOR APPLICATIONS: 31 MAY 2018

Benefits:

- The successful applicant will receive a financial support of 3.70€ per hour, and will be expected to work a 7-hour day, 5 days a week. The monthly financial support will roughly amount to 550 € .
- The internship is eligible to an Erasmus+ Traineeship mobility grant from a sending institution situated in an E+ member or partner country.

- Credits: 30 ECTS upon successful completion of the internship
- Private en suite accommodation in a nearby hall of residence can be provided. The monthly rent is around 250 € and includes WI-FI and a fridge in the room.

More Information:

- About ENSMM: www.ens2m.fr
- About FEMTO-ST: www.femto-st.fr
- About Besançon: www.besancon.fr/
- About the Hall of Residence: www.crous-besancon.fr/

Appendix 1

Title:

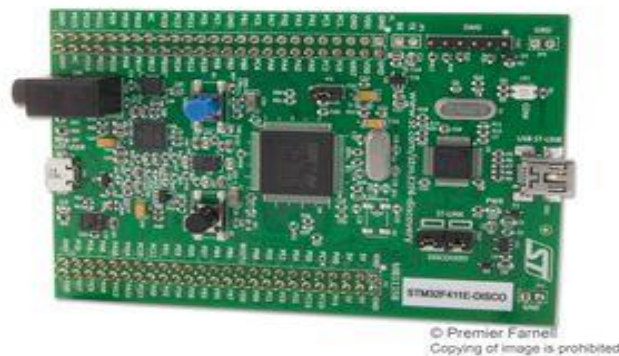
Development of PID thermal controller with STM32F4 Discovery microcontroller demo board

Keywords: Electronics, programming in C language, mechatronic

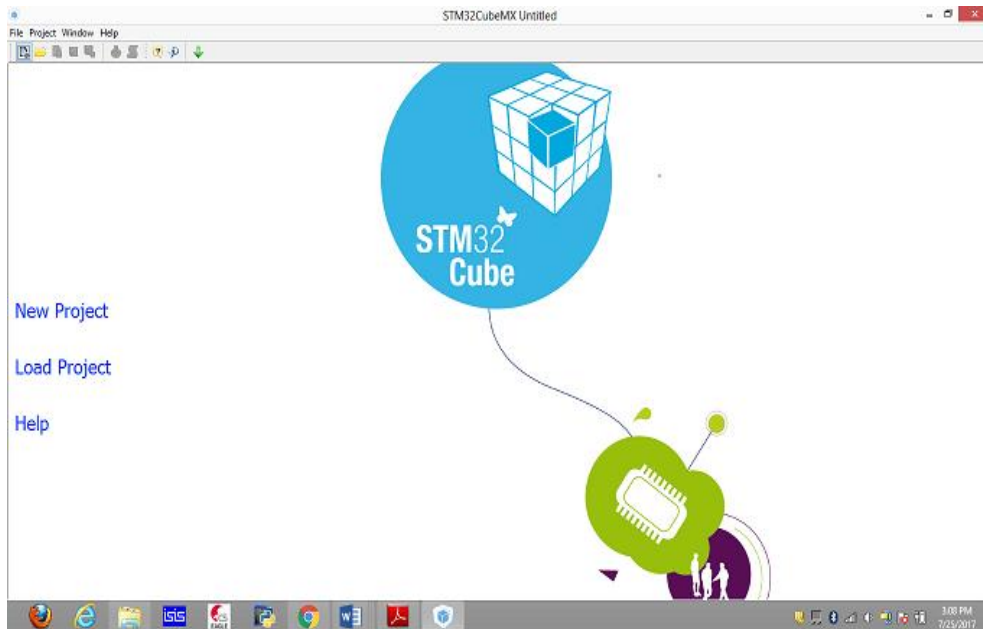
Description:

The aim of the internship is to develop a PID controller with STM microcontroller family. The first step will be done on the demo board discovery STM32F411 with the shield board including the heating elements. The first step which includes understanding the working environment of STM32 CubeMx and Keil compilers for STM32 F0 and F4 series. A first PID controller developed in a previous internship will be used as starting points. You will have to understand the working of I2C and SPI bus communication to interfacing ADC converter (MCP3550) and DAC (AD5541) to realize the control of the temperature of a copper oven.

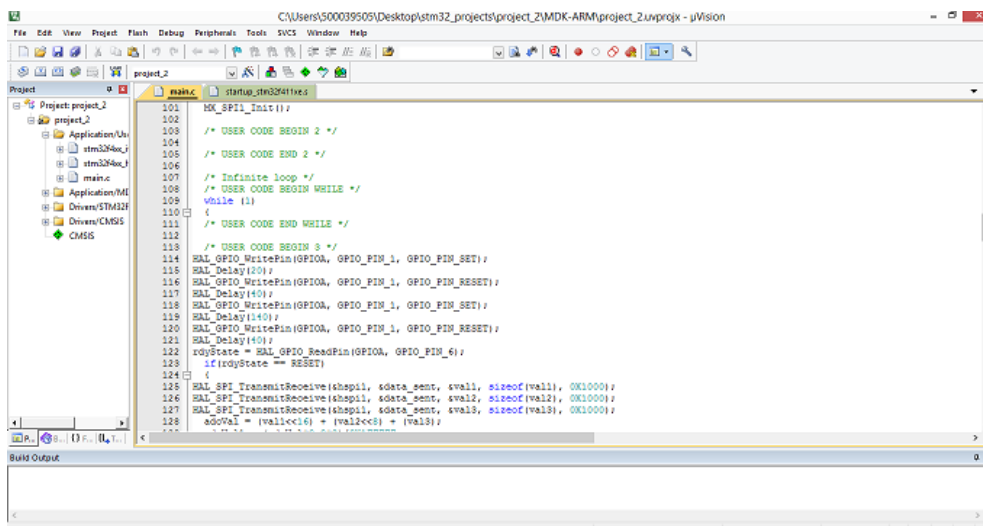
According to your progress, the second step will be to realize an USB communication with the discovery board (STM32F411E-Disco) using RS232 communication standard with an HyperTerminal and same kind of communication wireless with a Bluetooth interface. Then, when communication will be done, the last step will be the programming of the PID controller on a prototype PCB including the heating element, thermal sensor and DAC/ADC. If the candidate is efficient, we can imagine going further with a control under Labview ...



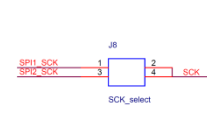
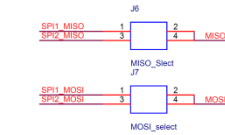
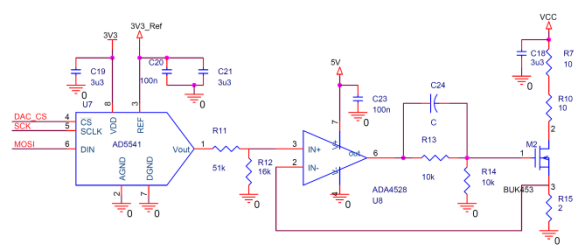
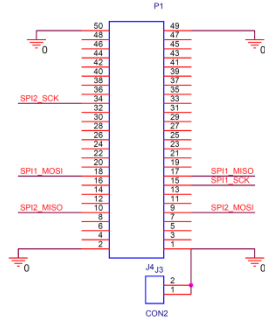
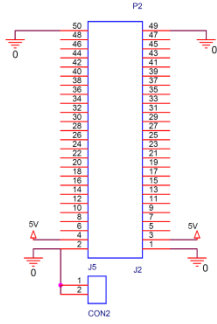
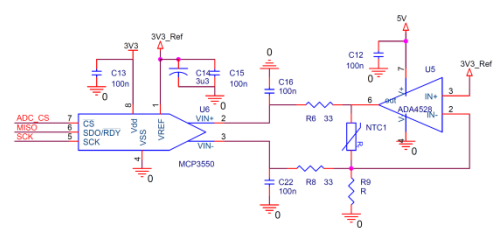
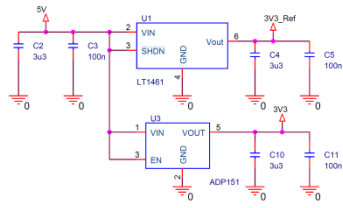
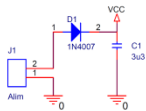
STM32F411 discovery board



STM32 Cube software



Keil programming environment



Oven shield board circuit diagrams

Appendix 2

Title:

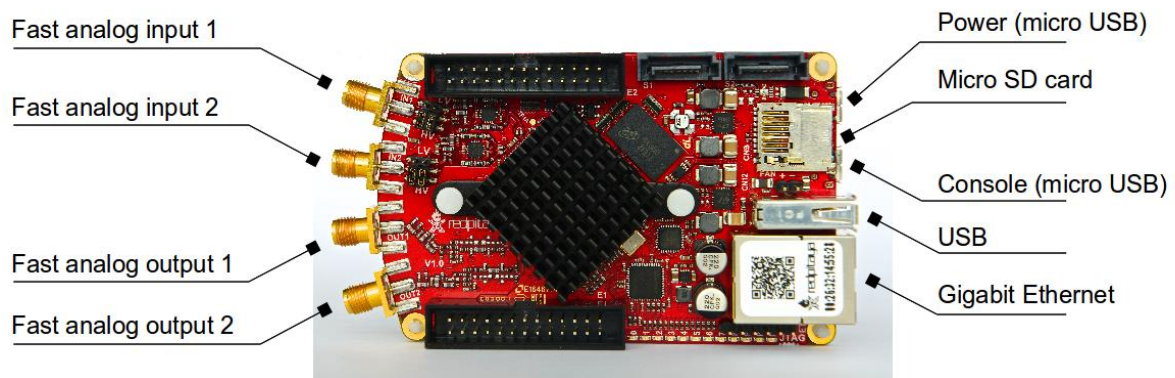
Discovering of an open instrumentation tool: Red Pitaya

Keywords: Electronics, linux, instrumentation

Description:

The purpose of the internship is the discovery of the RedPitaya instrumentation tool. The trainee will have to list the working environments to exploit the RedPitaya board. The operating system will be Linux, the control tools available under Labview could be tested. The basic metrological measurements will be implemented as oscilloscope, frequency generator, FFT ...

The main goal of this measurement platform discovery is its integration into existing measurement benches. For this, it will be necessary to be able to loop the RedPitaya development board with programming tools, either free or under Labview depending of the using possibilities.



REdPitaya board