Final Project

The final project is composed by two different tasks:

- Task 1 – Control remotely a ChipKIT Uno32 board just using its MCU JTAG port
- Task 2 – Develop a system that uses an SPI or I2C device

Task 1

The ChipKIT Uno32 board has a PIC32 microcontroller with JTAG capabilities. Each group must develop a program to an Arduino board that receives UART (9600,8,N,1) commands from a PC and controls the PIC32 through its JTAG port using the corresponding IEEE 1149.1 TAP controller. The commands (composed by a single character) are the following:

- d – Gets the ID CODE of the PIC32 and prints it in hexadecimal
- 1 – Turn on the LED LD5 of the ChipKIT board
- 0 – Turn off the LED LD5 of the ChipKIT board
- b – Print the state of the button connected to pin 29 of the ChipKIT

Task 2

Each group must choose an SPI or I2C device and develop a small system around it. One possible idea is to create a “shield” for an Arduino board where that device is present.

This task not only includes the development of the “shield” PCB (using EasyEDA) but also the firmware (using PlatformIO + VSCode) for the ATMega328p that use the device. Students should avoid using Arduino libraries and instead use directly the registers present in the ATMega328p for these synchronous serial communications.

This final project must be completed until 20th December* when each group will send an email to hsm@fe.up.pt with the GitLab repository links of both tasks and a pdf report that describes all this final project.

* Can be extended until 10th January if necessary!