U.PORTO
FEUP FACULDADE DE ENGENHARIA UNIVERSIDADE DO PORTO

Mestrado Integrado em Engenharia Electrotécnica e de Computadores

Sistemas Eletrónicos 2019/20

Asynchronous Communication System

Objective – Development of an asynchronous communication system composed by several nodes (at least 1 master and 2 slaves). Those nodes have the same hardware and should be based in the ATmega328P MCU and MAX485 transceivers.

Students must develop the schematic and the corresponding PCB for the nodes that have in fact the same hardware and only differ in the firmware.

Students must also develop both versions of the firmware (master and slave) in C language using the approach described in the slides, i.e. using a 9th bit for differentiating the address and data frames (check chapter 19 - USART0, of the MCU datasheet).

Each node must have a LED connected to the MCU that will be used in the final demonstration where the Master will switch each LED of the connected Slaves in a sequential order. For that each node is addressed with a set of 4 DIP switches.

The solution can be tested using Arduino boards instead of the proposed nodes.

Each group must send until end of November 25th by email (hsm@fe.up.pt) the link of a GitHub repository where all the files (schematic, pcb layout, source code) will be stored with a proper Readme file or Wiki page. That email should have the subject SELE_A2_Bxx or SELE_T4_Bxx (where xx is the workbench's number).

Recommended tools:

Schematic and PCB design: EasyEDA - https://easyeda.com/

IDE: PlatformIO + VSCode - https://platformio.org/install/ide?install=vscode

Git + GitHub: https://code.visualstudio.com/docs/editor/versioncontrol#_git-support