# **Annex 1**

This laboratory assignment aims at studying Discrete Event Systems (DESs) in the aspects of modeling, analysis of properties and synthesis. Synthesis will be based on a recent methodology in the framework of supervised control. This assignment further develops the previous assignment in the keyboard reading component by introducing fault handling mechanisms.

The tools to be used in this work are MATLAB and a Petri Net editor. In the last part of the work the Schneider PLCs will be used once more to validate the proposed methodologies.

The main purpose of the second laboratory assignment is the modeling and analysis of a discrete event system, based on a Petri net. That is in close relation with the first laboratory assignment.

The main objective of this last phase, part C, is the application of the *Supervisory Control* theory to diagnose and isolate a failure on the system. The failure to detect occurs when the user presses two keys simultaneously. In other words, the main objective of part C consists in designing and implementing a supervisor that detects the *multiple keys pressed error* and resumes the normal operation of the system.

Note: see in the course SVN tools helping this part of the assignment, namely the Matlab toolbox "spnbox" which allows, for example, showing invariant places of a Petri net. The toolbox is distributed as a ZIP file named "spnbox.zip" and is already uncompressed in the course SVN.