Student project proposal
Experimental Validation of a Real-time Control Software for Battery Energy Storage Systems (BESSs)

Project title

Project type  □ MSc thesis  ☑ BA semester project  □ MSc semester project

Project responsible and e-mail
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Project description
The project titled “Experimental Validation of a Real-time Control Software for Battery Energy Storage Systems (BESSs)” is composed of two parts concerning the software development and testing respectively.

In particular, the first part consists of finalizing the real-time control software for a Battery Energy Storage System (BESS). In this part the student will acquire the required LabVIEW coding skills while using source-code control tools to manage a shared software repository. The main task of this phase is to develop a Graphical User Interface (GUI) in LabVIEW to be integrated into the already existing real-time control software. The GUI will be responsible of displaying to the user all the information required to operate the BESS, such as BMS and converter real-time measurements, errors and warnings.

The second part of the project focuses on the experimental testing of the real-time control software. This latter is based on a state-machine approach, currently under development. For this reason, the student will be asked to define appropriate tests to assess the robustness of the control and the different state transitions. Moreover, once the testing procedure is defined in agreement with the supervisor, the testing will be performed on the 720 kW DESL BESS.

Tasks of the student

- Study of the existing LabView interface for the real-time control of the 720 kW BESS of DESL
- Development of a Graphical User Interface (GUI) for the software
- Development of different procedures to test the robustness of the state machine implemented in the control
- Validation of the control via experimental campaign with the defined procedure

Requirements

- Basic knowledge of power electronics and power systems.
- Basic knowledge of communication protocols
- Familiarity with LabView