

Master thesis : Electrical Ground Support Equipment (EGSE) of OUFTI2

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Electrical Ground Support Equipment (EGSE) of OUTFI2

Graduation work carried out in view of obtaining the
master's degree in "Electrical Engineering" by
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Supervisor: Jean-Michel Redouté
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Abstract

The main objective is to develop and test an Electrical Ground Support Equipment (EGSE). The EGSE is the device that ensures the proper operation of OUTFI-2. Of course, it is essential to fully test any satellite before sending it into space. The choice of only 27 pins or signals was decided in advance for their importance. Their importance comes from the fact that they are essential for the proper operation of OUTFI-2.

The first step was to build the actual device that will perform data acquisition. This will consist of a hardware device that can be interfaced to a PC. Because of their different natures, signals were divided into two categories : the SPI signal and the non-SPI signal. The SPI signals consist of communication signal that allow the On-Board Computer to communicate with some subsystems. For SPI signals, a logic analyzer has been used to acquire them. The logic analyzer had the advantage to be compatible with a software suite that allows easy interface with the PC. For non-SPI signals, the acquisition was done by using a Arduino Uno. To interface the non-SPI signal to the PC, the logic analyser was reused since channels remain available. However, the strategy used for data acquisition turned out to be not possible. Indeed, thanks to numerous tests, and despite concessions, it turned out that the solution found to acquire the data could not work. These early tests avoided implementing a hardware solution that was doomed to fail.

However, another component of the work was to work on data processing. Despite the failure in data acquisition, it was possible to progress in the software part of the EGSE. The EGSE software must allow data processing and display in a graphical interface. To move forward in this part, it was necessary to define the structure of the data acquired by the data acquisition part of the EGSE. Many tests have been done to validate the code as much as possible. Most of the validation was done on real data exchanged by using logic analyser. For the sotware part, the EGSE is up to date with the modules implemented for the moment.

In the end, ideas and observations that I was able to collect to find an alternative for data acquisition as well as an EGSE status report has been provided in order to have another student taking the lead in this project.