

# Digital Control Project



## Component

École Nationale  
Supérieure  
d'Électrotechnique  
d'Électronique  
d'Informatique  
d'Hydraulique  
et des  
Télécommunications

## In brief

- > **Amety's Code:** N8EE14B
- > **Open to exchange students:** Yes

## Presentation

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### Objectives

Develop digital speed control for a mechatronic system consisting of a power converter and a brushless DC motor. The system is controlled by a digital system comprising an FPGA and an SOPC processor.

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### Description

The aim is to encourage students to develop all the functionalities required for speed control of a brushless DC machine. The work is carried out in pairs, each pair having a model for experimental purposes.

Autopilot control is achieved using digital control logic implementing pulse width modulation developed in VHDL language and position sensors.

A speed sensor is then designed, again in VHDL, to enable the measurements required for speed control.

The students then design the entire speed control algorithm, from simulation to implementation on a processor using the C language.

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## Pre-requisites

- Concept of autopilot control of electrical machines
- Control of a pulse width modulation energy converter
- Sizing of a continuous regulator and its digital equivalent