

[🏠 \(/xwiki/bin/view/Main/\)](#) ▾ / [MASTERS \(/xwiki/wiki/masters/view/Main/\)](#) ▾  
/ [MASTERS 2025 Lab Manual Developement \(/xwiki/wiki/masters/view/masters-2025-lab-manuals/\)](#) ▾  
/ [25085 MTR4 - Developing Motor Control Applications using Model Based Design \(/xwiki/wiki/masters/view/masters-2025-lab-manuals/25085/\)](#) ▾  
/ [Lab 3 - Speed Control Mode \(/xwiki/wiki/masters/view/masters-2025-lab-manuals/25085/lab3/\)](#) ▾

## Lab 3 - Speed Control Mode

Last modified by [Mark Reynolds \(/xwiki/bin/view/XWiki/MarkReynolds\)](#) on 2025/07/22 11:50

### Purpose

In the previous Lab 2 session, we discovered that the life of a speed controller is not easy. So, let's give our brains a break and let the dsPIC33C family flex its computational muscles to handle the speed control task.

The Lab 3 demonstration features a sensorless Field Oriented Control (FOC) algorithm driving a Permanent Magnet Synchronous Motor (PMSM) (ACT) motor, now with both torque and speed control loops. You might notice that the speed controller is a bit slow—indicating room for improvement in its performance. In this lab, we'll focus on the tuning process to perk up our speed controller and get it running smoothly and effectively.

### Procedure

#### 1 Program Hardware (HW) and Connect With the Communicator

The first part of the lab is the same as Lab 1. Please refer to Lab 1 if you require further guidance or clarification during the process.

- 1.1 Clear Lab 2: Close **X2C®**. Close **Scilab®**. Close the **project** within **MPLAB® X IDE**.
- 1.2 Open **mc\_foc\_ssl\_fip\_dspic33a\_mclv48v300w.X** in MPLAB X IDE.
- 1.3 Open **Scilab**.
- 1.4 Navigate to the model directory **C:\...\mc\_foc\_sl\_fip\_float\_dsPIC33A\_mclv48v300w\project\x2cmodel** and execute the **initProject.sce**
- 1.5 From the model, start the Communicator.
- 1.6 Transform the model.
- 1.7 Generate the code and verify that the code generated successfully (X2C.c).
- 1.8 Compile and program from MPLAB X IDE.

- 1.9 From X2C Communicator, connect to the HW.
- 1.10 Open the **Scope** window.
- 1.11 Press **SW1** on the board to start the motor spin.
- 1.12 Use POT to change the speed. Apply some load. Note the behavior of the speed controller.

Visit the troubleshooting section if the motor does not spin.



Tags:

Created by [Richard Scherlitz \(/xwiki/bin/view/XWiki/RichardScherlitz\)](#) on 2025/01/09 12:17

Information contained on this site regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION, INCLUDING BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights.

No comments for this page

Comment