In the dSPACE interface, how to look for the signals you assigned in the Simulink model
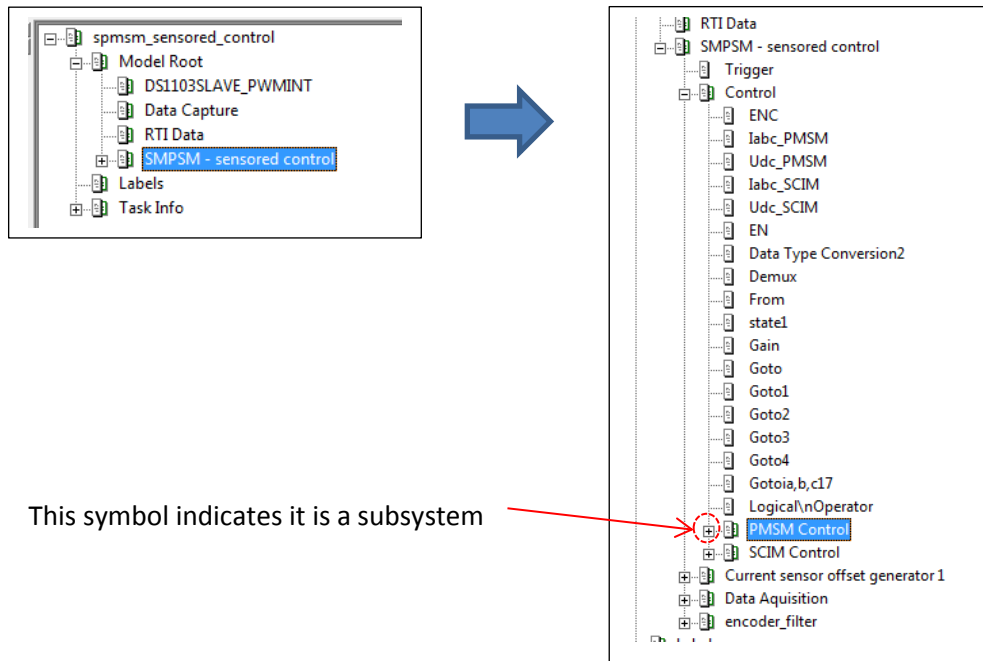

This symbol indicates it is a subsystem

Data type 1. labels

Double click the line in the Simulink model, you can assign signal name to that line.

Simulink model

Data type 2. Parameter

To make a connection between the Simulink model and the dSPACE system, you can simply drag the selected signal (e.g. this one) to the dSPACE instruments.
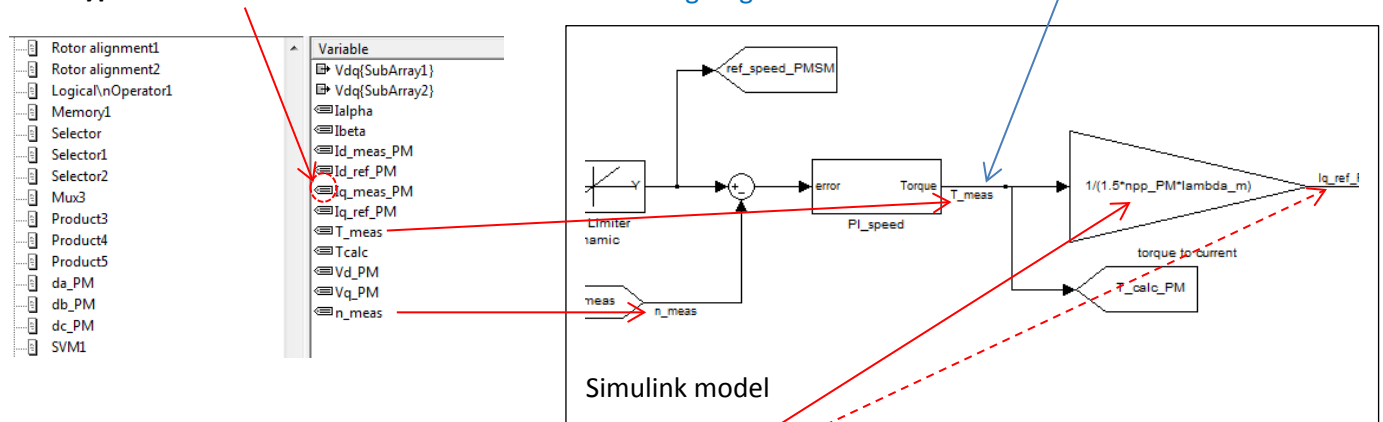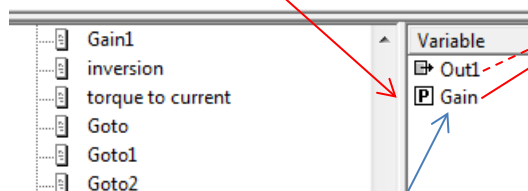
Important notes

- **It is very important to set the speed reference to be zero before clicking the <u>start</u> bottom**!
- **Load torque range** : 0-14.6 Nm
- **Speed range**: -1400 – 1400 rpm.

- In Matlab, press 'Ctrl + B' you can build the Simulink model, to be used by dSPACE. Before doing this, be sure that you are in the same file folder which contains other dSPACE files.

- You may reload the complied new Simulink model in dSPACE here ('reload variable description', which refers to the SDF file – the same file name as the Simulink model but with .sdf as file extension).
  You may right lick the 'SDF' file to check its properties – make sure the date and time information for this file is the correct one.
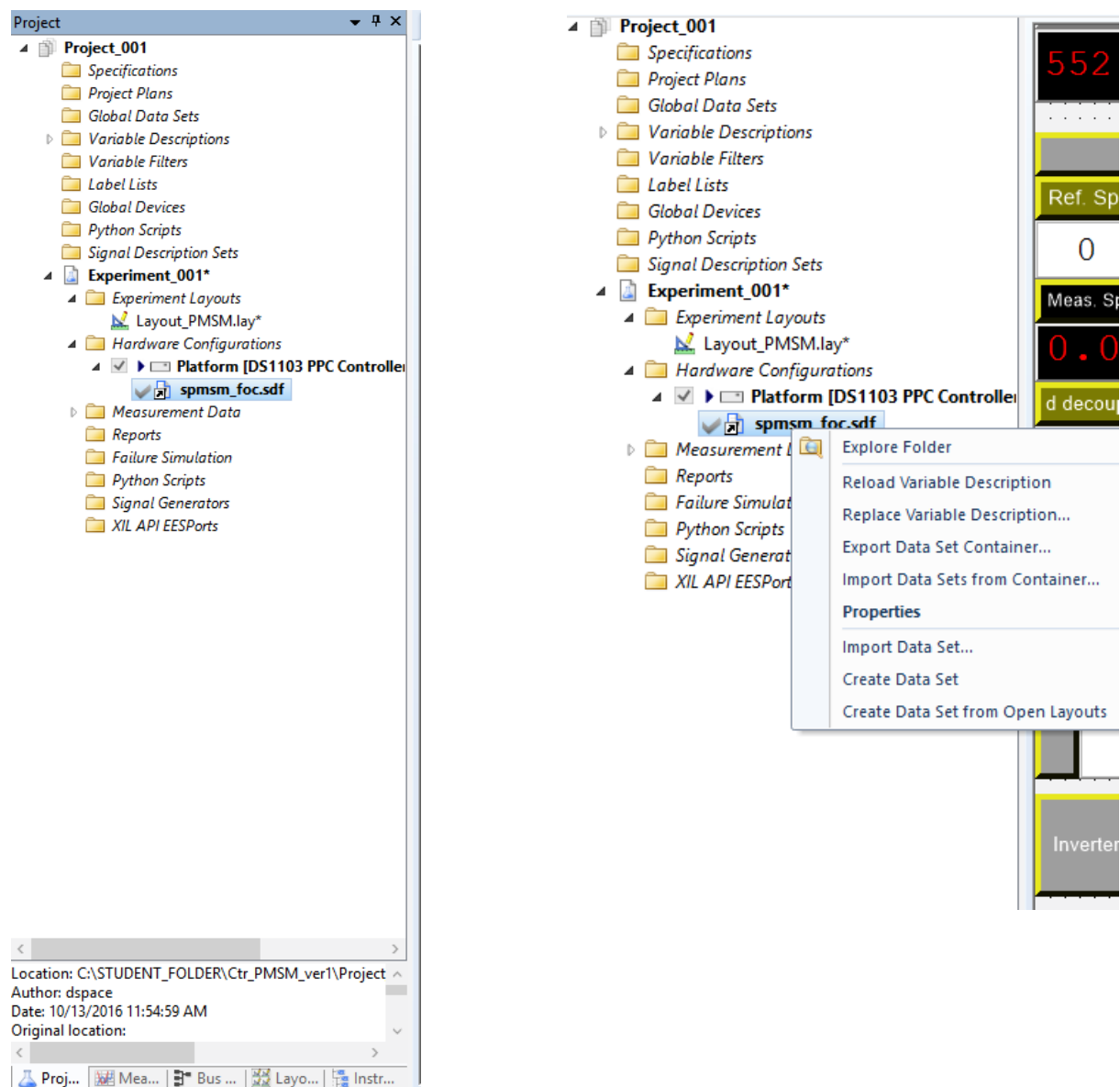
To start, click 'go online' and 'start measurement'

Start and stop the drive (and reset any errors if needed)

(1) Select 'Align Rotor' or 'FOC' operation modes. You need to align the rotor and reset the encoder position the first time you load the model or after 'reset' any errors occurred.

(2) Here you set the reference speed, load torque for normal FOC operation. For tuning the PI parameters of the d-axis current loop, you can toggle the id reference between 0 and e.g. 5 (A)

(3) Here you set PI parameters for the id current loop, iq current loop and the speed loop (from left to right)

(4) Here you can enable / disable inverter voltage error compensation (enable: Derr_gain = 1; disable: Derr_gain = 0). You can also set the minimum current value in 'QZ_Imax', below which the inverter voltage error compensation will be disabled.
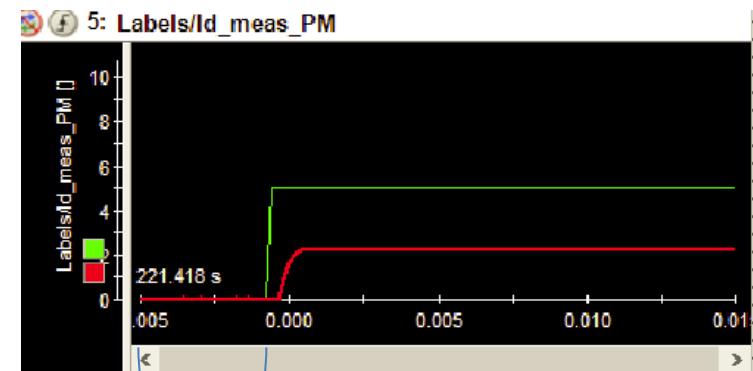
For observing the transient current step response

Go to here

Captured step response example
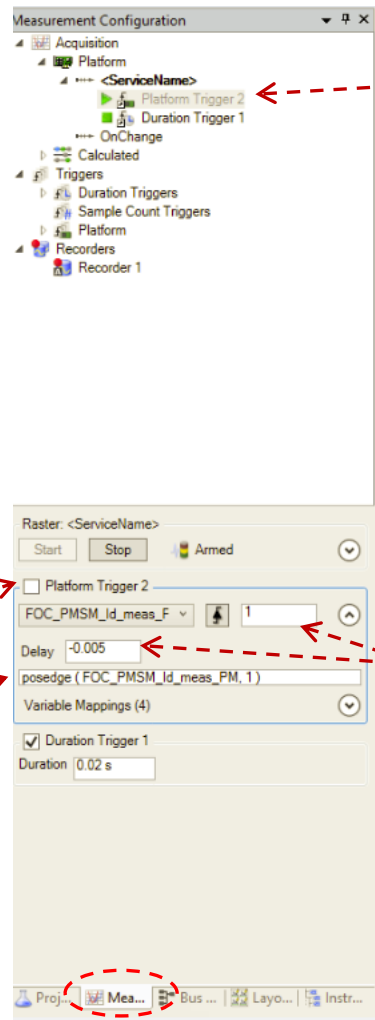
Enable the trigger for transient waveform capturing.

Triggering signal source (Measured id current)

0.05 seconds delayed display

Start to trigger when the current is >= 1 (A)

Scopes

1: PMSM Control/ia_PMSM — PM machine ia ib ic currents

2: SCIM Control/ia_IM — Induction machine currents

PM machine stator flux linkage, alfa vs. beta components

3: Labels/n_meas — Reference and measured speeds

3_70: Labels/Iq_meas_PM — Reference and measured iq currents

4: PMSM Control/the_PLL — Encoder position and estimated positions

5: Labels/Id_meas_PM — Reference and measured id currents

Kp (PLL) 200.0   Ki (PLL) 5000.0

Real Theta

PLL parameters used in the position estimator