

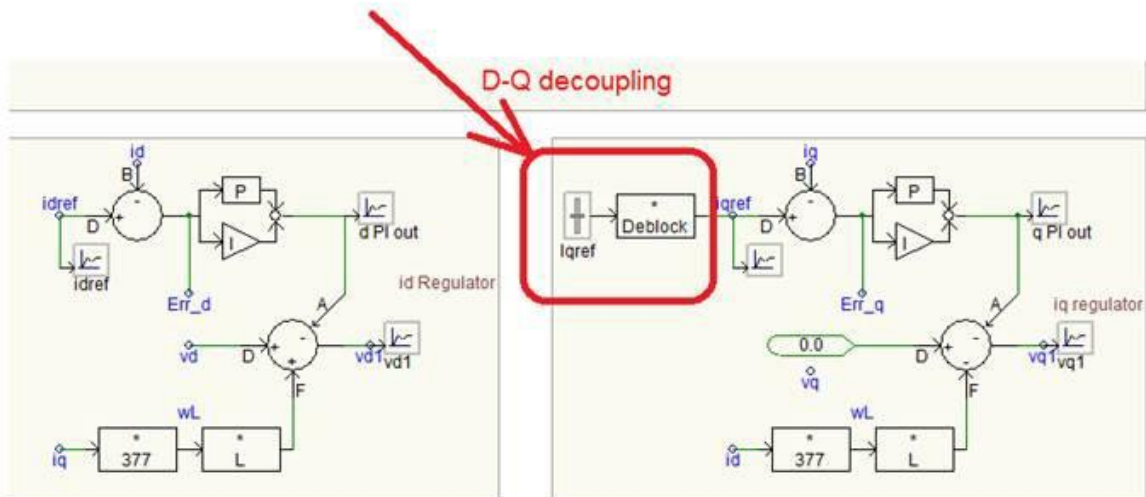
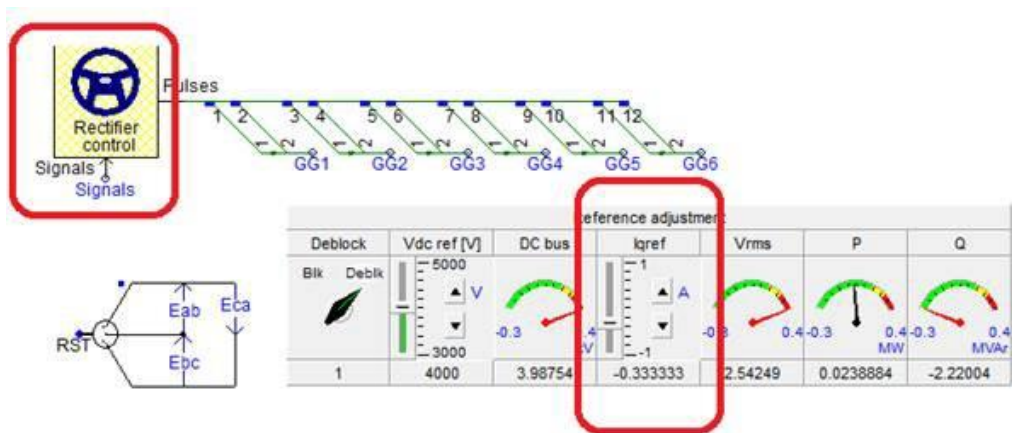
Superconducting Magnetic Energy Storage

The implementation of the SMES model was loosely based on the papers below

- [1] Wang Fu-sheng, LI Hon-mei "3-Phase Current-Surce SMES-UPS Based on TFSC and its Control Strategies", IPEMC 2006
- [2] Paulo F. Ribeiro, Brian K. Johnson, Mareisa L. Crow, Aysen Arsoy, Yilu Liu "Energy Storage Systems for Advanced Power Applications", Proceeding of the IEEE, Vol. 89, No. 12, December 2001

The SMES case has two sets of controls, one to maintain the capacitor DC voltage and the other one to charge/discharge the inductor. There is no actual reactive power control per say but there is a set point for the 'Iq' reference as part of the six pulse bridge.

If it is desired to include a reactive power control, this one can be setup by means of a PI controller, such that it modifies the 'Iqref' quantity within the 'Rectifier control page' (see arrow in the figure below). Please note that the angle yielded by the PLL has been setup such that the 'd' axis controls the active power, and the 'q' axis the reactive power.



Regarding the power control, within the SMES page, there is a selector for charge/discharge modes. Having initially charged the reactor and then switching back to the discharge mode, a control for the input/output power of the SMES can be added where is indicated in the figure below.

