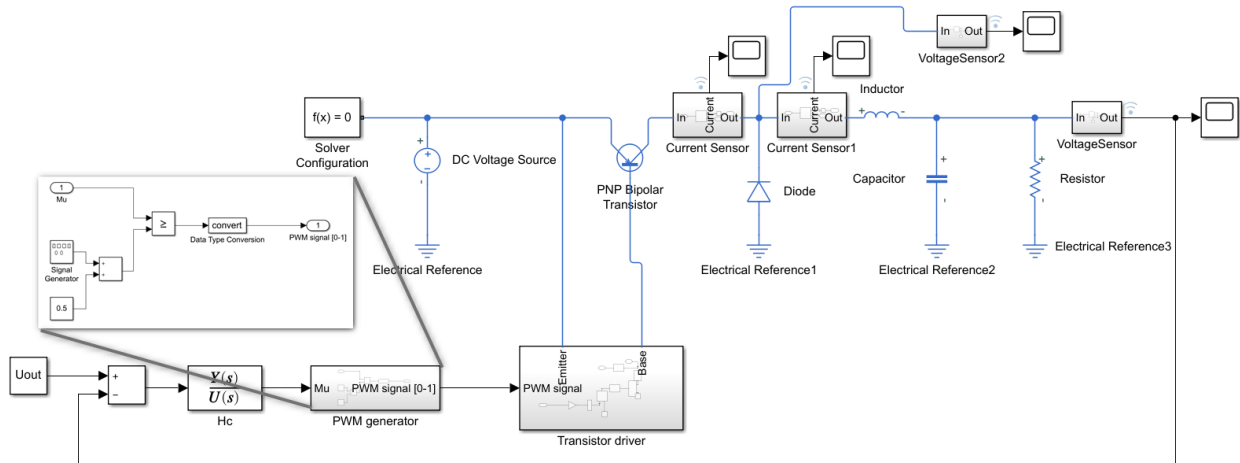


## 5. Validation of control algorithm with advanced model

The residual parameters of the physical components had caused the output voltage to drop below the desired value. A closed-loop controller should be able to compensate for these changes.

You have to check if the controller determined in Part 3 is able to fix these changes of the output voltage. You should complete the Simscape simulation from Part 4 (with all the residual elements) with the closed loop controller, like on this figure:



Where Hc is the controller determined in Part 3.

**Attention:** if your output voltage dropped below half of the desired voltage, change the inductor series resistance to 0.1 Ohm.

### Task:

- Compare the output voltage for the two simulations: with controller and without controller (constant Duty cycle). What changed? Is the average output voltage around the desired value? How is the overshoot and response time?
- Check the command value (output of the controller Hc). What is the difference compared to the constant duty cycle? How does the controller compensate for the residual elements?