

Smart Low Voltage Micro-grid

Rory James

MEng Electronic Engineering - pk008865@reading.ac.uk

Jonathan Walker

MEng Electronic Engineering – fb009717@reading.ac.uk

ABSTRACT

This paper explains the fundamentals of h-bridge switching. It serves to show the theory of driving high and low-side MOSFETs by driver chips and bootstrapping techniques, showing the drawbacks and comparing to alternative techniques such as using a pulse transformer which brings with it its own downsides such as maximum duty cycles of 50%. Ultimately bootstrapping is one of the most common techniques for driving high side switches as it is relatively simple, cheap and compact in package size.

The national grid has been operating since 1901; the following paper looks into all of the research needed to build a hardware simulation of a low voltage micro-grid. In particular it looks at the variable loads required to draw power from the grid and how to control them, MOSFETS driven by PWM was the most effective control method in the end. It also looks into the problems the national grid faces on a day to day basis as well as the more major problems that it faces. Also a breakdown of the objective of the project and how they were split amongst the team is also included.

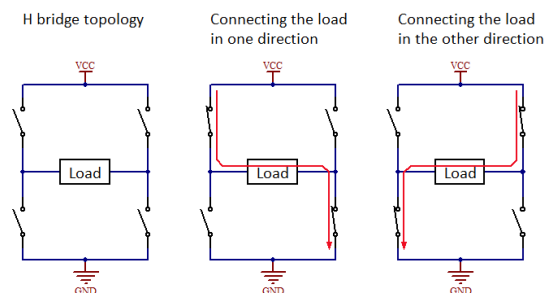


Figure 1. H-Bridge configuration (Axotron 2011) [1]

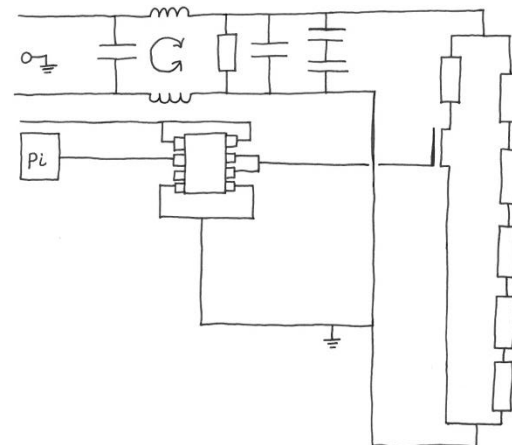


Figure 2. Variable resistor final design

J Time, Your SCARP paper title, *Proc. 13th School Conf. for Annual Research Projects*, V F Ruiz (Ed), pp. xx–yy, University of Reading, 3rd June 2014.