

Project : Harmonic Control of Power Line Current

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Abstract

In recent years power factor has become an obligating standard not only for very high power consumption products but for all electrical products above 75w (European standard IEC-1000-3).

The requirement for “green” Power (efficient use of energy source) and minimization of line interference, caused by low power factor to and from electrical products has encouraged investigators to look for a variety of solutions to correct the power factor problem.

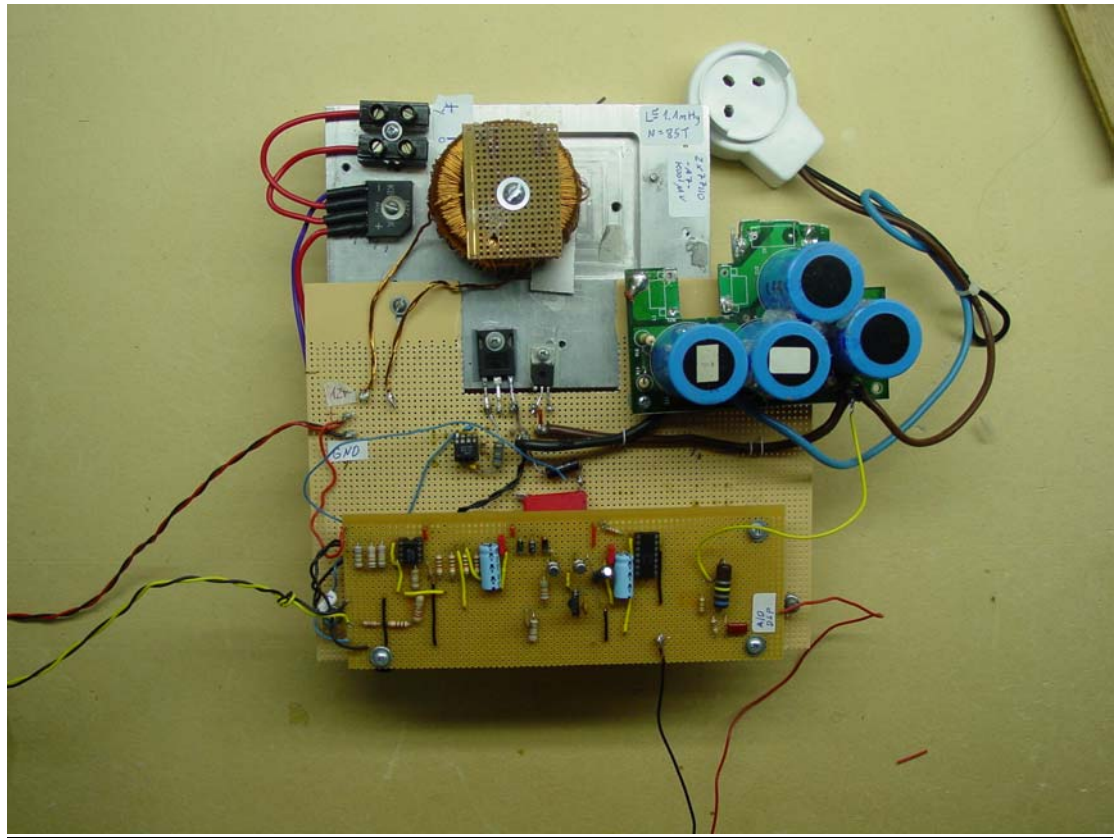
This project presents a new control method , developed in Ben-Gurion University of the Negev, to control the current harmonics injected into the AC line. The harmonic control is achieved by controlling the input voltage power factor without the need for direct input voltage sensing, a necessity in other methods.

The harmonic control method is based on a closed loop controlled DC-DC converter incorporating input current programming.

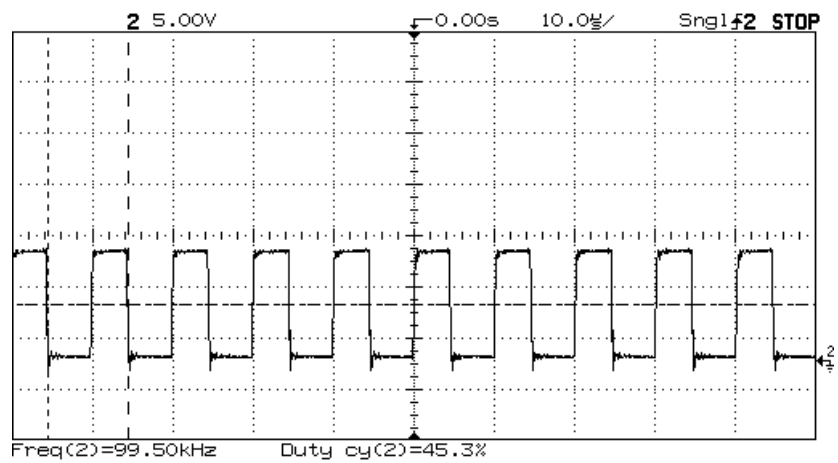
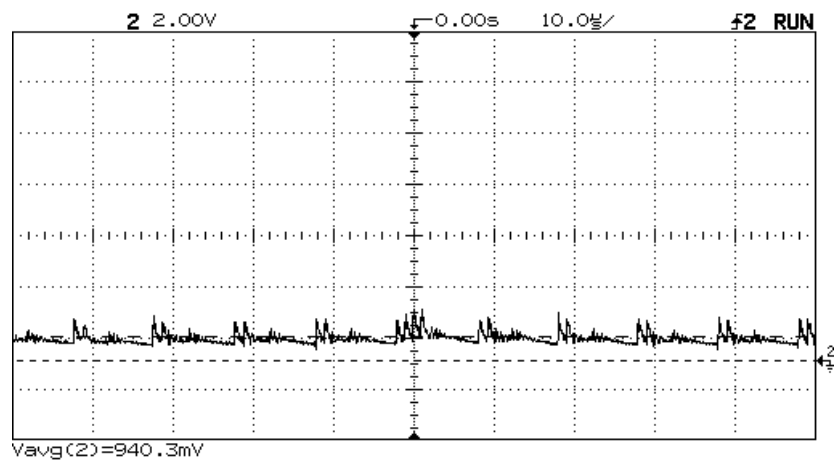
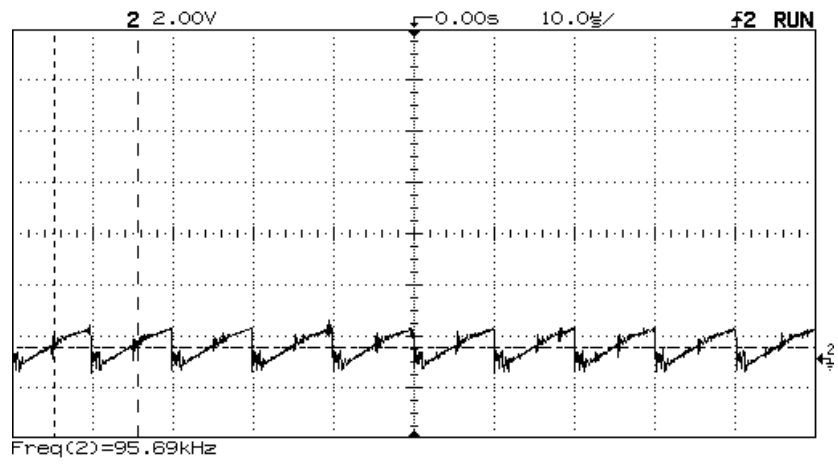
The objective of this project was to integrate digital and analog control methods , by using the unique characteristics of the DSP controller.

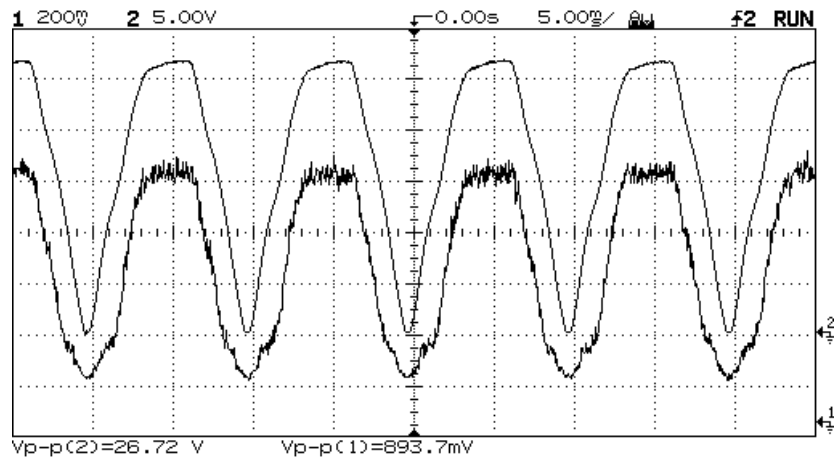
Using a microprocessor or a DSP unit allows a large amount of design flexibility and compatibility with a varying input voltage and output power. It also provides an integrated solution for a large variety of soft start control and peripheral protection circuits.

For realization of the control system suggested above, a 1 KW power factor correction system was built, with universal input voltage and a 380v output voltage.



PWM generation





Vin Vs. Iin