

DSP BASED ACTIVE FILTER CONTROLLER FOR CUSTOMER AND UTILITY GENERATED HARMONICS AND REACTIVE POWER COMPENSATION

R. D. Patidar and S. P. Singh
Department of Electrical Engineering
Indian Institute of Technology, Roorkee (India)
E-mail: rdpatdee@iitr.ernet.in, patidarrd07@gmail.com

Keywords: Active power filter, harmonics, dc-link capacitor voltage, digital signal processor, power quality, reactive power compensation.

ABSTRACT

This paper proposes an optimal current controller for active power filter to compensate the customer as well as the utility generated current harmonics and reactive power. The current controlled voltage source inverter, used in active filter configuration, is regulated so that the combination of load and active filter emulate as an equivalent admittance across the source voltage. The optimized peak value of the desired source currents is obtained to ensure the compensated source currents, be balanced and in-phase with respective source voltages. In order to make the source currents sinusoidal, the positive sequence components of the source voltages are deduced. A fast acting, self supported energy based dc-link controller is proposed to obtain the active component of power loss in the inverter circuit. Fixed band hysteresis controllers are used to generate the PWM signals. To validate the proposed algorithm, simulation followed by experimental studies using a low cost, fixed-point TMS320F2812eZdsp are carried out.