

## Article Abstract

<b>Title:</b>	DSP based adaptive hysteresis-band current controlled active filter for power quality conditioning under non-sinusoidal supply voltages
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<b>Abstract:</b>	The use of non-linear loads critically affects the quality of supply by drawing harmonic currents and reactive power from the electrical distribution system. Active power filters are the most viable solution for solving such power quality problems in compliance with the harmonic standards. This article presents a digital signal processor (DSP) based fundamental-tuned-filter (FTF) algorithm for elimination of harmonics and reactive power compensation under distorted voltage without the use of conventional phase-locked-loop or low-pass filter blocks. FTF offers easy tracking of fundamental or selected frequency component from the contaminated signal. The limitation of fixed band hysteresis control i.e. variable switching frequency is resolved at some extent by generating switching pattern of active power filter switches using adaptive hysteresis-band control strategy. The bandwidth of hysteresis-band changes according to the slope of the reference current, modulation frequency, supply voltage and DC-capacitor voltage which give nearly constant switching frequency. Reference current signal is generated using DC-bus energy balance without sensing the load or filter current, hence, offers easy implementation using DSP with less sensor count. To prove the viability of proposed controller, first it is realized in MATLAB-Simulink environment, and subsequently a laboratory prototype is developed based on TMS320F28335, 32-bit floating-point DSP to show the effectiveness of the proposed strategy.
<b>Keywords:</b>	Power electronics, harmonics, reactive power compensation, shunt active power filter, fundamental tuned filter, adaptive hysteresis band, digital signal processor.