

## Harmonic Analysis to Improve Power Quality

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**Abstract :** The presence of nonlinear and power electronic switching devices produce distorted output and harmonics into the system. This paper presents a technique to analyze harmonics using digital series oscilloscope (DSO). In power distribution system further measurements are done by DSO, and the waveforms are analyzed using FFT program. The results of this proposed work are helpful for the investigator to install an appropriate compensating device to mitigate the harmonics, in turn, improve the power quality. This case study is carried out at AIT Chikmagalur. It is done as a starting step towards the improvement of energy efficiency at AIT Chikmagalur, and with an overall aim of reducing the electricity bill with a complete energy audit of the institution. Strategies were put forth to reach the above objective: The following strategies were proposed to be implemented to analyze the power quality in EEE department of the institution. Strategy 1: The power factor has to be measured using the energy meter. Power factor improvement may reduce the voltage drop in lines. This brings the voltages at the socket in the labs closer to the nominal voltage of 230V, and thus power quality improves. Strategy 2: The harmonics at the power inlet has to be measured by means of a DSO. The DSO waveform is analyzed using FFT to know the percentage harmonic up to the 13th harmonics of 50Hz. Reduction in the harmonics in the inlet of the EEE department may reduce line losses and therefore reduces energy bill to the institution.

**Keywords :** harmonic analysis, energy bill, power quality, electronic switching devices

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