

Sunita R. Sharma, Synchronous sampling wattmeter, M. Tech. Thesis, Department of Electrical Engineering, Indian Institute of Technology Bombay, 2000.

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Abstract - Different power measurement techniques based on asynchronous and synchronous sampling of input voltage and current signals are discussed. In asynchronous sampling wattmeter, the sampling instants are not in synchronous with the instantaneous voltage and current input signals whereas in synchronous sampling wattmeter the sampling instants are synchronous with the instantaneous voltage and current input signals. A Micro-controller based implementation of the synchronous sampling wattmeter is designed to measure exact power upto ninth harmonics. It uses analog to digital converter ADC0809 (8-bits microprocessor compatible, 8-channel analog multiplexer) interfaced with Intel 89C52 (8-bits micro controller) in which digitized samples of the voltage and current waveforms are multiplied together and the products accumulated over the measurement period. The sum is divided by the number of samples, scaled, and read out as a four seven segment display of average power. A Phase locked loop is used as a frequency multiplier, to generate the sampling frequency from the input signal frequency, and hence the name Synchronous Sampling Wattmeter.