Frequency Counter

Introduction:

A frequency counter is an instrument that is used to measure the frequency of a signal. In scientific terms, frequency is the number of cycles per second of a signal. In layman terms, frequency of a signal denotes the rate of occurrence of the signal in certain time. Frequency Counters are basically simple counter systems with a limited time period for counting.

Here we design a simple frequency counter system using two timers and two counters. While one of the Timer IC is used to produce clock signals, the other is used to produce the time limited signal of one second.

Operating Principle:

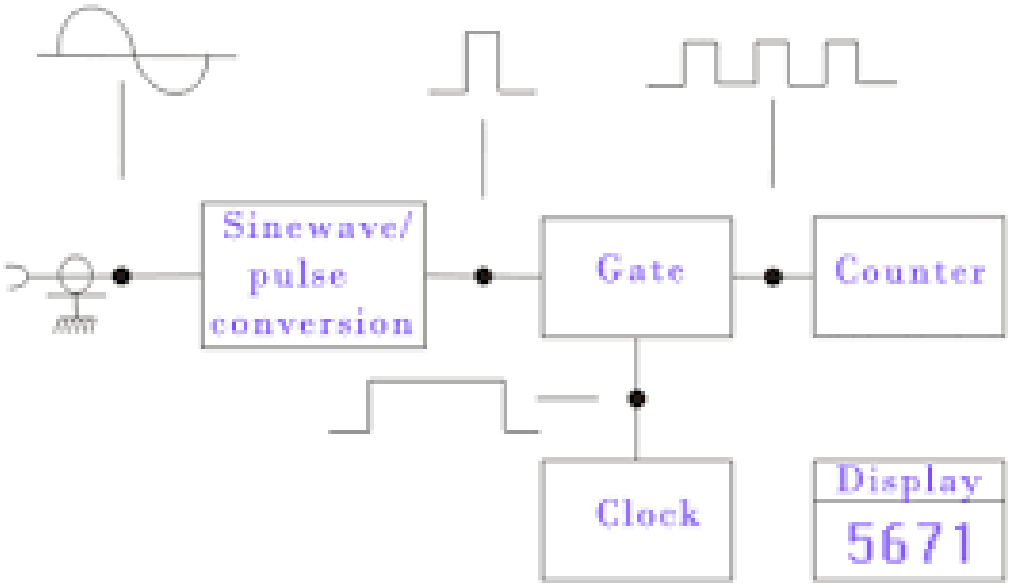
This circuit is based on the simple definition of frequency, which is the number of cycles per second. Basically, a Square Wave Generator circuit is used to produce a simple pulse wave. These pulses are given as input to the Timer / Counter of the Microcontroller and count the number of pulses.

After performing some simple calculations, the resulting frequency is displayed on a 16X2 LCD Display in Hertz.

An important point to note is that I have used Arduino UNO as the source for Square Wave. You can use either Arduino or

a completely build your own Square Wave Generator using 555 Timer IC by configuring it as an Astable Multivibrator.

Block Diagram:



Applications:

1. The Frequency Counter Circuit using 8051 Microcontroller can be used to accurately measure the frequency of a signal.
2. Since we are counting pulses, we can measure the frequency of only square waves and its derivatives (with different duty cycles.)