**Time Delay Calculations for 8051 Microcontroller**

The 8051 microcontroller works with 11.0592 MHz frequency.

Frequency 11.0592MHz=12 pules

1 clock pulse =11.0592MHz/12

F =0.921 MHz

Time delay=1/F

T=1/0.92MHz

T=1.080506 us (for ‘1’ cycle)

1000us=1MS

1000ms=1sec

**Procedure to Calculate the Delay Program**

1. First we have to load the TMOD register value for ‘Timer0’ and ‘Timer1’in different modes. For example, if we want to operate timer1 in mode1 it must be configured as “TMOD=0x10”.

2. Whenever we operate the timer in mode 1, timer takes the maximum pulses of 65535. Then the calculated time-delay pulses must be subtracted from the maximum pulses, and afterwards converted to hexadecimal value. This value has to be loaded in timer1 higher bit and lower bits. This timer operation is programmed using [embedded C in a microcontroller](https://www.elprocus.com/basics-and-structure-of-embedded-c-program-with-examples-for-beginners/).

Example: 500us time delay

500us/1.080806us

461pulses

P=65535-461

P=65074

65074 conveted by hexa decimal =FE32

TH1=0xFE;

TL1=0x32;

3. Start the timer1 “TR1=1;”

4. Monitor the flag bit “while(TF1==1)”

5. Clear the flag bit “TF1=0”

6. Cleat the timer “TR1=0”