

Derivation of initial counter value for maximum delay which can be obtained using 1:1024 prescaler in TIMERO

$$\begin{aligned}\text{XTAL} = 16\text{MHz} &\rightarrow T_{\text{xtal_clock}} &= 1/16 \text{ us} \\ \text{Prescaler} = 1:256 &\rightarrow T_{\text{counter_clock}} &= 1024 \times (1/16) \text{ us} \\ &&= 64\text{us} \\ \text{Delay for 256 increments} &&= 256 \times 64\text{us} \\ &&= 16384\text{us} \\ &&= 16.384\text{ms} \\ &&< 500\text{ms}\end{aligned}$$

500ms delay cannot be obtained directly, but using iterations, it can be obtained