

Derivation of initial counter value

$$\text{XTAL} = 16\text{MHz} \rightarrow T_{\text{xtal_clock}}$$

$$= 1/16 \text{ us}$$

$$\text{Prescaler} = 1:256 \rightarrow T_{\text{counter_clock}}$$

$$= 256 \times (1/16) \text{ us}$$

$$= 16\text{us}$$

$$\text{Counter increments needed}$$

$$= 2000\text{us} / 16\text{us}$$

$$= 125 \text{ increments}$$

$$\text{Initial counter Value}$$

$$= 1 + 255 - 125$$

$$= 131$$