The measurement model is given by:

$$\begin{bmatrix} y1(t) \end{bmatrix} = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} Position(t) \\ Velocity(t) \end{bmatrix} + \epsilon,$$
$$\epsilon \sim N\Big(\begin{bmatrix} 0.00 \end{bmatrix}, \begin{bmatrix} mnoise \end{bmatrix} \Big)$$

The dynamic model is given by:

$$\begin{bmatrix} dPosition(t) \\ dVelocity(t) \end{bmatrix} = (\begin{bmatrix} 0 & 1 \\ spring & friction \end{bmatrix} \begin{bmatrix} Position(t) \\ Velocity(t) \end{bmatrix})dt + dw(t),$$
$$dw(t) \sim N\Big(\begin{bmatrix} 0.00 \\ 0.00 \end{bmatrix}, \begin{bmatrix} 0 & 0 \\ 0 & dnoise \end{bmatrix} \Big)$$

The initial condition of the dynamic model is given by:

$$\begin{bmatrix} Position(0) \\ Velocity(0) \end{bmatrix} \sim N\Big(\begin{bmatrix} inipos \\ 1 \end{bmatrix}, \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \Big)$$