



Inverse Kinematics:

$$\begin{aligned} X &= \frac{X_{max}}{2} + \frac{l_3^2 - l_4^2}{2(X_{max} - l_g)} \\ Y &= \frac{Y_{max}}{2} + \frac{l_3^2 - l_4^2}{2(Y_{max} - l_g)} \end{aligned} \quad (1)$$

Forward Kinematics:

$$\begin{aligned} l_1 &= \sqrt{\left(X - \frac{l_g}{2}\right)^2 + \left(Y_{max} - Y + \frac{l_g}{2}\right)^2} \\ l_2 &= \sqrt{\left(X_{max} - X + \frac{l_g}{2}\right)^2 + \left(Y_{max} - Y + \frac{l_g}{2}\right)^2} \\ l_3 &= \sqrt{\left(X - \frac{l_g}{2}\right)^2 + \left(Y - \frac{l_g}{2}\right)^2} \\ l_4 &= \sqrt{\left(X_{max} - X + \frac{l_g}{2}\right)^2 + \left(Y - \frac{l_g}{2}\right)^2} \end{aligned} \quad (2)$$