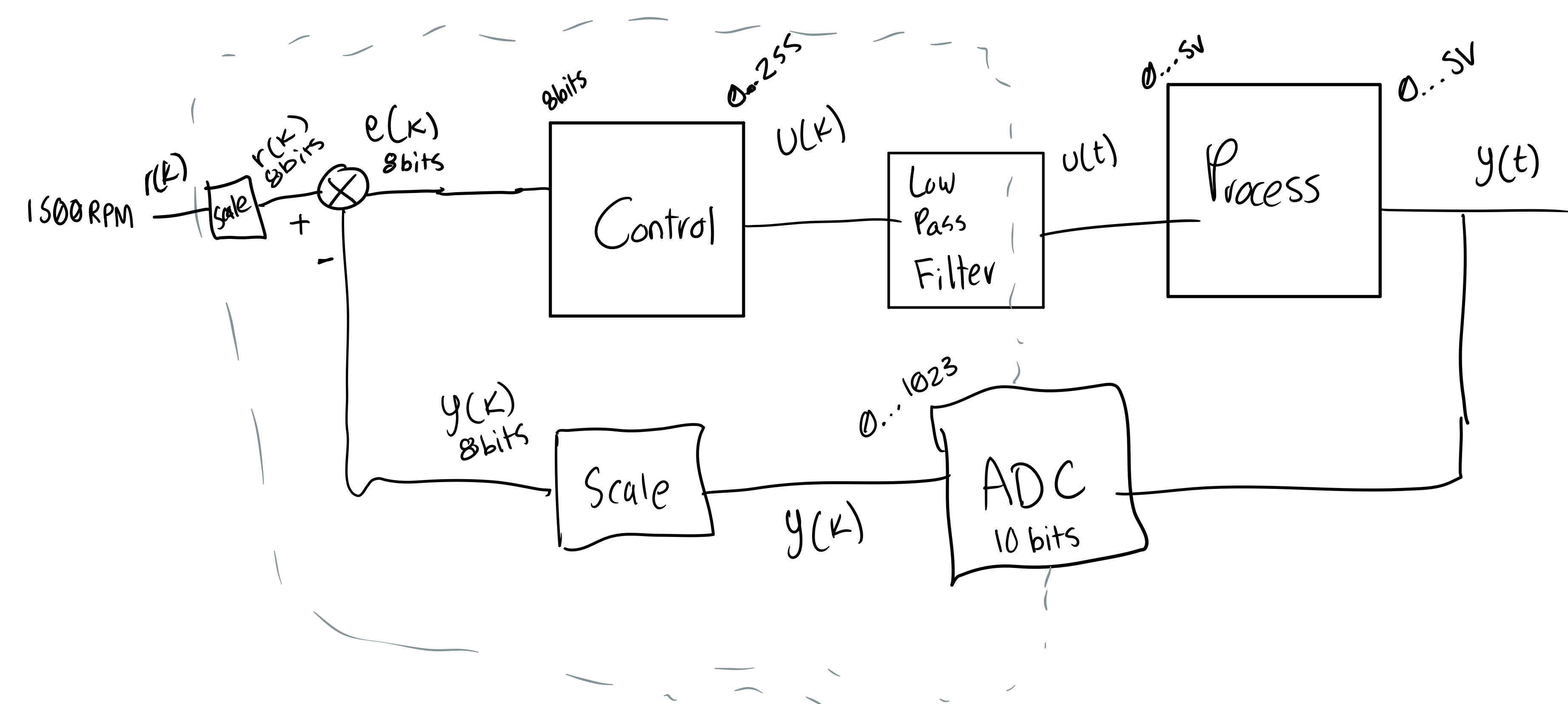


# ON/OFF CONTROLLER



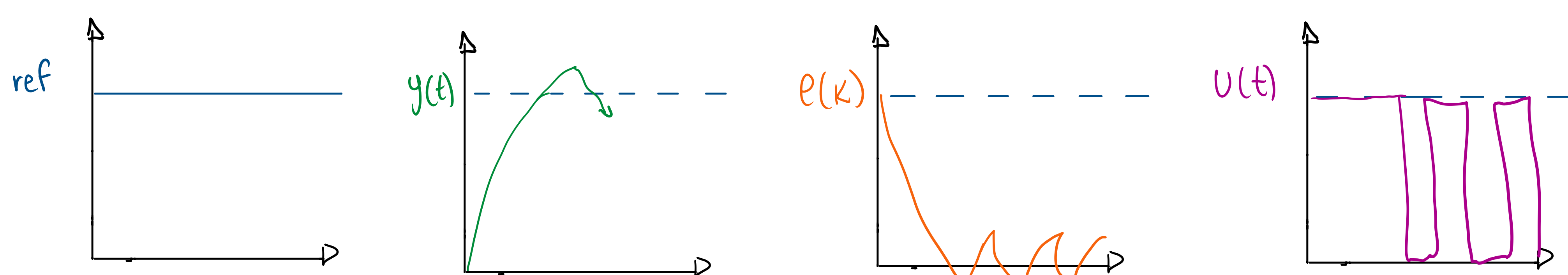
$$r(k) = \text{scale (serial)}$$

$$y(k) = \text{scale (ADC)}$$

$$e(k) = r(k) - y(k)$$

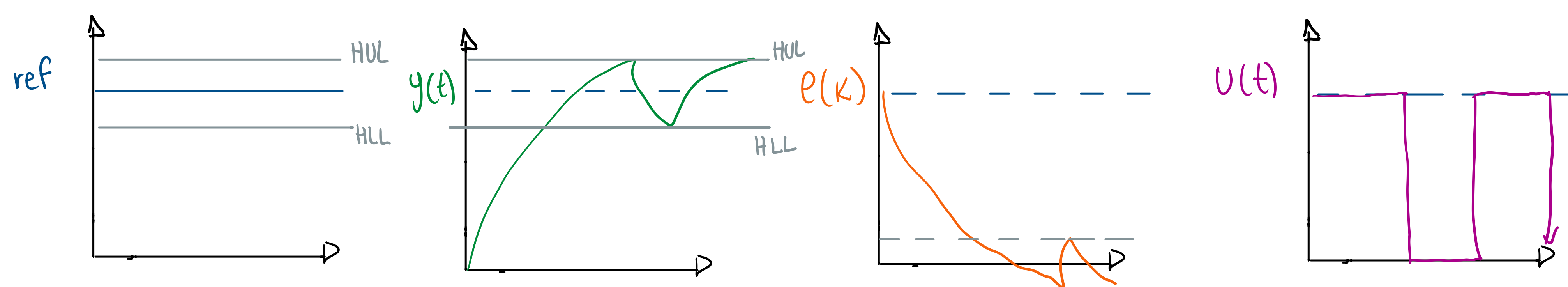
$$C = \begin{cases} \text{if } e(k) > 0 & \text{then ON } u(k) = 100\% = 255 \\ \text{if } e(k) < 0 & \text{then OFF } u(k) = 0\% = 0 \end{cases}$$

analogwrite(u(k))



Es un Controlador  
No lineal

## ON/OFF with Hysteresis



## P control

$$K_p = \frac{U(s)}{E(s)} = \frac{U(k)}{E(k)}$$

$$\therefore U(k) = K_p E(k)$$

$$\text{if } U(k) > (U_{sat} = 255)$$

$$U(k) = U_{sat}$$

$$\text{if } U(k) < (L_{sat} = 0)$$

$$U(k) = L_{sat}$$

Es un controlador lineal, sin  
superar los límites de saturación ( $K_p < 1$ )

$$\begin{matrix} e=1 & y=2 \\ e=2 & y=4 \\ e=255 & y=255 \end{matrix} \quad K_p=2$$

## TAREA

Nominal testing step = 1500 RPM  
close loop step response

