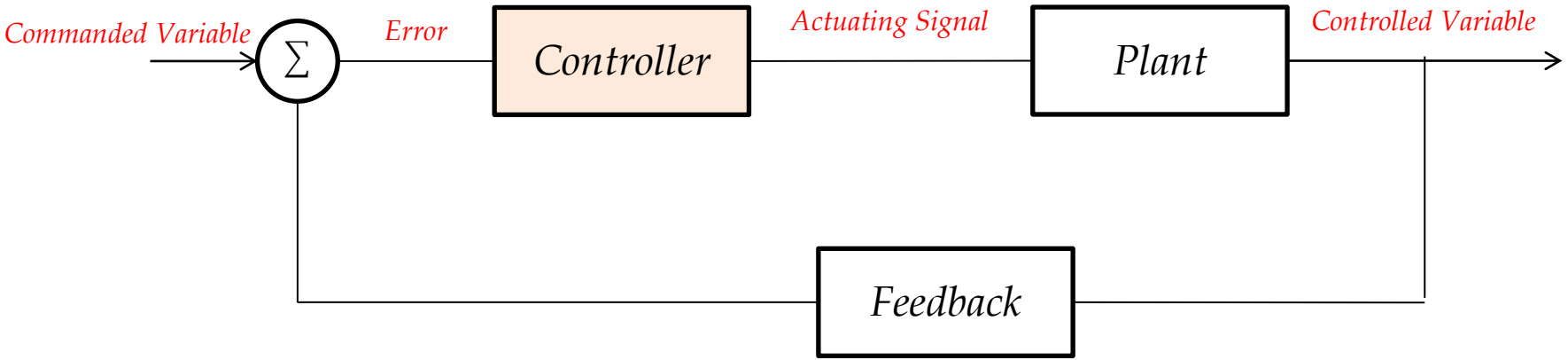
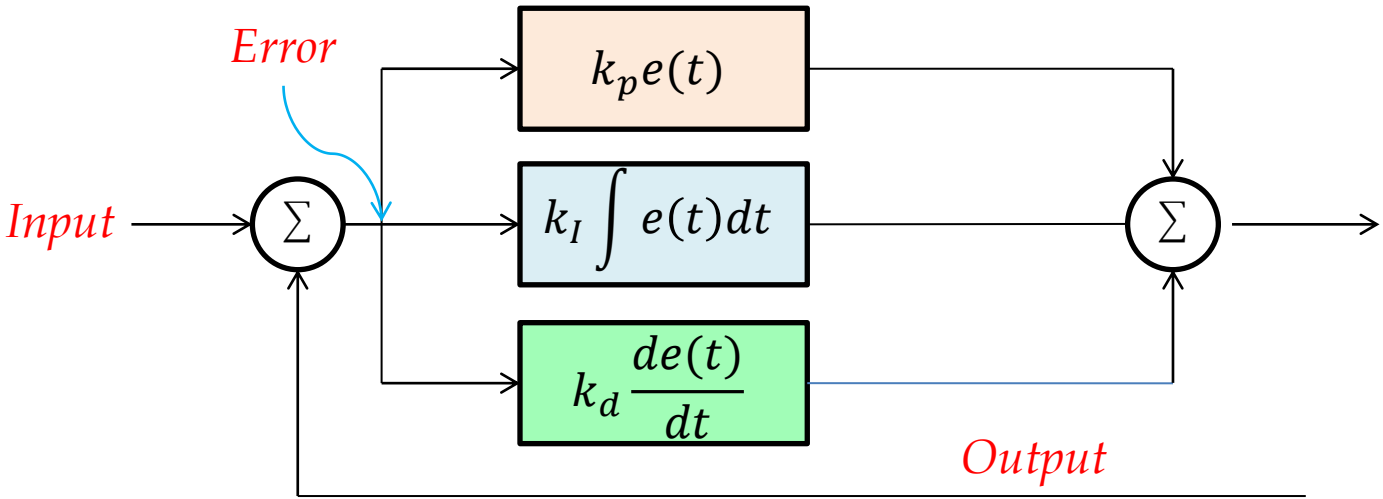
PID Controller

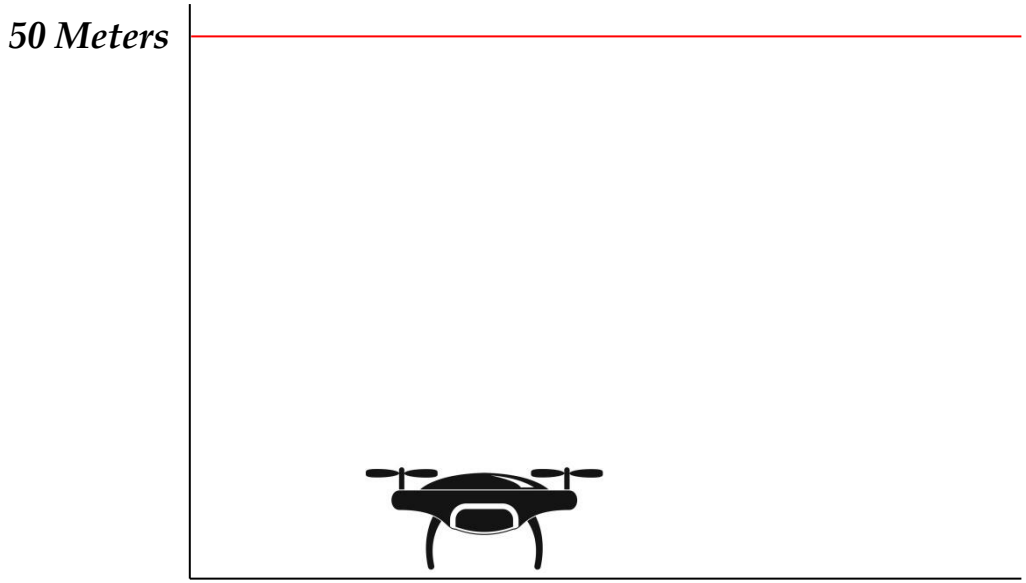
Control System

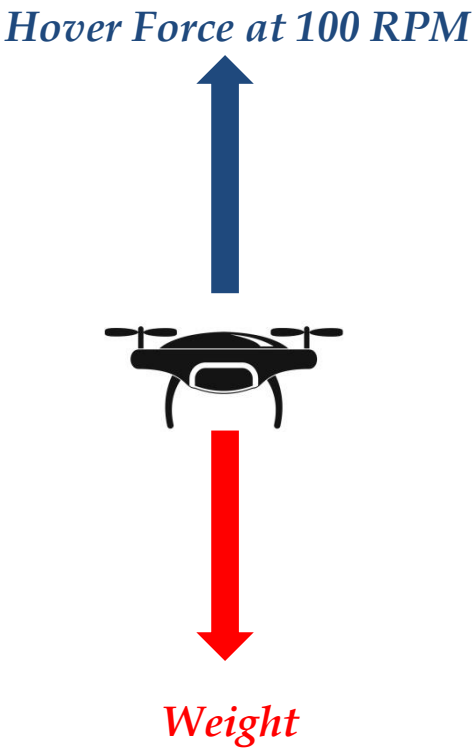


PID Controller

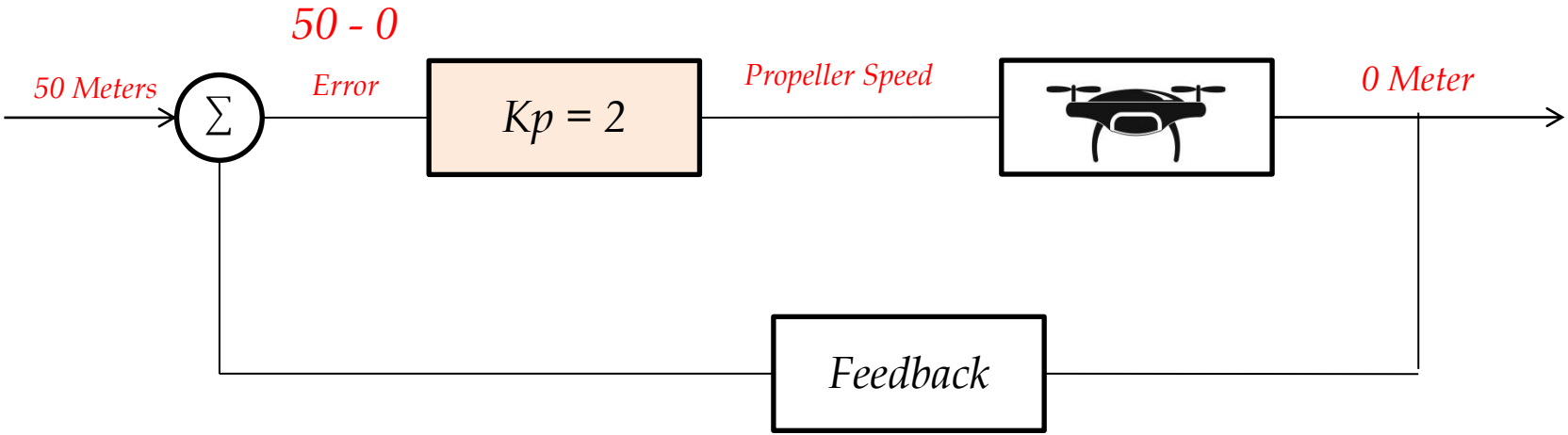


Drone Controlling Problem

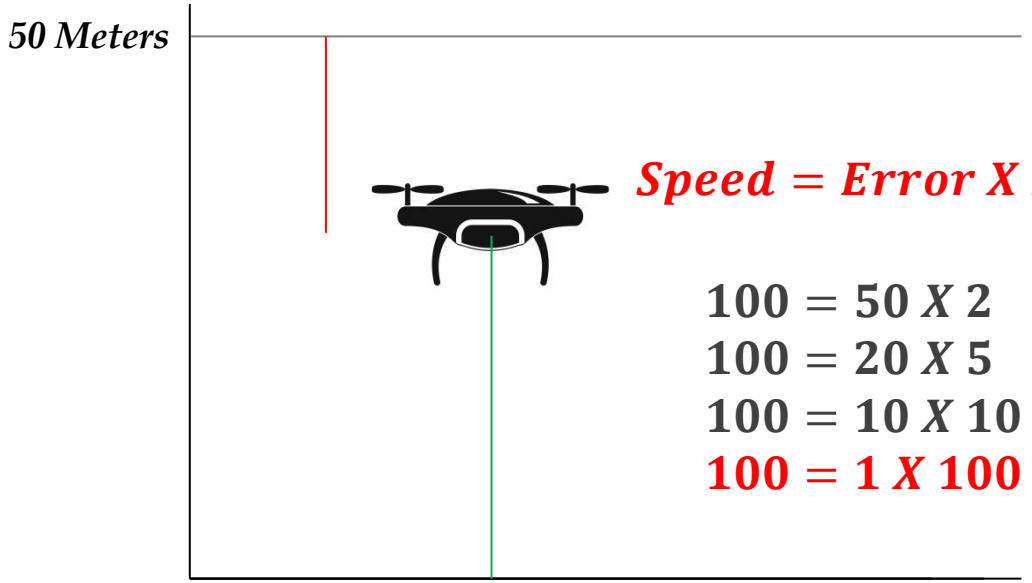




Proportional Controller (Present)

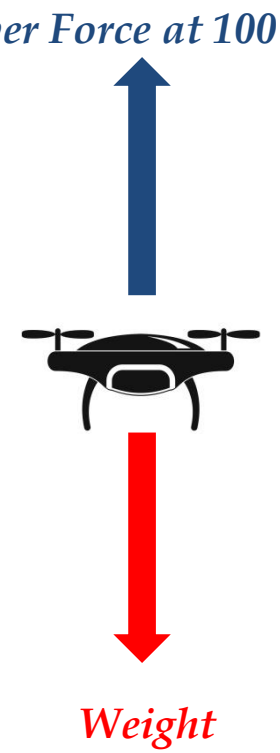


Drone Controlling Problem

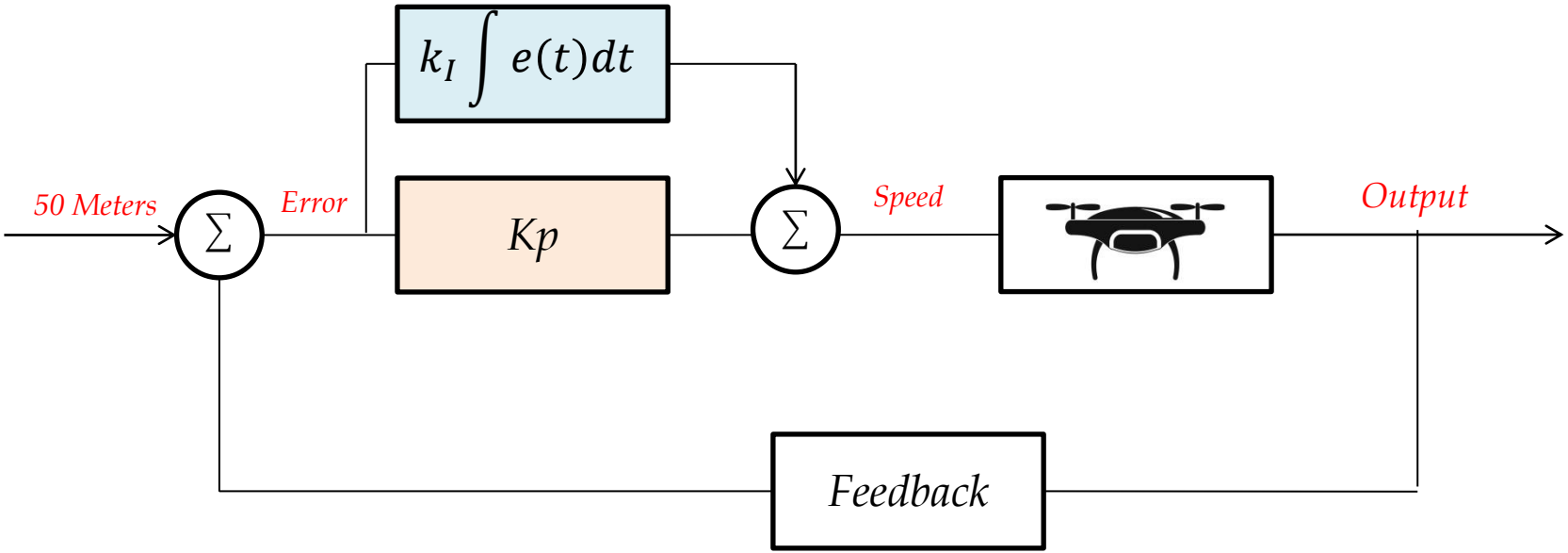


$$Speed = Error\ X\ K_p$$

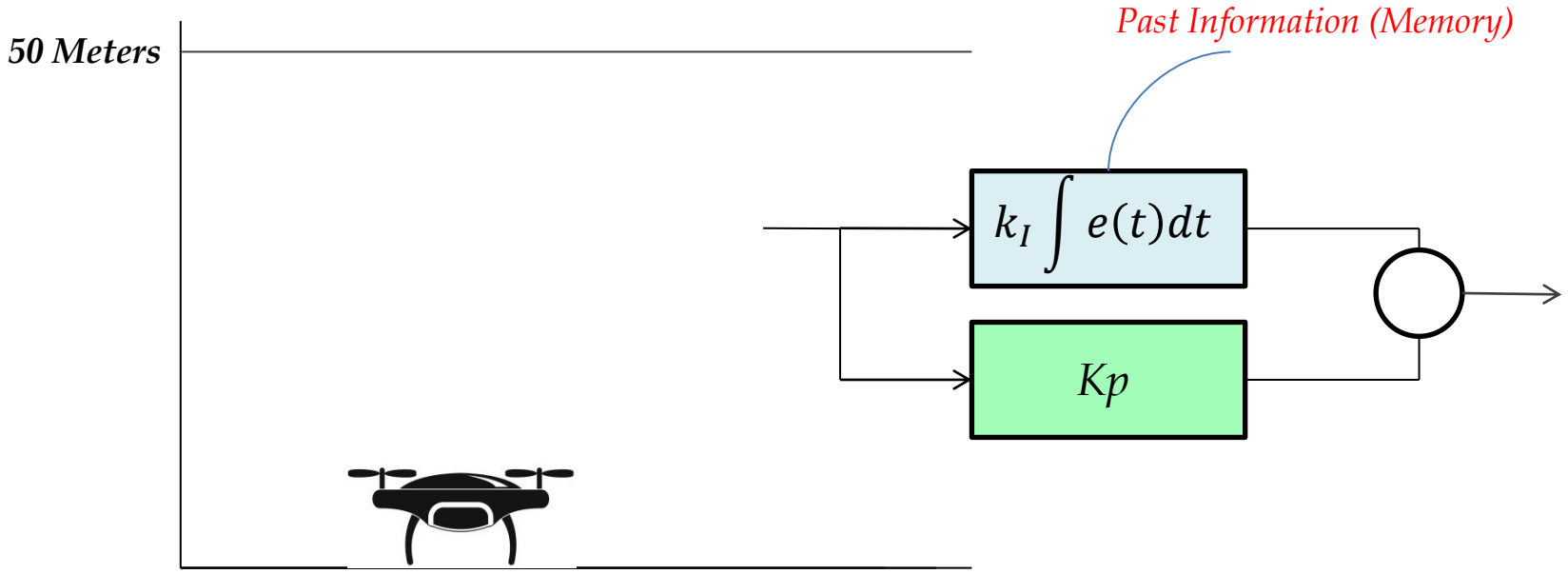
$$100 = 50\ X\ 2$$
$$100 = 20\ X\ 5$$
$$100 = 10\ X\ 10$$
$$100 = 1\ X\ 100$$



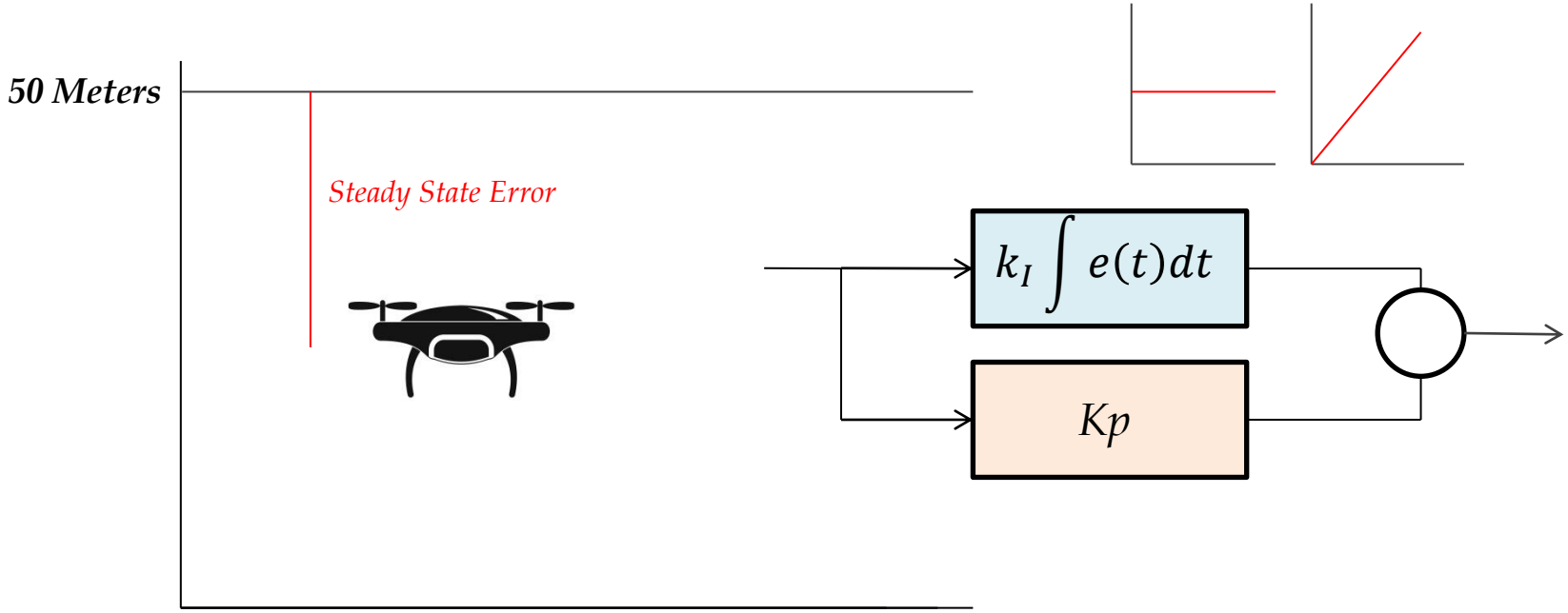
Integral + Proportional (Future)



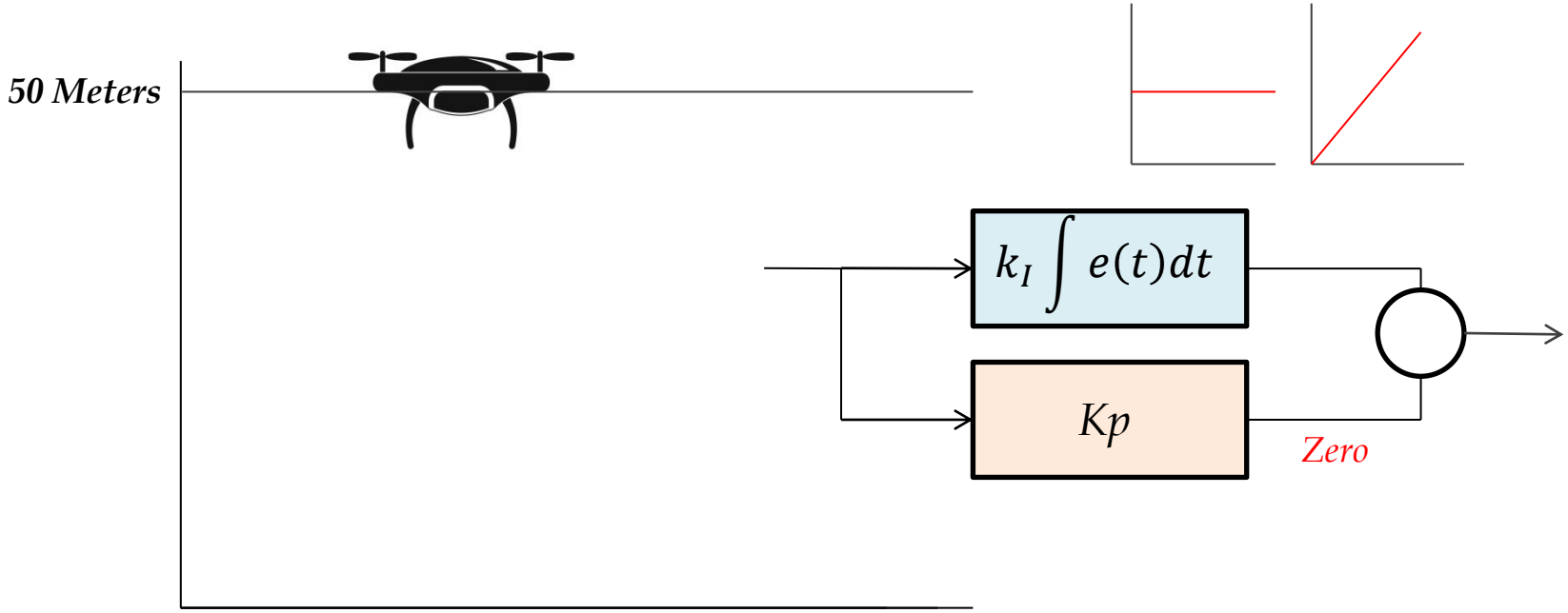
Integral + Proportional (Future)



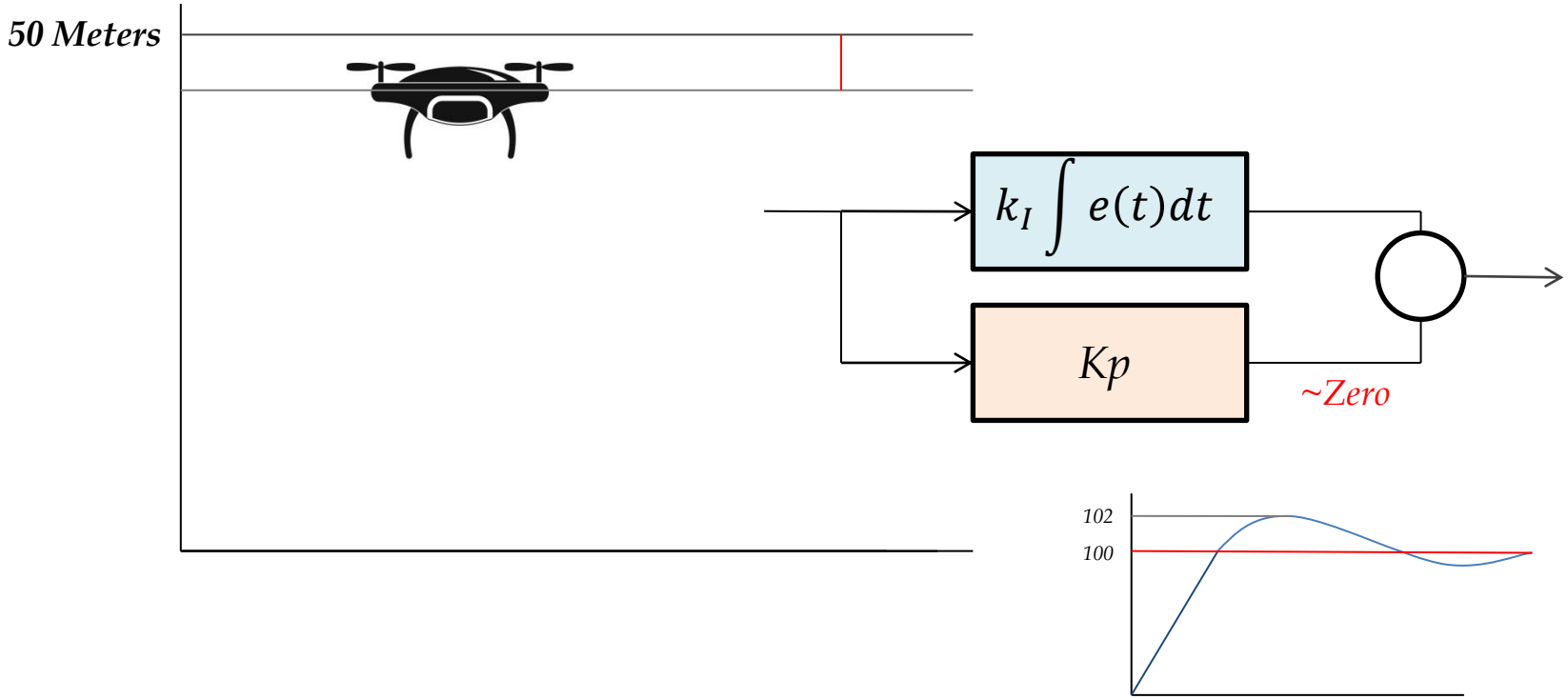
Integral + Proportional (Future)



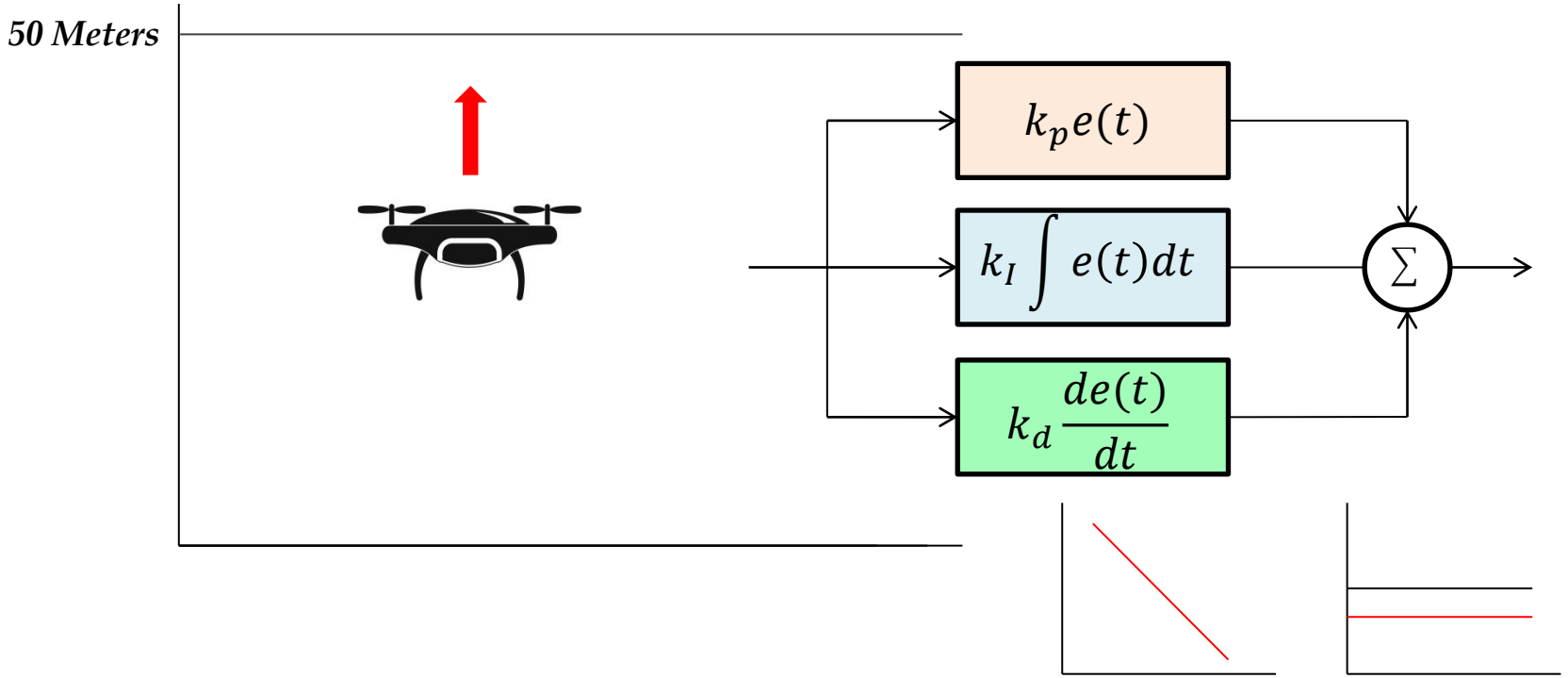
Integral + Proportional (Future)



Integral + Proportional (Future)



Derivative Controller (Future)



Proportional Controller

1. Doesn't Eliminate the Steady State Error.
2. Added with Other Controllers.
3. High Values Reduce the Steady State Error but Lead to System Oscillations.

Integral + Proportional

1. Integrates the Error Signal.
2. Eliminate the Steady State Error.
3. Adds Overshoot
4. Can Lead to System Instability.

Derivative + Proportional

1. High Sensitivity.
2. Provides Significant Correction before the error becomes too large.
3. Doesn’t Affect the Steady State Error Directly.
4. Adds Damping to the system .
5. Helps to remove Overshoot