



Example 9-14: Parallel Connection

Suppose that the impulse response of an LTI system is

$$h(t) = u(t - 1) - u(t - 2) = \begin{cases} 1 & 1 \leq t < 2 \\ 0 & \text{otherwise} \end{cases}$$

Using properties of convolution, we can express $h(t)$ as

$$h(t) = u(t) * [\delta(t - 1) - \delta(t - 2)]$$

so that the system could be implemented by a cascade of an integrator followed by a parallel combination of two delay systems. ■