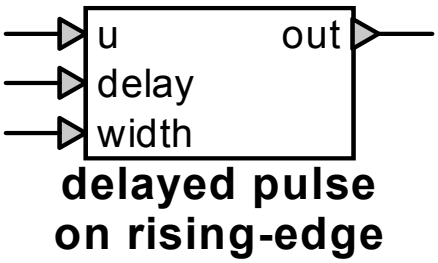
Control function: delayed pulse on rising-edge



1 Description

This device produces a pulse of amplitude 1, with starting and stopping determined dynamically by the value of the inputs.

1.1 Pins

This device has four pins:

pin	*type*	*description*
u	input	triggering signal
delay	input	delay before starting
width	input	variable pulse width
out	output	generated pulses

1.2 Parameters

The following parameters must be defined:

parameter	*description*	*units*
stepped	=1 to indicate stepped transitions =0 to indicate ramped transitions	

The value of the parameter *stepped* determines whether the device operates with *stepped* or *ramped* transitions. In *stepped* mode (the default for ideal logical signals), the output is represented as a stepped signal, where changes in value are observed as vertical steps at the time they occur. In *ramped* mode, the value transitions of the output are seen as ramps between $t-\Delta t$ and t.

1.3 Input

The input pins may be connected to any control signal.

1.4 Output

The output is a series of pulses generated dynamically according to the variable values of triggering, delay and width provided as inputs.

The representation of the output as having *stepped* or *ramped* transitions is determined by the value given to the parameter *stepped*.

1.5 Representation

The implementation of the model can be inspected by opening the device's subcircuit.

The value of the output is 0 or 1 as determined by the following rules:

$$\begin{aligned} &\text{out} = 1 \quad \text{when } T_{on} \le t_{trig} < T_{off} \\ &\text{out} = 0 \quad \text{otherwise} \end{aligned} \tag{1}$$

where

$$\begin{aligned} T_{on} &= t_{trig} + \text{delay} \\ T_{off} &= T_{on} + \text{width} \end{aligned} \tag{2}$$

and where

$$t_{trig} \text{ is held constant for at least delay} + \text{width seconds} \tag{3}$$