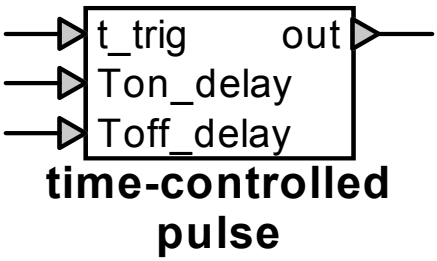
# Control function: time-controlled pulse






## 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* |
|---|---|---|
| t_trig | input | pulse triggering time |
| Ton_delay | input | delay before starting |
| Toff_delay | input | delay before stopping |
| out | output | generated pulses |

### 1.2 Parameters

The following parameters must be defined:

| *parameter* | *description* | *units* |
|---|---|---|
| stepped | =1 to indicate stepped transitions<br>=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 instant and Ton,Toff delays 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:

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

where

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