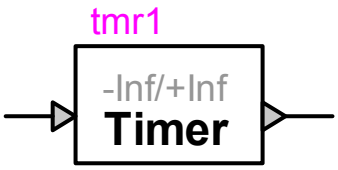
Control device : timer



1 Description

This device applies starting and stopping instants to the input signal. During the user-specified interval, the output takes the value of the input. Outside the interval, the output value is zero.

1.1 Pins

This device has two signal pins:

pin	*description*	*value when unconnected*
in	input	0
out	output	as calculated

1.2 Starting instant

Selection options for the starting instant:

starting instant
start in steady-state
start after t = 0
start at t = constant value

1.3 Stopping instant

Selection options for the stopping instant:

stopping instant

stop at $t =$ constant value
never stop

1.4 History

No user-defined history is required.

1.5 Scopes

Setting the scope flag enables monitoring of the output signal during the simulation.

1.6 Output signal interpolation

During the simulation, the output value of this device is calculated at successive instants t at intervals Δt. Between these simulation instants, the output value can be set to vary in one of two modes, ramped or stepped:

mode	*output value between* $t - \Delta t$ *and* t^-	*value at* t^-	*value at* t
ramped	interpolated linearly between values out($t - \Delta t$) and out(t^-)	calculated at t^-	calculated at t
stepped	remains at out($t - \Delta t$)	remains at out($t - \Delta t$)	calculated at t

2 Time-domain representation

In the time-domain calculation at t>0, the output value is calculated as follows:

$$\begin{aligned} &\text{if } Tstart \le t < Tstop, && out(t) = in(t) \\ &\text{else} && out(t) = 0 \end{aligned} \qquad (1)$$

3 Steady-state representation

In the steady-state calculation at t=0, the output value is calculated as follows:

$$\begin{aligned} &\text{if } Tstart < 0, && out(0) = in(0) \\ &\text{else} && out(0) = 0 \end{aligned} \qquad (2)$$

4 Netlist

4.1 Format

Netlist format:

```
_c_tmr;name;2;2;out,in,
Tstart,Tstop,step/ramp,scope,
```

field	*description*	*value*
c_tmr name 2 2	part name instance name pin count pin count	
out in	signal name of the output signal name of the input	
tstart	starting instant	
tstop	stopping instant	
step/ramp	output interpolation	"S1" for stepped "S0" for ramped
scope	monitoring, optional	"?s" for enabled