edge_delay.xbe

Attributes

```
xbe name=edge_delay evaluate=yes limit_tstep=yes save_history=yes allow_ssw=no
#
# shift input signal by the given delay. The input signal is assumed
# to be x_high or x_low (like clock signals)
#
# the total delay is n_delay*(theta_delay)+theta_delay_1, converted to time
#
Jacobian: variable
input_vars: x
output_vars: y
aux_vars:
iparms:
+  n_delay=1
+  flag_frequency=1
+  flag_period=0
+  flag_zero_delay=0
sparms:
# Note: frequency (or T) is used only to convert theta_delay
# to t_delay. The input signal is not required to be periodic.
rparms:
+  x_low=0
+  x_high=1
+  frequency=0
+  T=0
+  theta_delay=0.0
+  theta_delay_1=0.0
+  t_delay=0
+  x_last=0.0
+  t_low_to_high=0
+  t_high_to_low=0
+  x_cross=0
+  epsl2=0
+  epsl3=0
stparms:
igparms:
outparms: x y
```

Description

`edge_delay.xbe` is used for shifting a clock- or PWM-type signal by a delay interval Δ. Its behaviour is controlled by integer parameters `flag_frequency`, `flag_period`, `n_delay`, and real parameters `frequency`, `T`, `x_low`, `x_high`, `theta_delay`, `theta_delay_1`.

The delay interval is computed in terms of T (which is typically a clock period) as

$$\Delta = (n\,\theta + \theta')\,\frac{T}{360}\,, \tag{1}$$

where n, θ, θ' are given by `n_delay`, `theta_delay`, `theta_delay_1`, respectively. The remaining parameters have the following meaning.

`frequency`: If `flag_frequency` is 1, then T in Eq. 1 is computed as 1/`frequency`.

`T`: If `flag_period` is 1, then `T` gives T in Eq. 1.

x_low: Low level (in both input and output waveforms).

x_high: High level (in both input and output waveforms).

x and y are made available as output variables. Fig. 1 illustrates the working of this element.

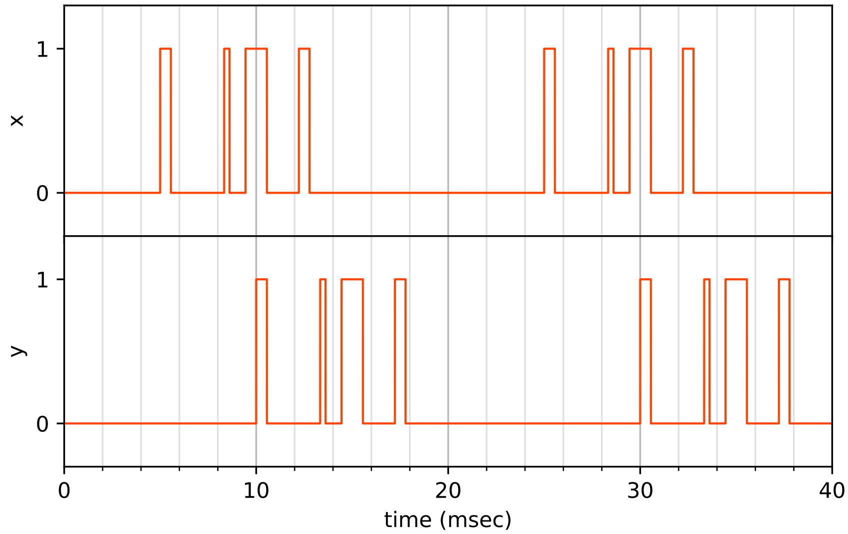

Figure 1: Input $x(t)$ and output $y(t)$ for edge_delay.xbe. The parameter values are flag_frequency = 1, flag_period = 0, frequency = 50, n_delay = 1, theta_delay = 90, theta_delay_1 = 0, x_low = 0, x_high = 1.