clock_1a.xbe

Attributes

```
xbe name=clock_1a evaluate=yes limit_tstep=yes
# clock source, with f_hz and duty cycle specified
Jacobian: constant
input_vars:
output_vars: y
aux_vars:
iparms:
sparms:
rparms:
+  f_hz=1e3
+  D=0.5
+  y_low=0
+  y_high=1
+  delta1=0.01
+  delta2=0.01
+  t0=0
+  T1=0
+  T2=0
+  T=0
+  L0=0
+  tk1=0
+  tk2=0
+  tk3=0
+  tk4=0
+  tk5=0
+  slope1=0
+  slope2=0
+  epsl=0
stparms:
igparms:
outparms: y
```

Description

`clock_1a.xbe` is a square wave source with `y` as its output. In the first interval (`T1`) of each period, $y = y_{\text{high}}$, and in the second interval (`T2`), $y = y_{\text{low}}$. The parameters have the following meaning.

`f_hz`: Frequency in Hz.

`D`: Duty ratio; e.g., `D=0.5` means a duty ratio of 50%.

`t0`: An "offset" time interval by which the waveform is shifted (to the right).

`delta1`: Width of the transition from the `T2` phase to the `T1` phase.

`delta2`: Width of the transition from the `T1` phase to the `T2` phase.

`y` is made available as an output variable. The effect of the various paramters of `clock_1.xbe` on $y(t)$ is shown in the following figures.

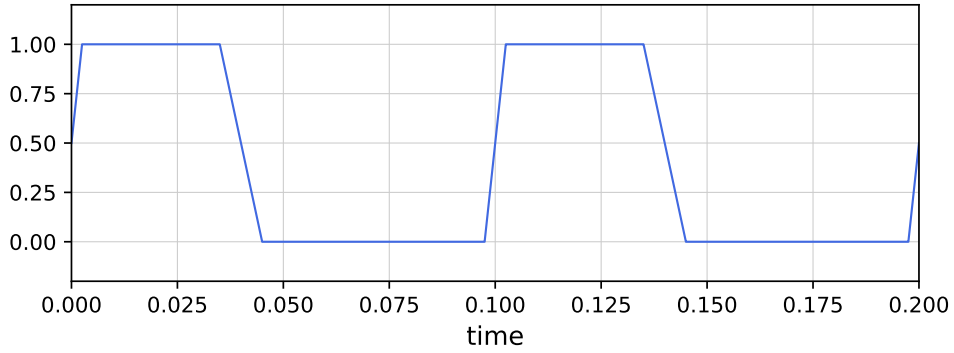

Figure 1: $y(t)$ obtained with $\texttt{y\_low} = 0$, $\texttt{y\_high} = 1$, $\texttt{f\_hz} = 10$, $\texttt{delta1} = 0.005$, $\texttt{delta2} = 0.01$, $\texttt{D} = 0.4$. $\texttt{t0} = 0$.

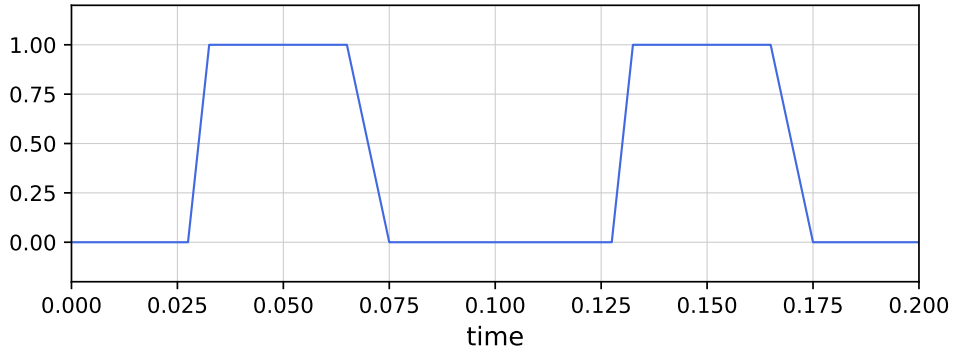

Figure 2: $y(t)$ obtained with $\texttt{y\_low} = 0$, $\texttt{y\_high} = 1$, $\texttt{f\_hz} = 10$, $\texttt{delta1} = 0.005$, $\texttt{delta2} = 0.01$, $\texttt{D} = 0.4$. $\texttt{t0} = 0.03$.

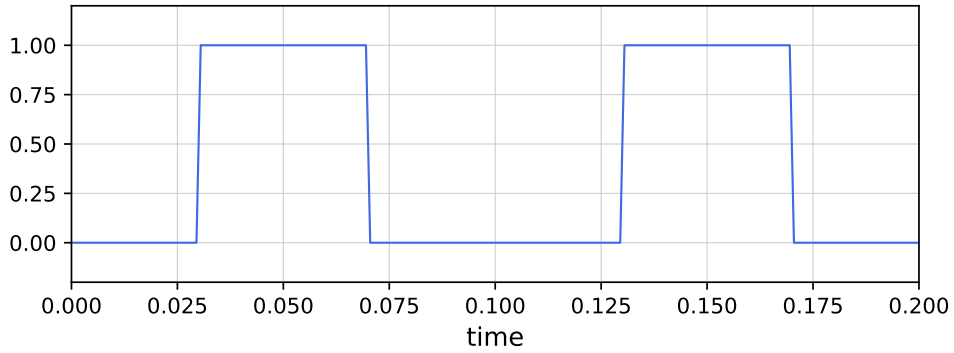

Figure 3: $y(t)$ obtained with $\texttt{y\_low} = 0$, $\texttt{y\_high} = 1$, $\texttt{f\_hz} = 10$, $\texttt{delta1} = 0.001$, $\texttt{delta2} = 0.001$, $\texttt{D} = 0.4$. $\texttt{t0} = 0.03$.