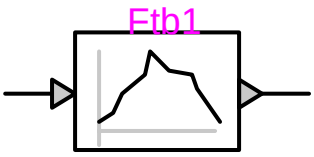
Control device : table function



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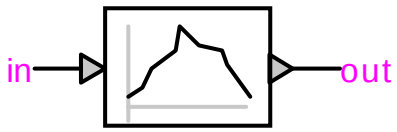
1 Description

This device applies the specified table function to its input. The function is specified as a lookup table. Staircase and linear interpolation may be applied to the table entries.

1.1 Pins



This device has two signal pins:

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

1.2 Lookup table

The function is defined in the form of a lookup table of (x,f(x)) value pairs. The number of value pairs is arbitrary. The lookup values will be interpolated between the specified value points, using staircase or linear interpolation as specified by the user.

1.3 History

Selection options for the history value of the output signal:

option	*value*	*rules*
zero	Inherit from input	
constant value	history(t) = user-defined value	any value, 0 means inherit, use 0.0 to get 0.
function value	history(t) = user-defined function	constant or f(t)

1.4 Scopes

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

1.5 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:

$$out(t) = f(in(t)) \quad (1)$$

3 Steady-state representation

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

if history is defined, $out(0) = history(0)$
else $out(0) = f(in(0))$ (2)

4 Netlist

4.1 Format

Netlist format:

```
_c_ftb;name;2;2;out,in,
history,interpolation,step/ramp,scope,
history function expression
;
space-separated value pair 1
space-separated value pair 2
...
space-separated value pair n
```

field	*description*	*value*
c_ftb name 2 2	part name instance name pin count pin count	
out in	signal name of the output signal name of the input	
history	history	constant value or "H" for function
interpolation	interpolation kind	"0" for staircase "1" for linear
step/ramp	calculation mode	"S1" for stepped "S0" for ramped
scope	monitoring, optional	"?s" for enabled
history function expression	optional, required when history field is "H"	
;	optional, required when the above line is present	
space-separated value pairs		