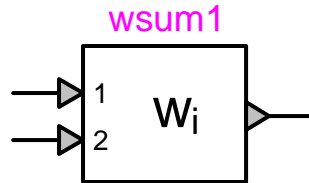


Control device : weighted sum

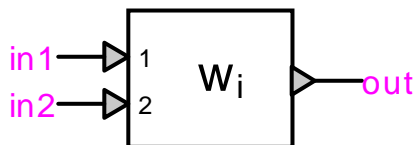


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1 Description

The output of this device is the weighted sum of its inputs. The weight coefficients are user-defined parameters.

1.1 Pins



This device has two or more signal pins:

<i>pin</i>	<i>description</i>	<i>value when unconnected</i>
in1	input 1	0
...	more inputs	0
out	output	as calculated

1.2 Weight coefficients

The weight of each input is a user-defined constant value. The number of inputs is derived from the number of specified weights.

<i>parameters</i>	<i>rules</i>
weights	space-separated list of constant values
count of weights	$1 \leq n \leq 32$

1.3 Gain

The gain is a user-defined constant value.

<i>parameters</i>	<i>rules</i>
gain	constant value

1.4 History

Selection options for the history value of the output signal:

<i>option</i>	<i>value</i>	<i>rules</i>
zero	Inherit from inputs	any value, 0 means inherit, use 0.0 to get actual 0. constant or f(t)
constant value	history(t) = user-defined value	
function value	history(t) = user-defined function	

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:

<i>mode</i>	<i>output value between $t - \Delta t$ and t^-</i>	<i>value at t^-</i>	<i>value at t</i>
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:

$$out(t) = \sum_{k=1}^n (coef_k \cdot in_k(t)) \quad (1)$$

where

n count of inputs
coef weight coefficient

3 Steady-state representation

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

if history is defined, $out(0) = history(0)$

$$\text{else} \quad out(0) = \sum_{k=1}^n (coef_k \cdot in_k(0)) \quad (2)$$

where

n count of inputs
coef weight coefficient

4 Netlist

4.1 Format

Netlist format:

```
_c_sum;name;npins;npins;out,list(inputs),  
history,gain,step/ramp,scope,  
history function expression  
;  
list of input coefficients
```

<i>field</i>	<i>description</i>	<i>value</i>
c_sum name npins npins	part name instance name pin count pin count	1+count(inputs) 1+count(inputs)
out list(inputs)	signal name of the output signal names of the inputs	
history	history	constant value or "H" for function
gain	gain multiplier	
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	
list of input coefficients	space-separated list of input coefficients	