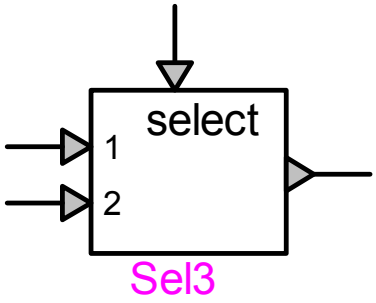
Control device : input selector

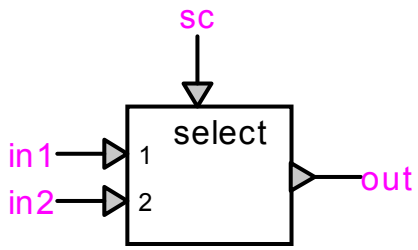


Control device : input selector 1
1 Description 1
1.1 Pins 2
1.2 Parameters 2
1.3 History 2
1.4 Scopes 2
1.5 Output signal interpolation 2
2 Time-domain representation 3
3 Steady-state representation 3
4 Netlist 3
4.1 Format 3

1 Description

This control device selects one of the inputs as output, as determined by the value of the selection control signal.

1.1 Pins



This device has four or more signal pins:

pin	*description*	*value when unconnected*
in1	input 1	0
in2	input 2	0
...	more inputs	0
sc	selection control	0
out	output	as calculated

1.2 Parameters

The following parameters can be specified:

parameters	*rules*
count of inputs	$2 \le n \le 32$
initial selection at t=0	

1.3 History

No user-defined history is required.

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 the 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:

$$out(t) = in_k(t), \quad \text{where} \quad k = \max(1, \min(n, sc(t))) \tag{1}$$

3 Steady-state representation

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

$$\begin{aligned} &\text{if } k0 > 0, \quad out(t) = in_{k0}(t), \quad \text{where } k0 = \text{initial selection index} \\ &\text{else} \qquad\quad out(t) = in_k(t), \quad \text{where } k = \max(1, \min(n, sc(0))) \end{aligned} \tag{2}$$

4 Netlist

4.1 Format

Netlist format:

```
_c_sel;name;npins;npins;out,sc,list(inputs),
k0,step/ramp,scope,
```

field	*description*	*value*
c_sel	part name	
name	instance name	
npins	pin count	2+count(inputs)
npins	pin count	2+count(inputs)
out	signal name of the output	
sc	signal name of the selection control	
list(inputs)	signal names of the inputs	
k0	selection index at t=0	
step/ramp	calculation mode	"S1" for stepped "S0" for ramped
scope	monitoring, optional	"?s" for enabled

The comma separated data is saved into the ParamsA attribute of this device