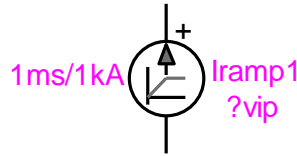


Ramp current source device



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1 Available versions

The "I ramp" device accepts both 1-phase (general) and 3-phase signals. The 3-phase version is the equivalent of 3 decoupled sources (one for each phase).

1.1 When changing phases

- ❑ When the device is in its 1-phase state and its signal is changed to 3-phase, but the device is not double-clicked, balanced conditions are assumed and the 3 sources become identical to the 1-phase (phase-A) version. The Netlist is generated for the 3-phase version.
- ❑ When the device is in its 3-phase state and its signal is changed to 1-phase, but the device is not double-clicked, phase-A quantities are automatically retained for the 1-phase version. The Netlist is generated for the 1-phase version.

1.2 The generic version of "I ramp"

1.2.1 Parameters

The generic version of "I ramp" has two pins.

The model parameters corresponding to the source function picture shown on the first data tab are:

- ❑ t_{start} start time, if $t < t_{start}$ the source is an open-circuit.
- ❑ t_0 rise time to I_m
- ❑ I_m maximum voltage of the ramp
- ❑ t_{stop} stop time, if $t > t_{stop}$ the source is an open-circuit. The stop time must be greater than the start time.

1.2.2 Netlist format

```
_lramp;lramp1;2;2;s1,s2,  
0,1ms,1kA,10ms,?v,?i,?p,
```

Field	Description
<code>_lramp</code>	Part name
<code>lramp1</code>	Instance name, any name.
<code>2</code>	Total number of pins
<code>2</code>	Number of pins given in this data section
<code>s1</code>	Signal name connected to k-pin (positive), any name
<code>s2</code>	Signal name connected to m-pin, any name
<code>t_{start}</code>	Start time
<code>t₀</code>	Rise time t_0
<code>I_m</code>	Maximum current of ramp
<code>t_{stop}</code>	Stop time
<code>?v</code>	Request for voltage scope, sent to scope group vb (branch voltages), optional
<code>?i</code>	Request for current scope, sent to scope group ib (branch currents), optional
<code>?p</code>	Request for power scope, sent to scope group p (branch power), optional

The m-pin of this device can be deleted to create an automatic ground connection.

An example of Netlist for the 3-phase version is given by:

```
_lramp;lramp1a;2;2;s33a,s34a,  
0,1ms,1kA,10ms,?v,?i,?p,  
_lramp;lramp1b;2;2;s33b,s34b,  
0,1ms,1kA,10ms,?v,?i,?p,  
_lramp;lramp1c;2;2;s33c,s34c,  
0,1ms,1kA,10ms,?v,?i,?p,
```

EMTPWorks automatically generates 3 separate (decoupled) sources, one per phase. The phase identification character (a, b or c) is automatically appended to the device instance name and signals.

2 Steady-state model

The steady-state model of this device is an open-circuit.

3 Frequency Scan model

The frequency scan model of this device is an open-circuit.

4 Time-domain model

The device is evaluated at each simulation time-point according to its function.

The source is active (not an open-circuit) for $t_{\text{start}} \leq t \leq t_{\text{stop}}$.