

Description

Use this template to define and generate custom components for a MapleSim model.

Component Description

Enter the name to display in MapleSim after you generate the component. The name must not contain spaces or special characters (for example, & and *).

Component Name:

Component Equations

Specify the component equations that define the behavior of the custom component, component parameters (if applicable), and system model. Use the commands in the **DynamicSystems** package to define a system model. For more information, see the [DynamicSystems](#) help topic.

In the table below, you can change the default variable names for storing component equations and parameters. The system of equations below is an example that can be replaced by the equations for a custom component.

System variable:	<input type="text" value="sys"/>	variable name used for storing system object
Parameter variable:	<input type="text" value="params"/> parameters	variable name used for storing component parameters
Initial Conditions variable:	<input type="text" value="initialconditions"/>	variable name used for storing initial equations

Differentialgleichungssystem des Roessler Attraktors:

$$eq := [diff(x(t), t) = -y(t) - z(t), diff(y(t), t) = x(t) + a \cdot y(t), diff(z(t), t) = b + x(t) \cdot z(t) - c \cdot z(t)]$$

$$\left[\frac{d}{dt} x(t) = -y(t) - z(t), \frac{d}{dt} y(t) = x(t) + a y(t), \frac{d}{dt} z(t) = b + x(t) z(t) - c z(t) \right] \quad (3.1)$$

$$params := [a = 0.2, b = 0.2, c = 5.7]$$

$$[a = 0.2, b = 0.2, c = 5.7] \quad (3.2)$$

$$initialconditions := []$$

$$[] \quad (3.3)$$

```
sys := DynamicSystems[DiffEquation]( eq, inputvariable = [x(t), y(t), z(t)], outputvariable = [x(t), y(t), z(t)] )
```

Warning, diff-eg is nonlinear

Diff. Equation

continuous

3 output(s); 3 input(s)

inputvariable = [x(t), y(t), z(t)]

outputvariable = [x(t), y(t), z(t)]

(3.4)

Component Analysis

Use any of the following tools to test and analyze the equations that you entered above.

Bode Plot (Magnitude)

Bode Plot (Phase)

Root Locus Plot

K from 0 to

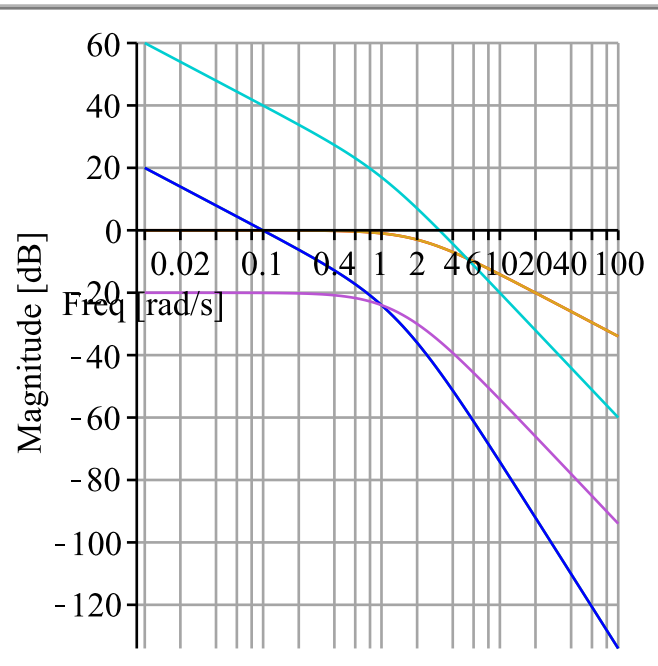
100

Simulate

for 10 s using input signal:

Step

Note: The signal is only applied to the first input. Use [DynamicSystems](#) for full simulation control.

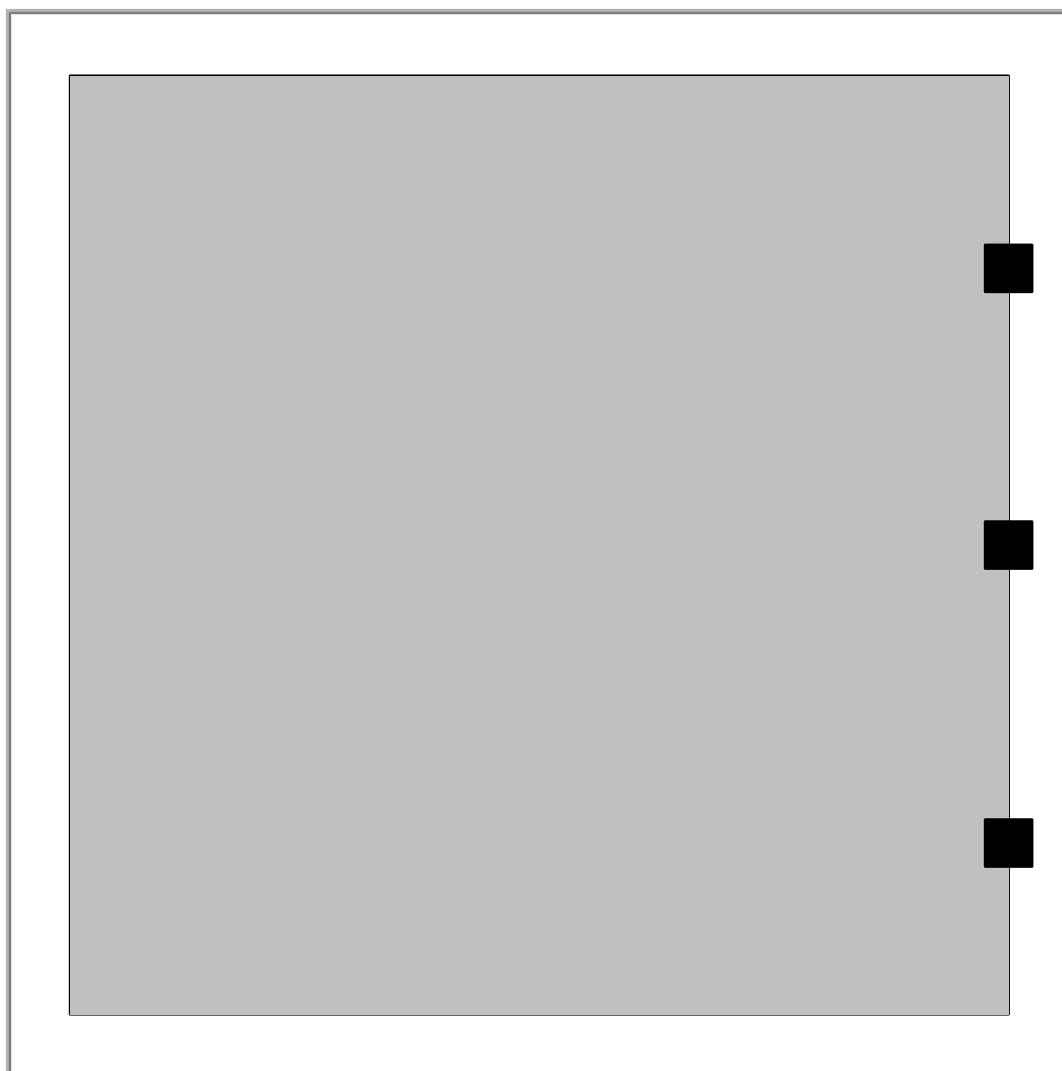


Component Ports

Use the following tools to specify port types and assign values to ports. The options available in the **Port Components** drop-down menus are the input and output variables that you defined in the Component Equations section. Because MapleSim supports acausal modeling, you can assign a combination of input and output variables to a single port.

To start, click **Clear All Ports** to remove the sample ports below. To create a new port, click **Add Port**, select a port type from the **Port Type** drop-down list, and then assign the input and/or output variables to the port in the **Port Components** section.

You can click a port to view its properties or drag a port to position it.



Add Port

Delete Selected Port

Clear All Ports

Port Type: Signal Input

Port Name: inp

Port Components:

value	<input type="text" value="y(t)"/>	<input type="button" value="Choose..."/> ▼
...	<input type="text"/>	<input type="button" value="Choose..."/> ▼
...	<input type="text"/>	<input type="button" value="Choose..."/> ▼
...	<input type="text"/>	<input type="button" value="Choose..."/> ▼
...	<input type="text"/>	<input type="button" value="Choose..."/> ▼

Component Generation

Click **Generate MapleSim Component** to generate the component and make it available in MapleSim. In MapleSim, the custom component will be available in the **User** menu located in the **Subsystems** pane.

Source Details

```

model custom

  parameter Real a = 0.2e0 "a";
  parameter Real b = 0.2e0 "b";
  parameter Real c = 0.57e1 "c";

  Real x (start = 0);
  Real y (start = 0);
  Real z (start = 0);

  annotation(
    Coordsys(
      extent=[-100, -100;
100, 100],
      grid=[2, 2],

```

Optionally, if you want to view or work with the Modelica code associated with a custom component, you can edit the code in the **Source Details** section and click **Generate Component from Source** to regenerate the component.

After generating the custom component, save this worksheet in Maple and then save the .msim file to which this worksheet is attached in MapleSim.