

# Distribution Extensions

A Distributed Property is a property of a Block or a Value Type used to apply a probability distribution to the values of the property. Specific distributions can be defined by applying a Subclass of the «DistributedProperty» stereotype to a property according to [OMG SysML 1.4, E.7 Distribution Extensions](#).

To set a distributed property

1. Select a property and double-click it to open the Specification window.
2. Select **Applied Stereotype** and click [...] to include a distribution property as needed.
3. Specify the required properties, e.g. *Mean* and *Standard Deviation (SD)* for «normal» or **Min** and **Max** for other distributed properties as shown in the figure as follows

The diagram shows a SysML block definition diagram with three blocks: «block» b, «block» system, and «block» mc. Block «b» has a constraint {value < 11} and a value property value: Real = Math.random()\*15. Block «mc» has a value property value: Real = value. Block «system» has a value property value: Real = 100. The Specification window for the «normal» stereotype is open, showing the properties table with Mean = 10.0 and Standard Deviation = 2.0. The Applied Stereotype section shows the «normal» stereotype applied to the «Real» type.

Specification of Value Property normal

Specify properties of the selected Value Property in the properties specification table. Choose the Expert or All options from the Properties drop-down list to see more properties.

normal : Real

Aggregation composite

Applied Stereotype

ValueProperty [Property] [MD Customization for SysML]

Normal [Property] [SysML::Non-Normative Extensions]

Default Value

Is Derived ☐ false

Is Read Only ☐ false

Is Static ☐ false

Mean 10.0

Multiplicity (Unspecified)

Name normal

Standard Deviation 2.0

To Do

Type ☒ Real [SysML::Libraries::PrimitiveValueTypes]

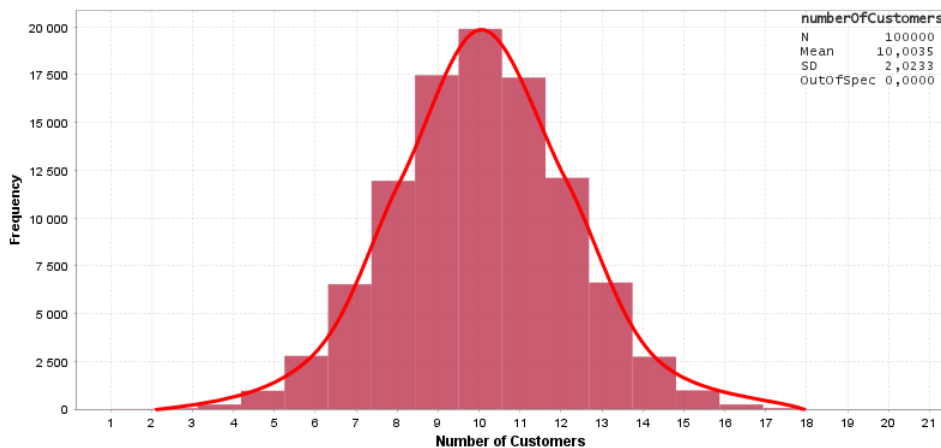
Applied Stereotype

Stereotypes applied to this element.

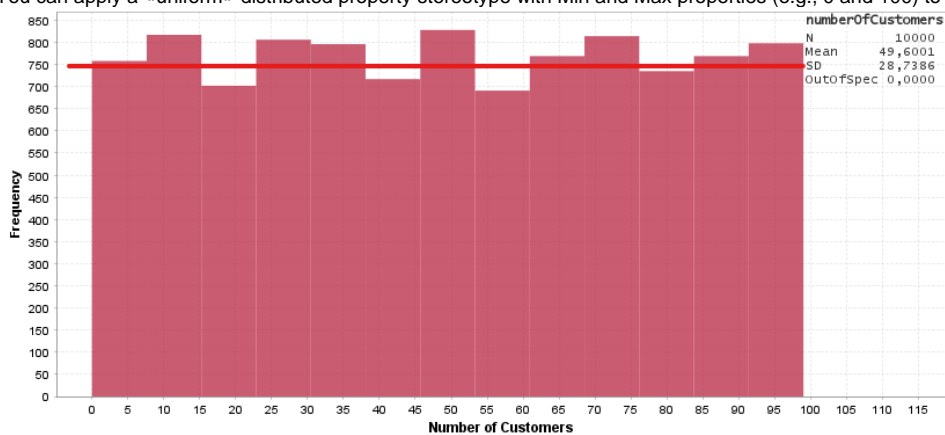
Type here to filter properties

Close Back Forward Help

4. Click **Close**. The distributed property will be applied.
5. Run the simulation model. Depending on the applied stereotype, the distributed properties will be initialized with a random value, e.g. normal distribution, constant distribution between min & max value. You can review sampling results by running the model with association end multiplicity, e.g. 100, and keep the result with «CSVExport» for analysis.
6. Results of the distributed property «normal» (with 100000 samples) with a Mean value of 10 and a Standard Deviation value of 2.



7. You can apply a «uniform» distributed property stereotype with Min and Max properties (e.g., 0 and 100) to plot a uniform distribution chart.



#### Related pages

- [Supported SysML elements](#)
- [Requirements traceability from the Variables pane](#)