Displaying parts and ports

- Ways to display parts and ports
    - Using the Display Parts/Ports dialog
    - Using the diagram toolbar and the shortcut menu
    - Using the smart manipulator toolbar
    - Using the drag-and-drop operation in the SysML Internal Block diagram
- Displaying properties of a port

You can display ports, properties, and deep nested ports and properties that have already been created in all structure diagrams. This functionality is driven by stereotypes, which allow you to display properties on which stereotypes have been applied. If you have applied your own stereotypes for the elements (e.g., electrical, mechanical, optical), you can use those stereotypes when selecting the properties you want to display on the diagram pane.

> **Note**
>
> For more information about how to create custom stereotypes and apply them, see UML Profiling and DSL Guide.

This page contains the following information:

- Ways to display parts and ports
    - Using the Display Parts/Ports dialog
    - Using the diagram toolbar and the shortcut menu
    - Using the smart manipulator toolbar
    - Using the drag-and-drop operation in the SysML Internal Block diagram
- Displaying properties of a port

Ways to display parts and ports

You can display ports and properties in the following ways:

- Using the Display Parts/Ports dialog
- Using the diagram toolbar and the shortcut menu
- Using the smart manipulator toolbar
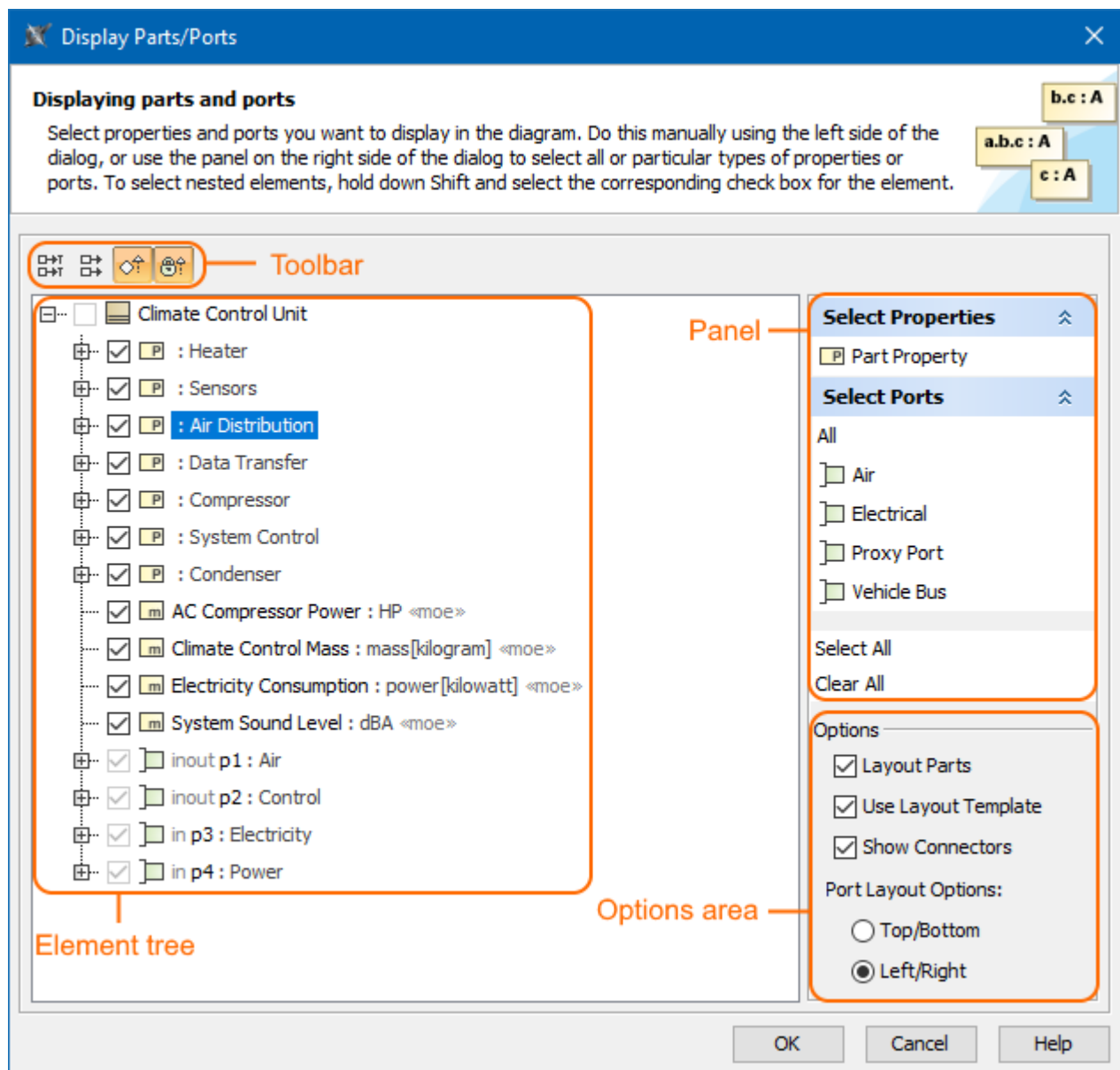- Using the drag-and-drop operation in the SysML Internal Block diagram

Using the Display Parts/Ports dialog

You can use the **Display Parts/Ports** dialog to control how much of a structure should be displayed. The **Display Parts/Ports** dialog opens automatically when creating a new SysML Internal Block diagram for a Block element that owns ports and properties. It can also be accessed and opened in the structure diagrams that have already been created. The **Display Parts/Ports** dialog allows you to:

- Preview all parts, ports, and other properties in one place.
- Manually or automatically select required parts, ports, and other properties you want to display.
- Manually or automatically choose deeply nested parts, ports, and other properties you want to display.
- Define layout options for parts.
- Specify layout options for ports.

The **Display Parts/Ports** dialog consists of the following areas:

- *Dialog toolbar* allows you to show or hide additional information about listed elements.
- *Element tree* displays all owned internal structure of context Block.
- *Panel* is a context-sensitive area that depends on the selected property from the Element tree. It allows you to batch select parts/ports in the Element tree. You can select all, clear all, or choose only properties by type, stereotype, or aspect.
- *Options* area allows you to choose the layout of the selected parts and ports when they appear in the diagram.

The following procedure will guide in working with the **Display Parts/Ports** dialog when you want to display required ports and properties on the diagram pane.

To display ports and properties using the **Display Parts/Ports** dialog

1. Open the **Display Parts/Ports** dialog:

   - When creating a new SysML Internal Block diagram, the dialog opens automatically.
   - When editing an already created structure diagram, the dialog can be opened in the following ways:

     - Select either a diagram frame or single/multiple element shapes, and, on the diagram toolbar, click [icon] and choose **Display Parts /Ports**.
     - Right-click either a diagram frame or single/multiple element shapes, and select **Display** > **Display Parts/Ports**.

2. (Optional) Enable buttons from the **Display Parts/Ports** dialog toolbar if you want to show or hide additional information about listed elements:

   - Click [icon] to show the full path of elements.

   - Click [icon] to show the full types of elements.

   - Click [icon] to show the inherited elements.

- Click ⊕ to show the inherited properties.

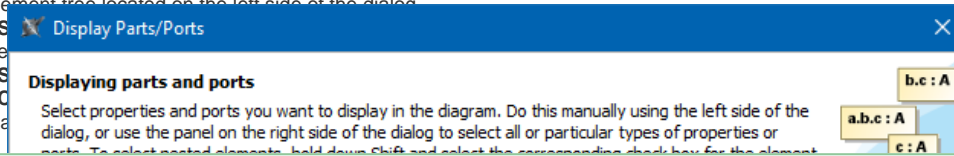3. Choose the properties you want to display by using one or more of the following methods:

> ⚠ **Warning**
> If some check boxes are inactive in the element list, those elements are already displayed in the diagram.

- Use the element tree located on the left side of the dialog:
  - Manually select individual check boxes one by one.
  - Select recursively nested elements by holding down the Shift key while selecting the corresponding check box for the element.

> ✅ **Example 1**
> All properties (in this example all ports *AirFlowPort, ElectricityPort, AutomotiveBusesPort*) of the *Air Distribution* Part Property are
> selected recursively by holding down the Shift key while selecting the corresponding check box from the element tree in the **Display**
> **Parts/Ports** dialog.

- Use the context-sensitive panel located on the right side of the dialog:
  - **Select Properties** group - displays all property types (including your own stereotypes) that are owned by the selected element from the element tree located on the left side of the dialog.
  - **S** ... ment from the element tree ...
  - **S** ... log.
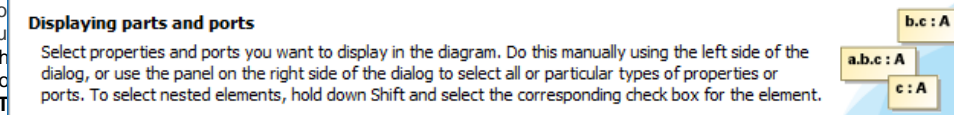 - **O** ... on the left side of the dialog ...

> ✅ **Example 2**
> All Electrical ports (in this example only one *ElectricityPort* port) of the *Data Transfer* Part Property are selected in the element tree by
> using the **Select Ports** group in the context-sensitive panel of the **Display Parts/Ports** dialog.

4. Specify the ...
   - Pa ... omatic layout.
   - Us ... lied. When this check box ... plate are selected auto ...
   - Sh ...
   - Po ...
     - T ...

5. Click **OK**.

After those steps, all ... am pane.

Using the diagra...

In the structure diagr... ands from:

- The **Display**...
- The **Display**...

You can also use the ... se commands are interactive and depen... m pane, both the menu contains only the commands that can be applied to the selected Part Property shape. If you select nothing in the diagram pane, both the menu shows commands that can be applied to the whole diagram.

These commands under the **Display** button and shortcut menu are comprised of elements that are still not displayed on the diagram according to their:

- Metatypes.
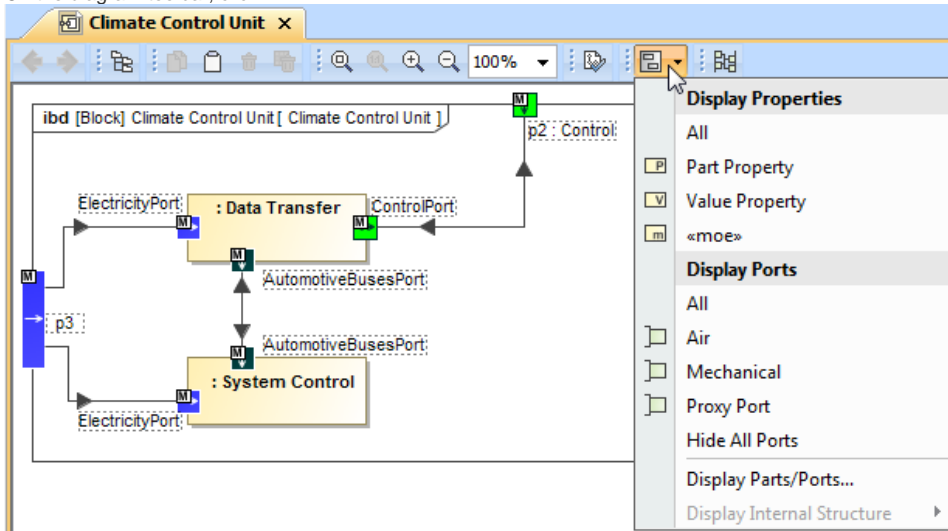- Stereotypes.
- Types stereotypes.

The following procedures will show you how to:

- How to display Ports, Properties using the **Display** button.
- How to display Ports, Properties using the shortcut menu.
- How to hide Ports.

To display ports, properties using the **Display** button

1. Select either a diagram frame or single/multiple element shapes.

2. On the diagram toolbar, click ⊟ ▼.

3. From the opened command menu, select required properties or ports to display:
   - All ports that are available to display are listed under the **Display Ports** command group.

> ⚠ **Important**
> If nothing is selected on the diagram pane, the **Display Ports** command group will contain commands that allow you to display two levels of structure: ports are displayed on the diagram frame and on the first level parts.
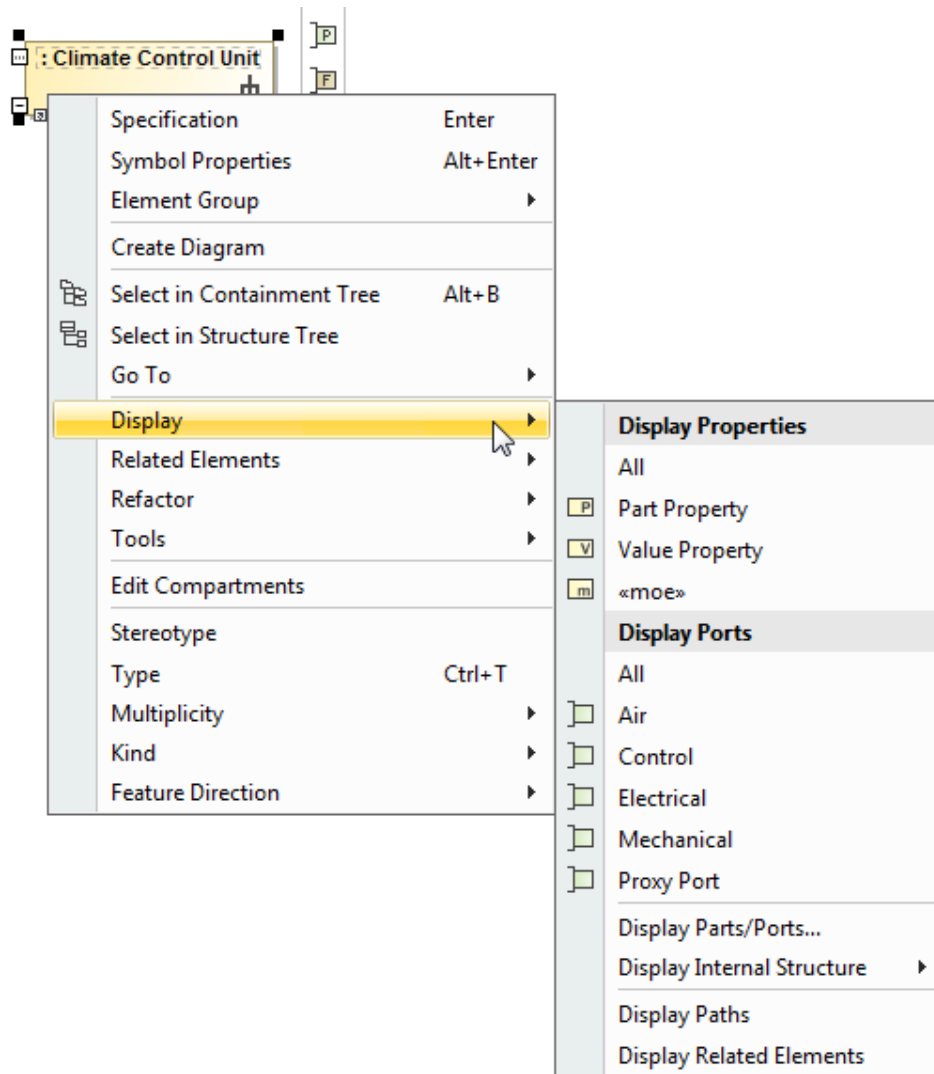
   - All properties that are available to display are listed under the **Display Properties** command group.

   After selecting the required command from the **Display** button, the appropriate properties are displayed on the diagram pane.

To display ports, properties using the shortcut menu

1. Right-click either the diagram pane or single/multiple element shapes.

2. From the shortcut menu, select the **Display** command group.

3. From the opened command menu, select required properties to display:
   - All Ports that are available to display are listed under the **Display Ports** command group.

> ⚠ **Important**
> If nothing is selected on the diagram pane, the **Display Ports** command group allows you to display two levels of structure: ports are displayed on the diagram frame and on the first level parts.

   - All Properties that are available to display are listed under the **Display Properties** command group.
   After selecting the required command from the **Display** command menu, the appropriate properties, ports are displayed onto the diagram pane.
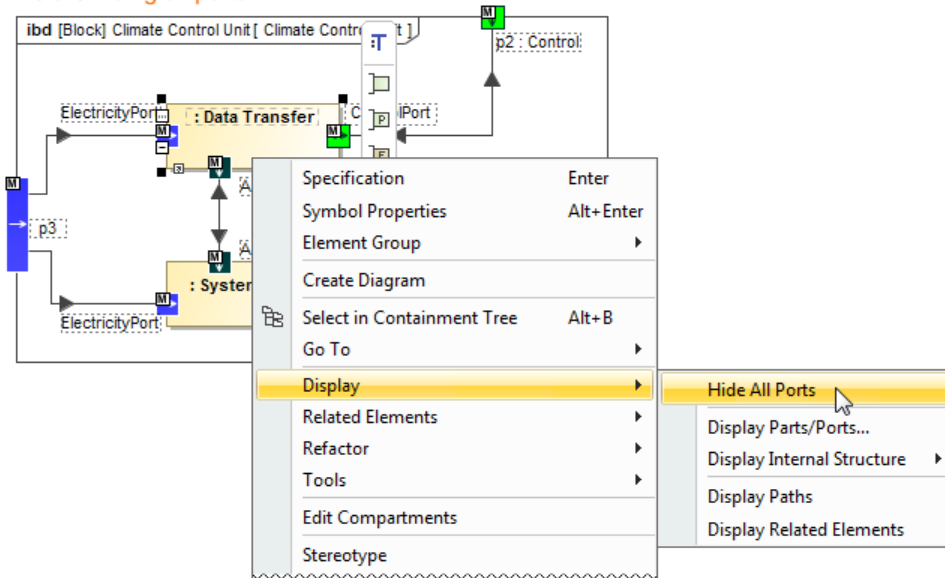
To hide ports

- Select either a diagram pane or any number of element shapes, and, on the diagram toolbar, click 🖳 ▾ and choose **Hide All Ports**.
- Right-click either a diagram pane or any number of element shapes, and select **Display** > **Hide All Ports**.
  After selecting the command, the ports of the selected shape will be hidden from the diagram pane, but not removed from the model.
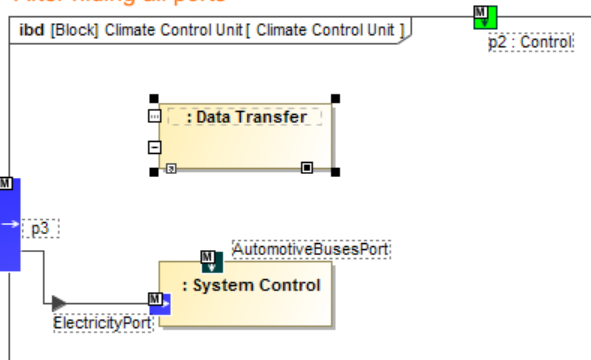
> ⚠ **Warning**
> If the **Hide All Ports** command doesn't appear, the selection or diagram doesn't contain any ports that can be hidden.
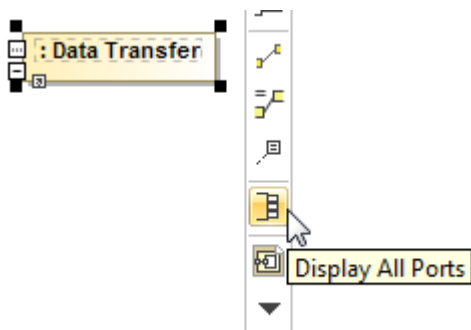
Before hiding all ports

After hiding all ports

Using the smart manipulator toolbar

When the properties are already displayed on the structure diagrams, you can display their direct ports using the **Display All Ports** button from the smart manipulator toolbar. It does not allow you to display deeply nested ports, only first level ports. To display deeply nested ports, you should use the **Display Parts/Ports** dialog. Follow the steps below to learn how to display ports of a selected property shape.

To display Ports on shapes

1. **Select** the required element shape or a diagram frame.
2. From the smart manipulator toolbar, click ⊟.
   All first level Ports of the selected shape will be displayed on the diagram pane.

> **Warning**
> If the **Display All Ports** button is not available, the selected element or diagram doesn't own any Port.

Using the drag-and-drop operation in the SysML Internal Block diagram

The most efficient way to create a new Part Property and display it with all ports in the SysML Internal Block diagram is by dragging the Block or Property elements. This method does not allow you to display deeply nested properties, only first level properties. To display deeply nested elements, use the **Display Parts/Ports** dialog. The following procedures will show you:

- How to create a Part Property shape and how to display all its ports when dragging the Block element.
- How to display a Part Property shape and all its ports by dragging the Part Property element.

You can create a new Part Property by dragging the Block element from the Model Browser to the SysML Internal Block diagram pane. The newly created Part Property will be typed by the dragged Block and displayed on the diagram pane. If this Block has ports defined, you can display them by using the long drag, and selecting an appropriate option from the opened menu (see Example 3).

To create and display a Part Property by dragging a Block element

- Drag a single or a multiple Block element from the Model Browser onto the diagram pane.
- Drag a single or a multiple Block element from the Model Browser onto the diagram pane, and hold it down until the Tooltip appears (long drag). Drop it, and, from the opened menu, select the **Create Property Symbol** command.
  The new Part Property is created in the model, and displayed on the diagram pane. The newly created Part Property is typed by the dragged Block automatically.

To create and display a Part Property and display all its ports by dragging a Block element

- Drag a single or a multiple Block element from the Model Browser onto the diagram pane, and hold it down until the Tooltip appears (long drag).
- Drop it, and, from the opened menu, select the **Create Property Symbol and Display All Ports** command.
  The new Part Property is created in the model, and displayed with all its ports on the diagram pane. The newly created Part Property is typed by the dragged Block automatically.

> ⓘ **Tip**
> After creating an element, it is beneficial to find its location in the model tree by performing one of the following:
>
> - Right-click the shape, and, from the shortcut menu, choose the **Select in Containment Tree** command.
>
> - Select the shape and press Alt+B.

> ✓ **Example 3**

You can display a Part Property shape by dragging a Part Property element from the Model Browser to the SysML Internal Block diagram pane. If this Part Property has ports defined, you can display them by using the long drag, and selecting an appropriate option from the opened menu (see Example 4).

The following procedures describe how to display Part Property shape and all its ports by dragging the Part Property element.

To display a Part Property shape by dragging a Part Property element

- Drag a single or a multiple Part Property element from the Model Browser onto the diagram pane.
- Drag a single or a multiple Part Property element from the Model Browser onto the diagram pane, and hold it down until the Tooltip appears (long drag). Drop it, and, from the opened menu, select the **Create Part Property Symbol** command.
  The Part Property shape is displayed on the diagram pane.

To display a Part Property with all of its ports by dragging a Part Property element

- Drag a single or a multiple Part Property element from the Model Browser onto the diagram pane, and hold it down until the Tooltip appears (long drag).
- Drop it, and, from the opened menu, select the **Create Part Property Symbol and Display All Ports** command.
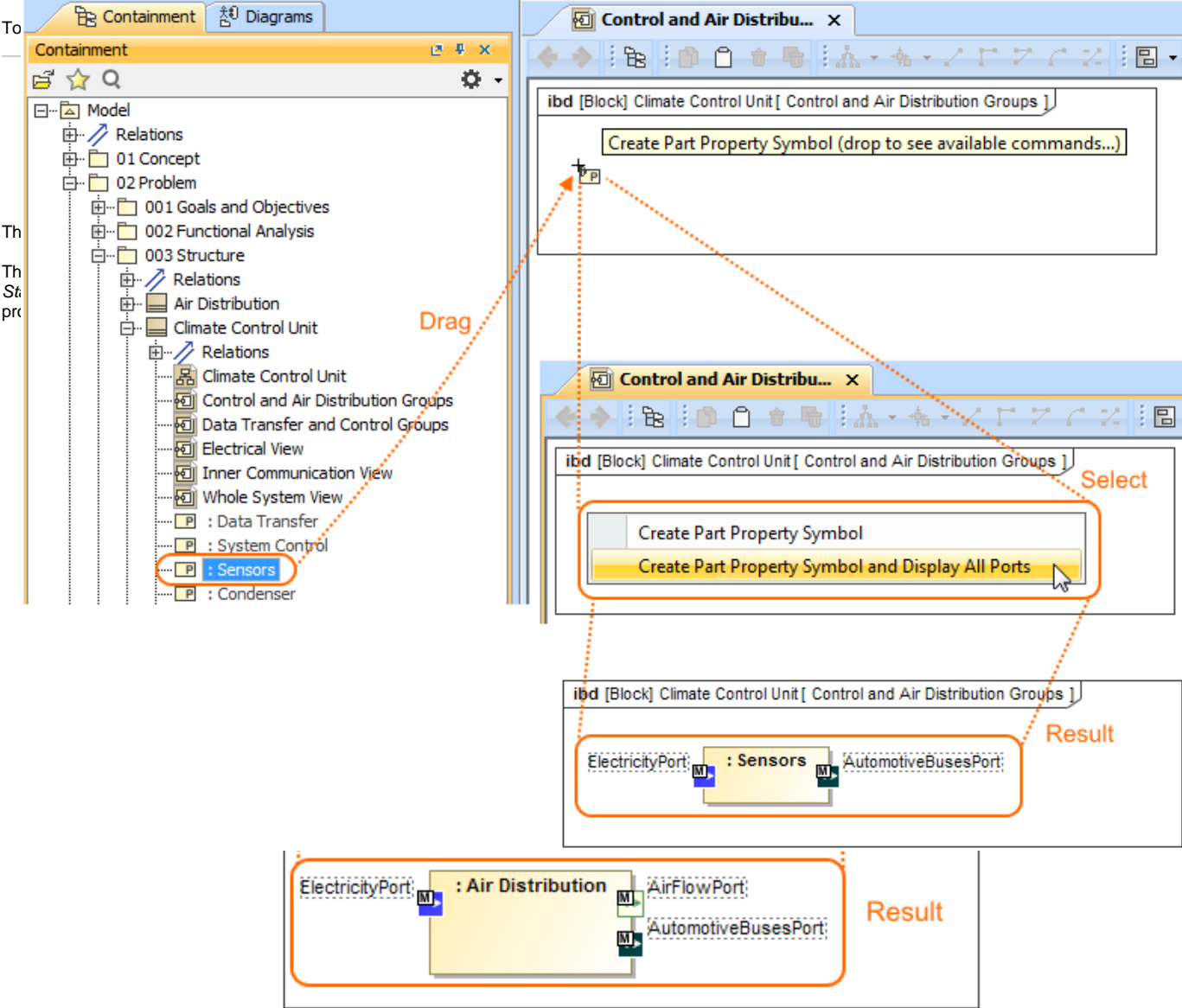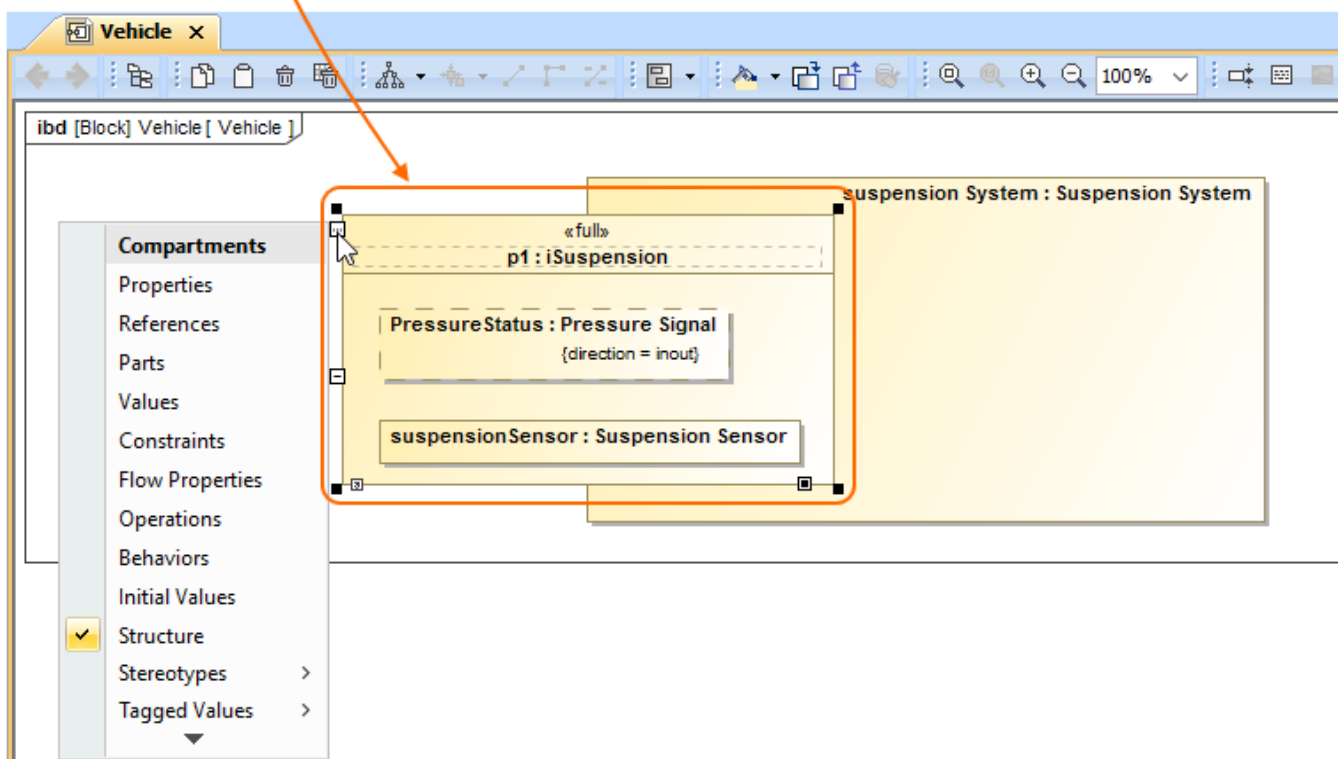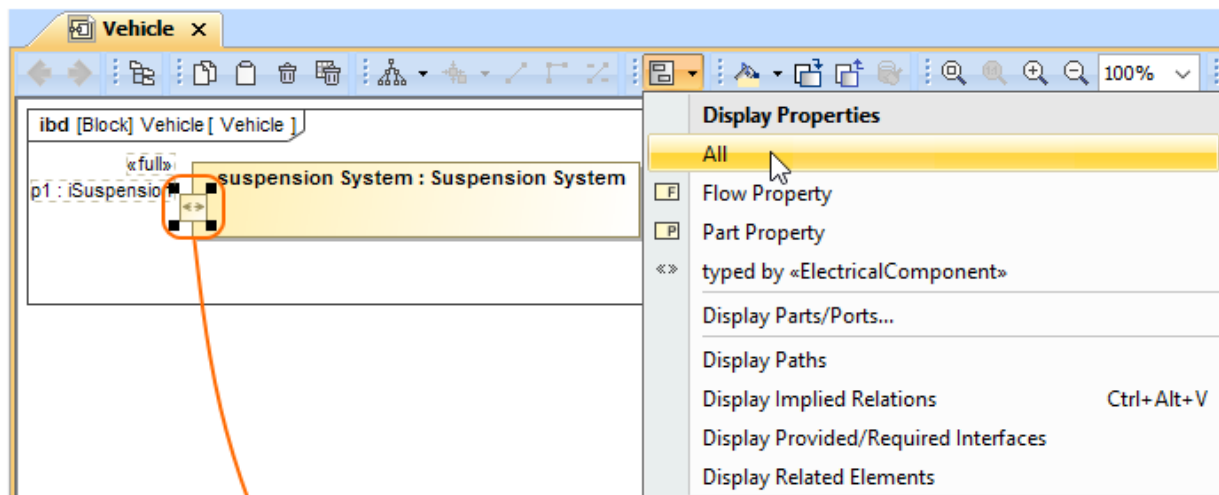 The Part Property shape is displayed with all its ports on that shape.

> ✓ **Example 4**

After completing the steps outlined above, the Part Property shape and/or all its ports are displayed on the SysML Internal Block diagram.

Displaying properties of a port

If you display properties of a port, all properties of its type will be displayed inside the port shape and Part Property compartments will be enabled for that port.

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Drag

Select

Create Part Property Symbol

Create Part Property Symbol and Display All Ports

Result

Result

Related pages

- Applying Stereotypes
- Nesting parts that are association ends
- Mapping ports on a Part type change
- Proxy Port
- Full Port
- Flow Port
- Displaying elements
- SysML Internal Block Diagram
- Autowiring
- Connecting Parts Through Interface
- Enforce Ports Compatibility mode
- Hiding direction arrow on Port shape
- Property path notation

Sample model

The models used in the figures of this page are:

- The **Vehicle Climate Control Unit** sample model. To open this sample download Vehicle Climate Control Unit.mdzip.
- The **Vehicle parts under ports** sample model. To open this sample download Vehicle parts under ports.mdzip.