



## **SysML Hands-On Exercises**

### **Exercise 7.2 SysML Internal Block Diagrams**

#### **MagicDraw**

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#### **OBJECTIVES**

The objective of this exercise is to create an Internal Block Diagram using Proxy Ports. This process is intended to represent specifying part of the internal connectivity for the communications processing components of the UAV.

#### **PREPARATION**

1. This exercise assumes the student has Cameo System Modeler 19.0 (or MagicDraw 19.0 with SysML plug-in) installed correctly on his or her machine with a valid license for use.
2. The student should load the Part 7 course materials onto the computer, specifically Exercise 7.2 Starter UAV.mdzip and Exercise 7.2 Final UAV.mdzip.
3. The student should view the video Introduction to SysML Part 7 Exercise 7.2 in its entirety before attempting the exercise.

#### **NOTES AND CAUTIONS**

We recommend that the student watch the video demonstration of this exercise in its entirety before beginning their own work. The video includes background and explanatory material that is not repeated in the written instructions.

We also recommend that the student read the material carefully. The most common source of error is confusion between blocks, packages and diagrams, some of which have similar names. When the student is not sure what an element is, either in the browser or in a diagram, select that element and look in the Properties tab for the gray label that identifies the element type. Also, be careful in reading the instructions in realizing when an instruction should be carried out in the browser or in a diagram.

## EXERCISE

### 7.2.1 Start Cameo System Modeler

### 7.2.2 Open Exercise 7.2 Starter UAV.mdzip

### 7.2.3 Create an Internal Block Diagram

- Right-click the **Aircraft Platform** block in the browser. Select Create Diagram → SysML Internal Block Diagram.
- Select parts to display as shown in Figure 1. Expand the part properties and select the ports to display as well..
- Name the diagram **Aircraft Platform IBD**.
- The initial diagram should appear similar to Figure 2.
- Rearrange the parts and ports so that the diagram appears similar to Figure 3.

### 7.2.4 Create Proxy Ports for Aircraft Platform block

- Select Proxy Port in the Diagram Toolbar (under the Internal Block Diagram heading), then click on the left side of the diagram frame so that it highlights blue.
- Double-click the new proxy port to open the specification window (Figure 4). Set the Type to the interface block **Uplink**, check the *Is Conjugated* box, and set the name to **p1**.
- Add five additional proxy ports to the **Aircraft Platform** block in the same way, using Table 1 as a guide.

Name	Type	Is Conjugated	Multiplicity
p2	Downlink	no	Unspecified
p4	Radar Data	yes	0..*
p5	Camera Data	yes	0..*
p6	Camera Control	no	0..*
p7	Radar Control	no	0..*
<i>Table 1 Proxy ports for <b>Aircraft Platform</b> block</i>			

- After adding the ports to the diagram frame and dragging the new ports to the positions shown, the diagram should appear as in Figure 5 *Aircraft Platform IBD, third stage*.
- Draw connectors between ports as shown in Figure 6.
- Save and close the project.

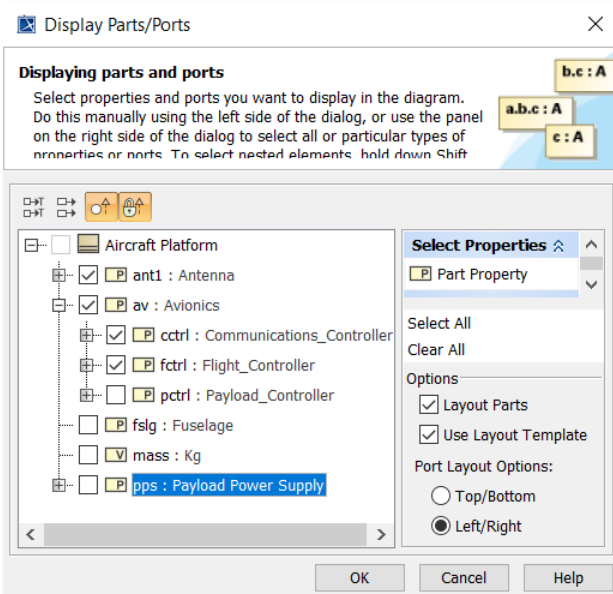


Figure 1 Display parts for internal block diagram

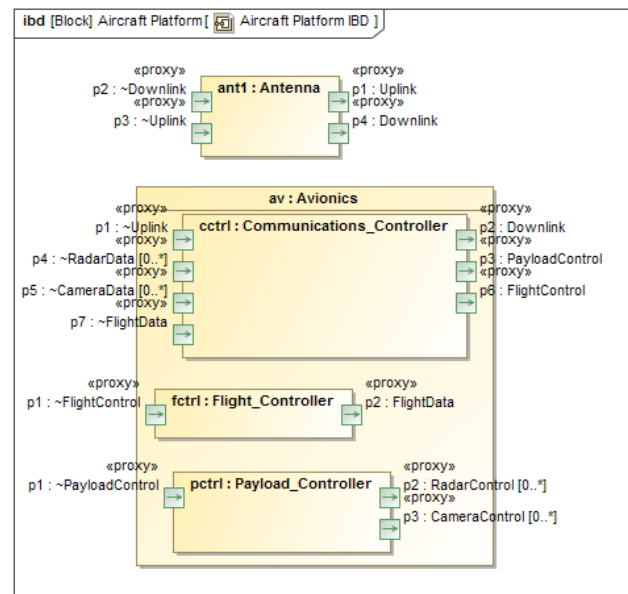


Figure 2 Aircraft Platform IBD, first stage

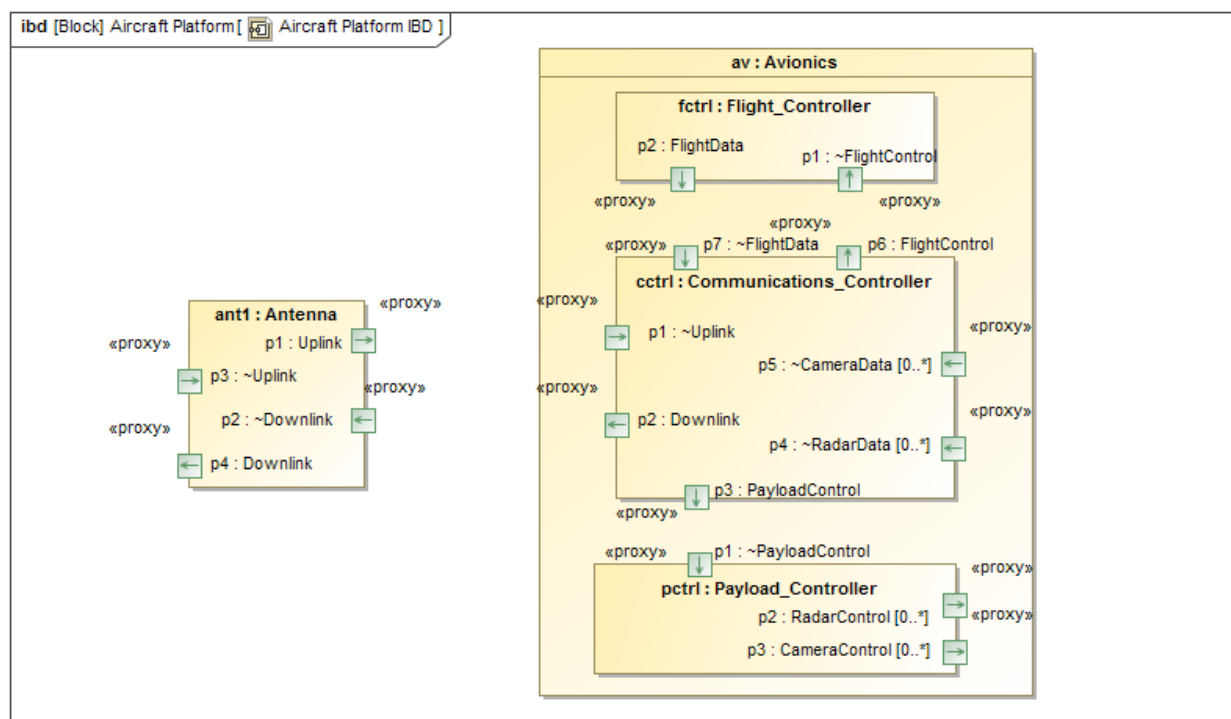


Figure 3 Aircraft Platform IBD, second stage

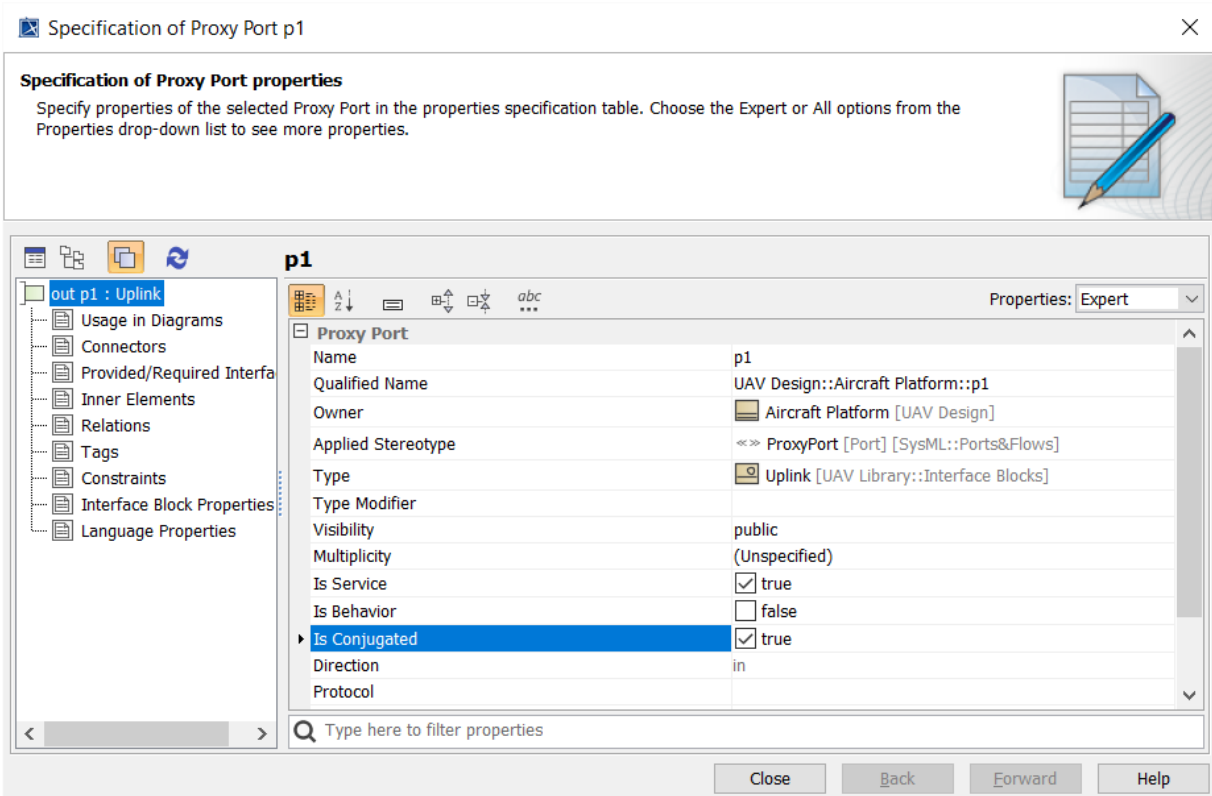


Figure 4 Specification window for proxy port

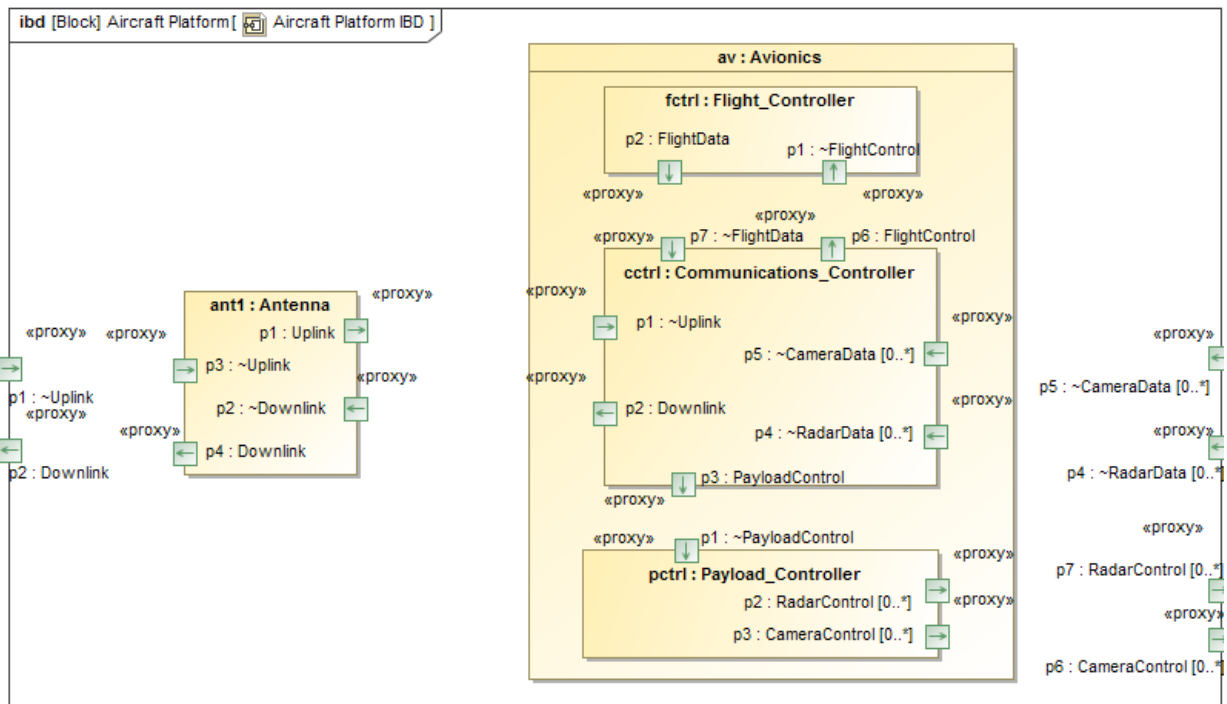


Figure 5 Aircraft Platform IBD, third stage

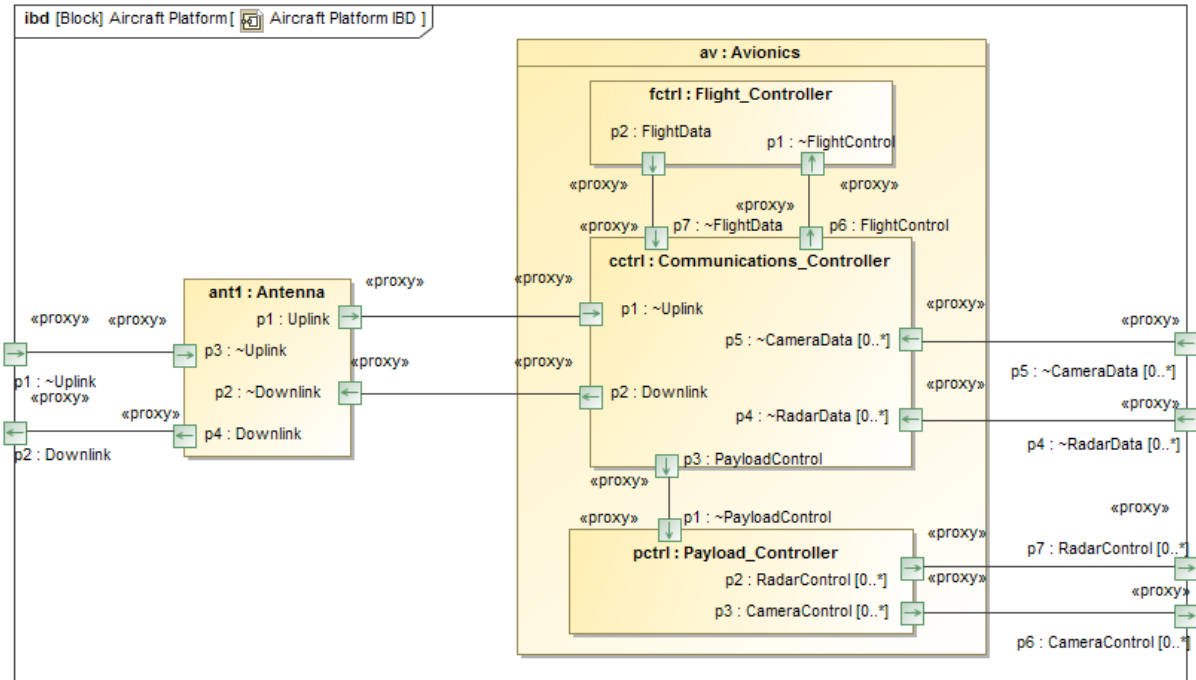


Figure 6 Aircraft Platform IBD, final stage