

1. PROJECT

ROOT_OBJECTS

```
--|examples_AADL/Common\Behavior_Properties|--,  
--|examples_AADL/Common\Stood|--,  
--|examples_AADL\NavTypes|--,  
--|examples_AADL\FlightSystem|--
```

END

1.1. Project Description

FEDERATED AVIONICS ARCHITECTURE

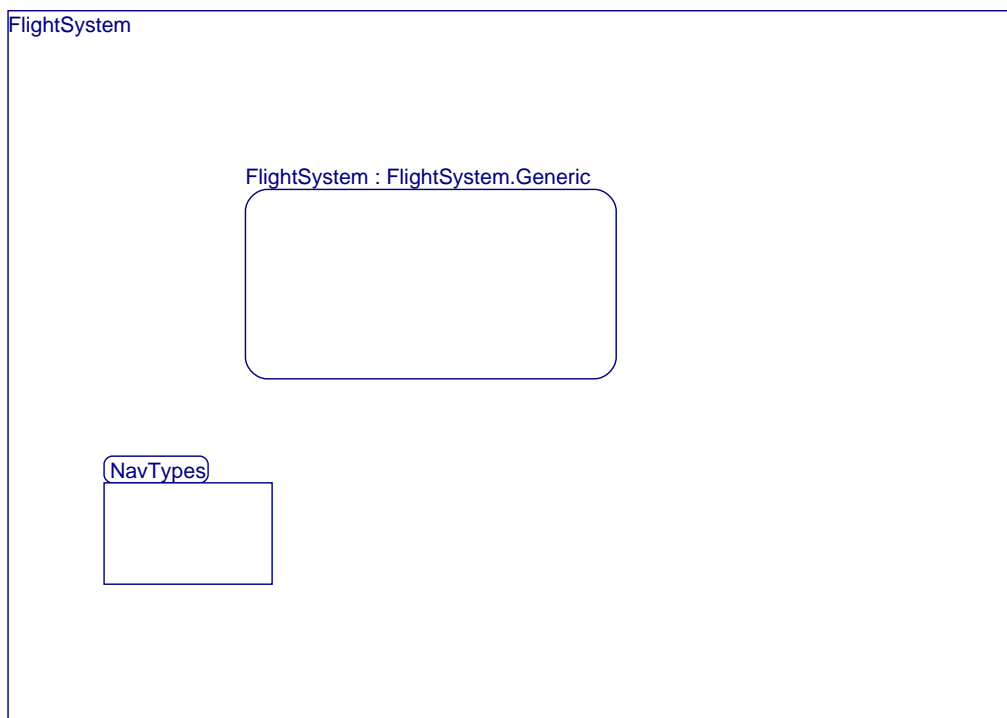
A small description of an aircraft flight system.

This model is directly inspired from the one developed by Elie Najm and Irfan Hamid in 2004, in the context of the ASSERT European research project.

The project is composed of two Stood designs:

- NavTypes: an AADL Package defining a set of Data Components
- FlightSystem: the main application

1.2. AADL Diagram



2. SYSTEM FlightSystem IS

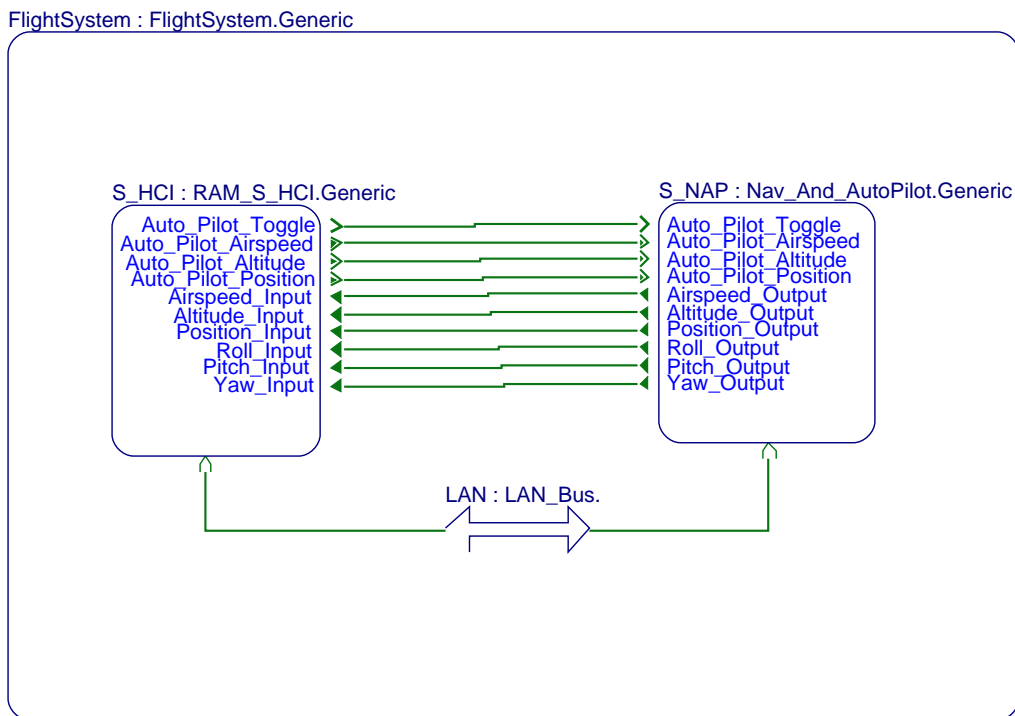
2.1. DESCRIPTION

2.1.1. PROBLEM

2.1.1.1. Statement of the Problem (text)

The system is composed of 2 subsystems (we may say computers) linked over a bus (or LAN). One processor is responsible for taking input from the various sensors (navigational sensors such as the GPS and INS, as well as attitude sensors such as speed, altitude, roll, pitch and yaw). Course corrections are computed based on the desired destination (waypoints are not implemented so there is just 1 destination), and then if autopilot is engaged these course corrections are executed by sending orders to the actuators for the flight control surfaces. This example is from the point of view of architectural design and analysis.

2.1.1.2. AADL Diagram



3. SYSTEM S_HCI IS

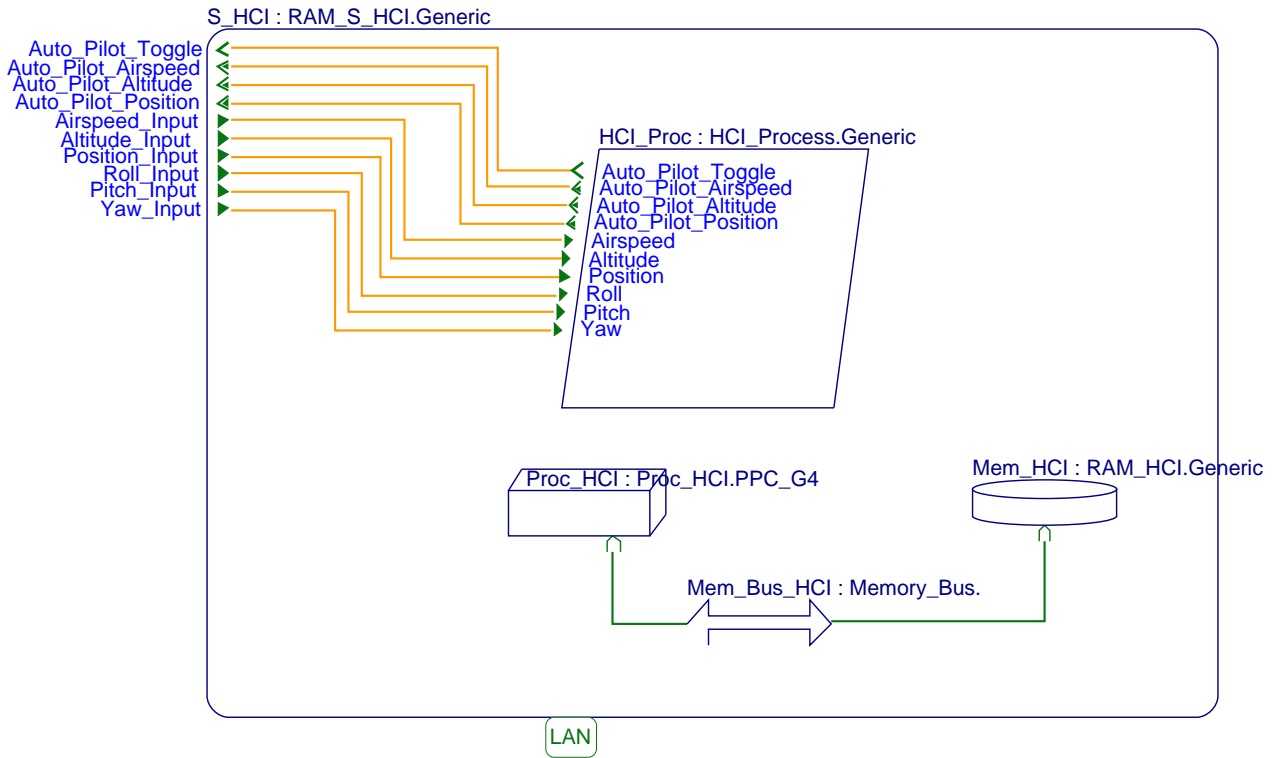
3.1. DESCRIPTION

3.1.1. PROBLEM

3.1.1.1. Statement of the Problem (text)

This is the Human Computer Interface system

3.1.1.2. AADL Diagram



4. PROCESS HCI_Proc IS

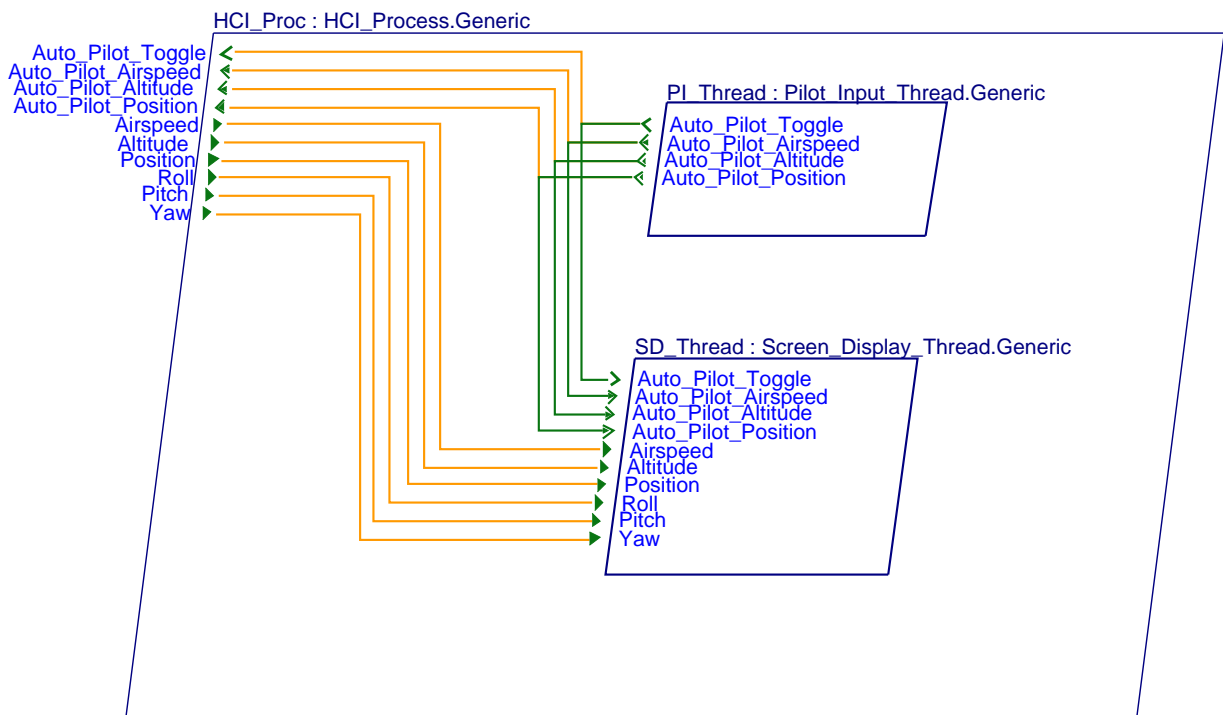
4.1. DESCRIPTION

4.1.1. PROBLEM

4.1.1.1. Statement of the Problem (text)

This process hosts both the display and the pilot input threads

4.1.1.2. AADL Diagram



5. SYSTEM S_NAP IS

5.1. DESCRIPTION

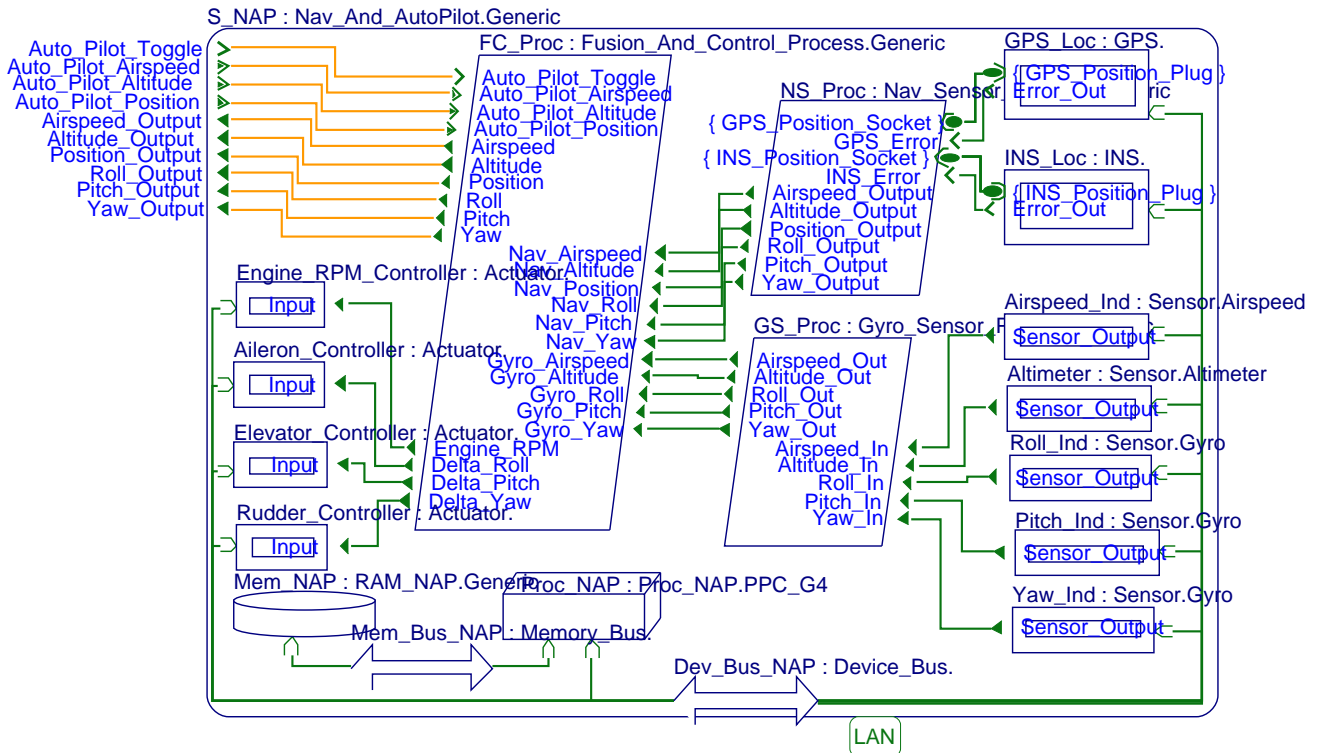
5.1.1. PROBLEM

5.1.1.1. Statement of the Problem (text)

The subsystem that gets data from all nav and gyro/altimeter/airspeed sensors

Fuses them and then if autopilot is on sends control signals to the control surfaces

5.1.1.2. AADL Diagram



6. PROCESS NS_Proc IS

6.1. DESCRIPTION

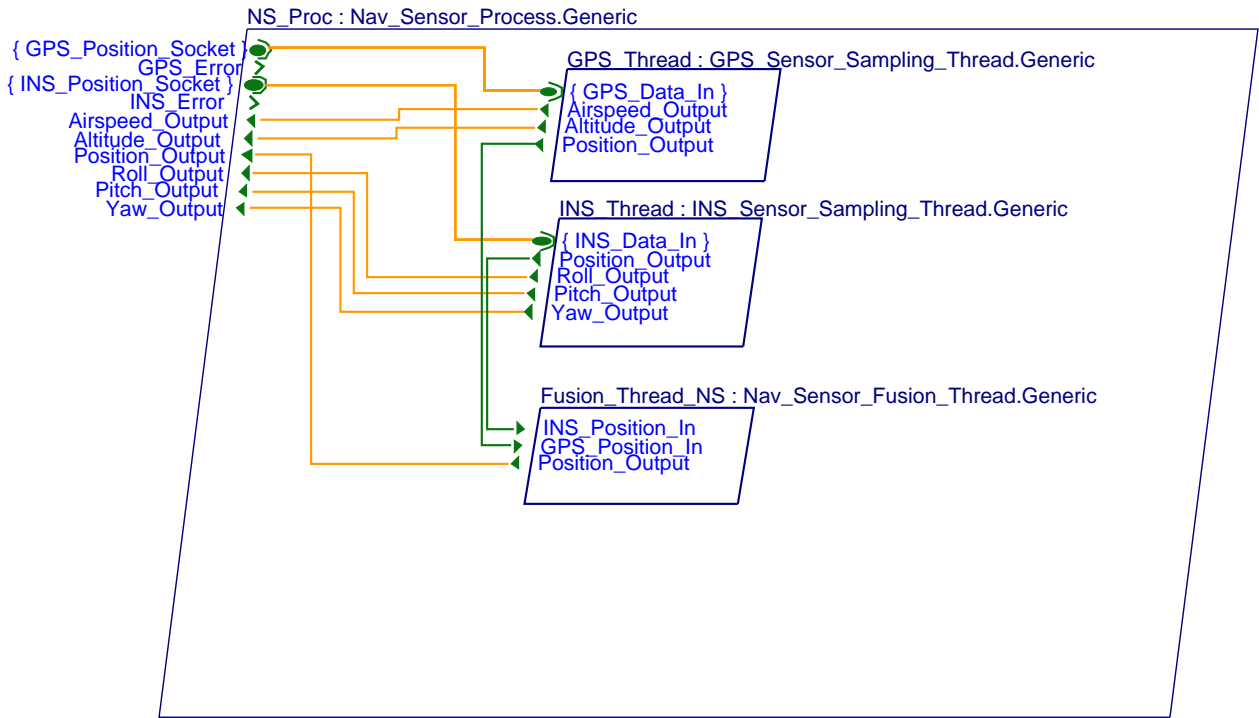
6.1.1. PROBLEM

6.1.1.1. Statement of the Problem (text)

This process hosts the threads that get the data from the nav sensors (GPS/INS)

Also hosts the thread that fuses the common data elements from both sensors

6.1.1.2. AADL Diagram



7. PROCESS GS_Proc IS

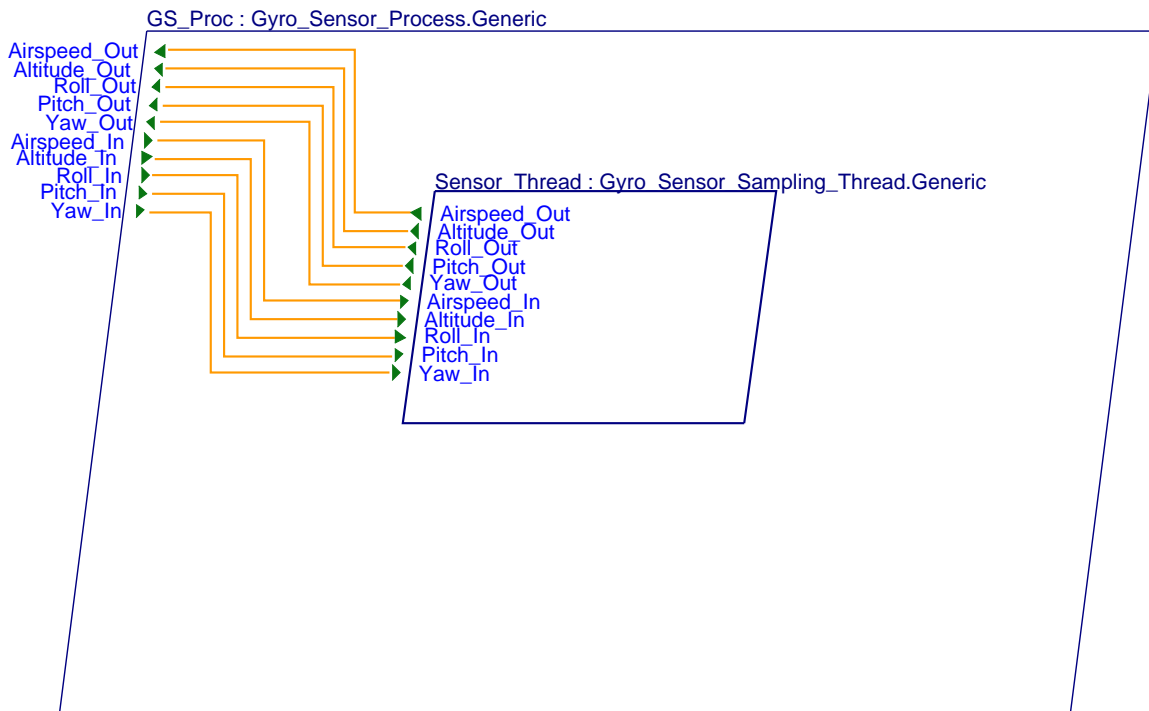
7.1. DESCRIPTION

7.1.1. PROBLEM

7.1.1.1. Statement of the Problem (text)

This process hosts the single gyrosopic and altimeter/airspeed indicator input thread

7.1.1.2. AADL Diagram



8. PROCESS FC_Proc IS

8.1. DESCRIPTION

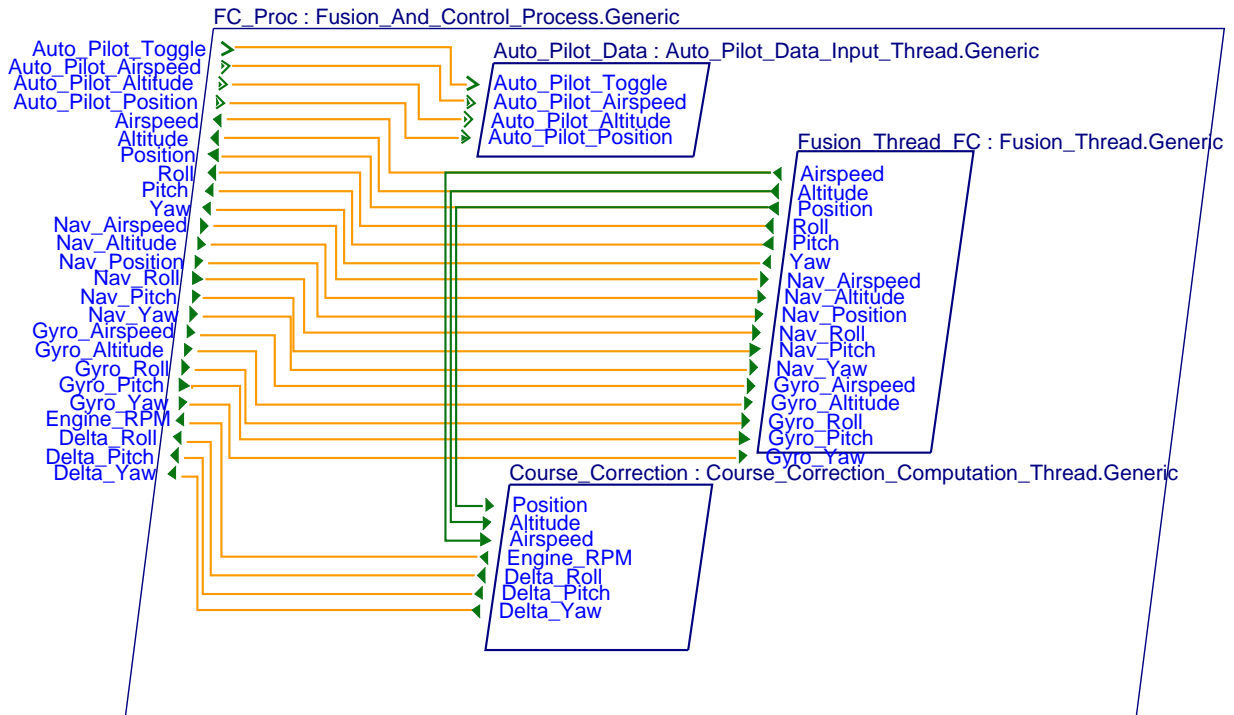
8.1.1. PROBLEM

8.1.1.1. Statement of the Problem (text)

This process fuses the non-positional data from the various sensors

Computes the course correction, and sends out control signals to the devices

8.1.1.2. AADL Diagram



9. BUS LAN IS

9.1. DESCRIPTION

9.1.1. PROBLEM