

F14 Project

Design Description

The MathWorks Inc.

F14 Project: Design Description

The MathWorks Inc.

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Model Version

Version: 1.90

Last modified: Fri Mar 11 12:05:55 2016

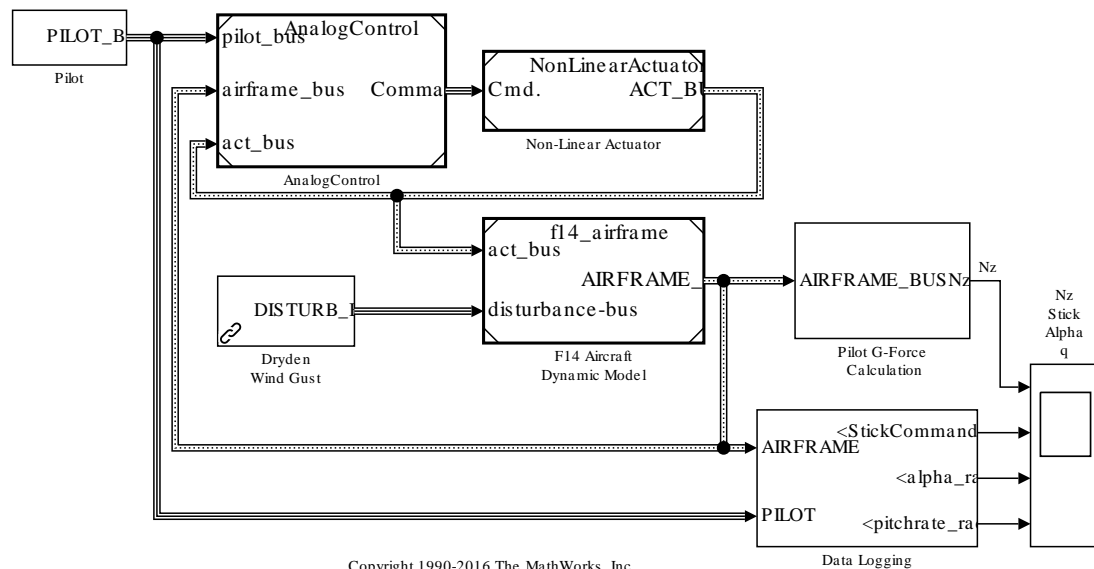
Checksum: 4291721502 2476774646 2065474070 3526925607

Root System

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Figure 1. slproject_f14



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Data Logging

Blocks

Parameters

"AnalogControl" (ModelReference)

Table 1. "AnalogControl" Parameters

| Parameter | Value |
|-----------------|-------------------|
| Model name | AnalogControl |
| | AnalogControl.mdl |
| | AnalogControl |
| Simulation mode | Normal |
| Code interface | Model reference |
| Variant | off |

| Parameter | Value |
|------------------------------------|-------|
| Generate preprocessor conditionals | off |

"F14 Aircraft Dynamic Model" (ModelReference)

Table 2. "F14 Aircraft Dynamic Model" Parameters

| Parameter | Value |
|------------------------------------|------------------|
| Model name | f14_airframe |
| | f14_airframe.slx |
| | f14_airframe |
| Simulation mode | Normal |
| Code interface | Model reference |
| Variant | off |
| Generate preprocessor conditionals | off |

"Non-Linear Actuator" (ModelReference)

Table 3. "Non-Linear Actuator" Parameters

| Parameter | Value |
|------------------------------------|-----------------------|
| Model name | NonLinearActuator |
| | NonLinearActuator.mdl |
| | NonLinearActuator |
| Simulation mode | Normal |
| Code interface | Model reference |
| Variant | off |
| Generate preprocessor conditionals | off |

Block Execution Order

1. Non-Linear Actuator (ModelReference)
2. W-gust model [14] (TransferFcn)
3. Gain [11] (Gain)
4. Gain2 [12] (Gain)
5. Gain3 [12] (Gain)
6. Q-gust model [13] (TransferFcn)
7. Gain1 [11] (Gain)

8. Sum [13] (Sum)
9. F14 Aircraft Dynamic Model (ModelReference)
10. Gain3 [17] (Gain)
11. [16] (Constant)
12. Product [19] (Product)
13. Sum2 [20] (Sum)
14. Gain4 [18] (Gain)
15. Pilot [15] (SignalGenerator)
16. SigConversion_InsertedFor_Bus Selector1_at_outport_0 (SignalConversion)
17. SigConversion_InsertedFor_Bus Selector1_at_outport_1 (SignalConversion)
18. Nz Stick Alpha q [3] (Scope)
19. AnalogControl (ModelReference)
20. White Noise [21] (RandomNumber)
21. Output [20] (Gain)

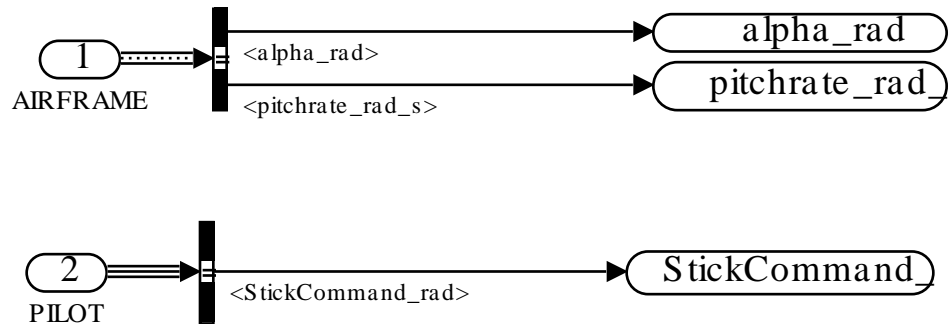
Subsystems

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| Blocks | 54 |
| vertical_channel | 57 |
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Data Logging

Figure 2. slproject_f14/Data Logging



Blocks

Parameters

"AIRFRAME" (Inport)

Table 4. "AIRFRAME" Parameters

| Parameter | Value |
|------------------------------------|---------------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |

"alpha_rad" (Outport)

Table 5. "alpha_rad" Parameters

| Parameter | Value |
|--------------|-------------|
| Port number | 2 |
| Icon display | Signal name |
| Minimum | [] |
| Maximum | [] |

| Parameter | Value |
|--|---------------|
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

"Bus Selector" (BusSelector)

Table 6. "Bus Selector" Parameters

| Parameter | Value |
|----------------|------------------|
| Output signals | StickCommand_rad |
| Output as bus | off |
| | StickCommand_rad |

Output Hierarchy:

1. *Bus Selector*
 1. <StickCommand_rad>

"Bus Selector1" (BusSelector)

Table 7. "Bus Selector1" Parameters

| Parameter | Value |
|----------------|--------------------------------------|
| Output signals | alpha_rad,pitchrate_rad_s |
| Output as bus | off |
| | alpha_rad wdot pitchrate_rad_s |

| Parameter | Value |
|-----------|-------------------|
| | pitchrate_rad_s_s |

Output Hierarchy:

1. *Bus Selector1*
 1. <alpha_rad>
 2. <pitchrate_rad_s>

"Out3" (Outport)

Table 8. "Out3" Parameters

| Parameter | Value |
|--|---------------|
| Port number | 3 |
| Icon display | Signal name |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

"PILOT" (Inport)

Table 9. "PILOT" Parameters

| Parameter | Value |
|-------------|-------|
| Port number | 2 |

| Parameter | Value |
|------------------------------------|---------------|
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |

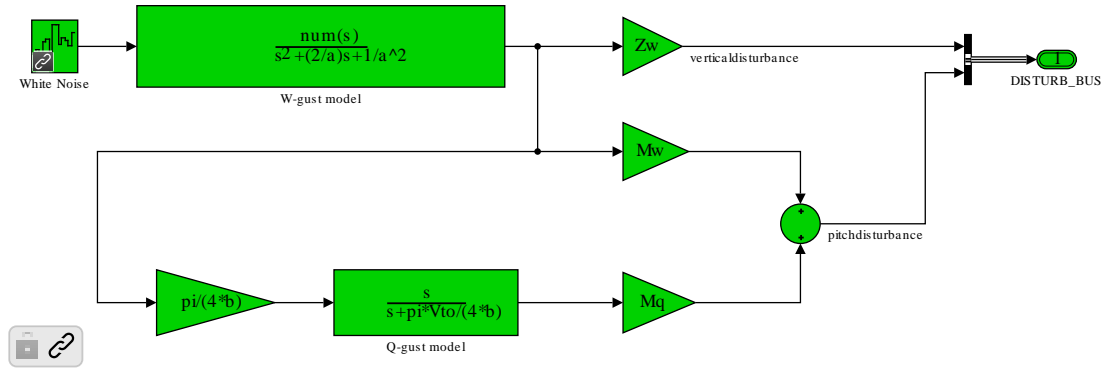
"Stick_rad" (Outport)

Table 10. "Stick_rad" Parameters

| Parameter | Value |
|--|---------------|
| Port number | 1 |
| Icon display | Signal name |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

Dryden Wind Gust

Figure 3. slproject_f14/Dryden Wind Gust



Blocks

Parameters

"Bus Creator" (BusCreator)

Table 11. "Bus Creator" Parameters

| Parameter | Value |
|---------------------------------------|--|
| Number of inputs | 'verticaldisturbance','pitchdisturbance' |
| Display option | bar |
| Data type | Bus: DISTURB_BUS |
| Output as nonvirtual bus | off |
| Override bus signal names from inputs | on |

"DISTURB_BUS" (Output)

Table 12. "DISTURB_BUS" Parameters

| Parameter | Value |
|--|------------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Bus: DISTURB_BUS |
| Lock output data type setting against changes by the fixed-point tools | off |

| Parameter | Value |
|--|---------|
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

"Gain" (Gain)

Table 13. "Gain" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | Zw |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain1" (Gain)

Table 14. "Gain1" Parameters

| Parameter | Value |
|-----------|-------|
| Gain | Mq |

| Parameter | Value |
|--|------------------------|
| Multiplication | Element-wise($K.*u$) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain2" (Gain)

Table 15. "Gain2" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | Mw |
| Multiplication | Element-wise($K.*u$) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain3" (Gain)**Table 16. "Gain3" Parameters**

| Parameter | Value |
|--|------------------------|
| Gain | $\pi/(4*b)$ |
| Multiplication | Element-wise($K.*u$) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Q-gust model" (TransferFcn)**Table 17. "Q-gust model" Parameters**

| Parameter | Value |
|-------------------------------|-------------------------|
| Numerator coefficients | [1 0] |
| Denominator coefficients | [1 $\pi*V_{to}/(4*b)$] |
| State Name (e.g., 'position') | " |

"Sum" (Sum)**Table 18. "Sum" Parameters**

| Parameter | Value |
|---|----------------|
| Icon shape | round |
| List of signs | ++ |
| Sum over | All dimensions |
| Dimension | 1 |
| Require all inputs to have the same data type | on |

| Parameter | Value |
|--|------------------------------------|
| Accumulator data type | Inherit: Inherit via internal rule |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock data type settings against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

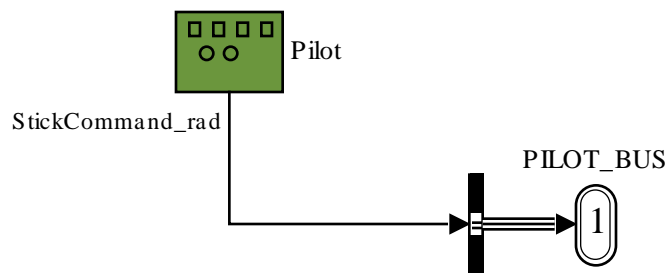
"W-gust model" (TransferFcn)

Table 19. "W-gust model" Parameters

| Parameter | Value |
|-------------------------------|---|
| Numerator coefficients | $\text{Swg}/\sqrt{a^3} * [\sqrt{3} * a, 1]$ |
| Denominator coefficients | $[1 \ (2/a) \ 1/a^2]$ |
| State Name (e.g., 'position') | " |

Pilot

Figure 4. slproject_f14/Pilot



Blocks

Parameters

"Bus Creator" (BusCreator)**Table 20. "Bus Creator" Parameters**

| Parameter | Value |
|---------------------------------------|----------------|
| Number of inputs | 1 |
| Display option | bar |
| Data type | Bus: PILOT_BUS |
| Output as nonvirtual bus | off |
| Override bus signal names from inputs | on |

"Pilot" (SignalGenerator)**Table 21. "Pilot" Parameters**

| Parameter | Value |
|------------------------------------|---------------------|
| Wave form | square |
| Time (t) | Use simulation time |
| Amplitude | 1 |
| Frequency | .1 |
| Units | Hertz |
| Interpret vector parameters as 1-D | on |

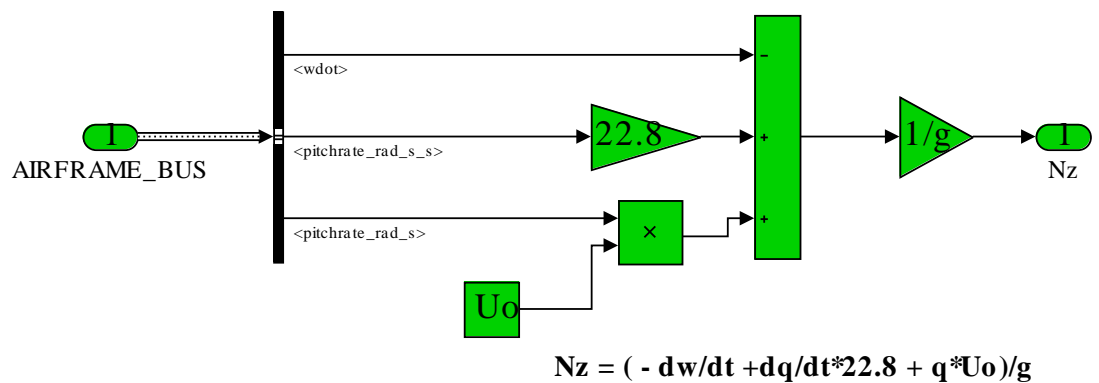
"PILOT_BUS" (Outport)**Table 22. "PILOT_BUS" Parameters**

| Parameter | Value |
|--|----------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Bus: PILOT_BUS |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |

| Parameter | Value |
|--------------------------------|---------|
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

Pilot G-Force Calculation

Figure 5. slproject_f14/Pilot G-Force Calculation



Blocks

Parameters

" " (Constant)

Table 23. " " Parameters

| Parameter | Value |
|--|--|
| Constant value | Uo |
| Interpret vector parameters as 1-D | on |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Inherit from 'Constant value' |
| Lock output data type setting against changes by the fixed-point tools | off |
| Sample time | inf |

| Parameter | Value |
|--------------|-------|
| Frame period | inf |

"AIRFRAME_BUS" (Inport)

Table 24. "AIRFRAME_BUS" Parameters

| Parameter | Value |
|------------------------------------|---------------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |

"Bus Selector" (BusSelector)

Table 25. "Bus Selector" Parameters

| Parameter | Value |
|----------------|---|
| Output signals | wdot,pitchrate_rad_s_s,pitchrate_rad_s |
| Output as bus | off |
| | alpha_rad wdot pitchrate_rad_s pitchrate_rad_s_s |

Output Hierarchy:

1. *Bus Selector*
 1. <wdot>
 2. <pitchrate_rad_s_s>
 3. <pitchrate_rad_s>

"Gain3" (Gain)

Table 26. "Gain3" Parameters

| Parameter | Value |
|-------------------|--------------------|
| Gain | 22.8 |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |

| Parameter | Value |
|--|------------------------|
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain4" (Gain)

Table 27. "Gain4" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | 1/g |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Nz" (Outport)

Table 28. "Nz" Parameters

| Parameter | Value |
|--------------|-------------|
| Port number | 1 |
| Icon display | Port number |

| Parameter | Value |
|--|---------------|
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

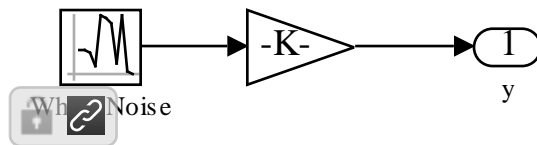
"Product" (Product)

Table 29. "Product" Parameters

| Parameter | Value |
|--|------------------------------|
| Number of inputs | 2 |
| Multiplication | Element-wise(.*) |
| Multiply over | All dimensions |
| Dimension | 1 |
| Require all inputs to have the same data type | on |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Zero |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Sum2" (Sum)**Table 30. "Sum2" Parameters**

| Parameter | Value |
|--|------------------------------------|
| Icon shape | rectangular |
| List of signs | -++ |
| Sum over | All dimensions |
| Dimension | 1 |
| Require all inputs to have the same data type | on |
| Accumulator data type | Inherit: Inherit via internal rule |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock data type settings against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

White Noise**Figure 6. slproject_f14/Dryden Wind Gust/White Noise****Blocks****Parameters****"Output" (Gain)****Table 31. "Output" Parameters**

| Parameter | Value |
|-----------|--|
| Gain | $[\sqrt{\text{Cov}}]/[\sqrt{\text{Ts}}]$ |

| Parameter | Value |
|--|------------------------|
| Multiplication | Element-wise($K.*u$) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"White Noise" (RandomNumber)

Table 32. "White Noise" Parameters

| Parameter | Value |
|------------------------------------|-------|
| Mean | 0 |
| Variance | 1 |
| Seed | seed |
| Sample time | T_s |
| Interpret vector parameters as 1-D | on |

"y" (Outport)

Table 33. "y" Parameters

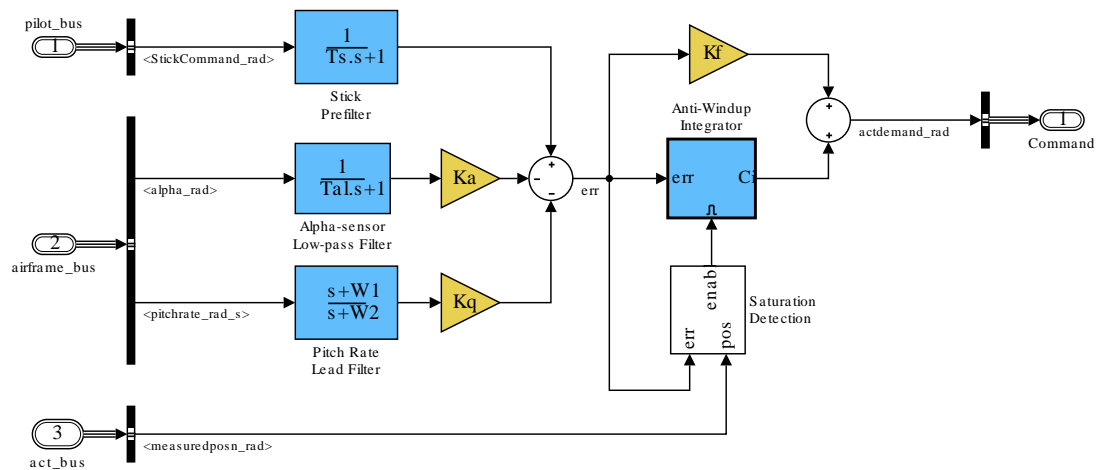
| Parameter | Value |
|--|---------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |

| Parameter | Value |
|--|---------|
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s^2, N*-m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

AnalogControl

Checksum: 4138199528 3508836178 2956880679 1689988376

Figure 7. AnalogControl



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Interface

Input Signals

The following tables describe external signals used to compute the subsystem's inputs. The name of the input signal is the name of the input port that accepts the signal. The number in angle brackets is the number of the input port. A dimension of [1 1] indicates a scalar signal.

Table 34.

Description:

Data Type: double

Width: 2

Dimensions: [-2 2 1 1 1 1]

Table 35.

Description:

Data Type: double

Width: 4

Dimensions: [-2 4 1 1 1 1 1 1 1]

Table 36.

Description:

Data Type: double

Width: 1

Dimensions: [1 1]

Output Signals

The following tables describe the signals output by this system. The name of the output signal is the name of the signal's parent block, i.e., the block that computes the signal. The number in angle brackets is the number of the port that emits the signal.

Table 37.

Description:

Data Type: double

Width: 1

Dimensions: [1 1]

Blocks

Parameters

"act_bus" (Inport)

Table 38. "act_bus" Parameters

| Parameter | Value |
|------------------------------------|-------|
| Port number | 3 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |

| Parameter | Value |
|-----------|--------------|
| Maximum | [] |
| Data type | Bus: ACT_BUS |

"airframe_bus" (Inport)

Table 39. "airframe_bus" Parameters

| Parameter | Value |
|------------------------------------|-------------------|
| Port number | 2 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Bus: AIRFRAME_BUS |

"Alpha-sensor Low-pass Filter" (TransferFcn)

Table 40. "Alpha-sensor Low-pass Filter" Parameters

| Parameter | Value |
|-------------------------------|---------|
| Numerator coefficients | [1] |
| Denominator coefficients | [Tal,1] |
| State Name (e.g., 'position') | " |

"Bus Creator" (BusCreator)

Table 41. "Bus Creator" Parameters

| Parameter | Value |
|---------------------------------------|------------------|
| Number of inputs | 1 |
| Display option | bar |
| Data type | Bus: CONTROL_BUS |
| Output as nonvirtual bus | off |
| Override bus signal names from inputs | on |

"Bus Selector" (BusSelector)**Table 42. "Bus Selector" Parameters**

| Parameter | Value |
|----------------|------------------------------------|
| Output signals | measuredposn_rad |
| Output as bus | off |
| | actualposn_rad measuredposn_rad |

Output Hierarchy:

1. *Bus Selector*
 1. <measuredposn_rad>

"Bus Selector1" (BusSelector)**Table 43. "Bus Selector1" Parameters**

| Parameter | Value |
|----------------|------------------|
| Output signals | StickCommand_rad |
| Output as bus | off |
| | StickCommand_rad |

Output Hierarchy:

1. *Bus Selector1*
 1. <StickCommand_rad>

"Bus Selector2" (BusSelector)**Table 44. "Bus Selector2" Parameters**

| Parameter | Value |
|----------------|---|
| Output signals | alpha_rad,pitchrate_rad_s |
| Output as bus | off |
| | alpha_rad wdot pitchrate_rad_s pitchrate_rad_s_s |

Output Hierarchy:

1. *Bus Selector2*
 1. <alpha_rad>
 2. <pitchrate_rad_s>

"Command" (Outport)**Table 45. "Command" Parameters**

| Parameter | Value |
|--|------------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Bus: CONTROL_BUS |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

"Gain" (Gain)**Table 46. "Gain" Parameters**

| Parameter | Value |
|--|------------------------|
| Gain | Kf |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |

| Parameter | Value |
|--------------------------------|-------|
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain2" (Gain)

Table 47. "Gain2" Parameters

| Parameter | Value |
|--|-----------------------------|
| Gain | Kq |
| Multiplication | Element-wise($K \cdot u$) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain3" (Gain)

Table 48. "Gain3" Parameters

| Parameter | Value |
|---------------------|-----------------------------|
| Gain | Ka |
| Multiplication | Element-wise($K \cdot u$) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |

| Parameter | Value |
|--|-------|
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"pilot_bus" (Inport)

Table 49. "pilot_bus" Parameters

| Parameter | Value |
|------------------------------------|----------------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Bus: PILOT_BUS |

"Pitch Rate Lead Filter" (TransferFcn)

Table 50. "Pitch Rate Lead Filter" Parameters

| Parameter | Value |
|-------------------------------|--------|
| Numerator coefficients | [1,W1] |
| Denominator coefficients | [1,W2] |
| State Name (e.g., 'position') | " |

"Stick Prefilter" (TransferFcn)

Table 51. "Stick Prefilter" Parameters

| Parameter | Value |
|-------------------------------|--------|
| Numerator coefficients | [1] |
| Denominator coefficients | [Ts,1] |
| State Name (e.g., 'position') | " |

"Sum" (Sum)**Table 52. "Sum" Parameters**

| Parameter | Value |
|--|------------------------------------|
| Icon shape | round |
| List of signs | 2 |
| Sum over | All dimensions |
| Dimension | 1 |
| Require all inputs to have the same data type | on |
| Accumulator data type | Inherit: Inherit via internal rule |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock data type settings against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Sum2" (Sum)**Table 53. "Sum2" Parameters**

| Parameter | Value |
|--|------------------------------------|
| Icon shape | round |
| List of signs | +-- |
| Sum over | All dimensions |
| Dimension | 1 |
| Require all inputs to have the same data type | on |
| Accumulator data type | Inherit: Inherit via internal rule |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock data type settings against changes by the fixed-point tools | off |

| Parameter | Value |
|--------------------------------|-------|
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

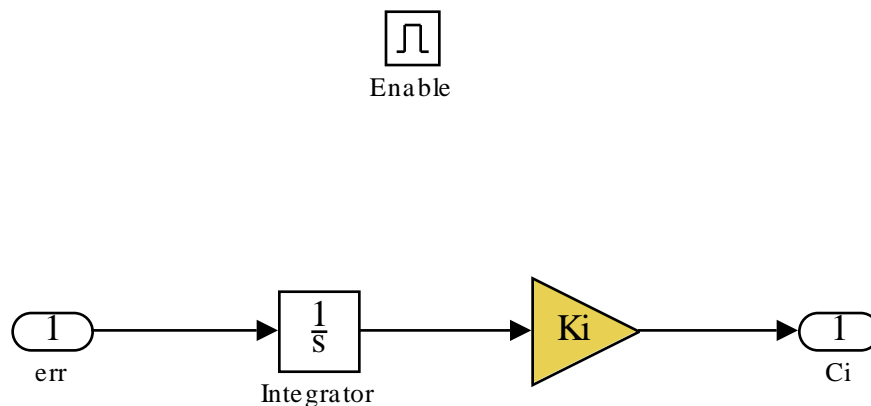
Block Execution Order

1. Alpha-sensor Low-pass Filter [24] (TransferFcn)
2. Stick Prefilter [28] (TransferFcn)
3. Gain3 [27] (Gain)
4. Pitch Rate Lead Filter [28] (TransferFcn)
5. Gain2 [27] (Gain)
6. Sum2 [29] (Sum)
7. Sign [39] (Signum)
8. Sign1 [39] (Signum)
9. Relational Operator [39] (RelationalOperator)
10. Abs [37] (Abs)
11. Constant [35] (Constant)
12. Compare [34] (RelationalOperator)
13. Logical Operator [38] (Logic)
14. *Anti-Windup Integrator*
 1. Integrator [33] (Integrator)
 2. Gain1 [33] (Gain)
15. Gain [26] (Gain)
16. Sum [29] (Sum)

Anti-Windup Integrator

Checksum: 2766817279 4243784605 1270373841 1633104711

Figure 8. AnalogControl/Anti-Windup Integrator



Interface

Input Signals

The following tables describe external signals used to compute the subsystem's inputs. The name of the input signal is the name of the input port that accepts the signal. The number in angle brackets is the number of the input port. A dimension of [1 1] indicates a scalar signal.

Table 54.

Description:

Data Type: double

Width: 1

Dimensions: [1 1]

Output Signals

The following tables describe the signals output by this system. The name of the output signal is the name of the signal's parent block, i.e., the block that computes the signal. The number in angle brackets is the number of the port that emits the signal.

Table 55.

Description:

Data Type: double

Width: 1

Dimensions: [1 1]

Blocks

Parameters

"Ci" (Outport)

Table 56. "Ci" Parameters

| Parameter | Value |
|--|---------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |

| Parameter | Value |
|--|---------|
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | 0 |

"Enable" (EnablePort)

Table 57. "Enable" Parameters

| Parameter | Value |
|--|--------------------|
| States when enabling | held |
| Propagate sizes of variable-size signals | Only when enabling |
| Show output port | off |
| Enable zero-crossing detection | on |
| Port dimensions | 1 |
| Sample time | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | double |
| Interpolate data | on |

"err" (Inport)

Table 58. "err" Parameters

| Parameter | Value |
|------------------------------------|-------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |

| Parameter | Value |
|--------------------------------|---------------|
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |

"Gain1" (Gain)

Table 59. "Gain1" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | Ki |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Integrator" (Integrator)

Table 60. "Integrator" Parameters

| Parameter | Value |
|--------------------------|----------|
| External reset | none |
| Initial condition source | internal |
| Initial condition | 0 |
| Limit output | off |
| Upper saturation limit | inf |

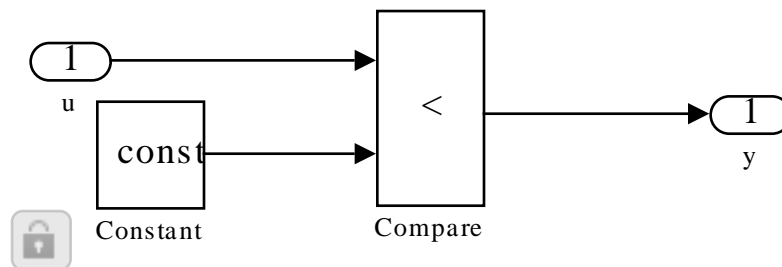
| Parameter | Value |
|---|-------|
| Lower saturation limit | -inf |
| Wrap state | off |
| Wrapped state upper value | pi |
| Wrapped state lower value | -pi |
| Show saturation port | off |
| Show state port | off |
| Ignore limit and reset when linearizing | off |
| Enable zero-crossing detection | on |
| State Name (e.g., 'position') | " |

Block Execution Order

1. Integrator [33] (Integrator)
2. Gain1 [33] (Gain)

Compare To Saturation Position

Figure 9. AnalogControl/Saturation Detection/Compare To Saturation Position



Blocks

Parameters

"Compare" (RelationalOperator)

Table 61. "Compare" Parameters

| Parameter | Value |
|---------------------|-------|
| Relational operator | < |

| Parameter | Value |
|---|---------|
| Require all inputs to have the same data type | on |
| Output data type | boolean |
| Enable zero-crossing detection | off |
| Sample time (-1 for inherited) | -1 |
| Integer rounding mode | Nearest |

"Constant" (Constant)

Table 62. "Constant" Parameters

| Parameter | Value |
|--|---------------------------------------|
| Constant value | const |
| Interpret vector parameters as 1-D | on |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Inherit via back propagation |
| Lock output data type setting against changes by the fixed-point tools | off |
| Sample time | inf |
| Frame period | inf |

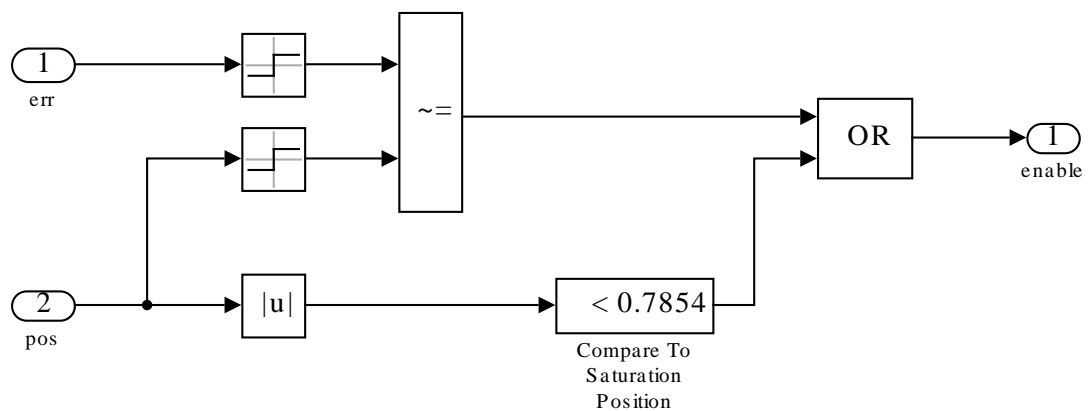
"u" (Inport)

Table 63. "u" Parameters

| Parameter | Value |
|------------------------------------|---------------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |

"y" (Output)**Table 64. "y" Parameters**

| Parameter | Value |
|--|---------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

Saturation Detection**Figure 10. AnalogControl/Saturation Detection**

Blocks

Parameters

"Abs" (Abs)

Table 65. "Abs" Parameters

| Parameter | Value |
|--|------------------------|
| Enable zero-crossing detection | off |
| Sample time (-1 for inherited) | -1 |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | off |

"enable" (Outport)

Table 66. "enable" Parameters

| Parameter | Value |
|--|---------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |

| Parameter | Value |
|--------------------------------|--------|
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

"err" (Inport)

Table 67. "err" Parameters

| Parameter | Value |
|------------------------------------|---------------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |

"Logical Operator" (Logic)

Table 68. "Logical Operator" Parameters

| Parameter | Value |
|--|-------------|
| Operator | OR |
| Number of input ports | 2 |
| Icon shape | rectangular |
| Require all inputs and output to have the same data type | off |
| Output data type | boolean |
| Sample time (-1 for inherited) | -1 |

"pos" (Inport)

Table 69. "pos" Parameters

| Parameter | Value |
|-------------|-------|
| Port number | 2 |

| Parameter | Value |
|------------------------------------|---------------|
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |

"Relational Operator" (RelationalOperator)

Table 70. "Relational Operator" Parameters

| Parameter | Value |
|---|---------|
| Relational operator | ~= |
| Require all inputs to have the same data type | off |
| Output data type | boolean |
| Enable zero-crossing detection | off |
| Sample time (-1 for inherited) | -1 |
| Integer rounding mode | Nearest |

"Sign" (Signum)

Table 71. "Sign" Parameters

| Parameter | Value |
|--------------------------------|-------|
| Enable zero-crossing detection | off |
| Sample time (-1 for inherited) | -1 |

"Sign1" (Signum)

Table 72. "Sign1" Parameters

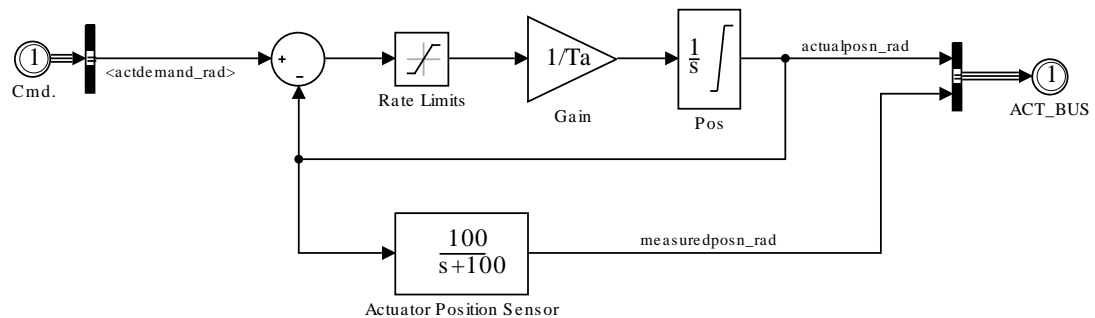
| Parameter | Value |
|--------------------------------|-------|
| Enable zero-crossing detection | off |

| Parameter | Value |
|--------------------------------|-------|
| Sample time (-1 for inherited) | -1 |

NonLinearActuator

Checksum: 437192274 1527516956 4109926576 1868529003

Figure 11. NonLinearActuator



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Interface

Input Signals

The following tables describe external signals used to compute the subsystem's inputs. The name of the input signal is the name of the input port that accepts the signal. The number in angle brackets is the number of the input port. A dimension of [1 1] indicates a scalar signal.

Table 73.

Description:

Data Type: double

Width: 1

Dimensions: [1 1]

Output Signals

The following tables describe the signals output by this system. The name of the output signal is the name of the signal's parent block, i.e., the block that computes the signal. The number in angle brackets is the number of the port that emits the signal.

Table 74.

Description:

Data Type: double

Width: 2

Dimensions: [-2 2 1 1 1 1]

Blocks

Parameters

"ACT_BUS" (Outport)

Table 75. "ACT_BUS" Parameters

| Parameter | Value |
|--|--------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Bus: ACT_BUS |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | on |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | 0 |

"Actuator Position Sensor" (TransferFcn)

Table 76. "Actuator Position Sensor" Parameters

| Parameter | Value |
|--------------------------|---------|
| Numerator coefficients | [100] |
| Denominator coefficients | [1 100] |

| Parameter | Value |
|-------------------------------|-------|
| State Name (e.g., 'position') | " |

"Bus Creator" (BusCreator)

Table 77. "Bus Creator" Parameters

| Parameter | Value |
|---------------------------------------|--------------|
| Number of inputs | 2 |
| Display option | bar |
| Data type | Bus: ACT_BUS |
| Output as nonvirtual bus | off |
| Override bus signal names from inputs | on |

"Bus Selector" (BusSelector)

Table 78. "Bus Selector" Parameters

| Parameter | Value |
|----------------|---------------|
| Output signals | actdemand_rad |
| Output as bus | off |
| | actdemand_rad |

Output Hierarchy:

1. *Bus Selector*
 1. <actdemand_rad>

"Cmd." (Inport)

Table 79. "Cmd." Parameters

| Parameter | Value |
|------------------------------------|-------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |

| Parameter | Value |
|-----------|------------------|
| Maximum | [] |
| Data type | Bus: CONTROL_BUS |

"Gain" (Gain)

Table 80. "Gain" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | 1/Ta |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Pos" (Integrator)

Table 81. "Pos" Parameters

| Parameter | Value |
|---------------------------|------------|
| External reset | none |
| Initial condition source | internal |
| Initial condition | 0 |
| Limit output | on |
| Upper saturation limit | pi*45/180 |
| Lower saturation limit | -pi*45/180 |
| Wrap state | off |
| Wrapped state upper value | pi |

| Parameter | Value |
|---|-------|
| Wrapped state lower value | -pi |
| Show saturation port | off |
| Show state port | off |
| Ignore limit and reset when linearizing | off |
| Enable zero-crossing detection | on |
| State Name (e.g., 'position') | " |

"Rate Limits" (Saturate)

Table 82. "Rate Limits" Parameters

| Parameter | Value |
|--|------------------------|
| Upper limit | 0.5 |
| Lower limit | -0.5 |
| Treat as gain when linearizing | on |
| Enable zero-crossing detection | on |
| Sample time (-1 for inherited) | -1 |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |

"Sum" (Sum)

Table 83. "Sum" Parameters

| Parameter | Value |
|---------------|----------------|
| Icon shape | round |
| List of signs | +- |
| Sum over | All dimensions |
| Dimension | 1 |

| Parameter | Value |
|--|------------------------------------|
| Require all inputs to have the same data type | on |
| Accumulator data type | Inherit: Inherit via internal rule |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock data type settings against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

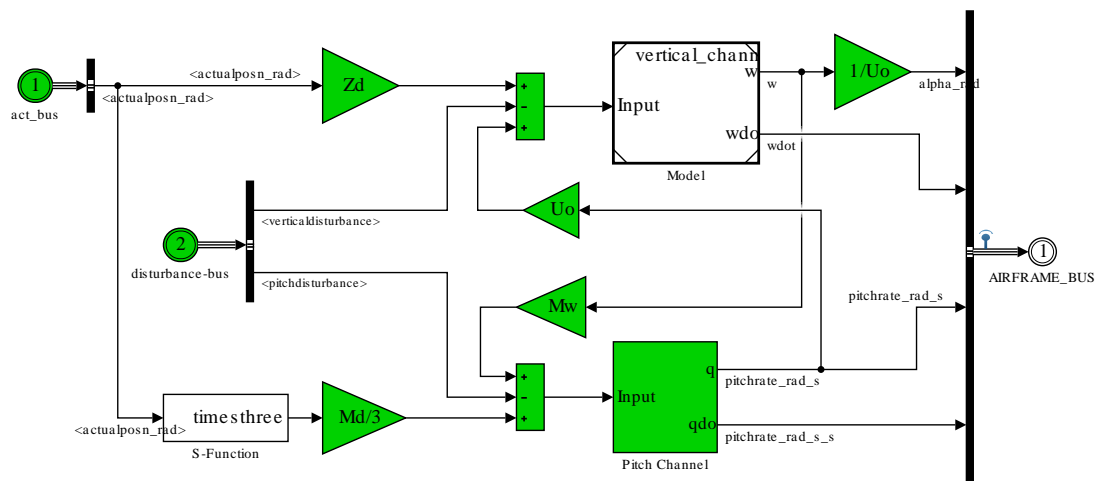
Block Execution Order

1. *TmpSynthesizedDirectFeedthroughAtomicSubsystem*
 1. Sum [44] (Sum)
 2. Rate Limits [44] (Saturate)
 3. Gain [43] (Gain)
2. Actuator Position Sensor [41] (TransferFcn)
3. Pos [43] (Integrator)
4. BusConversion_InsertedFor_ACT_BUS_at_inport_0_BusCreator1 (BusCreator)

f14_airframe

Checksum: 1800891934 1481337598 2775587900 3442253071

Figure 12. f14_airframe



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Interface

Input Signals

The following tables describe external signals used to compute the subsystem's inputs. The name of the input signal is the name of the input port that accepts the signal. The number in angle brackets is the number of the input port. A dimension of [1 1] indicates a scalar signal.

Table 84.

Description:

Data Type: double

Width: 2

Dimensions: [-2 2 1 1 1 1]

Table 85.

Description:

Data Type: double

Width: 2

Dimensions: [-2 2 1 1 1 1]

Output Signals

The following tables describe the signals output by this system. The name of the output signal is the name of the signal's parent block, i.e., the block that computes the signal. The number in angle brackets is the number of the port that emits the signal.

Table 86.

Description:

Data Type: double

Width: 4

Dimensions: [-2 4 1 1 1 1 1 1 1 1]

Blocks

Parameters

"act_bus" (Inport)

Table 87. "act_bus" Parameters

| Parameter | Value |
|------------------------------------|-------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |

| Parameter | Value |
|--------------------------------|--------------|
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Bus: ACT_BUS |

"AIRFRAME_BUS" (Outport)

Table 88. "AIRFRAME_BUS" Parameters

| Parameter | Value |
|--|-------------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Bus: AIRFRAME_BUS |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | on |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | 0 |

"Bus Creator" (BusCreator)

Table 89. "Bus Creator" Parameters

| Parameter | Value |
|------------------|--|
| Number of inputs | 'alpha_rad','wdot','pitchrate_rad_s','pitchrate_rad_s' |
| Display option | bar |
| Data type | Bus: AIRFRAME_BUS |

| Parameter | Value |
|---------------------------------------|-------|
| Output as nonvirtual bus | off |
| Override bus signal names from inputs | on |

"Bus Selector" (BusSelector)

Table 90. "Bus Selector" Parameters

| Parameter | Value |
|----------------|------------------------------------|
| Output signals | actualposn_rad |
| Output as bus | off |
| | actualposn_rad measuredposn_rad |

Output Hierarchy:

1. *Bus Selector*
 1. <actualposn_rad>

"Bus Selector1" (BusSelector)

Table 91. "Bus Selector1" Parameters

| Parameter | Value |
|----------------|---|
| Output signals | verticaldisturbance,pitchdisturbance |
| Output as bus | off |
| | verticaldisturbance pitchdisturbance |

Output Hierarchy:

1. *Bus Selector1*
 1. <verticaldisturbance>
 2. <pitchdisturbance>

"disturbance-bus" (Inport)

Table 92. "disturbance-bus" Parameters

| Parameter | Value |
|------------------------------------|-------|
| Port number | 2 |
| Port dimensions (-1 for inherited) | -1 |

| Parameter | Value |
|--------------------------------|------------------|
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |
| Data type | Bus: DISTURB_BUS |

"Gain3" (Gain)

Table 93. "Gain3" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | Uo |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain4" (Gain)

Table 94. "Gain4" Parameters

| Parameter | Value |
|---------------------|------------------------|
| Gain | Mw |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |

| Parameter | Value |
|--|------------------------|
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain5" (Gain)

Table 95. "Gain5" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | Zd |
| Multiplication | Element-wise($K.*u$) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain6" (Gain)

Table 96. "Gain6" Parameters

| Parameter | Value |
|-------------------|------------------------|
| Gain | Md/3 |
| Multiplication | Element-wise($K.*u$) |
| Parameter minimum | [] |
| Parameter maximum | [] |

| Parameter | Value |
|--|------------------------|
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Gain7" (Gain)

Table 97. "Gain7" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | 1/Uo |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Model" (ModelReference)

Table 98. "Model" Parameters

| Parameter | Value |
|------------|------------------|
| Model name | vertical_channel |

| Parameter | Value |
|------------------------------------|----------------------|
| | vertical_channel.slx |
| | vertical_channel |
| Simulation mode | Normal |
| Code interface | Model reference |
| Variant | off |
| Generate preprocessor conditionals | off |

"S-Function" (S-Function)

Table 99. "S-Function" Parameters

| Parameter | Value |
|--------------------|------------|
| S-function name | timesthree |
| S-function modules | " |

"Sum1" (Sum)

Table 100. "Sum1" Parameters

| Parameter | Value |
|--|------------------------------------|
| Icon shape | rectangular |
| List of signs | +--+ |
| Sum over | All dimensions |
| Dimension | 1 |
| Require all inputs to have the same data type | on |
| Accumulator data type | Inherit: Inherit via internal rule |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock data type settings against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Sum2" (Sum)**Table 101. "Sum2" Parameters**

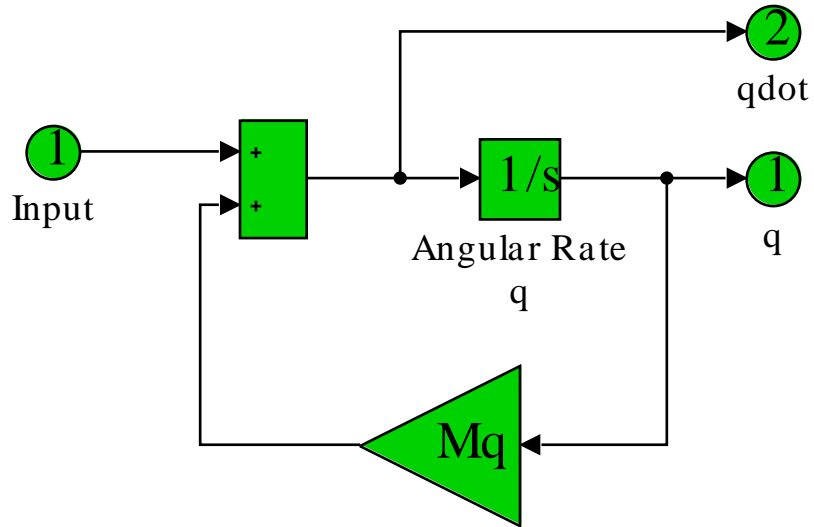
| Parameter | Value |
|--|------------------------------------|
| Icon shape | rectangular |
| List of signs | +--+ |
| Sum over | All dimensions |
| Dimension | 1 |
| Require all inputs to have the same data type | on |
| Accumulator data type | Inherit: Inherit via internal rule |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock data type settings against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

Block Execution Order

1. Gain5 [50] (Gain)
2. Angular Rate q [54] (Integrator)
3. Gain3 [49] (Gain)
4. Sum1 [52] (Sum)
5. Model [51] (ModelReference)
6. Gain7 [51] (Gain)
7. Gain4 [49] (Gain)
8. S-Function [52] (S-Function)
9. Gain6 [50] (Gain)
10. Sum2 [53] (Sum)
11. Gain [55] (Gain)
12. Sum [57] (Sum)
13. HiddenToWks_InsertedFor_Bus Creator_at_outport_0_1 (ToWorkspace)
14. BusConversion_InsertedFor_AIRFRAME_BUS_at_inport_0_BusCreator1 (BusCreator)

Pitch Channel

Figure 13. f14_airframe/Pitch Channel



Blocks

Parameters

"Angular Rate q " (Integrator)

Table 102. "Angular Rate q " Parameters

| Parameter | Value |
|---|----------|
| External reset | none |
| Initial condition source | internal |
| Initial condition | 0 |
| Limit output | off |
| Upper saturation limit | inf |
| Lower saturation limit | -inf |
| Wrap state | off |
| Wrapped state upper value | pi |
| Wrapped state lower value | -pi |
| Show saturation port | off |
| Show state port | off |
| Ignore limit and reset when linearizing | off |

| Parameter | Value |
|--------------------------------|-------|
| Enable zero-crossing detection | on |
| State Name (e.g., 'position') | " |

"Gain" (Gain)

Table 103. "Gain" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | Mq |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Input" (Inport)

Table 104. "Input" Parameters

| Parameter | Value |
|------------------------------------|-------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |
| Minimum | [] |
| Maximum | [] |

| Parameter | Value |
|-----------|---------------|
| Data type | Inherit: auto |

"q" (Outport)

Table 105. "q" Parameters

| Parameter | Value |
|--|---------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

"qdot" (Outport)

Table 106. "qdot" Parameters

| Parameter | Value |
|--|---------------|
| Port number | 2 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |

| Parameter | Value |
|--|---------|
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*-m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

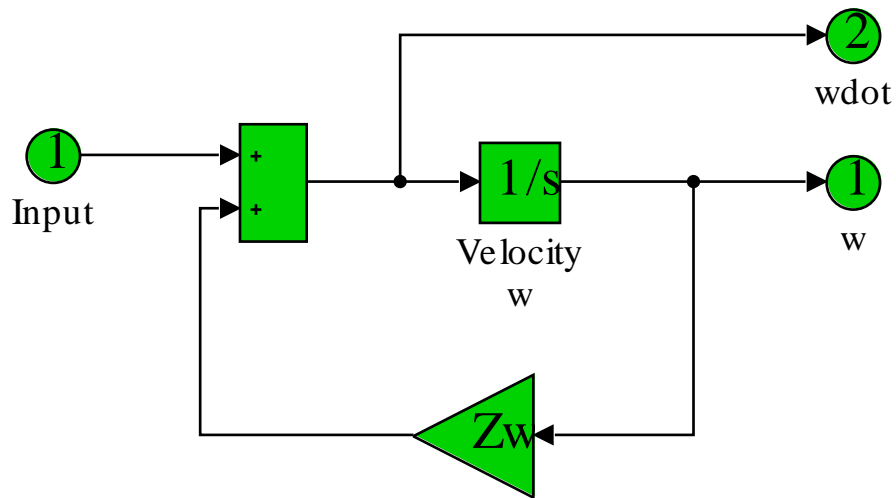
"Sum" (Sum)

Table 107. "Sum" Parameters

| Parameter | Value |
|--|------------------------------------|
| Icon shape | rectangular |
| List of signs | ++ |
| Sum over | All dimensions |
| Dimension | 1 |
| Require all inputs to have the same data type | on |
| Accumulator data type | Inherit: Inherit via internal rule |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock data type settings against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

vertical_channel

Checksum: 496161586 3893941811 1112689743 2271130466

Figure 14. vertical_channel

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Interface

Input Signals

The following tables describe external signals used to compute the subsystem's inputs. The name of the input signal is the name of the input port that accepts the signal. The number in angle brackets is the number of the input port. A dimension of [1 1] indicates a scalar signal.

Table 108.

Description:

Data Type: double

Width: 1

Dimensions: [1 1]

Output Signals

The following tables describe the signals output by this system. The name of the output signal is the name of the signal's parent block, i.e., the block that computes the signal. The number in angle brackets is the number of the port that emits the signal.

Table 109.

Description:

Data Type: double

Width: 1

Dimensions: [1 1]

Table 110.

Description:

Data Type: double

Width: 1

Dimensions: [1 1]

Blocks

Parameters

"Gain" (Gain)

Table 111. "Gain" Parameters

| Parameter | Value |
|--|------------------------|
| Gain | Zw |
| Multiplication | Element-wise(K.*u) |
| Parameter minimum | [] |
| Parameter maximum | [] |
| Parameter data type | Inherit: Same as input |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as input |
| Lock output data type setting against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Input" (Inport)

Table 112. "Input" Parameters

| Parameter | Value |
|------------------------------------|-------|
| Port number | 1 |
| Port dimensions (-1 for inherited) | -1 |
| Sample time (-1 for inherited) | -1 |

| Parameter | Value |
|-----------|---------------|
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |

"Sum" (Sum)

Table 113. "Sum" Parameters

| Parameter | Value |
|--|------------------------------------|
| Icon shape | rectangular |
| List of signs | ++ |
| Sum over | All dimensions |
| Dimension | 1 |
| Require all inputs to have the same data type | on |
| Accumulator data type | Inherit: Inherit via internal rule |
| Output minimum | [] |
| Output maximum | [] |
| Output data type | Inherit: Same as first input |
| Lock data type settings against changes by the fixed-point tools | off |
| Integer rounding mode | Floor |
| Saturate on integer overflow | on |
| Sample time (-1 for inherited) | -1 |

"Velocity w" (Integrator)

Table 114. "Velocity w" Parameters

| Parameter | Value |
|--------------------------|----------|
| External reset | none |
| Initial condition source | internal |
| Initial condition | 0 |
| Limit output | off |
| Upper saturation limit | inf |
| Lower saturation limit | -inf |

| Parameter | Value |
|---|-------|
| Wrap state | off |
| Wrapped state upper value | pi |
| Wrapped state lower value | -pi |
| Show saturation port | off |
| Show state port | off |
| Ignore limit and reset when linearizing | off |
| Enable zero-crossing detection | on |
| State Name (e.g., 'position') | " |

"w" (Outport)

Table 115. "w" Parameters

| Parameter | Value |
|--|---------------|
| Port number | 1 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

"wdot" (Outport)**Table 116. "wdot" Parameters**

| Parameter | Value |
|--|---------------|
| Port number | 2 |
| Icon display | Port number |
| Minimum | [] |
| Maximum | [] |
| Data type | Inherit: auto |
| Lock output data type setting against changes by the fixed-point tools | off |
| Output as nonvirtual bus in parent model | off |
| Unit (e.g., m, m/s ² , N*m) | inherit |
| Port dimensions (-1 for inherited) | -1 |
| Variable-size signal | Inherit |
| Sample time (-1 for inherited) | -1 |
| Source of initial output value | Dialog |
| Output when disabled | held |
| Initial output | [] |

Block Execution Order

1. Velocity w [60] (Integrator)
2. Gain [59] (Gain)
3. Sum [60] (Sum)

System Design Variables

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Design Variable Summary

Table 117. Design Variables

| Variable Name | Parent Blocks | Size | Bytes | Class | Value |
|---------------|---------------|------|-------|--------|----------|
| Uo | [16] | 1x1 | 8 | double | 689.4000 |
| g | Gain4 [18] | 1x1 | 8 | double | 32.2000 |

Design Variable Details

Table 118. ACT_BUS

| Property | Value |
|-------------|--|
| Alignment | -1 |
| Elements | [ACT_BUS.Elements(1) [63], ACT_BUS.Elements(2) [64]] |
| Description | |
| DataScope | Auto |
| HeaderFile | |

Table 119. ACT_BUS.Elements [63](1)

| Property | Value |
|----------------|----------------|
| Min | |
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |
| Description | |
| Unit | |
| Name | actualposn_rad |
| DataType | double |

| | |
|------------|------|
| Complexity | real |
| Dimensions | 1 |

Table 120. ACT_BUS.Elements [63](2)

| Property | Value |
|----------------|------------------|
| Min | |
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |
| Description | |
| Unit | |
| Name | measuredposn_rad |
| DataType | double |
| Complexity | real |
| Dimensions | 1 |

Used by Blocks:

- slproject_f14/AnalogControl [2]
- slproject_f14/F14 Aircraft Dynamic Model [3]
- slproject_f14/Non-Linear Actuator [3]

Resolved in: base workspace

Table 121. AIRFRAME_BUS

| Property | Value |
|-------------|--|
| Alignment | -1 |
| Elements | [AIRFRAME_BUS.Elements(1) [64], AIRFRAME_BUS.Elements(2) [65], AIRFRAME_BUS.Elements(3) [65], AIRFRAME_BUS.Elements(4) [65]] |
| Description | |
| DataScope | Auto |
| HeaderFile | |

Table 122. AIRFRAME_BUS.Elements [64](1)

| Property | Value |
|----------|-------|
| Min | |

| | |
|----------------|-----------|
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |
| Description | |
| Unit | |
| Name | alpha_rad |
| DataType | double |
| Complexity | real |
| Dimensions | 1 |

Table 123. AIRFRAME_BUS.Elements [64](2)

| Property | Value |
|----------------|--------|
| Min | |
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |
| Description | |
| Unit | |
| Name | wdot |
| DataType | double |
| Complexity | real |
| Dimensions | 1 |

Table 124. AIRFRAME_BUS.Elements [64](3)

| Property | Value |
|----------------|-----------------|
| Min | |
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |
| Description | |
| Unit | |
| Name | pitchrate_rad_s |
| DataType | double |
| Complexity | real |
| Dimensions | 1 |

Table 125. AIRFRAME_BUS.Elements [64](4)

| Property | Value |
|----------------|-------------------|
| Min | |
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |
| Description | |
| Unit | |
| Name | pitchrate_rad_s_s |
| DataType | double |
| Complexity | real |
| Dimensions | 1 |

Used by Blocks:

- slproject_f14/AnalogControl [2]
- slproject_f14/F14 Aircraft Dynamic Model [3]

Resolved in: base workspace

Table 126. CONTROL_BUS

| Property | Value |
|-------------|---------------------------|
| Alignment | -1 |
| Elements | CONTROL_BUS.Elements [66] |
| Description | |
| DataScope | Auto |
| HeaderFile | |

Table 127. CONTROL_BUS [66].Elements

| Property | Value |
|----------------|---------------|
| Min | |
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |
| Description | |
| Unit | |
| Name | actdemand_rad |
| DataType | double |
| Complexity | real |

| | |
|------------|---|
| Dimensions | 1 |
|------------|---|

Used by Blocks:

- slproject_f14/AnalogControl [2]
- slproject_f14/Non-Linear Actuator [3]

Resolved in: base workspace

Table 128. DISTURB_BUS

| Property | Value |
|-------------|--|
| Alignment | -1 |
| Elements | [DISTURB_BUS.Elements(1) [67], DISTURB_BUS.Elements(2) [67]] |
| Description | |
| DataScope | Auto |
| HeaderFile | |

Table 129. DISTURB_BUS.Elements [67](1)

| Property | Value |
|----------------|---------------------|
| Min | |
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |
| Description | |
| Unit | |
| Name | verticaldisturbance |
| DataType | double |
| Complexity | real |
| Dimensions | 1 |

Table 130. DISTURB_BUS.Elements [67](2)

| Property | Value |
|----------------|-------|
| Min | |
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |

| | |
|-------------|------------------|
| Description | |
| Unit | |
| Name | pitchdisturbance |
| DataType | double |
| Complexity | real |
| Dimensions | 1 |

Used by Blocks:

- slproject_f14/Dryden Wind Gust/Bus Creator [10]
- slproject_f14/Dryden Wind Gust/DISTURB_BUS [10]
- slproject_f14/F14 Aircraft Dynamic Model [3]

Resolved in: base workspace

Ka. 0.6770

Used by Blocks:

- slproject_f14/AnalogControl [2]

Resolved in: base workspace

Kf. -1.7460

Used by Blocks:

- slproject_f14/AnalogControl [2]

Resolved in: base workspace

Ki. -3.8640

Used by Blocks:

- slproject_f14/AnalogControl [2]

Resolved in: base workspace

Kq. 0.8156

Used by Blocks:

- slproject_f14/AnalogControl [2]

Resolved in: base workspace

Md. -6.8847

Used by Blocks:

- slproject_f14/F14 Aircraft Dynamic Model [3]

Resolved in: base workspace

Mq. -0.6571

Used by Blocks:

- slproject_f14/Dryden Wind Gust/Gain1 [11]
- slproject_f14/F14 Aircraft Dynamic Model [3]

Resolved in: base workspace

Mw. -0.0059

Used by Blocks:

- slproject_f14/Dryden Wind Gust/Gain2 [12]
- slproject_f14/F14 Aircraft Dynamic Model [3]

Resolved in: base workspace

Table 131. PILOT_BUS

| Property | Value |
|-------------|-------------------------|
| Alignment | -1 |
| Elements | PILOT_BUS.Elements [69] |
| Description | |
| DataScope | Auto |
| HeaderFile | |

Table 132. PILOT_BUS [69].Elements

| Property | Value |
|----------------|------------------|
| Min | |
| Max | |
| DimensionsMode | Fixed |
| SampleTime | -1 |
| Description | |
| Unit | |
| Name | StickCommand_rad |
| DataType | double |

| | |
|------------|------|
| Complexity | real |
| Dimensions | 1 |

Used by Blocks:

- slproject_f14/AnalogControl [2]
- slproject_f14/Pilot/Bus Creator [14]
- slproject_f14/Pilot/PILOT_BUS [15]

Resolved in: base workspace

Ta. 0.0500

Used by Blocks:

- slproject_f14/Non-Linear Actuator [3]

Resolved in: base workspace

Tal. 0.3959

Used by Blocks:

- slproject_f14/AnalogControl [2]

Resolved in: base workspace

Ts. 0.1000

Used by Blocks:

- slproject_f14/AnalogControl [2]

Resolved in: base workspace

Uo. 689.4000

Used by Blocks:

- slproject_f14/F14 Aircraft Dynamic Model [3]
- slproject_f14/Pilot G-Force Calculation/ [16]

Resolved in: base workspace

W1. 2.9710

Used by Blocks:

- slproject_f14/AnalogControl [2]

Resolved in: base workspace

W2. 4.1440

Used by Blocks:

- slproject_f14/AnalogControl [2]

Resolved in: base workspace

Zd. -63.9979

Used by Blocks:

- slproject_f14/F14 Aircraft Dynamic Model [3]

Resolved in: base workspace

Zw. -0.6385

Used by Blocks:

- slproject_f14/Dryden Wind Gust/Gain [11]
- slproject_f14/F14 Aircraft Dynamic Model [3]

Resolved in: base workspace

g. 32.2000

Used by Blocks:

- slproject_f14/Pilot G-Force Calculation/Gain4 [18]

Resolved in: base workspace

Requirements Traceability

slproject_f14 does not contain requirements traceability links.

System Model Configuration

Source: Model
Source Name: slproject_f14

Table 133. slproject_f14 Configuration Set

| Property | Value |
|----------------|--|
| Description | |
| Components | [slproject_f14 Configuration Set.Components(1) [-73], slproject_f14 Configuration Set.Components(2) [74], slproject_f14 Configuration Set.Components(3) [75], slproject_f14 Configuration Set.Components(4) [76], slproject_f14 Configuration Set.Components(5) [79], slproject_f14 Configuration Set.Components(6) [80], slproject_f14 Configuration Set.Components(7) [-81], slproject_f14 Configuration Set.Components(8) [81], slproject_f14 Configuration Set.Components(9) [83]] |
| Name | Configuration |
| SimulationMode | normal |
| ConfigType | Model |

Table 134. slproject_f14 Configuration Set.Components [73](1)

| Property | Value |
|--------------------------|------------|
| Name | Solver |
| Description | |
| Components | |
| StartTime | 0.0 |
| StopTime | 10.0 |
| AbsTol | auto |
| FixedStep | auto |
| InitialStep | auto |
| MaxNumMinSteps | -1 |
| MaxOrder | 5 |
| ZcThreshold | auto |
| ConsecutiveZCsStepRelTol | 10*128*eps |
| MaxConsecutiveZCs | 1000 |
| ExtrapolationOrder | 4 |
| NumberNewtonIterations | 1 |
| MaxStep | 0.1 |

| | |
|-----------------------------|-------------------|
| MinStep | auto |
| MaxConsecutiveMinStep | 1 |
| RelTol | 1e-3 |
| SolverMode | Auto |
| EnableConcurrentExecution | off |
| ConcurrentTasks | off |
| Solver | ode45 |
| SolverName | ode45 |
| SolverType | Variable-step |
| SolverJacobianMethodControl | auto |
| ShapePreserveControl | DisableAll |
| ZeroCrossControl | UseLocalSettings |
| ZeroCrossAlgorithm | Nonadaptive |
| SolverResetMethod | Fast |
| PositivePriorityOrder | off |
| AutoInsertRateTranBlk | off |
| SampleTimeConstraint | Unconstrained |
| InsertRTBMode | Whenever possible |
| SampleTimeProperty | |

Table 135. slproject_f14 Configuration Set.Components [73](2)

| Property | Value |
|---------------------------|--------------------|
| Name | Data Import/Export |
| Description | |
| Components | |
| Decimation | 1 |
| ExternalInput | [t, u] |
| FinalStateName | xFinal |
| InitialState | xInitial |
| LimitDataPoints | on |
| MaxDataPoints | 1000 |
| LoadExternalInput | off |
| LoadInitialState | off |
| SaveFinalState | off |
| SaveCompleteFinalSimState | off |
| SaveFormat | Array |
| SaveOutput | off |
| SaveState | off |
| SignalLogging | off |

| | |
|----------------------------|-------------------|
| DSMLogging | on |
| InspectSignalLogs | off |
| VisualizeSimOutput | on |
| StreamToWorkspace | off |
| StreamVariableName | streamout |
| SaveTime | off |
| ReturnWorkspaceOutputs | off |
| StateSaveName | xout |
| TimeSaveName | tout |
| OutputSaveName | yout |
| SignalLoggingName | slproject_f14 |
| DSMLoggingName | dsmout |
| OutputOption | RefineOutputTimes |
| OutputTimes | [] |
| ReturnWorkspaceOutputsName | out |
| Refine | 1 |
| LoggingToFile | off |
| LoggingFileName | out.mat |
| LoggingIntervals | [-inf, inf] |

Table 136. slproject_f14 Configuration Set.Components [73](3)

| Property | Value |
|-----------------------------------|--------------|
| Name | Optimization |
| Description | |
| Components | |
| BlockReduction | on |
| BooleanDataType | on |
| ConditionallyExecuteInputs | on |
| DefaultParameterBehavior | Tunable |
| InlineParams | off |
| UseDivisionForNetSlopeComputation | off |
| UseFloatMulNetSlope | off |
| DefaultUnderspecifiedDataType | double |
| UseSpecifiedMinMax | off |
| InlineInvariantSignals | off |
| OptimizeBlockIOStorage | on |
| BufferReuse | on |
| GlobalBufferReuse | on |
| GlobalVariableUsage | None |

| | |
|----------------------------------|---------------------|
| StrengthReduction | off |
| AdvancedOptControl | |
| EnforceIntegerDowncast | on |
| ExpressionFolding | on |
| BooleansAsBitFields | off |
| BitfieldContainerType | uint_T |
| EnableMemcpy | on |
| MemcpyThreshold | 64 |
| PassReuseOutputArgsAs | Structure reference |
| PassReuseOutputArgsThreshold | 12 |
| FoldNonRolledExpr | on |
| LocalBlockOutputs | on |
| RollThreshold | 5 |
| StateBitsets | off |
| DataBitsets | off |
| ActiveStateOutputEnumStorageType | Native Integer |
| UseTempVars | off |
| ZeroExternalMemoryAtStartup | on |
| ZeroInternalMemoryAtStartup | on |
| InitFltsAndDblsToZero | on |
| NoFixptDivByZeroProtection | off |
| EfficientFloat2IntCast | off |
| EfficientMapNaN2IntZero | on |
| OptimizeModelRefInitCode | off |
| LifeSpan | inf |
| EvaledLifeSpan | Inf |
| MaxStackSize | Inherit from target |
| BufferReusableBoundary | on |
| SimCompilerOptimization | off |
| AccelVerboseBuild | off |

Table 137. slproject_f14 Configuration Set.Components [73](4)

| Property | Value |
|---------------------|-------------|
| Name | Diagnostics |
| Description | |
| Components | |
| RTPrefix | error |
| ConsistencyChecking | none |
| ArrayBoundsChecking | none |

| | |
|---------------------------------------|--------------------------|
| SignalInfNanChecking | none |
| SignalRangeChecking | none |
| ReadBeforeWriteMsg | UseLocalSettings |
| WriteAfterWriteMsg | UseLocalSettings |
| WriteAfterReadMsg | UseLocalSettings |
| AlgebraicLoopMsg | warning |
| ArtificialAlgebraicLoopMsg | warning |
| SaveWithDisabledLinksMsg | warning |
| SaveWithParameterizedLinksMsg | none |
| CheckSSInitialOutputMsg | on |
| UnderspecifiedInitializationDetection | Classic |
| MergeDetectMultiDrivingBlocksExec | none |
| CheckExecutionContextRuntimeOutputMsg | off |
| SignalResolutionControl | TryResolveAllWithWarning |
| BlockPriorityViolationMsg | warning |
| MinStepSizeMsg | warning |
| TimeAdjustmentMsg | none |
| MaxConsecutiveZCsMsg | error |
| MaskedZcDiagnostic | warning |
| IgnoredZcDiagnostic | warning |
| SolverPrmCheckMsg | warning |
| InheritedTsInSrcMsg | warning |
| MultiTaskDSMMsg | warning |
| MultiTaskCondExecSysMsg | none |
| MultiTaskRateTransMsg | error |
| SingleTaskRateTransMsg | none |
| TasksWithSamePriorityMsg | warning |
| SigSpecEnsureSampleTimeMsg | warning |
| CheckMatrixSingularityMsg | none |
| IntegerOverflowMsg | warning |
| Int32ToFloatConvMsg | warning |
| ParameterDowncastMsg | error |
| ParameterOverflowMsg | error |
| ParameterUnderflowMsg | none |
| ParameterPrecisionLossMsg | warning |
| ParameterTunabilityLossMsg | warning |
| FixptConstUnderflowMsg | none |
| FixptConstOverflowMsg | none |
| FixptConstPrecisionLossMsg | none |

| | |
|---|------------------|
| UnderSpecifiedDataTypeMsg | none |
| UnnecessaryDatatypeConvMsg | none |
| VectorMatrixConversionMsg | none |
| InvalidFcnCallConnMsg | error |
| FcnCallInpInsideContextMsg | UseLocalSettings |
| SignalLabelMismatchMsg | none |
| UnconnectedInputMsg | warning |
| UnconnectedOutputMsg | warning |
| UnconnectedLineMsg | warning |
| SFcnCompatibilityMsg | none |
| FrameProcessingCompatibilityMsg | error |
| UniqueDataStoreMsg | none |
| BusObjectLabelMismatch | warning |
| RootOutportRequireBusObject | warning |
| AssertControl | UseLocalSettings |
| Echo | |
| EnableOverflowDetection | off |
| AllowSymbolicDim | off |
| ModelReferenceIOMsg | none |
| ModelReferenceVersionMismatchMessage | none |
| ModelReferenceIOMismatchMessage | none |
| ModelReferenceCSMismatchMessage | none |
| ModelReferenceSimTargetVerbose | off |
| UnknownTsInhSupMsg | warning |
| ModelReferenceDataLoggingMessage | warning |
| ModelReferenceSymbolNameMessage | warning |
| ModelReferenceExtraNoncontSigs | error |
| StateNameClashWarn | warning |
| SimStateInterfaceChecksumMismatchMsg | warning |
| SimStateOlderReleaseMsg | error |
| InitInArrayFormatMsg | warning |
| StrictBusMsg | ErrorLevel1 |
| BusNameAdapt | WarnAndRepair |
| NonBusSignalsTreatedAsBus | none |
| SFUnusedDataAndEventsDiag | warning |
| SFUnexpectedBacktrackingDiag | warning |
| SFInvalidInputDataAccessInChartInitDiag | warning |
| SFNoUnconditionalDefaultTransitionDiag | warning |
| SFTransitionOutsideNaturalParentDiag | warning |

| | |
|--|---------|
| SFUnconditionalTransitionShadowingDiag | warning |
| SFUndirectedBroadcastEventsDiag | warning |
| SFTransitionActionBeforeConditionDiag | warning |
| SFOutputUsedAsStateInMooreChartDiag | error |
| SFTemporalDelaySmallerThanSampleTimeDiag | warning |
| SFUnconditionalPathOutOfParentDiag | warning |
| SFSelfTransitionDiag | warning |
| SFExecutionAtInitializationDiag | none |
| SFMachineParentedDataDiag | warning |
| IntegerSaturationMsg | warning |
| AllowedUnitSystems | all |
| UnitsInconsistencyMsg | warning |
| AllowAutomaticUnitConversions | on |

Table 138. slproject_f14 Configuration Set.Components [73](5)

| Property | Value |
|--------------------------|-------------------------|
| Name | Hardware Implementation |
| Description | |
| Components | |
| ProdBitPerChar | 8 |
| ProdBitPerShort | 16 |
| ProdBitPerInt | 32 |
| ProdBitPerLong | 32 |
| ProdBitPerLongLong | 64 |
| ProdBitPerFloat | 32 |
| ProdBitPerDouble | 64 |
| ProdBitPerPointer | 32 |
| ProdLargestAtomicInteger | Char |
| ProdLargestAtomicFloat | None |
| ProdIntDivRoundTo | Undefined |
| ProdEndianess | Unspecified |
| ProdWordSize | 32 |
| ProdShiftRightIntArith | on |
| ProdLongLongMode | off |
| ProdHWDeviceType | 32-bit Generic |
| TargetBitPerChar | 8 |
| TargetBitPerShort | 16 |
| TargetBitPerInt | 32 |
| TargetBitPerLong | 32 |

| | |
|--------------------------------------|-------------|
| TargetBitPerLongLong | 64 |
| TargetBitPerFloat | 32 |
| TargetBitPerDouble | 64 |
| TargetBitPerPointer | 32 |
| TargetLargestAtomicInteger | Char |
| TargetLargestAtomicFloat | None |
| TargetShiftRightIntArith | on |
| TargetLongLongMode | off |
| TargetIntDivRoundTo | Undefined |
| TargetEndianness | Unspecified |
| TargetWordSize | 32 |
| TargetTypeEmulationWarnSuppressLevel | 0 |
| TargetPreprocMaxBitsSint | 32 |
| TargetPreprocMaxBitsUint | 32 |
| TargetHWDeviceType | Specified |
| TargetUnknown | off |
| ProdEqTarget | on |
| UseEmbeddedCoderFeatures | on |
| UseSimulinkCoderFeatures | on |

Table 139. slproject_f14 Configuration Set.Components [73](6)

| Property | Value |
|--|-------------------------------|
| Name | Model Referencing |
| Description | |
| Components | |
| UpdateModelReferenceTargets | IfOutOfDateOrStructuralChange |
| SkipRefExpFcnMdlSchedulingOrderCheck | off |
| EnableRefExpFcnMdlSchedulingChecks | on |
| CheckModelReferenceTargetMessage | error |
| EnableParallelModelReferenceBuilds | off |
| ParallelModelReferenceErrorOnInvalidPool | on |
| ParallelModelReferenceMATLABWorkerInit | None |
| ModelReferenceNumInstancesAllowed | Multi |
| PropagateVarSize | Infer from blocks in model |
| ModelDependencies | |
| ModelReferencePassRootInputsByReference | on |
| ModelReferenceMinAlgLoopOccurrences | on |
| PropagateSignalLabelsOutOfModel | off |
| SupportModelReferenceSimTargetCustomCode | off |

Table 140. slproject_f14 Configuration Set.Components [73](7)

| Property | Value |
|------------------------|----------------------|
| Name | Simulation Target |
| Description | |
| Components | |
| SimCustomSourceCode | |
| SimCustomHeaderCode | |
| SimCustomInitializer | |
| SimCustomTerminator | |
| SimReservedNameArray | |
| SimUserSources | |
| SimUserIncludeDirs | |
| SimUserLibraries | |
| SimUserDefines | |
| SFSimEnableDebug | off |
| SFSimOverflowDetection | on |
| SFSimEcho | on |
| SimBlas | on |
| SimCtrlC | on |
| SimExtrinsic | on |
| SimIntegrity | on |
| SimUseLocalCustomCode | off |
| SimParseCustomCode | on |
| SimBuildMode | sf_incremental_build |
| SimDataInitializer | |
| SimGenImportedTypeDefs | off |

Table 141. slproject_f14 Configuration Set.Components [73](8)

| Property | Value |
|----------------------------------|-----------------|
| Name | Code Generation |
| SystemTargetFile | grt.tlc |
| HardwareBoard | None |
| TLCOptions | |
| CodeGenDirectory | |
| GenCodeOnly | off |
| MakeCommand | make_rtw |
| GenerateMakefile | on |
| PackageGeneratedCodeAndArtifacts | off |

| | |
|------------------------------|---|
| PackageName | |
| TemplateMakefile | grt_default_tmf |
| PostCodeGenCommand | |
| Description | |
| GenerateReport | off |
| SaveLog | off |
| RTWVerbose | on |
| RetainRTWFile | off |
| ProfileTLC | off |
| TLCDebug | off |
| TLCCoverage | off |
| TLCAssert | off |
| ProcessScriptMode | Default |
| ConfigurationMode | Optimized |
| ProcessScript | |
| ConfigurationScript | |
| ConfigAtBuild | off |
| RTWUseLocalCustomCode | off |
| RTWUseSimCustomCode | off |
| CustomSourceCode | |
| CustomHeaderCode | |
| CustomInclude | |
| CustomSource | |
| CustomLibrary | |
| CustomDefine | |
| CustomLAPACKCallback | |
| CustomInitializer | |
| CustomTerminator | |
| Toolchain | Automatically locate an installed toolchain |
| BuildConfiguration | Faster Builds |
| CustomToolchainOptions | |
| IncludeHyperlinkInReport | off |
| LaunchReport | off |
| PortableWordSizes | off |
| GenerateErtSFunction | off |
| CreateSILPILBlock | None |
| CodeExecutionProfiling | off |
| CodeExecutionProfileVariable | executionProfile |
| CodeProfilingSaveOptions | SummaryOnly |

| | |
|--------------------------------|---|
| CodeProfilingInstrumentation | off |
| SILDebugging | off |
| TargetLang | C |
| IncludeERTFirstTime | off |
| GenerateTraceInfo | off |
| GenerateTraceReport | off |
| GenerateTraceReportSl | off |
| GenerateTraceReportSf | off |
| GenerateTraceReportEml | off |
| GenerateCodeInfo | off |
| GenerateWebview | off |
| GenerateCodeMetricsReport | off |
| GenerateCodeReplacementReport | off |
| RTWCompilerOptimization | off |
| ObjectivePriorities | |
| RTWCustomCompilerOptimizations | |
| CheckMdlBeforeBuild | Off |
| CustomRebuildMode | OnUpdate |
| DataInitializer | |
| Components | [slproject_f14 Configuration Set.Components(8).-Components(1) [84], slproject_f14 Configuration Set.Components(8).Components(2) [86]] |

Table 142. slproject_f14 Configuration Set.Components [73](9)

| Property | Value |
|---------------------|---|
| Description | Simulink Coverage Configuration Component |
| Components | |
| Name | Simulink Coverage |
| CovEnable | off |
| CovScope | EntireSystem |
| CovIncludeTopModel | on |
| RecordCoverage | off |
| CovPath | / |
| CovSaveName | covdata |
| CovCompData | |
| CovMetricSettings | dw |
| CovFilter | |
| CovHTMLOptions | |
| CovNameIncrementing | off |

| | |
|------------------------------------|----------------------------|
| CovHtmlReporting | on |
| CovForceBlockReductionOff | on |
| CovEnableCumulative | on |
| CovSaveCumulativeToWorkspaceVar | on |
| CovSaveSingleToWorkspaceVar | on |
| CovCumulativeVarName | covCumulativeData |
| CovCumulativeReport | off |
| CovSaveOutputData | on |
| CovOutputDir | slcov_output/\$ModelName\$ |
| CovDataFileName | \$ModelName\$_cvdata |
| CovReportOnPause | on |
| CovModelRefEnable | off |
| CovModelRefExcluded | |
| CovExternalEMLEnable | off |
| CovSFcnEnable | off |
| CovBoundaryAbsTol | 1.0000e-05 |
| CovBoundaryRelTol | 0.0100 |
| CovUseTimeInterval | off |
| CovStartTime | 0 |
| CovStopTime | 0 |
| CovMetricStructuralLevel | Decision |
| CovMetricLookupTable | off |
| CovMetricSignalRange | off |
| CovMetricSignalSize | off |
| CovMetricObjectiveConstraint | off |
| CovMetricSaturateOnIntegerOverflow | off |
| CovMetricRelationalBoundary | off |
| CovLogicBlockShortCircuit | off |
| CovUnsupportedBlockWarning | on |
| CovHighlightResults | on |

Table 143. slproject_f14 Configuration Set.Components(8).Components [83](1)

| Property | Value |
|-------------------------|-----------------|
| Name | Code Appearance |
| Description | |
| Components | |
| ForceParamTrailComments | off |
| GenerateComments | on |

| | |
|-----------------------------|--------------|
| CommentStyle | Auto |
| IgnoreCustomStorageClasses | on |
| IgnoreTestpoints | off |
| IncHierarchyInIds | off |
| MaxIdLength | 31 |
| PreserveName | off |
| PreserveNameWithParent | off |
| ShowEliminatedStatement | off |
| OperatorAnnotations | off |
| IncAutoGenComments | off |
| SimulinkDataObjDesc | off |
| SFDataObjDesc | off |
| MATLABFcnDesc | off |
| IncDataTypeInIds | off |
| PrefixModelToSubsysFcnNames | on |
| MangleLength | 1 |
| CustomSymbolStr | \$R\$N\$M |
| CustomSymbolStrGlobalVar | \$R\$N\$M |
| CustomSymbolStrType | \$N\$R\$M_T |
| CustomSymbolStrField | \$N\$M |
| CustomSymbolStrFcn | \$R\$N\$M\$F |
| CustomSymbolStrFcnArg | rt\$I\$N\$M |
| CustomSymbolStrBlkIO | rtb_\$N\$M |
| CustomSymbolStrTmpVar | \$N\$M |
| CustomSymbolStrMacro | \$R\$N\$M |
| CustomSymbolStrUtil | \$N\$C |
| CustomUserTokenString | |
| CustomCommentsFcn | |
| DefineNamingRule | None |
| DefineNamingFcn | |
| ParamNamingRule | None |
| ParamNamingFcn | |
| SignalNamingRule | None |
| SignalNamingFcn | |
| InsertBlockDesc | off |
| InsertPolySpaceComments | off |
| SimulinkBlockComments | on |
| MATLABSourceComments | off |
| EnableCustomComments | off |

| | |
|---------------------|-----------|
| InternalIdentifier | Shortened |
| InlinedPrmAccess | Literals |
| ReqsInCode | off |
| UseSimReservedNames | off |
| ReservedNameArray | |

Table 144. slproject_f14 Configuration Set.Components(8).Components [83](2)

| Property | Value |
|------------------------------|------------------|
| Name | Target |
| Description | |
| Components | |
| IsERTTarget | off |
| TargetFcnLib | ansi_tfl_tmw.mat |
| TargetLibSuffix | |
| TargetPreCompLibLocation | |
| GenFloatMathFcnCalls | NOT IN USE |
| TargetLangStandard | C89/C90 (ANSI) |
| TargetFunctionLibrary | NOT IN USE |
| CodeReplacementLibrary | None |
| UtilityFuncGeneration | Auto |
| ERTMultiwordTypeDef | System defined |
| ERTMultiwordLength | 256 |
| MultiwordLength | 2048 |
| GenerateFullHeader | on |
| InferredTypesCompatibility | off |
| GenerateSampleERTMain | off |
| GenerateTestInterfaces | off |
| ModelReferenceCompliant | on |
| ParMdlRefBuildCompliant | on |
| CompOptLevelCompliant | on |
| ConcurrentExecutionCompliant | on |
| IncludeMdlTerminateFcn | on |
| CombineOutputUpdateFcns | off |
| CombineSignalStateStructs | off |
| SuppressErrorStatus | off |
| ERTFirstTimeCompliant | off |
| IncludeFileDelimiter | Auto |
| ERTCustomFileBanners | off |

| | |
|--|----------------------|
| SupportAbsoluteTime | on |
| LogVarNameModifier | rt_ |
| MatFileLogging | on |
| MultiInstanceERTCode | off |
| CodeInterfacePackaging | Nonreusable function |
| SupportNonFinite | on |
| SupportComplex | on |
| PurelyIntegerCode | off |
| SupportContinuousTime | on |
| SupportNonInlinedSFcns | on |
| RemoveDisableMethod | off |
| RemoveResetMethod | off |
| SupportVariableSizeSignals | off |
| ParenthesesLevel | Nominal |
| CastingMode | Nominal |
| GenerateClassInterface | off |
| ModelStepFunctionPrototypeControlCompliant | off |
| CPPClassGenCompliant | on |
| GRTInterface | on |
| GenerateAllocFcn | off |
| UseToolchainInfoCompliant | on |
| GenerateSharedConstants | on |
| ExtMode | off |
| ExtModeStaticAlloc | off |
| ExtModeTesting | off |
| ExtModeStaticAllocSize | 1000000 |
| ExtModeTransport | 0 |
| ExtModeMexFile | ext_comm |
| ExtModeMexArgs | |
| ExtModeIntrfLevel | Level1 |
| RTWCAPISignals | off |
| RTWCAPIParams | off |
| RTWCAPISates | off |
| RTWCAPIRootIO | off |
| GenerateASAP2 | off |
| MultiInstanceErrorCode | Error |

Glossary

Atomic Subsystem. A subsystem treated as a unit by an implementation of the design documented in this report. The implementation computes the outputs of all the blocks in the atomic subsystem before computing the next block in the parent system's block execution order (sorted list).

Block Diagram. A Simulink block diagram represents a set of simultaneous equations that relate a system or subsystem's inputs to its outputs as a function of time. Each block in the diagram represents an equation of the form $y = f(t, x, u)$ where t is the current time, u is a block input, y is a block output, and x is a system state (see the Simulink documentation for information on the functions represented by the various types of blocks that make up the diagram). Lines connecting the blocks represent dependencies among the blocks, i.e., inputs whose current values are the outputs of other blocks. An implementation of a design described in this document computes a root or atomic system's outputs at each time step by computing the outputs of the blocks in an order determined by block input/output dependencies.

Block Parameter. A variable that determines the output of a block along with its inputs, for example, the gain parameter of a Gain block.

Block Execution Order. The order in which Simulink evaluates blocks during simulation of a model. The block execution order determined by Simulink ensures that a block executes only after all blocks on whose outputs it depends are executed.

Checksum. A number that indicates whether different versions of a model or atomic subsystem differ functionally or only cosmetically. Different checksums for different versions of the same model or subsystem indicate that the versions differ functionally.

Design Variable. A symbolic (MATLAB) variable or expression used as the value of a block parameter. Design variables allow the behavior of the model to be altered by altering the value of the design variable.

Signal. A block output, so-called because block outputs typically vary with time.

Virtual Subsystem. A subsystem that is purely graphical, i.e., is intended to reduce the visual complexity of the block diagram of which it is a subsystem. An implementation of the design treats the blocks in the subsystem as part of the first nonvirtual ancestor of the virtual subsystem (see Atomic Subsystem).

About this Report

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Report Overview

This report describes the design of the F14 Project system. The report was generated automatically from a Simulink model used to validate the design. It contains the following sections:

Model Version. Specifies information about the version of the model from which this design description was generated. Includes the model checksum, a number that indicates whether different versions of the model differ functionally or only cosmetically. Different checksums for different versions indicate that the versions differ functionally.

Root System. Describes the design's root system.

Subsystems. Describes each of the design's subsystems.

Design Variables. Describes system design variables, i.e., MATLAB variables and expressions used as block parameter values.

System Model Configuration. Lists the configuration parameters, e.g., start and stop time, of the model used to simulate the system described by this report.

Requirements Traceability. Shows design requirements associated with elements of the design model. This section appears only if the design model contains requirements links.

Glossary. Defines Simulink terms used in this report.

Root System Description

This section describes a design's root system. It contains the following sections:

Diagram. Simulink block diagram that represents the algorithm used to compute the root system's outputs.

Description. Description of the root system. This section appears only if the model's root system has a Documentation property or a Doc block.

Interface. Name, data type, width, and other properties of the root system's input and output signals. The number of the block port that outputs the signal appears in angle brackets appended to the signal name. This section appears only if the root system has input or output ports.

Blocks. This section has two subsections:

- **Parameters.** Describes key parameters of blocks in the root system. This section also includes graphical and/or tabular representations of lookup table data used by lookup table blocks, i.e., blocks that use lookup tables to compute their outputs.

- **Block Execution Order.** Order in which blocks must be executed at each time step in order to ensure that each block's inputs are available when it executes.

State Charts. Describes state charts used in the root system. This section appears only if the root system contains Stateflow blocks.

Subsystem Descriptions

This section describes a design's subsystems. Each subsystem description contains the following sections:

Checksum. This section appears only if the subsystem is an atomic subsystem. The checksum indicates whether the version of the model subsystem used to generate this report differs functionally from other versions of the model subsystem. If two model checksums differ, the corresponding versions of the model differ functionally.

Diagram. Simulink block diagram that graphically represents the algorithm used to compute the subsystem's outputs.

Description. Description of the subsystem. This section appears only if the subsystem has a Documentation property or contains a Doc block.

Interface. Name, data type, width, and other properties of the subsystem's input and output signals. The number of the block port that outputs the signal appears in angle brackets appended to the signal name. This section appears only if the subsystem is atomic and has input or output ports.

Blocks. Blocks that this subsystem contains. This section has two subsections:

- **Parameters.** Key parameters of blocks in the subsystem. This section also includes graphical and/or tabular representations of lookup table data used by lookup table blocks, blocks that use lookup tables to compute their outputs.
- **Block Execution Order.** Order in which the subsystem's blocks must be executed at each time step in order to ensure that each block's inputs are available when the block executes. This section appears only if the subsystem is atomic. Note: in Acrobat(PDF) reports, the number in square brackets next to the block name is a hyperlink to the block parameter table. The number has no model significance.

State Charts. Describes state charts used in the subsystem. This section appears only if the root system contains Stateflow blocks.

State Chart Descriptions

This section describes the state machines used by Stateflow blocks to compute their outputs, i.e., Stateflow blocks. Each state machine description contains the following sections:

Chart. Diagram representing the state machine.

States. Describes the state machine's states. Each state description includes the state's diagram and diagrams and/or descriptions of graphical functions, Simulink functions, truth tables, and MATLAB functions parented by the state.

Transitions. Transitions between the state machine's states. Each transition description specifies the values of key transition properties. Appears only if a transition has properties that do not appear on the chart.

Junctions. Transition junctions. Each junction description specifies the values of key junction properties. Appears only if a junction has properties that do not appear on the chart.

Events. Events that trigger state transitions. Each event description specifies the values of key event properties.

Data. Data types and other properties of the Stateflow block's inputs, outputs, and other state machine data.

Targets. Executable implementations of the state machine used to compute the outputs of the corresponding Stateflow block.

MATLAB Supporting Functions. List of functions invoked by MATLAB functions defined in the chart.