F14 Project

Design Description

The MathWorks Inc.

F14 Project: Design Description

The MathWorks Inc.

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Parameters

"AnalogControl" (ModelReference)

Table 1. "AnalogControl" Parameters

Parameter	Value
Model name	AnalogControl
	AnalogControl.mdl
	AnalogControl
Simulation mode	Normal
Variant	off
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
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
Variant	off
Generate Preprocessor Conditionals	off

Block Execution Order

1. Non-Linear Actuator [2] (ModelReference)
2. W-gust model [12] (TransferFcn)
3. Gain [9] (Gain)
4. Gain2 [10] (Gain)
5. Gain3 [11] (Gain)
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7. Gain1 [10] (Gain)
8. Sum [12] (Sum)
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11. Gain3 [16] (Gain)
12. ??? [15] (Constant)
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15. Gain4 [16] (Gain)
16. Pilot [13] (SignalGenerator)
17. SigConversion_InsertedFor_Bus Selector1_at_outport_0 (SignalConversion)
18. SigConversion_InsertedFor_Bus Selector1_at_outport_1 (SignalConversion)
19. Nz Stick Alpha q [2] (Scope)
20. AnalogControl [1] (ModelReference)
21. BusConversion_InsertedFor_AnalogControl_at_inport_0_BusCreator1 (BusCreator)
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23. White Noise [19] (RandomNumber)
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Figure 2. slproject_f14/Data Logging
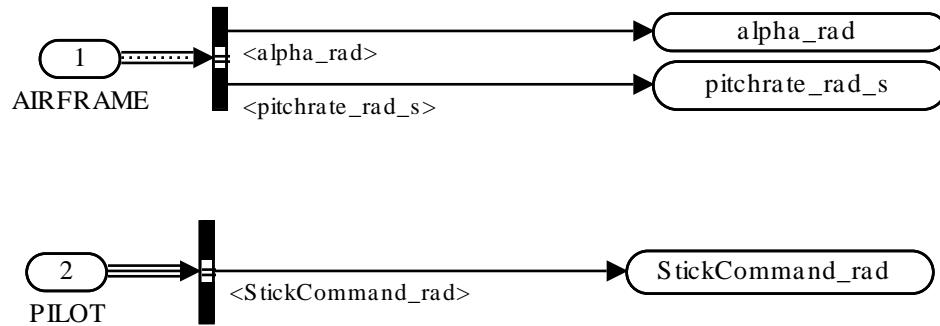
Blocks

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	[]
Data type	Inherit: auto

Parameter	Value
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
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 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
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
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
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
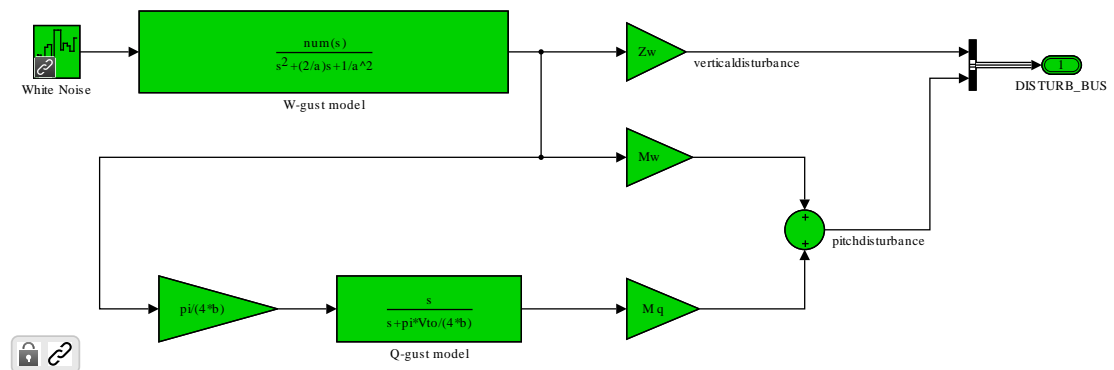
Blocks

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

"DISTURB_BUS" (Outport)

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
Output as nonvirtual bus in parent model	off
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	Value
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
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

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

"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*Vto/(4*b)]
State Name (e.g., 'positi-on')	''

"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
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	Swg/sqrt(a^3)*[sqrt(3)*a,1]
Denominator coefficients	[1 (2/a) 1/a^2]

Parameter	Value
State Name (e.g., 'positi-on')	''

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

"Pilot" (SignalGenerator)

Table 21. "Pilot" Parameters

Parameter	Value
Wave form	square
Time (t)	Use simulation time
Amplitude	1
Frequency	.1
Units	Hertz

Parameter	Value
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
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 G-Force Calculation

Figure 5. slproject_f14/Pilot G-Force Calculation

$$Nz = (- dw/dt + dq/dt*22.8 + q*Uo)/g$$
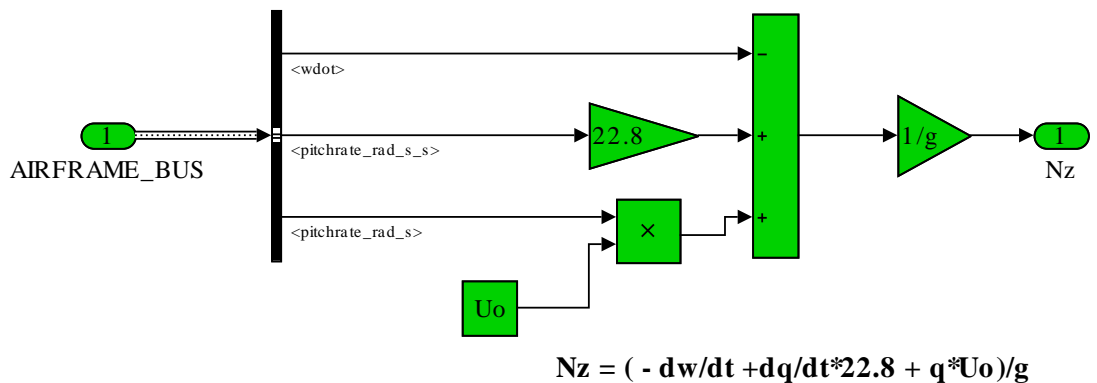
Blocks

Parameters

" " (Constant)

Table 23. " " Parameters

Parameter	Value
Constant value	Uo
Interpret vector parameters as 1-D	on
Sampling mode	Sample based
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
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

Parameter	Value
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 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	Value
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
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
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

Parameter	Value
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

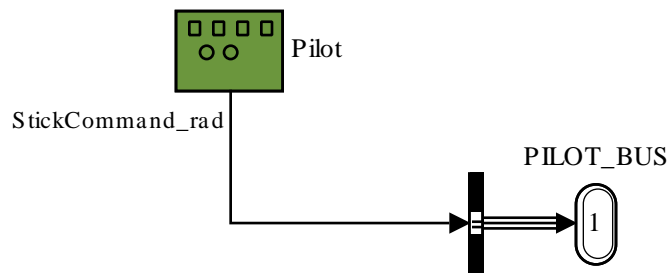| Parameter	Value
Gain	[sqrt(Cov)]/[sqrt(Ts)]
Multiplication	Element-wise(K.*u)
Parameter minimum	[]
Parameter maximum	[]
Parameter data type	Inherit: Same as input
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Same as input
Lock output data type setting against changes by the fixed-point 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	Ts
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
Output as nonvirtual bus in parent model	off
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: 3344560974 1934540220 287812397 2334380706

Figure 7. AnalogControl
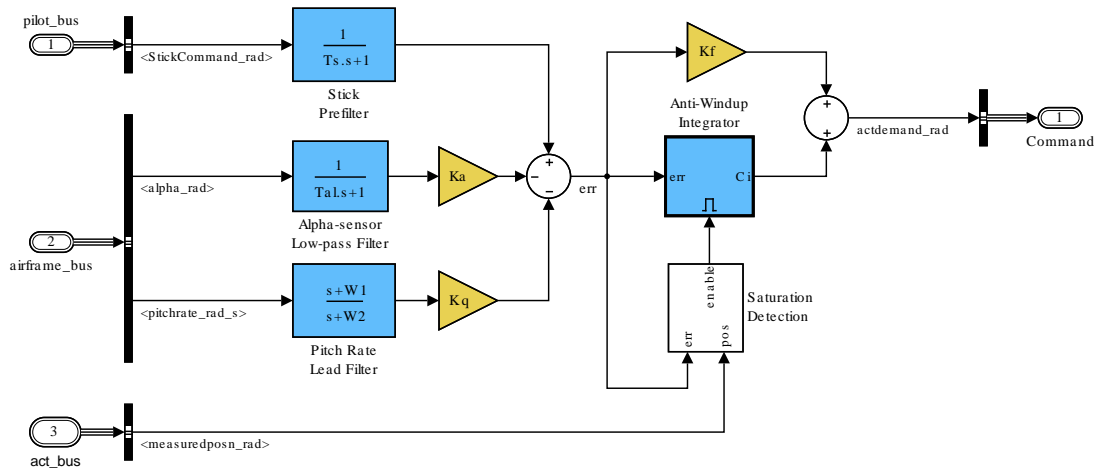
Copyright 1990-2014 The MathWorks, Inc.

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: ACT_BUS
Width: 1
Dimensions: [1 1]

Table 35.

Description:
Data Type: AIRFRAME_BUS
Width: 1
Dimensions: [1 1]

Table 36.

Description:
Data Type: PILOT_BUS
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: CONTROL_BUS

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	[]
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

"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
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1
Source of initial output value	Dialog

Parameter	Value
Output when disabled	held
Initial output	[]

"Gain" (Gain)

Table 46. "Gain" Parameters

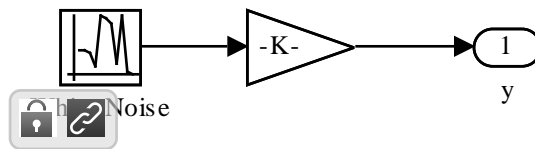| Parameter	Value
Gain	Kf
Multiplication	Element-wise(K.*u)
Parameter minimum	[]
Parameter maximum	[]
Parameter data type	Inherit: Same as input
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Same as input
Lock output data type setting against changes by the fixed-point tools	off
Integer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

"Gain3" (Gain)

Table 48. "Gain3" Parameters

Parameter	Value
Gain	Ka
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

"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

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

Block Execution Order

1. Alpha-sensor Low-pass Filter [23] (TransferFcn)
2. Stick Prefilter [27] (TransferFcn)
3. Gain3 [26] (Gain)
4. Pitch Rate Lead Filter [27] (TransferFcn)
5. Gain2 [25] (Gain)
6. Sum2 [28] (Sum)
7. Sign [37] (Signum)
8. Sign1 [37] (Signum)
9. Relational Operator [37] (RelationalOperator)
10. Abs [35] (Abs)
11. Constant [33] (Constant)
12. Compare [32] (RelationalOperator)
13. Logical Operator [36] (Logic)
14. HiddenBuf_InsertedFor_Anti-Windup Integrator_at_inport_1 (SignalConversion)
15. *Anti-Windup Integrator*
16. Gain [25] (Gain)

17. Sum [27] (Sum)
18. BusConversion_InsertedFor_Command_at_inport_0_BusCreator1 (BusCreator)

Anti-Windup Integrator

Checksum: 767147657 1349820253 3471122164 1387938813

Figure 8. AnalogControl/Anti-Windup Integrator
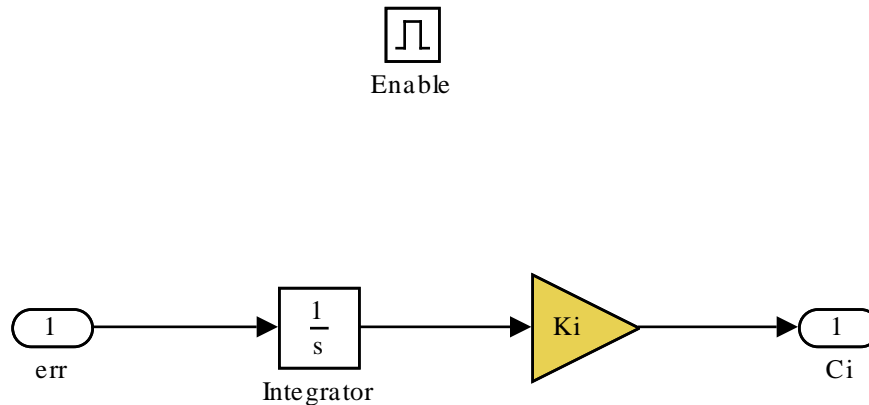
Interface

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
Output as nonvirtual bus in parent model	off
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

Parameter	Value
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
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
Lower saturation limit	-inf
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 [32] (Integrator)
2. Gain1 [31] (Gain)

Compare To Saturation Position

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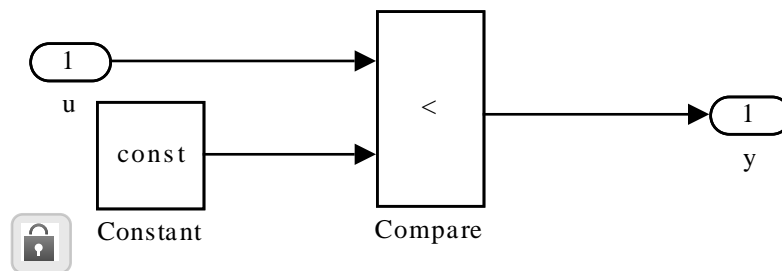
Blocks

Parameters

"Compare" (RelationalOperator)

Table 61. "Compare" Parameters

Parameter	Value
Relational operator	<
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

"Constant" (Constant)

Table 62. "Constant" Parameters

Parameter	Value
Constant value	const
Interpret vector parameters as 1-D	on
Sampling mode	Sample based
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	[]

Parameter	Value
Data type	Inherit: auto

"y" (Outport)

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
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
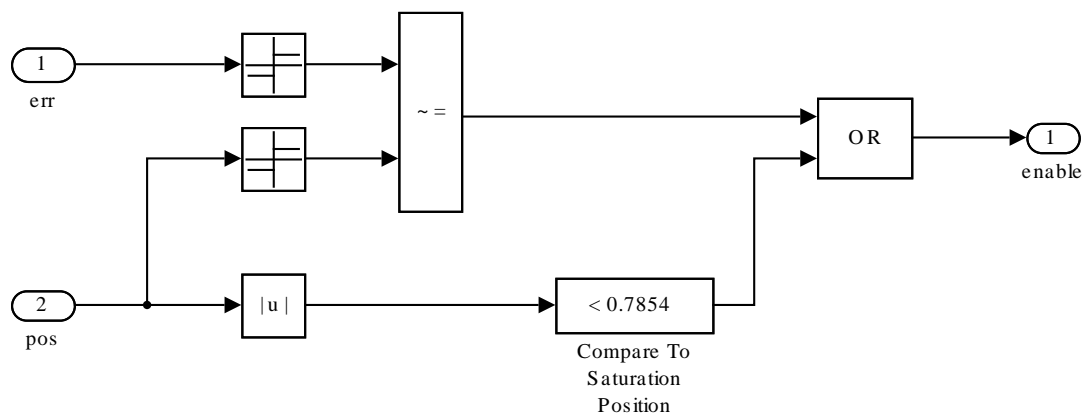
Blocks

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
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1

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

Parameter	Value
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

"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
Sample time (-1 for inherited)	-1

NonLinearActuator

Checksum: 176495232 2889688275 4097866525 1085206345

Figure 11. NonLinearActuator
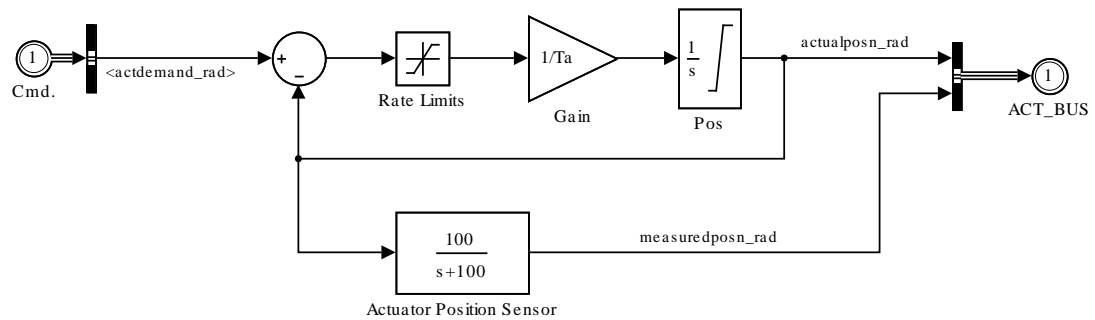
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Interface

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: CONTROL_BUS

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: ACT_BUS

Width: 1

Dimensions: [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
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]
State Name (e.g., 'position')	''

"Bus Creator" (BusCreator)

Table 77. "Bus Creator" Parameters

Parameter	Value
Number of inputs	2
Display option	bar

Parameter	Value
Data type	Bus: ACT_BUS
Output as nonvirtual bus	off

"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	[]
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

Parameter	Value
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
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

Parameter	Value
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
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*
2. Actuator Position Sensor [39] (TransferFcn)
3. Pos [41] (Integrator)
4. BusConversion_InsertedFor_ACT_BUS_at_inport_0_BusCreator1 (BusCreator)

f14_airframe

Checksum: 2478671904 3949805503 798325109 815273359

Figure 12. f14_airframe
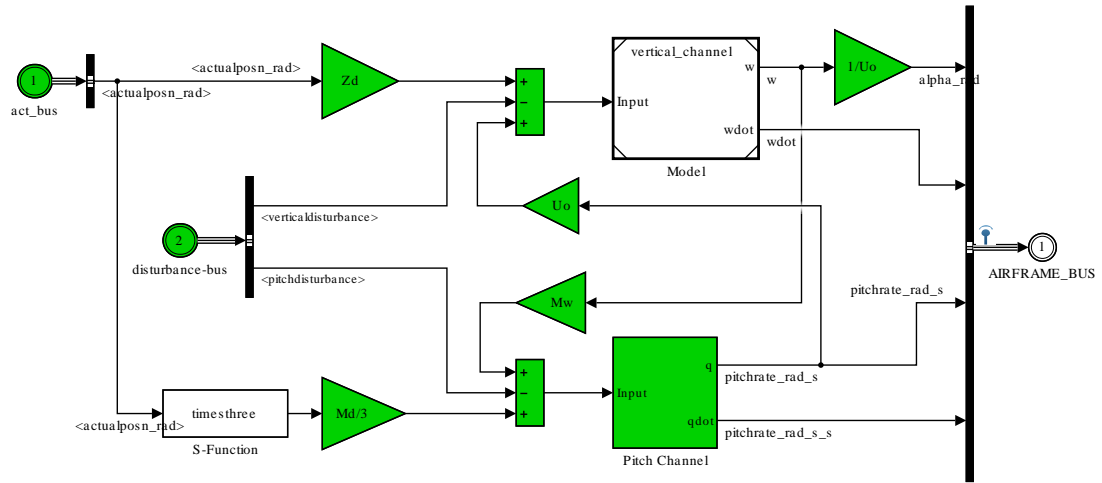
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Interface

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: ACT_BUS

Width: 1

Dimensions: [1 1]

Table 85.

Description:

Data Type: DISTURB_BUS

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 86.

Description:

Data Type: AIRFRAME_BUS

Width: 1

Dimensions: [1 1]

Blocks

Parameters

"act_bus" (Inport)

Table 87. "act_bus" Parameters

Parameter	Value
Port number	1
Port dimensions (-1 for inherited)	-1
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
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	0

"Bus Creator" (BusCreator)

Table 89. "Bus Creator" Parameters

Parameter	Value
Number of inputs	'alpha_rad','wdot','pitchrate_rad_s','pitchrate_rad_s_s'
Display option	bar
Data type	Bus: AIRFRAME_BUS
Output as nonvirtual bus	off

"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

Parameter	Value
	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
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

Parameter	Value
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	[]
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

Parameter	Value
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 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	[]

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

"Model" (ModelReference)

Table 98. "Model" Parameters

Parameter	Value
Model name	vertical_channel
	vertical_channel.slx
	vertical_channel
Simulation mode	Normal
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

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

"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 [47] (Gain)

2. Angular Rate q [51] (Integrator)
3. Gain3 [46] (Gain)
4. Sum1 [49] (Sum)
5. Model [49] (ModelReference)
6. Gain7 [48] (Gain)
7. Gain4 [47] (Gain)
8. S-Function [49] (S-Function)
9. Gain6 [48] (Gain)
10. Sum2 [50] (Sum)
11. Gain [52] (Gain)
12. Sum [54] (Sum)
13. 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

Parameter	Value
Upper saturation limit	inf
Lower saturation limit	-inf
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')	''

"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

Parameter	Value
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
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
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

Parameter	Value
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
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

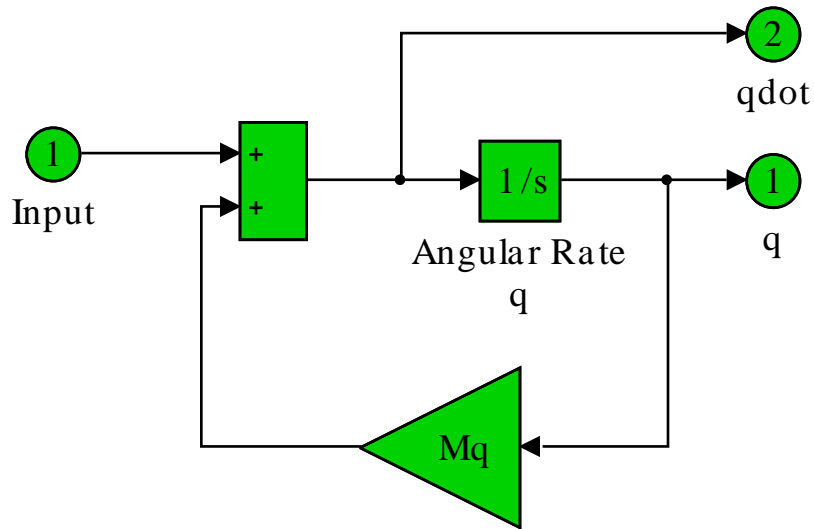| Parameter	Value
Icon shape	rectangular
List of signs	++
Sum over	All dimensions
Dimension	1
Require all inputs to have the same data type	on
Accumulator data type	Inherit: Inherit via internal rule
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Same as first input
Lock data type settings 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: 931895902 3317110929 2824189960 2669727160

Figure 14. vertical_channel
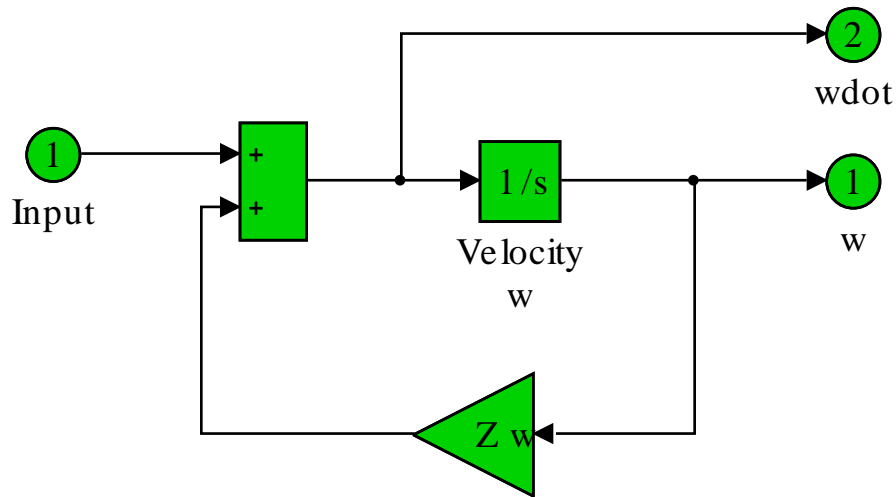
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Interface

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

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

Parameter	Value
Lower saturation limit	-inf
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
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

Parameter	Value
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
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 [57] (Integrator)
2. Gain [56] (Gain)
3. Sum [57] (Sum)

System Design Variables

Table of Contents

Design Variable Summary

Table 117. Design Variables

Variable Name	Parent Blocks	Size	Bytes	Class	Value
Uo	??? [15]	1x1	8	double	689.4000
g	Gain4 [16]	1x1	8	double	32.2000

Design Variable Details

Table 118. ACT_BUS

Property	Value
Alignment	-1
Elements	[ACT_BUS.Elements(1) [60], ACT_BUS.Elements(2) [61]]
Description	
DataScope	Auto
HeaderFile	

Table 119. ACT_BUS.Elements [60](1)

Property	Value
Min	
Max	
DimensionsMode	Fixed
SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	actualposn_rad
DataType	double

Complexity	real
Dimensions	1

Table 120. ACT_BUS.Elements [60](2)

Property	Value
Min	
Max	
DimensionsMode	Fixed
SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	measuredposn_rad
DataType	double
Complexity	real
Dimensions	1

Used by Blocks:

- slproject_f14/AnalogControl [1]
- slproject_f14/F14 Aircraft Dynamic Model [2]
- slproject_f14/Non-Linear Actuator [2]

Resolved in: base workspace

Table 121. AIRFRAME_BUS

Property	Value
Alignment	-1
Elements	[AIRFRAME_BUS.Elements(1) [61], AIRFR-AME_BUS.Elements(2) [62], AIRFRAME_-BUS.Elements(3) [62], AIRFRAME_BUS.El-ements(4) [63]]
Description	
DataScope	Auto
HeaderFile	

Table 122. AIRFRAME_BUS.Elements [61](1)

Property	Value
Min	

Property	Value
Max	
DimensionsMode	Fixed
SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	alpha_rad
DataType	double
Complexity	real
Dimensions	1

Table 123. AIRFRAME_BUS.Elements [61](2)

Property	Value
Min	
Max	
DimensionsMode	Fixed
SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	wdot
DataType	double
Complexity	real
Dimensions	1

Table 124. AIRFRAME_BUS.Elements [61](3)

Property	Value
Min	
Max	
DimensionsMode	Fixed
SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	pitchrate_rad_s
DataType	double

Complexity	real
Dimensions	1

Table 125. AIRFRAME_BUS.Elements [61](4)

Property	Value
Min	
Max	
DimensionsMode	Fixed
SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	pitchrate_rad_s_s
DataType	double
Complexity	real
Dimensions	1

Used by Blocks:

- slproject_f14/AnalogControl [1]
- slproject_f14/F14 Aircraft Dynamic Model [2]

Resolved in: base workspace

Table 126. CONTROL_BUS

Property	Value
Alignment	-1
Elements	CONTROL_BUS.Elements [63]
Description	
DataScope	Auto
HeaderFile	

Table 127. CONTROL_BUS [63].Elements

Property	Value
Min	
Max	
DimensionsMode	Fixed

SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	actdemand_rad
DataType	double
Complexity	real
Dimensions	1

Used by Blocks:

- slproject_f14/AnalogControl [1]
- slproject_f14/Non-Linear Actuator [2]

Resolved in: base workspace

Table 128. DISTURB_BUS

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

Table 129. DISTURB_BUS.Elements [64](1)

Property	Value
Min	
Max	
DimensionsMode	Fixed
SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	verticaldisturbance
DataType	double
Complexity	real
Dimensions	1

Table 130. DISTURB_BUS.Elements [64](2)

Property	Value
Min	
Max	
DimensionsMode	Fixed
SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	pitchdisturbance
DataType	double
Complexity	real
Dimensions	1

Used by Blocks:

- slproject_f14/Dryden Wind Gust/Bus Creator [8]
- slproject_f14/Dryden Wind Gust/DISTURB_BUS [9]
- slproject_f14/F14 Aircraft Dynamic Model [2]

Resolved in: base workspace

Ka.   0.6770

Used by Blocks:

- slproject_f14/AnalogControl [1]

Resolved in: base workspace

Kf.   -1.7460

Used by Blocks:

- slproject_f14/AnalogControl [1]

Resolved in: base workspace

Ki.   -3.8640

Used by Blocks:

- slproject_f14/AnalogControl [1]

Resolved in: base workspace

Kq. 0.8156

Used by Blocks:

• slproject_f14/AnalogControl [1]

Resolved in: base workspace

Md. -6.8847

Used by Blocks:

• slproject_f14/F14 Aircraft Dynamic Model [2]

Resolved in: base workspace

Mq. -0.6571

Used by Blocks:

• slproject_f14/Dryden Wind Gust/Gain1 [10]
• slproject_f14/F14 Aircraft Dynamic Model [2]

Resolved in: base workspace

Mw. -0.0059

Used by Blocks:

• slproject_f14/Dryden Wind Gust/Gain2 [10]
• slproject_f14/F14 Aircraft Dynamic Model [2]

Resolved in: base workspace

Table 131. PILOT_BUS

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

Table 132. PILOT_BUS [66].Elements

Property	Value
Min	

Max	
DimensionsMode	Fixed
SamplingMode	Sample based
SampleTime	-1
Description	
DocUnits	
Name	StickCommand_rad
DataType	double
Complexity	real
Dimensions	1

Used by Blocks:

- slproject_f14/AnalogControl [1]
- slproject_f14/Pilot/Bus Creator [13]
- slproject_f14/Pilot/PILOT_BUS [14]

Resolved in: base workspace

Ta.　0.0500

Used by Blocks:

- slproject_f14/Non-Linear Actuator [2]

Resolved in: base workspace

Tal.　0.3959

Used by Blocks:

- slproject_f14/AnalogControl [1]

Resolved in: base workspace

Ts.　0.1000

Used by Blocks:

- slproject_f14/AnalogControl [1]

Resolved in: base workspace

Uo.　689.4000

Used by Blocks:

- slproject_f14/F14 Aircraft Dynamic Model [2]

- slproject_f14/Pilot G-Force Calculation/ [15]

Resolved in: base workspace

W1. 2.9710

Used by Blocks:

- slproject_f14/AnalogControl [1]

Resolved in: base workspace

W2. 4.1440

Used by Blocks:

- slproject_f14/AnalogControl [1]

Resolved in: base workspace

Zd. -63.9979

Used by Blocks:

- slproject_f14/F14 Aircraft Dynamic Model [2]

Resolved in: base workspace

Zw. -0.6385

Used by Blocks:

- slproject_f14/Dryden Wind Gust/Gain [9]
- slproject_f14/F14 Aircraft Dynamic Model [2]

Resolved in: base workspace

g. 32.2000

Used by Blocks:

- slproject_f14/Pilot G-Force Calculation/Gain4 [16]

Resolved in: base workspace

Requirements Traceability

slproject_f14 does not contain requirements traceability links.

System Model Configuration

Table 133. slproject_f14 Configuration Set

Property	Value
Description	
Components	[slproject_f14 Configuration Set.Components(1) [-70], slproject_f14 Configuration Set.Components(2) [71], slproject_f14 Configuration Set.-Components(3) [72], slproject_f14 Configuration Set.Components(4) [73], slproject_f14 Configuration Set.Components(5) [75], slproject_f14 Configuration Set.Components(6) [77], slproject_f14 Configuration Set.Components(7) [-77], slproject_f14 Configuration Set.Components(8) [78]]
Name	Configuration
SimulationMode	normal

Table 134. slproject_f14 Configuration Set.Components [70](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 [70](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
SignalLoggingSaveFormat	Dataset
SaveOutput	off
SaveState	off
SignalLogging	on
DSMLogging	on
InspectSignalLogs	off
VisualizeSimOutput	on
SaveTime	off

ReturnWorkspaceOutputs	off
StateSaveName	xout
TimeSaveName	tout
OutputSaveName	yout
SignalLoggingName	slproject_f14
DSMLoggingName	dsmout
OutputOption	RefineOutputTimes
OutputTimes	[]
ReturnWorkspaceOutputsName	out
Refine	1

Table 136. slproject_f14 Configuration Set.Components [70](3)

Property	Value
Name	Optimization
Description	
Components	
BlockReduction	on
BooleanDataType	on
ConditionallyExecuteInputs	on
InlineParams	off
UseIntDivNetSlope	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
SystemCodeInlineAuto	off
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
ParallelExecutionInRapidAccelerator	on

Table 137. slproject_f14 Configuration Set.Components [70](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
CheckExecutionContextPreStartOutputMsg	off
CheckExecutionContextRuntimeOutputMsg	off
SignalResolutionControl	TryResolveAllWithWarning
BlockPriorityViolationMsg	warning
MinStepSizeMsg	warning
TimeAdjustmentMsg	none
MaxConsecutiveZCsMsg	error
MaskedZcDiagnostic	warning
IgnoredZcDiagnostic	warning
SolverPrmCheckMsg	warning
InheritedTsInSrcMsg	warning
DiscreteInheritContinuousMsg	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	warning
UniqueDataStoreMsg	none
BusObjectLabelMismatch	warning
RootOutportRequireBusObject	warning
AssertControl	UseLocalSettings
Echo	
EnableOverflowDetection	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
LoggingUnavailableSignals	error
SFUnusedDataAndEventsDiag	warning
SFUnexpectedBacktrackingDiag	warning
SFInvalidInputDataAccessInChartInitDiag	warning
SFNoUnconditionalDefaultTransitionDiag	warning
SFTransitionOutsideNaturalParentDiag	warning
SFUnconditionalTransitionShadowingDiag	warning
SFUndirectedBroadcastEventsDiag	warning
SFTransitionActionBeforeConditionDiag	warning

Table 138. slproject_f14 Configuration Set.Components [70](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
TargetEndianess	Unspecified
TargetWordSize	32
TargetTypeEmulationWarnSuppressLevel	0
TargetPreprocMaxBitsSint	32
TargetPreprocMaxBitsUint	32
TargetHWDeviceType	Specified
TargetUnknown	off

ProdEqTarget	on

Table 139. slproject_f14 Configuration Set.Components [70](6)

Property	Value
Name	Model Referencing
Description	
Components	
UpdateModelReferenceTargets	IfOutOfDateOrStructuralChange
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 [70](7)

Property	Value
Name	Simulation Target
Description	
Components	
SimCustomSourceCode	
SimCustomHeaderCode	
SimCustomInitializer	
SimCustomTerminator	
SimReservedNameArray	
SimUserSources	
SimUserIncludeDirs	
SimUserLibraries	
SFSimEnableDebug	on
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 [70](8)

Property	Value
Name	Code Generation
SystemTargetFile	grt.tlc
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	
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
IncludeRootSignalInRTWFile	off
IncludeVirtualBlocksInRTWFileBlockHierarchy-Map	off
IncludeRegionsInRTWFileBlockHierarchyMap	off
IncludeERTFirstTime	on
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) [80], slproject_f14 Configuration Set.Components(8).Components(2) [81]]

Table 142. slproject_f14 Configuration Set.Components(8).Components [80](1)

Property	Value
Name	Code Appearance
Description	
Components	
Comment	
ForceParamTrailComments	off
GenerateComments	on
CommentStyle	Auto
IgnoreCustomStorageClasses	on
IgnoreTestpoints	off
IncHierarchyInIds	off
MaxIdLength	31
ParamChangeEventCodePlacement	Output method
PreserveName	off
PreserveNameWithParent	off
ShowEliminatedStatement	off
OperatorAnnotations	off
IncAutoGenComments	off
SimulinkDataObjDesc	off
SFDataObjDesc	off
MATLABFcnDesc	off
IncDataTypeInIds	off
PrefixModelToSubsysFcnNames	on
MangleLength	1
CustomSymbolStr	RN$M
CustomSymbolStrGlobalVar	RN$M
CustomSymbolStrType	NR$M_T
CustomSymbolStrField	NM
CustomSymbolStrFcn	RNMF
CustomSymbolStrFcnArg	rt$I$N$M
CustomSymbolStrBlkIO	rtb_NM
CustomSymbolStrTmpVar	NM
CustomSymbolStrMacro	RN$M

CustomSymbolStrUtil	NC
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 143. slproject_f14 Configuration Set.Components(8).Components [80](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
GenerateSampleERTMain	off

GenerateTestInterfaces	off
ModelReferenceCompliant	on
ParMdlRefBuildCompliant	on
CompOptLevelCompliant	on
ConcurrentExecutionCompliant	on
IncludeMdlTerminateFcn	on
GeneratePreprocessorConditionals	Disable all
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
SupportVariableSizeSignals	off
ParenthesesLevel	Nominal
GenerateClassInterface	off
ModelStepFunctionPrototypeControlCompliant	off
CPPClassGenCompliant	on
AutosarCompliant	off
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
RTWCAPIStates	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

Table of Contents

Report Overview

This report describes the design of the slproject_f14 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.

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.