Application_Software

Design Description

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Application_Software: Design Description

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Published 04-Jul-2024 12:42:17
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Chapter 1. Model Version

Version: 8.53

Last modified: Wed Jun 26 17:00:41 2024

Checksum: 3920508006 1422572844 295053840 4155145195

Chapter 2. Root System

Figure 2.1. Application_Software
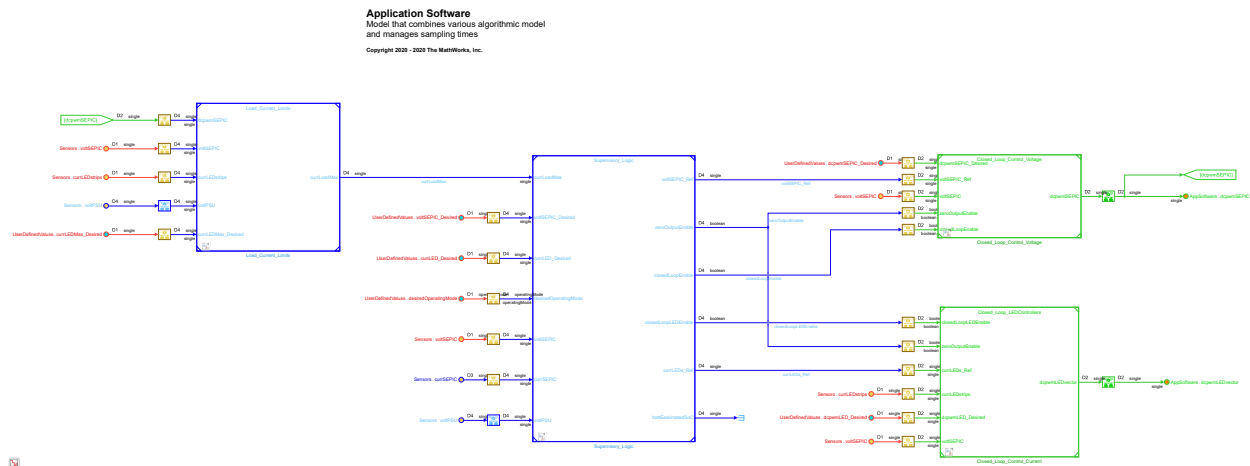
Interface

Input Signals

Table 2.1. Input Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Application_Software/Bus Element In1		single	6	1x6
	Application_Software/Bus Element In2		operatingMode	1	1x1
	Application_Software/Bus Element In3		single	1	1x1
	Application_Software/Bus Element In4		single	1	1x1
	Application_Software/Bus Element In5		single	6	1x6

Signal Name	Block	Description	Data Type	Width	Dimensions
	Application_Software/Bus Element In6		single	1	1x1
	Application_Software/Sensors 1		single	1	1x1
	Application_Software/Sensors 2		single	6	1x6
	Application_Software/Sensors 3		single	1	1x1
	Application_Software/Sensors 4		single	6	1x6
	Application_Software/Sensors 5		single	1	1x1
	Application_Software/Sensors 6		single	1	1x1
	Application_Software/Sensors 7		single	1	1x1
	Application_Software/Sensors 8		single	1	1x1
	Application_Software/Sensors 9		single	1	1x1

Output Signals

Table 2.2. Output Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Application_Software/Rate Transition12		single	1	1x1
	Application_Software/Rate Transition4		single	6	1x6

Blocks

Parameters

"Bus Element In1" (Inport)

Table 2.3. "Bus Element In1" Parameters

Parameter	Value
Port number	1
Port dimensions (-1 for inherited)	[6]
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	single

"Bus Element In2" (Inport)

Table 2.4. "Bus Element In2" Parameters

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

"Bus Element In3" (Inport)

Table 2.5. "Bus Element In3" Parameters

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

Parameter	Value
Maximum	[]
Data type	single

"Bus Element In4" (Inport)

Table 2.6. "Bus Element In4" Parameters

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

"Bus Element In5" (Inport)

Table 2.7. "Bus Element In5" Parameters

Parameter	Value
Port number	1
Port dimensions (-1 for inherited)	[6]
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	single

"Bus Element In6" (Inport)

Table 2.8. "Bus Element In6" Parameters

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

Parameter	Value
Data type	single

"Bus Element Out" (Outport)

Table 2.9. "Bus Element Out" Parameters

Parameter	Value
Port number	1
Port name	AppSoftware
Element	dcpwmSEPIC
Is a bus element port block	on
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Port dimensions (-1 for inherited)	[1]
Variable-size signal	No
Sample time (-1 for inherited)	-1
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Bus Element Out1" (Outport)

Table 2.10. "Bus Element Out1" Parameters

Parameter	Value
Port number	1
Port name	AppSoftware
Element	dcpwmLEDvector
Is a bus element port block	on
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Port dimensions (-1 for inherited)	[6]
Variable-size signal	No
Sample time (-1 for inherited)	-1
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Closed_Loop_Control_Current" (ModelReference)

Table 2.11. "Closed_Loop_Control_Current" Parameters

Parameter	Value
Model name	Closed_Loop_LEDControllers.slx
ModelFile	Closed_Loop_LEDControllers.slx

Parameter	Value
ModelName	Closed_Loop_LEDControllers
Simulation mode	Normal
Show model initialize port	off
Show model reinitialize ports	off
Show model reset ports	off
Show model terminate port	off
Schedule rates	off
Schedule rates with	Ports
AutoFillPortDiscreteRates	on
Code interface	Model reference
Variant	off
Communication step size	-1

"Closed_Loop_Control_Voltage" (ModelReference)

Table 2.12. "Closed_Loop_Control_Voltage" Parameters

Parameter	Value
Model name	Closed_Loop_Control_Voltage
ModelFile	Closed_Loop_Control_Voltage.slx
ModelName	Closed_Loop_Control_Voltage
Simulation mode	Normal
Show model initialize port	off
Show model reinitialize ports	off
Show model reset ports	off
Show model terminate port	off
Schedule rates	off
Schedule rates with	Ports
AutoFillPortDiscreteRates	on
Code interface	Model reference
Variant	off
Communication step size	-1

"From" (From)

Table 2.13. "From" Parameters

Parameter	Value
Goto tag	dcpwmSEPIC
Icon display	Tag

"Goto" (Goto)

Table 2.14. "Goto" Parameters

Parameter	Value
Tag	dcpwmSEPIC
Icon display	Tag
Tag visibility	local

"Load_Current_Limits" (ModelReference)

Table 2.15. "Load_Current_Limits" Parameters

Parameter	Value
Model name	Load_Current_Limits
ModelFile	Load_Current_Limits.slx
ModelName	Load_Current_Limits
Simulation mode	Normal
Show model initialize port	off
Show model reinitialize ports	off
Show model reset ports	off
Show model terminate port	off
Schedule rates	off
Schedule rates with	Ports
AutoFillPortDiscreteRates	on
Code interface	Model reference
Variant	off
Communication step size	-1

"Rate Transition" (RateTransition)

Table 2.16. "Rate Transition" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition1" (RateTransition)

Table 2.17. "Rate Transition1" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition10" (RateTransition)

Table 2.18. "Rate Transition10" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition11" (RateTransition)

Table 2.19. "Rate Transition11" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition12" (RateTransition)

Table 2.20. "Rate Transition12" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition13" (RateTransition)

Table 2.21. "Rate Transition13" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition14" (RateTransition)

Table 2.22. "Rate Transition14" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition15" (RateTransition)

Table 2.23. "Rate Transition15" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition16" (RateTransition)

Table 2.24. "Rate Transition16" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition17" (RateTransition)

Table 2.25. "Rate Transition17" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition18" (RateTransition)

Table 2.26. "Rate Transition18" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition19" (RateTransition)

Table 2.27. "Rate Transition19" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition2" (RateTransition)

Table 2.28. "Rate Transition2" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition20" (RateTransition)

Table 2.29. "Rate Transition20" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition21" (RateTransition)

Table 2.30. "Rate Transition21" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition22" (RateTransition)

Table 2.31. "Rate Transition22" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition23" (RateTransition)

Table 2.32. "Rate Transition23" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	on
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	-1

"Rate Transition3" (RateTransition)

Table 2.33. "Rate Transition3" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition4" (RateTransition)

Table 2.34. "Rate Transition4" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition5" (RateTransition)

Table 2.35. "Rate Transition5" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition6" (RateTransition)

Table 2.36. "Rate Transition6" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition7" (RateTransition)

Table 2.37. "Rate Transition7" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition8" (RateTransition)

Table 2.38. "Rate Transition8" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	1
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Rate Transition9" (RateTransition)

Table 2.39. "Rate Transition9" Parameters

Parameter	Value
Ensure data integrity during data transfer	on
Ensure deterministic data transfer (maximum delay)	off
Initial conditions	0
Output port sample time options	Specify
Sample time multiple(>0)	1
Output port sample time	ts1ms

"Sensors1" (Inport)

Table 2.40. "Sensors1" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	[1]
Sample time (-1 for inherited)	ts500us
Minimum	[]
Maximum	[]
Data type	single

"Sensors2" (Inport)

Table 2.41. "Sensors2" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	[6]
Sample time (-1 for inherited)	ts500us
Minimum	[]
Maximum	[]
Data type	single

"Sensors3" (Inport)

Table 2.42. "Sensors3" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	[1]
Sample time (-1 for inherited)	ts500us
Minimum	[]
Maximum	[]
Data type	single

"Sensors4" (Inport)

Table 2.43. "Sensors4" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	[6]
Sample time (-1 for inherited)	ts500us
Minimum	[]
Maximum	[]
Data type	single

"Sensors5" (Inport)

Table 2.44. "Sensors5" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	[1]
Sample time (-1 for inherited)	ts100ms
Minimum	[]
Maximum	[]
Data type	single

"Sensors6" (Inport)

Table 2.45. "Sensors6" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	[1]
Sample time (-1 for inherited)	ts500us
Minimum	[]
Maximum	[]
Data type	single

"Sensors7" (Inport)

Table 2.46. "Sensors7" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	[1]
Sample time (-1 for inherited)	ts500us
Minimum	[]
Maximum	[]
Data type	single

"Sensors8" (Inport)

Table 2.47. "Sensors8" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	[1]
Sample time (-1 for inherited)	ts10ms
Minimum	[]
Maximum	[]
Data type	single

"Sensors9" (Inport)

Table 2.48. "Sensors9" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	[1]
Sample time (-1 for inherited)	ts100ms
Minimum	[]
Maximum	[]
Data type	single

"Supervisory_Logic" (ModelReference)

Table 2.49. "Supervisory_Logic" Parameters

Parameter	Value
Model name	Supervisory_Logic.slx
ModelFile	Supervisory_Logic.slx
ModelName	Supervisory_Logic
Simulation mode	Normal
Show model initialize port	off
Show model reinitialize ports	off
Show model reset ports	off
Show model terminate port	off
Schedule rates	off
Schedule rates with	Ports
AutoFillPortDiscreteRates	on
Code interface	Model reference
Variant	off
Communication step size	-1

Block Execution Order

1. Rate Transition (RateTransition)
2. Rate Transition1 (RateTransition)
3. Rate Transition2 (RateTransition)
4. Rate Transition3 (RateTransition)
5. Rate Transition5 (RateTransition)
6. Closed_Loop_Control_Current (ModelReference)
7. Rate Transition11 (RateTransition)
8. Rate Transition10 (RateTransition)
9. Rate Transition9 (RateTransition)
10. Rate Transition8 (RateTransition)
11. Rate Transition7 (RateTransition)
12. Closed_Loop_Control_Voltage (ModelReference)
13. Rate Transition20 (RateTransition)
14. Rate Transition21 (RateTransition)
15. Rate Transition23 (RateTransition)
16. Load_Current_Limits (ModelReference)
17. Rate Transition13 (RateTransition)
18. Rate Transition14 (RateTransition)
19. Rate Transition15 (RateTransition)
20. Rate Transition16 (RateTransition)

21. [Rate Transition17](#) (RateTransition)
22. [Rate Transition19](#) (RateTransition)
23. [Rate Transition6](#) (RateTransition)
24. [Supervisory_Logic](#) (ModelReference)

Chapter 3. Subsystems

Anti-windup

Figure 3.1. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup

preInt
preSat
postSat
P

Disabled

preInt
preSat
postSat
1
P

Passthrough

1
preSat

2
postSat

3
P

4
preInt

5
Upper Limit

6
Lower Limit

preSat
postSat
1
preInt
P

Back Calculation

1

preSat
preInt
postSat
1
P
Upper Limit
Lower Limit

Disc. Clamping Parallel

preSat
P
preInt
1
postSat
Upper Limit
Lower Limit

Disc. Clamping Ideal

preSat
preInt
postSat
1
P
Upper Limit
Lower Limit

Cont. Clamping Parallel

preSat
P
preInt
1
postSat
Upper Limit
Lower Limit

Cont. Clamping Ideal

Blocks

Parameters

"Lower Limit" (Inport)

Table 3.1. "Lower Limit" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.2. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]

Parameter	Value
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P" (Inport)

Table 3.3. "P" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"postSat" (Inport)

Table 3.4. "postSat" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"preInt" (Inport)

Table 3.5. "preInt" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"preSat" (Inport)

Table 3.6. "preSat" Parameters

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

"Upper Limit" (Inport)

Table 3.7. "Upper Limit" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Closed_Loop_Control_Voltage

Checksum: 320294025 406183504 2613559264 2216029192

Figure 3.2. Closed_Loop_Control_Voltage

Closed Loop Control of the Voltage
Closed loop control and PI implementation of
voltage control

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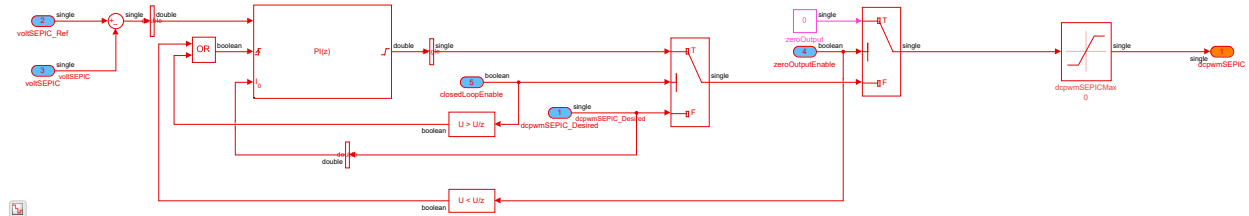
Interface

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 3.8. Input Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Closed_Loop_Control_Voltage/closedLoopEnable		boolean	1	1x1
	Closed_Loop_Control_Voltage/voltSEPIC_Ref		single	1	1x1
	Closed_Loop_Control_Voltage/zeroOutputEnable		boolean	1	1x1
dcpwmSEPIC_Desired	Closed_Loop_Control_Voltage/dcpwmSEPIC_Desired		single	1	1x1
voltSEPIC	Closed_Loop_Control_Voltage/voltSEPIC		single	1	1x1

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 3.9. Output Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Closed_Loop_Control_Voltage/Saturation		single	1	1x1

Blocks

Parameters

"closedLoopEnable" (Inport)

Table 3.10. "closedLoopEnable" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	boolean

"Data Type Conversion" (DataTypeConversion)

Table 3.11. "Data Type Conversion" Parameters

Parameter	Value
Output minimum	[]
Output maximum	[]
Output data type	double
Lock output data type setting against changes by the fixed-point tools	off
Input and output to have equal	Real World Value (RWV)
Integer rounding mode	Floor
Saturate on integer overflow	off

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

"Data Type Conversion1" (DataTypeConversion)

Table 3.12. "Data Type Conversion1" Parameters

Parameter	Value
Output minimum	[]
Output maximum	[]
Output data type	single
Lock output data type setting against changes by the fixed-point tools	off
Input and output to have equal	Real World Value (RWV)
Integer rounding mode	Floor
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

"Data Type Conversion2" (DataTypeConversion)

Table 3.13. "Data Type Conversion2" Parameters

Parameter	Value
Output minimum	[]
Output maximum	[]
Output data type	double
Lock output data type setting against changes by the fixed-point tools	off
Input and output to have equal	Real World Value (RWV)
Integer rounding mode	Floor
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

"dcpwmSEPIC" (Outport)

Table 3.14. "dcpwmSEPIC" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off

Parameter	Value
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
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)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	off

"dcpwmSEPIC_Desired" (Inport)

Table 3.15. "dcpwmSEPIC_Desired" Parameters

Parameter	Value
Port number	1
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"Detect Decrease" (SubSystem)

Table 3.16. "Detect Decrease" Parameters

Parameter	Value
SimulinkmasksInitialCondition_MP	0.0
SimulinkmasksInputProcessing_MP	Elements as channels (sample based)
SimulinkmasksOutputDataType_MP	boolean

"Detect Increase" (SubSystem)

Table 3.17. "Detect Increase" Parameters

Parameter	Value
SimulinkmasksInitialCondition_MP	0.0
SimulinkmasksInputProcessing_MP	Elements as channels (sample based)
SimulinkmasksOutputDataType_MP	boolean

"Discrete PID Controller" (SubSystem)

Table 3.18. "Discrete PID Controller" Parameters

Parameter	Value
SimulinkmasksController_MP	PI
SimulinkmasksForm_MP	Parallel
SimulinkmasksTimeDomain_MP	Discrete-time
SimulinkmasksPIDBlockInTriggeredSubsystem_MP	off
SimulinkmasksSampleTime1ForInherited_MP	TsModel
SimulinkmasksIntegratorMethod_MP	Forward Euler
SimulinkmasksSource_MP	internal
SimulinkmasksProportionalP_MP	VoltCtrlr_PGain
SimulinkmasksIntegralI_MP	VoltCtrlr_IGain
SimulinkmasksUseITs_MP	off
SimulinkmasksPIDAutoTuningMethodSelect_MP	Transfer Function Based (PID Tuner App)
SimulinkmasksEnableZerocrossingDetection_MP	on
SimulinkmasksSource_MP	external
SimulinkmasksExternalReset_MP	rising
SimulinkmasksIgnoreResetWhenLinearizing_MP	off

Parameter	Value
SimulinkmasksEnableTrackingMode_MP	off
SimulinkmasksTrackingCoefficientKt_MP	1
SimulinkmasksLimitOutput_MP	on
SimulinkmasksSource_MP	internal
SimulinkmasksUpperSaturationLimit_MP	1
SimulinkmasksLowerSaturationLimit_MP	0
SimulinkmasksIgnoreSaturationWhenLinearizing_MP	off
SimulinkmasksAntiwindupMethod_MP	clamping
Simulinkblkprm_promptsIntegratorLimitOutput	off
SimulinkmasksUpperSaturationLimit_MP	inf
SimulinkmasksLowerSaturationLimit_MP	-inf
SimulinkmasksIntegerRoundingMode_MP	Floor
SimulinkmasksSaturateOnIntegerOverflow_MP	off
SimulinkmasksLockDataTypeAgainstFxpTools_MP	off
SimulinkmasksPPProductOutput_MP	Inherit: Inherit via internal rule
POutMin	[]
POutMax	[]
SimulinkmasksIProductOutput_MP	Inherit: Inherit via internal rule
IOutMin	[]
IOutMax	[]
SimulinkmasksSumOutput_MP	Inherit: Inherit via internal rule
SumOutMin	[]
SumOutMax	[]
SimulinkmasksSaturationOutput_MP	Inherit: Same as input
SaturationOutMin	[]
SaturationOutMax	[]
SimulinkmasksPParameter_MP	Inherit: Inherit via internal rule
PParamMin	[]
PParamMax	[]
SimulinkmasksIParameter_MP	Inherit: Inherit via internal rule
IParamMin	[]
IParamMax	[]

Parameter	Value
SimulinkmasksIntegratorOutput_MP	Inherit: Inherit via internal rule
IntegratorOutMin	[]
IntegratorOutMax	[]
SimulinkmasksAccumulatorOfSum_MP	Inherit: Inherit via internal rule
Clamping algorithm constant zero output	Inherit: Inherit via back propagation
ClampingZeroOutMin	[]
ClampingZeroOutMax	[]
SimulinkmasksStateNameMustResolveToSimulinkSignalObject_MP	off

"OR" (Logic)

Table 3.19. "OR" 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

"Saturation" (Saturate)

Table 3.20. "Saturation" Parameters

Parameter	Value
Upper limit	dcpwmSEPICMax
Lower limit	0
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

Parameter	Value
Integer rounding mode	Floor

"Sum" (Sum)

Table 3.21. "Sum" Parameters

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

"Switch" (Switch)

Table 3.22. "Switch" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on

Parameter	Value
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"Switch1" (Switch)

Table 3.23. "Switch1" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"voltSEPIC" (Inport)

Table 3.24. "voltSEPIC" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"voltSEPIC_Ref" (Inport)

Table 3.25. "voltSEPIC_Ref" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"zeroOutput" (Constant)

Table 3.26. "zeroOutput" Parameters

Parameter	Value
Constant value	0
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	single
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"zeroOutputEnable" (Inport)

Table 3.27. "zeroOutputEnable" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	boolean

Block Execution Order

1. [Clamping_zero](#) (Constant)
2. [Constant](#) (Constant)
3. [Constant2](#) (Constant)
4. [Constant3](#) (Constant)
5. [Constant4](#) (Constant)
6. [zeroOutput](#) (Constant)
7. [Constant1](#) (Constant)
8. [Sum](#) (Sum)
9. [Data Type Conversion](#) (DataTypeConversion)
10. [Proportional Gain](#) (Gain)
11. [Delay Input1](#) (UnitDelay)
12. [FixPt Relational Operator](#) (RelationalOperator)
13. [Delay Input1](#) (UnitDelay)
14. [FixPt Relational Operator](#) (RelationalOperator)
15. [OR](#) (Logic)
16. [Data Type Conversion2](#) (DataTypeConversion)
17. [Integrator](#) (DiscreteIntegrator)
18. [Sum](#) (Sum)
19. [Saturation](#) (Saturate)
20. [DeadZone](#) (DeadZone)
21. [Relational Operator](#) (RelationalOperator)
22. [fix for DT propagation issue](#) (RelationalOperator)
23. [Switch1](#) (Switch)
24. [Integral Gain](#) (Gain)
25. [fix for DT propagation issue1](#) (RelationalOperator)
26. [Switch2](#) (Switch)
27. [Equal1](#) (RelationalOperator)
28. [AND3](#) (Logic)
29. [Switch](#) (Switch)
30. *[TmpAtomicSubsysAtSwitchInport3](#)*
    1. *[TmpAtomicSubsysAtSwitch1Inport1](#)*
    2. [Switch1](#) (Switch)
31. [Switch](#) (Switch)
32. [Saturation](#) (Saturate)

D Gain

Figure 3.3. Closed_Loop_Control_Voltage/Discrete PID Controller/D Gain
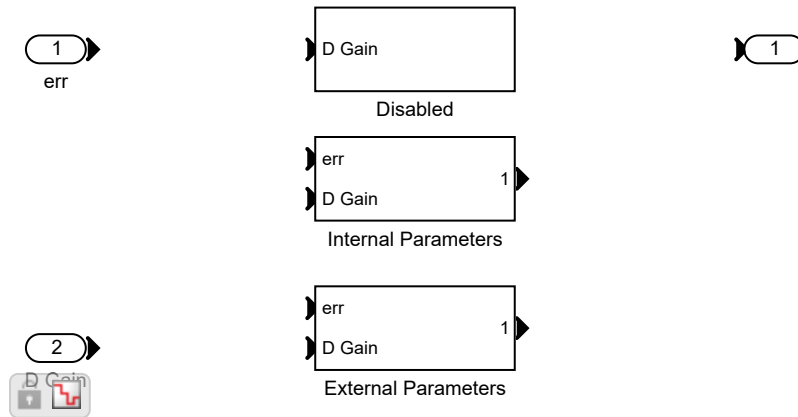
Blocks

Parameters

"D Gain" (Inport)

Table 3.28. "D Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"err" (Inport)

Table 3.29. "err" Parameters

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

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

"Out1" (Outport)

Table 3.30. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Dead Zone

Figure 3.4. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Cont. Clamping Ideal/Dead Zone

Disabled

preSat

1
preSat

preSat   DZ out

Enabled

1
DZ out

2
Upper Limit

3
Lower Limit

preSat
Upper Limit   DZ out
Lower Limit

External
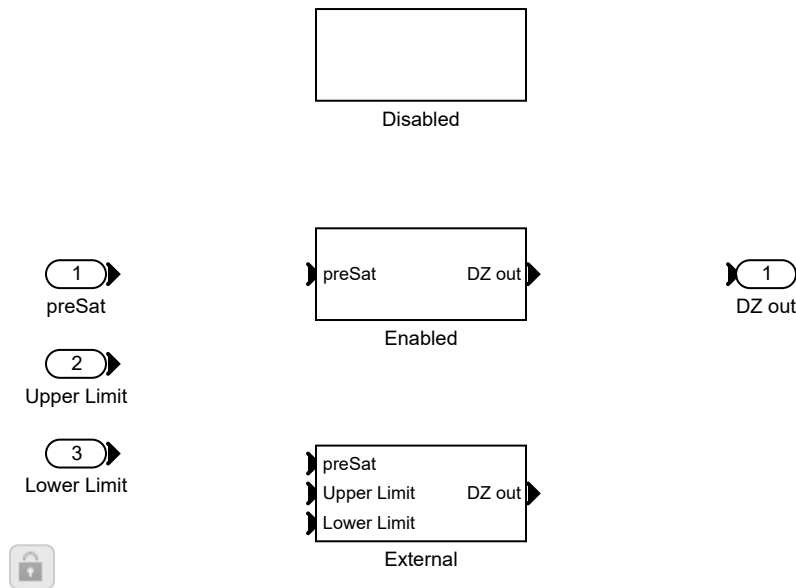
Dead Zone

Figure 3.5. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Cont. Clamping Parallel/Dead Zone

Disabled

preSat   DZ out

Enabled

1
preSat

2
Upper Limit

3
Lower Limit

1
DZ out

preSat
Upper Limit   DZ out
Lower Limit

External
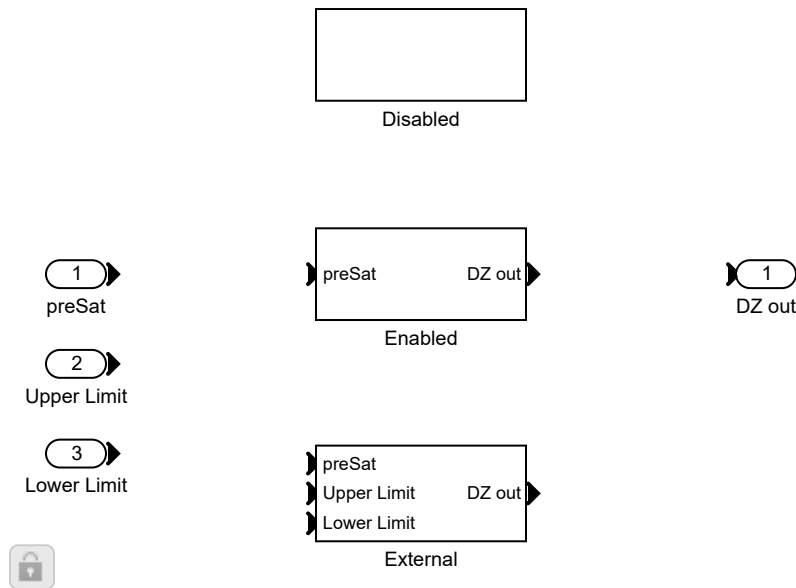
Dead Zone

Figure 3.6. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Disc. Clamping Ideal/Dead Zone

Disabled

| 1 |
preSat

| 2 |
Upper Limit

| 3 |
Lower Limit

preSat   DZ out
Enabled

| 1 |
DZ out

preSat
Upper Limit   DZ out
Lower Limit
External
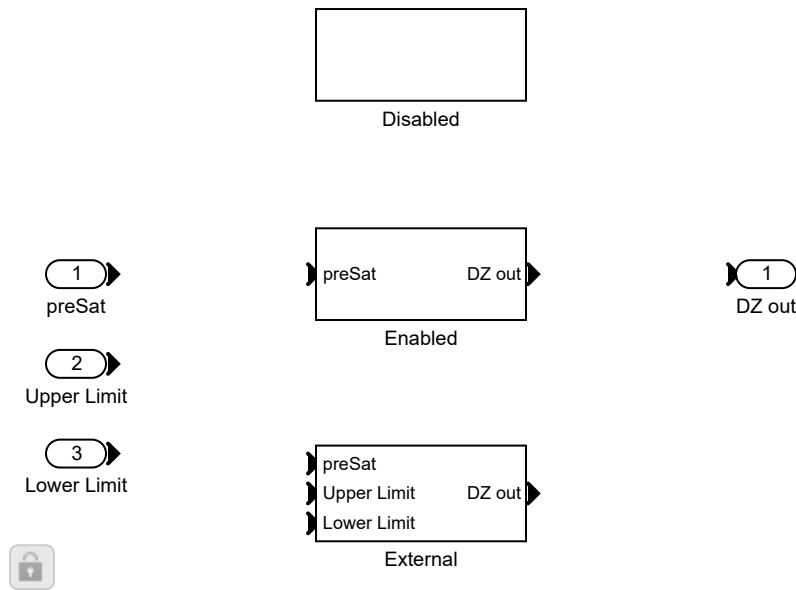
Dead Zone

Figure 3.7. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Disc. Clamping Parallel/Dead Zone
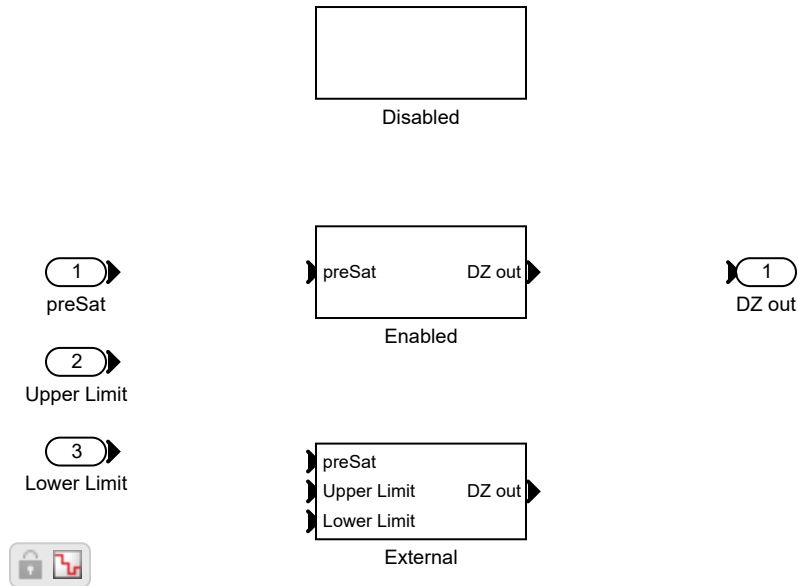
Blocks

Parameters

"DZ out" (Outport)

Table 3.31. "DZ out" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit

Parameter	Value
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Lower Limit" (Inport)

Table 3.32. "Lower Limit" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"preSat" (Inport)

Table 3.33. "preSat" Parameters

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

"Upper Limit" (Inport)

Table 3.34. "Upper Limit" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Dead Zone Dynamic

Figure 3.8. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Cont. Clamping Ideal/Dead Zone/External/Dead Zone Dynamic
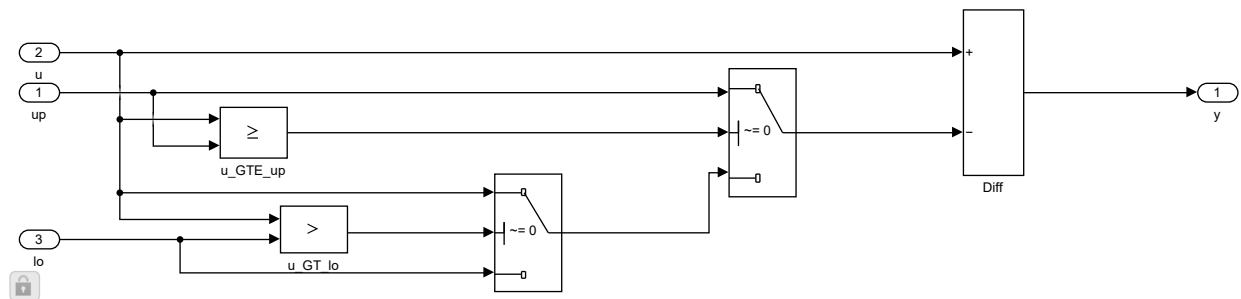
Detect Decrease

Figure 3.9. Closed_Loop_Control_Voltage/Detect Decrease
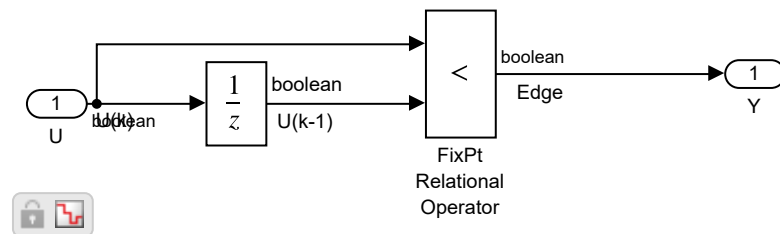
Blocks

Parameters

"Delay Input1" (UnitDelay)

Table 3.35. "Delay Input1" Parameters

Parameter	Value
Initial condition	vinit
Input processing	Elements as channels (sample based)
Sample time (-1 for inherited)	-1
State name must resolve to Simulink signal object	off

"FixPt Relational Operator" (RelationalOperator)

Table 3.36. "FixPt 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

"U" (Inport)

Table 3.37. "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" (Outport)

Table 3.38. "Y" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	0
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Detect Increase

Figure 3.10. Closed_Loop_Control_Voltage/Detect Increase
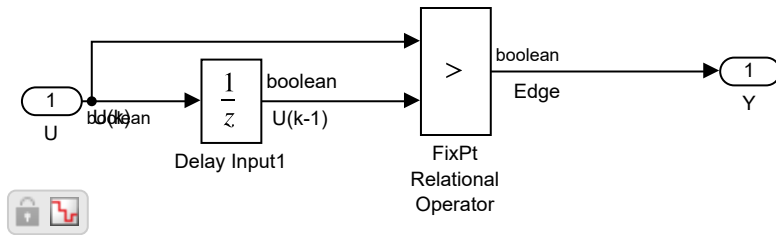
Blocks

Parameters

"Delay Input1" (UnitDelay)

Table 3.39. "Delay Input1" Parameters

Parameter	Value
Initial condition	vinit
Input processing	Elements as channels (sample based)
Sample time (-1 for inherited)	-1
State name must resolve to Simulink signal object	off

"FixPt Relational Operator" (RelationalOperator)

Table 3.40. "FixPt 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

"U" (Inport)

Table 3.41. "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" (Outport)

Table 3.42. "Y" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	0
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Disabled

Figure 3.11. Closed_Loop_Control_Voltage/Discrete PID Controller/D Gain/ Disabled
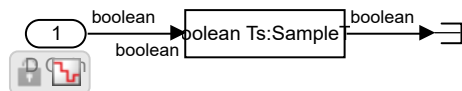
Blocks

Parameters

"D Gain" (Inport)

Table 3.43. "D Gain" Parameters

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

"Signal Specification" (SignalSpecification)

Table 3.44. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.12. Closed_Loop_Control_Voltage/Discrete PID Controller/External Derivative/Disabled
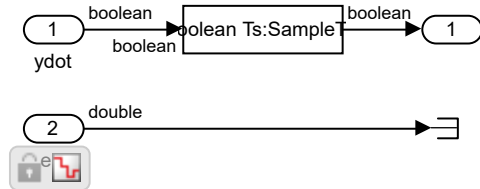
Blocks

Parameters

"err" (Inport)

Table 3.45. "err" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.46. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.47. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"ydot" (Inport)

Table 3.48. "ydot" Parameters

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

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

Disabled

Figure 3.13. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter ICs/ Disabled

Blocks

Parameters

"D0" (Inport)

Table 3.49. "D0" Parameters

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

"Out1" (Outport)

Table 3.50. "Out1" Parameters

Parameter	Value
Port number	1

Parameter	Value
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.51. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification1" (SignalSpecification)

Table 3.52. "Signal Specification1" Parameters

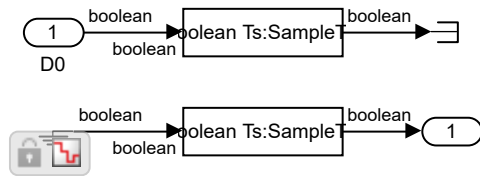| Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.14. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/Disabled
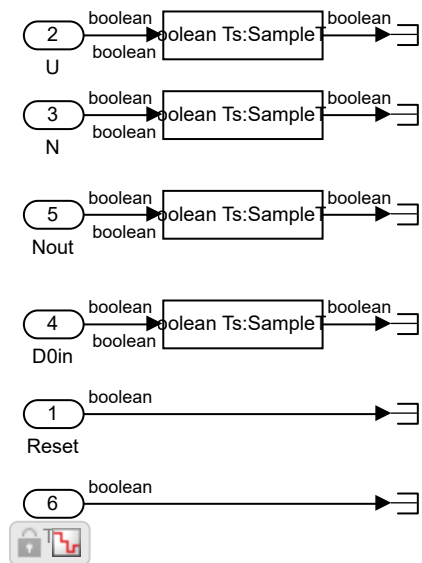
Blocks

Parameters

"D0in" (Inport)

Table 3.53. "D0in" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"N" (Inport)

Table 3.54. "N" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Nout" (Inport)

Table 3.55. "Nout" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Reset" (Inport)

Table 3.56. "Reset" Parameters

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

"Signal Specification1" (SignalSpecification)

Table 3.57. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification2" (SignalSpecification)

Table 3.58. "Signal Specification2" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1

Parameter	Value
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification3" (SignalSpecification)

Table 3.59. "Signal Specification3" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification4" (SignalSpecification)

Table 3.60. "Signal Specification4" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Ts" (Inport)

Table 3.61. "Ts" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.62. "U" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Disabled

Figure 3.15. Closed_Loop_Control_Voltage/Discrete PID Controller/Ideal P Gain Fdbk/Disabled
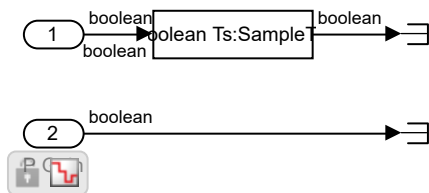
Blocks

Parameters

"In1" (Inport)

Table 3.63. "In1" Parameters

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

"P Gain" (Inport)

Table 3.64. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.65. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.16. Closed_Loop_Control_Voltage/Discrete PID Controller/N Gain/ Disabled
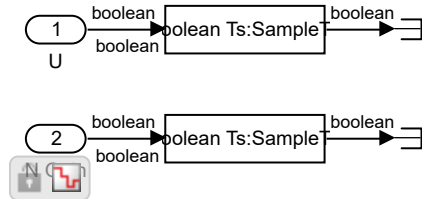
Blocks

Parameters

"N Gain" (Inport)

Table 3.66. "N Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.67. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit

Parameter	Value
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification2" (SignalSpecification)

Table 3.68. "Signal Specification2" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"U" (Inport)

Table 3.69. "U" Parameters

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

Disabled

Figure 3.17. Closed_Loop_Control_Voltage/Discrete PID Controller/P Copy/ Disabled

Blocks

Parameters

"P Gain" (Inport)

Table 3.70. "P Gain" Parameters

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

Disabled

Figure 3.18. Closed_Loop_Control_Voltage/Discrete PID Controller/Saturation Fdbk/Disabled
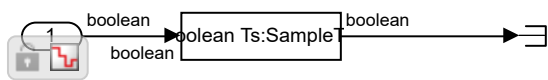
Blocks

Parameters

"In1" (Inport)

Table 3.71. "In1" Parameters

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

"Signal Specification1" (SignalSpecification)

Table 3.72. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.19. Closed_Loop_Control_Voltage/Discrete PID Controller/Sum Fdbk/ Disabled
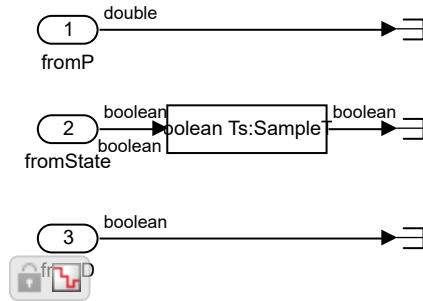
Blocks

Parameters

"fromD" (Inport)

Table 3.73. "fromD" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"fromP" (Inport)

Table 3.74. "fromP" Parameters

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

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"fromState" (Inport)

Table 3.75. "fromState" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.76. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.20. Closed_Loop_Control_Voltage/Discrete PID Controller/Tracking Mode/Disabled
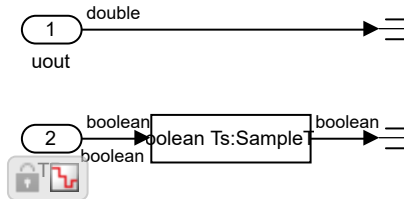
Blocks

Parameters

"Signal Specification1" (SignalSpecification)

Table 3.77. "Signal Specification1" Parameters

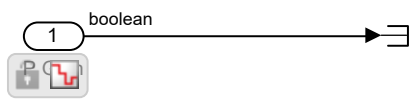| Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"TR" (Inport)

Table 3.78. "TR" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime

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

"uout" (Inport)

Table 3.79. "uout" Parameters

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

Disabled wSignal Specification

Figure 3.21. Closed_Loop_Control_Voltage/Discrete PID Controller/N Copy/ Disabled wSignal Specification
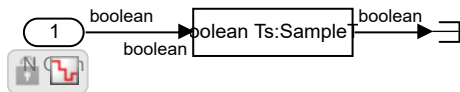
Blocks

Parameters

"N Gain" (Inport)

Table 3.80. "N Gain" Parameters

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

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.81. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disc. Clamping Parallel

Figure 3.22. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Disc. Clamping Parallel

Blocks

Parameters

"AND3" (Logic)

Table 3.82. "AND3" Parameters

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

"Clamping_zero" (Constant)

Table 3.83. "Clamping_zero" Parameters

Parameter	Value
Constant value	0
Interpret vector parameters as 1-D	on
Output minimum	ClampingZeroOutMin
Output maximum	ClampingZeroOutMax
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

"Constant" (Constant)

Table 3.84. "Constant" Parameters

Parameter	Value
Constant value	1
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	int8
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"Constant1" (Constant)

Table 3.85. "Constant1" Parameters

Parameter	Value
Constant value	0
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]

Parameter	Value
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

"Constant2" (Constant)

Table 3.86. "Constant2" Parameters

Parameter	Value
Constant value	-1
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	int8
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"Constant3" (Constant)

Table 3.87. "Constant3" Parameters

Parameter	Value
Constant value	1
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	int8
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"Constant4" (Constant)

Table 3.88. "Constant4" Parameters

Parameter	Value
Constant value	-1
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	int8
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"Equal1" (RelationalOperator)

Table 3.89. "Equal1" Parameters

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

"fix for DT propagation issue" (RelationalOperator)

Table 3.90. "fix for DT propagation issue" Parameters

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

"fix for DT propagation issue1" (RelationalOperator)

Table 3.91. "fix for DT propagation issue1" Parameters

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

"Lower Limit" (Inport)

Table 3.92. "Lower Limit" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.93. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit

Parameter	Value
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P" (Inport)

Table 3.94. "P" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"postSat" (Inport)

Table 3.95. "postSat" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"preInt" (Inport)

Table 3.96. "preInt" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"preSat" (Inport)

Table 3.97. "preSat" Parameters

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

"Relational Operator" (RelationalOperator)

Table 3.98. "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	on
Sample time (-1 for inherited)	-1
Integer rounding mode	Simplest

"Signal Specification2" (SignalSpecification)

Table 3.99. "Signal Specification2" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Switch" (Switch)

Table 3.100. "Switch" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	on
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	SampleTime
Allow different data input sizes (Results in variable-size output signal)	off

"Switch1" (Switch)

Table 3.101. "Switch1" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"Switch2" (Switch)

Table 3.102. "Switch2" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"Upper Limit" (Inport)

Table 3.103. "Upper Limit" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Discrete

Figure 3.23. Closed_Loop_Control_Voltage/Discrete PID Controller/Integrator/ Discrete
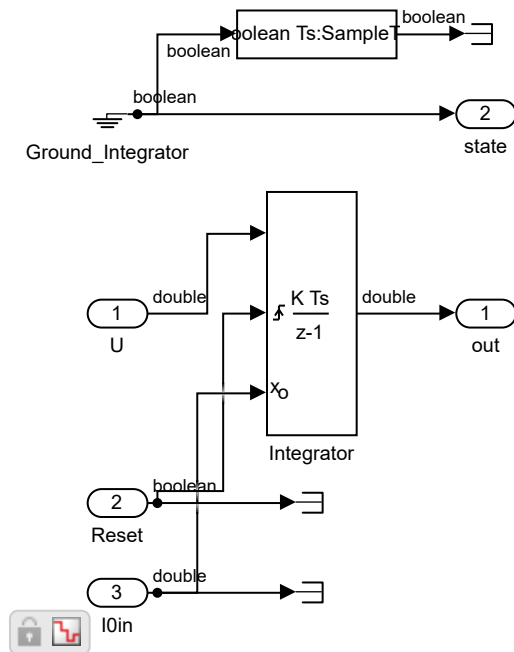
Blocks

Parameters

"I0in" (Inport)

Table 3.104. "I0in" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Integrator" (DiscreteIntegrator)

Table 3.105. "Integrator" Parameters

Parameter	Value
Integrator method	Integration: Forward Euler
Gain value	1.0
External reset	rising
Initial condition source	external
Initial condition	InitialConditionForIntegrator
Sample time (-1 for inherited)	SampleTime
Output minimum	IntegratorOutMin
Output maximum	IntegratorOutMax
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Limit output	off
Upper saturation limit	UpperIntegratorSaturationLimit
Lower saturation limit	LowerIntegratorSaturationLimit
Show saturation port	off
Show state port	off
Ignore limit and reset when linearizing	off
State name must resolve to Simulink signal object	off

"out" (Outport)

Table 3.106. "out" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Reset" (Inport)

Table 3.107. "Reset" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.108. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"state" (Outport)

Table 3.109. "state" Parameters

Parameter	Value
Port number	2
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off

Parameter	Value
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"U" (Inport)

Table 3.110. "U" Parameters

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

Discrete PID Controller

Figure 3.24. Closed_Loop_Control_Voltage/Discrete PID Controller

Blocks

Parameters

"I0" (Inport)

Table 3.111. "I0" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Reset" (Inport)

Table 3.112. "Reset" Parameters

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

"u" (Inport)

Table 3.113. "u" Parameters

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

"y" (Outport)

Table 3.114. "y" Parameters

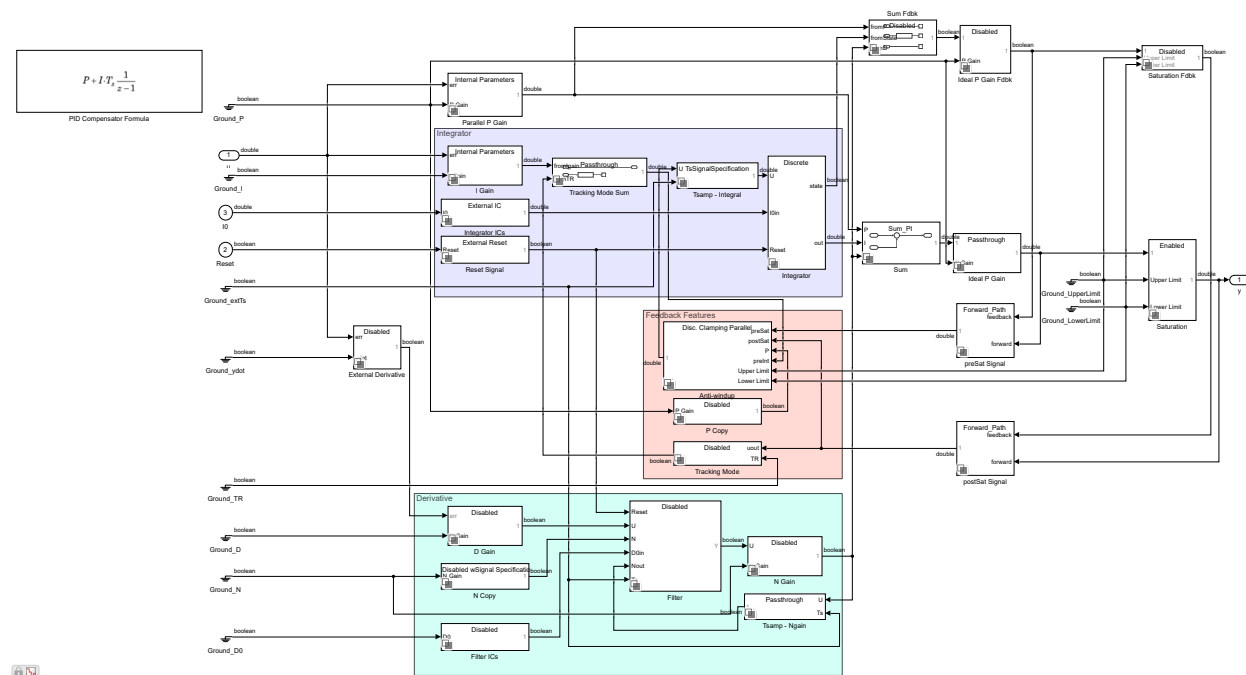| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Enabled

Figure 3.25. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Cont. Clamping Ideal/Dead Zone/Enabled
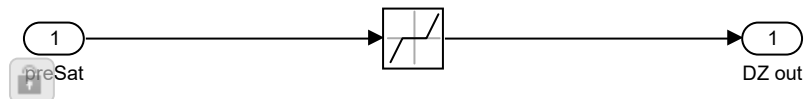
Enabled

Figure 3.26. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Cont. Clamping Parallel/Dead Zone/Enabled
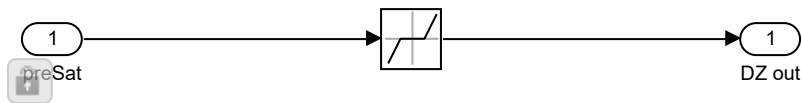
Enabled

Figure 3.27. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Disc. Clamping Ideal/Dead Zone/Enabled
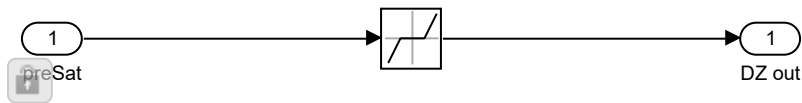
Enabled

Figure 3.28. Closed_Loop_Control_Voltage/Discrete PID Controller/Anti-windup/Disc. Clamping Parallel/Dead Zone/Enabled
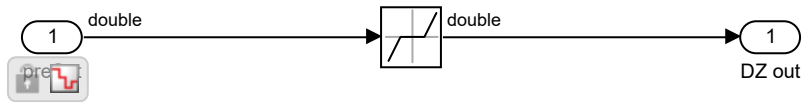
Blocks

Parameters

"DeadZone" (DeadZone)

Table 3.115. "DeadZone" Parameters

Parameter	Value
Start of dead zone	LowerSaturationLimit
End of dead zone	UpperSaturationLimit

Parameter	Value
Saturate on integer overflow	off
Treat as gain when linearizing	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1

"DZ out" (Outport)

Table 3.116. "DZ out" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"preSat" (Inport)

Table 3.117. "preSat" Parameters

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

Enabled

Figure 3.29. Closed_Loop_Control_Voltage/Discrete PID Controller/Saturation/ Enabled
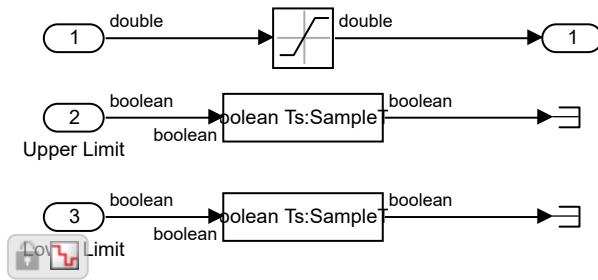
Blocks

Parameters

"In1" (Inport)

Table 3.118. "In1" Parameters

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

Parameter	Value
Data type	Inherit: auto

"Lower Limit" (Inport)

Table 3.119. "Lower Limit" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.120. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off

Parameter	Value
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Saturation" (Saturate)

Table 3.121. "Saturation" Parameters

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

"Signal Specification" (SignalSpecification)

Table 3.122. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification1" (SignalSpecification)

Table 3.123. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Upper Limit" (Inport)

Table 3.124. "Upper Limit" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

External Derivative

Figure 3.30. Closed_Loop_Control_Voltage/Discrete PID Controller/External Derivative
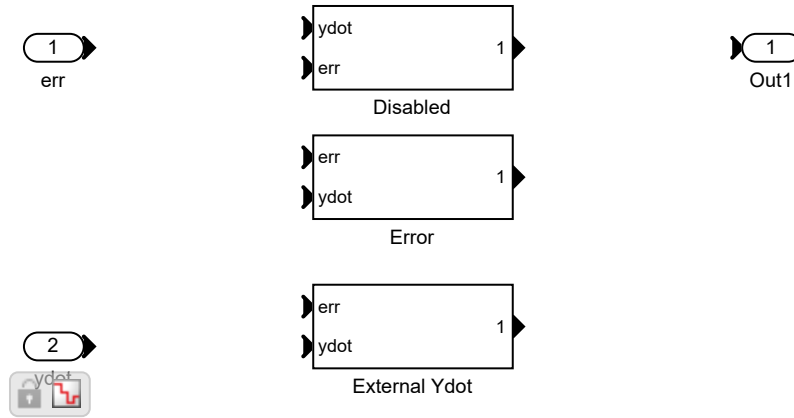
Blocks

Parameters

"err" (Inport)

Table 3.125. "err" Parameters

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

"Out1" (Outport)

Table 3.126. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number

Parameter	Value
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"ydot" (Inport)

Table 3.127. "ydot" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

External IC

Figure 3.31. Closed_Loop_Control_Voltage/Discrete PID Controller/Integrator ICs/External IC

Blocks

Parameters

"I0" (Inport)

Table 3.128. "I0" Parameters

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

"Out1" (Outport)

Table 3.129. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit

Parameter	Value
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

External Reset

Figure 3.32. Closed_Loop_Control_Voltage/Discrete PID Controller/Reset Signal/External Reset
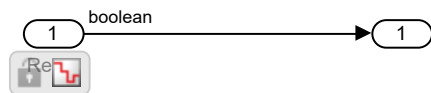
Blocks

Parameters

"Out1" (Outport)

Table 3.130. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto

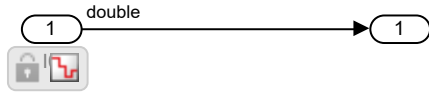| Parameter	Value
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Reset" (Inport)

Table 3.131. "Reset" Parameters

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

External Ts

Figure 3.33. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/Disc. Backward Euler Filter Only/Tsamp/External Ts
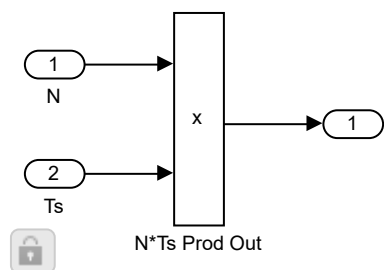
External Ts

Figure 3.34. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/Disc. Trapezoidal Filter Only/Tsamp/External Ts
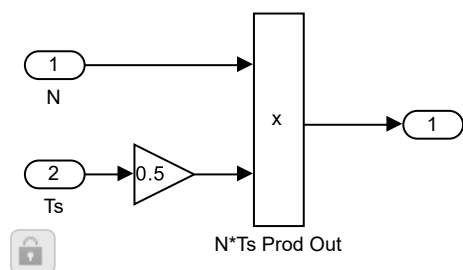
Filter

Figure 3.35. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter
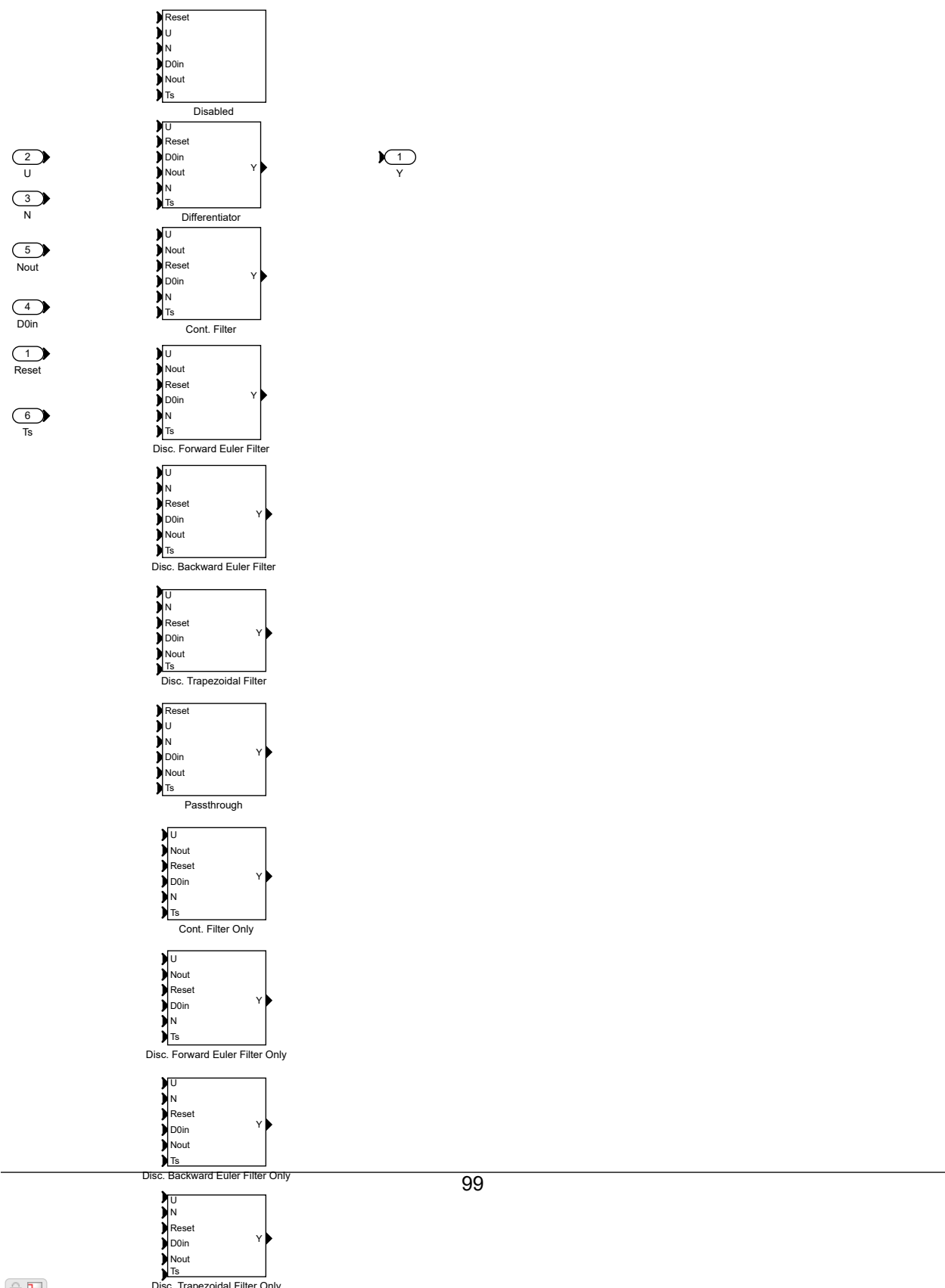
Blocks

Parameters

"D0in" (Inport)

Table 3.132. "D0in" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"N" (Inport)

Table 3.133. "N" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Nout" (Inport)

Table 3.134. "Nout" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Reset" (Inport)

Table 3.135. "Reset" Parameters

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

"Ts" (Inport)

Table 3.136. "Ts" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.137. "U" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Y" (Outport)

Table 3.138. "Y" Parameters

| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Filter ICs

Figure 3.36. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter ICs
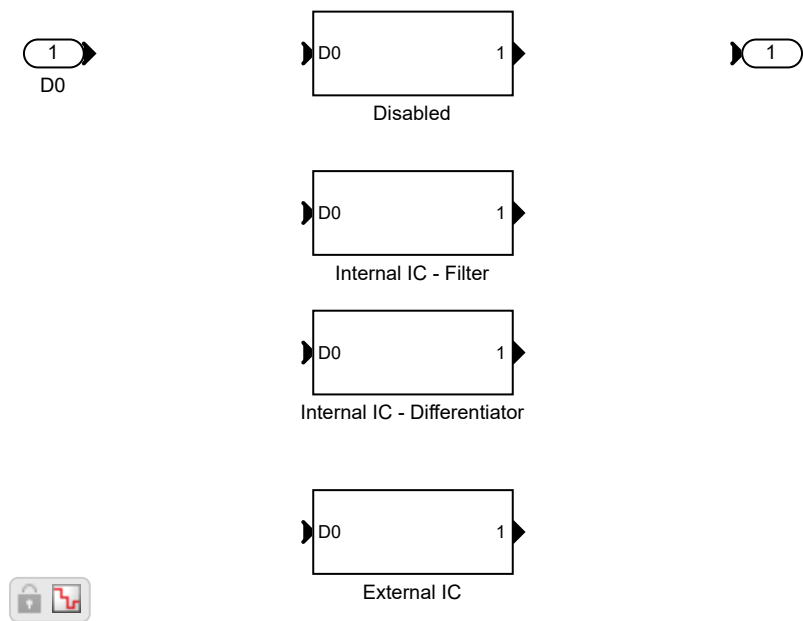
Blocks

Parameters

"D0" (Inport)

Table 3.139. "D0" Parameters

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

"Out1" (Outport)

Table 3.140. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Forward_Path

Figure 3.37. Closed_Loop_Control_Voltage/Discrete PID Controller/postSat Signal/Forward_Path
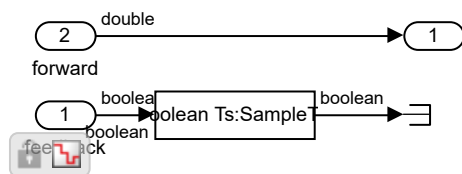
Blocks

Parameters

"feedback" (Inport)

Table 3.141. "feedback" Parameters

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

"forward" (Inport)

Table 3.142. "forward" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.143. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification1" (SignalSpecification)

Table 3.144. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Forward_Path

Figure 3.38. Closed_Loop_Control_Voltage/Discrete PID Controller/preSat Signal/Forward_Path
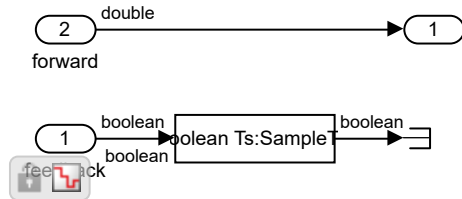
Blocks

Parameters

"feedback" (Inport)

Table 3.145. "feedback" Parameters

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

"forward" (Inport)

Table 3.146. "forward" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.147. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification1" (SignalSpecification)

Table 3.148. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit

Parameter	Value
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

I Gain

Figure 3.39. Closed_Loop_Control_Voltage/Discrete PID Controller/I Gain

Blocks

Parameters

"err" (Inport)

Table 3.149. "err" Parameters

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

"I Gain" (Inport)

Table 3.150. "I Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.151. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Ideal P Gain

Figure 3.40. Closed_Loop_Control_Voltage/Discrete PID Controller/Ideal P Gain
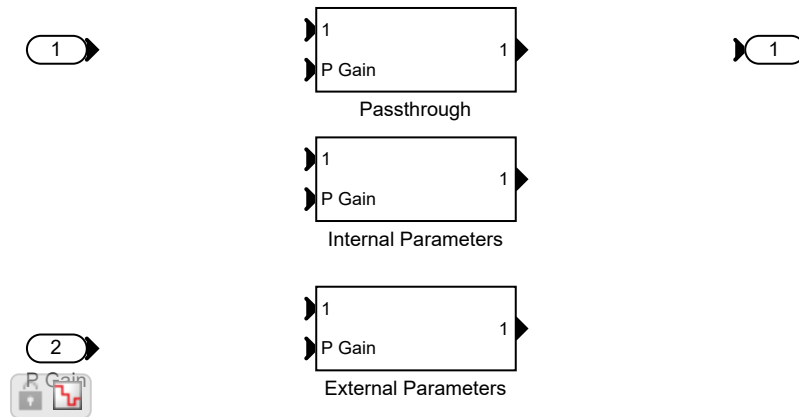
Blocks

Parameters

"In1" (Inport)

Table 3.152. "In1" Parameters

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

"Out1" (Outport)

Table 3.153. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number

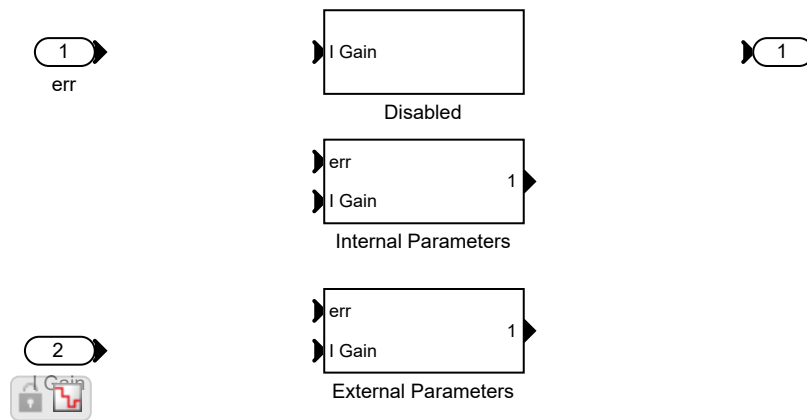| Parameter	Value
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.154. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Ideal P Gain Fdbk

Figure 3.41. Closed_Loop_Control_Voltage/Discrete PID Controller/Ideal P Gain Fdbk

Blocks

Parameters

"In1" (Inport)

Table 3.155. "In1" Parameters

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

"Out1" (Outport)

Table 3.156. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.157. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Integrator

Figure 3.42. Closed_Loop_Control_Voltage/Discrete PID Controller/Integrator
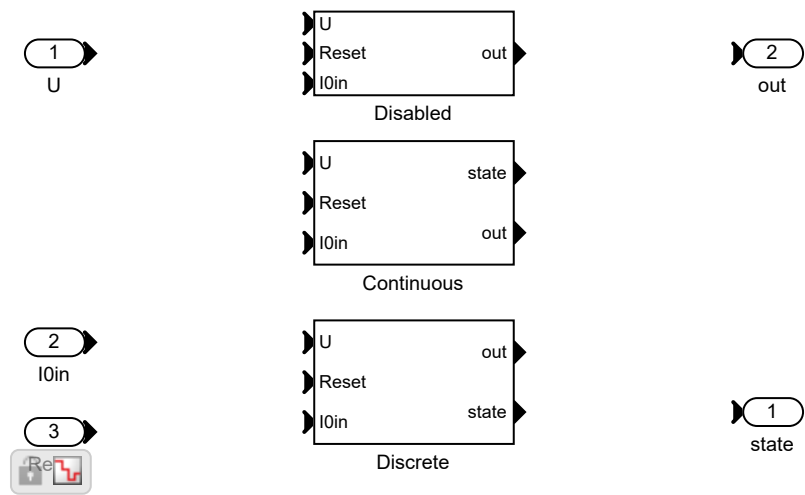
Blocks

Parameters

"I0in" (Inport)

Table 3.158. "I0in" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"out" (Outport)

Table 3.159. "out" Parameters

Parameter	Value
Port number	2

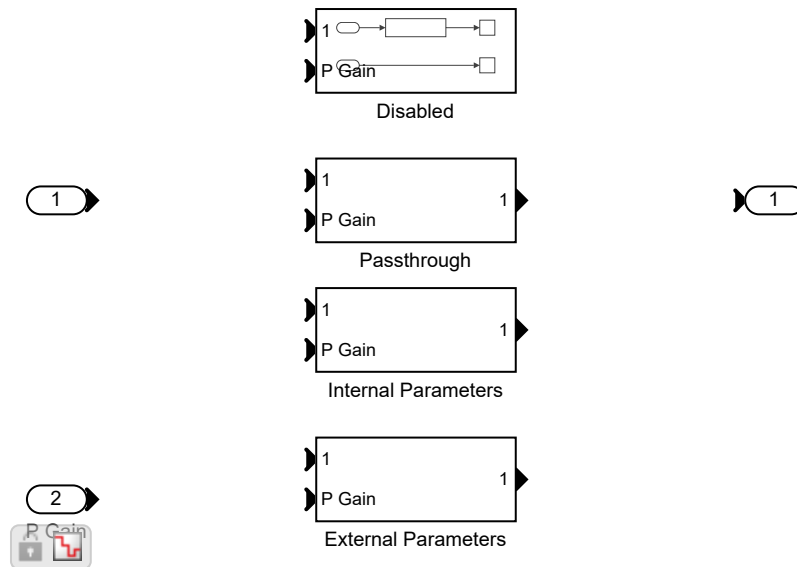| Parameter	Value
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Reset" (Inport)

Table 3.160. "Reset" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"state" (Outport)

Table 3.161. "state" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"U" (Inport)

Table 3.162. "U" Parameters

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

Integrator ICs

Figure 3.43. Closed_Loop_Control_Voltage/Discrete PID Controller/Integrator ICs
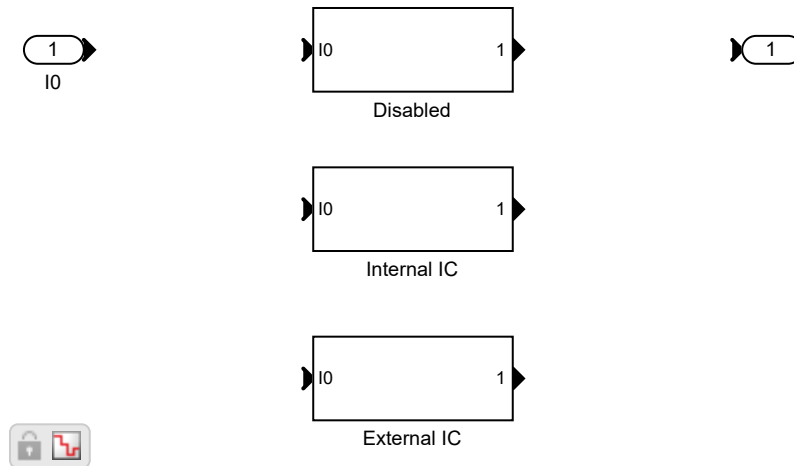
Blocks

Parameters

"I0" (Inport)

Table 3.163. "I0" Parameters

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

"Out1" (Outport)

Table 3.164. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Internal Parameters

Figure 3.44. Closed_Loop_Control_Voltage/Discrete PID Controller/I Gain/ Internal Parameters
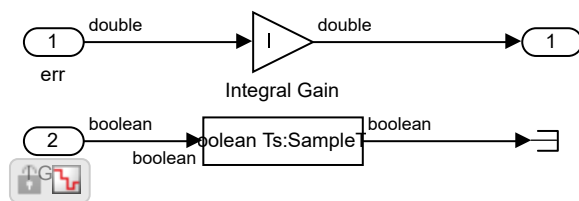
Blocks

Parameters

"err" (Inport)

Table 3.165. "err" Parameters

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

"I Gain" (Inport)

Table 3.166. "I Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Integral Gain" (Gain)

Table 3.167. "Integral Gain" Parameters

Parameter	Value
Gain	I
Multiplication	Element-wise(K.*u)
Parameter minimum	IParamMin
Parameter maximum	IParamMax
Parameter data type	Inherit: Inherit via internal rule
Output minimum	IOutMin

Parameter	Value
Output maximum	IOutMax
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

"Out1" (Outport)

Table 3.168. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.169. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Internal Parameters

Figure 3.45. Closed_Loop_Control_Voltage/Discrete PID Controller/Parallel P Gain/Internal Parameters

Blocks

Parameters

"err" (Inport)

Table 3.170. "err" Parameters

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

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.171. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.172. "P Gain" Parameters

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

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

"Proportional Gain" (Gain)

Table 3.173. "Proportional Gain" Parameters

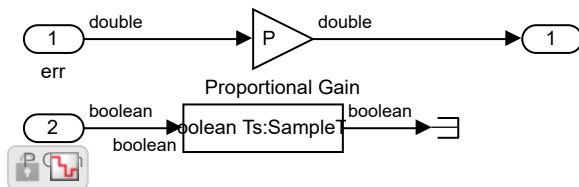| Parameter	Value
Gain	P
Multiplication	Element-wise(K.*u)
Parameter minimum	PParamMin
Parameter maximum	PParamMax
Parameter data type	Inherit: Inherit via internal rule
Output minimum	POutMin
Output maximum	POutMax
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

"Signal Specification" (SignalSpecification)

Table 3.174. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit

Parameter	Value
Sample time (-1 for inherited)	SampleTime

Internal Ts

Figure 3.46. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/ Differentiator/Tsamp/Internal Ts
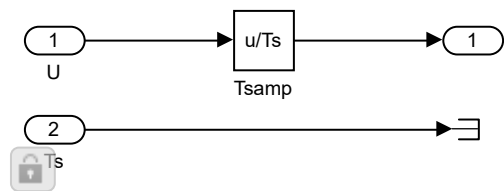
Internal Ts

Figure 3.47. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/Disc. Backward Euler Filter/Tsamp/Internal Ts
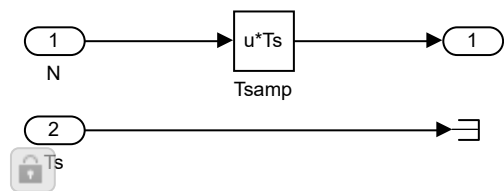
Internal Ts

Figure 3.48. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/Disc. Trapezoidal Filter/Tsamp/Internal Ts
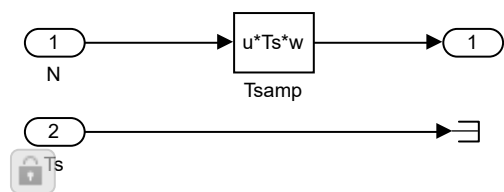
N Copy

Figure 3.49. Closed_Loop_Control_Voltage/Discrete PID Controller/N Copy
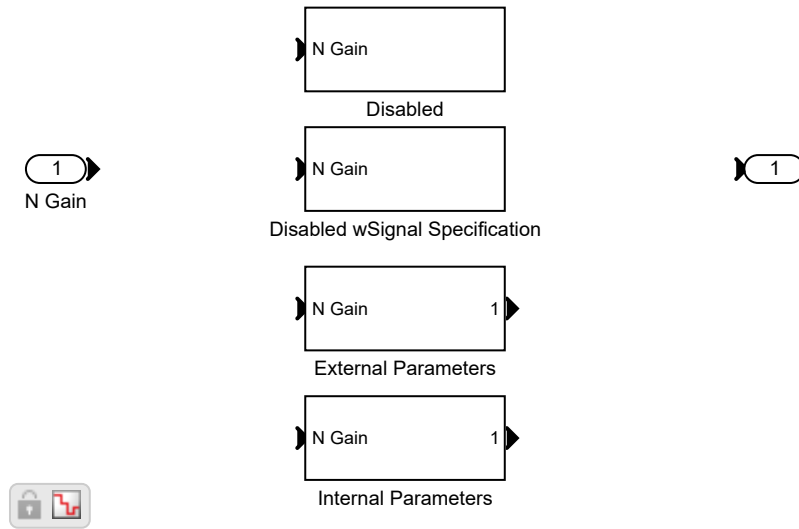
Blocks

Parameters

"N Gain" (Inport)

Table 3.175. "N Gain" Parameters

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

"Out1" (Outport)

Table 3.176. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

N Gain

Figure 3.50. Closed_Loop_Control_Voltage/Discrete PID Controller/N Gain
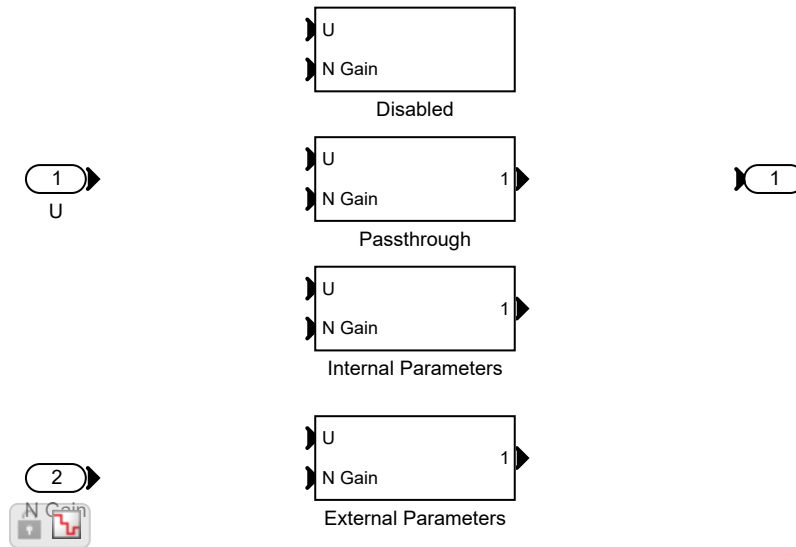
Blocks

Parameters

"N Gain" (Inport)

Table 3.177. "N Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.178. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"U" (Inport)

Table 3.179. "U" Parameters

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

P Copy

Figure 3.51. Closed_Loop_Control_Voltage/Discrete PID Controller/P Copy
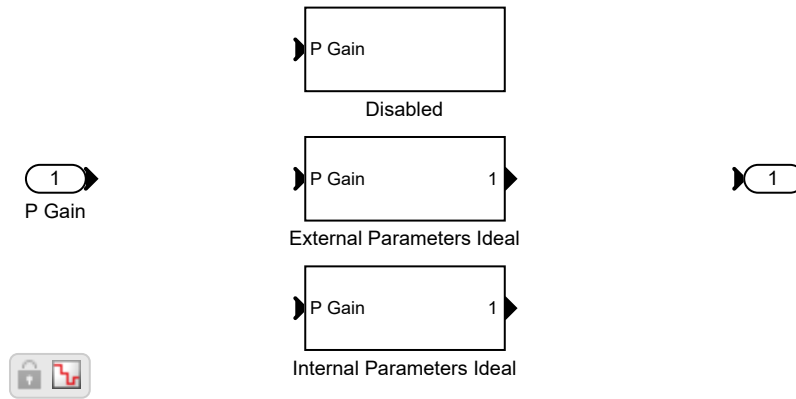
Blocks

Parameters

"Out1" (Outport)

Table 3.180. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime

Parameter	Value
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.181. "P Gain" Parameters

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

Parallel P Gain

Figure 3.52. Closed_Loop_Control_Voltage/Discrete PID Controller/Parallel P Gain

Blocks

Parameters

"err" (Inport)

Table 3.182. "err" Parameters

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

"Out1" (Outport)

Table 3.183. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.184. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Passthrough

Figure 3.53. Closed_Loop_Control_Voltage/Discrete PID Controller/Ideal P Gain/Passthrough
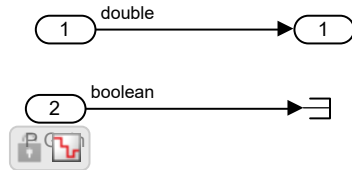
Blocks

Parameters

"In1" (Inport)

Table 3.185. "In1" Parameters

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

"Out1" (Outport)

Table 3.186. "Out1" Parameters

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

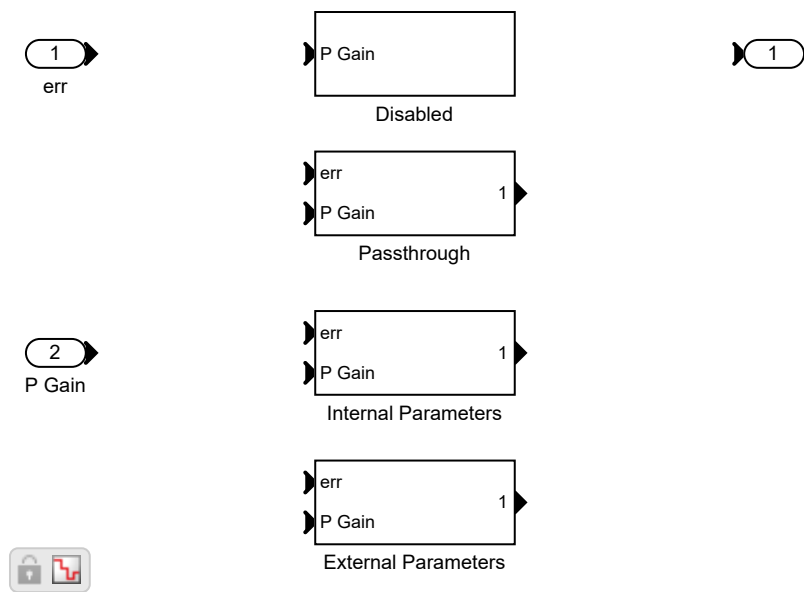| Parameter	Value
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.187. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Passthrough

Figure 3.54. Closed_Loop_Control_Voltage/Discrete PID Controller/Tracking Mode Sum/Passthrough
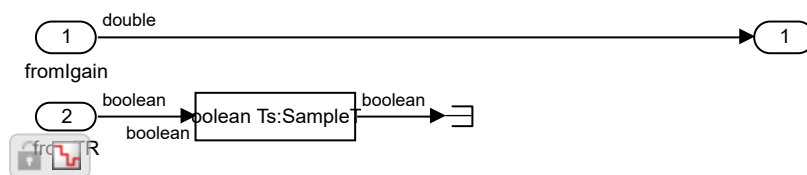
Blocks

Parameters

"fromIgain" (Inport)

Table 3.188. "fromIgain" Parameters

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

"fromTR" (Inport)

Table 3.189. "fromTR" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.190. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.191. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Passthrough

Figure 3.55. Closed_Loop_Control_Voltage/Discrete PID Controller/Tsamp - Ngain/Passthrough

Blocks

Parameters

"Out1" (Outport)

Table 3.192. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off

Parameter	Value
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Ts" (Inport)

Table 3.193. "Ts" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.194. "U" Parameters

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

postSat Signal

Figure 3.56. Closed_Loop_Control_Voltage/Discrete PID Controller/postSat Signal
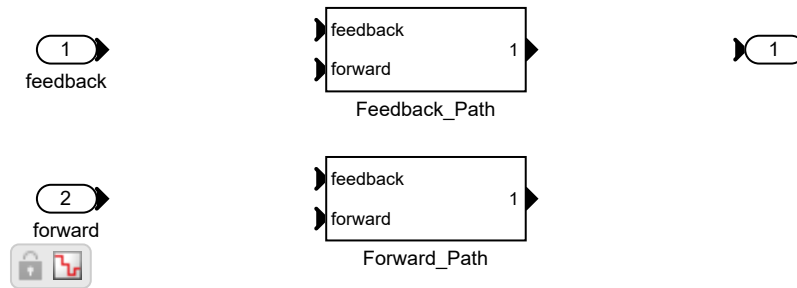
Blocks

Parameters

"feedback" (Inport)

Table 3.195. "feedback" Parameters

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

"forward" (Inport)

Table 3.196. "forward" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.197. "Out1" Parameters

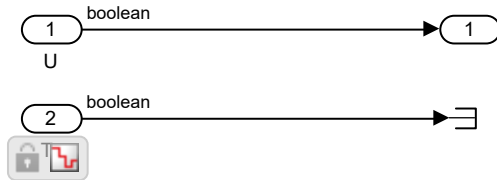| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

preSat Signal

Figure 3.57. Closed_Loop_Control_Voltage/Discrete PID Controller/preSat Signal
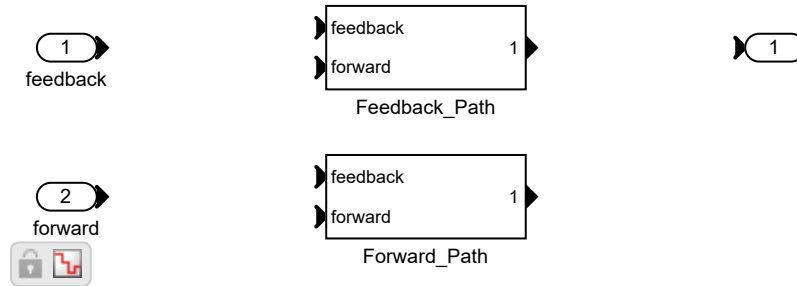
Blocks

Parameters

"feedback" (Inport)

Table 3.198. "feedback" Parameters

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

"forward" (Inport)

Table 3.199. "forward" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.200. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Reset Signal

Figure 3.58. Closed_Loop_Control_Voltage/Discrete PID Controller/Reset Signal
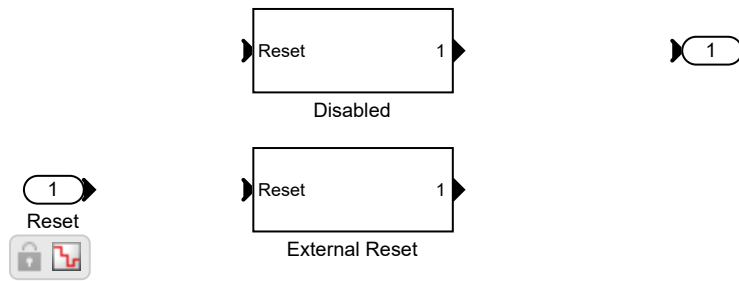
Blocks

Parameters

"Out1" (Outport)

Table 3.201. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held

Parameter	Value
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Reset" (Inport)

Table 3.202. "Reset" Parameters

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

Saturation

Figure 3.59. Closed_Loop_Control_Voltage/Discrete PID Controller/Saturation

Blocks

Parameters

"In1" (Inport)

Table 3.203. "In1" Parameters

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

"Lower Limit" (Inport)

Table 3.204. "Lower Limit" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.205. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit

Parameter	Value
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Upper Limit" (Inport)

Table 3.206. "Upper Limit" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Saturation Dynamic

Figure 3.60. Closed_Loop_Control_Voltage/Discrete PID Controller/Saturation Fdbk/External/Saturation Dynamic

Saturation Fdbk

Figure 3.61. Closed_Loop_Control_Voltage/Discrete PID Controller/Saturation Fdbk
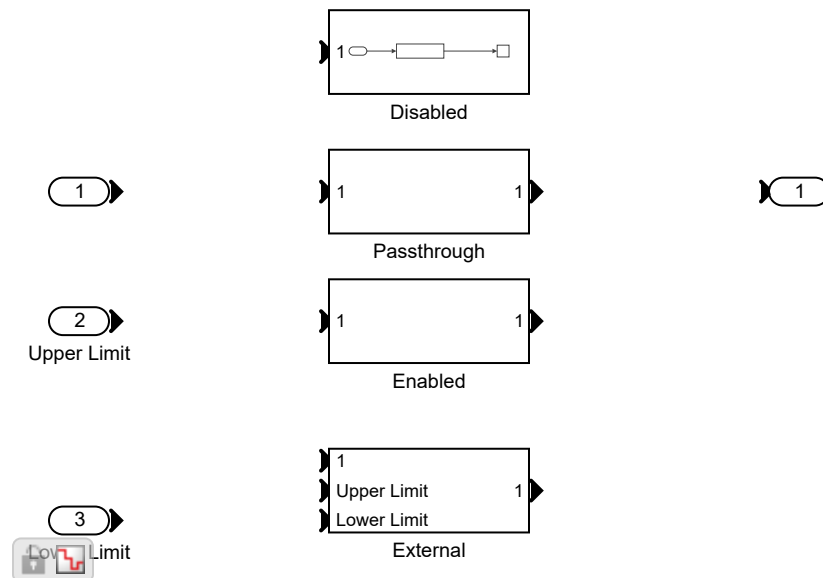
Blocks

Parameters

"In1" (Inport)

Table 3.207. "In1" Parameters

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

"Lower Limit" (Inport)

Table 3.208. "Lower Limit" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.209. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto

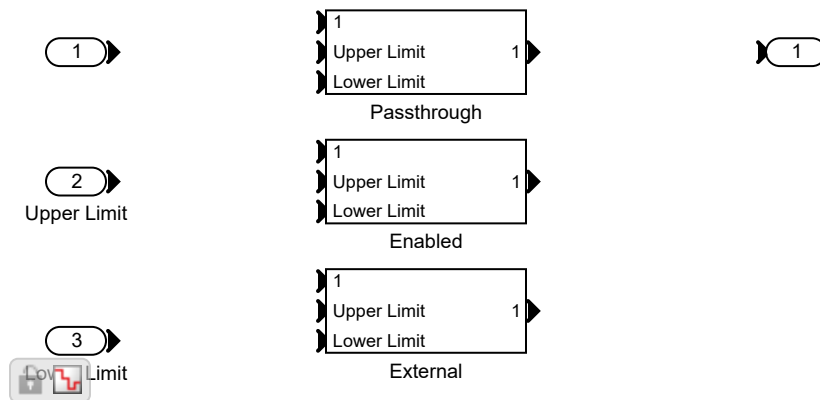| Parameter	Value
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Upper Limit" (Inport)

Table 3.210. "Upper Limit" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Sum

Figure 3.62. Closed_Loop_Control_Voltage/Discrete PID Controller/Sum

Blocks

Parameters

"D" (Inport)

Table 3.211. "D" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"I" (Inport)

Table 3.212. "I" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.213. "Out1" Parameters

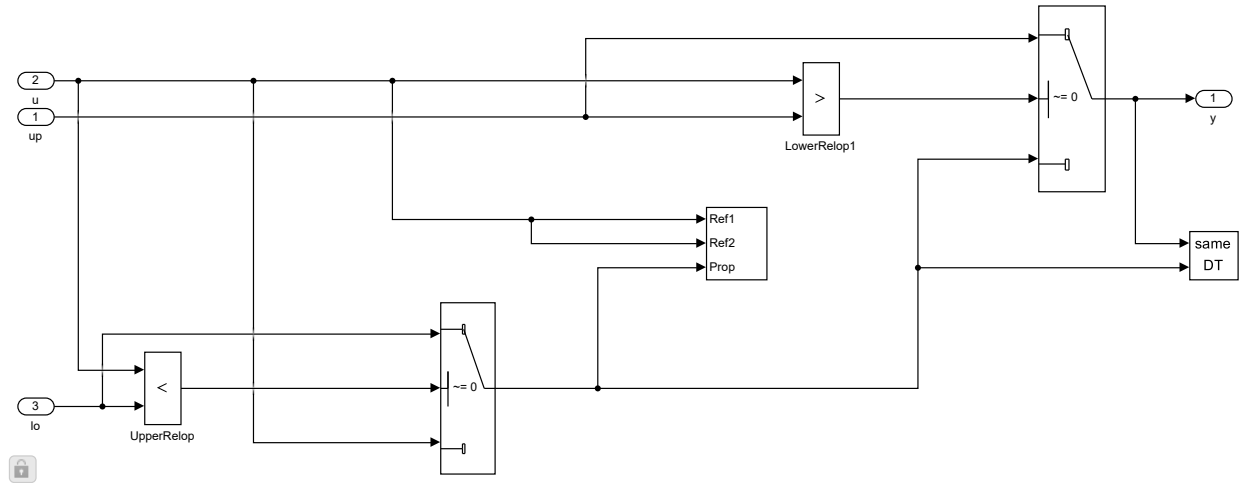| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P" (Inport)

Table 3.214. "P" Parameters

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

Sum Fdbk

Figure 3.63. Closed_Loop_Control_Voltage/Discrete PID Controller/Sum Fdbk
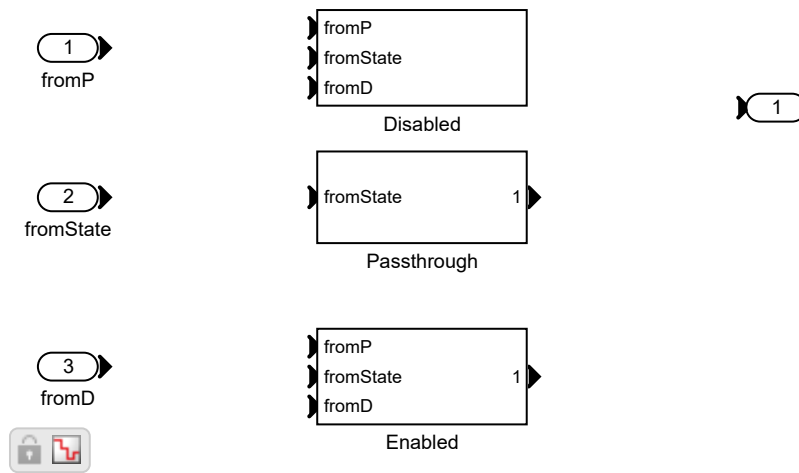
Blocks

Parameters

"fromD" (Inport)

Table 3.215. "fromD" Parameters

Parameter	Value
Port number	3

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

"fromP" (Inport)

Table 3.216. "fromP" Parameters

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

"fromState" (Inport)

Table 3.217. "fromState" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.218. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off

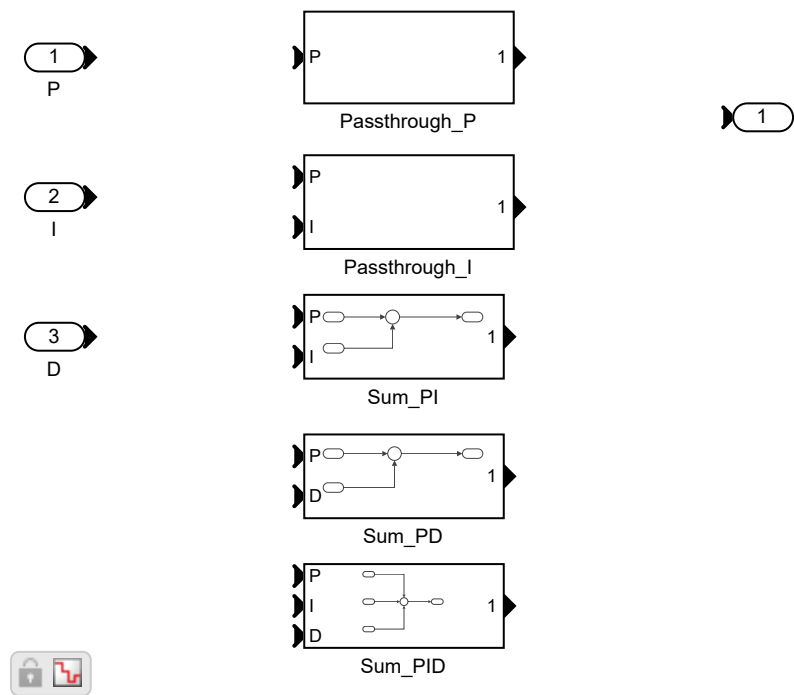| Parameter	Value
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Sum_PI

Figure 3.64. Closed_Loop_Control_Voltage/Discrete PID Controller/Sum/ Sum_PI
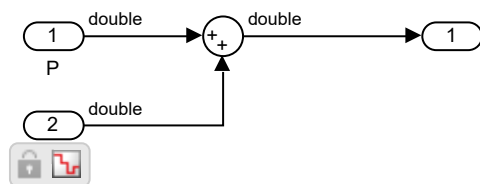
Blocks

Parameters

"I" (Inport)

Table 3.219. "I" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.220. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P" (Inport)

Table 3.221. "P" Parameters

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

"Sum" (Sum)

Table 3.222. "Sum" Parameters

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

Tracking Mode

Figure 3.65. Closed_Loop_Control_Voltage/Discrete PID Controller/Tracking Mode
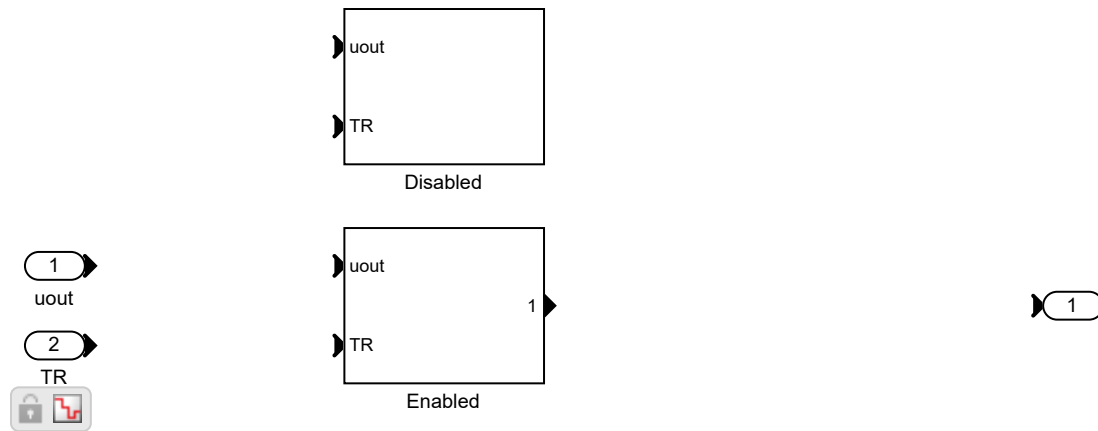
Blocks

Parameters

"Out1" (Outport)

Table 3.223. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"TR" (Inport)

Table 3.224. "TR" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"uout" (Inport)

Table 3.225. "uout" Parameters

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

Tracking Mode Sum

Figure 3.66. Closed_Loop_Control_Voltage/Discrete PID Controller/Tracking Mode Sum
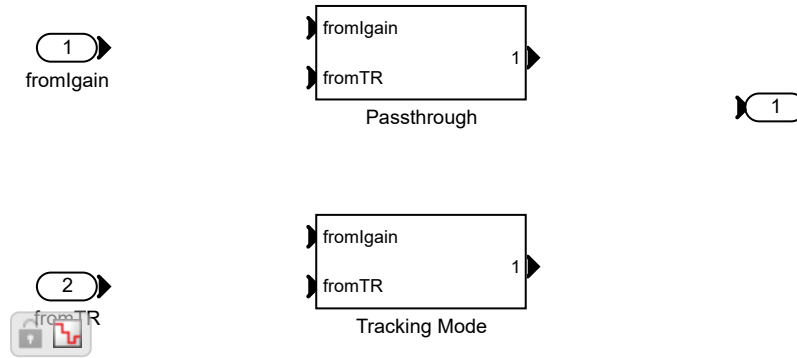
Blocks

Parameters

"fromIgain" (Inport)

Table 3.226. "fromIgain" Parameters

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

"fromTR" (Inport)

Table 3.227. "fromTR" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime

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

"Out1" (Outport)

Table 3.228. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Tsamp

Figure 3.67. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/ Differentiator/Tsamp
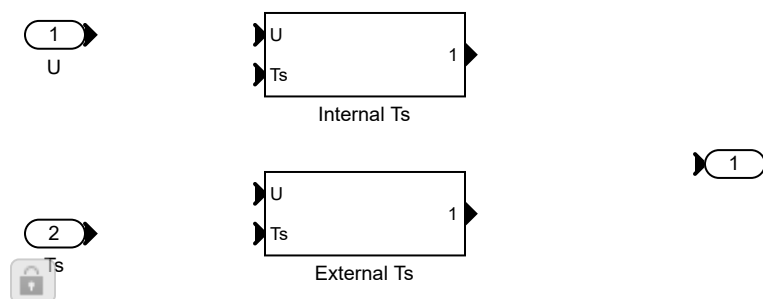
Tsamp

Figure 3.68. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/Disc. Backward Euler Filter Only/Tsamp
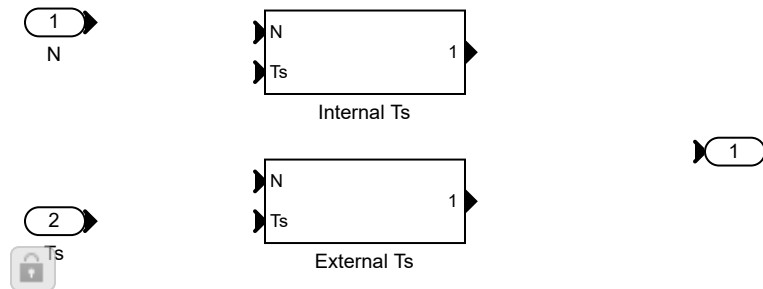
Tsamp

Figure 3.69. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/Disc. Backward Euler Filter/Tsamp
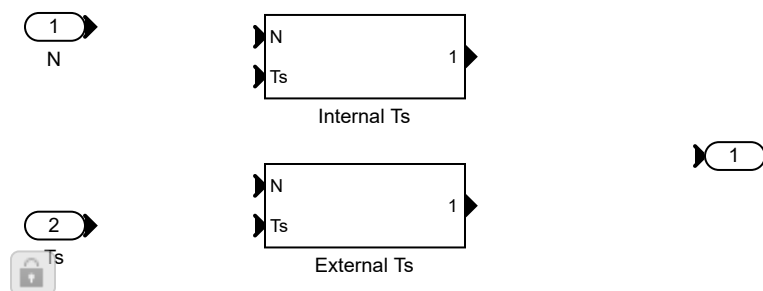
Tsamp

Figure 3.70. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/Disc. Trapezoidal Filter Only/Tsamp
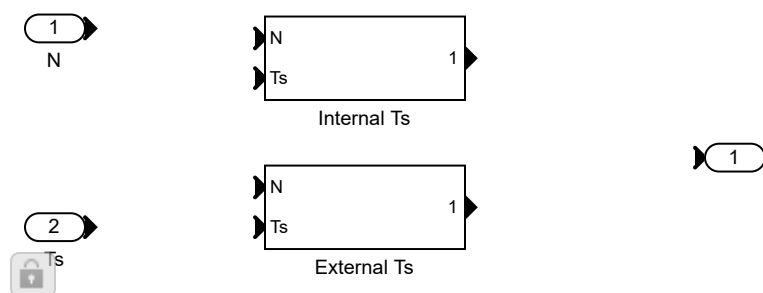
Tsamp

Figure 3.71. Closed_Loop_Control_Voltage/Discrete PID Controller/Filter/Disc. Trapezoidal Filter/Tsamp
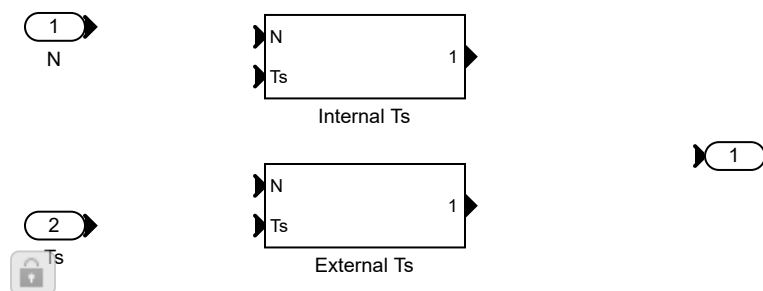
Tsamp - Integral

Figure 3.72. Closed_Loop_Control_Voltage/Discrete PID Controller/Tsamp - Integral
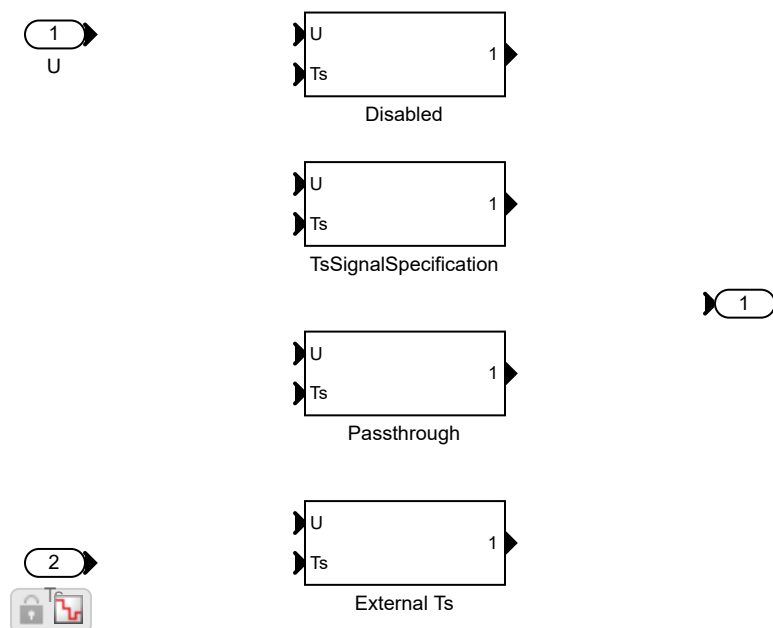
Blocks

Parameters

"Out1" (Outport)

Table 3.229. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Ts" (Inport)

Table 3.230. "Ts" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.231. "U" Parameters

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

Tsamp - Ngain

Figure 3.73. Closed_Loop_Control_Voltage/Discrete PID Controller/Tsamp - Ngain
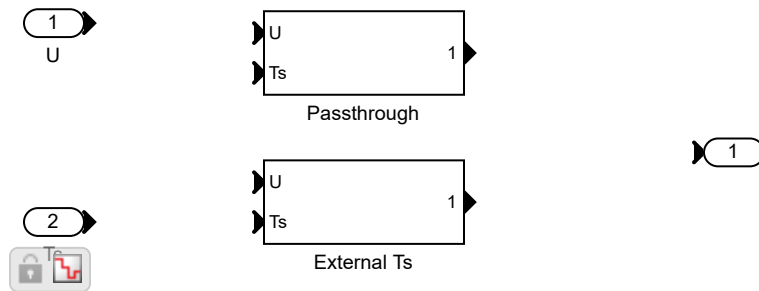
Blocks

Parameters

"Out1" (Outport)

Table 3.232. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]

Parameter	Value
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Ts" (Inport)

Table 3.233. "Ts" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.234. "U" Parameters

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

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

TsSignalSpecification

Figure 3.74. Closed_Loop_Control_Voltage/Discrete PID Controller/Tsamp - Integral/TsSignalSpecification
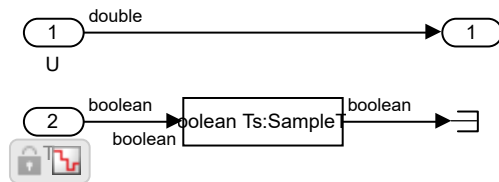
Blocks

Parameters

"Out1" (Outport)

Table 3.235. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.236. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Ts" (Inport)

Table 3.237. "Ts" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.238. "U" Parameters

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

Anti-windup

Figure 3.75. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup

preInt
preSat
postSat
P

Disabled

preInt
preSat
postSat
P
1

Passthrough

1 preSat

2 postSat

3 P

4 preInt

5 Upper Limit

6 Lower Limit

preSat
postSat
preInt
P
1

Back Calculation

1

preSat
preInt
postSat
P
Upper Limit
Lower Limit
1

Disc. Clamping Parallel

preSat
P
preInt
postSat
Upper Limit
Lower Limit
1

Disc. Clamping Ideal

preSat
preInt
postSat
P
Upper Limit
Lower Limit
1

Cont. Clamping Parallel

preSat
P
preInt
postSat
Upper Limit
Lower Limit
1

Cont. Clamping Ideal

171

Blocks

Parameters

"Lower Limit" (Inport)

Table 3.239. "Lower Limit" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.240. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]

Parameter	Value
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P" (Inport)

Table 3.241. "P" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"postSat" (Inport)

Table 3.242. "postSat" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"preInt" (Inport)

Table 3.243. "preInt" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"preSat" (Inport)

Table 3.244. "preSat" Parameters

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

"Upper Limit" (Inport)

Table 3.245. "Upper Limit" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Closed_Loop_LEDControllers

Checksum: 1384248535 3510322714 4017254199 2716059293

Figure 3.76. Closed_Loop_LEDControllers

Closed Loop Control of the Current
lLosed loop control and PI implementation of
current control using a custom Simulink Library

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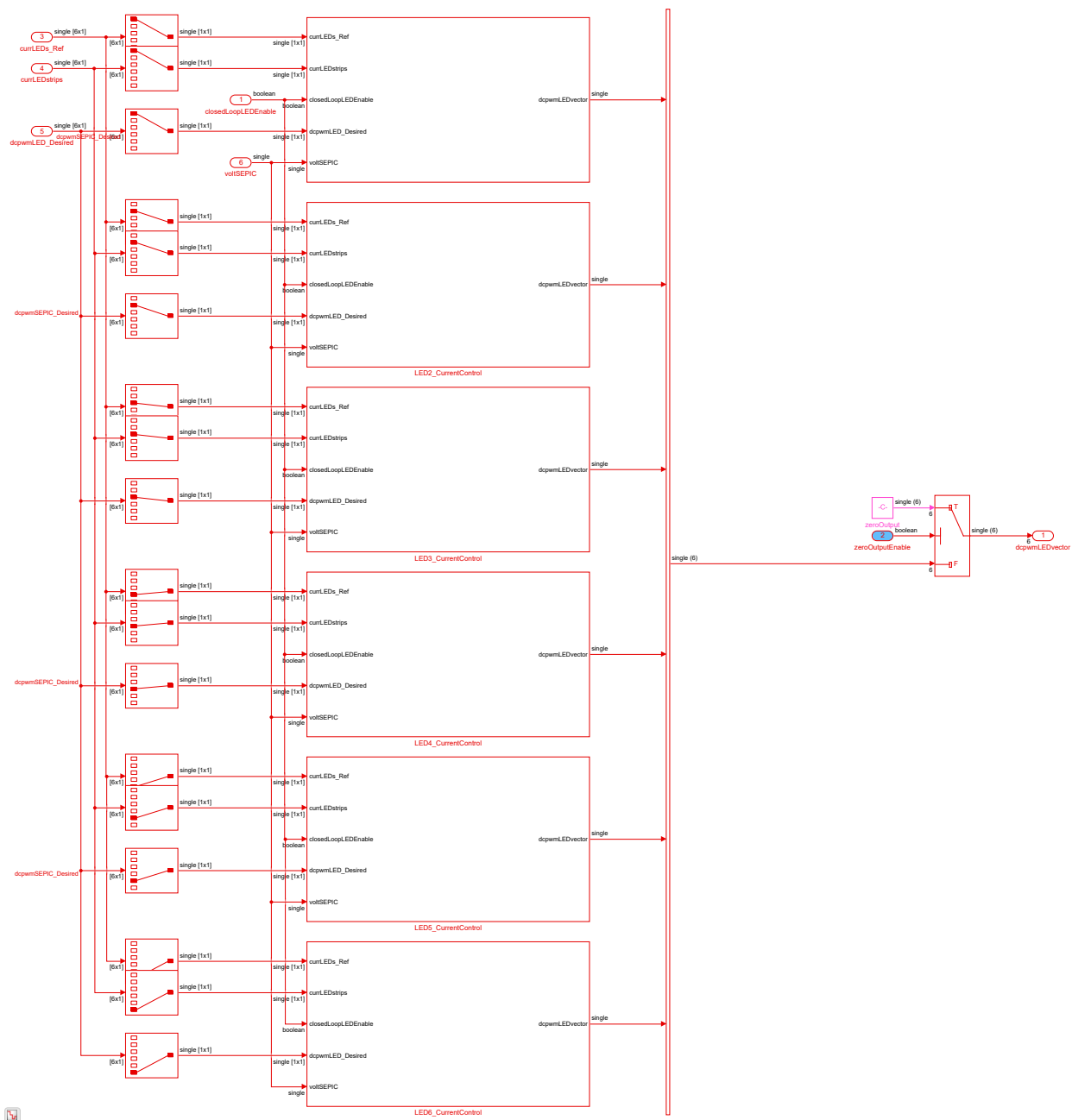
Interface

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 3.246. Input Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Closed_Loop_LEDControllers/ closedLoopLEDEnable		boolean	1	1x1
	Closed_Loop_LEDControllers/ currLEDs_Ref		single	6	6x1
	Closed_Loop_LEDControllers/ currLEDstrips		single	6	6x1
	Closed_Loop_LEDControllers/ voltSEPIC		single	1	1x1
	Closed_Loop_LEDControllers/ zeroOutputEnable		boolean	1	1x1
dcpwmSEPIC_Desired	Closed_Loop_LEDControllers/ dcpwmLED_Desired		single	6	6x1

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 3.247. Output Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Closed_Loop_LEDControllers/ Switch		single	6	1x6

Blocks

Parameters

"closedLoopLEDEnable" (Inport)

Table 3.248. "closedLoopLEDEnable" Parameters

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

"currLEDs_Ref" (Inport)

Table 3.249. "currLEDs_Ref" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	[6 1]
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"currLEDstrips" (Inport)

Table 3.250. "currLEDstrips" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	[6 1]
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"dcpwmLED_Desired" (Inport)

Table 3.251. "dcpwmLED_Desired" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	[6 1]
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"dcpwmLEDvector" (Outport)

Table 3.252. "dcpwmLEDvector" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	off

"LED1_CurrentControl" (SubSystem)

Table 3.253. "LED1_CurrentControl" Parameters

Parameter	Value
P Gain	CurrCtrlr_PGain
I Gain	CurrCtrlr_IGain

"LED2_CurrentControl" (SubSystem)

Table 3.254. "LED2_CurrentControl" Parameters

Parameter	Value
P Gain	CurrCtrlr_PGain
I Gain	CurrCtrlr_IGain

"LED3_CurrentControl" (SubSystem)

Table 3.255. "LED3_CurrentControl" Parameters

Parameter	Value
P Gain	CurrCtrlr_PGain
I Gain	CurrCtrlr_IGain

"LED4_CurrentControl" (SubSystem)

Table 3.256. "LED4_CurrentControl" Parameters

Parameter	Value
P Gain	CurrCtrlr_PGain
I Gain	CurrCtrlr_IGain

"LED5_CurrentControl" (SubSystem)

Table 3.257. "LED5_CurrentControl" Parameters

Parameter	Value
P Gain	CurrCtrlr_PGain
I Gain	CurrCtrlr_IGain

"LED6_CurrentControl" (SubSystem)

Table 3.258. "LED6_CurrentControl" Parameters

Parameter	Value
P Gain	CurrCtrlr_PGain
I Gain	CurrCtrlr_IGain

"Mux" (Mux)

Table 3.259. "Mux" Parameters

Parameter	Value
Number of inputs	6
Display option	bar

"Selector" (Selector)

Table 3.260. "Selector" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	1
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	1
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector1" (Selector)

Table 3.261. "Selector1" Parameters

Parameter	Value
Number of input dimensions	1

Parameter	Value
Index mode	One-based
Index Option	Index vector (dialog)
Index	1
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	1
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector10" (Selector)

Table 3.262. "Selector10" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	4
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	4
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector11" (Selector)

Table 3.263. "Selector11" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	4

Parameter	Value
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	4
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector12" (Selector)

Table 3.264. "Selector12" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	5
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	5
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector13" (Selector)

Table 3.265. "Selector13" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	5
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1

Parameter	Value
Index Option	Index vector (dialog)
Index	5
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector14" (Selector)

Table 3.266. "Selector14" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	5
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	5
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector15" (Selector)

Table 3.267. "Selector15" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	6
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	6
Output Size	1

Parameter	Value
Check for out-of-range index in accelerated simulation	off

"Selector16" (Selector)

Table 3.268. "Selector16" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	6
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	6
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector17" (Selector)

Table 3.269. "Selector17" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	6
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	6
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector2" (Selector)

Table 3.270. "Selector2" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	1
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	1
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector3" (Selector)

Table 3.271. "Selector3" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	2
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	2
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector4" (Selector)

Table 3.272. "Selector4" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	2
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	2
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector5" (Selector)

Table 3.273. "Selector5" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	2
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	2
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector6" (Selector)

Table 3.274. "Selector6" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	3
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	3
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector7" (Selector)

Table 3.275. "Selector7" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	3
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	3
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector8" (Selector)

Table 3.276. "Selector8" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	3
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	3
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Selector9" (Selector)

Table 3.277. "Selector9" Parameters

Parameter	Value
Number of input dimensions	1
Index mode	One-based
Index Option	Index vector (dialog)
Index	4
Output Size	1
Input port size	6
Sample time (-1 for inherited)	-1
Index Option	Index vector (dialog)
Index	4
Output Size	1
Check for out-of-range index in accelerated simulation	off

"Switch" (Switch)

Table 3.278. "Switch" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"voltSEPIC" (Inport)

Table 3.279. "voltSEPIC" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"zeroOutput" (Constant)

Table 3.280. "zeroOutput" Parameters

Parameter	Value
Constant value	zeros(6,1)
Interpret vector parameters as 1-D	on
Output minimum	[]

Parameter	Value
Output maximum	[]
Output data type	single
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"zeroOutputEnable" (Inport)

Table 3.281. "zeroOutputEnable" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	boolean

Block Execution Order

1. Clamping_zero (Constant)
2. Constant (Constant)
3. Constant2 (Constant)
4. Constant3 (Constant)
5. Constant4 (Constant)
6. Clamping_zero (Constant)
7. Constant (Constant)
8. Constant2 (Constant)
9. Constant3 (Constant)
10. Constant4 (Constant)
11. Clamping_zero (Constant)
12. Constant (Constant)
13. Constant2 (Constant)
14. Constant3 (Constant)
15. Constant4 (Constant)
16. Clamping_zero (Constant)
17. Constant (Constant)
18. Constant2 (Constant)
19. Constant3 (Constant)
20. Constant4 (Constant)
21. Clamping_zero (Constant)
22. Constant (Constant)

23. [Constant2](#) (Constant)
24. [Constant3](#) (Constant)
25. [Constant4](#) (Constant)
26. [Clamping_zero](#) (Constant)
27. [Constant](#) (Constant)
28. [Constant2](#) (Constant)
29. [Constant3](#) (Constant)
30. [Constant4](#) (Constant)
31. [zeroOutput](#) (Constant)
32. [Constant1](#) (Constant)
33. [Constant1](#) (Constant)
34. [Constant1](#) (Constant)
35. [Constant1](#) (Constant)
36. [Constant1](#) (Constant)
37. [Constant1](#) (Constant)
38. [Sum](#) (Sum)
39. [Proportional Gain](#) (Gain)
40. [Integrator](#) (DiscreteIntegrator)
41. [Sum](#) (Sum)
42. [DeadZone](#) (DeadZone)
43. [Relational Operator](#) (RelationalOperator)
44. [fix for DT propagation issue](#) (RelationalOperator)
45. [Switch1](#) (Switch)
46. [Integral Gain](#) (Gain)
47. [fix for DT propagation issue1](#) (RelationalOperator)
48. [Switch2](#) (Switch)
49. [Equal1](#) (RelationalOperator)
50. [AND3](#) (Logic)
51. [Switch](#) (Switch)
52. [Sum](#) (Sum)
53. [Proportional Gain](#) (Gain)
54. [Integrator](#) (DiscreteIntegrator)
55. [Sum](#) (Sum)
56. [DeadZone](#) (DeadZone)
57. [Relational Operator](#) (RelationalOperator)
58. [fix for DT propagation issue](#) (RelationalOperator)
59. [Switch1](#) (Switch)
60. [Integral Gain](#) (Gain)
61. [fix for DT propagation issue1](#) (RelationalOperator)
62. [Switch2](#) (Switch)
63. [Equal1](#) (RelationalOperator)
64. [AND3](#) (Logic)
65. [Switch](#) (Switch)
66. [Sum](#) (Sum)
67. [Proportional Gain](#) (Gain)
68. [Integrator](#) (DiscreteIntegrator)
69. [Sum](#) (Sum)
70. [DeadZone](#) (DeadZone)
71. [Relational Operator](#) (RelationalOperator)

72. [fix for DT propagation issue](#) (RelationalOperator)
73. [Switch1](#) (Switch)
74. [Integral Gain](#) (Gain)
75. [fix for DT propagation issue1](#) (RelationalOperator)
76. [Switch2](#) (Switch)
77. [Equal1](#) (RelationalOperator)
78. [AND3](#) (Logic)
79. [Switch](#) (Switch)
80. [Sum](#) (Sum)
81. [Proportional Gain](#) (Gain)
82. [Integrator](#) (DiscreteIntegrator)
83. [Sum](#) (Sum)
84. [DeadZone](#) (DeadZone)
85. [Relational Operator](#) (RelationalOperator)
86. [fix for DT propagation issue](#) (RelationalOperator)
87. [Switch1](#) (Switch)
88. [Integral Gain](#) (Gain)
89. [fix for DT propagation issue1](#) (RelationalOperator)
90. [Switch2](#) (Switch)
91. [Equal1](#) (RelationalOperator)
92. [AND3](#) (Logic)
93. [Switch](#) (Switch)
94. [Sum](#) (Sum)
95. [Proportional Gain](#) (Gain)
96. [Integrator](#) (DiscreteIntegrator)
97. [Sum](#) (Sum)
98. [DeadZone](#) (DeadZone)
99. [Relational Operator](#) (RelationalOperator)
100. [fix for DT propagation issue](#) (RelationalOperator)
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101 [Switch1](#) (Switch)
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102 [Integral Gain](#) (Gain)
.
103 [fix for DT propagation issue1](#) (RelationalOperator)
.
104 [Switch2](#) (Switch)
.
105 [Equal1](#) (RelationalOperator)
.
106 [AND3](#) (Logic)
.
107 [Switch](#) (Switch)
.
108 [Sum](#) (Sum)
.
109 [Proportional Gain](#) (Gain)
.

D Gain

Figure 3.77. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/D Gain
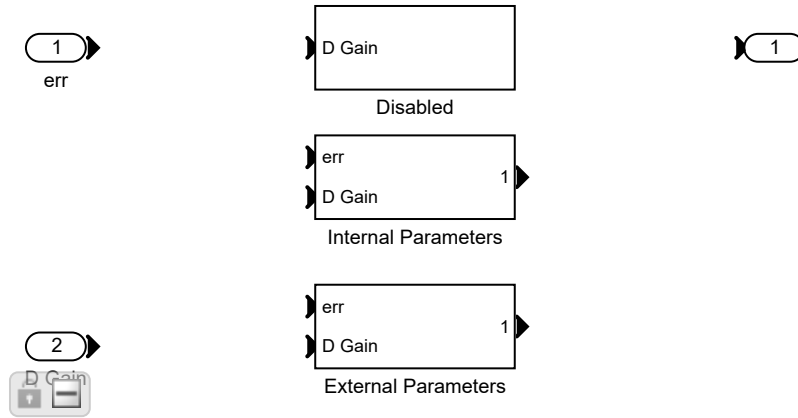
Blocks

Parameters

"D Gain" (Inport)

Table 3.282. "D Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"err" (Inport)

Table 3.283. "err" Parameters

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

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

"Out1" (Outport)

Table 3.284. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Dead Zone

Figure 3.78. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Cont. Clamping Ideal/Dead Zone

Disabled

1
preSat

2
Upper Limit

3
Lower Limit

preSat   DZ out
Enabled

1
DZ out

preSat
Upper Limit   DZ out
Lower Limit
External
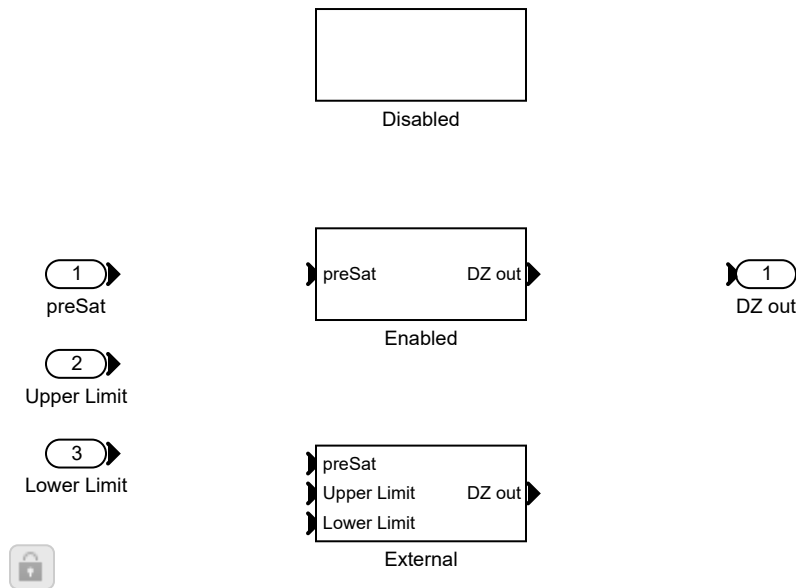
Dead Zone

Figure 3.79. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Cont. Clamping Parallel/Dead Zone

Disabled

| 1 |
preSat

| 2 |
Upper Limit

| 3 |
Lower Limit

preSat   DZ out
Enabled

| 1 |
DZ out

preSat
Upper Limit   DZ out
Lower Limit
External

Dead Zone

Figure 3.80. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Disc. Clamping Ideal/Dead Zone

Disabled

1	preSat

preSat

preSat   DZ out

Enabled

2	Upper Limit

Upper Limit

3	Lower Limit

Lower Limit

preSat
Upper Limit   DZ out
Lower Limit

External
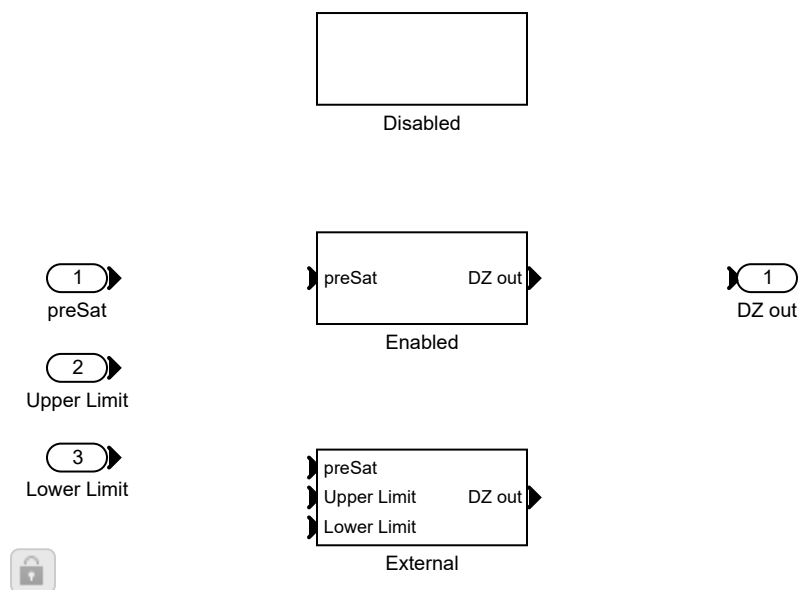
1	DZ out

DZ out

Dead Zone

Figure 3.81. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Disc. Clamping Parallel/Dead Zone
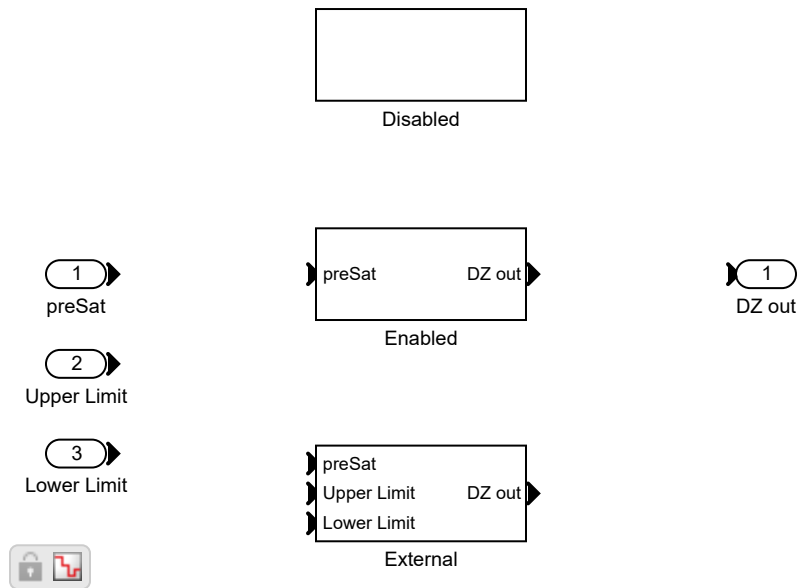
Blocks

Parameters

"DZ out" (Outport)

Table 3.285. "DZ out" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit

Parameter	Value
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Lower Limit" (Inport)

Table 3.286. "Lower Limit" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"preSat" (Inport)

Table 3.287. "preSat" Parameters

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

"Upper Limit" (Inport)

Table 3.288. "Upper Limit" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Dead Zone Dynamic

Figure 3.82. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Cont. Clamping Ideal/Dead Zone/External/Dead Zone Dynamic
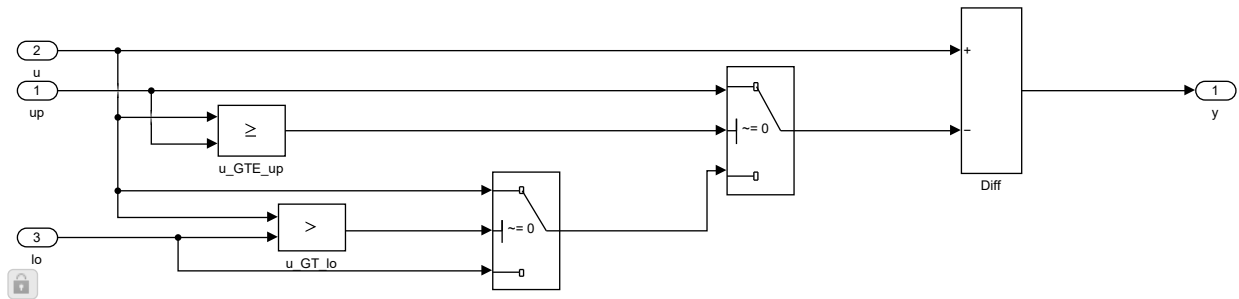
Disabled

Figure 3.83. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/D Gain/Disabled
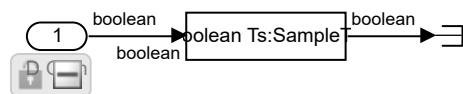
Blocks

Parameters

"D Gain" (Inport)

Table 3.289. "D Gain" Parameters

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

"Signal Specification" (SignalSpecification)

Table 3.290. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.84. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ External Derivative/Disabled
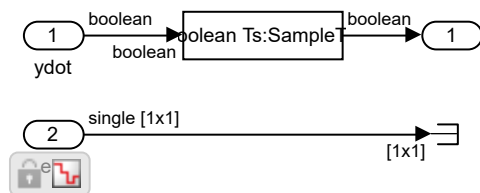
Blocks

Parameters

"err" (Inport)

Table 3.291. "err" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.292. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]

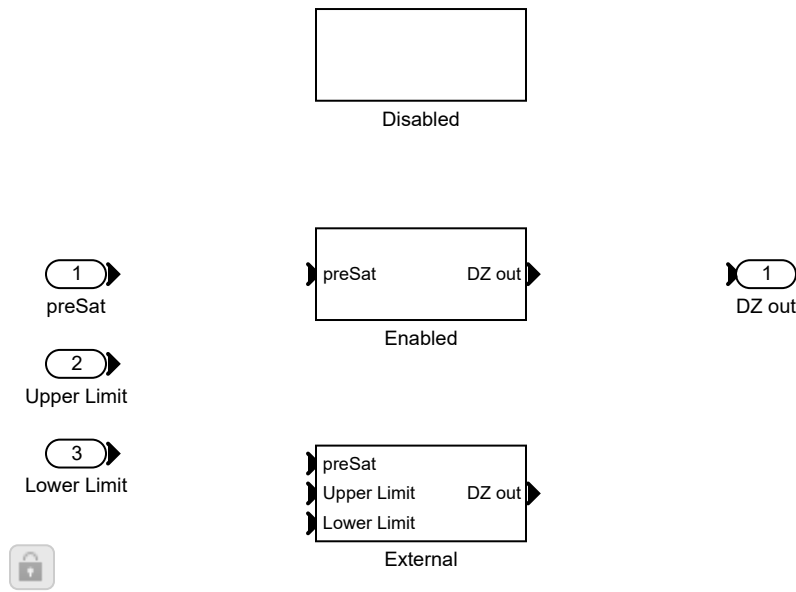| Parameter	Value
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.293. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"ydot" (Inport)

Table 3.294. "ydot" Parameters

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

Disabled

Figure 3.85. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Filter ICs/Disabled

Blocks

Parameters

"D0" (Inport)

Table 3.295. "D0" Parameters

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

"Out1" (Outport)

Table 3.296. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.297. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification1" (SignalSpecification)

Table 3.298. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]

Parameter	Value
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.86. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Disabled
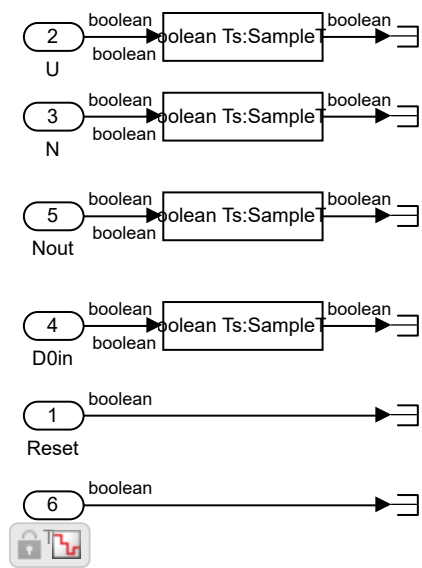
Blocks

Parameters

"D0in" (Inport)

Table 3.299. "D0in" Parameters

Parameter	Value
Port number	4

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

"N" (Inport)

Table 3.300. "N" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Nout" (Inport)

Table 3.301. "Nout" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Reset" (Inport)

Table 3.302. "Reset" Parameters

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

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

"Signal Specification1" (SignalSpecification)

Table 3.303. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification2" (SignalSpecification)

Table 3.304. "Signal Specification2" Parameters

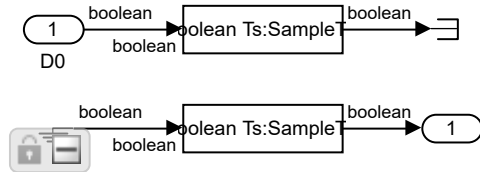| Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification3" (SignalSpecification)

Table 3.305. "Signal Specification3" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification4" (SignalSpecification)

Table 3.306. "Signal Specification4" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Ts" (Inport)

Table 3.307. "Ts" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.308. "U" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Disabled

Figure 3.87. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Ideal P Gain Fdbk/Disabled
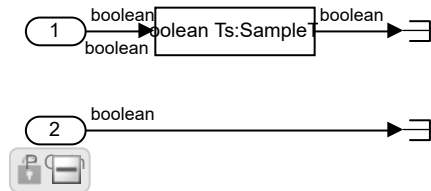
Blocks

Parameters

"In1" (Inport)

Table 3.309. "In1" Parameters

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

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

"P Gain" (Inport)

Table 3.310. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.311. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.88. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/N Gain/Disabled
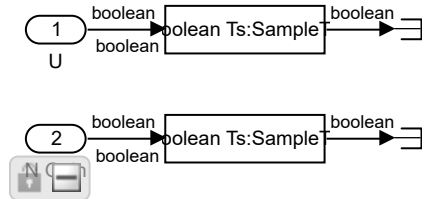
Blocks

Parameters

"N Gain" (Inport)

Table 3.312. "N Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.313. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit

Parameter	Value
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification2" (SignalSpecification)

Table 3.314. "Signal Specification2" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"U" (Inport)

Table 3.315. "U" Parameters

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

Disabled

Figure 3.89. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/P Copy/Disabled

Blocks

Parameters

"P Gain" (Inport)

Table 3.316. "P Gain" Parameters

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

Disabled

Figure 3.90. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Saturation Fdbk/Disabled
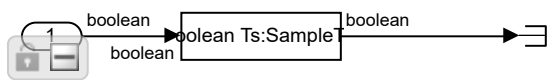
Blocks

Parameters

"In1" (Inport)

Table 3.317. "In1" Parameters

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

"Signal Specification1" (SignalSpecification)

Table 3.318. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.91. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Sum Fdbk/Disabled
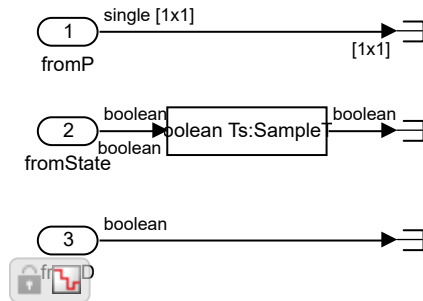
Blocks

Parameters

"fromD" (Inport)

Table 3.319. "fromD" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"fromP" (Inport)

Table 3.320. "fromP" Parameters

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

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"fromState" (Inport)

Table 3.321. "fromState" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.322. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disabled

Figure 3.92. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Tracking Mode/Disabled
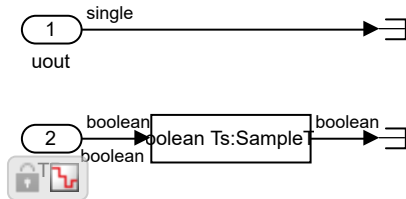
Blocks

Parameters

"Signal Specification1" (SignalSpecification)

Table 3.323. "Signal Specification1" Parameters

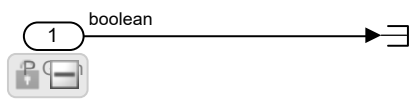| Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"TR" (Inport)

Table 3.324. "TR" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime

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

"uout" (Inport)

Table 3.325. "uout" Parameters

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

Disabled wSignal Specification

Figure 3.93. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/N Copy/Disabled wSignal Specification
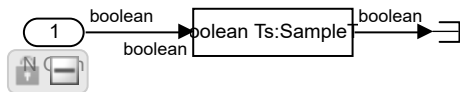
Blocks

Parameters

"N Gain" (Inport)

Table 3.326. "N Gain" Parameters

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

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.327. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Disc. Clamping Parallel

Figure 3.94. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Disc. Clamping Parallel
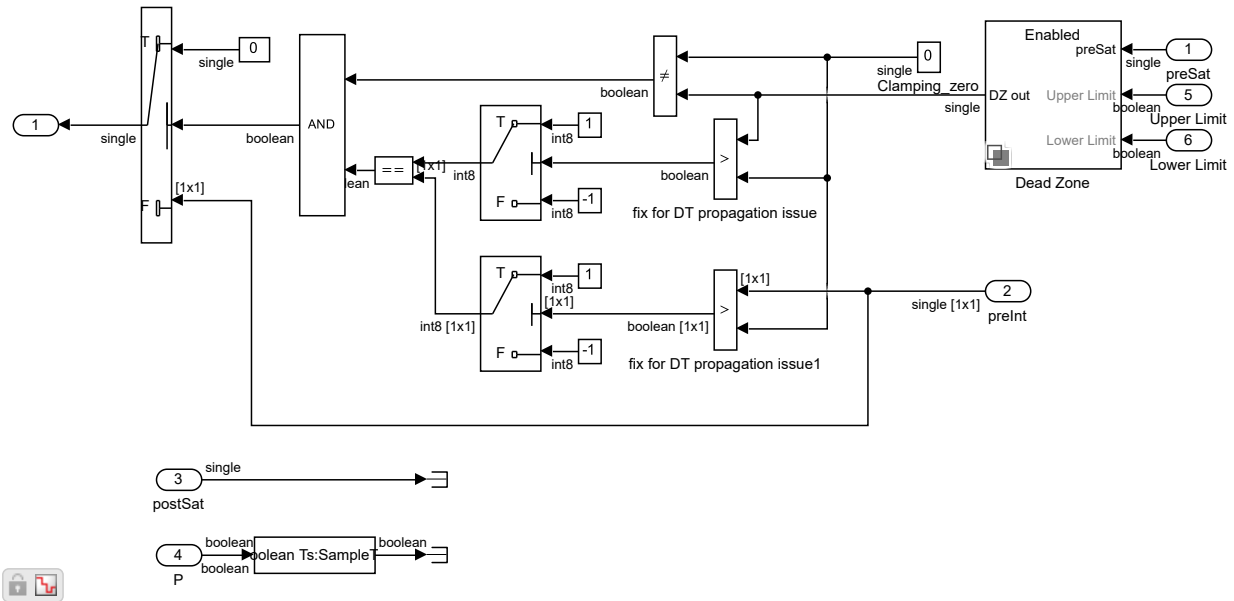
Blocks

Parameters

"AND3" (Logic)

Table 3.328. "AND3" Parameters

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

"Clamping_zero" (Constant)

Table 3.329. "Clamping_zero" Parameters

Parameter	Value
Constant value	0
Interpret vector parameters as 1-D	on
Output minimum	ClampingZeroOutMin
Output maximum	ClampingZeroOutMax
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

"Constant" (Constant)

Table 3.330. "Constant" Parameters

Parameter	Value
Constant value	1
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	int8
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"Constant1" (Constant)

Table 3.331. "Constant1" Parameters

Parameter	Value
Constant value	0
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]

Parameter	Value
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

"Constant2" (Constant)

Table 3.332. "Constant2" Parameters

Parameter	Value
Constant value	-1
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	int8
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"Constant3" (Constant)

Table 3.333. "Constant3" Parameters

Parameter	Value
Constant value	1
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	int8
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"Constant4" (Constant)

Table 3.334. "Constant4" Parameters

Parameter	Value
Constant value	-1
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	int8
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"Equal1" (RelationalOperator)

Table 3.335. "Equal1" Parameters

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

"fix for DT propagation issue" (RelationalOperator)

Table 3.336. "fix for DT propagation issue" Parameters

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

"fix for DT propagation issue1" (RelationalOperator)

Table 3.337. "fix for DT propagation issue1" Parameters

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

"Lower Limit" (Inport)

Table 3.338. "Lower Limit" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.339. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit

Parameter	Value
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P" (Inport)

Table 3.340. "P" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"postSat" (Inport)

Table 3.341. "postSat" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"preInt" (Inport)

Table 3.342. "preInt" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"preSat" (Inport)

Table 3.343. "preSat" Parameters

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

"Relational Operator" (RelationalOperator)

Table 3.344. "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	on
Sample time (-1 for inherited)	-1
Integer rounding mode	Simplest

"Signal Specification2" (SignalSpecification)

Table 3.345. "Signal Specification2" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Switch" (Switch)

Table 3.346. "Switch" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	on
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	SampleTime
Allow different data input sizes (Results in variable-size output signal)	off

"Switch1" (Switch)

Table 3.347. "Switch1" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"Switch2" (Switch)

Table 3.348. "Switch2" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"Upper Limit" (Inport)

Table 3.349. "Upper Limit" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Discrete

Figure 3.95. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Integrator/Discrete
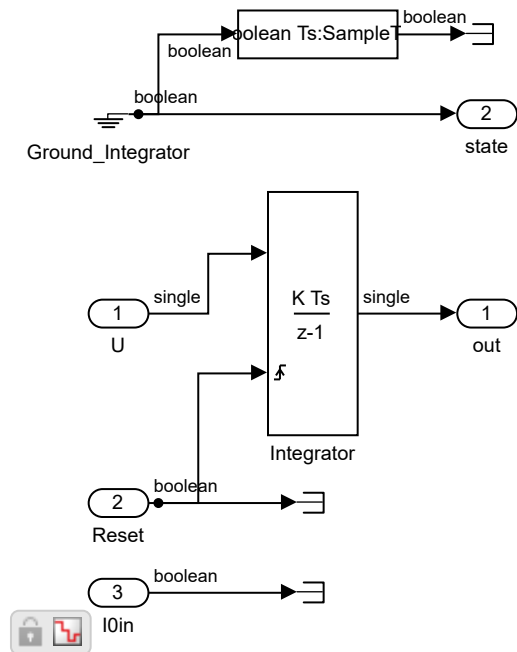
Blocks

Parameters

"I0in" (Inport)

Table 3.350. "I0in" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Integrator" (DiscreteIntegrator)

Table 3.351. "Integrator" Parameters

Parameter	Value
Integrator method	Integration: Forward Euler
Gain value	1.0
External reset	rising
Initial condition source	internal
Initial condition	InitialConditionForIntegrator
Sample time (-1 for inherited)	SampleTime
Output minimum	IntegratorOutMin
Output maximum	IntegratorOutMax
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Limit output	off
Upper saturation limit	UpperIntegratorSaturationLimit
Lower saturation limit	LowerIntegratorSaturationLimit
Show saturation port	off
Show state port	off
Ignore limit and reset when linearizing	off
State name must resolve to Simulink signal object	off

"out" (Outport)

Table 3.352. "out" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Reset" (Inport)

Table 3.353. "Reset" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Signal Specification1" (SignalSpecification)

Table 3.354. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"state" (Outport)

Table 3.355. "state" Parameters

Parameter	Value
Port number	2
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off

Parameter	Value
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"U" (Inport)

Table 3.356. "U" Parameters

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

Enabled

Figure 3.96. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Cont. Clamping Ideal/Dead Zone/Enabled
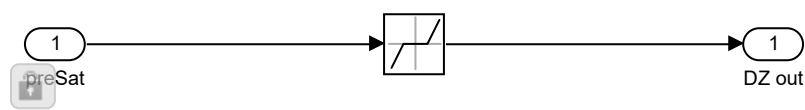
Enabled

Figure 3.97. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Cont. Clamping Parallel/Dead Zone/Enabled
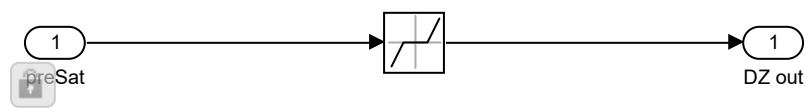
Enabled

Figure 3.98. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Disc. Clamping Ideal/Dead Zone/Enabled
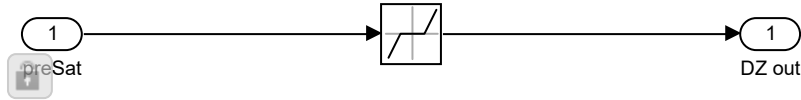
Enabled

Figure 3.99. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Anti-windup/Disc. Clamping Parallel/Dead Zone/Enabled
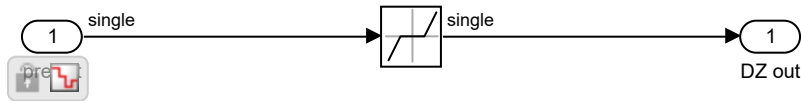
Blocks

Parameters

"DeadZone" (DeadZone)

Table 3.357. "DeadZone" Parameters

Parameter	Value
Start of dead zone	LowerSaturationLimit
End of dead zone	UpperSaturationLimit
Saturate on integer overflow	off
Treat as gain when linearizing	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1

"DZ out" (Outport)

Table 3.358. "DZ out" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"preSat" (Inport)

Table 3.359. "preSat" Parameters

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

Enabled

Figure 3.100. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Saturation/Enabled
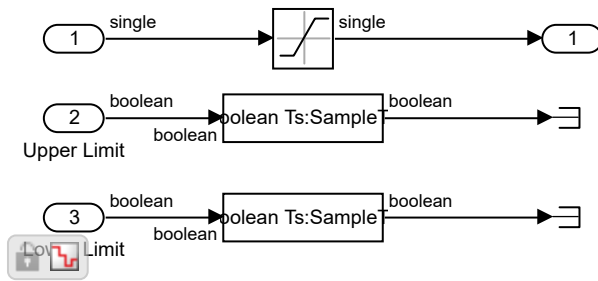
Blocks

Parameters

"In1" (Inport)

Table 3.360. "In1" Parameters

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

"Lower Limit" (Inport)

Table 3.361. "Lower Limit" Parameters

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

Parameter	Value
Data type	Inherit: auto

"Out1" (Outport)

Table 3.362. "Out1" Parameters

| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Saturation" (Saturate)

Table 3.363. "Saturation" Parameters

Parameter	Value
Upper limit	UpperSaturationLimit
Lower limit	LowerSaturationLimit
Treat as gain when linearizing	off

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

"Signal Specification" (SignalSpecification)

Table 3.364. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification1" (SignalSpecification)

Table 3.365. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Upper Limit" (Inport)

Table 3.366. "Upper Limit" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

External Derivative

Figure 3.101. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ External Derivative
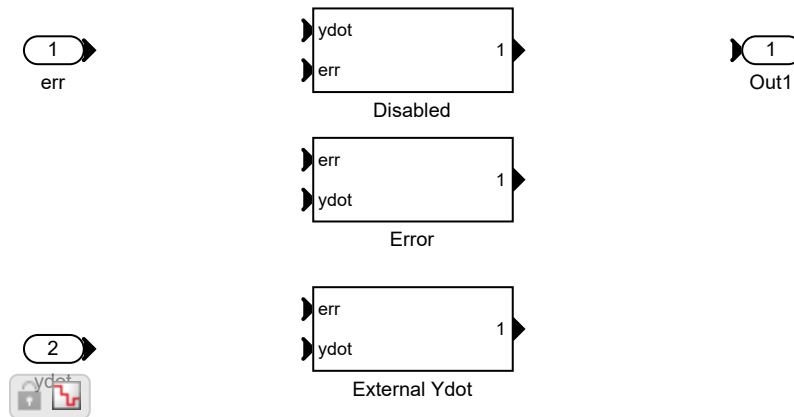
Blocks

Parameters

"err" (Inport)

Table 3.367. "err" Parameters

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

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

"Out1" (Outport)

Table 3.368. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"ydot" (Inport)

Table 3.369. "ydot" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

External Reset

Figure 3.102. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Reset Signal/External Reset
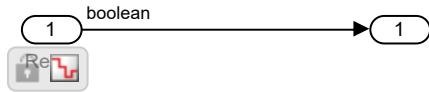
Blocks

Parameters

"Out1" (Outport)

Table 3.370. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit

Parameter	Value
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Reset" (Inport)

Table 3.371. "Reset" Parameters

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

External Ts

Figure 3.103. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Disc. Backward Euler Filter Only/Tsamp/External Ts
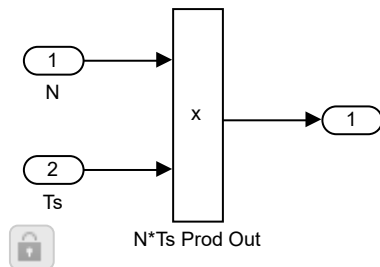
External Ts

Figure 3.104. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Disc. Trapezoidal Filter Only/Tsamp/External Ts
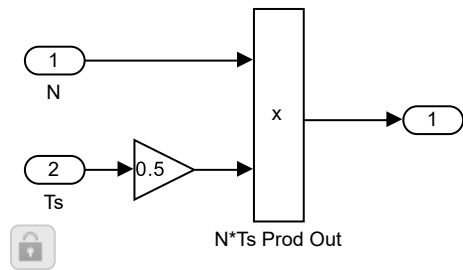
Filter

Figure 3.105. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter
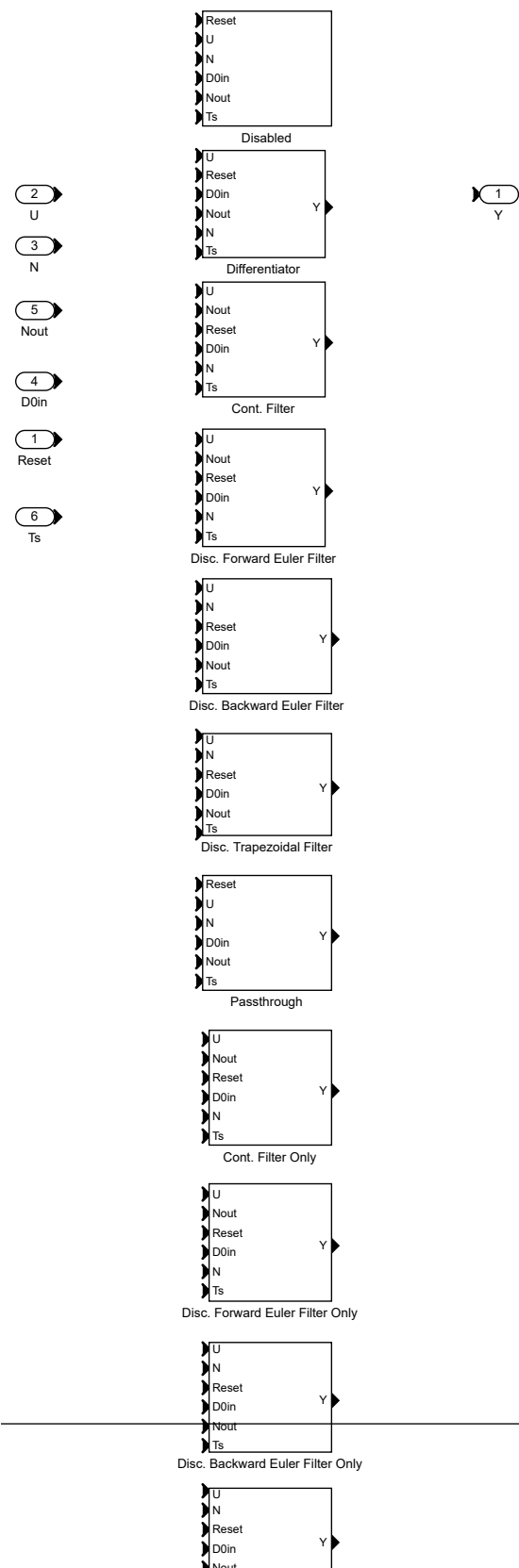
Blocks

Parameters

"D0in" (Inport)

Table 3.372. "D0in" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"N" (Inport)

Table 3.373. "N" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Nout" (Inport)

Table 3.374. "Nout" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Reset" (Inport)

Table 3.375. "Reset" Parameters

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

"Ts" (Inport)

Table 3.376. "Ts" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.377. "U" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Y" (Outport)

Table 3.378. "Y" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Filter ICs

Figure 3.106. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter ICs
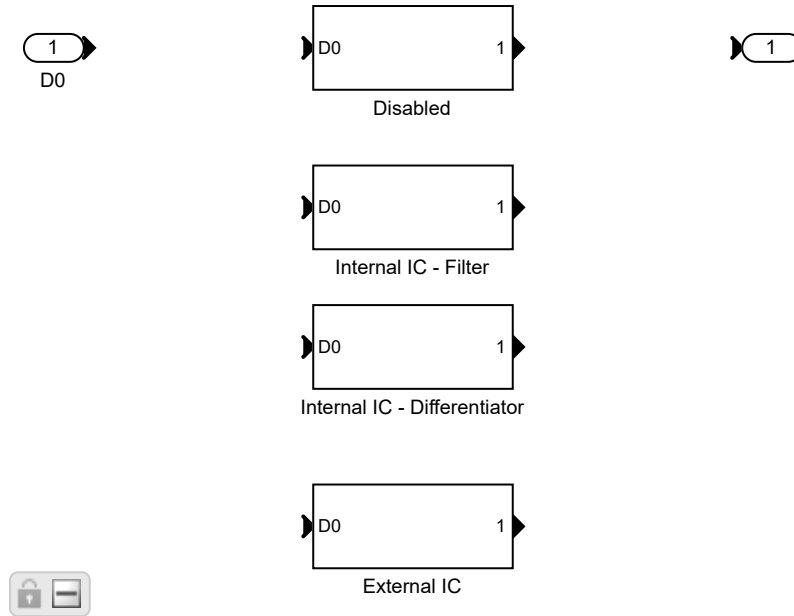
Blocks

Parameters

"D0" (Inport)

Table 3.379. "D0" Parameters

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

"Out1" (Outport)

Table 3.380. "Out1" Parameters

| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Forward_Path

Figure 3.107. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ postSat Signal/Forward_Path
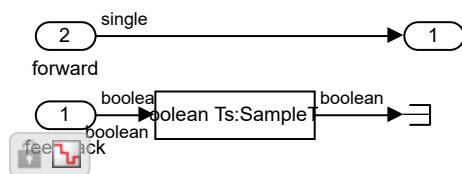
Blocks

Parameters

"feedback" (Inport)

Table 3.381. "feedback" Parameters

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

"forward" (Inport)

Table 3.382. "forward" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.383. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification1" (SignalSpecification)

Table 3.384. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Forward_Path

Figure 3.108. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ preSat Signal/Forward_Path

Blocks

Parameters

"feedback" (Inport)

Table 3.385. "feedback" Parameters

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

"forward" (Inport)

Table 3.386. "forward" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.387. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification1" (SignalSpecification)

Table 3.388. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit

Parameter	Value
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

I Gain

Figure 3.109. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/I Gain

Blocks

Parameters

"err" (Inport)

Table 3.389. "err" Parameters

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

"I Gain" (Inport)

Table 3.390. "I Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.391. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Ideal P Gain

Figure 3.110. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Ideal P Gain
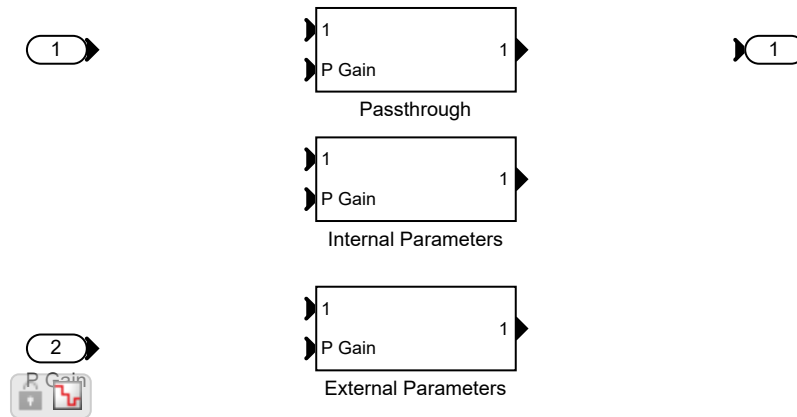
Blocks

Parameters

"In1" (Inport)

Table 3.392. "In1" Parameters

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

"Out1" (Outport)

Table 3.393. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number

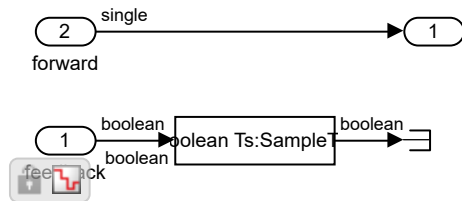| Parameter	Value
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.394. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Ideal P Gain Fdbk

Figure 3.111. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Ideal P Gain Fdbk
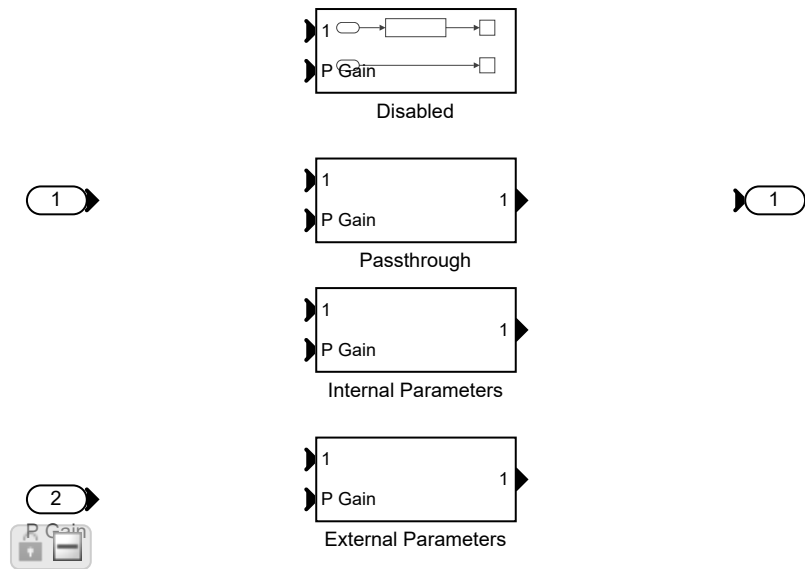
Blocks

Parameters

"In1" (Inport)

Table 3.395. "In1" Parameters

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

"Out1" (Outport)

Table 3.396. "Out1" Parameters

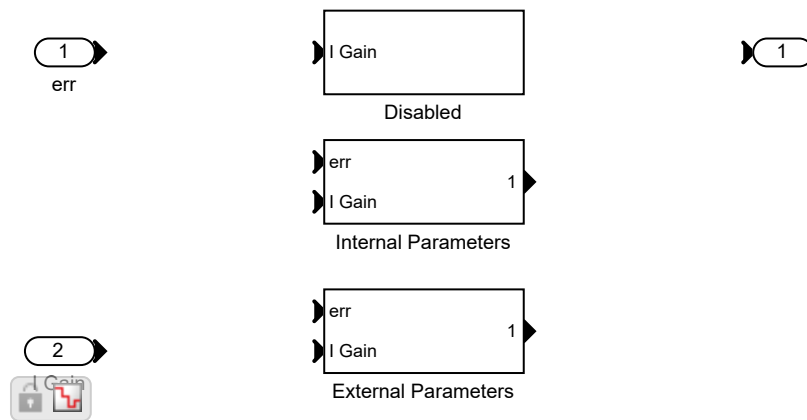| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.397. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Integrator

Figure 3.112. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Integrator
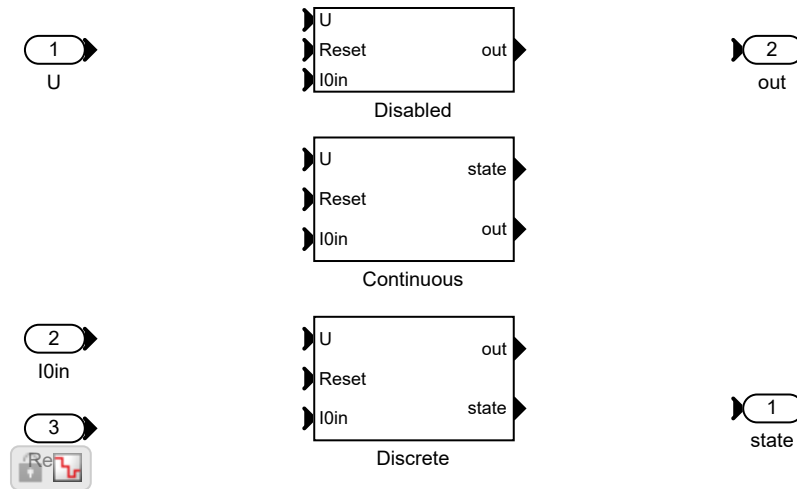
Blocks

Parameters

"I0in" (Inport)

Table 3.398. "I0in" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"out" (Outport)

Table 3.399. "out" Parameters

Parameter	Value
Port number	2
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Reset" (Inport)

Table 3.400. "Reset" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"state" (Outport)

Table 3.401. "state" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"U" (Inport)

Table 3.402. "U" Parameters

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

Integrator ICs

Figure 3.113. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Integrator ICs
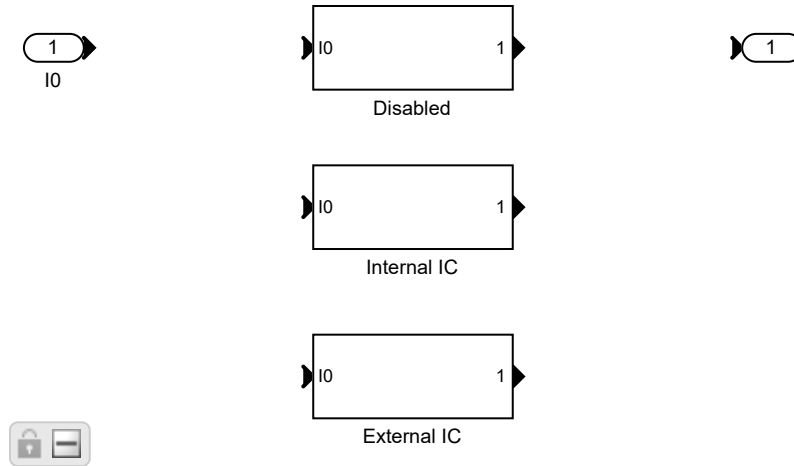
Blocks

Parameters

"I0" (Inport)

Table 3.403. "I0" Parameters

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

"Out1" (Outport)

Table 3.404. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Internal IC

Figure 3.114. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Integrator ICs/Internal IC
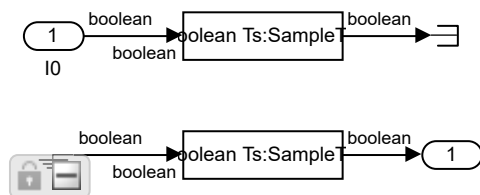
Blocks

Parameters

"I0" (Inport)

Table 3.405. "I0" Parameters

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

"Out1" (Outport)

Table 3.406. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]

Parameter	Value
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.407. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Signal Specification1" (SignalSpecification)

Table 3.408. "Signal Specification1" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Internal Parameters

Figure 3.115. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/I Gain/Internal Parameters

Blocks

Parameters

"err" (Inport)

Table 3.409. "err" Parameters

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

"I Gain" (Inport)

Table 3.410. "I Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Integral Gain" (Gain)

Table 3.411. "Integral Gain" Parameters

Parameter	Value
Gain	I
Multiplication	Element-wise(K.*u)
Parameter minimum	IParamMin
Parameter maximum	IParamMax
Parameter data type	Inherit: Inherit via internal rule
Output minimum	IOutMin
Output maximum	IOutMax
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

"Out1" (Outport)

Table 3.412. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime

Parameter	Value
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.413. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Internal Parameters

Figure 3.116. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Parallel P Gain/Internal Parameters
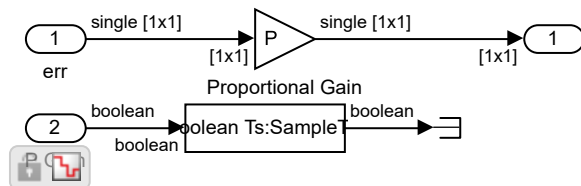
Blocks

Parameters

"err" (Inport)

Table 3.414. "err" Parameters

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

"Out1" (Outport)

Table 3.415. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.416. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Proportional Gain" (Gain)

Table 3.417. "Proportional Gain" Parameters

Parameter	Value
Gain	P
Multiplication	Element-wise(K.*u)
Parameter minimum	PParamMin
Parameter maximum	PParamMax
Parameter data type	Inherit: Inherit via internal rule
Output minimum	POutMin
Output maximum	POutMax
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

"Signal Specification" (SignalSpecification)

Table 3.418. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean

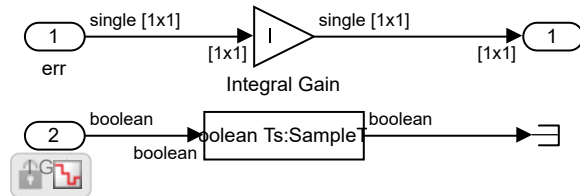| Parameter	Value
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Internal Ts

Figure 3.117. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Differentiator/Tsamp/Internal Ts
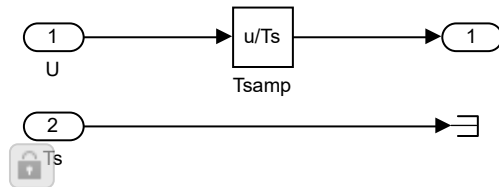
Internal Ts

Figure 3.118. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Disc. Backward Euler Filter/Tsamp/Internal Ts
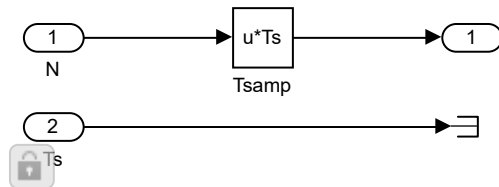
Internal Ts

Figure 3.119. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Disc. Trapezoidal Filter/Tsamp/Internal Ts
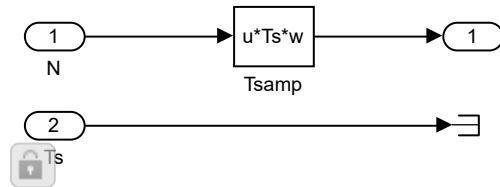
LED1_CurrentControl

Figure 3.120. Closed_Loop_LEDControllers/LED1_CurrentControl
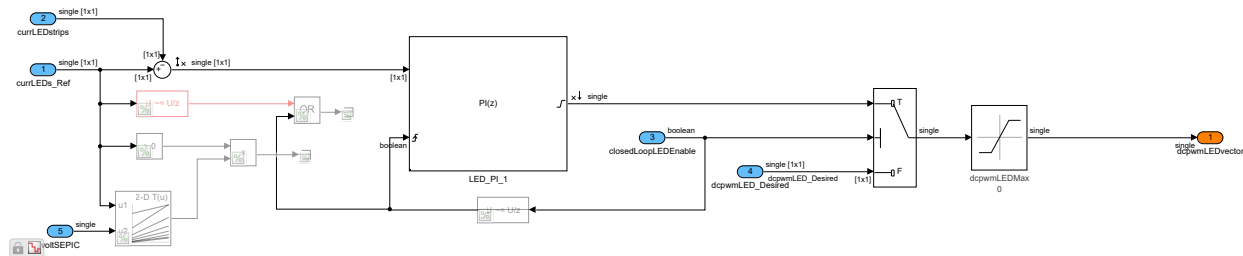
Blocks

Parameters

"closedLoopLEDEnable" (Inport)

Table 3.419. "closedLoopLEDEnable" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	boolean

"currLEDs_Ref" (Inport)

Table 3.420. "currLEDs_Ref" Parameters

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

"currLEDstrips" (Inport)

Table 3.421. "currLEDstrips" Parameters

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

"dcpwmLED_Desired" (Inport)

Table 3.422. "dcpwmLED_Desired" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	[1 1]
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	single

"dcpwmLEDvector" (Outport)

Table 3.423. "dcpwmLEDvector" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
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
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	off

"LED_PI_1" (SubSystem)

Table 3.424. "LED_PI_1" Parameters

Parameter	Value
SimulinkmasksController_MP	PI
SimulinkmasksForm_MP	Parallel
SimulinkmasksTimeDomain_MP	Discrete-time
SimulinkmasksPIDBlockInTriggeredSubsystem_MP	off
SimulinkmasksSampleTime1ForInherited_MP	-1

Parameter	Value
SimulinkmasksIntegratorMethod_MP	Forward Euler
SimulinkmasksSource_MP	internal
SimulinkmasksProportionalP_MP	PGain
SimulinkmasksIntegralI_MP	IGain
SimulinkmasksUseITs_MP	off
SimulinkmasksPIDAutoTuningMethodSelect_MP	Transfer Function Based (PID Tuner App)
SimulinkmasksEnableZerocrossingDetection_MP	on
SimulinkmasksSource_MP	internal
SimulinkmasksIntegrator_MP	0
SimulinkmasksExternalReset_MP	rising
SimulinkmasksIgnoreResetWhenLinearizing_MP	off
SimulinkmasksEnableTrackingMode_MP	off
SimulinkmasksTrackingCoefficientKt_MP	1
SimulinkmasksLimitOutput_MP	on
SimulinkmasksSource_MP	internal
SimulinkmasksUpperSaturationLimit_MP	1
SimulinkmasksLowerSaturationLimit_MP	0
SimulinkmasksIgnoreSaturationWhenLinearizing_MP	off
SimulinkmasksAntiwindupMethod_MP	clamping
Simulinkblkprm_promptsIntegratorLimitOutput	off
SimulinkmasksUpperSaturationLimit_MP	inf
SimulinkmasksLowerSaturationLimit_MP	-inf
SimulinkmasksIntegerRoundingMode_MP	Floor
SimulinkmasksSaturateOnIntegerOverflow_MP	off
SimulinkmasksLockDataTypeAgainstFxpTools_MP	off
SimulinkmasksPProductOutput_MP	Inherit: Inherit via internal rule
POutMin	[]
POutMax	[]
SimulinkmasksIProductOutput_MP	Inherit: Inherit via internal rule
IOutMin	[]
IOutMax	[]
SimulinkmasksSumOutput_MP	Inherit: Inherit via internal rule
SumOutMin	[]

Parameter	Value
SumOutMax	[]
SimulinkmasksSaturationOutput_MP	Inherit: Same as input
SaturationOutMin	[]
SaturationOutMax	[]
SimulinkmasksPParameter_MP	Inherit: Inherit via internal rule
PParamMin	[]
PParamMax	[]
SimulinkmasksIParameter_MP	Inherit: Inherit via internal rule
IParamMin	[]
IParamMax	[]
SimulinkmasksIntegratorOutput_MP	Inherit: Inherit via internal rule
IntegratorOutMin	[]
IntegratorOutMax	[]
SimulinkmasksAccumulatorOfSum_MP	Inherit: Inherit via internal rule
Clamping algorithm constant zero output	Inherit: Inherit via back propagation
ClampingZeroOutMin	[]
ClampingZeroOutMax	[]
SimulinkmasksStateNameMustResolveToSimulinkSignalObject_MP	off

"Saturation" (Saturate)

Table 3.425. "Saturation" Parameters

Parameter	Value
Upper limit	dcpwmLEDMax
Lower limit	0
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

Parameter	Value
Integer rounding mode	Floor

"Sum" (Sum)

Table 3.426. "Sum" Parameters

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

"Switch1" (Switch)

Table 3.427. "Switch1" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on

Parameter	Value
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"voltSEPIC" (Inport)

Table 3.428. "voltSEPIC" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	single

LED_PI_1

Figure 3.121. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1
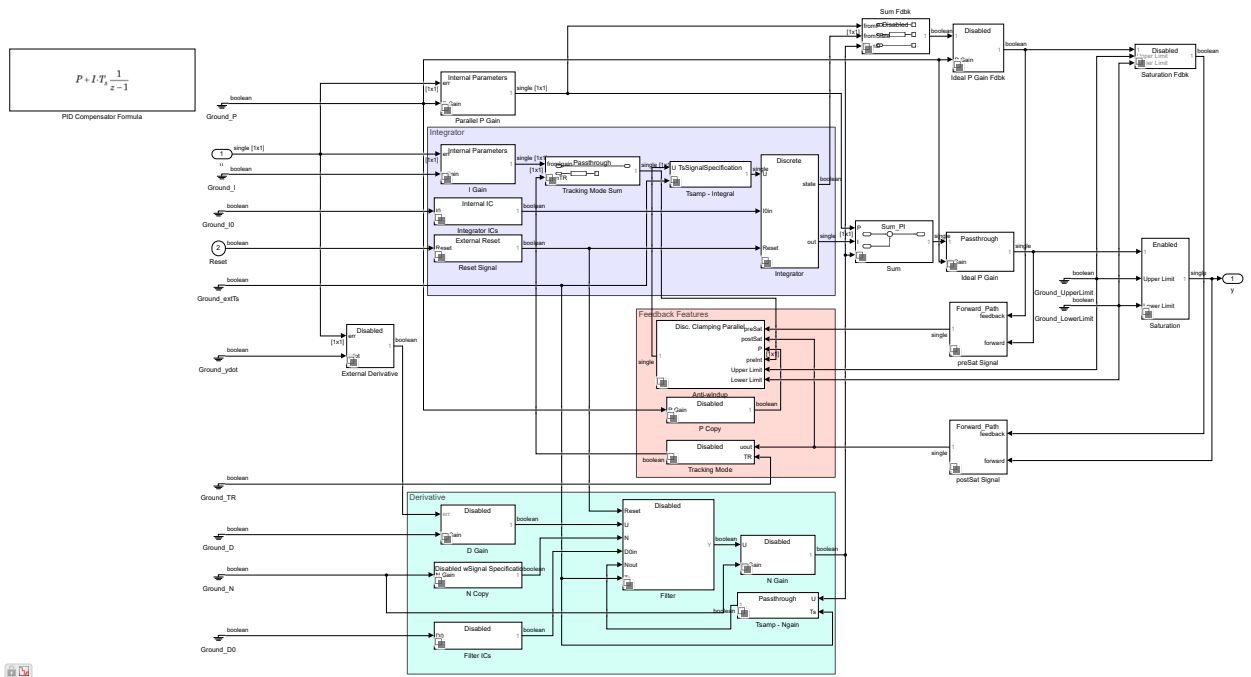
Blocks

Parameters

"Reset" (Inport)

Table 3.429. "Reset" Parameters

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

"u" (Inport)

Table 3.430. "u" Parameters

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

"y" (Outport)

Table 3.431. "y" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

N Copy

Figure 3.122. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/N Copy
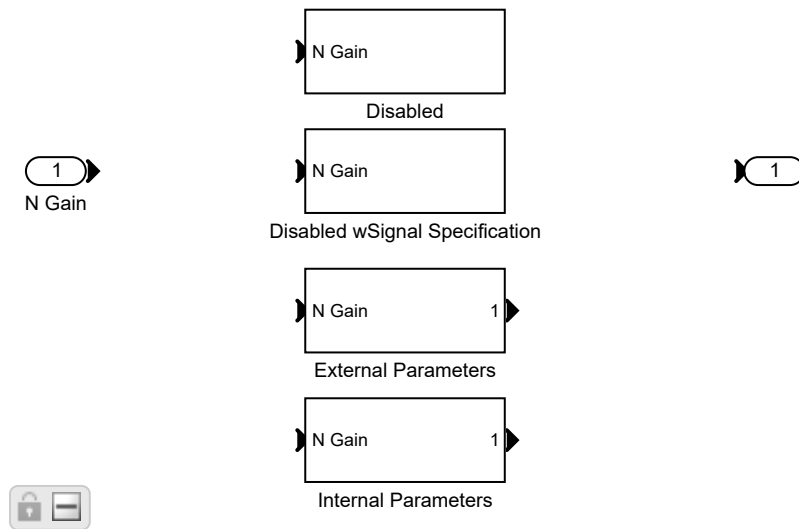
Blocks

Parameters

"N Gain" (Inport)

Table 3.432. "N Gain" Parameters

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

"Out1" (Outport)

Table 3.433. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]

Parameter	Value
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

N Gain

Figure 3.123. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/N Gain
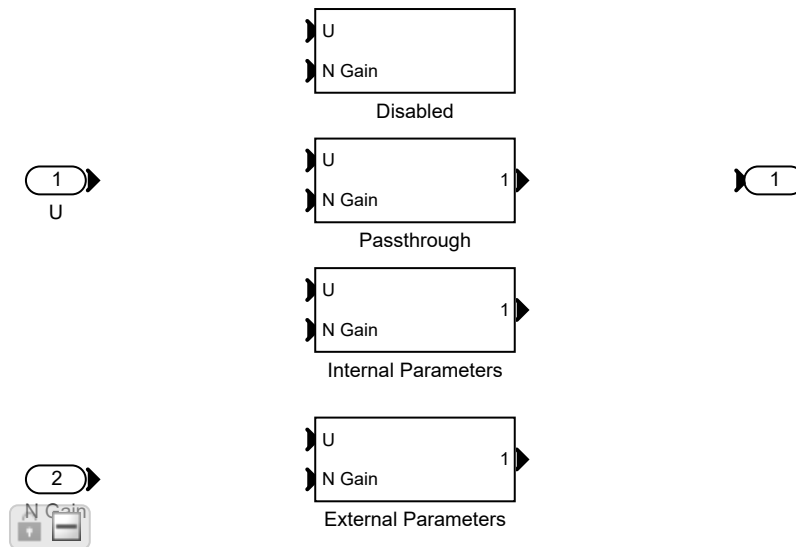
Blocks

Parameters

"N Gain" (Inport)

Table 3.434. "N Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.435. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"U" (Inport)

Table 3.436. "U" Parameters

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

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

P Copy

Figure 3.124. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/P Copy

Blocks

Parameters

"Out1" (Outport)

Table 3.437. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.438. "P Gain" Parameters

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

Parallel P Gain

Figure 3.125. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Parallel P Gain

Blocks

Parameters

"err" (Inport)

Table 3.439. "err" Parameters

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

"Out1" (Outport)

Table 3.440. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.441. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Passthrough

Figure 3.126. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Ideal P Gain/Passthrough
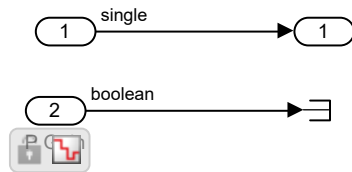
Blocks

Parameters

"In1" (Inport)

Table 3.442. "In1" Parameters

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

"Out1" (Outport)

Table 3.443. "Out1" Parameters

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

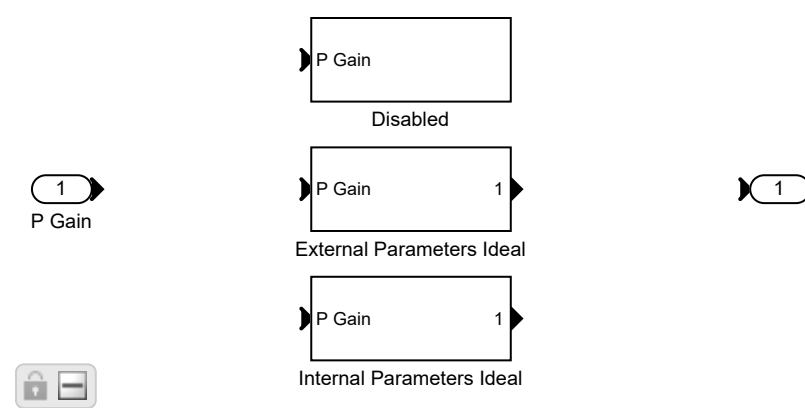| Parameter	Value
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P Gain" (Inport)

Table 3.444. "P Gain" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Passthrough

Figure 3.127. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Tracking Mode Sum/Passthrough

Blocks

Parameters

"fromIgain" (Inport)

Table 3.445. "fromIgain" Parameters

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

"fromTR" (Inport)

Table 3.446. "fromTR" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.447. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto

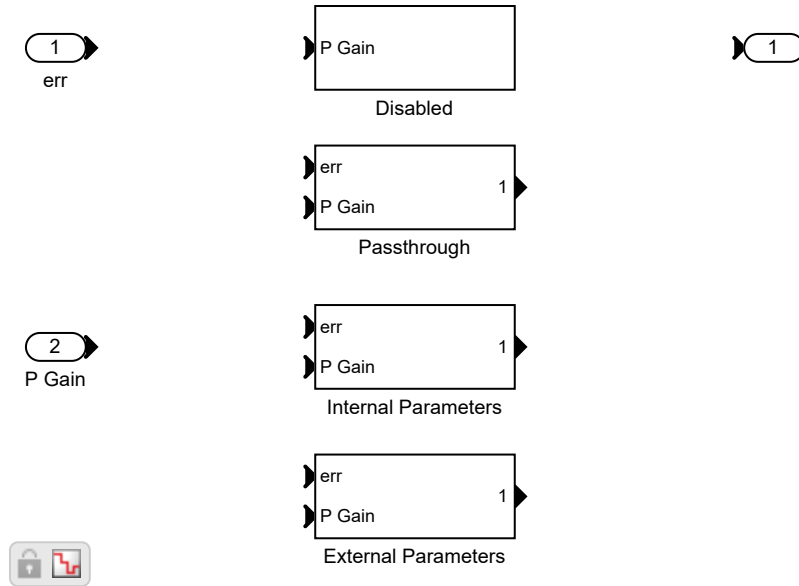| Parameter	Value
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.448. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

Passthrough

Figure 3.128. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Tsamp - Ngain/Passthrough

Blocks

Parameters

"Out1" (Outport)

Table 3.449. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off

Parameter	Value
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Ts" (Inport)

Table 3.450. "Ts" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.451. "U" Parameters

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

postSat Signal

Figure 3.129. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ postSat Signal
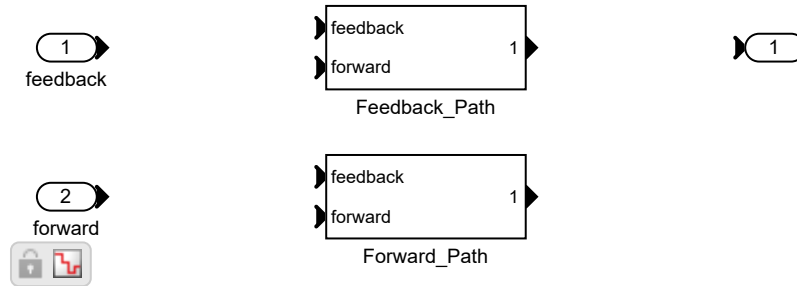
Blocks

Parameters

"feedback" (Inport)

Table 3.452. "feedback" Parameters

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

"forward" (Inport)

Table 3.453. "forward" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.454. "Out1" Parameters

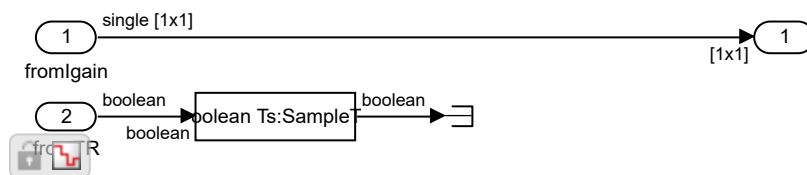| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

preSat Signal

Figure 3.130. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ preSat Signal
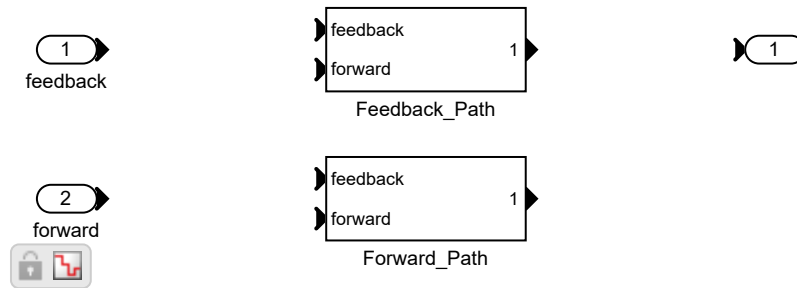
Blocks

Parameters

"feedback" (Inport)

Table 3.455. "feedback" Parameters

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

"forward" (Inport)

Table 3.456. "forward" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]

Parameter	Value
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.457. "Out1" Parameters

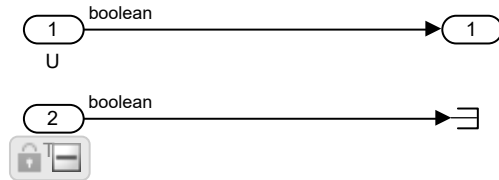| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Reset Signal

Figure 3.131. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Reset Signal
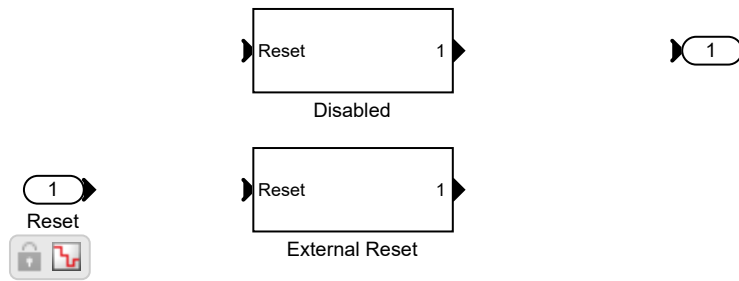
Blocks

Parameters

"Out1" (Outport)

Table 3.458. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held

Parameter	Value
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Reset" (Inport)

Table 3.459. "Reset" Parameters

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

Saturation

Figure 3.132. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Saturation

Blocks

Parameters

"In1" (Inport)

Table 3.460. "In1" Parameters

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

"Lower Limit" (Inport)

Table 3.461. "Lower Limit" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.462. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit

Parameter	Value
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Upper Limit" (Inport)

Table 3.463. "Upper Limit" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Saturation Dynamic

Figure 3.133. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Saturation Fdbk/External/Saturation Dynamic
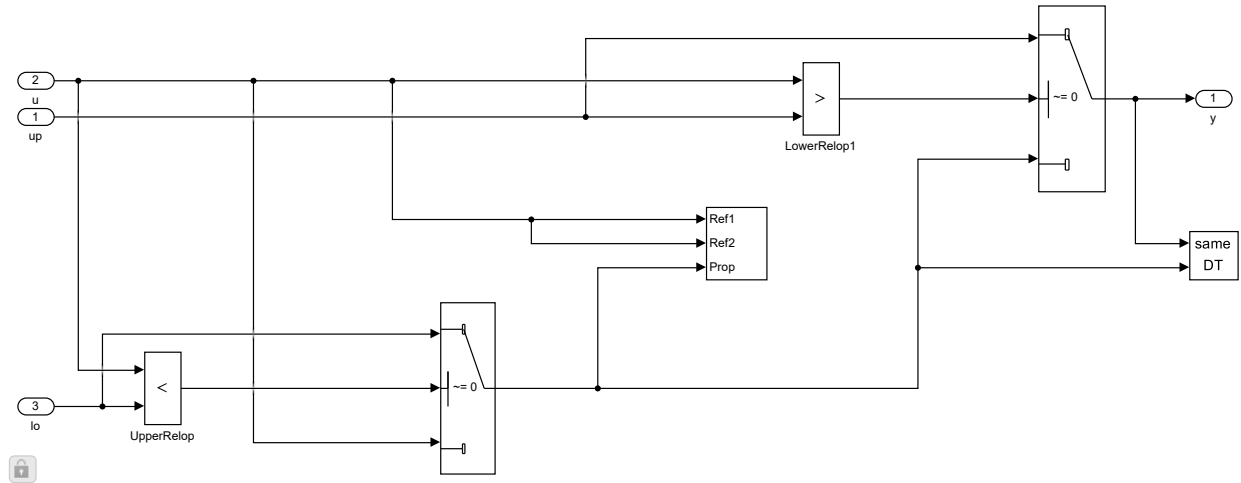
Saturation Fdbk

Figure 3.134. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Saturation Fdbk
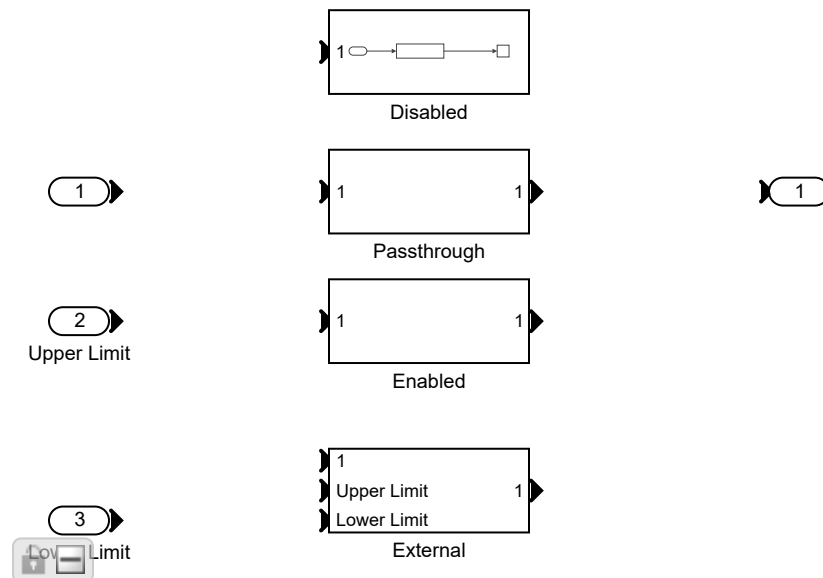
Blocks

Parameters

"In1" (Inport)

Table 3.464. "In1" Parameters

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

"Lower Limit" (Inport)

Table 3.465. "Lower Limit" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.466. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Upper Limit" (Inport)

Table 3.467. "Upper Limit" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Sum

Figure 3.135. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Sum

Blocks

Parameters

"D" (Inport)

Table 3.468. "D" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"I" (Inport)

Table 3.469. "I" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.470. "Out1" Parameters

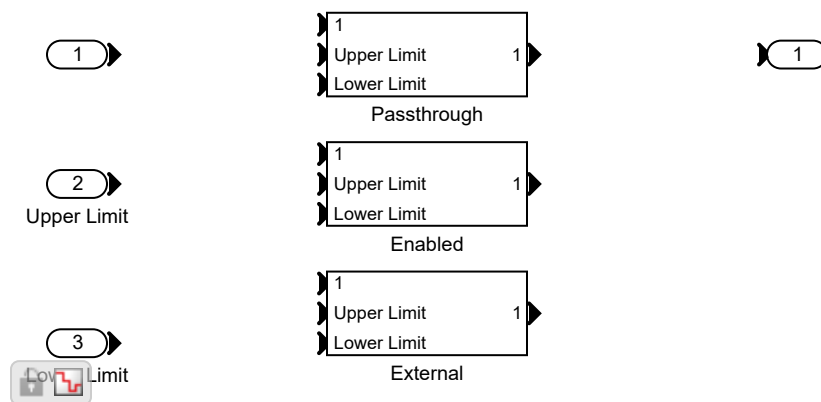| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P" (Inport)

Table 3.471. "P" Parameters

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

Sum Fdbk

Figure 3.136. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/Sum Fdbk
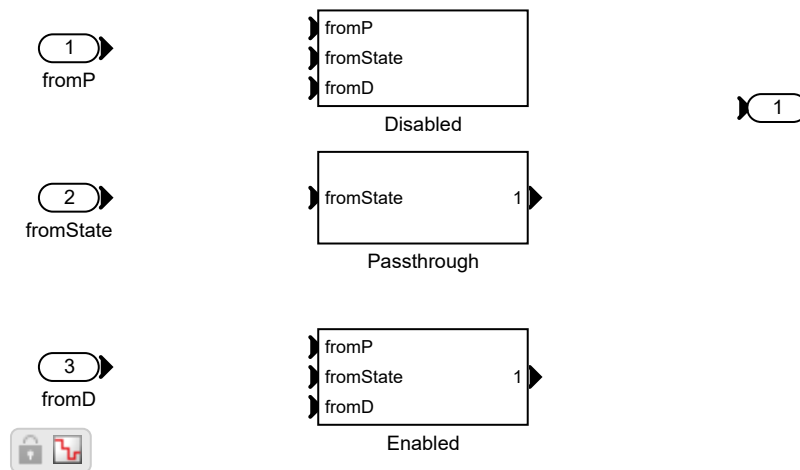
Blocks

Parameters

"fromD" (Inport)

Table 3.472. "fromD" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"fromP" (Inport)

Table 3.473. "fromP" Parameters

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

"fromState" (Inport)

Table 3.474. "fromState" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.475. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Sum_PI

Figure 3.137. Closed_Loop_LEDControllers/LED1_CurrentControl/ LED_PI_1/Sum/Sum_PI
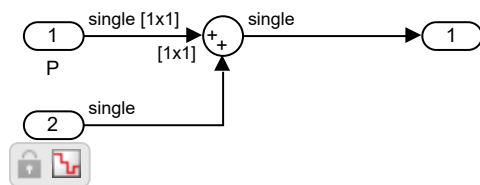
Blocks

Parameters

"I" (Inport)

Table 3.476. "I" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Out1" (Outport)

Table 3.477. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]

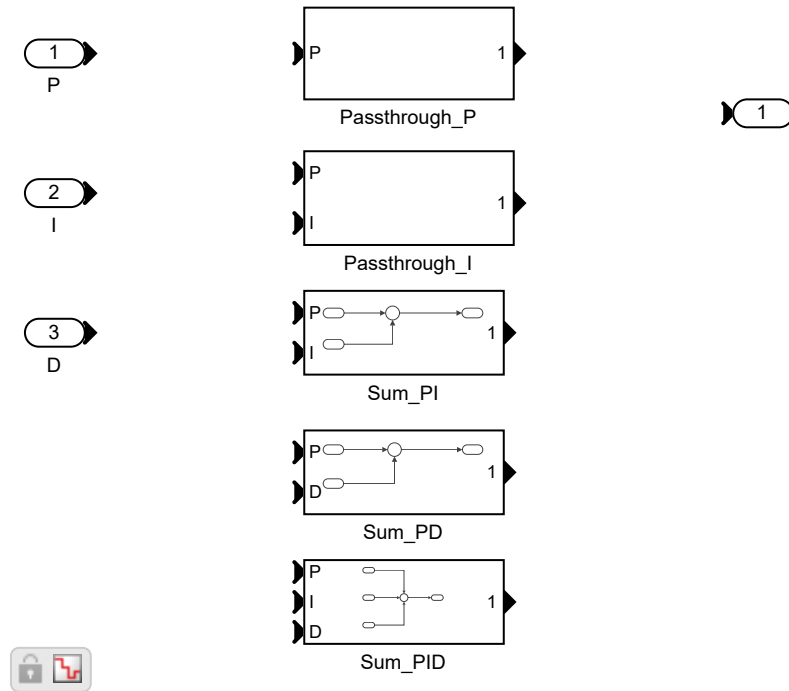| Parameter	Value
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"P" (Inport)

Table 3.478. "P" Parameters

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

"Sum" (Sum)

Table 3.479. "Sum" Parameters

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

Tracking Mode

**Figure 3.138. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/
Tracking Mode**
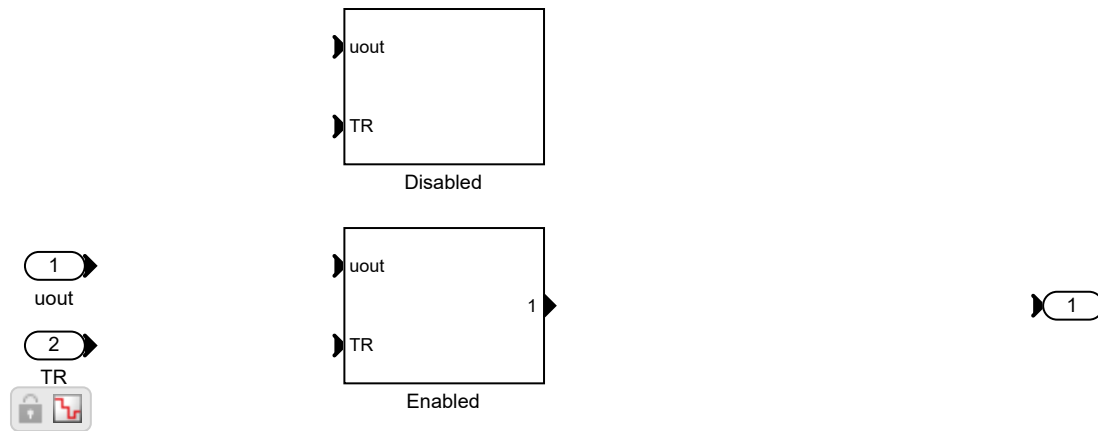
Blocks

Parameters

"Out1" (Outport)

Table 3.480. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"TR" (Inport)

Table 3.481. "TR" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"uout" (Inport)

Table 3.482. "uout" Parameters

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

Tracking Mode Sum

Figure 3.139. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Tracking Mode Sum
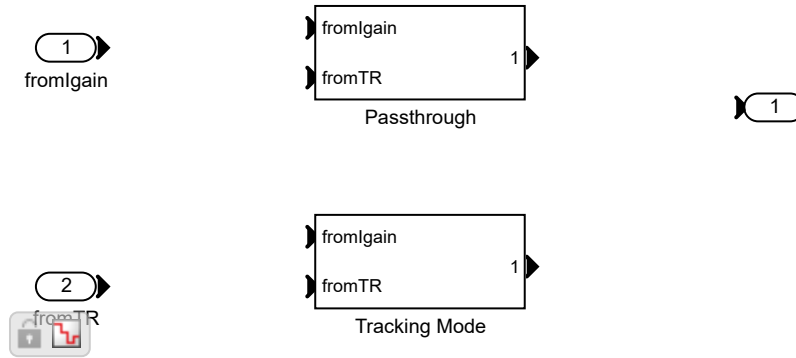
Blocks

Parameters

"fromIgain" (Inport)

Table 3.483. "fromIgain" Parameters

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

"fromTR" (Inport)

Table 3.484. "fromTR" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime

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

"Out1" (Outport)

Table 3.485. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Tsamp

Figure 3.140. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Differentiator/Tsamp
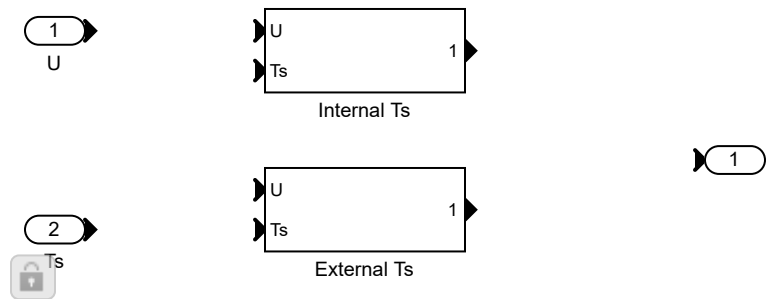
Tsamp

Figure 3.141. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Disc. Backward Euler Filter Only/Tsamp
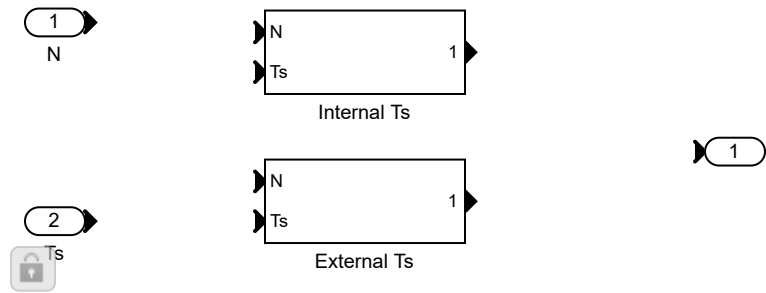
Tsamp

Figure 3.142. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Disc. Backward Euler Filter/Tsamp
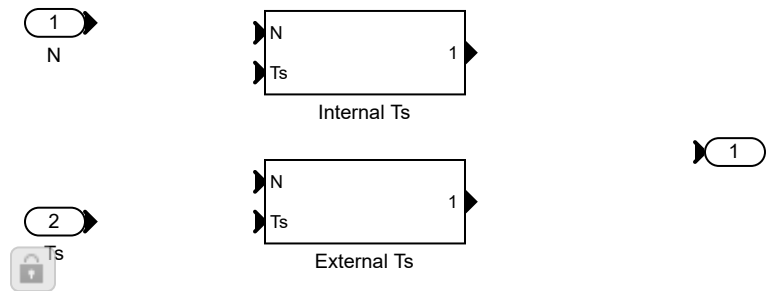
Tsamp

Figure 3.143. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Disc. Trapezoidal Filter Only/Tsamp
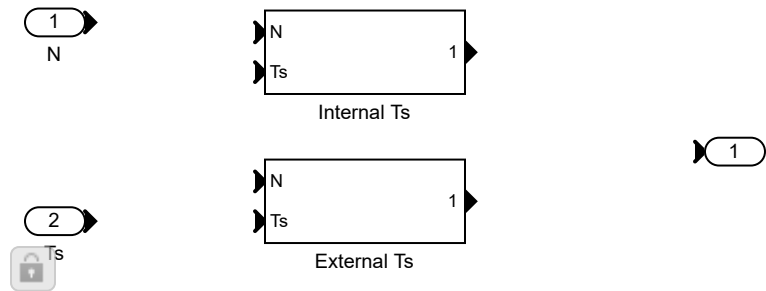
Tsamp

Figure 3.144. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Filter/Disc. Trapezoidal Filter/Tsamp
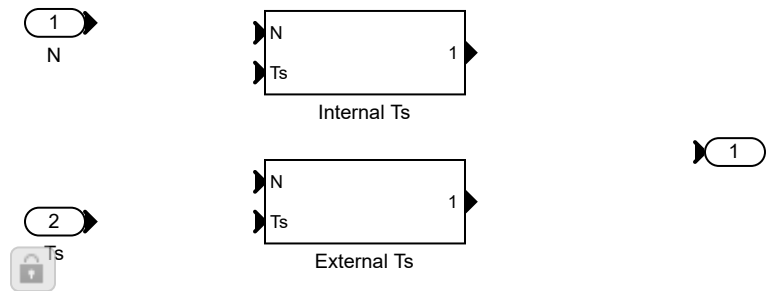
Tsamp - Integral

Figure 3.145. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Tsamp - Integral
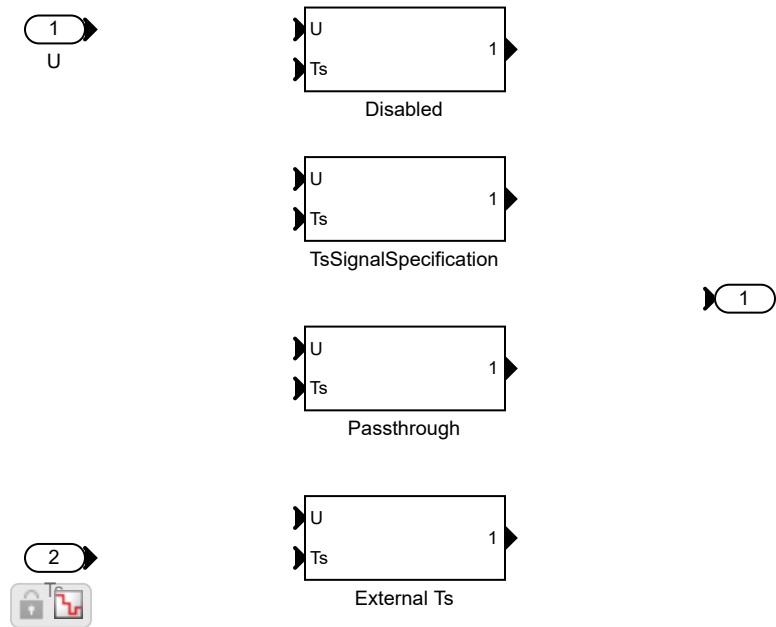
Blocks

Parameters

"Out1" (Outport)

Table 3.486. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Ts" (Inport)

Table 3.487. "Ts" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.488. "U" Parameters

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

Tsamp - Ngain

Figure 3.146. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Tsamp - Ngain
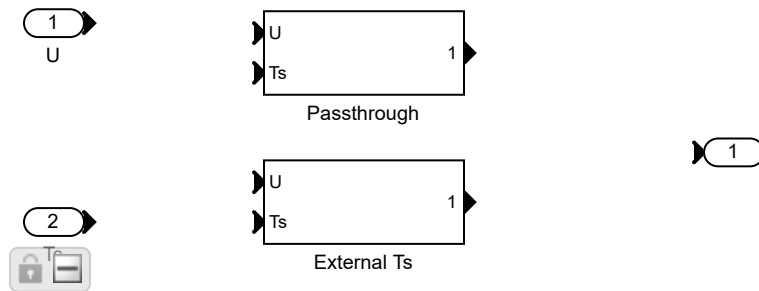
Blocks

Parameters

"Out1" (Outport)

Table 3.489. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]

Parameter	Value
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Ts" (Inport)

Table 3.490. "Ts" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.491. "U" Parameters

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

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

TsSignalSpecification

Figure 3.147. Closed_Loop_LEDControllers/LED1_CurrentControl/LED_PI_1/ Tsamp - Integral/TsSignalSpecification
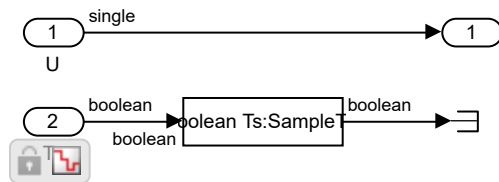
Blocks

Parameters

"Out1" (Outport)

Table 3.492. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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)	SampleTime
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Signal Specification" (SignalSpecification)

Table 3.493. "Signal Specification" Parameters

Parameter	Value
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Require nonvirtual bus	off
Unit (e.g., m, m/s^2, N*m)	inherit
Dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	SampleTime

"Ts" (Inport)

Table 3.494. "Ts" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	SampleTime
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"U" (Inport)

Table 3.495. "U" Parameters

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

Load_Current_Limits

Checksum: 1490960355 184315977 362951436 1833958423

Figure 3.148. Load_Current_Limits
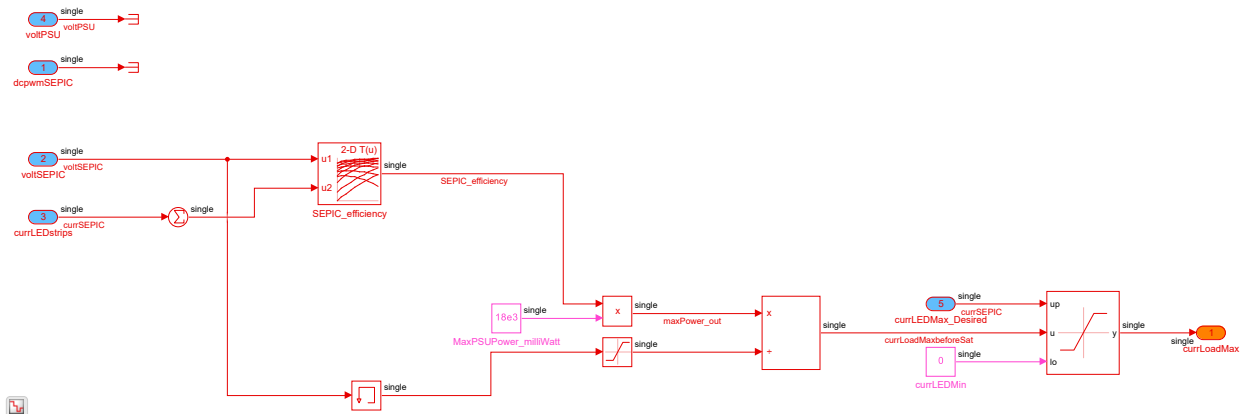
Interface

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 3.496. Input Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Load_Current_Limits/dcpwmSEPIC		single	1	1x1
currSEPIC	Load_Current_Limits/currLEDMax_Desired		single	1	1x1
currSEPIC	Load_Current_Limits/currLEDstrips		single	6	1x6
voltPSU	Load_Current_Limits/voltPSU		single	1	1x1
voltSEPIC	Load_Current_Limits/voltSEPIC		single	1	1x1

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 3.497. Output Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Load_Current_Limits/Saturation Dynamic		single	1	1x1

Blocks

Parameters

"currLEDMax_Desired" (Inport)

Table 3.498. "currLEDMax_Desired" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel

Parameter	Value
Minimum	[]
Maximum	[]
Data type	single

"currLEDMin" (Constant)

Table 3.499. "currLEDMin" Parameters

Parameter	Value
Constant value	0
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	single
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"currLEDstrips" (Inport)

Table 3.500. "currLEDstrips" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	6
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"currLoadMax" (Outport)

Table 3.501. "currLoadMax" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off

Parameter	Value
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	mA
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"dcpwmSEPIC" (Inport)

Table 3.502. "dcpwmSEPIC" Parameters

Parameter	Value
Port number	1
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"Divide" (Product)

Table 3.503. "Divide" Parameters

Parameter	Value
Number of inputs	*/
Multiplication	Element-wise(.*)
Apply over	All dimensions
Dimension	1
Require all inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

"MaxPSUPower_milliWatt" (Constant)

Table 3.504. "MaxPSUPower_milliWatt" Parameters

Parameter	Value
Constant value	18e3
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	single
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"Memory2" (Memory)

Table 3.505. "Memory2" Parameters

Parameter	Value
Initial condition	0

Parameter	Value
Inherit sample time	off
Direct feedthrough of input during linearization	off
Treat as a unit delay when linearizing with discrete sample time	off
State name must resolve to Simulink signal object	off

"Product" (Product)

Table 3.506. "Product" Parameters

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

"Saturation" (Saturate)

Table 3.507. "Saturation" Parameters

Parameter	Value
Upper limit	50
Lower limit	1e-3
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

Parameter	Value
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor

"Saturation Dynamic" (SubSystem)

Table 3.508. "Saturation Dynamic" Parameters

Parameter	Value
SimulinkmasksOutputMinimum_MP	[]
SimulinkmasksOutputMaximum_MP	[]
SimulinkmasksOutputDataType_MP	Inherit: Same as second input
SimulinkmasksLockOutputDataTypeAgainstFxpTools_MP	off
SimulinkmasksIntegerRoundingMode_MP	Floor
SimulinkmasksSaturateOnIntegerOverflow_MP	off

"SEPIC_efficiency" (Lookup_n-D)

Table 3.509. "SEPIC_efficiency" Parameters

Parameter	Value
Number of table dimensions	2
Data specification	Table and breakpoints
Breakpoints specification	Explicit values
Breakpoints for dimension 1 source	Dialog
Breakpoints for dimension 1	Voltage_Test_Vector
Breakpoints for dimension 2 source	Dialog
Breakpoints for dimension 2	Curr_Test_Load
Breakpoints First Point for dimension 1	1
Breakpoints First Point for dimension 2	1
Breakpoints Spacing for dimension 1	1
Breakpoints Spacing for dimension 2	1
Breakpoints minimum for dimension 1	[]
Breakpoints minimum for dimension 2	[]
Breakpoints maximum for dimension 1	[]
Breakpoints maximum for dimension 2	[]
Breakpoints data type for dimension 1	Inherit: Same as corresponding input

Parameter	Value
Breakpoints data type for dimension 2	Inherit: Same as corresponding input
Index search method	Binary search
Begin index search using previous index result	off
Use one input port for all inputs (u)	off
Table data source	Dialog
Table data	effMatrix'
Table minimum	[]
Table maximum	[]
Table data type	Inherit: Same as output
Intermediate results data type	Inherit: Same as output
Interpolation method	Linear point-slope
Extrapolation method	Clip
Diagnostic for out-of-range input	None
Remove protection against out-of-range input in generated code	off
Use last table value for inputs at or above last breakpoint	on
Apply full precision fixed-point algorithm when possible	off
Sample time (-1 for inherited)	-1
Internal rule priority	Speed
Require all inputs (u) to have the same data type	on
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	Simplest
Saturate on integer overflow	off
Fraction data type	Inherit: Inherit via internal rule
Support tunable table size in code generation	off
Maximum indices for each dimension	[]

Figure 3.149. SEPIC_efficiency
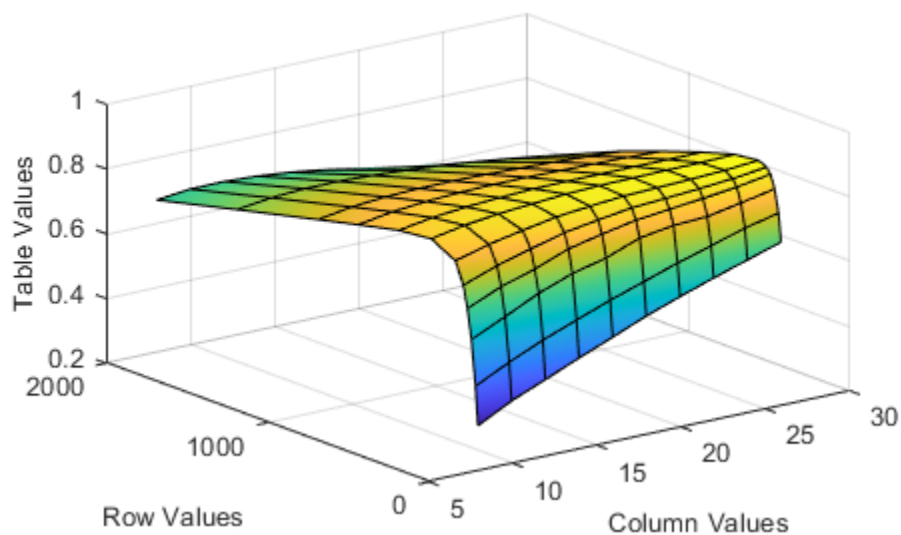
Table 3.510. SEPIC_efficiency (:,:)

	10	25	50	75	100	150	300	500	750	1000	1500	2000
8	0.3376	0.4572	0.5967	0.6879	0.7554	0.8217	0.8622	0.8516	0.8229	0.7930	0.7322	0.6703
10	0.3922	0.5087	0.6447	0.7327	0.7931	0.8498	0.8812	0.8682	0.8402	0.8095	0.7461	0.6812
12	0.4351	0.5545	0.6947	0.7647	0.8224	0.8704	0.8940	0.8786	0.8494	0.8182	0.7518	0.6821
14	0.4796	0.5940	0.7331	0.8045	0.8501	0.8894	0.9023	0.8849	0.8549	0.8216	0.7518	0.6764
16	0.5212	0.6326	0.7588	0.8278	0.8668	0.9000	0.9098	0.8896	0.8571	0.8222	0.7478	0.6658
18	0.5644	0.6674	0.7981	0.8481	0.8817	0.9089	0.9139	0.8906	0.8567	0.8203	0.7412	0.6509
20	0.6016	0.7029	0.8140	0.8592	0.8884	0.9124	0.9148	0.8907	0.8553	0.8169	0.7327	0.6314
22	0.6366	0.7334	0.8189	0.8704	0.8957	0.9159	0.9166	0.8908	0.8533	0.8132	0.7217	0.6069
24	0.6698	0.7658	0.8385	0.8829	0.9045	0.9209	0.9169	0.8902	0.8513	0.8078	0.7089	0.5755
26	0.7025	0.7892	0.8592	0.9004	0.9174	0.9292	0.9199	0.8903	0.8473	0.8013	0.6942	0.5320

"Sum" (Sum)

Table 3.511. "Sum" Parameters

Parameter	Value
Icon shape	round
List of signs	+
Apply over	All dimensions
Dimension	1

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

"voltPSU" (Inport)

Table 3.512. "voltPSU" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"voltSEPIC" (Inport)

Table 3.513. "voltSEPIC" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

Block Execution Order

1. MaxPSUPower_milliWatt (Constant)
2. currLEDMin (Constant)

Saturation Dynamic

Figure 3.150. Load_Current_Limits/Saturation Dynamic
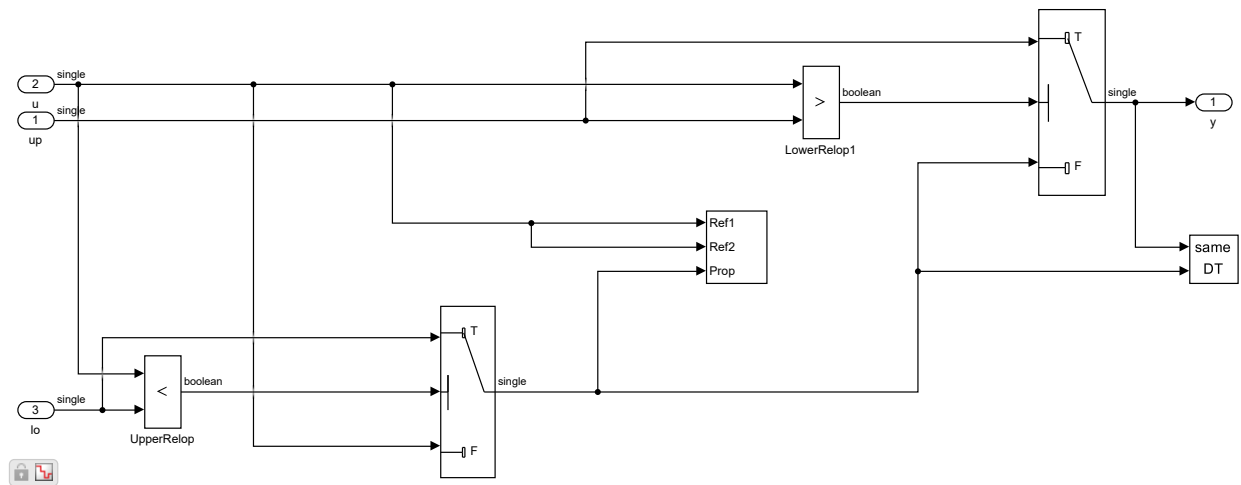
Blocks

Parameters

"Data Type Duplicate" (DataTypeDuplicate)

Table 3.514. "Data Type Duplicate" Parameters

Parameter	Value
Number of input ports	2

"Data Type Propagation" (S-Function)

Table 3.515. "Data Type Propagation" Parameters

Parameter	Value
Simulinkmasksx1PropagatedDataType_MP	Inherit via propagation rule
Simulinkmasksx11IfAnyReferenceInputIsDoubleOutputIs_MP	double
Simulinkmasksx12IfAnyReferenceInputIsSingleOutputIs_MP	single
Simulinkmasksx13IsSigned_MP	IsSigned1
Simulinkmasksx141NumberofBitsBase_MP	NumBits1
Simulinkmasksx142NumberofBitsMultiplicativeAdjustment_MP	1
Simulinkmasksx143NumberofBitsAdditiveAdjustment_MP	0
Simulinkmasksx144NumberofBitsAllowableFinalValues_MP	1:128
Simulinkmasksx2PropagatedScaling_MP	Inherit via propagation rule
Simulinkmasksx211SlopeBase_MP	Slope1
Simulinkmasksx212SlopeMultiplicativeAdjustment_MP	1
Simulinkmasksx213SlopeAdditiveAdjustment_MP	0
Simulinkmasksx221BiasBase_MP	Bias1
Simulinkmasksx222BiasMultiplicativeAdjustment_MP	1
Simulinkmasksx223BiasAdditiveAdjustment_MP	0

"lo" (Inport)

Table 3.516. "lo" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"LowerRelop1" (RelationalOperator)

Table 3.517. "LowerRelop1" Parameters

Parameter	Value
Relational operator	>

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

"Switch" (Switch)

Table 3.518. "Switch" Parameters

Parameter	Value
Criteria for passing first input	u2 ~= 0
Threshold	0
Require all data port inputs to have the same data type	off
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
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	off
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"Switch2" (Switch)

Table 3.519. "Switch2" Parameters

Parameter	Value
Criteria for passing first input	u2 ~= 0
Threshold	0
Require all data port inputs to have the same data type	off
Output minimum	OutMin
Output maximum	OutMax
Output data type	Inherit: Inherit via back propagation

Parameter	Value
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	off
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"u" (Inport)

Table 3.520. "u" Parameters

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

"up" (Inport)

Table 3.521. "up" Parameters

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

"UpperRelop" (RelationalOperator)

Table 3.522. "UpperRelop" Parameters

Parameter	Value
Relational operator	<
Require all inputs to have the same data type	off

Parameter	Value
Output data type	boolean
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1
Integer rounding mode	Nearest

"y" (Outport)

Table 3.523. "y" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	OutMin
Maximum	OutMax
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
Bus virtuality	inherit
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Supervisory_Logic

Checksum: 1376513457 3856009661 2514755584 891682540

Figure 3.151. Supervisory_Logic
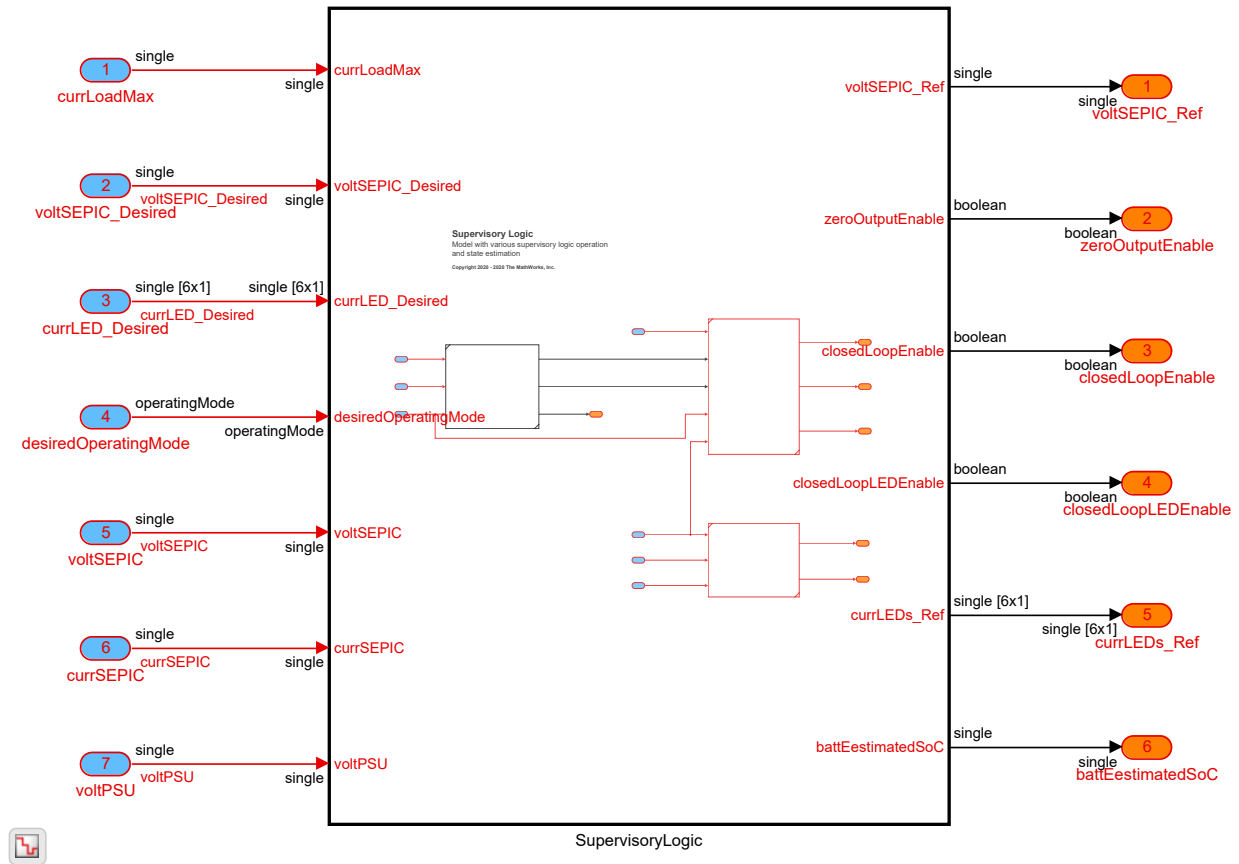
SupervisoryLogic

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 3.524. Input Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Supervisory_Logic/currLoadMax		single	1	1x1
	Supervisory_Logic/desiredOperatingMode		operatingMode	1	1x1

Signal Name	Block	Description	Data Type	Width	Dimensions
currLED_Desired	Supervisory_Logic/currLED_Desired		single	6	6x1
currSEPIC	Supervisory_Logic/currSEPIC		single	1	1x1
voltPSU	Supervisory_Logic/voltPSU		single	1	1x1
voltSEPIC	Supervisory_Logic/voltSEPIC		single	1	1x1
voltSEPIC_Desired	Supervisory_Logic/voltSEPIC_Desired		single	1	1x1

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 3.525. Output Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Supervisory_Logic/SupervisoryLogic		single	1	1x1
	Supervisory_Logic/SupervisoryLogic		boolean	1	1x1
	Supervisory_Logic/SupervisoryLogic		boolean	1	1x1
	Supervisory_Logic/SupervisoryLogic		single	6	6x1
	Supervisory_Logic/SupervisoryLogic		single	1	1x1
	Supervisory_Logic/SupervisoryLogic		boolean	1	1x1

Blocks

Parameters

"battEestimatedSoC" (Outport)

Table 3.526. "battEestimatedSoC" Parameters

Parameter	Value
Port number	6
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
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)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"closedLoopEnable" (Outport)

Table 3.527. "closedLoopEnable" Parameters

Parameter	Value
Port number	3
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]

Parameter	Value
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"closedLoopLEDEnable" (Outport)

Table 3.528. "closedLoopLEDEnable" Parameters

Parameter	Value
Port number	4
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit

Parameter	Value
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"currLED_Desired" (Inport)

Table 3.529. "currLED_Desired" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	[6 1]
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"currLEDs_Ref" (Outport)

Table 3.530. "currLEDs_Ref" Parameters

Parameter	Value
Port number	5
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit

Parameter	Value
Unit (e.g., m, m/s^2, N*m)	mA
Port dimensions (-1 for inherited)	[6 1]
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"currLoadMax" (Inport)

Table 3.531. "currLoadMax" Parameters

Parameter	Value
Port number	1
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"currSEPIC" (Inport)

Table 3.532. "currSEPIC" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"desiredOperatingMode" (Inport)

Table 3.533. "desiredOperatingMode" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	Enum:operatingMode

"voltPSU" (Inport)

Table 3.534. "voltPSU" Parameters

Parameter	Value
Port number	7
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"voltSEPIC" (Inport)

Table 3.535. "voltSEPIC" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"voltSEPIC_Desired" (Inport)

Table 3.536. "voltSEPIC_Desired" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"voltSEPIC_Ref" (Outport)

Table 3.537. "voltSEPIC_Ref" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	V
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0

Parameter	Value
Interpret vector parameters as 1-D	on

"zeroOutputEnable" (Outport)

Table 3.538. "zeroOutputEnable" Parameters

Parameter	Value
Port number	2
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Block Execution Order

1. *SupervisoryLogic*
    1. *BatterySoCEstimation*
        1. Constant (Constant)
        2. Unit Delay (UnitDelay)
        3. *BatteryFault*
            1. SFunction (S-Function)

SupervisoryLogic

Checksum: 2746552794 693046307 1981534933 3169024031

Figure 3.152. Supervisory_Logic/SupervisoryLogic

Supervisory Logic
Model with various supervisory logic operation
and state estimation

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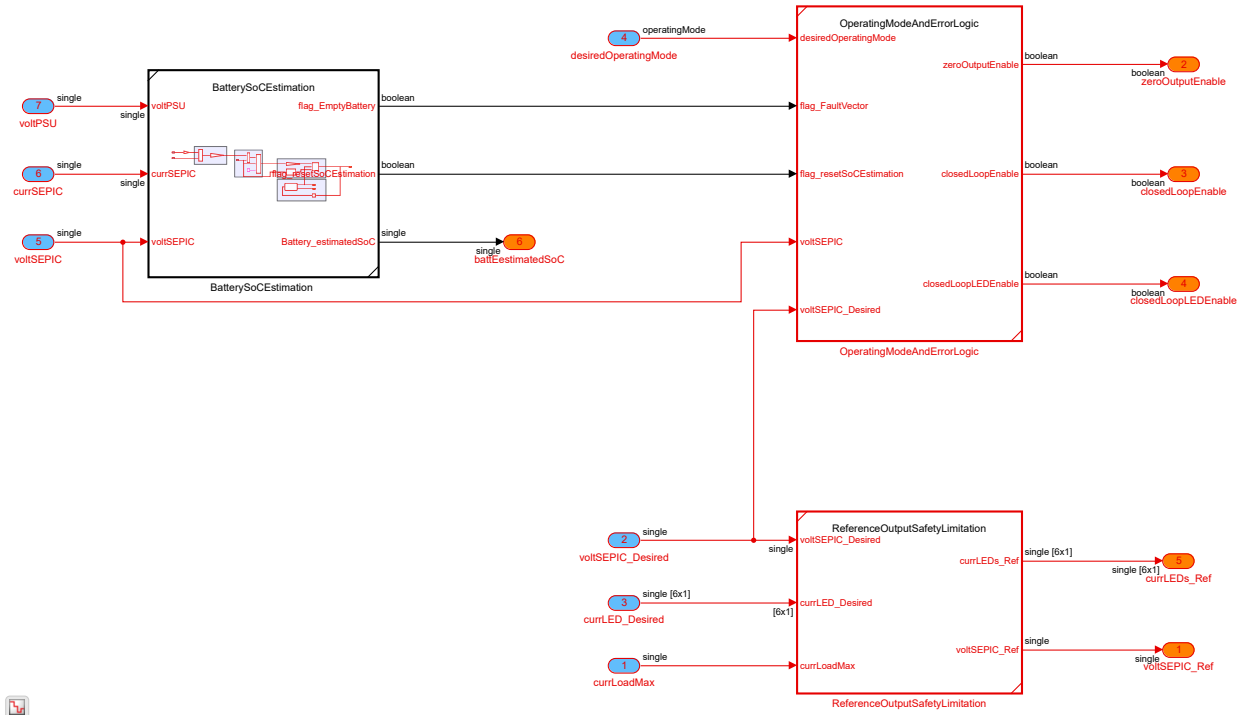
Interface

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 3.539. Input Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Supervisory_Logic/SupervisoryLogic/currLED_Desired		single	6	6x1

Signal Name	Block	Description	Data Type	Width	Dimensions
	Supervisory_Logic/SupervisoryLogic/currLoadMax		single	1	1x1
	Supervisory_Logic/SupervisoryLogic/currSEPIC		single	1	1x1
	Supervisory_Logic/SupervisoryLogic/desiredOperatingMode		operatingMode	1	1x1
	Supervisory_Logic/SupervisoryLogic/voltPSU		single	1	1x1
	Supervisory_Logic/SupervisoryLogic/voltSEPIC		single	1	1x1
	Supervisory_Logic/SupervisoryLogic/voltSEPIC_Desired		single	1	1x1

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 3.540. Output Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	Supervisory_Logic/SupervisoryLogic/BatterySoCEstimation		single	1	1x1
	Supervisory_Logic/SupervisoryLogic/OperatingModeAndErrorLogic		boolean	1	1x1

Signal Name	Block	Description	Data Type	Width	Dimensions
	Supervisory_Logic/SupervisoryLogic/OperatingModeAndErrorLogic		boolean	1	1x1
	Supervisory_Logic/SupervisoryLogic/ReferenceOutputSafetyLimitation		single	6	6x1
	Supervisory_Logic/SupervisoryLogic/ReferenceOutputSafetyLimitation		single	1	1x1
	Supervisory_Logic/SupervisoryLogic/OperatingModeAndErrorLogic		boolean	1	1x1

Blocks

Parameters

"battEestimatedSoC" (Outport)

Table 3.541. "battEestimatedSoC" Parameters

Parameter	Value
Port number	6
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit

Parameter	Value
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"closedLoopEnable" (Outport)

Table 3.542. "closedLoopEnable" Parameters

Parameter	Value
Port number	3
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off

Parameter	Value
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"closedLoopLEDEnable" (Outport)

Table 3.543. "closedLoopLEDEnable" Parameters

Parameter	Value
Port number	4
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"currLED_Desired" (Inport)

Table 3.544. "currLED_Desired" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	[6 1]
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"currLEDs_Ref" (Outport)

Table 3.545. "currLEDs_Ref" Parameters

Parameter	Value
Port number	5
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	mA
Port dimensions (-1 for inherited)	[6 1]
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0

Parameter	Value
Interpret vector parameters as 1-D	on

"currLoadMax" (Inport)

Table 3.546. "currLoadMax" Parameters

Parameter	Value
Port number	1
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"currSEPIC" (Inport)

Table 3.547. "currSEPIC" Parameters

Parameter	Value
Port number	6
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"desiredOperatingMode" (Inport)

Table 3.548. "desiredOperatingMode" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	Enum: operatingMode

"voltPSU" (Inport)

Table 3.549. "voltPSU" Parameters

Parameter	Value
Port number	7
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"voltSEPIC" (Inport)

Table 3.550. "voltSEPIC" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"voltSEPIC_Desired" (Inport)

Table 3.551. "voltSEPIC_Desired" Parameters

Parameter	Value
Port number	2
Port dimensions (-1 for inherited)	1
Sample time (-1 for inherited)	TsModel
Minimum	[]
Maximum	[]
Data type	single

"voltSEPIC_Ref" (Outport)

Table 3.552. "voltSEPIC_Ref" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	V
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"zeroOutputEnable" (Outport)

Table 3.553. "zeroOutputEnable" Parameters

Parameter	Value
Port number	2
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]

Parameter	Value
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	TsModel
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Block Execution Order

1. *BatterySoCEstimation*
    1. Constant (Constant)
    2. Unit Delay (UnitDelay)
    3. *BatteryFault*
        1. SFunction (S-Function)
    4. *TmpAtomicSubsysAtBattery_electricCurrentInport1*
        1. unit_mAtoA (Gain)
        2. SEPIC_loadPower (Product)
        3. Battery_neededPower (Gain)
        4. Divide (Product)
    5. Battery_electricCurrent (Switch)
    6. Battery_socChanges (Gain)
    7. OpenCircuit_SoC (Lookup_n-D)
    8. Discrete-Time Integrator (DiscreteIntegrator)
2. *OperatingModeAndErrorLogic*
    1. Constant (Constant)
    2. Add (Sum)
    3. Sum (Sum)
    4. Compare (RelationalOperator)
    5. Delay Input1 (UnitDelay)
    6. FixPt Relational Operator (RelationalOperator)

BatterySoCEstimation

Checksum: Could not compute checksum for "BatterySoCEstimation" (possibly because model could not be compiled).

Figure 3.153. BatterySoCEstimation
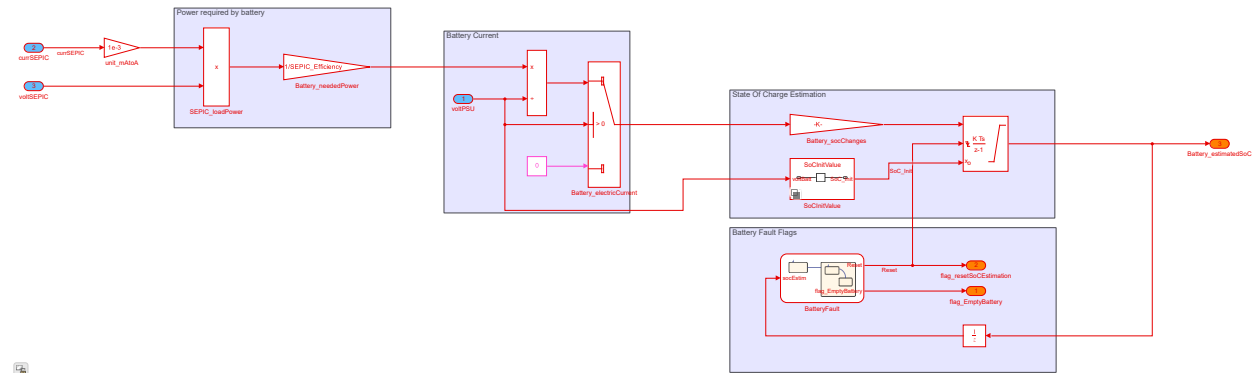
Interface

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 3.554. Input Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	BatterySoCEstimation/voltPSU			0	
	BatterySoCEstimation/voltSEPIC			0	
currSEPIC	BatterySoCEstimation/currSEPIC			0	

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 3.555. Output Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	BatterySoCEstimation/Discrete-Time Integrator			0	
	BatterySoCEstimation/Battery Fault			0	
Reset	BatterySoCEstimation/Battery Fault			0	

Blocks

Parameters

"Battery_electricCurrent" (Switch)

Table 3.556. "Battery_electricCurrent" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0

Parameter	Value
Require all data port inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"Battery_estimatedSoC" (Outport)

Table 3.557. "Battery_estimatedSoC" Parameters

Parameter	Value
Port number	3
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off

Parameter	Value
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	off

"Battery_neededPower" (Gain)

Table 3.558. "Battery_neededPower" Parameters

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

"Battery_socChanges" (Gain)

Table 3.559. "Battery_socChanges" Parameters

Parameter	Value
Gain	-1/Batt_MaxCoulomb
Multiplication	Element-wise(K.*u)
Parameter minimum	[]
Parameter maximum	[]
Parameter data type	Inherit: Inherit via internal rule
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule

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

"Constant" (Constant)

Table 3.560. "Constant" Parameters

Parameter	Value
Constant value	0
Interpret vector parameters as 1-D	on
Output minimum	[]
Output maximum	[]
Output data type	single
Lock output data type setting against changes by the fixed-point tools	off
Sample time	inf
Frame period	inf

"currSEPIC" (Inport)

Table 3.561. "currSEPIC" Parameters

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

"Discrete-Time Integrator" (DiscreteIntegrator)

Table 3.562. "Discrete-Time Integrator" Parameters

Parameter	Value
Integrator method	Integration: Forward Euler

Parameter	Value
Gain value	1.0
External reset	falling
Initial condition source	external
Initial condition	0
Sample time (-1 for inherited)	-1
Output minimum	[]
Output maximum	[]
Output data type	single
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Limit output	on
Upper saturation limit	1
Lower saturation limit	0
Show saturation port	off
Show state port	off
Ignore limit and reset when linearizing	off
State name must resolve to Simulink signal object	off

"Divide" (Product)

Table 3.563. "Divide" Parameters

Parameter	Value
Number of inputs	*/
Multiplication	Element-wise(.*)
Apply over	All dimensions
Dimension	1
Require all inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off

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

"flag_EmptyBattery" (Outport)

Table 3.564. "flag_EmptyBattery" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	off

"flag_resetSoCEstimation" (Outport)

Table 3.565. "flag_resetSoCEstimation" Parameters

Parameter	Value
Port number	2
Icon display	Port number

Parameter	Value
Output function call	off
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	off

"SEPIC_loadPower" (Product)

Table 3.566. "SEPIC_loadPower" Parameters

Parameter	Value
Number of inputs	2
Multiplication	Element-wise(.*)
Apply over	All dimensions
Dimension	1
Require all inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off

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

"Unit Delay" (UnitDelay)

Table 3.567. "Unit Delay" Parameters

Parameter	Value
Initial condition	0
Input processing	Elements as channels (sample based)
Sample time (-1 for inherited)	-1
State name must resolve to Simulink signal object	off

"unit_mAtoA" (Gain)

Table 3.568. "unit_mAtoA" Parameters

Parameter	Value
Gain	1e-3
Multiplication	Element-wise(K.*u)
Parameter minimum	[]
Parameter maximum	[]
Parameter data type	Inherit: Inherit via internal rule
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

"voltPSU" (Inport)

Table 3.569. "voltPSU" Parameters

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

"voltSEPIC" (Inport)

Table 3.570. "voltSEPIC" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	Inherit: auto

Block Execution Order

Execution order is undetermined for subsystem block diagram
BatterySoCEstimation. Execution order depends on models that reference this
subsystem.

State Charts

Chart
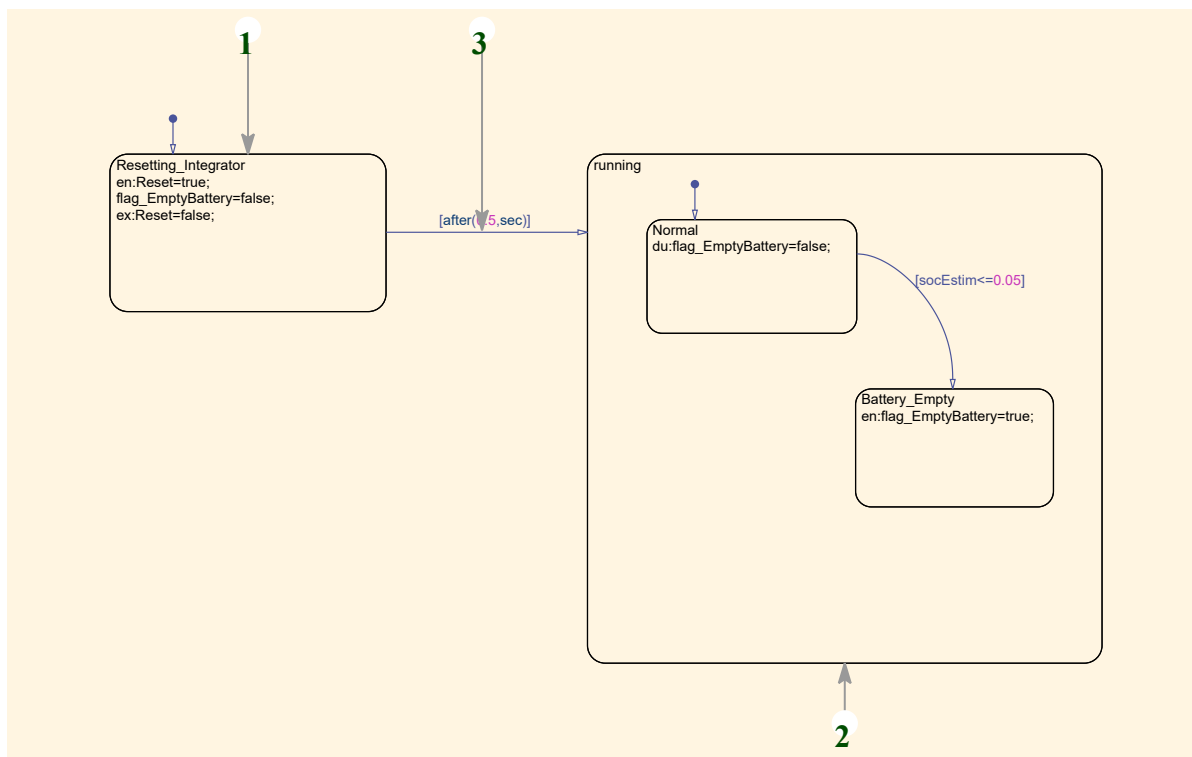
1. [Resetting_Integrator](#)
2. [running](#)
3. [\[after(0.5,sec)\]](#)

States

OR State - Resetting_Integrator
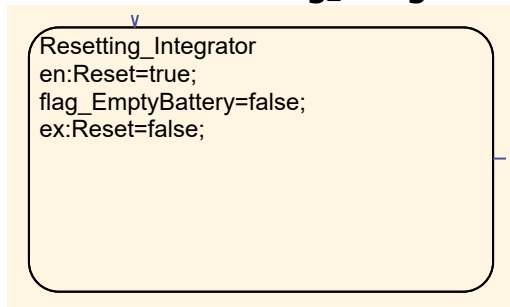
OR State - running
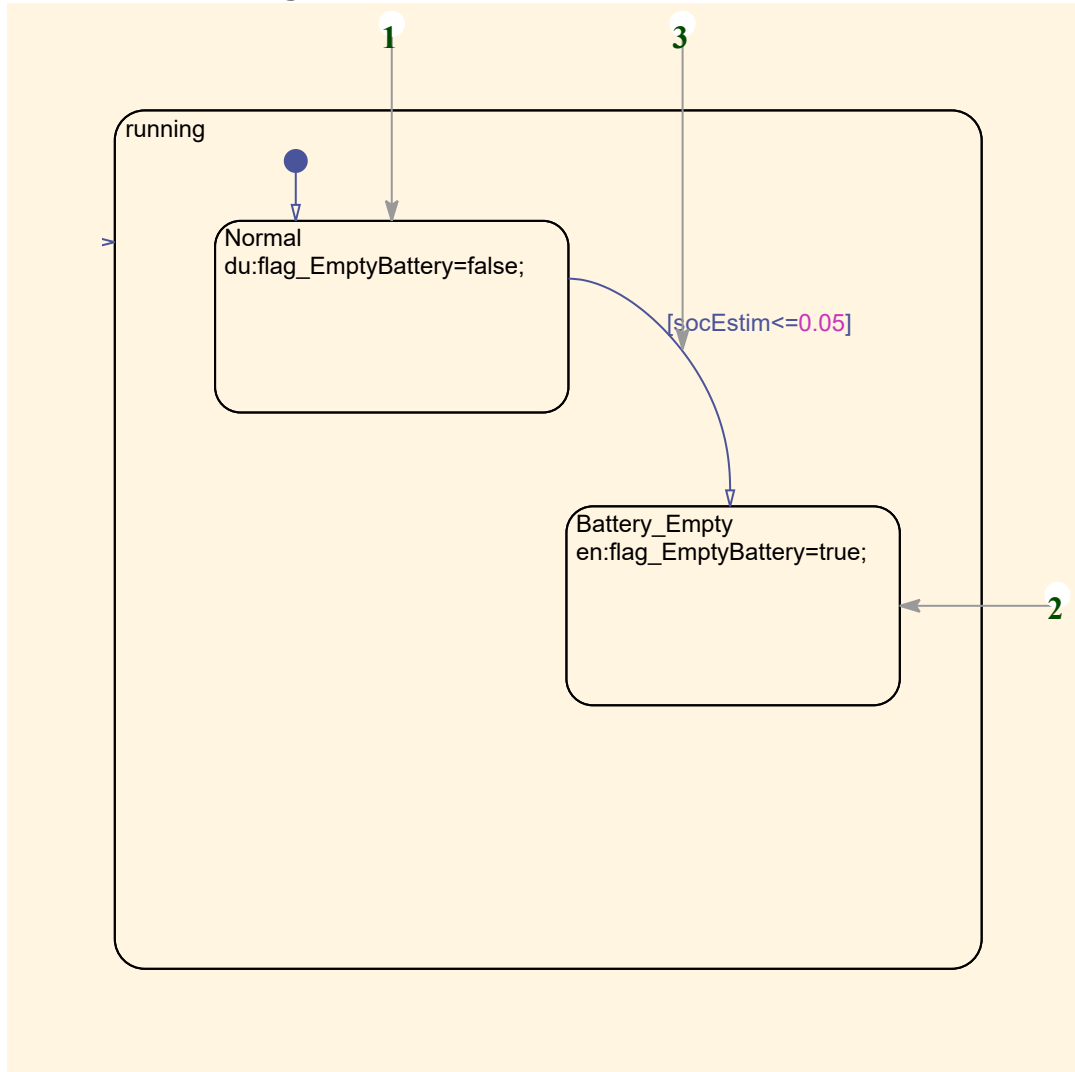
1. [Normal](#)
2. [Battery_Empty](#)
3. [[socEstim<=0.05]](#)

OR State - Normal
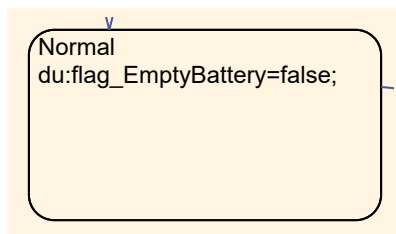
OR State - Battery_Empty
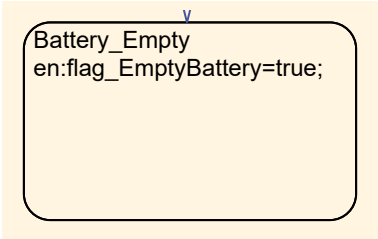
Data

Table 3.571. Data - flag_EmptyBattery

Scope	Output
Data Type	Inherit: Same as Simulink

Table 3.572. Data - Reset

Scope	Output
Data Type	boolean

Table 3.573. Data - socEstim

Scope	Input
Data Type	single

Legacy Code

Figure 3.154. BatterySoCEstimation/SoCInitValue/SoCInitValue_LegacyCode/ Legacy Code

Blocks

Parameters

"C Caller1" (CCaller)

Table 3.574. "C Caller1" Parameters

Parameter	Value
Function name	EmLiIon_LUT
Sample time (-1 for inherited)	-1

"CCode_in" (Inport)

Table 3.575. "CCode_in" Parameters

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

"Out1" (Outport)

Table 3.576. "Out1" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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

Parameter	Value
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	off

SoCInitValue

Figure 3.155. BatterySoCEstimation/SoCInitValue
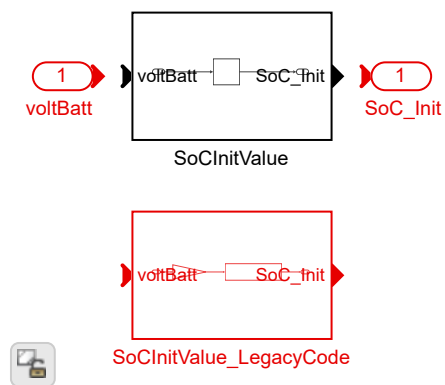
Blocks

Parameters

" SoC_Init" (Outport)

Table 3.577. " SoC_Init" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	off

"voltBatt " (Inport)

Table 3.578. "voltBatt " Parameters

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

SoCInitValue

Figure 3.156. BatterySoCEstimation/SoCInitValue/SoCInitValue

Blocks

Parameters

"OpenCircuit_SoC" (Lookup_n-D)

Table 3.579. "OpenCircuit_SoC" Parameters

Parameter	Value
Number of table dimensions	1
Data specification	Table and breakpoints
Breakpoints specification	Explicit values
Breakpoints for dimension 1 source	Dialog
Breakpoints for dimension 1	Batt_Em0_LUT*Batt_nrCellSeries
Breakpoints First Point for dimension 1	1
Breakpoints Spacing for dimension 1	1
Breakpoints minimum for dimension 1	[]
Breakpoints maximum for dimension 1	[]
Breakpoints data type for dimension 1	Inherit: Same as corresponding input
Index search method	Binary search
Begin index search using previous index result	off
Use one input port for all inputs (u)	off
Table data source	Dialog
Table data	Batt_SoC_LUT
Table minimum	[]
Table maximum	[]
Table data type	Inherit: Same as output

Parameter	Value
Intermediate results data type	Inherit: Same as output
Interpolation method	Linear point-slope
Extrapolation method	Linear
Diagnostic for out-of-range input	None
Remove protection against out-of-range input in generated code	off
Use last table value for inputs at or above last breakpoint	off
Apply full precision fixed-point algorithm when possible	off
Sample time (-1 for inherited)	-1
Internal rule priority	Speed
Require all inputs (u) to have the same data type	on
Output minimum	0
Output maximum	1
Output data type	Inherit: Same as first input
Lock data type settings against changes by the fixed-point tools	off
Integer rounding mode	Simplest
Saturate on integer overflow	off
Fraction data type	Inherit: Inherit via internal rule
Support tunable table size in code generation	off
Maximum indices for each dimension	[]

"SoC_Init" (Outport)

Table 3.580. "SoC_Init" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit

Parameter	Value
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	off

"voltBatt" (Inport)

Table 3.581. "voltBatt" Parameters

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

Compare To Zero

Figure 3.157. OperatingModeAndErrorLogic/Compare To Zero
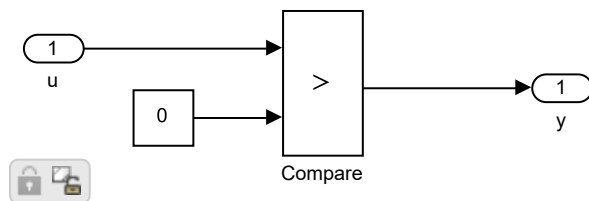
Blocks

Parameters

"Compare" (RelationalOperator)

Table 3.582. "Compare" Parameters

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

"Constant" (Constant)

Table 3.583. "Constant" Parameters

Parameter	Value
Constant value	0
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 3.584. "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" (Outport)

Table 3.585. "y" Parameters

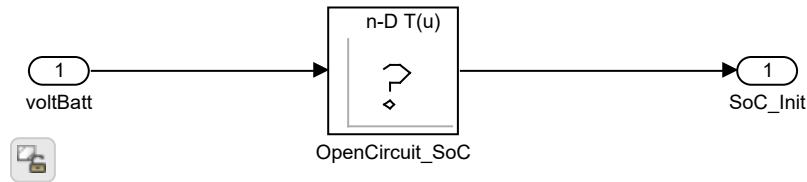| Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	Inherit: auto
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	inherit
Port dimensions (-1 for inherited)	-1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Detect Change

Figure 3.158. OperatingModeAndErrorLogic/Detect Change
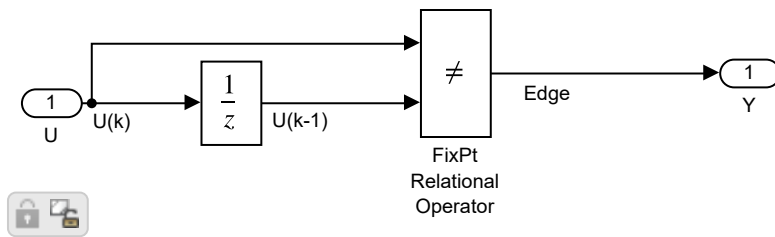
Blocks

Parameters

"Delay Input1" (UnitDelay)

Table 3.586. "Delay Input1" Parameters

Parameter	Value
Initial condition	vinit
Input processing	Elements as channels (sample based)
Sample time (-1 for inherited)	-1
State name must resolve to Simulink signal object	off

"FixPt Relational Operator" (RelationalOperator)

Table 3.587. "FixPt 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

"U" (Inport)

Table 3.588. "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" (Outport)

Table 3.589. "Y" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	0
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

OperatingModeAndErrorLogic

Checksum: Could not compute checksum for "OperatingModeAndErrorLogic" (possibly because model could not be compiled).

Figure 3.159. OperatingModeAndErrorLogic
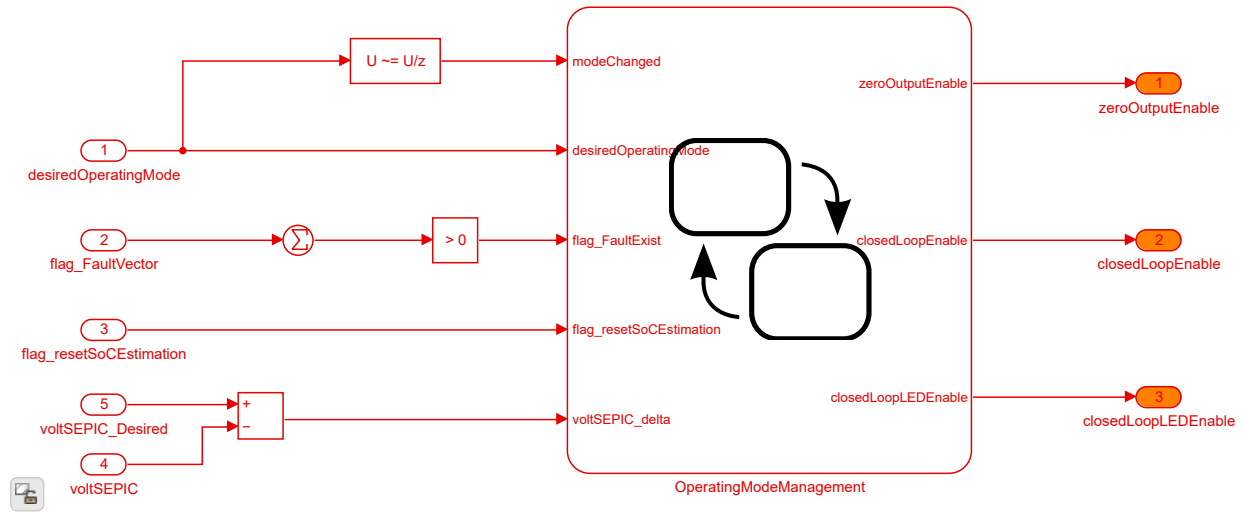
Interface

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 3.590. Input Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	OperatingModeAndErrorLogic/desiredOperatingMode			0	
	OperatingModeAndErrorLogic/flag_FaultVector			0	
	OperatingModeAndErrorLogic/flag_resetSoCEstimation			0	
	OperatingModeAndErrorLogic/voltSEPIC			0	
	OperatingModeAndErrorLogi			0	

Signal Name	Block	Description	Data Type	Width	Dimensions
	c/voltSEPIC_De sired				

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 3.591. Output Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	OperatingMod eAndErrorLogi c/OperatingMo deManagemen t			0	
	OperatingMod eAndErrorLogi c/OperatingMo deManagemen t			0	
	OperatingMod eAndErrorLogi c/OperatingMo deManagemen t			0	

Blocks

Parameters

"Add" (Sum)

Table 3.592. "Add" Parameters

Parameter	Value
Icon shape	rectangular
List of signs	+-
Apply over	All dimensions
Dimension	1
Output minimum	[]
Output maximum	[]

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

"closedLoopEnable" (Outport)

Table 3.593. "closedLoopEnable" Parameters

Parameter	Value
Port number	2
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"closedLoopLEDEnable" (Outport)

Table 3.594. "closedLoopLEDEnable" Parameters

Parameter	Value
Port number	3
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"Compare To Zero" (SubSystem)

Table 3.595. "Compare To Zero" Parameters

Parameter	Value
SimulinkmasksOperator_MP	>
SimulinkmasksOutputDataType_MP	boolean
SimulinkmasksEnableZerocrossingDetection_MP	on

"desiredOperatingMode" (Inport)

Table 3.596. "desiredOperatingMode" Parameters

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

"Detect Change" (SubSystem)

Table 3.597. "Detect Change" Parameters

Parameter	Value
SimulinkmasksInitialCondition_MP	operatingMode(0)
SimulinkmasksInputProcessing_MP	Elements as channels (sample based)
SimulinkmasksOutputDataType_MP	boolean

"flag_FaultVector" (Inport)

Table 3.598. "flag_FaultVector" Parameters

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

"flag_resetSoCEstimation" (Inport)

Table 3.599. "flag_resetSoCEstimation" Parameters

Parameter	Value
Port number	3

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

"Sum" (Sum)

Table 3.600. "Sum" Parameters

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

"voltSEPIC" (Inport)

Table 3.601. "voltSEPIC" Parameters

Parameter	Value
Port number	4
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"voltSEPIC_Desired" (Inport)

Table 3.602. "voltSEPIC_Desired" Parameters

Parameter	Value
Port number	5
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"zeroOutputEnable" (Outport)

Table 3.603. "zeroOutputEnable" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	boolean
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit
Data mode	inherit
Unit (e.g., m, m/s^2, N*m)	1
Port dimensions (-1 for inherited)	1
Variable-size signal	Inherit
Sample time (-1 for inherited)	-1
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0

Parameter	Value
Interpret vector parameters as 1-D	on

Block Execution Order

Execution order is undetermined for subsystem block diagram OperatingModeAndErrorLogic. Execution order depends on models that reference this subsystem.

State Charts

Chart

1. [desiredOperatingMode ~= NoOutput &&flag_resetSoCEstimation==0]
2. Operation
3. Initialization_no_output

States

OR State - Operation
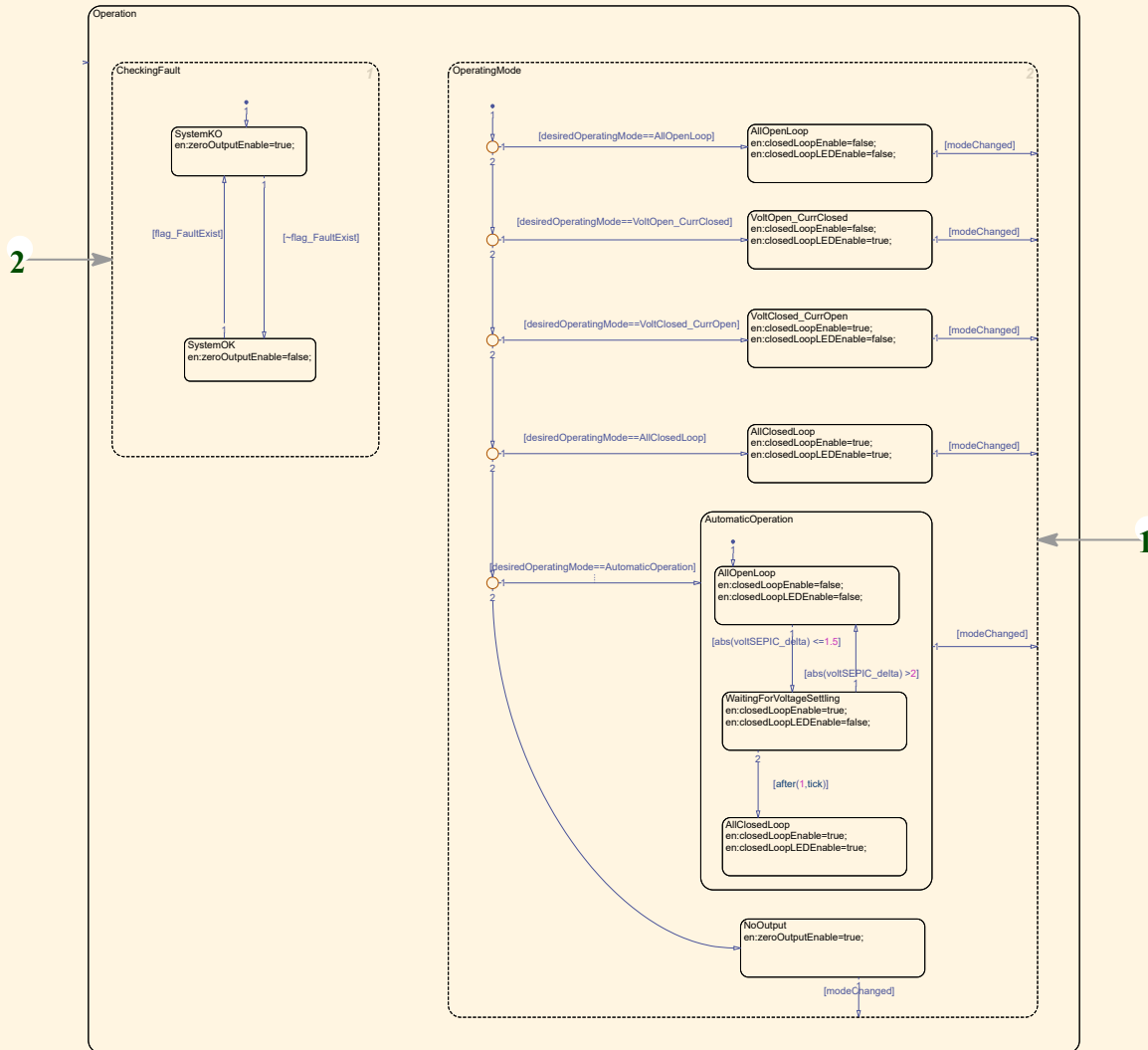
1. OperatingMode
2. CheckingFault

OR State - Initialization_no_output

```
Initialization_no_output
en:closedLoopEnable=false;
en:closedLoopLEDEnable=false;
en:zeroOutputEnable=true;
```

AND State - OperatingMode
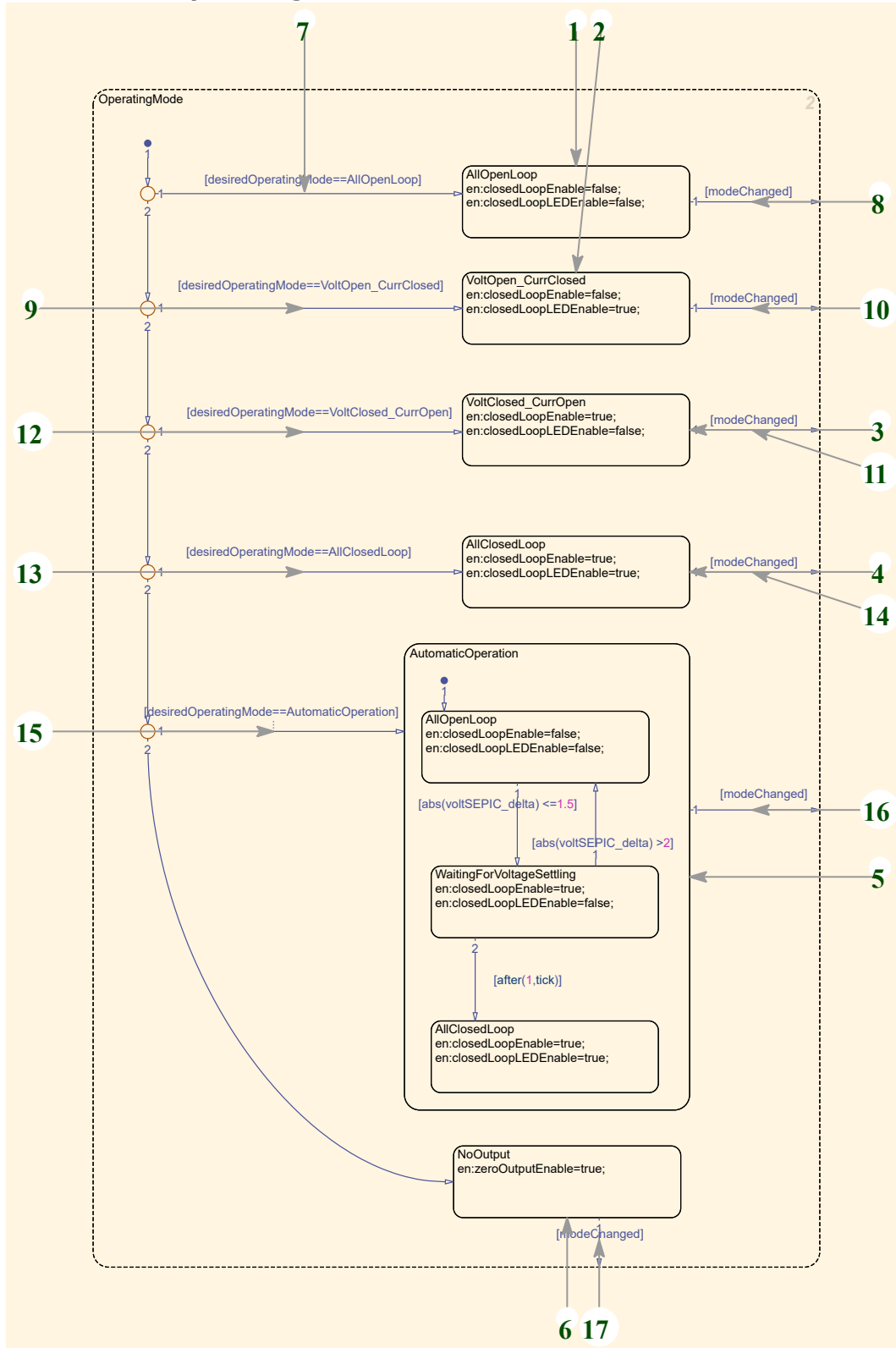
1. AllOpenLoop
2. VoltOpen_CurrClosed
3. VoltClosed_CurrOpen
4. AllClosedLoop
5. AutomaticOperation
6. NoOutput
7. [desiredOperatingMode==AllOpenLoop]
8. [modeChanged]
9. [desiredOperatingMode==VoltOpen_CurrClosed]
10. [modeChanged]
11. [modeChanged]
12. [desiredOperatingMode==VoltClosed_CurrOpen]
13. [desiredOperatingMode==AllClosedLoop]
14. [modeChanged]
15. [desiredOperatingMode==AutomaticOperation]
16. [modeChanged]
17. [modeChanged]

AND State - CheckingFault
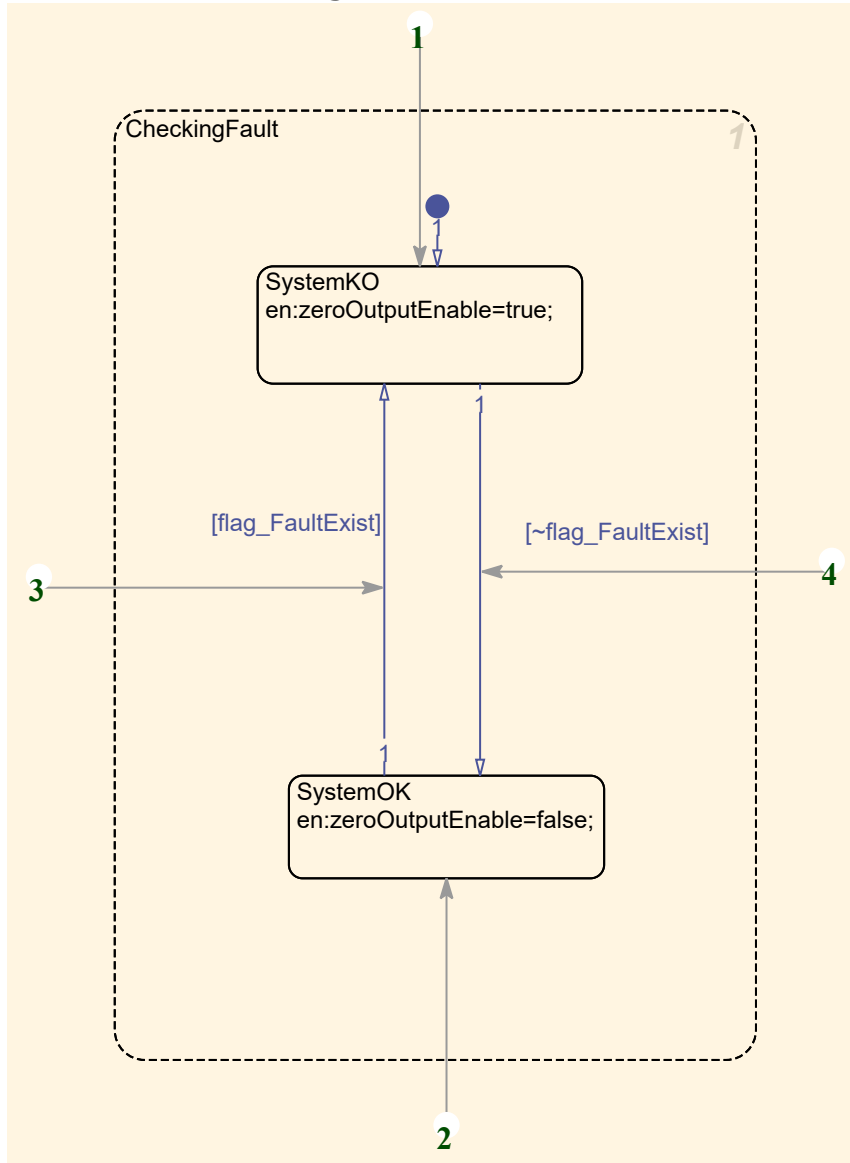
1. SystemKO
2. SystemOK
3. [flag_FaultExist]
4. [~flag_FaultExist]

OR State - AllOpenLoop
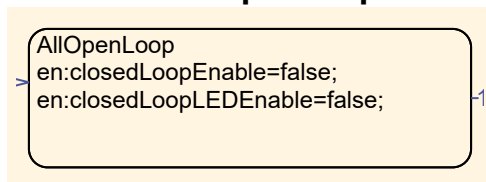
OR State - VoltOpen_CurrClosed

VoltOpen_CurrClosed
en:closedLoopEnable=false;
en:closedLoopLEDEnable=true;
1

OR State - VoltClosed_CurrOpen

VoltClosed_CurrOpen
en:closedLoopEnable=true;
en:closedLoopLEDEnable=false;
1

OR State - AllClosedLoop

AllClosedLoop
en:closedLoopEnable=true;
en:closedLoopLEDEnable=true;
1

OR State - AutomaticOperation

1

AutomaticOperation

AllOpenLoop
en:closedLoopEnable=false;
en:closedLoopLEDEnable=false;

4

[abs(voltSEPIC_delta) <=1.5]

[abs(voltSEPIC_delta) >2]

5

-1

WaitingForVoltageSettling
en:closedLoopEnable=true;
en:closedLoopLEDEnable=false;

2

2

6

[after(1,tick)]

AllClosedLoop
en:closedLoopEnable=true;
en:closedLoopLEDEnable=true;

3
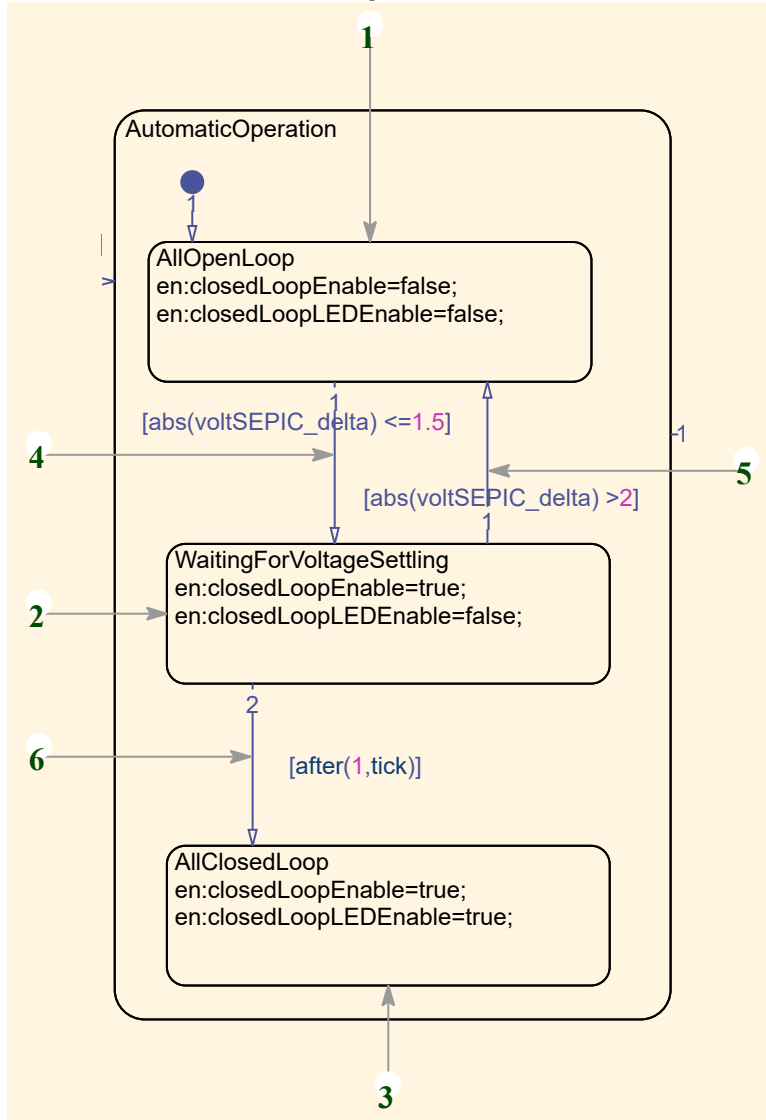
1. [AllOpenLoop](#)
2. [WaitingForVoltageSettling](#)
3. [AllClosedLoop](#)
4. [\[abs(voltSEPIC_delta) <=1.5\]](#)
5. [\[abs(voltSEPIC_delta) >2\]](#)
6. [\[after(1,tick)\]](#)

OR State - NoOutput

NoOutput
en:zeroOutputEnable=true;

OR State - SystemKO

```
SystemKO
en:zeroOutputEnable=true;
```

OR State - SystemOK

```
SystemOK
en:zeroOutputEnable=false;
```

OR State - AllOpenLoop

```
AllOpenLoop
en:closedLoopEnable=false;
en:closedLoopLEDEnable=false;
```
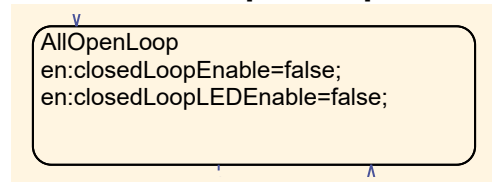
OR State - WaitingForVoltageSettling

```
WaitingForVoltageSettling
en:closedLoopEnable=true;
en:closedLoopLEDEnable=false;
```

OR State - AllClosedLoop

```
AllClosedLoop
en:closedLoopEnable=true;
en:closedLoopLEDEnable=true;
```
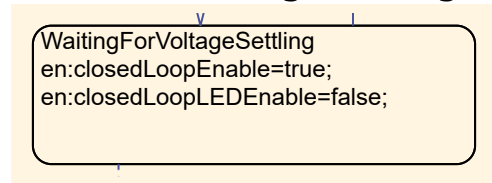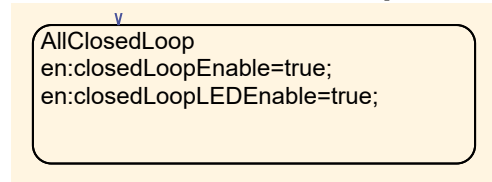
Data

Table 3.604. Data - closedLoopEnable

Scope	Output
Data Type	boolean

Table 3.605. Data - closedLoopLEDEnable

Scope	Output

Data Type	boolean

Table 3.606. Data - desiredOperatingMode

Scope	Input
Data Type	Enum: operatingMode

Table 3.607. Data - flag_FaultExist

Scope	Input
Data Type	boolean

Table 3.608. Data - flag_resetSoCEstimation

Scope	Input
Data Type	boolean

Table 3.609. Data - modeChanged

Scope	Input
Data Type	boolean

Table 3.610. Data - voltSEPIC_delta

Scope	Input
Data Type	Inherit: Same as Simulink

Table 3.611. Data - zeroOutputEnable

Scope	Output
Data Type	boolean

Compare To Zero

Figure 3.160. ReferenceOutputSafetyLimitation/Compare To Zero
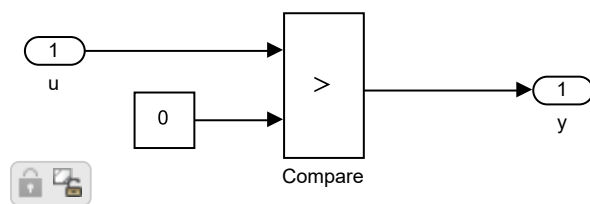
Blocks

Parameters

"Compare" (RelationalOperator)

Table 3.612. "Compare" Parameters

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

"Constant" (Constant)

Table 3.613. "Constant" Parameters

Parameter	Value
Constant value	0
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 3.614. "u" 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

"y" (Outport)

Table 3.615. "y" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

ReferenceOutputSafetyLimitation

Checksum: Could not compute checksum for "ReferenceOutputSafetyLimitation" (possibly because model could not be compiled).

Figure 3.161. ReferenceOutputSafetyLimitation
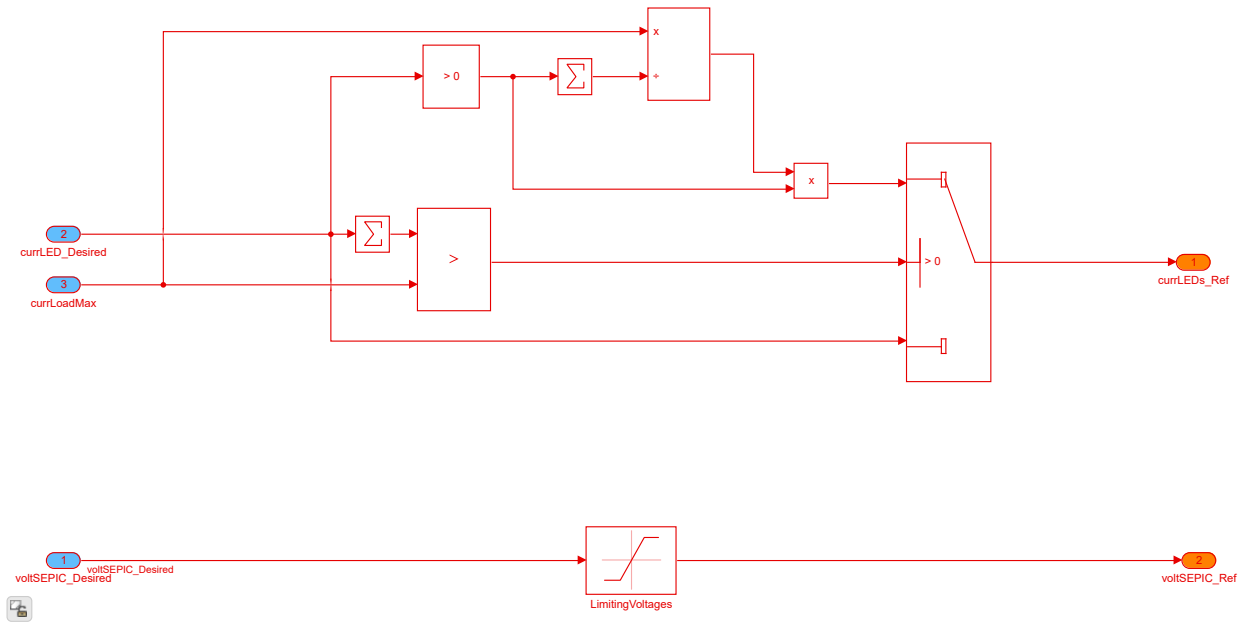
Interface

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 3.616. Input Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	ReferenceOutputSafetyLimitation/currLED_Desired			0	
	ReferenceOutputSafetyLimitation/currLoadMax			0	
voltSEPIC_Desired	ReferenceOutputSafetyLimitation/voltSEPIC_Desired			0	

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 3.617. Output Signals

Signal Name	Block	Description	Data Type	Width	Dimensions
	ReferenceOutputSafetyLimitation/Switch			0	
	ReferenceOutputSafetyLimitation/LimitingVoltages			0	

Blocks

Parameters

"Add" (Sum)

Table 3.618. "Add" Parameters

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

"Add1" (Sum)

Table 3.619. "Add1" Parameters

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

"Compare To Zero" (SubSystem)

Table 3.620. "Compare To Zero" Parameters

Parameter	Value
SimulinkmasksOperator_MP	>
SimulinkmasksOutputDataType_MP	boolean
SimulinkmasksEnableZerocrossingDetection_MP	on

"currLED_Desired" (Inport)

Table 3.621. "currLED_Desired" Parameters

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

"currLEDs_Ref" (Outport)

Table 3.622. "currLEDs_Ref" Parameters

Parameter	Value
Port number	1
Icon display	Port number
Output function call	off
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
Bus virtuality	inherit
Data mode	inherit
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
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

"currLoadMax" (Inport)

Table 3.623. "currLoadMax" Parameters

Parameter	Value
Port number	3
Port dimensions (-1 for inherited)	-1
Sample time (-1 for inherited)	-1
Minimum	[]
Maximum	[]
Data type	Inherit: auto

"Divide" (Product)

Table 3.624. "Divide" Parameters

Parameter	Value
Number of inputs	*/
Multiplication	Element-wise(.*)
Apply over	All dimensions
Dimension	1
Require all inputs to have the same data type	off
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Sample time (-1 for inherited)	-1

"LimitingVoltages" (Saturate)

Table 3.625. "LimitingVoltages" Parameters

Parameter	Value
Upper limit	voltSEPICMax
Lower limit	0
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

"Product" (Product)

Table 3.626. "Product" Parameters

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

"Relational Operator" (RelationalOperator)

Table 3.627. "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	on
Sample time (-1 for inherited)	-1
Integer rounding mode	Simplest

"Switch" (Switch)

Table 3.628. "Switch" Parameters

Parameter	Value
Criteria for passing first input	u2 > Threshold
Threshold	0
Require all data port inputs to have the same data type	off

Parameter	Value
Output minimum	[]
Output maximum	[]
Output data type	Inherit: Inherit via internal rule
Lock output data type setting against changes by the fixed-point tools	off
Integer rounding mode	Floor
Saturate on integer overflow	off
Enable zero-crossing detection	on
Sample time (-1 for inherited)	-1
Allow different data input sizes (Results in variable-size output signal)	off

"voltSEPIC_Desired" (Inport)

Table 3.629. "voltSEPIC_Desired" Parameters

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

"voltSEPIC_Ref" (Outport)

Table 3.630. "voltSEPIC_Ref" Parameters

Parameter	Value
Port number	2
Icon display	Port number
Output function call	off
Minimum	[]
Maximum	[]
Data type	single
Lock output data type setting against changes by the fixed-point tools	off
Output as nonvirtual bus in parent model	off
Bus virtuality	inherit

Parameter	Value
Data mode	inherit
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
Signal type	real
Ensure outport is virtual	off
Output when disabled	held
Initial output	[]
MustResolveToSignalObject	off
Specify output when source is unconnected	off
Constant value	0
Interpret vector parameters as 1-D	on

Block Execution Order

Execution order is undetermined for subsystem block diagram ReferenceOutputSafetyLimitation. Execution order depends on models that reference this subsystem.

Chapter 4. System Design Variables

Design Variable Summary

Table 4.1. Design Variables

Variable Name	Parent Blocks	Size	Bytes	Class	Value
AppSoftware	Bus Element Out	1x1	161	Simulink. Bus	\<Simulink.Bus\>
Sensors	Sensors1	1x1	285	Simulink. Bus	\<Simulink.Bus\>
UserDefinedValues	Bus Element In1	1x1	539	Simulink. Bus	\<Simulink.Bus\>
ts1ms	Rate Transition Rate Transition1 Rate Transition10 Rate Transition11 Rate Transition12 Rate Transition2 Rate Transition3 Rate Transition4 Rate Transition5 Rate Transition6 Rate Transition7 Rate Transition8 Rate Transition9	1x1	8	double	1.0000e-03

Design Variable Details

Table 4.2. AppSoftware

Property	Value
Alignment	-1
PreserveElementDimensions	false
Elements	[AppSoftware.Elements(1), AppSoftware.Elements(2)]
Description	
DataScope	Auto
HeaderFile	

Table 4.3. **AppSoftware.Elements(1)**

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	dcpwmSEPIC
DataType	single
Complexity	real
Dimensions	1

Table 4.4. **AppSoftware.Elements(2)**

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	dcpwmLEDvector
DataType	single
Complexity	real
Dimensions	6

Used by Blocks:

- Application_Software/Bus Element Out

Resolved in: base workspace

Batt_Em0_LUT. [3.498;
 3.5609;
 3.6063;
 3.646;
 3.6786;
 3.7073;
 3.7933;
 3.8793;
 3.9735;
 4.076;
 4.1926]

Used by Blocks:

• [Application_Software/Supervisory_Logic](#)

Resolved in: data dictionary (LocalDataD_SupervisoryLogic.sldd)

Batt_MaxCoulomb. 5400

Used by Blocks:

• [Application_Software/Supervisory_Logic](#)

Resolved in: data dictionary (LocalDataD_SupervisoryLogic.sldd)

Batt_SoC_LUT. [0;
 0.1;
 0.2;
 0.3;
 0.4;
 0.5;
 0.6;
 0.7;
 0.8;
 0.9;
 1]

Used by Blocks:

• [Application_Software/Supervisory_Logic](#)

Resolved in: data dictionary (LocalDataD_SupervisoryLogic.sldd)

Batt_nrCellSeries. 3

Used by Blocks:

• [Application_Software/Supervisory_Logic](#)

Resolved in: data dictionary (LocalDataD_SupervisoryLogic.sldd)

Table 4.5. CurrCtrlr_IGain

Property	Value
Value	0.1701
Complexity	real
Dimensions	[1 1]
CoderInfo	[CurrCtrlr_IGain.CoderInfo](#)
Description	
DataType	single
Min	
Max	

Unit	

Table 4.6. CurrCtrlr_IGain.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	CurrCtrlr_IGain.CoderInfo.CustomAttributes

CurrCtrlr_IGain.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)
Note: this object has no unfiltered properties.

Used by Blocks:

- Application_Software/Closed_Loop_Control_Current

Resolved in: data dictionary (LocalDataD_Closed_Loop_LEDControllers.sldd)

Table 4.7. CurrCtrlr_PGain

Property	Value
Value	8.5050e-05
Complexity	real
Dimensions	[1 1]
CoderInfo	CurrCtrlr_PGain.CoderInfo
Description	
DataType	single
Min	
Max	
Unit	

Table 4.8. CurrCtrlr_PGain.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	

Alignment	-1
CustomStorageClass	Default
CustomAttributes	CurrCtrlr_PGain.CoderInfo.CustomAttributes

CurrCtrlr_PGain.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)

Note: this object has no unfiltered properties.

Used by Blocks:

- Application_Software/Closed_Loop_Control_Current

Resolved in: data dictionary (LocalDataD_Closed_Loop_LEDControllers.sldd)

Curr_Test_Load. [10 25 50 75 100 150 300 500 750 1000 1500 2000]

Used by Blocks:

- Application_Software/Load_Current_Limits

Resolved in: data dictionary (LocalDataD_Load_Current_Limits.sldd)

Table 4.9. SEPIC_Efficiency

Property	Value
Value	0.8800
Complexity	real
Dimensions	[1 1]
CoderInfo	SEPIC_Efficiency.CoderInfo
Description	
DataType	single
Min	
Max	
Unit	

Table 4.10. SEPIC_Efficiency.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	SEPIC_Efficiency.CoderInfo.CustomAttributes

SEPIC_Efficiency.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)
Note: this object has no unfiltered properties.

Used by Blocks:

- Application_Software/Supervisory_Logic

Resolved in: data dictionary (LocalDataD_SupervisoryLogic.sldd)

Table 4.11. Sensors

Property	Value
Alignment	-1
PreserveElementDimensions	false
Elements	[Sensors.Elements(1), Sensors.Elements(2), Sensors.Elements(3), Sensors.Elements(4)]
Description	
DataScope	Auto
HeaderFile	

Table 4.12. Sensors.Elements(1)

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	voltSEPIC
DataType	single
Complexity	real
Dimensions	1

Table 4.13. Sensors.Elements(2)

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	

Name	currSEPIC
DataType	single
Complexity	real
Dimensions	1

Table 4.14. Sensors.Elements(3)

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	currLEDstrips
DataType	single
Complexity	real
Dimensions	6

Table 4.15. Sensors.Elements(4)

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	voltPSU
DataType	single
Complexity	real
Dimensions	1

Used by Blocks:

- Application_Software/Sensors1

Resolved in: base workspace

Table 4.16. UserDefinedValues

Property	Value

Alignment	-1
PreserveElementDimensions	false
Elements	[UserDefinedValues.Elements(1), UserDefinedValues.Elements(2), UserDefinedValues.Elements(3), UserDefinedValues.Elements(4), UserDefinedValues.Elements(5), UserDefinedValues.Elements(6)]
Description	
DataScope	Auto
HeaderFile	

Table 4.17. UserDefinedValues.Elements(1)

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	currLED_Desired
DataType	single
Complexity	real
Dimensions	6

Table 4.18. UserDefinedValues.Elements(2)

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	currLEDMax_Desired
DataType	single
Complexity	real
Dimensions	1

Table 4.19. UserDefinedValues.Elements(3)

Property	Value

Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	dcpwmSEPIC_Desired
DataType	single
Complexity	real
Dimensions	1

Table 4.20. UserDefinedValues.Elements(4)

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	dcpwmLED_Desired
DataType	single
Complexity	real
Dimensions	6

Table 4.21. UserDefinedValues.Elements(5)

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	desiredOperatingMode
DataType	Enum: operatingMode
Complexity	real
Dimensions	1

Table 4.22. UserDefinedValues.Elements(6)

Property	Value
Min	
Max	
DimensionsMode	Fixed
Description	
Unit	
Name	voltSEPIC_Desired
DataType	single
Complexity	real
Dimensions	1

Used by Blocks:

- Application_Software/Bus Element In1

Resolved in: base workspace

Table 4.23. VoltCtrlr_IGain

Property	Value
Value	1.3631
Complexity	real
Dimensions	[1 1]
CoderInfo	VoltCtrlr_IGain.CoderInfo
Description	
DataType	single
Min	
Max	
Unit	

Table 4.24. VoltCtrlr_IGain.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default

CustomAttributes	VoltCtrlr_IGain.CoderInfo.CustomAttributes

VoltCtrlr_IGain.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)
Note: this object has no unfiltered properties.

Used by Blocks:

- Application_Software/Closed_Loop_Control_Voltage

Resolved in: data dictionary (LocalDataD_Closed_Loop_Control_Voltage.sldd)

Table 4.25. VoltCtrlr_PGain

Property	Value
Value	0.0055
Complexity	real
Dimensions	[1 1]
CoderInfo	VoltCtrlr_PGain.CoderInfo
Description	
DataType	single
Min	
Max	
Unit	

Table 4.26. VoltCtrlr_PGain.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	VoltCtrlr_PGain.CoderInfo.CustomAttributes

VoltCtrlr_PGain.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)
Note: this object has no unfiltered properties.

Used by Blocks:

- Application_Software/Closed_Loop_Control_Voltage

Resolved in: data dictionary (LocalDataD_Closed_Loop_Control_Voltage.sldd)

Voltage_Test_Vector. [8 10 12 14 16 18 20 22 24 26]

Used by Blocks:

• [Application_Software/Load_Current_Limits](#)

Resolved in: data dictionary (LocalDataD_Load_Current_Limits.sldd)

Table 4.27. dcpwmLEDMax

Property	Value
Value	1
Complexity	real
Dimensions	[1 1]
CoderInfo	[dcpwmLEDMax.CoderInfo](#)
Description	Maximum duty cycle for the PWM driving the LEDs
DataType	single
Min	0
Max	1
Unit	1

Table 4.28. dcpwmLEDMax.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	[dcpwmLEDMax.CoderInfo.CustomAttributes](#)

dcpwmLEDMax.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)
Note: this object has no unfiltered properties.

Used by Blocks:

• [Application_Software/Closed_Loop_Control_Current](#)

Resolved in: data dictionary (GlobalDataD_ControllerApplication.sldd)

Table 4.29. dcpwmSEPICMax

Property	Value

Value	0.9500
Complexity	real
Dimensions	[1 1]
CoderInfo	dcpwmSEPICMax.CoderInfo
Description	Maximum duty cycle for the PWM driving the SEPIC power stage
DataType	single
Min	0
Max	1
Unit	1

Table 4.30. dcpwmSEPICMax.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	dcpwmSEPICMax.CoderInfo.CustomAttributes

dcpwmSEPICMax.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)
Note: this object has no unfiltered properties.

Used by Blocks:

• Application_Software/Closed_Loop_Control_Voltage

Resolved in: data dictionary (GlobalDataD_ControllerApplication.sldd)

Table 4.31. effMatrix

0.3376	0.3922	0.4351	0.4796	0.5212	0.5644	0.6016	0.6366	0.6698	0.7025
0.4572	0.5087	0.5545	0.5940	0.6326	0.6674	0.7029	0.7334	0.7658	0.7892
0.5967	0.6447	0.6947	0.7331	0.7588	0.7981	0.8140	0.8189	0.8385	0.8592
0.6879	0.7327	0.7647	0.8045	0.8278	0.8481	0.8592	0.8704	0.8829	0.9004
0.7554	0.7931	0.8224	0.8501	0.8668	0.8817	0.8884	0.8957	0.9045	0.9174
0.8217	0.8498	0.8704	0.8894	0.9000	0.9089	0.9124	0.9159	0.9209	0.9292
0.8622	0.8812	0.8940	0.9023	0.9098	0.9139	0.9148	0.9166	0.9169	0.9199
0.8516	0.8682	0.8786	0.8849	0.8896	0.8906	0.8907	0.8908	0.8902	0.8903
0.8229	0.8402	0.8494	0.8549	0.8571	0.8567	0.8553	0.8533	0.8513	0.8473

0.7930	0.8095	0.8182	0.8216	0.8222	0.8203	0.8169	0.8132	0.8078	0.8013
0.7322	0.7461	0.7518	0.7518	0.7478	0.7412	0.7327	0.7217	0.7089	0.6942
0.6703	0.6812	0.6821	0.6764	0.6658	0.6509	0.6314	0.6069	0.5755	0.5320

Used by Blocks:

- Application_Software/Load_Current_Limits

Resolved in: data dictionary (LocalDataD_Load_Current_Limits.sldd)

ts1ms. 1.0000e-03

Used by Blocks:

- Application_Software/Rate Transition
- Application_Software/Rate Transition1
- Application_Software/Rate Transition10
- Application_Software/Rate Transition11
- Application_Software/Rate Transition12
- Application_Software/Rate Transition2
- Application_Software/Rate Transition3
- Application_Software/Rate Transition4
- Application_Software/Rate Transition5
- Application_Software/Rate Transition6
- Application_Software/Rate Transition7
- Application_Software/Rate Transition8
- Application_Software/Rate Transition9

Resolved in: base workspace

Table 4.32. voltSEPICMax

Property	Value
Value	20.4000
Complexity	real
Dimensions	[1 1]
CoderInfo	voltSEPICMax.CoderInfo
Description	Maximum voltage output of the SEPIC converter for the provided LED strips
DataType	single
Min	9
Max	42
Unit	V

Table 4.33. voltSEPICMax.CoderInfo

Property	Value

StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	voltSEPICMax.CoderInfo.CustomAttributes

voltSEPICMax.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)
Note: this object has no unfiltered properties.

Used by Blocks:

• Application_Software/Supervisory_Logic

Resolved in: data dictionary (GlobalDataD_ControllerApplication.sldd)

Enumeration Types

Table 4.34. operatingMode Properties

Property	Value
Name	operatingMode
Source Type	MATLAB file
Source	operatingMode.m
Members	• NoOutput (0) • AllOpenLoop (1) • VoltOpen_CurrClosed (2) • VoltClosed_CurrOpen (3) • AllClosedLoop (4) • AutomaticOperation (5)
Default Value	NoOutput (0)

Design Variable Summary

Table 4.35. Design Variables

Variable Name	Parent Blocks	Size	Bytes	Class	Value
TsModel	Discrete PID Controller closedLoopEnable dcpwmSEPIC dcpwmSEPIC_Desired	1x1	8	double	1.0000e-03

Variable Name	Parent Blocks	Size	Bytes	Class	Value
	voltSEPIC voltSEPIC_Ref zeroOutputEnable				
VoltCtrlr_IGain	Discrete PID Controller	1x1	4	single	1.3631
VoltCtrlr_PGain	Discrete PID Controller	1x1	4	single	0.0055
dcpwmSEPICMax	Saturation	1x1	4	single	0.9500

Design Variable Details

TsModel. 1.0000e-03

Used by Blocks:

- Closed_Loop_Control_Voltage/Discrete PID Controller
- Closed_Loop_Control_Voltage/closedLoopEnable
- Closed_Loop_Control_Voltage/dcpwmSEPIC
- Closed_Loop_Control_Voltage/dcpwmSEPIC_Desired
- Closed_Loop_Control_Voltage/voltSEPIC
- Closed_Loop_Control_Voltage/voltSEPIC_Ref
- Closed_Loop_Control_Voltage/zeroOutputEnable

Resolved in: model workspace (Closed_Loop_Control_Voltage)

Table 4.36. VoltCtrlr_IGain

Property	Value
Value	1.3631
Complexity	real
Dimensions	[1 1]
CoderInfo	VoltCtrlr_IGain.CoderInfo
Description	
DataType	single
Min	
Max	
Unit	

Table 4.37. **VoltCtrlr_IGain.CoderInfo**

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	VoltCtrlr_IGain.CoderInfo.CustomAttributes

VoltCtrlr_IGain.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)

Note: this object has no unfiltered properties.

Used by Blocks:

- Closed_Loop_Control_Voltage/Discrete PID Controller

Resolved in: data dictionary (LocalDataD_Closed_Loop_Control_Voltage.sldd)

Table 4.38. **VoltCtrlr_PGain**

Property	Value
Value	0.0055
Complexity	real
Dimensions	[1 1]
CoderInfo	VoltCtrlr_PGain.CoderInfo
Description	
DataType	single
Min	
Max	
Unit	

Table 4.39. **VoltCtrlr_PGain.CoderInfo**

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default

CustomAttributes	VoltCtrlr_PGain.CoderInfo.CustomAttributes

VoltCtrlr_PGain.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)
Note: this object has no unfiltered properties.

Used by Blocks:

• Closed_Loop_Control_Voltage/Discrete PID Controller

Resolved in: data dictionary (LocalDataD_Closed_Loop_Control_Voltage.sldd)

Table 4.40. dcpwmSEPICMax

Property	Value
Value	0.9500
Complexity	real
Dimensions	[1 1]
CoderInfo	dcpwmSEPICMax.CoderInfo
Description	Maximum duty cycle for the PWM driving the SEPIC power stage
DataType	single
Min	0
Max	1
Unit	1

Table 4.41. dcpwmSEPICMax.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	dcpwmSEPICMax.CoderInfo.CustomAttributes

dcpwmSEPICMax.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)
Note: this object has no unfiltered properties.

Used by Blocks:

• Closed_Loop_Control_Voltage/Saturation

Resolved in: data dictionary (GlobalDataD_ControllerApplication.sldd)

Design Variable Summary

Table 4.42. Design Variables

Variable Name	Parent Blocks	Size	Bytes	Class	Value
CurrCtrlr _IGain	LED1_CurrentControl LED2_CurrentControl LED3_CurrentControl LED4_CurrentControl LED5_CurrentControl LED6_CurrentControl	1x1	4	single	0.1701
CurrCtrlr _PGain	LED1_CurrentControl LED2_CurrentControl LED3_CurrentControl LED4_CurrentControl LED5_CurrentControl LED6_CurrentControl	1x1	4	single	8.5050e-05
TsModel	closedLoopLEDEnable currLEDs_Ref currLEDstrips dcpwmLED_Desired dcpwmLEDvector voltSEPIC zeroOutputEnable	1x1	8	double	1.0000e-03
dcpwmL EDMax	LED1_CurrentControl LED2_CurrentControl LED3_CurrentControl LED4_CurrentControl LED5_CurrentControl LED6_CurrentControl	1x1	4	single	1

Table 4.43. Functions used in Design Variable Expressions

Function Name	Parent Blocks	Calling character vector
zeros	zeroOutput	zeros(6,1)

Design Variable Details

Table 4.44. CurrCtrlr_IGain

Property	Value
Value	0.1701

Complexity	real
Dimensions	[1 1]
CoderInfo	CurrCtrlr_IGain.CoderInfo
Description	
DataType	single
Min	
Max	
Unit	

Table 4.45. CurrCtrlr_IGain.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	CurrCtrlr_IGain.CoderInfo.CustomAttributes

CurrCtrlr_IGain.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)

Note: this object has no unfiltered properties.

Used by Blocks:

- Closed_Loop_LEDControllers/LED1_CurrentControl
- Closed_Loop_LEDControllers/LED2_CurrentControl
- Closed_Loop_LEDControllers/LED3_CurrentControl
- Closed_Loop_LEDControllers/LED4_CurrentControl
- Closed_Loop_LEDControllers/LED5_CurrentControl
- Closed_Loop_LEDControllers/LED6_CurrentControl

Resolved in: data dictionary (LocalDataD_Closed_Loop_LEDControllers.sldd)

Table 4.46. CurrCtrlr_PGain

Property	Value
Value	8.5050e-05
Complexity	real
Dimensions	[1 1]
CoderInfo	CurrCtrlr_PGain.CoderInfo
Description	

DataType	single
Min	
Max	
Unit	

Table 4.47. CurrCtrlr_PGain.CoderInfo

Property	Value
StorageClass	ExportedGlobal
TypeQualifier	
Identifier	
Alignment	-1
CustomStorageClass	Default
CustomAttributes	CurrCtrlr_PGain.CoderInfo.CustomAttributes

CurrCtrlr_PGain.CoderInfo.CustomAttributes (SimulinkCSC.AttribClass_Simulink_Default,)

Note: this object has no unfiltered properties.

Used by Blocks:

- Closed_Loop_LEDControllers/LED1_CurrentControl
- Closed_Loop_LEDControllers/LED2_CurrentControl
- Closed_Loop_LEDControllers/LED3_CurrentControl
- Closed_Loop_LEDControllers/LED4_CurrentControl
- Closed_Loop_LEDControllers/LED5_CurrentControl
- Closed_Loop_LEDControllers/LED6_CurrentControl

Resolved in: data dictionary (LocalDataD_Closed_Loop_LEDControllers.sldd)

TsModel. 1.0000e-03

Used by Blocks:

- Closed_Loop_LEDControllers/closedLoopLEDEnable
- Closed_Loop_LEDControllers/currLEDs_Ref
- Closed_Loop_LEDControllers/currLEDstrips
- Closed_Loop_LEDControllers/dcpwmLED_Desired
- Closed_Loop_LEDControllers/dcpwmLEDvector
- Closed_Loop_LEDControllers/voltSEPIC
- Closed_Loop_LEDControllers/zeroOutputEnable

Resolved in: model workspace (Closed_Loop_LEDControllers)

Design Variable Summary

Table 4.48. Design Variables

Variable Name	Parent Blocks	Size	Bytes	Class	Value
Curr_Test_Load	SEPIC_efficiency	1x12	96	double	[10 25 50 75 100 150 300 500 750 1000 1500 2000]
TsModel	currLEDMax_Desired currLEDstrips currLoadMax dcpwmSEPIC voltPSU voltSEPIC	1x1	8	double	0.1000
Voltage_Test_Vector	SEPIC_efficiency	1x10	80	double	[8 10 12 14 16 18 20 22 24 26]
effMatrix	SEPIC_efficiency SEPIC_efficiency	12x10	960	double	[0.33759 0.39222 0.43513 0.47955 0.52117 0.56436 0.60158 0.63664 0.66977 0.70251; 0.45725 0.50865 0.55446 0.59398 0.63255 0.66739 0.70287 0.73339 0.76577 0.78923; 0.5967 0.64469 0.69468 0.73313 0.75882 0.79809 0.81397 0.81893 0.83855 0.85919; 0.68791 0.73269 0.76473 0.80449 0.82778 0.84811 0.85923 0.87041 0.88289 0.90035; 0.75541 0.79314 0.82243 0.85011 0.86683 0.88168 0.88839 0.89565 0.90448 0.91744; 0.82173 0.84978 0.87042 0.88945 0.89997 0.90891 0.91238 0.9159 0.92085 0.92924; 0.86218 0.88124 0.8

Variable Name	Parent Blocks	Size	Bytes	Class	Value
					9398 0.90231 0.90978 0.91388 0.91482 0.91661 0.91692 0.91993; 0.85156 0.86822 0.87865 0.88489 0.88965 0.89056 0.8907 0.89085 0.89018 0.89027; 0.82289 0.84019 0.84943 0.85487 0.8571 0.85672 0.85528 0.85331 0.85132 0.84733; 0.79302 0.80949 0.81818 0.82162 0.82224 0.82026 0.81686 0.81318 0.80783 0.80127; 0.73222 0.74605 0.75179 0.75176 0.74783 0.74115 0.73273 0.72174 0.70885 0.69421; 0.67034 0.68117 0.68214 0.67642 0.66583 0.65094 0.63142 0.60686 0.57553 0.53197]

Design Variable Details

Curr_Test_Load. [10 25 50 75 100 150 300 500 750 1000 1500 2000]

Used by Blocks:

• Load_Current_Limits/SEPIC_efficiency

Resolved in: data dictionary (LocalDataD_Load_Current_Limits.sldd)

TsModel. 0.1000

Used by Blocks:

• Load_Current_Limits/currLEDMax_Desired
• Load_Current_Limits/currLEDstrips
• Load_Current_Limits/currLoadMax
• Load_Current_Limits/dcpwmSEPIC
• Load_Current_Limits/voltPSU
• Load_Current_Limits/voltSEPIC

Resolved in: model workspace (Load_Current_Limits)

Voltage_Test_Vector. [8 10 12 14 16 18 20 22 24 26]
Used by Blocks:

- [Load_Current_Limits/SEPIC_efficiency](#)

Resolved in: data dictionary (LocalDataD_Load_Current_Limits.sldd)

Table 4.49. effMatrix

0.3376	0.3922	0.4351	0.4796	0.5212	0.5644	0.6016	0.6366	0.6698	0.7025
0.4572	0.5087	0.5545	0.5940	0.6326	0.6674	0.7029	0.7334	0.7658	0.7892
0.5967	0.6447	0.6947	0.7331	0.7588	0.7981	0.8140	0.8189	0.8385	0.8592
0.6879	0.7327	0.7647	0.8045	0.8278	0.8481	0.8592	0.8704	0.8829	0.9004
0.7554	0.7931	0.8224	0.8501	0.8668	0.8817	0.8884	0.8957	0.9045	0.9174
0.8217	0.8498	0.8704	0.8894	0.9000	0.9089	0.9124	0.9159	0.9209	0.9292
0.8622	0.8812	0.8940	0.9023	0.9098	0.9139	0.9148	0.9166	0.9169	0.9199
0.8516	0.8682	0.8786	0.8849	0.8896	0.8906	0.8907	0.8908	0.8902	0.8903
0.8229	0.8402	0.8494	0.8549	0.8571	0.8567	0.8553	0.8533	0.8513	0.8473
0.7930	0.8095	0.8182	0.8216	0.8222	0.8203	0.8169	0.8132	0.8078	0.8013
0.7322	0.7461	0.7518	0.7518	0.7478	0.7412	0.7327	0.7217	0.7089	0.6942
0.6703	0.6812	0.6821	0.6764	0.6658	0.6509	0.6314	0.6069	0.5755	0.5320

Used by Blocks:

- [Load_Current_Limits/SEPIC_efficiency](#)

Resolved in: data dictionary (LocalDataD_Load_Current_Limits.sldd)

Design Variable Summary

Table 4.50. Design Variables

Variable Name	Parent Blocks	Size	Bytes	Class	Value
Batt_Em0_LUT	[BatterySoCEstimation](#)	11x1	88	double	[3.498; 3.5609; 3.6063; 3.646; 3.6786; 3.7073; 3.7933; 3.8793; 3.9735;

Variable Name	Parent Blocks	Size	Bytes	Class	Value
					4.076; 4.1926]
Batt_Max Coulomb	BatterySoCEstimation	1x1	4	single	5400
Batt_SoC_LUT	BatterySoCEstimation	11x1	88	double	[0; 0.1; 0.2; 0.3; 0.4; 0.5; 0.6; 0.7; 0.8; 0.9; 1]
Batt_nrCellSeries	BatterySoCEstimation	1x1	8	double	3
SEPIC_Efficiency	BatterySoCEstimation	1x1	4	single	0.8800
TsModel	battEestimatedSoC closedLoopEnable closedLoopLEDEnable currLED_Desired currLEDs_Ref currLoadMax currSEPIC desiredOperatingMode voltPSU voltSEPIC voltSEPIC_Desired voltSEPIC_Ref zeroOutputEnable battEestimatedSoC closedLoopEnable closedLoopLEDEnable currLED_Desired currLEDs_Ref currLoadMax currSEPIC desiredOperatingMode voltPSU voltSEPIC voltSEPIC_Desired voltSEPIC_Ref zeroOutputEnable	1x1	8	double	0.1000
voltSEPICMax	ReferenceOutputSafetyLimitation	1x1	4	single	20.4000

Design Variable Details

TsModel. 0.1000

Used by Blocks:

- [Supervisory_Logic/SupervisoryLogic/battEestimatedSoC](#)
- [Supervisory_Logic/SupervisoryLogic/closedLoopEnable](#)
- [Supervisory_Logic/SupervisoryLogic/closedLoopLEDEnable](#)
- [Supervisory_Logic/SupervisoryLogic/currLED_Desired](#)
- [Supervisory_Logic/SupervisoryLogic/currLEDs_Ref](#)
- [Supervisory_Logic/SupervisoryLogic/currLoadMax](#)
- [Supervisory_Logic/SupervisoryLogic/currSEPIC](#)
- [Supervisory_Logic/SupervisoryLogic/desiredOperatingMode](#)
- [Supervisory_Logic/SupervisoryLogic/voltPSU](#)
- [Supervisory_Logic/SupervisoryLogic/voltSEPIC](#)
- [Supervisory_Logic/SupervisoryLogic/voltSEPIC_Desired](#)
- [Supervisory_Logic/SupervisoryLogic/voltSEPIC_Ref](#)
- [Supervisory_Logic/SupervisoryLogic/zeroOutputEnable](#)
- [Supervisory_Logic/battEestimatedSoC](#)
- [Supervisory_Logic/closedLoopEnable](#)
- [Supervisory_Logic/closedLoopLEDEnable](#)
- [Supervisory_Logic/currLED_Desired](#)
- [Supervisory_Logic/currLEDs_Ref](#)
- [Supervisory_Logic/currLoadMax](#)
- [Supervisory_Logic/currSEPIC](#)
- [Supervisory_Logic/desiredOperatingMode](#)
- [Supervisory_Logic/voltPSU](#)
- [Supervisory_Logic/voltSEPIC](#)
- [Supervisory_Logic/voltSEPIC_Desired](#)
- [Supervisory_Logic/voltSEPIC_Ref](#)
- [Supervisory_Logic/zeroOutputEnable](#)

Resolved in: model workspace (Supervisory_Logic)

Enumeration Types

Table 4.51. operatingMode Properties

Property	Value
Name	operatingMode
Source Type	MATLAB file
Source	operatingMode.m
Members	• NoOutput (0) • AllOpenLoop (1)

Property	Value
	• VoltOpen_CurrClosed (2) • VoltClosed_CurrOpen (3) • AllClosedLoop (4) • AutomaticOperation (5)
Default Value	NoOutput (0)

Chapter 5. Requirements

Application_Software does not contain requirements traceability links.

Chapter 6. System Model Configuration

Source: Data dictionary

Source Name: GlobalDataD_ConfigSettings

Table 6.1. Application_Software Configuration Set

Property	Value
Description	
Components	[Application_Software Configuration Set.Components(1), Application_Software Configuration Set.Components(2), Application_Software Configuration Set.Components(3), Application_Software Configuration Set.Components(4), Application_Software Configuration Set.Components(5), Application_Software Configuration Set.Components(6), Application_Software Configuration Set.Components(7), Application_Software Configuration Set.Components(8), Application_Software Configuration Set.Components(9), Application_Software Configuration Set.Components(10)]
Name	ConfigSet_Sim_ASW

Table 6.2. Application_Software Configuration Set.Components(1)

Property	Value
Name	Solver
Description	
Components	
StartTime	0.0
StopTime	10
AbsTol	auto
AutoScaleAbsTol	on
FixedStep	auto
InitialStep	auto
MaxOrder	5
ZcThreshold	auto
ConsecutiveZCsStepRelTol	10*128*eps
MaxConsecutiveZCs	1000
ExtrapolationOrder	4
NumberNewtonIterations	1

MaxStep	auto
MinStep	auto
MaxConsecutiveMinStep	1
RelTol	1e-3
EnableMultiTasking	off
AllowMultiTaskInputOutput	off
ConcurrentTasks	off
SolverName	FixedStepDiscrete
SolverType	Fixed-step
SolverJacobianMethodControl	auto
DaesscMode	auto
ShapePreserveControl	DisableAll
ZeroCrossControl	UseLocalSettings
ZeroCrossAlgorithm	Nonadaptive
SolverResetMethod	Fast
PositivePriorityOrder	off
AutoInsertRateTranBlk	off
SampleTimeConstraint	Unconstrained
InsertRTBMode	Whenever possible
SampleTimeProperty	[Application_Software Configuration Set.Components(1).SampleTimeProperty(1), Application_Software Configuration Set.Components(1).SampleTimeProperty(2), Application_Software Configuration Set.Components(1).SampleTimeProperty(3)]
DecoupledContinuousIntegration	off
MinimalZcImpactIntegration	off
ODENIntegrationMethod	ode3
EnableFixedStepZeroCrossing	off
MaxZcPerStep	2
MaxZcBracketingIterations	10

Table 6.3. Application_Software Configuration Set.Components(2)

Property	Value
Name	Data Import/Export
Description	
Components	
Decimation	1
ExternalInput	[t, u]

FinalStateName	xFinal
InitialState	xInitial
LimitDataPoints	off
MaxDataPoints	1000
LoadExternalInput	off
LoadInitialState	off
SaveFinalState	off
SaveOperatingPoint	off
SaveFormat	StructureWithTime
SaveOutput	off
SaveState	off
SignalLogging	off
DSMLogging	off
StreamToWks	on
InspectSignalLogs	off
SaveTime	off
ReturnWorkspaceOutputs	on
StateSaveName	xout
TimeSaveName	tout
OutputSaveName	yout
SignalLoggingName	logsOut
DSMLoggingName	dsmout
OutputOption	RefineOutputTimes
OutputTimes	[]
ReturnWorkspaceOutputsName	out
Refine	1
LoggingToFile	off
DatasetSignalFormat	timeseries
LoggingFileName	out.mat
LoggingIntervals	[-inf, inf]

Table 6.4. **Application_Software Configuration Set.Components(3)**

Property	Value
Name	Optimization
Description	
Components	

BlockReduction	on
BooleanDataType	on
ConditionallyExecuteInputs	on
DefaultParameterBehavior	Inlined
InlineParams	on
UseDivisionForNetSlopeComputation	UseDivisionForReciprocalsOfIntegersOnly
GainParamInheritBuiltInType	off
UseFloatMulNetSlope	off
InheritOutputTypeSmallerThanSingle	off
DefaultUnderspecifiedDataType	double
UseSpecifiedMinMax	off
InlineInvariantSignals	off
OptimizeBlockIOStorage	on
BufferReuse	on
ReuseModelBlockBuffer	off
GlobalBufferReuse	on
GlobalVariableUsage	Use global to hold temporary results
StrengthReduction	off
AdvancedOptControl	
ExpressionFolding	on
BooleansAsBitfields	on
BitfieldContainerType	uint_T
BitwiseOrLogicalOp	Same as modeled
EnableMemcpy	on
MemcpyThreshold	64
PassReuseOutputArgsAs	Individual arguments
PassReuseOutputArgsThreshold	12
LocalBlockOutputs	on
RollThreshold	5
StateBitsets	on
DataBitsets	on
ActiveStateOutputEnumStorageType	Native Integer
ZeroExternalMemoryAtStartup	off
ZeroInternalMemoryAtStartup	on
InitFltsAndDblsToZero	off
NoFixptDivByZeroProtection	on

EfficientFloat2IntCast	on
EfficientMapNaN2IntZero	on
LifeSpan	1
EvaledLifeSpan	1
ClockResolution	-1
MaxStackSize	64
BufferReusableBoundary	on
RemoveLocalVariableInitialization	on
SimCompilerOptimization	on
AccelVerboseBuild	off
OptimizeBlockOrder	off
OptimizeDataStoreBuffers	on
BusAssignmentInplaceUpdate	on
DifferentSizesBufferReuse	off
UseRowMajorAlgorithm	off
OptimizationLevel	level2
OptimizationPriority	Balanced
OptimizationCustomize	on
LabelGuidedReuse	off
MultiThreadedLoops	off
AutoScheduleForLoops	off
DenormalBehavior	GradualUnderflow
EfficientTunableParamExpr	on

Table 6.5. Application_Software Configuration Set.Components(4)

Property	Value
Name	Diagnostics
Description	
Components	
RTPrefix	error
ConsistencyChecking	none
ArrayBoundsChecking	none
SignalInfNanChecking	none
StringTruncationChecking	error
SignalRangeChecking	none
ReadBeforeWriteMsg	DisableAll

WriteAfterWriteMsg	DisableAll
WriteAfterReadMsg	DisableAll
AlgebraicLoopMsg	warning
ArtificialAlgebraicLoopMsg	warning
SaveWithDisabledLinksMsg	warning
SaveWithParameterizedLinksMsg	warning
CheckSSInitialOutputMsg	on
UnderspecifiedInitializationDetection	Simplified
MergeDetectMultiDrivingBlocksExec	error
SignalResolutionControl	UseLocalSettings
BlockPriorityViolationMsg	warning
MinStepSizeMsg	warning
TimeAdjustmentMsg	none
MaxConsecutiveZCsMsg	error
MaskedZcDiagnostic	warning
IgnoredZcDiagnostic	warning
SolverPrmCheckMsg	none
InheritedTsInSrcMsg	warning
MultiTaskDSMMsg	error
MultiTaskCondExecSysMsg	error
MultiTaskRateTransMsg	error
SingleTaskRateTransMsg	none
TasksWithSamePriorityMsg	warning
SigSpecEnsureSampleTimeMsg	warning
CheckMatrixSingularityMsg	none
IntegerOverflowMsg	warning
Int32ToFloatConvMsg	warning
ParameterDowncastMsg	error
ParameterOverflowMsg	error
ParameterUnderflowMsg	none
ParameterPrecisionLossMsg	none
ParamSuppressDoubleToSinglePrecisionLossMsg	off
ParamPrecisionLossAbsoluteDiffThreshold	0.0
ParamPrecisionLossRelativeDiffThreshold	0.0
ParamOverflowErrorThreshold	OneBit
ParameterTunabilityLossMsg	warning

FixptConstUnderflowMsg	none
FixptConstOverflowMsg	none
FixptConstPrecisionLossMsg	none
UnderSpecifiedDataTypeMsg	none
UnnecessaryDatatypeConvMsg	none
VectorMatrixConversionMsg	none
FcnCallInpInsideContextMsg	error
SignalLabelMismatchMsg	none
UnconnectedInputMsg	warning
UnconnectedOutputMsg	warning
UnconnectedLineMsg	warning
UseOnlyExistingSharedCode	error
SFcnCompatibilityMsg	none
FrameProcessingCompatibilityMsg	error
UniqueDataStoreMsg	error
BusObjectLabelMismatch	warning
RootOutportRequireBusObject	warning
AssertControl	UseLocalSettings
AllowSymbolicDim	off
ModelReferenceVersionMismatchMessage	none
ModelReferenceIOMismatchMessage	none
UnknownTsInhSupMsg	warning
ModelReferenceDataLoggingMessage	warning
ModelReferenceNoExplicitFinalValueMsg	none
ModelReferenceSymbolNameMessage	none
StateNameClashWarn	warning
OperatingPointInterfaceChecksumMismatchMsg	warning
NonCurrentReleaseOperatingPointMsg	error
PregeneratedLibrarySubsystemCodeDiagnostic	warning
SubsystemReferenceDiagnosticForUnitTest	error
InitInArrayFormatMsg	warning
StrictBusMsg	ErrorOnBusTreatedAsVector
BusNameAdapt	WarnAndRepair
NonBusSignalsTreatedAsBus	none
SFUnusedDataAndEventsDiag	warning
SFUnexpectedBacktrackingDiag	warning

SFInvalidInputDataAccessInChartInitDiag	warning
SFNoUnconditionalDefaultTransitionDiag	warning
SFTransitionOutsideNaturalParentDiag	warning
SFUnreachableExecutionPathDiag	warning
SFUndirectedBroadcastEventsDiag	warning
SFTransitionActionBeforeConditionDiag	warning
SFOutputUsedAsStateInMooreChartDiag	error
SFTemporalDelaySmallerThanSampleTimeDiag	warning
SFSelfTransitionDiag	warning
SFExecutionAtInitializationDiag	none
IntegerSaturationMsg	warning
AllowedUnitSystems	all
UnitsInconsistencyMsg	warning
AllowAutomaticUnitConversions	on
RCSCRenamedMsg	warning
RCSCObservableMsg	warning
ForceCombineOutputUpdateInSim	off
UnderSpecifiedDimensionMsg	none
DebugExecutionForFMUViaOutOfProcess	off
ArithmeticOperatorsInVariantConditions	warning
VariantConditionMismatch	none
InheritVATfromSVC	warning
VariantConfigNotUsedByTopModel	warning
ParamWriterValidationControl	UseLocalSettings

Table 6.6. __Application_Software Configuration Set.Components__(5)

Property	Value
Name	Hardware Implementation
Description	
Components	
ProdBitPerChar	16
ProdBitPerShort	16
ProdBitPerInt	16
ProdBitPerLong	32
ProdBitPerLongLong	64
ProdBitPerFloat	32

ProdBitPerDouble	64
ProdBitPerPointer	32
ProdBitPerSizeT	32
ProdBitPerPtrDiffT	32
ProdLargestAtomicInteger	Integer
ProdLargestAtomicFloat	None
ProdIntDivRoundTo	Zero
ProdEndianess	LittleEndian
ProdWordSize	16
ProdShiftRightIntArith	on
ProdLongLongMode	off
ProdHWDeviceType	Texas Instruments->C2000
TargetBitPerChar	8
TargetBitPerShort	16
TargetBitPerInt	32
TargetBitPerLong	32
TargetBitPerLongLong	64
TargetBitPerFloat	32
TargetBitPerDouble	64
TargetBitPerPointer	32
TargetBitPerSizeT	32
TargetBitPerPtrDiffT	32
TargetLargestAtomicInteger	Char
TargetLargestAtomicFloat	None
TargetShiftRightIntArith	on
TargetLongLongMode	off
TargetIntDivRoundTo	Undefined
TargetEndianess	Unspecified
TargetWordSize	32
TargetPreprocMaxBitsSint	32
TargetPreprocMaxBitsUint	32
TargetHWDeviceType	Generic->32-bit Embedded Processor
TargetUnknown	off
ProdEqTarget	on
UseEmbeddedCoderFeatures	on
UseSimulinkCoderFeatures	on

HardwareBoardFeatureSet	EmbeddedCoderHSP

Table 6.7. **Application_Software Configuration Set.Components(6)**

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

Table 6.8. **Application_Software Configuration Set.Components(7)**

Property	Value
Name	Simulation Target
Description	
Components	
SimCustomSourceCode	
SimCustomHeaderCode	
SimCustomInitializer	
SimCustomTerminator	
SimReservedNameArray	
SimUserSources	
SimUserIncludeDirs	
SimUserLibraries	

SimUserDefines	
SimCustomCompilerFlags	
SimCustomLinkerFlags	
SFSimEnableDebug	off
SFSimEcho	on
SimCtrlC	on
SimIntegrity	on
SimUseLocalCustomCode	off
SimParseCustomCode	on
SimAnalyzeCustomCode	off
SimDebugExecutionForCustomCode	off
SimGenImportedTypeDefs	off
CompileTimeRecursionLimit	50
EnableRuntimeRecursion	on
EnableImplicitExpansion	on
MATLABDynamicMemAlloc	off
MATLABDynamicMemAllocThreshold	65536
LegacyBehaviorForPersistentVarInContinuousTime	off
CustomCodeFunctionArrayLayout	
DefaultCustomCodeFunctionArrayLayout	NotSpecified
CustomCodeUndefinedFunction	FilterOut
CustomCodeGlobalsAsFunctionIO	off
DefaultCustomCodeDeterministicFunctions	None
CustomCodeDeterministicFunctions	
SimHardwareAcceleration	generic
SimTargetLang	C
GPUAcceleration	off
SimGPUMallocThreshold	200
SimGPUStackLimitPerThread	1024
SimGPUErrorChecks	off
SimGPUCustomComputeCapability	
SimGPUCompilerFlags	
SimDLTargetLibrary	mkl-dnn
SimDLAutoTuning	on

Table 6.9. Application_Software Configuration Set.Components(8)

Property	Value
Name	Code Generation
Description	Embedded Coder
SystemTargetFile	ert.tlc
EmbeddedCoderDictionary	
HardwareBoard	None
ShowCustomHardwareApp	off
ShowEmbeddedHardwareApp	off
TLCOptions	
GenCodeOnly	off
MakeCommand	make_rtw
GenerateMakefile	on
PackageGeneratedCodeAndArtifacts	off
PackageName	
TemplateMakefile	ert_default_tmf
PostCodeGenCommand	
GenerateReport	on
RTWVerbose	off
RetainRTWFile	off
ProfileTLC	off
TLCDebug	off
TLCCoverage	off
TLCAssert	off
BuiltinFFTWCallback	off
RTWUseLocalCustomCode	off
RTWUseSimCustomCode	off
CustomSourceCode	
CustomHeaderCode	
CustomInclude	
CustomSource	
CustomLibrary	
CustomDefine	
CustomBLASCallback	
CustomLAPACKCallback	
CustomFFTCallback	

CustomInitializer	
CustomTerminator	
Toolchain	Automatically locate an installed toolchain
BuildConfiguration	Faster Builds
CustomToolchainOptions	
IncludeHyperlinkInReport	on
LaunchReport	off
PortableWordSizes	on
CreateSILPILBlock	None
CodeExecutionProfiling	on
CodeExecutionProfileVariable	executionProfile
CodeProfilingSaveOptions	AllData
CodeProfilingInstrumentation	coarse
CodeStackProfiling	off
CodeStackProfileVariable	stackProfile
CodeCoverageSettings	Application_Software Configuration Set.Components(8).CodeCoverageSettings
SILPILDebugging	off
RemoveFixptWordSizeChecks	off
DataTypeReplacement	CoderTypedefs
CoderTypedefsCompatibility	off
TargetLang	C
GenerateGPUCode	None
HalideCodeGeneration	off
GenerateTraceInfo	on
GenerateTraceReport	on
GenerateTraceReportSl	on
GenerateTraceReportSf	on
GenerateTraceReportEml	on
GenerateWebview	off
GenerateCodeMetricsReport	on
GenerateCodeReplacementReport	off
RTWCompilerOptimization	off
ObjectivePriorities	
RTWCustomCompilerOptimizations	
CheckMdlBeforeBuild	Off
GPUKernelNamePrefix	

GPUDeviceID	-1
GPUMallocMode	discrete
GPUMallocThreshold	200
GPUEnableMemoryManager	off
GPUStackLimitPerThread	1024
GPUcuBLAS	on
GPUcuSOLVER	on
GPUcuFFT	on
GPUErrorChecks	off
GPUComputeCapability	3.5
GPUCustomComputeCapability	
GPUCompilerFlags	
GPUMaximumBlocksPerKernel	0
DLTargetLibrary	none
DLAutoTuning	on
DLDataType	fp32
DLArmComputeVersion	19.05
DLArmComputeArch	unspecified
DLLearnablesCompression	None
LargeConstantGeneration	KeepInSourceFiles
LargeConstantThreshold	131072
Components	[Application_Software Configuration Set.Components(8).Components(1), Application_Software Configuration Set.Components(8).Components(2)]

Table 6.10. Application_Software Configuration Set.Components(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
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
CovMcdcMode	Masking
CovExcludeInactiveVariants	off

Table 6.11. Application_Software Configuration Set.Components(10)

Property	Value
Description	
Components	[Application_Software Configuration Set.Components(10).Components](#)
Name	Simscape
EditingMode	Full
ExplicitSolverDiagnosticOptions	warning
GlobalZcOffDiagnosticOptions	warning
SimscapeNormalizeSystem	on
SimscapeNominalValues	[{"value":"1","unit":"A"},{"value":"1","unit":"bar"},{"value":"1","unit":"cm^2"},{"value":"1","unit":"cm^3/s"},{"value":"1","unit":"kJ/kg"},{"value":"1","unit":"kW"},{"value":"1","unit":"l"},{"value":"1","unit":"N"},{"value":"1","unit":"N*m"},{"value":"1","unit":"V"}]
SimscapeLogType	none
SimscapeLogSimulationStatistics	off
SimscapeLogToSDI	off
SimscapeLogOpenViewer	off
SimscapeLogName	simlog
SimscapeLogDecimation	1
SimscapeLogLimitData	on
SimscapeLogDataHistory	5000
SimscapeUseOperatingPoints	on
SimscapeOperatingPoint	op_tm_average
SimscapeCompileComponentReuse	off
SimscapeMultithreadedCompilation	on

Table 6.12. Application_Software Configuration Set.Components(1).SampleTimeProperty(1)

Field	Value
SampleTime	0.1
Offset	0
Priority	20

Table 6.13. Application_Software Configuration Set.Components(1).SampleTimeProperty(2)

Field	Value
SampleTime	0.5
Offset	0
Priority	21

Table 6.14. Application_Software Configuration Set.Components(1).SampleTimeProperty(3)

Field	Value
SampleTime	1.0
Offset	0
Priority	22

Table 6.15. Application_Software Configuration Set.Components(8).CodeCoverageSettings

Property	Value
TopModelCoverage	off
ReferencedModelCoverage	off
CoverageTool	None

Table 6.16. Application_Software Configuration Set.Components(8).Components(1)

Property	Value
Name	Code Appearance
Description	
Components	
ForceParamTrailComments	on
GenerateComments	on
CommentStyle	Auto
IgnoreCustomStorageClasses	off
IgnoreTestpoints	off
MaxIdLength	31
ShowEliminatedStatement	off

OperatorAnnotations	off
SimulinkDataObjDesc	on
SFDataObjDesc	off
MATLABFcnDesc	off
MangleLength	1
SharedChecksumLength	8
CustomSymbolStrGlobalVar	rt$N$M
CustomSymbolStrType	NM
CustomSymbolStrField	NM
CustomSymbolStrFcn	NM$F
CustomSymbolStrFcnArg	rt$I$N$M
CustomSymbolStrBlkIO	rtb_NM
CustomSymbolStrTmpVar	NM
CustomSymbolStrMacro	NM
CustomSymbolStrUtil	NC
CustomSymbolStrEmxType	emxArray_MN
CustomSymbolStrEmxFcn	emx$M$N
CustomUserTokenString	
CustomCommentsFcn	
DefineNamingRule	None
DefineNamingFcn	
ParamNamingRule	None
ParamNamingFcn	
SignalNamingRule	None
SignalNamingFcn	
InsertBlockDesc	on
InsertPolySpaceComments	off
SimulinkBlockComments	on
BlockCommentType	BlockPathComment
StateflowObjectComments	on
MATLABSourceComments	off
EnableCustomComments	off
InternalIdentifier	Classic
InlinedPrmAccess	Literals
ReqsInCode	off
UseSimReservedNames	off

ReservedNameArray	
EnumMemberNameClash	error

Table 6.17. <u>Application Software Configuration Set.Components(8).Components(2)</u>

Property	Value
Name	Target
Description	
Components	
IsERTTarget	on
TargetLibSuffix	
TargetPreCompLibLocation	
TargetLangStandard	C89/C90 (ANSI)
CodeReplacementLibrary	None
UtilityFuncGeneration	Shared location
MultiwordTypeDef	System defined
MultiwordLength	2048
DynamicStringBufferSize	256
GenerateFullHeader	on
InferredTypesCompatibility	off
ExistingSharedCode	
GenerateSampleERTMain	off
GenerateTestInterfaces	off
ModelReferenceCompliant	on
ParMdlRefBuildCompliant	on
CompOptLevelCompliant	on
ConcurrentExecutionCompliant	on
IncludeMdlTerminateFcn	off
CombineOutputUpdateFcns	on
CombineSignalStateStructs	on
GroupInternalDataByFunction	off
SuppressErrorStatus	off
IncludeFileDelimiter	Auto
ERTCustomFileBanners	on
SupportAbsoluteTime	on
LogVarNameModifier	rt_

MatFileLogging	off
MultiInstanceERTCode	off
CodeInterfacePackaging	Nonreusable function
PurelyIntegerCode	off
SupportNonFinite	off
SupportComplex	off
SupportContinuousTime	off
SupportNonInlinedSFcns	off
RemoveDisableFunc	off
RemoveResetFunc	on
SupportVariableSizeSignals	off
ParenthesesLevel	Nominal
CastingMode	Nominal
ModelStepFunctionPrototypeControlCompliant	on
CPPClassGenCompliant	on
GRTInterface	off
GenerateAllocFcn	off
UseToolchainInfoCompliant	on
GenerateSharedConstants	on
LUTObjectStructOrderExplicitValues	Size,Breakpoints,Table
LUTObjectStructOrderEvenSpacing	Size,Breakpoints,Table
ArrayLayout	Column-major
UnsupportedSFcnMsg	error
ERTHeaderFileRootName	RE
ERTSourceFileRootName	RE
ERTDataFileRootName	$R_data
InstructionSetExtensions	{None}
InstructionSetFMA	off
OptimizeReductions	off
IsSLRTTarget	off
HeaderGuardPrefix	
LogToMDFFile	off
DSAsUniqueAccess	off
ExtMode	off
ExtModeTransport	0
ExtModeStaticAlloc	off

ExtModeAutomaticAllocSize	on
ExtModeMaxTrigDuration	10
ExtModeStaticAllocSize	2048
ExtModeTesting	off
ExtModeMexFile	ext_comm
ExtModeMexArgs	
ExtModeIntrfLevel	Level1
TargetOS	BareBoardExample
MultiInstanceErrorCode	Error
RootIOFormat	Individual arguments
RTWCAPISignals	off
RTWCAPIParams	off
RTWCAPIStates	off
RTWCAPIRootIO	off
ERTSrcFileBannerTemplate	ert_code_template.cgt
ERTHdrFileBannerTemplate	ert_code_template.cgt
ERTDataSrcFileTemplate	ert_code_template.cgt
ERTDataHdrFileTemplate	ert_code_template.cgt
ERTCustomFileTemplate	example_file_process.tlc
EnableDataOwnership	off
SignalDisplayLevel	10
ParamTuneLevel	10
GlobalDataDefinition	Auto
DataDefinitionFile	global.c
GlobalDataReference	Auto
ERTFilePackagingFormat	CompactWithDataFile
RateTransitionBlockCode	Inline
DataReferenceFile	global.h
PreserveExpressionOrder	off
PreserveIfCondition	off
ConvertIfToSwitch	off
PreserveExternInFcnDecls	on
PreserveStaticInFcnDecls	on
SuppressUnreachableDefaultCases	off
EnableSignedLeftShifts	on
EnableSignedRightShifts	on

ImplementImageWithCVMat	off
IndentStyle	K&R
IndentSize	2
NewlineStyle	Default
MaxLineWidth	80
EnableUserReplacementTypes	off
ReplacementTypes	[Application_Software Configuration Set.Components(8).Components(2).ReplacementTypes](#)
MaxIdInt64	MAX_int64_T
MinIdInt64	MIN_int64_T
MaxIdUint64	MAX_uint64_T
MaxIdInt32	MAX_int32_T
MinIdInt32	MIN_int32_T
MaxIdUint32	MAX_uint32_T
MaxIdInt16	MAX_int16_T
MinIdInt16	MIN_int16_T
MaxIdUint16	MAX_uint16_T
MaxIdInt8	MAX_int8_T
MinIdInt8	MIN_int8_T
MaxIdUint8	MAX_uint8_T
BooleanTrueId	true
BooleanFalseId	false
TypeLimitIdReplacementHeaderFile	
ArrayContainerType	C-style array

Table 6.18. Application_Software Configuration Set.Components(10).Components

Property	Value
Description	Simscape Multibody
Components	[[Application_Software Configuration Set.Components(10).Components.Components(1), Application_Software Configuration Set.Components(10).Components.Components(2)](#)]
Name	SimscapeMultibody

Table 6.19. Application_Software Configuration Set.Components(8).Components(2).ReplacementTypes

Field	Value
double	
single	
int32	
int16	
int8	
uint32	
uint16	
uint8	
boolean	
int	
uint	
char	
uint64	
int64	

Table 6.20. Application_Software Configuration Set.Components(10).Components.Components(1)

Property	Value
Description	Diagnostics
Components	
Name	DiagnosticsConfigSet
SimMechanicsInvalidVisualProperty	warning
SimMechanicsCrossSectionNullEdge	warning
SimMechanicsUnconnectedFramePorts	warning
SimMechanicsUnconnectedGeometryPorts	warning
SimMechanicsRedundantBlock	warning
SimMechanicsConflictingReferenceFrames	warning
SimMechanicsRigidlyBoundBlock	error
SimMechanicsUnsatisfiedHighPriorityTargets	warning
SimMechanicsJointTargetOverSpecification	error

Table 6.21. Application_Software Configuration Set.Components(10).Components.Components(2)

Property	Value
Description	Explorer
Components	
Name	ExplorerConfigSet
SimMechanicsOpenEditorOnUpdate	on

Chapter 7. 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.

Enumeration Type. Enumerated data is data that is restricted to a finite set of values. An enumerated data type is a MATLAB® class that defines a set of enumerated values. Each enumerated value consists of an enumerated name and an underlying integer which the software uses internally and in generated code.

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).

Chapter 8. About this Report

Report Overview

This report describes the design of the Application_Software 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.

Enumeration Type. Describes the enumeration types used by this model.

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. 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.