

Coverage Report for SelfBalancingEV_V2

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Analysis Information

Coverage Data Information

Collected in version (R2022a)

Model Information

Model version	1.5
Author	DELL
Last saved	Sat Mar 26 23:54:24 2022

Simulation Optimization Options

Default parameter behavior	tunable
Block reduction	forced off
Conditional branch optimization	on

Coverage Options

Analyzed model	SelfBalancingEV_V2
Logic block short circuiting	off

Blocks Eliminated from Coverage Analysis

# Model Object	Rationale
SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/current	Block reduction eliminated
SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/current1	Block reduction eliminated
SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/current2	Block reduction eliminated
SelfBalancingEV_V2/State of charge, current and	Block reduction eliminated

Tests

Test	Started execution	Ended execution
Run 1	27-Mar-2022 00:08:14	27-Mar-2022 00:08:22

Summary

Model Hierarchy/Complexity	Run 1		
	Decision	Execution	
1. SelfBalancingEV_V2	36 52%	 96%	
2. ABS control System	NA	100%	
3. relative slip calculator	NA	100%	
4. wheel speed calculator	NA	100%	
5. bang-bang controller	NA	100%	
6. Acceleration Limit Tester	1 50%	 100%	
7. Correction Generator	NA	100%	
8. PID Controller	NA	100%	
9. Integrator	NA	100%	
10. Continuous	NA	100%	
11. N Gain	NA	100%	
12. Internal Parameters	NA	100%	
13. Parallel P Gain	NA	100%	
14. Internal Parameters	NA	100%	
15. Sum	NA	100%	
16. Sum_PID	NA	100%	
17. MODES	8 50%	 100%	
18. Bike ON/OFF	1 50%	 100%	
19. Compare To Zero	NA	100%	
20. ECO_MODE	1 50%	 100%	
21. Compare To Constant Eco_mode	NA	100%	
22. SPORTS_MODE	1 50%	 100%	
23. Compare To Constant Sports_mode	NA	100%	
24. Self_Balance	1 50%	 100%	
25. Compare To Constant Self_balance	NA	100%	
26. URBAN_MODE	1 50%	 100%	
27. Compare To Constant Urban_mode	NA	100%	
28. WRONG_INPUT	1 50%	 100%	
29. Compare To Constant Wrong_input	NA	100%	
30. State of charge, current and voltage monitoring system	18 50%	 92%	
31. Vehicle battery	18 50%	 92%	

32.....	Current Measurement	NA	100%	
33.....	Model	18 50%	91%	
34.....	Compare To Zero	NA	100%	
35.....	Compare To Zero2	NA	100%	
36.....	E_dyn Charge	3 25%	57%	0%
37.....	Exp	6 50%	100%	
38.....	Compare To Zero2	NA	100%	
39.....	Power loss estimation	NA	100%	
40.....	Saturation Dynamic	2 50%	100%	
41.....	Saturation Dynamic1	2 75%	100%	
42.....	Saturation Dynamic2	2 50%	100%	
43.....	powergui1	NA	100%	
44.....	EquivalentModel1	NA	100%	
45....	Subsystem	4 50%	100%	
46.....	Compare To Constant2	NA	100%	
47.....	Compare To Constant4	NA	100%	
48....	System Switch	1 100%	100%	
49....	Thermal Management	NA	100%	
50.....	PID Controller	NA	100%	
51.....	Integrator	NA	100%	
52.....	Continuous	NA	100%	
53.....	N Gain	NA	100%	
54.....	Internal Parameters	NA	100%	
55.....	Parallel P Gain	NA	100%	
56.....	Internal Parameters	NA	100%	
57.....	Sum	NA	100%	
58.....	Sum_PID	NA	100%	
59.....	Solver Configuration1	NA	100%	
60.....	EVAL_KEY	NA	100%	
61....	Two Wheeled Bike	NA	100%	
62.....	World Frame	NA	100%	
63.....	Solver Configuration	NA	100%	
64.....	EVAL_KEY	NA	100%	

Details

1. Model "SelfBalancingEV_V2"

Child Systems: [ABS control System](#), [Acceleration Limit Tester](#), [Correction Generator](#), [MODES](#), [State of charge, current and voltage monitoring system](#), [Subsystem](#), [System Switch](#), [Thermal Management](#), [Two Wheeled Bike](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	1	36
Decision	NA	52% (33/64) decision outcomes

Execution	NA	96% (152/158) objective outcomes
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Saturate block "Saturation"

Justify or Exclude

Parent: [/SelfBalancingEV_V2](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	2
Decision	50% (2/4) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

input >= lower limit	50%
false	0/2
true	2/2
input > upper limit	50%
false	2/2
true	0/2

Switch block "Switch"

Justify or Exclude

Parent: [/SelfBalancingEV_V2](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

trigger > threshold	50%
false (output is from 3rd input port)	2/2
true (output is from 1st input port)	0/2

Full Coverage

Model Object

Metric

Constant block " Constant "	Execution
Constant block " Constant1 "	Execution
Constant block " Constant2 "	Execution
Constant block " Constant3 "	Execution
Constant block " Constant4 "	Execution
Constant block " Input Acceleration "	Execution
Constant block " ON/OFF "	Execution
Constant block " Switch_Mode(0-4) "	Execution

2. SubSystem block "[ABS control System](#)"

Justify or Exclude

Parent: [/SelfBalancingEV_V2](#)
Child Systems: [relative slip calculator](#), [wheel speed calculator](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (25/25) objective outcomes

Full Coverage

Model Object	Metric
Lookup_n-D block " mu-slip lookup table "	Execution
Gain block " Gain "	Execution
Gain block " Relative Slip "	Execution
Gain block " angular vehicle speed "	Execution
Gain block " normal force "	Execution
Gain block " wheel radius "	Execution
Sum block " Sum "	Execution
Stop block " Stop Simulation "	Execution
Integrator block " ang vehicle speed "	Execution
Integrator block " stopping distance "	Execution

3. SubSystem block "[relative slip calculator](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/ABS control System](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (3/3) objective outcomes

Full Coverage

Model Object	Metric
Product block " Divide "	Execution
Sum block " Sum1 "	Execution
Constant block " Constant "	Execution

4. SubSystem block "[wheel speed calculator](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/ABS control System](#)
Child Systems: [bang-bang controller](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (12/12) objective outcomes

Full Coverage

Model Object	Metric
Gain block " Gain "	Execution
Gain block " force and torque "	Execution
Sum block " Sum1 "	Execution
Integrator block " Integrator Limited "	Execution
Integrator block " braking pressure "	Execution
TransferFcn block " hydraulic lag "	Execution

5. SubSystem block "[bang-bang controller](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/ABS control System/wheel speed calculator](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (6/6) objective outcomes

Full Coverage

Model Object	Metric
DataTypeConversion block " Data Type Conversion "	Execution
DataTypeConversion block " Data Type Conversion1 "	Execution
Sum block " Sum1 "	Execution
RelationalOperator block " GreaterThan "	Execution
RelationalOperator block " Less Than "	Execution
Constant block " Constant "	Execution

6. SubSystem block "[Acceleration Limit Tester](#)"

[Justify or Exclude](#)

Parent: [/SelfBalancingEV_V2](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	1
Decision	NA	50% (1/2) decision outcomes
Execution	NA	100% (2/2) objective outcomes

Switch block "[Switch1](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Accelaration Limit Tester](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

trigger >= threshold	50%
false (output is from 3rd input port)	10534/10534
true (output is from 1st input port)	0/10534

Full Coverage

Model Object	Metric
Constant block " const "	Execution

7. SubSystem block "[Correction Generator](#)"

[Justify or Exclude](#)

Parent: [/SelfBalancingEV_V2](#)
Child Systems: [PID Controller](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (7/7) objective outcomes

Full Coverage

Model Object	Metric
Gain block " rad 2 deg "	Execution
Sum block " Sum "	Execution
Step block " initial disturbance "	Execution

8. SubSystem block "[PID Controller](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Correction Generator](#)
Child Systems: [Integrator](#), [N Gain](#), [Parallel P Gain](#), [Sum](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (4/4) objective outcomes

9. SubSystem block "[Integrator](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Correction Generator/PID Controller](#)
Child Systems: [Continuous](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

10. SubSystem block "[Continuous](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Correction Generator/PID Controller/Integrator](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
Integrator block " Integrator "	Execution

11. SubSystem block "[N Gain](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Correction Generator/PID Controller](#)

Child Systems: [Internal Parameters](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

12. SubSystem block "[Internal Parameters](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Correction Generator/PID Controller/N Gain](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
Gain block " Filter Coefficient "	Execution

13. SubSystem block "[Parallel P Gain](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Correction Generator/PID Controller](#)

Child Systems: [Internal Parameters](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

14. SubSystem block "[Internal Parameters](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Correction Generator/PID Controller/Parallel P Gain](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object

Gain block "[Proportional Gain](#)"

Metric

Execution

15. SubSystem block "[Sum](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Correction Generator/PID Controller](#)

Child Systems: [Sum_PID](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

16. SubSystem block "[Sum_PID](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Correction Generator/PID Controller/Sum](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object

Metric

Sum block "Sum"

Execution

17. SubSystem block "MODES"

Justify or Exclude

Parent: [/SelfBalancingEV_V2](#)

Child Systems: [Bike ON/OFF](#), [ECO_MODE](#), [SPORTS_MODE](#), [Self_Balance](#), [URBAN_MODE](#), [WRONG_INPUT](#)

Uncovered Links:

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	2	8
Decision	50% (1/2) decision outcomes	50% (7/14) decision outcomes
Execution	NA	100% (19/19) objective outcomes

Decisions analyzed

Enable control activated	50%
false	0/1709
true	1709/1709

18. SubSystem block "Bike ON/OFF"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES](#)

Child Systems: [Compare To Zero](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	1
Decision	NA	50% (1/2) decision outcomes
Execution	NA	100% (3/3) objective outcomes

Switch block "Switch"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES/Bike ON/OFF](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
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false (output is from 3rd input port)	1709/1709
true (output is from 1st input port)	0/1709 

Full Coverage

Model Object	Metric
Constant block " Off_speed "	Execution

19. SubSystem block "[Compare To Zero](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/MODES/Bike ON/OFF](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
RelationalOperator block " Compare "	Execution

20. SubSystem block "[ECO_MODE](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/MODES](#)

Child Systems: [Compare To Constant Eco_mode](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	1
Decision	NA	50% (1/2) decision outcomes
Execution	NA	100% (3/3) objective outcomes

Switch block "[Switch1](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/MODES/ECO_MODE](#)

Uncovered Links: 

Metric	Coverage

Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	2/2
true (output is from 1st input port)	0/2 

Full Coverage

Model Object	Metric
Constant block " Eco_mode "	Execution

21. SubSystem block "[Compare To Constant Eco_mode](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES/ECO_MODE](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
RelationalOperator block " Compare "	Execution

22. SubSystem block "[SPORTS_MODE](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES](#)

Child Systems: [Compare To Constant Sports_mode](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	1
Decision	NA	50% (1/2) decision outcomes
Execution	NA	100% (3/3) objective outcomes

Switch block "[Switch3](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES/SPORTS_MODE](#)

Uncovered Links:

Metric **Coverage**

Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	2/2
true (output is from 1st input port)	0/2

Full Coverage

Model Object

Metric

Constant block "[Sports_mode](#)" Execution

23. SubSystem block "[Compare To Constant Sports_mode](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES/SPORTS_MODE](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object

Metric

RelationalOperator block "[Compare](#)" Execution

24. SubSystem block "[Self_Balance](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES](#)

Child Systems: [Compare To Constant Self_balance](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	1

Decision	NA	50% (1/2) decision outcomes
Execution	NA	100% (4/4) objective outcomes

Switch block "[Switch4](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/MODES/Self_Balance](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	0/1709
true (output is from 1st input port)	1709/1709

Full Coverage

Model Object	Metric
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Constant block "[OFF](#)" Execution

Constant block "[ON](#)" Execution

25. SubSystem block "[Compare To Constant Self_balance](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/MODES/Self_Balance](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
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RelationalOperator block "[Compare](#)" Execution

26. SubSystem block "[URBAN_MODE](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES](#)
Child Systems: [Compare To Constant Urban_mode](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	1
Decision	NA	50% (1/2) decision outcomes
Execution	NA	100% (3/3) objective outcomes

Switch block "Switch2"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES/URBAN_MODE](#)
Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	2/2
true (output is from 1st input port)	0/2

Full Coverage

Model Object

Constant block "[Urban_mode](#)"

Metric

Execution

27. SubSystem block "[Compare To Constant Urban_mode](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/MODES/URBAN_MODE](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
RelationalOperator block " Compare "	Execution

28. SubSystem block "[WRONG_INPUT](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/MODES](#)
Child Systems: [Compare To Constant Wrong_input](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	1
Decision	NA	50% (1/2) decision outcomes
Execution	NA	100% (3/3) objective outcomes

Switch block "[Switch5](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/MODES/WRONG_INPUT](#)
Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	2/2
true (output is from 1st input port)	0/2

Full Coverage

Model Object	Metric
Constant block " NULL "	Execution

29. SubSystem block "[Compare To Constant Wrong_input](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/MODES/WRONG_INPUT](#)

Metric	Coverage (this object)	Coverage (inc. descendants)

Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
RelationalOperator block " Compare "	Execution

30. SubSystem block "[State of charge, current and voltage mon...](#)"

[Justify or Exclude](#)

Parent: [/SelfBalancingEV_V2](#)

Child Systems: [Vehicle battery](#), [powergui](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	18
Decision	NA	50% (16/32) decision outcomes
Execution	NA	92% (66/72) objective outcomes

31. SubSystem block "[Vehicle battery](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system](#)

Child Systems: [Current Measurement](#), [Model](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	18
Decision	NA	50% (16/32) decision outcomes
Execution	NA	92% (65/71) objective outcomes

Full Coverage

Model Object	Metric
Constant block " Ta "	Execution

32. SubSystem block "[Current Measurement](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
Gain block " do not delete this gain "	Execution

33. SubSystem block "[Model](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery](#)

Child Systems: [Compare To Zero](#), [Compare To Zero2](#), [E_dyn Charge](#), [Exp](#), [Power loss estimation](#), [Saturation Dynamic](#), [Saturation Dynamic1](#), [Saturation Dynamic2](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	18
Decision	NA	50% (16/32) decision outcomes
Execution	NA	91% (63/69) objective outcomes

Saturate block "[Saturation](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Uncovered Links: 

Metric	Coverage
Cyclomatic Complexity	2
Decision	50% (2/4) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

input >= lower limit	50%
false	0/1709 
true	1709/1709
input > upper limit	50%
false	1709/1709
true	0/1709 

Switch block "[Switch7](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	10534/10534
true (output is from 1st input port)	0/10534

Full Coverage

Model Object	Metric
Fcn block " E_NL "	Execution
Fcn block " E_dyn Discharge "	Execution
Fcn block " Fcn1 "	Execution
Fcn block " Fcn5 "	Execution
Fcn block " Fcn6 "	Execution
Fcn block " Fcn9 "	Execution
DataTypeConversion block " Data Type Conversion1 "	Execution
DataTypeConversion block " Data Type Conversion2 "	Execution
Gain block " Gain "	Execution
Gain block " Gain2 "	Execution
Gain block " R "	Execution
Gain block " R1 "	Execution
Gain block " R2 "	Execution
Gain block " R3 "	Execution
Gain block " R4 "	Execution
Sum block " Add "	Execution

Sum block " Add2 "	Execution
Sum block " Add3 "	Execution
RelationalOperator block " Relational Operator "	Execution
TransferFcn block " BAL "	Execution
Constant block " Constant "	Execution
Constant block " Constant1 "	Execution
Constant block " Constant12 "	Execution
Constant block " Constant9 "	Execution
TransferFcn block " Current filter "	Execution
Integrator block " int(i) "	Execution
Memory block " it init "	Execution
Memory block " it init1 "	Execution

34. SubSystem block "[Compare To Zero](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
RelationalOperator block " Compare "	Execution

35. SubSystem block "[Compare To Zero2](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
RelationalOperator block " Compare "	Execution

36. SubSystem block "[E_dyn Charge](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	3
Decision	NA	25% (1/4) decision outcomes
Execution	NA	57% (8/14) objective outcomes

Fcn block "[Charge Lead-Acid](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/E_dyn Charge](#)

Uncovered Links: 

Metric	Coverage
Cyclomatic Complexity	0
Execution	0% (0/1) objective outcomes

Fcn block "[Charge NiCD](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/E_dyn Charge](#)

Uncovered Links: 

Metric	Coverage
Cyclomatic Complexity	0
Execution	0% (0/1) objective outcomes

Fcn block "[Charge NiMH](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/E_dyn Charge](#)

Uncovered Links: 

Metric	Coverage
Cyclomatic Complexity	0
Execution	0% (0/1) objective outcomes

MultiPortSwitch block "[Multiport Switch1](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/E_dyn_Charge](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	3
Decision	25% (1/4) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

truncated input value	25%
= 1 (output is from input port 1)	0/10534
= 2 (output is from input port 2)	10534/10534
= 3 (output is from input port 3)	0/10534
= *,4 (output is from input port 4)	0/10534

Product block "[Product1](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/E_dyn_Charge](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	0
Execution	0% (0/1) objective outcomes

Product block "[Product2](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/E_dyn_Charge](#)

Uncovered Links:

Metric	Coverage

Cyclomatic Complexity	0
Execution	0% (0/1) objective outcomes

Product block "[Product3](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/E_dyn Charge](#)

Uncovered Links: 

Metric	Coverage
Cyclomatic Complexity	0
Execution	0% (0/1) objective outcomes

Full Coverage

Model Object	Metric
Fcn block " Charge Li-Ion "	Execution
Product block " Product "	Execution
Constant block " Constant "	Execution
Constant block " Constant1 "	Execution
Constant block " Constant2 "	Execution
Constant block " Constant3 "	Execution
Constant block " Constant4 "	Execution

37. SubSystem block "[Exp](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Child Systems: [Compare To Zero2](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	6
Decision	NA	50% (5/10) decision outcomes
Execution	NA	100% (12/12) objective outcomes

MultiPortSwitch block "[Multiport Switch1](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	3
Decision	25% (1/4) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

truncated input value	25%
= 1 (output is from input port 1)	0/10534
= 2 (output is from input port 2)	10534/10534
= 3 (output is from input port 3)	0/10534
= *,4 (output is from input port 4)	0/10534

Saturate block "[Saturation](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2](#)/[State of charge, current and voltage monitoring system](#)/[Vehicle battery](#)/[Model](#)/[Exp](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	2
Decision	50% (2/4) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

input >= lower limit	50%
false	0/1709
true	1709/1709
input > upper limit	50%
false	1709/1709
true	0/1709

Full Coverage

Model Object

Metric

Abs block " Abs "	Decision, Execution
Fcn block " Li-Ion "	Execution
DataTypeConversion block " Data Type Conversion1 "	Execution
Gain block " Gain1 "	Execution
Gain block " Gain4 "	Execution
Product block " Divide "	Execution
Sum block " Add3 "	Execution
Constant block " Constant "	Execution
Integrator block " Integrator2 "	Execution

38. SubSystem block "[Compare To Zero2](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/Exp](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
RelationalOperator block " Compare "	Execution

39. SubSystem block "[Power loss estimation](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (2/2) objective outcomes

Full Coverage

Model Object	Metric
Product block " Product "	Execution

Memory block "[Memory](#)"

Execution

40. SubSystem block "[Saturation Dynamic](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	2
Decision	NA	50% (2/4) decision outcomes
Execution	NA	100% (3/3) objective outcomes

Switch block "[Switch](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/Saturation Dynamic](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	10534/10534
true (output is from 1st input port)	0/10534

Switch block "[Switch2](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/Saturation Dynamic](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
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false (output is from 3rd input port)	10534/10534
true (output is from 1st input port)	0/10534 

Full Coverage

Model Object	Metric
S-Function block " Data Type Propagation "	Execution

41. SubSystem block "[Saturation Dynamic1](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	2
Decision	NA	75% (3/4) decision outcomes
Execution	NA	100% (3/3) objective outcomes

Switch block "[Switch2](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/Saturation Dynamic1](#)

Uncovered Links: 

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	10534/10534
true (output is from 1st input port)	0/10534 

Full Coverage

Model Object	Metric
Switch block " Switch "	Decision, Execution

42. SubSystem block "[Saturation Dynamic2](#)"[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	2
Decision	NA	50% (2/4) decision outcomes
Execution	NA	100% (3/3) objective outcomes

Switch block "[Switch](#)"[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/Saturation Dynamic2](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	10534/10534
true (output is from 1st input port)	0/10534

Switch block "[Switch2](#)"[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/State of charge, current and voltage monitoring system/Vehicle battery/Model/Saturation Dynamic2](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
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false (output is from 3rd input port)	10534/10534
true (output is from 1st input port)	0/10534 

Full Coverage

Model Object	Metric
S-Function block " Data Type Propagation "	Execution

43. SubSystem block "[powergui1](#)"

[Justify or Exclude](#)

Parent:	SelfBalancingEV_V2/State of charge, current and voltage monitoring system
Child Systems:	EquivalentModel1

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

44. SubSystem block "[EquivalentModel1](#)"

[Justify or Exclude](#)

Parent:	SelfBalancingEV_V2/State of charge, current and voltage monitoring system/powergui1
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Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
S-Function block " State-Space "	Execution

45. SubSystem block "[Subsystem](#)"

[Justify or Exclude](#)

Parent:	/SelfBalancingEV_V2
Child Systems:	Compare To Constant2, Compare To Constant4

Metric	Coverage (this object)	Coverage (inc. descendants)
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Cyclomatic Complexity	0	4
Decision	NA	50% (4/8) decision outcomes
Execution	NA	100% (8/8) objective outcomes

Saturate block "[Saturation](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Subsystem](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	2
Decision	50% (2/4) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

input >= lower limit	50%
false	0/2
true	2/2
input > upper limit	50%
false	2/2
true	0/2

Switch block "[Switch1](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Subsystem](#)

Uncovered Links:

Metric	Coverage
Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	0/2
true (output is from 1st input port)	2/2

Switch block "[Switch3](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Subsystem](#)

Uncovered Links: 

Metric **Coverage**

Cyclomatic Complexity	1
Decision	50% (1/2) decision outcomes
Execution	100% (1/1) objective outcomes

Decisions analyzed

logical trigger input	50%
false (output is from 3rd input port)	2/2
true (output is from 1st input port)	0/2 

Full Coverage

Model Object

Metric

Constant block " Constant "	Execution
Constant block " High Speed "	Execution
Constant block " Right Indicator "	Execution

46. SubSystem block "[Compare To Constant2](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Subsystem](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object

Metric

RelationalOperator block " Compare "	Execution
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47. SubSystem block "[Compare To Constant4](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Subsystem](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
RelationalOperator block " Compare "	Execution

48. SubSystem block "[System Switch](#)"

Justify or Exclude

Parent: [/SelfBalancingEV_V2](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	1
Decision	NA	100% (2/2) decision outcomes
Execution	NA	100% (3/3) objective outcomes

Full Coverage

Model Object	Metric
Switch block " System Status ON/OFF "	Decision, Execution
Constant block " Constant "	Execution
Constant block " Constant1 "	Execution

49. SubSystem block "[Thermal Management](#)"

Justify or Exclude

Parent: [/SelfBalancingEV_V2](#)

Child Systems: [PID Controller](#), [Solver Configuration1](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (8/8) objective outcomes

Full Coverage

Model Object	Metric
Sum block " Sum "	Execution

50. SubSystem block "[PID Controller](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Thermal Management](#)

Child Systems: [Integrator](#), [N Gain](#), [Parallel P Gain](#), [Sum](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (4/4) objective outcomes

51. SubSystem block "[Integrator](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Thermal Management/PID Controller](#)

Child Systems: [Continuous](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

52. SubSystem block "[Continuous](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Thermal Management/PID Controller/Integrator](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object

Integrator block "[Integrator](#)"

Metric

Execution

53. SubSystem block "[N Gain](#)"

[Justify or Exclude](#)

Parent: [SelfBalancingEV_V2/Thermal Management/PID Controller](#)

Child Systems: [Internal Parameters](#)

Metric	Coverage (this object)	Coverage (inc. descendants)

Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

54. SubSystem block "[Internal Parameters](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Thermal Management/PID Controller/N Gain](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
Gain block " Filter Coefficient "	Execution

55. SubSystem block "[Parallel P Gain](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Thermal Management/PID Controller](#)

Child Systems: [Internal Parameters](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

56. SubSystem block "[Internal Parameters](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Thermal Management/PID Controller/Parallel P Gain](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
Gain block " Proportional Gain "	Execution

57. SubSystem block "Sum"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Thermal Management/PID Controller](#)

Child Systems: [Sum_PID](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

58. SubSystem block "Sum_PID"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Thermal Management/PID Controller/Sum](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (1/1) objective outcomes

Full Coverage

Model Object	Metric
Sum block " Sum "	Execution

59. SubSystem block "Solver Configuration1"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Thermal Management](#)

Child Systems: [EVAL_KEY](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (3/3) objective outcomes

60. SubSystem block "EVAL_KEY"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Thermal Management/Solver Configuration1](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (3/3) objective outcomes

Full Coverage

Model Object	Metric
SimscapeInputBlock block " INPUT_1_1_1 "	Execution
SimscapeLtiOutput block " LTI_OUTPUT_1_1 "	Execution
SimscapeLtiState block " LTI_STATE_1 "	Execution

61. SubSystem block "[Two Wheeled Bike](#)"

Justify or Exclude

Parent: [/SelfBalancingEV_V2](#)
Child Systems: [World Frame](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (4/4) objective outcomes

62. SubSystem block "[World Frame](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Two Wheeled Bike](#)
Child Systems: [Solver Configuration](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (4/4) objective outcomes

63. SubSystem block "[Solver Configuration](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Two Wheeled Bike/World Frame](#)
Child Systems: [EVAL_KEY](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (4/4) objective outcomes

64. SubSystem block "[EVAL_KEY](#)"

Justify or Exclude

Parent: [SelfBalancingEV_V2/Two Wheeled Bike/World Frame/Solver Configuration](#)

Metric	Coverage (this object)	Coverage (inc. descendants)
Cyclomatic Complexity	0	0
Execution	NA	100% (4/4) objective outcomes

Full Coverage

Model Object	Metric
SimscapeInputBlock block " INPUT_1_1_1 "	Execution
SimscapeExecutionBlock block " OUTPUT_1_0 "	Execution
SimscapeSinkBlock block " SINK_1 "	Execution
SimscapeExecutionBlock block " STATE_1 "	Execution