

Report Generated by Test Manager

Title: AHRS_voter REQ-Based Tests

Author:






Date: 13-May-2020 13:38:05

Test Environment

Platform: PCWIN64

MATLAB: (R2019b)


Summary

Name	Outcome	Duration (Seconds)
Results: 2020-May-13 13:37:41	3✔	18.095
 AHRS_voter_REQ_Based_Test	3✔	18.095
 AHRS Voting Test Suite	3✔	18.096
 Mid Value Voting Test Case	✔	10.8
 Average Value Voting Test Case	✔	3.426
 Single Value Voting Test Case	✔	3.76

Results: 2020-May-13 13:37:41

Result Type: Result Set
Parent: None
Start Time: 13-May-2020 13:37:42
End Time: 13-May-2020 13:38:00
Outcome: Total: 3, **Passed: 3**

Aggregated Coverage Results

Analyzed Model	Sim Mode	Complexity	Decision	Execution
 AHRS voter	Normal	38	97%	100%

[Back to Report Summary](#)

AHRS_voter_REQ_Based_Test

Test Result Information

Result Type: Test File Result
Parent: [Results: 2020-May-13 13:37:41](#)
Start Time: 13-May-2020 13:37:42
End Time: 13-May-2020 13:38:00
Outcome: Total: 3, **Passed: 3**
Description:

Checksum when compiled as referenced model: 274277033 2770558437
1049845676 2563622565

Checksum when compiled as top model: 1951542874 3450456451 46553782
3275149564

Test Suite Information

Name: AHRS_voter_REQ_Based_Test

[Back to Report Summary](#)

AHRS Voting Test Suite

Test Result Information

Result Type: Test Suite Result
Parent: [AHRS_voter_REQ_Based_Test](#)
Start Time: 13-May-2020 13:37:42
End Time: 13-May-2020 13:38:00

Outcome: Total: 3, **Passed: 3**

Test Suite Information

Name: AHRS Voting Test Suite

[Back to Report Summary](#)

Mid Value Voting Test Case

Test Result Information

Result Type: Test Case Result
Parent: [AHRS Voting Test Suite](#)
Start Time: 13-May-2020 13:37:42
End Time: 13-May-2020 13:37:52
Outcome: **Passed**
Description:

Test the mid value voting algorithm with three valid AHRS.

Test Case Information

Name: Mid Value Voting Test Case
Type: Simulation Test

Test Case Requirements

Description: HLR_11: AHRS Voting for Triple Sensors (HelicopterSoftwareRequirements#15)
Document: HelicopterSoftwareRequirements.slreqx
Description: HLR_9 : AHRS Validity Check (HelicopterSoftwareRequirements#13)
Document: HelicopterSoftwareRequirements.slreqx

Verify Result

Name	
✓	Test Sequence/step_1.verify(abs(voted_fb(1))<Tol)
✓	Test Sequence/step_1.verify(abs(voted_fb(2))<Tol)
✓	Test Sequence/step_1.verify(abs(voted_fb(3))<Tol)
✓	Test Sequence/step_1.verify(abs(voted_fb(4))<Tol)
✓	Test Sequence/step_1.verify(abs(voted_fb(5))<Tol)
✓	Test Sequence/step_3.verify((voted_fb(1)-AHRS1.theta)<Tol)
✓	Test Sequence/step_3.verify((voted_fb(2)-AHRS2.phi)<Tol)

✓	Test Sequence/step_3:verify((voted_fb(3)-AHR3.r)<Tol)
✓	Test Sequence/step_3:verify((voted_fb(4)-AHR3.q)<Tol)
✓	Test Sequence/step_3:verify((voted_fb(5)-AHR1.p)<Tol)
✓	Test Sequence/step_5:verify((voted_fb(1)-AHR2.theta)<Tol)
✓	Test Sequence/step_5:verify((voted_fb(2)-AHR1.phi)<Tol)
✓	Test Sequence/step_5:verify((voted_fb(3)-AHR2.r)<Tol)
✓	Test Sequence/step_5:verify((voted_fb(4)-AHR2.q)<Tol)
✓	Test Sequence/step_5:verify((voted_fb(5)-AHR3.p)<Tol)
✓	Test Sequence/step_7:verify((voted_fb(1)-AHR3.theta)<Tol)
✓	Test Sequence/step_7:verify((voted_fb(2)-AHR3.phi)<Tol)
✓	Test Sequence/step_7:verify((voted_fb(3)-AHR1.r)<Tol)
✓	Test Sequence/step_7:verify((voted_fb(4)-AHR1.q)<Tol)
✓	Test Sequence/step_7:verify((voted_fb(5)-AHR2.p)<Tol)

Simulation

System Under Test Information

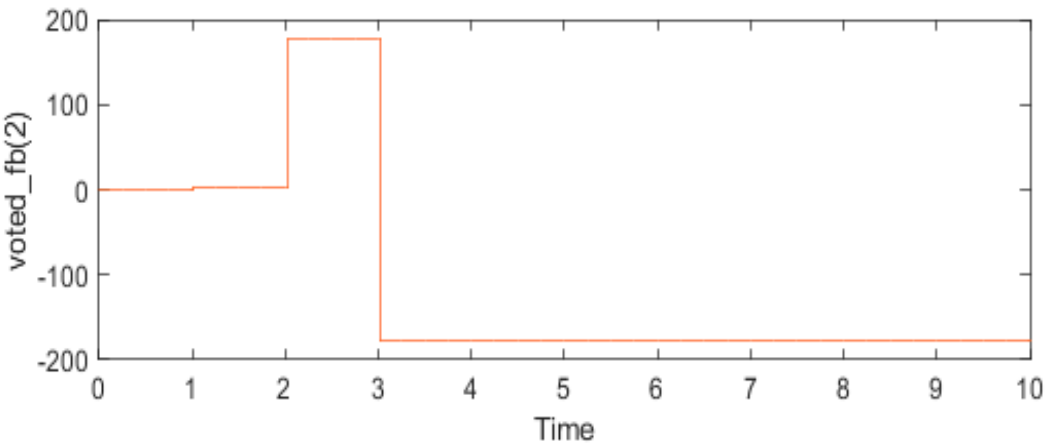
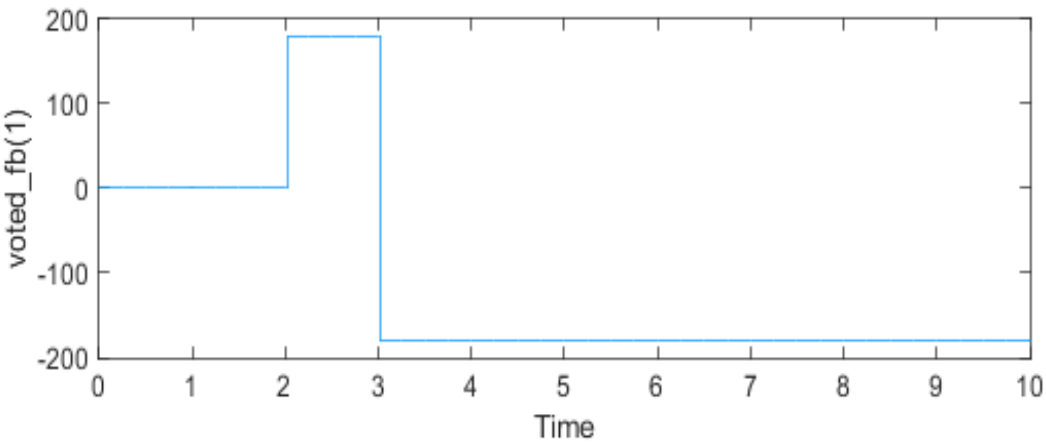
Model:	AHRS_voter
Harness:	AHRS_voter_Harness_triple_sensor
Harness Owner:	AHRS_voter
Simulation Mode:	normal
Override SIL or PIL Mod 0	
e:	
Configuration Set:	Configuration1
Start Time:	0
Stop Time:	10
Checksum:	231701358 1698728558 2339496506 15998729
Simulink Version:	10.0
Model Version:	1.7
Model Author:	bpotter
Date:	Wed May 13 13:30:04 2020
User ID:	bpotter
Model Path:	C:\Users\bpotter\MATLAB\Projects\ARP_DO_Proje ct\DO_03_Design\AHRS_voter\specification\AHRS_ voter_Harness_triple_sensor.slx
Machine Name:	AH-BPOTTER
Solver Name:	FixedStepDiscrete
Solver Type:	Fixed-Step
Fixed Step Size:	0.01

Simulation Start Time: 2020-05-13 13:37:44
Simulation Stop Time: 2020-05-13 13:37:50
Platform: PCWIN64

Simulation Output

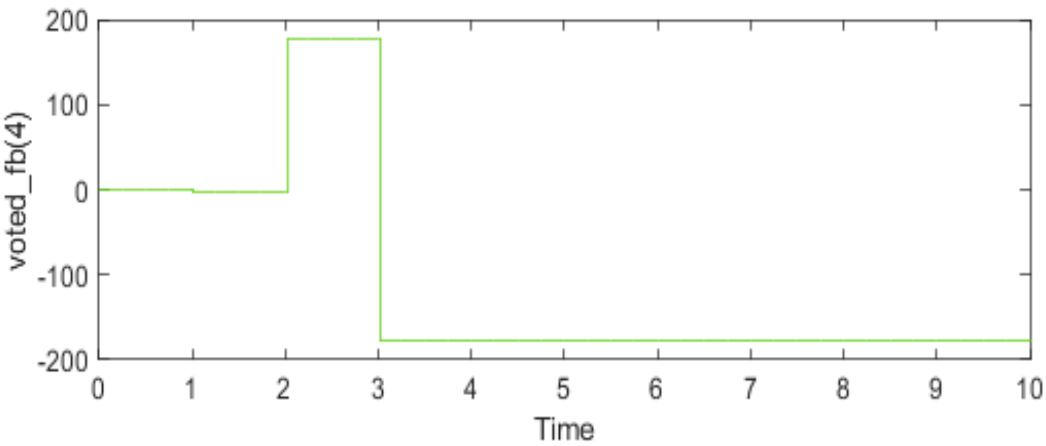
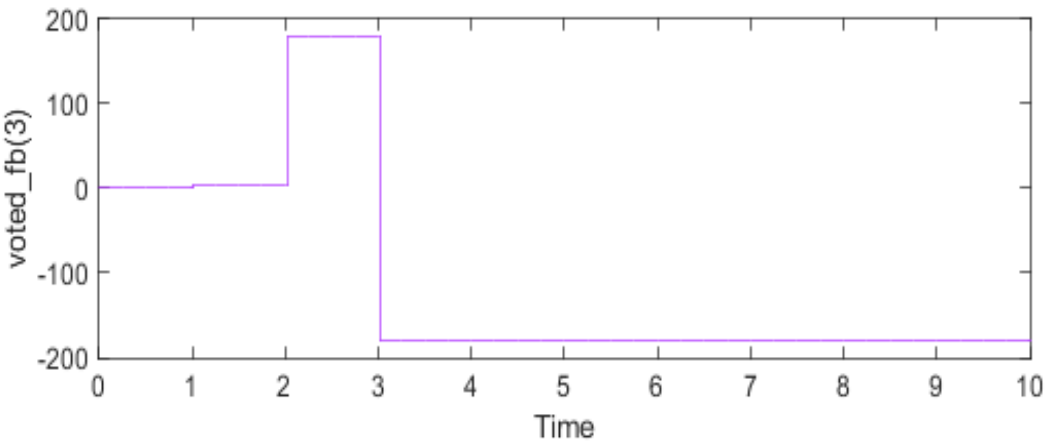
Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
voted_fb(1)	double		0.01	zoh	union	Link
voted_fb(2)	double		0.01	zoh	union	Link
voted_fb(3)	double		0.01	zoh	union	Link
voted_fb(4)	double		0.01	zoh	union	Link
voted_fb(5)	double		0.01	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
voted_fb(1)	double		0.01	zoh	union
voted_fb(2)	double		0.01	zoh	union



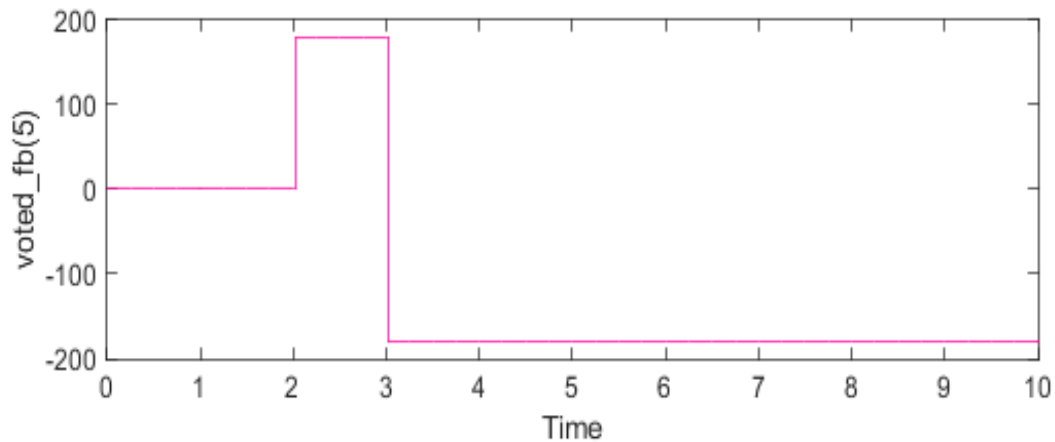
[Back to Report Summary](#)[Back to Signal Summary](#)

Name	Data Type	Units	Sample Time	Interp	Sync
voted_fb(3)	double		0.01	zoh	union
voted_fb(4)	double		0.01	zoh	union



[Back to Report Summary](#)[Back to Signal Summary](#)

Name	Data Type	Units	Sample Time	Interp	Sync
voted_fb(5)	double		0.01	zoh	union



[Back to Report Summary](#)[Back to Signal Summary](#)

Average Value Voting Test Case

Test Result Information

Result Type: Test Case Result
 Parent: [AHRS Voting Test Suite](#)
 Start Time: 13-May-2020 13:37:53
 End Time: 13-May-2020 13:37:56

Outcome: **Passed**

Description:

Test the average value voting algorithm with two valid AHRS.

Test Case Information

Name: Average Value Voting Test Case

Type: Simulation Test

Test Case Requirements

Description: HLR_12: AHRS Voting for Dual Sensors (HelicopterSoftwareRequirements#16)

Document: HelicopterSoftwareRequirements.slreqx

Description: HLR_9 : AHRS Validity Check (HelicopterSoftwareRequirements#13)

Document: HelicopterSoftwareRequirements.slreqx

Verify Result

Name	
✓	Test Sequence/step_1.verify(abs(voted_fb(1)-(AHRS1.theta+AHRS2.theta)/2)<Tol)
✓	Test Sequence/step_1.verify(abs(voted_fb(2)-(AHRS1.phi+AHRS2.phi)/2)<Tol)
✓	Test Sequence/step_1.verify(abs(voted_fb(3)-(AHRS1.r+AHRS2.r)/2)<Tol)
✓	Test Sequence/step_1.verify(abs(voted_fb(4)-(AHRS1.q+AHRS2.q)/2)<Tol)
✓	Test Sequence/step_1.verify(abs(voted_fb(5)-(AHRS1.p+AHRS2.p)/2)<Tol)
✓	Test Sequence/step_3.verify(abs(voted_fb(1)-(AHRS1.theta+AHRS3.theta)/2)<Tol)
✓	Test Sequence/step_3.verify(abs(voted_fb(2)-(AHRS1.phi+AHRS3.phi)/2)<Tol)
✓	Test Sequence/step_3.verify(abs(voted_fb(3)-(AHRS1.r+AHRS3.r)/2)<Tol)
✓	Test Sequence/step_3.verify(abs(voted_fb(4)-(AHRS1.q+AHRS3.q)/2)<Tol)
✓	Test Sequence/step_3.verify(abs(voted_fb(5)-(AHRS1.p+AHRS3.p)/2)<Tol)
✓	Test Sequence/step_5.verify(abs(voted_fb(1)-(AHRS3.theta+AHRS2.theta)/2)<Tol)
✓	Test Sequence/step_5.verify(abs(voted_fb(2)-(AHRS3.phi+AHRS2.phi)/2)<Tol)
✓	Test Sequence/step_5.verify(abs(voted_fb(3)-(AHRS3.r+AHRS2.r)/2)<Tol)
✓	Test Sequence/step_5.verify(abs(voted_fb(4)-(AHRS3.q+AHRS2.q)/2)<Tol)
✓	Test Sequence/step_5.verify(abs(voted_fb(5)-(AHRS3.p+AHRS2.p)/2)<Tol)

Simulation

System Under Test Information

Model: AHRS_voter

Harness: AHRS_voter_Harness_dual_sensor

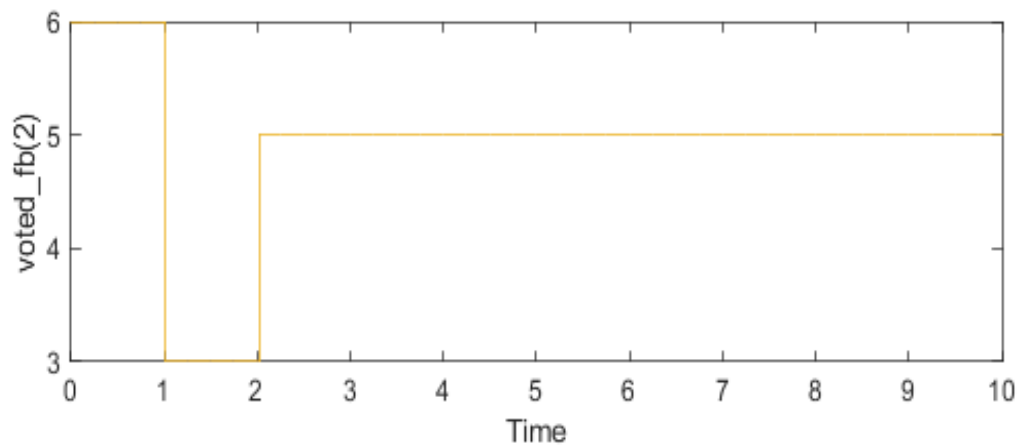
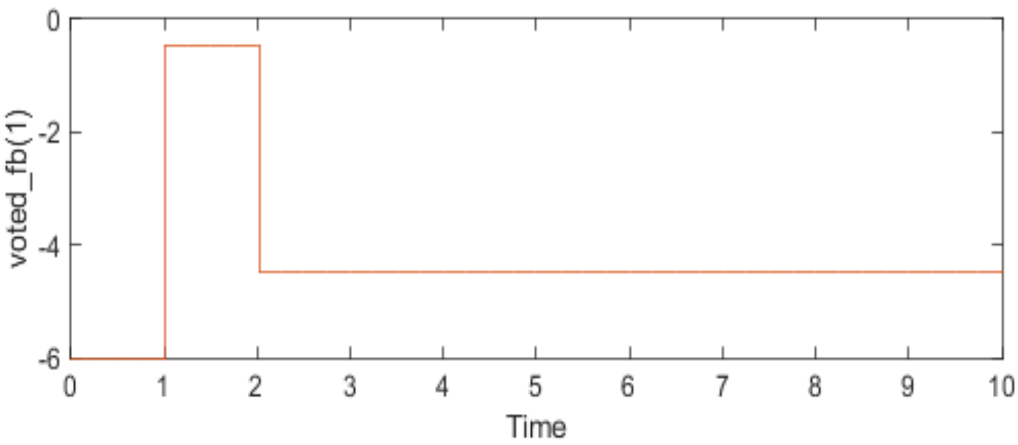
Harness Owner: AHRS_voter
 Simulation Mode: normal
 Override SIL or PIL Mode:
 e:
 Configuration Set: Configuration1
 Start Time: 0
 Stop Time: 10
 Checksum: 1703446638 1188228208 2213404036 899697831
 Simulink Version: 10.0
 Model Version: 1.4
 Model Author: bpotter
 Date: Wed May 13 13:30:04 2020
 User ID: bpotter
 Model Path: C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_03_Design\AHRS_voter\specification\AHRS_voter_Harness_dual_sensor.slx

 Machine Name: AH-BPOTTER
 Solver Name: FixedStepDiscrete
 Solver Type: Fixed-Step
 Fixed Step Size: 0.01
 Simulation Start Time: 2020-05-13 13:37:53
 Simulation Stop Time: 2020-05-13 13:37:56
 Platform: PCWIN64

Simulation Output

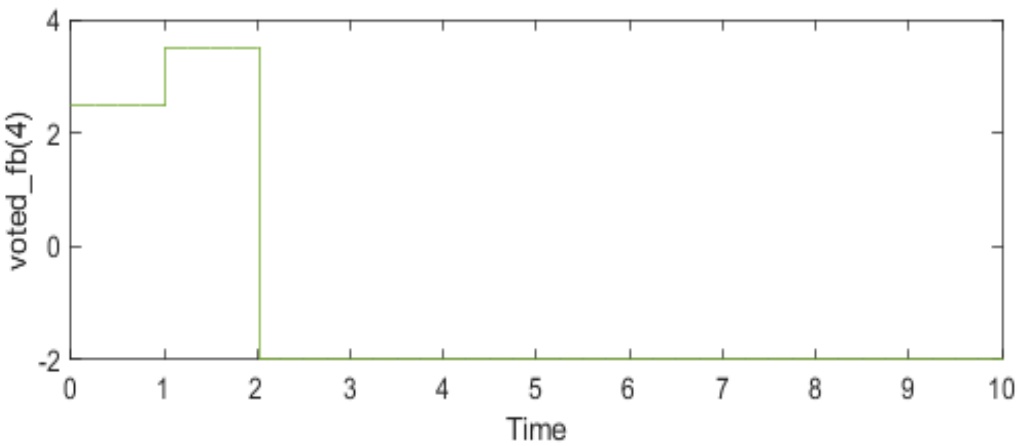
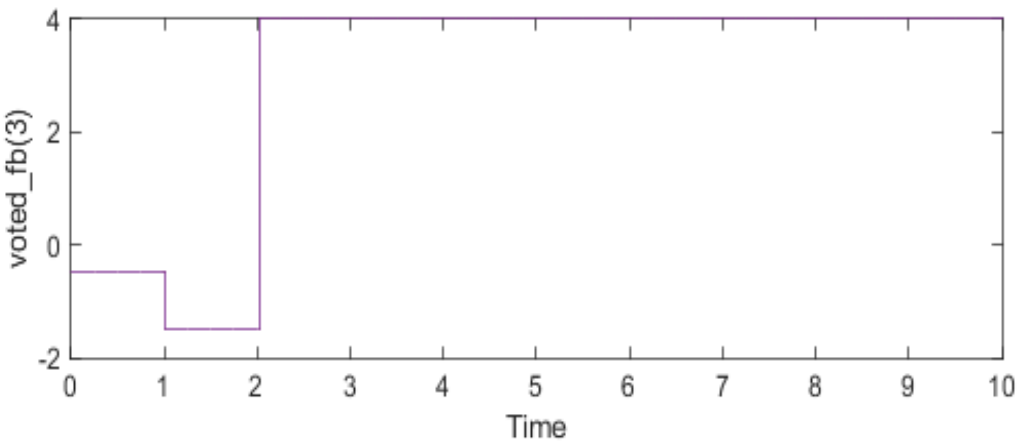
Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
voted_fb(1)	double		0.01	zoh	union	Link
voted_fb(2)	double		0.01	zoh	union	Link
voted_fb(3)	double		0.01	zoh	union	Link
voted_fb(4)	double		0.01	zoh	union	Link
voted_fb(5)	double		0.01	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
voted_fb(1)	double		0.01	zoh	union
voted_fb(2)	double		0.01	zoh	union



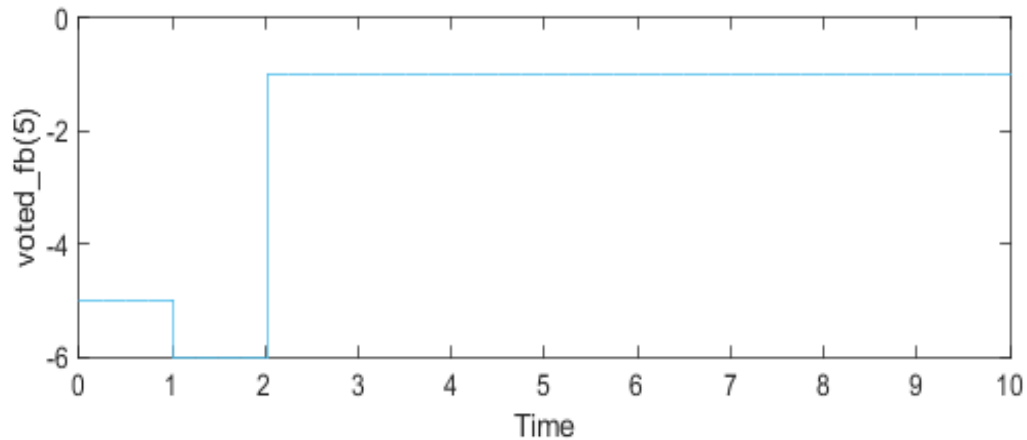
[Back to Report Summary](#)[Back to Signal Summary](#)

Name	Data Type	Units	Sample Time	Interp	Sync
voted_fb(3)	double		0.01	zoh	union
voted_fb(4)	double		0.01	zoh	union



[Back to Report Summary](#)[Back to Signal Summary](#)

Name	Data Type	Units	Sample Time	Interp	Sync
voted_fb(5)	double		0.01	zoh	union



[Back to Report Summary](#)[Back to Signal Summary](#)

Single Value Voting Test Case

Test Result Information

Result Type: Test Case Result
 Parent: [AHRS Voting Test Suite](#)
 Start Time: 13-May-2020 13:37:56
 End Time: 13-May-2020 13:38:00

Outcome: **Passed**

Description:

Test the single value voting algorithm with one valid AHRS.

Test Case Information

Name: Single Value Voting Test Case

Type: Simulation Test

Test Case Requirements

Description: HLR_13: AHRS Usage of Single Sensor (HelicopterSoftwareRequirements#17)

Document: HelicopterSoftwareRequirements.slreqx

Description: HLR_9 : AHRS Validity Check (HelicopterSoftwareRequirements#13)

Document: HelicopterSoftwareRequirements.slreqx

Verify Result

Name	
✓	Test Sequence/step_1:verify(abs(voted_fb(1)-AHRS1.theta)<Tol)
✓	Test Sequence/step_1:verify(abs(voted_fb(2)-AHRS1.phi)<Tol)
✓	Test Sequence/step_1:verify(abs(voted_fb(3)-AHRS1.r)<Tol)
✓	Test Sequence/step_1:verify(abs(voted_fb(4)-AHRS1.q)<Tol)
✓	Test Sequence/step_1:verify(abs(voted_fb(5)-AHRS1.p)<Tol)
✓	Test Sequence/step_3:verify(abs(voted_fb(1)-AHRS2.theta)<Tol)
✓	Test Sequence/step_3:verify(abs(voted_fb(2)-AHRS2.phi)<Tol)
✓	Test Sequence/step_3:verify(abs(voted_fb(3)-AHRS2.r)<Tol)
✓	Test Sequence/step_3:verify(abs(voted_fb(4)-AHRS2.q)<Tol)
✓	Test Sequence/step_3:verify(abs(voted_fb(5)-AHRS2.p)<Tol)
✓	Test Sequence/step_5:verify(abs(voted_fb(1)-AHRS3.theta)<Tol)
✓	Test Sequence/step_5:verify(abs(voted_fb(2)-AHRS3.phi)<Tol)
✓	Test Sequence/step_5:verify(abs(voted_fb(3)-AHRS3.r)<Tol)
✓	Test Sequence/step_5:verify(abs(voted_fb(4)-AHRS3.q)<Tol)
✓	Test Sequence/step_5:verify(abs(voted_fb(5)-AHRS3.p)<Tol)

Simulation

System Under Test Information

Model: AHRS_voter

Harness: AHRS_voter_Harness_single_sensor

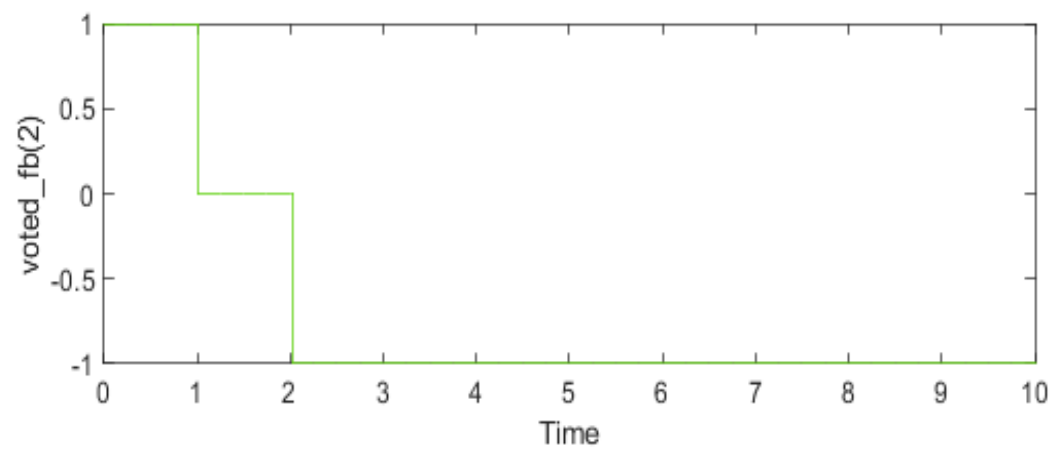
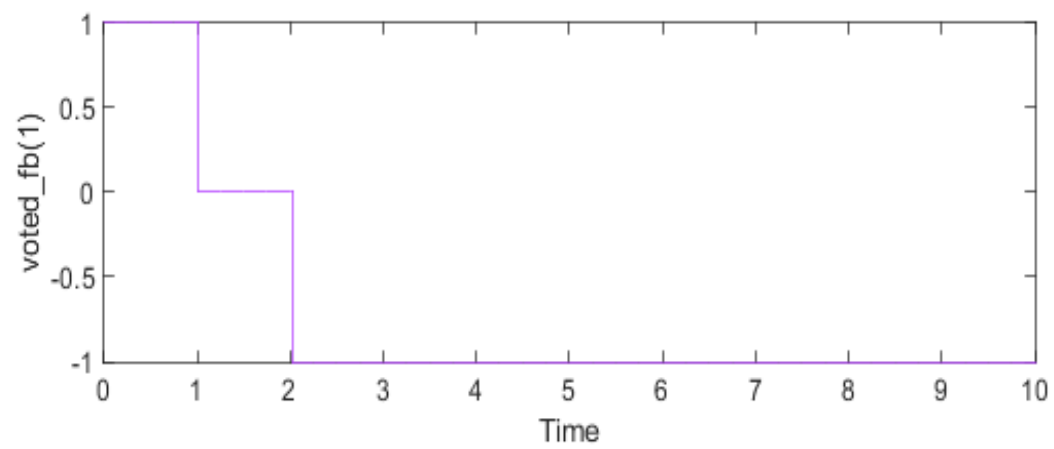
Harness Owner: AHRS_voter
 Simulation Mode: normal
 Override SIL or PIL Mode:
 e:
 Configuration Set: Configuration1
 Start Time: 0
 Stop Time: 10
 Checksum: 574558904 1918968225 650566932 2452243834
 Simulink Version: 10.0
 Model Version: 1.6
 Model Author: bpotter
 Date: Wed May 13 13:30:04 2020
 User ID: bpotter
 Model Path: C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_03_Design\AHRS_voter\specification\AHRS_voter_Harness_single_sensor.slx

 Machine Name: AH-BPOTTER
 Solver Name: FixedStepDiscrete
 Solver Type: Fixed-Step
 Fixed Step Size: 0.01
 Simulation Start Time: 2020-05-13 13:37:57
 Simulation Stop Time: 2020-05-13 13:37:59
 Platform: PCWIN64

Simulation Output

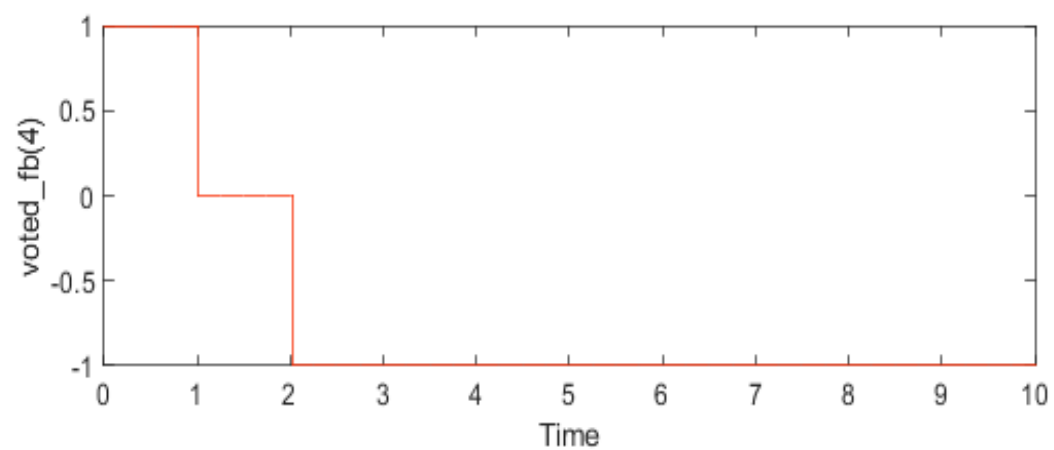
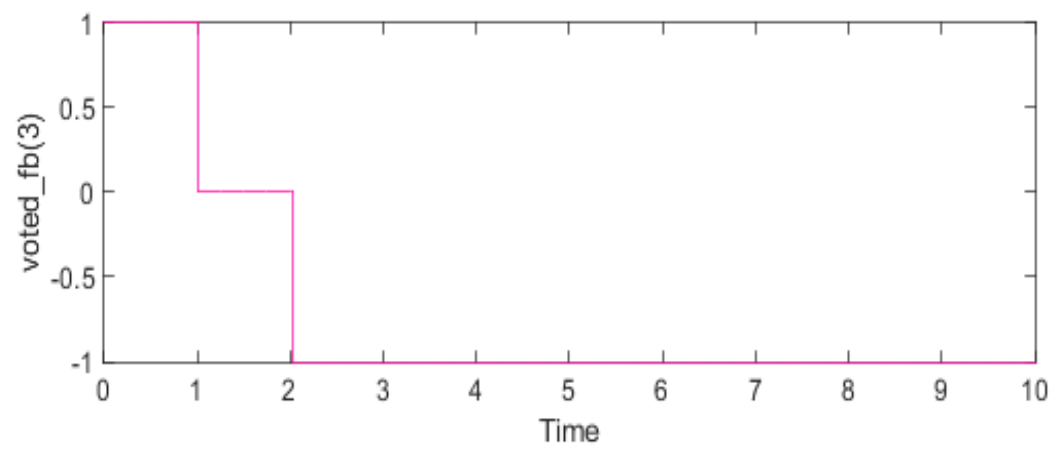
Name	Data Type	Units	Sample Time	Interp	Sync	Link to Plot
voted_fb(1)	double		0.01	zoh	union	Link
voted_fb(2)	double		0.01	zoh	union	Link
voted_fb(3)	double		0.01	zoh	union	Link
voted_fb(4)	double		0.01	zoh	union	Link
voted_fb(5)	double		0.01	zoh	union	Link

Name	Data Type	Units	Sample Time	Interp	Sync
voted_fb(1)	double		0.01	zoh	union
voted_fb(2)	double		0.01	zoh	union



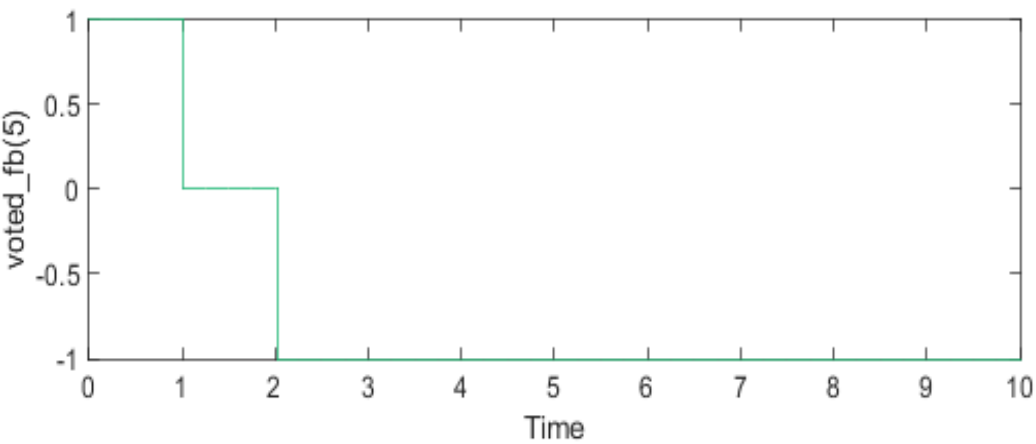
[Back to Report Summary](#)[Back to Signal Summary](#)

Name	Data Type	Units	Sample Time	Interp	Sync
voted_fb(3)	double		0.01	zoh	union
voted_fb(4)	double		0.01	zoh	union



[Back to Report Summary](#)[Back to Signal Summary](#)

Name	Data Type	Units	Sample Time	Interp	Sync
voted_fb(5)	double		0.01	zoh	union



[Back to Report Summary](#)[Back to Signal Summary](#)
