HelicopterSoftwareRequirements Requirements Report

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Chapter 1: Requirement Set: HelicopterSoftwareRequirements

Description

Attributes

Filepath	C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_02_Requirements\specification\HelicopterSoftwareRequirements.slreqx
Revision	11
Created by	bpotter
Created on	29-Sep-2017 12:55:07
Modified by	bpotter
Modified on	14-Dec-2018 07:33:19

Implementation Status

Total	Implemented	Justified	None
13	13	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
13	0	0	0	4	9

Change Information No change issue detected.

1 Imported from HelicopterSoftwareRequirements.docx

Requirement Type Container

ID HelicopterSoftwareRequirements

Description

Revision Information

SID	1	**Revision**	10
Created by	bpotter	**Created on**	29-Sep-2017 12:55:25
Modified by	bpotter	**Modified on**	10-Dec-2018 07:43:34

Change Information No change issue detected.

Implementation Status

Total	Implemented	Justified	None
13	13	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
13	0	0	0	4	9

1.1 Introduction

Requirement Type Informational

ID Introduction

Description

This document provides the high level software requirements for a helicopter flight control system that provides attitude and attitude rate control based on pilot input commands.

Revision Information

SID	2	**Revision**	11
Created by	bpotter	**Created on**	29-Sep-2017 12:55:25
Modified by	bpotter	**Modified on**	14-Dec-2018 07:31:15

Change Information No change issue detected.

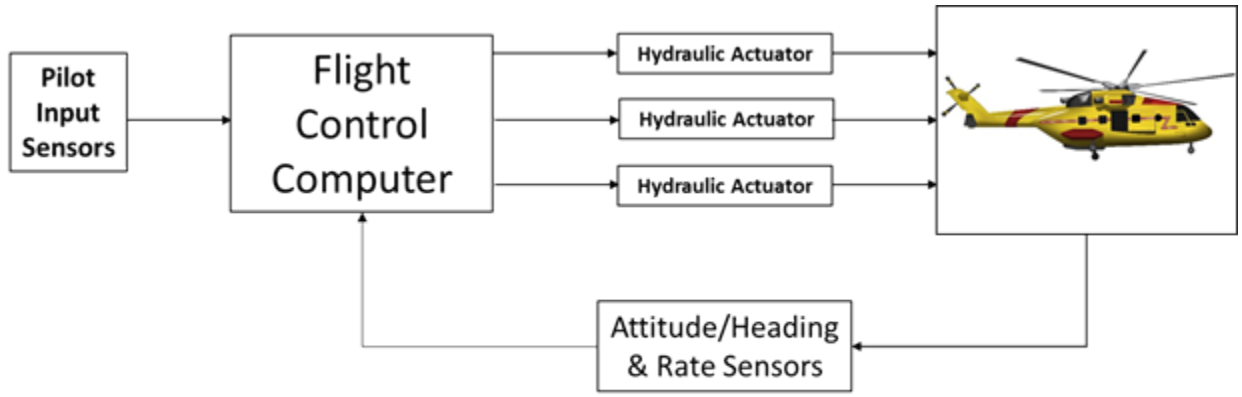
1.2 System Description

Requirement Type Informational

ID System Description

Description

The flight control system consists of pilot input controls, cyclic and pedals, a flight control computer and hydraulic actuators to control the main and tail rotors. A diagram of the system is shown in the figure below.



Helicopter Control System

The cyclic controls the pitch of the rotor blades to allow the helicopter pitch up or down and roll right or left. The pedal input controls the tail rotor to allow the helicopter to yaw right or left. This control system does not include throttle control or collective control, which combined control the total lift of the helicopter.
This document defines the high-level software requirements for the Flight Control Computer.

Revision Information

SID	3	**Revision**	10
Created by	bpotter	**Created on**	29-Sep-2017 12:55:25
Modified by	bpotter	**Modified on**	10-Dec-2018 07:42:50

Change Information No change issue detected.

1.3 High-Level Software Requirements

Requirement Type Container

ID High-Level Software Requirements

Description

This section provides the high level requirements for the flight control computer software. Each requirement is tagged with HLR_ and a unique number for the purposes of providing trace anchors for the software design and software verification cases to trace to. Each requirement is also put into a subsection of this section.

Revision Information

SID	4	**Revision**	11
Created by	bpotter	**Created on**	29-Sep-2017 12:55:25
Modified by	bpotter	**Modified on**	14-Dec-2018 07:29:07

Change Information No change issue detected.

Implementation Status

Total	Implemented	Justified	None
13	13	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
13	0	0	0	4	9

1.3.1 Pilot Input Signal Processing

Requirement Type Functional

ID HLR_1

Description

The flight control computer hardware processes three LVDT inputs from the pilot cockpit controls, including fore/aft cyclic position, left/right cyclic position and pedal left/right position. The hardware provides a 16 bit signed integer input to the software for each of the LVDT positions.
The characteristics of the LVDT inputs to the software are defined in the following table along with the desired command of the system.

Signal	LVDT Input Sign	LVDT Input Range	Software Input Range	Pilot Command Scaling
Fore/aft cyclic	Aft = +	+/- 2 inches	-32768 to +32767	15 deg/inch
Left/right cyclic	Right = +	+/- 2 inches	-32768 to +32767	15 deg/inch
Left/right pedal	Right = +	+/- 3 inches	-32768 to +32767	5 deg/sec/inch

Revision Information

SID	5	**Revision**	4
Created by	bpotter	**Created on**	29-Sep-2017 12:55:25
Modified by	bpotter	**Modified on**	04-Oct-2017 14:20:59

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

SR_1 Pilot Input Signals (⇒Refines)

Artifact FCC.slx

FCC:13 (⇐Implemented by)

FCC:15 (⇐Implemented by)

FCC:17 (⇐Implemented by)

Artifact Heli_outer_loop.slx

Heli_outer_loop:1 (⇐Implemented by)

Heli_outer_loop:5 (⇐Implemented by)

Heli_outer_loop:6 (⇐Implemented by)

Heli_outer_loop:34 (⇐Implemented by)

Heli_outer_loop:31 (⇐Implemented by)

- Heli_outer_loop:35 (⇦Implemented by)
- Heli_outer_loop:32 (⇦Implemented by)
- Heli_outer_loop:36 (⇦Implemented by)
- Heli_outer_loop:33 (⇦Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	0	1

1.3.2 Hydraulic Actuator Feedback

Requirement Type Functional

ID HLR_2

Description

The flight control computer hardware processes three LVDT inputs from the hydraulic actuators, including fore/aft main rotor control, left/right main rotor control and left/right tail rotor control. The hardware provides a 16 bit signed integer input to the software for each of the LVDT positions.
The characteristics of the LVDT inputs to the software are defined in the following table along with the desired command of the system.

Signal	LVDT Input Sign	LVDT Input Range	Software Input Range
Fore/aft main rotor feedback	Aft = +	+/- 0.1 meter	-32768 to +32767
Left/right main rotor feedback	Right = +	+/- 0.1 meter	-32768 to +32767
Left/right tail rotor feedback	Right = +	+/- 0.1 meter	-32768 to +32767

Revision Information

SID	6	Revision	4
Created by	bpotter	Created on	29-Sep-2017 12:55:25
Modified by	bpotter	Modified on	04-Oct-2017 14:21:13

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

- SR_2 Hydraulic Actuator Interfaces (⇒Refines)
- SR_3 Hydraulic Actuator Signals (⇒Refines)

Artifact ActuatorLoop.slx

- ActuatorLoop:1 (⇐Implemented by)
- ActuatorLoop:14 (⇐Implemented by)
- ActuatorLoop:13 (⇐Implemented by)

Artifact FCC.slx

- FCC:1 (⇐Implemented by)
- FCC:8 (⇐Implemented by)
- FCC:9 (⇐Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	0	1

1.3.3 Hydraulic Actuator Drive

Requirement Type Functional

ID HLR_3

Description

The flight control computer software shall drive three electrohydraulic valve (EHV) outputs, one to each of the hydraulic actuators. The software provides a 16 bit signed integer input to the hardware for each of the electrohydraulic valve commands.

The characteristics of the EHV commands to the hardware are defined in the following table along with the desired command of the system.

Signal	EHV Input Sign	EHV Input Range	Software Output Range
Fore/aft main rotor command	Aft = +	+/- 0.1 meter	-32768 to +32767
Left/right main rotor command	Right = +	+/- 0.1 meter	-32768 to +32767
Left/right tail	Right = +	+/- 0.1 meter	-32768 to +32767

rotor command			

Revision Information

SID	7	**Revision**	4
Created by	bpotter	**Created on**	29-Sep-2017 12:55:26
Modified by	bpotter	**Modified on**	04-Oct-2017 14:21:47

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

- SR_2 Hydraulic Actuator Interfaces (⇨Refines)
- SR_3 Hydraulic Actuator Signals (⇨Refines)

Artifact ActuatorLoop.slx

- ActuatorLoop:3 (⇦Implemented by)
- ActuatorLoop:15 (⇦Implemented by)
- ActuatorLoop:16 (⇦Implemented by)

Artifact FCC.slx

- FCC:2 (⇦Implemented by)
- FCC:5 (⇦Implemented by)
- FCC:7 (⇦Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	0	1

1.3.4 Hydraulic Actuator Loop Control

Requirement Type Functional

ID HLR_4

Description

Each hydraulic actuator loop shall be implemented as a proportional/ integral/derivative (PID) control loop operating at 1 millisecond frame rate.

The proportional gain shall be 0.339.
The integral gain shall be 2.73.
The derivative gain shall be 0.00272.
The derivative filter coefficient shall be 0.00863

Revision Information

SID	8	**Revision**	4
Created by	bpotter	**Created on**	29-Sep-2017 12:55:26
Modified by	bpotter	**Modified on**	04-Oct-2017 14:23:01

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

SR_4 Hydraulic Actuator Control Loop Performance (⇒Refines)

Artifact ActuatorLoop.slx

ActuatorLoop:1 (⇐Implemented by)
ActuatorLoop:7 (⇐Implemented by)
ActuatorLoop:4 (⇐Implemented by)
ActuatorLoop:5 (⇐Implemented by)
ActuatorLoop:9 (⇐Implemented by)
ActuatorLoop:2 (⇐Implemented by)
ActuatorLoop:10 (⇐Implemented by)
ActuatorLoop:6 (⇐Implemented by)
ActuatorLoop:8 (⇐Implemented by)
ActuatorLoop:11 (⇐Implemented by)
ActuatorLoop:3 (⇐Implemented by)

Artifact FCC.slx

FCC:3 (⇐Implemented by)
FCC:4 (⇐Implemented by)
FCC:6 (⇐Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	0	1

1.3.5 Multi-Variable Inner Loop Control

Requirement Type Functional

ID HLR_5

Description

The flight control computer software shall provide closed loop control of pitch rate, roll rate and yaw rate with a bandwidth of 40 rad/sec. The input variables from the AHRS sensor for computing the feedback signals shall be pitch attitude, roll attitude, yaw body rate, roll body rate and pitch body rate. The input variables from the outer loop control shall be pitch rate command, roll rate command and yaw rate command.

The following gain matrix shall be used to convert the AHRS input signal vector (5x1) to the proper feedback vector (1x3) for closing the loop:

2.395000 -0.360900 -0.002145 0.808700 -0.020500
-0.142700 -1.115000 0.045730 -0.043180 -0.100700
-0.027920 -0.022290 -2.025000 -0.061520 0.031510

The inner loop control shall operate at a 10miilisecond frame rate.

Revision Information

SID	9	**Revision**	9
Created by	bpotter	**Created on**	29-Sep-2017 12:55:26
Modified by	bpotter	**Modified on**	24-Oct-2018 06:50:48

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

- SR_6 Attitude Rate Tracking Performance (⇒Refines)
- SR_7 Control Bandwidth (⇒Refines)
- SR_8 Control Gain and Phase Margins (⇒Refines)

Artifact FCC.slx

- FCC:28 (⇐Implemented by)

Artifact Heli_inner_loop.slx

- Heli_inner_loop:1 (⇐Implemented by)
- Heli_inner_loop:14 (⇐Implemented by)
- Heli_inner_loop:15 (⇐Implemented by)
- Heli_inner_loop:16 (⇐Implemented by)
- Heli_inner_loop:5 (⇐Implemented by)
- Heli_inner_loop:3 (⇐Implemented by)
- Heli_inner_loop:8 (⇐Implemented by)
- Heli_inner_loop:6 (⇐Implemented by)
- Heli_inner_loop:7 (⇐Implemented by)
- Heli_inner_loop:20 (⇐Implemented by)
- Heli_inner_loop:21 (⇐Implemented by)
- Heli_inner_loop:22 (⇐Implemented by)
- Heli_inner_loop:4 (⇐Implemented by)
- Heli_inner_loop:23 (⇐Implemented by)
- Heli_inner_loop:25 (⇐Implemented by)
- Heli_inner_loop:2 (⇐Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	0	1

1.3.6 Pitch Outer Loop Control

Requirement Type Functional

ID HLR_6

Description

The pitch outer loop shall be implemented as a proportional/integral (PI) control loop operating at 10 millisecond frame rate.

The proportional gain shall be 1.13.
The integral gain shall be 2.25.

Revision Information

SID	10	Revision	9
Created by	bpotter	Created on	29-Sep-2017 12:55:26
Modified by	bpotter	Modified on	24-Oct-2018 06:40:28

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

- SR_6 Attitude Rate Tracking Performance (⇨Refines)
- SR_7 Control Bandwidth (⇨Refines)
- SR_8 Control Gain and Phase Margins (⇨Refines)
- SR_9 Attitude Rate Authority Limiting (⇨Refines)

Artifact FCC.slx

- FCC:29 (⇦Implemented by)

Artifact Heli_outer_loop.slx

- Heli_outer_loop:1 (⇦Implemented by)
- Heli_outer_loop:10 (⇦Implemented by)
- Heli_outer_loop:15 (⇦Implemented by)
- Heli_outer_loop:17 (⇦Implemented by)
- Heli_outer_loop:14 (⇦Implemented by)
- Heli_outer_loop:19 (⇦Implemented by)
- Heli_outer_loop:18 (⇦Implemented by)
- Heli_outer_loop:2 (⇦Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None

1	0	0	0	0	1

1.3.7 Roll Outer Loop Control

Requirement Type Functional

ID HLR_7

Description

The roll outer loop shall be implemented as a proportional/integral (PI) control loop operating at 10 millisecond frame rate.
The proportional gain shall be -0.086.
The integral gain shall be -1.19.

Revision Information

SID	11	**Revision**	9
Created by	bpotter	**Created on**	29-Sep-2017 12:55:26
Modified by	bpotter	**Modified on**	24-Oct-2018 06:41:35

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

- SR_6 Attitude Rate Tracking Performance (⇒Refines)
- SR_7 Control Bandwidth (⇒Refines)
- SR_8 Control Gain and Phase Margins (⇒Refines)
- SR_9 Attitude Rate Authority Limiting (⇒Refines)

Artifact FCC.slx

- FCC:29 (⇐Implemented by)

Artifact Heli_outer_loop.slx

- Heli_outer_loop:8 (⇐Implemented by)
- Heli_outer_loop:23 (⇐Implemented by)
- Heli_outer_loop:24 (⇐Implemented by)
- Heli_outer_loop:20 (⇐Implemented by)
- Heli_outer_loop:22 (⇐Implemented by)
- Heli_outer_loop:21 (⇐Implemented by)
- Heli_outer_loop:11 (⇐Implemented by)
- Heli_outer_loop:5 (⇐Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	0	1

1.3.8 Yaw Outer Loop Control

Requirement Type Functional

ID HLR_8

Description

The yaw outer loop shall be implemented as a proportional/integral (PI) control loop operating at 10 millisecond frame rate.
The proportional gain shall be 1.33.
The integral gain shall be -2.33.

Revision Information

SID	12	**Revision**	9
Created by	bpotter	**Created on**	29-Sep-2017 12:55:26
Modified by	bpotter	**Modified on**	24-Oct-2018 06:42:25

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

- SR_6 Attitude Rate Tracking Performance (⇨Refines)
- SR_7 Control Bandwidth (⇨Refines)
- SR_8 Control Gain and Phase Margins (⇨Refines)
- SR_9 Attitude Rate Authority Limiting (⇨Refines)

Artifact FCC.slx

- FCC:29 (⇦Implemented by)

Artifact Heli_outer_loop.slx

- Heli_outer_loop:6 (⇦Implemented by)
- Heli_outer_loop:12 (⇦Implemented by)
- Heli_outer_loop:26 (⇦Implemented by)
- Heli_outer_loop:27 (⇦Implemented by)
- Heli_outer_loop:25 (⇦Implemented by)
- Heli_outer_loop:29 (⇦Implemented by)
- Heli_outer_loop:28 (⇦Implemented by)
- Heli_outer_loop:9 (⇦Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	0	1

1.3.9 AHRS Validity Check

Requirement Type Functional

ID HLR_9

Description

Prior to using the data from an AHRS, the flight control software shall verify the AHRS data is valid.

Revision Information

SID	13	**Revision**	6
Created by	bpotter	**Created on**	29-Sep-2017 12:55:26
Modified by	bpotter	**Modified on**	30-Oct-2017 12:53:43

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

- SR_10 Sensor Validation (⇒Refines)

Artifact AHRS_voter.slx

- AHRS_voter:9 (⇐Implemented by)
- AHRS_voter:10 (⇐Implemented by)
- AHRS_voter:11 (⇐Implemented by)
- AHRS_voter:50 (⇐Implemented by)
- AHRS_voter:49 (⇐Implemented by)

Artifact AHRS_voter_REQ_Based_Test.mldatx

- AHRS_voter_REQ_Based_Test:?? (⇐Verified by)
- AHRS_voter_REQ_Based_Test:?? (⇐Verified by)
- AHRS_voter_REQ_Based_Test:?? (⇐Verified by)

Artifact FCC.slx

- FCC:31 (⇐Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	1	0

1.3.10 AHRS Input Signal Processing

Requirement Type Functional

ID HLR_10

Description

The flight control computer hardware processes three AHRS digital bus inputs.

The characteristics of the AHRS inputs, from each of the three sensors, to the software are defined in the following table.

Signal	Input Sign	Input Range
AHRS Valid	N/A	1 = Valid 0 = Invalid
Pitch Attitude	Up = +	+/- 90 degrees
Roll Attitude	Right = +	+/- 180 degrees
Pitch body rate	Up = +	+/- 60 deg/sec
Roll body rate	Right = +	+/- 60 deg/sec
Yaw body rate	Right = +	+/- 60 deg/sec

Revision Information

SID	14	**Revision**	6
Created by	bpotter	**Created on**	29-Sep-2017 12:55:26
Modified by	bpotter	**Modified on**	30-Oct-2017 12:54:02

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

- SR_5 Attitude Heading Reference System Interfaces (⇨Refines)

Artifact AHRS_voter.slx

- AHRS_voter:11 (⇦Implemented by)
- AHRS_voter:10 (⇦Implemented by)
- AHRS_voter:9 (⇦Implemented by)
- AHRS_voter:4 (⇦Implemented by)
- AHRS_voter:3 (⇦Implemented by)
- AHRS_voter:1 (⇦Implemented by)

Artifact FCC.slx

- FCC:23 (⇦Implemented by)
- FCC:21 (⇦Implemented by)
- FCC:19 (⇦Implemented by)

Artifact Heli_outer_loop.slx

- Heli_outer_loop:7 (⇦Implemented by)
- Heli_outer_loop:4 (⇦Implemented by)

Heli_outer_loop:3 (⇦Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	0	1

1.3.11 AHRS Voting for Triple Sensors

Requirement Type Functional

ID HLR_11

Description

When three AHRS are valid, the flight control computer shall use the middle value of the three sensors for each of the individual parameters from the AHRS.

Revision Information

SID	15	Revision	5
Created by	bpotter	Created on	29-Sep-2017 12:55:26
Modified by	bpotter	Modified on	30-Oct-2017 12:49:57

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

SR_11 Sensor Voting (⇨Refines)

Artifact AHRS_voter.slx

AHRS_voter:12 (⇦Implemented by)

AHRS_voter:49 (⇦Implemented by)

AHRS_voter:2 (⇦Implemented by)

AHRS_voter:15 (⇦Implemented by)

AHRS_voter:14 (⇦Implemented by)

AHRS_voter:13 (⇦Implemented by)

AHRS_voter:7 (⇦Implemented by)

AHRS_voter:6 (⇦Implemented by)

AHRS_voter:5 (⇦Implemented by)

AHRS_voter:8 (⇦Implemented by)

AHRS_voter:16 (⇦Implemented by)

Artifact AHRS_voter_REQ_Based_Test.mldatx

AHRS_voter_REQ_Based_Test:?? (⇦Verified by)

Artifact FCC.slx

FCC:31 (⇦Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	1	0

1.3.12 AHRS Voting for Dual Sensors

Requirement Type Functional

ID HLR_12

Description

When only two AHRS are valid, the flight control computer shall use the average of the two sensors for each of the individual parameters from the AHRS.

Revision Information

SID	16	Revision	5
Created by	bpotter	Created on	29-Sep-2017 12:55:26
Modified by	bpotter	Modified on	30-Oct-2017 12:51:10

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

SR_11 Sensor Voting (⇨Refines)

Artifact AHRS_voter.slx

AHRS_voter:17 (⇦Implemented by)

AHRS_voter:49 (⇦Implemented by)

AHRS_voter:2 (⇦Implemented by)

AHRS_voter:34 (⇦Implemented by)

AHRS_voter:28 (⇦Implemented by)

AHRS_voter:20 (⇦Implemented by)

AHRS_voter:19 (⇦Implemented by)

AHRS_voter:18 (⇦Implemented by)

AHRS_voter:27 (⇦Implemented by)

AHRS_voter:26 (⇦Implemented by)

AHRS_voter:33 (⇦Implemented by)

AHRS_voter:32 (⇦Implemented by)

AHRS_voter:31 (⇦Implemented by)

AHRS_voter:30 (⇦Implemented by)

AHRS_voter:29 (⇦Implemented by)

AHRS_voter:25 (⇦Implemented by)

Artifact AHRS_voter_REQ_Based_Test.mldatx

AHRS_voter_REQ_Based_Test:?? (⇦Verified by)

Artifact FCC.slx

FCC:31 (⇦Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	1	0

1.3.13 AHRS Usage of Single Sensor

Requirement Type Functional

ID HLR_13

Description

When only one AHRS is valid, the flight control computer shall use the individual parameters from that AHRS.

Revision Information

SID	17	**Revision**	5
Created by	bpotter	**Created on**	29-Sep-2017 12:55:26
Modified by	bpotter	**Modified on**	30-Oct-2017 12:52:03

Change Information No change issue detected.

Links

Artifact HelicopterSystemRequirements.slreqx

SR_11 Sensor Voting (⇨Refines)

Artifact AHRS_voter.slx

AHRS_voter:35 (⇦Implemented by)

AHRS_voter:49 (⇦Implemented by)

AHRS_voter:2 (⇦Implemented by)

AHRS_voter:36 (⇦Implemented by)

AHRS_voter:37 (⇦Implemented by)

AHRS_voter:38 (⇦Implemented by)

AHRS_voter:41 (⇦Implemented by)

AHRS_voter:42 (⇦Implemented by)

AHRS_voter:40 (⇦Implemented by)

AHRS_voter:39 (⇦Implemented by)

AHRS_voter:47 (⇦Implemented by)

⚠ AHRS_voter:46 (⇦Implemented by)

⚠ AHRS_voter:45 (⇦Implemented by)

⚠ AHRS_voter:44 (⇦Implemented by)

⚠ AHRS_voter:48 (⇦Implemented by)

Artifact AHRS_voter_REQ_Based_Test.mldatx

⚠ AHRS_voter_REQ_Based_Test:?? (⇦Verified by)

Artifact FCC.slx

⚠ FCC:31 (⇦Implemented by)

Implementation Status

Total	Implemented	Justified	None
1	1	0	0

Verification Status

Total	Passed	Justified	Failed	Unexecuted	None
1	0	0	0	1	0

Appendix

Artifact List

Simulink Requirement Set files:

#	Name	Folder	Revision
1	HelicopterSystemRequirements.slreqx	C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_02_Requirements\specification	9

Simulink models:

#	Name	Folder	Version
1	FCC.slx	C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_03_Design\FCC\specification	Unloaded.
2	Heli_outer_loop.slx	C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_03_Design\Heli_outer_loop\specification	Unloaded.
3	ActuatorLoop.slx	C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_03_Design\ActuatorLoop\specification	Unloaded.
4	Heli_inner_loop.slx	C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_03_Design\Heli_inner_loop\specification	Unloaded.
5	AHRS_voter.slx	C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_03_Design\AHRS_voter\specification	Unloaded.

Simulink Test files:

#	Name	Folder	File timestamp
1	AHRS_voter_REQ_Based_Test.mldatx	C:\Users\bpotter\MATLAB\Projects\ARP_DO_Project\DO_03_Design\AHRS_voter\verification\simulation_	11-Apr-2019 07:29:15

		tests\high_level_tests	