AHR 150A

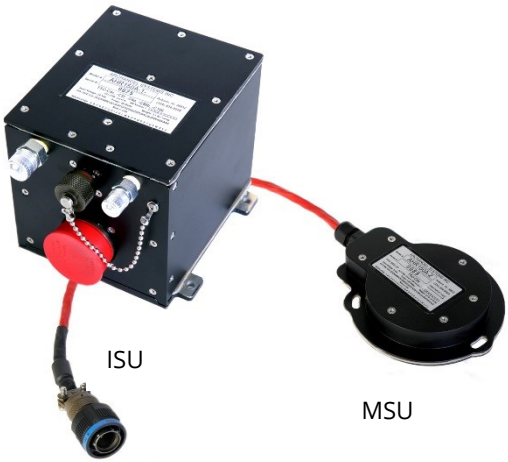
Air Data Attitude Heading Reference System

Pictured: Boeing CH-47 Chinook

The AHR150A ADAHRS (Air Data Attitude Heading Reference System) from Archangel Systems represents a paradigm shift in the ADAHRS market. Using MEMS sensors and sophisticated blending algorithms, the ADAHRS yields "FOG-grade" performance at greatly reduced size, weight, power, and cost.

Several companies, including The Boeing Company, Erickson Corporation, and Airbus, have selected the AHR150A for their supplemental and type certificates in rotary- and fixed-wing platforms.

Rate limits for the AHR150A are ±128°/second. A variant, the AHR300A, reaches ±256°/second and is similarly certified. And, with multiple high- and low-speed ARINC 429 ports, both products seamlessly integrate into any avionics suite.



FEATURES

Qualified for Mission Critical applications including IFR, SAR, and primary flight systems

Certified for Part 23, 25, 27, and 29 aircraft

Air data is RVSM compliant

Designed with low data latency for fly-by-wire aircraft

Directional Gyro mode meets TSO C5f requirements

Mil Spec 38999 filtered connectors

Angle rate limit of ±128°/second (±256°/second on the AHR300A)

CERTIFICATIONS

DO-178B Level A software

FAA TSO C4c, C5f, C6e, C88b, and C106

EASA—All equivalent ETSOs

DO-160E Environmental certifications including EMI, EMC, and HIRF

EXPORTING

Exportable worldwide

No end-user statement required

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AHR 150A

Air Data Attitude Heading Reference System

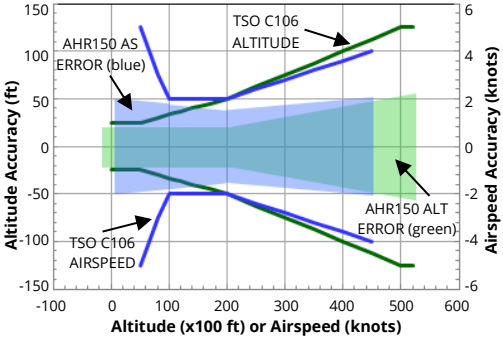
AHR150A ISU Dimensions/Weight

Size	(AHR150A-1) (AHR300A-1)	4.375" x 5.25" x 5" (H x W x D)
Weight	(AHR150A-1) (AHR300A-1)	3.1 lbs

AHR150A-2 MSU Dimensions/Weight

Size	0.75" x 3.0" (H x diameter)
Weight	0.5 lbs

Air Data Accuracy (6 σ)



Environment/Power

Temperature	-40°C to +70°C operating -55°C to +125°C non-operating
Altitude	-1,000 to 52,000 ft pressure
Power	16–36 VDC, 0.5 A @ 28 V nominal

Inputs/Outputs

ARINC 429	4 high-speed transmit, 1 receive, ARINC 705-5 words 4 low-speed transmit, 1 receive, ARINC 706-4 words
Discrete Outputs	Master fault, 11-bit ICAO altitude
Discrete Inputs	CW/CCW slewing, DG/Mag mode select
User-programmable Inputs	Orientation, Unit ID, Lever Arms, SSEC/PSEC Select

Ranges (Normal Operations)

Rates	AHR150A ±128°/second AHR300A ±256°/second
Accelerations	±10 g

AHRS Accuracy (Dynamic—Normal Flight)

Pitch, Roll	±1.0°, 3 σ
Heading	±2.0°, 3 σ
Body Rates	0.2% of input rate 0.1% non-linearity

Certifications/MTBF

FAA	TSO C4c, C5f, C6e, C88b, and C106
EASA	All similar ETSOs
Environmental Categories	DO-160E [D2]XABB[UK1]EWFDFS ZZXAZZ[Y(QKL)]L[B4K44]XAAX
Software Categories	DO-178B Level A
MTBF MIL-HDBK-217	
35°C ambient	
AHR150A-1/300A-1	13,800 hours in fixed wing 9,600 hours in rotary wing
AHR150A-2	46,240 hours

*MTBUR not available since customers do not report flight hours to Archangel.

AHR150A

Air Data Attitude Heading Reference System

- Archangel offers the option of pre-setting the AHR150A-1 and AHR300A-1 units to the customer's configuration through a specific unit's two letter designation following the unit model i.e., AHR150A-XX.

Existing Deployment:

As of December 2022, Archangel Systems has a total of 526 AHR150-1, 764 AHR150-2 MSU 298 AHR300-1 units delivered to customers worldwide.

Power-on Built-in Tests (PBIT)

ISU:
When the ISU performs a cold boot, the subsystems (ADS, DSP, IMU, IOP, & MSU) perform the PBITs as following mentioned:

a. All Sensors
b. ARINC Communication
c. Serial Communications
d. RAM
e. EEPROM (PDIF Data)
f. Program Memory

MSU:
Program Memory
RAM Check
Accelerometer Check

Continuous Built-in Tests (CBIT)

ISU:
Once the ISU has completed the boot sequence it begins performing CBITs. These tests are carried out each time the operating loop is executed.

a. Sensor reasonable
    i. In range
    ii. Stuck at
b. All internal Communication using CRC
c. Inertial Solution Comparison (-1 Only) between dissimilar processors
d. Air Data Solution Comparison (-1 Only) between dissimilar processors
e. Serial data Communications using CRC
f. Babbling Buss

MSU:
Bounds Check Test
Continuous Magnetic Sensor Data Tests
Power supply Voltage Monitoring

Notes

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