



ADU5

THE NEW STANDARD IN ATTITUDE DETERMINATION

5Hz ATTITUDE AND MORE

Thales once again raises the bar on GPS attitude determination and real-time positioning with the ADU5™. The ADU5 is built on the strength of its predecessors, the Ashtech® 3DF, ADU1 and ADU2 and delivers unsurpassed accuracy in a rugged, full-function system. ADU5 provides precise heading, pitch and roll along with three-dimensional position and velocities at a rate of up to 5 Hz for static and dynamic platforms, making it an ideal solution for a wide variety of airborne, marine and terrestrial applications. In addition, while the ADU5 has the same dimensions and interface as ADU2, it consumes much less power than ADU2.

ADVANCED FEATURES

The ADU5 from Thales utilizes a 4-antenna X 14-channel receiver configuration for optimal satellite tracking and reliable positioning. The ADU5 also incorporates signals from Satellite Based Augmentation Systems [SBAS] such as WAAS, EGNOS, and MSAT and features an embedded 2-channel 300 KHz beacon receiver for easy DGPS operations.

The ADU5 employs “on-the-fly” integer ambiguity resolution techniques using carrier phase measurements from the 4 onboard GPS receivers to provide instantaneous 3-D attitude information. Attitude angular accuracies depend on the spatial separation between the four antennas. ADU5 can provide accuracies of 0.1 degree for heading and 0.2 degree for pitch and roll using a 2 meter antenna separation. ADU5 also features a unique Kalman filter with user selectable dynamic modes such as ship, aircraft, adaptive, etc. to match operating conditions.

USER-FRIENDLY OPERATION

Windows® based Evaluate™ and CalibADU™ software are provided



standard along with the ADU5. Evaluate software communicates directly with the receiver for control and monitoring. It provides visual displays of satellite tracking information, position, velocities and attitude. It is also capable of data logging and statistical accuracy analysis. CalibADU software allows the user to determine the relative antenna vectors and calibrate the receiver with the click of a button.

EASY INTEGRATION

Packaged in a robust housing, the ADU5 can be integrated into existing navigation system racks. As with its predecessors, the ADU5 can be readily employed in a variety of precision GPS usages such as gyrocompass calibration, dredge positioning, oceanographic acoustic doppler current profiling (ADCP), airborne videography and remote sensing, as well as many other terrestrial, marine and airborne weapons and antenna pointing applications.

TECHNICAL SPECIFICATIONS

Real-Time Position Accuracy¹

Autonomous

CEP: 3 m (9.843 ft)
95%: 5 m (16.404 ft)

Differential

Local Base Station

CEP: 40 cm (15.75 in)
95%: 90 cm (35.43 in)

Beacon

CEP: 90 cm (35.43 in)
95%: 1.6 m (5.25 ft)

SBAS

CEP: 1 m (3.28 ft)
95%: 3 m (9.84 ft)

Velocity Accuracy¹ (knots)

0.1 (95%)

Time to First Fix¹

Re-acquisition	3 sec
Hot start	11 sec
Warm start	35 sec
Cold start	90 sec
< 2 minute cold start to first attitude data	

Real-Time Attitude Accuracy²

1 meter Antenna Separation

Heading 0.4° rms
Pitch/Roll 0.8° rms

3 meter Antenna Separation

Heading 0.06° rms
Pitch/Roll 0.12° rms

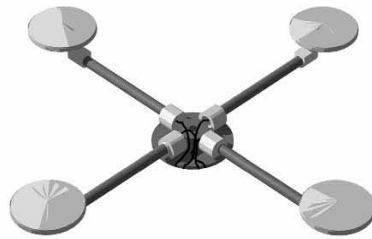
10 meter Antenna Separation

Heading 0.02° rms
Pitch/Roll 0.04° rms

ADU5 Features

56 GPS code and carrier channels. On the primary receiver, 2 channels can be configured to track SBAS signals. Also, the primary receiver has 2 additional channels to track 300 kHz differential beacon signals.

- Standard NMEA-0183 output
 - 4 antenna input
 - 5 Hz attitude and position update rate
 - Raw data output (code & carrier)
 - Event Marker
 - 1 PPS (5V TTL)
- Precision: 200 ns (stand-alone)
50 ns (differential)
- Edge Correlator™ multipath mitigation
 - Differential remote RTCM v2.2, message types 1, 2, 3, 6, 9, 16
 - Separate real-time differential position on antenna 1
 - < 6 watt power consumption
 - 10 to 29 VDC input
 - 2 RS-232 serial ports
- 115,200 Baud (maximum)



Optional portable antenna array shown with Marine IV Antennas.

Environmental and Physical

Receiver

Operating Temp: -20°C to +55°C
(-4°F to 131°F)
Storage Temp: -30°C to +75°C
(-22°F to 167°F)
Weight: 1.93 kg (4.125 lbs)
Dimensions: 21.5 cm W x 9.5 cm H x 19.48 cm D
(8.46 in W x 3.74 in H x 7.67 in D)
Speed (max)³: 514 m/sec (1,000 knots)
Altitude (max)³: 18287 m (60,000 feet)

Antenna

Operating Temp: -40°C to +65°C
(-40°F to 149°F)
Storage Temp: -55°C to +75°C
(-67°F to 167°F)
Weight: 114 gr (0.25 lbs)

ADU5 Accessories

- Installation/calibration software
- 2 RS-232 interface cables
- Evaluate software-interface for set-up and monitoring
- Receiver operating and installation manual

Optional Accessories

- 10, 30 and 60-meter antenna cables
- In-line antenna cable amplifier
- Marine antenna kit
- Aircraft antenna kit
- TNC/Type N adapter
- 1 meter square precalibrated antenna array kit
- GPS + Beacon in-line water-proof amplifier

(1) Accuracy and TTFF specs. based on tests conducted in Santa Clara and Moscow. Tests at different locations under different conditions may produce different results.

Position accuracy specifications are for horizontal positioning. Vertical error is typically <2 times horizontal error.

(2) Attitude accuracy increases with antenna separation; for example, doubling the antenna separation makes the accuracy twice as good.

(3) Higher altitudes and speeds available under validated export license.

Thales

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