

TSO-C106 Based ADC (pending application) ADI-32000 Product Series Data Sheet

Air Data's line of ADCs are designed to measure and compute navigation parameters in transport aircrafts, military trainers, helicopters and unmanned vehicles (UAV). Parameters such as pressure altitude, baro-corrected altitude, altitude rate (vertical speed), computed and true airspeeds, Mach number and static air temperature are computed. A comprehensive built-in test (BIT) function that provides high-reliability fault detection and isolation capability is also one of their features. The unit packaging is robust and provides standard pitot and static tubing interface.

Characteristics

- Operating voltage 28 VDC (16 to 32 VDC per MIL-STD-704F and DO-160G), < 7 Watts
- Nominal weight < 2.2 lbs/1.0 kg
- Designed to meet the TSO-C106 standard, AES DO-178C Level B, AEH DO-254 Level A
- Environmental qualification DO-160G
- Operating temperature -45°C to +71°C
- Storage temperature -55°C to +85°C
- Altitude range -1,000 to 75,000 feet, very high accuracy (± 5 feet typical at sea level)
- Airspeed range 0 to 800 knots, ± 3 knots typical at 50 knots
- Mach range 0 to 2.0
- AOA/AOS range -170° to +170°

Communication Protocols and Data

For navigation data words reception and transmission, the ADC has provision to interface with one or more of the following protocols:

- ARINC 429 bus
- MIL-STD-1553C RT bus
- RS-422 serial bus
- CAN Bus 2.0B

Navigation and other data words are transmitted via selected transmission protocols. Each data word is transmitted with its associated validity indicator.



TSO-C106 Based ADC P/N ADI-32000-VAR

Discrete Outputs

The following Ground/Open type discrete outputs are available:

- Altitude low
- High speed
- Low speed
- ADC OK

Output characteristics:

- Ground condition: < 1.5 VDC at 100 mA maximum
- Open condition: > 1 M Ω

Note that 2 DIO spare are available upon request

SSEC/PEC Capable

The ADC is capable of airspeed and static pressure error correction using predefined Position Error Correction (PEC) and Static Source Error Correction (SSEC) data. This function can be disabled by discrete input.

Electrical Connectors

J1 connector D38999/24FE35PN

- 55-position circular connector
- Contact size: 22D
- Current rating: 5A
- To mate with D38999/26FE35SN

J2 connector D38999/24FC4PN

- 4-position circular connector
- Contact size: 16
- Current rating: 13A
- To mate with D38999/26FC4SN

Pneumatic Input Ports

The ADC provides two pneumatic input ports to be connected to the Pitot and static lines on the aircraft. The Pitot interface is of the AS4395-4 (MS-33656-4) type. The static interface is of the AS4395-6 (MS-33656-6) type.

TAT Interface

The ADC provides electrical stimulation and interface with TAT probe of 50 Ω , 100 Ω or 500 Ω nominal resistance.

AOA/AOS Interface

The ADC provides electrical stimulation and interface with AOA/AOS probes of 1,500 Ω , 2,000 Ω or 5,000 Ω nominal resistance.

ADP/TAT Probe Heaters Control

The ADC provides the capability to interface with two (2) separate ADP/TAT Heaters with a power rating of 280 W max at 28 VDC (10A) continuous (all flight conditions).

Analog Outputs

The ADC provides two analog outputs for the static pressure and the differential (impact) pressure values with the following characteristics:

- Output voltage: [0 – 5 V] \pm 12.5 mV
- Load: greater than 10 k Ω
- Output impedance: less than 1 Ω
- Ranges:
 - Static pressure range: 0 up to 130 kPa
 - Differential pressure: 0 up to 150 kPa
- Ripple voltage: less than 5 mV
- Bandwidth: -3 dB at 13 Hz

Finish and Color

The ADC is protected with a chemical conversion coating per MIL-C-5541, Class 3 (Yellow) and painted lusterless black color #37038 as per FED-STD-595B with a polyurethane coating per MIL-PRF-85285, Type I, Class H over an epoxy primer coating per MIL-PRF-23377, Type I, Class C.

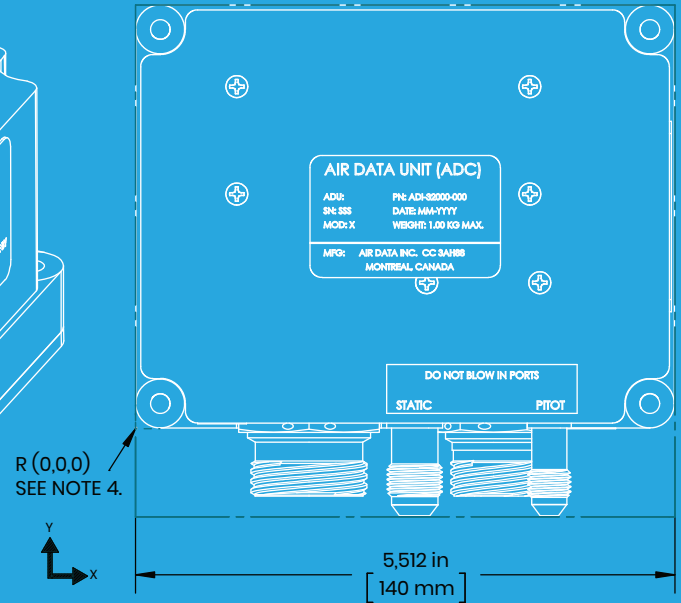
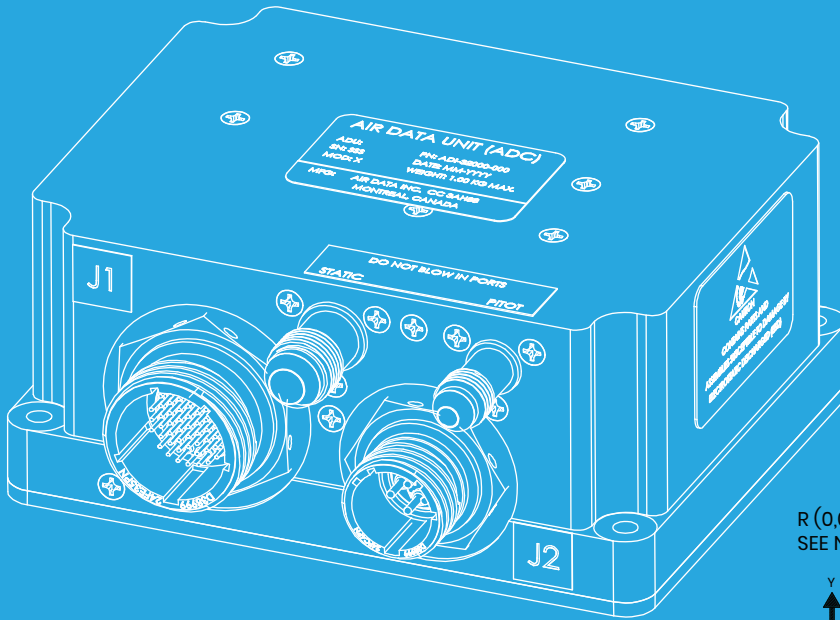
Power Consumption and Cooling

The ADC maximum power consumption is 7W @ 28VDC. The ADC is cooled by natural convection and radiation.

Navigation Parameters and Status Words List

Data World Description	Direction	Computation Rate
Baro Correction Settings	RX/TX	As received
Pressure Altitude	TX	60 Hz
Baro-Corrected Altitude	TX	60 Hz
Altitude Rate	TX	60 Hz
Indicated Airspeed	TX	60 Hz
Calibrated Airspeed	TX	60 Hz
Mach Number	TX	60 Hz
Total Air Temperature	TX	60 Hz
Static Air Temperature	TX	60 Hz
True Airspeed	TX	60 Hz
Static Pressure (Corrected)	TX	60 Hz
Total Pressure	TX	60 Hz
Maximum Allowable Airspeed	TX	60 Hz
Angle of Attack	TX	60 Hz
Angle of Side-Slip	TX	60 Hz
Air Density (ρ)	TX	60 Hz
Pressure Ratio (P_s/P_o)	TX	60 Hz
Air Data Probe Temperature	TX	60 Hz
Maintenance Word #1	TX	20 Hz
Maintenance Word #2	TX	20 Hz
Maintenance Word #3	TX	20 Hz
Maintenance Word #4	TX	20 Hz

Outline Drawing



NOTES:

1. APPLICABLE STANDARDS/SPECIFICATIONS

- A. DOD-STD-100
- B. ASME Y14.5M 2004

2. CONNECTORS:

- A. (J1) D38999-24FE35PN
- B. (J2) D38999-24FC4PN

3. PHYSICAL CHARACTERISTICS OF HOUSING & COVER:

- A. MATERIAL: ALUMINUM 6061-T6
- B. COLOR: LUSTERLESS BLACK PAINT COLOR #37038 AS PER FED-STD-595B
- C. FINISH: POLYURETHANE COATING PER MIL-PRF-85285, TYPE I, CLASS H OVER AN EPOXY PRIMER COATING PER MIL-PRF-23377, Type I, Class C

4. XYZ COORDINATE SYSTEM IS LOCATED AT THE BASE OF THE UNIT (COVER SIDE) AS SHOWN WITH (0,0,0) AND IS USED FOR CALCULATING THE CENTER OF GRAVITY

A. THE UNIT CENTRE OF GRAVITY:

- X = 2.511 in (63.79 mm)
- Y = 2.089 in (53.07 mm)
- Z = 1.258 in (31.96 mm)

B. THE UNIT WEIGHT: 1 KG MAX

5. DIMENSIONS:

5.1. DIMENSIONS SHOWN IN () ARE FOR REFERENCE ONLY

5.2. DIMENSIONS NOT TO EXCEED:

- LENGTH: 5.512 in (140 mm)
- WIDTH: 4.331 in (110 mm) HOUSING ONLY; 5.229 in (132.81 mm) WITH CONNECTORS
- HEIGHT: 2.441 in (62 mm)

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