

# ADTS 401

## ADTS 401

Air Data Test System

- High accuracy, RVSM compliant
- ATE systems compatible
- Protection for unit under test
- Compatible with existing IEEE systems
- 12 month recalibration period
- Programmable test routines and limits



# ADTS 401

## Air Data Test System

Druck is the foremost supplier of air data test systems, with over 25 years of experience in the design and manufacture of advanced pressure measuring instruments and sensors.

The ADTS 401 is the latest in a series of reliable, high accuracy, air data test systems. The compact, rack-mount design has evolved as a result of Druck's continuous research and development, customer feedback and experience gained from manufacturing thousands of automatic pressure controllers. This has enabled performance, ease of maintenance and operational simplicity to be optimised.

The ADTS 401 is a twin-channel Ps and Pt pressure control system used for the precision calibration/verification of aircraft pitot-statics, compliant with RVSM (Reduced Vertical Separation Minima) requirements. A separate pressure/vacuum supply unit type PV 103 provides suitable pneumatic supplies.

Fully programmable for a wide range of fixed or rotary wing aircraft, the ADTS 401 enables vital flight instrumentation such as altimeters, airspeed indicators, rate of climb indicators, Mach meters and air data computers to be quickly and accurately tested.

The ADTS 401 has been designed for 19" rack mounting and being only 7" (4U) high with a range of IEEE 488 interfaces available it is ideal for use with existing ATE (Automatic Test Equipment) systems.

In addition to automated and local keypad control, a remote hand terminal option is also available for even greater flexibility of operation.

### CONTROL KEY FUNCTIONS

ALT/Ps	Altitude read and value entry.
Speed/Qc	Airspeed read and value entry.
Mach/Pt	Mach read and value entry.
EPR	Engine Pressure Ratio test (Ps/Pt for inlet/exhaust).
RoC/Ps Rate	Rate of Climb value entry and timing display.
Rate Timer	Select timing for RoC testing or leak testing.
Hold	Freeze control value to 'on state' at current conditions.
Rate	Rate control for Pt channel.
Help	On-screen operator advice.
Leak Measure/Control	Select Measure or Control Mode.
Ground	Controlled vent to ground and read QFE/QNH.
Local/Remote Port	Keypad control or ATE/IEEE 488. Select multi-outputs on Ps and Pt if Line Switching Unit (LSU) is in use.
Print	Print displayed values if printer connected.
Execute Test Program	Manual stepping when in-built TPM program is enabled.
Set Up	Select units, limits, local conditions, display format, etc.



## Standard Specification

### MEASUREMENT SPECIFICATION

PARAMETER	OPERATING RANGE	RESOLUTION	ACCURACY	REPEATABILITY
Altitude	-3,000 to +80,000ft <sup>(1)</sup>	1ft	3ft at sea level <sup>(2)</sup> 7ft at 30,000 ft <sup>(2)</sup> 29ft at 60,000ft <sup>(2)</sup>	±1ft ±2ft ±7ft
Static Sensor	35 <sup>(3)</sup> to 1355 mbar abs (1 to 40 inHg)	0.01 mbar (0.0001 inHg)	±0.1 mbar (±0.003 inHg)	±0.05 mbar ±0.0015 inHg
Airspeed	10 to 850 knots <sup>(4)</sup> or 10 to 1,000 knots	0.1 kts 0.1 kts	±0.5 kts at 50 kts ±0.07 kts at 550 kts ±0.05 kts at 1,000 kts	±0.4 kts ±0.02 kts ±0.02 kts
Pitot Sensor	35 <sup>(3)</sup> to 2700 mbar abs (1 to 80 inHg) or 35 <sup>(3)</sup> to 3500 mbar abs (1 to 103 inHg)	0.01 mbar 0.0001 inHg 0.01 mbar 0.0001 inHg	±0.015% RDG ±0.007% F.S.	0.05 mbar rising to 0.17mbar 0.0015 mbar rising to 0.005mbar
Rate of Climb	0 to 6000 ft/min <sup>(5)</sup>	1ft/min	±1% of value	±0.5%
Mach	0 to 10	0.001	Better than 0.005	0.001 rising to 0.005
Engine Pressure Ratio (EPR)	0.1 to 10	0.001	Better than 0.005	

#### Notes

- 105,000 ft available (control with suitable vacuum pump)
- Accuracy at ambient 5° to 35°C for 0° to 50°C **x 1.5**.
- Lowest calibration point, operates to 0 mbar a
- Limits settable to prevent excessive mach. (Civil limit Mach 1).
- 100,000 ft/min rates selectable  
- limit protected for safety  
- volume dependant

The ADTS 401 is a 19" rack mounted instrument with a local front panel display and keypad. A remote hand held terminal is optional and a matched separate pressure/vacuum supply unit PV 103R is available.

#### Scaling Factors

Altitude - ft, metres  
 Airspeed - knots, km/hr, mph  
 Rate of Climb - ft/min, m/min, m/sec, hm/min  
 Others - mbar, inHg, inH2O (4°C, 20°C, 60°F), mmHg, kPa, hPa, psi  
 Alternatives:  
 Airspeed - CAS (calibrated)  
 - TAS (true - ability to enter temperature)

#### Rate Control/Indication

Roc	Rate of Climb	Rt Ps	Rate of Static
Rt Pt	Rate of Pitot	Rt Qc	Rate of Pt - Ps
Rt CAS	Rate of calibrated airspeed		
Rt EPR	Rate of engine pressure ratio		

#### Overpressure

Negligible calibration change with up to 1.25 x FS overload applied.

#### Calibration Stability

Better than 50ppm per annum.

#### Recalibration

Simple keypad instruction. 12 month interval suggested. Use of a primary pressure standard is recommended, Ruska Primary Pitot Static Tester Model 2468.

#### Display

LCD backlit, supertwist/wide angle viewing. 123 x 42 mm (4.8" x 1.6") window with 4 lines of 20 characters 8 mm (0.3") high. Optional hand terminal display window 73 x 24 mm (2.87" x 0.95").

#### Response

2 readings per second display value update.  
 5 readings per second interface and control system updates.

#### Power Supplies

90 - 260 Vac, 47 - 440 Hz.  
 100 VA normal, 400 VA max.

#### Power Failure Protection

In the event of a power interruption, the output ports will be vented to ambient conditions safely. On power reconnect, the system is in measure mode.

#### Self Test

Integral test routines and reporting for both electrical and pneumatic faults.

#### Digital Interfaces

Parallel printer interface available as standard.  
 IEEE-488.2 and earlier versions also available as options.

#### Temperature Range

Calibrated 5° to 35°C  
 Operating 0° to 50°C  
 Storage -20° to 70°C

#### Sealing

Front panel dustproof. Enclosure complies with CE safety requirements.

#### Humidity

0 - 90% non-condensing.

#### Shock and Vibration

Designed to meet MIL-T-28800 Class 2.

#### Safety Performance

EN61326 for EMC emissions and immunity.  
 EN61010 for electrical and mechanical safety.

#### Physical

13kg (29lb) nominal.  
 Case dimensions 483 mm x 432 mm x 170 mm (19" x 17" x 7").

#### Pneumatic Connections

Front panel mounted fittings with blanking caps:

Static	AN-6 37° flare
Pitot	AN-4 37° flare

Rear panel mounted fittings with blanking caps:

Pressure supply	AN-4 37° flare
Vacuum supply	AN-6 37° flare

All fittings are supplied with replaceable filters and 2.5m (8') long mating hoses. Rear Ps and Pt connections available as an option.

#### Pneumatic Supplies

For normal use, dry, non-corrosive gases with source pressure at a maximum 25% above specified pressure range. PV 103R recommended.



# ADTS 401

## Air Data Test System



### OPTIONS

- (A) **Remote Control Terminal**  
A remote control hand-held terminal complete with 2m (6' approx) long cable.
- (B) **Bench Case**  
A case to enclose the instrument for benchtop use.
- (C1) **IEEE-488 Interface (SCPI version)**  
Current Air Data Test Systems communications protocol.
- (C2) **IEEE-488 Interface (Honeywell Sperry compatible)**  
Compatible with earlier instruments.
- (C3) **IEEE-488 Interface (Garrett PFC compatible)**  
Compatible with earlier instruments.
- (C4) **IEEE-488 Interface (Ruska 6610 compatible)**  
Compatible with earlier instruments.
- (C5) **IEEE-488 Interface (Crouzet 500 compatible)**  
Compatible with earlier instruments.
- (D) **Test Program Manager**  
A software package with serial interface mode adaptor. Permits PC based control and program download for resident test routines. Please refer to Product Note for further details.
- (E) **Altimeter Encoder Interface**  
For altimeters with ICAO reporting encoders. Permits display of the bit stream and reporting of altitude value.
- (F) **ARINC 429 Interface**  
Permits the ADTS to monitor data from an aircraft bus, display the 12 pitot static label information and transmit to the aircraft. Please refer to Product Note for further details.
- (G) **Rear mounted Ps and Pt ports**  
Additional test ports provided on the rear panel.

### ACCESSORIES

ac power lead - 2m length (6' approx). Ps, Pt, pressure and vacuum hoses - 2.5m lengths (8' approx.). Operators manual and calibration certificate also supplied as standard.

### CALIBRATION STANDARDS

Instruments manufactured by Druck are calibrated against precision calibration equipment traceable to international standards.

*Continuing development sometimes necessitates specification changes without notice.*

### RELATED PRODUCTS

#### Pressure/Vacuum Supply Unit

For use with the ADTS 401, the PV 103R is a 19" rack mounting module for ATE systems and features low maintenance dry pumps.



#### Line Switching Unit

Enabling automatic selection of multiple Ps and Pt outlets, the LSU 100 (rack version) or LSU 101 (flightline version) is available for use with Druck Air Data Test Systems.



#### Flightline Air Data Test System

ADTS 405F Flightline Air Data Test System suitable for use on aircraft with remote control.



#### Calibrators and Pressure Sensors

Druck offer a complete range of precision calibrators for field, workshop or laboratory use. These include primary and secondary pressure standards from Druck companies, Ruska and Pressurements. Druck also manufacture a wide range of pressure transducers and transmitters for ground flight test and flight qualified applications.



*Please refer to Druck for further information on these products.*

### ORDERING INFORMATION

Please state the following (where applicable):-

1. ADTS 401
2. Pressure range required for Pt.
3. Minimum/maximum airspeed limits.
4. Options and related products if required.



Druck Limited  
Fir Tree Lane, Groby  
Leicester LE6 0FH England  
Tel: + 44 (0) 116 231 7100  
Fax: + 44(0) 116 231 7103  
E-mail: sales@druck.com  
Internet: http://www.druck.com



Agent