DPS1000 RVSM Pitot-Static Test Set

USER INSTRUCTION MANUAL
M/N: DPS1000, P/N: 101-01175

Doc. P/N: 56-101-01175
Revision Q
September 23, 2024



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SAFETY

Before using this instrument, the operator should read and understand all the related data. This includes the applicable local safety procedures, this publication, and the instructions for the accessories/options/equipment you are using it with and the system or components under test.

This equipment was designed to be safe when used as per the procedures of this Instruction Manual.

Before you start an operation or procedure in this publication, make sure you have the required skills (if necessary, with qualifications from an approved training establishment).

Always follow good engineering practices.

WARNING: A **WARNING** notice indicates a hazard with a potential for property damage, personal injury, or death if the instructions are not followed. The operator should not proceed beyond the **WARNING** notice until required conditions are understood and fully complied with.

CAUTION: A **CAUTION** notice indicates a hazard with a potential for damage to the equipment and or loss of data if the instructions are not followed. The operator should not proceed beyond the **CAUTION** notice until required conditions are understood and fully complied with.

WARNINGS

WARNING: Do not use this equipment when it is not in its normal condition.

WARNING: When testing with this equipment follow the appropriate procedures as per the AMM or CMM observing all safety instructions.

WARNING: Do not use this equipment for purposes other than as specified in this manual.

WARNING: Do not use this equipment in a wet environment.

WARNING: Do not use this equipment in an atmosphere of explosive gas.

WARNING: This test equipment shall only be serviced by authorized personnel.

CAUTIONS

CAUTION: Inspect the aircraft Static Vents for dirt or debris before making any connections.

CAUTION: Inspect the aircraft Pitot Probes for dirt or debris before making any connections.

CAUTION: Do not connect this equipment to a contaminated aircraft pitot-static system.

CAUTION: To prevent damage to this equipment, do not allow water or other contaminants to be introduced into the ports.

CAUTION: Do not use a wrench when connecting hoses to the Test Set's Static and Pitot ports – hand-tighten only.

CAUTION: When equipment is connected to the hoses, exercise care not to stand on, or in anywise kink the hoses.

CAUTION: Always monitor aircraft instruments to ensure the maximum rates of change are not exceeded.

CAUTION: Failure to follow procedures as written could produce a negative airspeed condition capable of damaging the aircraft instruments.

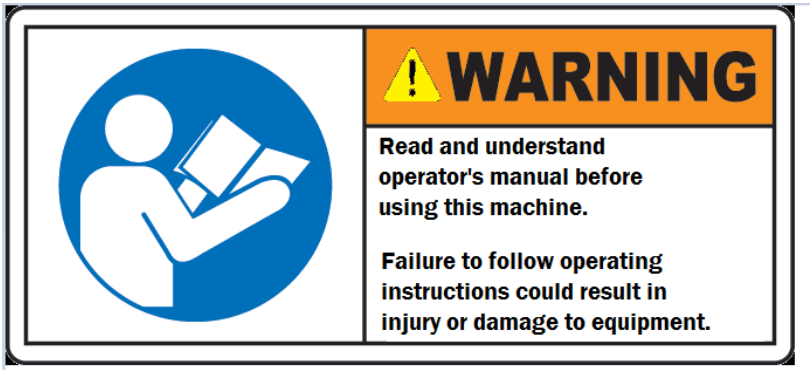
MARKING AND SYMBOLS

CE	This instrument meets the relevant European safety directives (*). The instrument carries the CE mark (**).

(*) Wi-Fi disabled for EMC.

(**) Units with MOD D installed are CE Compliant.

SYMBOLS ON THE INSTRUMENT

	Warning – Read and understand operator's manual before using this machine.

ATTENTION

Although every effort has been made to provide the end user of this equipment with the most current and accurate information, it may be necessary to revise this manual in the future. Please be sure to complete and return the enclosed **OWNER WARRANTY REGISTRATION CARD** to Barfield in order to validate the warranty and to ensure that you will receive updated information when published. You MUST have your name and address on file at Barfield as a registered user of this equipment to be able to obtain the service covered by the warranty.

Visit the company website, http://barfieldinc.com/, for publication updates.

Please send the Registration Card to:

BARFIELD, INC.
P.O. Box 025367
Miami, FL 33102-5367
USA

CONTACT INFORMATION

Users are requested to notify the manufacturer of any discrepancy, omission, or error found in this manual. Inquiries should include specific questions and reference the publication title, number, chapter, page, figure, paragraph, and effective date.

Please send comments to:

TECHNICAL CUSTOMER SUPPORT - GSTE
BARFIELD, INC.
P.O. BOX 025367
MIAMI, FL 33102-5367
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Telephone	**(305) 894-5400** **(800) 321-1039**
Fax	**(305) 894-5401**
Email	gsesales@barfieldinc.com

MAINTENANCE AND REPAIR INFORMATION

The manufacturer of this equipment does not recommend the user to attempt any maintenance or repair. In case of malfunction, contact the manufacturer to obtain the list of approved repair facilities worldwide, ensuring that this equipment will be serviced using proper procedures and certified instruments.

BARFIELD PRODUCT SUPPORT DIVISION

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REVISION RECORD

REV.	ECO #	REV. DATE	DESCRIPTION OF CHANGE
A	N/A	May 28, 2014	Initial Release.
B	260-01041	October 15, 2014	Update Barfield logo and warranty.
C	260-01092	March 18, 2015	Completely Revised.
D	260-01118	August 11, 2015	TOC Page vii, Chapter #s Pages 54 & 55.
E	260-01135	October 29, 2015	Update navigation screens and introduce OPT-A.
F	260-01175	October 17, 2016	Updated Format & Logo, Updated Approved Repair Facility Information, added new software upload procedure from latest released app. Added Cabin Pressure Mode. Added IBF Mode.
G	260-01184	November 7, 2016	Updated with software six month note reminder.
H	260-01200	May 12, 2017	Updated page numbers, format and “custom limit” deletion note.
I	260-01213	October 10, 2017	TOC reformatted. Operating limits modified. Software Update procedure modified.
J	260-01217	May 11, 2018	TOC reformatted; Minor grammatical and formatting revisions; Addition of CE Mark Page, Introduction information (Recertification & Test Set Equivalent), Figure 1, Table 3 (Conformity), Recertification (Calibration vs. Bench Check), Hold/Resume feature information and Figure 23, Conclusion of Go To Ground and Appendix A.; Modifications to Figure 4, Figure 11, Table 6, Connector description, and EPR Test information; Performance specifications updated to include MOD “B” and NON-MOD “B” performance accuracy and corresponding Figures (previously listed as Table 4 Aeronautical Specifications).
K	260-01231	March 13, 2019	Minor reformatting, removal of compliance requirement 91.171 (incorrect FAA regulation) (see pg. 5), updated Appendix reference for 2. System Config from Appendix G to E and 3. Firmware Update from Appendix E to G (see pg. 37).

(*Continued on next page…)*

REVISION RECORD (CONTINUED)

REV.	ECO#	REV. DATE	DESCRIPTION OF CHANGE
L	260-01270	September 2, 2020	Reformatting & grammar revisions; removed Figure 36 (duplicate); Addition to Introduction: 4. App Information and modified 5. Software; Addition to Table: Key to Figure 11; Addition to Chapter 4, 11: Aircraft Testing section; Addition of Appendix E: Wi-Fi Connection Procedure.
M	260-01378	July 27, 2022	Owner's Warranty Registration card updated. Addition of Environment to Table 2. Revised Table 3 and Appendices E and F. Updated formatting.
N	260-01386	August 16, 2022	RoHS Standard added to Table 3.
P	260-01398	March 9, 2023	Specifications Table 4, Table 5, Table 7, and corresponding notes revised. Addition of Table 6 and notes.
Q	260-01470	September 23, 2024	Revised Chapter 3, 1. Assembly; Chapter 4, 3. Accessories; Chapter 5, 2. Shipping; Appendix C; and Figure 52.

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INTRODUCTION

1. PUBLICATION BREAKDOWN

This user instruction manual establishes the standards of operation for the DPS1000, Pitot-Static Test Set.

Its purpose is to provide enough information for the personnel unfamiliar with this unit to understand it, identify its parts, and operate it in accordance with proper procedures, operating techniques, precautions, and limitations.

Note: The manufacturer has designed this equipment to be safe when operated using the procedures and instructions detailed in this manual. Do not use this equipment for any other purpose than that stated, as the protection provided by the equipment may be impaired.

2. INFORMATION PROVIDED WITH THE TEST SET

In addition to this User Instruction Manual, the Test Set is delivered with the items described below.

A. The identification label (similar to Figure 1) located on the front bulkhead of the Test Set, provides the following information:

Manufacturer Name CE Marking

Designation of Equipment

Equipment Part Number

Equipment Model Number Equipment Serial Number

Equipment Modification (if applicable) Equipment Options (if applicable)

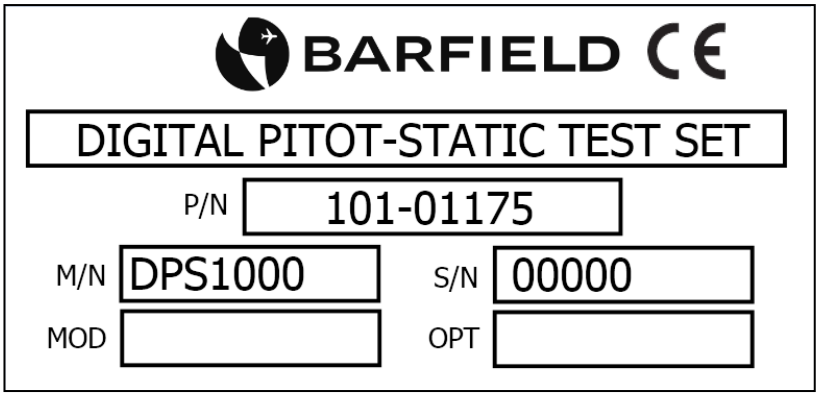


Figure 1 Identification Label

B. The Owner's Warranty Registration card (refer to Figure 2) is to be completed by the owner and returned to Barfield, Inc. within **ten (10) days** of purchase to ensure automatic update of printed matter and validation of warranty.

To register your unit, please visit https://www.barfieldinc.com/warranty_registration or scan the QR code on the supplied Warranty Registration.



Figure 2 Owner Warranty Registration Card

C. Each new or re-certified unit is delivered with a Certificate (not pictured) that shows the date when the unit was tested by the manufacturer, its serial number, and when the next certification is due. This certificate confirms that the unit performed according to its design specifications.

D. The DPS1000 Limited Two-Year Warranty can be seen in Figure 3.

3. RECERTIFICATION

A. The Test Set has a one-year recertification requirement. Maintenance required by this unit must be performed by qualified technicians in a shop equipped with the necessary tooling and resources. Contact Barfield for Maintenance and Calibration requirements.

B. At the conclusion of the power up initialization the Test Set will display the date when it was “Last Calibrated” in the format of Day-Month-Year and will provide the user with the number of days remaining before its calibration due date with a statement of “Cal due” in ### days format.

CAUTION: RECERTIFICATION BY A CALIBRATION/REPAIR SHOP NOT POSSESSING THE NECESSARY TECHNICAL KNOWLEDGE, DOCUMENTATION, SPECIAL TEST EQUIPMENT, TOOLING, AND STANDARDS WILL ADVERSELY AFFECT THE ACCURACY/CAPABILITY OF THE DPS1000 FOR TESTING THE AIRCRAFT, INCLUDING THE DEMANDING REDUCED VERTICAL SEPARATION MINIMUM (RVSM) ACCURACY REQUIREMENT.

C. The process of Calibration requires that the Unit Under Test (UUT) be compared to Certified Traceable Standards having an accuracy at least 4 times better than the UUT. Adjustments are made to the UUT in order to align the UUT to the exact values of the Standards so that the errors at all required test points are zeroed out.

Conducting a simple Bench Check (*) (Verification) is quite different to the calibration process as no adjustments are made to the UUT; so long as test points fall within the specified allowable tolerances the unit is said to pass. This method disregards the stability specification for the unit since any number of test increments could fall just within the maximum allowable error. This may result in units being returned to service and drifting out of tolerance a few months later.

Note (*): Barfield does NOT consider a Bench Check (Verification) process to be a suitable or responsible alternative to an actual calibration/realignment of the measurement system's linearity accuracy. Barfield does not endorse this practice for obvious reasons as the test set cannot be guaranteed to meet its designed accuracy specifications and especially so under varying operating temperature situations.

4. MOBILE DEVICE'S APP INFORMATION

Visit the Apple App Store or Google Play App Store to download the free application, "Barfield ADTS," onto your iOS or Android mobile device (not supplied).

Barfield's innovative app transforms any iOS and Android tablet or cellphone into a wireless remote control for the DPS1000.

The app includes all necessary software to remotely operate the DPS1000 using its factory enabled, free, embedded, secure Wi-Fi (refer to **APPENDIX E: WI-FI CONNECTION PROCEDURE**).

Additionally, the app will detect whether a new firmware version is available when connected to the DPS1000 and automatically prompt the user to proceed with the upgrade if necessary (refer to document **42-101-01175_01178** for more detailed information).

5. SOFTWARE UPDATE

A pop up window will appear every six (6) months on the screen, reminding the user to verify the latest software revision. Press "Continue" to dismiss the message. Please, check Barfield's website regularly for the latest software updates and releases. Also, set up your mobile device for automatic updates for Barfield's ADTS app.

6. TEST SET EQUIVALENT

The Barfield DPS1000, Reduced Vertical Separation Minimum (RVSM) rated Pitot-Static Test Set, is a suitable substitute for the Barfield 1811D, 1811G, 1811H, 1811HA, 1811NG, DPS300, DPS350, DPS400, DPS450 and DPS500(*) Pitot Static Test Sets for all aircraft applications that fall within the range of 55,000 feet altitude, 6,000 feet/minute rate of climb and 650 knots airspeed.

Note (*): The DPS500 is capable of achieving higher altitude and handling aircraft pneumatic systems with larger volumes. The DPS500 is much more suitable for testing out-flow safety valves than the DPS1000 or most competitive commercial/non-military grade Airdata test sets.

DPS1000/1811NG LIMITED TWO YEAR WARRANTY

BARFIELD INC. ("BARFIELD") warrants only to the original Purchaser of this DPS1000/1811NG product from BARFIELD or an authorized distributor that this product will be free from defects in material and workmanship under normal use and service for two years after date of purchase. BARFIELD reserves the right, before having any obligation under this limited warranty, to inspect the damaged BARFIELD product, and all costs of shipping the DPS1000/1811NG product to BARFIELD for inspection shall be borne solely by the Purchaser. In order to recover under this limited warranty, Purchaser must make claim to BARFIELD within 60 days of occurrence, and must present acceptable proof of original ownership (such as a purchase order, invoice, warranty card registration, or other documentation BARFIELD deems acceptable) for the DPS1000/1811NG product. BARFIELD, at its option, shall repair or replace the defective unit covered by this warranty. Please retain the dated sales receipt as evidence of the original purchaser's date of purchase. You will need it for any warranty service. In order to keep this limited warranty in effect, the DPS1000/1811NG product must have been handled and used as prescribed in the instructions accompanying this product. This limited warranty does not cover any damage due to accident, misuse, abuse or negligence. This limited warranty is non-transferable and does not apply to any purchaser who bought the DPS1000/1811NG product from a reseller or distributor not authorized by BARFIELD, including but not limited to purchases from internet sites. This warranty does not affect any other legal rights you may have by operation of law. Contact BARFIELD at www.Barfieldinc.com or customer service at (305) 894-5506 for warranty service procedures.

DISCLAIMER OF WARRANTY

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BARFIELD INC.
4101 NW 29th Street
Miami, Florida 33142, USA

Form 7.5.3-20
Dated 01/07/2015, Rev. 2

Figure 3 Limited 2 Year Warranty

CHAPTER 1: GENERAL

1. INTENDED USE

A. The Barfield DPS1000 Imperium Series (P/N 101-01175) is a self-contained flight line Pitot-Static Test Set. The Test Set provides complete measurement and pneumatic control for performing leak testing, functional tests of air data instruments, components, and systems.

B. The Test Set meets the demanding RVSM accuracy requirement of ± 0.003 inHg.

2. SPECIFICATIONS

A. Physical Characteristics

Size (H, W, L)	9.0 in. (22.86 cm), 14.8 in. (37.6 cm), 22.2 in. (56.38 cm)
Weight	35 lbs. (15.9 kg)

Table 1 Physical Characteristics

B. Environmental

Environment	Indoor or Outdoor use
Operating Altitude	7,000 ft (2,134 m)
Operating Temp.	0°C to 50°C (32°F to 122°F)
Storage Temp.	-20°C to 60°C (-4°F to 140°F)
Operating Humidity	0 to 90% RH (non-condensing)
Power	100-120/200-240VAC, 50/60Hz, 400VA

Table 2 Environmental

C. Conformity

Electrical Safety	EN61010-1:2010, A1:2019
Pressure Safety	Pressure Equipment Directive - Class: Sound Engineering Practice (SEP)
EMC	EN61326-1:2013 (Class A) (*)
RoHS	EN63000:2018
Installation Category	Category II
Pollution Degree	2
CE marked	Refer to page iv

Table 3 Conformity

Note (*): Wi-Fi disabled.

D. **Performance**

AERONAUTICAL MOD "B"					
	Ps Channel ALT (Altitude)	**ROC** (Rate of Climb)	**Pt Channel CAS** (Calibrated Airspeed)	**RtCAS** (Rate of CAS)	**Mach**
Units	Feet	ft/min	knots (kts)	kts/min	-
Operating Range	-2,000 to 53,000 (*3) 0 to 20,000 0 to 6,000 (*1)		0 to 650	50 to 600 (*2)	0 to 2.8
Accuracy	0.01% FS (*3) ± 3 ft @ -2,000 ft ± 3 ft @ 0 ft ± 4 ft @ 6,000 ft ± 4 ft @ 12,000 ft ± 5 ft @ 18,000 ft ± 6 ft @ 20,000 ft ± 7 ft @ 25,000 ft ± 8 ft @ 30,000 ft ± 10 ft @ 35,000 ft ± 12 ft @ 40,000 ft ± 15 ft @ 45,000 ft ± 20 ft @ 50,000 ft ± 22 ft @ 52,500 ft ± 27 ft @ 53,000 ft	± 2% of value	0.06% FS (*4) ± 1.3 kts @ 20 kts ± 0.5 kts @ 50 kts ± 0.3 kts @ 100 kts ± 0.2 kts @ 250 kts ± 0.2 kts @ 400 kts ± 0.2 kts @ 500 kts ± 0.2 kts @ 650 kts	± 2% of value	**Mach:** MACH > 0.15 and < 1.0 ± 0.001 **Mach:** MACH > 1.0 ± 0.001 rising to ± 0.003
Repeatability	0.0025% FS ± 1 ft @ 0 ft ± 2 ft @ 20,000 ft ± 2 ft @ 30,000 ft ± 4 ft @ 45,000 ft ± 6 ft @ 52,500 ft	-	± 0.5 kts @ 20 kts ± 0.2 kts @ 50 kts ± 0.1 kts @ 650 kts	-	± 0.001
Resolution	1	1	0.1	1	0.001
Stability (12 month)	0.01% FS (max) 0.005% FS (typ) (*5)	-	0.025% FS (max) 0.015% FS (typ) (*5)	-	-
Leak Rate (*7)	**5,000 ft:** 25 ft/min (max) < 15 ft/min (typ) **20,000 ft:** 50 ft/min (max) < 25 ft/min (typ)	-	**200 kts:** 1.0 kts/min (max) 0.25 kts/min (typ)	-	-

Table 4 MOD "B" Performance Accuracy

Note (*1): ROC (with 125 cu in volume or less) default is 3,000 ft/min in Aeronautical mode.

Note (*2): RtCAS (with 75 cu in volume) default is 300 kts/min in Aeronautical mode.

Note (*3): Ps Channel: Specification based on (0.01% FS) accuracy based on calibrated range of 3.0369 to 32.1480 inHg (± 0.003 inHg). The operating range is 55,000, accuracy specification is declared up to 53,000 ft. The 53,000 ft accuracy tolerance is slightly derated as compared with 52,500 ft and lower altitudes.

Note (*4): Pt Channel: Specification based on typical accuracy (0.06% FS). As a result of the Qc Auto Zero, the Pt Channel accuracy is 0.005% FS rising to 0.06% FS at 650 kts. Refer to Note (*6) below for more details.

Note (*5): Barfield has confirmed "typ" stability performance to be the expected performance that is experienced. If this level of accuracy performance is required, the customer should retain the calibration certificate results over the past recent years to have proof of the annual Incoming (As-received) results. This will provide the customer with the performance level of accuracy the unit is providing, and they can confirm it's meeting their required performance requirements for the application.

- If the Incoming (As-received) performance is not meeting the customer's required accuracy, the recommended 12-month calibration interval should be reduced to obtain the required accuracy required.

Note (*6): Specifications based on empirical results obtained from the evaluation of units received back for annual recertification. However, if the application requires this level of accuracy, historic proof of accuracy should be maintained. This can be established by keeping a record of the annual calibration certifications, specifically the Incoming (As-received) report, as this provides proof of accuracy and stability maintained over the recommended 12-month annual calibration cycle.

- Unlike most 3rd party calibration services, customer units calibrated and certified by Barfield will receive an (1) Incoming (As-received) report and an (2) Outgoing (As-left) calibration certification report. The incoming report provides the ability to track and prove stability and accuracy. As an OEM, Barfield is the most qualified to calibration, perform repairs, installs MODs, and provide firmware updates.

Note (*7): This tolerance represents the DPS1000 internal leak rate with no hoses attached to the Static (Ps) or Pitot (Pt) ports. If configured with AN4 ports, the AN4 ports are capped.

Important note regarding Leak Testing: To obtain the true Leak Rate, the effects of adiabatic must be considered, thus thermal equilibrium of the Static and Pitot channel pneumatic may be required. This can be achieved by increasing the WAIT time while performing Leak Testing using either of the two modes provided: (1) traditional manual Leak Rate Timer mode or (2) while in automatic ATP Leak Test mode. Thermal equilibrium occurs when the trapped air in the Static channel and Pitot Channel are not increasing or decreasing in temperature. When air is trapped in a sealed system the pressure increases or decreases when the gas "air" expands or contracts because of thermal instability. This small increase or decrease in pressure will have the appearance of a larger pneumatic leak than exists. To measure the test set or test set and aircraft true leak rate, thermal stability must be established before the leak measurement is performed. By increasing the wait time from 1 minute to 5 minutes or longer, this will allow thermal stability to be achieved resulting in more accurate true leak rate results.

Note: Accuracy specifications are based on performing the 12-month recertification cycle when connected to a leak tight system.

Note: Specifications are subject to change without notice.

PRESSURE UNITS MOD "B"					
	Ps Channel	**Ps ROC** (Rate of Change)	**Qc Channel** (Note: Pt = Qc + Ps)	**RtQc** (Rate of Qc)	**EPR** (Engine Pressure Ratio)
Units	inHg (abs)	inHg/min	inHg (diff)	inHg/min	Ratio: Pt7/Pt2
Operating Range	2.9648 to 38.0000	0.1 to 16	0.0 to 40 (*6)	0.5 to 10	0.1 to 10
Calibrated Range	3.0369 to 32.1480 inHg From 32.148 to 38 inHg accuracy derated (*2)	0.1 to 16	Qc = 0.0 to 40 (*6) Pt = 3.0369 inHg to 78.0 inHg (*6)	0.5 to 10	0.1 to 10
Accuracy	0.01% FS (*1) ± 0.003 inHg	± 2% of value	± 0.010 inHg (*3) ±0.005% FS rising to ±0.06% FS (typ)	± 2% of value	0.01
Repeatability	± 0.001 inHg	-	0.001 rising to 0.005	-	-
Resolution	0.0001	-	0.0001	-	0.001
Stability (12 months) (*5)	0.01% FS (max) 0.005% FS (typ)	-	0.025% FS (max) 0.015% FS (typ) (*4)	-	-

Table 5 MOD "B" Pressure Units Specifications

Note (*1): Ps Channel: Specification based on (0.01% FS) accuracy based on the calibrated range of 3.0369 to 32.148 inHg (±0.003 inHg).

Note (*2): Accuracy from 32.1480 to 38 inHg accuracy is 0.01% of 38.0 inHg = (± 0.004 inHg).

Note (*3): Pt Channel: Specification based on typical accuracy (0.06% FS). As a result of the Qc Auto Zero, the Qc Channel accuracy is 0.005% FS rising to 0.06% FS at (Qc = 25.6 inHg) = 650 kts. Above 650 kts = 25.6 inHg to 40 inHg, accuracy tolerance can rise to 0.10% FS. Refer to Note (*5) below for more details.

Note (*4): This tolerance represents the stability over a 12-month period. The max tolerance represents the worse-case drift. The "typ" value represents what the sensor manufacturer specifies as typical stability.

Note (*5): This tolerance represents the stability over a 12-month period. Barfield has confirmed "typ" stability performance to be the expected performance that is experienced. If this level of accuracy performance is required, the customer should retain the calibration certificate results over the past recent year to have proof of annual Incoming (As-received) results to prove the level of accuracy required for the customer's application.

Note (*6): Pt max = Ps max + Qc max = 38.0 + 40.0 = 78 inHg.

Note: Accuracy specifications are based on performing the 12-month recertification cycle when connected to a leak tight system.

Note: Specifications are subject to change without notice.

AERONAUTICAL NON-MOD "B"					
	Ps Channel	**Ps ROC** (Rate of Change)	**Pt Channel CAS**	**RtCAS**	**Mach**
Units	Feet	ft/min	knots (kts)	kts/min	-
Operating Range	-2,000 to 55,000	0 to 20,000 0 to 6,000 (*1)	0 to 650	50 to 600 (*2)	0 to 2.8
Accuracy	0.01% FS (*3) ± 3 ft @ -2,000 ft ± 3 ft @ 0 ft ± 3ft @ 6,000 ft ± 4 ft @ 12,000 ft ± 5 ft @ 18,000 ft ± 6 ft @ 20,000 ft ± 6 ft @ 25,000 ft ± 8 ft @ 30,000 ft ± 9 ft @ 35,000 ft ± 11 ft @ 40,000 ft ± 15 ft @ 45,000 ft ± 18 ft @ 50,000 ft ± 23 ft @ 55,000 ft	± 2% of value	0.06% FS (*4) ± 1.3 kts @ 20 kts ± 0.5 kts @ 50 kts ± 0.3 kts @ 100 kts ± 0.2 kts @ 250 kts ± 0.2 kts @ 400 kts ± 0.2 kts @ 500 kts ± 0.2 kts @ 650 kts	± 2% of value	**Mach:** MACH > 0.15 and < 1.0 ± 0.001 **Mach:** MACH > 1.0 ± 0.001 rising to ± 0.003
Repeatability	0.0025% FS ± 1 ft @ 0 ft ± 2 ft @ 20,000 ft ± 2 ft @ 30,000 ft ± 4 ft @ 45,000 ft ± 6 ft @ 52,500 ft	-	± 0.5 kts @ 20 kts ± 0.2 kts @ 50 kts ± 0.1 kts @ 650 kts	-	± 0.001
Resolution	1	1	0.1	1	0.001
Stability (12 month)	0.01% FS (*5)	-	0.025% FS	-	-
Leak Rate (*7)	**5,000 ft:** 25 ft/min (max) < 15 ft/min (typ) **20,000 ft:** 50 ft/min (max) < 25 ft/min (typ)	-	**200 kts:** 1.0 kts/min (max) 0.25 kts/min (typ)	-	-

Table 6 Non-MOD "B" Performance Accuracy

Note (*1): ROC (with 125 cu in volume) default is 3,000 ft/min in Aeronautical mode.

Note (*2): RtCAS (with 75 cu in volume) default is 300 kts/min in Aeronautical mode.

Note (*3): Ps Channel: Specification based on (0.008% FS) accuracy based on the calibrated range of 2.6931 to 38 inHg. Sensor manufacturer specification.

Note (*4): Pt Channel: Specification based on typical accuracy (0.06% FS). As a result of the Qc Auto Zero, the Pt Channel accuracy is 0.005% FS rising to 0.06% FS at 650 kts. Refer to Note (*6) below for more details.

Note (*5): This tolerance represents the stability over a 12-month period. If tighter tolerances are required, the calibration interval should be reduced or establish proof of stability.

Note (*6): Specification are based on empirical results obtained from evaluation of units received back for annual recertification. However, if your application requires this level of accuracy, historic proof of stability should be maintained for proof of accuracy.

Note (*7): This tolerance represents the DPS1000 internal leak rate with no hoses attached to the Static (Ps) or Pitot (Pt). If configured with AN4 ports, the AN4 ports are capped.

PRESSURE UNITS NON-MOD "B"					
	Ps Channel	**Ps ROC** (Rate of Change)	**Qc Channel** (Note: Pt = Qc + Ps)	**RtQc** (Rate of Qc)	**EPR** (Engine Pressure Ratio)
Units	inHg (abs)	inHg/min	inHg (diff)	inHg/min	Ratio: Pt7/Pt2
Operating Range	2.6931 to 38.0000	0.1 to 16	0.0 to 40 (*3)	0.5 to 10	0.1 to 10
Calibrated Range	2.6931 to 32.1480	0.1 to 16	0.0 to 40 (*3)	0.5 to 10	0.1 to 10
Accuracy	0.01% FS (*1) ± 0.003 inHg	± 2% of value	± 0.010 inHg (*2)	± 2% of value	0.01
Repeatability	± 0.001 inHg	-	0.001 rising to 0.005	-	-
Resolution	0.0001	-	0.0001	-	0.001
Stability (12 months) (*3)	0.01% FS	-	0.025% FS	-	-

Table 7 Non-MOD "B" Pressure Units Specifications

Note (*1): Ps Channel: Specification based on (0.008% FS) accuracy based on the calibrated range of 2.6931 to 32.1480 inHg, and 0.1% FS from 32.1480 to 38 inHg.

Note (*2): Pt Channel: Specification based on typical accuracy (0.06% FS). As a result of the Qc Auto Zero, the Pt Channel accuracy is 0.005% FS rising to 0.06% FS at 650 kts. Above 650 kts = 25.6 inHg to 40 inHg, accuracy tolerance can rise to 0.10% FS. Refer to Note (*4) below for more details.

Note (*3): Pt max = Ps max + Qc max = 38.0 + 40.0 = 78 inHg.

Note (*4): Specification are based on empirical results obtained from the evaluation of units received back for annual recertification. However, if the application requires this level of accuracy, historic proof of stability should be maintained for proof of accuracy.

Note (*5): This tolerance represents the stability over a 12-month period. If tighter tolerances are required, the calibration interval should be reduced or establish proof of stability.

Note: Accuracy specifications are based on performing the 12-month recertification cycle and when connected to a leak tight system.

Note: Specifications are subject to change without notice.

E. **Display Units**

CAS	kts, km/h, mph
ALT	ft, m
MACH	n/a (dimensionless ratio)
ROC	ft/min, m/min
RtCAS	kts/min
RtQc	inHg/min
Pt, Ps, Qc	inHg, mbar, psia, psid, kPa, mmHg, inH_2O@4°C, inH_2O@20°C, inH_2O@60°F
EPR	inHg, mbar, psi, mmHg, kPa, hPa, inH_2O@4°C, inH_2O@20°C, inH_2O@60°F

Table 8 Display Units

F. **Pressure Media**

Two internal high reliability electric pumps generate the required pressure and vacuum. The 4-head vacuum pump is configured to provide each channel (Static (Ps) and Pitot (Pt)) with its own dedicated 2-headed vacuum source. The pressure pump is a single head unit and supplies both channels with a common pressure supply.

G. **Transducers**

The Static (Ps) channel uses an absolute pressure transducer while the Pitot (Pt) channel uses a differential pressure transducer.

H. **Input Power**

Electronic switching power supply module with auto input voltage detection circuitry for an A/C input voltage of 100-120/200-240VAC at 50-60Hz.

I. **Fuse Protection**

Fuse overload protection is provided by a Miniature Fuse, 5 x 20 mm, Time-Lag T, L, 250VAC, 4A is installed on the fuse compartment of the power entry module.

Note: For 200-240VAC Operation, 5x20 mm, Time-Lag T, L, 250VAC @ 2A is recommended.

3. INSTRUCTIONS FOR USE

A. With the Barfield DPS1000 Static (Ps) and Pitot (Pt) ports connected via the hoses (included) and mating aircraft adapters (not included) to their respective ports on the aircraft, the user is able to enter pressures or equivalent aeronautical values using the Test Set's touch screen input display to drive the aircraft system to the required points of test.

B. Optionally, the DPS1000 Test Set can be controlled using a Wi-Fi enabled tablet or cellphone, either Android or iOS (not supplied), as a wireless remote-control device. Barfield provides a custom App which is available as a free download from the Google Play Store and the Apple App Store. The tablet/mobile display will exactly mirror that of the tester so that the transition to remote control is seamless. Please refer to **APPENDIX E: WI-FI CONNECTION PROCEDURE** for more information.

C. Please refer to **CHAPTER 4: OPERATION** for complete operating instructions.

D. Please refer to **APPENDIX D: MENU NAVIGATION** for the Menu Navigation.

4. TECHNICAL ASSISTANCE

A. For technical assistance on the Barfield DPS1000, please contact Barfield Inc. at:

TECHNICAL CUSTOMER SUPPORT - GSTE
BARFIELD, INC.
P.O. BOX 025367
MIAMI, FL 33102-5367
USA

Telephone (305) 894-5400
(800) 321-1039

Fax (305) 894-5401

Email gsesales@barfieldinc.com

CHAPTER 2: RATINGS

1. SUPPLY VOLTAGES

A. The Test Set may be powered from either 100 to 120 VAC at 50 or 60 Hz, 400 VA, or from 200 to 240 VAC at 50 or 60 Hz, 400 VA.

2. CONNECTION DESCRIPTION

A. Power Entry – the power entry module pictured in Figure 4 is a connector Style IEC 320-C14 module with an ON/OFF Switch and equipped with an internal fuse holder.

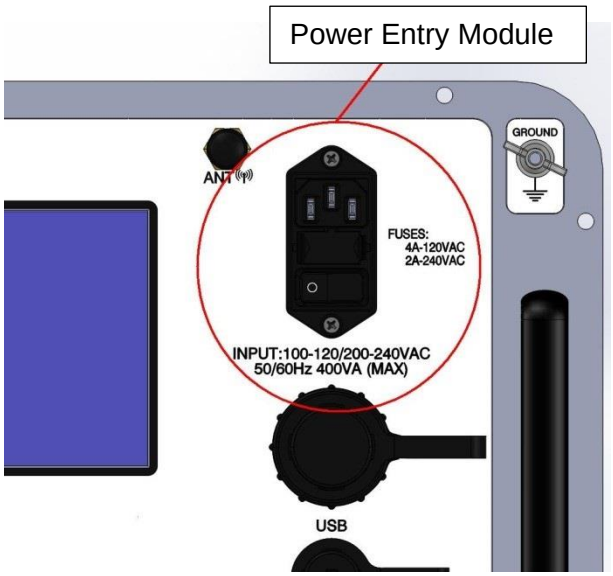


Figure 4 Power Entry Module

B. The Tester must be connected to the correct electrical power supply as stated beneath the power connector.

CAUTION: THE SUPPLY MUST PROVIDE CONNECTION TO A PROTECTIBE GROUND TERMINAL. THE TEST SET MUST ALWAYS BE CONNECTED TO THE SUPPLY GROUND.

3. ENVIRONMENTAL

A. Altitude: 7,000 ft (2,134 m)

B. Operating Temp: 0°C to 50°C (32°F to 122°F)

C. Storage Temp: -20°C to 60°C (-4°F to 140°F)

D. Operating Humidity: 0 to 90% RH (non-condensing)

CHAPTER 3: INSTALLATION

1. ASSEMBLY

A. Package

Carefully unpack the Test Set and make a visual inspection of the tester for evidence of damage that might have occurred during shipping. The user should take inventory of the package contents to ensure the following items are there:

1. DPS1000 Pitot Static Test Set, P/N 101-01175 (refer to Figure 5).
2. Ruggedized travel/shipping case, P/N 194-00073 (refer to Figure 5).
3. Hose kit P/N 115-00632 (refer to Figure 14) composed of:
   a) 1 each, Blue, 25 ft Hose with quick disconnect and 1 tethered plug for Static (Ps) port connection, P/N 115-00630.
   b) 1 each, Red, 25 ft Hose with quick disconnect and 1 tethered plug for Pitot (Pt) port connection, P/N 115-00629.
4. Carrying bag for hose kit, P/N 195-00021 (refer to Figure 15).
5. Power cord, 90 degree, 115VAC, P/N AE9887-ND (refer to Figure 8).
6. Instruction manual, P/N 56-101-01175 (refer to Figure 19).



Figure 5 DPS1000 & Travel/Shipping Case

B. Enclosure

1. The Test Set is encased in a (yellow) copolymer injection molded case comprised of upper and lower sections:
   a) The lower section of the case supports the panel assembly.
   b) The upper section is a removable lid.
   c) The case is equipped with a one-touch extension handle and wheels for carry-on ease.
   d) The case is the largest legal airline carry-on size (refer to Table 9 for dimensions).

2. The Test Set case is then housed within the cavity of the (black) ruggedized travel/shipping case, P/N 194-00073 (refer to Figure 5 and 6).
   a) The travel/shipping case is equipped with a one-touch extension handle and wheels for increased mobility.
   b) The travel/shipping case is injection molded, airtight, and watertight case with custom PE foam.
   c) The custom PE foam contains cavities for the Test Set as well as accessories. These accessories include carrying bag P/N 195-00021 (with hose kit P/N 115-00632), instruction manual 56-101-01175 (refer to Figure 6), and hose side keyed quick connect (quantity 2, not pictured).



Figure 6 Custom Foam Cavities

   d) The travel/shipping case is sized to qualify as a checked bag with most commercial airlines (refer to Table 9 for dimensions).

   Note: Refer to Figure 7 for case dimensions index.

Dimensions	Copolymer Injection Molded (Yellow) Case	Travel/Shipping (Black) Case P/N 194-00073
Height	9.0 in. (22.86 cm)	13.7 in. (34.8 cm)
Width	14.8 in. (37.6 cm)	18.2 in. (46.2 cm)
Length	22.2 in. (56.38 cm)	24.3 in. (61.7 cm)
Weight	35 lbs. (15.9 kg)	19.5 lbs. (8.8 kg)

Table 9 Nominal External Case Dimensions

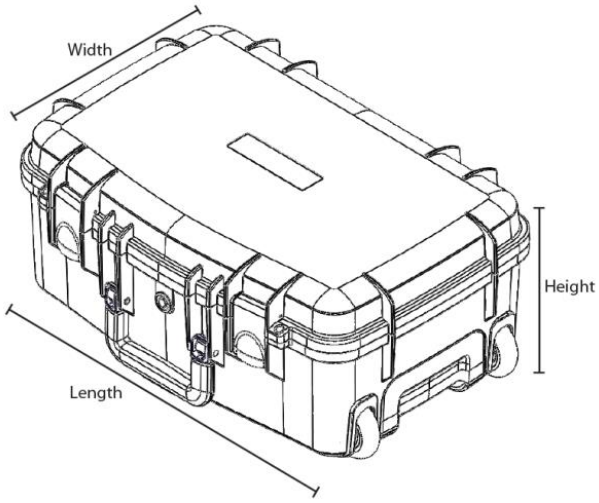


Figure 7 Case Dimensions Key

C. **Container Storage**

It is recommended that the factory-shipping container and packing materials be retained should it become necessary, for any reason, to re-ship the Test Set, such as for the OEM recertification. The test set should then be packaged for re-shipment within the shipping/travel case, P/N 194-00073 to maximize protection.

D. **Items not included**

1. Nav-Aids Pitot Static Adapters – Contact Barfield with your aircraft requirements.
2. Wi-Fi enabled tablet – either Android or IOS device.
3. Wi-Fi Application – available as free download from either Google Play Store or Apple App Store.

2. GROUNDING (EARTHING)

A. The supply must provide connection to a protective ground terminal. The unit must always be connected to the supply ground.

B. The DPS1000 chassis may be grounded to the aircraft or instrument under test using the Ground stud located in the upper right corner of the panel depicted as item 5 in Figure 13.

CAUTION: THE GROUND WIRE USED MUST BE NO GREATER THAN 3 METERS IN LENGTH AS PER EN 61326-1: 2013.

3. ELECTRICAL CONNECTIONS

The included power supply cable P/N AE9887-ND (refer to Figure 8) is a common 3 prong IEC320-C13 AC power cable. The cable length is 6.56 in. (2.00 m), and the wire gauge is 18 AWG.

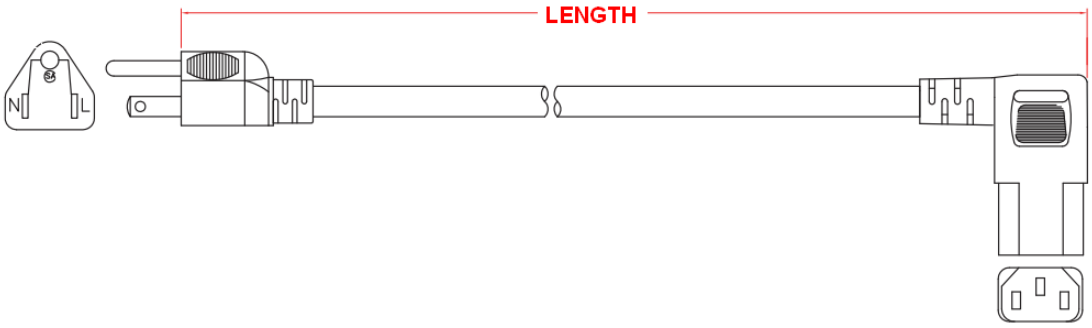


Figure 8 Power Supply Cable P/N AE9887-ND

4. VENTILATION / DRAINAGE

A. Ventilation

The DPS1000 has exhaust vents on the right side of the unit which must not be blocked. Also, there are intake vents on the left side for drawing air through the case which also must be kept free from obstructions. Both sets of vents are labeled as shown in Figure 9.



Figure 9 Do Not Obstruct Vents

B. Drainage

The DPS1000 has a port located on the front of the enclosure. It is pictured and labeled as shown in Figure 10 and is used to exhaust humid air which is produced by the internal pressure pump. This port must not be blocked or otherwise restricted.



Figure 10 Humid Air Exhaust

5. PNEUMATIC PRESSURE CONNECTIONS

A. **Pitot & Static Quick Disconnect Ports** (Standard Configuration, refer to Figure 11).

1. Pitot (Pt) – P/N B-QC4-D-2PMK5FV
2. Static (Ps) – P/N B-QC4-D-2PMK2FV

Note: OPT A includes AN4 fittings in both ports Pt (pitot) and Ps (static), P/N 284-00013

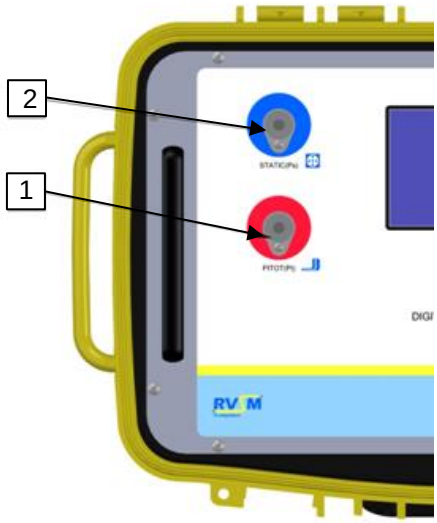


Figure 11 DPS1000 Pressure Connections

B. **Blanking Caps** (Used on OPT A only)

When not in use, the panel mounted blanking caps should be fitted to the ports to prevent the introduction of any foreign matter.

Do not use a wrench when connecting Blanking Caps to the Test Set's Static (Ps) and Pitot (Pt) ports – hand-tighten only (refer to Figure 12).

Note: During the performance of a leak test of the Test Set, a leak at these AN4 caps will adversely affect the outcome of the test.

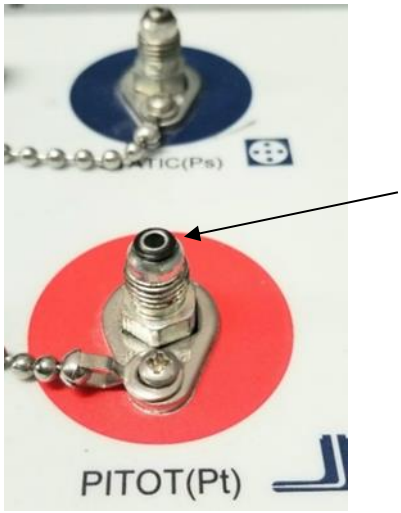


Figure 12 O-Flared Ports

CHAPTER 4: OPERATION

1. OPERATING CONTROLS

A. The DPS1000 front panel switches and controls are depicted in Figure 13.

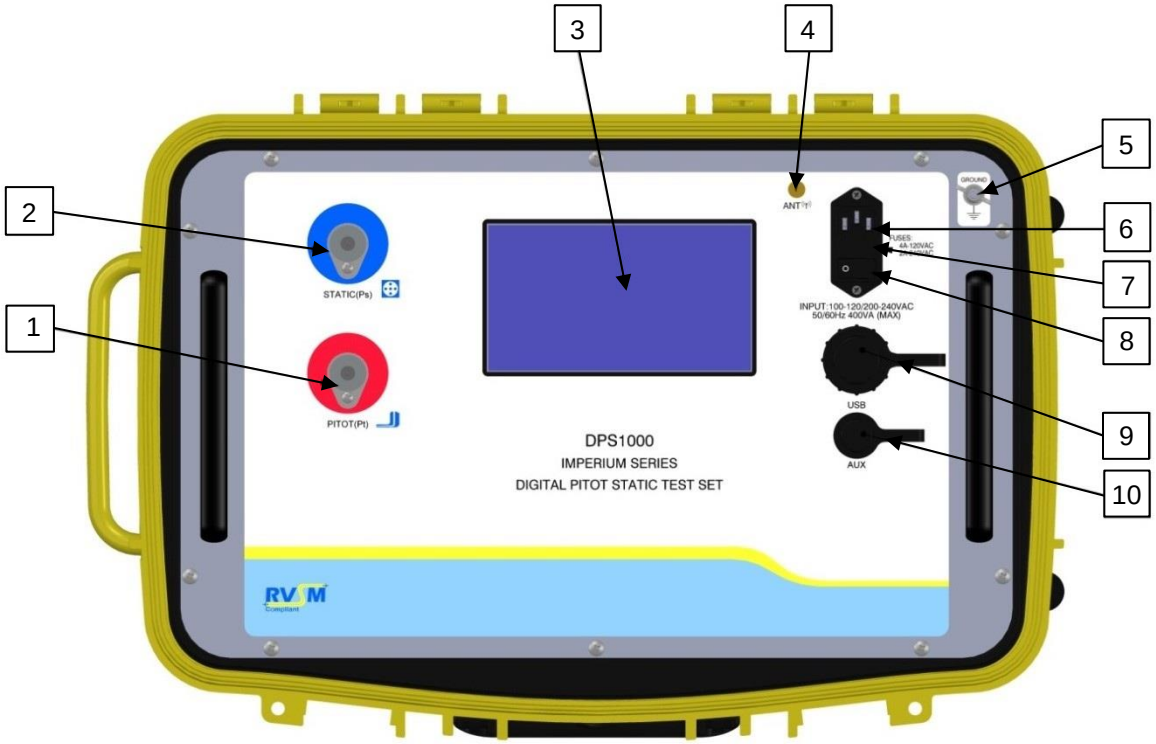


Figure 13 DPS1000 Front Panel

Key to Figure 13		
1	Pitot (Pt) Pressure Port	Connect to Aircraft Pitot system. This is also referred to as the Pt Port and Total Pressure port.
2	Static (Ps) Pressure Port	Connect to Aircraft Static system. This is also referred to as the Ps Port.
3	Display – Touch Screen	Touch screen Graphic User Interface (GUI) is used to display and control all aspects of the Test Sets operation. The only physical switch is the Power ON/OFF. (*1)
4	Wi-Fi Antenna	Used for Wi-Fi (*2) communication. This feature can be used to communicate with either an android or iOS tablet or cellphone. (*3)

(Continued on next page)

Key to Figure 13 (Continued)		
5	Ground (Earth) Stud	Used to ensure Test Set chassis is at same ground potential as the Aircraft or Instrument being tested.
6	Fused Power Entry Module	Connects external power to the tester. Unit uses either a cable with a standard 115 VAC plug or the optional cable for operator installation of 230 VAC plug. (*4)
7	Power Entry Fuse Holder	Power entry module fuses. • For 120 VAC operation use 1(ea) fuse: 4A. • For 220 VAC operation use 1(ea) fuse: 2A.
8	Power ON/OFF Switch	Used to power ON/OFF Test Set operation.
9	USB Port	Standard USB port used for multiple purposes: • To Upgrade Test Set HUIM or PCM Firmware from flash drive (refer to **APPENDIX H: FIELD FIRMWARE UPDATE PROCEDURE VIA USB & BARFIELD ADTS APP**). • To download Test Set history log contents onto USB flash drive.
10	Micro USB Port	OEM use only.

Note (*1): When a remote iOS or Android device is connected to DPS1000, the touch screen on the DPS1000 is disabled except for the "Disconnect Remote" and "Local UI: enable" buttons (refer to **APPENDIX E: WI-FI CONNECTION PROCEDURE**).

Note (*2): Wi-Fi is a free, embedded, secure, factory-enabled capability.

Note (*3): ADTS App is NOT supported when UUT is in Calibration Mode

Note (*4): The DPS1000 must be connected to an outlet with ground connection.

CAUTION: THE DPS1000 SHOULD NEVER BE POWERD OFF AND RAPIDLY POWERED BACK ON WITH NO WAITING TIME AS THIS MAY DAMAGE UNIT.

2. OPTIONS

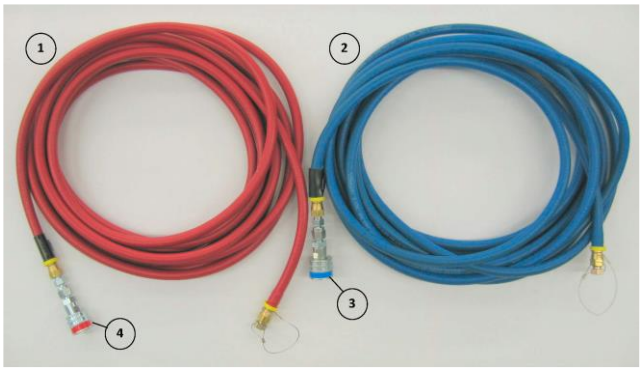
It is important, whether testing on the aircraft or on the bench, that the Test Set be positioned to not impede the ability to quickly power down and/or disconnect electrical power should the need arise.

3. ACCESSORIES

A. Included Items

1. Hose Kit, P/N 115-00632 (refer to Figure 14).
2. Carrying Bag for hose kit, P/N 195-00021 (refer to Figure 15).

3. Wi-Fi Antenna, P/N 126-00001 (refer to Figure 16).
4. Power Supply Cable, P/N AE9887-ND (refer to Figure 8).
5. AN4 Caps with Lanyard, P/N 176-00001 (OPT A) (refer to Figure 17).
6. Ruggedized travel/shipping case, P/N 194-00073 (refer to Figure 18).
7. Instruction Manual, P/N 56-101-01175 (refer to Figure 19).



P/N 115-00632 (Standard Configuration)



P/N 115-00633 (OPT A)

Figure 14 Hose Kit



Figure 15 Carrying Bag, P/N 195-00021



Figure 16 Antenna, P/N 126-00001



Figure 17 AN4 Caps with Lanyard, P/N 176-00001 (OPT A)



Figure 18 Travel/Shipping Case, P/N 194-00073

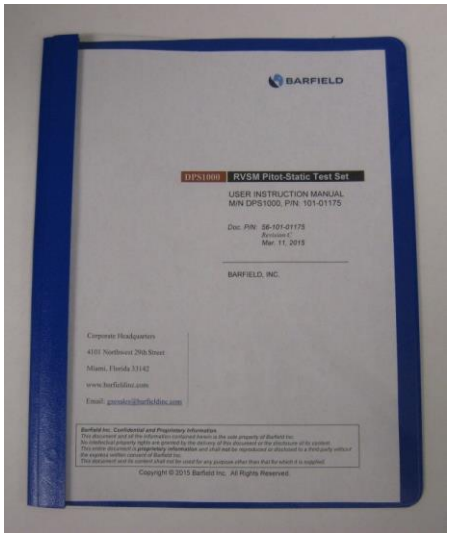


Figure 19 Instruction Manual, P/N 56-101-01175

B. **Items not included**

1. Nav-Aids Pitot Static Adapters – Contact Barfield with your aircraft requirements.
2. Wi-Fi enabled tablet – either Android or IOS device.
3. Wi-Fi Application – available as free download from either Google Play Store or Apple App Store.

4. PREPARATION

The DPS1000 has been designed with a user-friendly GUI, "Graphical User Interface," which provides an intuitive understanding of the man/machine interaction thereby greatly simplifying the learning experience. However, we **STRONGLY RECOMMEND** that the user becomes familiar with the DPS1000 operations and menu structure before connecting it to an aircraft system or instruments and/or performing any tests.

The test procedures are described in place of any specifications by either the airframe or the instrument manufacturer. Particular attention should be addressed to the preliminary procedures to avoid erroneous test results and to preclude any risk of damage to the aircraft or Test Set instruments. The ports on the Test Set and mating hoses are color-coded to help prevent accidental crossing of Pitot (Pt) and Static (Ps) hoses.

Each Test Set is completely calibrated and tested before shipment. However, to ensure the integrity of the tests, the DPS1000 should be leak checked before each use. To help automate this process, use the predefined ATP Test Set only.

WARNING: OBSERVE AIRCRAFT AND EQUIPMENT SERVICING PROCEDURES AS WELL AS SAFETY PRECAUTIONS DETAILED IN AIRCRAFT MAINTENANCE MANUAL (AMM), COMPONENT MAINTENANCE MANUAL (CMM), AND PROCEDURES AND PRACTICES STATED IN LOCAL ORDERS.

5. POWER ON INITIALIZATION

A. Set power switch to ON. After approximately 7 seconds, the display will indicate "DPS1000" during the initial boot-up process.

The following or similar screens will appear during the Test Set initialization (refer to Figure 20).

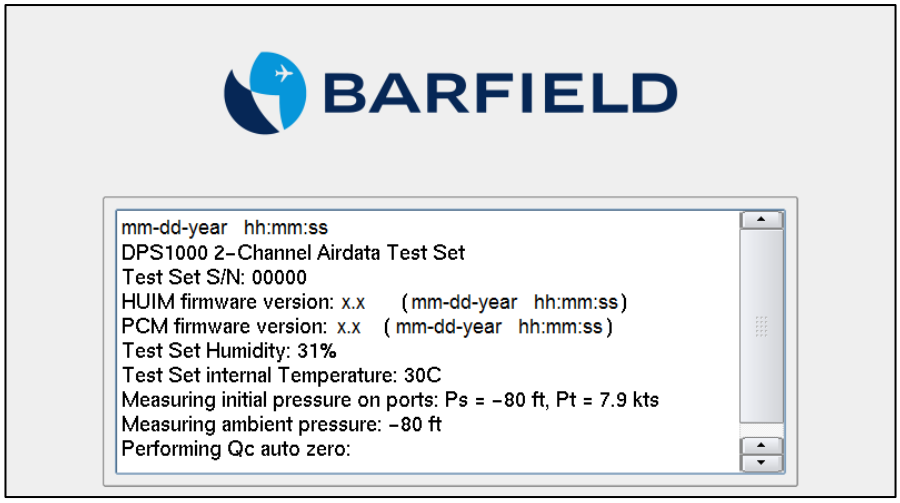


Figure 20 Power On Initialization Display

B. During the DPS1000 power ON initialization process the information is both displayed and written to a log file. The log file provides the ability to go back and view the initialization process and results if needed.

The log file can be viewed at a later time by going to the Menu sequence: Main Menu, Page 2, Page 3, Log File, Current History.

Note: The "Current History" log file contains logged information for the current powered ON session.

C. In the final step of the power ON initialization process, the Test Set will equalize the internal pneumatic pressures contained within the internal DPS1000 manifold and control vessels to ambient. When this process has completed, the Test Set will then be vented to ambient pressure, which will appear on the display.

D. At this time the Test Set is ready for the hoses to be attached to the Pitot (Pt) and Static (Ps) ports – hand-tighten only.

E. As mentioned earlier, it is standard practice and highly recommended to perform a Test Set Leak Test.

It is preferred that the complete aircraft hook-up configuration be assembled with all hoses and manifolds to result in the most comprehensive leak test of all components prior to attaching adapters to aircraft ports. Install plugs/caps in place of each Nav-Aids to allow leak testing of the hoses, fittings, and manifold if applicable.

At a minimum, perform the leak test with the hoses attached to the Test Set and with the other end of the hoses capped.

This process will provide the most accurate leak test results and allow the user to establish a baseline regarding the leak rate of the Test Set and hose combination prior to interfacing with the aircraft or instrument under test.

6. OPERATING MODES

A. The DPS1000 has two pneumatic control modes of operation, (1) the default mode, 2-channel (Static and Pitot) mode and (2) 1-channel, Pt-Only mode, which the user can select by following this Menu sequence: Main Menu, Page 2, Additional Functions, Control Mode.

B. When powered ON after the initialization process has completed, the Test Set will always be configured into the default 2-channel (Static and Pitot) mode.

The 2-channel mode is by far the most common configuration used while working with aircraft Pitot-Static systems and Aeronautical instruments. In the 2-channel mode, the Static (Ps) port is used to both measure and simulate the ALT, pressure altitude equivalent pressures while the Pitot (Pt) port is used to measure and simulate the CAS "calibrated airspeed" (CAS) equivalent pressures. At all times, the displayed value for pressure altitude "ALT" (ft or m) is computed based on a Baro setting of **29.9213** inHg (**1013.25** mb).

Note: Always verify that the Aircraft/Instrument has Baro Set at 29.9213 inHg (1013.25 mb).

Note: The Baro setting value cannot be changed.

C. The Pt Only mode can be used to drive an Airspeed or MACH indicator that has its Static (Ps) port left vented to ambient (local barometric pressure). When the single channel Pt-Only mode is selected, the DPS1000 will perform a Go To Ground function before transitioning into this mode to ensure the Test Set Static (Ps) port is at ambient barometric pressure. At the conclusion of the Go To Ground function the Test Set will leave the Static (Ps) port vented to ambient pressure while driving the Pitot (Pt) port to the Target pressures specified by the user.

D. Below are examples of the 2 modes:

1. Default: Aeronautical 2-Channel (Dual Ps, Pt) (refer to Figure 21).
2. Aeronautical 1-Channel (Pt Only) (refer to Figure 22).

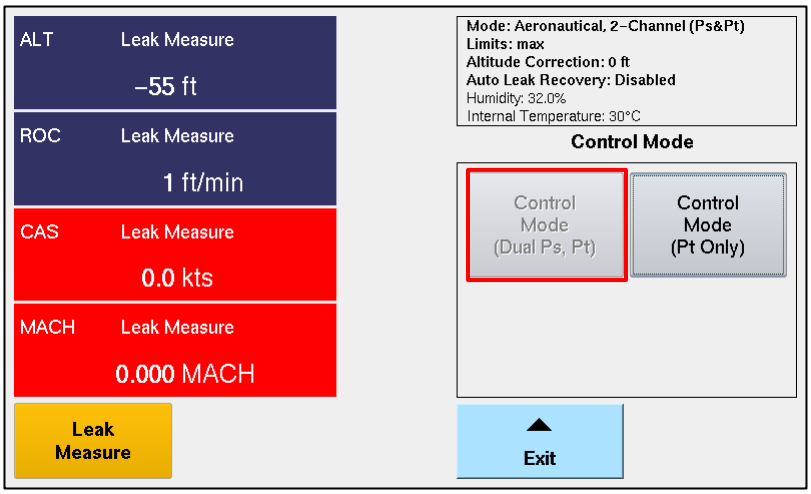


Figure 21 Default 2-Channel (Dual Ps, Pt) mode

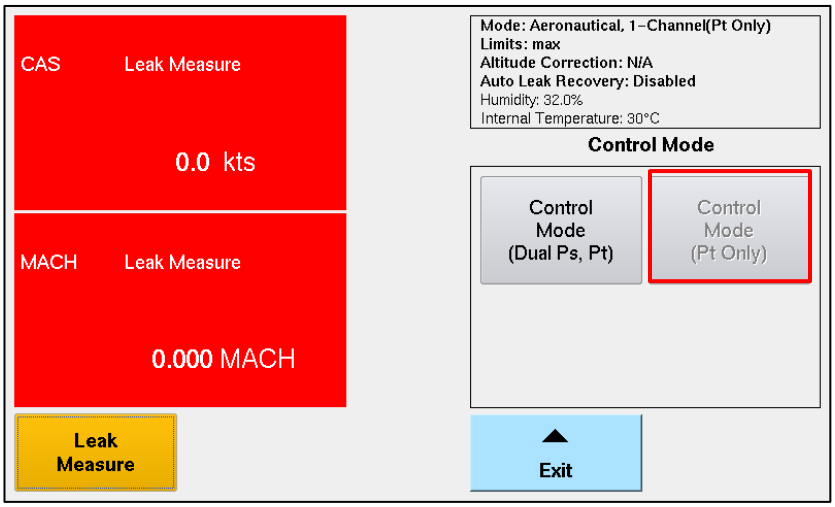


Figure 22 Optional 1-Channel (Pt Only) Mode

Note: Please refer to **APPENDIX D: MENU NAVIGATION** for the complete menu navigation.

7. TEST SET CONFIGURATION STATUS DISPLAY

The Test Set presents the Configuration Status information in the top right quadrant of the display. The following information is included:

A. **Mode**: 2-channel (Dual Ps, Pt) or 1-channel (Pt Only).

B. **Limits**: Indicates the limits profile currently in use.

C. **Altitude Correction**: Indicates the correction factor entered by the user. Default = 0 unless user specifies otherwise.

D. **Auto Leak Recovery**: Enabled or Disabled.

Note: The Configuration Status area is an active touch zone the user can navigate by either pressing the top right box or selecting this Menu sequence: Main Menu, Page 2, Setup 1 (refer to Figure 23 and Figure 24).

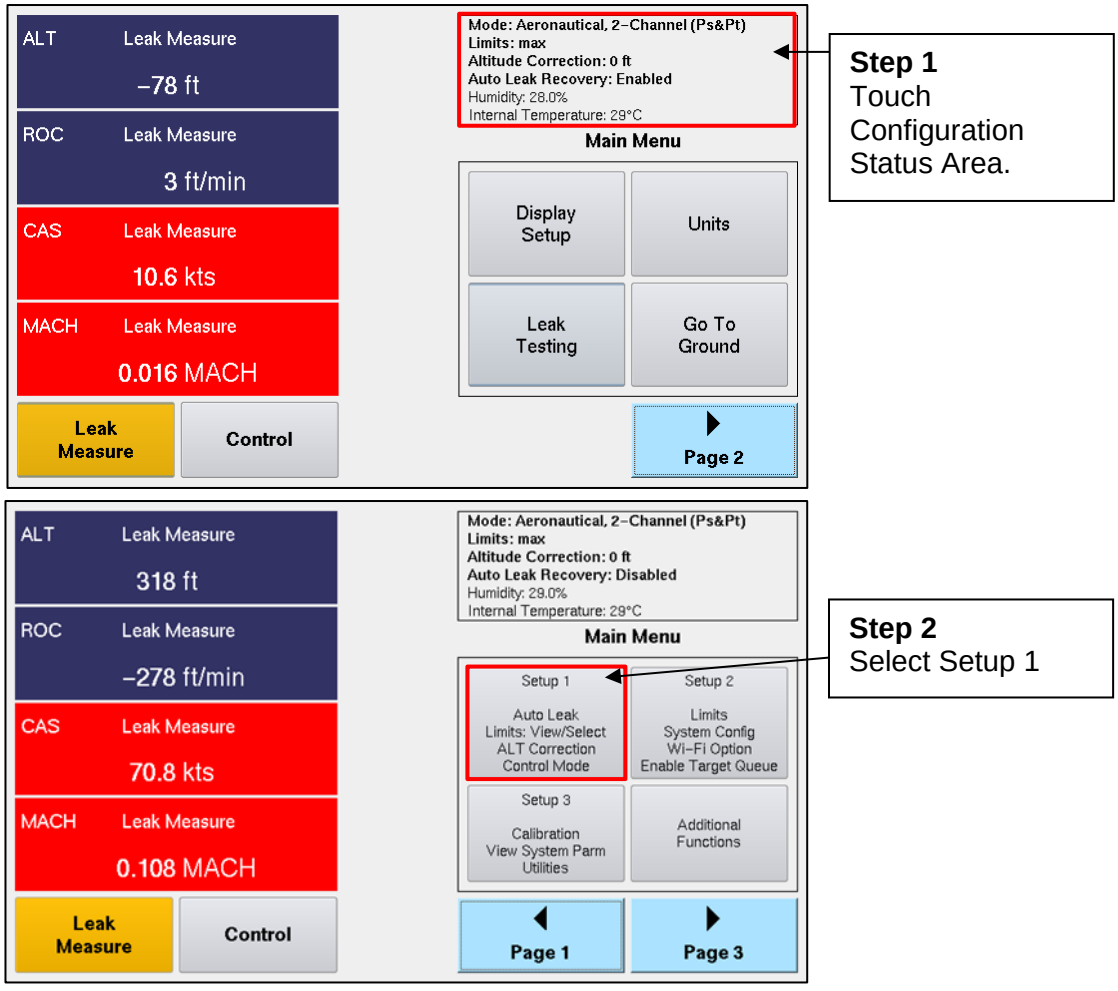


Figure 23 Test Set Configuration Information Displayed (1)

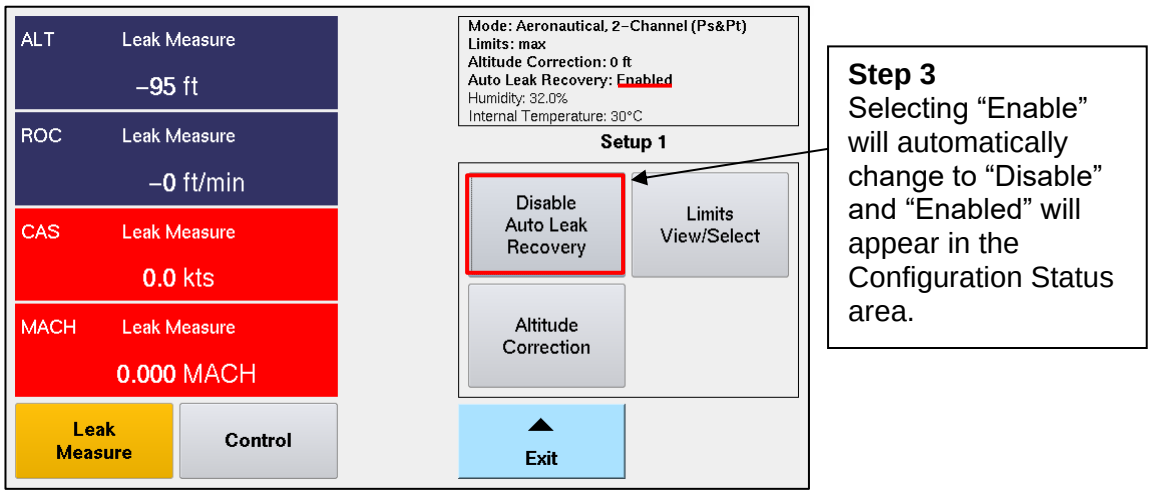


Figure 24 Test Set Configuration Information Displayed (2)

8. USER INTERFACE MENU AND DISPLAY

A. The User Interface (UI) was designed and structured to provide the user/operator with an efficient and intuitive man-machine interface.

1. The left-half of the screen provides all the measurement and control display screens.
2. The right-half of the screen provides all the menu displays and selections.
3. The top right-quadrant is used to display Test Set operational status (Mode, Limits, Altitude Correction, Auto Leak Recovery) information.
4. The Leak Measure and Control mode soft-key will have an amber background indicating which mode the Test Set is presently operating in (refer to Figure 25 and Figure 26).
5. While in Leak Measure mode, "Target =" is not displayed for any of the 4-parameters or 2-parameters displayed and therefore the *touch zones for those parameters are not active* (refer to Figure 25).
6. While in Control mode, the 4-parameters or 2-parameters displayed will have a "Target =" value displayed, when the Test Set transitions from Leak Measure to Control mode the Target value(s) are automatically set to the present value measured on the Static (Ps) and Pitot (Pt) ports (refer to Figure 26).

   During the transition to Control mode, "Wait Resuming Control" is displayed, and ALL touch screen zones are disabled except for the "Cancel" soft key. When the message "Wait Resuming Control" disappears the pneumatic controller has achieved pressure equalization with the current pressure on the Static (Ps) and Pitot (Pt) ports. At this time the 4-parameter or 2-paramter touch zones are active and the user can enter Target values for each of the displayed parameters.

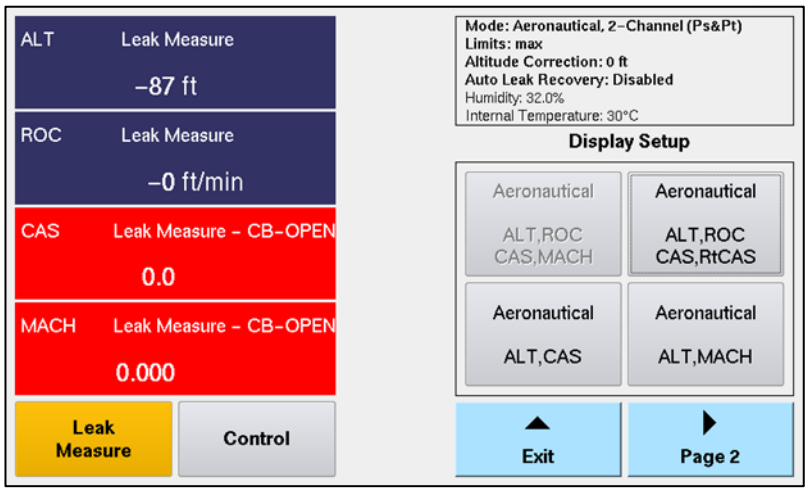


Figure 25 Leak Measure Mode

7. While in Control mode, the Leak Testing soft key is ghosted (refer to Figure 26). Leak testing can only be accomplished while in Leak Measure mode.

   Note: Regarding the UI Menu structure, the menu screen below is considered the top level “Root Menu.”

   Note: Throughout this section, while explaining all the UI related functions, the soft-key (touch screen) sequence will be listed based on starting at the top level “Main Menu” position.

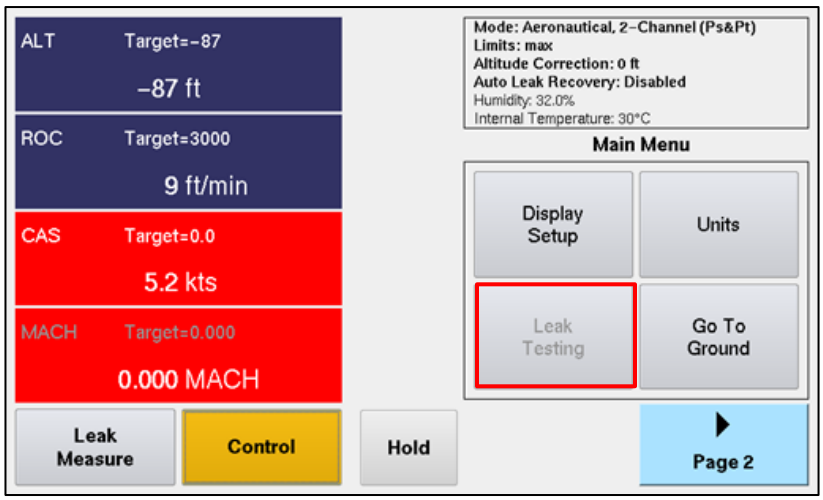


Figure 26 Control Mode

8. While in Control mode, the user can specify the Target value(s) by simply touching the pane touch zone area for the Target parameter of interest.

   Refer to Figure 30 for an example of the ALT, ROC, CAS, MACH display setup. The user can enter the Target value for any of the 4-parameters by initially touching the parameter touch zone area, which will cause the Target keypad to be displayed for user entry. For this example, the ALT touch zone was selected.

9. While in Control mode, the user can select the Hold feature which sets the controller Target values to present ALT and CAS values at the time Hold is selected (refer to Figure 27). Target values will be displayed as “HOLD” while in Hold mode (refer to

Figure 28). Select “Resume” to continue to the original Target parameters (refer to Figure 28).

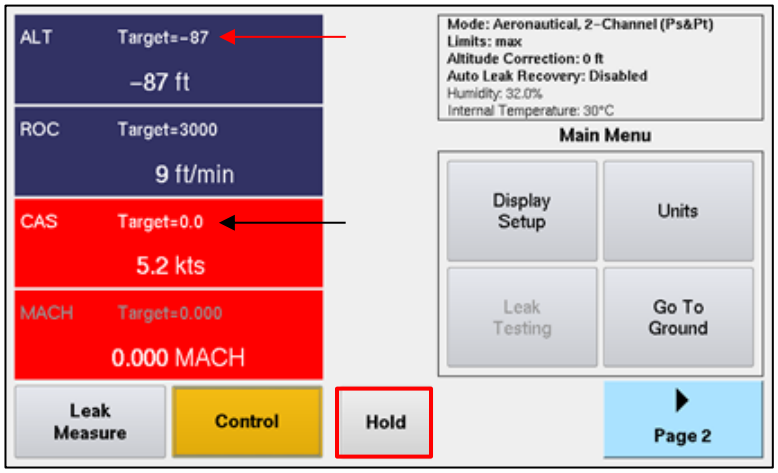


Figure 27 Control Mode (Select “Hold”)

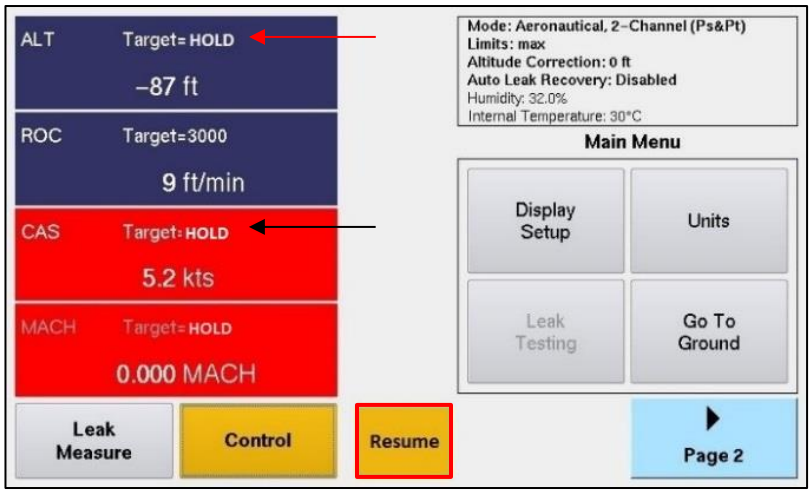


Figure 28 Hold Mode (Select “Resume”)

Note: The Hold feature does not place a STOP to the ALT and CAS values displayed. Since the ALT and CAS values are in transition with some ROC and RtCAS, the PCM controller requires some response time to reach the new temporary Target. When “Resume” is selected, the original target ALT and CAS values will reload.

10. While in Leak Measure mode, there are no Target value(s) displayed because the internal controller is off; the unit is simply measuring the aeronautical or pressure at the Static (Ps) and Pitot (Pt) ports. The displayed parameters, ROC and RtCAS, provide a relative but noisy, instantaneous leak rate indication. The touch screen is not active for any of the 4 or 2-parameter screen layouts. Only the right-half Main Menu and submenu page(s) of the screen and Leak Measure mode and the Control mode soft-keys are active (refer to Figure 29).

    Leak Testing - There are two types of leak tests supported on the Test Set: (1) the traditional leak testing using the Leak Rate Timer and (2) the Automatic Test Process

(ATP) Leak Test Profiles (refer to Figure 34). Refer to **D. Leak Testing** on page 32 to understand the two methods the unit provides for measuring Leak Rate accurately.



Figure 29 Target Value Keypad Screen

B. **Display Setup – Configuring display format**

The Display Setup allows the user to configure the display as a 2 or 4-parameter format (refer to Figure 30 and Figure 31). While operating in Aeronautical mode for example, the 4-parameter format will allow ALT, ROC, CAS and MACH or ALT, ROC, CAS, and RtCAS to be displayed. While in Control mode, Target values can be assigned to ALL 4 parameters by simply touching the screen on each of the 2 or 4-parameter displayed areas.

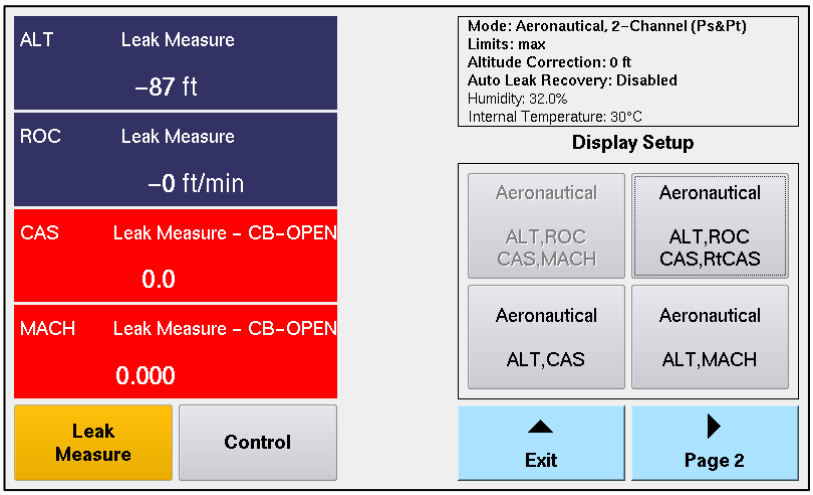


Figure 30 Display Setup: 4-Parameter Format

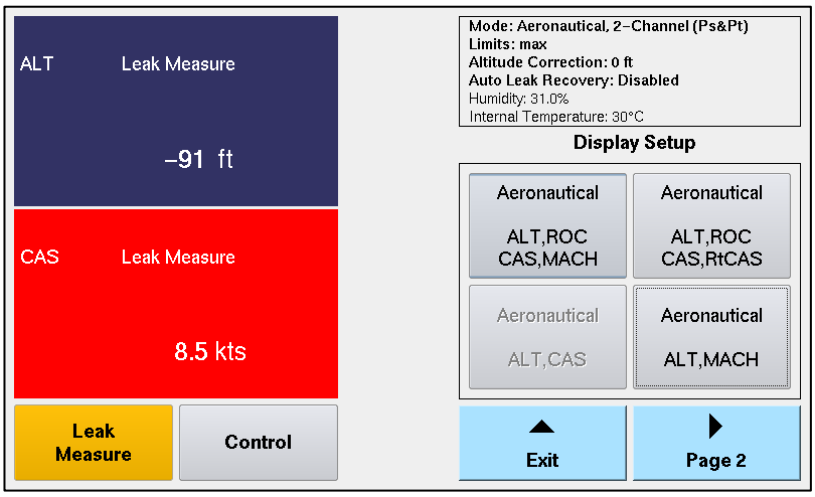


Figure 31 Display Setup: 2-Parameter Format

C. **Units – Displayed units**

Once the Display Setup has been selected, (Aeronautical, Pressure units or EPR, 4-parameter or 2-parameter display format) the Units menu choices allow the user to select the units of measure for the given display parameters selected (refer to Figure 32 and Figure 33).

For example, for Aeronautical mode, the available units for ALT are (1) ft or (2) m, depending on the selection. The corresponding units are for ROC (1) ft/min or (2) m/min, for CAS (1) kts or (2) km/h, and for RtCAS (1) kts/min or (2) km/h/min. Regarding MACH, it is a dimensionless quantity that is always displayed as MACH.

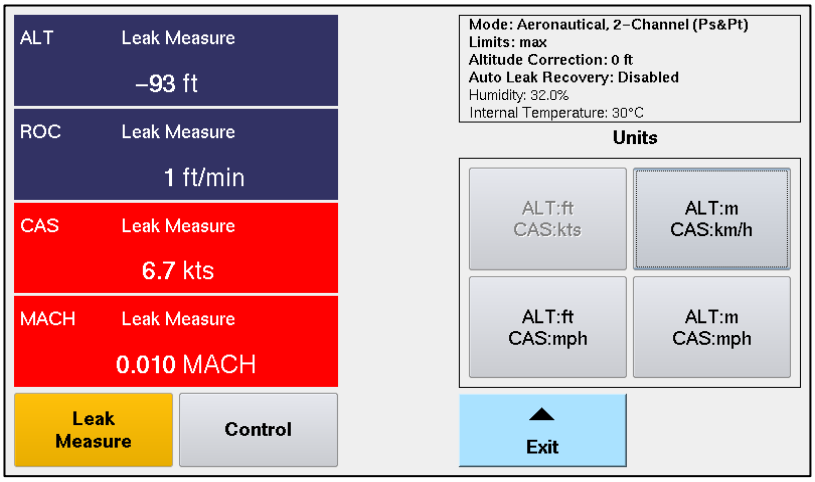


Figure 32 Display Units for Aeronautical Mode

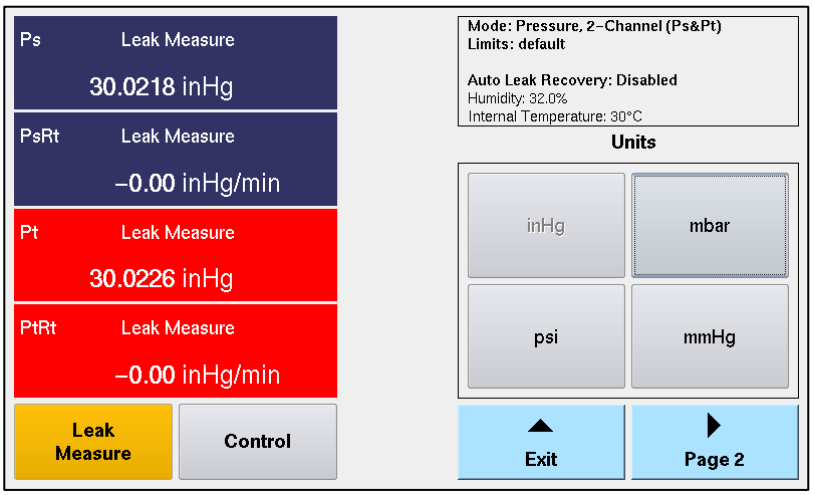


Figure 33 Display Units for Pressure Units Mode

D. **Leak Testing** – There are two types of leak tests supported on the Test Set: (1) the traditional leak testing using the Leak Rate Timer and (2) the Automatic Test Process (ATP) Leak Test Profiles (refer to Figure 34).

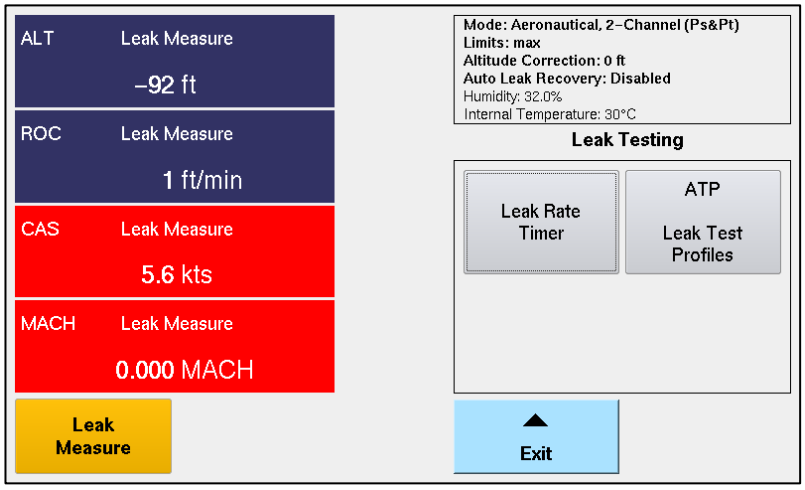


Figure 34 Leak Testing Menu

1. **Leak Rate Timer** – this is the traditional leak testing that allows the user to set the desired target values of ALT and CAS. Once the Test Set achieves those target values, the user selects the following Menu sequence in Leak Measure mode:

2. **Main Menu – Leak Testing, Leak Rate Timer**

   Wait Time is the duration of time that will allow the Static (Ps) and Pitot (Pt) pressure(s) to stabilize before beginning the Leak Test measurement cycle.

   Note: Anytime there is compression or expansion of a gas in a closed system there will be a resulting pressure change because of adiabatic.

   a) The Wait Time is to allow thermal equilibrium “adiabatic” to occur so that the leak measurement made during the “Leak Time” phase is truly a result of the system leak rate and not a result of adiabatic instability.

   b) For Low Level Leak testing (<5,000 ft.) a Wait Time of 1:00 min is recommended.

   c) For High Level leak testing (>10,000 ft. or high ROC) a Wait Time of 5:00 minutes or more is recommended to allow adiabatic stability to occur.

d) Leak Time is the duration of time that will be used to measure the leak rate. The value can be changed. Touch the “Leak Time” zone area and a touch screen keypad will appear allowing the user to re-define the Leak Time (refer to Figure 35).

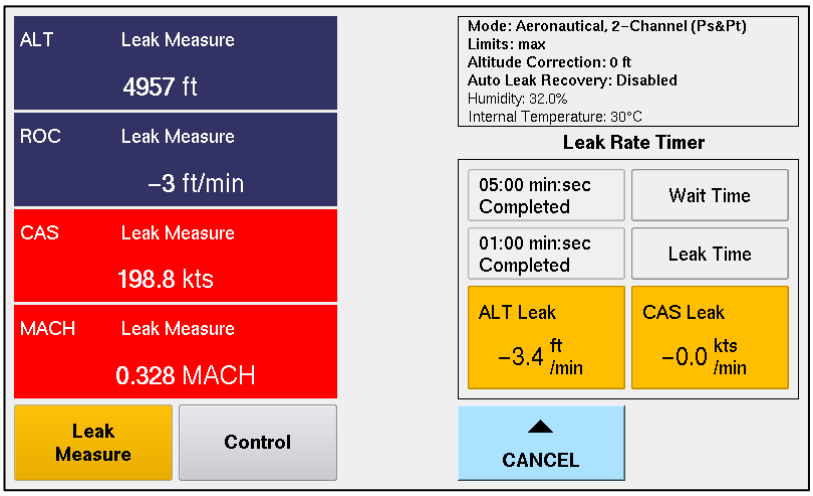


Figure 35 Leak Rate Timer Results

3. **ATP Leak Test Profiles – Automated Leak Testing**

The user can select the ATP “Automatic Test Process” Leak Test Profile which defines the necessary test parameters.

Once the ATP profile has been selected, the user can select RUN and step away, returning once process completed to observe the leak test results.

The user can select the ATP Leak Test Profile by following this Main Menu sequence: Main Menu, Leak Testing, ATP Leak Test Profiles, Select Leak Test Profile(s) (refer to Figure 36).

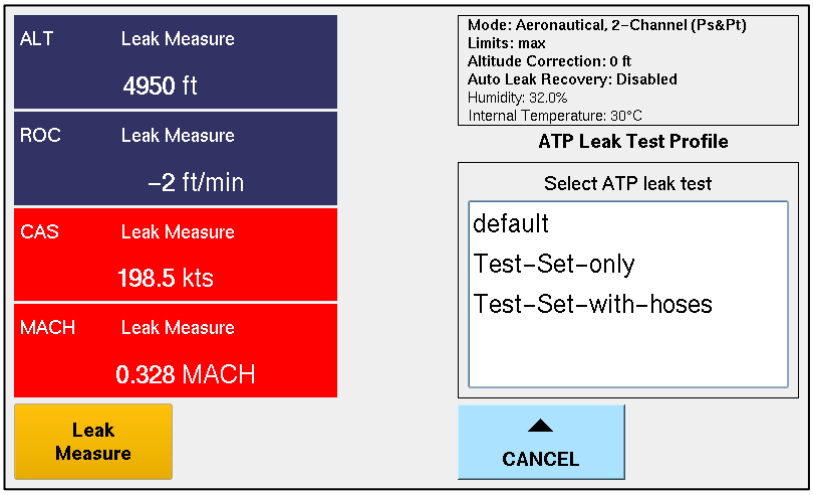


Figure 36 Select ATP Leak Test Profile

The ATP Leak Test provides the following profile options (refer to Figure 37 and Figure 38):

a) **ALR:** “Auto Leak Recover” can be “(X)” selected/deselected.

b) **Ambient Comp:** Can be “(X)” select/deselected.

Ambient Comp compensates for local ambient barometric pressure to ensure for example that a 5,000 ft. leak test is really checked at a pressure altitude equivalent to 5,000 ft. above the local barometric pressure.

c) **Pass Limits:** Can be "(X)" selected/deselected which determines whether pass/fail limits are used. If Pass Limits is selected "(X)," the user can specify the pass limit value for each of the 3 possible leak tests.

Note: Regarding the actual Leak Test(s), there are 3 possible leak tests that can be selected. (1) Pt channel, (2) Ps Low ALT, and (3) Ps High ALT.

Note: For the Pitot (Pt) channel leak, the ATP will automatically take the Ps channel to ground prior to starting the Pt channel leak test.

d) **Wait:** The wait time is the time allowed for the system under test to settle and stabilize after the target CAS or ALT has been reached. The general rule is the higher the target CAS or ALT the longer the wait time. That time should be used to allow for adiabatic to settle so that the leak measurement truly represents the systems leak rate and is not influenced by the expansion/contraction of gases in a closed system. The Pitot (Pt) and Static (Ps) Low ALT share the same Wait time value while the Ps High ALT has its own wait time value specified.

e) **Measure:** The measure time is simply the amount of time to allow for the leak measurement cycle. Typically, 1:00 minute is used for Static (Ps) and Pitot (Pt) Low ALT and a longer time may be used for Static (Ps) High ALT.

f) **Run:** Begins executing the ATP leak test that is presently loaded as defined.

g) **Save:** Simply saves the present ATP leak test parameters as presently defined.

h) **Cancel:** Exits the ATP leak test. Any changes made to the ATP leak test parameters will not be saved.

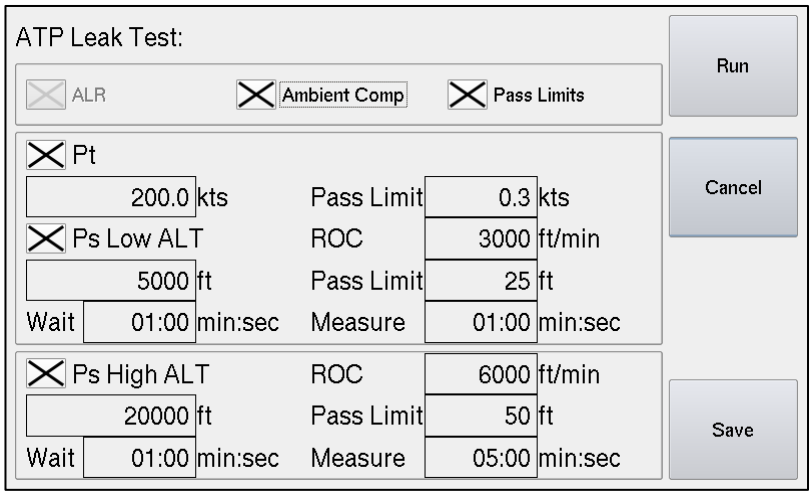


Figure 37 ATP Leak Test: Parameter Profile Screen

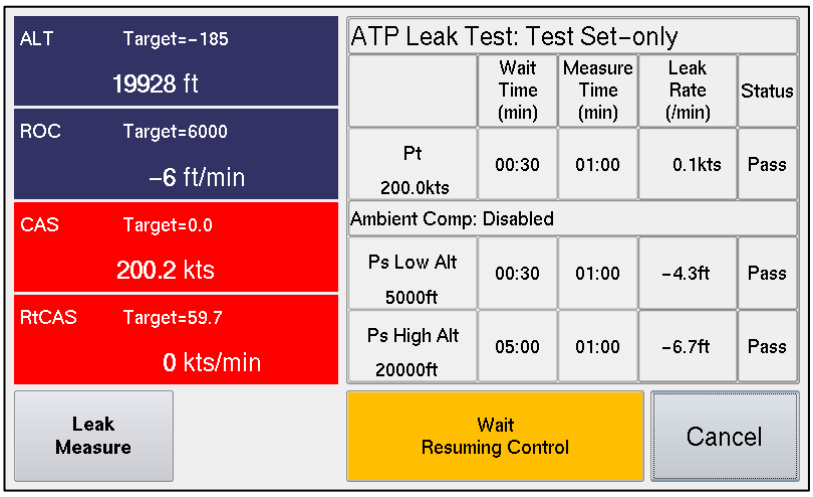


Figure 38 ATP Leak Test Results Screen

E. **Go To Ground:** This function will take the Test Set back to Ground (ambient barometric pressure altitude) and CAS = 0 Kts. Go To Ground can be selected while operating in Leak Measure or Control mode (refer to Figure 39).

Note: During Power ON initializations, the Test Set measures ambient barometric pressure "GROUND" and stores it in a temporary memory. When the user selects Go To Ground, the Ps Target = ambient pressure altitude. After completion of Go To Ground (Unit Safe at Ground) the Test Set measures ambient barometric pressure again and that becomes the latest ambient barometric pressure altitude at ground.

Main Menu: Go To Ground (refer to Figure 39)

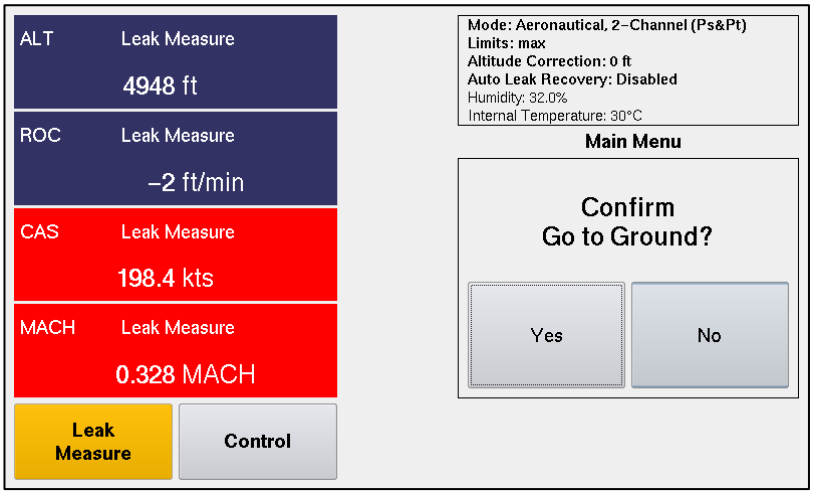


Figure 39 Go to Ground Confirm Screen

1. The user can select "Go To Ground" from the Main menu, while in either Leak Measure or Control mode. At the conclusion of Go To Ground (refer to Figure 40), the Test Set will perform an AutoZero function to trim off any small Qc pressure offset that may have crept into the Qc transducer typically due to thermal component (Test Set Warming or cooling). The AutoZero function greatly improves the low airspeed (< 50 kts) measurement accuracy. Also, the Test Set will remain vented to ambient until the Control mode is selected.

Note: There are two circumstances where an AutoZero function is performed: (1) at the conclusion of Go To Ground function and (2) approximately 1 minute if CAS is < 50 kts while the Test Set is in the Leak Measure mode.

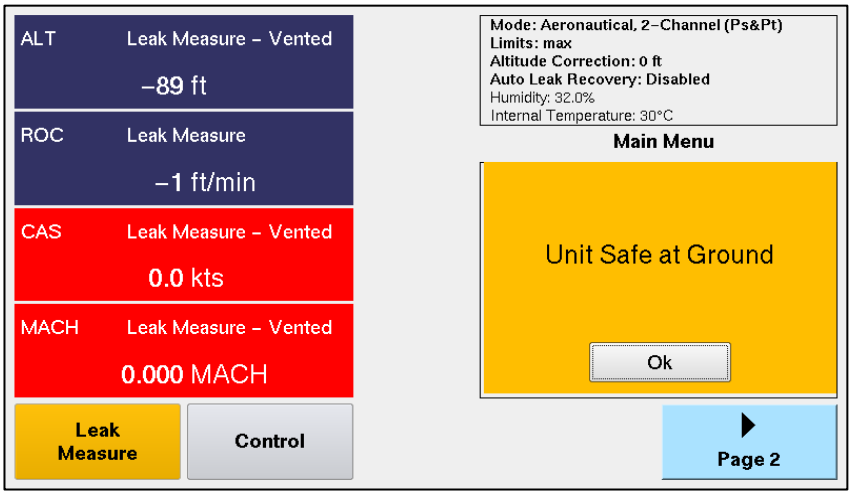


Figure 40 Conclusion of Go To Ground

2. When the AutoZero function is performed, the CB valve (Sv_CB) is OPEN.
3. After a Go To Ground function is performed, the Test Set will remain vented to ambient until “Ok” is selected.

   Note: Selecting “Ok” results in the internal ambient valve closing. The unit is now a sealed system, no longer vented to ambient. Under these conditions it is normal for the displayed ALT and CAS values to be affected over time by thermal conditions changing within the Test Set. Since the pneumatics are now internally sealed, the effects of rising or falling temperatures results in the expansion/contraction of gas, the gas being air in this application. This, of course, will cause the displayed values for ALT and CAS to slowly vary based on internal adiabatic “expansion/contraction of gas” conditions.

F. **Setup 1:** The following is available under this set of menus:

Main Menu: Page 2, Setup 1 (refer to Figure 41).

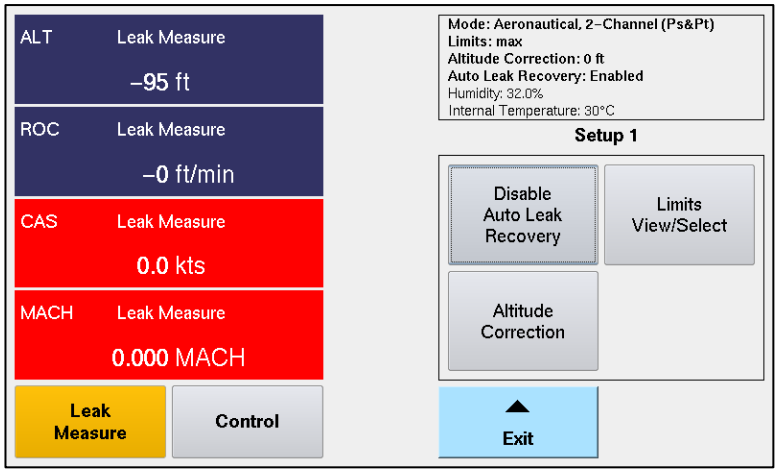


Figure 41 Setup 1

1. **Auto Leak Recovery:** When the Test Set is operating in Leak Measure mode and Auto Leak Recovery is Enabled. If a high leak rate occurs (High ROC or RtCAS), then ALR will automatically activate CONTROL mode which will then set ALT target and CAS target to present level and the controller will come online and try to maintain the current Altitude and CAS. To disable this feature, select Disable Auto Leak Recovery.
2. **Limits View / Select:** Allows user to select and view any of the saved limit file values.
3. **Altitude Correction:** Allows user to enter a correction factor regarding the altitude difference between the physical Test Set and the Aircraft ports and or Unit under test. Below is an example of the Aircraft static port being located 20 ft. physically higher (+) than where the Test Set is located (refer to Figure 42, Figure 43, Figure 44, and Figure 45).

   Note: If the Test Set was physically higher than the instrument or aircraft, then the altitude correction would be entered as a negative (-) value.

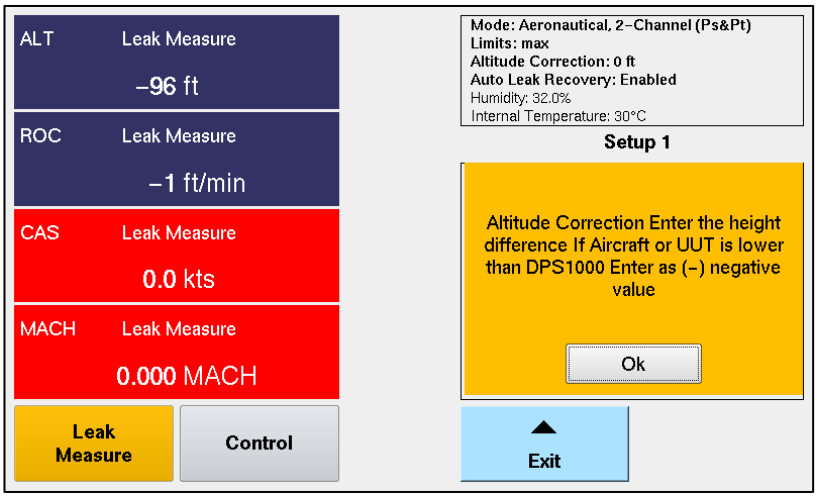


Figure 42 Altitude Correction Screen

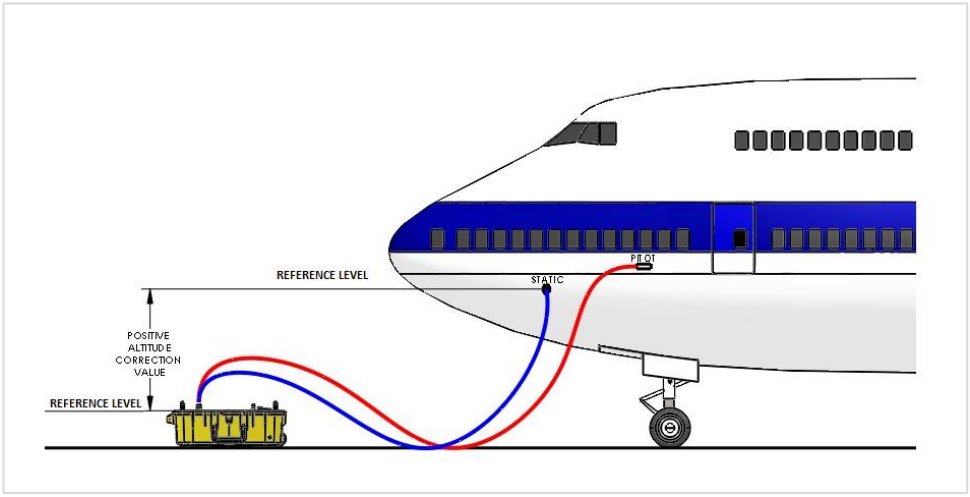


Figure 43 Altitude Correction On-Aircraft

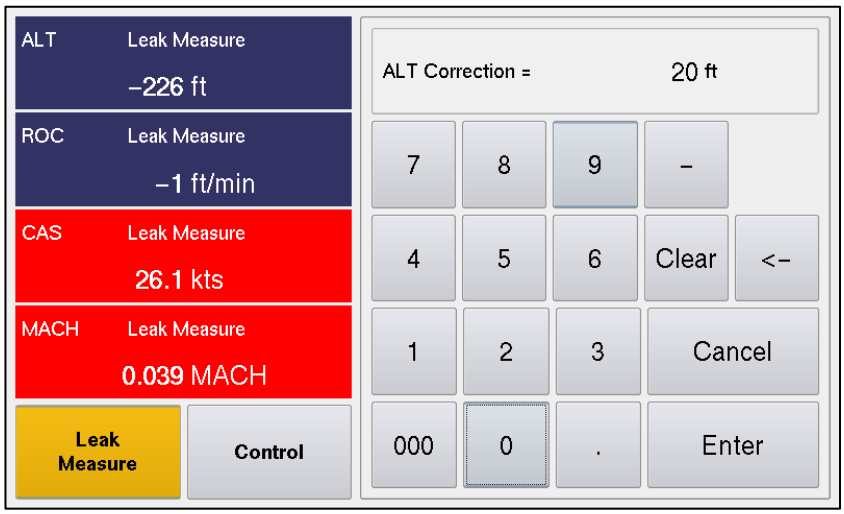


Figure 44 Altitude Correction Keypad

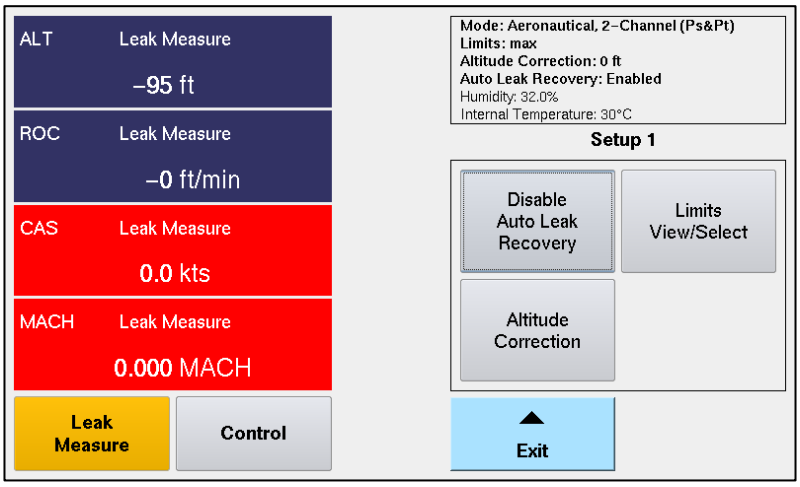


Figure 45 Test Set Configuration, Updated Altitude Correction

4. **Control Mode:** Allows user to select the default: 2-Channel (Dual Ps, Pt) mode or 1-Channel (Pt Only) mode. You will see the operating "Mode" is always indicated in the status window located on the top right-side of the UI display (refer to Figure 46).
5. The Pt Only mode can be used to drive an Airspeed or MACH indicator that has its Static (Ps) port vented to ambient (*local barometric pressure*). When the single channel Pt Only mode is selected, the Test Set will perform a Go To Ground function before transitioning into this mode to ensure the Test Set Static (Ps) port is at ambient barometric pressure. At the conclusion of the Go To Ground the Test Set will leave the Static (Ps) port vented to ambient while driving the Pitot (Pt) port to the Target pressure specified by the user.

   Note: The DPS1000 <u>always</u> powers up into the default: 2-Channel (Dual Ps, Pt) mode.

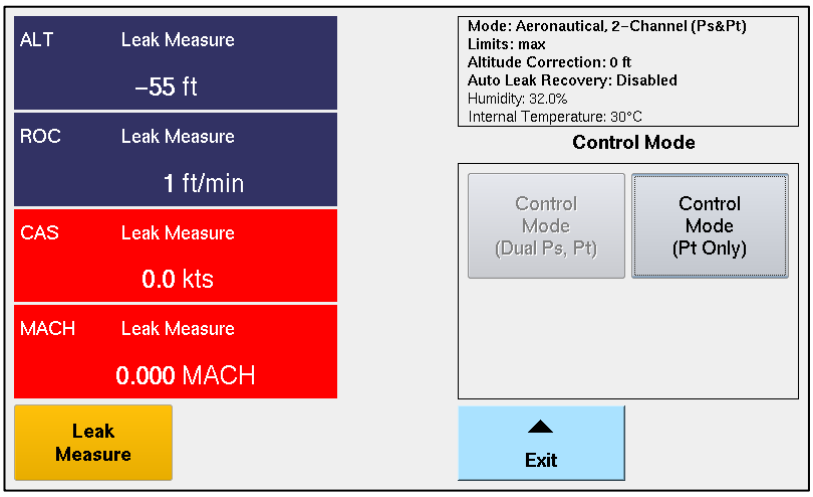


Figure 46 Setup 1: Control Mode(s)

6. **Copy History file to USB:** This allows the user to copy and transfer the history log to an external USB flash drive. Once on the flash drive, the file can be opened and reviewed using any tool that allows viewing of ascii text files. It is recommended to email this file to Barfield to aide in trouble shooting some issues/problems when the need occurs. In case of required technical support, Barfield personnel may request that this file be forwarded to them for troubleshooting purposes.

G. **Setup 2** (PIN Required)

The Setup 2 menu is PIN protected to provide some level of security to the activities completed under this menu structure. After entering the user PIN code (default code is **123456**), the following screen (refer to Figure 47 and Figure 48) will appear:



Figure 47 Setup 2: Selecting Limit File to Edit (1)

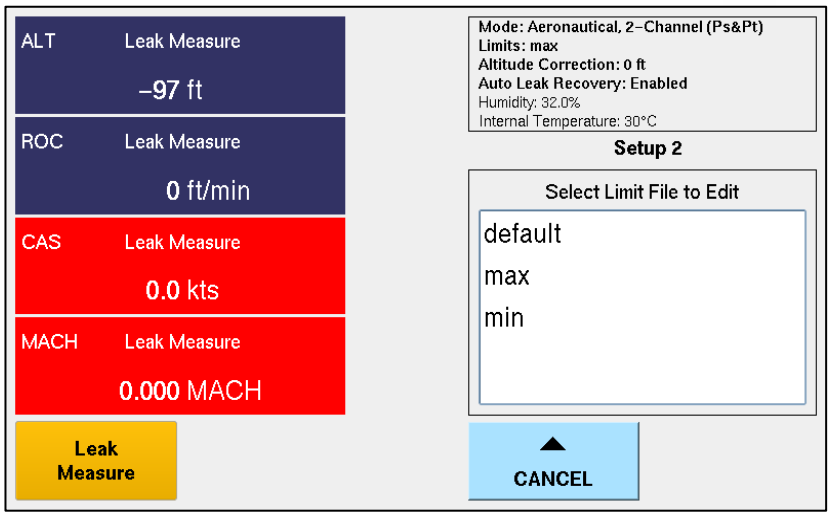


Figure 48 Setup 2: Selecting Limit File to Edit (2)

1. **Limits:** Create, Edit, Delete

   a) Create Custom Limits

   Allows user to create custom limit profile(s).

   Note: This is in addition to the two pre-defined (1) default and (2) max limit profiles.

   b) Edit Custom Limits

   Allows user to edit custom limit profile(s) (refer to Figure 49 and Figure 50).

   Note: The user cannot edit the two pre-defined (1) default and (2) max limit profiles.

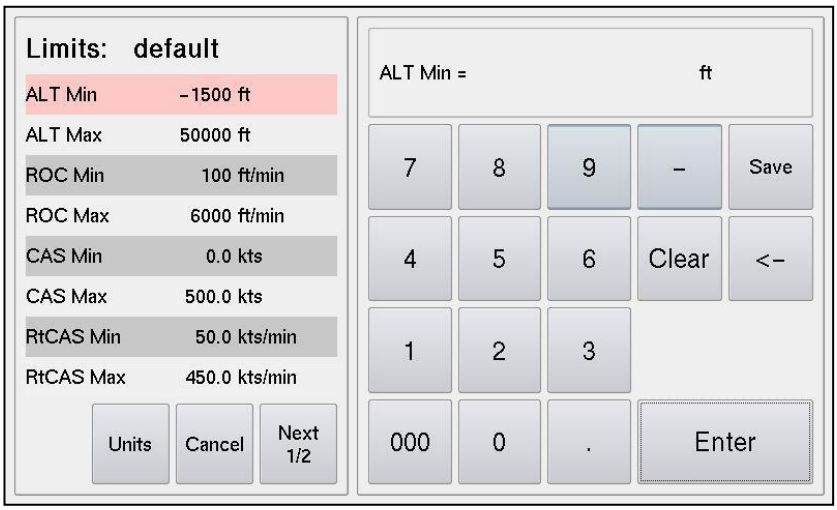


Figure 49 Setup 2: Edit Custom Limits (Page 1)

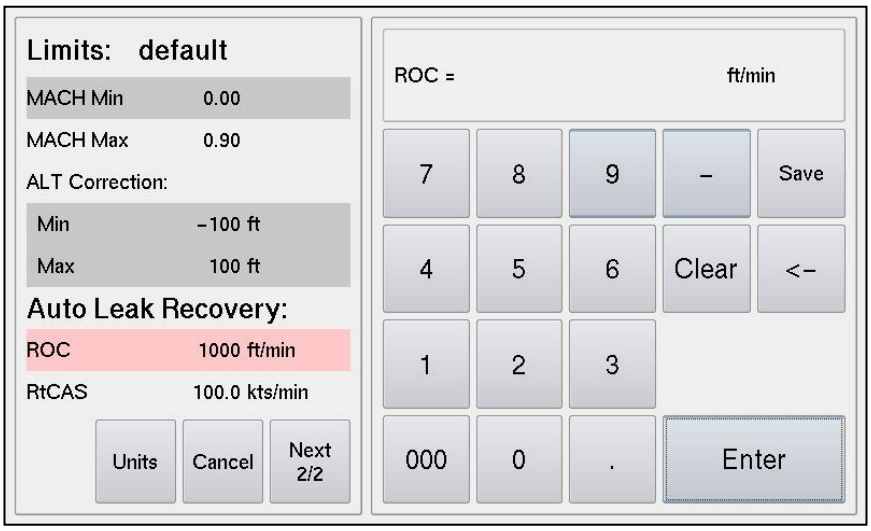


Figure 50 Setup 2: Edit Custom Limits (Page 2)

c) Delete Custom Limits

Allows user to delete custom limit profile(s) (refer to Figure 51 and Figure 52).

Note: Before deleting a user-created "custom limit profile," the user needs to ensure that it is not selected at the time of deletion. The user must select a different limit ("default" for example) to delete the "custom limit profile" created.

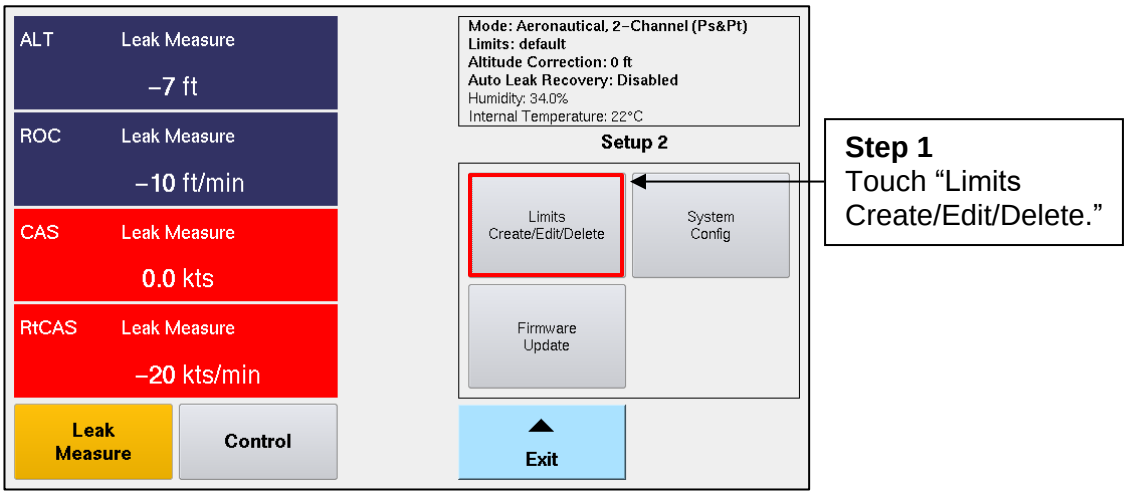


Figure 51 Delete Custom Limits (1)

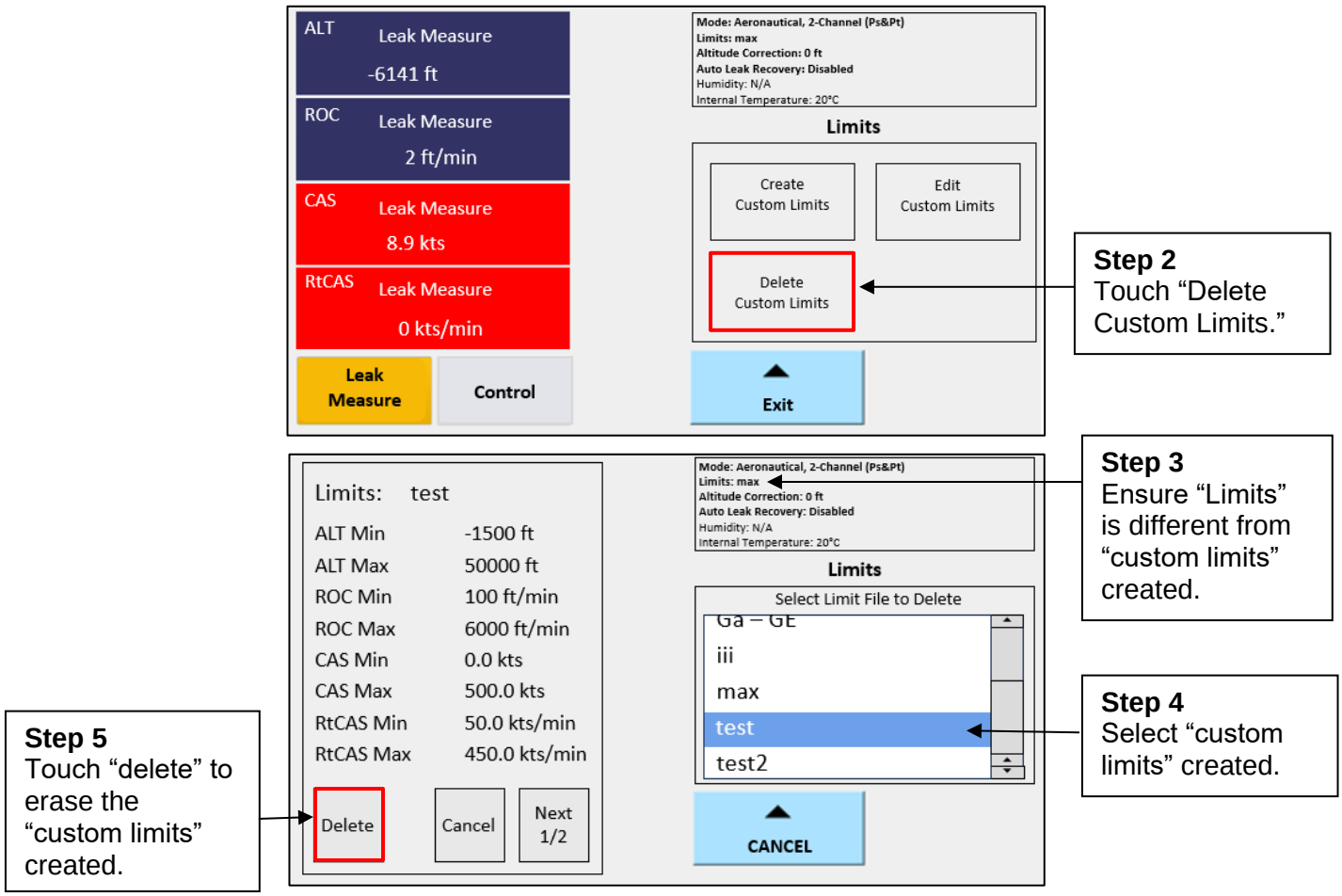


Figure 52 Delete Custom Limits (2)

2. **System Config**
   a) **Set Date & Time:** set time and date of unit.
   b) **Wi-Fi Option:** enables or disables the Wi-Fi capability.
   c) **Cabin Pressure Mode:** refer to **APPENDIX F: CABIN PRESSURE MODE**.
3. **Firmware Update:** refer to **APPENDIX E: WI-FI CONNECTION PROCEDURE**.
   a) **Flash - HUIM from USB:** Update HUIM firmware from dpsx file located on the USB flash drive.
   b) **Flash - PCM from USB:** Update PCM firmware from controller.hex file located on the USB flash drive.

H. **Setup 3:** This is for OEM only, OEM or Service PIN required. (A custom PIN required for each Test Set).

I. **Change User PIN:** Allows user to change the current user PIN.
Note: User must know the current PIN to change it.

J. **Touchscreen Calibration**
Main Menu: Page 2, Page 3
Note: If touch screen sensitivity or zone accuracy has shifted, allow user to calibrate touch screen.

K. **Log File:** There are two log file selections available:

Main Menu: Page 2, Page 3

1. Current History – Recorded event history since the unit was last powered on.
2. Complete History – Recorded ALL event history dating back to either when the product was 1st powered ON or when it was last cleared.

   Note: Only OEM, under Stepup3, can clear the Complete History file.

L. **Backlight:** Adjust display backlight intensity (refer to Figure 53).

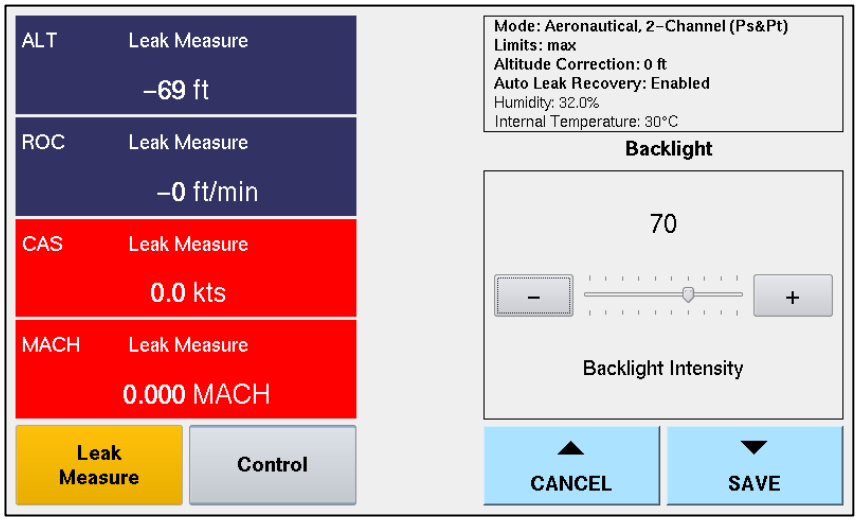


Figure 53 Backlight Adjustment

9. TEST SET OPERATION

A. Preliminary Setup

1. Ensure that the Test Set's power ON/OFF switch (refer to item 8 on Figure 13) is in the OFF position prior to connecting the AC power cable.
2. As a standard practice and under normal circumstances it is recommended that the DPS1000 not have hoses connected prior to initialization. This is not a requirement just an additional precaution.

B. Power ON

During normal use, it is recommended that the Test Set be powered ON and allowed to complete its Power ON initialization process prior to connecting the hoses to the Static (Ps) and Pitot (Pt) ports. During power ON initialization the following discovery occurs:

1. The Test Set displays a power ON initialization window during this phase as shown above. There is a log file created that records all the initialization steps and results that occur during this phase.
2. The Test Set measures the initial pressures found on Static (Ps) and Pitot (Pt) ports and records them as a temporary value.
3. The ambient pressure is measured and recorded as a temporary value. This value will be used by the Go To Ground function.

4. The Pitot (Pt) measurement channel performs a Qc (differential) auto-zero to trim any small offset that has occurred.
5. An internal control channel leak test is performed. The control channel leak test should not be confused with the actual leak test of the Test Set itself. The control channels are very small pneumatic channels within the manifold between the proportional control valves and the transducers. During this test, the unit's internal manifold mounted output valves SvPs_Out and SvPt_Out are closed (refer to **APPENDIX C: DPS1000 INTERNAL PNEUMATIC DIAGRAM**), and therefore the Static (Ps) and Pitot (Pt) Output reservoirs are not included in this test.
6. The Vacuum and pressure pumps are tested to verify they can achieve the performance expected.
7. The initialization display window and log file include the Test Set's power on cycle count: # of hours the Test Set has been powered ON, # of hours on the pressure pump, # of hours on the vacuum pump.
8. At the end of the initialization cycle the Test Set performs a Go to Ground to ensure both the Static (Ps) and Pitot (Pt) ports are at ambient pressure.

   Note: During this power ON initialization Go To Ground phase the Target ROC will default to a very low rate (2,000 ft/min), the user can change the ROC for that occurrence by pressing the ROC touch zone and changing the Target value.

   Note: After power ON initialization has completed, the Test Set will remain in Leak Measure mode with the Static (Ps) and Pitot (Pt) ports Vented to ambient and the displayed message as per Figure 54.

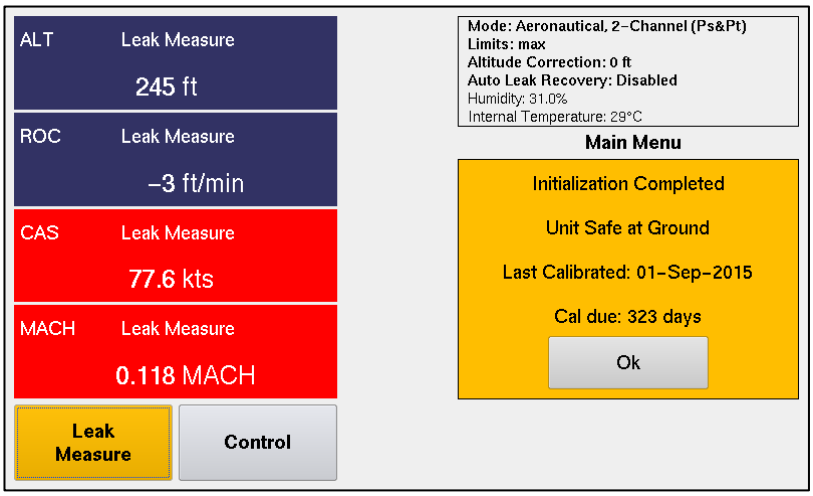


Figure 54 Initialization Display

C. Leak Measure Mode

The Test Set has two modes of operation, (1) Leak Measure and (2) Control. The default mode of operation for the Test Set is Leak Measure mode. At the conclusion of power ON initialization the Test Set will be placed in the Leak Measure mode.

While in Leak Measure mode the Test Set is continuously measuring / monitoring the pressure on both the Static (Ps) and Pitot (Pt) ports. The display will be continuously updated (~ 2 times/second) with the latest pressure measurement results. In Leak Measure mode, the pneumatic pressure pump, vacuum pump and four proportional control values (PvPs_V, PvPs_P, PvPt_V, PvPt_P, refer to **APPENDIX C: DPS1000 INTERNAL PNEUMATIC DIAGRAM**) are off.

When the Display Setup is configured for Aeronautical mode, the Test Set has some additional features and safeguards such as ALR and Leak Test ATP.

While in Leak Measure mode, the ALR “Auto Leak Recover” (if enabled) monitors the leak rate of ROC and RtCAS. If the rates exceed the values defined under the Limits menu (Example: with Limits = default, ALR for ROC = 1,000 ft/min and RtCAS = 25 kts/min) the Test Set will automatically switch into Control mode with the Target values set to the current ALT and CAS values and the Test Set pneumatic controller will try to overcome the leak and stabilize the pressures on the Static (Ps) and Pitot (Pt) ports. When this occurs, the following message will be displayed, “Excessive Leak Detected.”

The Leak Test ATP profiles are only available when the Display Setup is configured for Aeronautical display mode. When the user selects Pressure or EPR “Engine Pressure Ratio” display mode, the Leak Test ATP is not available, only the Leak Rate Timer feature is available under these two display modes.

D. **Control mode**

The Control mode provides a two-channel pneumatic controller. The Test Set controller is referred to as the PCM (Pneumatic Control Module). This module provides an absolute pressure controller for the Static (Ps) channel and a differential pressure controller for the Pitot (Pt) channel.

The two-channel precision controller is used to control and simulate the Target pressure and vacuum set point conditions and rates as requested by the user setting Target set points.

The pneumatic controller can control the Static (Ps) channel pressure with a resolution of ~0.0002 inHg while maintaining the Pitot (Pt) channel differential pressure with a resolution of ~0.0004 inHg. The precision custom controller provides the ability to maintain a constant CAS “Airspeed,” even during high rates of ROC enabling 0 kts CAS (the most demanding control situation) to be well maintained under considerably high slew rates of 6,000 ft/min or higher.

When the DPS1000 transitions into Control mode, the display indicates “Wait Resuming Control.” During this transition period (~4 seconds) the PCM is responsible for establishing the same controlled pressures as last measured on the Static (Ps) and Pitot (Pt) ports while in Leak Measure mode. During the Leak Measure mode to Control mode transition, the Target set points are always preloaded with the same value as the existing pressure measured on the ports at the time the Control mode was selected.

The following internal control sequences occur:

1. The pressures presently on the Static (Ps) and Pitot (Pt) ports are measured and recorded.
2. The output valves located internally on the Test Set pneumatic control manifold, SvPs_Out and SvPt_Out (refer to **APPENDIX C: DPS1000 INTERNAL PNEUMATIC DIAGRAM**), are closed to isolate the pneumatic controller from the aircraft or instrument under test. This is done to ensure that no transient pressure spikes are seen or impressed onto the UUT or aircraft while the internal control manifold is establishing the same control pressures that were last measured on the Static (Ps) and Pitot (Pt) ports. During this process the Test Set displays “Wait Resuming Control.” Once the PCM has established stable internal control vessel pressures the output valves (SvPs_Out and SvPt_Out) are opened.

10. TEST SET LEAK TEST

Each Test Set is completely calibrated and tested before shipment. However, to ensure the integrity of the sensitive tests to be made, the pretests included in this section should be performed immediately before each use of the Test Set.

A. Preliminary Setup

1. Ensure hoses are connected to the Static (Ps) and Pitot (Pt) port of the Test Set. If the connectors on the aircraft end of the hoses are not quick disconnects or self-sealing, then a tight sealing plug should be used to seal the hose assembly. This is necessary to test the hose leakage as well as the tester. If a sealing plug is not available, then leak test the Test Set without connecting the hoses.
2. Connect the Test Set power cord, the Static (blue) hose and Pitot (red) hose to the Test Set if not already connected.

   Note: The quick connect ports on the Test Set and mating hoses are color-coded and keyed to help prevent the accidental crossing of Pitot and Static hoses.
3. Set the power switch to ON.
   a) Allow the initialization to complete.
   b) Select “Leak Testing.”
4. **Leak Testing:** There are two methods available to perform Leak Testing using the Test Set (refer to Figure 55).

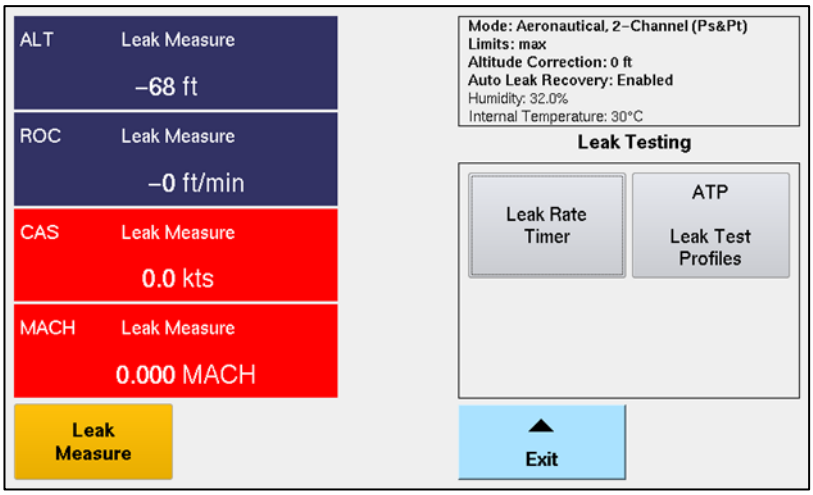


Figure 55 Leak Testing Menu(s)

   a) **Method (1) Leak Rate Timer:** This traditional method uses the Leak Rate Timer where the user first establishes a given CAS and ALT and uses the Leak Rate Timer to measure the Leak Rate.
   b) **Method (2) ATP Leak Test:** The Test Set has an automated feature called ATP Leak Test which allows the user to setup a profile ahead of time with the following parameters (refer to Figure 56 and Figure 37). This is much more efficient since the user can select or create the profile and select RUN to execute the automated leak test and return when the ATP Leak Test has completed to review the leak test results.

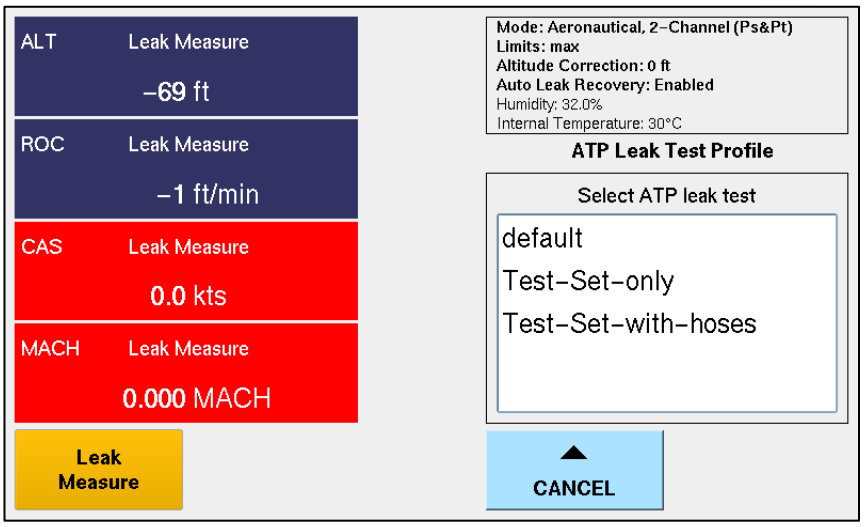


Figure 56 Selecting ATP Leak Test Profile

5. From the UI main menu, touch to select “Leak Testing.” A panel appears with two options: “Leak Rate Timer and ATP Leak Test Profiles (refer to Figure 55).
   a) Touch “ATP Leak Test Profiles.” The ATP Leak Test Profiles screen appears with three options.
   b) Touch “ATP Select Leak Test Profile(s).” The Select ATP leak test control screen appears displaying the following: Default, Test Set Only and Test Set with Hoses.
   c) Touch “Test Set Only.” The Test Set Only control screen appears.
   d) Touch “Test Set with Hoses.” The Test Set with Hoses control screen appears.
6. On the “Test Set Only” and “Test Set with Hoses” screens, the unit performs a combined Pitot and Static leak test in the following order:
   a) Pitot (Pt channel) Leak Test (default = 200.0 kts) while Static (Ps) channel remains at ground “ambient” pressure. If the Static (Ps) channel is not presently at ground, the ATP will automatically perform a Go To Ground function before starting the Pitot (Pt) channel leak test.
   b) Static (Ps) channel low level (default = 5,000 ft)
   c) Static (Ps) channel high ALT (default = 20,000 ft)

   Note: Both ATP Leak Test Profiles can be altered by the user. Once they have been altered, they can be saved. However, a different profile name will be required.

   Note:
   - “Test Set-only” implies that no aircraft or instrument(s) are connected.
   - “Test Set with hoses” implies the Test Set has the hoses attached and capped off so the test result represents the base line leak rate for all components except the aircraft or instruments about to be tested.
   - It is highly recommended to complete at least the “Test Set with Hoses” leak test before proceeding to the aircraft or instrument.

B. **Static and Pitot Test Set Leak Test** (Test Set and hoses only)

Note: Confirm hoses connected to both Static (Ps) and Pitot (Pt) ports on the Test Set – hand-tighten only.

Note: Confirm the other end of each hose is sealed with an AN4 plug – hand-tighten only.

Note: Determine the method of Leak Test (refer to section **B.1. Method 1: Leak Rate Timer** below or **B.2. Method 2: ATP Leak Test** on page 49).

1. **Method 1: Leak Rate Timer**

   a) Select “Control” mode. Wait Resuming Control screen appears for a few seconds.

   b) Select ALT Target. ALT keypad display appears. Enter desired altitude to perform the leak test.

   c) After establishing the Target altitude, select “Leak Measure” mode.

   d) From the Main Menu, select Leak Testing and touch Leak Rate Timer.

   e) Review Wait Time and Leak Time (refer to Figure 57).

   f) To start the timer, select Start Leak Test (refer to Figure 57). The Wait timer starts counting down until it reaches “0.” The word “completed” appears under the elapsed time. At this point, the Leak timer starts counting down until it reaches “0.” The display area turns yellow and the words “Leak Test Completed Select OK to view results” are displayed.

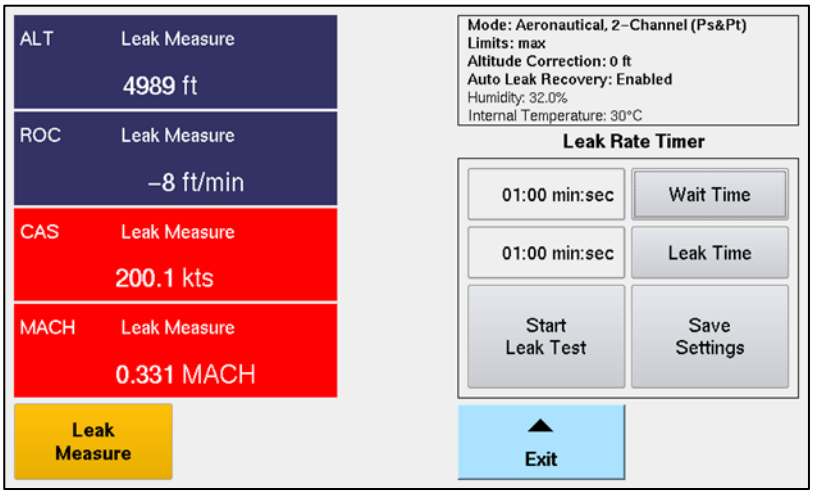


Figure 57 Leak Test Timer Screen

   g) Touch the “OK” button and the display shows the ALT Leak rate and the CAS Leak rate.

   h) Record or note the ALT Leak rate and CAS Leak rate.

   i) Touch “Cancel” to return to previous screen. Touch “Exit” and “Exit” (twice) to return to main menu.

   j) Select Go To Ground. Touch “Yes” to confirm Go To Ground.

   k) Wait for Test Set to reach Ground (ambient pressure altitude). Test Set displays “Unit Safe at Ground” (refer to Figure 58).

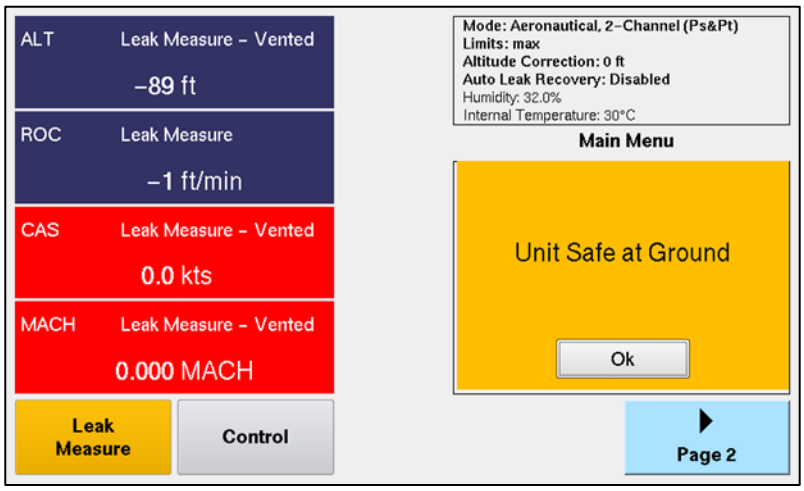


Figure 58 Leak Rate Time: Unit Safe at Ground

l) The Test Set will automatically switch into Leak Measure mode with the Static (Ps) and Pitot (Pt) ports vented to ambient and the pumps will be powered off.

m) This completes leak testing the Static (Ps) channel using Method 1 (Leak Rate Timer).

2. **Method 2: ATP Leak Test** (refer to Figure 59)

Note: It is highly recommended that the user performs the Test Set Only and/or Test Set with Hoses prior to performing the Aircraft Leak Test.

a) From the Main Menu, select “Leak Testing.” Touch “ATP Leak Test Profiles.” A screen with three selections will appear.

b) Select either an existing profile by touching “Select Leak Test Profile(s)” or “Create Leak Test Profiles” (refer to **ATP Leak Test Profiles – Automated Leak Testing** on p. 33).

c) Follow the AMM or appropriate documents regarding the specific leak test required. This information is necessary to create/define the appropriate and safe ATP Leak Test profile.

d) From the ATP Leak Test GUI screen, select the Leak Test parameters as required.

e) Select “Run.” Depending on the configuration of the ATP Leak Test, the automated leak test process will begin.

f) If Pitot (Pt) Leak Test was selected it will be tested first. This test is always performed while Ps is at ground “ambient pressure.”

Note:

- If Static (Ps) ALT is not at ground pressure, a Go To Ground will be performed before starting the Pt Leak Test.
- If Static (Ps) Low ALT was selected it will be tested second. If Static (Ps) High ALT was selected, it will be tested third.
- At the conclusion of the ATP Leak Test, the Test Set will automatically perform a Go To Ground function and the following screen will display the results (refer to Figure 59).

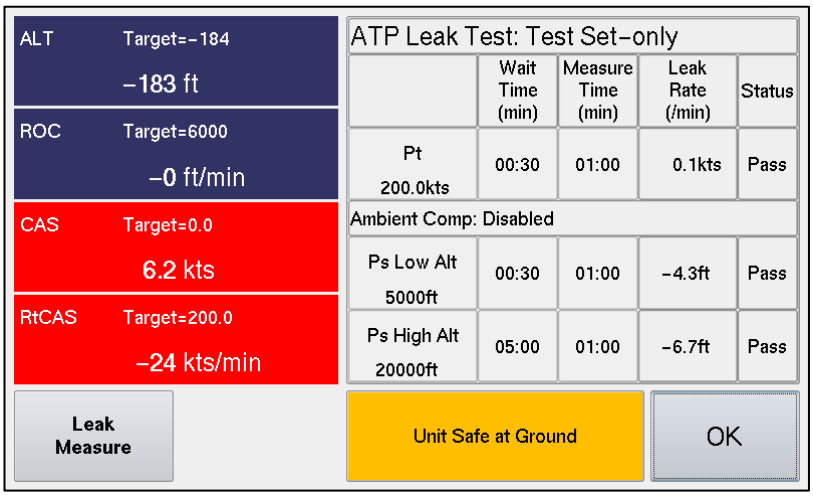


Figure 59 ATP Leak Test Results

g) This concludes the ATP Leak Test.

C. Applying Leak Correction

If the leak rate does not exceed 2 kts/min or 50 ft/min, record the leak rate of the Test Set and hoses so that the values can be subtracted from the aircraft's leak test. The calculated value removes the leaks caused by the Test Set and hoses and isolates the aircraft systems' leak rate.

11. AIRCRAFT TESTING

CAUTION: OBSERVE ALL SAFETY PRECAUTIONS DETAILED IN THE AMM.

CAUTION: WHEN USING PS ONLY, ENSURE THAT THE DIFFERNTIAL PRESSURE (QC) STAYS WITHIN THE LIMITS OF THE AIRSPEED INDICATOR (ASI).

A. Preliminary Setup

1. Ensure the Static (Ps) and Pitot (Pt) Test Set Leak Test (Test Set and hoses only) are completed and that the Test Set is "Safe at Ground" and vented before connecting the tester to the aircraft systems.

   Note: The ports on the Test Set and mating hoses are color-coded to help prevent the accidental crossing of Static (Ps) and Pitot (Ps) hoses.

2. Using a Barfield universal adapter or another manufacturer's custom aircraft pitot adapter, connect the Pitot (red) port hose to the aircraft pitot system as referenced in the AMM.

   Using Barfield's 2423F Static Port adapter or another manufacturer's custom aircraft static adapter, connect the Static (blue) port hose to the aircraft static system, as referenced in the AMM.

   Note: Some aircraft have more than one Static (Ps) port associated with a given static system. Make sure that other ports in the system being tested are sealed before continuing.

3. It is recommended to have the Test Set chassis grounded to the aircraft or UUT using the Ground stud located in the upper-right corner of the panel as depicted in item 5 of Figure 13.

4. Set the aircraft altimeter baro setting to 29.92 inHg (1013.25 mbar).
5. View and select the appropriate Limits on the DPS1000 for the Aircraft / Instruments to be tested.
6. If necessary, (from the Main Menu) select Display Setup to configure display for the Aeronautical display parameters required.
7. If necessary, (from the Main Menu) select Units to configure the display for the Units required.

B. **Leak Testing - Combined ALT & CAS** (using traditional Leak Rate Timer)

1. If the display indicates “Leak Measure,” select the CONTROL key to toggle the Test Set into the CONTROL mode.
2. Select CAS touch zone, the keypad screen will be displayed with the “CAS = kts” parameter indicated in the user entry window.
3. Enter the desired CAS “Airspeed” value (for example, 300) and touch ENTER.
4. The Test Set and aircraft will begin moving towards the airspeed entered.
5. If a different ROC rate is required, select ROC touch zone, the keypad screen will be displayed with the “ROC = ft” parameter indicated.
6. Enter the desired ROC “Vertical Speed.”
7. Touch ALT zone. A keypad screen appears. Input the desired altitude value required for the leak test altitude. Touch “Enter.”
8. The Test Set and aircraft / instruments will begin moving towards this altitude at the VSI rate entered.
9. Allow Test Set to stabilize at Target values for a minimum of 10 seconds before selecting Leak Measure mode.
10. In Leak Measure mode, select Leak Testing from the main menu.
11. Select Leak Rate Timer.
12. If required, set the Wait time and Leak time to the values required.

    Note: The default values are (Wait=1:00) minute and (Leak=1:00 minute) for CAS airspeed and low altitude (typ < 10,000 ft). For High ALT (typ > 10,000 ft) additional wait time is recommended (Wait=5:00) or more may be required to allow the adiabatic to settle so the leak measurement will represent the actual leak rate.

    Note: The Test Set can conduct a combined Static (Ps) and Pitot (Pt) test (as described above) or individual system leak tests. To accomplish a single channel (Pitot (Pt) only or Static (Ps) only) modify the procedures by simply not entering Target value for the parameter / channel. For example, for Pt only Leak check, the ALT target would remain at ambient Ground pressure altitude while the CAS Target would be set at the desired CAS airspeed value.

    In this example, if the Test Set Static (Ps) channel is not already at ambient “Ground” pressure, perform a “Go To Ground” function first, then set CAS Target to desired airspeed.
13. If additional Leak Test at other altitudes or airspeeds is required, repeat steps B.1-B.12 from this section for any additional test points.

14. Once Leak Test is completed, select the Go To Ground function to return the DPS1000 to ground ambient pressure.

15. When Test Set and aircraft have reached ambient Ground pressure the pumps will be powered off and the Test Set will remain Vented to ambient until the Control mode is selected (refer to Figure 60).

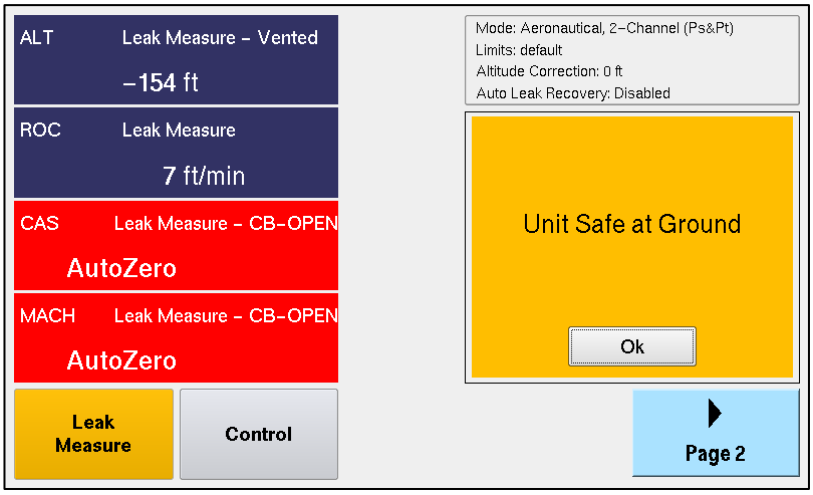


Figure 60 Unit Safe at Ground

C. **Leak Testing: Combined ALT & CAS** (using ATP Leak Test Profile)

The ATP Leak Test Profile feature provides an automated process for Leak Testing. Once a profile is created and saved, it can be used to automate the Leak Test process allowing the user to perform other tasks while the ATP Leak Test is running.

1. For a detailed explanation of the ATP Leak Test capability and parameter field descriptions, reference section **B.2. Using Method (2) ATP Leak Test** on page 49.
2. Verify the DPS1000 including hoses and the Aircraft Pitot System Leak Test and Static System Leak Tests have been completed.

   Note: It is always recommended that prior to performing any testing the Test Set and hoses should be leak tight. The reality is every Test Set and hose configuration has some level of leakage present, a confirmation of the existing leak rate is important to establish prior to trying to determine the leak rate of the aircraft or instruments being tested.
3. Verify if the alternate pneumatic system(s) (co-pilot, standby auxiliary, etc.) share the same pneumatic lines, if so, they must be sealed.
4. Ensure the aircraft altimeter has the baro set at 29.92 inHg (1013.25 mbar).
5. Select the appropriate Limit values for the aircraft / Instrument's to be tested.

   Note: If the appropriate limits file does not exist go into Setup 2 and create the limit file:

   a) From Main Menu touch blue icon "page 2." A screen is displayed with four options (Setup 1, Setup 2, Setup 3, and Change User Pin#).

   b) Select Setup 2. A keypad screen appears.

   c) Input user PIN (default PIN: **123456**). A screen is displayed.

   d) Touch "Limits Create/Edit/Delete." A keypad screen appears.

   e) Create Custom Limits - enter the parameter values for ALT, ROC, CAS, RtCAS, MACH, and ALR (Auto Leak Recovery).

CAUTION: USING INCORRECT LIMITS CAN CAUSE DAMAGE TO SENSITIVE COMPONENTS AND AIRCRAFT SYSTEMS.

Note: Before creating new limits refer to the appropriate AMM or CMM for the actual minimum and maximum values to be applied.

6. Enter the Altitude Correction value if required.
   a) From Main Menu, touch blue icon “page 2.” A screen with four options appears (Setup 1, Setup 2, Setup 3, and Change User Pin #).
   b) Touch “Setup 1.” A screen with four options is displayed.
   c) Select Altitude (ALT) Correction. A yellow window with a message is displayed.
   d) Read message, select “Ok.” The “ALT Correction” numbered keypad panel opens
   e) Enter Altitude correction value. The height difference between the aircraft system or instrument under test and the DPS1000 Test Set.
7. Using the AMM or CMM, select the appropriate Leak Test ATP Leak Test Profile.
   a) From Main Menu, select Leak Testing. The Leak Testing panel opens.
   b) Touch ATP Leak Test Profiles. The ATP Leak Profiles panel is displayed.
   c) Select the appropriate profile to perform the Leak Test as specified by the AMM or CMM
   d) If required, the default ATP profile can be selected, and the parameters can be changed to the values specified by the AMM or CMM.
   e) If the ATP profile value(s) or process(s) (Pt, Ps Low ALT, Ps High ALT) are changed, the user can select “Save” and name the ATP profile with an appropriate name for future use.
8. Once the ATP Leak Test profile has been configured and parameters are verified correctly, select “Run.”

   Note: The Leak Test ATP is a fully automatic feature that proceeds as follows:

   a) When selected, the Pt leak test will be performed. If the Static (Ps) port is not at ambient Ground pressure the ATP will begin by performing a Go to Ground function prior to starting the Pitot (Pt) leak test.
   b) When selected, the Static (Ps) Low ALT leak test will be performed.
   c) When selected, the Static (Ps) High ALT leak test will be performed.
   d) On completion of the last selected leak test, the Test Set will perform a Go To Ground function.
   e) Once the Test Set and aircraft or instrument(s) under test are safe at ground “ambient” pressure, the Leak Test results will be displayed (refer to Figure 61).

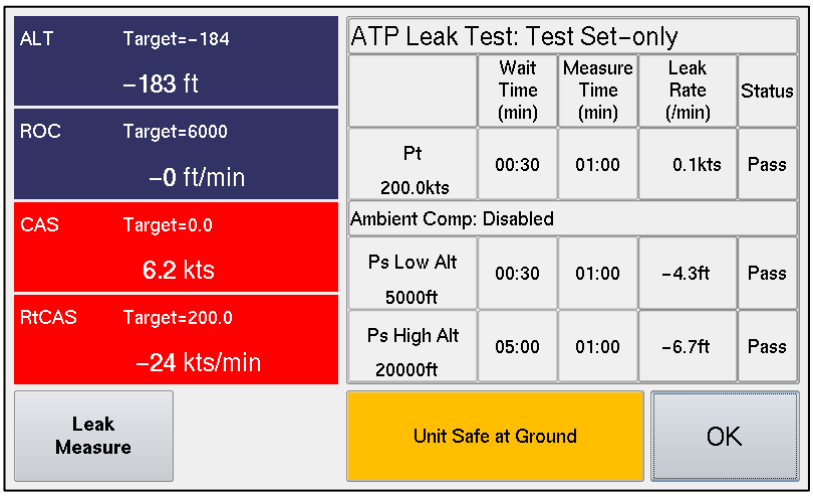


Figure 61 Leak Test Results

f) Record the leak test results.

g) If additional leak test at other altitudes or airspeeds is required, select the appropriate ATP Leak Test profile, edit the values, and repeat steps 8 and 9 above for any additional test points.

9. This completes the Combined ATP Leak Test process.

D. Testing the Aircraft Static System

CAUTION: OBSERVE ALL SAFETY PRECAUTIONS DETAILED IN THE AMM AND/OR CMM.

Note: The AMM or CMM procedure should always be recognized as the primary authority and this manual should be recognized as a secondary aide. As such the primary objective of this manual is to provide instruction relevant to general Test Set operation while the AMM or CMM dictates the specific test process, sequences, and values.

1. Ensure the Test Set is powered ON. Wait for Initialization to be completed, the system to be safe at Ground, and the display to indicate “Vented.”

   Note: If required, select Go To Ground and wait for the Test Set to indicate “Unit Safe at Ground.”

2. Connect the hoses, both Static (Ps) and Pitot (Pt) to the Test Set ports – hand-tighten only.

   Note: The Pitot (Pt) hose is not required to perform a Static (Ps) system test, however it is highly recommended as a safety precaution to protect the ASI from possible damage.

3. If not already done, perform a Leak Test on the Test Set and hoses.

   Note: CAP the aircraft end of each hose – hand-tighten only.

4. Connect the hoses to the aircraft Static (Ps) and Pitot (Pt) ports.

   Note: Using the Pitot (Pt) hose for a Static system test will prevent the possibility of damaging the ASI “Airspeed Indicator” which can happen if the Static (Ps) channel is driven to a high altitude while testing and creates a large differential pressure which could exceed the ASI full scale rating.

Note: While testing the Static (Ps) system, the Target value for CAS should remain at 0 kts. While testing various altitude levels, the Test Set will maintain 0 kts (Qc = 0.000 inHg pressure differential) between the Static (Ps) and Pitot (Pt) ports which will ensure the ASI is not damaged.

5. Verify that the alternate pneumatic system(s) (co-pilot, standby auxiliary, etc.) shares the same pneumatic lines. If so, they must be sealed or isolated from the current pneumatic system about to be tested.
6. If necessary, change the displayed parameters on the Test Set to those required. This can be accomplished by selecting “Display Setup” followed by selecting the desired aeronautical parameters.
7. If necessary different units can be selected by selecting the icon “Units” from the Main Menu.
8. Verify the limits selected are appropriate for the aircraft and/or Instruments that are going to be tested.
9. If there is a height difference between the Test Set and the aircraft or instruments about to be tested, enter the Altitude Correction.
   a) From Main Menu, select the blue icon “page 2.” A panel opens with four selections.
   b) Touch “Setup 1.” The “Limits View/Select” screen is displayed.
   c) Select “Altitude Correction” and touch “OK.” A numbered keypad appears.
   d) Input the altitude difference (with aircraft / instruments higher than Test Set, the value would be entered as a (+) positive number).
10. At this time confirm the following have been accomplished:
    a) The Test Set and hose combination have been leak tested.
    b) The Test Set hose(s) Static (Ps) and Pitot (Pt) has been connected to the aircraft or instrument to be tested.
    c) The Test Set limits have been configured with the appropriate vales to protect the aircraft system or instrument(s) about to be tested.
    d) If required, the altitude correction value has been entered.
11. Touch the “Control” icon.
    a) The Test Set will transition from Leak Measure to Control mode. Note the ALT and CAS target are preloaded with the current pressure altitude and CAS values.
    b) Wait for “Resuming Control” phase to complete (typically 4 seconds)
12. Set the ROC Target value as specified by the AMM, CMM, or AP “authorized procedure.”
13. Set the ALT Target value as specified by the AMM, CMM, or AP.
14. Continue with the next ALT Target value required:
    a) For test procedures requiring small step changes in ALT, there is a “Nudge” feature available that will simplify having to enter multiple small changes in Target values.
    b) The “Nudge” key is located on the same pop-up keypad used for entering a new Target value (refer to Figure 29).
    c) The “Nudge” value can also be re-defined.
15. On completion of the Static system testing, select the Go to Ground function and wait for the “Unit is Safe at Ground” message to be displayed.
16. This completes the Aircraft Static System testing.

E. **Testing the Aircraft Pitot System**

CAUTION: OBSERVE ALL SAFETY PRECAUTIONS DETAILED IN THE AMM AND/OR CMM.

Note: AMM or CMM procedure should always be recognized as the primary authority and this manual should be recognized as a secondary aide. As such the primary objective of this manual is to provide instruction relevant to general Test Set operation while the AMM or CMM dictates the specific test process, sequences, and values.

1. Verify the Test Set is powered ON.
2. Wait for Initialization to be completed, the system to be safe at Ground and the display to indicate “Vented.”

   Note: If required, select Go To Ground and wait for the Test Set to indicate “Unit Safe at Ground.”
3. Connect the Pitot (Pt) port of the Test Set to the aircraft or ASI instrument being tested.

   Note: The Static (Ps) hose is not required to perform a Pitot system test if the Test Set is configured for “1-Channel Pt Only” mode.

   Note: When the Test Set is operated in the default “2-Channel Ps & Pt” mode, both the Static and Pitot hose must be connected to the Aircraft to create a leak tight system. To operate in this configuration, refer to the following section **F. Combine Testing of the Aircraft Pitot and Static System** on page 58.
4. If performing a Pt only test, configure the Test Set to “1-Channel Pt only” mode as follows:

   Note: Test Set should be “Vented” to ambient and in Leak Measure mode at this time.

   a) From the Main Menu screen, select the blue button “page 2.”
   b) Select the “Additional Functions” button. A screen is displayed with three options.
   c) Touch “Control Mode.” Control Mode screen opens with two selections.
   d) Select “Control Mode (Pt Only).”
   e) Touch “Exit” twice. Select “page 1.”

      Note: The UI display is now positioned back to the Main Menu.
5. If not already done, perform a Leak Test on the Test Set and hoses.

   Note: CAP the aircraft end of each hose.
6. Connect the hoses to the aircraft Pitot ports.

   Note: While testing the Pitot system with Test Set configured as “1-Channel Pt only” mode, the Static (Ps) channel of the Test Set will remain vented to ambient, this is the same point of reference the aircraft’s Static port is referencing while driving the Pitot system with the Test Set.

   a) If the Test Set is configured in its default “2-Channel Ps & Pt” mode, the Target value for ALT should always remain at ambient Ground pressure altitude (value determined from the last Go To Ground). While testing various CAS values, the Tester will maintain ambient pressure altitude equivalent on the Static (Ps) port.
   b) It is very important that the Test Set maintains ALT = ambient pressure altitude especially if the Static (Ps) hose is not connected to the aircraft’s Static system.

7. Verify if the alternate pneumatic system(s) (co-pilot, standby auxiliary, etc.) shares the same pneumatic lines. If so, they must be sealed or isolated from the current pneumatic system about to be tested.
8. If necessary, change the displayed parameters on the Test Set to those required.
   a) From the main menu, select “Display Setup.”
   b) On the “Display Setup” screen, select the desired aeronautical parameters.
9. If necessary, different units can be selected by touching “Units” from the Main Menu.
10. Verify the limits selected are appropriate for the aircraft and or Instruments that are going to be tested.
11. At this time confirm the following has been accomplished:
    a) The Test Set and hose combination have been leak tested.
    b) The Test Set Pitot (Pt) has been connected to the aircraft or instrument to be tested.
    c) The Test Set limits have been configured with the appropriate values to protect the aircraft system or instrument(s) about to be tested.
12. Select the Control key.
    a) The Test Set will transition from Leak Measure to Control mode. You will notice the ALT and CAS target will be preloaded with the current pressure altitude and CAS values.
    b) Wait for Resuming Control phase to complete (typically 4 seconds).
13. Set the ROC Target value as specified by the AMM, CMM, or AP “authorized procedure.”
14. Set the ALT Target value as specified by the AMM, CMM, or AP.
15. Continue with the next ALT Target value required:
    a) For test procedures requiring small step changes in ALT, there is a “Nudge” feature available that will simplify having to enter multiple small changes in Target values.
    b) To use the “Nudge” key:
       - Still in Control Mode, touch ALT. the keypad screen is displayed (It is the same keypad used to enter a new Target value).
       - Touch “Nudge Mode” button. The Nudge Mode screen appears displaying four options (Up, Down, Define Nudge and Cancel).
       - Touch “Define Nudge.” A pop-up keypad opens.
       - Define Nudge value.
       - The “Nudge” value can also be re-defined.
16. Upon completion of the Static system testing, select the Go to Ground function and wait for the “Unit is Safe at Ground” to be displayed.
17. This completes the Testing of Aircraft Static System.

F. **Combine Testing of the Aircraft Pitot and Static System**

CAUTION: OBSERVE ALL SAFETY PRECAUTIONS DETAILED IN THE AMM AND/OR CMM.

Note: The AMM or CMM procedure should always be recognized as the primary authority and this manual should be recognized as a secondary aide. As such the primary objective of this manual is to provide instruction relevant to general Test Set operation while the AMM or CMM dictates the specific test process, sequences, and values.

1. Verify the Test Set is powered ON.
2. Ensure Initialization has completed, the system is safe at Ground, and the display indicates “Vented.”
   a) If required, select Go To Ground and wait for the Test Set to indicate “Unit Safe at Ground.”
2. Connect the hoses, both Static (Ps) and Pitot (Pt) to the Test Set ports – hand-tighten only.

   Note: The Pitot (Pt) hose is not required to perform a Static system test however, it is highly recommended as a safety precaution to protect the ASI from possible damage.
3. If not already accomplished, perform a Leak Test on the Test Set and hoses.

   Note: Cap the aircraft end of each hose – hand-tighten only.
4. Connect the hoses to the aircraft Static (Ps) and Pitot (Pt) ports.
5. Verify that the alternate pneumatic system(s) (co-pilot, standby auxiliary, etc.) share the same pneumatic lines. If so, they must be sealed or isolated from the current pneumatic system about to be tested.
6. If necessary, change the displayed parameters on the Test Set to those required. This can be accomplished by touching “Display Setup” from the Main Menu. From the “Display Setup” screen, select the desired aeronautical parameters.
7. If necessary, different units can be selected by touching the “Units” icon from the main menu. From the “Units” screen, touch the desired units.
8. Ensure the limits selected are appropriate for the aircraft and or Instruments that are going to be tested.
9. If there is a height difference between the Test Set and the aircraft or instruments about to be tested, enter the Altitude Correction.
   a) From the Main Menu, touch the blue icon “page 2.” Select “Setup 1.” Touch “Altitude Correction” from the “Limits View/Select” screen. A yellow screen is displayed. Touch “OK” to display the “ALT Correction” keypad screen. Input, altitude difference (with aircraft / instruments higher than Test Set the value would be entered as a (+) positive number).
10. At this time confirm the following has been accomplished:
    a) The Test Set and hose combination have been leak tested.
    b) The Test Set hose(s) Static (Ps) and Pitot (Pt) has been connected to the aircraft or instrument to be tested.
    c) The Test Set limits have been configured with the appropriate vales to protect the aircraft system or instrument(s) about to be tested.
    d) If required, the altitude correction value has been entered.

11. Select the “Control” icon.
    a) The Test Set will transition from Leak Measure to Control mode. You will notice the ALT and CAS target will be preloaded with the current pressure altitude and CAS values.
    b) Wait for Resuming Control phase to complete (typically 4 seconds).
12. Set the ROC Target value as specified by the AMM, CMM, or AP.
13. If required, set the value for RtCAS as specified by the AMM or CMM. The default value is 300 kts/min.
14. Set the ALT Target values and CAS Target values as specified by the AMM and CMM procedures.
15. Continue with the next ALT Target value or CAS Target value as required.
    a) For test procedures requiring small step changes in ALT or CAS, there is a “Nudge” feature available that will simplify having to enter multiple small changes in Target values.
    b) By touching the appropriate touch zone area (ALT, CAS, or MACH) the Target keypad will appear (only in Control mode). The value can be entered directly by keypad, or the Nudge key can be selected which will then provide the Nudge function screen.
    c) The “Nudge” key is located on the same pop-up keypad used for entering a new Target value (refer to Figure 29).
    d) The “Nudge” value can also be re-defined.
11. On completion, select the Go to Ground function and wait for the “Unit is Safe at Ground” to be displayed.
12. This Completes the “Combine Testing of the Aircraft Pitot and Static System.”

G. **MACH Test and Constant MACH**

The Test Set can provide either constant CAS “calibrated airspeed” or constant MACH. The parameter which is held constant is determined by which Target parameter the user enters as a set point. If the user selects CAS touch zone and enters the Target for CAS then CAS becomes the controlling parameter for the Pitot (Pt) channel. Similarly, if the user enters a MACH Target value, then MACH becomes the controlling parameter.

With a Target value entered for MACH “i.e. Constant MACH,” once the Test Set reaches the Target MACH value, the Pitot (Pt) channel controller will continue to maintain the MACH value requested while the Static (Ps) Target value is changed by the user entering a different ALT Target.

Note: While operating in constant MACH mode (i.e. MACH Target set by user) each time the user changes the ALT Target value you will notice the equivalent CAS Target will be automatically computed and updated as the equivalent CAS Target for the given MACH and ALT Targets requested. You will also notice that when operating in the constant MACH mode, the CAS Target parameter will be ghosted as a reminder that CAS is not the controlling parameter during constant MACH mode.

1. If required, from the Main Menu select Display Setup and select ALT, ROC, CAS, MACH display format.
2. Select Control mode.
3. Wait for Resuming Control to complete.
4. Enter the Target value for MACH.

5. Wait for MACH Target to be achieved.
6. The controller will maintain the MACH target value while the user selects various ALT target values.
7. On completion of the Constant MACH testing, select Go To Ground and wait for the Test Set to indicate “Unit is Safe at Ground” to be displayed.
8. At this time, the hose can be disconnected from the Test Set.

H. **Airspeed Switch Test**

1. If required, from the Main Menu, select Display Setup and select “ALT, ROC, CAS, MACH” display format.
2. Select Control mode.
3. Enter the Target CAS value below the operating limits of the switch.

   Note: For an airspeed switch with a 140 kts ± 2 kts trip point, start with a CAS Target of ~136 kts.
4. If necessary, change the RtCAS Target low enough to observe the switch operation.
5. Wait for initial CAS Target to be achieved.
6. Select CAS touch zone, on Target keypad select “Nudge Mode.”
7. Use the Nudge Up (↑) key to slowly increase the CAS Target value until the Airspeed switch trip point is determined.

   Note: If required, the Nudge value “CAS Nudge = 0.x kts” can be changed by selecting the Define Nudge soft key.
8. Record the trip point where the switch contacts closed.
9. Use the Nudge Down key to slowly decrease the CAS Target value until the Airspeed switch operates (opens).
10. Record the trip point where the switch contacts open.
11. On completion of the Airspeed switch testing select the Go To Ground function and wait for the “Unit Safe at Ground” message to be displayed.

    Note: The above Nudge feature can be used with any of the Controlled Target parameters such as ALT, ROC, MACH, RtCAS, Ps, Pt, EPR.

12. ENGINE PRESSURE RATIO (EPR) TEST

A. **Preliminary Setup**

1. Connect the Static (blue) hose to the PT2 (Lo) port and the Pitot (red) hose to the PT7 (Hi) port of the EPR transmitter to be tested.
2. Set the power switch to ON.
   a) Allow initialization to complete.

B. **Test**

CAUTION: OBSERVE ALL SAFETY PRECAUTIONS DETAILED IN THE AMM AND/OR CMM.

Note: The AMM or CMM procedure should always be recognized as the primary authority and this manual should be recognized as a secondary aide. As such the primary objective of this manual is to provide instruction relevant to general Test Set operation while the AMM or CMM dictates the specific test process, sequences, and values.

1. **Method 1:** EPR Testing using conventional aeronautical units.

   The EPR Ratio can be simulated using conventional aeronautical units of measure; that is, Altitude in feet for PT2 inlet pressure and Airspeed in knots for PT7 outlet pressure.

   Use Table 10 as a reference guide for setting specific Airspeed and Altitude values as specified by the AMM, CMM, or AP to achieve the required EPR Ratio values.

   Note: Before beginning the test, ensure that the limits profile is set to max. This can be accomplished by either pressing the top right box or selecting this Menu sequence: Main Menu, Page 2, Set up 1, Limits View/Select, Select Limits, max, Ok.

   Note: This test is limited by Test Set airspeed range (650 knots).

ENGINE PRESSURE RATIO (EPR)		
Airspeed (knots)	**Altitude (feet)**	**EPR**
650	25,870	3.4
546	35,000	3.4
650	21,650	3.0
504	35,000	3.0
650	14,690	2.5
534	25,870	2.5
444	35,000	2.5
650	4,210	2.0
500	20,000	2.0
369	35,000	2.0
478	5,000	1.5
365	20,000	1.5
265	35,000	1.5

Table 10 Engine Pressure Ratio Test Table

   a) From the Main Menu select aeronautical parameters by this sequence: Main Menu, Display Setup, then choose ALT, ROC, CAS, RtCAS or ALT, CAS as desired.
   b) Place the DPS1000 in Control Mode.
   c) Enter the first Altitude Target value.
   d) Enter the first Airspeed Target value.
   e) After the DPS1000 achieves both Target values, confirm the EPR Ratio reading.
   f) Repeat the process by entering Both Target values for all increments of test.

2. **Method 2:** EPR Testing using EPR Mode.

   The Test Set has an actual EPR Mode that can be used to test the EPR transmitter. EPR = Pt/Ps (where Ps= Inlet pressure and Pt=Outlet pressure). In EPR Mode the Test Set provides display of the individual pressures for PT2 and PT7 as well as the exact EPR Ratio resulting from the equation of PT7 / PT2. In the EPR Mode, the Static (Ps) setting is

the overriding factor versus the Pitot (Pt) or the EPR Ratio. The default unit of measure are in inHg; however, various units of measure are available for the EPR Mode as per Table 10.

Note: The user can change the displayed units of measure on the Test Set by this sequence: Main Menu, Units and then choosing from among inHg, mbar, psi, mmHg, kPa, hPa, inH_2O@20°C, inH_2O@4°C, inH_2O@60°F.

Note: Before beginning the test, ensure that the limits profile is set to max. This can be accomplished by either pressing the top right box or selecting this Menu sequence: Main Menu, Page 2, Set up 1, Limits View/Select, Select Limits, max, Ok.

Note: This test is limited by Test Set airspeed range (650 knots).

a) From the Main Menu select EPR Mode by this sequence: Main Menu, Page 2, Additional Functions, EPR. Then return to the Main Menu.

b) Place the Test Set in Control Mode.

c) Enter the first Static (PT2) pressure Target value.

d) Enter the first Pitot (PT7) pressure Target value or the first EPR Target.

e) After the Test Set achieves both the Target values confirm the EPR Ratio reading.

f) Repeat the process by entering both Target values for all increments of test.

3. After testing has been completed, use the Standard Test Set Shutdown Procedures to return the Test Set and aircraft to ambient pressures.

13. SHUTDOWN PROCEDURE

A. Test Set Shutdown Procedure

1. From the Main Menu, select the Go to Ground function.
2. Confirm the Go to Ground by selecting “Yes” (refer to Figure 62).

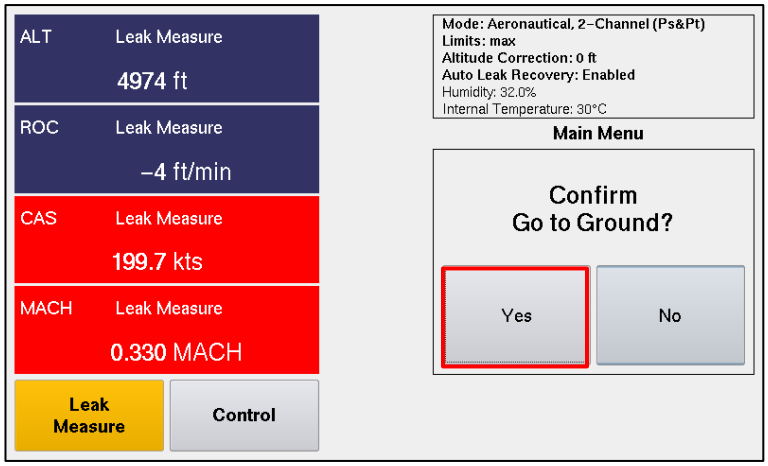


Figure 62 Confirm Go To Ground

3. When the Go to Ground function has completed, the display will indicate “Unit Safe at Ground” and both the Static (Ps) and Pitot (Pt) ports are Vented to ambient (refer to Figure 63).

CAUTION: DO NOT REMOVE THE STATIC (PS) HOSE, PTITO (PT) HOSE, OR NAV-AIDS ADAPTERS BEFORE THE TEST SET DISPLAYS “UNIT SAFE AT GROUND.”

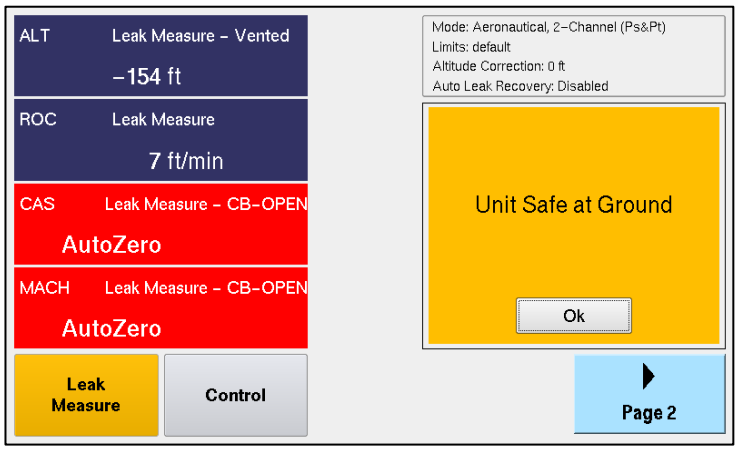


Figure 63 Unit Safe at Ground

4. Switch power OFF.
5. Disconnect the Static (Ps) and Pitot (Pt) hoses from the aircraft ports and or adapters.
6. Disconnect the Static (Ps) and Pitot (Pt) hoses from the tester ports.

CHAPTER 5: RECEIVING, SHIPPING, AND STORAGE

1. RECEIVING

No special unpacking procedures are necessary. It is recommended that the factory-shipping container and packing materials be retained should it become necessary to re-ship the Test Set for a variety of reasons, including OEM recertification.

It is also recommended that the Test Set undergoes a leak check upon receipt and its carrying case should be carefully inspected for damage. If the Test Set has an excessive leak or is damaged, immediately notify the carrier and the manufacturer.

2. SHIPPING

A. It is recommended that the factory-shipping container and packing materials be retained should it become necessary to re-ship the Test Set for a variety of reasons, including OEM recertification. To re-ship the Test Set, place all items within the travel/shipping case P/N 194-00073 to maximize protection.

B. Ensure the Test Set is Safe at Ground.

C. Disconnect hoses from the Static (Ps) and Pitot (Pt) ports and install AN4 caps on each – hand-tighten only.

D. Ensure Test Set is powered off. Disconnect the power cable and store in lid pouch.

E. Reaffix the lid if previously removed.

F. Use standard delicate electronic equipment packaging procedures when packing the Test Set for reshipment.

3. STORAGE

A. Place a four-ounce bag of desiccant inside the case.

B. Close and latch the cover.

C. Store in a cool dry place.

Note: Should the Test Set become exposed to moisture or very high humidity, dry it as soon as possible and temporarily store it in a dehumidified area.

CHAPTER 6: MAINTENANCE

1. GENERAL

A. The manufacturer of this equipment does not recommend that the user attempt any maintenance or repair. In case of malfunction, contact the manufacturer to obtain the list of approved repair facilities worldwide. This will ensure that this equipment is serviced using proper procedures and certified instrument.

2. PREVENTATIVE

A. The user should visually inspect the unit prior to each use to look for signs of apparent damage.

B. Inspect the ports, hoses, and aircraft adapters for the presence of moisture or any type of foreign matter.

C. With the Test Set disconnected from the hose and adapter assemblies, power the unit on and observe the initialization routine to make sure there are no apparent issues reported.

3. TROUBLESHOOTING

A. If the unit displays an error code during use, please record the error code and contact Barfield or its representative for further instructions before proceeding.

B. If the Test Set seems to be malfunctioning but displays no error code, then return the unit safely to ground level. Cycle the power to see if the problem clears, making notes of any issues discovered during the Power On Self-Test routines.

4. CALIBRATION

A. The Test Set calibration interval is once per annum (12 months) (refer to section **3. RECERTIFICATION** on page 2).

B. Please see the list of approved repair facilities under **MAINTENANCE AND REPAIR INFORMATION** on page vi.

CAUTION: RECERTIFICATION BY A CALIBRATION/REPAIR SHOP NOT POSSESSING THE NECESSARY TECHNICAL KNOWLEDGE, DOCUMENTATION, SPECIAL TEST EQUIPMENT, TOOLING, AND STANDARDS WILL ADVERSELY AFFECT THE ACCURACY/CAPABILITY OF THE DPS1000 FOR TESTING THE AIRCRAFT, INCLUDING THE DEMANDING REDUCED VERTICAL SEPARATION MINIMUM (RVSM) ACCURACY REQUIREMENT.

APPENDIX A: ABBREVIATIONS & GLOSSARY

abs	Absolute
ALT	Altitude (ft or m).
ALR	Auto Leak Recover
AMM	Aircraft Maintenance Manual
AP	Authorized Procedure
App	Application
ASI	Airspeed Indicator
ATP	Automatic Test Process
CAS	Calibrated Air Speed (kts or km/h)
CMM	Component Maintenance Manual
EPR	Engine Pressure Ratio
^{o}F	Degrees Fahrenheit
^{o}C	Degrees Celsius
ft	Foot
g	Gauge
hr	Hour
hm	Hecto meter
inHg	inches of Mercury
HUIM	Host User Interface Module
Hz	Hertz
IAS	Indicated Airspeed
in	Inch
kg	Kilogram
km	Kilometer
kts	Knots
LCD	Liquid Crystal Display
m	Meter
max	Maximum
mbar	Millibar
min	Minute or minimum
mm	Millimeter
mph	Miles per hour
mV	Millivolt
OEM	Original Equipment Manufacturer

PCM	Pneumatic Control Module
PIN	Personal Identification Number
Ps	Static Pressure
psi	Pounds per square inch
Pt	Pitot Pressure
PsRt	Ps Rate, rate of Ps pressure change
PtRt	Pt rate, rate of Pt pressure change
Qc	Differential pressure (Qc = Pt - Ps)
QFE	Local atmospheric pressure
QNH	Barometric pressure at sea level
ROC	Rate Of Climb in units of (ft/min or m/min)
Rt	Rate
RtCAS	Rate of change of CAS in units of (kts/min) or (km/h/min)
RtQc	Qc rate, rate of Qc pressure change
R/O	Read Only
TAS	True Air Speed (Adjusted for ambient temperature) – Not Supported
UI	User Interface
UUT	Unit Under Test

APPENDIX B: OPERATING LIMITS

The DPS1000 comes with 2 predefined sets of operating limits, the (1) default limits profile and the (2) max limits profile.

The unit also includes limits files for each of the three operating modes: (1) Aeronautical, (2) Pressure units and (3) EPR. Each of these three operating modes contains a default limits profile and a max limits profile. The values for both limits profiles are stored in a “read only” (R/O) file. There will also be a max limits profile for each of the three modes; these values are also stored in a R/O file.

Test Set will power up and initialize with the default limits profile when the product first ships. If the customer changes the limits to the max or a custom limits profile, the Test Set will power up using the last profile selected.

The following tables represent the default and max limits profile values included in the Test Set:

AERONATICAL LIMITS PROFILE (DEFAULT)		
Parameters	**Limits**	**Comments**
ALT Min	-1,500 ft (-460 m)	Minimum Target Altitude
ALT Max	50,000 ft (15,240 m)	Maximum Target Altitude
ROC Min	100 ft/min (30 m/min)	Minimum Target ROC
ROC Max	3,000 ft/min (914 m/min)	
ROC – (default)	3,000 ft/min (914 m/min)	
CAS Min	0.0 kts	Target = 0.0 or ≥ 5.0 kts
CAS Max	500 kts (926 km/h)	
RtCAS Min	50 kts/min (100 km/h/min)	
RtCAS Max	300 kts/min (556 km/h/min)	
RtCAS – (default)	300 kts/min (550 km/h/min)	
MACH Min	0.03	Target = 0.0 MACH or ≥ 0.03
MACH Max	0.90	
ALT Correction Min	-100 (-30 m)	
ALT Correction Max	+100 (30 m)	
ALR: Auto Leak Recovery	Enabled (default)	
ALR: ROC	1,000 ft/min (300 m/min)	
ALR: RtCAS	100 kts/min (185 km/h/min)	

Table 11 Aeronautical Limits Profile (default)

Note: Operating Limits continued onto next page.

AERONAUTICAL LIMITS PROFILE (MAX)		
Parameters	**Limits**	**Comments**
ALT Min	-2,000 ft (-610 m)	Minimum Altitude
ALT Max	55,000 ft (16,765 m)	
ROC Min	100 ft/min (30 m/min)	
ROC Max	20,000 ft/min (6,000 m/min)	
ROC – (default)	3,000 ft/min (914 m/min)	
CAS Min	0.0	
CAS Max	650 kts (1,200 km/h)	
RtCAS Min	50 kts/min (95 m/min)	
RtCAS Max	600 kts/min (1,000 km/h/min)	
MACH Min	0.00	
MACH Max	2.1	
ALT Correction Min	-100	
ALT Correction Max	+100	
ALR: Auto Leak Recovery	Enabled (default)	
ALR: ROC	2,000 ft/min (600 m/min})	
ALR: RtCAS	200 kts/min (370 km/h/min)	

Table 12 Aeronautical Limits Profile (max)

PRESSURE LIMITS PROFILE (DEFAULT)		
Parameters	**Limits**	**Comments**
Ps Min	2.693 inHg	Ps Minimum Pressure
Ps Max	32.000 inHg	Ps Maximum Pressure
Qc Min	0.000 inHg	Qc Minimum Pressure
Qc Max	30.000 inHg	Qc Maximum Pressure
Pt Min	2.693 inHg	Pt Minimum Pressure
Pt Max	62.000 inHg	Pt Maximum Pressure
PsRt Min	0.10 inHg/min	Ps Minimum Rate
PsRt Max	3.0 inHg/min	Ps Maximum Rate
QcRt Min	0.50 inHg/min	Qc Minimum Rate
QcRt Max	9.0 inHg/min	Qc Maximum Rate

Table 13 Pressure Limits Profile (default)

Note: Operating Limits continued onto next page.

PRESSURE LIMITS PROFILE (MAX)		
Parameters	**Limits**	**Comments**
Ps Min	2.693 inHg	Ps Minimum Pressure
Ps Max	38.000 inHg	Ps Maximum Pressure
Qc Min	0.000 inHg	Qc Minimum Pressure
Qc Max	40.000 inHg	Qc Maximum Pressure
Pt Min	2.693 inHg	Pt Minimum Pressure
Pt Max	78.000 inHg	Pt Maximum Pressure
PsRt Min	0.1 inHg/min	Ps Minimum Rate
PsRt Max	9.0 inHg/min	Ps Maximum Rate
PsRt – (default)	3.0 inHg/min	Ps default Rate
QcRt Min	0.10 inHg/min	Qc Minimum Rate
QcRt Max	9.0 inHg/min	Qc Maximum Rate
QcRt – (default)	3.0 inHg/min	Qc default Rate

Table 14 Pressure Limits Profile (max)

EPR LIMITS PROFILE (DEFAULT)		
Parameters	**Limits**	**Comments**
Ps Min	2.693 inHg	Ps Minimum Pressure
Ps Max	32.000 inHg	Ps Maximum Pressure
Pt Min	2.693 inHg	Pt Minimum Pressure
Pt Max	62.000 inHg	Pt Maximum Pressure
EPR **Min**	0.10	EPR Minimum
EPR **Max**	12.0	Ps Maximum Rate
RtEPR Min	0.50 inHg/min	EPR Minimum Rate
RtEPR Max	6.0 inHg/min	EPR Maximum Rate
RtEPR (default)	3.0 inHg/min	EPR default Rate

Table 15 EPR Limits Profile (default)

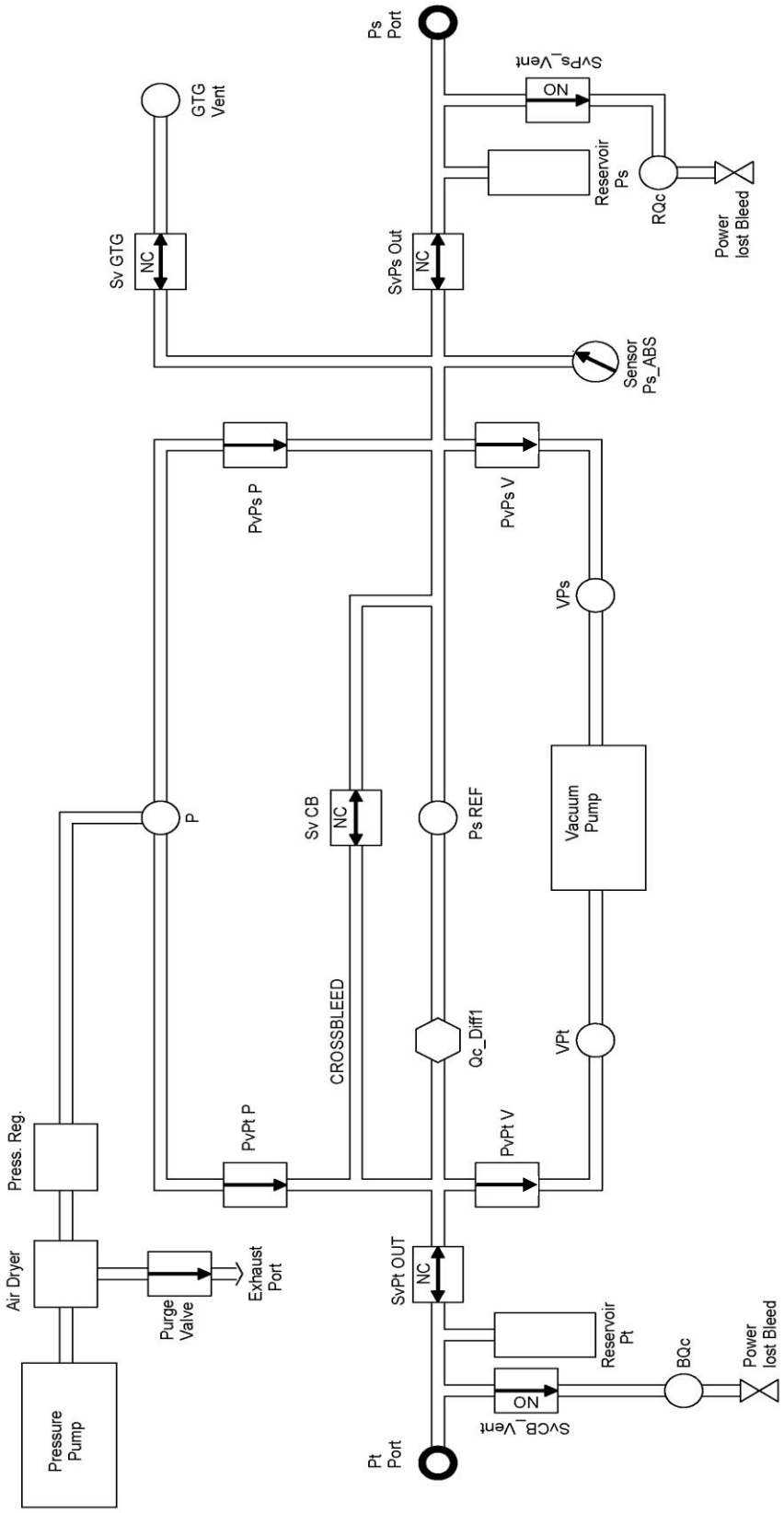
Note: EPR = Pt / Ps (where Ps = Inlet pressure and Pt = Outlet pressure)

EPR LIMITS PROFILE (MAX)		
Parameters	**Limits**	**Comments**
Ps Min	2.693 inHg	Ps Minimum Pressure
Ps Max	38.000 inHg	Ps Maximum Pressure
Pt Min	2.693 inHg	Pt Minimum Pressure
Pt Max	78.000 inHg	Pt Maximum Pressure
EPR **Min**	0.10	Ps Minimum Rate
EPR **Max**	15	Ps Maximum Rate
RtEPR Min	0.50 inHg/min	EPR Minimum Rate
RtEPR Max	9.0 inHg/min	EPR Maximum Rate
RtEPR (default)	6.0 inHg/min	EPR default Rate

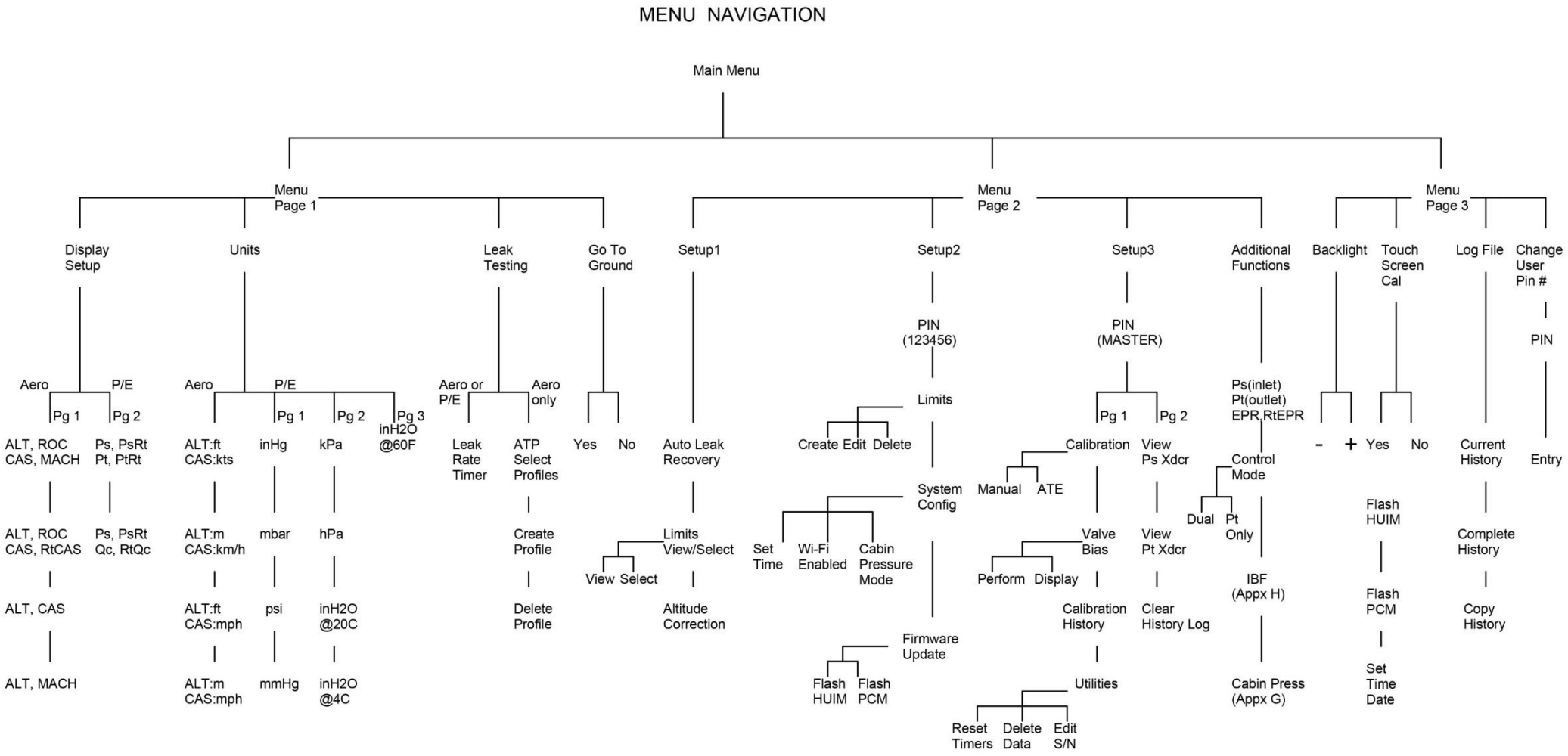
Table 16 EPR Limits Profile (max)

Note: EPR = Pt / Ps (where Ps = Inlet pressure and Pt = Outlet pressure)

APPENDIX C: DPS1000 INTERNAL PNEUMATIC DIAGRAM



APPENDIX D: MENU NAVIGATION



Aero = Aeronautical, P/E = Pressure/EPR

Units for Aeronautical and Pressure/EPR are determined by which is selected under Display Setup

APPENDIX E: WI-FI CONNECTION PROCEDURE

The DPS1000 and 1811NG Test Sets can be controlled using a Wi-Fi enabled Android or iOS tablet or cellphone (not supplied) as a wireless remote-control device.

Download the free Barfield app from the Google Play Store or Apple App Store - search for "Barfield ADTS."

Note: Refer to document no. 42-101-01175_01178 for additional information on the firmware update procedure for the DPS1000/1811NG units.

1. ESTABLISHING WI-FI CONNECTION FOR ANDROID DEVICES

A. Establishing Wi-Fi Connection

1. Launch the Barfield ADTS app from your device.
2. Press "Connect" (refer to Figure 64).

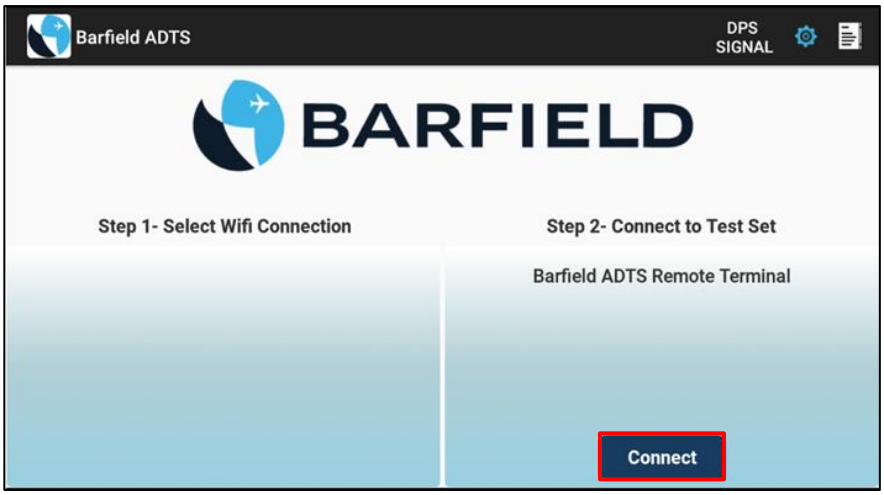


Figure 64 Connect Screen

3. If you are not connected to a DPS1000/1811NG Test Set Wi-Fi, complete steps 1.A.4-1.A.11 below. If you are connected, continue onto step 1.A.12.
4. An INFORMATION pop-up message will appear (refer to Figure 65).

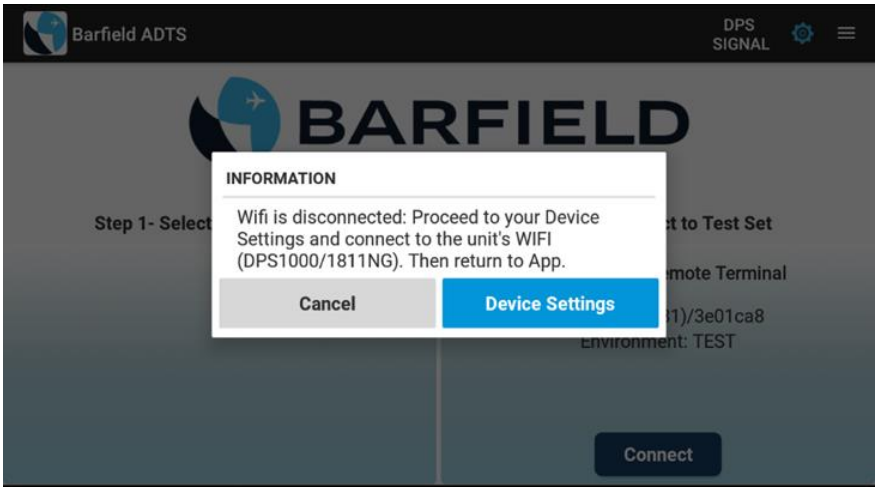


Figure 65 INFORMATION Pop-up Message

5. Press “Device Settings.”
6. You will be redirected to your Android device’s Wi-Fi connection Settings screen.
7. Connect to available DPS1000/1811NG Wi-Fi.
8. If connecting to your android device for the first time, a password request will trigger (refer to Figure 66).

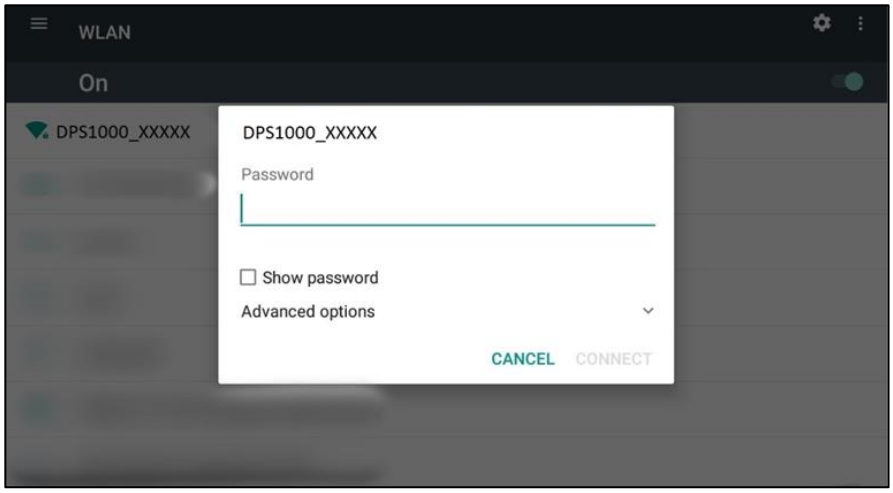


Figure 66 Password Request Screen

9. Type in default password **barfield** (all lowercase).
10. Press “CONNECT.”

11. Return to the Barfield ADTS App.

    Note: The selected DPS1000/1811NG Wi-Fi will be displayed on the screen (refer to Figure 67).

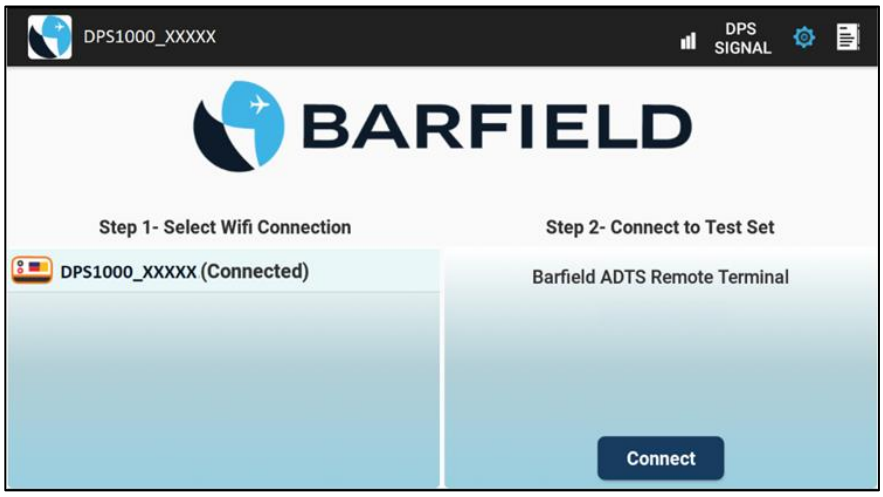


Figure 67 Connect screen with selected unit displayed

12. Press “Connect.”
13. The Barfield ADTS app is now ready for use with the Test Set.

2. ESTABLISHING WI-FI CONNECTION FOR iOS DEVICES

A. Establishing Wi-Fi Connection

1. Launch the Barfield ADTS app from your device.
2. Press “Connect” (refer to Figure 64).
3. If you are not connected to a DPS1000/1811NG Test Set Wi-Fi, complete steps 2.A.4-2.A.11 below. If you are connected, continue onto step 2.A.12.
4. An Information pop-up message will appear (refer to Figure 68).

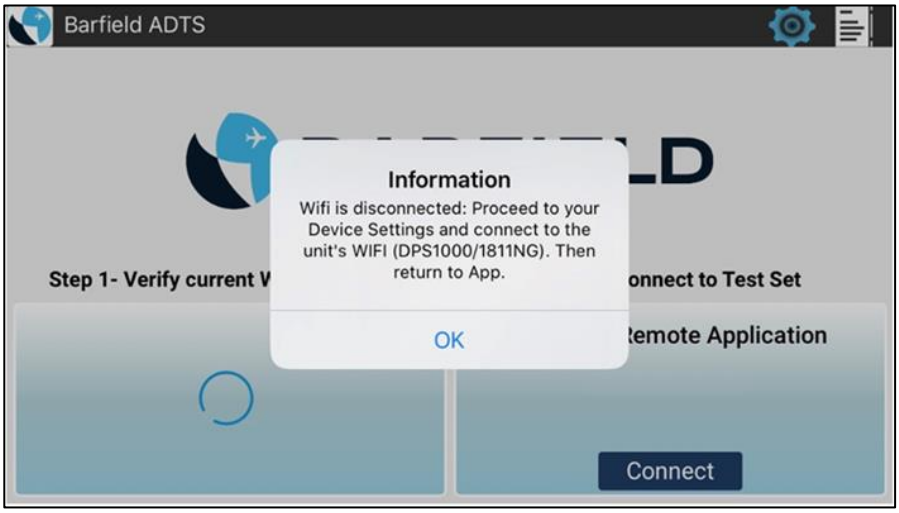


Figure 68 Information Pop-up Message (iOS)

5. Click “OK.”
6. Open your device’s Settings and select “Wi-Fi.”
7. Connect to available DPS1000/1811NG Wi-Fi connection (refer to Figure 69).

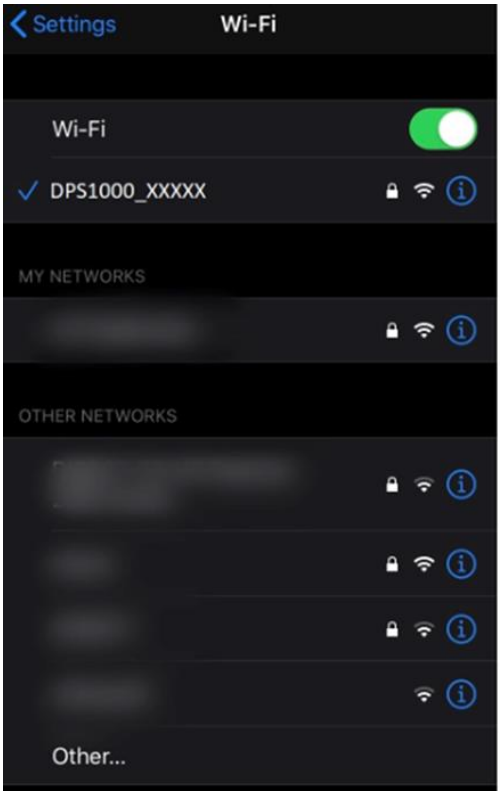


Figure 69 DPS1000/1811NG Wi-Fi Selected

8. If you are connecting your iOS device to the DPS1000/1811NG Wi-Fi for the first time, a password request will trigger (refer to Figure 70).

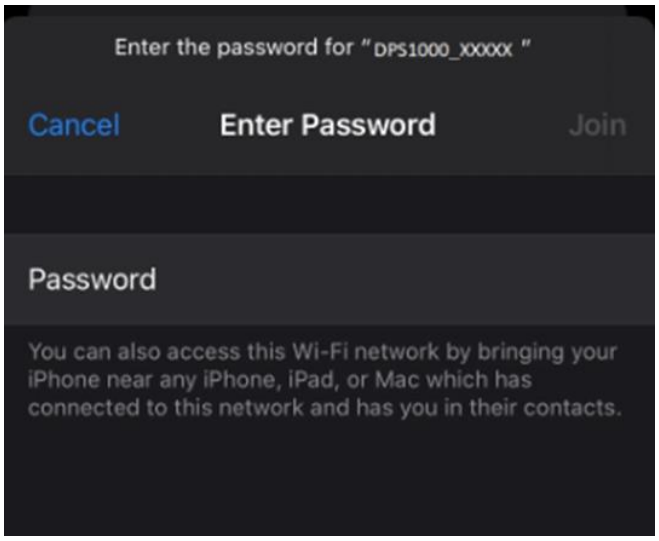


Figure 70 Password Request Screen

9. Type in default password **barfield** (all lowercase).
10. Press “Join” on your iOS device.
11. Return to the Barfield ADTS App.

    Note: The selected DPS1000/1811NG Wi-Fi will now be displayed on the screen (refer to Figure 67).
12. Press “Connect.”
13. The Barfield ADTS app is now ready for use with the Test Set.

3. DISCONNECTION WI-FI CONNECTION FOR ANDROID & iOS DEVICES

A. Disconnecting from Wi-Fi Connection

1. Properly disconnect the Android or iOS device from the Test Set using one of the following methods:
   a) From the ADTS Barfield App, select the Menu icon and select “Disconnect” from the drop-down menu (refer to Figure 71), or
   b) Select “Disconnect Remote” from the Test Set’s screen (refer to Figure 72).

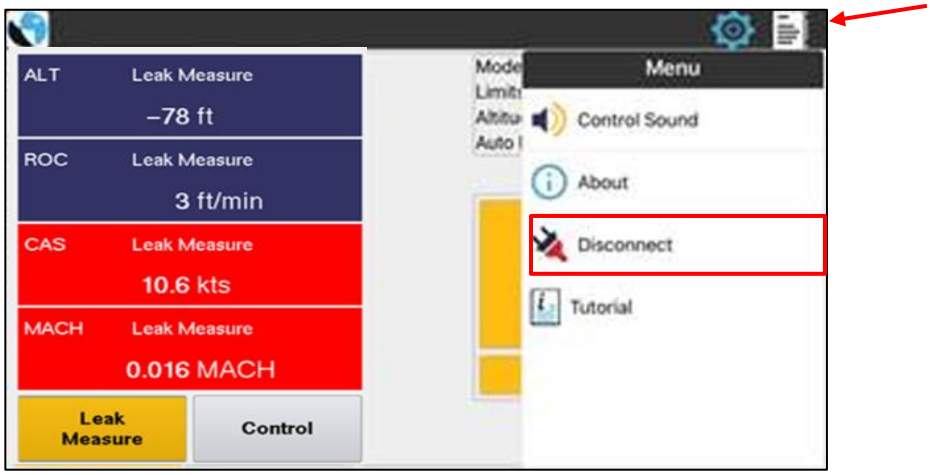


Figure 71 Select Disconnect

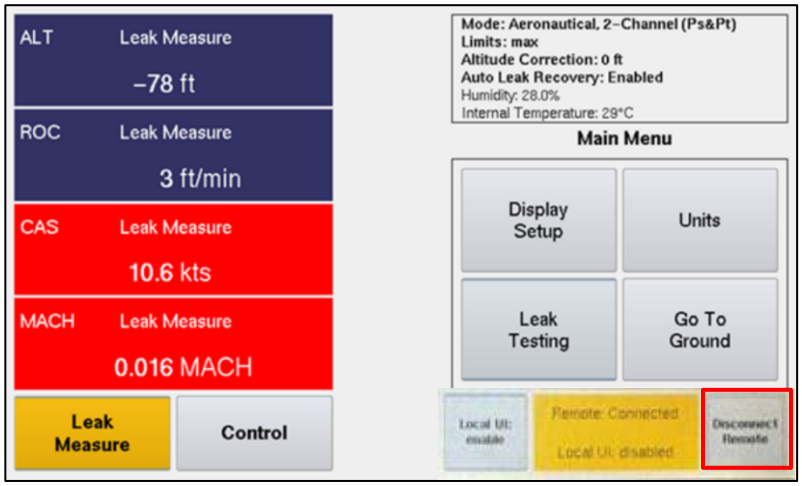


Figure 72 Disconnect Remote button

B. **Enabling 1811NG Touchscreen**

Note: By default, while the Test Set is connected to the Android device, the DPS1000's touch screen is disabled. Only the "Disconnect Remote" and "Local UI: enable" buttons are enabled.

1. To enable the DPS1000's touchscreen, press the "Local UI: enable" on the Test Set (refer to Figure 73). The touchscreen is now enabled despite the remote being connected. The Test Set is now controlled via the touchscreen.

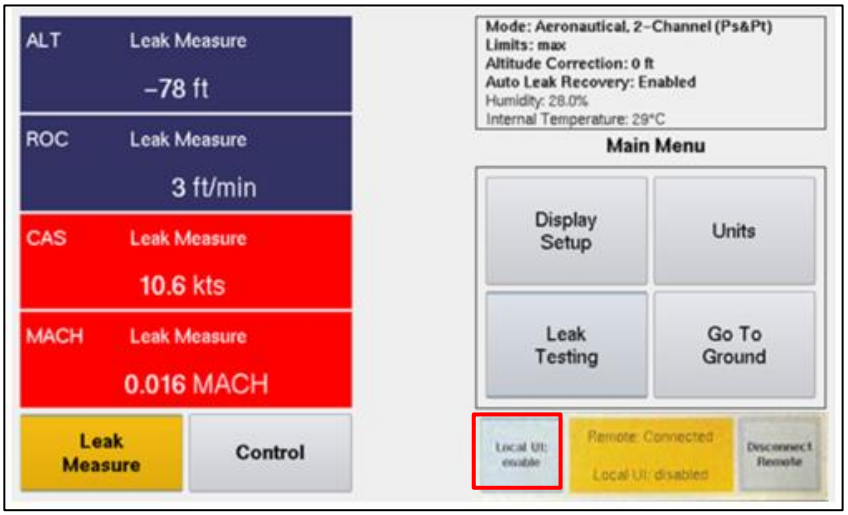


Figure 73 Local UI: Enable button

2. The mobile device (remote) will now only mirror the Test Set, showing what is taking place on the display; it no longer controls the Test Set.
3. A yellow button on the remote's screen will indicate "Remote Connected, Remote UI disabled" (refer to Figure 74).

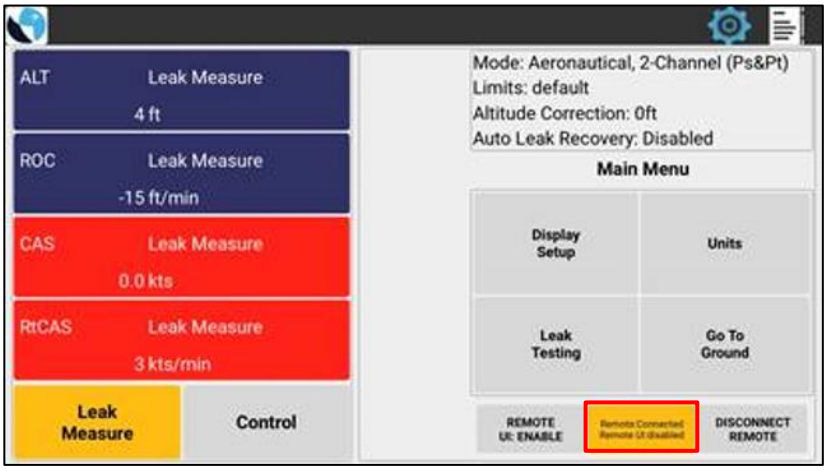


Figure 74 Remote Connected/Remote UI disabled

APPENDIX F: CABIN PRESSURE MODE

The following appendix details the configuration and usage of the unit when setup to perform cabin pressure testing.

It should be noted that this test is not commonly performed on aircraft. Therefore, the Cabin Pressure testing feature is disabled in the default configuration of the Test Set (as shipped from Barfield).

Section A below describes the process of enabling the Cabin Pressure function while Section B describes the actual usage of the Cabin Pressure Mode.

1. CABIN PRESSURE MODE

A. Enabling Cabin Pressure Mode

1. From the Main Menu, select “Page 2.”
2. A Main Menu screen below appears with four options (refer to Figure 75). Select “Setup 2.”

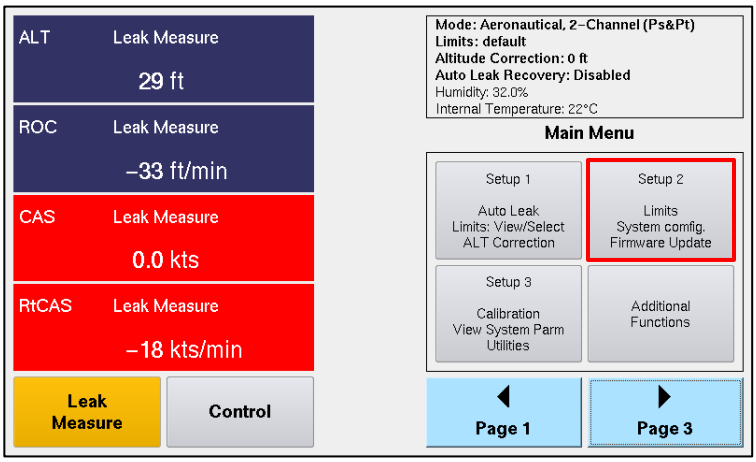


Figure 75 Main Menu Screen (Page 2)

3. A numbered keypad is displayed (refer to Figure 76). Enter the user PIN code (default code is “**123456**”). Then, select “Enter.”

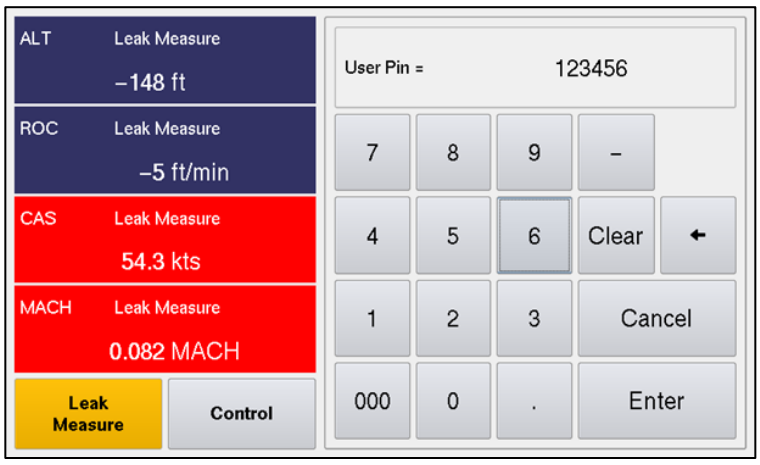


Figure 76 Numbered Keypad Screen

4. “Setup 2” screen is displayed (refer to Figure 77). Select “System Configuration.”

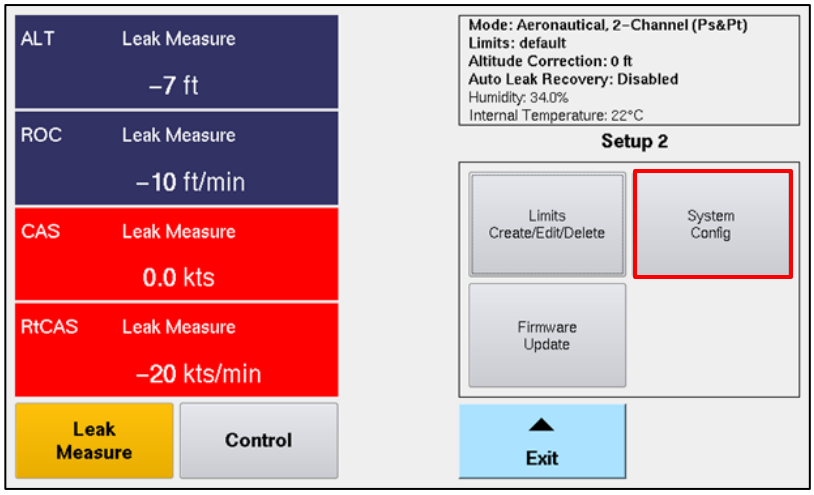


Figure 77 Setup 2 Screen

5. A screen appears with three options. Select “Cabin Pressure Mode Disabled” (refer to Figure 78).

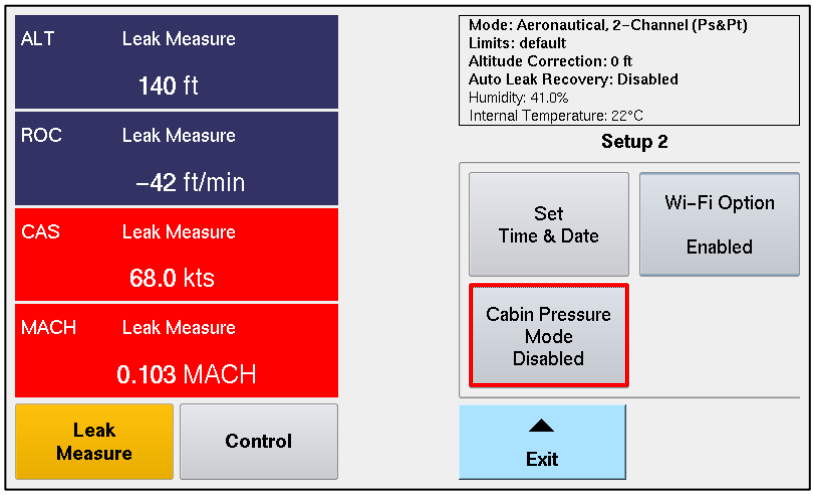


Figure 78 Disabled Cabin Pressure Mode

6. The Test Set will change the Cabin Pressure Mode to “Enabled” (refer to Figure 79).

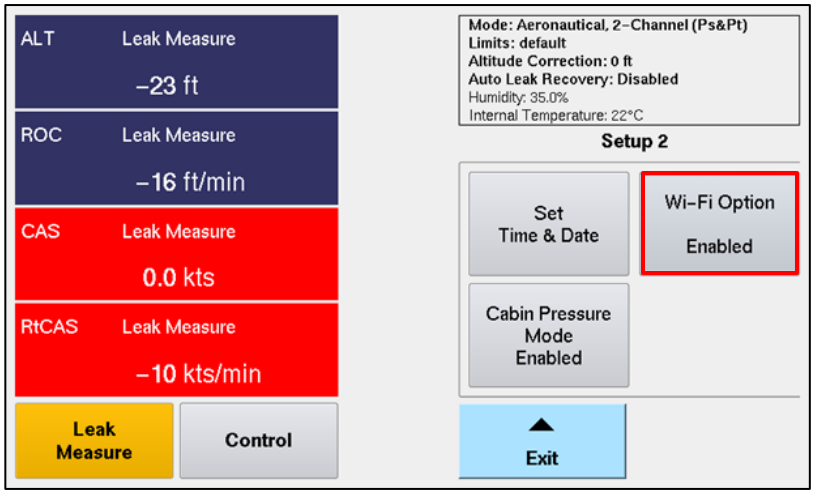


Figure 79 Enabled Cabin Pressure Mode

7. The Test Set is now ready to be used in the Cabin Pressure Mode. To access the mode, restart the Test Set.

B. **Using Cabin Pressure Mode**

1. Turn the Test Set ON.
2. Allow the initialization to complete.
3. The Test Set will then prompt you to answer “Yes” or “No” to the message below (refer to Figure 80).
4. Select “No” and the unit will continue with normal operation (no cabin pressure mode). Select “Yes” to use the unit in Cabin Pressure Mode.

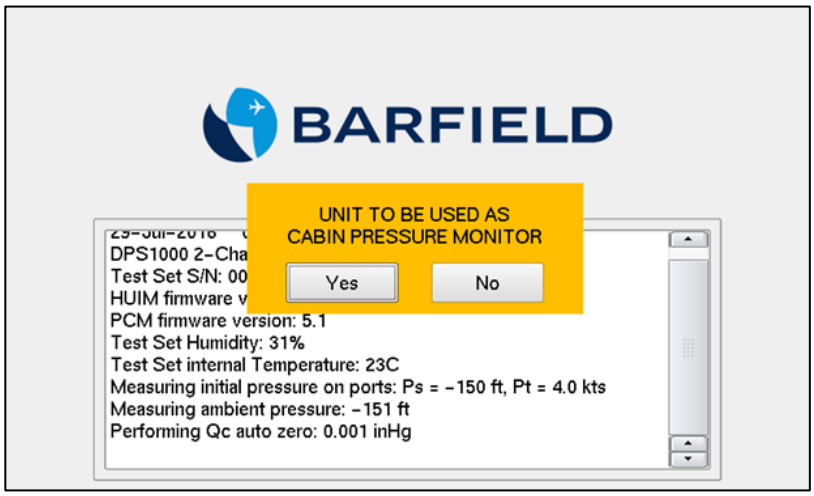


Figure 80 Initialization Screen

5. The Cabin Pressure Mode's Step 1 window is displayed (refer to Figure 81).

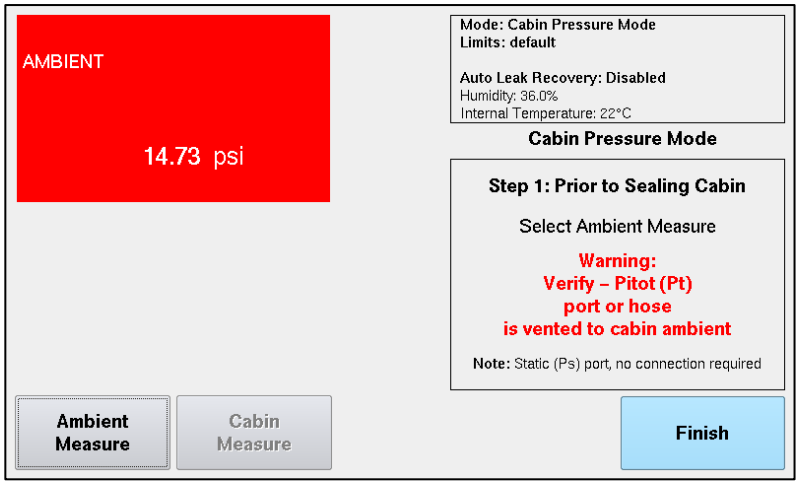


Figure 81 Cabin Pressure Mode (Step 1)

6. In Step 1 of the Cabin Pressure Mode, ensure that the cabin of the aircraft is open, and the Pitot (Pt) port of the unit is vented to ambient (Static (Ps) port connection not required). Refer to Figure 82 for an example of the Test Set's Pitot (Pt) port venting to ambient.

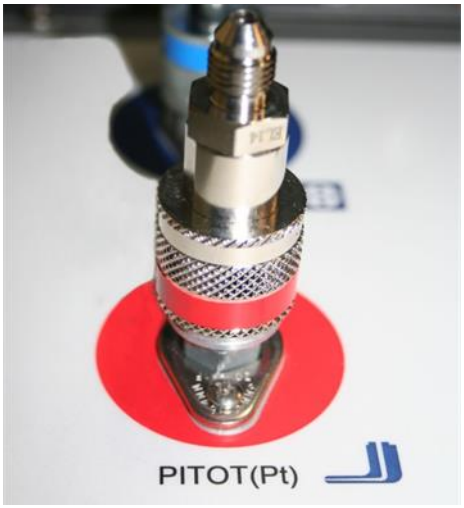


Figure 82 DPS100 Connection Port

7. Follow the on-screen instructions. Then, select "Ambient Measure."

8. A warning pop-up window is displayed with the message below (refer to Figure 83). Select “Yes.”

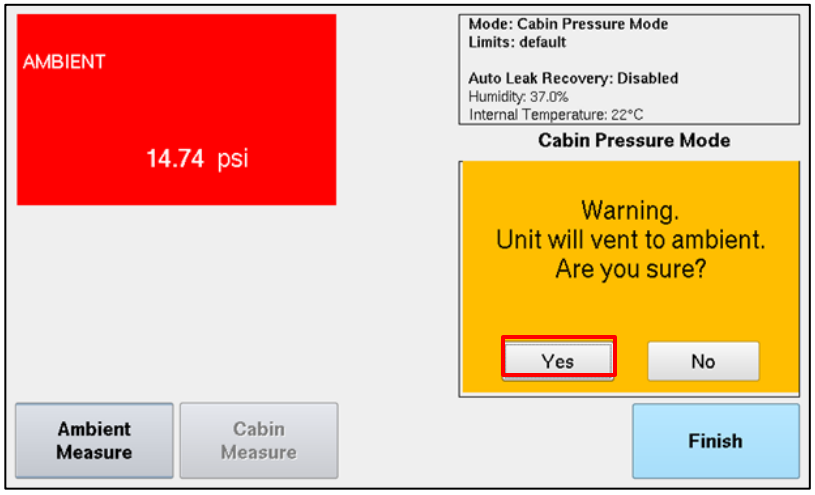


Figure 83 Warning Message (1)

9. Step 2 window is displayed (refer to Figure 84). Here, the unit will vent to ambient.

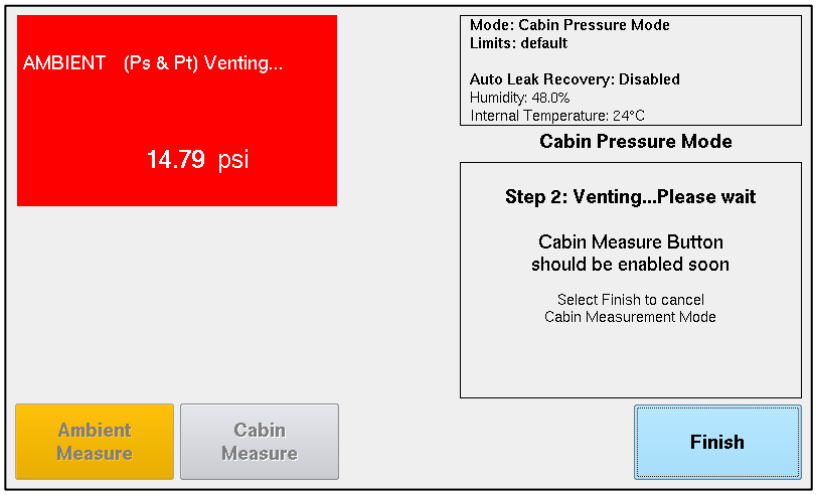


Figure 84 Cabin Pressure Mode (Step 2)

6. Once the Test Set is vented, Step 3 window will appear (refer to Figure 85). Select “Cabin Pressure.”

   Note: Ensure that the cabin is sealed and ready for pressurization as per AMM.

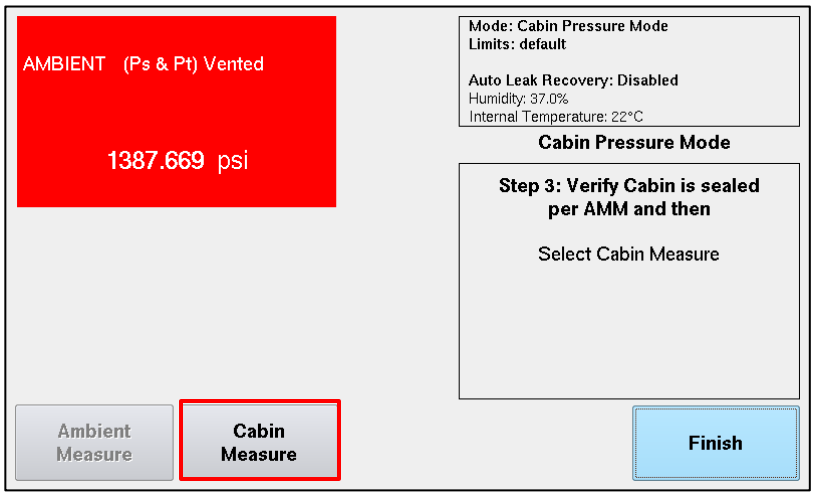


Figure 85 Cabin Pressure Mode (Step 3)

7. Upon pressing the Cabin Measure button, the Test Set will vent to ambient.
8. A warning pop-up message is displayed with the message below (refer to Figure 86). Select “Ok.”

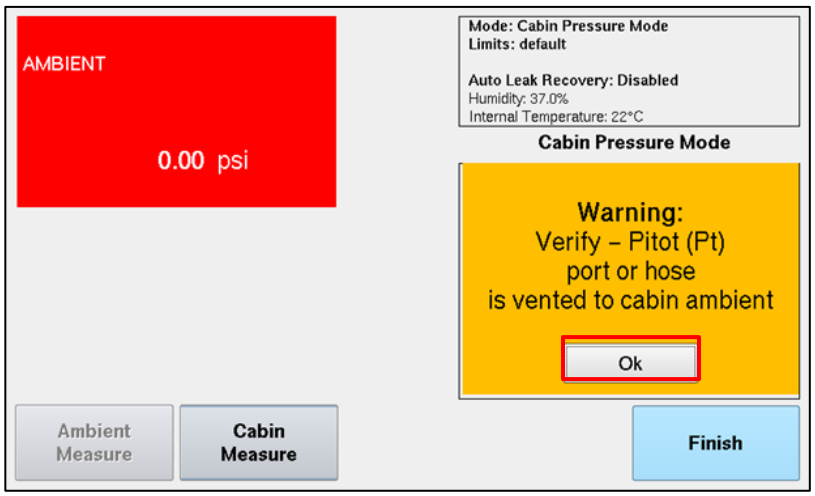


Figure 86 Warning Message (2)

9. Step 3 shows the screen for the cabin pressure mode on which the unit is monitoring the change in the cabin pressure and displays this value in unit of psi and ROC in ft/min. (refer to Figure 87).

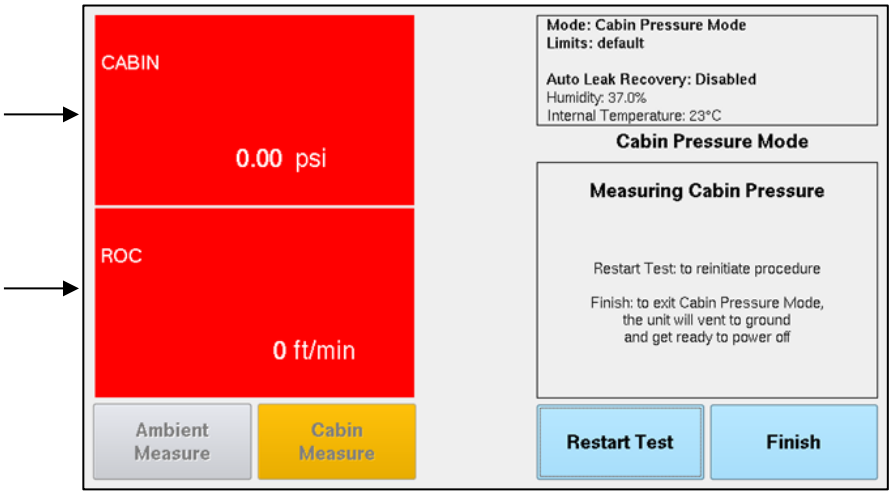


Figure 87 Measuring Cabin Pressure & Rate

10. The user should follow the AMM for the pressurization procedure and the unit will display the measured pressures and rates.

    Note: As a safety feature, the following conditions will be monitored and a visual warning will be issue by the unit:

    - If a rate greater than ± 850 ft/min is applied, the screen will flash.
    - If a pressure greater than 8.4 psi is applied, the screen will flash.

11. Once the test is completed, select “Finish” to exit the Cabin Pressure Mode.

12. A warning screen is displayed with the message below (refer to Figure 88). Select “Yes.”

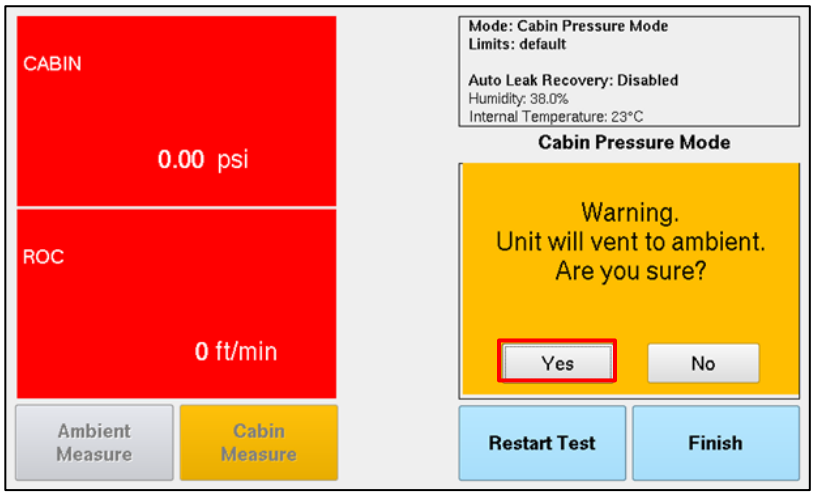


Figure 88 Warning Message (3)

13. The Test Set will begin the venting process (refer to Figure 89).

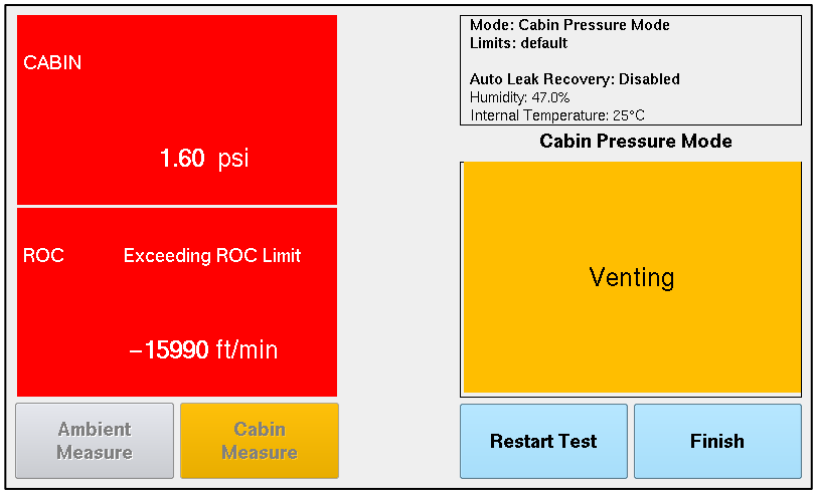


Figure 89 Venting Process

14. Once the venting process is completed, the Test Set will display the message below (refer to Figure 90). Set the power switch to OFF.



Figure 90 Unit Safe to Power Off

15. This completes the usage of the Cabin Pressure Mode.

APPENDIX G: IBF SYSTEM MODE

The following appendix details the configuration and usage of the unit when setup to perform in IBF (Inlet Barrier Filter) Mode.

The purpose of the IBF is to protect the turbine engine from foreign damage and micro erosion when operating in normal and severe environmental conditions.

1. IBF SYSTEM MODE

A. Accessing IBF system mode

1. Set power switch to ON.
2. Allow the initialization to complete.
3. Connect the standard Static (Ps) channel hose to the Test Set.
4. Connect the IBF accessory hose P/N 115-00644 to the end of the Static (Ps) hose (refer to Figure 91).

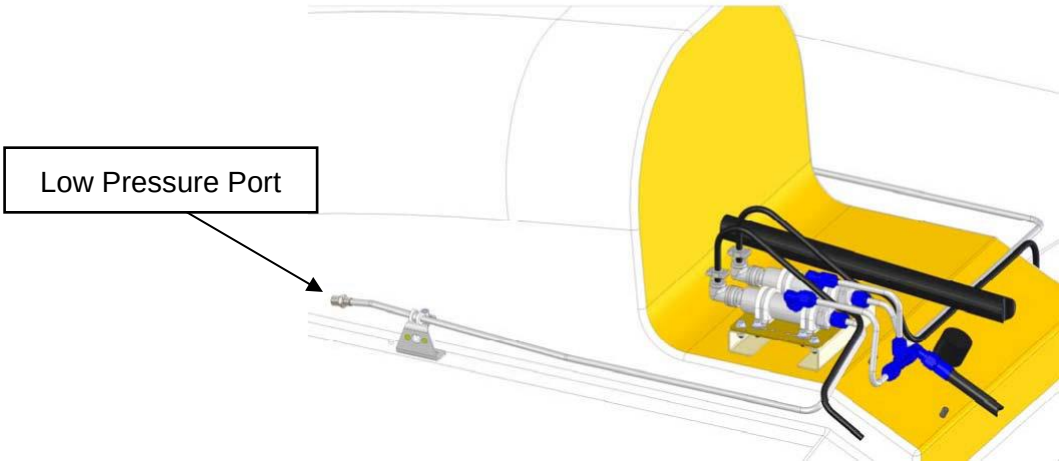


Figure 91 Low Pressure Hose

5. Connect the open end of the IBF accessory hose to the Low-Pressure Port.
6. From the “Main Menu,” press “Page 2.” A screen is displayed with 4 options (refer to Figure 92).

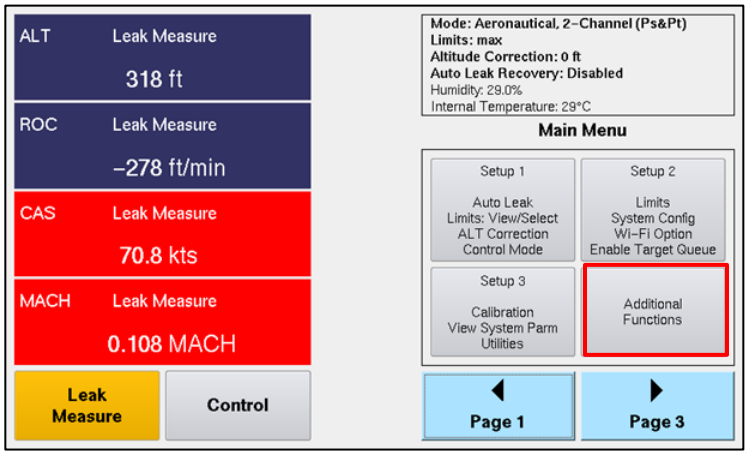


Figure 92 Select Additional Functions

7. A new screen will appear with 4 options (refer to Figure 93). Select “IBF Inlet Barrier Filter Mode.”

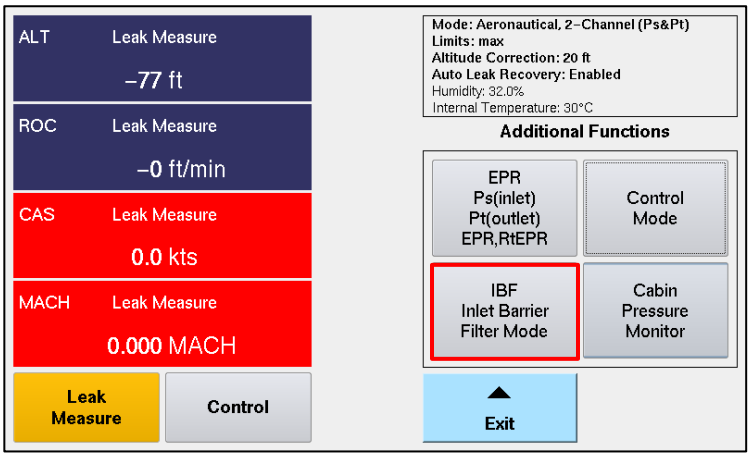


Figure 93 Select IBF Inlet Barrier Filter Mode

8. Step 1 window is displayed with the message below (refer to Figure 94). Select “IBF Vent/Tare.”

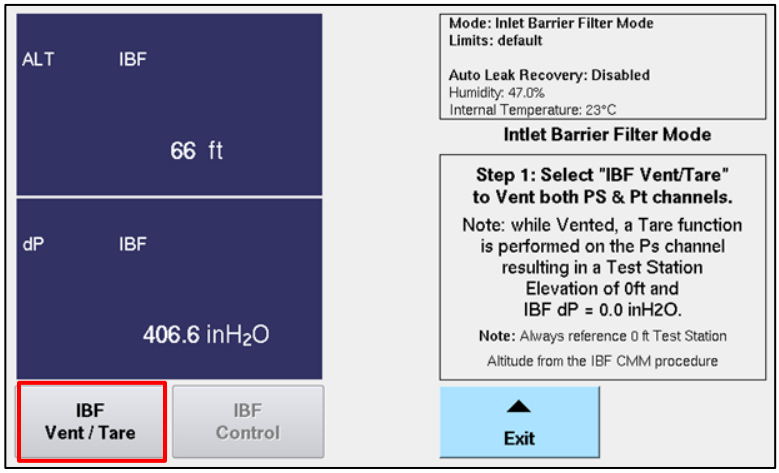


Figure 94 IBF Mode (Step 1)

9. A warning pop-up message will appear. Select “Yes” (refer to Figure 95).

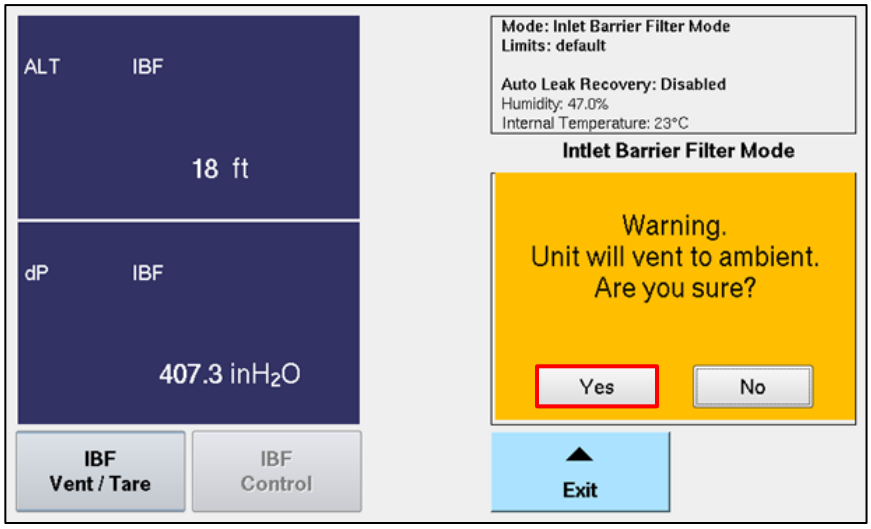


Figure 95 Warning Message (4)

10. Step 2 window is briefly displayed while the Test Set is venting to ambient and performing Tear function (refer to Figure 96).

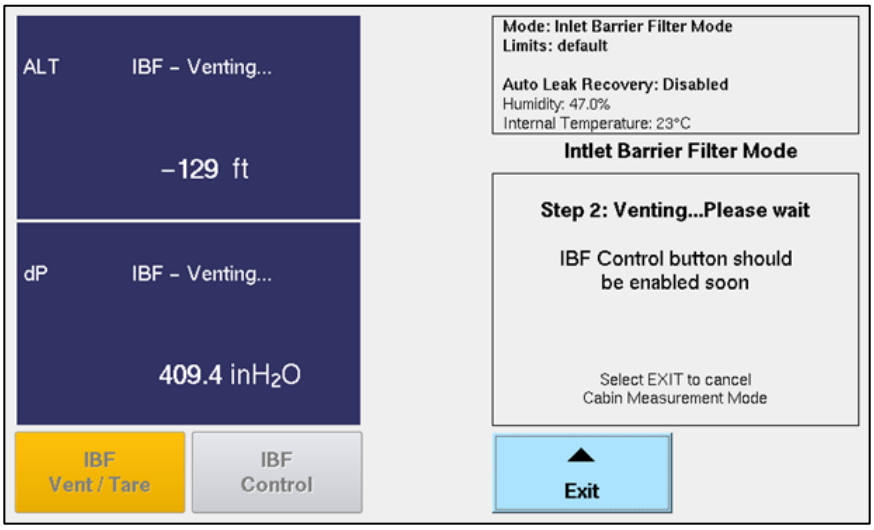


Figure 96 IBF Mode (Step 2)

Note: The Test Set is now vented to Ambient with ALT Tare at 0 ft pressure altitude and dP Tare at 0.0 inH$_2$O.

11. Step 3 window is displayed (refer to Figure 97). Select “IBF Control.”

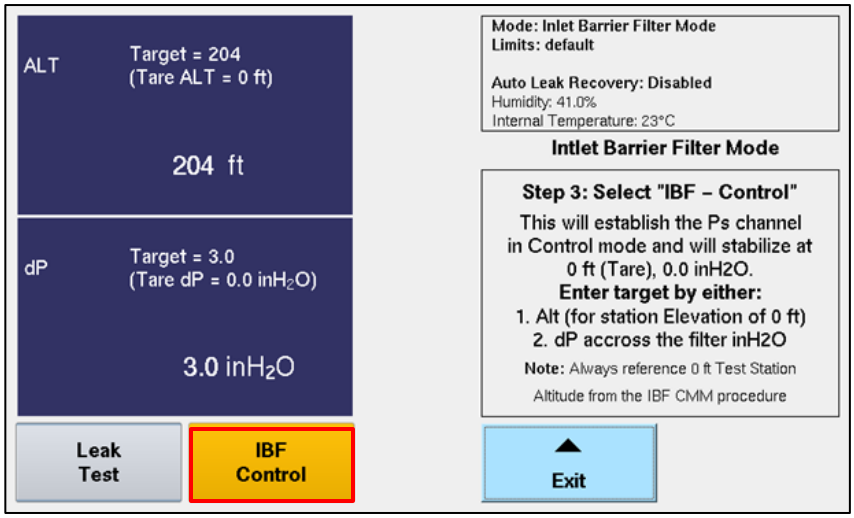


Figure 97 IBF Mode (Step 3)

12. The Test Set will transition into control mode with the Target value (both ALT & dP) set to the current pressure measure on the Static (Ps) port.
13. Select “ALT” or “dP.”
14. A keypad screen is displayed (refer to Figure 98). Enter Target values. Then press “Enter.”

    Note: Initially, the value will be ALT=0ft and dP=0.0inH2O.

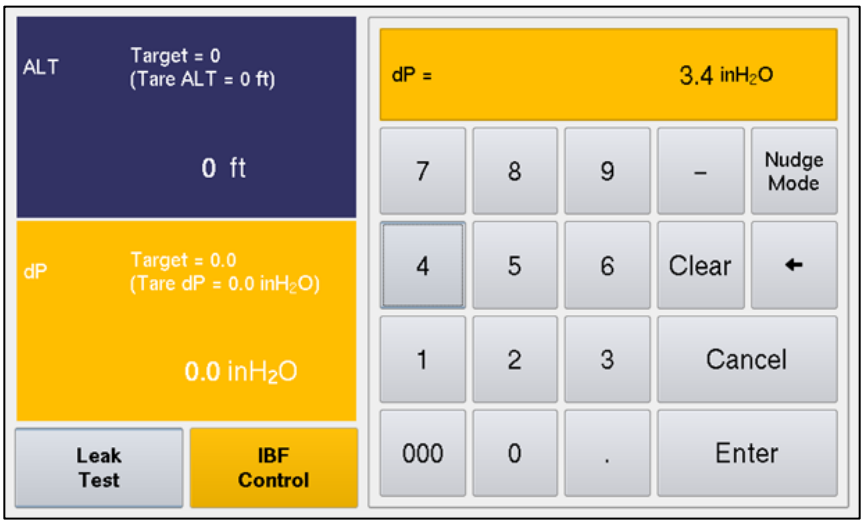


Figure 98 Keypad Screen

15. Wait and allow target suction value to be achieved.
16. Select “Leak Test.”

    Note: Monitor dP or ALT values displayed for possible leaks.
17. Once testing is completed, press “Exit.”

18. A warning pop-up message will appear. Select “Yes” (refer to Figure 99).

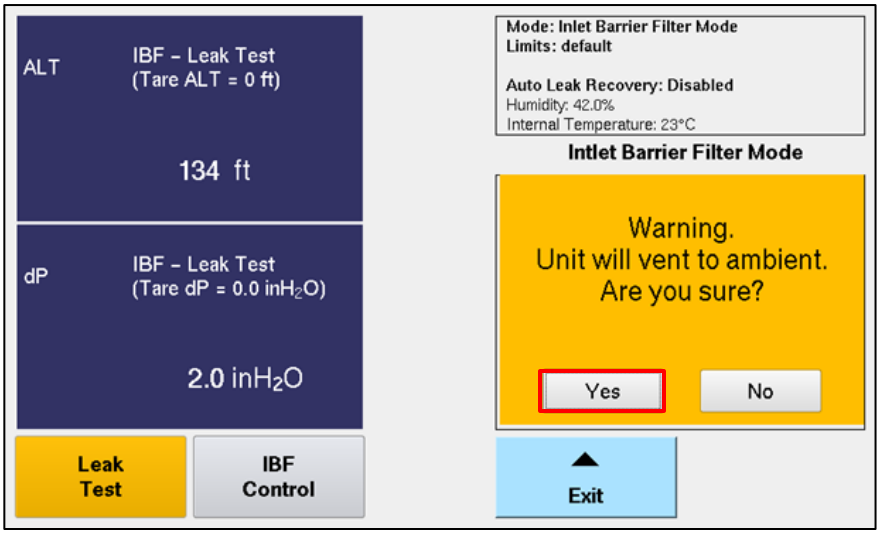


Figure 99 Warning Message (5)

19. The Test Set will briefly vent, and a new window is displayed with the message below (refer to Figure 100). Press “Ok.”

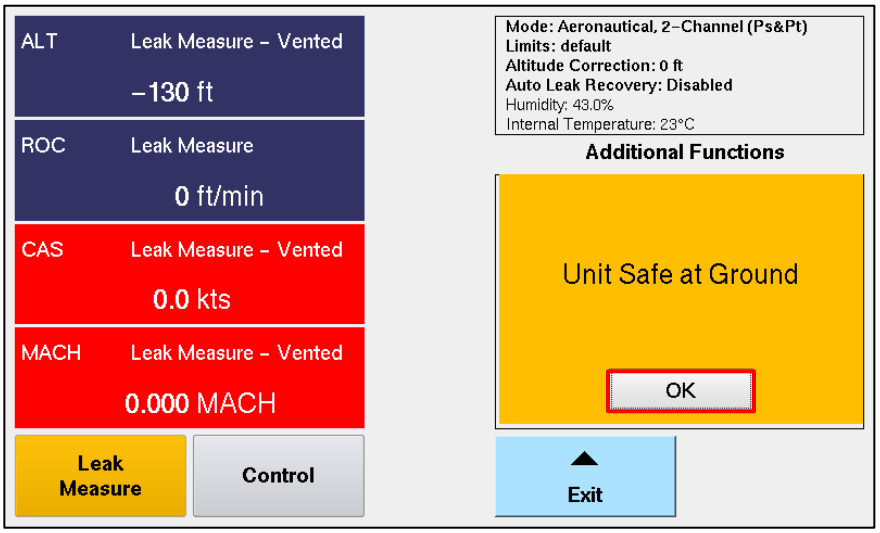


Figure 100 Unit Safe at Ground

20. Once the venting process is completed, power Test Set OFF.

APPENDIX H: FIELD FIRMWARE UPDATE PROCEDURE VIA USB & BARFIELD ADTS APP

(Refer to the 42-101-01175_01178 for this procedure)