

505 Gillingham Lane  
Sugar Land, TX 77478  
O: (281) 325-8300  
F: (281) 325-8399  
E: [customerservice@laversab.com](mailto:customerservice@laversab.com)



**MODEL 6600-NG**  
**USER'S MANUAL**

**Date: May 12, 2017.**

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**WARNING**

THE 6600-NG USES LINE VOLTAGES FOR ITS OPERATION WHICH ARE POTENTIALLY DANGEROUS. IMPROPER OPERATION OF THIS EQUIPMENT MAY RESULT IN PERSONAL INJURY OR LOSS OF LIFE. HENCE THE EQUIPMENT DESCRIBED IN THIS MANUAL SHOULD BE OPERATED ONLY BY PERSONNEL TRAINED IN PROCEDURES THAT WILL ASSURE SAFETY TO THEMSELVES, TO OTHERS AND TO THE EQUIPMENT.

BEFORE PERFORMING ANY MAINTENANCE, TURN THE POWER OFF AND DISCONNECT THE POWER CORD FROM THE POWER SOURCE.

ALWAYS USE A 3-PIN GROUNDED OUTLET AS YOUR AC POWER SOURCE

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## SECTION 1 : INTRODUCTION

The model 6600-NG is a high accuracy automated pressure controller, with three independent pressure outputs, specifically designed for controlling air data parameters such as altitude, airspeed, Mach and climb. The three independent outputs of Pt, Ps2 and Ps1 makes the 6600-NG ideal for testing aircraft with AOA/AOS probes. This instrument can also be used to control pressures in units of inHg, mbar, psi, mmHg and kpa. The 6600-NG is equipped with internal pressure and vacuum pumps. The Remote unit is used to interface with the Main unit. The small size of the Remote unit allows it to be used in the cockpit of an aircraft.

The 6600-NG has three high accuracy transducers that measure pressure in the range of 1 to 42 inHg absolute on the Ps1 and Ps2 outputs, and 0 to 30 inHg differential on the Pt output. These transducers are designed to accurately measure the pressure of dry air over an ambient temperature range of -40°C to 80°C. The high accuracy of the Ps1 and Ps2 transducers makes the 6600-NG fully RVSM compliant.

The 6600-NG allows the user to control altitude in feet or meters, climb in feet per minute or meters per second. Airspeed can be controlled in knots, mach, km/hr and mph. Airspeed-rate can be also be controlled in these units. The 6600-NG also allows the user to control EPR on the Pt output.

The model 6600-NG features programmable limits on altitude, airspeed, airspeed rate, mach number, climb rate and Differential pressure (between Ps2 and Ps1). These limits are checked during data entry and thereby prohibit entry of erroneous target values. These limits are also checked continuously during operation, and if any of these is exceeded, the unit automatically takes abortive action.

The user has the ability to program into the 6600-NG a profile of set-points to be controlled in a sequence. Once such a profile has been setup, the user can command the unit to move from one set-point to the next simply by using the Up-arrow key. Up to 50 points can be stored in one profile. The 6600-NG can store up to 10 such profiles in non-volatile memory at any one time.

Calibration of the unit is required only once a year. This process is the only scheduled maintenance function required on the 6600-NG.

The standard version of the model 6600-NG operates on AC power and comes with an RS232 interface. Options include an internal battery which lasts up to 8 hours, internal heaters which allow the unit to operate down to -40°C, and an altimeter-encoder interface.

The 6600-NG has built-in Wi-Fi capability which allows for wireless remote operation using an iPad.

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## SECTION 2 : CONTROLS & CONNECTIONS

### 2.1 MAIN UNIT, TOP PANEL

The model 6600-NG top panel provides easy access to all the connections. Please refer to Figure 2.1. (shown on next page)

#### [1] AC INPUT connector :

This is a 3-pin male circular connector. A power cord is provided with the 6600-NG. The circular connector end of the power cord needs to be connected here. The power requirement of the 6600-NG is 90-260 VAC, 47-440 Hz with a maximum power consumption of 100 VA (200 VA with heaters). The pin-out of this connector is provided in Appendix C

**Caution:** Connecting incorrect power to the 6600-NG will cause considerable damage

#### [2] AC Fuse :

A 5x20 mm fuse is located inside the fuse holder. This time-delay fuse, with a rating of 2.0 amps, 250 Volts, limits AC power to the unit.

#### [3] AC On/Off switch :

This toggle switch connects (or disconnects) AC power between the AC INPUT connector and the 6600-NG. Even when this switch is ON, the 6600-NG becomes fully operational only after the Power key located on the keypad of the Remote Unit is pressed for a minimum of 3 seconds.

When an integrated battery is included, the battery-charging circuits inside the 6600-NG become active when the AC On/Off switch is turned ON.

When internal heaters are included, the heater-control circuits inside the 6600-NG become active when the AC On/Off switch is turned ON.

#### [4] Battery Fuse :

This fuse is installed only if an integrated battery is included. A 5x20 mm fuse is located inside the fuse holder. This time-delay fuse, with a rating of 10 amps, 250 Volts, limits Battery power to the unit.



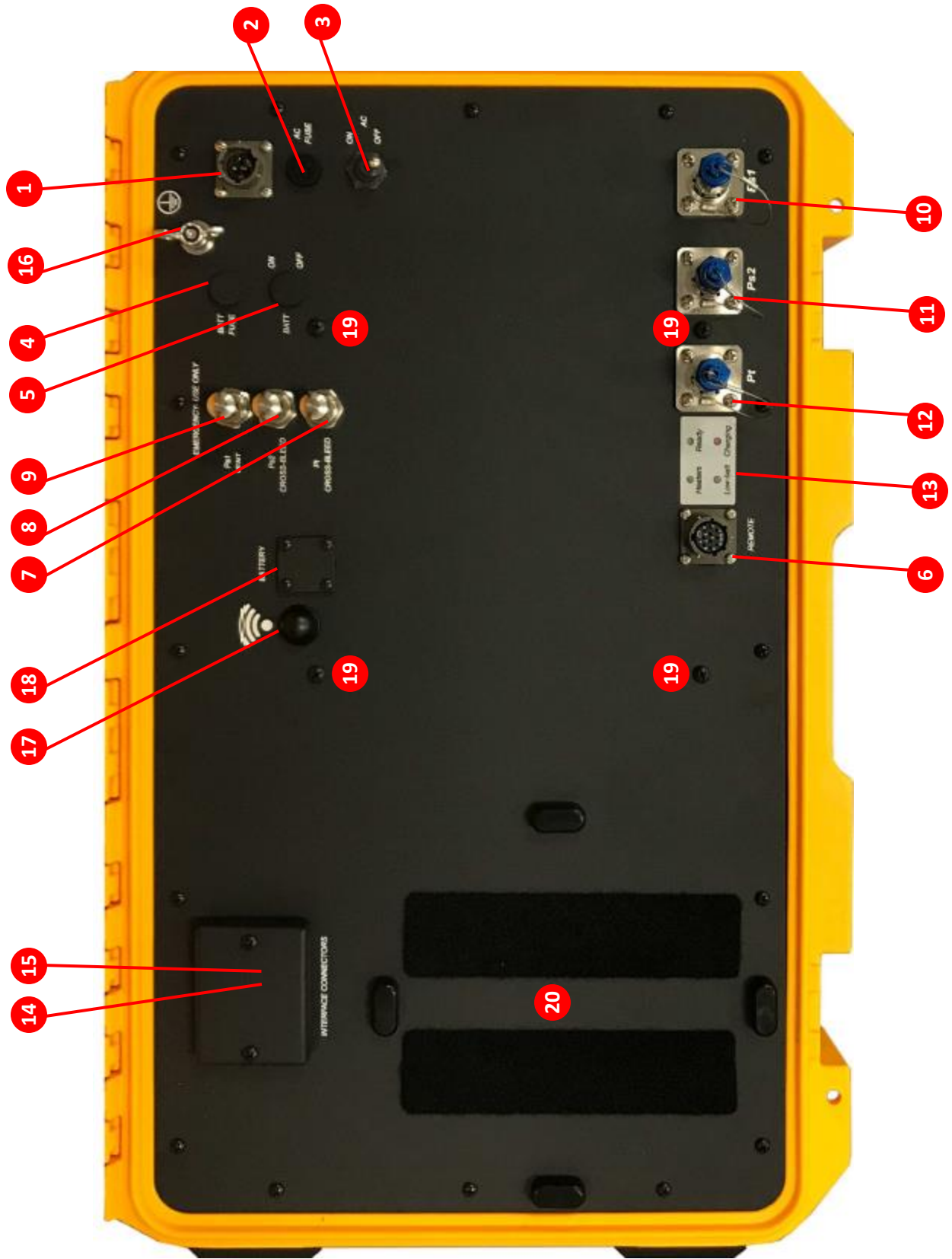


Figure 2.1 : 6600-NG Top Panel

**[5] Battery On/Off switch:**

This switch is installed only if an integrated battery is included. This switch connects (or disconnects) the battery from other circuits within the 6600-NG. If AC power is not available, turning this switch On allows the unit to operate on battery-power.

In situations where AC power may be intermittent, it is advisable to keep the Battery On/Off switch in the On position. This will allow the internal circuits to automatically switch to battery power when AC power is lost.

**Caution:** When the unit is not being used, the Battery On/Off switch must be in the Off position. Leaving this switch On will drain the battery since some internal circuits will be active when this switch is On.

**[6] Remote Unit connection:**

Using the 30-foot remote cable, connect the Remote unit to the Main unit through this 10-pin circular connector. It is recommended that this connection be made prior to applying power to the 6600-NG. If this cable is disconnected, the 6600-NG will stop operating.

**[7] Emergency Vent Valve, "Pt Cross-bleed" :**

In the event that the 6600-NG is in-operable due to a malfunction or due to loss of power, it is possible to vent the Pt system manually. This is done using the metering valve labeled "Pt Cross-bleed". This valve is a positive shut-off valve. Opening this valve slowly will equalize the pressure between the Pt and Ps1 systems (causing airspeed to be at zero).

Since opening this valve transfers pressure from the Pt system into the Ps1 system of the aircraft, while opening this valve, care must be taken to vent the Ps1 system simultaneously (if necessary), to prevent the altimeter in the aircraft from going below (minus) -1000 feet. Also, care must be taken not to exceed the maximum value of the Climb indicator in the aircraft.

Once airspeed is down to zero, this valve must be opened completely, to ensure that airspeed stays at zero while the Ps1 system is vented to ambient (using the "Ps1 Vent" valve).

**Caution:** This valve is for emergency use only and should not be used during normal operation. When emergency venting is completed, this valve should be closed immediately.

**Caution:** This valve should not be tightened *at all* past its stop. It seals before it hits the stop. Even finger-tight beyond the stop may damage the seat of the valve, causing it to leak constantly.

**[8] Emergency Vent Valve, "Ps2 Cross-bleed" :**

In the event that the 6600-NG is in-operable due to a malfunction or due to loss of power, it is possible to vent the Ps2 system manually. This is done using the metering valve labeled "Ps2 Cross-bleed". This valve is a positive shut-off valve. Opening this valve slowly will equalize the pressure between the Ps2 and Ps1 systems (causing the differential between Ps1 and Ps2 to be at zero).

Since opening this valve transfers pressure from the Ps2 system into the Ps1 system of the aircraft, while opening this valve, care must be taken to vent the Ps1 system simultaneously (if necessary), to prevent the altimeter in the aircraft from going below (minus) -1000 feet. Also, care must be taken not to exceed the maximum value of the Climb indicator in the aircraft.

Once Ps2 pressure is almost equal to Ps1 pressure, this valve must be opened completely, to ensure that the differential stays near zero while the Ps1 system is vented to ambient (using the "Ps1 Vent" valve).

**Caution:** This valve is for emergency use only and should not be used during normal operation. When emergency venting is completed, this valve should be closed immediately.

**Caution:** This valve should not be tightened *at all* past its stop. It seals before it hits the stop. Even finger-tight beyond the stop may damage the seat of the valve, causing it to leak constantly.

[9] Emergency Vent-Valve, "Ps1 Vent":

In the event that the 6600-NG is in-operable due to a malfunction or due to loss of power, it is possible to vent the Ps1 system manually. This is done using the metering valve labeled "Ps1 Vent". This valve is a positive shut-off valve. Opening this valve slowly will vent the Ps1 output of the 6600-NG to ambient pressure.

While venting, care must be taken not to exceed the maximum value of the Climb indicator in the aircraft. Also, before venting the Ps1 system to ambient, the "Pt Cross-bleed" and "Ps2 Cross-bleed" valves must be opened completely to ensure that airspeed is zero and there is no differential pressure on Ps2.

**Caution:** This valve is for emergency use only and should not be used during normal operation. When emergency venting is completed, this valve should be closed immediately.

**Caution:** This valve should not be tightened *at all* past its stop. It seals before it hits the stop. Even finger-tight beyond the stop may damage the seat of the valve, causing it to leak constantly.

[10] Ps1 port :

The Ps1 port of the tester is provided with a #4-AN fitting. This port must be connected through a hose to the Ps1 port of the aircraft. The hose must be connected after performing the Self Test on the 6600-NG. The hose, once connected, must not be disconnected while the aircraft Ps1 system is not at "Ground" level.

**Caution:** Do not connect the Ps1 hose to the Ps1 port before performing the Self Test.

**Caution:** Do not disconnect the Ps1 hose from the Ps1 port unless the aircraft Ps1 system is at "Ground" level and the tester has been turned Off.

[11] Ps2 port :

The Ps2 port of the tester is provided with a #4-AN fitting. This port must be connected through a hose to the Ps2 port of the aircraft. The hose must be connected after performing the Self Test on the 6600-NG. The hose, once connected, must not be disconnected while the aircraft Ps2 system is not at "Ground" level.

**Caution:** If the Ps2 port is not being used, it must be capped and Ps2 units must be in "Dfin" with the Ps2 Target value set to 0.0000 inHg (Dfin) .

**Caution:** Do not connect the Ps2 hose to the Ps2 port before performing the Self Test.

**Caution:** Do not disconnect the Ps2 hose from the Ps2 port unless the aircraft Ps2 system is at "Ground" level and the tester has been turned Off.

[12] Pt port :

The Pt port of the tester is provided with a #4-AN fitting. This port must be connected through a hose to the Pt port of the aircraft. The hose must be connected after performing the Self Test on the 6600-NG. The hose, once connected, must not be disconnected while the aircraft Pt system is not at "Ground" level.

**Caution:** Do not connect the Pt hose to the Pt port before performing the Self Test.

**Caution:** Do not disconnect the Pt hose from the Pt port unless the aircraft Pt system is at "Ground" level and the the tester has been turned Off.

[13] Indicator LED's :

**'Ready' LED:** This green LED provides several indications as described below.

- a. When the unit is ready for use, the LED is steadily On.
- b. When the Remote is not connected, the LED blinks two times every 2-seconds
- c. When the temperature is too low for operation (on units without heaters), the LED blinks once every 2-seconds.
- d. After the unit is ready for use, when the Power key on the Remote is pressed, the LED blinks rapidly while the Power key is held down. If the Power key is held down for more than 3 seconds, either a turn-On or Turn-Off condition is 'detected' and the LED blinks slowly for 5 more seconds, during which the user must release the Power key.

**'Heaters' LED:** On units equipped with internal heaters, this yellow LED will turn On while the heaters are On. The LED may stay On even after the Ready LED comes On.

**'Low-Batt' LED:** On units with an internal battery, this yellow LED will turn On when a low-battery condition is detected. After this LED turns On, the user will typically have 15 to 20 minutes before the unit automatically turns Off due to total discharge of the battery. The Remote unit also displays a low-battery condition as a warning message.

**'Charging' LED:** On units with an internal battery, this red LED will be On while the battery is being charged.

**[14] RS232 interface connector:**

This connector is accessed by opening the "Interface Connectors" access panel. The connector is a standard DB-9 female connector used for a serial RS232 interface. It can be connected directly to the "COM" port of a standard PC to allow communication. This port is normally used for downloading "profiles" from a computer. Other remote communication with the 6600-NG is also possible through this interface.

For more details on downloading profiles, please refer to Section 4. For more details on communication with the 6600-NG, please refer to Section 8. The pin-out of this connector is provided in Appendix C.

**[15] Encoder interface connector:**

This connector is accessed by opening the "Interface Connectors" access panel. If the Encoder option is included with the tester, this connector will interface to an altimeter encoder and enable the 10-bit Gray code to be displayed on the Remote unit. For more details, please refer to Section 3.10.9. The pin-out of this connector is provided in Appendix C.

**[16] Earth Ground stud**

**[17] Wi-Fi Antenna**

**[18] Battery connector:**

If a removable battery is provided with the unit, connect the battery here.

**Caution:** While connecting or disconnecting the integrated battery, make sure that the Battery On/Off switch is Off, the AC On/Off switch is Off and there is no AC power connected to the unit.

**[19] Battery mounting locations:**

If a removable battery is provided with the unit, the battery case is be mounted to the Top panel of the unit at these mounting points.

**[20] Remote Unit placement:**

During transportation, the Remote Unit is placed in this location.

## 2.2 REMOTE UNIT

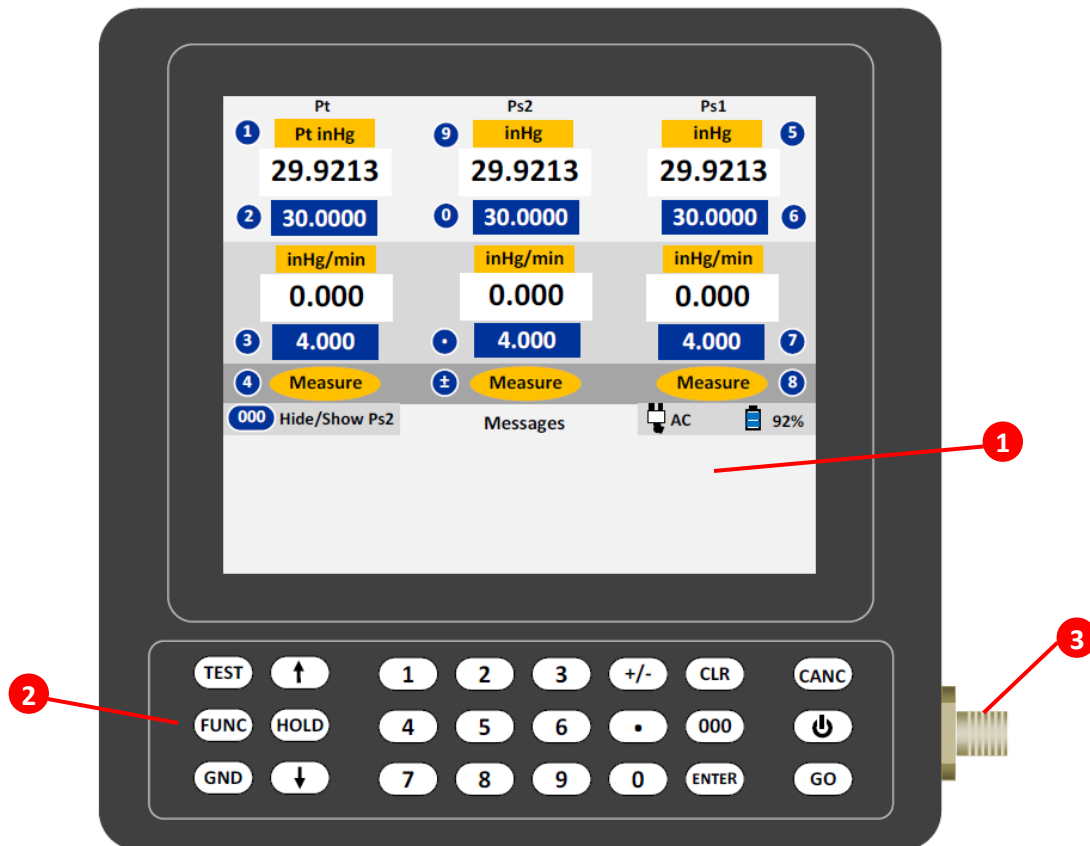


Figure 2.2 : Remote Unit

Please refer to Figure 2.2 which shows the front-view of the Remote unit.

### [1] LCD Display:

The Remote unit has a 5.8 inch Color TFT display with a resolution of 640 x 480 pixels. The backlight has a maximum brightness of 800 nits which makes the display sunlight-readable. The backlight brightness can be adjusted by the user through a function on the Remote. More details are provided in Section 3.10.3.

### [2] Keypad:

**Left section:** This section of the keypad includes the following keys:

**TEST** - Used to perform a Self-test

**FUNC** - Allows selection of several functions

**GND** - Performs the "Go To Ground" operation.

**HOLD** - Stops ramping to a set-point and holds outputs at current values.


**Up-Arrow** - Used to jog a target-value up or move to next profile-point.

**Down-Arrow** – Used to jog a target-value down or move to previous profile-point..

Further details are provided in Section 3.

**Center section:** This section of the keypad is used for numeric entry. To enter a negative value, enter the value and then press the '+/-' key. Use the '000' key to enter three consecutive zeroes, which is especially useful when entering numbers in thousands.

**Right section:** This section has the 'GO' and 'CANC' keys which are used to either execute or exit/cancel a command. The **CANC** key is also used to acknowledge messages.

The Power key, indicated by the  symbol, is used to either turn-On or turn-Off the 6600-NG. When the Remote unit is Off and the Ready LED is On, pressing the Power key for 2 to 3 seconds will turn-On the 6600-NG. The display takes another 2 seconds to come on. The Power key may be held down until the display turns On (a total of about 4 seconds), but must be released within 2 to 3 seconds after the display turns On (to avoid going into the Power-Off cycle).

When the Remote unit is On, pressing the Power key for 3 seconds will turn the 6600-NG and the Remote unit Off. After the unit turns Off, the Power key must be released within 2 to 3 seconds, to avoid going into the Power-On cycle.

### [3] Connector:

This circular connector is used to connect the Remote unit to the Main unit through the Remote cable. The Remote unit must not be disconnected from the Main unit while the unit is operating. This will cause the unit to turn Off.

### [4] Tilt-stand:

On the rear of the Remote unit, a tilt-stand has been provided which allows the Remote to be tilted to a convenient viewing angle.

---

## SECTION 3 : OPERATING THE 6600-NG

This section provides all the details required to operate the 6600-NG. It is highly recommended that the user read through this section before operating the 6600-NG. After understanding these details, the user should refer to the 'Typical Use' chart shown in Figure 5.1, which outlines a step-by-step process of using the 6600-NG with an aircraft.

### 3.1 START-UP

- Open the Pt, Ps2 and Ps1 ports to ambient by removing the blue caps.
- Connect the Remote unit to the Main unit using the Remote cable.
- Connect AC power to the Main unit using the power cable.
- Turn On the AC On/Off switch on the Top Panel of the Main unit.
- Wait for the Ready LED to turn On.
- Press the Power key on the Remote for about 4 seconds until the display turns On.
- Release the Power key. After the sign-on screen, the display will appear similar to that shown in Figure 3.1 (next page).

**Note: The pumps will be Off. The pumps turn On only if one of the outputs is in either Control or Leak mode. The pumps also turn On during Self-Test.**

- Perform a Self-Test by pressing the **TEST** key. The message 'Open all 3 ports to ambient, then press **GO**. Press **CANC** to exit' will be displayed in the Lower section of the display. Make sure all 3 ports are open to ambient, then press **GO**.
- The Self-Test takes about 2 minutes. Status updates are shown in the lower section of the display. When it is completed, the message 'Self-Test successful. Press **CANC** to exit' will appear on the last line. Press **CANC**.

The following sub-section provides details of the parameters shown on the main operating screen and how to modify these parameters.

Later sub-sections provide details on how to perform various other functions of the 6600-NG



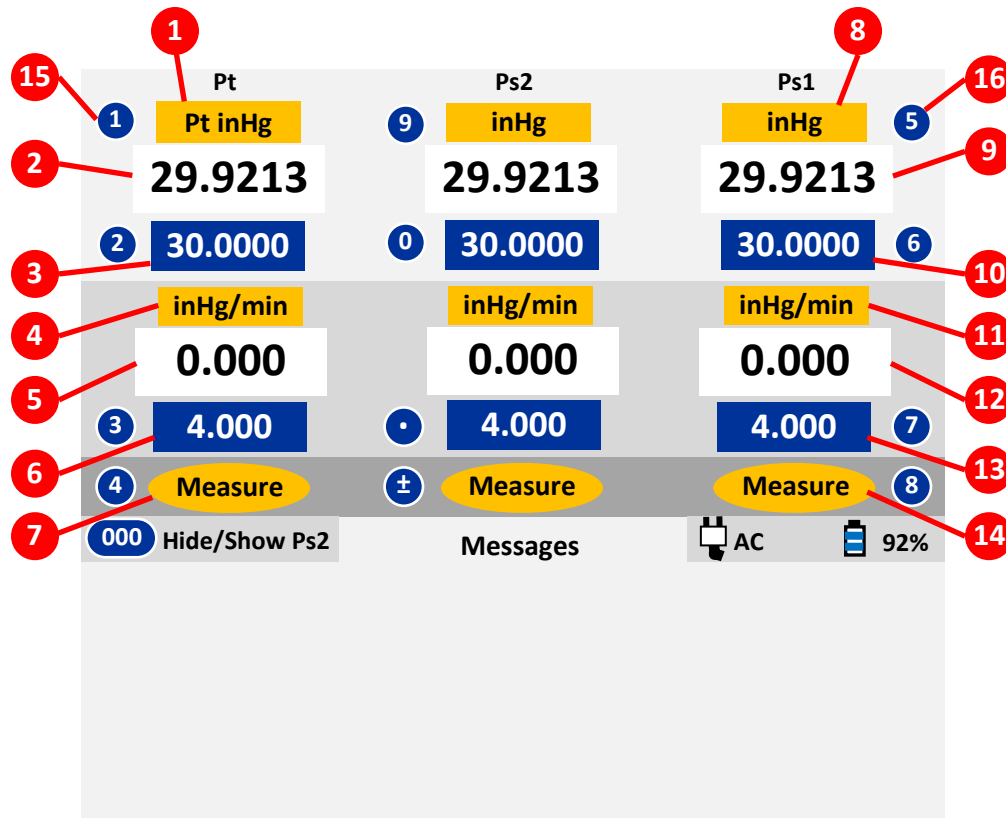


Figure 3.1 : Main operating screen (partial details)

### 3.2 MAIN OPERATING SCREEN

Please refer to Figure 3.1. There are 16 different items (indicated in red) shown on this screen. Numbers 1 to 7 on the left side, refer to the Pt-output parameters. Numbers 8 to 14 on the right side, refer to the Ps1-output parameters. Numbers 15 and 16 point to a typical symbol indicating a key number (as shown, key # 1 and key # 5). Details of each item follow.

#### [1] Pt units

The selected Pt units are displayed here. There are 15 different Pt units available.

- |          |            |             |            |
|----------|------------|-------------|------------|
| 1. knots | 5. Pt inHg | 9. Pt psi   | 13. Pt kpa |
| 2. Mach  | 6. Qc inHg | 10. Qc psi  | 14. Qc kpa |
| 3. km/hr | 7. Pt mbar | 11. Pt mmHg | 15. EPR    |
| 4. mph   | 8. Qc mbar | 12. Qc mmHg |            |

Note: Qc units display differential pressure with respect to Ps1 pressure. Pt units display absolute Pt pressure.

Selecting the desired Pt units is described in Section 3.3.

[2] Pt Actual value

The Actual value (actual pressure converted to selected units) being measured or controlled at the Pt output is displayed here in the selected Pt units. The displayed resolution of this value depends on the selected units and is shown in the table below. This Actual value is updated every 250 msec.

Pt units	Displayed Resolution
knots	0.1
Mach	0.001
km/hr	0.1
mph	0.1
Pt inHg	0.0001
Qc inHg	0.0001
Pt mbar	0.01
Qc mbar	0.01
Pt psi	0.001
Qc psi	0.001
Pt mmHg	0.01
Qc mmHg	0.01
Pt kpa	0.001
Qc kpa	0.001
EPR	0.001

**Important Note:** When Pt units are knots, km/hr or mph, and both ports are open to ambient, the Actual airspeed value could be as high as +/-8 knots (instead of the expected 0 knots). This is still within the specified accuracy of +/-0.003 inHg. Also, this does *not* mean that airspeed indications will be off by +/-8 knots over the entire range of the airspeed indicator. Because of the extreme sensitivity of airspeed to pressure at very low airspeeds, an error of 8 knots at ambient will translate to an error of only 1.5 knots at 20 knots and only 0.6 knots at 50 knots. The error will decrease further as knots increases.

[3] Pt Target value

The target value that the user desires to achieve on the Pt output is displayed here. When the Pt output is in Control mode, the 6600-NG will automatically adjust the Pt Actual value to match the Pt Target value. The resolution of the Pt target value is the same as the resolution of the Pt Actual value.

How the user can change the Pt Target value is described in Section 3.4.

#### [4] Pt-Rate units

The Pt-Rate units are typically the Pt units per minute. If Pt units are knots then the rate units are knots/min. However, there are three exceptions as shown in the table below. Pt-Rate units cannot be changed by the user.

Exceptions	
Pt units	Pt-Rate units
Mach	knots/min
km/hr	km/hr/sec
EPR	inHg/min

#### [5] Pt-Rate Actual value

The Actual rate of change of pressure at the Pt output, converted to current Pt-Rate units, is displayed here. The displayed resolution depends on the Pt-Rate units as shown in the table below. The Actual Rate value is updated every 250 msec.

Pt-Rate Units	Displayed Resolution
knots/min	0.1
km/hr/sec	0.01
mph/min	0.1
inHg/min	0.001
mbar/min	0.01
psi/min	0.001
mmHg/min	0.01
kpa/min	0.001

#### [6] Pt-Rate Target value

The rate at which the Pt Target value ramps from one target to the next target, is determined by the Pt-Rate Target value. That is, if the Pt-Rate target is set to 150 knots/min, and the airspeed (Pt) target is changed from 25 knots to 100 knots, the 6600-NG will ramp the airspeed at a rate of 150 knots/min, taking roughly 30 seconds to move from 25 knots to 100 knots.

Note: On most aircraft, there is no indicator which displays this Pt-rate.

The Pt-Rate target value has the same resolution as the Pt-Rate Actual value. How to set the Pt-Rate Target is described in Section 3.5.

### [7] Pt Mode

The Pt output can be in one of three modes: Measure, Leak or Control. The unit always powers-up in Measure mode. The user must change to Control mode to move to a specific target. The user changes to Leak mode (from Control mode) when performing a Leak check. After the Leak check is completed, the unit automatically goes back into Control mode. So, during the entire operation of the tester, the user should only stay between Control and Leak modes. The user should typically never have to go into Measure mode.

How to change modes is described in Section 3.6 .

### [8] Ps1 units

The selected Ps1 units are displayed here. There are 7 different Ps1 units available.

- |           |         |         |        |
|-----------|---------|---------|--------|
| 1. Feet   | 3. inHg | 5. psi  | 7. kpa |
| 2. Meters | 4. mbar | 6. mmHg |        |

Selecting the desired Ps1 units is described in Section 3.3.

### [9] Ps1 Actual value

The Actual value (actual pressure converted to selected units) being measured or controlled at the Ps1 output is displayed here in the selected Ps1 units. The displayed resolution of this value depends on the selected units and is shown in the table below. This Actual value is updated every 250 msec.

Ps1 units	Displayed Resolution
Feet	1
Meters	0.1
inHg	0.0001
mbar	0.01
psi	0.001
mmHg	0.01
kpa	0.001

### [10] Ps1 Target value

The target value that the user desires to achieve on the Ps1 output is displayed here. When the Ps1 output is in Control mode, the 6600-NG will automatically adjust the Ps1 Actual value to match the Ps1 Target value. The resolution of the Ps1 target value is the same as the resolution of the Ps1 Actual value.

How the user can change the Ps1 Target value is described in Section 3.4.

[11] Ps1-Rate units

The Ps1-Rate units are typically the Ps1 units per minute. If Ps1 units are Feet then the rate units are Feet/min. However, there is one exception as shown in the table below. Ps1-Rate units cannot be changed by the user.

Exception	
Ps1 units	Ps1-Rate units
Meters	Meters/sec

[12] Ps1-Rate Actual value

The Actual rate of change of pressure at the Ps1 output, converted to current Ps1-Rate units, is displayed here. The displayed resolution depends on the Ps1-Rate units as shown in the table below. The Actual Rate value is updated every 250 msec.

Ps1-Rate Units	Displayed Resolution
Feet/ min	1
Meters/sec	0.01
inHg/min	0.001
mbar/min	0.01
psi/min	0.001
mmHg/min	0.01
kpa/min	0.001

[13] Ps1-Rate Target value

The rate at which the Ps1 Target value ramps from one target to the next target, is determined by the Ps1-Rate Target value. When units are Feet or Meters, this rate is the Climb-rate or Vertical Speed.

The Ps1-Rate target value has the same resolution as the Ps1-Rate Actual value. How to set the Ps1-Rate Target is described in Section 3.5.

**[14] Ps1 Mode**

The Ps1 output can be in one of three modes: Measure, Leak or Control. The unit always powers-up in Measure mode. The user must change to Control mode to move to a specific target. The user changes to Leak mode (from Control mode) when performing a Leak check. After the Leak check is completed, the unit automatically goes back into Control mode. So, during the entire operation of the tester, the user should only stay between Control and Leak modes. The user should typically never have to go into Measure mode.

How to change modes is described in Section 3.6.

**[15] Key # symbols for changing Pt parameters**

The key number symbols (within circles) 1, 2, 3 and 4 indicate the key # on the keypad that needs to be pressed to modify the Pt parameter adjacent to symbol, as detailed in the table below.

Key #	Parameter
1	Pt units
2	Pt Target value
3	Pt Rate Target value
4	Pt Mode

Note: Parameters can be changed only when a key-number symbol appears next to it. Under some conditions, parameters cannot be changed and therefore, the key-number symbol will be removed from the display.

**[16] Key # symbols for changing Ps1 parameters**

The key number symbols (within circles) 5, 6, 7 and 8 indicate the key # on the keypad that needs to be pressed to modify the Ps1 parameter adjacent to symbol, as detailed in the table below.

Key #	Parameter
5	Ps1 units
6	Ps1 Target value
7	Ps1 Rate Target value
8	Ps1 Mode

Note: Parameters can be changed only when a key-number symbol appears next to it. Under some conditions, parameters cannot be changed and therefore, the key-number symbol will be removed from the display.

There are additional parameters displayed on Main Operating screen, as shown in Fig. 3.2 below. These are described in detail below.

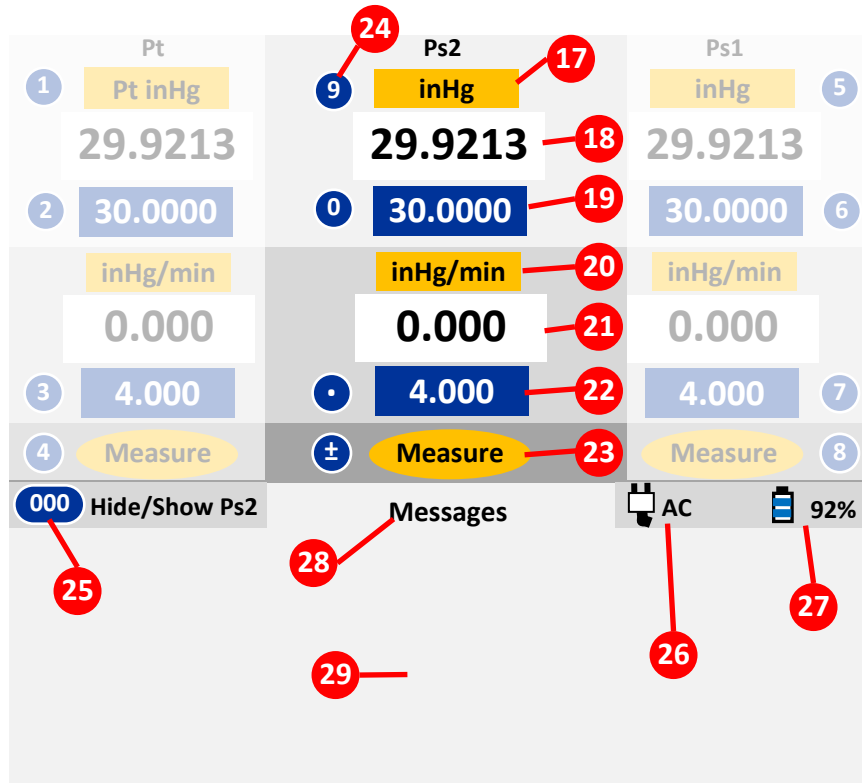


Figure 3.2 : Main operating screen (remaining details)

#### [17] Ps2 units

The selected Ps2 units are displayed here. There are 14 different Pt units available.

- |               |               |               |           |
|---------------|---------------|---------------|-----------|
| 1. inHg       | 5. psi        | 9. kpa        | 13. knots |
| 2. Diff. inHg | 6. Diff. psi  | 10. Diff. kpa | 14. km/hr |
| 3. mbar       | 7. mmHg       | 11. Feet      |           |
| 4. Diff. mbar | 8. Diff. mmHg | 12. Meters    |           |

Note: Diff. units (including knots and km/hr) display differential pressure with respect to Ps1 pressure. Remaining units display absolute Ps2 pressure.

Selecting the desired Ps2 units is described in Section 3.xx.

#### [18] Ps2 Actual value

The Actual value (actual pressure converted to selected units) being measured or controlled at the Ps2 output is displayed here in the selected Ps2 units. The displayed resolution of this value depends on the selected units and is shown in the table below. This Actual value is updated every 250 msec.

Ps2 units	Displayed Resolution
inHg	0.0001
Diff. inHg	0.0001
mbar	0.01
Diff. mbar	0.01
psi	0.001
Diff. psi	0.001
mmHg	0.01
Diff. mmHg	0.01
kpa	0.001
Diff. kpa	0.001
Feet	1
Meters	0.1
knots	0.1
km/hr	0.1

[19] **Ps2 Target value**

The target value that the user desires to achieve on the Ps2 output is displayed here. When the Ps2 output is in Control mode, the 6600-NG will automatically adjust the Ps2 Actual value to match the Ps2 Target value. The resolution of the Ps2 target value is the same as the resolution of the Ps2 Actual value.

How the user can change the Ps2 Target value is described in Section 3.xx.

[20] **Ps2-Rate units**

The Ps2-Rate units are typically the Ps2 units per minute. If Ps2 units are inHg then the rate units are inHg/min. However, there are two exceptions as shown in the table below. Ps2-Rate units cannot be changed by the user.

Exceptions	
Ps2 units	Ps2-Rate units
Meters	meters/sec
km/hr	km/hr/sec

[21] **Ps2-Rate Actual value**



The Actual rate of change of pressure at the Ps2 output, converted to current Ps2-Rate units, is displayed here. The displayed resolution depends on the Ps2-Rate units as shown in the table below. The Actual Rate value is updated every 250 msec.

Ps2-Rate Units	Displayed Resolution
inHg/min	0.001
mbar /min	0.01
psi/min	0.001
mmHg/min	0.01
kpa/min	0.001
Feet/min	1
Meters/sec	0.01
km/hr/sec	0.01

#### [22] Ps2-Rate Target value

The rate at which the Ps2 Target value ramps from one target to the next target, is determined by the Ps2-Rate Target value. That is, if the Ps2-Rate target is set to 4.000 inHg/min, and the Ps2 target is changed from 29.0 inHg to 30.0 inHg, the 6600-NG will ramp the Ps2 output at a rate of 4.0 inHg/min, taking roughly 15 seconds to move from 29 inHg to 30 inHg.

Note: On most aircraft, there is no indicator which displays this Ps2-rate.

The Ps2-Rate target value has the same resolution as the Ps2-Rate Actual value. How to set the Ps2-Rate Target is described in Section 3.xx.

#### [23] Ps2 Mode

The Ps2 output can be in one of three modes: Measure, Leak or Control. The unit always powers-up in Measure mode. The user must change to Control mode to move to a specific target. The user changes to Leak mode (from Control mode) when performing a Leak check. After the Leak check is completed, the unit automatically goes back into Control mode. So, during the entire operation of the tester, the user should only stay between Control and Leak modes. The user should typically never have to go into Measure mode.

How to change modes is described in Section 3.xx .

#### [24] Key # symbols for changing Ps2 parameters

The key number symbols (within circles) 9, 0, period and +/- indicate the key on the keypad that needs to be pressed to modify the Ps2 parameter adjacent to symbol, as detailed in the table below.

Key #	Parameter
9	Ps2 units
0	Ps2 Target value
period	Ps2 Rate Target value
+/-	Ps2 Mode

Note: Parameters can be changed only when a key-number symbol appears next to it. Under some conditions, parameters cannot be changed and therefore, the key-number symbol will be removed from the display.

**[25]    '000' key for Hide/ Show Ps2**

The '000' key can be pressed to either hide or show the Ps2 parameters (displayed in the center section of the display).

**Caution:**    When the Ps2 parameters are hidden, the unit automatically converts the Ps2 output to Diff. inHg and sets the Ps2 target to 0.0 Diff inHg.

**Caution:**    If the Ps2 output is connected to the aircraft, the Ps2 parameters must NOT be hidden.

**[26]    AC Power status**

When AC power is connected to the 6600-NG, the icon which shows the power plug (with 'AC' shown to the right of the icon), is displayed here.

When AC power is disconnected from the unit, this icon and 'AC' are not displayed.

**[27]    Battery status**

If the integrated battery is connected to the unit and the Battery On/Off switch is On, the battery icon is displayed here, along with the percentage charge remaining in the battery. When the battery charge goes below 10%, the percentage charge value turns red and starts blinking, until AC power is connected to the unit.

When the battery percentage charge reduces below 10%, a warning message is displayed (every few minutes) in the 'Message' section of the screen. This message needs to be acknowledged by the user before continuing to operate the unit.

**[28]    Title of Lower section of the display**

The title of the lower section of the display changes based on the information being displayed in the lower section.

**[29]    'Messages' section**

This section of the display, the 'Lower' section, is used extensively while performing various functions like changing units, changing modes, changing target values, displaying leak rates etc. The following sub-sections will provide additional details.

This section is also used to display error messages and warnings. Error messages are usually displayed on the last line of the display.

**Note:** In the sections below, any displayed parameter that is blinking will be activated only after the **GO** key is pressed. This allows multiple parameters to be changed and activated at the same instant when **GO** is pressed. To revert to the original parameter, press **CANC**.

### 3.3 CHANGING UNITS

**Note:** Selected units are maintained through a power OFF/ON cycle.

#### Pt units

Pt units can be changed only if the key# symbol (1) is displayed to the left of the Pt units field. Press key '1' on the keypad and the Lower section of the display will appear as shown below.

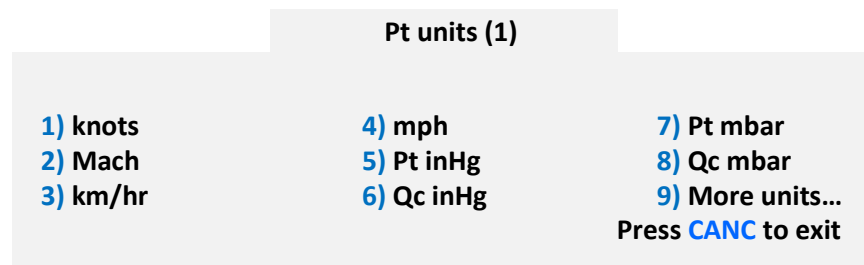


Figure 3.3 : Select Pt units (1)

The first 8 units are shown on this screen. Press the key with the number (shown in blue) associated with the unit to be selected. For selecting units 9 through 15, first press '9' and the Lower section of the display will appear as shown in Figure 3.4 below. Then select the unit desired by pressing the key with the # associated with the unit. To exit from this screen without making a selection, press **CANC**.

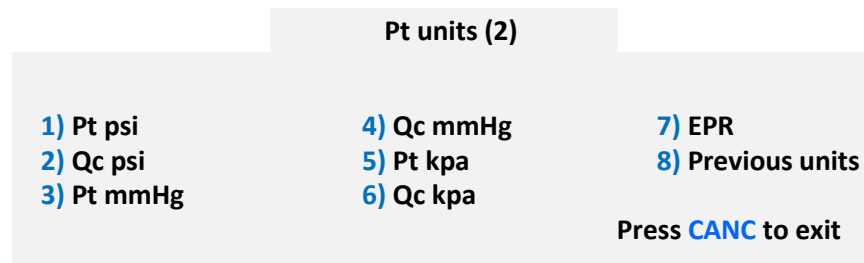


Figure 3.4 : Select Pt units (2)

For example, if units of QcinHg is to be selected, in the 'Pt units (1)' screen, press '6'. The Lower section will blank out and the Upper section will appear as shown in Figure 3.5 below.

The fields for Pt units, Pt target and Pt-Rate target will be blinking. The Actual and Target values will be based on the selected unit. To activate units of QcinHg, press **GO**. To revert back to the original units, press **CANC**.

If Target values (or any other Pt, Ps1 or Ps2 parameters) need to be changed, they can be changed before pressing **GO**. When **GO** is pressed, the blinking stops and units of QcinHg becomes activated.

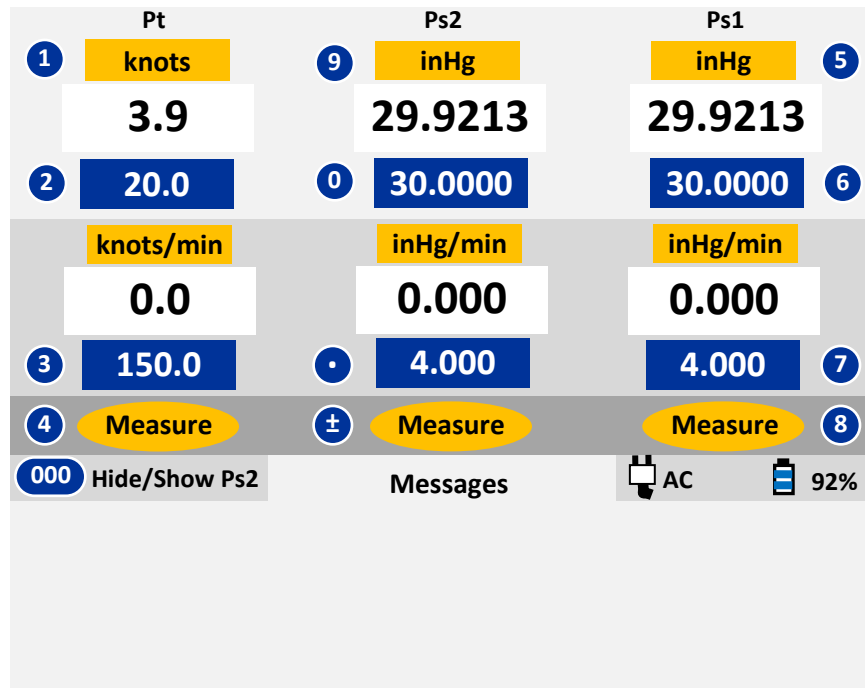


Figure 3.5 : Select knots

### Ps1 units

Ps1 units can be changed only if the key# symbol (5) is displayed to the right of the Ps1 units field. Press key '5' on the keypad and the Lower section of the display will appear as shown in Figure 3.6 below.

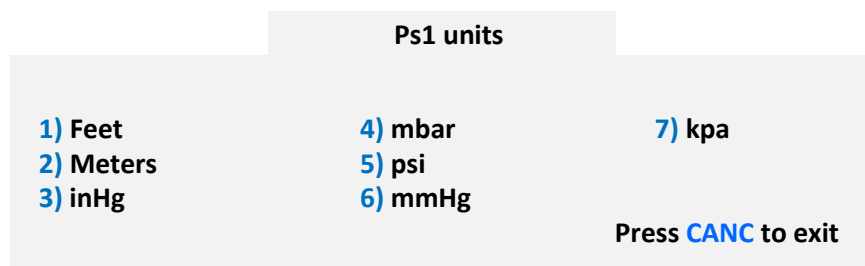


Figure 3.6 : Select Ps1 units

The seven Ps1 units are shown on this screen. Press the key with the # (shown in blue) associated with the unit to be selected. For example, if units of inHg is to be selected, in the 'Ps1 units' screen, press '3'. The Lower section will blank out and the Upper section will appear as shown in Figure 3.7 below.

The fields for Ps1 units, Ps1 target and Ps1-Rate target will be blinking. The Actual and Target values will be based on the selected unit. To activate units of inHg, press **GO**. To revert back to the original units, press **CANC**.

If Target values (or any other Pt, Ps1 or Ps2 parameters) need to be changed, they can be changed before pressing **GO**. When **GO** is pressed, the blinking stops and units of inHg becomes activated.

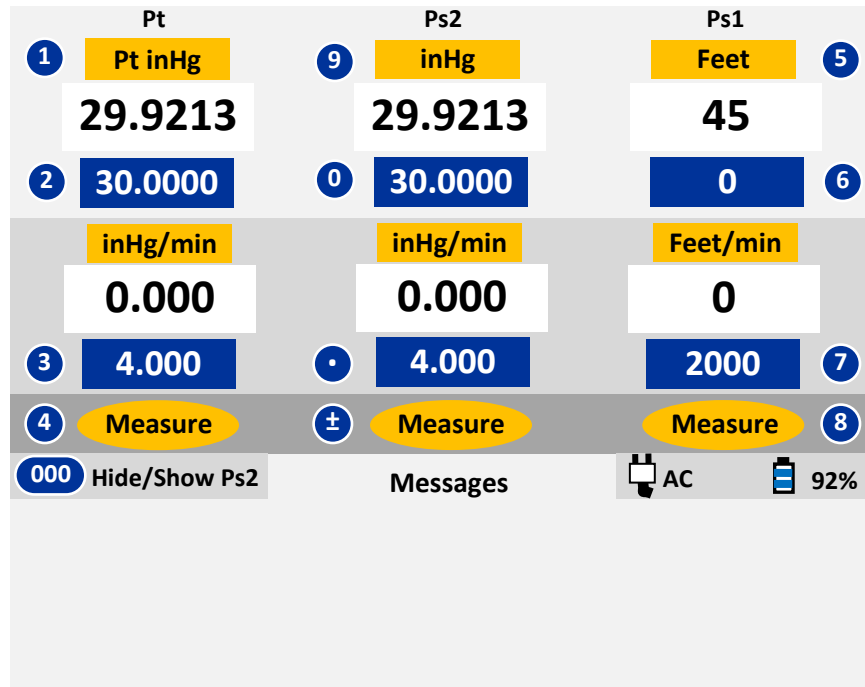


Figure 3.7 : Select Feet

### Ps2 units

Ps2 units can be changed only if the key# symbol (9) is displayed to the left of the Ps2 units field. Press key '9' on the keypad and the Lower section of the display will appear as shown in Figure 3.8 below.

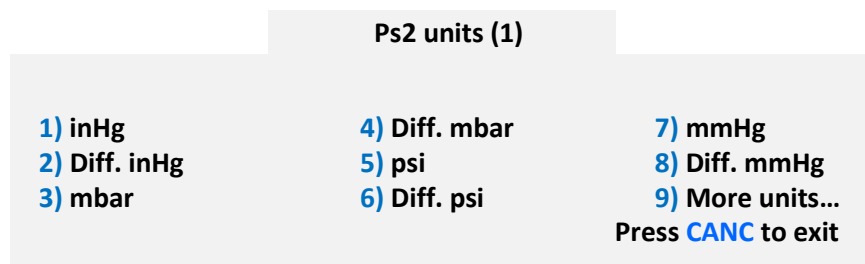


Figure 3.8 : Select Ps2 Units (1)

The first 8 units are shown on this screen. Press the key with the number (shown in blue) associated with the unit to be selected. For selecting units 9 through 14, first press '9' and the Lower section of the display

will appear as shown in Figure 3.9 below. Then select the unit desired by pressing the key with the # associated with the unit. To exit from this screen without making a selection, press **CANC**.

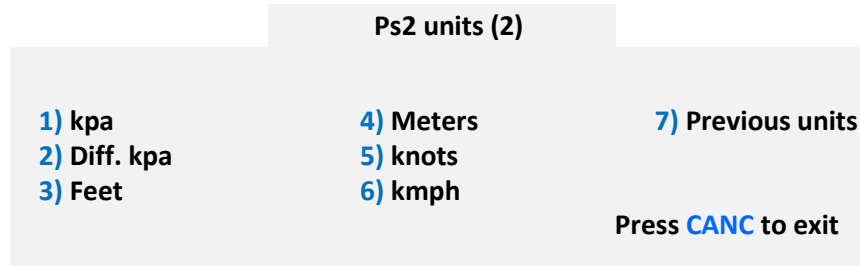


Figure 3.9 : Select Ps2 Units (2)

For example, if units of 'Diff. inHg' is to be selected, in the 'Ps2 units (1)' screen, press '2'. The Lower section will blank out and the Upper section will appear as shown in Figure 3.10 below.

The fields for Ps2 units, Ps2 target and Ps2-Rate target will be blinking. The Actual and Target values will be based on the selected unit. To activate units of 'Diff. inHg' (Dfin), press **GO**. To revert back to the original units, press **CANC**.

If Target values (or any other Pt, Ps1 or Ps2 parameters) need to be changed, they can be changed before pressing **GO**. When **GO** is pressed, the blinking stops and units of 'Dfin' becomes activated.

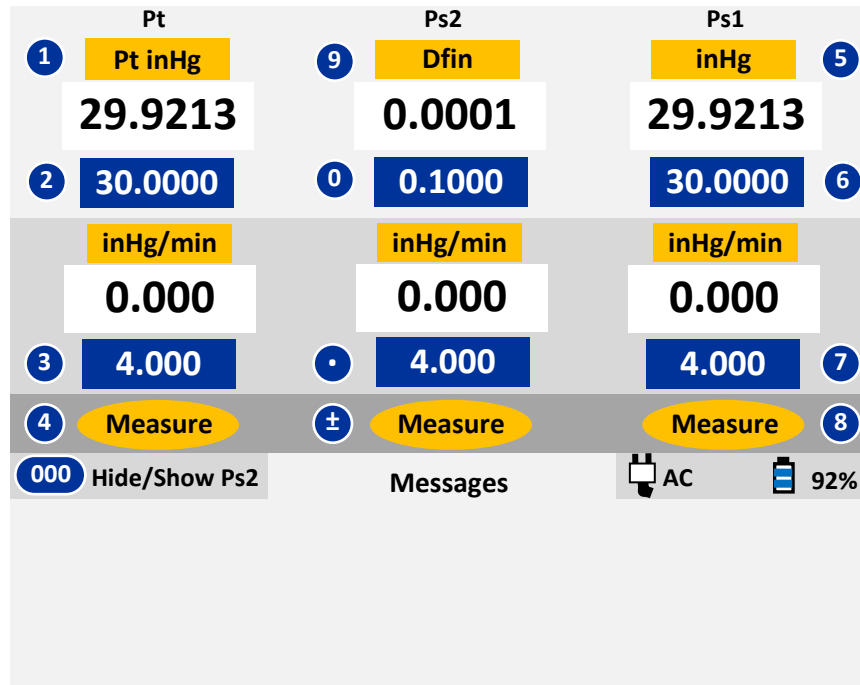


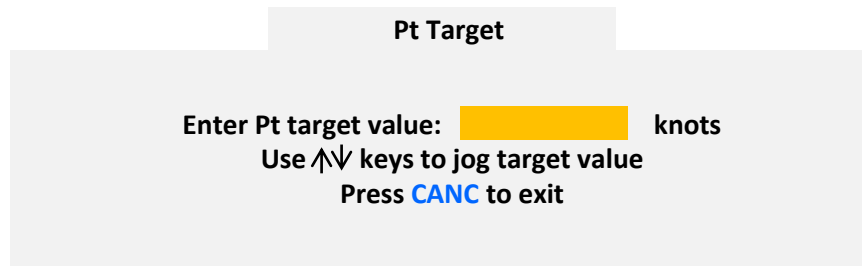
Figure 3.10 : Select Dfin

### 3.4 CHANGING TARGET VALUES

**Note:** Target values are maintained through a power OFF/ON cycle.

#### Pt Target value

The Pt Target value can be changed only if the key# symbol (2) is displayed to the left of the Pt Target value field. Press key '2' on the keypad and the Lower section of the display will appear as shown in Figure 3.11 below.



**Figure 3.11 : Pt Target value**

Use the keypad to enter the desired value in the field shown. To clear an entry, press **CLR**. To accept the entry, press **ENTER**. To exit this screen without changing the Target value, press **CANCEL**. If the number of digits entered (either before or after the decimal) exceeds the maximum allowed for the current units, a long beep will be heard.

If the entered value exceeds the programmed limits, the following message will appear.

Pt target exceeds limit. Press **CLR**

If the Target value needs to be changed in small increments, instead of entering a value, the arrow keys may be used to Jog the Target value up or down. If the current Pt Target value is 20.0 knots, and the Lower screen appears as in Figure 3.11 above, pressing the **Up-Arrow** key will make the screen appear as shown in Figure 3.12 below.

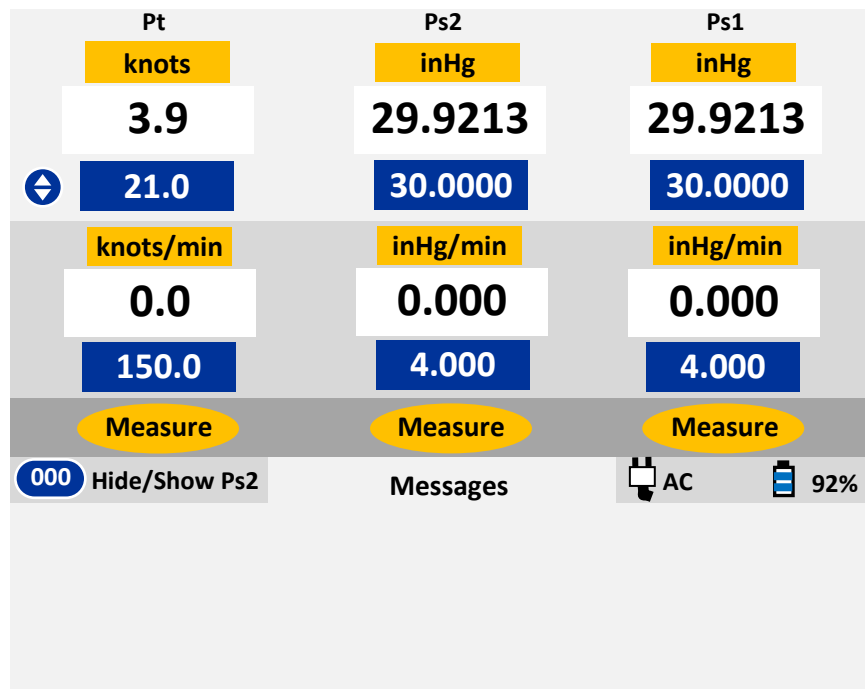


Figure 3.12 : Jog the Pt Target value

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the left of the Pt Target value field. This indicates that the Pt Target value can be jogged up or down repeatedly, in steps of 1 knot, using the Arrow keys, until **CANC** is pressed. In this case, since the **Up-Arrow** key was pressed, the Pt Target value was incremented to 21.0 knots. Press **Up-Arrow** one more time and the value will change to 22.0. Press **Down-Arrow** two times and the value decrements to 20.0.

**Note:** It is not possible to Jog a Target value if it is blinking.

The incremental value for the Jog feature varies depending on Pt units and is shown in the table below.

Pt units	Jog increment
knots	1.0
Mach	0.001
km/hr	1.0
mph	1.0
Pt inHg	0.001
Qc inHg	0.001
Pt mbar	0.01
Qc mbar	0.01
Pt psi	0.001
Qc psi	0.001
Pt mmHg	0.01
Qc mmHg	0.01



Pt kpa	0.001
Qc kpa	0.001
EPR	0.001

### Ps1 Target value

The Ps1 Target value can be changed only if the key# symbol (6) is displayed to the right of the Ps1 Target value field. Press key '6' on the keypad and the Lower section of the display will appear as shown in Figure 3.13 below.

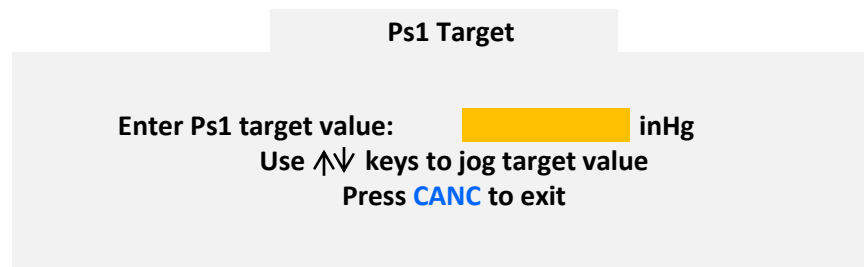


Figure 3.13 : Ps1 Target value

Use the keypad to enter the desired value in the field shown. To clear an entry, press **CLR**. To accept the entry, press **ENTER**. To exit this screen without changing the Target value, press **CANCEL**. If the number of digits entered (either before or after the decimal) exceeds the maximum allowed for the current units, a long beep will be heard.

If the entered value exceeds the programmed limits, the following message will appear.

Ps1 target exceeds limit. Press **CLR**

If the Target value needs to be changed in small increments, instead of entering a value, the arrow keys may be used to Jog the Target value up or down. If the current Ps1 Target value is 0 Feet, and the Lower screen appears as in Figure 3.13 above, pressing the **Up-Arrow** key will make the screen appear as shown in Figure 3.14 below.

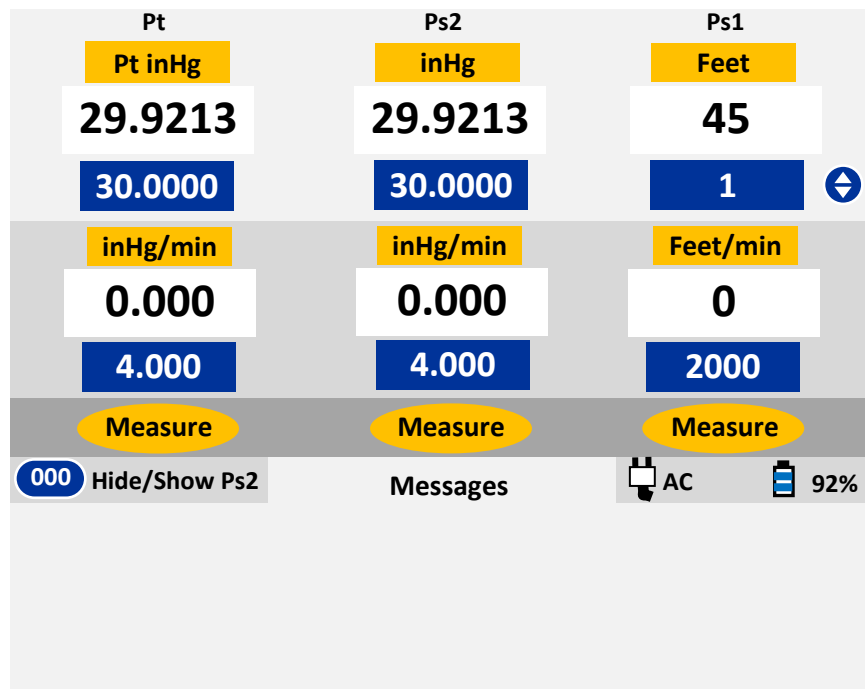


Figure 3.14 : Jog the Ps1 Target value

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the right of the Ps1 Target value field. This indicates that the Ps1 Target value can be jogged up or down repeatedly, in steps of 1 foot, using the Arrow keys, until **CANC** is pressed. In this case, since the **Up-Arrow** key was pressed, the Ps1 Target value was incremented to 1 foot. Press **Up-Arrow** one more time and the value will change to 2. Press **Down-Arrow** two times and the value decrements to 0.

**Note: It is not possible to Jog a Target value if it is blinking.**

The incremental value for the Jog feature varies depending on Ps1 units and is shown in the table below.

Ps1 units	Jog increment
Feet	1
Meters	1.0
inHg	0.001
mbar	0.01
psi	0.001
mmHg	0.01
kpa	0.001

### Ps2 Target value

The Ps1 Target value can be changed only if the key# symbol (6) is displayed to the right of the Ps1 Target value field. Press key '6' on the keypad and the Lower section of the display will appear as shown in Figure 3.15 below.

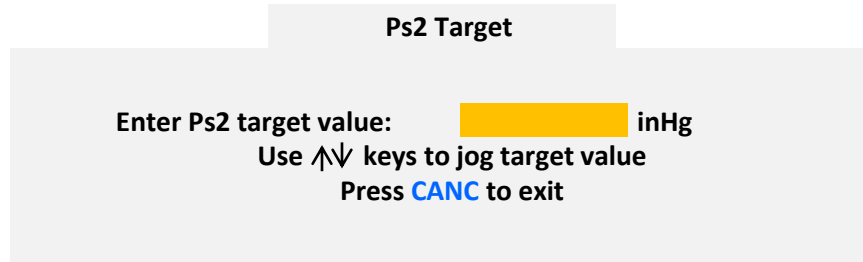


Figure 3.15 : Ps2 Target value

Use the keypad to enter the desired value in the field shown. To clear an entry, press **CLR**. To accept the entry, press **ENTER**. To exit this screen without changing the Target value, press **CANCEL**. If the number of digits entered (either before or after the decimal) exceeds the maximum allowed for the current units, a long beep will be heard.

If the entered value exceeds the programmed limits, the following message will appear.

Ps2 target exceeds limit. Press **CLR**

If the Target value needs to be changed in small increments, instead of entering a value, the arrow keys may be used to Jog the Target value up or down. If the current Ps2 Target value is 0.1000 Dfin, and the Lower screen appears as in Figure 3.15 above, pressing the **Up-Arrow** key will make the screen appear as shown in Figure 3.16 below.

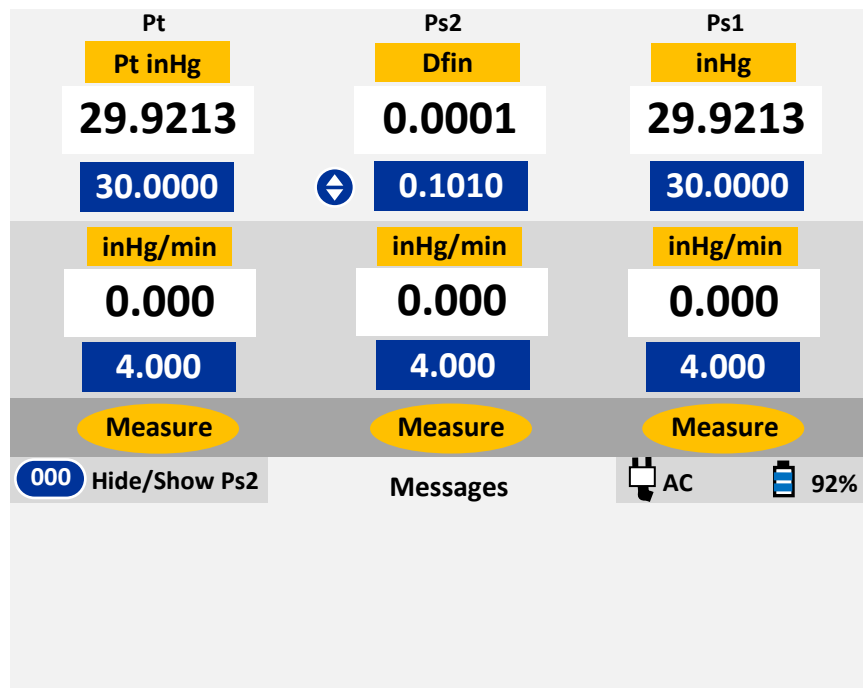


Figure 3.16 : Jog the Ps2 Target value

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the left of the Ps2 Target value field. This indicates that the Ps2 Target value can be jogged up or down repeatedly, in steps of 0.0010 Dfin, using the Arrow keys, until **CANC** is pressed. In this case, since the **Up-Arrow** key was pressed, the Ps2 Target value was incremented to 0.1010 Dfin from 0.1000 Dfin. Press **Up-Arrow** one more time and the value will change to 0.1020. Press **Down-Arrow** two times and the value decrements to 0.1000.

**Note: It is not possible to Jog a Target value if it is blinking.**

The incremental value for the Jog feature varies depending on Ps2 units and is shown in the table below.

Ps2 units	Jog increment
inHg	0.0010
Diff. inHg	0.0010
mbar	0.01
Diff. mbar	0.01
psi	0.001
Diff. psi	0.001
mmHg	0.01
Diff. mmHg	0.01
kpa	0.001
Diff. kpa	0.001
Feet	1
Meters	1.0
knots	1.0
km/hr	1.0

### 3.5 CHANGING RATE TARGET VALUES

**Note: Rate-Target values are maintained through a power OFF/ON cycle.**

**Note: Rate-Target values entered in Air-Data units (altitude and airspeed units) are maintained separately from Rate-Target values entered in pressure units (inHg, mbar, etc.). When operating in Air-Data units, the air-data rates are effective. When operating in pressure units, the pressure rates are effective. However, the Ps1 pressure rate is internally limited by the altitude rate and never allowed to exceed it.**

#### Pt Rate Target value

The Pt Rate Target value can be changed only if the key# symbol **(3)** is displayed to the left of the Pt Rate Target value field. Press key '**3**' on the keypad and the Lower section of the display will appear as shown in Figure 3.17 below.

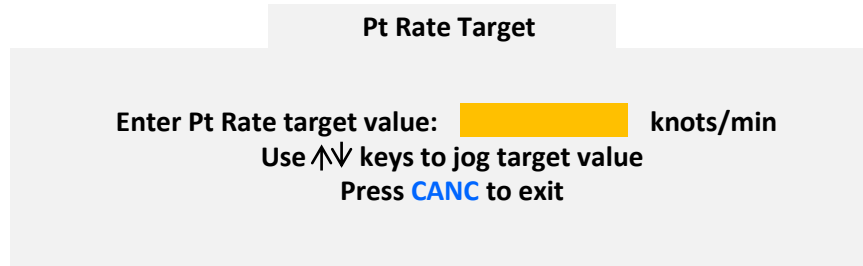


Figure 3.17 : Pt Rate Target value

Use the keypad to enter the desired value in the field shown. To clear an entry, press **CLR**. To accept the entry, press **ENTER**. To exit this screen without changing the Rate Target value, press **CANC**. If the number of digits entered (either before or after the decimal) exceeds the maximum allowed for the current units, a long beep will be heard.

If the entered value exceeds the programmed limits, the following message will appear.

Pt Rate target exceeds limit. Press **CLR**

**Note:** When Pt is in pressure units, the Pt Rate target is internally set to be equal to the Ps1 Rate target while the Ps1 output is ramping. Once the Ps1 output stops ramping, the commanded Pt Rate target becomes effective.

**Note:** In pressure units, Pt-Rate targets can be set between 0 and 30 inHg/min. (or equivalent)

If the Rate Target value needs to be changed in small increments, instead of entering a value, the arrow keys may be used to Jog the Rate Target value up or down. If the current Pt Rate Target value is 150.0 knots, and the Lower screen appears as in Figure 3.17 above, pressing the **Up-Arrow** key will make the screen appear as shown in Figure 3.18 below.

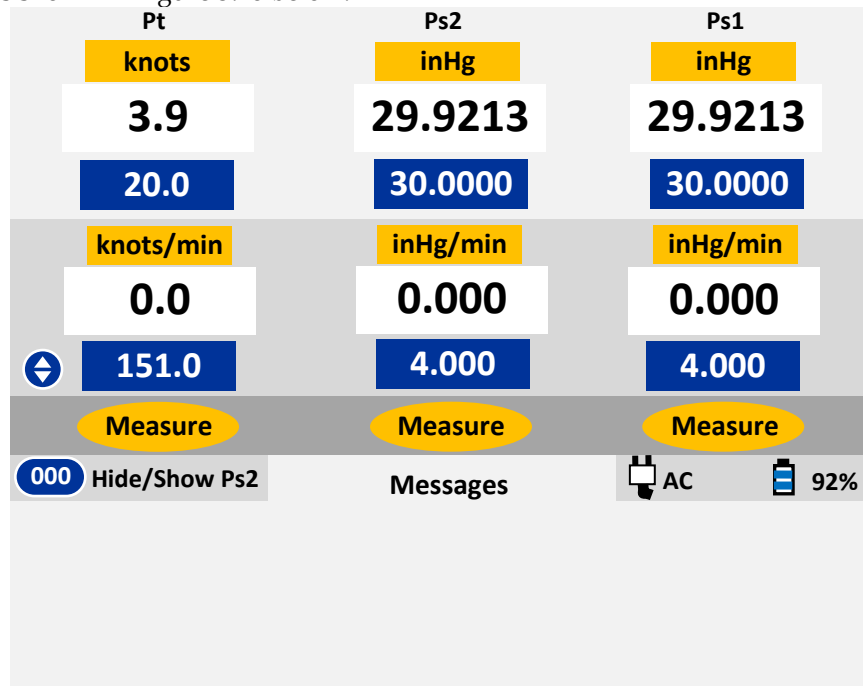


Figure 3.18 : Jog the Pt Rate Target value

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the left of the Pt Rate Target value field. This indicates that the Pt Rate Target value can be jogged up or down repeatedly, in steps of 1 knot/min, using the Arrow keys, until **CANC** is pressed. In this case, since the **Up-Arrow** key was pressed, the Pt Rate Target value was incremented to 151.0 knots. Press **Up-Arrow** one more time and the value will change to 152.0. Press **Down-Arrow** two times and the value decrements to 150.0.

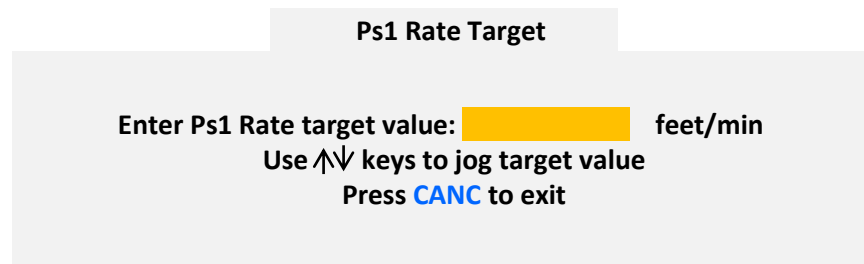
**Note: It is not possible to Jog a Rate Target value if it is blinking.**

The incremental value for the Jog feature varies depending on Pt Rate units and is shown in the table below.

Pt-Rate Units	Jog increment
knots/min	1.0
km/hr/sec	1.0
mph/min	1.0
inHg/min	0.01
mbar/min	0.1
psi/min	0.01
mmHg/min	0.1
kpa/min	0.01

### Ps1 Rate Target value

The Ps1 Rate Target value can be changed only if the key# symbol (**7**) is displayed to the right of the Ps1 Rate Target value field. Press key '**7**' on the keypad and the Lower section of the display will appear as shown in Figure 3.19 below.



**Figure 3.19 : Ps1 Rate Target value**

Use the keypad to enter the desired value in the field shown. To clear an entry, press **CLR**. To accept the entry, press **ENTER**. To exit this screen without changing the Rate Target value, press **CANC**. If the number of digits entered (either before or after the decimal) exceeds the maximum allowed for the current units, a long beep will be heard.

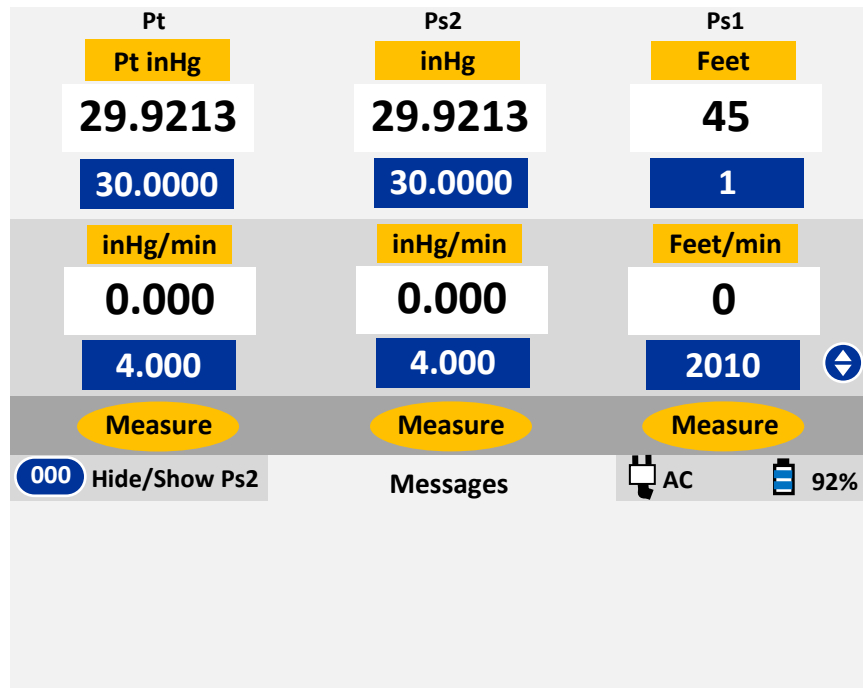
If the entered value exceeds the programmed limits, the following message will appear.

Ps1 Rate target exceeds limit. Press **CLR**

**Note:** When Ps1 is in pressure units, the commanded Ps1 Rate target is limited by the pressure-equivalent of the Ps1 Rate target that has been set for altitude units (feet/min or meters/sec). This ensures that the rate of change of Ps1 pressure does not exceed the target altitude rate.

**Note:** In pressure units, Ps1-Rate targets can be set between 0 and 30 inHg/min. (or equivalent)

If the Rate Target value needs to be changed in small increments, instead of entering a value, the arrow keys may be used to Jog the Rate Target value up or down. If the current Ps1 Rate Target value is 2000 Feet/min, and the Lower screen appears as in Figure 3.13 above, pressing the **Up-Arrow** key will make the screen appear as shown in Figure 3.14 below.



**Figure 3.20 : Jog the Ps1 Rate Target value**

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the right of the Ps1 Rate Target value field. This indicates that the Ps1 Rate Target value can be jogged up or down repeatedly, in steps of 10 Feet/min, using the Arrow keys, until **CANC** is pressed. In this case, since the **Up-Arrow** key was pressed, the Ps1 Rate Target value was incremented to 2010 Feet/min. Press **Up-Arrow** one more time and the value will change to 2020. Press **Down-Arrow** two times and the value decrements to 2000.

**Note:** It is not possible to Jog a Rate Target value if it is blinking.

The incremental value for the Jog feature varies depending on Ps1 units and is shown in the table below.

Ps1-Rate Units	Jog increment
Feet/min	10
Meters/sec	0.1

inHg/min	0.01
mbar/min	0.1
psi/min	0.01
mmHg/min	0.1
kpa/min	0.01

### Ps2 Rate Target value

The Ps2 Rate Target value can be changed only if the key# symbol (**period**) is displayed to the left of the Ps2 Rate Target value field. Press key '**period**' on the keypad and the Lower section of the display will appear as shown in Figure 3.21 below.

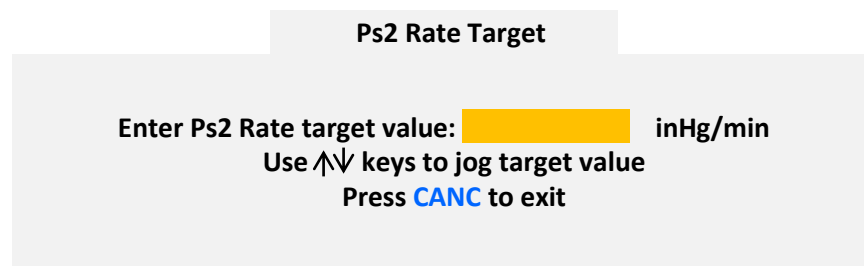


Figure 3.21 : Ps2 Rate Target value

Use the keypad to enter the desired value in the field shown. To clear an entry, press **CLR**. To accept the entry, press **ENTER**. To exit this screen without changing the Rate Target value, press **CANCEL**. If the number of digits entered (either before or after the decimal) exceeds the maximum allowed for the current units, a long beep will be heard.

If the entered value exceeds the programmed limits, the following message will appear.

Ps2 Rate target exceeds limit. Press **CLR**

**Note:** When Ps2 is in pressure units, the Ps2 Rate target is internally set to be equal to the Ps1 Rate target while the Ps1 output is ramping. Once the Ps1 output stops ramping, the commanded Ps2 Rate target becomes effective.

**Note:** In pressure units, Ps2-Rate targets can be set between 0 and 30 inHg/min. (or equivalent)

If the Rate Target value needs to be changed in small increments, instead of entering a value, the arrow keys may be used to Jog the Rate Target value up or down. If the current Ps2 Rate Target value is 4.000 inHg/min, and the Lower screen appears as in Figure 3.21 above, pressing the **Up-Arrow** key will make the screen appear as shown in Figure 3.22 below.



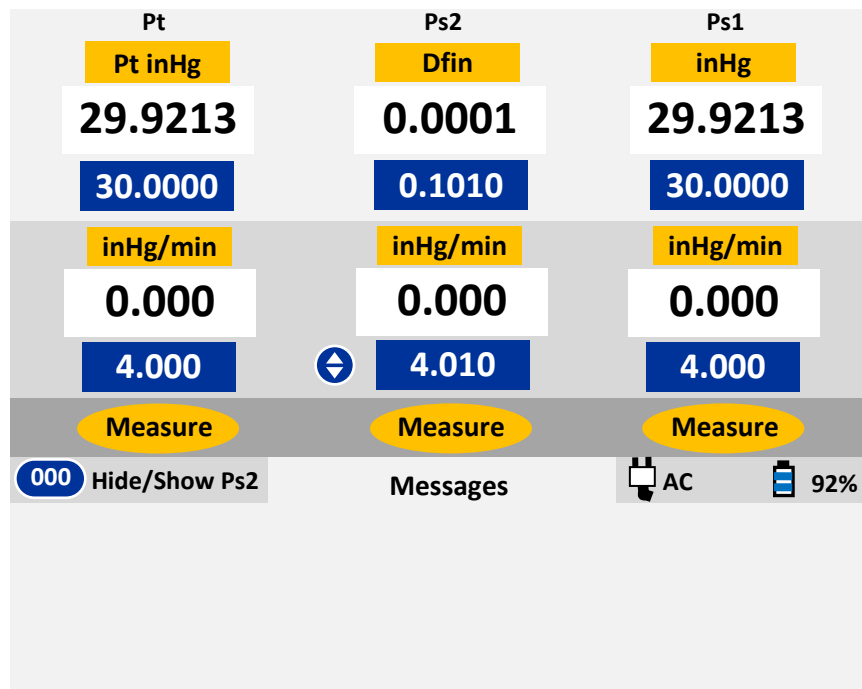


Figure 3.22 : Jog the Ps2 Rate Target value

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the left of the Ps2 Rate Target value field. This indicates that the Ps2 Rate Target value can be jogged up or down repeatedly, in steps of 0.01 inHg/min, using the Arrow keys, until **CANC** is pressed. In this case, since the **Up-Arrow** key was pressed, the Ps2 Rate Target value was incremented to 4.010 from 4.000 inHg/min. Press **Up-Arrow** one more time and the value will change to 4.020. Press **Down-Arrow** two times and the value decrements to 4.000.

**Note: It is not possible to Jog a Rate Target value if it is blinking.**

The incremental value for the Jog feature varies depending on Ps2 Rate units and is shown in the table below.

Ps2-Rate Units	Jog increment
inHg/min	0.01
mbar /min	0.1
psi/min	0.01
mmHg/min	0.1
kpa/min	0.01
Feet/min	10
Meters/sec	0.1
km/hr/sec	0.1

### 3.6 CHANGING MODES

**Note:** On power-up, Pt, Ps2 and Ps1 are in Measure mode.

#### Pt Mode

The Pt mode can be changed when the key# symbol (4) is displayed to the left of the Pt mode field. Press key '4' on the keypad and the Lower section of the display will appear as shown in Figure 3.23 below.

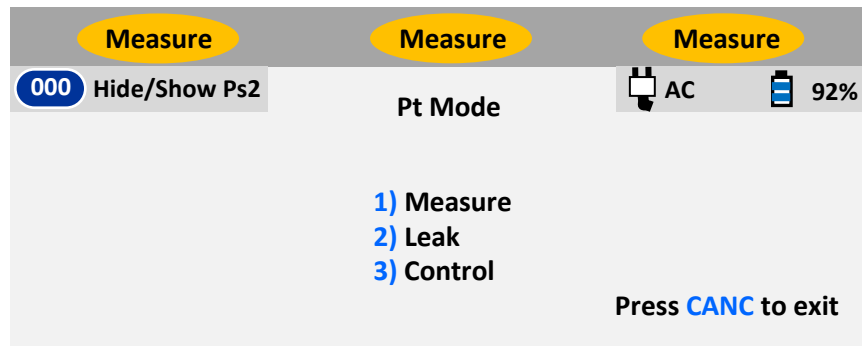


Figure 3.23 : Select Pt Mode

Press the key with the # (shown in blue) associated with the mode to be selected. Press '2' to select Leak mode. The screen appears as shown in Figure 3.24 below.

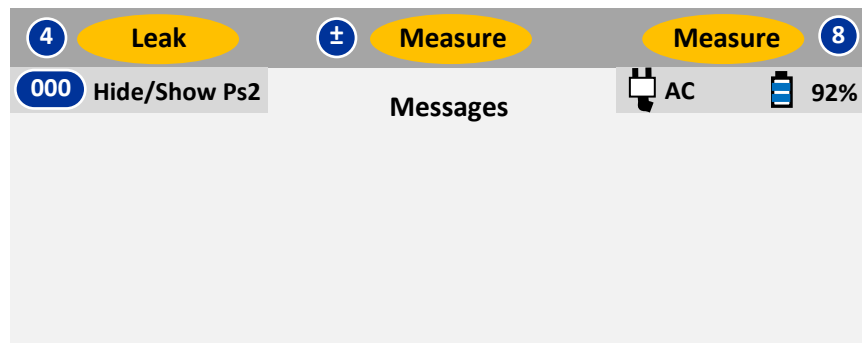


Figure 3.24 : Pt Leak mode

'Leak' will be blinking in the Pt mode field, waiting for either **GO** or **CANCEL** to be pressed. (**Caution: Do NOT press GO at this moment**). Pressing **GO** will activate Pt Leak mode and stop 'Leak' from blinking. Pressing **CANCEL** will revert back to Pt Measure mode. For now, press **CANCEL** and return Pt to Measure mode.

Press '4' to select Pt mode again. Then press '3' to select Pt Control mode. The screen appears as shown in Figure 3.25 below.

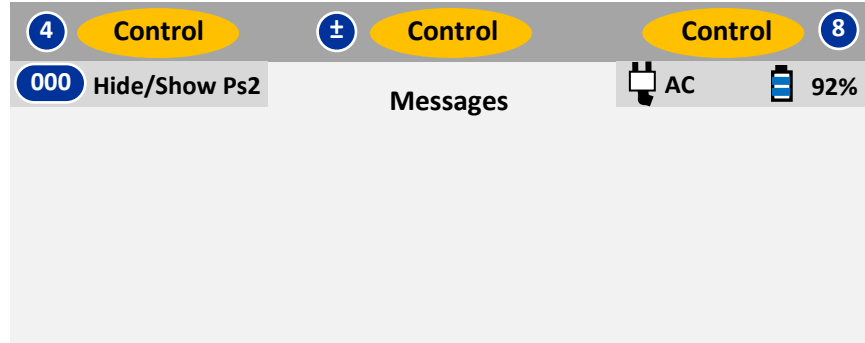


Figure 3.25 : Pt Control mode

'Control' will be blinking in the Pt mode field. Also, 'Control' will be blinking in the Ps1 mode field. This is because when either Pt mode, Ps2 mode or Ps1 mode is changed to Control, all three modes (Pt, Ps2, Ps1) are automatically setup for Control. (**Caution: Do NOT press GO at this moment**). Pressing **GO** will activate all 3 outputs (Pt, Ps2, Ps1) into Control mode. Pressing **CANC** will revert all 3 modes modes back to Measure. For now, press **CANC** and return Pt, Ps2 and Ps1 to Measure mode.

**Note: When Pt mode is changed to Control, Ps2 and Ps1 modes are automatically changed to Control. Similarly, when Ps2 or Ps1 mode is changed to Control, Pt mode is automatically changed to Control.**

**Note: Leak and Measure modes can be selected independently for Pt, Ps2 and Ps1.**

### Ps1 Mode

The Ps1 mode can be changed when the key# symbol (8) is displayed to the right of the Ps1 mode field. Press key '8' on the keypad and the Lower section of the display will appear as shown in Figure 3.26 below.

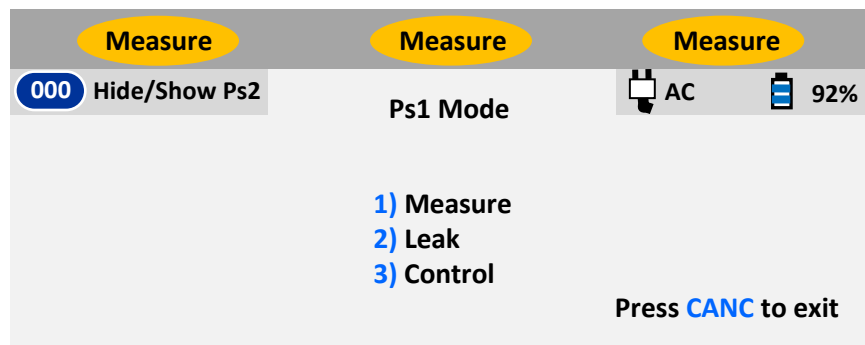


Figure 3.26 : Select Ps1 Mode

Press the key with the # (shown in blue) associated with the mode to be selected. Press '2' to select Leak mode. The screen appears as shown in Figure 3.27 below.

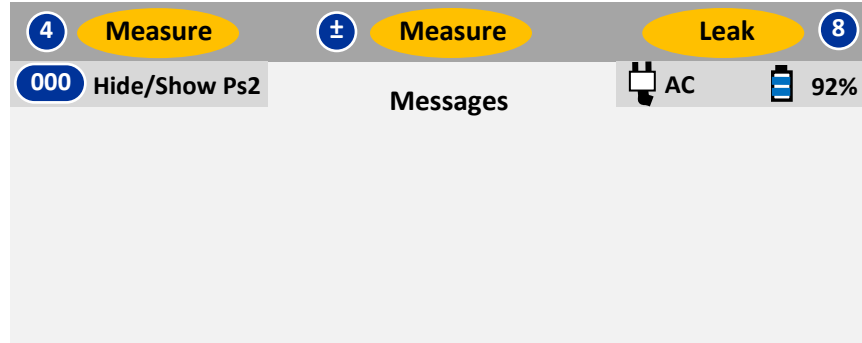


Figure 3.27 : Ps1 Leak mode

'Leak' will be blinking in the Ps1 mode field, waiting for either **GO** or **CANC** to be pressed. (**Caution: Do NOT press GO at this moment**). Pressing **GO** will activate Ps1 Leak mode and stop 'Leak' from blinking. Pressing **CANC** will revert back to Ps1 Measure mode. For now, press **CANC** and return Ps1 to Measure mode.

Press '8' to select Ps1 mode again. Then press '3' to select Ps1 Control mode. The screen appears as shown in Figure 3.28 below.



Figure 3.28 : Ps1 Control mode

'Control' will be blinking in the Ps1 mode field. Also, 'Control' will be blinking in the Pt and Ps2 mode fields. This is because when either Pt, Ps2 or Ps1 modes are changed to Control, all three modes (Pt, Ps2, Ps1) are automatically setup for Control. (**Caution: Do NOT press GO at this moment**). Pressing **GO** will activate all 3 outputs (Pt, Ps2, Ps1) into Control mode. Pressing **CANC** will revert all 3 modes back to Measure. For now, press **CANC** and return Pt, Ps2 and Ps1 to Measure mode.

**Note: When Ps1 mode is changed to Control, Pt and Ps2 modes are automatically changed to Control. Similarly, when Pt or Ps2 mode is changed to Control, Ps1 mode is automatically changed to Control.**

**Note: Leak and Measure modes can be selected independently for Pt, Ps2 and Ps1.**

### Ps2 Mode

The Ps2 mode can be changed when the key# symbol (**±**) is displayed to the left of the Ps2 mode field. Press key '**±**' on the keypad and the Lower section of the display will appear as shown in Figure 3.29 below.

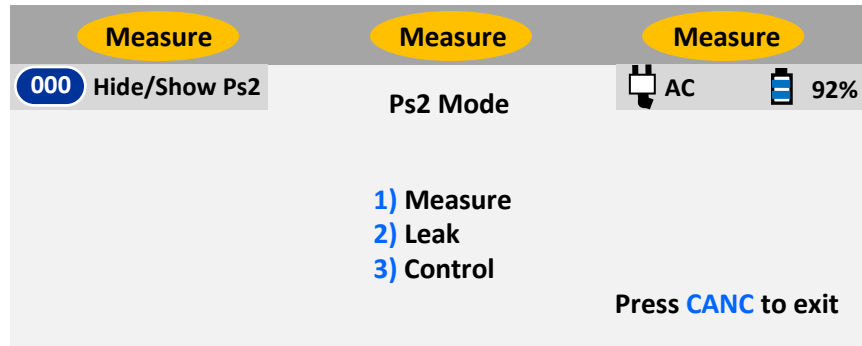


Figure 3.29 : Select Ps2 Mode

Press the key with the # (shown in blue) associated with the mode to be selected. Press '2' to select Leak mode. The screen appears as shown in Figure 3.30 below.

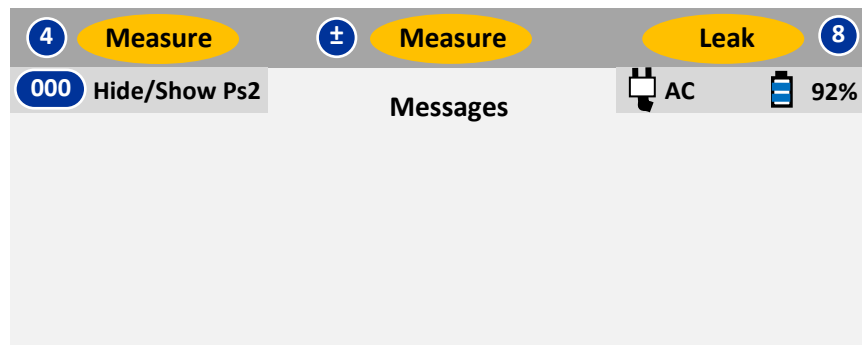


Figure 3.30 : Ps2 Leak mode

'Leak' will be blinking in the Ps2 mode field, waiting for either **GO** or **CANCEL** to be pressed. (**Caution: Do NOT press GO at this moment**). Pressing **GO** will activate Ps2 Leak mode and stop 'Leak' from blinking. Pressing **CANCEL** will revert back to Ps2 Measure mode. For now, press **CANCEL** and return Ps2 to Measure mode.

Press '±' to select Ps2 mode again. Then press '3' to select Ps2 Control mode. The screen appears as shown in Figure 3.31 below.

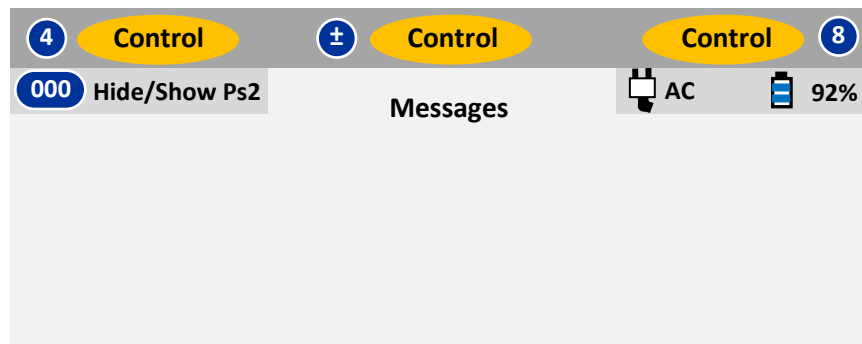


Figure 3.31 : Ps1 Control mode

'Control' will be blinking in the Ps2 mode field. Also, 'Control' will be blinking in the Pt and Ps1 mode fields. This is because when either Pt, Ps2 or Ps1 modes are changed to Control, all three modes (Pt, Ps2, Ps1) are automatically setup for Control. (**Caution: Do NOT press GO at this moment**). Pressing **GO** will activate all 3 outputs (Pt, Ps2, Ps1) into Control mode. Pressing **CANC** will revert all 3 modes back to Measure. For now, press **CANC** and return Pt, Ps2 and Ps1 to Measure mode.

**Note: When Ps2 mode is changed to Control, Pt and Ps1 modes are automatically changed to Control. Similarly, when Pt or Ps1 mode is changed to Control, Ps2 mode is automatically changed to Control.**

**Note: Leak and Measure modes can be selected independently for Pt, Ps2 and Ps1.**

### 3.6.1 MEASURE TO CONTROL TRANSITION

When either the Pt, Ps2 or Ps1 output is changed from Measure or Leak to Control mode, a sequence of events takes place that needs explaining. Since the controlling portion of the 6600-NG is isolated from the output during Measure or Leak modes, it will usually be at a pressure quite different from that at the output. Simply introducing the controlling section into the pneumatic system connected to the output will cause a surge in pressure at the output. To prevent such a surge, the 6600-NG measures the pressure at the output, shuts-off the output from the internal 6600-NG pneumatics, and then controls the pressure within the internal control mechanism to match the pressure at the output. Once this is done, the 6600-NG controlling section is connected to the output. This process is termed as Equalization.

While the 6600-NG is undergoing this process, the term 'EQZN' is displayed on the screen in place of the "Actual" values. When the outputs are close to "Ground", the EQZN process usually takes about 15 seconds or less to complete. When the outputs are not close to "Ground", usually the process is completed almost instantly and 'EQZN' may or may not appear on the screen.

When the outputs are close to "Ground", following the Equalization process, the 6600-NG will automatically inject a small vacuum on the Ps1 output and a small pressure on the Pt and Ps2 outputs. This is done to determine the volume of the Pt, Ps2 and Ps1 systems on the aircraft, so that the 6600-NG can automatically adjust the gain of its control mechanism. Due to this, the actual pressure value will always increase on both Pt and Ps2 outputs and decrease on the Ps1 output (altitude will increase) for about 5 seconds, regardless of the target value. Once this process is complete, the actual values will move towards the target values.

### 3.6.2 LEAK CHECKS

Leak checks can be performed either independently or simultaneously on the Pt, Ps2 and Ps1 outputs of the 6600-NG. The ideal way to perform leak checks is to put only one output in Leak mode while keeping the other output in Control mode. However, if necessary, all 3 outputs can be simultaneously put into Leak mode.

**Note: During a leak check it is not possible to change units, target values or modes.**

### Independent Pt Leak-check

The ideal way to perform a Pt leak-check is to keep Ps1 and Ps2 in Control at "Ground" and control Pt to 120 knots before starting the leak check. Below is a step-by-step process of performing the Pt leak-check. It is assumed that the Self-Test has already been performed as described in Section 3.1

1. Close all three output ports (tightly, please).
2. Set the Units as follows: Pt=knots, Ps2=Dfin, Ps1=feet. (Key sequence: **1, 1, ENTER, 9, 2, ENTER, 5, 1, ENTER, GO**)
3. Press **GND** to perform the Go-To-Ground function. The pumps will turn On and the tester will go through the EQZN process. The targets will automatically be set to Pt=0 knots, Ps2=0.0 Dfin, Ps1= the feet equivalent to "Ground" (ambient pressure).
4. Once the EQZN process is completed, the tester will control the Actual values at the Targets.
5. Change the Pt Target to 120 knots. (Key sequence: **2, 1, 2, 0, ENTER**) The new Target value will be blinking. Press **GO** to activate. The Pt Actual value will ramp to 120 knots. The Ps1 and Ps2 outputs will still be controlling at their target values.
6. Once the Pt Actual reaches 120 knots, allow it to stabilize for a few seconds.
7. Change the Pt mode to Leak. (Key sequence: **4, 2**). 'Leak' will be blinking in the Pt mode field. Press **GO** to activate.

The Lower section of the screen will appear similar to Figure 3.32 below. The parameters shown in the Leak screen are explained below, after Figure 3.35.

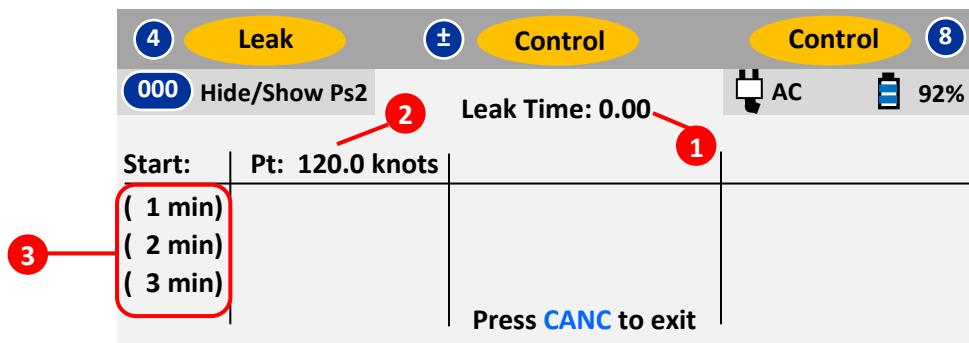


Figure 3.32 : Pt Leak (start)

At the end of one minute, the screen will appear similar to Figure 3.33 below.

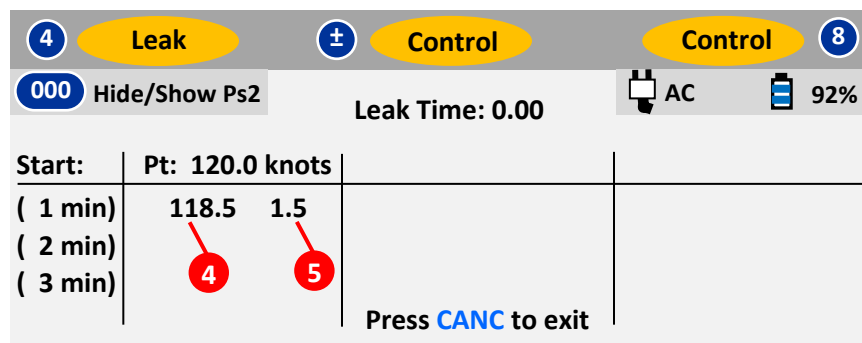


Figure 3.33 : Pt Leak (1-min)

At the end of two minutes, the screen will appear similar to Figure 3.34 below.

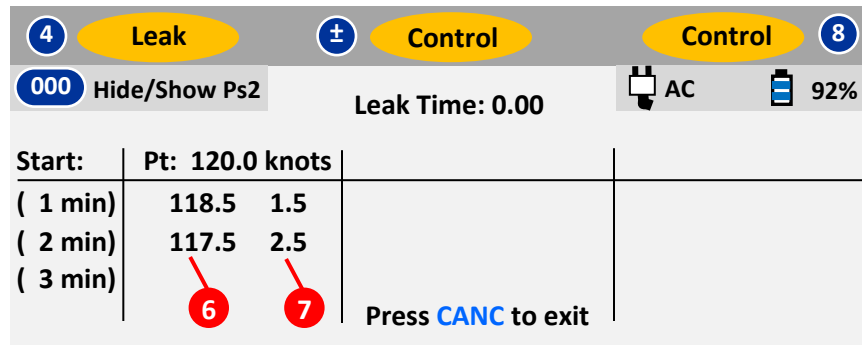


Figure 3.34 : Pt Leak (2-min)

At the end of three minutes, the screen will appear similar to Figure 3.35 below.

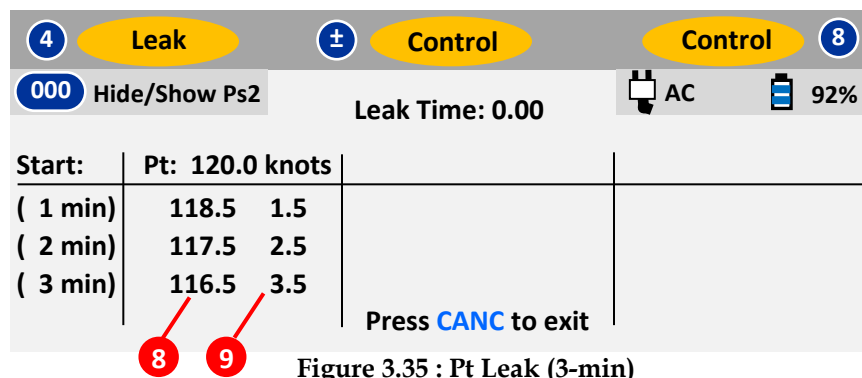


Figure 3.35 : Pt Leak (3-min)

The parameters indicated in Figures 3.32 through 3.35 are explained below.

- [1] Leak Timer: Shows the elapsed time since the Leak-check was started.
- [2] Start value: The Actual value at the start of the leak-check (at time 0:00)
- [3] Leak timer values: Currently set at 1, 2 and 3 minutes. Can be changed to values up to 20 minutes. See Section 3.10.7 for details.
- [4] The Actual value at the end of 1 minute
- [5] Total leak in 1 minute
- [6] The Actual value at the end of 2 minutes
- [7] Total leak in 2 minutes
- [8] The Actual value at the end of 3 minutes
- [9] Total leak in 3 minutes

When **CANCEL** is pressed to exit out of Leak mode, the 6600-NG automatically goes back to Control mode.



**Instant Pt leak rate:** While the leak-check is going on, the Actual values are still updated every 250 msec in the Upper section of the screen. The Actual Pt Rate is the “instant” leak rate and will instantly indicate any change in the leak. This is especially helpful when adjustments are made to the Pt system (including tightening fittings, adjusting adapters etc) to reduce the leak.

**Excessive Pt Leak:** If the ‘instant’ leak-rate is excessive, to protect the aircraft instruments, the 6600-NG will automatically put Pt back into Control mode and abort the leak check. An error message:

**ERR 7: Pt leak excessive. Exiting Leak mode.** Press **CANC**

will be displayed on the last line of the screen. Pressing **CANC** will clear the Lower section.

### Independent Ps1 Leak-check

The ideal way to perform a Ps1 leak-check is to keep Pt in Control at 120 knots, Ps2 in Control at 0.0 Dfin and control Ps1 to a minimum of 3000 feet **above** “Ground”, before starting the leak check. Below is a step-by-step process of performing the Ps1 leak-check. It is assumed that the Self-Test has already been performed as described in Section 3.1

1. Close all three output ports (tightly, please).
2. Set the Units as follows: Pt=knots, Ps2=Dfin, Ps1=feet. (Key sequence: **1, 1, ENTER, 9, 2, ENTER, 5, 1, ENTER, GO**)
8. Press **GND** to perform the Go-To-Ground function. The pumps will turn On and the tester will go through the EQZN process. The targets will automatically be set to Pt=0 knots, Ps2=0.0 Dfin, Ps1= the feet equivalent to “Ground” (ambient pressure).
3. Once the EQZN process is completed, the tester will control the Actual values at the Targets.
4. Change the Pt Target to 120 knots. (Key sequence: **2, 1, 2, 0, ENTER**). The new Target value will be blinking. Do **NOT** press **GO**.
5. Assuming that “Ground” is 0 feet, change the Ps1 Target to 3000 feet. . (Key sequence: **6, 3, 000, ENTER**) The new Target value will be blinking.
6. Press **GO** to activate both targets simultaneously. The Pt Actual value will ramp to 120 knots. The Ps1 Actual value will ramp to 3000 feet. Ps2 will still control at 0.0 Dfin.
7. Once the Actual values reach their targets, allow them to stabilize for a few seconds.
8. Change the Ps1 mode to Leak. (Key sequence: **8, 2**). ‘Leak’ will be blinking in the Ps1 mode field. Press **GO** to activate. Note that Pt and Ps2 will still be in Control at 120 knots and 0.0 Dfin.

The Lower section of the screen will appear similar to Figure 3.36 below, with the 1-min, 2-min and 3-min values appearing as the leak time crosses 1, 2 and 3 minutes.

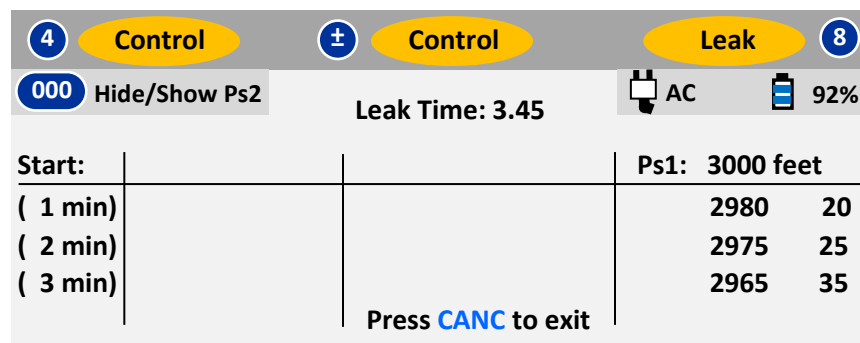


Figure 3.36 : Ps1 Leak (after 3 min)

When **CANC** is pressed to exit out of Leak mode, the 6600-NG automatically goes back to Control mode.

**Instant Ps1 leak rate:** While the leak-check is going on, the Actual values are still updated every 250 msec in the Upper section of the screen. The Actual Ps1 Rate is the “instant” leak rate and will instantly indicate any change in the leak. This is especially helpful when adjustments are made to the Ps1 system (including tightening fittings, adjusting adapters etc) to reduce the leak.

**Excessive Ps1 Leak:** If the ‘instant’ leak-rate exceeds the Target Ps1 rate (factory-set at 2000 feet/min), to protect the aircraft instruments, the 6600-NG will automatically put Ps1 back into Control mode and abort the leak check. An error message:

**ERR 8: Ps1 leak excessive. Exiting Leak mode.** Press **CANC**

will be displayed on the last line of the screen. Pressing **CANC** will clear the Lower section.

### Independent Ps2 Leak-check

The ideal way to perform a Ps1 leak-check is to keep Pt in Control at 0 knots, keep Ps1 in in control at Ground and control Ps2 to 1.0 Dfin, before starting the leak check. Below is a step-by-step process of performing the Ps2 leak-check. It is assumed that the Self-Test has already been performed as described in Section 3.1

1. Close all three output ports (tightly, please).
2. Set the Units as follows: Pt=knots, Ps2=Dfin, Ps1=feet. (Key sequence: **1, 1, ENTER, 9, 2, ENTER, 5, 1, ENTER, GO**)
3. Press **GND** to perform the Go-To-Ground function. The pumps will turn On and the tester will go through the EQZN process. The targets will automatically be set to Pt=0 knots, Ps2=0.0 Dfin, Ps1= the feet equivalent to “Ground” (ambient pressure).
4. Once the EQZN process is completed, the tester will control the Actual values at the Targets.
5. Change the Ps2 Target to 1.0 Dfin. (Key sequence: **0, 1, ENTER**) The new Target value will be blinking. Press **GO** to activate. The Ps2 Actual value will ramp to 1.0 Dfin. The Ps1 and Pt outputs will still be controlling at their target values.
6. Once the Ps2 Actual values reaches its target, allow it to stabilize for a few seconds.
7. Change the Ps2 mode to Leak. (Key sequence: **±, 2**). ‘Leak’ will be blinking in the Ps2 mode field. Press **GO** to activate. Note that Pt and Ps1 will still be in Control at their targets.

The Lower section of the screen will appear similar to Figure 3.37 below, with the 1-min, 2-min and 3-min values appearing as the leak time crosses 1, 2 and 3 minutes.

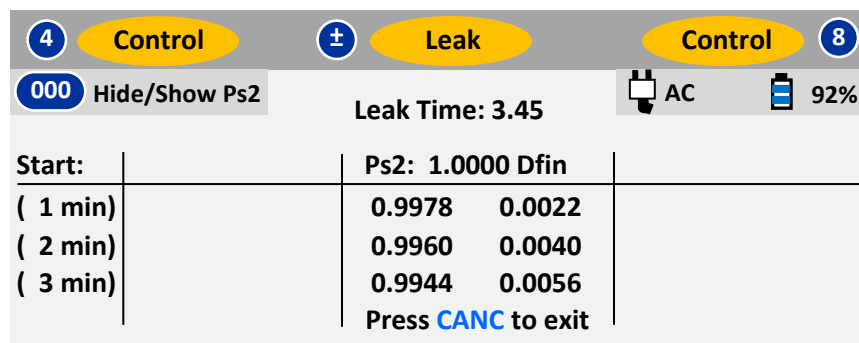


Figure 3.37 : Ps1 Leak (after 3 min)

When **CANC** is pressed to exit out of Leak mode, the 6600-NG automatically goes back to Control mode.

**Instant Ps2 leak rate:** While the leak-check is going on, the Actual values are still updated every 250 msec in the Upper section of the screen. The Actual Ps1 Rate is the “instant” leak rate and will instantly indicate any change in the leak. This is especially helpful when adjustments are made to the Ps1 system (including tightening fittings, adjusting adapters etc) to reduce the leak.

**Excessive Ps2 Leak:** If the ‘instant’ leak-rate is excessive, to protect the aircraft instruments, the 6600-NG will automatically put Ps2 back into Control mode and abort the leak check. An error message:

**ERR 8: Ps2 leak excessive. Exiting Leak mode.** Press **CANC**

will be displayed on the last line of the screen. Pressing **CANC** will clear the Lower section.

### Simultaneous Pt, Ps2 and Ps1 Leak

To leak-check Pt, Ps2 and Ps1 outputs simultaneously, all three outputs should be changed to Leak, before pressing **GO**.

Assuming that the simultaneous leak check needs to be done with all three outputs in “inHg” at values of Pt=24 inHg, Ps2=23 inHg and Ps1 at 22 inHg, follow the steps below.

1. Close all three output ports (tightly, please).
2. Set the Units as follows: Pt=inHg, Ps2=inHg, Ps1=inHg. (Key sequence: **1, 5, ENTER, 9, 1, ENTER, 5, 3, ENTER, GO**)
3. Set all three Rate Targets to 4.0 inHg/min. (Key sequence: **3, 4, ENTER, period, 4, ENTER, 7, 4, ENTER, GO**)
4. Press **GND** to perform the Go-To-Ground function. The pumps will turn On and the tester will go through the EQZN process. All three targets will automatically be set to the ambient (“Ground”) pressure in inHg.
5. Once the EQZN process is completed, the tester will control the Actual values at the Targets.
6. Change the Targets to Pt=24, Ps2=23 and Ps1=22. (Key sequence: **2, 2, 4, ENTER, 0, 2, 3, ENTER, 6, 2, 2, ENTER**) The new Target value will be blinking. Press **GO** to activate. All three Actual values will ramp to their targets.
7. Once all three Actual values reach their target, allow them to stabilize for a few seconds.
8. Change all three modes to Leak. (Key sequence: **4, 1, ±, 2, 8, 2**). ‘Leak’ will be blinking in all three mode fields. Press **GO** to activate.

The Lower section of the screen will appear similar to Figure 3.38 below, with the 1-min, 2-min and 3-min values appearing as the leak time crosses 1, 2 and 3 minutes.

Start:	Pt: 24.0000 inHg	Ps2: 23.0000 inHg	Ps1: 22.0000 inHg
( 1 min)	24.0022 0.0022	23.0021 0.0021	22.0024 0.0024
( 2 min)	24.0041 0.0041	23.0040 0.0040	22.0043 0.0043
( 3 min)	24.0059 0.0059	23.0057 0.0057	22.0060 0.0060

Press **CANC** to exit

Figure 3.38 : Simultaneous Pt , Ps2 & Ps1 leak-check (after 3-min)

When **CANC** is pressed, all three outputs will return to Control mode.

### 3.7 SELF-TEST FUNCTION

The Self-Test must not be performed when the tester is connected to the aircraft. Therefore, it is up to the user to run the Self-Test after ensuring that all three outputs are open to ambient (close to “Ground”) and all three outputs are in Measure mode.

**Note:** The Self-Test should be performed each time the tester is to be used on an aircraft, just before connecting to the aircraft.

To start the Self-Test, press **TEST**. If the conditions for running a Self-Test are not met, the following message will be displayed in the Lower section.

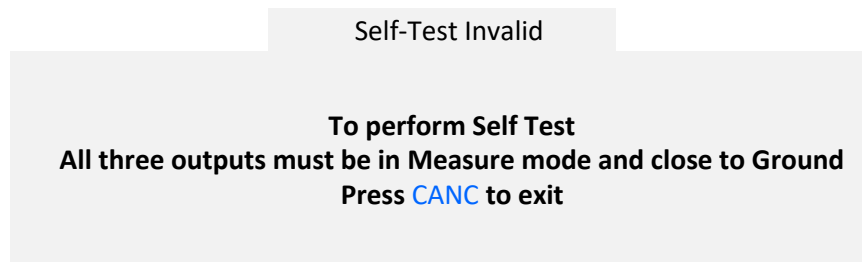


Figure 3.39 : Self-Test Invalid

If the conditions are met, the following message is displayed.

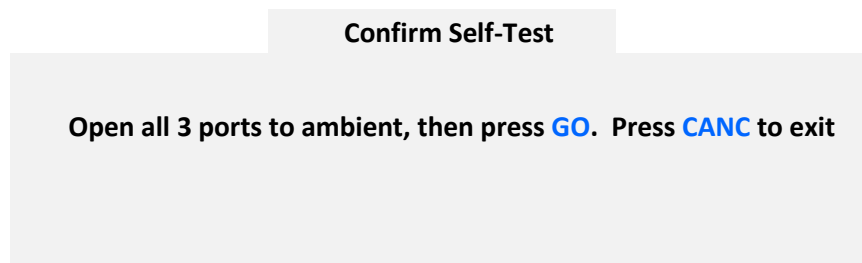


Figure 3.40 : Confirm Self-Test

Press **GO** to start the Self-Test. The Lower section of the display will show the 'Self-Test Progress' screen. The screen will be updated as each test completes successfully. If a specific test fails, the last line of display will show the failure message and the Self-Test will be aborted. If all the tests pass, the screen will appear as shown in Figure 3.41

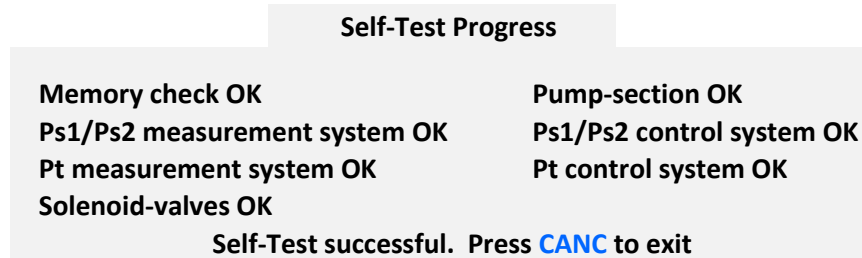


Figure 3.41 : Self-Test successful

**Note: The Actual values are NOT updated during the Self-Test.**

As shown in Figure 3.41, there are seven categories of tests performed, which essentially check most of the sub-systems within the 6600-NG. The pumps are started just after 'Pt measurement system OK' is displayed. There is a long delay of about 2 minutes before the next update of the screen (Solenoid-valves OK). During this time the 6600-NG performs all the remaining four tests (since they are inter-dependent) before displaying the results. The pumps are turned Off after the tests are completed.

After the tests are completed successfully (or aborted due to a failure), press **CANCEL** to exit.

**Note: Once the Self-Test is started, it cannot be aborted (except by turning power Off).**

### 3.8 GO-TO-GROUND FUNCTION

**Note: "Ground" signifies the ambient pressure, NOT the field elevation.**

The GND key is used to activate this function. This function performs the following operations:

- a. Sets the Pt Target to the equivalent of 0 knots (in the current Pt units).
- b. Sets the Ps2 Target to the equivalent of 0.0 Dfin (in the current Ps2 units)
- c. Sets the Ps1 Target to the equivalent of the ambient ("Ground") pressure (in the current Ps1 units).
- d. Sets Pt, Ps2 and Ps1 modes to Control.
- e. Controls both outputs to their respective targets.

This function is typically used in two situations. First, just after connecting to the aircraft when the user wants to put the 6600-NG into Control mode and control at "Ground" before proceeding further. Second, when all tests on the aircraft are completed and the user wants to ensure that the outputs are close to "Ground" before disconnecting the tester from the aircraft.

**Note: This function does NOT alter the Rate Target values. Also, it does NOT alter the Units.**

The 6600-NG has an internal sensor which is always measuring the ambient pressure. This measurement of the ambient-pressure is used to establish the "Ground" target value.

When **GND** is pressed, the Lower section of the screen appears as below.

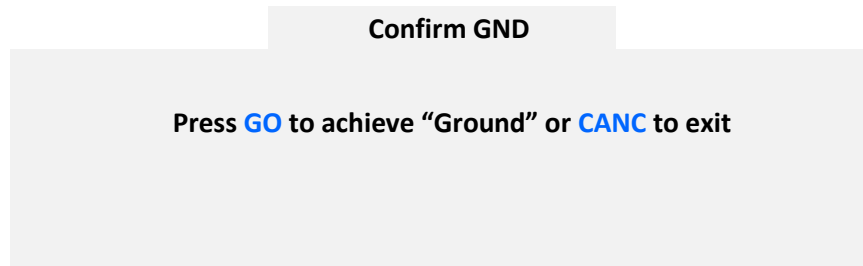


Figure 3.42 : Confirm GND

Pressing **GO** will activate the 6600-NG to perform the operations described above.

### 3.9 HOLD FUNCTION

This function needs to be used only if the user wants to "Pause" while the 6600-NG is ramping from one target to another. This function is valid only when one or more outputs is in Control mode. When the **HOLD** key is pressed, the 6600-NG will stop ramping all outputs and try to maintain a zero-rate for Pt, Ps2 and Ps1.

The Lower section will display the following message:

Output(s) are on "Hold". Press **GO** to release "Hold"

In the Upper section, all the target values will be blinking. The Actual values will stop ramping towards the targets.

**Note: The target values are not altered during "HOLD".**

To release "HOLD", press **GO**. The target values will stop blinking and the outputs will start ramping once more towards their targets.

It is meaningless to use Hold when the outputs are already at their targets and not ramping.

### 3.10 OTHER FUNCTIONS

There are several other functions available on the 6600-NG that can be accessed by pressing the **FUNC** key. These are explained in the sub-sections below. The functions available are:

1. View Limits
2. Modify Limits
3. Brightness (Adjust display brightness)
4. Run Profile
5. Load Profile
6. Height Correction

7. Leak Timers
8. Calibration
9. Encoder

When the **FUNC** key is pressed, the Lower section of the screen appears as shown below. The specific function can be selected by pressing the related number-key.

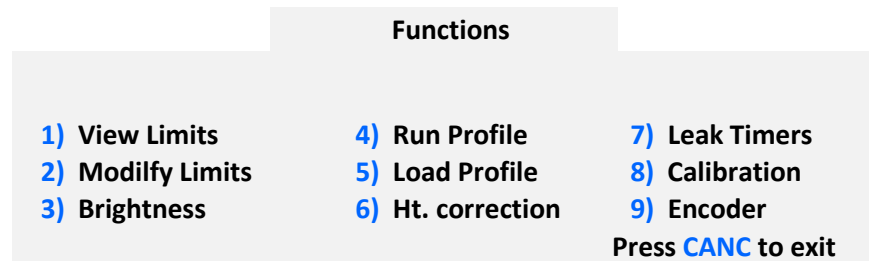


Figure 3.31 : Functions

### 3.10.1 VIEW LIMITS

The 6600-NG has eight user-programmable limits. These are used to prevent incorrect entry of target values. These limits are also checked continuously when the outputs are in Control mode. If any limit is exceeded, the 6600-NG puts all outputs into Measure mode and displays an error condition.

Select '1' in the Functions menu and the screen appears as shown below.

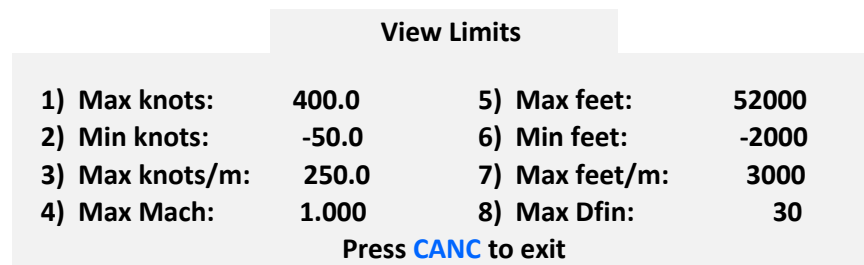


Figure 3.32 : View Limits

The details of each limit are provided in Section 3.10.2 (Modify Limits).

**Note:** Limit values cannot be modified in the "View Limits" screen.

### 3.10.2 MODIFY LIMITS

The eight user-programmable limits can be modified by selecting '2' in the Functions menu. Access to the 'Modify Limits' function is protected by means of a password. The following screen will appear.

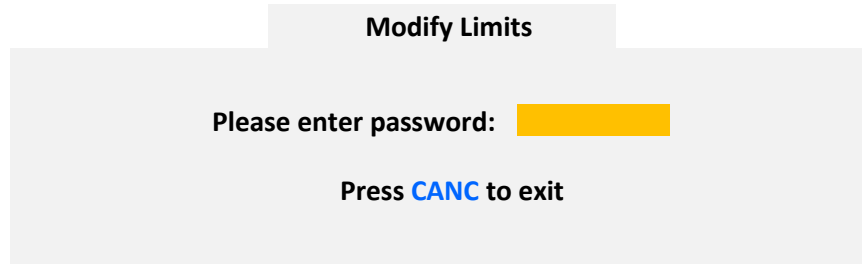


Figure 3.33 : Modify Limits (password)

The password has been provided on the calibration certificate. Enter the password digits followed by **ENTER**. The screen will appear as shown below.

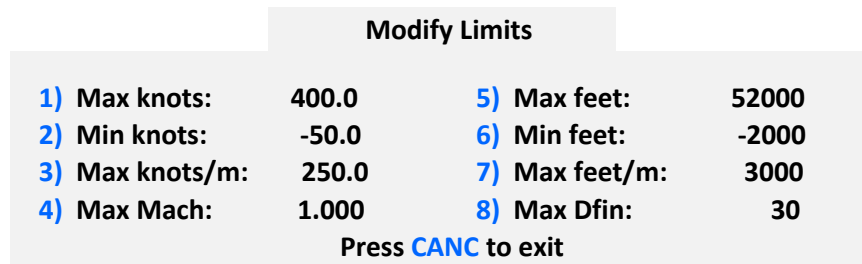


Figure 3.34 : Modify Limits (selection)

To modify a specific limit value, press the number-key for that limit. If '1' is pressed to modify the 'Max knots' limit, the screen will appear as below. The last line of the display will show the upper and lower bound of the value that may be entered. Other limit values can be modified similarly.

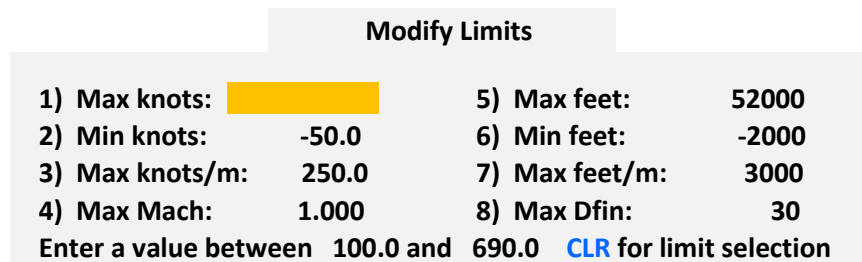


Figure 3.35 : Modify Limits (value entry)

An explanation of each limit follows.

- 1) **Max knots:** This limit can be set between 100 and 690 knots. It defines the maximum airspeed that can be controlled. It also defines the maximum differential pressure (Qc) that can be controlled. The factory setting is 400 knots.
- 2) **Min knots:** This limit can be set between -50 and -500 knots. It defines the negative-airspeed limit. It also defines the most negative differential pressure (Qc) that can be controlled. The factory setting is -50 knots.



- 3) **Max knots/min:** This limit can be set between 50 and 500 knots/min. It defines the maximum rate of change of airspeed. However, it does NOT define the maximum rate of change of Pt-pressure in pressure units. (See note below). The factory setting is 250 knots/min.

**Note: In pressure units, Pt, Ps2 and Ps1 Rate Targets can be set between 0 and 30 inHg/min.**

- 4) **Max Mach:** This limit can be set between 0.5 and 3.0 Mach. The factory setting is 1.000 Mach.
- 5) **Max feet:** This limit can be set between 5,000 and 100,000 feet. It defines the maximum altitude that can be controlled. It also defines the minimum Ps1 pressure that can be controlled. The factory setting is 52,000 feet.
- 6) **Min feet:** This limit can be set between -2,000 and 0 feet. It defines the minimum altitude that can be controlled. It also defines the maximum Ps1 pressure that can be controlled. The factory setting is -2,000 feet.
- 7) **Max feet/min:** This limit can be set between 1,000 and 50,000 feet/min. It defines the maximum altitude rate that can be controlled. However, it does NOT define the maximum rate of change of Ps1-pressure in pressure units. (See note below).

**Note: In pressure units, Ps1-Rate targets can be set between 0 and 30 inHg/min.**

- 8) **Max Dfin:** This limit can be set between 1 and 30 inHg. It defines the maximum differential pressure (plus or minus) permissible between Ps1 and Ps2.

### 3.10.3 ADJUST DISPLAY BRIGHTNESS

The brightness of the display can be adjusted by selecting '3' in the Functions menu. The screen will then appear as shown below.

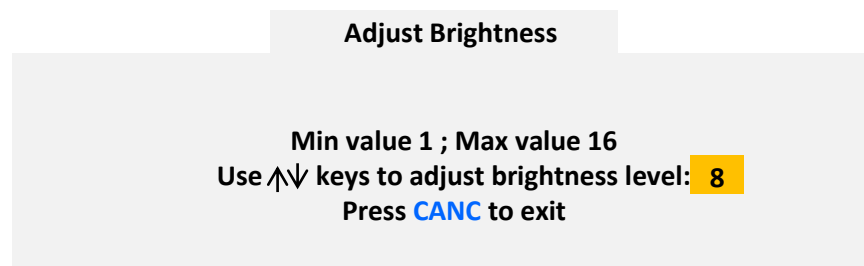


Figure 3.36 : Adjust Brightness

Use the Arrow keys to adjust the brightness. On power-up the brightness level is always set to 15.

### 3.10.4 RUN PROFILE

Profiles are explained in detail in Section 4. A profile is a pre-programmed set of parameters, usually based on an aircraft's AMM, which allows the user to perform a test without having to enter all the parameters. Each profile can have up to 50 points, where each point defines all the 12 parameters that are

usually entered by the user (units, target values, modes). The 6600-NG can store up to 10 profiles in its non-volatile memory.

Profile number 10 is factory-installed. It is names as "Test-1" and serves only as an example. To run this profile, press '4' while in the Functions menu. The following will appear.

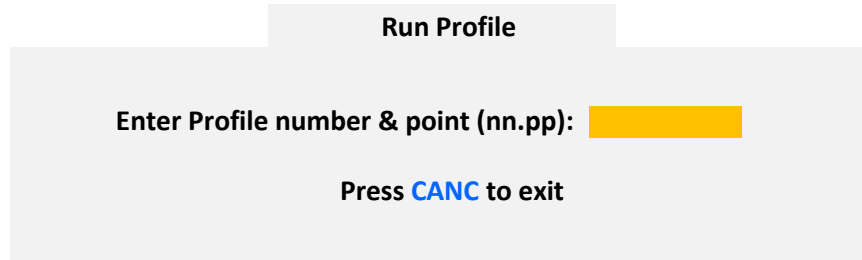


Figure 3.37 : Run Profile (enter profile number)

Enter the Profile number. In this case, enter '10.1' followed by ENTER. This will bring up point 1 of profile 10. (To run profile number 1, starting at point 1, you would enter '1.1'. So, an entry format of 'n.p' instead of 'nn.pp' is also valid.). The screen will appear as follows.

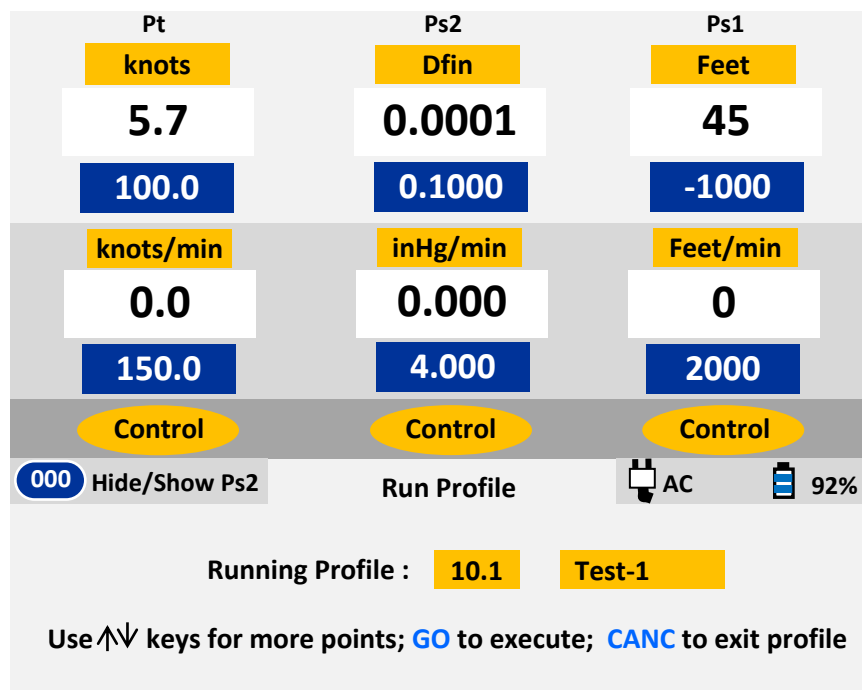


Figure 3.38 : Run Profile (10.1 Blinking)

As shown in Figure 3.38, the following changes have been made to the Upper section of the screen:

- Units have been set to Pt=knots, Ps2=Dfin & Ps1=Feet
- Targets have been set to Pt=100.0 knots, Ps2=0.1000 Dfin and Ps1= -1000 Feet
- Target-Rates have been set to Pt=150.0 knots/min, Ps2=4.000 inHg/min and Ps1=2000 Feet/min
- Modes have been set to Control on all 3 outputs

In the Lower section, the profile number (10.1) will be blinking (waiting for **GO** or **CANC**). The name of the profile 'Test-1' is displayed to the right of the profile number. Do NOT press **GO** or **CANC**. Instead, press the **Up-Arrow** key to move to point number 2 of the profile. The screen will appear as follows.

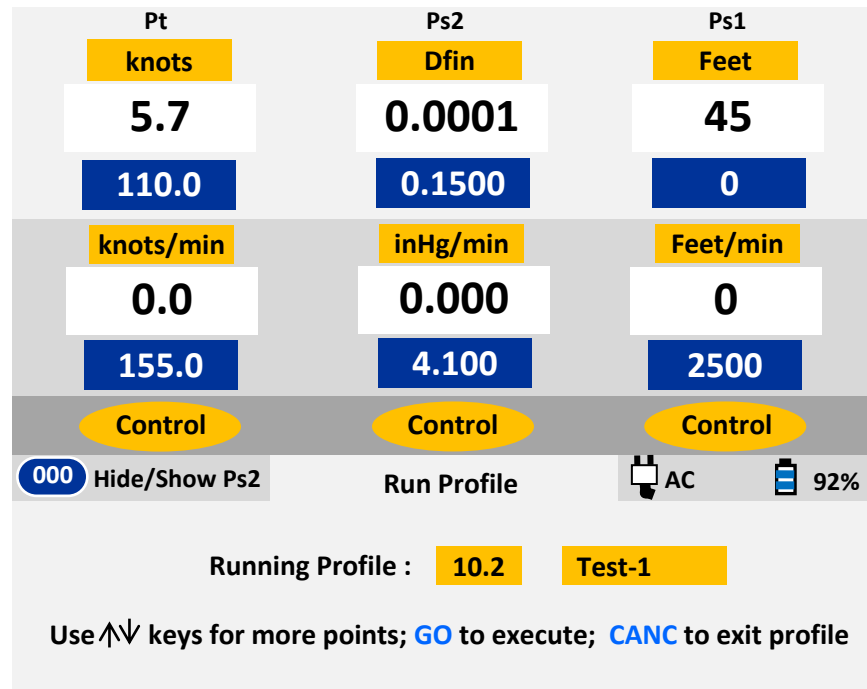


Figure 3.39 : Run Profile (10.2 Blinking)

For this point, units and modes remain the same as point 1, but the Target values and the Rate Target values have changed. In the Lower section, '10.2' is blinking. Keep pressing the **Up-Arrow** key to scroll through all the points of the profile. Use the **Down-Arrow** key to go to the previous point. The last point of the profile is point number 13.

You can cancel out of a profile at any time by pressing **CANC**. The last effective parameters will remain valid even after you cancel out of the profile. You can enter a profile at any point (like 10.6).

Cancel out of Profile 10 by pressing **CANC**. Press **FUNC** and then '4' to return to the 'Run Profile' screen and then enter '10.1' followed by **ENTER**. Again, '10.1' will be blinking and all 12 parameters will be setup. Now, press **GO** to execute the profile. (Before doing this, please ensure that all three ports are closed and all three Vent valves are closed).

Wait for the 6600-NG to achieve the targets set in 10.1. The screen will appear as shown below.

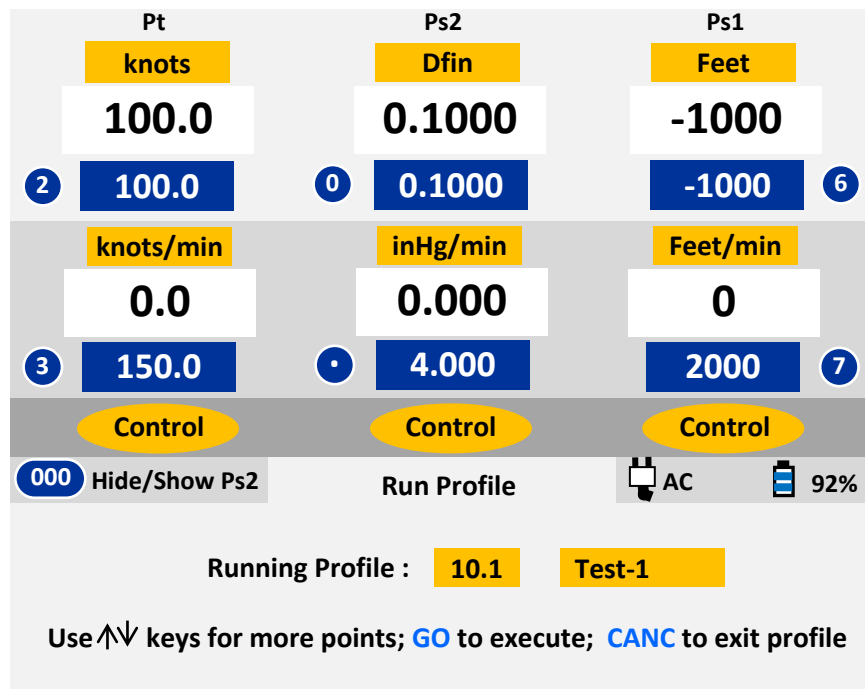


Figure 3.40 : Run Profile (10.1 Achieved)

Now press **Up-Arrow** to move to 10.2, which will be blinking. Press **GO**. Wait for targets to be achieved. Then press **Up-Arrow** again to move to 10.3 and wait for targets to be achieved.

Notice that the Upper section of the screen has key-number symbols **2**, **3**, **0**, **period**, **6** and **7** being displayed next to the Target values (as shown in Figure 3.40 above). This means that these target values can be modified, only by jogging them with the arrow keys. Press **2** to jog the Pt Target value. The screen will appear as shown below.

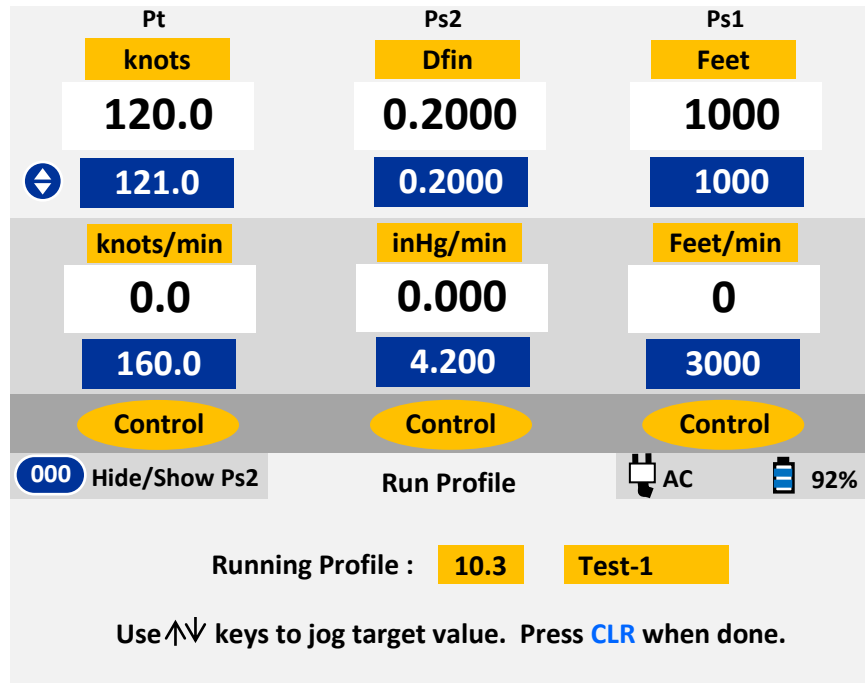


Figure 3.41 : Run Profile (Jog Pt Target at 10.3)

The symbol with the arrows is shown to the left of the Pt Target value. This value can be moved up or down by 1 knot, using the arrow keys. When jogging is completed, return to the Profile by pressing **CLR**. Similarly, the other target values can also be jogged while running the profile.

This feature is especially helpful for making small changes to the target values to check over-speed warnings, altitude alerters, exact switching points for encoders and transponders etc., without leaving the profile.

At this point, you can either continue running the profile or exit out of it by pressing **CANC**.

### 3.10.5 LOAD PROFILE

Profiles are loaded from a PC through the RS232 interface connector on the top panel of the 6600-NG. A serial cable and a USB-to-Serial converter are included with the unit. A profile is loaded from the PC using Hyperterminal (see Section 4 for details). Before loading profiles, the 6600-NG needs to be setup to accept the profiles. This is done by selecting '5' on the Functions menu. Then the Lower screen will appear as shown below.

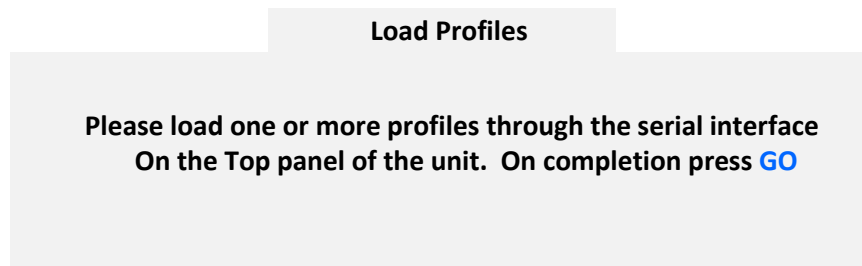


Figure 3.42 : Load Profiles

Stay in this screen and load one or more profiles. When loading is completed, press **GO**. You can exit at any time without loading profiles by pressing **GO**.

### 3.10.6 HEIGHT CORRECTION

**Note: The Height correction is always reset to zero on power-up.**

If the Ps1 ports on the aircraft are significantly higher than the location of the 6600-NG during testing, it may be necessary to correct for this difference in height. This is done using the 'Height Correction' function by selecting '6' on the Functions menu. The following screen will appear

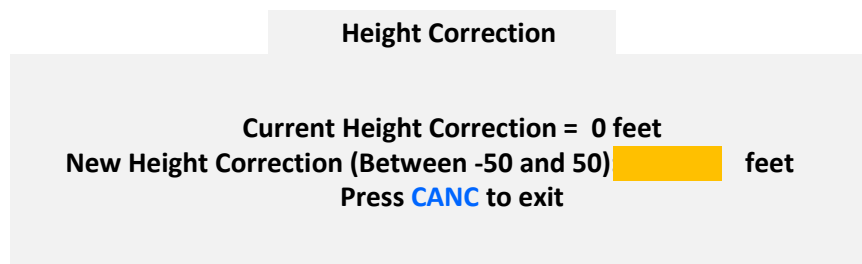


Figure 3.43 : Height Correction

When a valid value (say '20') is entered, the following screen appears.

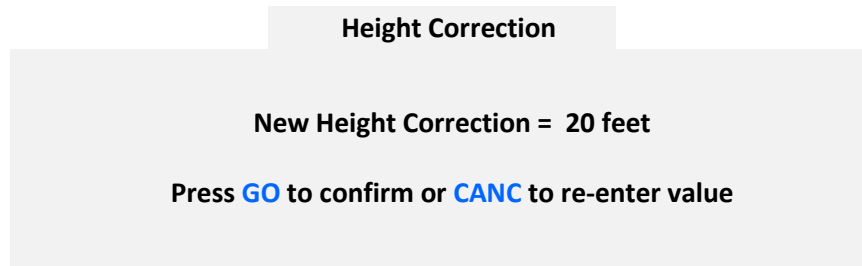


Figure 3.44 : Height Correction confirmation

Unless the location of the tester is higher than the location of the Ps1 ports on the aircraft, the value entered is usually a positive number.

### 3.10.7 SET LEAK TIMERS

**Note:** Timer values are maintained through a power cycle.

To check or modify the Leak timers used in the Leak mode, select '7' on the Functions menu. The screen will appear as follows.

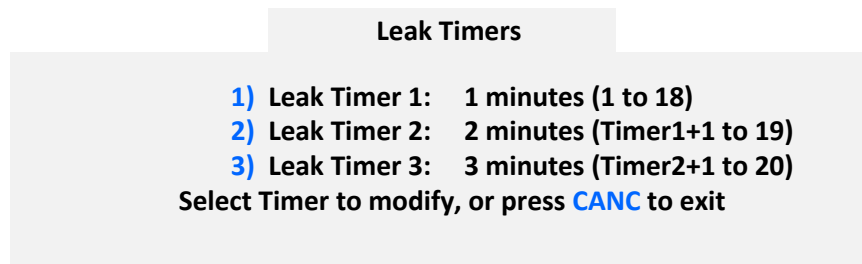


Figure 3.45 : Set Leak Timers

Press '1' to change the value for Leak Timer 1. The screen appears as follows.

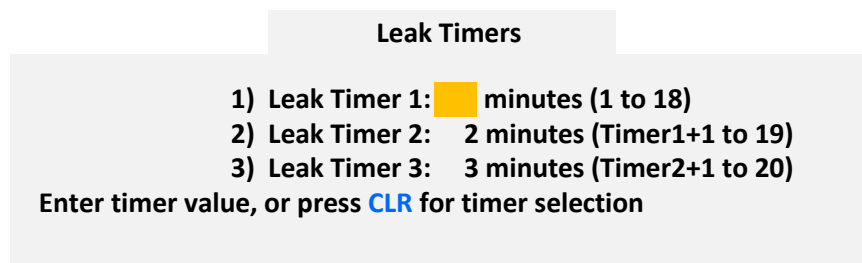


Figure 3.46 : Adjust Leak Timer

Enter a value from 1 to 18 or press CLR to select another timer. The value for Timer-3 must be higher than the value for Timer-2, which must be higher than the value for Timer-1.

### 3.10.8 CALIBRATION (PRELIMINARY)

Section 6 provides details on calibration of the 6600-NG. Before selecting the calibration function it is necessary to set Pt units to 'QcinHg', Ps2 units to 'inHg' and Ps1 units to 'inHg'. Also, all 3 outputs must be in Measure mode. If this is not set up correctly and Function '8' is selected, the following screen will appear.

During calibration, all 3 outputs must be in Measure mode  
and units for each output must be as follows:  
Pt: Qc inHg ; Ps2: inHg ; Ps1: inHg  
Press **CANC** to exit

Figure 3.47 : Calibration (invalid setup)

If the setup is done correctly, selecting option '8' on the Functions menu will bring up the screen shown below.

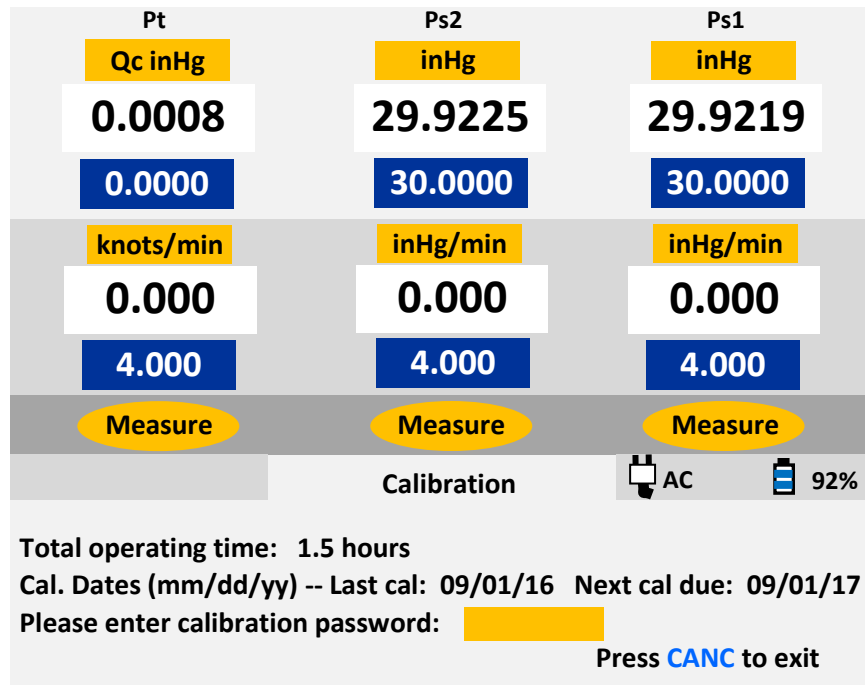


Figure 3.48 : Calibration (password)

Performing a calibration requires a password. However, without a password, other information is provided on this screen.

- a. **Total operating time:** This shows the total time (in increments of 0.1 hours) that the 6600-NG has been operating since it was shipped from the factory. The factory-setting is 0.1 hours.
- b. **Last calibration date:** This is the date ('mm/dd/yy' format) that the 6600-NG was last calibrated. This date is updated each time the 6600-NG is calibrated.
- c. **Next calibration due:** This is the date ('mm/dd/yy' format) that the next calibration is due for the 6600-NG. This date is also updated each time the 6600-NG is calibrated.

Other details of the calibration procedure are provided in Section 6.

**Note: The 6600-NG must be calibrated only by an authorized calibration facility.**

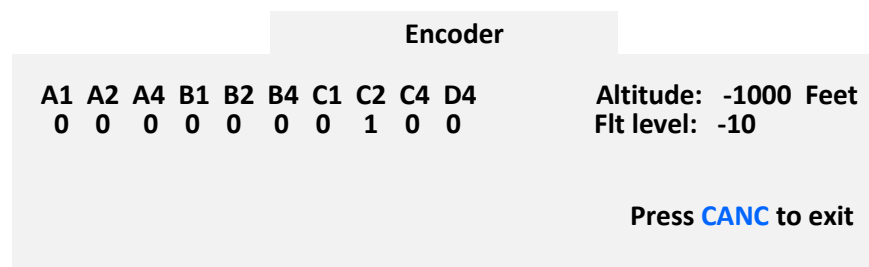
### 3.10.9 ENCODER

An altimeter-encoder can be connected to the 'Encoder' interface connector on the top panel of the 6600-NG. The pin-out of the Encoder interface is provided in Appendix C. When an Encoder is connected, Function '9' shows the 10-bit Gray code that is generated by the Encoder at a specific altitude.

Before selecting Function '9', it is important to set up the 6600-NG properly. Follow these steps:

- a. Connect the Ps1 output of the 6600-NG to the encoder's Ps1 port.
- b. Close (cap-off) the Pt and Ps2 ports of the 6600-NG.
- c. Set Units as follows: Pt=knots, Ps2=Dfin and Ps1=Feet (or Meters)
- d. Set the Ps1 Rate target to a value of 3000 ft/min or less.
- e. Change to Control mode by pressing **GND**.
- f. Perform a quick leak-check on the encoder at 3000 feet above "Ground".
- g. Proceed only if the leak is less than 30 ft/min.
- h. Set the Ps1 Target to -1000 feet and GO. Wait for the Actual altitude to be steady at -1000 feet.

Now select Function '9'. The following screen should appear.



**Figure 3.49 : Encoder (1)**

The screen shows the 10-bit code received from the encoder, the flight level equivalent to the code and the current altitude (which is the same as the altitude shown in the Actual Ps1 value in the Upper section).



If the 10-bit code does not match a valid flight-level, then the flight level is shown as 'xxx'. The flight level is placed directly beneath the actual altitude so that it is easy to compare them and determine if they match.

To change the Target Altitude, press '6' (this is allowed since the key-number symbol '6' is placed to the right of the Altitude Target in the Upper section). The screen will appear as below.

<b>Encoder</b>										
<b>A1</b>	<b>A2</b>	<b>A4</b>	<b>B1</b>	<b>B2</b>	<b>B4</b>	<b>C1</b>	<b>C2</b>	<b>C4</b>	<b>D4</b>	<b>Altitude: -1000 Feet</b>
0	0	0	0	0	0	0	1	0	0	<b>Flt level: -10</b>
<b>Target Altitude:</b> <span style="background-color: yellow; display: inline-block; width: 80px; height: 15px;"></span> <b>Feet</b>										
<b>Use arrow keys to jog target value</b>										<b>Press CANC to exit</b>

**Figure 3.50 : Encoder (Target Altitude entry)**

Enter a new target altitude (which will appear blinking in the Ps1 Target field in the Upper section), then press **GO**. It is also possible to jog the current target (up or down) using the arrow keys. Similarly, the altitude rate target can also be changed or jogged, if necessary.

The ideal way to test an encoder would be to start at -1000 feet, with an altitude rate of about 3000 feet/min. Check the encoder output at -1000 feet, then set the target altitude to the maximum altitude of the encoder. As the Actual altitude moves up, the flight levels will change and it will be easy to see if they match the altitude within the expected +/-50 ft band. If necessary, reduce the altitude rate. If a discrepancy is noticed, or an invalid code ('xxx') is received, change the target altitude to examine the error more thoroughly. Otherwise, allow the test to continue until the final target altitude is reached.

**Note: The power supplied on the Encoder interface connector of the 6600-NG is +12 Volts DC. If the encoder being tested requires a different voltage, it will need to be supplied externally. If this is done, the Ground of the external power supply must be connected to the Ground (GND) pin of the Encoder interface connector. (See pin-out details in Appendix C).**

### 3.11 BATTERY OPERATION

If the 6600-NG has been supplied with an (optional) battery, the battery will be capable of operating the 6600-NG for up to 8 hours.

The battery can be recharged simply by connecting AC power to the 6600-NG and turning On the AC On/Off switch. It is not necessary to turn On the Battery On/Off switch during charging.

Internal fans and ventilating fans will operate during the charging process. The red "Charging" LED will turn On. When this LED turns Off, it indicates that the charging is complete. Typically it requires 10 to 12 hours to recharge a fully-discharged battery.

**Note: The internal charger will not recharge the battery if the ambient temperature (inside the tester) is below 0°C. If the 6600-NG is equipped with heaters, these will operate to bring the internal temperature above 5°C before the charging is started.**

**Note: It is possible to operate the 6600-NG while the battery is being charged.**

Section 3.2 provides details of the battery-charge percentage that is displayed on the Remote unit while the unit is in operation.

### 3.12 LEAK-CHECKING THE 6600-NG

While performing an internal leak-check of the 6600-NG itself, it is important to keep in mind several issues that significantly affect the results of this leak-check.

- a. The fittings on the output ports must be torqued down adequately, even though O-rings are provided on these fittings.
- b. When performing a leak-check at 5 inHg, after the target has been reached, the unit must be left in Control mode for a minimum of 10 minutes to allow the temperature effects to subside. Because of the small internal volume in the 6600-NG, temperature effects are greatly amplified and appear (incorrectly) as a leak to the user.
- c. Temperature effects do not have a major impact on the leak-rate when the tester is connected to an aircraft through hoses. The additional volume in the system when the aircraft is connected helps in negating the temperature effects.
- d. The additional volume when the aircraft is connected also helps in significantly reducing the contribution of the internal leak of the 6600-NG, to the overall leak in the system. Typically, the internal leak of the 6600-NG contributes less than 10% to the leak with the aircraft connected. Therefore, an internal leak of 100 ft/min in the 6600-NG will contribute only 10 ft/min (or less) to the leak measured with the aircraft connected.

To perform an internal leak-check of the 6600-NG, follow these steps:

1. Set the Ps1 units to Feet. Note the Ps1 Rate Target value (needed at end of test). Set the Ps1 Rate target to 10,000 ft/min, **GO**.
2. Set the Leak-Timers to 1, 2 and 3 minutes. Set the Units to Pt=Pt inHg, Ps2=inHg, Ps1=inHg.
3. Set all 3 Rate Targets to 4.0 inHg/min.
4. Perform a Self-Test (**TEST**). Then close all three output ports very tightly.
5. Go-To-Ground. (**GND**)
6. Set the Pt, Ps2, Ps1 Target values to 5.0 inHg. **GO**.
7. Once all 3 targets have been achieved, wait for a minimum of 10 minutes to allow temperature effects to stabilize. (All 3 outputs must remain in Control mode)
8. Put all 3 outputs into Leak mode simultaneously. **GO**.
9. After 1 minute in Leak mode, the leak values will be updated. The total leak shown for each of the outputs must not exceed 0.0200 inHg.
10. If the total leak exceeds the maximum allowed, cancel out of the leak-screen and repeat the leak-test from Step 7, **after further tightening the caps on the output ports**.
11. If the total leak continues to exceed the maximum allowed, the unit may need to be repaired.
12. Go-to-Ground. (**GND**). After Ground is achieved, change Ps1 units to Feet and reset the Ps1 Rate Target to its original value. **GO**.
13. Turn Off the 6600-NG.

## SECTION 4 : PROFILES

Profiles are created in Microsoft Excel and loaded into the 6600-NG through the COM1 port on your PC using the Hyperterminal program that is normally available on all PC's.

### 4.1 WHAT IS A PROFILE

A profile is a set of up to 50 points that tell the 6600-NG what you would want it to do at each point. Each point consists of 12 parameters: 1) Pt units, 2) Pt mode, 3) Pt target value, 4) Pt Rate target value, 5) Ps1 units, 6) Ps1 mode, 7) Ps1 target value, 8) Ps1 Rate target value, 9) Ps2 units, 10) Ps2 mode, 11) Ps2 target value and 12) Ps2 Rate target value. These 12 parameters are defined by you in the Excel program.

A total of 10 such profiles can reside in the 6600-NG at any time. Each profile is identified by a number between 1 to 10 and also a name which can have up to 12 characters. The profile number and the name are also part of the profile that is created in Excel.

A typical profile named "Sample" is shown below as it would appear in Excel.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Profile											
2	Sample					3			0			
3	knots	Control	100.0	150.0	Feet	Control	0	6000	Dfin	Control	0.0000	4.000
4	knots	Control	200.0	150.0	Feet	Control	0	6000	Dfin	Control	0.1000	4.000
5	knots	Leak	200.0	150.0	Feet	Control	0	6000	Dfin	Control	0.1000	4.000
6	knots	Control	100.0	150.0	Feet	Control	1000	6000	Dfin	Control	0.2000	4.000
7	knots	Control	200.0	150.0	Feet	Control	5000	6000	Dfin	Control	0.3000	4.000
8	knots	Control	300.0	150.0	Feet	Control	10000	6000	Dfin	Control	0.4000	4.000
9	knots	Control	100.0	150.0	Feet	Control	18000	6000	Dfin	Control	0.5000	4.000
10	knots	Control	100.0	150.0	Feet	Leak	18000	6000	Dfin	Control	0.5000	4.000
11	knots	Control	100.0	150.0	Feet	Control	30000	6000	Dfin	Control	0.6000	4.000
12	knots	Control	100.0	150.0	Feet	Control	50000	6000	Dfin	Control	0.7000	4.000
13	knots	Control	20.0	150.0	Feet	Control	Ground	6000	Dfin	Control	0.0000	4.000
14	knots	Measure	20.0	150.0	Feet	Measure	Ground	6000	Dfin	Measure	0.0000	4.000
15	END											

Row 1 always says "Profile". This indicates to the 6600-NG that a profile is to follow.

Row 2 left cell shows the name of the profile. This profile is named "Sample". The name can have up to 12 alphanumeric characters. This name will be displayed on the Remote unit when this particular profile is Executed (Run).

Row 2 middle cell shows the number of the profile. This profile has a number 3. This tells the 6600-NG that this profile is to be loaded in as profile number 3. When profile 3 is Run on the 6600-NG, this "Sample" profile will be executed. This number can be any number between 1 and 10. When this profile is loaded into the 6600-NG it will overwrite the previous profile that was resident in the 6600-NG as number 3.

Row 2 right cell shows the height correction. This should normally be zero, unless a specific height correction is required.

Rows 3 through 14 are the points of the profile. This profile has only 12 points. For each of these points the columns contain the following information:

Column	Information
A	Pt units
B	Pt mode
C	Pt target value
D	Pt Rate target value
E	Ps1 units
F	Ps1 mode
G	Ps1 target value
H	Ps1 Rate target value
I	Ps2 units
J	Ps2 mode
K	Ps2 target value
L	Ps2 Rate target value

In the sample profile, Row 3, which is the first point in the profile, tells the 6600-NG to setup the parameters as follows:

- A. Pt Units = knots
- B. Pt mode = Control
- C. Pt target = 100.0 knots
- D. Pt Rate target = 150.0 knots/min
- E. Ps1 units = Feet
- F. Ps1 mode = Control
- G. Ps1 target = 0 feet
- H. Ps1 Rate target = 6000 ft/min
- I. Ps2 units = Dfin
- J. Ps2 mode = Control
- K. Ps2 target = 0.0000 Dfin
- L. Ps2 Rate target = 4.000 inHg/min

Row 4 (point 2) makes the 6600-NG go to Pt=200 knots at 150 knots/min, Ps1=0 feet at 6000 ft/min and Ps2=0.1000 Dfin at 4.000 inHg/min.

Row 5 (point 3) puts the Pt into Leak mode while still keeping Ps1 in Control at 0 feet and Ps2 in Control at 0.1000 Dfin.

Row 6 (point 4) puts the Pt back into Control and takes it down to 100 knots at 150 knots/min. Ps1 is simultaneously moved up to 1000 feet at 6000 ft/min and Ps2 is moved to 0.2 Dfin at 4.0 inHg/min.

Row 7 (point 5) takes Pt up to 200 knots at 150 knots/min, Ps1 up to 5000 feet at 6000 ft/min and Ps2 up to 0.3 Dfin at 4.0 inHg/min.

Row 8 (point 6) takes Pt up to 300 knots at 150 knots/min, Ps1 up to 10,000 feet at 6000 ft/min and Ps2 up to 0.4 Dfin at 4.0 inHg/min.

Row 9 (point 7) takes Pt down to 100 knots at 150 knots/min, Ps1 up to 18,000 feet at 6000 ft/min and Ps2 up to 0.5 Dfin at 4.0 inHg/min.

Row 10 (point 8) keeps Pt at 100 knots, Ps2 at 0.5 Dfin and puts Ps1 into Leak mode while at 18,000 feet.

Row 11 (point 9) keeps Pt at 100 knots and ramps Ps1 in Control mode to 30,000 feet at 6000 ft/min and Ps2 up to 0.6 Dfin at 4.0 inHg/min

Row 12 (point 10) keeps Pt at 100 knots, ramps Ps1 to 50,000 feet at 6000 ft/min and Ps2 to 0.7 Dfin at 4.0 inHg/min.

Row 13 (point 11) takes Pt down to 20 knots at 150 knots/min, ramps Ps1 back to "Ground" at 6000 ft/min and Ps2 to 0.0 Dfin at 4.0 inHg/min.

Row 14 (point 12) puts Pt, Ps1 and Ps2 into Measure mode.

Row 15, column A, indicates the end of the Profile by "END".

## 4.2 CREATING A PROFILE

1. Start with opening the "Profile Template.xls" file.
2. Do not change anything on Row 1.
3. On Row 2, left-most cell, replace "Template" with the name of your profile. Limit is 12 characters.
4. On Row 2, middle cell, replace "3" with a profile number between 1 and 10 that you would like this profile to be saved as, in the 6600-NG.
5. Enter the height correction, if required. Otherwise leave the cell as 0.
6. In rows 3 through 50, change the cells as per the points you want to generate in your test. For entering Units and Modes use the drop down menu selections for those cells. If you do not use all the rows for your profile, select the cells in the unused rows up to row 50 and delete them, shifting the cells up. DO NOT delete rows 51, 52 and 53.
7. Format the cells with values so that they show the correct number of digits after the decimal point. For instance, knots values have 1 digit after the decimal, Mach values have 3 digits after the decimal. Format the cell just like a regular Excel cell with a number. The following tables list the digits after the decimal for the various units.

Pt units	Digits after decimal		Comment
	Pt target	Pt Rate target	
knots	1	1	
Mach	3	1	Rate is in knots/min
km/hr	1	2	Rate is in km/hr/sec
mph	1	1	
Pt inHg	4	3	
Qc inHg	4	3	
Pt mbar	2	2	

Qc mbar	2	2	
Pt psi	3	3	
Qc psi	3	3	
Pt mmHg	2	2	
Qc mmHg	2	2	
Pt kpa	3	3	
Qc kpa	3	3	
EPR	3	3	Rate is in inHg/ min

Ps1 units	Digits after decimal		Comment
	Ps1 target	Ps1 Rate target	
Feet	0	0	
Meters	1	2	Rate is in meters/sec
inHg	4	3	
Mbar	2	2	
Psi	3	3	
mmHg	2	2	
kpa	3	3	

Ps2 units	Digits after decimal		Comment
	Ps2 target	Ps2 Rate target	
inHg	4	3	
Diff. inHg	4	3	
mbar	2	2	
Diff. mbar	2	2	
psi	3	3	
Diff. psi	3	3	
mmHg	2	2	
Diff. mmHg	2	2	
kpa	3	3	
Diff. kpa	3	3	
Feet	0	0	
Meters	1	2	Rate is in meters/sec
knots	1	1	
Km/hr	1	2	Rate is in km/hr/sec

8. Check the values, units and modes in your profile to ensure they are all valid and correct. If you are going into the Leak mode at any point, then make sure that you achieve that point in Control mode before you actually change to Leak mode. For example, if you want to perform a Leak at 18,000 feet, then you must have one point in Control mode which takes the Ps1 output to 18,000 feet, followed by another point where the Ps1 output is put into Leak mode at 18,000 feet.
9. Now that the profile is complete, save the profile as an Excel file (.xls file) using the name of the profile as the filename. Then save it again using the "Save As" command but this time change the file type (using the "Save as type:" drop-down selection) to "Text - Tab delimited". Use the profile name as the filename again. You will get many warnings from Excel about the incompatibility of this text file, but simply say "Yes" to all the warnings. Once you have saved

the file as a text file, you will need to close the file. When you do this, many more warnings will pop up. Please say "yes" to all these too.

10. At the end, you should have two files for your new profile. One .xls file and one .txt file, both with the same filename. Your profile has been created.

### 4.3 SETTING UP HYPERTERMINAL

You load a profile into the 6600-NG using the Hyperterminal program. At first you need to setup Hyperterminal. You only need to do this once.

1. Hyperterminal comes loaded in your PC as part of the accessories. Go into "All Programs", then select "Accessories", then select "Communication", then select Hyperterminal. It will ask you to setup a new connection. Create a new connection with the name "6600-NG". A dialog box named "Connect To" will appear. The bottom selection in this box is "Connect using". From the drop down menu in "Connect using", select "COM1". Select "OK". A new dialog box will open named "Com1 Properties". Setup the Port Settings as follows:

Bits per second: 9600  
Data Bits: 8  
Parity: None  
Stop Bits: 1  
Flow control: None

Select "Apply". Then select "OK". This will take you into the "6600-NG Hyperterminal" window.

2. Select "File". Select "Properties". A new dialog box "6600-NG Properties" appears. Select the "Settings" tab. In the "Emulation" menu select "ANSI". Select "OK". Now you are back in the "6600-NG Hyperterminal" window. Select "File", select "Save". Close this window. A warning appears, select "Yes". Hyperterminal is now setup.
3. To verify that the 6600-NG file is setup in Hyperterminal, select "All Programs" from the desktop, select "Accessories", select "Communications", select "Hyperterminal". The "6600-NG" icon should appear. If it does not appear then you will need to repeat steps 1 and 2 above.

### 4.4 LOADING PROFILES

1. Connect the one-to-one RS232 cable to the RS232 port on the top panel of the 6600-NG. You will need to remove the access panel for this. Connect the other end of this cable to the COM1 port on your PC. If you are using a USB port on the PC, then connect through the USB to RS232 converter provided with the unit.
2. Setup the 6600-NG for loading profiles, as shown in Section 3.10.5.

3. Start the 6600-NG file in Hyperterminal. On the task bar select "Transfer". Then select "Send Text file". The dialog box will open that allows you to select the .txt file you want to transfer. Open this file. You will see the profile being loaded as it is echoed back from the 6600-NG.
4. After the profile has completed loading, the last section should say "PASS". If it does not then the profile did not load correctly. If no characters are echoed when you open the .txt file to transfer (load), then you probably have a communication problem.
5. If you see "garbage" on the first line of the profile as it loads then you should redo the load. This could happen on some systems on the very first profile you load during a session in Hyperterminal.
6. To load more profiles in the same session simply repeat step 3 from the point you select "Transfer". After all profiles you wish to load have been transferred, press GO on the 6600-NG. Check that the profile loaded properly by selecting Function 4 on the 6600-NG and entering the profile number starting at step 1 (i.e. "10.1" to check profile 10). Step through the profile using only the Up-Arrow key and check if the points match what you have setup on the PC as your profile.

#### 4.5 RUNNING A PROFILE

Details on how to Run a profile are provided in Section 3.10.4



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## SECTION 5 : TYPICAL USE

This section assumes that the user has read Section 3 and understood the functioning of the 6600-NG. Please do not proceed without first reading Section 3.

**Caution:** If the aircraft does not have any Ps2 ports then the Ps2 output of the tester must be capped-off.

Follow the procedure shown in Figure 5.1 below. This procedure should be used each time the tester is used with an aircraft. The procedure allows the user to perform low-level leak checks to ensure that the adapters and hoses are reasonably leak-tight.

**Caution:** If the aircraft does not have any Ps2 ports and the Ps2 output of the tester is capped-off, then before starting Step 4 of the procedure, it is important to change the Ps2 units to "Dfin" and set the Ps2 Target value to 0.0 Dfin.

**Caution:** During your tests, do not put Pt, Ps2 or Ps1 in MEASURE mode unless the aircraft is at "Ground". Use only the Control and Leak modes.

During your test procedure, if you lose power, the 6600-NG will maintain the pressure. When power comes back on, the 6600-NG and the aircraft will be at the same pressure as before except for pressure lost due to leaks in the system.

If the 6600-NG behaves erratically for whatever reason, turn Off the 6600-NG using the Power key on the Remote unit. Turn the unit back On after 30 seconds and attempt to use the 6600-NG again.

The 6600-NG is capable of overcoming substantial leaks in the system. It is not capable of overcoming extremely large leaks. Therefore it is essential that the system be reasonably leak-tight before taking the aircraft to higher altitude or airspeed.

During a leak-check if an excessive leak is detected, the 6600-NG will automatically put the outputs into Control mode. An error message will indicate that a large leak exists. In such cases, **CANC** out of Leak mode, go back to Ground and go through the leak-check process shown in Step 3 of the procedure in Figure 5.1, to find and fix the leak before proceeding further.

It may be helpful to keep a copy of the procedure, shown in Figure 5.1, with the 6600-NG to assist the operator while using the 6600-NG.

### TYPICAL USE

#### STEP 0: PREP AIRCRAFT

- 0.1 Connect adapters and hoses to the aircraft, tape-up all unused ports on the aircraft.
- 0.2 Leave hose ends near the tester but DO NOT connect to tester yet.
- 0.3 Set the BARO adjust on the aircraft to 29.92 or 1013.25 or 760 mmHg or Standard.

#### STEP 1: PREP tester & SELF TEST

- 1.1 Turn ON tester. Check / adjust leak timers.
- 1.2 Set Units: Ps1 & Ps2 to "inHg" and Pt to "Pt inHg". (Key sequence: **5, 3; 9, 1; 1, 5**)
- 1.3 Set all Rate targets to 4.0 inHg/min. (Key sequence: **3, 4, ENTER; period, 4, ENTER; 7, 4, ENTER**)
- 1.4 Open Ps1, Ps2, Pt ports on tester to ambient. Close Vent valves. Run Self-test (**TEST**)

#### STEP 2: GO-TO-GROUND

- 2.1 Connect hoses from aircraft to tester. Go-To-Ground (**GND**)

#### STEP 3: LOW-LEVEL LEAK CHECK

- 3.1 Verify stable control at Ground on all 3 outputs. If not stable at the target values, there must be a large leak on the output that is not stable at the target. Turn Off tester and fix problem.
- 3.2 If Actual values are stable at Ground, set Target values as follows:  
Ps1= 7 inHg **below** Ground, Ps2= 6 inHg **below** Ground, Pt= 5 inHg **below** Ground  
(Example: If the Ground target value is 29.0 inHg then set targets as follows:  
Ps1= 22.0 inHg, Ps2= 23.0 inHg, Pt= 24.0 inHg. For this example, the key sequence would be: **6, 2, 2, ENTER; 0, 2, 3, ENTER; 2, 2, 4, ENTER**).
- 3.3 Press **GO**. If targets cannot be achieved, there must be a large leak, so press **GND**, wait for Actual values to come close to Ground, then turn Off tester and fix problem.
- 3.4 If targets can be achieved and all 3 Actual values are stable, wait for 1 minute, then put all 3 outputs into Leak mode (Follow this key sequence: **4, 2; ±, 2; 8, 2**). All 3 modes will be flashing "Leak". Press **GO**. The lower screen will show the leak values.
- 3.5 At the end of 1 minute, Ps1, Ps2 and Pt, each should not leak more than 0.1 inHg.
- 3.6 Press **CANC** to exit out of Leak mode. All 3 outputs will automatically return to Control mode.
- 3.7 Return to Ground by pressing **GND** and **GO**. Wait for Actual values to be stable at Ground.
- 3.8 If any of the Leak values in step 3.5 exceeded 0.1 inHg, turn Off tester, fix the problem and restart from step 2.1
- 3.9 If all 3 Leak values in step 3.5 were less than 0.1 inHg, proceed to Step 4.

#### STEP 4: TEST AIRCRAFT INSTRUMENTS

- 4.1 Execute your Test Procedure to test cockpit instruments and perform high-level leak checks.
- 4.2 After testing is complete, Go-to-Ground (**GND**). Wait for Ground to be achieved.
- 4.3 Turn off tester, then disconnect hoses.

Figure 5.1

## SECTION 6 : CALIBRATION

### 6.1 EQUIPMENT

This calibration procedure requires the following equipment:

1. Vacuum pump for Pressure Standard
2. Pressure supply of clean, Dry air (dew-point below  $-10^{\circ}\text{C}$ ) at 25 psig, for Pressure Standard
3. Pressure standard with two independently controlled outputs as follows:
  - a. Output-1 should be able to generate differential pressures (with respect to Output-2) between 0 and 30 inHg, with an accuracy of at least 0.002 inHg.
  - b. Output-2 should be able to generate absolute pressures between 1.6 and 38 inHg, with an accuracy of at least 0.002 inHg.

### 6.2 6600-NG TRANSDUCERS

#### Pt Transducer

The Pt output of the 6600-NG has a differential transducer with a range of 0 to 30 inHg differential. The differential pressure is measured with the pressure at the Ps1 output as the reference. This transducer must be calibrated at 0 inHg differential and 30 inHg differential (with respect to Ps1). The accuracy of this transducer is  $\pm 0.003$  inHg.

**Caution:** The pressure applied to the Pt output of the 6600-NG must never be less than the pressure on the Ps1 output. If the Pt pressure is such that the Qc inHg (differential with respect to Ps1) is more negative than  $-0.05$  QcinHg, the Pt pressure will not be correctly displayed.

#### Ps1 and Ps2 Transducers

The Ps1 and Ps2 outputs of the 6600-NG have absolute transducers with a range of 1 to 38 inHg absolute. These transducers must be calibrated at 1.6 inHg and 38 inHg. The accuracy of these transducers is  $\pm 0.002$  inHg.

### 6.3 SETUP OF 6600-NG

To perform a calibration press **FUNC** and then select '8'. However, before selecting the calibration function it is necessary to set Pt units to 'QcinHg', Ps2 units to 'inHg' and the Ps1 units to 'inHg'. Also, all 3 outputs must be in Measure mode. If this is not set up correctly and Function '8' is selected, the following screen will appear.

**During calibration, all 3 outputs must be in Measure mode  
 and units for each output must be as follows:  
 Pt: Qc inHg ; Ps2: inHg ; Ps1: inHg  
 Press **CANC** to exit**

Figure 6.1 : Calibration (invalid setup)

If the setup is done correctly, selecting option '8' on the Functions menu will bring up the screen shown below.

Pt	Ps2	Ps1
Qc inHg	inHg	inHg
<b>0.0008</b>	<b>29.9225</b>	<b>29.9219</b>
<b>0.0000</b>	<b>30.0000</b>	<b>30.0000</b>
knots/min	inHg/min	inHg/min
<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
<b>4.000</b>	<b>4.000</b>	<b>4.000</b>
<b>Measure</b>	<b>Measure</b>	<b>Measure</b>
Calibration		AC  92%
Total operating time: 1.5 hours Cal. Dates (mm/dd/yy) -- Last cal: 09/01/16 Next cal due:09/01/17 Please enter calibration password: <span style="background-color: yellow; display: inline-block; width: 80px; height: 15px;"></span>		
Press <b>CANC</b> to exit		

Figure 6.2 : Calibration (password)

Details of the information provided on the Lower section of this screen are provided in Section 3.10.8.

To display the main calibration screen, enter the password followed by **ENTER**. The main calibration screen will appear as follows.

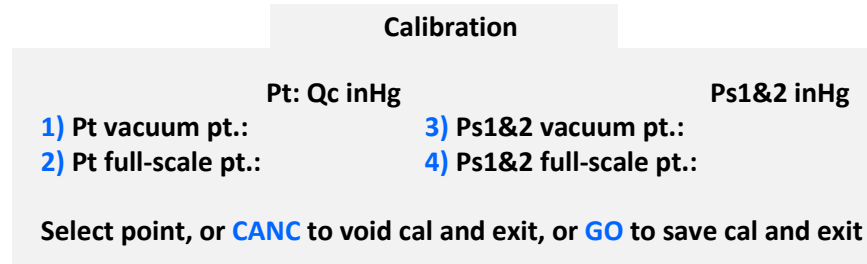


Figure 6.3 : Calibration (Main)

Connect the differential-pressure output (QcinHg) of the Pressure Standard to the Pt output of the 6600-NG. Connect the absolute-pressure output (PsinHg) of the Pressure Standard to the Ps1 and Ps2 outputs of the 6600-NG. (The Ps1 and Ps2 outputs can be internally connected together by opening the Ps2 Vent valve while keeping the Ps2 output closed)

The calibration adjustment requires generating two differential pressures at the Pt output and two absolute pressures at the Ps1 & Ps2 outputs. The details are provided in Section 6.4 below. The verification and entry of non-linearity offsets (if required) requires generating pressures in 10% increments of the full-scale pressure for each output. The details are provided in Section 6.5 below.

#### 6.4 CALIBRATION PROCEDURE

The step-by-step procedure for calibrating the 6600-NG is provided below. The assumption made is that the Pressure Standard can generate differential pressures (QcinHg) for the Pt output of the 6600-NG and can simultaneously generate absolute pressures (PsinHg) for the Ps1 and Ps2 outputs of the 6600-NG.

The sample calibration report shown in Figure 6.10 (at the end of this Section) will be referenced in the procedure below.

1. Set up the 6600-NG as detailed in Section 6.3.
2. Keep QcinHg=0 and exercise PsinHg between 1.6 inHg and 38 inHg, three times. This will purge the system with clean Dry Air.
3. Generate exactly QcinHg=0.0000 and PsinHg=1.6000. Wait for a minimum of 5 minutes to allow temperature effects to stabilize.
4. Note (on the calibration report, not on the Remote unit) the 6600-NG's Ps1 and Ps2 Actual values as the "As Found" values for the Ps1 and Ps2 vacuum point. (See Figure 6.10)
5. Press '3' on the Remote to enter the 'Ps1&2' vacuum point. The screen will appear as follows.

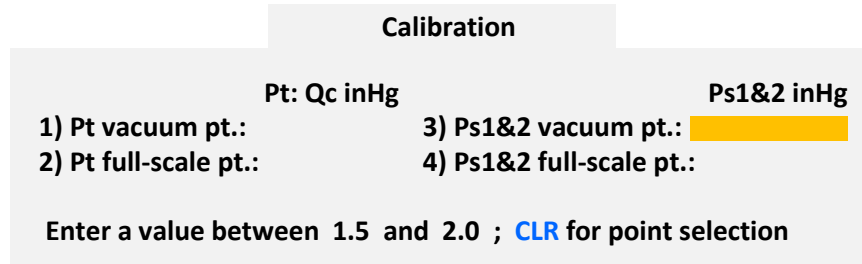


Figure 6.4

6. Enter '1.6000' followed by **ENTER** on the keypad. The highlighted field will be replaced by '1.6000'. Press **CLR** to return to the point-selection screen (Figure 6.3). You should see '1.6000' on this screen, as the Ps1&2 vacuum point. This indicates to the 6600-NG that the absolute pressure on the Ps1 and Ps2 outputs is currently exactly 1.6000 inHg.
7. Generate exactly QcinHg=0.000 and PsinHg=8.0000. Wait for a minimum of 5 minutes to allow temperature effects to stabilize.
8. Note (on the calibration report, not on the Remote unit) the 6600-NG's Pt Actual value as the "As Found" values for the Pt vacuum point. (See Figure 6.10)
9. Press **'1'** on the Remote to enter the Pt vacuum point. The screen will appear as follows.

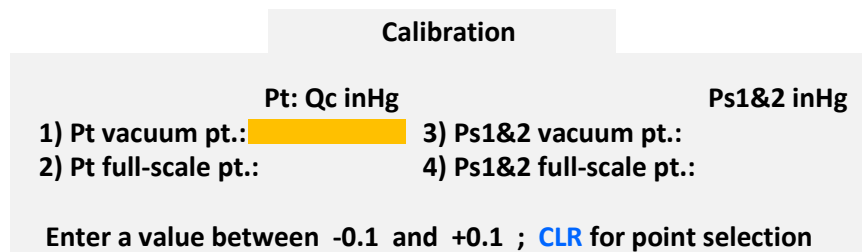


Figure 6.5

10. Enter '0.0000' (or simply 0) followed by **ENTER** on the keypad. The highlighted field will be replaced by '0.0000'. Press **CLR** to return to the point-selection screen (Figure 6.3). You should see '0.0000' on this screen, as the Pt vacuum point. This indicates to the 6600-NG that the differential pressure on the Pt output is currently exactly 0.0000 inHg.
11. Generate exactly QcinHg=30.0000 and PsinHg=8.0000. Wait for a minimum of 5 minutes to allow temperature effects to stabilize.
12. Note (on the calibration report, not on the Remote unit) the 6600-NG's Pt Actual value as the "As Found" values for the Pt full-scale point. (See Figure 6.10)
13. Press **'2'** on the Remote to enter the Pt full-scale point. The screen will appear as follows.

Calibration	
Pt: Qc inHg	Ps1&2 inHg
1) Pt vacuum pt.:	3) Ps1&2 vacuum pt.:
2) Pt full-scale pt.:	4) Ps1&2 full-scale pt.:
Enter a value between 29.6 and 30.0 ; CLR for point selection	

Figure 6.6

14. Enter '30.0000' (or simply 30) followed by **ENTER** on the keypad. The highlighted field will be replaced by '30.0000'. Press **CLR** to return to the point-selection screen (Figure 6.3). You should see '30.0000' on this screen, as the Pt full-scale point. This indicates to the 6600-NG that the differential pressure on the Pt output is currently exactly 30.0000 inHg.
15. Generate exactly QcinHg=0.0000 and PsinHg=38.0000. Wait for a minimum of 5 minutes to allow temperature effects to stabilize.
16. Note (on the calibration report, not on the Remote unit) the 6600-NG's Ps1 and Ps2 Actual values as the "As Found" values for the Ps1 and Ps2 full-scale point. (See Figure 6.10)
17. Press '4' on the Remote to enter the Ps1&2 full-scale point. The screen will appear as follows.

Calibration	
Pt: Qc inHg	Ps1&2 inHg
1) Pt vacuum pt.:	3) Ps1&2 vacuum pt.:
2) Pt full-scale pt.:	4) Ps1&2 full-scale pt.:
Enter a value between 37.5 and 38.5 ; CLR for point selection	

Figure 6.7

18. Enter '38.0000' (or simply 38) followed by **ENTER** on the keypad. The highlighted field will be replaced by '38.0000'. Press **CLR** to return to the point-selection screen (Figure 6.3). You should see '38.0000' on this screen, as the Ps1&2 full-scale point. This indicates to the 6600-NG that the absolute pressure on the Ps1 and Ps2 outputs is currently exactly 38.0000 inHg.
19. The calibration points have now been entered. You should be in the screen shown in Figure 6.3. Press **GO** to save the points and exit this screen. If you press **CANC**, the calibration will be void. When GO is pressed, the screen will appear similar to the one shown below.

Cal. results	
Calibration successful. New results shown below	
Pt zero (PZ): -0.0023	Ps2 zero (DZ): -0.0016 Ps1 zero (SZ): 0.0014
Pt slope (PS): 0.999865	Ps2 slope (DS): 0.999654 Ps1 slope (SS): 0.999798
Calibration date: Month (mm): Day (dd): Year (yy):	
Please enter 2 digits in each field	

Figure 6.8

20. The calibration results showing the zero offset values and slope values are displayed in this screen. Enter the current date as the 'Calibration date'. After the Year has been entered, the screen will appear similar to the one shown below.

**Cal. results**

**Calibration successful. New results shown below**

**Pt zero (PZ): -0.0023 Ps2 zero (DZ): -0.0016 Ps1 zero (SZ): 0.0014**  
**Pt slope (PS): 0.999865 Ps2 slope (DS): 0.999654 Ps1 slope (SS): 0.999798**

**Calibration date: 07/04/17 Note results, then press GO**

Figure 6.9

21. Note the calibration results, then press **GO**. Calibration is complete. The Lower section of the screen will blank out. The Actual values displayed in the Upper section should typically be 0.000 QcinHg for Pt and 38.000 inHg for Ps1 and Ps2.
22. Do not disconnect the Pressure Standard. It will be required for the verification process shown below.

## 6.5 VERIFICATION PROCEDURE

During the verification process, it is possible to correct for the non-linearity of the transducers at each verification point. To do this, it is necessary to send the non-linearity offsets from a PC to the RS232 serial port on the 6600-NG, using a program similar to Hyperterminal. Details of this setup are provided in Section 8.1.

Once communication between the 6600-NG and the PC has been setup and verified, in Hyperterminal, enter the command:

CP=xxxxxx followed by ENTER, where 'xxxxxx' is the calibration password.

If the password is correct, the 6600-NG will echo back a '0'. This completes the setup required for entering the non-linearity offsets, which will be entered at various points in the verification process detailed below.

The table shown below provides the pressure values for QcinHg and PsinHg that need to be generated for each point of the verification process. It also includes, for each point, the offset commands (followed by specific values) that may be entered through the RS232 port. This table is referenced in the procedure that follows.



Verification points					
Point	QcinHg	Pt offset	PsinHg	Ps1 offset	Ps2 offset
1	0.0000		1.6000	No offset	No offset
2	0.0000		3.8000	S1 (10%)	D1 (10%)
3	0.0000	No offset	7.6000	S2 (20%)	D2 (20%)
4	3.0000	P1 (10%)	7.6000		
5	6.0000	P2 (20%)	7.6000		
6	9.0000	P3 (30%)	7.6000		
7	12.0000	P4 (40%)	7.6000		
8	15.0000	P5 (50%)	7.6000		
9	18.0000	P6 (60%)	7.6000		
10	21.0000	P7 (70%)	7.6000		
11	24.0000	P8 (80%)	7.6000		
12	27.0000	P9 (90%)	7.6000		
13	30.0000	No offset	7.6000		
14	0.0000		11.4000	S3 (30%)	D3 (30%)
15	0.0000		15.2000	S4 (40%)	D4 (40%)
16	0.0000		19.0000	S5 (50%)	D5 (50%)
17	0.0000		22.8000	S6 (60%)	D6 (60%)
18	0.0000		26.6000	S7 (70%)	D7 (70%)
19	0.0000		30.4000	S8 (80%)	D8 (80%)
20	0.0000		34.2000	S9 (90%)	D9 (90%)
21	0.0000		38.0000	No offset	No offset

Offsets are entered through Hyperterminal as follows:

For Ps1 offsets: Sn=xxxx followed by ENTER

For Ps2 offsets: Dn=xxxx followed by ENTER

For Pt offsets: Pn=xxxx followed by ENTER

where n is the offset number between 1 and 9, and 'xxxx' is the positive or negative offset value equal to (Actual value - Pressure Standard value).

For example, at point 2 (Pressure Standard = 3.8000 PsinHg), if the 6600-NG Ps1 Actual value is 3.7982, the offset value will be (3.7982 - 3.8000 = -0.0018), and the command sent to the 6600-NG would be:

S1=-0.0018 followed by ENTER

At point 2, if the 6600-NG Ps1 Actual value is 3.8015, the offset value will be (3.8015 - 3.8000 = 0.0015), and the command sent to the 6600-NG would be:

S1=0.0015 followed by ENTER

If the commands are sent correctly, the 6600-NG will echo back '0'. When the offset is entered, the 6600-NG Actual value (Pt, Ps2 or Ps1) will immediately change to reflect the correction made due to the offset

entered. The objective is to enter an offset that causes the Actual value to match the value of the Pressure Standard.

An offset may be entered as a value with 4 digits after the decimal point. This allows offset entry of values as small as  $\pm 0.0001$  inHg.

**Note: There are no offsets for the 0.0000 inHg and 30.0000 inHg points for the Pt output. Also, there are no offsets for the 1.6000 inHg and 38.000 inHg points for the Ps1 and Ps2 output.**

**Note: When offset values are entered, they are actually added to the existing offset value already resident in the 6600-NG.**

### **Verification Procedure**

1. Generate the pressures shown in the Verification points table for a specific point.
2. Only for point 1, wait at least 5 minutes to allow temperature effects to stabilize. For other points, wait at least 1 minute.
3. If an offset needs to be entered for the point, enter it through the RS232 port.
4. Note the Actual values (after the offset has been entered), for Pt, Ps2 and Ps1, on the calibration report.
5. Repeat steps 1 through 4 for all the 21 points in the table.
6. The verification process is complete.
7. If you wish to record the offsets stored in the 6600-NG (recommended), then through the RS232 port, send the 'SO=0' command to see all the Ps1 offsets, the 'SO=1' command to see all the Pt offsets and command 'SO=2' for all the Ps2 offsets. The offsets will be displayed in 5% increments. Although the offsets for the 5% points are never entered, these values are interpolated based on the 10% offset values. Please bear in mind that the offsets displayed may not match what you entered in step 3 above. This is because the entered value is added to the existing value already stored in the 6600-NG.

Model: 6600-NG		Serial#: 85872			
Full scale:		Ps1: 38 inHg			
		Ps2: 38 inHg			
		Pt: 30 QcinHg (differential)			
Last Calibrated date:		09/01/16			
<u>CALIBRATION RESULTS</u>					
<u>Ps1 OUTPUT</u>					
<u>TEST POINT</u>	<u>AS FOUND</u>	<u>AS LEFT</u>	<u>DEVIATION</u>		
	inHg	inHg	inHg		
1. Vacuum	1.6008	1.6000	0.0008		
2. Fullscale	38.0017	38.0000	0.0017		
<u>Ps2 OUTPUT</u>					
<u>TEST POINT</u>	<u>AS FOUND</u>	<u>AS LEFT</u>	<u>DEVIATION</u>		
	inHg	inHg	inHg		
1. Vacuum	1.6010	1.6000	0.0010		
2. Fullscale	38.0020	38.0000	0.0020		
<u>Pt OUTPUT</u>					
<u>TEST POINT</u>	<u>AS FOUND</u>	<u>AS LEFT</u>	<u>DEVIATION</u>		
	QcinHg	QcinHg	QcinHg		
1. Vacuum	0.0012	0.0000	0.0012		
2. Fullscale	30.0030	30.0000	0.0030		
<u>VERIFICATION RESULTS</u>					
<u>Ps1 PRESSURE (absolute)</u>		<u>Ps2 PRESSURE (absolute)</u>		<u>Pt PRESSURE (differential)</u>	
<u>APPLIED</u>	<u>DISPLAYED</u>	<u>APPLIED</u>	<u>DISPLAYED</u>	<u>APPLIED</u>	<u>DISPLAYED</u>
inHg	inHg	inHg	inHg	QcinHg	QcinHg
1.6000	1.6003	1.6000	1.6002	0.0000	0.0004
3.8000	3.8002	3.8000	3.8001	3.0000	2.9995
7.6000	7.6004	7.6000	7.6003	6.0000	6.0002
11.4000	11.4001	11.4000	11.4002	9.0000	8.9997
15.2000	15.1998	15.2000	15.2001	12.0000	11.9998
19.0000	19.0002	19.0000	19.0002	15.0000	15.0003
22.8000	22.8000	22.8000	22.8003	18.0000	18.0002
26.6000	26.5999	26.6000	26.6001	21.0000	21.0003
30.4000	30.4003	30.4000	30.3998	24.0000	23.9996
34.2000	34.2002	34.2000	34.1999	27.0000	27.0002
38.0000	38.0003	38.0000	37.9998	30.0000	30.0001
Calibrated by:		Date:			

Figure 6.10 Sample calibration report

## **SECTION 7 : MAINTENANCE**

Scheduled maintenance of the 6600-NG includes calibration once a year. The calibration procedure is described in Section 6.

Calibration of the 6600-NG must be done only at an Authorized Calibration Center.

Other than annual calibration, there are no other scheduled maintenance requirements.

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## SECTION 8 : RS232 SERIAL INTERFACE

The model 6600-NG is capable of communicating with a PC via the RS232 serial interface. Using this interface it is possible to perform all the functions that can be performed using the Remote unit. Therefore, operation of the 6600-NG can be fully automated.

Profiles can be loaded through the RS232 interface. For more details on Profiles, please refer to Section 4.

The RS232 serial interface is a three-wire interface using the signals RX, TX and GND. Each byte of data is sent or received in ASCII format using 8 bits per byte, with 1 stop bit, no parity at 9600 baud.

The pin-out of the interface is as follows:

- Pin 2 - Transmit (TX)
- Pin 3 - Receive (RX)
- Pin 5 - Signal ground (GND)

The baud rate, parity, bits per byte, and number of stop bits cannot be altered and is set to 9600, No parity, 8 bits and 1 stop bit respectively (9600, N, 8, 1).

### 8.1 COMMUNICATION SETUP

On the PC, the COM1 serial port (or any other COM port) or a USB port (configured as a COM port) can be used to communicate with the 6600-NG. If a USB port is used, it is necessary to use an in-line USB to RS232 converter. This converter is provided with the 6600-NG. A RS232 cable (DB9-male to DB9-female) is also provided with the 6600-NG.

Connect the COM port on the PC to the RS232 port on the 6600-NG, using the cable (and USB to RS232 converter) provided. The RS232 connector is located on the top panel, under a protective cover. Run a serial communication program similar to Hyperterminal on the PC. Configure the COM port being used on the PC to operate at 9600,N,8,1. Setup Hyperterminal to echo typed characters so you can see what you are entering on the PC.

To verify communication, make sure the 6600-NG is operational, then in Hyperterminal, enter the command 'PA' followed by the ENTER key. The 6600-NG will return the Pt Actual value. This confirms that the communication between the PC and 6600-NG is functional.

### 8.2 COMMUNICATION PROTOCOL & COMMANDS

The following are a few details of the communication protocol.

1. All communication between the PC and 6600-NG is in ASCII.

2. All commands sent to the 6600-NG are 2-letter commands. Both letters are capitals.
3. Each command (followed by optional data) must be terminated by a Carriage Return <CR> (0x0d).
4. Multiple commands may be sent without any time delays between them. However, it is not recommended to send more than 10 commands together, as this may cause the input buffer on the 6600-NG to overflow.
5. When a command is sent from the PC, the 6600-NG will always respond with some data. If the command is a request for specific data, then this data will be returned. If the command is not a request for data, the 6600-NG will respond with a '0' or an error-code. If the command is invalid, the 6600-NG will respond with an error code.
6. Each response from the 6600-NG is terminated with a Carriage Return and Line Feed <CR>(0x0d)<LF> (0x0a).
7. When a command requires some data to be sent with it, the format is:  
    Command=data <CR>  
    However, there are several commands that can be used to either send data to the 6600-NG or to request data from the 6600-NG. An example would be the 'PT' command associated with the Pt Target value. To set the Pt Target value to 125.0 knots, the format would be : 'PT=125.0' <CR>. To request the value of the current Pt Target the command would be 'PT' <CR>.
8. The 6600-NG buffers commands as they are received, but processes them only at 250 msec intervals. If there are 5 commands in the buffer, all 5 will be processed within one 250 msec period. So it can take anywhere between 10 msec and 360 msec for the 6600-NG to respond to a command, depending on when the command is received and the operating state of 6600-NG.

**Note:** While the 6600-NG is performing the Self-Test, it will not respond to any commands. The commands will be buffered and processed only after the Self-Test is completed. The Self-Test typically takes about 2 minutes to complete.

**Note:** Parameters shown in the Upper section of the Remote do not blink when set up through the serial interface. However, they must still be either activated (using the GO command) or cancelled (using the CN command). The Lower section of the display is not updated when commands are sent through the serial interface.

The table below lists all the commands and details associated with each command.

Command	Description	Data sent from PC	Data sent from 6600-NG																
PA	Read the Pt Actual value in current units	None	Pt Actual value																
KA	Read the Pt Rate Actual value in current units	None	Pt Rate Actual value																
SA	Read the Ps1 Actual value in current units	None	Ps1 Actual value																
RA	Read the Ps1 Rate Actual value in current units	None	Ps1 Rate Actual value																
DA	Read the Ps2 Actual value in current units	None	Ps2 Actual value																
DR	Read the Ps2 Rate Actual value in current units	None	Ps2 Rate Actual value																
PT	Read the Pt Target value in current units	None	Pt Target value																
PT=n	Set the Pt Target value to n in current units	n	0 if OK; or Error code																
ST	Read the Ps1 Target value in current units	None	Ps1 Target value																
ST=n	Set the Ps1 Target value to n in current units	n	0 if OK; or Error code																
DT	Read the Ps2 Target value in current units	None	Ps2 Target value																
DT=n	Set the Ps2 Target value to n in current units	n	0 if OK; or Error code																
KT	Read the Pt Rate Target value in current units	None	Pt Rate Target value																
KT=n	Set the Pt Rate Target value to n in current units	n	0 if OK; or Error code																
RT	Read the Ps1 Rate Target value in current units	None	Ps1 Rate Target value																
RT=n	Set the Ps1 Rate Target value to n in current units	n	0 if OK; or Error code																
R2	Read the Ps2 Rate Target value in current units	None	Ps2 Rate Target value																
R2=n	Set the Ps2 Rate Target value to n in current units	n	0 if OK; or Error code																
SU	Read the current Ps1 units	None	n=1 to 7																
SU=n	Set the Ps1 units to n, per the following table <table border="1" data-bbox="535 1449 820 1732" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>n</th> <th>Ps1 unit</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Feet</td> </tr> <tr> <td>2</td> <td>Meters</td> </tr> <tr> <td>3</td> <td>inHg</td> </tr> <tr> <td>4</td> <td>Mbar</td> </tr> <tr> <td>5</td> <td>Psi</td> </tr> <tr> <td>6</td> <td>mmHg</td> </tr> <tr> <td>7</td> <td>kpa</td> </tr> </tbody> </table>	n	Ps1 unit	1	Feet	2	Meters	3	inHg	4	Mbar	5	Psi	6	mmHg	7	kpa	n	0 if OK; or Error code
n	Ps1 unit																		
1	Feet																		
2	Meters																		
3	inHg																		
4	Mbar																		
5	Psi																		
6	mmHg																		
7	kpa																		
PU	Read the current Pt units	None	n=1 to 15																

Command	Description	Data sent from PC	Data sent from 6600-NG																																
PU=n	Set the Pt units to n, per the following table <table border="1" data-bbox="537 386 821 934"> <thead> <tr> <th>n</th> <th>Pt unit</th> </tr> </thead> <tbody> <tr><td>1</td><td>Knots</td></tr> <tr><td>2</td><td>Mach</td></tr> <tr><td>3</td><td>Km/hr</td></tr> <tr><td>4</td><td>Mph</td></tr> <tr><td>5</td><td>Pt inHg</td></tr> <tr><td>6</td><td>Qc inHg</td></tr> <tr><td>7</td><td>Pt mbar</td></tr> <tr><td>8</td><td>Qc mbar</td></tr> <tr><td>9</td><td>Pt psi</td></tr> <tr><td>10</td><td>Qc psi</td></tr> <tr><td>11</td><td>Pt mmHg</td></tr> <tr><td>12</td><td>Qc mmHg</td></tr> <tr><td>13</td><td>Pt kpa</td></tr> <tr><td>14</td><td>Qc kpa</td></tr> <tr><td>15</td><td>EPR</td></tr> </tbody> </table>	n	Pt unit	1	Knots	2	Mach	3	Km/hr	4	Mph	5	Pt inHg	6	Qc inHg	7	Pt mbar	8	Qc mbar	9	Pt psi	10	Qc psi	11	Pt mmHg	12	Qc mmHg	13	Pt kpa	14	Qc kpa	15	EPR	n	0 if OK; or Error code
n	Pt unit																																		
1	Knots																																		
2	Mach																																		
3	Km/hr																																		
4	Mph																																		
5	Pt inHg																																		
6	Qc inHg																																		
7	Pt mbar																																		
8	Qc mbar																																		
9	Pt psi																																		
10	Qc psi																																		
11	Pt mmHg																																		
12	Qc mmHg																																		
13	Pt kpa																																		
14	Qc kpa																																		
15	EPR																																		
DU	Read the current Ps2 units	None	n=1 to 14																																
DU=n	Set the Ps2 units to n, per the following table <table border="1" data-bbox="537 1169 821 1684"> <thead> <tr> <th>n</th> <th>Ps2 unit</th> </tr> </thead> <tbody> <tr><td>1</td><td>inHg</td></tr> <tr><td>2</td><td>Diff. inHg</td></tr> <tr><td>3</td><td>Mbar</td></tr> <tr><td>4</td><td>Diff. mbar</td></tr> <tr><td>5</td><td>psi</td></tr> <tr><td>6</td><td>Diff. psi</td></tr> <tr><td>7</td><td>mmHg</td></tr> <tr><td>8</td><td>Diff. mmHg</td></tr> <tr><td>9</td><td>kpa</td></tr> <tr><td>10</td><td>Diff. kpa</td></tr> <tr><td>11</td><td>Feet</td></tr> <tr><td>12</td><td>Meters</td></tr> <tr><td>13</td><td>knots</td></tr> <tr><td>14</td><td>Km/hr</td></tr> </tbody> </table>	n	Ps2 unit	1	inHg	2	Diff. inHg	3	Mbar	4	Diff. mbar	5	psi	6	Diff. psi	7	mmHg	8	Diff. mmHg	9	kpa	10	Diff. kpa	11	Feet	12	Meters	13	knots	14	Km/hr	n	0 if OK; or Error code		
n	Ps2 unit																																		
1	inHg																																		
2	Diff. inHg																																		
3	Mbar																																		
4	Diff. mbar																																		
5	psi																																		
6	Diff. psi																																		
7	mmHg																																		
8	Diff. mmHg																																		
9	kpa																																		
10	Diff. kpa																																		
11	Feet																																		
12	Meters																																		
13	knots																																		
14	Km/hr																																		
PM	Read the current Pt mode	None	n=1 to 3																																



Command	Description	Data sent from PC	Data sent from 6600-NG																		
PM=n	Set the Pt mode to n, per the following <table border="1" data-bbox="537 342 821 478"> <thead> <tr> <th>n</th> <th>Pt mode</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Measure</td> </tr> <tr> <td>2</td> <td>Leak</td> </tr> <tr> <td>3</td> <td>Control</td> </tr> </tbody> </table>	n	Pt mode	1	Measure	2	Leak	3	Control	n	0 if OK; or Error code										
n	Pt mode																				
1	Measure																				
2	Leak																				
3	Control																				
SM	Read the current Ps1 mode	None	n=1 to 3																		
SM=n	Set the Ps1 mode to n, per the following <table border="1" data-bbox="537 594 821 730"> <thead> <tr> <th>n</th> <th>Ps1 mode</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Measure</td> </tr> <tr> <td>2</td> <td>Leak</td> </tr> <tr> <td>3</td> <td>Control</td> </tr> </tbody> </table>	n	Ps1 mode	1	Measure	2	Leak	3	Control	n	0 if OK; or Error code										
n	Ps1 mode																				
1	Measure																				
2	Leak																				
3	Control																				
DM	Read the current Ps2 mode	None	n=1 to 3																		
DM=n	Set the Ps2 mode to n, per the following <table border="1" data-bbox="537 856 821 993"> <thead> <tr> <th>n</th> <th>Ps2 mode</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Measure</td> </tr> <tr> <td>2</td> <td>Leak</td> </tr> <tr> <td>3</td> <td>Control</td> </tr> </tbody> </table>	n	Ps2 mode	1	Measure	2	Leak	3	Control	n	0 if OK; or Error code										
n	Ps2 mode																				
1	Measure																				
2	Leak																				
3	Control																				
PJ=n	Jog the Pt Target value Up (n=0) or Down (n=1)	n	0 if OK; or Error code																		
SJ=n	Jog the Ps1 Target value Up (n=0) or Down (n=1)	n	0 if OK; or Error code																		
DJ=n	Jog the Ps2 Target value Up (n=0) or Down (n=1)	n	0 if OK; or Error code																		
KJ=n	Jog the Pt Rate Target value Up (n=0) or Down (n=1)	n	0 if OK; or Error code																		
RJ=n	Jog the Ps1 Rate Target value Up (n=0) or Down (n=1)	n	0 if OK; or Error code																		
2J=n	Jog the Ps2 Rate Target value Up (n=0) or Down (n=1)	n	0 if OK; or Error code																		
Lm	Read the current limit value for Limit m, where m defines the type of limit per the table below. <table border="1" data-bbox="505 1507 854 1818"> <thead> <tr> <th>m</th> <th>Limit type</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Max knots</td> </tr> <tr> <td>2</td> <td>Min knots</td> </tr> <tr> <td>3</td> <td>Max knots/min</td> </tr> <tr> <td>4</td> <td>Max Mach</td> </tr> <tr> <td>5</td> <td>Max Feet</td> </tr> <tr> <td>6</td> <td>Min Feet</td> </tr> <tr> <td>7</td> <td>Max Feet/min</td> </tr> <tr> <td>8</td> <td>Max Dfin</td> </tr> </tbody> </table>	m	Limit type	1	Max knots	2	Min knots	3	Max knots/min	4	Max Mach	5	Max Feet	6	Min Feet	7	Max Feet/min	8	Max Dfin	None	Value for Limit m
m	Limit type																				
1	Max knots																				
2	Min knots																				
3	Max knots/min																				
4	Max Mach																				
5	Max Feet																				
6	Min Feet																				
7	Max Feet/min																				
8	Max Dfin																				

Command	Description	Data sent from PC	Data sent from 6600-NG																		
Lm=n	Set Limit m (where m is defined in the table shown in the cell above) to the value n. Note: This command requires the Limit password (LP) to be set.	n	0 if OK; or Error code																		
LP=n	Set the Limit Password to n. The Limit password is reset on power-up	n	0 if OK; or Error code																		
ER	Read the Error code for 6600-NG operational errors. These are errors different than those returned in response to a command.	None	Error code (0 if no error)																		
GO	Activate or execute commands that set up various parameters. Functions exactly like the GO key on the Remote.	None	0 if OK; or Error code																		
CN	Cancel commands that set up various parameters. Functions exactly like the CANC key on the Remote.	None	0 if OK; or Error code																		
GG	Executes the Go-to-Ground function	None	0 if OK; or Error code																		
SF=1	Starts the Self-test function	None	0 if OK; or Error code																		
SF=0	Read the Status of the Self-test as value n per the table below. <table border="1" data-bbox="415 989 943 1333"> <thead> <tr> <th>n</th> <th>Self-test status</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Self-test passed</td> </tr> <tr> <td>1</td> <td>Memory test failed</td> </tr> <tr> <td>2</td> <td>Ps1, Ps2 measurement system failed</td> </tr> <tr> <td>3</td> <td>Pt measurement system failed</td> </tr> <tr> <td>4</td> <td>Solenoids failed</td> </tr> <tr> <td>5</td> <td>Pumps failed</td> </tr> <tr> <td>6</td> <td>Ps1, Ps2 control system failed</td> </tr> <tr> <td>7</td> <td>Pt control system failed</td> </tr> </tbody> </table>	n	Self-test status	0	Self-test passed	1	Memory test failed	2	Ps1, Ps2 measurement system failed	3	Pt measurement system failed	4	Solenoids failed	5	Pumps failed	6	Ps1, Ps2 control system failed	7	Pt control system failed	None	Status code n
n	Self-test status																				
0	Self-test passed																				
1	Memory test failed																				
2	Ps1, Ps2 measurement system failed																				
3	Pt measurement system failed																				
4	Solenoids failed																				
5	Pumps failed																				
6	Ps1, Ps2 control system failed																				
7	Pt control system failed																				
HC	Read the current value for Height correction	None	Ht. correction value																		
HC=n	Set the Height correction value to n	n	0 if OK; or Error code																		
Tm	Read the current value for Leak-Timer m, where m is 1 to 3.	None	Value of Leak-Timer m																		
Tm=n	Set Leak-Timer m to value n	n	0 if OK; or Error code																		
EN	Read the 10-bit Encoder value. The 10-byte ASCII-string returned has A1 as the MSB and D4 as the LSB. Each byte is either '0' or '1'	None	10-byte string indicating encoder value																		
FL	Read the Flight level represented by the 10-bit encoder code. The value is always 3 bytes and is 'xxx' for invalid codes.	None	3-byte string indicating flight level																		
CP=n	Set the Calibration password to n.	n	0 if OK; or Error code																		

Command	Description	Data sent from PC	Data sent from 6600-NG										
Cm	<p>Read the value for calibration point m, where m is defined in the table below.</p> <table border="1" data-bbox="415 354 943 527"> <thead> <tr> <th>m</th> <th>Calibration point</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Pt vacuum point</td> </tr> <tr> <td>2</td> <td>Pt full-scale point</td> </tr> <tr> <td>3</td> <td>Ps1/Ps2 vacuum point</td> </tr> <tr> <td>4</td> <td>Ps1/Ps2 full-scale point</td> </tr> </tbody> </table>	m	Calibration point	1	Pt vacuum point	2	Pt full-scale point	3	Ps1/Ps2 vacuum point	4	Ps1/Ps2 full-scale point	None	Value for calibration point m
m	Calibration point												
1	Pt vacuum point												
2	Pt full-scale point												
3	Ps1/Ps2 vacuum point												
4	Ps1/Ps2 full-scale point												
Cm=n	Set the calibration point m to the value n. This command required the calibration password to be set.	n	0 if OK; or Error code										
CC=n	<p>Calibration complete (n=1)            Calibration Void (n=0)            After this command is sent, the calibration password is reset. The calibration password is also reset on power-up</p>	n	0 if OK; or Error code										
PZ	Read the zero-offset value for the Pt transducer	None	Pt zero-offset value										
PZ=n	This requires the calibration password to be set. Set the zero-offset value for the Pt transducer to n	n	0 if OK; or Error code										
PS	Read the slope value for the Pt transducer	None	Pt slope value										
PS=n	This requires the calibration password to be set. Set the slope value for the Pt transducer to n	n	0 if OK; or Error code										
SZ	Read the zero-offset value for the Ps1 transducer	None	Ps1 zero-offset value										
SZ=n	This requires the calibration password to be set. Set the zero-offset value for Ps1 transducer to n	n	0 if OK; or Error code										
SS	Read the slope value for the Ps1 transducer	None	Ps1 slope value										
SS=n	This requires the calibration password to be set. Set the slope value for the Ps1 transducer to n	n	0 if OK; or Error code										
DZ	Read the zero-offset value for the Ps2 transducer	None	Ps2 zero-offset value										
DZ=n	This requires the calibration password to be set. Set the zero-offset value for Ps2 transducer to n	n	0 if OK; or Error code										
DS	Read the slope value for the Ps2 transducer	None	Ps2 slope value										
DS=n	This requires the calibration password to be set. Set the slope value for the Ps2 transducer to n	n	0 if OK; or Error code										
HO	Read the value of 'Hours of Operation'	None	Value of Hours of operation										
LC	Read the 'Last calibration date'. The string returned is in the format 'mm/dd/yy'	None	Date as 8-byte string										
LC=n	This command requires the calibration password to be set. Set the 'Last calibration date' to n, where n has the format 'mmddyy' (no '/' in between)	n	0 if OK; or Error code										

Command	Description	Data sent from PC	Data sent from 6600-NG																																																																		
NC	Read the 'Next calibration due' date. The string returned shows 'mm/dd/yy'.	None	Date as 8-byte string																																																																		
OC=n	Clears all offset values to zero for Ps1 offsets (n=0) or Pt (n=1). This command requires the calibration password to be set.	n	0 if OK; or Error code																																																																		
SO=n	Returns the values for all the Ps1 (n=0) or Pt (n=1) or Ps2 (n=2) non-linearity offsets as shown below. <table border="1" data-bbox="381 567 966 1239" style="margin: 10px auto;"> <thead> <tr> <th>Ps1 offsets</th> <th>Pt offsets</th> <th>Ps2 offsets</th> </tr> </thead> <tbody> <tr><td>S0% =x.xxxx</td><td>P0% =x.xxxx</td><td>D0% =x.xxxx</td></tr> <tr><td>S5% =x.xxxx</td><td>P5% =x.xxxx</td><td>D5% =x.xxxx</td></tr> <tr><td>S10%=x.xxxx</td><td>P10%=x.xxxx</td><td>D10%=x.xxxx</td></tr> <tr><td>S15%= x.xxxx</td><td>P15%= x.xxxx</td><td>D15%= x.xxxx</td></tr> <tr><td>S20%= x.xxxx</td><td>P20%= x.xxxx</td><td>D20%= x.xxxx</td></tr> <tr><td>S25%= x.xxxx</td><td>P25%= x.xxxx</td><td>D25%= x.xxxx</td></tr> <tr><td>S30%= x.xxxx</td><td>P30%= x.xxxx</td><td>D30%= x.xxxx</td></tr> <tr><td>S35%= x.xxxx</td><td>P35%= x.xxxx</td><td>D35%= x.xxxx</td></tr> <tr><td>S40%= x.xxxx</td><td>P40%= x.xxxx</td><td>D40%= x.xxxx</td></tr> <tr><td>S45%= x.xxxx</td><td>P45%= x.xxxx</td><td>D45%= x.xxxx</td></tr> <tr><td>S50%= x.xxxx</td><td>P50%= x.xxxx</td><td>D50%= x.xxxx</td></tr> <tr><td>S55%= x.xxxx</td><td>P55%= x.xxxx</td><td>D55%= x.xxxx</td></tr> <tr><td>S60%= x.xxxx</td><td>P60%= x.xxxx</td><td>D60%= x.xxxx</td></tr> <tr><td>S65%= x.xxxx</td><td>P65%= x.xxxx</td><td>D65%= x.xxxx</td></tr> <tr><td>S70%= x.xxxx</td><td>P70%= x.xxxx</td><td>D70%= x.xxxx</td></tr> <tr><td>S75%= x.xxxx</td><td>P75%= x.xxxx</td><td>D75%= x.xxxx</td></tr> <tr><td>S80%= x.xxxx</td><td>P80%= x.xxxx</td><td>D80%= x.xxxx</td></tr> <tr><td>S85%= x.xxxx</td><td>P85%= x.xxxx</td><td>D85%= x.xxxx</td></tr> <tr><td>S90%= x.xxxx</td><td>P90%= x.xxxx</td><td>D90%= x.xxxx</td></tr> <tr><td>S95%= x.xxxx</td><td>P95%= x.xxxx</td><td>D95%= x.xxxx</td></tr> <tr><td>S100%= x.xxxx</td><td>P100%= x.xxxx</td><td>D100%= x.xxxx</td></tr> </tbody> </table>	Ps1 offsets	Pt offsets	Ps2 offsets	S0% =x.xxxx	P0% =x.xxxx	D0% =x.xxxx	S5% =x.xxxx	P5% =x.xxxx	D5% =x.xxxx	S10%=x.xxxx	P10%=x.xxxx	D10%=x.xxxx	S15%= x.xxxx	P15%= x.xxxx	D15%= x.xxxx	S20%= x.xxxx	P20%= x.xxxx	D20%= x.xxxx	S25%= x.xxxx	P25%= x.xxxx	D25%= x.xxxx	S30%= x.xxxx	P30%= x.xxxx	D30%= x.xxxx	S35%= x.xxxx	P35%= x.xxxx	D35%= x.xxxx	S40%= x.xxxx	P40%= x.xxxx	D40%= x.xxxx	S45%= x.xxxx	P45%= x.xxxx	D45%= x.xxxx	S50%= x.xxxx	P50%= x.xxxx	D50%= x.xxxx	S55%= x.xxxx	P55%= x.xxxx	D55%= x.xxxx	S60%= x.xxxx	P60%= x.xxxx	D60%= x.xxxx	S65%= x.xxxx	P65%= x.xxxx	D65%= x.xxxx	S70%= x.xxxx	P70%= x.xxxx	D70%= x.xxxx	S75%= x.xxxx	P75%= x.xxxx	D75%= x.xxxx	S80%= x.xxxx	P80%= x.xxxx	D80%= x.xxxx	S85%= x.xxxx	P85%= x.xxxx	D85%= x.xxxx	S90%= x.xxxx	P90%= x.xxxx	D90%= x.xxxx	S95%= x.xxxx	P95%= x.xxxx	D95%= x.xxxx	S100%= x.xxxx	P100%= x.xxxx	D100%= x.xxxx	n	Ps1, Ps2 or Pt offset values
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Sm	Read the value for Ps1 offset m, where m is as defined in the table below. <table border="1" data-bbox="519 1375 836 1711" style="margin: 10px auto;"> <thead> <tr> <th>m</th> <th>Ps1 offset</th> </tr> </thead> <tbody> <tr><td>1</td><td>10% offset</td></tr> <tr><td>2</td><td>20% offset</td></tr> <tr><td>3</td><td>30% offset</td></tr> <tr><td>4</td><td>40% offset</td></tr> <tr><td>5</td><td>50% offset</td></tr> <tr><td>6</td><td>60% offset</td></tr> <tr><td>7</td><td>70% offset</td></tr> <tr><td>8</td><td>80% offset</td></tr> <tr><td>9</td><td>90% offset</td></tr> </tbody> </table>	m	Ps1 offset	1	10% offset	2	20% offset	3	30% offset	4	40% offset	5	50% offset	6	60% offset	7	70% offset	8	80% offset	9	90% offset	None	Ps1 offset value																																														
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Sm=n	Set the Ps1 offset m to a value of n. This command requires the calibration password to be set.	n	0 if OK; or Error code																																																																		

Command	Description	Data sent from PC	Data sent from 6600-NG																				
Pm	<p>Read the value for Pt offset m, where m is as defined in the table below.</p> <table border="1"> <thead> <tr> <th>m</th> <th>Pt offset</th> </tr> </thead> <tbody> <tr><td>1</td><td>10% offset</td></tr> <tr><td>2</td><td>20% offset</td></tr> <tr><td>3</td><td>30% offset</td></tr> <tr><td>4</td><td>40% offset</td></tr> <tr><td>5</td><td>50% offset</td></tr> <tr><td>6</td><td>60% offset</td></tr> <tr><td>7</td><td>70% offset</td></tr> <tr><td>8</td><td>80% offset</td></tr> <tr><td>9</td><td>90% offset</td></tr> </tbody> </table>	m	Pt offset	1	10% offset	2	20% offset	3	30% offset	4	40% offset	5	50% offset	6	60% offset	7	70% offset	8	80% offset	9	90% offset	None	Pt offset value
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Pm=n	Set the Pt offset m to a value of n. This command requires the calibration password to be set.	n	0 if OK; or Error code																				
Dm	<p>Read the value for Ps2 offset m, where m is as defined in the table below.</p> <table border="1"> <thead> <tr> <th>m</th> <th>Ps2 offset</th> </tr> </thead> <tbody> <tr><td>1</td><td>10% offset</td></tr> <tr><td>2</td><td>20% offset</td></tr> <tr><td>3</td><td>30% offset</td></tr> <tr><td>4</td><td>40% offset</td></tr> <tr><td>5</td><td>50% offset</td></tr> <tr><td>6</td><td>60% offset</td></tr> <tr><td>7</td><td>70% offset</td></tr> <tr><td>8</td><td>80% offset</td></tr> <tr><td>9</td><td>90% offset</td></tr> </tbody> </table>	m	Ps2 offset	1	10% offset	2	20% offset	3	30% offset	4	40% offset	5	50% offset	6	60% offset	7	70% offset	8	80% offset	9	90% offset	None	Pt offset value
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8	80% offset																						
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Dm=n	Set the Ps2 offset m to a value of n. This command requires the calibration password to be set.	n	0 if OK; or Error code																				

### APPENDIX A : ERROR CODES

Error code	Description
1	Pt Actual value exceeds knots limit or Mach limit
2	Pt Rate Actual value exceeds knots/min limit
3	Ps1 Actual value exceeds Feet limit
4	Ps1 Rate Actual value exceeds Feet/min limit
5	Pt control transducer error
6	Ps1 or Ps2 control transducer error
7	Pt leak-rate excessive; automatically returns Pt to control
8	Ps1 or Ps2 leak-rate excessive; automatically return Ps1 or Ps2 to control
9	Knots limit will soon be exceeded in Leak mode; returned to control mode
10	Warning: Loss of AC power. Operating on battery
11	Loss of data from Pt or Ps1 transducer
12	Pt target exceeds knots limit
13	Pt target exceeds Mach limit
14	Pt Rate target exceeds knots/min limit (or 30 inHg/min for pressure units)
15	Ps1 target exceeds Feet limit
16	Ps1 Rate target exceeds Feet/min limit (or 30 inHg/min for pressure units)
17	Leaving Pt in Measure mode may cause knots limit to be exceeded
18	Leaving Pt in Measure mode may cause Mach limit to be exceeded
19	Serial interface error: invalid command or invalid value or syntax error
20	Calibration incomplete (Status code returned after CC command)
21	Pt calibration complete (Status code returned after CC command)
22	Ps1 calibration complete (Status code returned after CC command)
23	Both Pt & Ps1 calibration complete (Status code returned after CC command)
24	Ps2 Actual value exceeds limit
25	Ps2 Target value exceeds limit

## APPENDIX B : SPECIFICATIONS

### Ps1 Output

**Units** Feet, meters, inHg, mbar, psi, mmHg, kpa

#### **Pressure function**

range: 1 to 42 inHg (calibrated from 1.6 to 38 inHg)  
 resolution: 0.0001 inHg  
 accuracy: 0.002 inHg

#### **Altitude function**

range: -4000 ft. to 60,000 ft.  
 resolution: 1 foot  
 accuracy: 2 ft. @ 0 ft.  
 3 ft. @ 10,000 ft.  
 4 ft. @ 20,000 ft.  
 6 ft. @ 35,000 ft.  
 12 ft. @ 50,000 ft.

#### **Climb function**

range: 0 ft/min to 25,000 ft/min  
 resolution: 1 ft/min  
 accuracy: 1% of rate of climb

### Ps2 Output

**Units** inHg, mbar, psi, mmHg, kpa (Differential or Absolute)  
 Feet, meters, knots, km/hr

#### **Pressure function**

range: 1 to 42 inHg (calibrated from 1.6 to 38 inHg)  
 resolution: 0.0001 inHg  
 accuracy: 0.002 inHg

#### **Altitude function**

range: -4000 ft. to 60,000 ft.  
 resolution: 1 foot  
 accuracy: 2 ft. @ 0 ft.  
 3 ft. @ 10,000 ft.  
 4 ft. @ 20,000 ft.  
 6 ft. @ 35,000 ft.  
 12 ft. @ 50,000 ft.

#### **Climb function**

range: 0 ft/min to 25,000 ft/min  
 resolution: 1 ft/min  
 accuracy: 1% of rate of climb

#### **Airspeed function**

range: 0 to 500 knots  
 resolution: 0.1 knots  
 accuracy: 1.0 knots @ 20 knots  
 0.3 knots @ 50 knots  
 0.2 knots @ 100 knots  
 0.1 knots @ 200 knots  
 0.04 knots @ 500 knots

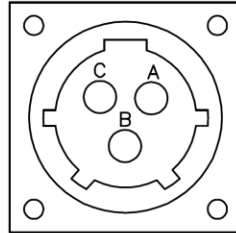
**Pt Output**

<b>Units</b>	knots, Mach, kmph, mph, PtinHg, QcinHg, Ptmbar, Qcmbar, Ptpsi, Qcpsi, PtmHg, QcmmHg, Ptkpa, Qckpa, EPR	
<b>Pressure function</b>		
range:	0 to 30 inHg (diff.)	
resolution:	0.0001 inHg	
accuracy:	0.003 inHg	
<b>Airspeed function</b>		
range:	0 to 690 knots	
resolution:	0.1 knots	
accuracy:	1.0 knots @ 20 knots	
	0.3 knots @ 50 knots	
	0.2 knots @ 100 knots	
	0.1 knots @ 200 knots	
	0.03 knots @ 690 knots	
Airspeed rate:	0 to 500 knots/min	
<b>Mach function</b>		
range:	0.0 to 3.0 Mach	
resolution:	0.001 Mach	
accuracy:	0.001 above 0.2 Mach	
<b>EPR function</b>		
range:	0.9 to 30	
resolution:	0.001	
accuracy:	0.002 typ.	
<b>Power requirement:</b>	90-260 VAC, 47-440 Hz., 100W (200W with heaters). Optional removable battery: 8 hours of operation	
<b>Interfaces:</b>	WiFi, RS232 ; Encoder optional	
<b>Dims &amp; weights:</b>	Main unit:	22" x 14" x 9" / 38 lbs
	Remote unit:	6" x 6" x 1" / 1.8 lb.
<b>Environmental specs:</b>	Operating temp.	0° to 50°C ; -40° to 50°C (with heaters)
	Storage temp.	-40° to 75°C
	Humidity:	5 to 100%



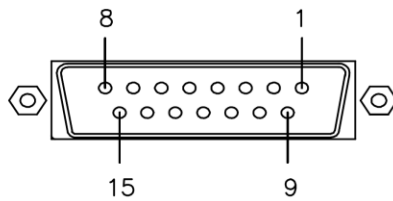
## APPENDIX C : CONNECTOR PIN-OUTS

### AC INPUT



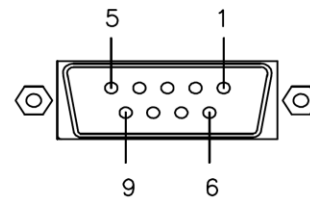
- A.- AC LINE.
- B.- AC NEUTRAL
- C.- EARTH GND.

### ENCODER



- 1.- A1
- 2.- A2
- 3.- A4
- 4.- B1
- 5.- B2
- 6.- B4
- 7.- C1
- 8.- C2
- 9.- C4
- 10.- D4
- 11.- N.C.
- 12.- N.C.
- 13.- +12V
- 14.- GND
- 15.- GND

### RS-232



- 1.- INTERNAL CONNECTION
- 2.- TX
- 3.- RX
- 4.- INTERNAL CONNECTION
- 5.- GND
- 6.- INTERNAL CONNECTION
- 7.- INTERNAL CONNECTION
- 8.- INTERNAL CONNECTION
- 9.- INTERNAL CONNECTION

## APPENDIX D : REPAIR & RETURN POLICIES

If it is determined that the product is defective, please call Laversab customer service department: (281) 325-8300 or fax (281) 325-8399 or e-mail [customerservice@laversab.com](mailto:customerservice@laversab.com) for further assistance.

Before shipping any equipment to Laversab for repair, please call the customer service department at (281) 325-8300 or fax (281) 325-8399 or e-mail to [customerservice@laversab.com](mailto:customerservice@laversab.com). Please include a description of the problem that has been identified when returning defective equipment.

Ship equipment to :

LAVERSAB, INC.  
505 GILLINGHAM LANE.  
SUGAR LAND TX, 77478  
U.S.A.

**Note:** Please pack the 6600-NG in a suitable carton prior to shipping. Do not ship without proper packing. Laversab, Inc. will not be liable for damage to the 6600-NG if it is shipped without proper packing.

## APPENDIX E : WI-FI OPERATION

This section includes the process for setting up a wireless Remote, such as an iPad, with the appropriate App for use with the 6600-NG. The wireless Remote will function only if the 6600-NG has been installed with the optional wireless capability.

The wireless antenna is located on the Top Panel of the tester, as shown in Figure 2.1. Care must be taken not to obstruct or cover the antenna with metallic objects, since this will be detrimental to effective Wi-Fi operation.

**Note: The Wired-Remote must be connected to the tester and operational even when the iPad is being used.**

### E.1 iPad COMPATIBILITY

The Laversab App is compatible with the following iPads configured with iOS 8.1 or higher:

iPad 2, iPad Mini, iPad Mini 2, iPad Mini 3, iPad Mini 4, iPad Air, iPad Air 2, iPad Pro.

### E.2 DOWNLOADING THE APP

The Laversab App must be downloaded from the Apple App Store. Although the App itself is provided at no charge, a credit card is required to create an Apple Store account which enables you to access and download the App.

Once you have access to the App Store, search for "Laversab" and the app should appear with the icon as shown below. If more than one App is displayed, select the App labeled "CH-3 / vx.xx", where 'x.xx' is the version number. If more than one version of the App is displayed, select the one with the latest version number. Do not select the App labeled "CH-2 / vx.xx", since this is intended for use only with a 2-Output tester.



### E.3 NETWORK SELECTION

Once the App has been installed on your iPad, the following steps need to be performed to connect to the tester through the App.

- a. Turn ON the tester and ensure that the Wired-Remote is displaying the Main Screen. The internal wireless access-point will now be active.
- b. On the iPad select the 'Settings' icon. Then select the Wi-Fi section. (See Figure E.1 below). The right side will show all the Wi-Fi networks available. One of the networks will be labeled "LAV-xxxx", where 'xxxx' is the serial number of the tester you want to connect to.
- c. Select the network with the correct label, ensuring that the serial number matches the serial number of your tester. The serial number of the tester can be found on the label placed on the inside of the lid of the tester's case, towards the bottom right corner.

- d. Once the correct network has been selected, you may be asked for a password for this network. The password is “lavus505” (the first letter is a non-capitalized L). Once the password has been entered, the Settings column will show the selected network (LAV-xxxxx) in the Wi-Fi section.

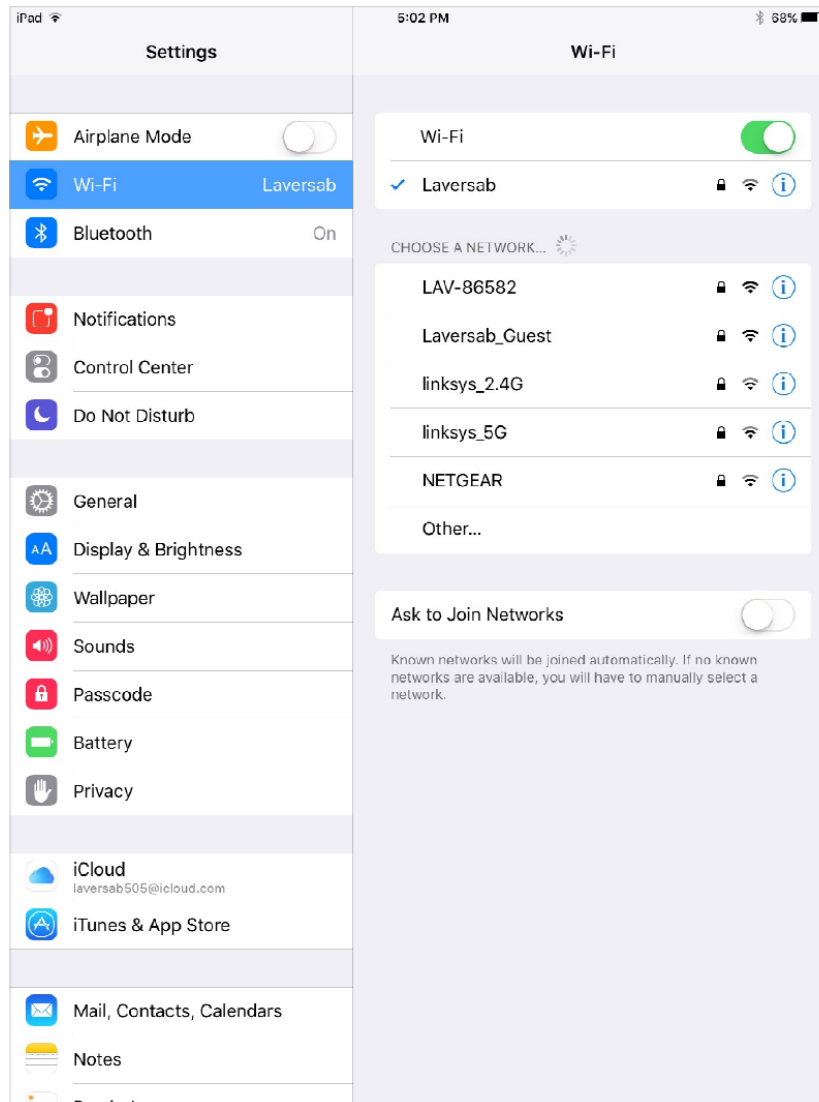


Figure E.1

#### E.4 STARTING THE APP

Locate and start the Laversab App labeled “3-CH / vx.xx”. The iPad screen will appear as shown in Figure E.2 below for about 3 seconds.

The next screen displayed will appear as shown in Figure E.3 below. Press and hold down the Power key displayed on the iPad screen (bottom right), for about 2 seconds. A tone will sound and the screen will appear similar to the one shown in Figure E.4 below. The screen will match the screen shown on the Wired-Remote.

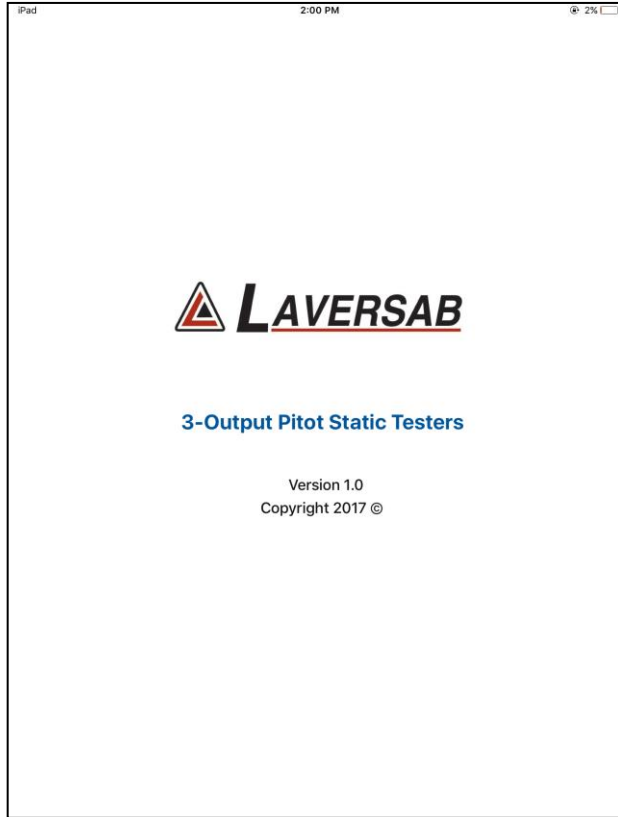


Figure E.2

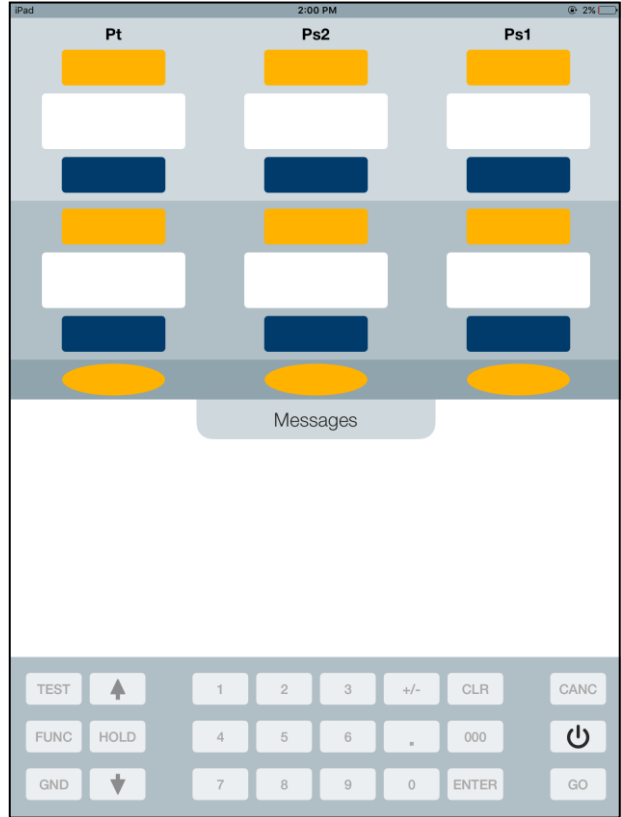


Figure E.3

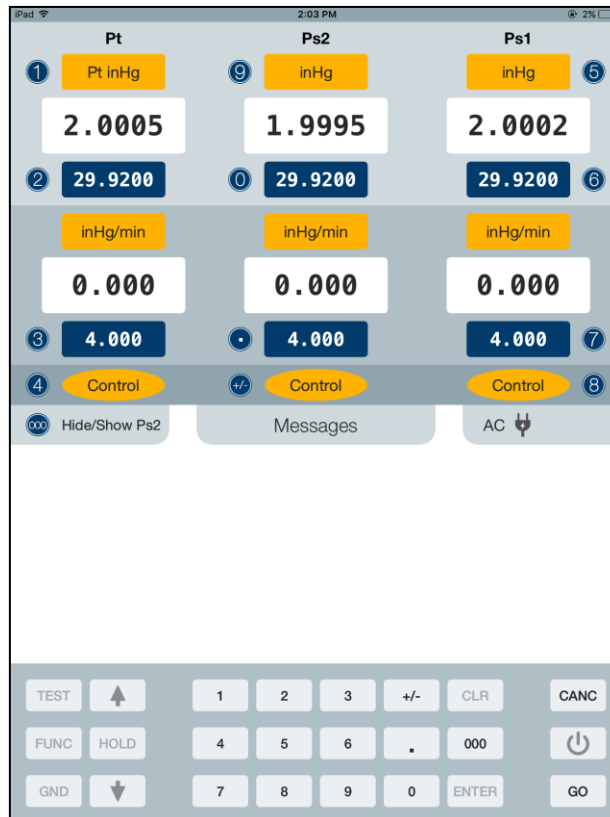


Figure E.4

**Note:** When the iPad is connected through the App to the tester, the keypad on the Wired-Remote is locked, as indicated by the message “Wireless Remote enabled. Keypad locked”, shown on the Wired-Remote. The upper section of the display on the Wired-Remote will continue to be updated, even though the keypad is locked. Once the App disconnects from the tester, or if the wireless connection is lost, the keypad on the Wired-Remote becomes active again and the above message is cleared.

## E.5 CLOSING THE APP

To disconnect the App from the tester, simply press and hold the Power key displayed on the iPad screen for about 2 seconds. A tone will sound and the screen will appear as shown in Figure E.3 above. This indicates that the App is disconnected from the tester. On the Wired-Remote, the message “Wireless Remote enabled. Keypad locked” will be cleared, indicating that the Wired-Remote is fully functional.

**Note:** If the App is not closed as described above, the Wired-Remote will remain locked out. However, if the iPad is turned off without closing the App, wireless communication will be lost and the Wired-Remote will automatically revert to full functionality within about 20 seconds.

## E.6 LOSS OF WIRELESS COMMUNICATION

Wireless communication between the tester and iPad may be lost due to several reasons include loss of Wifi signal from the tester. If there is a loss of wireless communication between the iPad and the tester for more than 20 seconds, the tester will automatically disconnect from the iPad App and the Wired-Remote will become fully functional.

To reconnect the tester to the iPad App, in iPad Settings, check that the correct network is selected and restart the App. The Power key in the App may then be used to establish communication between the App and the tester.

**Note:** If the App is minimized during operation for more than 3 minutes, communication between the App and the tester will be lost. Pressing the Power key in the App to first disconnect and then once more to reconnect, will re-establish communication.

## E.7 OPERATION WITH THE iPad

The tester can be operated with the iPad in almost exactly the same manner as from the Wired-Remote. However, there are a few differences, as detailed below.

- a. Instead of having to make selections only with the keypad, selections can also be made by touching the desired section on the screen. To change units, you can touch the area where the units are displayed (yellow background), or the circled number shown on the display, or the relevant number on the keypad. The same is true for target values (blue background) and modes (yellow ovals). Other selections can also be done using the touch-screen on the iPad.
- b. Function 3 (Brightness) and Function 8 (Calibration) are not activated on the iPad.

## E.8 HELPFUL NOTES

- Ensure that you have selected the correct network corresponding with your tester's serial number.
- If the wireless connection is lost, or the iPad is not operational, you can continue to operate the tester from the Wired-Remote.

- If the wireless connection is lost, the tester will continue to perform the operation already in progress. Switching to the Wired-Remote is seamless. However, any information displayed in the lower section of the display screen will not be duplicated on the Wired-Remote when it becomes fully functional. (For example, Leak-test results or Self-Test progress).
- If there is a large number of Wifi networks in the area (typically more than 10), it is possible that the wireless communication will not be very effective due to limitations of Wifi bandwidth.
- When first connecting to the tester's network, keep the iPad close to the tester.
- The Wifi signal may deteriorate significantly when the iPad is more than 100 feet away from the tester.