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# MODEL 6250 Rev. A3

# USER'S MANUAL

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# REVISION HISTORY

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| 125-9102A | 08/15/2014 | 6250 User's Manual, Rev.A |
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| 125-9102A3 | 09/15/2022 | 6250 User's Manual, Rev.A3 |
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## WARNING

THE 6250 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 6250 is a high accuracy automated pressure controller, specifically designed for controlling air data parameters such as altitude, airspeed, Mach and climb. This instrument can also be used to control pressures in units of inHg, mbar, psi, mmHg and kpa. The 6250 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 6250 has two high accuracy transducers that measure pressure in the range of 1 to 32 inHg absolute on the Static output, and 0 to 15 inHg differential on the Pitot 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 Pitot transducer makes it ideal for checking the low airspeeds typical in helicopters. The high accuracy of the Static transducer makes the 6250 fully RVSM compliant.

The 6250 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 6250 also allows the user to control EPR on the pitot output.

The model 6250 features programmable limits on altitude, airspeed, airspeed rate, mach number, and climb rate. 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 6250 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 6250 can store up to 15 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 6250.

The standard version of the model 6250 operates on AC power and comes with an RS232 interface. Options include an external removable battery which lasts 8 hours, internal heaters which allow the unit to operate down to -40°C, and an altimeter-encoder interface.

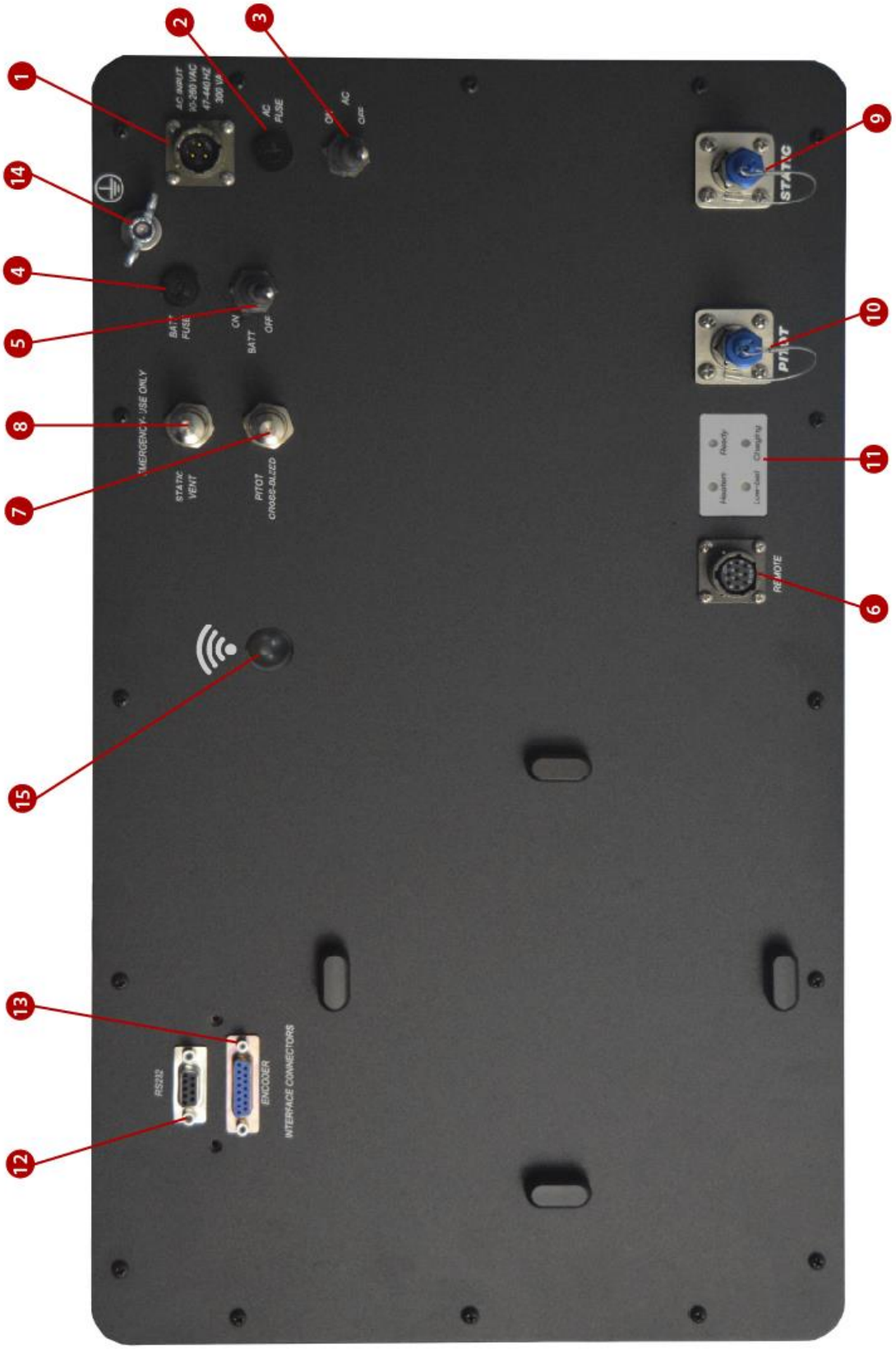


**Figure 2.1(A) : 6250 Top Panel**

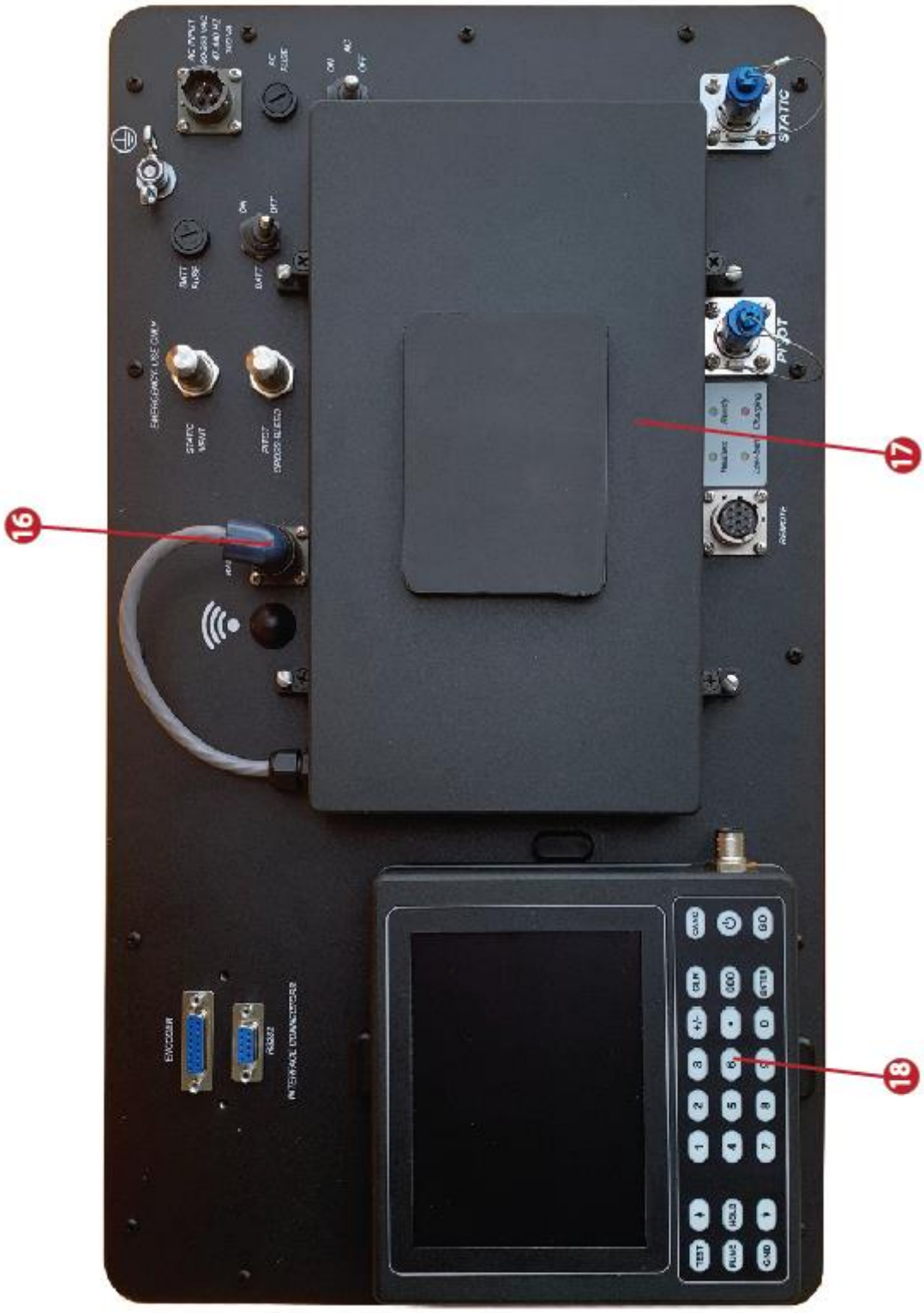


**Figure 2.1(B) : 6250 Top Panel with optional removable external battery pack**

# SECTION 2 : CONTROLS & CONNECTIONS

## 2.1 MAIN UNIT, TOP PANEL

The model 6250 top panel provides easy access to all the connections. Please refer to Figure 2.1(A) and 2.1(B) shown on previous two pages.

### [1] AC INPUT connector :

This is a 3-pin male circular connector. A power cord is provided with the 6250. The circular connector end of the power cord needs to be connected here. The power requirement of the 6250 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 6250 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 6250. Even when this switch is ON, the 6250 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 internal battery is included, the battery-charging circuits inside the 6250 become active when the AC On/Off switch is turned ON.

When internal heaters are included, the heater-control circuits inside the 6250 become active when the AC On/Off switch is turned ON.

### [4] Battery Fuse :

This fuse is installed only if the optional external 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.

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

This switch is installed only if an optional external battery is included. This switch connects (or disconnects) the battery from other circuits within the 6250. 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 6250. If this cable is disconnected, the 6250 stops operating.

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

In the event that the 6250 is in-operable due to a malfunction or due to loss of power, it is possible to vent the Pitot system manually. This is done using the metering valve labeled "Cross-bleed". This valve is a positive shut-off valve. Opening this valve slowly will equalize the pressure between the Pitot and Static systems (causing airspeed to be at zero).

Since opening this valve transfers pressure from the Pitot system into the Static system of the aircraft, while opening this valve, care must be taken to vent the Static 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 Static system is vented to ambient (using the Static 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, "Static Vent":**

In the event that the 6250 is in-operable due to a malfunction or due to loss of power, it is possible to vent the Static system manually. This is done using the metering valve labeled "Static Vent". This valve is a positive shut-off valve. Opening this valve slowly will vent the Static output of the 6250 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 Static system to ambient, the Cross-bleed valve must be opened to ensure that airspeed is zero.

**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] Static port :**

The Static port of the tester is provided with a #4-AN fitting. This port must be connected through a hose to the Static port of the aircraft. The hose must be connected after performing the Self Test on the 6250. The hose, once connected, must not be disconnected while the aircraft Static system is not at "Ground" level.

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

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

**[10] Pitot port :**

The Pitot port of the tester is provided with a #4-AN fitting. This port must be connected through a hose to the Pitot port of the aircraft. The hose must be connected after performing

the Self Test on the 6250. The hose, once connected, must not be disconnected while the aircraft Pitot system is not at "Ground" level.

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

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

**[11] 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.

**[12] 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 6250 is also possible through this interface.

For more details on downloading profiles, please refer to Section 4. For more details on communication with the 6250, please refer to Section 8. The pin-out of this connector is provided in Appendix C.

**[13] 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.

**[14] Earth Ground stud**
Please contact Laversab for additional info on it's usage.

**[15] Wi-Fi Antenna**
For more details on wireless operation, please refer to Appendix E on page 99

**[16] 6-Pin circular battery connector**

**[17] Removable external Lithium Ion battery assembly pack**

**[18] Remote Unit.**
For more details on the remote unit, please refer to section 2.2 on the next page.

## 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 6250. 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 6250. 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 6250 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 6250

This section provides all the details required to operate the 6250. It is highly recommended that the user read through this section before operating the 6250. 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 6250 with an aircraft.

## 3.1 START-UP

- Open the Pitot and Static 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 both ports to ambient, then press **GO**. Press **CANC** to exit' will be displayed in the Lower section of the display. Make sure both ports are open to ambient, then press **GO**.

- The Self-Test takes about 2 minutes. 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 6250

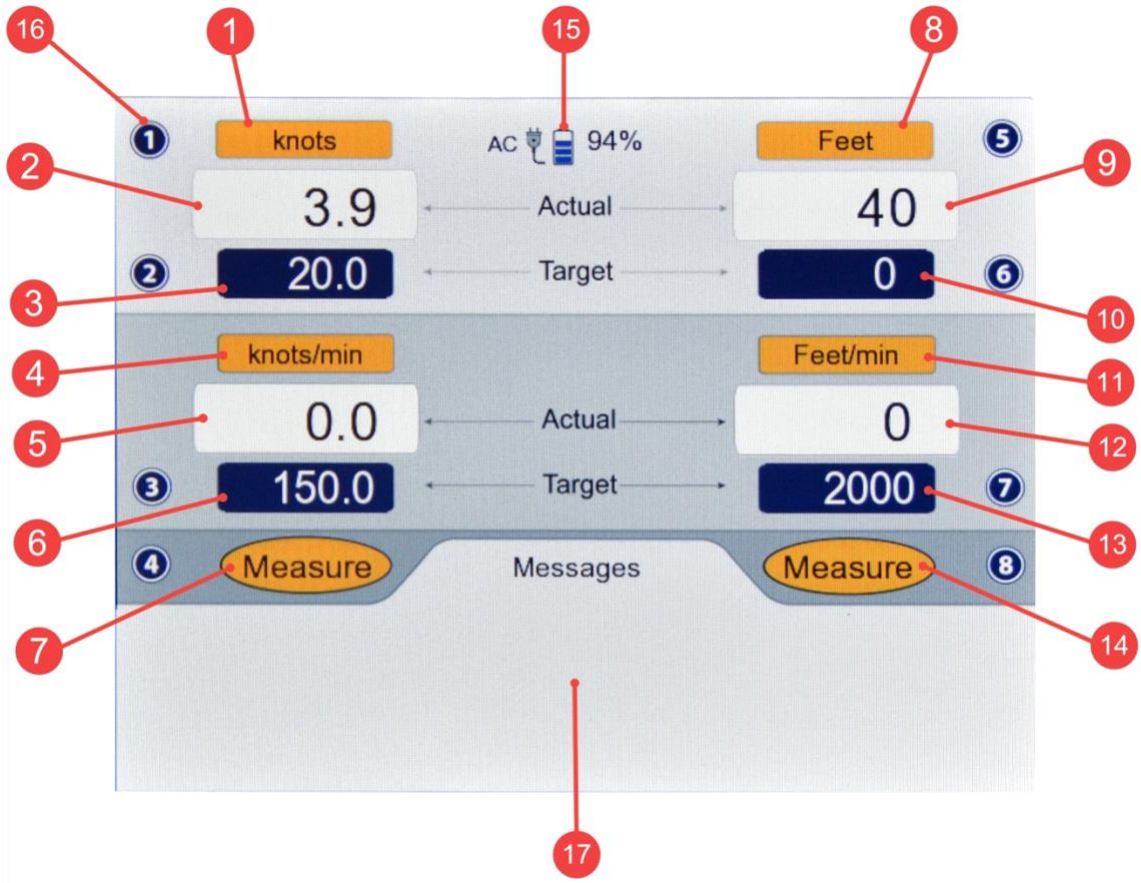


**Figure 3.1: Main operating screen**

## 3.2 MAIN OPERATING SCREEN

Please refer to Figure 3.1. There are 17 different items (indicated in red) shown on this screen. Numbers 1 to 7 on the left side, refer to the Pitot-ouput parameters. Numbers 8 to 14 on the right side, refer to the Static-output parameters. Number 15 points to the power status. Number 16 points to a typical symbol indicating a key number (as shown, key # 1 ). Number 17 points to the 'Messages' section of the screen. Details of each item follow.

### [1] Pitot units

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

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

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

Selecting the desired Pitot units is described in Section 3.3.

**[2] Pitot Actual value**

The Actual value (actual pressure converted to selected units) being measured or controlled at the Pitot output is displayed here in the selected Pitot 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.

| Pitot units | Displayed Resolution |
|---|---|
| knots | 0.1 |
| Mach | 0.001 |
| km/hr | 0.1 |
| mph | 0.1 |
| 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 |

**Important Note: When Pitot 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] Pitot Target value

The target value that the user desires to achieve on the Pitot output is displayed here. When the Pitot output is in Control mode, the 6250 will automatically adjust the Pitot Actual value to match the Pitot Target value. The resolution of the Pitot target value is the same as the resolution of the Pitot Actual value.

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

### [4] Pitot-Rate units

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

| Exceptions | |
|---|---|
| **Pitot units** | **Pitot-Rate units** |
| Mach | knots/min |
| km/hr | km/hr/sec |
| EPR | inHg/min |

### [5] Pitot-Rate Actual value

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

| Pitot-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] Pitot-Rate Target value

The rate at which the Pitot Target value ramps from one target to the next target, is determined by the Pitot-Rate Target value. That is, if the Pitot-Rate target is set to 150 knots/min, and the airspeed (Pitot) target is changed from 25 knots to 100 knots, the 6250 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 pitot-rate.

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

### [7] Pitot Mode

The Pitot 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] Static units

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

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

Selecting the desired Static units is described in Section 3.3.

### [9] Static Actual value

The Actual value (actual pressure converted to selected units) being measured or controlled at the Static output is displayed here in the selected Static 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.

| Static units | Displayed Resolution |
|---|---|
| Feet | 1 |
| Meters | 0.1 |
| inHg | 0.001 |
| mbar | 0.01 |
| psi | 0.001 |
| mmHg | 0.01 |
| kpa | 0.001 |

### [10] Static Target value

The target value that the user desires to achieve on the Static output is displayed here. When the Static output is in Control mode, the 6250 will automatically adjust the Static Actual value to match the Static Target value. The resolution of the Static target value is the same as the resolution of the Static Actual value.

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

### [11] Static-Rate units

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

| Exception | |
|---|---|
| **Static units** | **Static-Rate units** |
| Meters | Meters/sec |

### [12] Static-Rate Actual value

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

| Static-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] Static-Rate Target value

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

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

### [14] Static Mode

The Static 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] Power status

When AC power is connected to the 6250, the icon which shows the power plug (with 'AC' shown to the left of the icon), is displayed here.

If the internal battery is connected, 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.

**[16] Key-number symbols**

A key-number symbol is a dark-blue circle with a number (1 to 8) inside it. This symbol is placed next to a parameter which can be changed by the user. To change this parameter, the user needs to press the key with that number. So, if the symbol shows the number 5 and the symbol is placed next to the 'Static units' parameter, then the user should press the '**5**' key to change 'Static units'. Similarly, pressing the '**4**' key would allow the user to change 'Pitot 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.

**[17] '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.**

## Pitot units

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

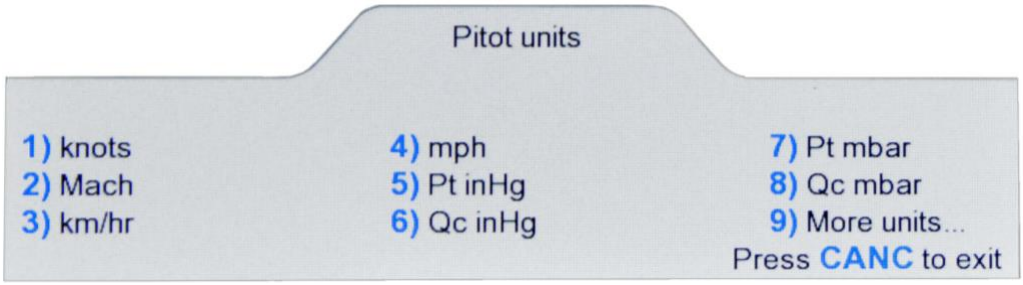


**Figure 3.2 : Select Pitot units (1)**

The first 8 units are shown on this screen. Press the key with the # (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 3.3 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**.

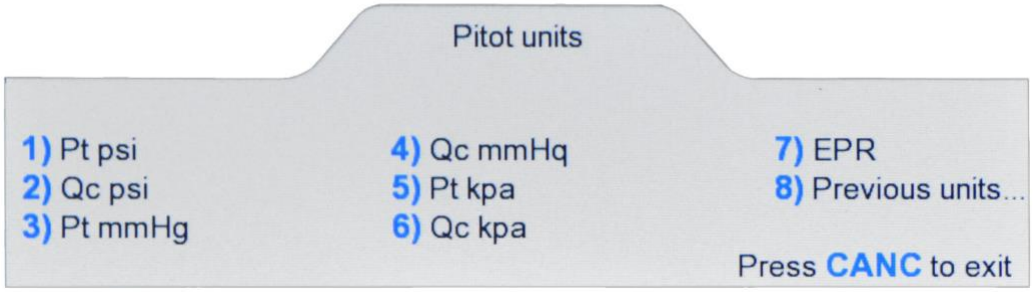


**Figure 3.3 : Select Pitot units (2)**

For example, if units of QcinHg is to be selected, in the 'Pitot units (1)' screen, press '**6**'. The Lower section will blank out and the Upper section will appear as shown in Figure 3.4 below.

The fields for Pitot units, Pitot target and Pitot-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 Pitot or Static 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 3.4 : Select QcinHg**

**Static units**

Static units can be changed only if the key# symbol **(5)** is displayed to the right of the Static units field. Press key '**5**' on the keypad and the Lower section of the display will appear as shown in Figure 3.5 below.

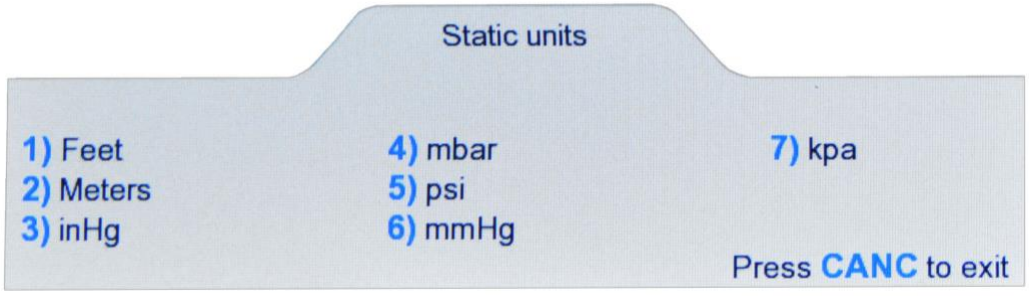


**Figure 3.5 : Select Static units**

The 7 Static 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 'Static units' screen, press '**3**'. The Lower section will blank out and the Upper section will appear as shown in Figure 3.6 below.

The fields for Static units, Static target and Static-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 Pitot or Static 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.

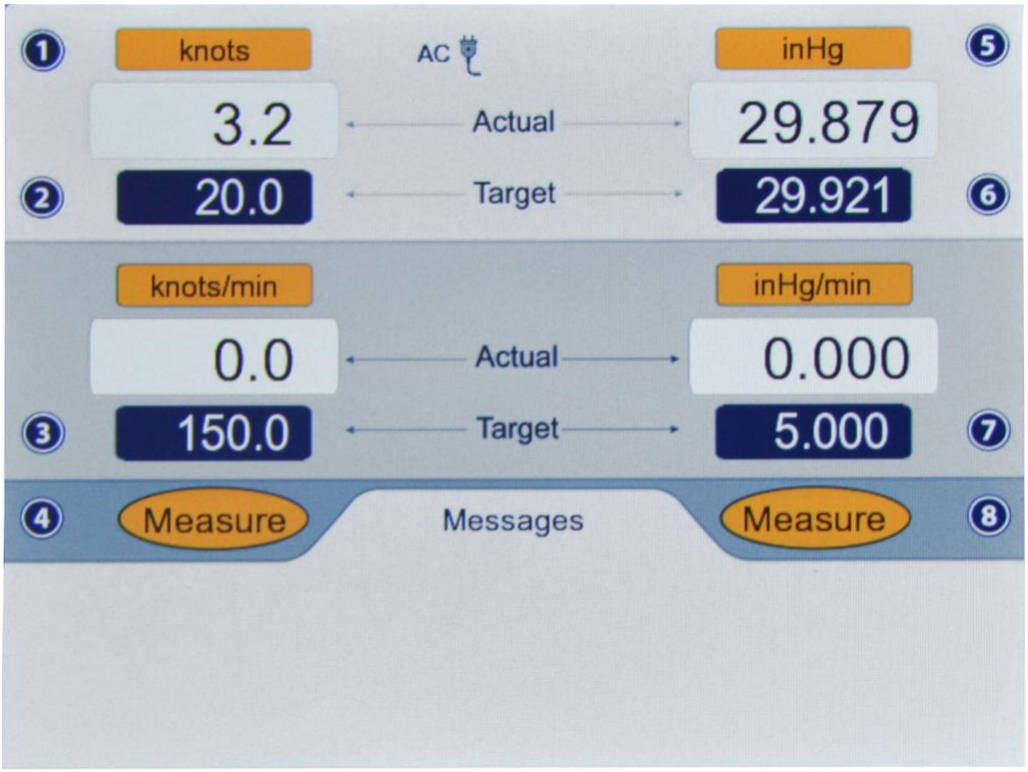


**Figure 3.6 : Select inHg**

## 3.4 CHANGING TARGET VALUES

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

**Pitot Target value**

The Pitot Target value can be changed only if the key# symbol **(2)** is displayed to the left of the Pitot Target value field. Press key '**2**' on the keypad and the Lower section of the display will appear as shown in Figure 3.7 below.

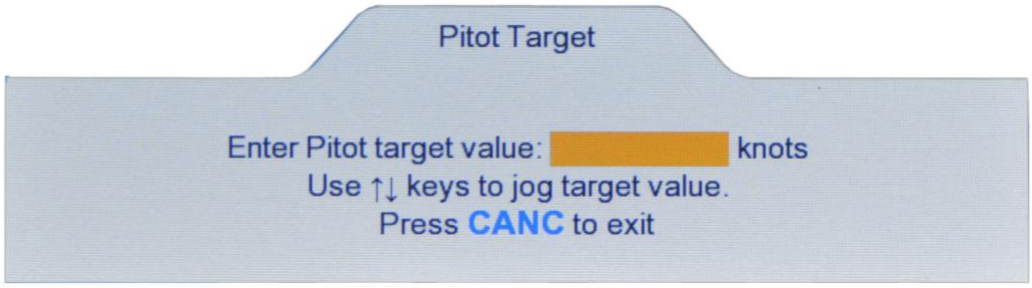


**Figure 3.7 : Pitot Target value**

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 **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.

Pitot 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 Pitot Target value is 20.0 knots, and the Lower screen appears as in Figure 3.7 above, pressing the **Up-Arrow** key will make the screen appear as shown in Figure 3.8 below.

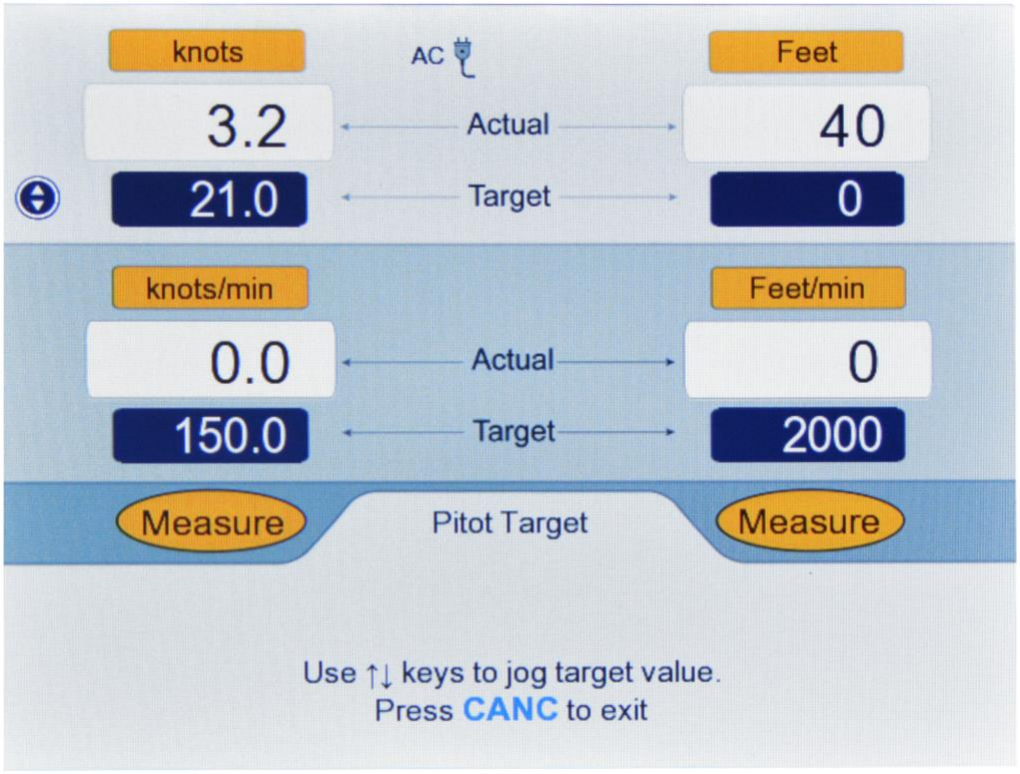


**Figure 3.8 : Jog the Pitot Target value**

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the left of the Pitot Target value field. This indicates that the Pitot 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 Pitot 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 Pitot units and is shown in the table below.

| Pitot 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 |

## Static Target value

The Static Target value can be changed only if the key# symbol **(6)** is displayed to the right of the Static Target value field. Press key '**6**' on the keypad and the Lower section of the display will appear as shown in Figure 3.9 below.

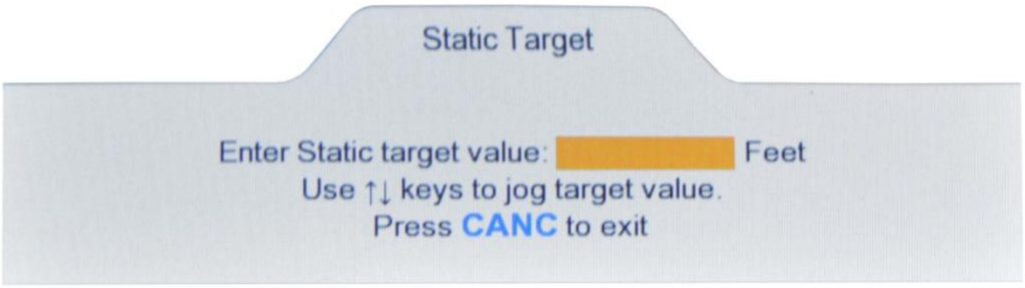


**Figure 3.9 : Static Target value**

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 **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.

Static 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 Static Target value is 0 Feet, and the Lower screen appears as in Figure 3.9 above, pressing the **Up-Arrow** key will make the screen appear as shown in Figure 3.10 below.

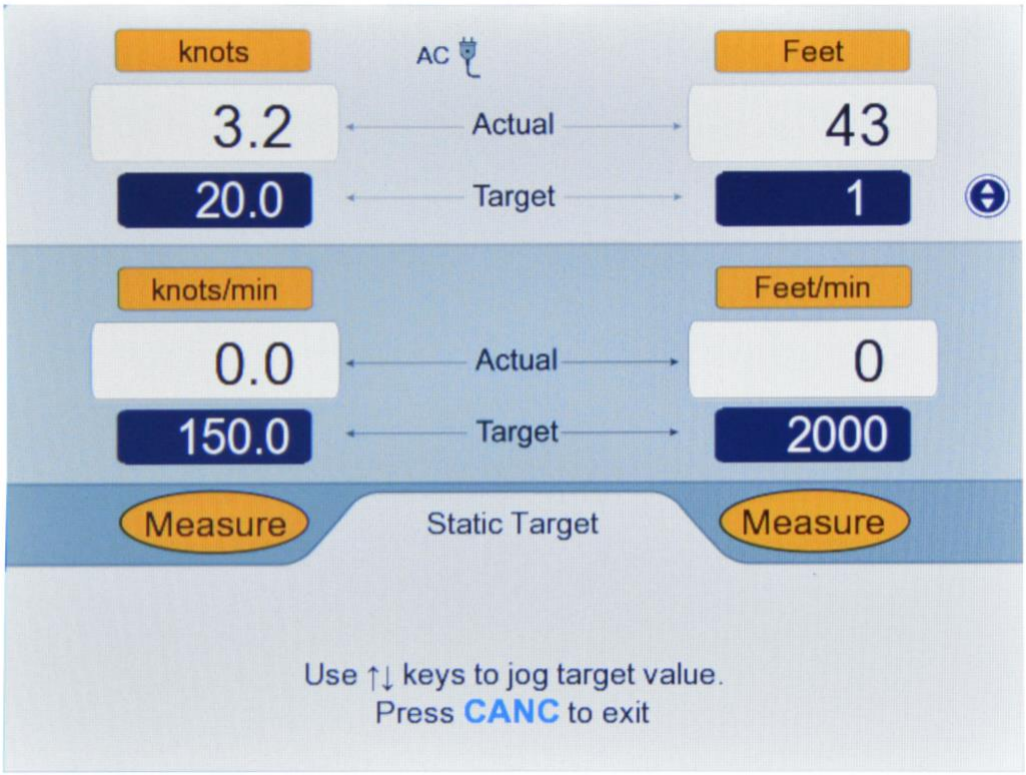


**Figure 3.10 : Jog the Static Target value**

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the right of the Static Target value field. This indicates that the Static 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 Static 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 Static units and is shown in the table below.

| Static units | Jog increment |
|---|---|
| Feet | 1 |
| Meters | 1.0 |
| inHg | 0.001 |
| mbar | 0.01 |
| psi | 0.001 |
| mmHg | 0.01 |
| kpa | 0.001 |

## 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 Static pressure rate is internally limited by the altitude rate and never allowed to exceed it.**

**Pitot Rate Target value**

The Pitot Rate Target value can be changed only if the key# symbol **(3)** is displayed to the left of the Pitot Rate Target value field. Press key '**3**' on the keypad and the Lower section of the display will appear as shown in Figure 3.11 below.

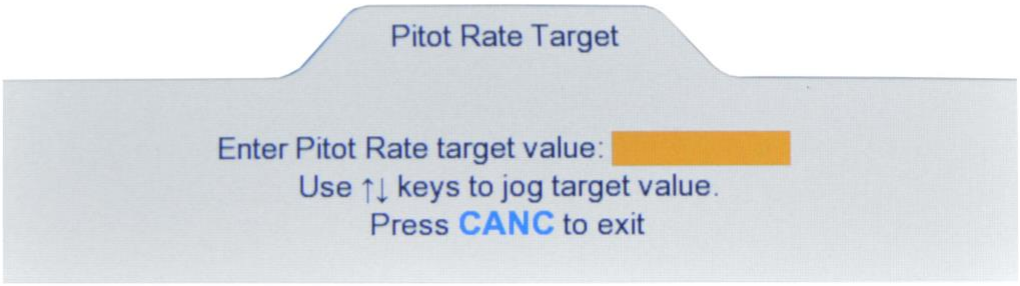


**Figure 3.11 : Pitot Rate Target value**

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.

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

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

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

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 Pitot Rate Target value is 150.0 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.

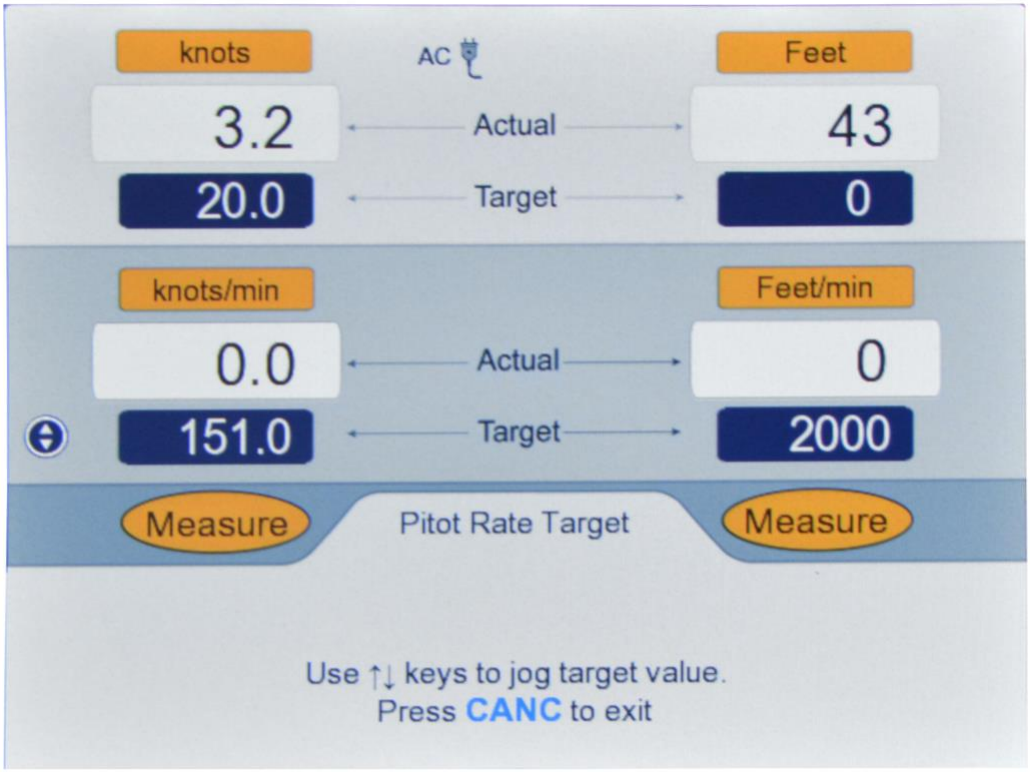


**Figure 3.12 : Jog the Pitot Rate Target value**

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the left of the Pitot Rate Target value field. This indicates that the Pitot 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 Pitot 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 Pitot Rate units and is shown in the table below.

| Pitot-Rate Units | Jog increment |
|---|---|
| knots/min | 1.0 |
| km/hr/sec | 0.1 |
| mph/min | 1.0 |
| inHg/min | 0.01 |
| mbar/min | 0.1 |

| | |
|---|---|
| psi/min | 0.01 |
| mmHg/min | 0.1 |
| kpa/min | 0.01 |

## Static Rate Target value

The Static Rate Target value can be changed only if the key# symbol **(7)** is displayed to the right of the Static Rate Target value field. Press key '**7**' on the keypad and the Lower section of the display will appear as shown in Figure 3.13 below.

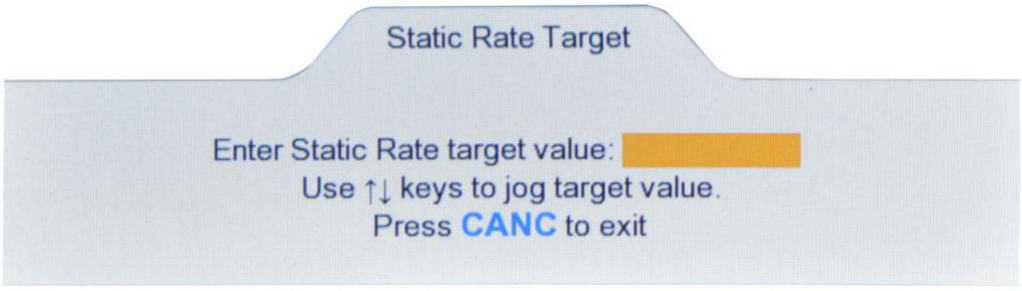


**Figure 3.13 : Static Rate Target value**

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.

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

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

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

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 Static 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 3.14 : Jog the Static Rate Target value**

In this screen, the Upper section has a new symbol (with Up & Down arrows) to the right of the Static Rate Target value field. This indicates that the Static 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 Static 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 Static units and is shown in the table below.

| Static-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 |

## 3.6 CHANGING MODES

**Note: On power-up, both Pitot and Static are in Measure mode.**

**Pitot Mode**

The Pitot mode can be changed when the key# symbol **(4)** is displayed to the left of the Pitot mode field. Press key '**4**' on the keypad and the Lower section of the display will appear as shown in Figure 3.15 below.

**Figure 3.15 : Select Pitot 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 3.16 below.

**Figure 3.16 : Pitot Leak mode**

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

Press '**4**' to select Pitot mode again. Then press '**3**' to select Pitot Control mode. The screen appears as shown in Figure 3.17 below.

**Figure 3.17 : Pitot Control mode**

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

**Note: When Pitot mode is changed to Control, Static mode is automatically changed to Control. Similarly, when Static mode is changed to Control, Pitot mode is automatically changed to Control.**

**Note: Leak and Measure modes can be selected independently for Pitot and Static.**

**Static Mode**

The Static mode can be changed when the key# symbol **(8)** is displayed to the right of the Static mode field. Press key '**8**' on the keypad and the Lower section of the display will appear as shown in Figure 3.18 below.

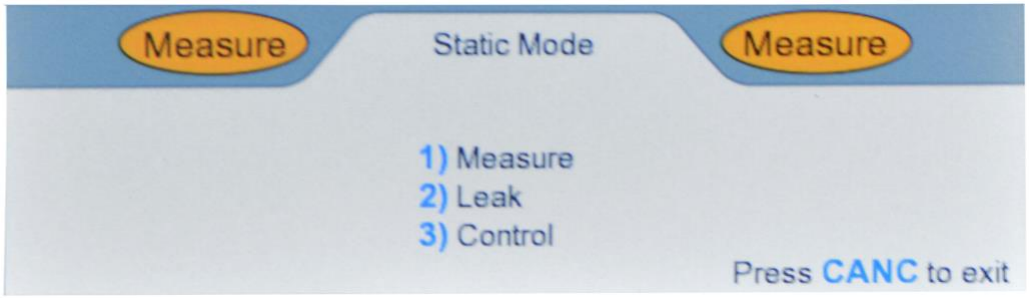


**Figure 3.18 : Select Static Mode**

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 3.19 below.

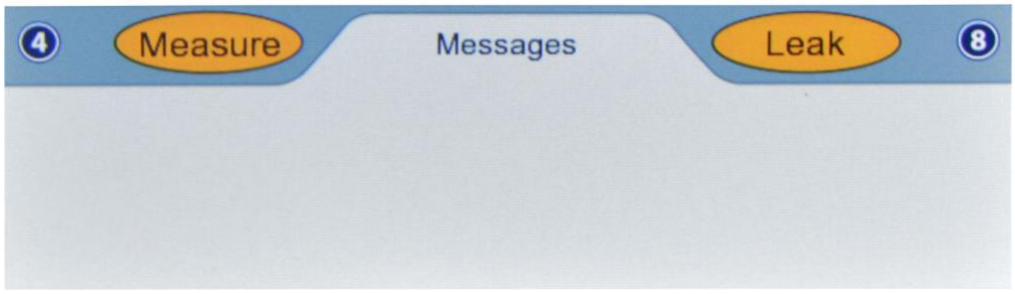


**Figure 3.19 : Static Leak mode**

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

Press '**8**' to select Static mode again. Then press '**3**' to select Static Control mode. The screen appears as shown in Figure 3.20 below.

**Figure 3.20 : Static Control mode**

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

**Note: When Pitot mode is changed to Control, Static mode is automatically changed to Control. Similarly, when Static mode is changed to Control, Pitot mode is automatically changed to Control.**

**Note: Leak and Measure modes can be selected independently for Pitot and Static.**

### 3.6.1 MEASURE TO CONTROL TRANSITION

When either a Pitot or Static 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 6250 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 6250 measures the pressure at the output, shuts-off the output from the internal 6250 pneumatics, and then controls the pressure within the internal control mechanism to match the pressure at the output. Once this is done, the 6250 controlling section is connected to the output. This process is termed as Equalization.

While the 6250 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 6250 will automatically inject a small vacuum on the Static output and a small pressure on the Pitot output. This is done to determine the volume of the Pitot and Static system on the aircraft, so that the 6250 can automatically adjust the gain of its control mechanism. Due to this, the actual value will always increase in both altitude and in knots 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 Pitot and Static outputs of the 6250. 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, both 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 Pitot Leak-check**

The ideal way to perform a Pitot leak-check is to keep Static in Control at "Ground' and control Pitot to a minimum of 100 knots before starting the leak check. Below is a step-

by-step process of performing the Pitot leak-check. It is assumed that the Self-Test has already been performed as described in Section 3.1

1. Close both Pitot and Static ports (tightly, please).
2. 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 20 knots and 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 Pitot Target to 100 knots. (Press **2** to change Pitot Target. Press **1**, **0**, **0**, **ENTER** for new value.) The new Target value will be blinking. Press **GO** to activate. The Pitot Actual value will ramp to 100 knots. The Static output will still be controlling at "Ground".
5. Once the Pitot Actual reaches 100 knots, allow it to stabilize for a few seconds.
6. Change the Pitot mode to Leak. (Press **4** to change Pitot mode. Press **2** to select Leak). 'Leak' will be blinking in the Pitot mode field. Press **GO** to activate.

The Lower section of the screen will appear similar to Figure 3.21 below. The parameters shown in the Leak screen are explained below, after Figure 3.24.

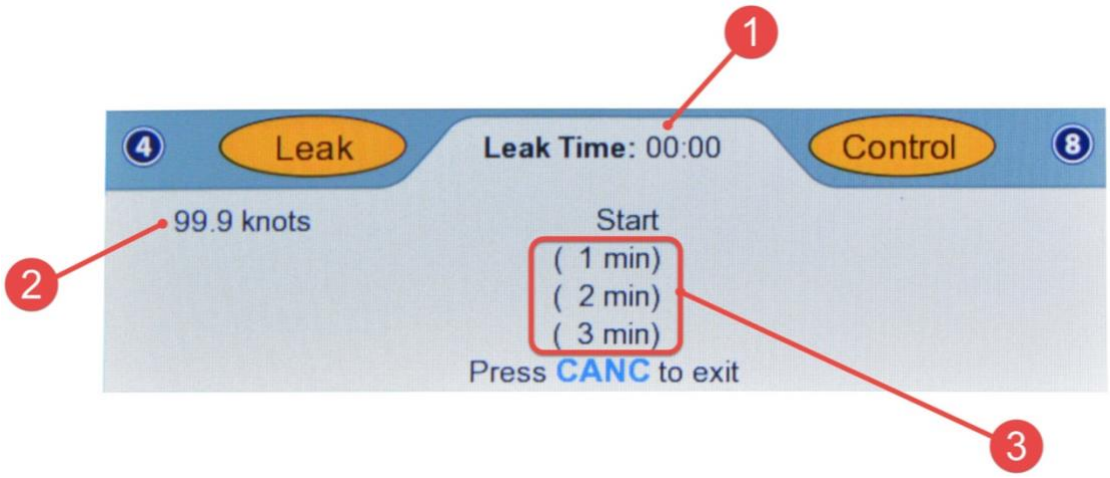


**Figure 3.21 : Pitot Leak (start)**

At the end of one minute, the screen will appear similar to Figure 3.22 below.

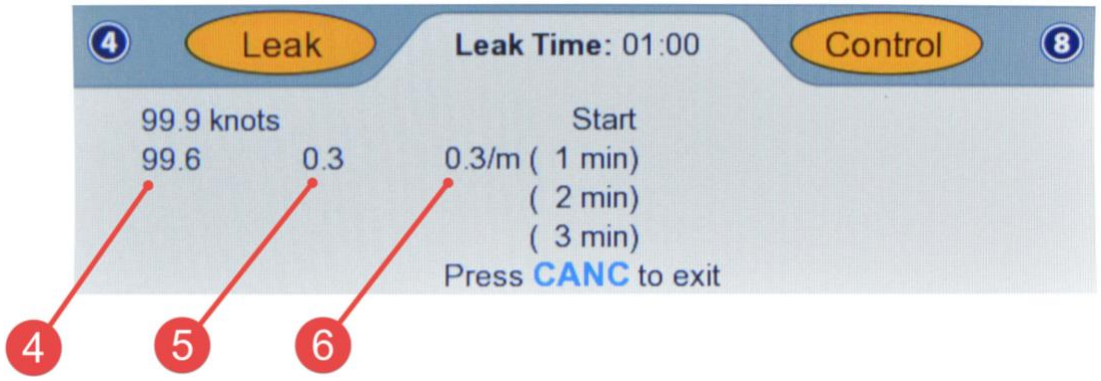


**Figure 3.22 : Pitot Leak (1-min)**

At the end of two minutes, the screen will appear similar to Figure 3.23 below.

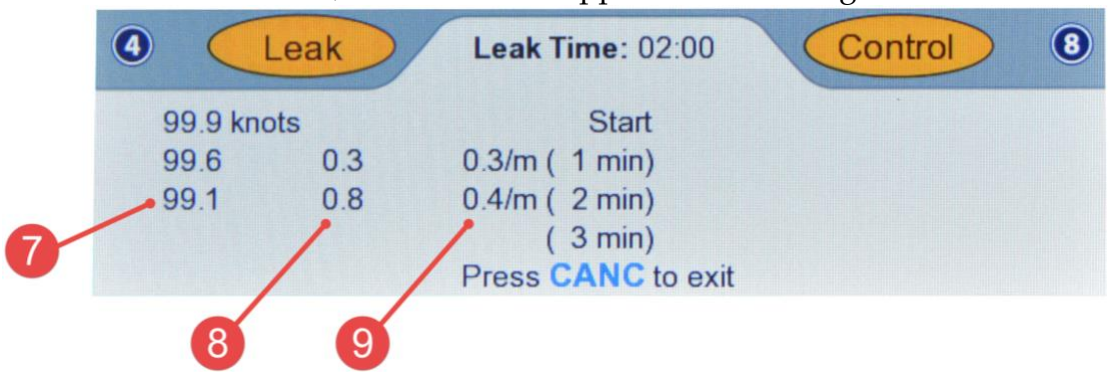


**Figure 3.23 : Pitot Leak (2-min)**

At the end of three minutes, the screen will appear similar to Figure 3.24 below.

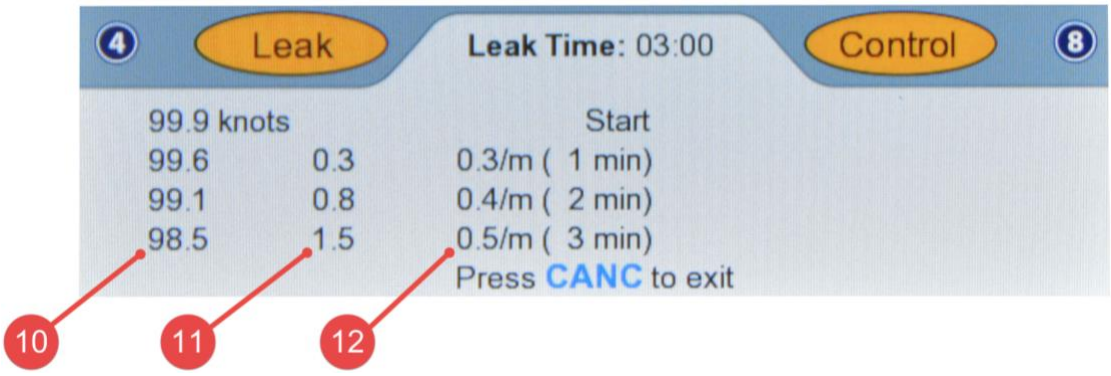


**Figure 3.24 : Pitot Leak (3-min)**

The parameters indicated in Figures 3.21 through 3.24 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] Average per-minute leak rate over 1 minute

[7] The Actual value at the end of 2 minutes

[8] Total leak in 2 minutes

[9] Average per-minute leak rate over 2 minutes

[10] The Actual value at the end of 3 minutes

[11] Total leak in 3 minutes

[12] Average per-minute leak rate over 3 minutes

When **CANC** is pressed to exit out of Leak mode, the 6250 automatically goes back to Control mode.

**Instant Pitot 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 Pitot 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 Pitot system (including tightening fittings, adjusting adapters etc) to reduce the leak.

**Excessive Pitot Leak:** If the 'instant' leak-rate exceeds 50 knots/min, to protect the aircraft instruments, the 6250 will automatically put Pitot back into Control mode and abort the leak check. An error message:

**ERR 7: Pitot 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 Static Leak-check**

The ideal way to perform a Static leak-check is to keep Pitot in Control at 100 knots and control Static to a minimum of 3000 feet **above** "Ground", before starting the leak check. Below is a step-by-step process of performing the Static leak-check. It is assumed that the Self-Test has already been performed as described in Section 3.1

1. Close both Pitot and Static ports (tightly, please).
2. 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 20 knots and 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 Pitot Target to 100 knots. (Press **2** to change Pitot Target. Press **1**, **0**, **0**, **ENTER** for new value.) The new Target value will be blinking. Do **NOT** press **GO**.
5. Assuming that "Ground" is 200 feet, change the Static Target to 3200 feet. . (Press **6** to change Static Target. Press **3**, **2**, **0**, **0**, **ENTER** for new value.) The new Target value will be blinking.
6. Press **GO** to activate both targets simultaneously. The Pitot Actual value will ramp to 100 knots. The Static Actual value will ramp to 3200 feet.
7. Once the Pitot and Static Actual values reach their targets, allow them to stabilize for a few seconds.
8. Change the Static mode to Leak. (Press **8** to change Static mode. Press **2** to select Leak). 'Leak' will be blinking in the Static mode field. Press **GO** to activate. Note that Pitot will still be in Control at 100 knots.

The Lower section of the screen will appear similar to Figure 3.25 below. The parameters shown in the Leak screen are explained below, after Figure 3.28.

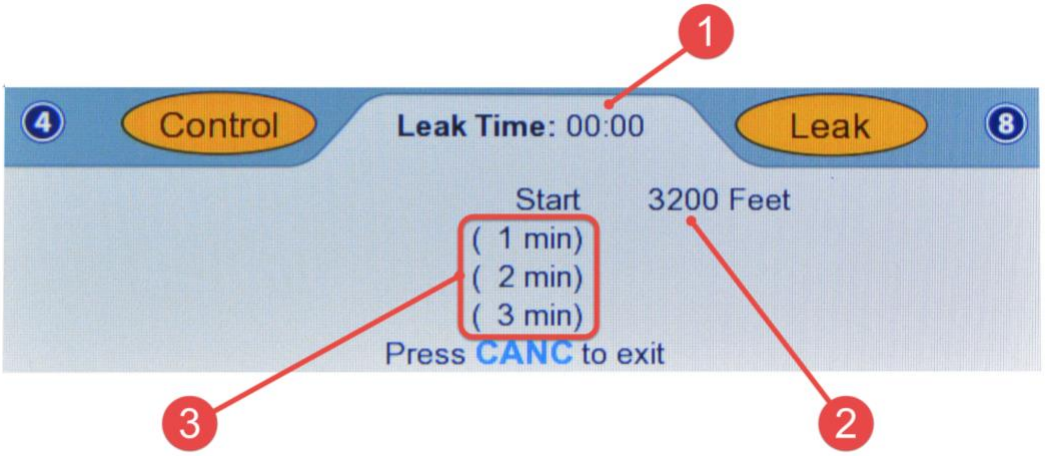


**Figure 3.25 : Static Leak (start)**

At the end of one minute, the screen will appear similar to Figure 3.26 below.

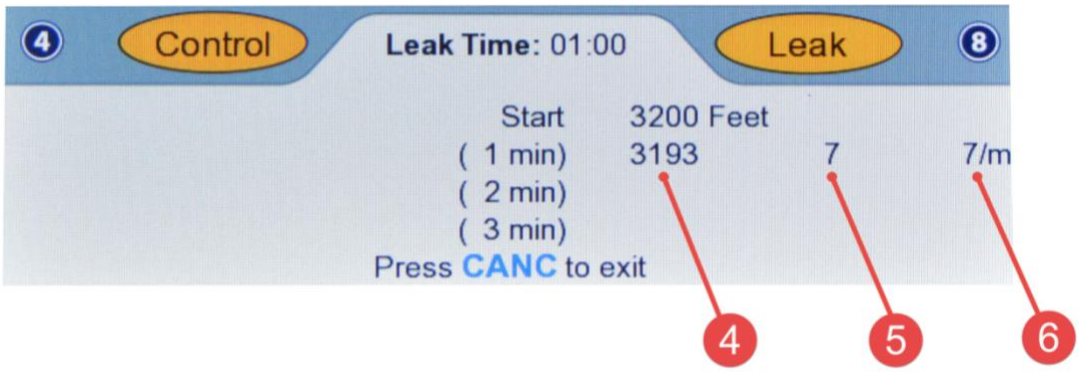


**Figure 3.26 : Static Leak (1-min)**

At the end of two minutes, the screen will appear similar to Figure 3.27 below.

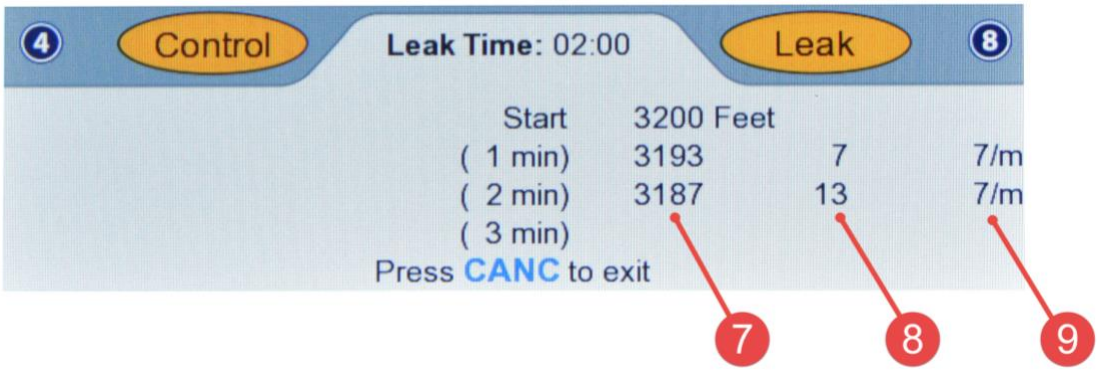


**Figure 3.27 : Static Leak (2-min)**

At the end of three minutes, the screen will appear similar to Figure 3.28 below.

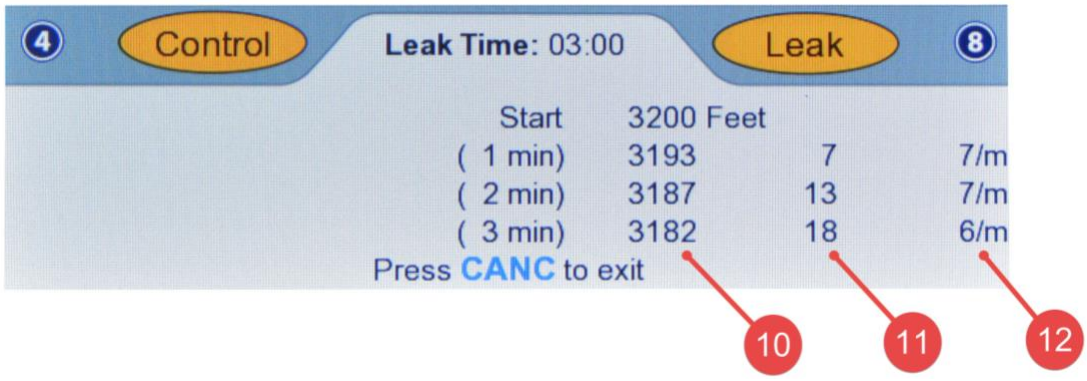


**Figure 3.28 : Static Leak (3-min)**

The parameters indicated in Figures 3.25 through 3.28 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] Average per-minute leak rate over 1 minute

[7] The Actual value at the end of 2 minutes

[8] Total leak in 2 minutes

[9] Average per-minute leak rate over 2 minutes

[10] The Actual value at the end of 3 minutes

[11] Total leak in 3 minutes

[12] Average per-minute leak rate over 3 minutes

When **CANC** is pressed to exit out of Leak mode, the 6250 automatically goes back to Control mode.

**Instant Static 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 Static 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 Static system (including tightening fittings, adjusting adapters etc) to reduce the leak.

**Excessive Static Leak:** If the 'instant' leak-rate exceeds the Target Static rate (factory-set at 2000 feet/min), to protect the aircraft instruments, the 6250 will automatically put Static back into Control mode and abort the leak check. An error message:

**ERR 8: Static 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 Pitot and Static Leak**

To leak-check Pitot and Static outputs simultaneously, both Pitot and Static modes should be changed to Leak, before pressing **GO**.

Assuming Pitot is controlling at 100 knots and Static is controlling at 3200 feet, press **4** then **2** to set Pitot mode blinking in 'Leak'. Press **8** then **2** to set Static mode blinking in 'Leak'. Press **GO**. Both Pitot and Static will go into leak mode and after 3 minutes, the Lower section of the screen will appear similar to Figure 3.29

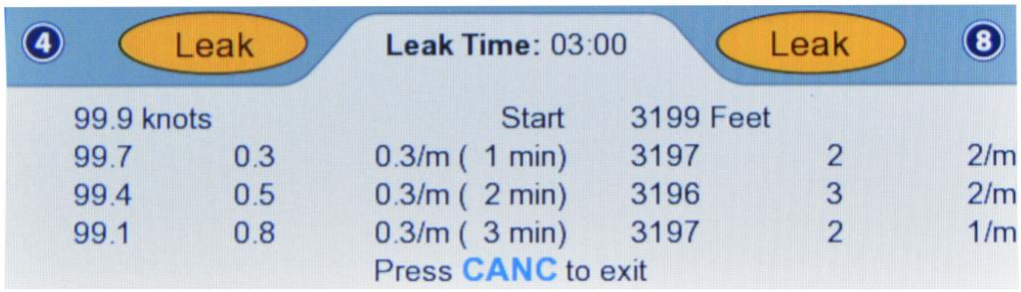


**Figure 3.29 : Simultaneous Pitot & Static leak-check (3-min)**

When **CANC** is pressed, both Pitot and Static 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 both Pitot and Static outputs are open to ambient (close to "Ground") and Both Pitot and Static 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.

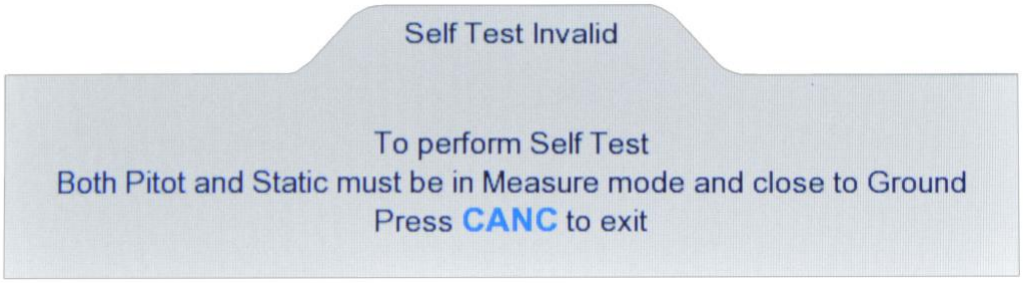


**Figure 3.30 : Self-Test Invalid**

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

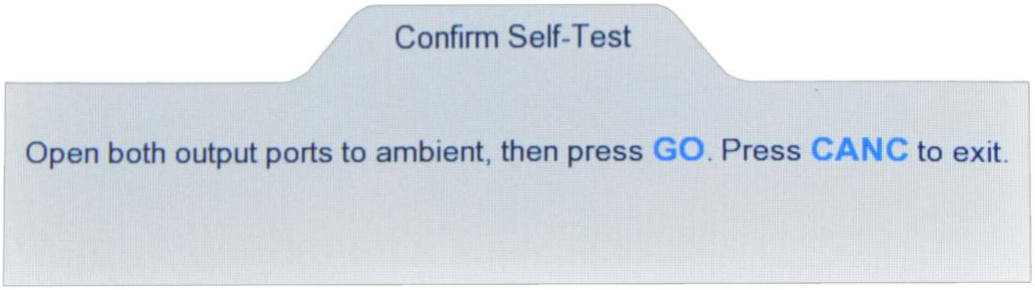


**Figure 3.31 : Confirm Self-Test**

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 3.32

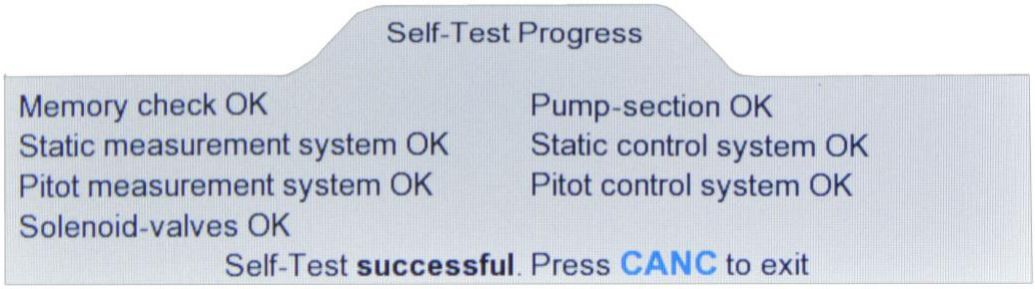


**Figure 3.32 : Self-Test successful**

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

As shown in Figure 3.32, there are seven categories of tests performed, which essentially check most of the sub-systems within the 6250. The pumps are started just after 'Pitot

measurement system OK' is displayed. There is a long delay of about 100 seconds before the next update of the screen (Solenoid-valves OK). During this time the 6250 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 **CANC** 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 Pitot Target to the equivalent of 20 knots (in the current Pitot units)
b. Sets the Static Target to the equivalent of the ambient ("Ground") pressure (in the current Static units).
c. Sets both Pitot and Static modes to Control.
d. 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 6250 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 Pitot-Rate or Static Rate target values. Also, it does NOT alter the Pitot or Static units.**

The 6250 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.

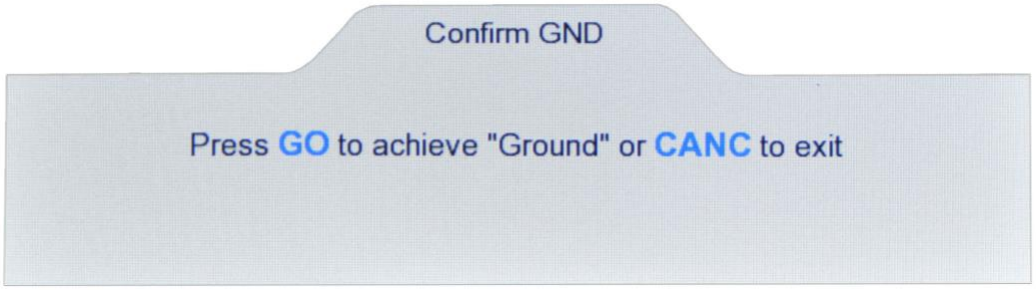


**Figure 3.33 : Confirm GND**

Pressing **GO** will activate the 6250 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 6250 is ramping from one target to another. This function is valid only when one or both outputs are in Control mode. When the **HOLD** key is pressed, the 6250 will stop ramping both outputs and try to maintain a zero Pitot-Rate and Static-Rate.

The Lower section will display the following message:

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

In the Upper section, all four 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 6250 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.

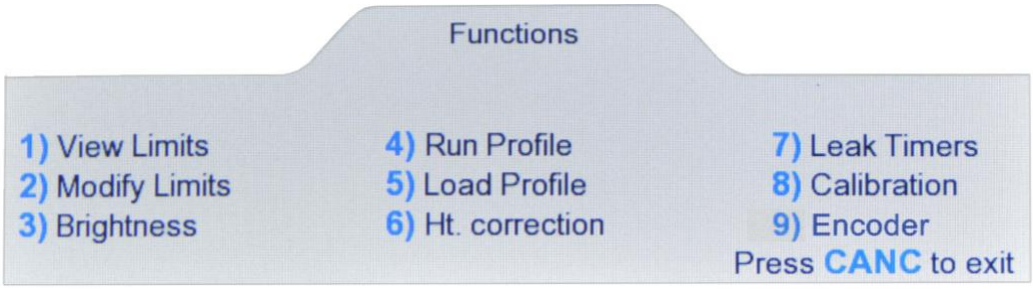


**Figure 3.34 : Functions**

### 3.10.1 VIEW LIMITS

The 6250 has seven 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 6250 puts both outputs into Measure mode and displays an error condition.

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

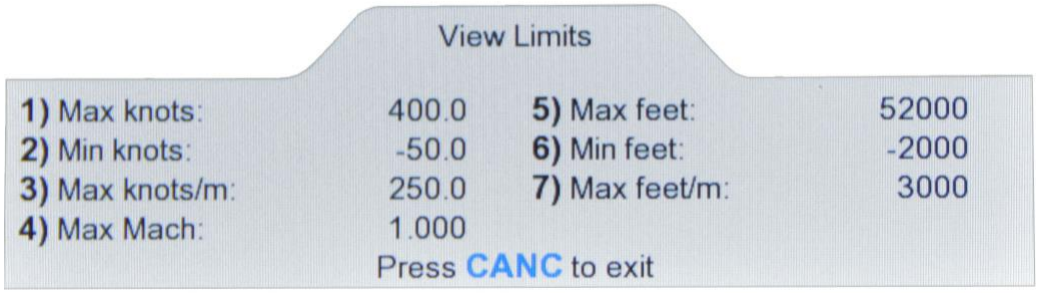


**Figure 3.35 : View Limits**

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

### 3.10.2 MODIFY LIMITS

The seven 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.

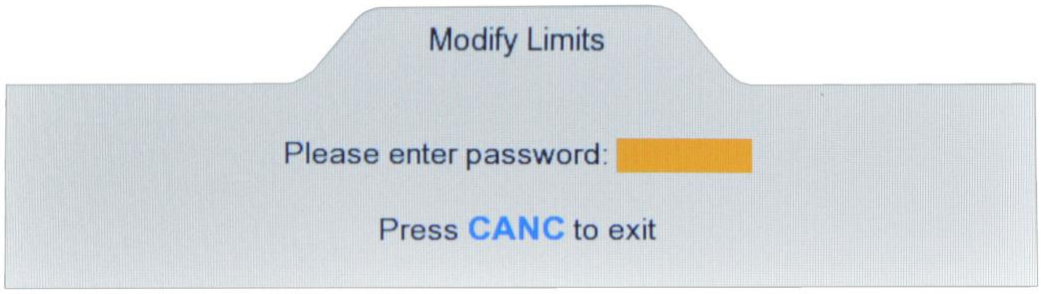


**Figure 3.36 : Modify Limits (password)**

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

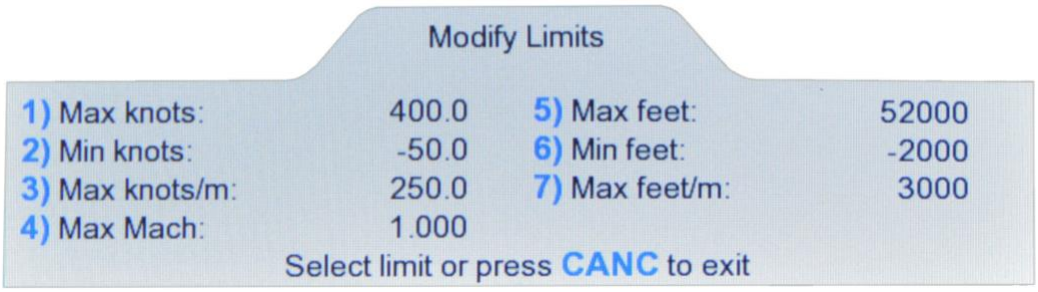


**Figure 3.37 : Modify Limits (selection)**

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.

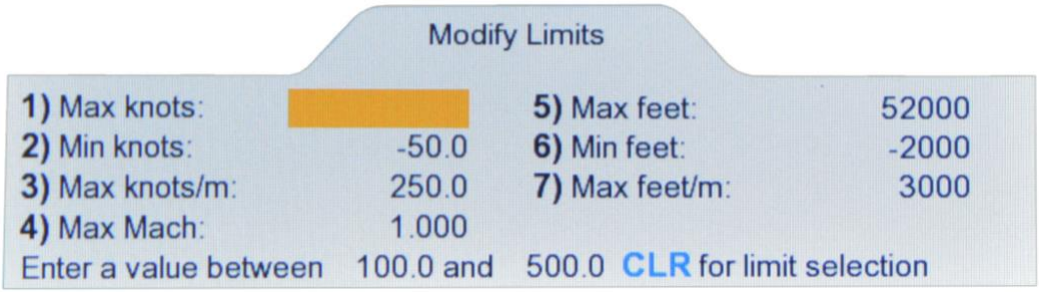


**Figure 3.38 : Modify Limits (value entry)**

An explanation of each limit follows.

1) **Max knots:** This limit can be set between 100 and 500 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 Pitot-pressure in pressure units. (See note below). The factory setting is 250 knots/min.

**Note: In pressure units, Pitot-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 Static pressure that can be controlled. The factory setting is 52,000 feet.

6) **Min feet:** This limit can be set between -2,100 and 0 feet. It defines the minimum altitude that can be controlled. It also defines the maximum Static 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 Static-pressure in pressure units. (See note below).

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

### 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.

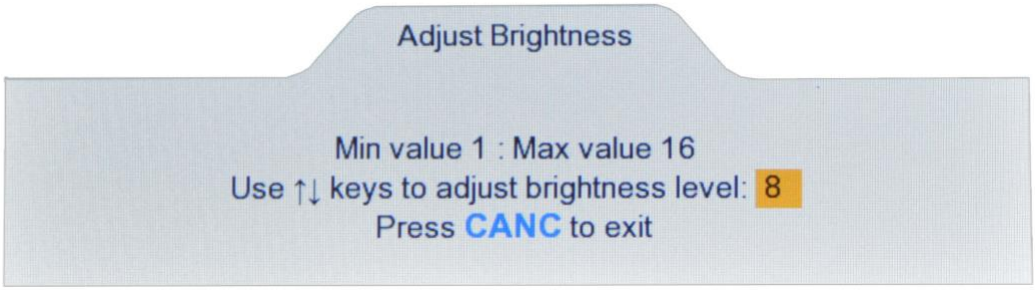


**Figure 3.39 : Adjust Brightness**

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 8 parameters that are usually entered by the user (units, target values, modes). The 6250 can store up to 15 profiles in its non-volatile memory.

Profile number 15 is factory-installed. It is a short, modified version of the FAR 91.411. To run this profile, press '**4**' while in the Functions menu. The following will appear.

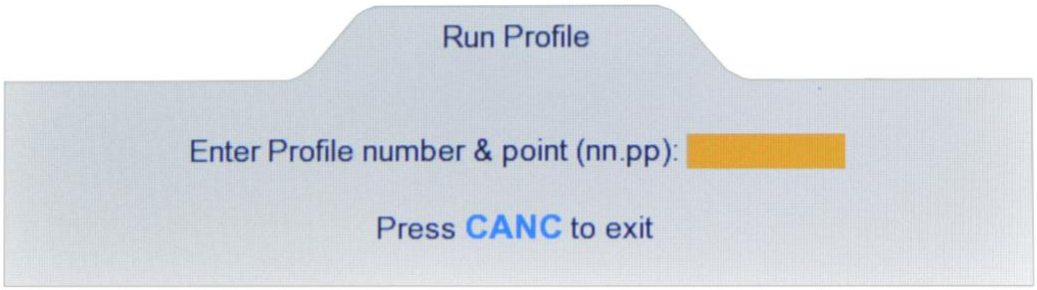


**Figure 3.40 : Run Profile (enter profile number)**

Enter the Profile number. In this case, enter '15.1' followed by ENTER. This will bring up point 1 of profile 15. (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.

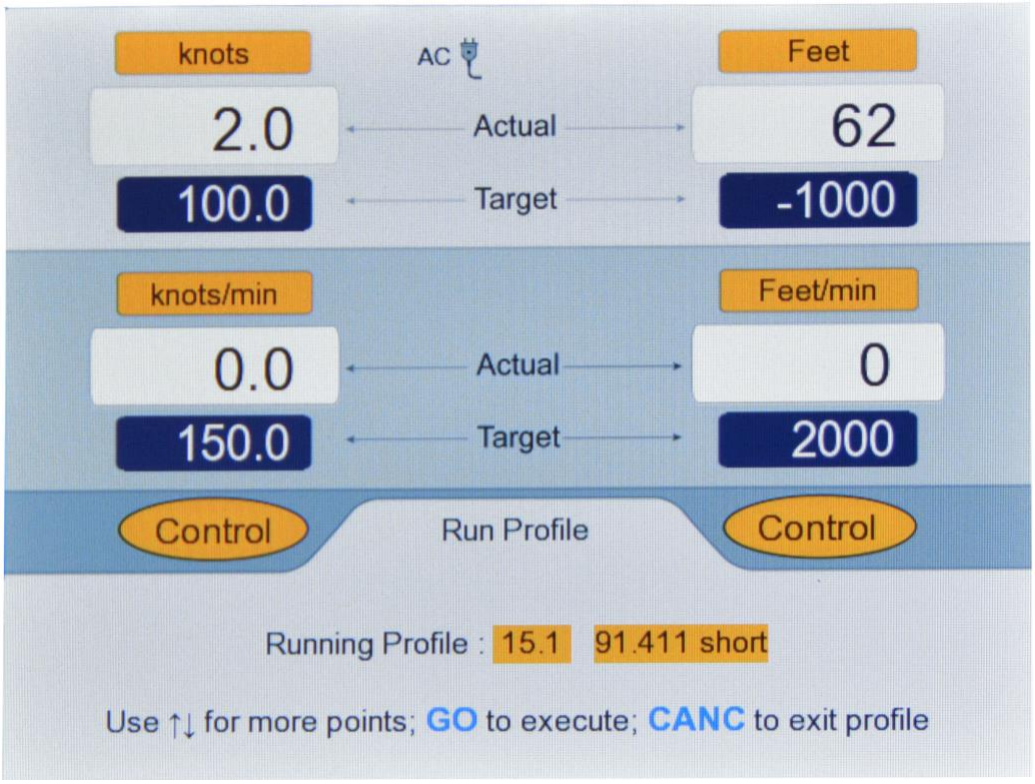


**Figure 3.41 : Run Profile (15.1 Blinking)**

As shown in Figure 3.41, the following changes have been made to the Upper section of the screen:

a. Units have been set to knots & Feet
b. Targets have been set to 100.0 knots and -1000 Feet
c. Target-Rates have been set to 150.0 knots/min and 2000 Feet/min
d. Modes have been set to Control on both outputs

In the Lower section, the profile number (15.1) will be blinking (waiting for **GO** or **CANC**). The name of the profile '91.411 short' 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.

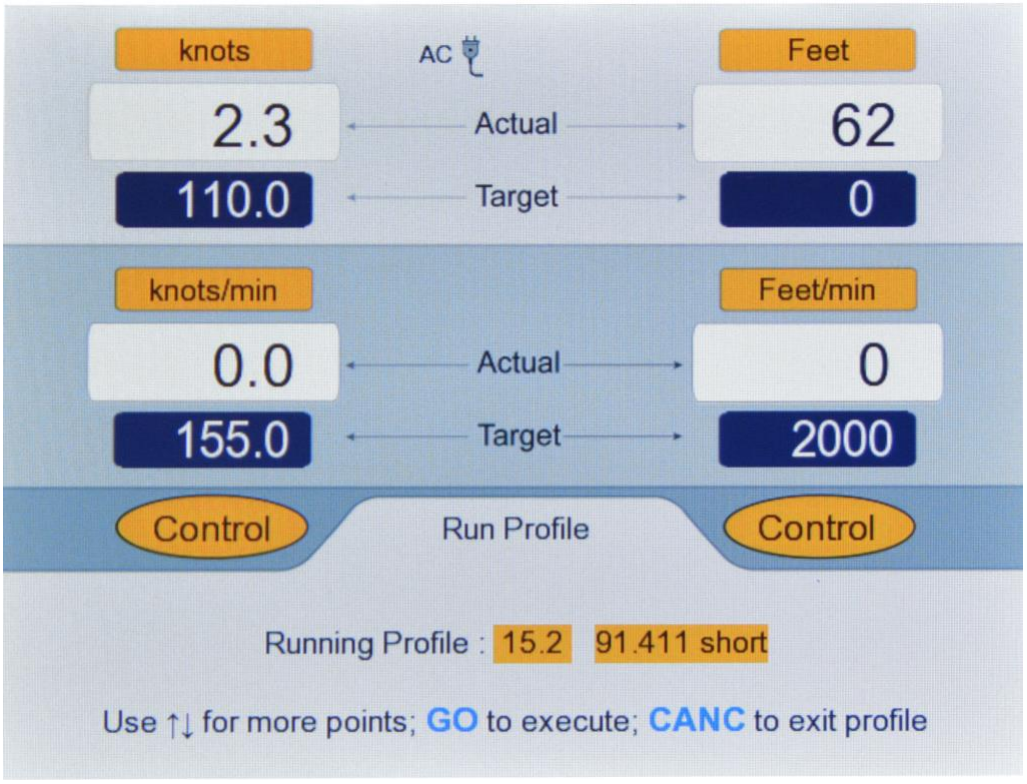


**Figure 3.42 : Run Profile (15.2 Blinking)**

For this point, units and modes remain the same as point 1, but three of the target values have changed. In the Lower section, '15.2' 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 15.6).

Cancel out of Profile 15 by pressing **CANC**. Press **FUNC** and then '**4**' to return to the 'Run Profile' screen and then enter '15.1' followed by **ENTER**. Again, '15.1' will be blinking and all 8 parameters will be setup. Now, press **GO** to execute the profile. (Before doing this, please ensure that both ports are closed and both Vent valves are closed).

Wait for the 6250 to achieve the targets set in 15.1. The screen will appear as shown below.

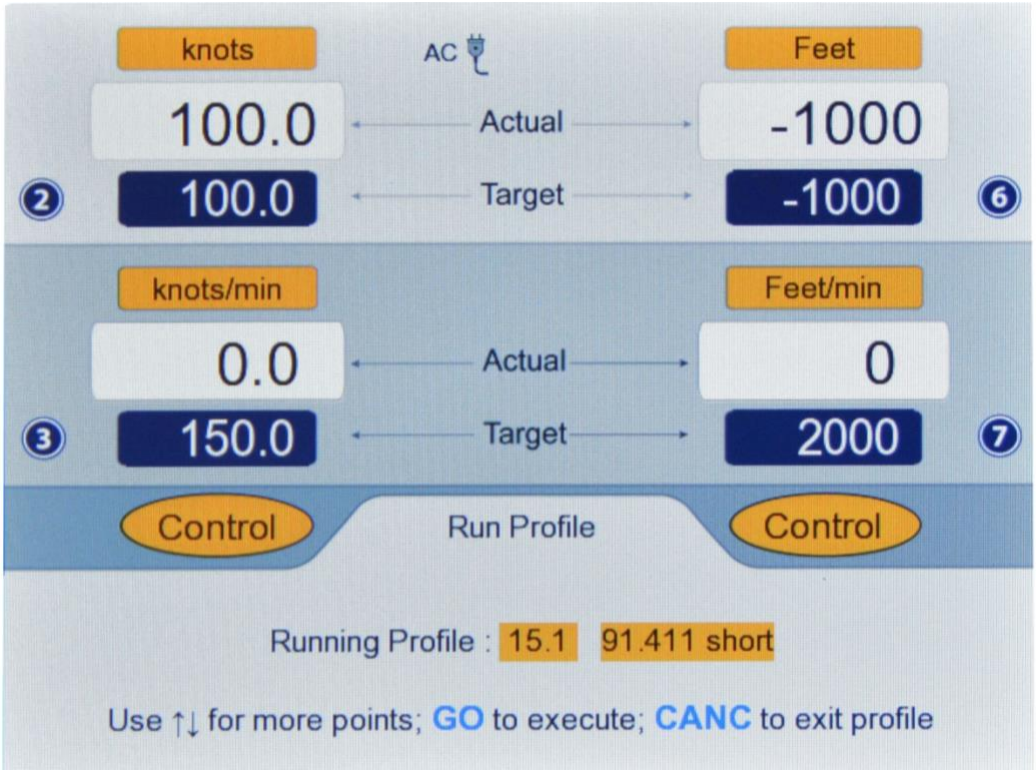


**Figure 3.43 : Run Profile (15.1 Achieved)**

Now press **Up-Arrow** to move to 15.2, which will be blinking. Press **GO**. Wait for targets to be achieved. Then press Up-Arrow to move to 15.3 and wait for targets to be achieved.

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

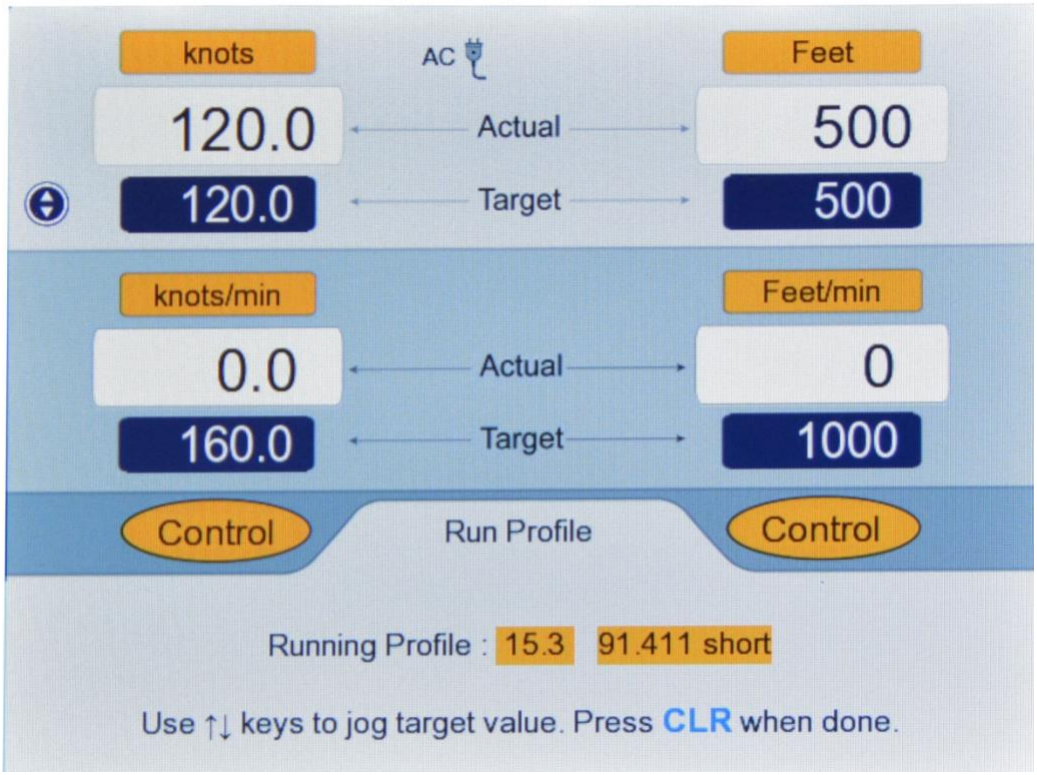


**Figure 3.44 : Run Profile (Jog Pitot Target at 15.3)**

The symbol with the arrows is shown to the left of the Pitot 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 6250. 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 6250 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.

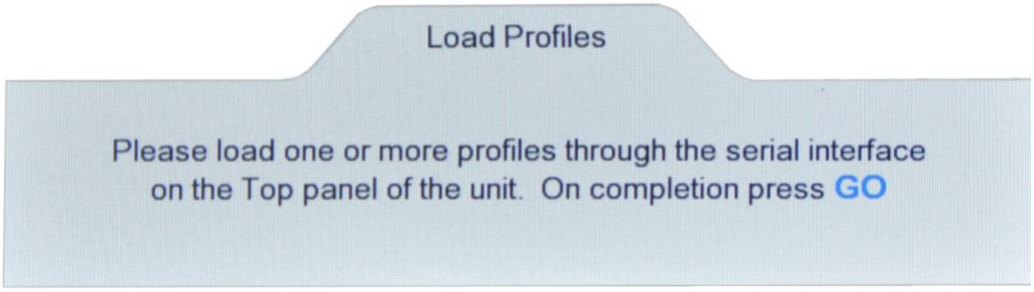


**Figure 3.45 : Load Profiles**

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 Static ports on the aircraft are significantly higher than the location of the 6250 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

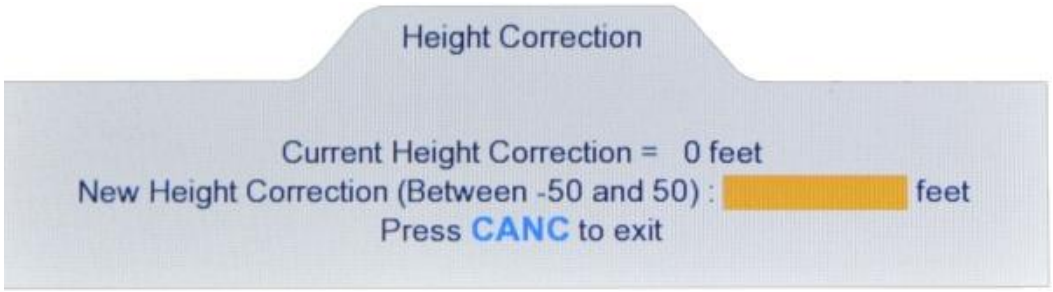


**Figure 3.46 : Height Correction**

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

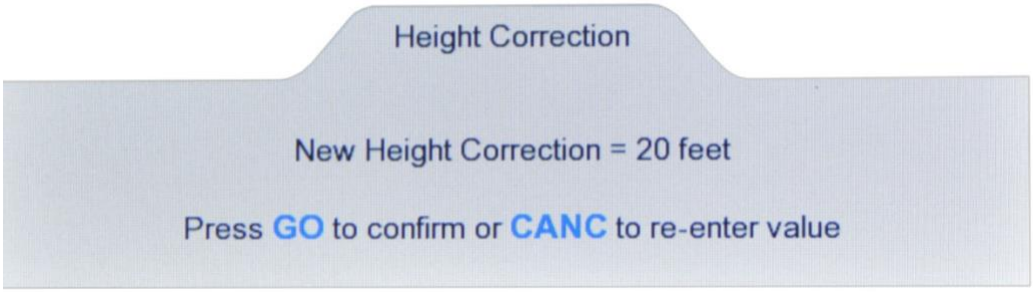

**Figure 3.47 : Height Correction confirmation**

Unless the location of the tester is higher than the location of the Static 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.

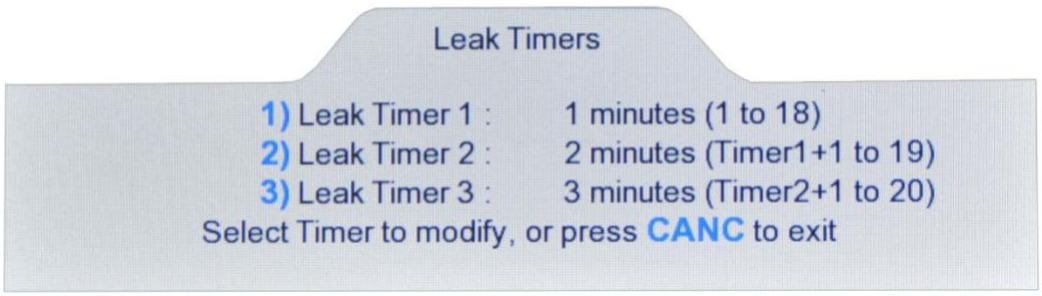


**Figure 3.48 : Set Leak Timers**

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

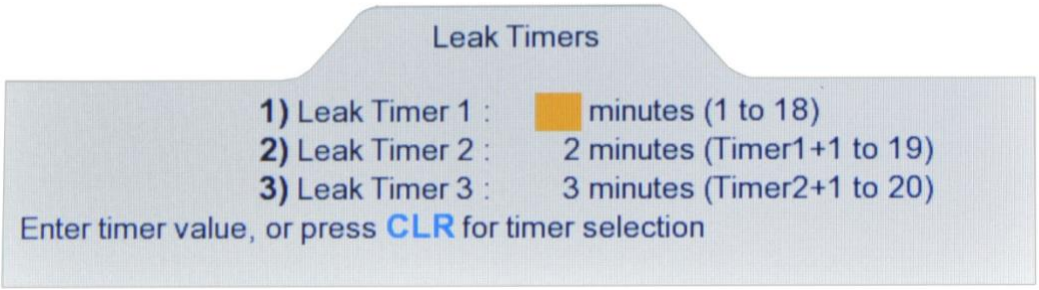


**Figure 3.49 : Adjust Leak Timer**

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 6250. Before selecting the calibration function it is necessary to set Pitot units to 'QcinHg' and the Static units to 'inHg'. Also, both outputs must be in Measure mode. If this is not set up correctly and Function '8' is selected, the following screen will appear.

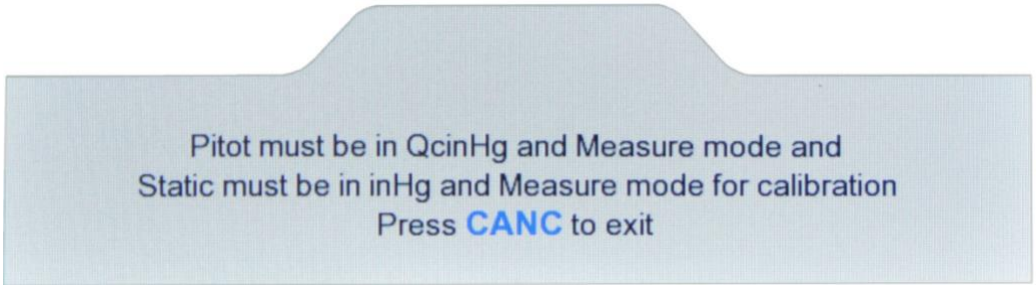


**Figure 3.50 : Calibration (invalid)**

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

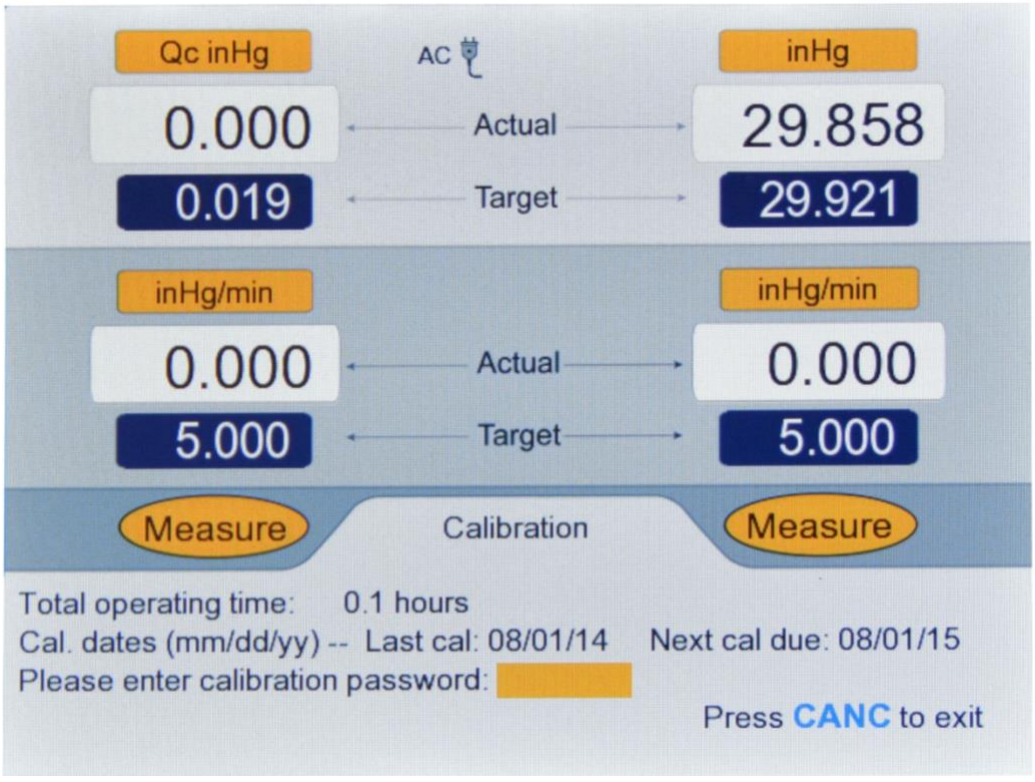


**Figure 3.51 : Calibration (password)**

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 6250 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 6250 was last calibrated. This date is updated each time the 6250 is calibrated.
c. **Next calibration due:** This is the date ('mm/dd/yy' format) that the next calibration is due for the 6250. This date is also updated each time the 6250 is calibrated.

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

**Note: The 6250 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 6250. 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 6250 properly. Follow these steps:

a. Connect the Static output of the 6250 to the encoder's Static port.
b. Close (cap-off) the Pitot port of the 6250.
c. Set Pitot units to knots and Static units to Feet (or Meters)
d. Set the Static 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 Static 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.

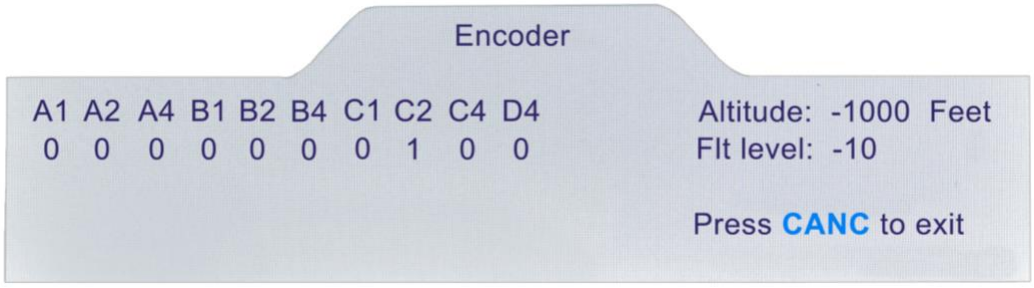


**Figure 3.52 : Encoder (1)**

The screen shows the 10-bit code recived 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 Static 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.

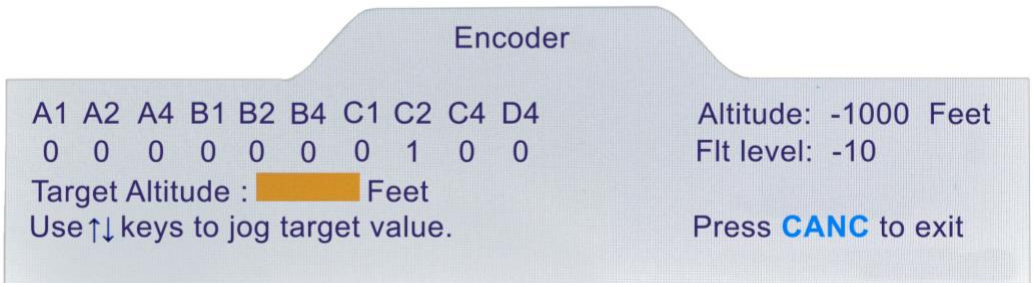


**Figure 3.53 : Encoder (Target Altitude entry)**

Enter a new target altitude (which will appear blinking in the Static 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 6250 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 6250 has been supplied with an optional external or integrated battery, the battery will be capable of operating the 6250 for about 8 hours.

The battery can be recharged simply by connecting AC power to the 6250 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 6250 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 6250 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 6250

While performing an internal leak-check of the 6250 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 torque down adequately, even though O-rings are provided on these fittings.
b. When performing a leak-check at 50,000 feet, after the altitude has been reached, the unit must be left in Control mode for a minimum of 5 minutes (preferably 10 minutes) to allow the temperature effects to subside. Because of the small

internal volume in the 6250, 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 6250, to the overall leak in the system. Typically, the internal leak of the 6250 contributes less than 10% to the leak with the aircraft connected. Therefore, an internal leak of 100 ft/min in the 6250 will contribute only 10 ft/min (or less) to the leak measured with the aircraft connected.

To perform an internal leak-check of the 6250, follow these steps:

1. Set the Leak-Timers to 1, 5 and 10 minutes. Set the units to knots and feet.
2. Perform a Self-Test (**TEST**). Then close both output ports very tightly.
3. Go-To-Ground. (**GND**)
4. Set targets to 150 knots and 50,000 feet. Set Rate targets to 150 knots/min and 5000 feet/min. **GO**.
5. Once targets have been achieved, wait for a minimum of 5 minutes to allow temperature effects to stabilize.
6. Put both Pitot and Static outputs into Leak mode simultaneously. **GO**.
7. Wait for the Leak-check to be completed, then note the Average per-minute leak rate (parameter 12 as described in Section 3.6.2) for Pitot and Static at the end of 10 minutes.
8. The Average per-minute leak rate for Pitot (at the end of 10 minutes) should not exceed 1.0 knot/min.
9. The Average per-minute leak rate for Static (at the end of 10 minutes) should not exceed 120 feet/min.
10. If the leak-rates exceed the maximum allowed, cancel out of the leak-screen and repeat the leak-test from Step 5, **after further tightening the caps on the output ports**.
11. If the leak-rates continue to exceed the maximum allowed, the unit may need to be repaired.
12. Go-to-Ground. Reset the Leak-Timers to their original values. Turn Off the 6250.

# SECTION 4 : PROFILES

Profiles are created in Microsoft Excel and loaded into the 6250 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 6250 what you would want it to do at each point. Each point consists of 8 parameters: 1) Pitot units, 2) Pitot mode, 3) Pitot target value, 4) Pitot Rate target value, 5) Static units, 6) Static mode, 7) Static target value and 8) Static Rate target value. These 8 parameters are defined by you in the Excel program.

A total of 15 such profiles can reside in the 6250 at any time. Each profile is identified by a number between 1 to 15 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 |
|---|---|---|---|---|---|---|---|---|
| 1 | Profile | | | | | | | |
| 2 | Sample | | | 3 | | | 0 | |
| 3 | knots | Control | 100.0 | 150.0 | Feet | Control | 0 | 6000 |
| 4 | knots | Control | 200.0 | 150.0 | Feet | Control | 0 | 6000 |
| 5 | knots | Leak | 200.0 | 150.0 | Feet | Control | 0 | 6000 |
| 6 | knots | Control | 100.0 | 150.0 | Feet | Control | 1000 | 6000 |
| 7 | knots | Control | 200.0 | 150.0 | Feet | Control | 5000 | 6000 |
| 8 | knots | Control | 300.0 | 150.0 | Feet | Control | 10000 | 6000 |
| 9 | knots | Control | 100.0 | 150.0 | Feet | Control | 18000 | 6000 |
| 10 | knots | Control | 100.0 | 150.0 | Feet | Leak | 18000 | 6000 |
| 11 | knots | Control | 100.0 | 150.0 | Feet | Control | 30000 | 6000 |
| 12 | knots | Control | 100.0 | 150.0 | Feet | Control | 50000 | 6000 |
| 13 | knots | Control | 20.0 | 150.0 | Feet | Control | Ground | 6000 |
| 14 | knots | Measure | 20.0 | 150.0 | Feet | Measure | Ground | 6000 |
| 15 | END | | | | | | | |

Row 1 always says "Profile". This indicates to the 6250 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 Run.

Row 2 middle cell shows the number of the profile. This profile has a number 3. This tells the 6250 that this profile is to be loaded in as profile number 3. When profile 3 is Run on the 6250, this "Sample" profile will be executed. This number can be any number between 1 and 15. When this profile is loaded into the 6250 it will overwrite the previous profile that was resident in the 6250 as number 3.

Row 2 right cell shows the height correction. This should normally be zero.

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 | Pitot units |
| B | Pitot mode |
| C | Pitot target value |
| D | Pitot Rate target value |
| E | Static units |
| F | Static mode |
| G | Static target value |
| H | Static Rate target value |

In the sample profile, Row 3, which is the first point in the profile, tells the 6250 to go in Control mode to 100 knots at 150 knots/min on the Pitot side, and in Control mode to 0 feet at 6000 feet/min on the Static side.

Row 4 (point 2) makes the 6250 go to 200 knots at 150 knots/min and 0 feet at 6000 ft/min.

Row 5 (point 3) puts the Pitot side into Leak mode while still keeping Static in Control at 0 feet.

Row 6 (point 4) puts the Pitot side back into Control and takes it down to 100 knots at 150 knots/min. The Static side is simultaneously moved up to 1000 feet at 6000 ft/min.

Row 7 (point 5) takes Pitot up to 200 knots at 150 knots/min and Static up to 5000 feet at 6000 ft/min.

Row 8 (point 6) takes Pitot up to 300 knots at 150 knots/min and Static up to 10,000 feet at 6000 ft/min.

Row 9 (point 7) takes Pitot down to 100 knots at 150 knots/min and Static up to 18,000 feet at 6000 ft/min.

Row 10 (point 8) keeps Pitot at 100 knots and puts Static into Leak mode while at 18,000 feet.

Row 11 (point 9) keeps Pitot at 100 knots and ramps Static in Control mode to 30,000 feet at 6000 ft/min.

Row 12 (point 10) keeps Pitot at 100 knots and ramps Static to 50,000 feet at 6000 ft/min.

Row 13 (point 11) takes Pitot down to 20 knots at 150 knots/min and ramps Static back to "Ground" at 6000 ft/min.

Row 14 (point 12) puts both Pitot and Static into Measure mode.

Row 15, column A, indicates the end of the Profile.

## 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 "11" with a profile number between 1 and 15 that you would like this profile to be saved as, in the 6250.
5. Do not change row 2 right-most cell.
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.

| Pitot units | Digits after decimal | | Comment |
|---|---|---|---|
| | Pitot target | Pitot 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 | 3 | 3 | |
| Qc inHg | 3 | 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 |

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

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 Static output to 18,000 feet, followed by another point where the Static 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 6250 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 "6250". 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 "6250 Hyperterminal" window.

2. Select "File". Select "Properties". A new dialog box "6250 Properties" appears. Select the "Settings" tab. In the "Emulation" menu select "ANSI". Select "OK". Now you are back in the "6250 Hyperterminal" window. Select "File", select "Save". Close this window. A warning appears, select "Yes". Hyperterminal is now setup.

3. To verify that the 6250 file is setup in Hyperterminal, select "All Programs" from the desktop, select "Accessories", select "Communications", select "Hyperterminal". The "6250" 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 6250. 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 6250 for loading profiles, as shown in Section 3.10.5.

3. Start the 6250 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 6250.

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 6250. Check that the profile loaded properly by selecting Function 4 on the 6250 and entering the profile number starting at step 1 (i.e. "15.1" to check profile 15). 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

# SECTION 5 : TYPICAL USE

This section assumes that the user has read Section 3 and understood the functioning of the 6250. Please do not follow the sequence shown below without first reading Section 3.

The following steps show a typical use of the 6250 for checking aircraft instruments.

1. Connect the aircraft adapters and hoses to the aircraft's Pitot and Static ports. You **must** connect to **both** the Pitot and the Static ports, even if the check is being done on only Pitot or Static. **Do NOT connect the hoses to the 6250 at this moment.**
2. Set the "Baro Adjust" on the aircraft to 29.92 inHg or 1013.25 mbar or "Standard".
3. Turn on the 6250 and check the Leak Timers. Adjust the Leak Timers if necessary.
4. Set the Static Rate target to a value that does not exceed the maximum allowed for the aircraft.
5. Set the Pitot Rate target to a value that that will be suitable for the airspeed indicator on the aircraft.
6. Open the Pitot and Static ports (on the 6250) to ambient and perform the Self-Test using the **TEST** key. Pitot and Static Vent valves must be closed (but not too tight).
7. Connect the hoses to 6250 Pitot and Static ports. Perform the Go-To-Ground function using the **GND** key. Wait for the targets to be achieved.
8. If the targets are not achieved, or if the Actual values are fluctuating, then this indicates that the Pitot or Static system is open to ambient and is unable to achieve the targets. Turn Off the 6250 and fix the problem before proceeding.
9. Once the tester is very stable in Control mode at Ground, set the Pitot target to 100 knots and **GO**.
10. When Pitot achieves 100 knots, wait for 30 seconds, then put ONLY Pitot into Leak mode, leaving Static in Control mode.
11. If Pitot has a significant leak (more than 5 knots/min.) then first try and find the leak while Pitot is in Leak mode. If you lose all airspeed while searching for the leak, cancel out of the Leak screen and go back to Step 10. Then continue to search for the leak. If you need to disconnect any hoses or adapters then first:
    a. Go To Ground
    b. Turn Off the 6250.
    c. Then disconnect hoses or adapters.
12. Only after the Pitot system is reasonably leak-tight (leak less than 5 knots/min), should you proceed to the next step.

13. Leave the Pitot target at 100 knots and set the Static target to 3000 feet above Ground. Both Pitot and Static outputs should be in Control mode. Press **GO**.
14. When both Pitot and Static targets have been achieved, wait for 30 seconds, then put ONLY Static into Leak mode, leaving Pitot in Control mode.
15. If the Static port has a significant leak (more than 100 feet/min.) then first try and find the leak while the 6250 is in the Leak screen. If you lose significant altitude while

searching for the leak, cancel out of the Leak screen and go back to Step 14. Then continue to search for the leak. If you need to disconnect any hoses or adapters the first:

a. Go To Ground
b. Turn Off the 6250.
c. Then disconnect hoses or adapters.

16. Only after the Static system is reasonably leak-tight (leak less than 100 feet/min) , should you proceed to the next step.

17. Now that both Pitot and Static systems are reasonably leak-tight, start your checkout procedure for checking the instruments inside the aircraft. At this point you may want to execute the appropriate Profile for your test.

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

18. After you finish the last point of your test procedure, press GND to perform the Go-to-Ground function. The targets will get set to 20 knots and "Ground" altitude.
19. After the targets have been achieved, turn Off the 6250.
20. Disconnect the hoses from the 6250.

During your test procedure, if you lose power, the 6250 will maintain the pressure. When power comes back on, the 6250 and the aircraft will be at the same pressure as before except for pressure lost due to leaks in the system.

If the 6250 behaves erratically for whatever reason, turn Off the 6250 using the Power key on the Remote unit. Turn the unit back On after 30 seconds and attempt to use the 6250 again.

The 6250 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 the Static leak-rate exceeds the target Static rate, the 6250 will automatically put Static into Control mode and try to compensate for the leak. Similarly, if the Pitot leak-rate exceeds 50 knots/min, the 6250 will automatically put Pitot into Control mode. An error message will indicate that a large leak exists. In such cases, go back to Ground and go through the leak-check process shown above, 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 6250 to assist the operator while using the 6250.

## 6250 : 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 6250 but DO NOT connect to 6250 yet.

0.3 Set the BARO adjust on the aircraft to 29.92 or 1013.25 or 760 mmHg or Standard.

**STEP 1: PREP 6250 & SELF TEST**

1.1 Turn ON 6250. Check / adjust leak timers. Set Pitot Rate and Static Rate target values

1.2 Open Pitot and Static ports on 6250 to ambient. Close Vent valves.

1.3 Run SELF-TEST (**TEST**)

**STEP 2: GO-TO-GROUND**

2.1 Connect hoses from aircraft to 6250.

2.2 Go-To-Ground (**GND**)

**STEP 3: LOW-LEVEL LEAK CHECKS**

3.1 Verify stable control at 20 knots and Ground. If not stable, Turn Off 6250 and fix problem.

3.2 **Low-level Pitot Leak check**

a. Pitot target = 100 knots; **GO**. Wait 30 seconds after 100 knots achieved.
b. Pitot Mode = Leak; **GO**
c. If Pitot cannot achieve target or if Pitot Leak is excessive (warning message ) then Go-to-Ground (**GND**), turn Off 6250, fix the leak. Then go back to Step 2.1
d. If Pitot leaks down to below 80 knots and leak has not yet been found then **CANC** out of Leak Screen, allow Pitot to "recharge" to 100 knots, then Pitot Mode = Leak ; **GO**. Keep searching for the leak.
e. When Pitot leak less than 5 knots/min, **CANC** out of Leak Screen and proceed to step 3.3

3.3 **Low-level Static Leak check:**

**a.** Pitot target =100 knots; Static Target = 3000 feet above Ground; **GO**. Wait 30 seconds after targets achieved.
b. Static Mode = Leak; **GO**.
c. If Static cannot achieve target or if Static Leak is excessive ( warning message) then Go-to-Ground (**GND**), turn Off 6250, fix the leak. Then go back to Step 2.1 but skip Step 3.2.
d. If Static leaks down more than 1000 feet and leak has not yet been found then **CANC** out of Leak Screen, allow Static to "recharge" to target, then Static Mode = Leak ; **GO**. Keep searching for the leak.
e. When Static leak is less than 100 feet/min, **CANC** out of Leak Screen and 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 6250, 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°C) at 15 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 15 inHg, with an accuracy of at least 0.002 inHg.
    b. Output-2 should be able to generate absolute pressures between 1.6 and 32 inHg, with an accuracy of at least 0.002 inHg.

## 6.2 6250 TRANSDUCERS

**Pitot Transducer**

The Pitot output of the 6250 has a differential transducer with a range of 0 to 15 inHg differential. The differential pressure is measured with the pressure at the Static output as the reference. This transducer must be calibrated at 0 inHg differential and 15 inHg differential (with respect to Static). The accuracy of this transducer is ± 0.003 inHg.

**Caution: The pressure applied to the Pitot output of the 6250 must never be less than the pressure on the Static output. If the Pitot pressure is such that the Qc inHg (differential with respect to Static) is more negative than -0.05 QcinHg, an internal relief-valve will open and equalize Pitot and Static pressures.**

**Static Transducer**

The Static output of the 6250 has an absolute transducer with a range of 1 to 32 inHg absolute. This transducer must be calibrated at 1.6 inHg and 32 inHg. The accuracy of this transducer is ± 0.003 inHg.

## 6.3 SETUP OF 6250

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

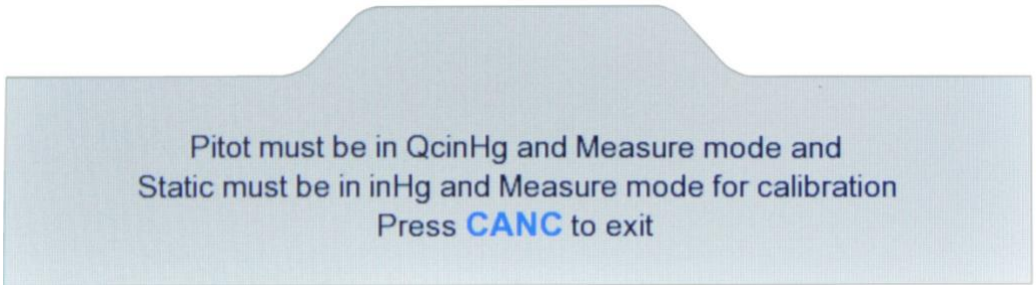


**Figure 6.1 : Calibration (invalid)**

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

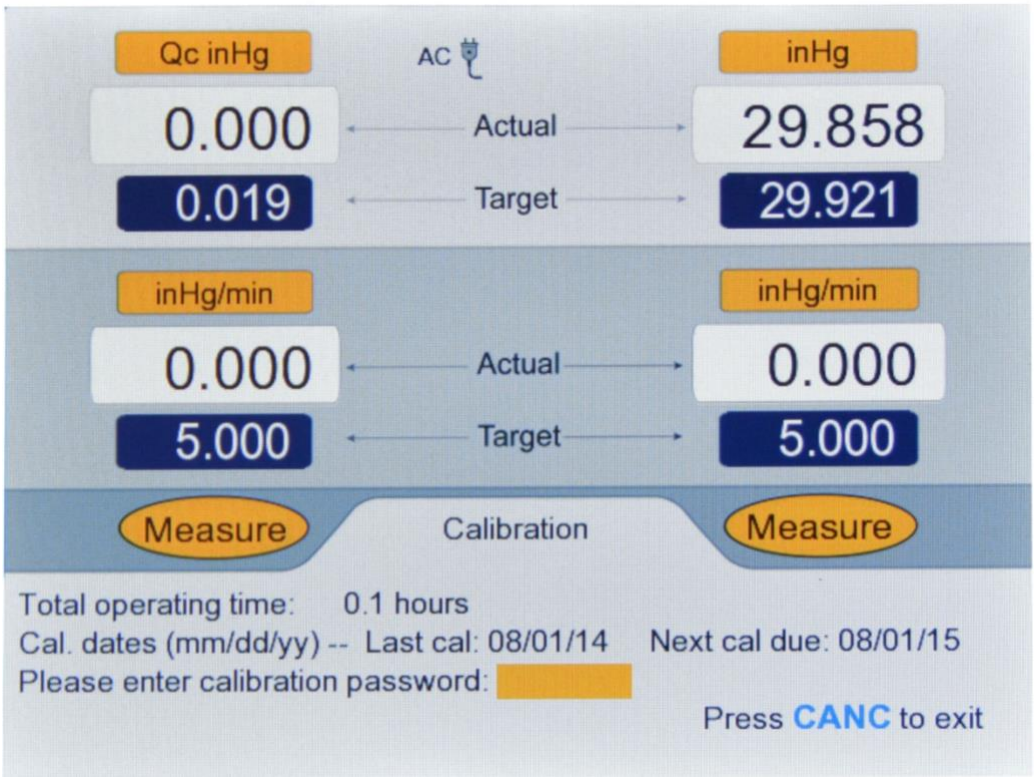


**Figure 6.2 : Calibration (password)**

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.

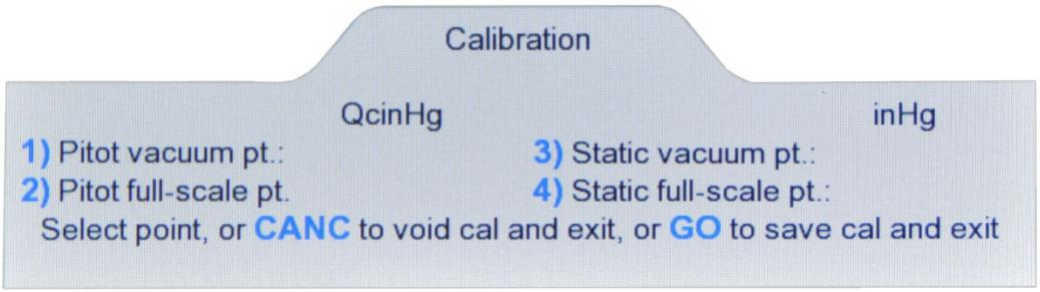


**Figure 6.3 : Calibration (Main)**

Connect the differential-pressure output (QcinHg) of the Pressure Standard to the Pitot output of the 6250. Connect the absolute-pressure output (PsinHg) of the Pressure Standard to the Static output of the 6250.

The calibration adjustment requires generating two differential pressures at the Pitot output and two absolute pressures at the Static output. 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 6250 is provided below. The assumption made is that the Pressure Standard can generate differential pressures (QcinHg) for the Pitot output of the 6250 and can simultaneously generate absolute pressures (PsinHg) for the Static output of the 6250.

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 6250 as detailed in Section 6.3.

2. Keep QcinHg=0 and exercise PsinHg between 1.6 inHg and 32 inHg, three times. This will purge the system with clean Dry Air.

3. Generate exactly QcinHg=0.000 and PsinHg=1.600. 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 6250's Static Actual value as the "As Found" value for the Static vacuum point. (See Figure 6.10)

5. Press '**3**' on the Remote to enter the Static vacuum point. The screen will appear as follows.

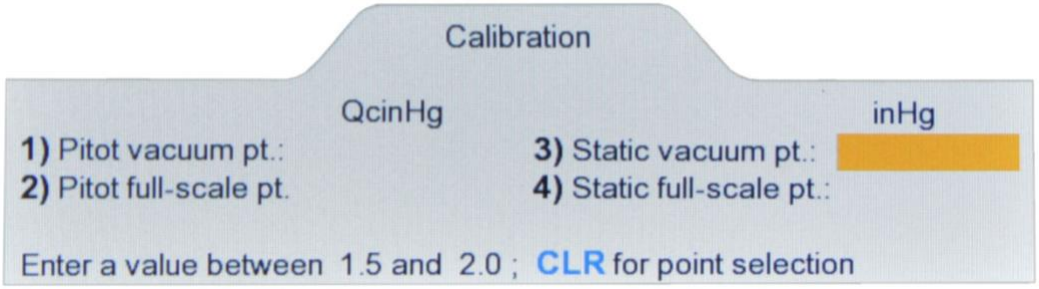


**Figure 6.4**

6. Enter '1.600' followed by **ENTER** on the keypad. The highlighted field will be replaced by '1.600'. Press **CLR** to return to the point-selection screen (Figure 6.3). You should see '1.600' on this screen, as the Static vacuum point. This indicates to the 6250 that the absolute pressure on the Static output is currently exactly 1.600 inHg.

7. Generate exactly QcinHg=0.000 and PsinHg=16.000. Wait for a minimum of 5 minutes to allow temperature effects to stabilize.

8. Press '**1**' on the Remote to enter the Pitot vacuum point. The screen will appear as follows.

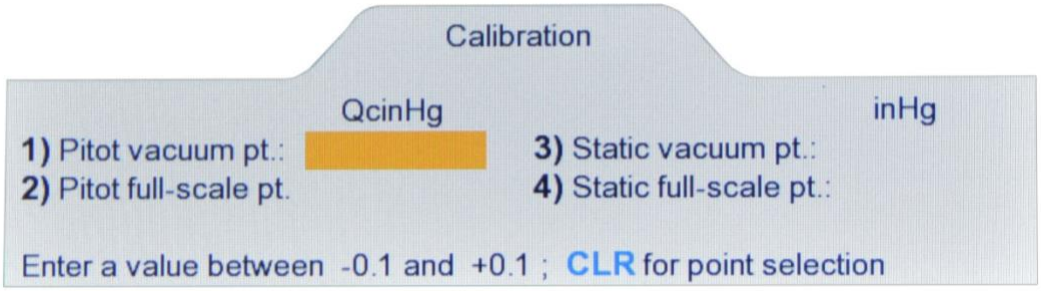


**Figure 6.5**

9. Enter '0.000' (or simply 0) followed by **ENTER** on the keypad. The highlighted field will be replaced by '0.000'. Press **CLR** to return to the point-selection screen (Figure 6.3). You should see '0.000' on this screen, as the Pitot vacuum point. This indicates to the 6250 that the differential pressure on the Pitot output is currently exactly 0.000 inHg.

10. Generate exactly QcinHg=15.000 and PsinHg=16.000. Wait for a minimum of 5 minutes to allow temperature effects to stabilize.

11. Press '**2**' on the Remote to enter the Pitot full-scale point. The screen will appear as follows.

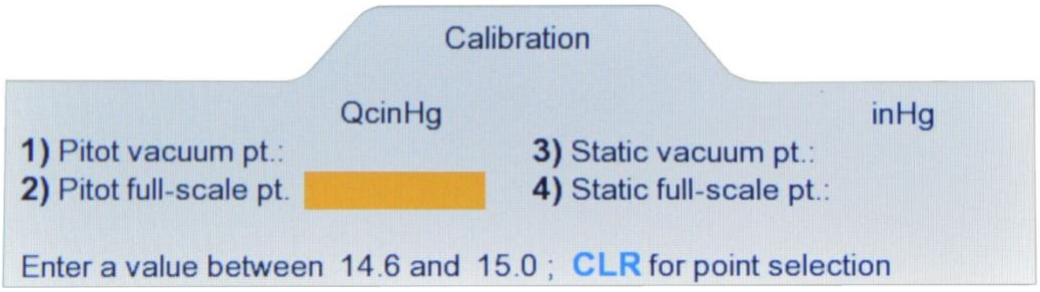


**Figure 6.6**

12. Enter '15.000' (or simply 15) followed by **ENTER** on the keypad. The highlighted field will be replaced by '15.000'. Press **CLR** to return to the point-selection screen (Figure 6.3). You should see '15.000' on this screen, as the Pitot full-scale point. This indicates to the 6250 that the differential pressure on the Pitot output is currently exactly 15.000 inHg.

13. Generate exactly QcinHg=0.000 and PsinHg=32.000. Wait for a minimum of 5 minutes to allow temperature effects to stabilize.

14. Press '**4**' on the Remote to enter the Static full-scale point. The screen will appear as follows.

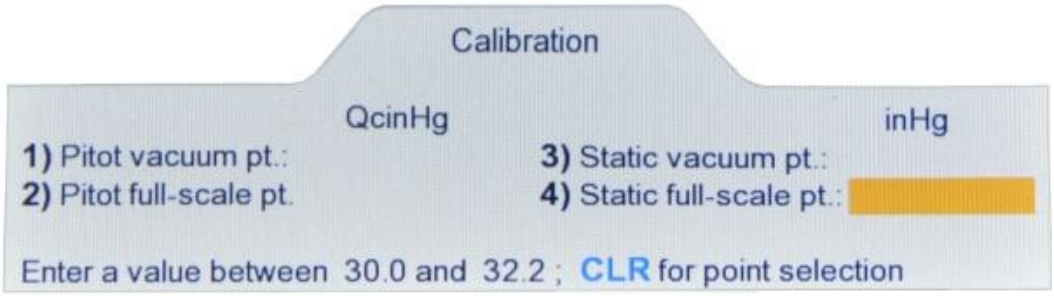


**Figure 6.7**

15. Enter '32.000' (or simply 32) followed by **ENTER** on the keypad. The highlighted field will be replaced by '32.000'. Press **CLR** to return to the point-selection screen (Figure 6.3). You should see '32.000' on this screen, as the Static full-scale point. This indicates to the 6250 that the absolute pressure on the Static output is currently exactly 32.000 inHg.

16. The calibration points have now been entered. 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.

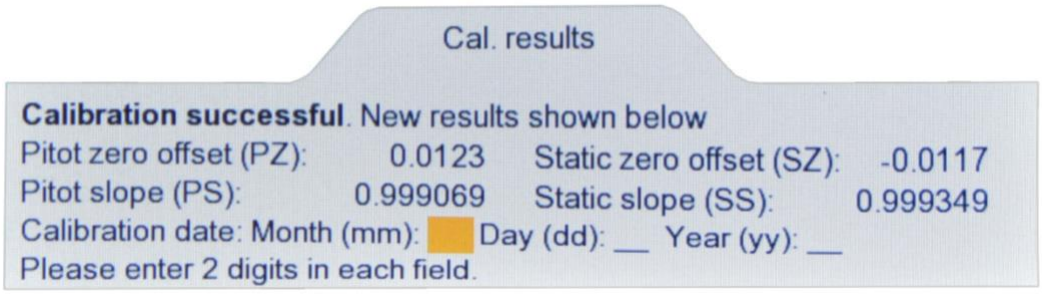


**Figure 6.8**

17. 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.

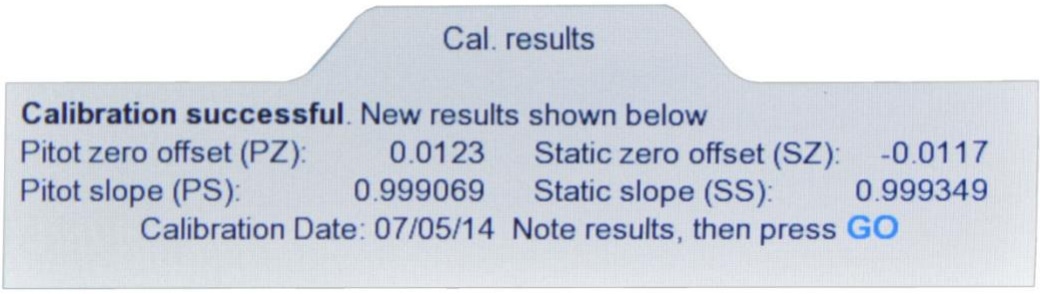


**Figure 6.9**

18. 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 Pitot and 32.000 inHg for Static.

19. 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 6250, using a program similar to Hyperterminal. Details of this setup are provided in Section 8.1.

Once communication between the 6250 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 6250 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** | **Pitot offset** | **PsinHg** | **Static offset** |
| 1 | 0.000 | | 1.600 | No offset |
| 2 | 0.000 | | 3.200 | S1 (10%) |
| 3 | 0.000 | | 6.400 | S2 (20%) |
| 4 | 0.000 | | 9.600 | S3 (30%) |
| 5 | 0.000 | | 12.800 | S4 (40%) |
| 6 | 0.000 | No offset | 16.000 | S5 (50%) |
| 7 | 1.500 | P1 (10%) | 16.000 | |
| 8 | 3.000 | P2 (20%) | 16.000 | |
| 9 | 4.500 | P3 (30%) | 16.000 | |
| 10 | 6.000 | P4 (40%) | 16.000 | |
| 11 | 7.500 | P5 (50%) | 16.000 | |
| 12 | 9.000 | P6 (60%) | 16.000 | |
| 13 | 10.500 | P7 (70%) | 16.000 | |
| 14 | 12.000 | P8 (80%) | 16.000 | |
| 15 | 13.500 | P9 (90%) | 16.000 | |
| 16 | 15.000 | No offset | 16.000 | |
| 17 | 0.000 | | 19.200 | S6 (60%) |
| 18 | 0.000 | | 22.400 | S7 (70%) |
| 19 | 0.000 | | 25.600 | S8 (80%) |
| 20 | 0.000 | | 28.800 | S9 (90%) |
| 21 | 0.000 | | 32.000 | No offset |

Offsets are entered through Hyperterminal as follows:

For Static offsets: Sn=xxxx followed by ENTER

For Pitot 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 = 3.200 PsinHg), if the 6250 Static Actual value is 3.198, the offset value will be (3.198 – 3.200 = -0.002), and the command sent to the 6250 would be:

S1=-0.002 followed by ENTER

At point 2, if the 6250 Static Actual value is 3.201, the offset value will be (3.201 – 3.200 = 0.001), and the command sent to the 6250 would be:

S1=0.001 followed by ENTER

If the commands are sent correctly, the 6250 will echo back '0'. When the offset is entered, the 6250 Actual value (Pitot or Static) 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 ±0.0001 inHg. For example, if the Static Actual value is fluctuating between two values like 3.200 and 3.201, it may be best to enter an offset of S1=0.0005.

**Note: There are no offsets for the 0% and 100% points for the Pitot output. Also, there are no offsets for the 5% (1.600 inHg) and 100% points for the Static output.**

**Note: When offset values are entered, they are actually added to the existing offset value already resident in the 6250.**

**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 value, either for Pitot or for Static, on the calibration report. Only at point 6, you will need to note the Actual values for *both* Pitot and Static.
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 6250 (recommended), then through the RS232 port, send the 'SO=0' command to see all the Static offsets and the 'SO=1' command to see all the Pitot 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 6250.

Model: 6250 Serial#: 82678

Full scale: Static: 32 inHg
Pitot: 15 QcinHg (differential)

Last Calibrated date: 08/15/14

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CALIBRATION RESULTS

STATIC OUTPUT

| TEST POINT | AS FOUND inHg | AS LEFT inHg | DEVIATION inHg |
|---|---|---|---|
| 1. Vacuum | 1.601 | 1.600 | 0.001 |
| 2. Fullscale | 32.002 | 32.000 | 0.002 |

PITOT OUTPUT

| TEST POINT | AS FOUND QcinHg | AS LEFT QcinHg | DEVIATION QcinHg |
|---|---|---|---|
| 1. Vacuum | 0.002 | 0.000 | 0.002 |
| 2. Fullscale | 15.003 | 15.000 | 0.003 |

---

VERIFICATION RESULTS

| STATIC PRESSURE (absolute) | | PITOT PRESSURE (differential) | |
|---|---|---|---|
| APPLIED inHg | DISPLAYED inHg | APPLIED QcinHg | DISPLAYED QcinHg |
| 1.600 | 1.000 | 0.000 | 0.000 |
| 3.200 | 3.200 | 1.500 | 1.499 |
| 6.400 | 6.401 | 3.000 | 3.000 |
| 9.600 | 9.600 | 4.500 | 4.500 |
| 12.800 | 12.800 | 6.000 | 6.000 |
| 16.000 | 16.000 | 7.500 | 7.500 |
| 19.200 | 19.200 | 9.000 | 9.001 |
| 22.400 | 22.401 | 10.500 | 10.501 |
| 25.600 | 25.600 | 12.000 | 12.000 |
| 28.800 | 28.800 | 13.500 | 13.500 |
| 32.000 | 32.000 | 15.000 | 15.000 |

---

Calibrated by: Date:

**Figure 6.1 Sample calibration report**

# SECTION 7 : MAINTENANCE

Scheduled maintenance of the 6250 includes calibration once a year. The calibration procedure is described in Section 6.

Calibration of the 6250 must be done only at an Authorized Calibration Center.

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

# SECTION 8 : RS232 SERIAL INTERFACE

The model 6250 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 6250 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 6250. If a USB port is used, it is necessary to use an in-line USB to RS232 converter. This converter is provided with the 6250. A RS232 cable (DB9-male to DB9-female) is also provided with the 6250.

Connect the COM port on the PC to the RS232 port on the 6250, 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 6250 is operational, then in Hyperterminal, enter the command 'PA' followed by the ENTER key. The 6250 will return the Pitot Actual value. This confirms that the communication between the PC and 6250 is functional.

## 8.2 COMMUNICATION PROTOCOL & COMMANDS

The following are a few details of the communication protocol.

1. All communication between the PC and 6250 is in ASCII.
2. All commands sent to the 6250 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 6250 to overflow.
5. When a command is sent from the PC, the 6250 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 6250 will respond with a '0' or an error-code. If the command is invalid, the 6250 will respond with an error code.
6. Each response from the 6250 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 6250 or to request data from the 6250. An example would be the 'PT' command associated with the Pitot Target value. To set the Pitot Target value to 125.0 knots, the format would be : 'PT=125.0' <CR>. To request the value of the current Pitot Target the command would be 'PT' <CR>.
8. The 6250 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 6250 to respond to a command, depending on when the command is received and the operating state of 6250.

**Note: While the 6250 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 6250 |
|---|---|---|---|
| PA | Read the Pitot Actual value in current units | None | Pitot Actual value |
| KA | Read the Pitot Rate Actual value in current units | None | Pitot Rate Actual value |
| SA | Read the Static Actual value in current units | None | Static Actual value |
| RA | Read the Static Rate Actual value in current units | None | Static Rate Actual value |
| PT | Read the Pitot Target value in current units | None | Pitot Target value |
| PT=n | Set the Pitot Target value to n in current units | n | 0 if OK; or Error code |
| ST | Read the Static Target value in current units | None | Static Target value |
| ST=n | Set the Static Target value to n in current units | n | 0 if OK; or Error code |
| KT | Read the Pitot Rate Target value in current units | None | Pitot Rate Target value |
| KT=n | Set the Pitot Rate Target value to n in current units | n | 0 if OK; or Error code |
| RT | Read the Static Rate Target value in current units | None | Static Rate Target value |
| RT=n | Set the Static Rate Target value to n in current units | n | 0 if OK; or Error code |
| PU | Read the current Pitot units | None | n, where n is 1 to 15 |
| PU=n | Set the Pitot units to n, per the following table | n | 0 if OK; or Error code |

| n | Pitot 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 |

<table>
<tr><th>Command</th><th>Description</th><th>Data sent from PC</th><th>Data sent from 6250</th></tr>
<tr><td>SU</td><td>Read the current Static units</td><td>None</td><td>n, where n is 1 to 7</td></tr>
<tr><td>SU=n</td><td>Set the Static units to n, per the following table<br><table><tr><th>n</th><th>Static unit</th></tr><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></table></td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>PM</td><td>Read the current Pitot mode</td><td>None</td><td>n, where n is 1 to 3</td></tr>
<tr><td>PM=n</td><td>Set the Pitot mode to n, per the following<br><table><tr><th>n</th><th>Pitot mode</th></tr><tr><td>1</td><td>Measure</td></tr><tr><td>2</td><td>Leak</td></tr><tr><td>3</td><td>Control</td></tr></table></td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>SM</td><td>Read the current Static mode</td><td>None</td><td>n, where n is 1 to 3</td></tr>
<tr><td>SM=n</td><td>Set the Static mode to n, per the following<br><table><tr><th>n</th><th>Static mode</th></tr><tr><td>1</td><td>Measure</td></tr><tr><td>2</td><td>Leak</td></tr><tr><td>3</td><td>Control</td></tr></table></td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>PJ=n</td><td>Jog the Pitot Target value Up (n=0) or Down (n=1)</td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>SJ=n</td><td>Jog the Static Target value Up (n=0) or Down (n=1)</td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>KJ=n</td><td>Jog the Pitot Rate Target value Up (n=0) or Down (n=1)</td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>RJ=n</td><td>Jog the Static Rate Target value Up (n=0) or Down (n=1)</td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>Lm</td><td>Read the current limit value for Limit m, where m defines the type of limit per the table below.<br><table><tr><th>m</th><th>Limit type</th></tr><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></table></td><td>None</td><td>Value for Limit m</td></tr>
</table>

| Command | Description | Data sent from PC | Data sent from 6250 |
|---|---|---|---|
| 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 6250 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. | None | Status code n |
| 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 |

| n | Self-test status |
|---|---|
| 0 | Self-test passed |
| 1 | Memory test failed |
| 2 | Static measurement system failed |
| 3 | Pitot measurement system failed |
| 4 | Solenoids failed |
| 5 | Pumps failed |
| 6 | Static control system failed |
| 7 | Pitot control system failed |

| | | | |
|---|---|---|---|
| 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 |
| **Command** | **Description** | **Data sent from PC** | **Data sent from 6250** |
| CP=n | Set the Calibration password to n. | n | 0 if OK; or Error code |
| Cm | Read the value for calibration point m, where m is defined in the table below.<br><br>**m** / **Calibration point**<br>1 – Pitot vacuum point<br>2 – Pitot full-scale point<br>3 – Static vacuum point<br>4 – Static full-scale point | None | Value for calibration point m |
| 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 | Calibration complete (n=1)<br>Calibration Void (n=0)<br>After this command is sent, the calibration password is reset. The calibration password is also reset on power-up | n | 0 if OK; or Error code |
| PZ | Read the zero-offset value for the Pitot transducer | None | Pitot zero-offset value |
| PZ=n | This requires the calibration password to be set. Set the zero-offset value for the Pitot transducer to n | n | 0 if OK; or Error code |
| PS | Read the slope value for the Pitot transducer | None | Pitot slope value |
| PS=n | This requires the calibration password to be set. Set the slope value for the Pitot transducer to n | n | 0 if OK; or Error code |
| SZ | Read the zero-offset value for the Static transducer | None | Static zero-offset value |
| SZ=n | This requires the calibration password to be set. Set the zero-offset value for the Static transducer to n | n | 0 if OK; or Error code |
| SS | Read the slope value for the Static transducer | None | Static slope value |

<table>
<tr><td>SS=n</td><td>This requires the calibration password to be set. Set the slope value for the Static transducer to n</td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><th>Command</th><th>Description</th><th>Data sent from PC</th><th>Data sent from 6250</th></tr>
<tr><td>SO=n</td><td>Returns the values for all the Static (n=0) or Pitot (n=1) non-linearity offsets as shown below.<br><br>
<table>
<tr><th>Static offsets</th><th>Pitot offsets</th></tr>
<tr><td>S0% =x.xxxx</td><td>P0% =x.xxxx</td></tr>
<tr><td>S5% =x.xxxx</td><td>P5% =x.xxxx</td></tr>
<tr><td>S10%=x.xxxx</td><td>P10%=x.xxxx</td></tr>
<tr><td>S15%= x.xxxx</td><td>P15%= x.xxxx</td></tr>
<tr><td>S20%= x.xxxx</td><td>P20%= x.xxxx</td></tr>
<tr><td>S25%= x.xxxx</td><td>P25%= x.xxxx</td></tr>
<tr><td>S30%= x.xxxx</td><td>P30%= x.xxxx</td></tr>
<tr><td>S35%= x.xxxx</td><td>P35%= x.xxxx</td></tr>
<tr><td>S40%= x.xxxx</td><td>P40%= x.xxxx</td></tr>
<tr><td>S45%= x.xxxx</td><td>P45%= x.xxxx</td></tr>
<tr><td>S50%= x.xxxx</td><td>P50%= x.xxxx</td></tr>
<tr><td>S55%= x.xxxx</td><td>P55%= x.xxxx</td></tr>
<tr><td>S60%= x.xxxx</td><td>P60%= x.xxxx</td></tr>
<tr><td>S65%= x.xxxx</td><td>P65%= x.xxxx</td></tr>
<tr><td>S70%= x.xxxx</td><td>P70%= x.xxxx</td></tr>
<tr><td>S75%= x.xxxx</td><td>P75%= x.xxxx</td></tr>
<tr><td>S80%= x.xxxx</td><td>P80%= x.xxxx</td></tr>
<tr><td>S85%= x.xxxx</td><td>P85%= x.xxxx</td></tr>
<tr><td>S90%= x.xxxx</td><td>P90%= x.xxxx</td></tr>
<tr><td>S95%= x.xxxx</td><td>P95%= x.xxxx</td></tr>
<tr><td>S100%= x.xxxx</td><td>P100%= x.xxxx</td></tr>
</table></td><td>n</td><td>Static or Pitot offset values</td></tr>
<tr><td>OC=n</td><td>Clears all offset values to zero for Static offsets (n=0) or Pitot (n=1). This command requires the calibration password to be set.</td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>Sm</td><td>Read the value for Static offset m, where m is as defined in the table below.<br><br>
<table>
<tr><th>m</th><th>Static offset</th></tr>
<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>
</table></td><td>None</td><td>Static offset value</td></tr>
</table>

<table>
<tr><td>Sm=n</td><td>Set the Static offset m to a value of n. This command requires the calibration password to be set.</td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><th>Command</th><th>Description</th><th>Data sent from PC</th><th>Data sent from 6250</th></tr>
<tr><td>Pm</td><td>Read the value for Pitot offset m, where m is as defined in the table below.
<table>
<tr><th>m</th><th>Pitot offset</th></tr>
<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>
</table></td><td>None</td><td>Pitot offset value</td></tr>
<tr><td>Pm=n</td><td>Set the Pitot offset m to a value of n. This command requires the calibration password to be set.</td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>HO</td><td>Read the value of 'Hours of Operation'</td><td>None</td><td>Value of Hours of operation</td></tr>
<tr><td>LC</td><td>Read the 'Last calibration date'. The string returned is in the format 'mm/dd/yy'</td><td>None</td><td>Date as 8-byte string</td></tr>
<tr><td>LC=n</td><td>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)</td><td>n</td><td>0 if OK; or Error code</td></tr>
<tr><td>NC</td><td>Read the 'Next calibration due' date. The string returned shows 'mm/dd/yy'.</td><td>None</td><td>Date as 8-byte string</td></tr>
<tr><td>SE</td><td>Returns details of 13 Self-test parameters in the following format: parameter code=n, where n=0 (pass) or 1 (fail). The parameter codes are explained in the table below.
<table>
<tr><th>Param. code</th><th>Description</th></tr>
<tr><td>A</td><td>Ps control solenoid</td></tr>
<tr><td>B</td><td>Ps output solenoid</td></tr>
<tr><td>C</td><td>Pt control solenoid</td></tr>
<tr><td>D</td><td>Pt output solenoid</td></tr>
<tr><td>E</td><td>Pressure pump</td></tr>
<tr><td>F</td><td>Vacuum pump</td></tr>
<tr><td>G</td><td>Ps control system</td></tr>
<tr><td>H</td><td>Pt control system</td></tr>
<tr><td>I</td><td>Ps main Xd measurement</td></tr>
<tr><td>J</td><td>Pt main Xd measurement</td></tr>
</table></td><td>None</td><td>13 parameters with pass/fail code for each</td></tr>
</table>

| | | | | | |
|---|---|---|---|---|---|
| | | K | Ps control Xd measurement | | |
| | | L | Pt control Xd measurement | | |
| | | M | Baro Xd measurement | | |

# APPENDIX A : ERROR CODES

| Error code | Description |
|---|---|
| 1 | Pitot Actual value exceeds knots limit or Mach limit |
| 2 | Pitot Rate Actual value exceeds knots/min limit |
| 3 | Static Actual value exceeds Feet limit |
| 4 | Static Rate Actual value exceeds Feet/min limit |
| 5 | Pitot control transducer error |
| 6 | Static control transducer error |
| 7 | Pitot leak-rate exceeds 50 knots/min; automatically returns Pitot to control |
| 8 | Static leak-rate exceeds Static Rate target; automatically return Static 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 Pitot or Static transducer |
| 12 | Pitot target exceeds knots limit |
| 13 | Pitot target exceeds Mach limit |
| 14 | Pitot Rate target exceeds knots/min limit (or 30 inHg/min for pressure units) |
| 15 | Static target exceeds Feet limit |
| 16 | Static Rate target exceeds Feet/min limit (or 30 inHg/min for pressure units) |
| 17 | Leaving Pitot in Measure mode may cause knots limit to be exceeded |
| 18 | Leaving Pitot 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 | Pitot calibration complete (Status code returned after CC command) |
| 22 | Static calibration complete (Status code returned after CC command) |
| 23 | Both Pitot & Static calibration complete (Status code returned after CC command) |
| 24 | Password not set (either for Limits or Calibration) |
| 25 | Cannot enter Calibration unless Pitot is in QcinHg and Measure mode, and Static is in inHg and Measure mode |
| | |

# APPENDIX B : SPECIFICATIONS

**Static Output**

| | |
|---|---|
| **Units** | Feet, meters, inHg, mbar, psi, mmHg, kpa |
| **Pressure function** | |
| range: | 1 to 32 inHg |
| resolution: | 0.001 inHg |
| accuracy: | 0.003 inHg |
| **Altitude function** | |
| range: | -2000 ft. to 50,000 ft. |
| resolution: | 1 foot |
| accuracy: | 3 ft. @ 0 ft.<br>4 ft. @ 10,000 ft.<br>6 ft. @ 20,000 ft.<br>9 ft. @ 35,000 ft.<br>18 ft. @ 50,000 ft. |
| **Climb function** | |
| range: | 0 ft/min to 10,000 ft/min |
| resolution: | 1 ft/min |
| accuracy: | 1% of rate of climb |

**Pitot Output**

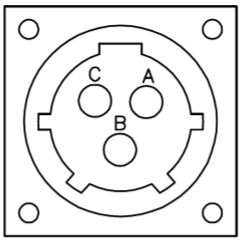
| | |
|---|---|
| **Units** | knots, Mach, kmph, mph, PtinHg, QcinHg, Ptmbar, Qcmbar, Ptpsi, Qcpsi, PtmmHg, QcmmHg, Ptkpa, Qckpa, EPR |
| **Pressure function** | |
| range: | 0 to 15 inHg (diff.) |
| resolution: | 0.001 inHg |
| accuracy: | 0.003 inHg (or better) |
| **Airspeed function** | |
| range: | 0 to 500 knots |
| resolution: | 0.1 knots |
| accuracy: | 1.0 knots @ 20 knots<br>0.3 knots @ 50 knots<br>0.2 knots @ 100 knots<br>0.1 knots @ 200 knots<br>0.04 knots @ 500 knots |
| Airspeed rate: | 0 to 500 knots/min |
| **Mach function** | |
| range: | 0.0 to 1.0 Mach |
| resolution: | 0.001 Mach |
| accuracy: | 0.001 above 0.2 Mach |
| **EPR function** | |
| range: | 0 to 199 |
| resolution: | 0.001 |
| accuracy: | 0.002 typ. |

| | |
|---|---|
| **Power requirement:** | 90-260 VAC, 47-440 Hz., 100W (200W with heaters).<br>Optional Internal battery: 8-hour operation |
| **Interfaces:** | RS232 ; Encoder optional |

| | | |
|---|---|---|
| **Dims & weights:** | Main unit: | 22″ x 14″ x 9″ / 28 lbs |
| | Remote unit: | 6″ x 6″ x 1″ / 1 lb. |
| **Environmental specs:** | Operating temp. | 0° to 50°C ; -40° to 50°C (with heaters) |
| | Storage temp. | -40° to 75°C |
| | Humidity: | 5 to 100% |

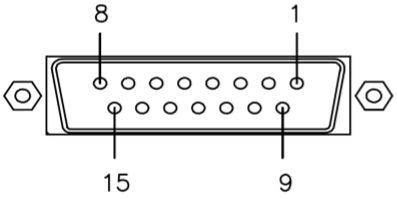
# APPENDIX C : CONNECTOR PIN-OUTS

## AC INPUT



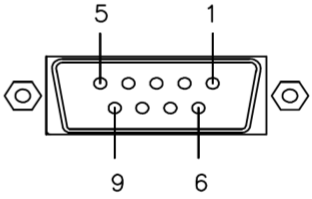

A.– AC LINE.
B.– AC NEUTRAL
C.– EARTH GND.

## 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 <aservice@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 <aservice@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 6250 in a suitable carton prior to shipping. Do not ship without proper packing. Laversab, Inc. will not be liable for damage to the 6250 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 6250. The wireless Remote will function only if the 6250 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 on Page 9. 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 2-Channel Laversab App is compatible with an android based tablet and also 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-2 / 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-3 / vx.xx", since this is intended for use only with a 3-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-xxxxx", where 'xxxxx' 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.

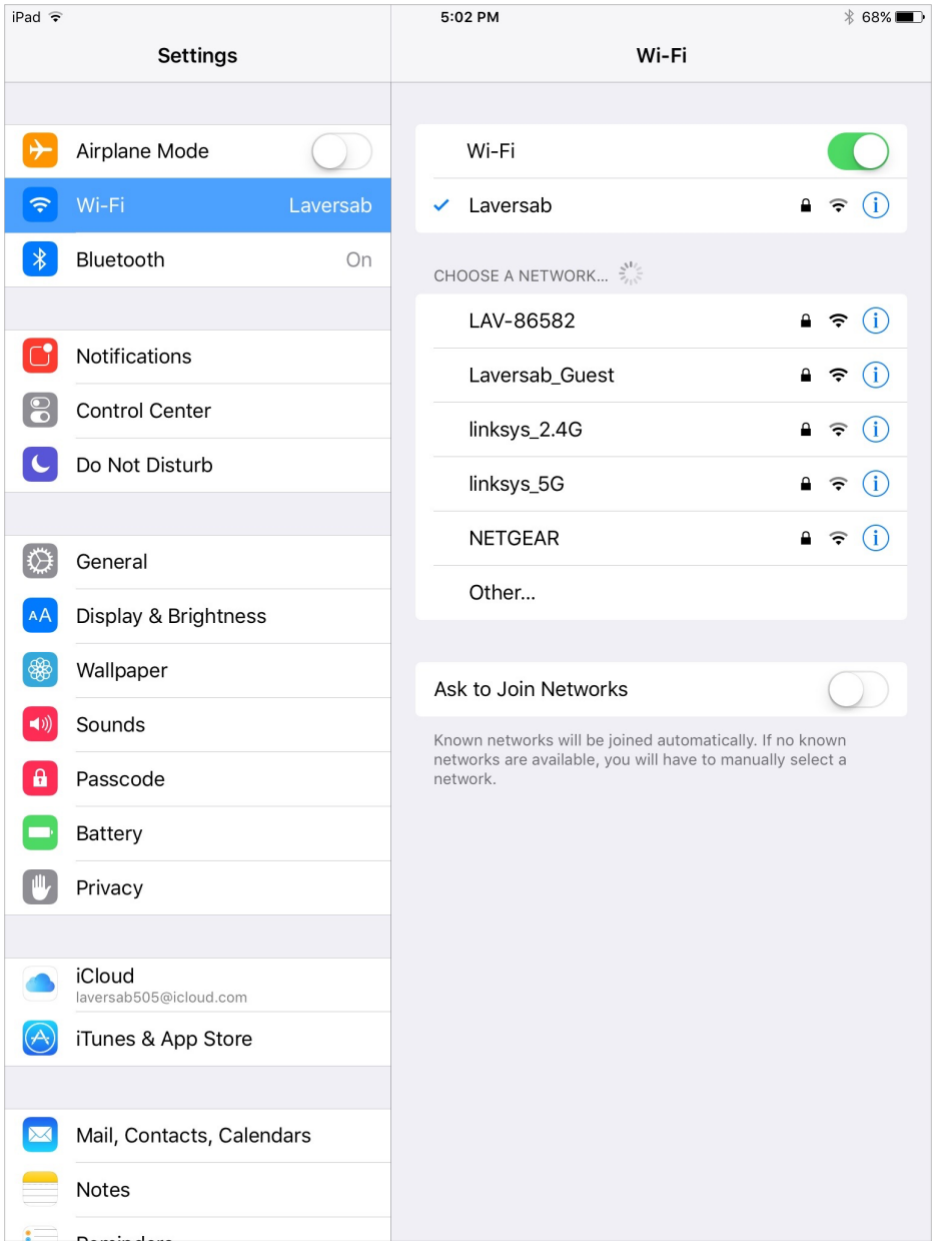



**Figure E.1**

## E.4 STARTING THE APP

Locate and start the Laversab App labeled "2-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.

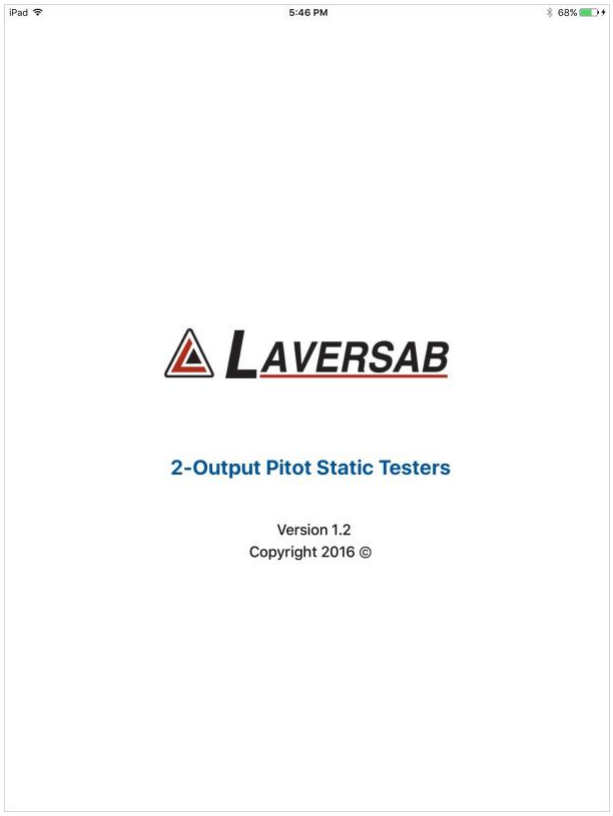



Figure E.2

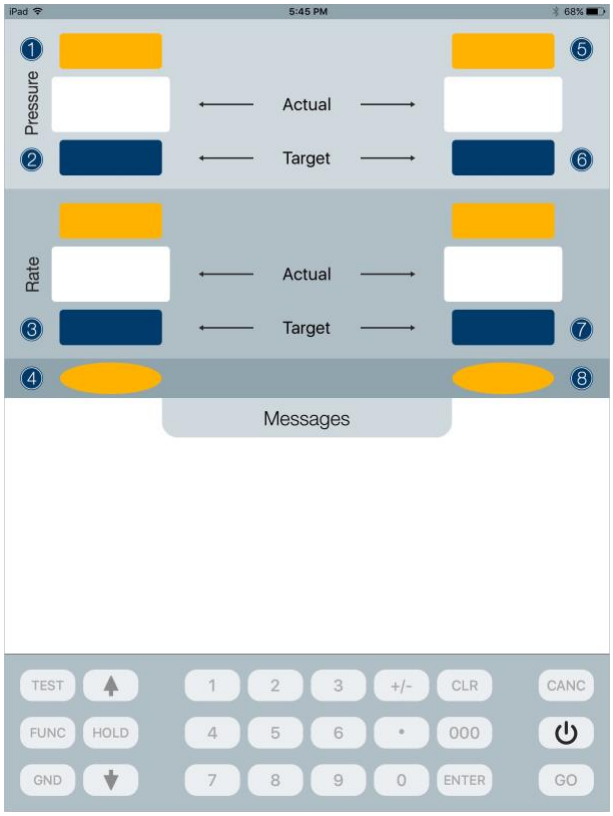



Figure E.3

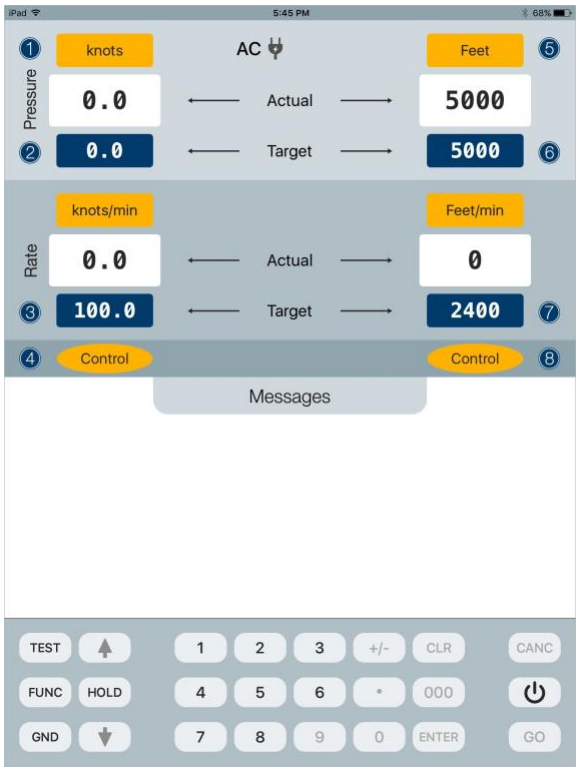



**Figure E.4**

**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.