Üson Raptor

Advanced gauge pressure decay tester

Owner's Manual

Üson

for good measure

Document No. 670012 - Rev. 1.3

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8640 North Eldridge Parkway
Houston, Texas 77041
U.S.A.
(281) 671-2000
(281) 671-2001 Fax
Mail: info@uson.com
www.uson.com
Customer Support Hotline: 281-671-2222

Contents

CE

CE DECLARATION OF CONFORMITY

Equipment: Leak Tester

Model #: Raptor

Serial #: _____

Date of Issue: 04 March 2014

Manufacturer: Uson L.P.
8640 N. Eldridge Parkway
Houston, TX 77041
USA

This equipment complies with the following standards:

IEC 61000-6-2 Generic Industrial Environment Immunity:

IEC 61000-4-2	Testing and measurement techniques – Electrostatic discharge immunity tests.
IEC 61000-4-3	Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test.
IEC 61000-4-4	Testing and measurement techniques – Electrical fast transient/burst immunity test.
IEC 61000-4-5	Testing and measurement techniques – Surge immunity test.
IEC 61000-4-6	Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields.
IEC 61000-4-8	Testing and measurement techniques – Power frequency magnetic field immunity test.
IEC 61000-4-11	Testing and measurement techniques – Immunity to voltage dips, short interruptions and voltage variations test.

CISPR 11 Emissions

CISPR 11 Radiated Emissions Class A
CISPR 11 Conducted Emissions Class A

IEC 61000-3-2 AC Current Harmonic Emissions

IEC 61000-3-3 Voltage Fluctuations Emissions

EN 61010:
Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory use.

This certifies that the aforementioned equipment conforms with the protection requirements of Council Directive 2004/108/EC EMC on the approximation of the laws of the Member States relating to Electromagnetic Compatibility and the Low-Voltage Directive.

Signature of the Manufacturer:

1
Safety

1.1 Introduction

This section explains the warnings and cautions that should be observed when installing or operating Raptor.

Safety information is covered at relevant points throughout the manual. Please read this manual in its entirety before installing or operating the instrument. Should any point remain unclear, contact your supplier for assistance before proceeding.

The tester is designed for installation and use in an industrial environment by suitably trained personnel.

1.2 Safety Precautions (English)

Areas of the equipment and/or manual that display this symbol are potentially hazardous. Consult the appropriate section of the user manual in respect of the specific hazard Raptor Owner's Guide.

Raptor operates on 24VDC from a power supply (supplied by Uson or customer), which must be connected to an earthed (grounded) power supply of 100-240VAC 50/60Hz.

The covers on the equipment should be removed only by personnel trained to avoid the risk of electric shock. The power supply to the equipment must be switched off and disconnected before removing any covers.

Do not substitute the fuse rating. Always use the correctly rated fuse, failure to do so may be hazardous and can cause damage to the equipment.

Do not make or break external connectors or connections while the Raptor is switched on.

The component to be tested, and the air supply line to the Raptor, must be free from water or liquid residue before testing; otherwise damage may be inflicted on the sensitive transducer within the instrument.

Operation of this product outside of the manufacturer's instructions may impair the protection provided by the equipment.

This instrument is capable of supplying high-pressure air. Before commencing any component tests, ensure that the system is guarded to local health and safety standards.

1.3 Safety Precautions (Español)

Las zonas del equipo que muestran este sRmbolo son potencialmente peligrosas. Consulte la sección del manual del usuario correspondiente a ese peligro en particular.

Raptor funciona con 24VDC desde una fuente de alimentación (suministrado por Usón o cliente), que debe estar conectado a una fuente de alimentación conectada a tierra (masa) de 100-240VAC 50/60Hz.

No cambie el voltaje del fusible. Utilice siempre el voltaje correcto del fusible, si no lo hiciera podrRa daZar el Raptor.

No realice o rompa conexiones o conectores externos mientras esté encendido el Raptor.

Cuando utilice un acoplamiento neumático con el Raptor tenga cuidado de asegurarse de que tanto el acoplamiento como el componente estén correctamente empotrados.

Debe comprobar el componente y la línea de suministro de aire al Raptor debe estar libre de agua o cualquier residuo líquido antes de la comprobación; si no fuera así podría daZar el transconductor, altamente sensible, que se encuentra en el interior del instrumento.

El falta de cumplimiento de las instrucciones de uso indicadas por el fabricante para este producto, puede perjudicar la protección provista en el equipo.

El instrumento es capaz de suministrar aire a alta presión. Antes de empezar prueba alguna de cualquier componente asegurarse de que el sistema cumple las normas establecidas por las autoridades locales en materia de Seguridad e Higiene.

2
Introduction

2.1 Raptor Overview

The Raptor (*Figure 2–1*) is an easy-to-use gauge pressure decay tester designed for precision accuracy with repeatable, reliable results. The tester is capable of saving up to 10 program setups, storing up to 5000 recent test results, and saving program and sensor calibration history.

The Raptor is designed and built to internationally recognized ISO9001:2008 and CE standards, and is offered in five different pressure ranges. The innovative tester incorporates several technologically advanced features, making it easy to setup, configure, and operate such as:

- Intuitive, icon-based touchscreen
- Bluetooth technology
- Uson proprietary applications for Android/IOS based devices (phone, tablet, etc.) for program setup, calibration, and real-time data viewing/access.

Figure 2–1: Raptor

2.2 Specifications

Model: Raptor

Description: Gauge Pressure Decay Tester

Display: 4.3” Diagonal Color, Graphic (480 x 272), Backlit Touch-Screen LCD

Digital I/O: 8 inputs, 5 outputs

Communication: USB, Ethernet, Bluetooth (Android iOS applications)

Languages: English, Spanish, French, German, Portuguese, Korean, Chinese

Test Programs: 10

Test Channels Available: 1

Enclosure Dimensions: 5.25"(H) x7.75”(W) x 13" (133.35mm x 196.85mm x 330.02mm)

Supplied Power Supply: Input 90 - 260V, 50 - 60Hz. Output: 24VDC @ 5.4 Amps

Pressure Ranges: -15 to 0 (full vacuum), 0-15, 0-30 psi, 0-60 psi, 0 to 145 psi/10 bar gauge

Units: User selectable units for pressure and calculated leak rate. Pressure Units: psi, mbar, inH20, mmH20, inHg, mmHg, kpa, $kgcm^2$, bar, pascal, cmH20. Calclulated Leak Rate: ml/sec, ml/min, ml/hr, cc/sec, cc/min. cc/hr.

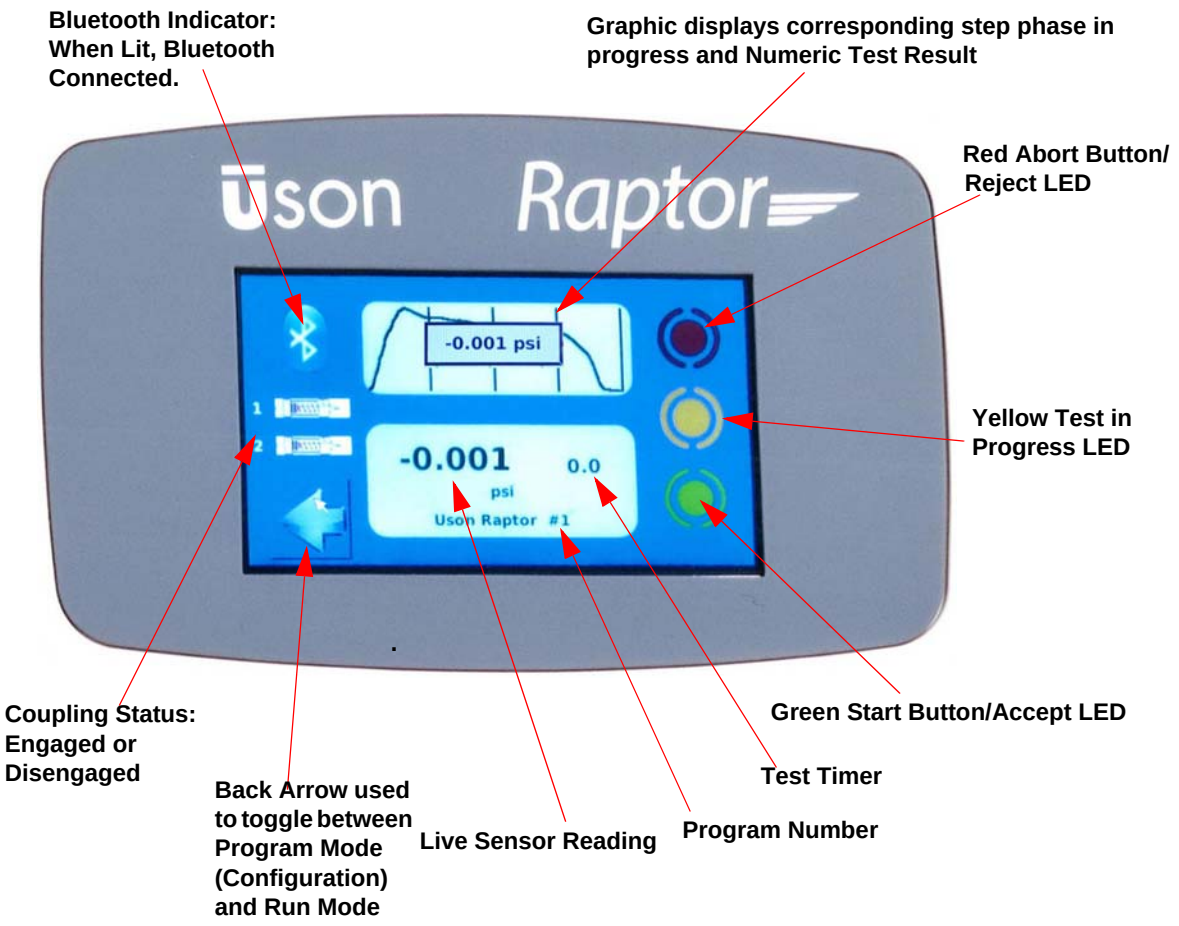
Calibration: NIST Traceable

Test Measurements: delta pressure, back pressure flow, and calculated leak rates.

2.3 Front Panel Overview

Raptor's front panel is equipped with a 4.3" (diagonal) color touch screen that displays visual information about the executed test such as countdown timers for Fill, Stab Test and Vent test stages, as well as LED indicators for part Accept, Reject, and whether or not a test is in progress. In addition, the front panel contains touchscreen buttons for Starting and Aborting a test, as shown in *Figure 2–2*.

Figure 2–2: Raptor Front Panel



2.4 Rear Connections/Controls

Raptor's components/controls/I/O are located on the back of the unit, as shown in *Figure 2–3* and described in *Table 2–1*.

Figure 2–3: Rear Panel View

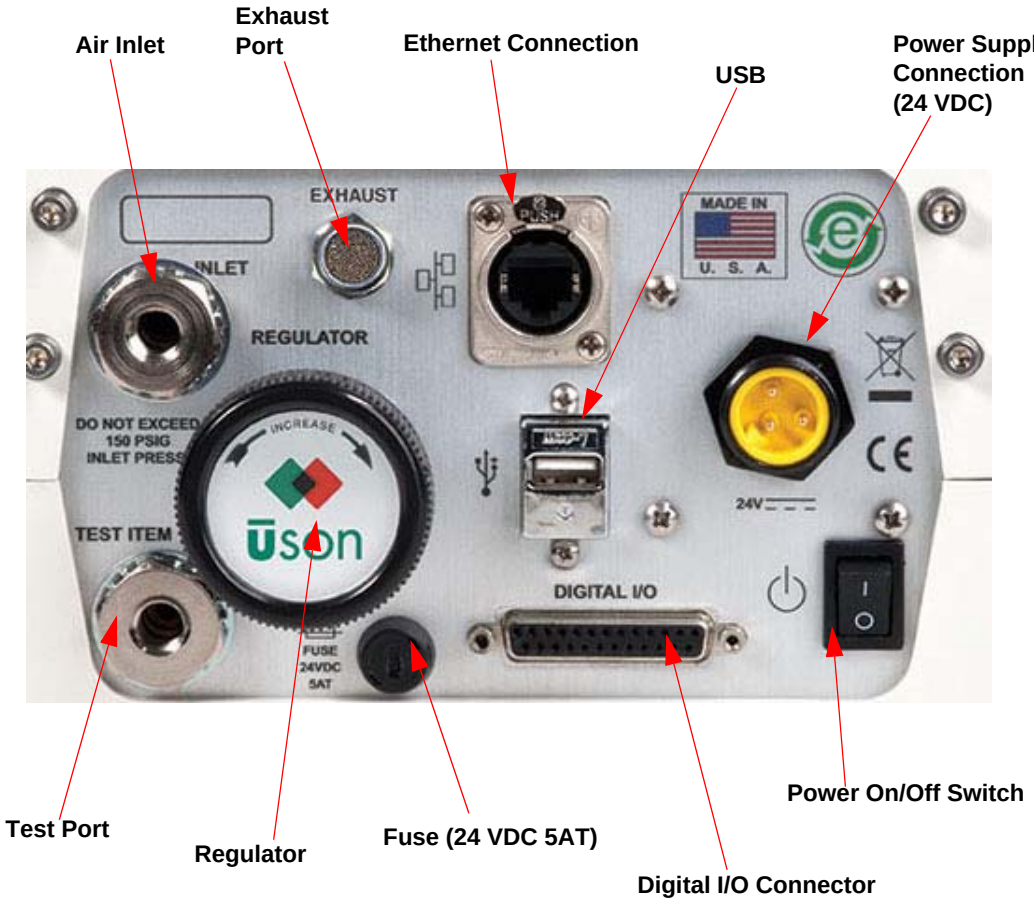


Table 2–1: Rear Panel Component Descriptions

Connection/Control	Description
Power Receptacle	24 VDC power connection.
Power On/Off Switch	Used to turn Raptor power on and off.
USB 2.0 Port	Used for logging test results at end of test, exporting last 5000 stored results, updating firmware, and updating license.
Fuse	24 VDC, 5 Amps. If need to replace, use same fuse type.
Ethernet	Used to connect to the factory network using DHCP.

Connection/Control	Description
Inlet	The compressed air supply entering the unit must be clean and dry, a high quality filter/regulator kit is recommended to improve quality. The inlet pressure needs to be a minimum of 60 psi and a maximum of 150 psi.
Tester Exhaust Port	Ports to Atmosphere.
Regulator	Controls the air pressure supplied to the test component.
Test Port	Connects the test port to the component to be tested.
I/O Connections	Digital I/O Connector. The I/O control connector is a 25-pin female D type connector. This is used for connecting to external device requiring access to the Program selection, Start and Reset inputs and/or the Pass, Reject, End of cycle outputs.

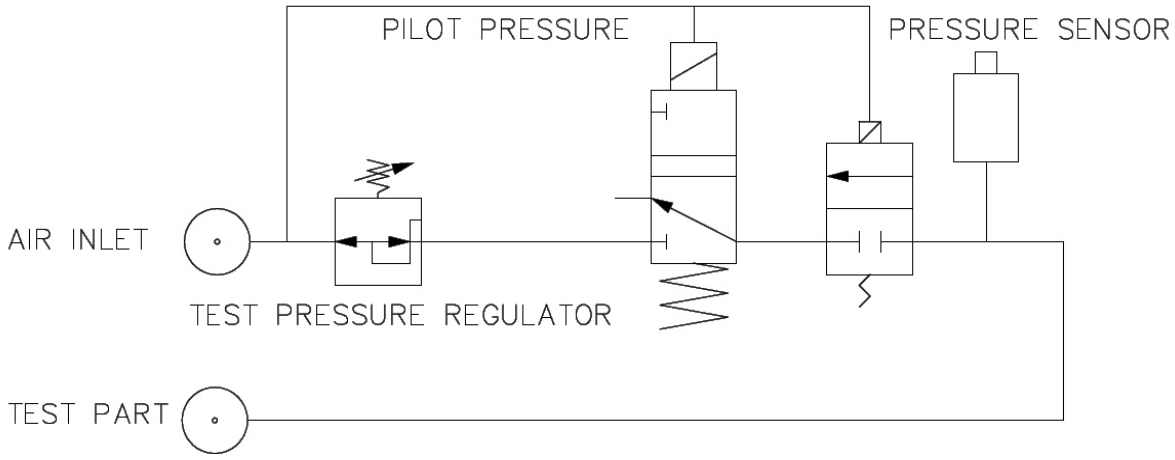
2.5 Pneumatic Configuration

The Raptor uses pneumatically controlled valves to supply compressed air (or other gas) for leak testing a component.

The valves operate in a programmed sequence to pressurize a test component. A leak in the test component results in a pressure change, which is used to decide whether a leak in the test component is within a specified tolerance.

See *Figure 2–4*.

Figure 2–4: Pneumatic Configuration



2.6 Test Steps

All 10 Raptor programs have the following test step structure. To skip a step, set the time for that step to 0.0 sec.

Table 2–2: Test Steps

Test Step	Description
Couple1	Time for external Couple valve 1 to activate/engage
Couple2	Time for external Couple valve 2 to activate/engage.
AutoZero	Time for Auto Zero step duration.
Fill	Time to ensure test component is filled to the correct test pressure.
Isolate	Time to isolate the test component from the supplied pressure.
Stabilize	Time to allow pressure and temperature to stabilize before leak measurement is performed.
Test	Time to measure the pressure change. Result may be given as a pressure drop or a leak rate.
Vent	Time to vent the test pressure from the test component.
UnCouple2	Time for external Couple valve 2 to deactivate/disengage.
UnCouple1	Time for external Couple valve 1 to deactivate/disengage.

2.7 Test Types

Raptor is designed to run two test types:

- Pressure Decay
- Back Pressure Flow

Test phases and their parameters are pre-determined by the selected program.

2.7.1 Pressure Decay Test

Pressure decay testing is used to test products for leaks by trapping air inside a product (either pressure or vacuum) and then measuring pressure change over time. The result from the Test step is the test result. The pressure change over time may also be given as a quantified leak rate, see See *"Comp/Cal" on page 7-1*.

The basic pressure decay test consists of the following steps:

- Fill
- Isolate

- Stabilize
- Test
- Vent

A basic Raptor pressure decay test setup is shown in *Figure 2–5*.

Figure 2–5: Basic Pressure Decay Test Setup

Steps Couple1, Couple2, AutoZero, UnCouple2 and Uncouple1 have 0.0 sec entered and will be skipped.

2.7.2 Back Pressure Flow Test

A back pressure flow test uses the same pneumatic circuit as the pressure decay test. A Back Pressure Flow test is where the part is continuously pressurized while air is escaping to atmosphere through the passages of the part under test. The residual pressure (back-pressure) seen at the part inlet is measured and must remain within the specific range of the Fill step maximum and minimum limits to pass the test.

The back pressure flow test consists of the following steps:

- Fill
- Vent

A Raptor back pressure flow test is shown in *Figure 2–6*.

Figure 2–6: Back Pressure Flow Test Setup

2.7.3 Back Pressure Flow

Raptor's Back Pressure test cycle contains two phases: Fill, & Vent (see *Table 2–3*). A Back Pressure test is setup by setting the isolate, stab, and test steps to 0 in the test setup screens. See *"Program Setup Screen" on page 4-8*.

Test phases and their parameters are pre-determined by the selected program.

Table 2–3: .Test Phases

Test Phase	Description
Fill	Pressurizes test component to the preset test pressure.
Isolate	Part is isolated from supplied pressure (i.e, valves close to isolate part). (Set to 0 for Back Pressure Flow tests.)
Stab	Isolates the test component from the test pressure and allows the pressure within the test component to stabilise for a pre-programmed time. (Set to 0 for Back Pressure Flow tests.)
Test	Compares the pressure change from the beginning and at the end of the step. The test fails if the pressure or rate of pressure drop between the two ports is outside a programmed tolerance. (Set to 0 for Back Pressure Flow tests.)
Vent	The result of the test is indicated on the display and by the status of the front panel LED. The test pressure is vented and the display returns to Ready.

3
Installation/Wiring

3.1 Introduction

All procedures should be read carefully before unpacking, installing/wiring the Raptor Tester.

WARNING: Adhere to all warnings outlined in Section 1, Safety.

WARNINGS: Raptor's power supply must be connected to an earthed (grounded) power supply of 90 - 260V, 50 - 60Hz. Only personnel trained to avoid the risk of electric shock should remove the covers on the equipment. The power supply to the equipment must be switched off and disconnected before removing any covers. Do not make or break external connectors or connections while the Raptor is switched on.

CAUTION: Do not substitute the fuse type or rating. Always use the correctly rated fuse, failure to do so may be hazardous and may cause damage to the equipment.

- .

CAUTION: When using a pneumatic Auto couple device with the Raptor, take care to ensure that both the Auto couple and the component are adequately restrained. The component to be tested and the air supply line to the Raptor must be free from water or liquid residue before testing; otherwise damage to the sensitive transducer within the instrument may occur. The use of an external dump valve or an in-line filter is recommended for contaminated components.

Uson's Service Manager can be reached by phone at (1) (281)- 671-2000 between the hours of 8 a.m. and 5 p.m., USA Central time. The Service Manager will assign a tracking number, evaluate the situation, and schedule service resources as required.

3.2 Unpacking

The Raptor is supplied with the following components:

- User manual on USB drive
- Power supply
- Calibration Certificate
- Uson Raptor Bluetooth letter
- Purchased options or accessories

If any component is missing please contact Uson 1-281-671-2000.

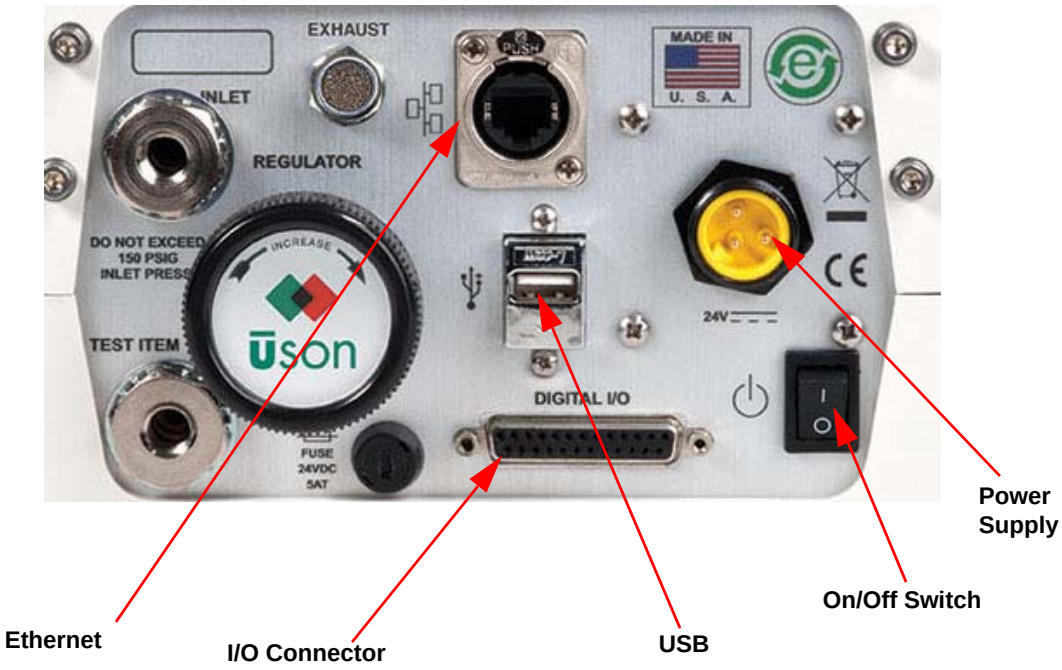
3.3 Environmental/Location Requirements

- The Tester will operate in a temperature range of 5°C to 40°C (41°F to 104°F), with a humidity range of 0 to 90% non-condensing.
- The Tester should be sited as near as possible to the test component in order to keep the internal volume to a minimum.
- To avoid temperature variations, which can affect the repeatability of the readings, the complete system should be installed away from heaters and draughts.
- It is advisable to insulate the connecting test-pipe work.
- The tester must be placed on a horizontal support, free from vibration, where there is free access to the front panel controls and rear panel connectors.

3.4 Wiring/Connections

Wiring connections are located on the Raptor's back panel and consist of I/O connector, USB port, Ethernet port, and Power Supply input, as shown in *Figure 3–1*.

Figure 3–1: Back Panel View



WARNING: AVOID DEATH/INJURY/AND OR EQUIPMENT DAMAGE.
(1) Always disconnect all Raptor units from their electrical power supply before installing, wiring, servicing/adjusting, and opening/closing enclosures. (2) Do not plug the Raptor units into an electrical power supply until all installation, wiring, servicing/adjusting, wiring, etc. procedures have been completed; and all enclosures are in place.
(3) Servicing, wiring, and performing adjustments to the Raptor units must be made by trained and qualified personnel only!

3.4.1 I/O Connector

The Raptor is designed with 8 inputs, and 5 outputs. The 25 pin I/O connector is located at the back of the unit, as shown in *Figure 3–1*. See *Table 3–1* for pin descriptions.

Eight optically isolated inputs are provided for interfacing with a PLC or fixture, as well as BCD program selection.

Outputs are included for driving two external couplings valves on/off (engaged/ disengaged), and for accept, reject, and testing.

Assertion of the input signals requires a 24V ± 3% VDC excitation. Asserted output signals provide 24VDC voltage levels with up to.7Amps per output.

Table 3–1: I/O Pin Connections

Pin #	INPUT Description	Pin #	OUTPUT Description***
1	INGND*	**14**	COUPLE 1
2	START**	**15**	OUTGND
3	ABORT**	**16**	COUPLE 2
4	START ENABLE**	**17**	OUTGND
5	BCD 0**	**18**	ACCEPT
6	BCD 1**	**19**	OUTGND
7	BCD 2**	**20**	REJECT
8	BCD 3**	**21**	OUTGND
9	BCD 4**	**22**	TESTING
10	INGND*	**23**	OUTGND
11	N/C	**24**	N/C
12	N/C	**25**	N/C
13	N/C		

***INGND: the return signal from the PLC or other externally connected input device.**
****START, START ENABLE, ABORT, BCD0-4 are signals from a PLC or other externally connected input device. When these signals are used for tester control, the amplitude must be 24VDC ± 3% VDC to assert the associated input signal. START ENABLE must be asserted for the START input to cause a test to begin. While most customers will tie START and START ENABLE together, some may want to ensure that a a fixture is closed, or a part in place, or a two hand start signal is used as the START ENABLE signal. In that case, START ENABLE must be present before a START assertion will cause the test to begin.**
*****OUTPUT description: COUPLE 1 and 2, ACCEPT, REJECT, and TESTING are 24VDC outputs with respect to OUTGND.**

3.4.2 USB Connection

The Raptor includes a single USB 2.0 port on the rear panel (see *Figure 3–1*) that can be used for connecting a USB flash drive for test result logging, exporting audit log, and maintenance.

3.4.3 Ethernet Connection

The Raptor includes an Ethernet connection on the rear panel (see *Figure 3–1*) that can be used for connecting to the factory network for logging test results.

3.4.4 Pneumatic Connections

Before connecting air (or other gas) to Raptor, make certain the supply air is clean and dry and pressure doesn't exceed the maximum input listed on the rear panel.

Recommended practice is to install and maintain an external filter/regulator immediately upstream of the tester.

Inlet: Connect supply air to the 1/8-inch female NPT bulkhead fitting labeled INLET on the back of the Raptor, as shown in *Figure 3–2*. Inlet Supply Air Range: 60 psi Minimum, 150 PSI Maximum.

Test Item: Connect the test component or test fixture to the 1/8-inch female bulkhead fitting labeled TEST ITEM on the back of the Raptor, as shown in *Figure 3–2*.

The tester is supplied with a seal leak test (predefined, program 6) that can be used to verify the integrity of bulkhead and tubing installation.

Bulkhead Fittings

Fittings must match the tubing and connection sizes used for the components being connected. The tester is supplied with a seal leak test (predefined, program 6) that can be used to verify the integrity of bulkhead and tubing installation.

Figure 3–2: Raptor Air Inlet Location

3.4.5 Connecting Power Supply

WARNINGS: Raptor's power supply must be connected to an earthed (grounded) power supply of 90 - 260V, 50 - 60Hz. Only personnel trained to avoid the risk of electric shock should remove the covers on the equipment. The power supply to the equipment must be switched off and disconnected before removing any covers. Do not make or break external connectors or connections while the Raptor is switched on.

1. Check that the power switch on the back panel of the tester is OFF (see *Figure 3–1* for location).

2. Referring to the *Figure 3–3*, connect the AC power cord to the power supply **(# 2)**. (The type of power cord supplied with Raptor will vary, depending on the country.)

3. Attach the DC output power cord **(# 3)**to the rear panel of the tester at power supply location, as shown in *Figure 3–1*. Lock it in position by turning the connector collar so that it firmly grips the receptacle.

4. Finally, connect the AC power cord **(#1)** to the facility power receptacle. The green light on the power supply should now be lit indicating the power supply is receiving AC power.

Before switching the tester ON, be sure that the power supply is located in a position where it will be open to air flow and stable.

WARNING: AVOID INJURY AND/OR EQUIPMENT DAMAGE. DO NOT modify these connections without factory assistance, as this may cause injuries to personnel or damage to tester components. Unauthorized modification will void the manufacturer's warranty.

Figure 3–3: Power Supply Description

3.4.6 Powering On/Off

The Raptor is switched on/off using the Power button located on the rear panel of the instrument (see *Figure 3–1* for location).

4

Configuring Raptor (Program Mode)

4.1 Introduction

- Raptor is configured by either an Apple iOS or Android smart device such as a tablet, phone, or pod.
- The smart device must have Uson's **Raptor Client** application software installed.
- The **Raptor Client** application software is available at Google Play for Android devices and iTunes store for iOS devices.

4.2 Raptor Client Software

- Allows connection to one Raptor at a time.
- Allows Raptor program parameters to be edited and downloaded to the tester.
- Allows Offline mode where program parameters can be modified without being connected to the tester; so when a connection is made, changes can be quickly downloaded, making it easier to set-up the tester.

4.2.1 Raptor Client Software on Android Device

1. The Android device must be running Android 4.3 or greater. If not the Raptor Client Software will not appear on Google Play.

2. Some Android devices have internal conflicts when Bluetooth and WiFi are both enabled at the same time. If you experience connectivity issues, Uson recommends turning off WiFi.

3. On Android devices, you will need to Pair the device to Raptor before the Raptor will appear on the Connect list.

The pairing process is done through the **Settings** option on the Android device.

To Pair:

1. Ensure Raptor is powered on and boot-up complete.
2. Go to **Settings** on the Android device.
3. Select **Bluetooth**.
4. Select **"Scan for Available Devices."**
5. Select your Raptor from the list.

The Raptor and Android device are now paired.

4.2.2 Raptor Client Software on Apple iOS device

1. The Apple iOS device must be running iOS 5.0 or greater

2. The Apple device hardware must be capable of Bluetooth LE (Low Energy).

3. If the above two conditions are not met, downloading of the Raptor Client software will not be allowed.

4.3 Starting Raptor Client

To start the Raptor Client Software, select the Raptor Client icon  .

The Raptor splash screen displays as shown in *Figure 4–1*. The Raptor splash allows the option of Connecting to a Raptor or Creating/editing program parameters while offline, see *"Raptor Offline and Database Operations" on page 9-1*.

4.4 Connecting to Raptor

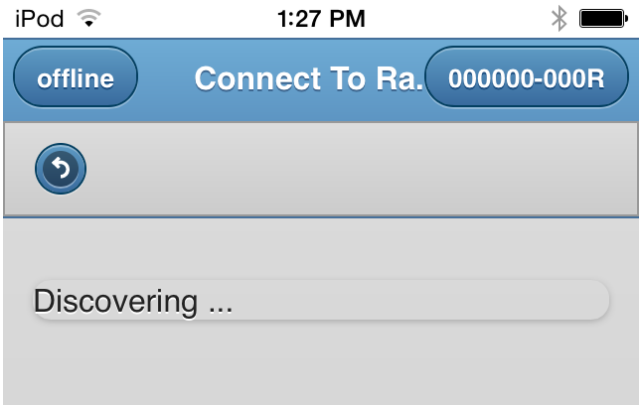
After installing the software on your Android device and pairing, you need to connect your Android device with the Raptor. **To Connect:**

1. Select **Connect**.

For an Android device, the Raptor testers that have been Paired to the device will display (see *Figure 4–3*). If your Android doesn't display, make sure that the Raptor has been paired to the Android device, see *"Connecting to Raptor" on page 4-2*.

When Connect is selected on an iOS device, the device will perform a Discovering routine, see *Figure 4–1*.

Figure 4–1: iOS Discover Routine



This discovering routine is essentially the same as pairing on an Android device. Upon completion of this routine, all Raptors discovered display, see *Figure 4–2*.

2. Select the Raptor serial number you with to Connect to, the “Connecting to ...” pop-up screen displays, as shown in *Figure 4–3*.

3. Once the Raptor is successfully connected with the Raptor Client software, “Connected” displays in the upper left corner of the Config or Run software screen, depending on the selected mode of the tester (see *Figure 4–4*).

Figure 4–2: Selecting Paired Raptor

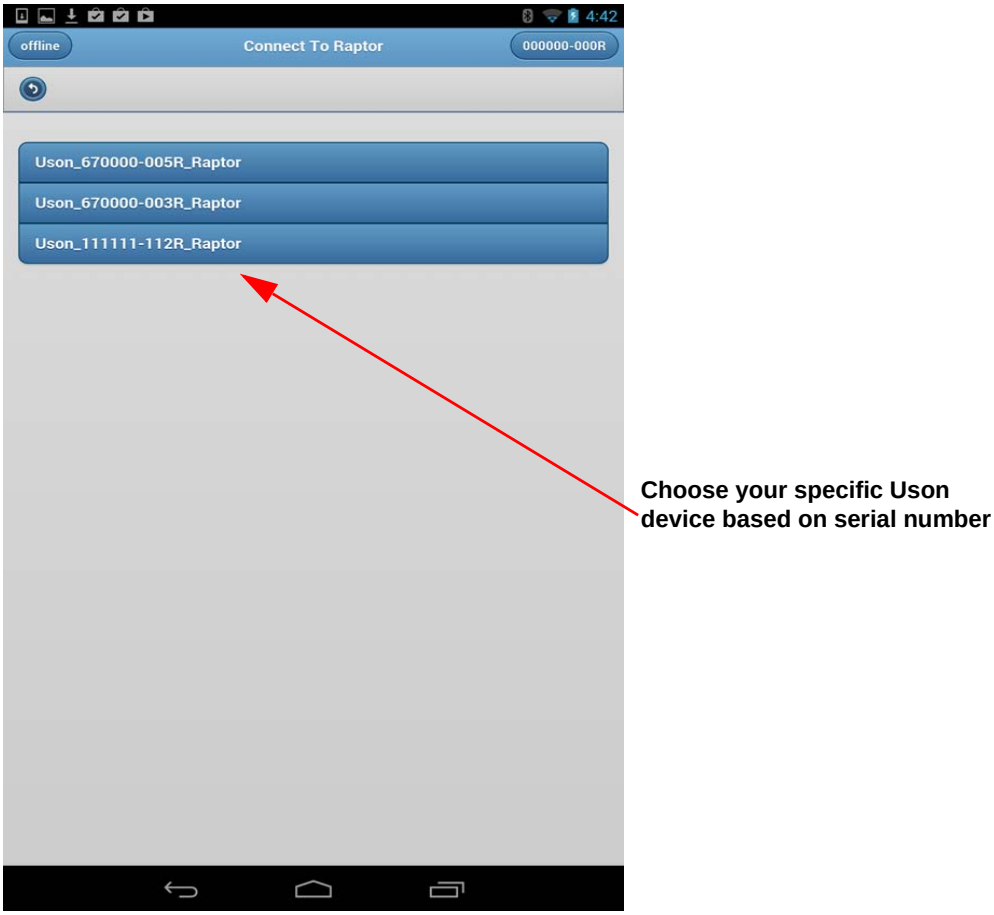


Figure 4–3: Connecting Pop-up Screen

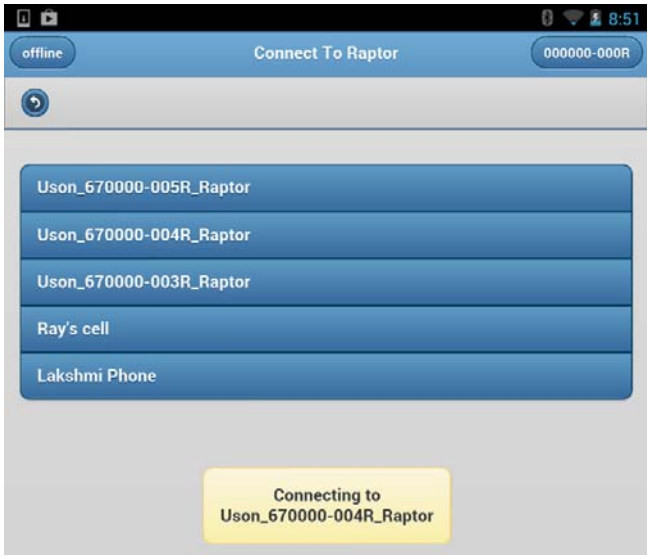
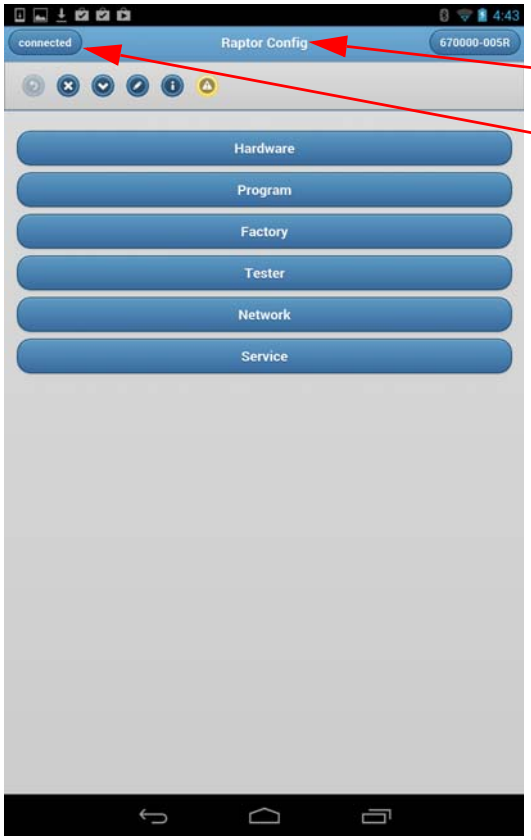


Figure 4–4: 4Unit Connected in Program Mode



4.4.1 Configuration Main Screen

The Raptor Configuration screen is used to setup your test system by moving through the various setup categories to enter/choose data/parameters specific to your testing application.

Every time you select/change parameters in any of the Configuration screens, you must select the download button to save the changes to the tester database. A "Download Complete" message displays when downloading has been completed. The Download button displays on the Config Home screen's main menu bar. If the Download button is not visible, use the back arrow button to return to Config Home screen.

The Configuration main menu bar includes several functions, as described in *Table 4–1*.

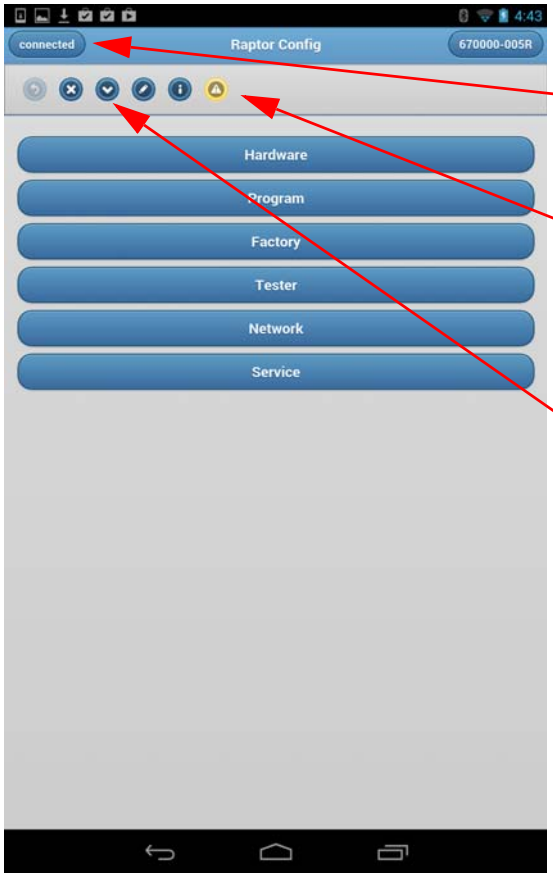
Table 4–1: Configuration Main Menu Bar

Button	Function/Description
	**Back Button. Used to view previous screen.**
	**Disconnect Button. Disconnects from Bluetooth.**
	**Download Button: Downloads Configuration Database to Raptor. This function must be selected after selecting/changing *any* configuration parameter. If the Download button is not displayed, select the back arrow to return to the Config Home screen.**
	**Saves Database to Device (Tablet)/Offline. This function is mainly used for working offline. You can setup your Raptor's parameters before connecting, then save to tablet.**
	**Displays tester information.**
	**Displays testing alerts. See "Troubleshooting".**

The configuration home screen contains *6 configuration categories (see Figure 4–5):*

- **Hardware**
- **Program**
- **Factory**
- **Tester**
- **Network**
- **Service**

Figure 4–5: Raptor Configuration Home Screen



The word "Connected" displays when connected; "offline" when not connected.

Main Menu Bar Functions (see *Table 4–1*).

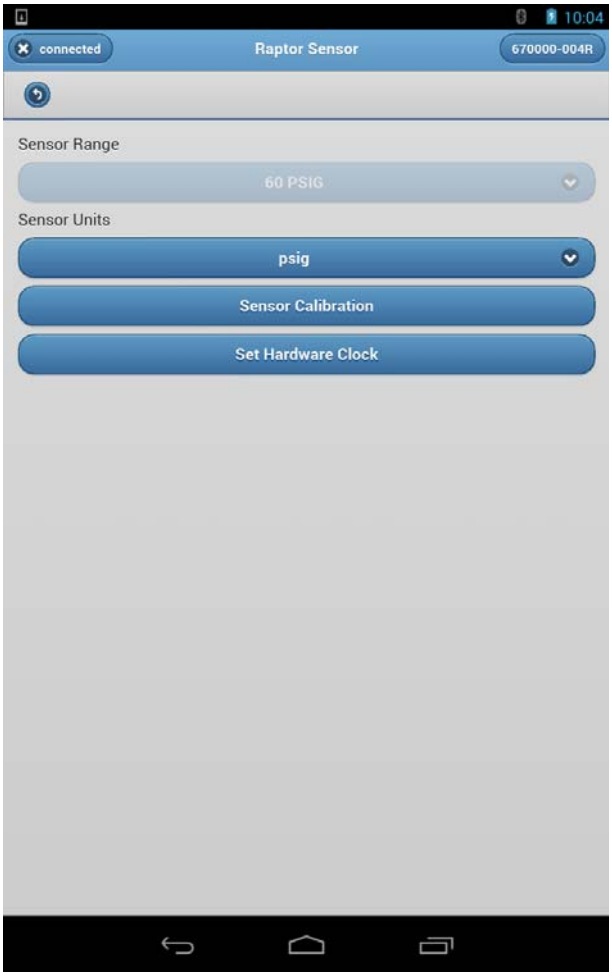
Download to Tester Button

4.4.2 Hardware Screen

The hardware screen (*Figure 4–6*) is used to configure the Raptor's sensors and to initiate the sensor calibration process.

- **Sensor Units:** Select desired sensor unit.
- **Sensor Calibration:** Select to initiate the sensor calibration process (see *"Sensor Calibration Procedure" on page 6-2*).
- **Set Hardware Clock:** This sets the clock in Raptor from the Android based device that it is connected to.

Figure 4–6: Hardware Setup (Sensor) Screen



4.4.3 Program Setup Screen

The Program screen is where you setup your test (program) steps' parameters (see *Figure 4–7*). The Raptor allows up to 10 saved programs. Test steps are preset (fixed) and cannot be changed.

To Skip a step, enter 0 in the Time(sec) field.

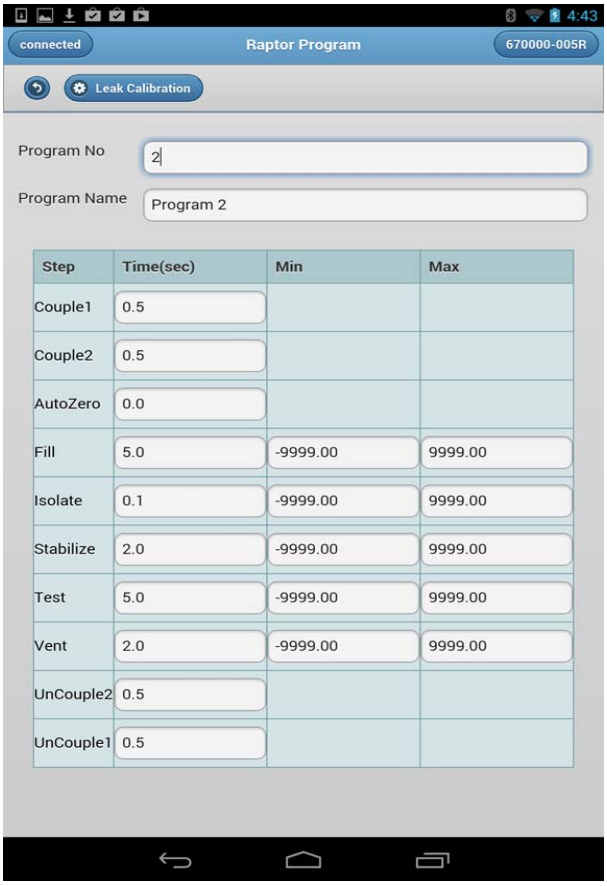
Every time you select/change parameters in any of the Configuration screens, select the back arrow to return to Config Home screen, then select the download button to save the changes to the tester database. A "Download Complete" message displays when downloading has been completed.

1. To enter program parameters, select the field and enter desired entry using the software's popup keyboard. (To exit the Program Setup screen, select the **Back** arrow 

.)
2. After configuring your program, exit to the Raptor Configuration Main screen by selecting the **Back arrow** 

, then select the **Down arrow**  to download the information to the Raptor unit. (See *Figure 4–12* for down arrow location).
3. If you wish to backup/save any changes made to program parameters, select the Saves Database to Device icon, (see *"Database Interactions" on page 9-1*).

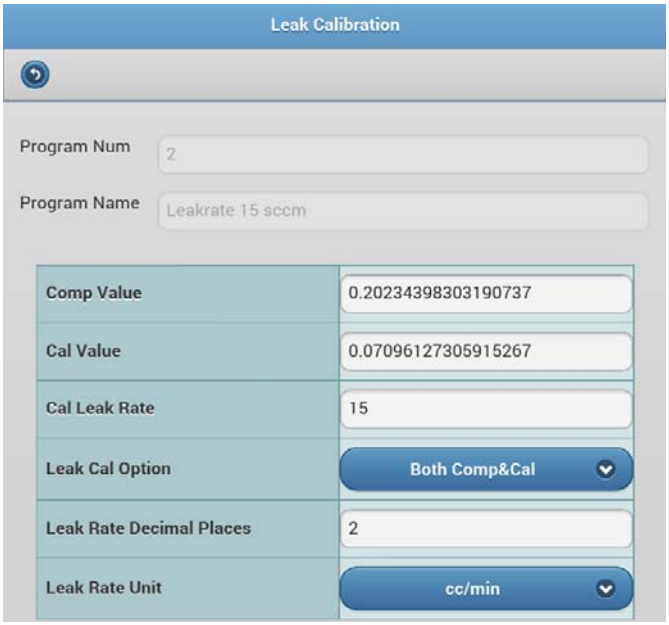
Figure 4–7: Program Setup Screen



Leak Calibration

The Leak Calibration button is located on the Program Setup screen (see *Figure 4–7*). Selecting the Leak Calibration button displays the Leak Calibration screen, as shown in *Figure 4–8*.

Figure 4–8: Leak Calibration Screen



Comp Value: Shows the current Comp Value. This value can be the result of a Comp test or manually entered by selecting the Comp Value field.

Cal Value: Shows the current Cal Value. This value can be the result of a Cal test or manually entered by selecting the Cal Value field.

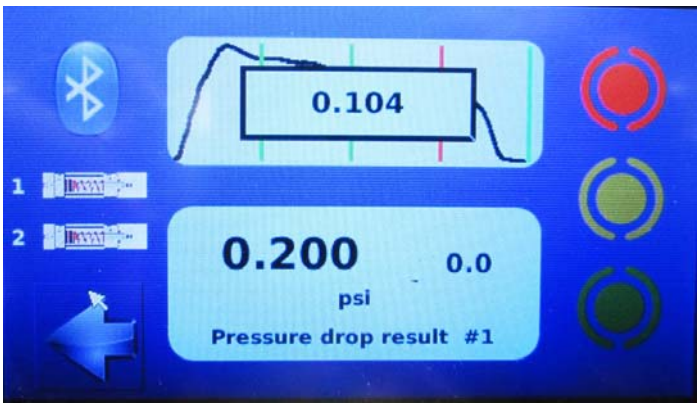
Cal Leak Rate: Shows the Leak Rate (Leak Master value).

Leak Cal Option: When selected, the Leak Cal Option screen displays, as shown in *Figure 4–9*.

Figure 4–9: Leak Cal Options

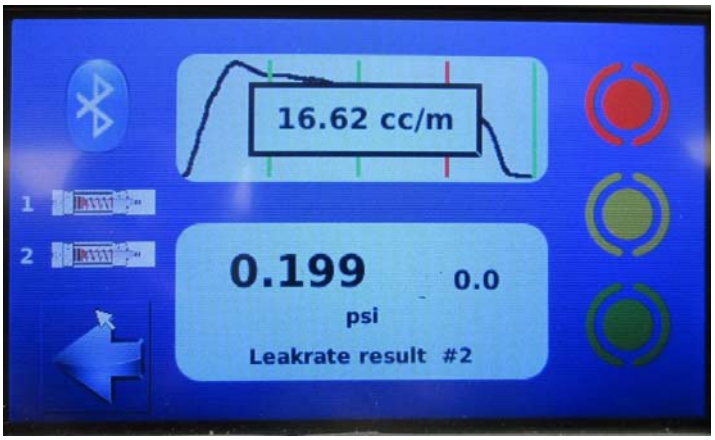
- **No Comp&Cal:** Used to disable the Comp and Cal features. The result is given in the pressure units selected in the Hardware screen. *The units will not appear in the Test Result box*. See *Figure 4–10*.
- **Only Comp:** Enables Comp for the selected program. In this mode, Raptor subtracts the Comp value from the end test result. The displayed result is the Compensated result which is displayed in the pressure units selected in the Hardware screen. *The units will not appear in the Test Results box*. See *Figure 4–10*.

Figure 4–10: Pressure Drop Result Display



- **Both Com&Cal:** If selected, the selected program will now be considered a Leak Rate type test. The result is given in the select Leak rate units and will be displayed in the Test Results box. See *Figure 4–11* and *"Comp/Cal" on page 7-1*.

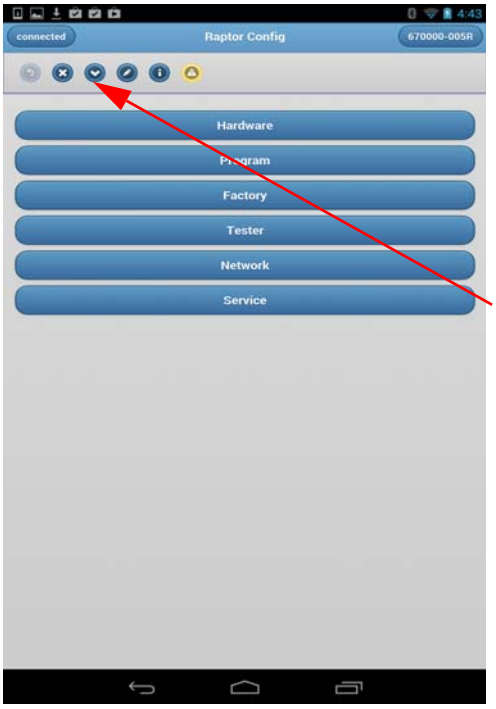
Figure 4–11: Leak Rate Result Display



Leak Rate Decimal Place: Sets the number of decimal places to be displayed in the results box.

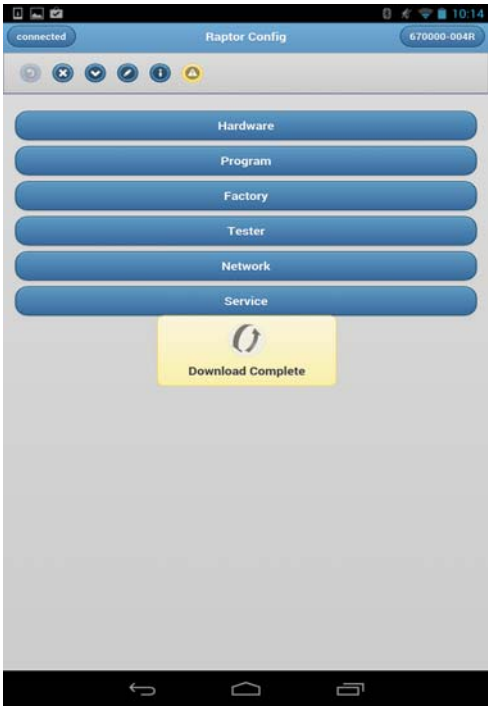
Leak Rate Unit: Selects the units of the test result. The available units are: ml/sec, ml/min, ml/hr, cc/sec, cc/min, cc/hr.

Figure 4–12: Configuration Home Screen Down Arrow Location



3. After selecting the download button, the “Download Complete” message displays, as shown in *Figure 4–13*.

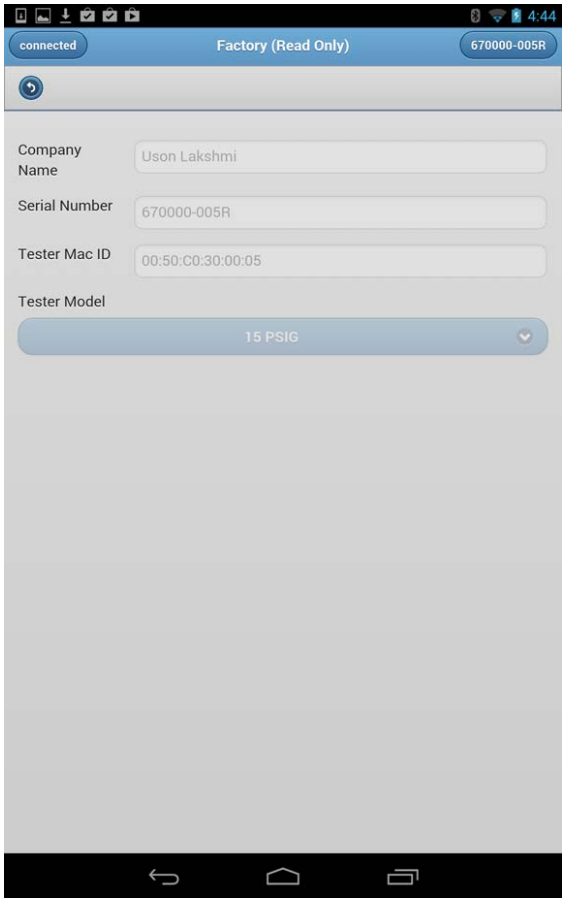
Figure 4–13: .. Download Complete Screen



4.4.4 Factory Screen

The Factory Screen (*Figure 4–14*) is a read only screen, and displays various information about your Raptor. To exit the Factory Settings screen, select the **Back arrow**  located towards the top left of the screen.

Figure 4–14: Factory Settings Screen



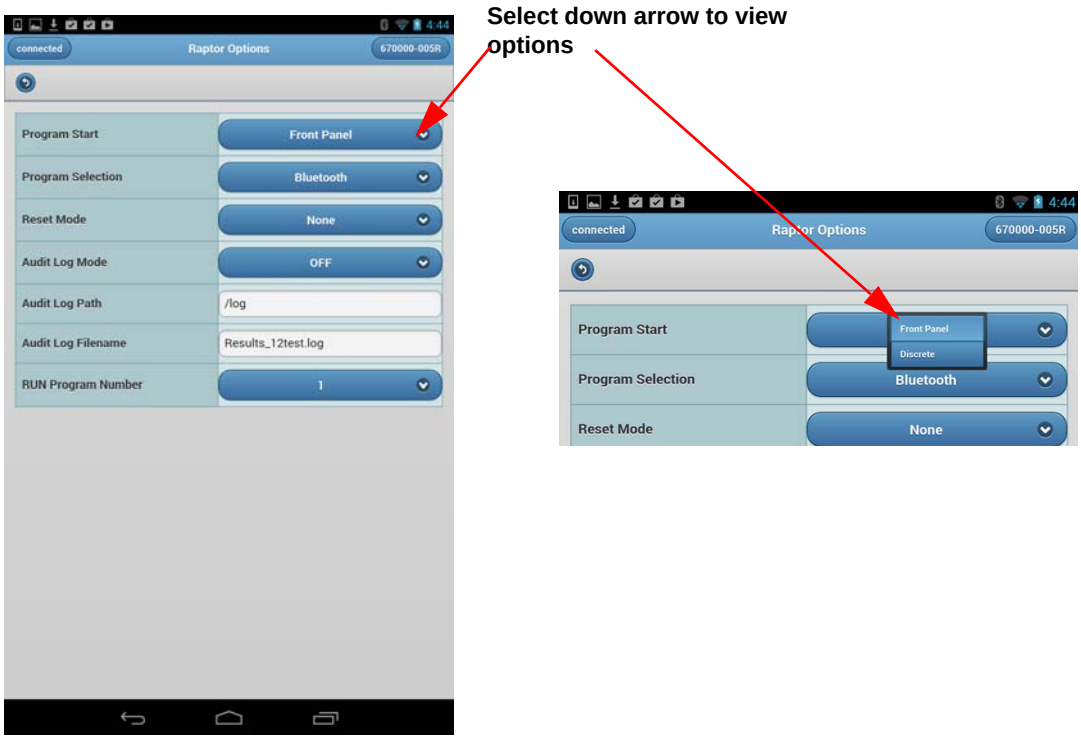
4.4.5 Tester Screen (Options)

The Tester screen is displayed when you select Config Home >Tester and is one of the primary screens for setting up your test options (see *Figure 4–15*). To choose an option, select the down arrow in the option menu, then select your desired option.

Every time you select/change parameters in any of the Configuration screens, select the back arrow to return to Config Home screen, then select the download button to save the changes to the tester database. A "Download Complete" message displays when downloading has been completed.

Tester categories include: Program Start, Program Selection, Reset Mode, Audit Log Mode, Audit Log Path, Audit Log Filename, and Run Program Number, as shown in *Figure 4–17*.

Figure 4–15: Tester Setup Screen



Program Start

Used to select how to start your Raptor test.

- **Front Panel:** Programs can only be started and stopped using the Start and Stop buttons from the Raptor's front panel touchscreen.
- **Discrete:** Programs started and stopped using I/O start and abort inputs.

Start Enable must be present (+24VDC) before a Start assertion will cause a test to begin. If the Start Enable function is not desired, tie the input to the Start input or to +24VDC.

Program Selection

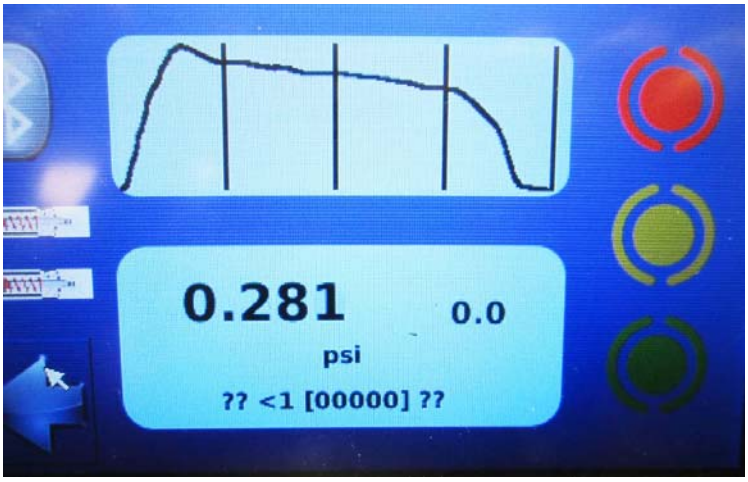
- **Bluetooth**: Select test programs via Uson's Android Application.
- **Discrete:** Selects which programs to run via I/O BCD inputs, see BCD Program Select, *Table 4–2*.

Table 4–2: BCD Program Selection Chart

BCD 4	BCD3	BCD2	BCD1	BCD0	BCD Value	Program Number
0	0	0	0	0	0	??
0	0	0	0	1	1	1
0	0	0	1	0	2	2
0	0	0	1	1	3	3
0	0	1	0	0	4	4
0	0	1	0	1	5	5
0	0	1	1	0	6	6
0	0	1	1	1	7	7
0	1	0	0	0	8	8
0	1	0	0	1	9	9
1	0	0	0	0	10	10
0	1	0	1	0	0xA**	10
**The Binary/Hex value of 0xA will also select Program 10						

If an invalid BCD combination is present on the inputs when a Start is asserted, the tester will not start and *Figure 4–16* displays.

Figure 4–16: BCD Invalid Display



Reset Mode

- **None:** If selected, no reset mode change.
- **Hold on Reject:** Used to place the designated test on Hold if the Raptor determines a part has failed (determined by program setup parameters).To resume testing after a reject occurs, reset the tester by selecting **Stop**.
- **Hold on Pass:** Used to place the designated test on Hold if the Raptor determines a part has passed (determined by program setup parameters).To resume testing after a hold occurs, reset the tester by selecting **Stop.**

Audit Log Mode

- **OFF:** Audit log mode turned off.
- **USB Disk:** Allows selecting the Mounted USB device as the log file destination.
- **Network:** Sets Windows Network as the audit log destination

Audit Log Path

- Use to enter audit log path name. The audit log path must begin with a forward slash (/). Enter using the software's pop-up keyboard.

Audit Log File Name

- Used to enter audit log file name. The audit log file name must end with .log. Enter using the software's pop-up keyboard.

RUN Program Number

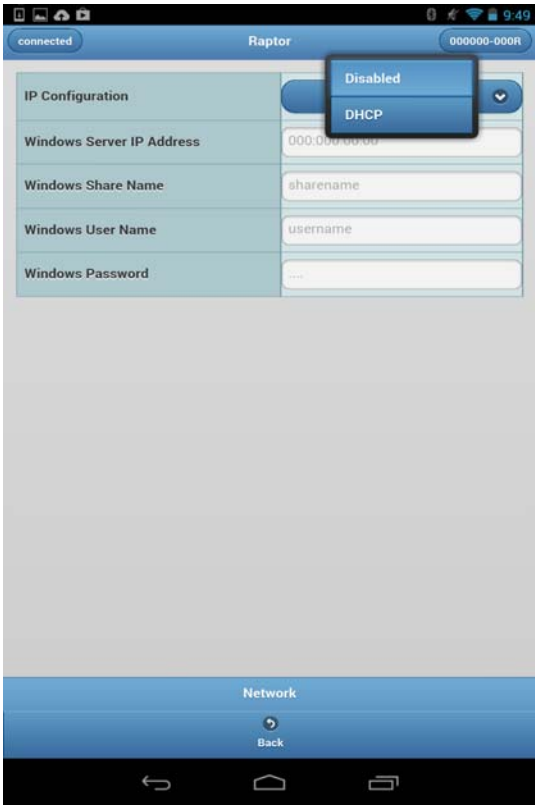
- **1-10:** Selects program number to run (1-10).

4.4.6 Network Screen

The Network screen (*Figure 4–17*) is used to configure your Raptor for a Windows network connection using the following data provided by your on-site IT manager:

- **IP Configuration**
- **Windows Server IP address**
- **Windows Share Name**
- **Windows Password**

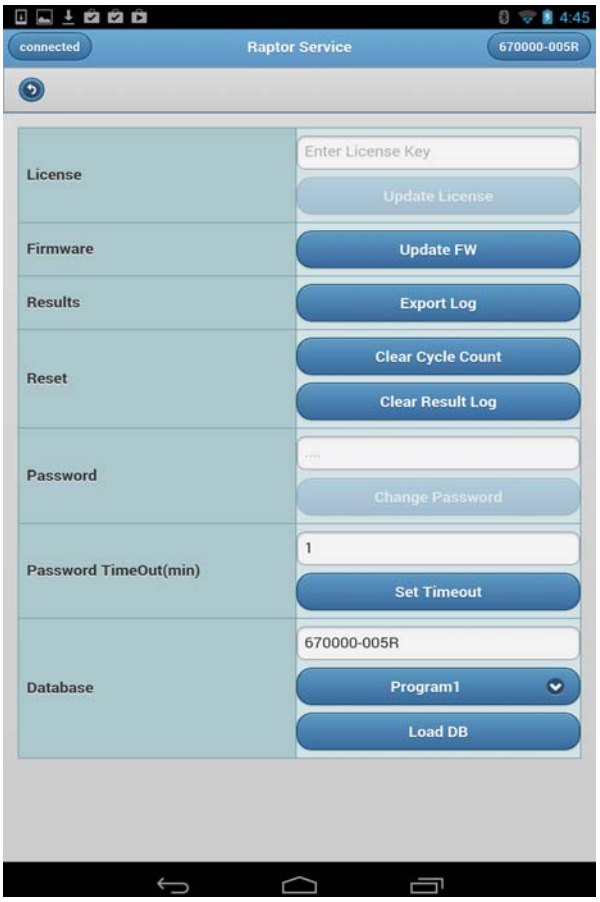
Figure 4–17: Network Screen



4.4.7 Service Screen

The Service screen is used to view and edit Raptor information, as shown in *Figure 4–18*.

Figure 4–18: Service Screen Main



License

All Raptor testers ship from Uson with a temporary license. The number of days remaining on the license can be found by selecting the info button on the top tool bar. (See Raptor Application note, ‘Installing Raptor License”, for further details.)

Firmware

Perform the following to update the Raptor tester firmware:

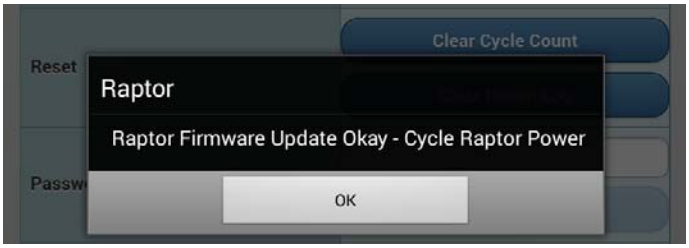
1. The firmware update file ‘**raptor.tar.gz’** will be sent by email.
2. Copy the file raptor.tar.gz to the root directory (X:\) of a USB drive.
3. Insert the USB device containing the firmware file into the back of the Raptor, see Fig 2-3.

4. From the Raptor Service screen, select **Update FW,** the Updating pop-up screen displays, as shown *Figure 4–20*.

Figure 4–19: Update Firmware Screen

5. When the update is complete, *Figure 4–20* displays.

Figure 4–20: Firmware Update Status Screen



6. Power cycle the Raptor to complete the Firmware update.

Results (Export Results Log)

- The Export Log exports the “results.log” file to a USB drive. The results.log file contains the results of the last 5000 tests in the following format:

Cycle #	Date	Time	Prog #	Test Press	Units	Test Value	Leak Rate Units	Result	Reason
77	05.05.2014	9:43:12	7	19.758	psi	0.074	psi	Pass	
113	05.05.2014	11:35:06	7	19.740	psi	14.510	cc/min	Fail	Max Limit
189	06.05.2014	11:11:26	10	15.007	psi	0.000	psi	Abort	Operator

Perform the following steps to Export the Results Log File:

1. Insert USB drive into the back of the Raptor.
2. Select **Export Log**, the “Export Test …” displays, as shown in *Figure 4–21*.

Figure 4–21: Export Test Results Log

3. When complete the USB drive may be removed from Raptor.
4. The results.log file may be found on the USB in the following directory structure: uson -> raptor -> results -> serial # -> results.log

Reset

- **Clear Cycle Count:** Select to clear cycle count from memory.
- **Clear Results Log:** Select to clear results log from memory.

Password (set)

Raptor’s password feature helps restrict inadvertent test parameter changes. The password feature takes effect after a password has been set and the password timeout duration has expired. The user must enter the password before any changes made to test parameters can be downloaded to the tester. The password also restricts access to the Service screen, as this is where the password settings are controlled.

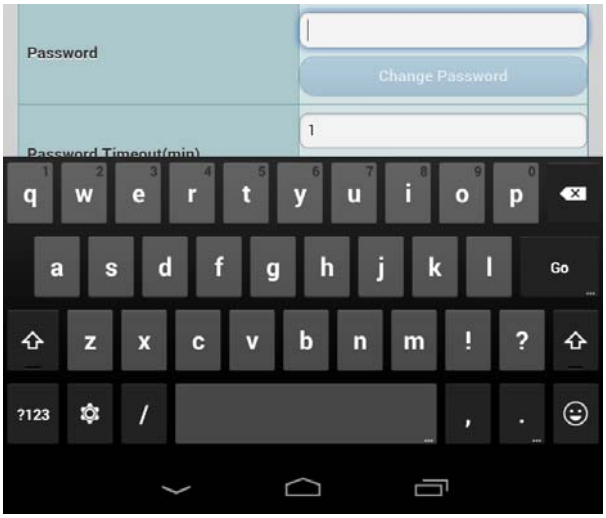
The default password for Raptor is 9999. When the password is set to 9999, all password functions are disabled.

Change Password

Perform the following steps to change the Raptor password:

1. Go to Service screen and select the '**Password'** field. The popup keyboard displays, as shown in *Figure 4–22*.

Figure 4–22: Password Screen



2. Enter the new password and the select '**Go**' from the keypad. The **Change Password** highlights, as shown in *Figure 4–23*.

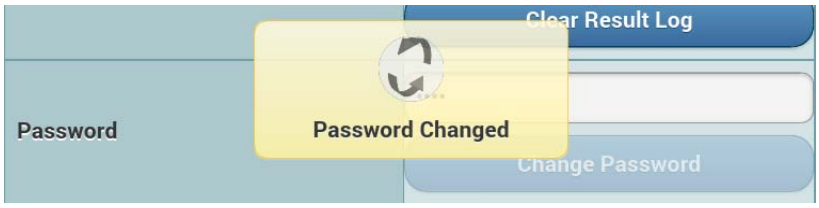
Figure 4–23: Change Password

3. Select **Change Password**. The Confirm new password screen displays. Re-enter the new password and select **Confirm.**

Figure 4–24: Confirm Password

4. After selecting Confirm, the password will be set to the new password, indicated by the Password Changed display screen, as shown in

Figure 4–25: Password Changed Screen



Password Timeout

- Used to select the time before the password times out and must be re-entered.

Database

- **Program:** Used to select Hardware, Tester Options, and all programs from database.
- **Load DB:** Used to select a database of programs to upload.(Uploads DB store on device and serves as DB backup).
- See *"Raptor Offline and Database Operations" on page 9-1* for more information.

4.4.8 Raptor Unit Information Screen 

Selecting the Info button  displays pertinent information about your Raptor unit, as show in *Figure 4–26*.

Figure 4–26: Raptor Unit Information Screen

4.5 Configuring Raptor Offline

You can use the Raptor Client software to configure your Raptor offline (i.e., not connected).

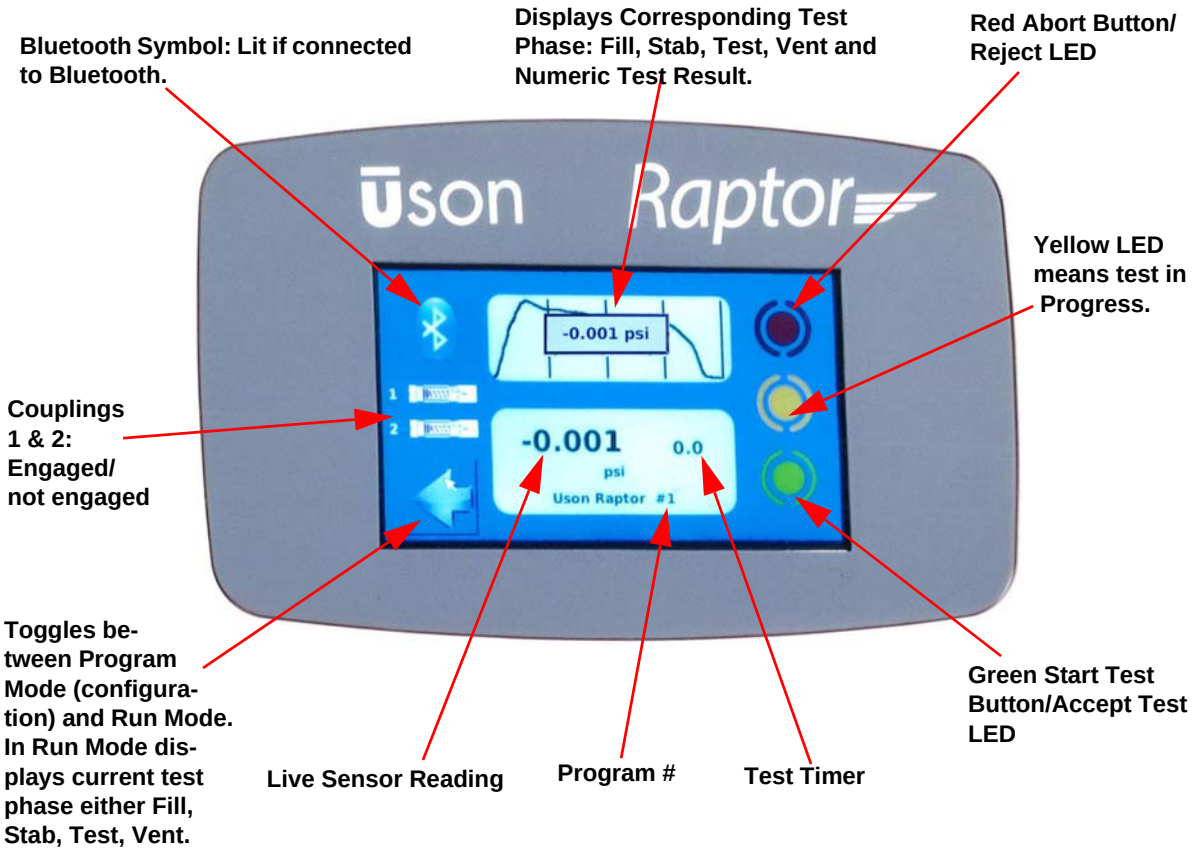
One of the differences is that the selections/changes are saved to the phone/tablet's database using the Save button  instead of downloading them to the tester (see *"Offline Operations" on page 9-2* for additional information).

5
Using Raptor (Run Mode)

5.1 Front Panel Display Overview

Raptor's front panel is equipped with a 4.3" (diagonal) color touch screen that displays visual information about the executed test such as countdown timers for Fill, Stab Test and Vent test stages, as well as LED indicators for part Accept, Reject, and whether or not a test is in progress. In addition, the front panel contains touchscreen buttons for Starting and Aborting a test and coupling information, as shown in *Figure 5–1*.

Figure 5–1: Raptor Front Panel Display



5.2 Running a Test

After configuring Raptor for your specific test program (see *Chapter 4, Configuring Raptor (Program Mode)*; *Chapter 6, Sensor Calibration*; and *Chapter 7, Comp/Cal*), you are now ready to begin using it for testing parts. Tests are performed in Run Mode, which is accessed via a toggle button on unit's front panel display (see *Figure 5.1*).

To Begin Testing:

1. Press the **Program Mode/Run Mode Toggle Button**  on the Raptor's front panel display to switch the tester from Program Mode to Run Mode.

You can only Toggle from Program Mode and Run Mode from Raptor Unit only (i.e., not from Bluetooth connected device).

2. Once in Run Mode, Press the **Green Start Button**  on the Raptor's front panel display (bottom right) to begin a test. When the program is running, the yellow LED lights.

3. Once the test is finished, the yellow LED dims and either a green or red LED lights on the Raptor's front display indicating the part's status: **Red LED:** Abort (rejected) or **Green:** Pass.

You can only Start and Stop Tests from Raptor Unit front panel or I/O Start and Stop inputs (i.e., not from Bluetooth connected device).

5.3 Run Mode Software Screen

The Raptor's run mode data is viewed using the Raptor Client software.

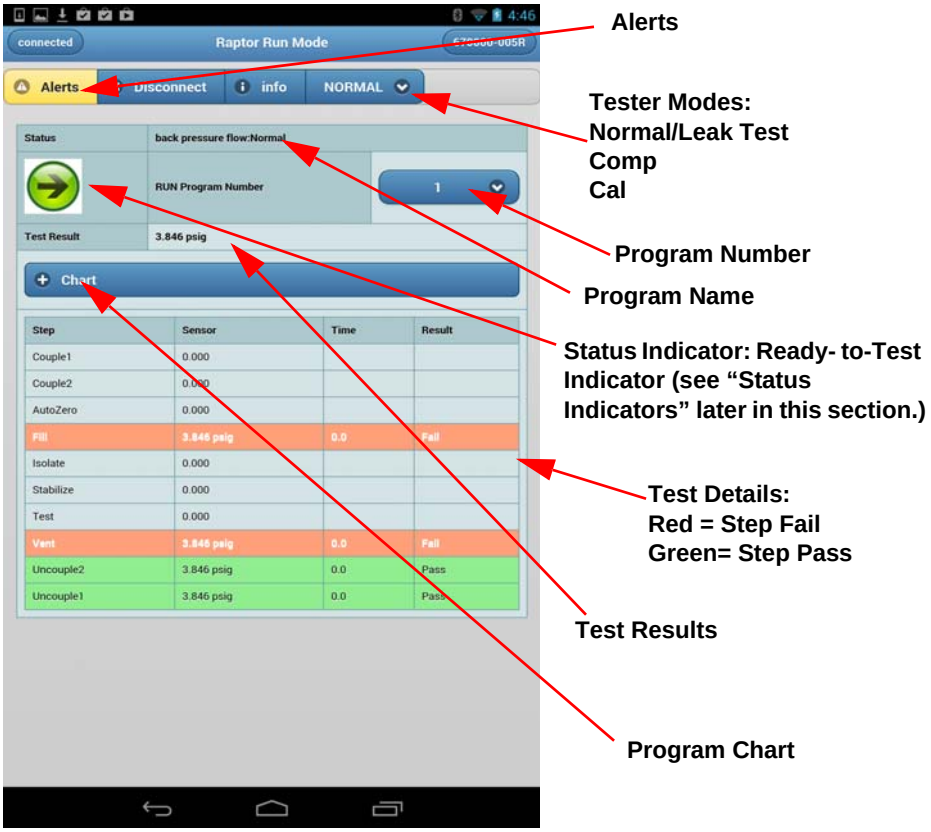
The Run mode main screen displays when the Raptor is in Run Mode. Likewise, when the unit is switched to Program Mode, the software switches to Program Mode screens.

To view the current program's run mode data:

1. Make sure the unit is placed in Run Mode by pressing the **Program Mode/ Run Mode Toggle Button**  on the Raptor's front panel display.

2. Once the unit is in Run Mode, the Android application displays the main Run Mode screen, as shown in *Figure 5–2*.

Figure 5–2: Raptor Run Mode Screen



5.3.1 Alerts

Program generated alerts are listed under Alerts. Press the Alerts Button  to access alerts (see Troubleshooting Section for Alert descriptions).

5.3.2 Tester Modes

There are three tester modes in Run Mode:

- **Normal mode:** Leak Test mode
- **Comp Mode:** Used to perform a compensation test on a non-leaking customer's part.
- **Cal Mode:** Used to perform a calibration test on a non-leaking customer's part in conjunction with a calibrated leak master.

To switch to a different mode, select the mode's down arrow, then select desired mode (see *Figure 5–2*).

5.3.3 Comp Mode

See *"Comp/Cal" on page 7-1.*

5.3.4 Cal Mode

See *"Comp/Cal" on page 7-1.*

5.3.5 Status Indicators (Ready/Not Ready)

Status indicators show whether the tester is Ready-to-Test or Not Ready-to-Test. The green arrow  indicates the tester is Ready-to-Test, the red octagon with hand  indicates the tester is Not Ready-to-Test.

Not Ready-to-Test indicators include a hexadecimal number (code) that corresponds to a particular tester condition that needs to remedied before the tester can resume testing, as shown in *Figure 5–3*. See *Table 5–1* for code descriptions.

Figure 5–3: Not-Ready-to-Test Indicator

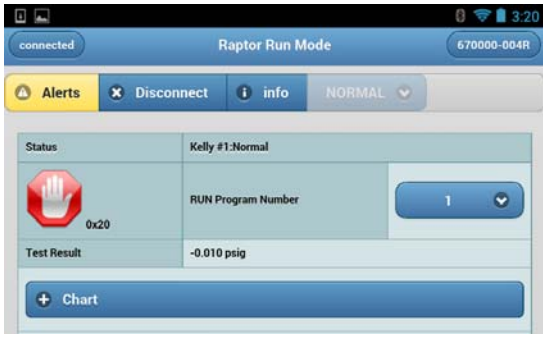


Table 5–1: Status Indicator Codes (Ready/Not Ready)

Indicator	Code	Definition
	**N/A**	Tester ready-to-test (run).
	**0x01**	Tester not ready-to-test (run).
	**0x02**	Tester not in run mode.
	**0x04**	MAC address invalid.
	**0x08**	Invalid serial number.
	**0x10**	License issue.
	**0x20**	Logging issue.

Indicator	Code	Definition
	**0x40**	Comp issue.
	**0x80**	Network connection issue,
	**0x100**	Network share issue.

5.3.6 Test Results

Shows a numeric test result.

6
Sensor Calibration

6.1 Overview

For the purposes of this manual, there is a difference between Sensor Calibration and Leak Calibration.

Leak Calibration, also known as Comp/Cal, is the process by which the tester is ‘taught’ to accept a non-leaking part and reject a leaking part.

Sensor Calibration is accomplished by setting calibration points to known air pressures by using an accurate traceable standard. This assures that the measurement made by the sensor corresponds to the actual pressure.

A two point calibration, also known as zero and span, assigns the value of zero pressure to the output of the sensor when zero pressure (atmospheric pressure) is applied to the sensor, and assigns a full scale pressure value when real full scale pressure is applied to the sensor.

WARNING: AVOID DATA ERRORS. Since sensor calibration affects the foundation of the tester’s accuracy, it should only be performed by qualified technicians with access to certified metrological equipment. Do not attempt a sensor calibration until you fully understand sensor calibration requirements.

6.2 Sensor Calibration Procedure

Use the following steps to perform Sensor Calibration:

1. To access the Sensor Calibration Screens, navigate to **Program Mode >Hardware Menu> Sensor Calibration** menu, as shown in *Figure 6–1*.

2. Connect a DPG (Digital Pressure Gauge) to the test port with the regulator set to zero.

3. Press **Start Calibration**, the software will select the zero calibration point.

4.When the DPG is at zero (atmosphere) press **Accept**, the software will select span.

5. Adjust the regulator to the appropriate pressure and press **Accept**.

6. Press **Save Calibration** when finished, the press the **back button** to exit the calibration menu.

Figure 6–1: Sensor Calibration Screen

7
Comp/Cal

7.1 Overview

For the purposes of this manual, there is a difference between Sensor Calibration and Leak Calibration.

Sensor Calibration is accomplished by setting calibration points to known air pressures with the use of an accurate traceable standard. This assures that the measurement made by the sensor corresponds to the actual pressure value.

Leak Calibration, also known as Comp /Cal, is the process by which the tester is 'taught' to accept a non-leaking part and reject a leaking part.

Leak calibration is a two-step process: the first step is Compensation (Comp), the second is Calibration (Cal).

- **Compensation (Comp):** A test is run with a non-leaking master part installed. This is done to establish and record the small pressure decay characteristics of the non-leaking part and the pneumatic system. In effect, the Comp test compensates for system conditions that may appear to be leaks but are not.
- **Calibration (Cal):** A test is run with a non-leaking master part installed and a calibrated Leak Master added to the circuit. This is done to quantify the pressure loss with a known leak rate. This pressure loss is the equated to the leak rate in sccm. In effect, the cal test calibrates the tester to know what a leak looks like.

Since the basic process of Comp/Cal is quantifying the characteristics of a non-leak and leak for a specific set of test parameters on a specific fixture, changing any test program parameters will invalidate the Comp/Cal; therefore, Comp/Cal will be required after making any changes to the test fixture.

A Comp/Cal procedure is required if any changes are made to the test fixture.

The tester will not run any programs if the unit is switched to Run Mode and there are invalidated or incomplete Comp/Cal procedures within the marked downloaded programs. In Program Mode, unmark the tests that require Comp/ Cal for download to allow other tests to run while in Run Mode.

.

Comp/Cal values can be entered manually.

7.1.1 When to Perform Comp/Cal

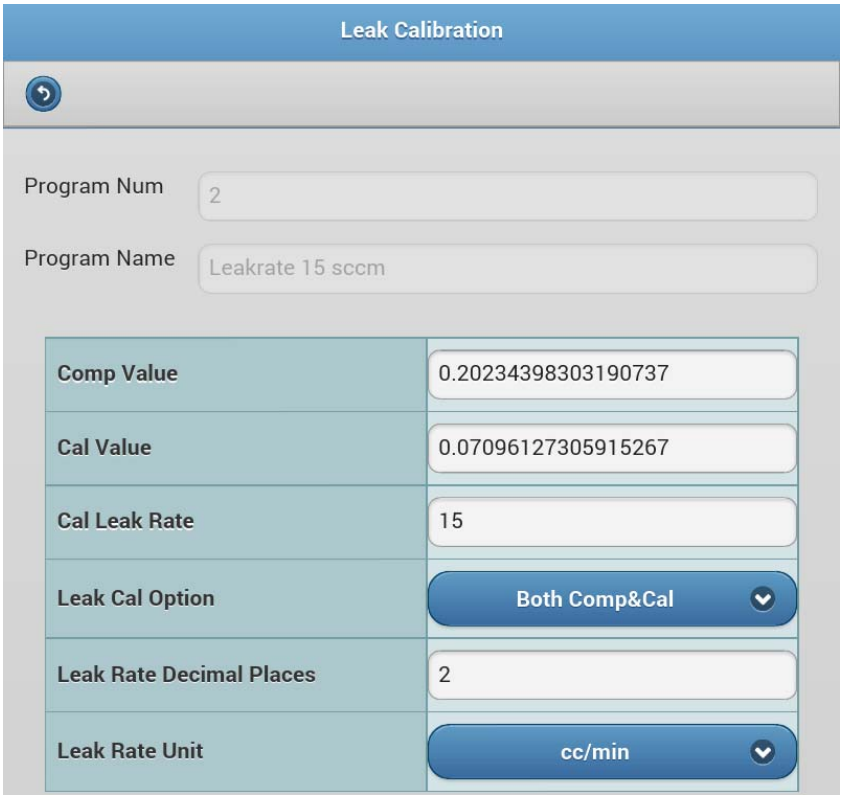
If you make any changes to the parameters of the test after performing a Comp/Cal, the Comp/Cal becomes invalid. A Comp/Cal will be required if you make changes to parameters in tests that require Comp/Cal.

7.2 Comp/Cal Procedure

Use the following steps to perform Comp/Cal:

1. Enter **Program mode**.
2. Navigate to **Config Home>Program.**
3. Select desired programs. Enter all parameters.
4. Press **Leak calibration** at the top of the screen.
5. Enter **Leak Rate** (Leak master value). See *Figure 7–1*.

Figure 7–1: Leak Calibration



6. Select Leak Cal option: **both comp&cal**. See figure *Figure 7–2*.

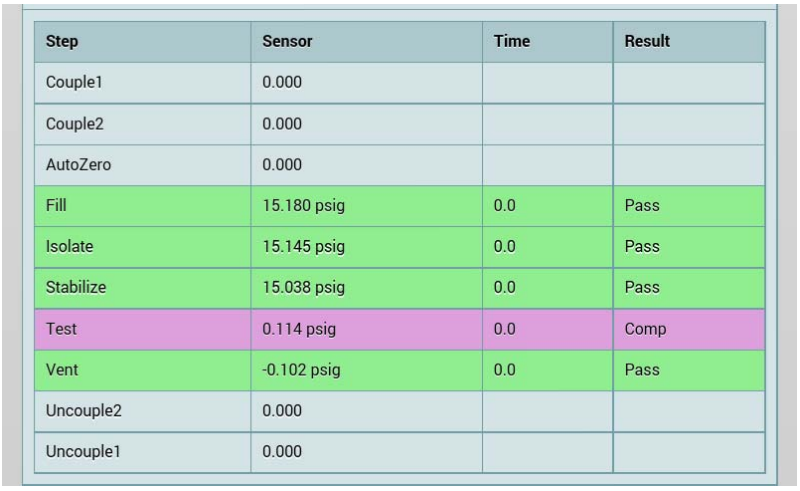
Figure 7–2: Leak Calibration Option Screen

7. Select the desired leak rate decimal place and leak rate units. See *Figure 7–3*.

Figure 7–3: Leak Rate Units

8. Enter **Run Mode**: Select the **comp/cal program** that was just created, and at the bottom of the screen, press **arrow** next to normal. Select **comp** and start a test with a known good part. *Figure 7–4* shows an example Comp test screen result, which displays in Magenta.

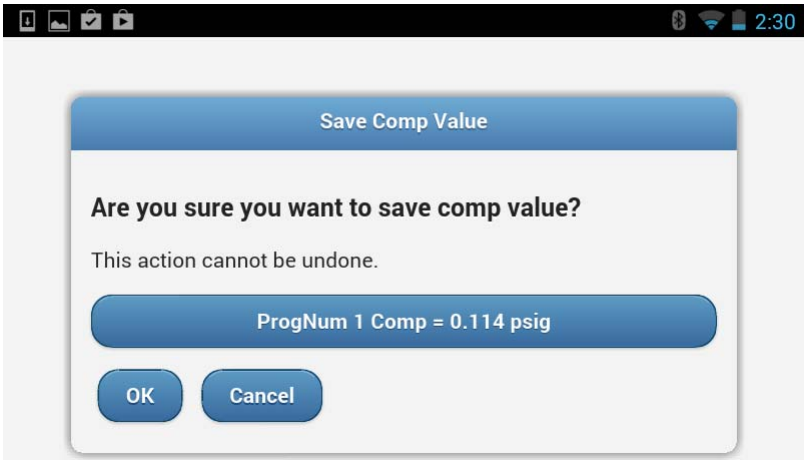
Figure 7–4: Comp Run Mode Example Screen



Step	Sensor	Time	Result
Couple1	0.000		
Couple2	0.000		
AutoZero	0.000		
Fill	15.180 psig	0.0	Pass
Isolate	15.145 psig	0.0	Pass
Stabilize	15.038 psig	0.0	Pass
Test	0.114 psig	0.0	Comp
Vent	-0.102 psig	0.0	Pass
Uncouple2	0.000		
Uncouple1	0.000		

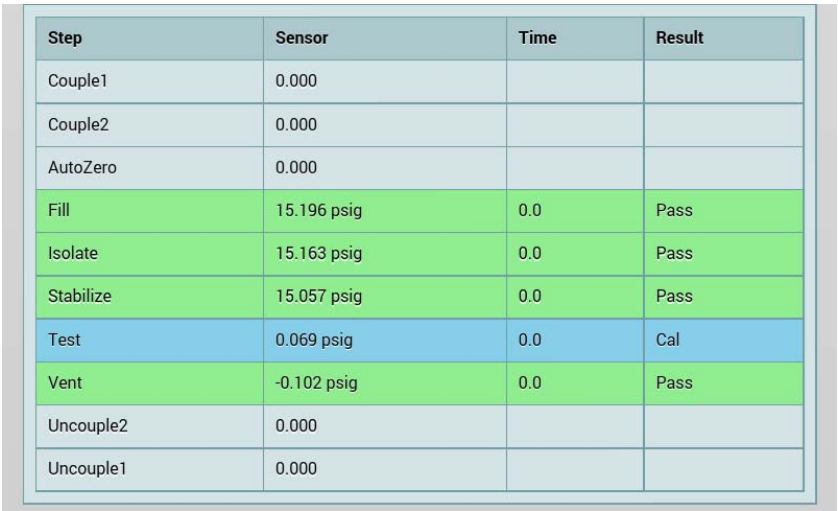
9. When the test is finished, the message “Are you sure you want to save comp value?” displays, as shown in *Figure 7–5*. Press “**OK”** to save or “**Cancel**” if you don’t.

Figure 7–5: Save Comp Value Screen



10. Press the **arrow** next to normal and select **Cal** to start a test with a known good part and appropriate leak master. *Figure 7–6* shows an example Cal test screen result, which displays in Blue.

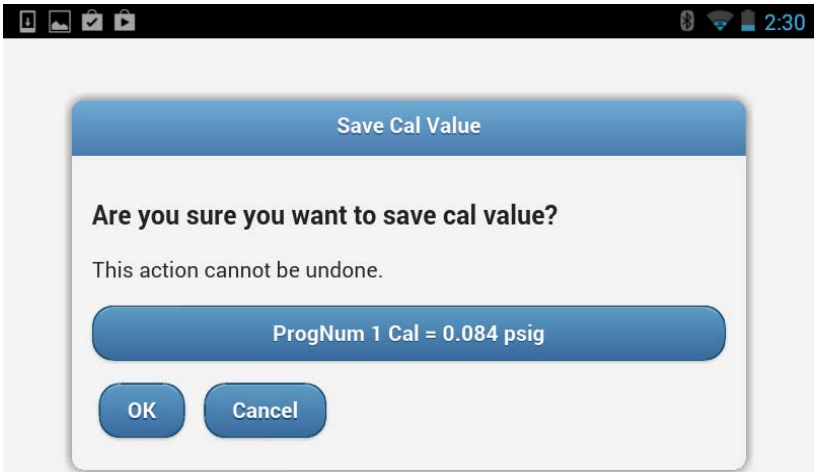
Figure 7–6: Cal Run Mode Example Screen



Step	Sensor	Time	Result
Couple1	0.000		
Couple2	0.000		
AutoZero	0.000		
Fill	15.196 psig	0.0	Pass
Isolate	15.163 psig	0.0	Pass
Stabilize	15.057 psig	0.0	Pass
Test	0.069 psig	0.0	Cal
Vent	-0.102 psig	0.0	Pass
Uncouple2	0.000		
Uncouple1	0.000		

11. After the test is finished, the message “Are you sure you want to save cal value?” message displays, as shown in *Figure 7–7*. Select “**OK**” to save or “**Cancel**” if you don’t.

Figure 7–7: Save Cal Value Screen



8 Basic Leak Testing

8.1 Leak Phases

A simple leak test cycle consists of the following phases:

Fill Phase:

The Fill Phase is when the test component is filled to the required test pressure.

Isolate Phase:

In the isolate phase, the filled component is isolated from the fill source.

Stabilize Phase:

During the Stabilize Phase the pressure and temperature in the test component achieve equilibrium.

Test Phase:

The Test Phase is when the instrument discriminates between a good and a leaking component. The detected leak must remain within preset limits or the test will end with either a rejected or salvageable component.

Vent Phase:

During the Vent Phase, the test component is vented to atmosphere.

8.1.1 Back Pressure Fill Test Method

There are times when the part under test contains a large passage (e.g.,a hole), or lack there of. If direct pressure is applied to a test part like this (i.e., fill step) the test pressure drops significantly, and with limits set appropriately, creates an accept. If the hole is blocked, or occluded, the pressure reads higher because of the blockage from the back pressure created (back pressure fill). This test method is detected when the user sets the Isolate/Stabilize/Test step times to 0. Then, the graded step, or test accept/reject is based on the results of the Fill step only.

8.2 Test Results: Pass or Fail

The Raptor makes it very easy to determine the test results. The display clearly indicate Pass or Fail at the end of the test. Green indicates a Pass result, Red indicates fail (reject).

9 Application Notes

9.1 Raptor Offline and Database Operations

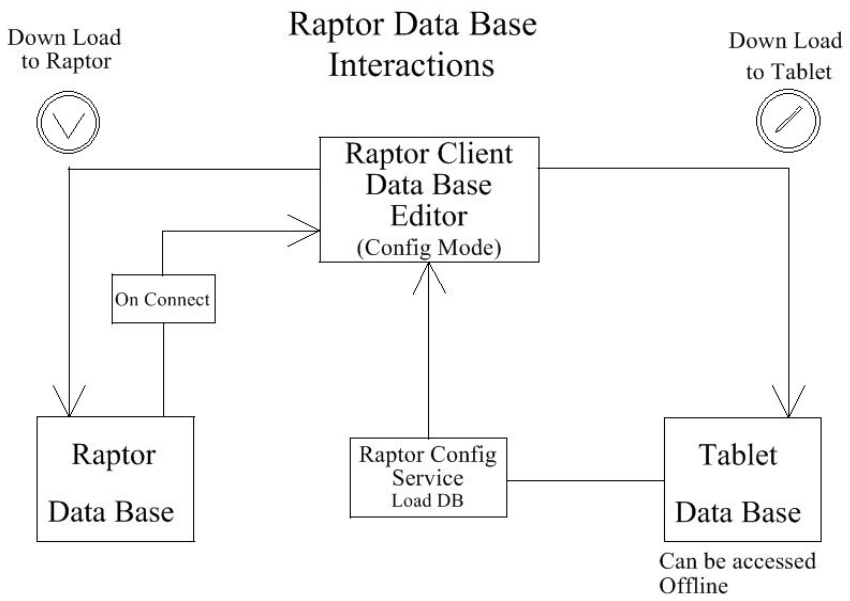
Uson's Raptor tester allows you to edit program parameters offline (i.e., not connected to the tester), so when a connection is made, program parameters can be downloaded to the tester quickly, which makes setting up a test easier and faster.

This application note discusses:

- Offline capabilities,
- Raptor database
- Tablet database
- Uson Raptor Client Application database editor

The interaction and operations of these features provide an easy method to modify, download, and backup program parameters. *Figure 9–1* shows how these features interact.

Figure 9–1: Database Interactions



9.1.1 Offline Operations

Using the Raptor Offline mode, program parameters can be edited and modified without being connected to the tester.

1. To use the offline mode, start the **Uson Raptor Client** application. The Raptor Client splash screen displays, as shown in *Figure 9–2*.

Figure 9–2: Raptor Client Splash Screen

2. Next, select the appropriate **Senor Model** range, as shown in *Figure 9–3*.

Figure 9–3: Sensor Model Ranges Screen

3. After the selecting the desired Sensor Model, all the current Serial Numbers for that model type display, as shown in *Figure 9–4*.

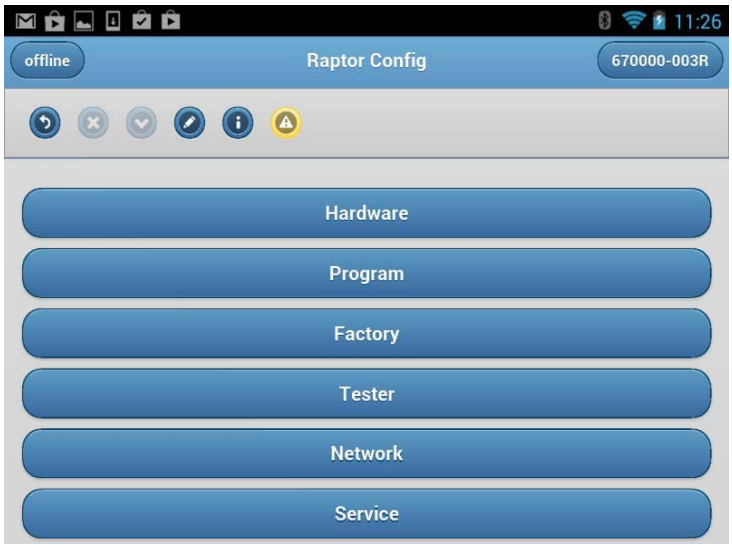
Serial Number 999999-999R is a default data base for all sensor models.

Figure 9–4: Serial Number List Screen

9.1.2 Editing an Existing Database

1. Select the Serial Number of the data base to be modified. For this example, serial number 670000-003R was selected, as shown in *Figure 9–5*.

Figure 9–5: Offline Configuration Screen for Selected Serial Number

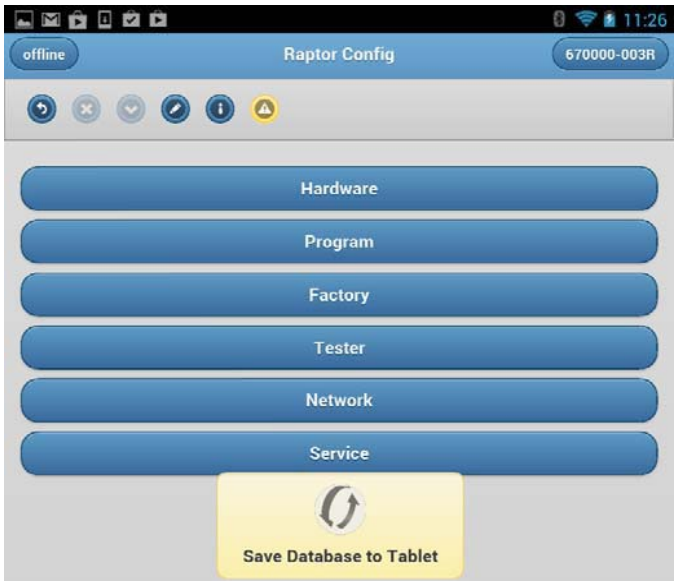


2. The status is as follows:

- A. Offline is displayed in the upper left box indicating the Raptor Client application is not currently connected to the tester.
- B. Serial number 670000-003R is displayed in the upper right box indicating that the data base residing on the Tablet for 670000-003R has been loaded into the Raptor Client data base editor.

3. After completing the desired changes to the program and test parameters, **SAVE** changes by selecting the '**Download to Tablet**' Icon  from the top tool bar. After saving, *Figure 9–6* displays.

Figure 9–6: Saving Database to Tablet Screen



4. Press the **Back** button  to return to the Client splash screen.

9.1.3 Creating a New Database

1. To create a database for a tester with a new Serial Number, select the **+ Create** button on the Raptor Client splash screen, as shown in *Figure 9–7*.

Figure 9–7: Create Database Screen

2. Select the appropriate **Senor Model** range.

3. Select **Serial Numbe**r.

4. Enter the desired serial number using the pop-up keypad, see *Figure 9–8*.

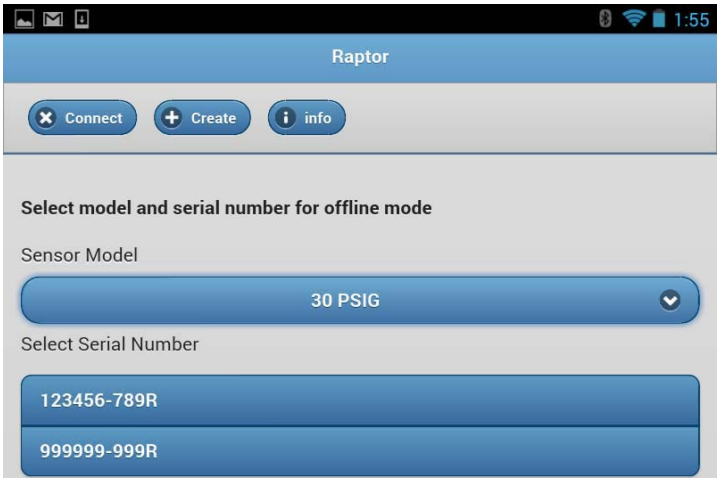
Figure 9–8: Raptor Add Serial Number Screen

5. Select **Add new Serial Number**.

6. Select the **Back** button.

7. Refresh the Client splash screen by selecting a different Sensor model and then selecting the newly created Sensor model. The new serial number will appear on the list, as shown in *Figure 9–9*.

Figure 9–9: Serial Number List (New Serial Number)



9.1.4 Data Base Operations When Connected

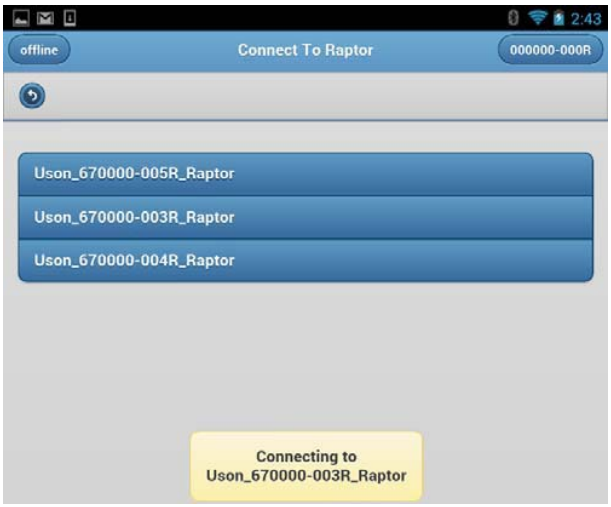
An important concept to remember about Raptor is that there are two data bases involved:

- The first data base resides on the Raptor tester itself. This is the data base used by the tester while in Run mode for program and test parameters.
- The second data base resides on the Tablet running the Uson Raptor Client application. This data base can be used for offline editing or serve as a tester data base backup or both.

9.1.5 Connecting Tester to Raptor Client App

Figure 9–10 shows the Uson Raptor Client application in the process of connecting to tester serial number 670000-003R.

Figure 9–10: Connecting to Tester Screen



When the connection process is complete the following screen displays, as shown in *Figure 9–11*.

Figure 9–11: Raptor Config Home Screen

When the Raptor tester and Uson Raptor Client application connect, the parameters from the Raptor tester database automatically load into the Database Editor.

9.1.6 Downloading Data Base Editor to Test Data Base

To download the current information in the Data Base Editor to the Raptor Tester data base, select the **Download to Tester** Icon  . After selecting the Download to Tester Icon, *Figure 9–12* and *Figure 9–13* display.

Figure 9–12: Download in Progress Screen

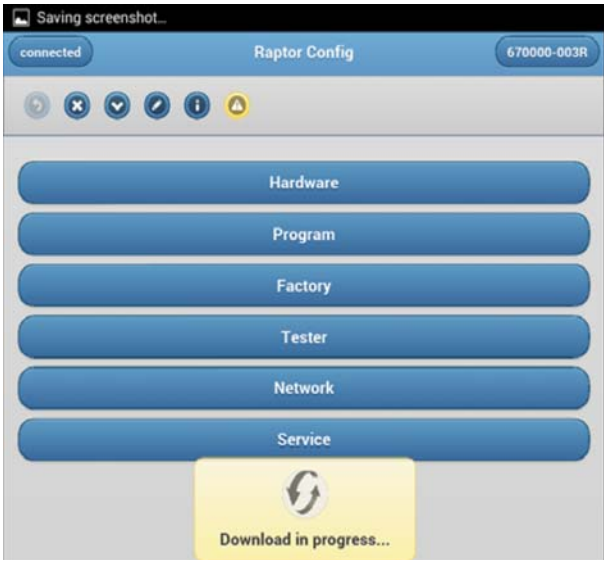
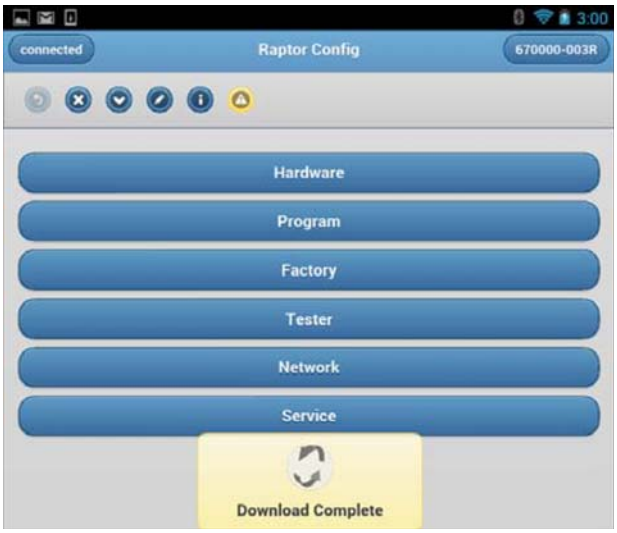


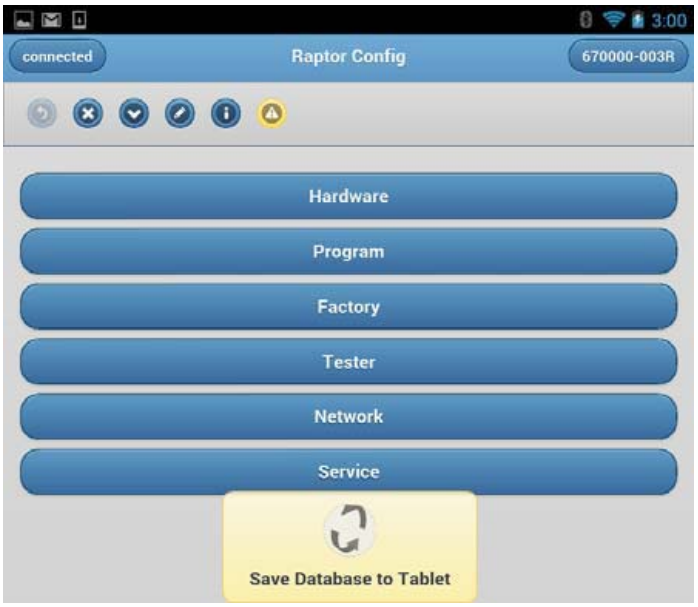
Figure 9–13: Download Complete Screen



9.1.7 Downloading Database Editor to Tablet Database

To download the current information in the Database Editor to the Tablet database, select the **Download to Tablet** Icon. After selecting the Download to Tablet Icon, *Figure 9–14* displays.

Figure 9–14: Saving to Tablet Database Screen



9.1.8 UpLoading Tablet Data Base to the Database Editor

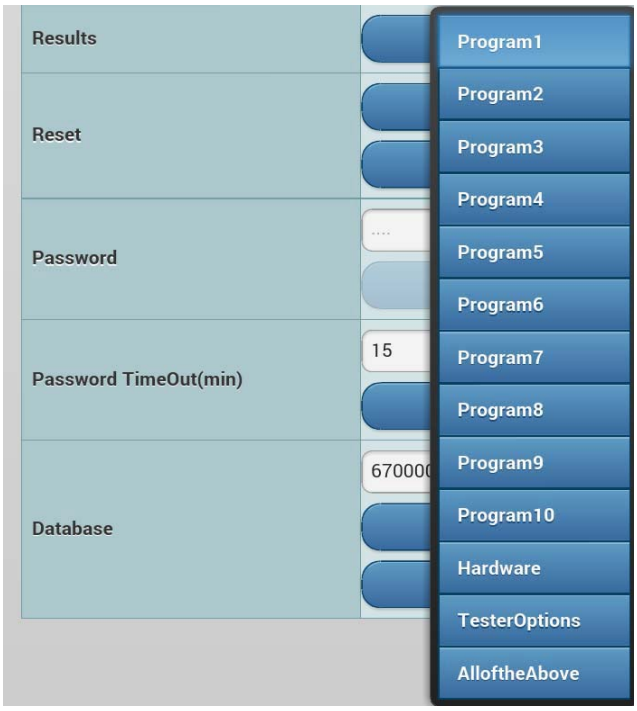
1. Select the **Service** button.

2. Enter the Serial Number of the Tablet database to be uploaded in the database options. See *Figure 9–15*.

Figure 9–15: Serial Number of the Tablet Database to be Uploaded

3. Select the desired parameters to upload, as shown in *Figure 9–16*.

Figure 9–16: Database Parameters to be Uploaded



4. Select **Load DB**. See *Figure 9–17*.

Figure 9–17: Select Load Database (DB) Screen

5. The Tablet Database has now been uploaded into the database editor.

6. Press the **Back** button to return to the Raptor Config screen.

With the Tablet Database now loaded into the Database Editor, the Download to tester Icon can be selected, which provides a means of tester backup from the Tablet Database.

10 Troubleshooting

If you encounter a problem with your Raptor, first review the following troubleshooting table.

If problem persist, call Uson's Service Manager at (1) (281)- 671-2000 between the hours of 8 a.m. and 5 p.m., USA Central time. The Service Manager will assign a tracking number, evaluate the situation, and schedule service resources as required.

10.1 Alerts

Table 10–1: Raptor Tablet/Phone Client App: Alert Descriptions

Alert	Description
01	Msg Id.
02	Connection Request Timed out.
03	Failed to retrieve password...Password disabled.
04	Request Tester Password Timeout.
05	Error Reading License.
06	Read Tester License Timeout.
07	Error Read Factory Config Database.
08	Req Factory DB Timeout.
09	Please Connect to a Raptor tester.
10	Error Request DB. Error Code,
11	Database Request Timeout .
12	Download Error.
13	Download Timeout.
14	Error Reading Options.
15	Serial number directory created.
16	SensorCal Accept Time out.
17	Sensor Calibration Error.
18	SensorCal download Time out.
19	SensorCal SaveOp Time out.

Alert	Description
20	Sensor Calibration SaveOP Error
21	SensorCal Stop OP Time out.
22	Sensor Stop Calibration Error.
23	Sensor Calibration Error.
24	SensorCal Start OP Time out.
25	Error Setting Raptor Date & Time.
26	Set Hardware clock timeout.
27	Error creating model directories.
28	Error Resetting password..
29	Raptor License Update Failed.Error Code.
30	Raptor Firmware Update Failed.
31	Export Result Log Operation Failed.
32	Error set password timeout.
33	Error Clear Count.
34	Error Clear log.

Table 10–2: Raptor Tester: Alert Descriptions

Alert	Description
99	Unknown Internal Failure.
100	Factory Configuration Database, Write Operation, Database Corrupt.
101	Factory Configuration Database, Write Operation, Open Failed.
102	Factory Configuration Database, Write Operation, Failed RD_PROGRAM_INVALID_PROGRAM_NUMBER.
200	Program Database, Read Operation, Invalid Program#.
201	Program Database, Read Operation, Database Corrupt.
202	Program Database, Write Operation, Database Corrupt.
203	Program Database, Write Operation, Open Failed.
204	Program Database, Write Operation, Write Failed.
205	Program Database, Write Operation, Invalid Program#.
300	Options Database, Read Operation, Database Corrupt.

Alert	Description
301	Options Database, Write Operation, Database Corrupt.
302	Options Database, Write Operation, Open Failed.
303	Options Database, Write Operation, Write Failed.
400	Sensor Database, Read Operation, Database Corrupt.
401	Sensor Database, Write Operation, Database Corrupt.
402	Sensor Database, Write Operation, Open Failed.
403	Sensor Database, Write Operation, Write Failed.
500	Set Time & Date, Format Error.
501	Set Time & Date, Internal Error Setting Time & Date.
502	Set Time & Date, Real-Time-Clock Error Setting Time & Date.
600	License, Write Operation, Open Failed.
601	License, Write Operation, Write Failed.
700	Export Result Log, Invalid Destination Selected.
701	Export Result Log, Destination Not Available.
702	Export Result Log, Invalid File Path.
703	Export Result Log, Open Failure.
704	Export Result Log, Write Failure.
705	Export Result Log, Internal State Failure.
706	Export Result Log, Not In Communications Mode.
707	Export Result Log, Destination Mount Failure.
708	Export Result Log, Internal Failure.
800	Firmware Update, Image Extraction Failure.
801	Firmware Update, Image Source Path Not Available.
802	Firmware Update, Image Source File Open Failure.
803	Firmware Update, Not In Communications Mode.
804	Firmware Update, Internal Failure.
805	Firmware Update, Image Source File Not Available.
806	Firmware Update, Image Not Found.
900	Write Password, Open Failed.

Alert	Description
901	Write Password, Write Failed.
902	Read Password, Open Failed.
903	Read Password, Value Invalid.
904	Read Password, Value Not Found.
1000	Clear Result Log, Internal Error.
1001	Clear Result Log, Internal State Failure.
1002	Clear Result Cycle Count, Internal Error.
1003	Clear Result Cycle Count, Internal State Failure.
1100	Configuration Mode Operation Command, Internal Error.
1101	Configuration Mode Operation Command, Internal State Failure.
1200	Bluetooth Communications, Missing Frame Marker, Buffer Search Found Marker.
1201	Bluetooth Communications, Missing Frame Marker, Deleted Buffer.
1202	Bluetooth Communications, Frame Had Incorrect CRC.
1203	Bluetooth Communications, Time-out While Waiting For Complete Message Frame.
1300	Start of Error Code Range Reserved For Tablet/Phone.
1301	Bluetooth Receive, Internal Failure.
1302	Bluetooth Receive, Frame Had Bad CRC.
1303	Bluetooth Receive, Internal Failure, I/O Exception.
1304	Bluetooth Receive, Internal Failure, Out Of Bounds.
1305	Bluetooth Receive, Internal Failure, I/O Exception Clearing Stream.
1306	Bluetooth Receive, Internal Failure, Unexpected End Of Stream.
1307	Bluetooth Receive, Time-out Waiting For Message Header.
1308	Bluetooth Receive, Missing Frame Marker,
1309	Bluetooth Receive, Missing Frame Marker, Deleted Buffer.
1310	Bluetooth Receive, Frame Has Too Many Bytes.
1311	Bluetooth Receive, Packet Processing.
1312	Bluetooth Receive, Packet Processing,
1313	Bluetooth Receive, Packet Processing, Out Of Bounds.

Alert	Description
1314	Bluetooth Receive, Packet Processing, Read Only Exception.
1315	Bluetooth Receive, Packet Processing, Overflow Exception.
1316	Bluetooth Receive, Unknown Message.
1317	Bluetooth Receive, Time-out Waiting For Payload.
1318	Bluetooth Receive, Packet Processing, Out Of Bounds.
1319	Bluetooth Receive, Packet Processing, Read Only Exception.
1320	Bluetooth Receive, Packet Processing, Overflow.
1321	Bluetooth Receive, Packet Processing, Underflow Exception.
1322	Bluetooth, Internal Failure.
1323	Bluetooth, Internal Failure.
1324	Bluetooth, Internal Failure..
1325	Bluetooth, Internal Failure.
1400	Program Database, Download, Invalid Program# .
1401	Program Database, Download, Invalid Program# 1.
1402	Program Database, Download, Invalid Program# 2.
1403	Program Database, Download, Invalid Program# 3.
1404	Program Database, Download, Invalid Program# 4.
1405	Program Database, Download, Invalid Program# 5.
1406	Program Database, Download, Invalid Program# 6.
1407	Program Database, Download, Invalid Program# 7.
1408	Program Database, Download, Invalid Program# 8
1409	Program Database, Download, Invalid Program# 9.
1410	Program Database, Download, Invalid Program# 10.
1411	Options Database, Download, Invalid Format.
1412	Sensor Database, Download, Invalid Format.
1413	Factory Configuration Database, Download.
1414	Program Database, Upload, Invalid Program#.
1415	Invalid Operation, Internal Failure.
1500	Database Group Download, Time-out Waiting For Raptor.

Alert	Description
1501	Database Group Upload, Time-out Waiting For Raptor.
1502	Connect Operation, Time-out.
1503	Raptor Device Search, Time-out.
1504	Factory Configuration Database Upload.
1505	Options Database Upload, Time-out Waiting For Raptor Reply.
1506	Sensor Calibration Operation, Accept, Time-out Waiting For Raptor Reply.
1507	Sensor Calibration Operation, Save, Time-out Waiting For Raptor Reply.
1508	Sensor Calibration Operation, Start, Time-out Waiting For Raptor Reply.
1509	Sensor Calibration Operation, Stop, Time-out Waiting For Raptor Reply.
1510	Sensor Calibration Operation, Sensor Database Download, Time-out Waiting For Raptor Reply.
1511	Run Mode Operation, Time-out Waiting For Raptor Reply.
1512	Program Database Download, Time-out Waiting For Raptor Reply.
1513	Program Database Upload, Time-out Waiting For Raptor Reply.
1514	Options Database Download, Time-out Waiting For Raptor Reply.
1515	Set Time & Date, Time-out Waiting For Raptor Reply.
1516	License Download, Time-out Waiting For Raptor Reply.
1517	Raptor Firmware Update, Time-out Waiting For Raptor Reply.
1518	Export Result Log File, Time-out Waiting For Raptor Reply.
1519	Password Set, Time-out Waiting For Raptor Reply.
1520	Password Read, Time-out Waiting For Raptor Reply.
1521	Clear Result Cycle Count, Time-out Waiting For Raptor Reply.
1522	Clear Result Log, Time-out Waiting For Raptor Reply.
1523	License Status, Time-out Waiting For Raptor Reply.
1699	End of Error Code.
1700	License, Not Found/
1701	License, Refresh Failed.

Alert	Description
1702	License, Expired.
1703	License, Previously Used.
1704	License, Date & Time Invalid.
1705	License, Internal Failure.
1706	License, Installation Failure.
1707	License, Installation Failure.
1708	License, Installation Failure.
1709	License, Installation Failure.
1710	License, Installation Failure.
1711	License, Installation Failure,
1712	License, Installation Failure.
1713	License, Already In Use.
1714	License Status, Corrupt
1715	License Status, Not Installed
1716	License Status, Expiration Occurred
1717	License Status, Clock Turn-back Detected
1718	License Status, Date Turn-back Detected
1719	License Status, Unexpected Status
1720	License Status, Installation Time-out
1800	Unexpected Error, Value reported is 1800 plus Internal Error
1900	Program Selection, Bad Program#. Normally only occurs when have Program Selection via digital inputs.
2000	Logging, No Connection To Network.
2001	Logging, Could Not Mount Logging Destination.
2002	Logging, Bad Logging Destination.
2003	Logging, Logging Destination Not Available.
2004	Logging, Invalid Destination File Path.
2005	Logging, Failed To Open Destination File.
2006	Logging, Failed To Write Destination File
2007	Logging, Internal Failure.

Alert	Description
2008	Logging, Internal Failure.
2009	Logging, Internal Failure. These error codes originate from the Tablet/Phone.

11
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d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not.

Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

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b) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

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